Appendix G

Traffic Impact Analysis prepared by Keith Higgins Traffic Engineers

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RIO RANCH MARKETPLACE
TRAFFIC IMPACT ANALYSIS

ADMINISTRATIVE DRAFT REPORT

MONTEREY COUNTY, CALIFORNIA

Prepared for

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1 INTRODUCTION

This traffic study was prepared to analyze the impacts associated with the development of the proposed Rio Ranch Marketplace project located 3705 Rio Road in the Carmel Valley Master Plan Area of unincorporated Monterey County, California. **Exhibit 1** shows the location of the proposed project with respect to the local road network. **Exhibit 2** shows the proposed project site plan.

1.1 Project Description

The project site is located on a vacant 3.8-acre site on the north side of Rio Road. The proposed project includes a maximum of 42,310-square feet of commercial space in six buildings that will include a 23,000 square-foot specialty grocery store, small retail shops, restaurants and cafés, consumer-oriented professional services and two farm sheds. The farms sheds will each be 250 square-foot open-air structures with rotating uses such as casual food and beverage service, community and fundraising events, and seasonal merchants (i.e., pumpkin patch, Christmas trees, floral and agricultural products, etc.). The project will have its primary access at the Crossroads Boulevard / Rio Road intersection, which will be reconfigured from a signalized T-intersection to a signalized four-leg intersection. Secondary access will be provided through the existing Barnyard Shopping Center and Carmel Mission Inn parking areas.

1.2 Scope of Work

This study analyzes the traffic impacts of the proposed project on the surrounding roadway network. The study includes the evaluation of the following intersections:

1. State Route (SR) 1 / Carmel Valley Road (Caltrans)
2. Carmel Rancho Boulevard / Carmel Valley Road (Monterey County)
3. Rio Road / SR 1 (Caltrans)
4. Crossroads Boulevard / Rio Road (Monterey County)
5. Carmel Center Place / Rio Road (Monterey County)
6. Carmel Rancho Boulevard / Rio Road (Monterey County)
7. SR 1 / Ocean Avenue (Caltrans)
8. SR 1 / Carpenter Street (Caltrans)
9. Carmel Rancho Boulevard / Clocktower Place (Monterey County)
10. Via Nona Marie / Rio Road (Monterey County)
11. Rancho San Carlos Boulevard / Carmel Valley Road (Monterey County)
12. Valley Greens Drive / Carmel Valley Road (Monterey County)
13. SR 1 / Ribera Road (Caltrans)
14. Rio Road / Atherton Drive (Monterey County and City of Carmel)
15. Rio Road / Lasuen Drive (City of Carmel)
16. Rio Road / Santa Lucia Avenue (City of Carmel)
17. Rio Road-Junipero Street / 13th Avenue-Ridgewood Road (City of Carmel)

The study includes the evaluation of the following road segments:

1. SR 1, Carpenter Street to Ocean Avenue (Caltrans)
2. SR 1, Ocean Avenue to Carmel Valley Road (Caltrans)
3. SR 1, Carmel Valley Road to Rio Road (Caltrans)
4. SR 1, Rio Road to Ribera Road (Caltrans)
5. Rio Road, 13th Avenue to SR 1 (Monterey County and Carmel)
6. Carmel Valley Road, Robinson Canyon Road to Schulte Road (Monterey County)
7. Carmel Valley Road, Schulte Road to Rancho San Carlos Road (Monterey County)
8. Carmel Valley Road, Rancho San Carlos Road to Rio Road (Monterey County)
9. Carmel Valley Road, Rio Road to Carmel Rancho Boulevard (Monterey County)
10. Carmel Valley Road, Carmel Rancho Boulevard to SR 1 (Monterey County)
11. Carmel Rancho Boulevard, Carmel Valley Road to Rio Road (Monterey County)
12. Rio Road, Carmel Rancho Boulevard to SR 1(Monterey County)
13. SR 1, Ribera Road to Highlands Inn (Caltrans)
14. Crossroads Boulevard, Rio Road to Carmel Center Place (Monterey County)
15. Carmel Center Place, Rio Road to Crossroads Boulevard (Monterey County)

Maps showing the study intersections and road segments are provided in **Exhibits 3** and **4**, respectively. Beyond the limits of the study area, project trips disperse onto numerous local streets or regional facilities. The impact of dispersed project trips lessens as they move away from the project site. The study intersections included in the analysis were identified as potentially having the greatest impact from the project.

Weekday AM, PM, and Saturday peak hour traffic operations were analyzed for the following conditions:

1. Existing Conditions
2. Existing Plus Project Conditions
3. Background Conditions
4. Background Plus Project Conditions
5. Cumulative Conditions
6. Cumulative Plus Project Conditions

1.3 Traffic Operation Evaluation Methodologies and Level of Service Standards

The study area covers the jurisdictions of the County of Monterey, the City of Carmel-by-the-Sea, and Caltrans, and is within the Carmel Valley Master Plan area. Level of service standards and analysis methodologies for each jurisdiction and/or planning area have been applied as follows:

Traffic Operation Evaluation Methodologies

Intersection and road segment traffic operations were evaluated based on the Level of Service (LOS) concept, and the LOS standard adopted by the jurisdiction within which the intersection is located. LOS is a qualitative description of an intersection's operation, ranging from LOS A to LOS F. Level of service "A" represents free flow un-congested traffic conditions. Level of service "F" represents highly congested traffic conditions with what is commonly considered

unacceptable delay to vehicles at intersections. The intermediate levels of service represent incremental levels of congestion and delay between these two extremes.

Intersection traffic operations were evaluated using the Synchro analysis software (Version 9) which is based on the *Highway Capacity Manual (HCM) 2010* methodologies for signalized and un-signalized intersections. HCM 2000 methods were used in cases where the HCM 2010 methods do not allow the analysis of specific lane configurations or signal phasing.

Signalized and all-way stop controlled intersection operations are based on the average vehicular delay at the intersection. The average delay is then correlated to a level of service. For one-way and two-way stop controlled intersections, the vehicular delay for side street traffic is analyzed. LOS for each side street movement is based on the distribution of gaps in the major street traffic stream and driver judgment in selecting gaps. Improvements are warranted when a side street approach reaches LOS F for two-way stop controlled intersections. LOS descriptions for signalized intersections are included as **Appendix A**. LOS descriptions for one-way and two-way stop controlled intersections are included as **Appendix B**. LOS descriptions for all-way stop controlled intersections are included as **Appendix C**.

Arterial road segment operations are based on travel speed as a percentage of free flow speed, per Exhibit 17-2 of the 2010 HCM. Two-lane highway segment operations are based on percent time spent following (PTSF), per Exhibit 15-3 of the 2010 HCM. Multi-lane highway segment operations are based on density in passenger cars per mile per lane (pc/mi/ln) per Exhibit 14-4 of the 2010 HCM. LOS descriptions for arterial, two-lane highway, and multi-lane highway road segments are included as **Appendix D**. The Carmel Valley Master Plan (CVMP) also provides the following average daily traffic (ADT) volume thresholds for the study segments along Carmel Valley Road (segments 6 – 12), which are provided in **Table 1**.

Table 1
Carmel Valley Road ADT Thresholds

Segment	CVMP Threshold
6. CVR between Robinson Canyon Rd & Schulte Rd	15,499
7. CVR between Schulte Rd & Rancho San Carlos Rd	16,340
8. CVR between Rancho San Carlos Rd & Rio Rd	48,487
9. CVR between Rio Rd & Carmel Rancho Blvd	51,401
10. CVR between Carmel Rancho Blvd & SR 1	27,839
11. Carmel Rancho Blvd between CVR & Rio Rd	33,495
12. Rio Rd between Carmel Rancho Blvd & SR 1	33,928

Level of Service Standards

The Monterey County Public Works Department has established LOS D as the minimum acceptable level of service for signalized intersections and road segments. For un-signalized intersections LOS E is considered the maximum acceptable level of service for the worst movement/approach. Improvements are warranted when the minor street approach operates at

LOS F and any traffic control warrant is met. The LOS standard for the City of Carmel-by-the-Sea is LOS C.

Per the Caltrans "Guide for Preparation of Traffic Impact Studies" publication, "Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained." MOE refers to the measures of effectiveness which are used to describe the measures best suited for analyzing State highway facilities.

Except for some road segments along Carmel Valley Road, LOS C has been established as the minimum acceptable level of service for roadways and intersections within Carmel Valley. Per CVMP Policy 2.18, LOS D has been established as the minimum acceptable level of service for study segments 6 and 7, and LOS C has been established at the minimum acceptable level of service for study segments 9, 10, 11 and 12.

1.4 Criteria for Significant Project Impacts

According to the California Environmental Quality Act (CEQA) guidelines, a project may have a significant effect on the environment if it would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system. In accordance with CEQA, specific impact criteria have been applied to the study intersections and road segments to determine if the project specific increase in traffic is substantial in relation to the existing traffic load and capacity of the street system.

The study area falls within multiple jurisdictions and planning areas, as described in Section 1.3. The significance criteria for the relevant jurisdictions and planning areas are listed below and have been applied to the analysis results.

Monterey County

A significant impact at a signalized study intersection is defined to occur under the following conditions:

- A significant impact would occur if an intersection operating at LOS A, B, C or D degrades to E or F. For intersections already operating at unacceptable level E, a significant impact would occur if a project adds 0.01 or more during peak hours to the critical movement's volume-to-capacity ratio. If the intersection is already operating at LOS F, any increase (one vehicle) in the critical movement's volume-to-capacity ratio is considered significant.

A significant impact at an unsignalized study intersection is defined to occur under the following conditions:

- A significant impact would occur if any traffic movement has LOS F and any traffic signal warrant is met.

A significant impact at a study road segment is defined to occur under the following conditions:

- A significant impact would occur if a roadway segment operating at LOS A through LOS E degrades to a lower level of service E or F. If a segment is already operating at LOS F any increase during the peak hour (one vehicle) is considered significant.

Carmel Valley Master Plan (CVMP)

The Monterey County significance criteria were applied to the study intersections that are within the Carmel Valley Master Plan Area (intersections 2, 4, 5, 6, 9, 10, 11, & 12) as follows:

A significant impact at a signalized study intersection is defined to occur under the following conditions:

- A significant impact would occur if an intersection operating at LOS A, B or C degrades to LOS D, E or F. For intersections already operating at unacceptable level D or E, a significant impact would occur if a project adds 0.01 or more during peak hours to the critical movement's volume-to-capacity ratio. If the intersection is already operating at LOS F, any increase (one vehicle) in the critical movement's volume-to-capacity ratio is considered significant.

A significant impact at an unsignalized study intersection is defined to occur under the following conditions:

- A significant impact would occur if any traffic movement has LOS F or any traffic signal warrant is met.

A significant impact on a study road segment would occur if operations degrade from LOS C or better to LOS D, E or F (segments 8, 9, 10, 11, 12) or if operations degrade from LOS D or better to LOS E or F (segments 6, 7); or if project traffic worsens the LOS of a segment operating at LOS E; or if project traffic is added to a segment operating at LOS F; or if the CVMP ADT threshold is exceeded.

Caltrans

Caltrans perceives an impact when there is any degradation in the performance measure below the cusp of C/D. If a facility is currently operating at or below LOS D, then any trips added represent a potential impact, and the performance measure should be brought back to predevelopment conditions. While a single trip added to a degraded facility is not usually reflected in the performance measure, Caltrans reserves the ability to consider a single trip as an impact. Any project trips added to a Caltrans facility operating at LOS D or below that results in an increase in the average delay at intersections or increase in Percent Time Spent Following (PTSF) on road segments is considered a significant impact in this analysis.

1.5 Funding for Transportation Improvements

Carmel Valley Traffic Impact Improvement Program

The Carmel Valley Traffic Improvement Program (CVTIP) includes a list of projects to relieve congestion and improve traffic operations on Carmel Valley Road. The CVTIP collects fees from new developments to contribute to these improvements. The traffic fees apply to projects within Carmel Valley and to projects in the Greater Carmel Valley Area that will add traffic to Carmel Valley Road. Per the Carmel Valley Traffic Improvement Program EIR, the fee amounts are updated on an annual basis.

TAMC Fee

The Transportation Agency for Monterey County (TAMC) and its member jurisdictions have adopted a county-wide, regional impact fee to cover the costs for studies and construction of many improvements throughout Monterey County. This impact fee, which went into effect on August 27, 2008, is applied to all new development within Monterey County. The governing document for the fee is the *Regional Impact Fee Nexus Study Update* (March 26, 2008) prepared by Kimley-Horn Associates, Inc. The *Regional Impact Fee Nexus Study Update* was updated again in 2013.

Monterey County Traffic Impact Fee

The 2010 Monterey County General Plan, which was adopted October 26, 2010, includes the following policies:

Policy C-1.8 Development proposed in cities and adjacent counties shall be carefully reviewed to assess the proposed development's impact on the County's circulation system. The County, in consultation with TAMC and Monterey County cities shall, within 18 months of adoption of the General Plan, develop a County Traffic Impact fee that addresses Tier 2 impacts of development in cities and unincorporated areas. From the time of adoption of the General Plan until the time of adoption of a County Traffic Impact Fee, the County shall impose an ad hoc fee on its applicants based upon a fair share traffic impact fee study.

Policy C-1.9 All available public and private sources shall be used for the funding of road and highway development, improvement and maintenance.

Policy C-1.10 The County, in coordination with TAMC and other affected agencies, shall continue efforts to improve traffic congestion at critical locations.

Policy C-1.11 In addition to the County Traffic Impact Fee established in Policy C-1.8, the County shall require new development to pay a Regional Traffic Impact Fee developed collaboratively between TAMC, the County, and other local and state agencies to ensure a funding mechanism for regional transportation improvements mitigating Traffic Tier 3 impacts.

To date, a county-wide traffic fee program has yet to be adopted. However, the County has been assessing fees for the Countywide Traffic Impact fee on an ad hoc basis per the fee program's draft fee schedule.

TAMC Measure X Transportation Safety and Investment Plan

The voters of Monterey County in November 2016 approved Measure X. It is anticipated to generate an estimated $20 million annually for a total of $600 million over thirty years through a retail transactions and use tax of a three-eighths' of one- percent (3/8%). The revenue from the sales tax measure will be used to fund transportation safety and mobility projects in Monterey County. Projects in the vicinity of Carmel Valley include safety, operations, and maintenance improvements along Carmel Valley Road, and intersection safety improvements at the Carmel Valley Road / Laureles Grade intersection. This sales tax measure will leverage additional state and federal funds to expand the total funding available for transportation improvements in the County.

2 EXISTING CONDITIONS

This section describes the existing street network relevant to the proposed project and the existing operational traffic conditions.

2.1 Existing Road Network

The key roadways near the proposed project are described below:

State Route 1 (SR 1) provides regional access to the project site. SR 1 is a major north-south roadway that connects the Monterey Peninsula with San Luis Obispo County to the south, and with Santa Cruz County and the San Francisco Bay Area to the north. SR 1 is a four-lane freeway north of Carpenter Street, a four- to five-lane (the five-lane section has a two-way center left-turn lane) roadway between Carpenter Street and Ocean Avenue, a three-lane roadway (two lanes northbound and one lane southbound) between Ocean Avenue and Carmel Valley Road, and a two-lane roadway south of Carmel Valley Road. SR 1 is part of the Monterey County Congestion Management Program (CMP) highway network and is designated as a State Scenic Highway.

Carmel Valley Road, Rio Road, and Carmel Rancho Boulevard provide local access to the project site. These roadways are described below.

Carmel Valley Road is an east-west roadway that begins at SR 1 and continues east to the City of Greenfield. Carmel Valley Road has four lanes from SR 1 to approximately 1,800 feet west of Rancho San Carlos Road. Carmel Valley Road has two lanes east of Rancho San Carlos Road. Carmel Valley Road is classified as a major arterial.

Rio Road includes two discontinuous segments of roadway east and west of the project site. The eastern part is a short north-south two-lane segment that connects to Carmel Valley Road and provides access to Carmel Middle School and the Community Church of the Monterey Peninsula. The western part is an east-west roadway with two lanes between SR 1 and Junipero Street, and four lanes between SR 1 and Val Verde Drive.

Carmel Rancho Boulevard is a four-lane north-south roadway that extends from Carmel Valley Road to Rio Road. It provides access to various commercial developments and also serves through traffic between Carmel Valley Road and SR 1 south of Rio Road.

2.2 Existing Bicycle, Pedestrian, and Transit Facilities

The County of Monterey has adopted a Bikeway Plan that designates routes along roadways that can be used by bicycling commuters and recreational riders for safe access to major employers, shopping centers and schools. Consistent with State and Federal designations, there are three basic types of bicycle facilities. Each type is described below:

1. Bike path (Class I) - A separate right-of-way designed for the exclusive use of cyclists and pedestrians, with minimal crossings for motorists.
2. Bike lane (Class II) - A lane on a regular roadway, separated from the motorized vehicle right-of-way by paint striping, designated for the exclusive or semi-exclusive

use of bicycles. Bike lanes allow one-way bike travel. Through travel by motor vehicles or pedestrians is prohibited, but crossing by pedestrians and motorists is permitted.

3. Bike route (Class III) - Provides shared use of the roadway with motorists, designated by signs or permanent markings.

Near the proposed project, Class II bike lanes are provided on the north side of Carmel Valley Road east of Carmel Rancho Boulevard, and on the south side Carmel Valley Road east of Carmel Middle School.

Sidewalks near the project site are provided on portions of Rio Road between Val Verde Drive and SR 1, and a Class I multi-use path is provided on the east side of SR 1 beginning at the Crossroads Shopping Center and continuing north to Canyon Drive.

The primary public transit service in the County of Monterey is the bus service provided by Monterey-Salinas Transit (MST). Near the project site, MST Route 24 provides bus service along Rio Road, Carmel Rancho Boulevard and Carmel Valley Road between Carmel Valley Village and the Monterey Transit Plaza with 60-minute headways during weekday peak hours. Bus stops within the study area are located on Carmel Rancho Boulevard north and south of Clock Tower Lane and on Rio Road between Carmel Center Place and Via Nona Marie.

2.3 Existing Intersection Operations

Weekday AM, PM, and Saturday peak hour turning movement counts were conducted at the study intersections in May, September, and November 2017. Peak hour traffic volumes at the commercial driveways along Rio Road between SR 1 and Carmel Rancho Boulevard were also counted. The raw traffic count data is included as **Appendix E**.

The raw traffic counts were balanced where appropriate. Weekday AM, PM, and Saturday peak hour traffic volumes at the study intersections are shown in **Exhibit 5**. Weekday AM, PM, and Saturday peak hour traffic volumes near the project site, including the commercial driveways on Rio Road, are shown in **Exhibit 6**.

Intersection levels of service are summarized in **Exhibit 7**. LOS calculation worksheets are included as **Appendix F**. The Caltrans peak hour signal warrant worksheet for the Carmel Rancho Boulevard / Clocktower Place intersection is included in **Appendix G.** Based on the level of service standards, all the study intersections operate at acceptable levels of service under Existing conditions with the following exceptions. These intersections operate at an unacceptable LOS D or E under Existing traffic conditions

- Intersection 3 – SR 1 / Rio Road – Caltrans, TAMC and Monterey County are completing the design of a second northbound SR 1 travel lane from just south of Rio Road to Carmel Valley Road where one northbound travel lane is currently provided. Additional improvements are also proposed at the Rio Road intersection including a second southbound through lane. This improvement will be constructed in the next several years.

- Intersection 8 – SR 1 / Carpenter Street – The provision of a third northbound through lane would improve traffic operations to an acceptable level. However, no improvements are currently planned at this intersection.

2.4 Existing Road Segment Operations

Peak hour segment volumes along SR 1, Rio Road, Carmel Rancho Boulevard, Crossroads Boulevard, and Carmel Center Place were derived from the traffic counts described in Section 2.3. Carmel Valley Road peak hour and Average Daily Traffic (ADT) volumes were obtained from Monterey County Department of Public Works staff. The Monterey County Department of Public Works conducts counts along Carmel Valley Road in June and October each year. The latest data available was from June and October 2016. The June and October 2016 counts were compared and the highest counts (which were conducted in October 2016) were used in the analysis. ADT volumes on Carmel Rancho Boulevard and Rio Road were also obtained from Monterey County staff. For these roadways, the June 2016 ADTs were higher, therefore the June 2016 ADT counts were used for these roadways.

Road segment levels of service are summarized in **Exhibit 8**. LOS calculation worksheets are included as **Appendix H**.

Except for segment 7, the ADT's on the roadways included in the Carmel Valley Master Plan (CVMP) are below the CVMP ADT thresholds under Existing conditions.

Based on the level of service standards, the following study road segments operate at unacceptable levels of service during the weekday AM, PM, and/or Saturday peak hours:

- Segment 2 – SB SR 1: Ocean Ave to Carmel Valley Rd
- Segment 3 – NB & SB SR 1: Carmel Valley Rd to Rio Rd
- Segment 4 – NB & SB SR 1: Rio Road to Ribera Road
- Segment 6 – EB & WB Carmel Valley Rd: Robinson Canyon Rd to Schulte Rd
- Segment 7 – EB & WB Carmel Valley Rd: Schulte Rd to Rancho San Carlos Rd
- Segment 12 – WB Rio Road: Carmel Rancho Blvd to SR 1
- Segment 13 – NB & SB SR 1: Ribera Rd to Highlands Inn

These road segments operate at an unacceptable LOS D, E, or F under Existing traffic conditions. The only scheduled segment improvement is the second northbound through lane described for Intersection 3 above. This improvement will improve traffic operations on Segment 12. No other segment improvements are currently planned.

3 PROJECT TRIP GENERATION, DISTRIBUTION, AND ASSIGNMENT

The procedures for generating and assigning project trips to the local road network are described in this section.

3.1 Project Trip Generation

The proposed project includes a maximum of 42,310-square feet of commercial space in six buildings that will include a 23,000 square-foot specialty grocery store, small retail shops, restaurants and cafés, consumer-oriented professional services and two farm sheds. The farm sheds will each be 250 square-foot open-air structures with rotating uses such as casual food and beverage service, community and fundraising events, and seasonal merchants (i.e., pumpkin patch, Christmas trees, floral and agricultural products, etc.).

Trip generation rates published by the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition (2012) were used to estimate the trips that will be generated by the proposed project using the ITE land use code for a shopping center (820). Trips generated by the project are categorized as primary trips, pass-by and diverted linked trips, and trips to and from the existing retail businesses near the project. The project trip generation estimate is presented in **Exhibit 9**.

Pass-by trips are those turning into and out of the project site while passing directly along the project frontage on Rio Road. Diverted linked trips are vehicles already on the nearby street system who have changed their route by a block or two to patronize the project site. In this case, they would be from movements at the SR 1 / Rio Road and Carmel Rancho Boulevard / Carmel Valley Road intersections. A 15% total allowance was used for the pass-by / diverted linked trips (about 3% pass-by to and from Rio Road and 12% diverted linked trips).

Ten percent of the project trips were estimated to be to and from the approximately 400,000 square feet of existing retail businesses in the immediate vicinity of the project site (i.e., the Crossroads and Barnyard Shopping Centers). These consist of through movements across Rio Road and movements at the driveway at the back of the project site that connects to the Barnyard Shopping Center parking lot. An allowance was also made for existing traffic that would be redistributed from the Via Nona Marie / Rio Road intersection to the new project access point at the Crossroads Boulevard / Rio Road intersection.

The project is estimated to generate 3,833 gross daily trips with 92 in the AM peak hour and 337 in the PM peak hour. Accounting for pass-by and diverted linked trips, the project will generate about 2,913 net new daily trips, with 69 trips occurring during the AM peak hour (42 in, 27 out), 252 trips occurring during the PM peak hour (122 in, 130 out), and 375 trips occurring during the Saturday peak hour (195 in, 180 out).

3.2 Project Trip Distribution and Assignment

The project trip distribution, which is based on existing traffic volume data and land use patterns in the study area, is shown graphically in **Exhibit 10**. The project-generated trips were assigned to the road network using these trip distribution percentages. The project trip

assignment for the primary project trips is shown in **Exhibit 11**. The project trip assignment for the pass-by and diverted linked trips is shown in **Exhibit 12**. Project trips to and from the existing retail businesses near the project site are shown in **Exhibit 13**. Redistributed existing traffic volumes from the Via Nona Marie / Rio Road intersection to the Crossroads Boulevard / Rio Road intersection are shown in **Exhibit 14**. The primary project trips, pass-by and diverted linked trips, project trips to and from the existing retail businesses near the project site, and redistributed existing traffic volumes were combined to obtain the total net project trip assignment, which is shown in **Exhibit 15**.

4 EXISTING PLUS PROJECT CONDITIONS

This section describes existing plus project conditions. Traffic related impacts associated with project development are discussed in this section.

4.1 Existing Plus Project Intersection Operations

The total net project trip assignments were added to the existing traffic volumes to obtain Existing Plus Project traffic volumes. Existing Plus Project weekday AM, PM, and Saturday peak hour traffic volumes are shown in **Exhibit 16**. Weekday AM, PM, and Saturday peak hour traffic volumes near the project site, including the commercial driveways on Rio Road, are shown in **Exhibit 17**.

Intersection levels of service are summarized in **Exhibit 7**. LOS calculation worksheets are included as **Appendix F**. The Caltrans peak hour signal warrant worksheet for the Carmel Rancho Boulevard / Clocktower Place intersection is included in **Appendix G.** Based on the level of service standards, all the study intersections are projected to operate at acceptable levels of service under Existing Plus Project conditions with the following exceptions:

- Intersection 3 – SR 1 / Rio Road
- Intersection 8 – SR 1 / Carpenter Street

These intersections are projected to operate at an unacceptable LOS D or E under Existing Plus Project traffic conditions.

4.2 Existing Plus Project Road Segment Operations

Existing Plus Project conditions road segment levels of service are summarized in **Exhibit 8**. LOS calculation worksheets are included as **Appendix H**.

Except for segment 7, the ADT's on the roadways included in the Carmel Valley Master Plan (CVMP) are projected to be below the CVMP ADT thresholds under Existing Plus Project conditions.

Based on the level of service standards, the following study road segments are projected to operate at unacceptable levels of service during the weekday AM, PM, and/or Saturday peak hours:

- Segment 2 – SB SR 1: Ocean Ave to Carmel Valley Rd
- Segment 3 – NB & SB SR 1: Carmel Valley Rd to Rio Rd
- Segment 4 – NB & SB SR 1: Rio Road to Ribera Road
- Segment 6 – EB & WB Carmel Valley Rd: Robinson Canyon Rd to Schulte Rd
- Segment 7 – EB & WB Carmel Valley Rd: Schulte Rd to Rancho San Carlos Rd
- Segment 12 – EB & WB Rio Road: Carmel Rancho Blvd to SR 1
- Segment 13 – NB & SB SR 1: Ribera Rd to Highlands Inn

These road segments are projected to operate at an unacceptable LOS D, E, or F under Existing Plus Project traffic conditions.

4.3 Existing Plus Project Conditions Impacts

Intersections

- Intersection 3 – SR 1 / Rio Road

  Under Existing traffic conditions, this intersection operates at LOS C, D, and E during the respective AM, PM, and Saturday midday peak hours. Under Existing Plus Project conditions, it would operate at LOS D, E, and E. This intersection is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this intersection during the weekday AM, PM, and Saturday peak hours.

- Intersection 8 – SR 1 / Carpenter Street

  Under Existing traffic conditions, this intersection operates at LOS C, D, and C during the peak hours. Under Existing Plus Project conditions, it would continue to operate at LOS C, D, and C. This intersection is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this intersection during the weekday PM peak hour.

Road Segments

- Segment 2 – Southbound SR 1 between Ocean Ave and Carmel Valley Rd

  Under Existing traffic conditions, this segment operates at LOS F in the southbound direction during all three study peak hours. Under Existing Plus Project conditions, it would continue to operate at LOS F. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this segment in the southbound direction during the weekday AM, PM, and Saturday peak hours.

- Segment 3 – SR 1 between Carmel Valley Rd and Rio Rd

  Under Existing traffic conditions, this segment operates at LOS D and E in the northbound direction and LOS D in the southbound direction during the peak hours. Under Existing Plus Project conditions, although it would continue to operate at LOS D and E, it will increase the percent time spent following (PTSF) measure of effectiveness. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this segment.

- Segment 4 – SR 1 between Rio Rd and Ribera Rd

  Under Existing traffic conditions, this segment operates at LOS D in the northbound and southbound directions during the peak hours. Under Existing Plus Project conditions, although it would continue to operate at LOS D, it will increase the percent time spent following (PTSF) measure of effectiveness. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this segment.

- Segment 6 – Carmel Valley Rd between Robinson Canyon Rd and Schulte Rd

Under Existing traffic conditions, this segment operates at LOS D and E in the eastbound and westbound directions during the peak hours. Under Existing Plus Project conditions, it would continue to operate at LOS D and E. This segment is within the Carmel Valley Master Plan area. Based on the impact criteria, the project **would not impact** this segment.

- Segment 7 – Carmel Valley Rd between Schulte Rd and Rancho San Carlos Rd

  Under Existing traffic conditions, the Average Daily Traffic (ADT) volumes on this segment exceed the Carmel Valley Master Plan ADT threshold, and it operates at LOS D and E in the eastbound and westbound directions during the peak hours. Under Existing Plus Project conditions, it would continue to operate at LOS D and E during the weekday AM and PM peak hours. This segment would degrade from LOS D to LOS E in the westbound direction during the Saturday peak hour. This segment is within the Carmel Valley Master Plan area. Based on the impact criteria, the project **would impact** this segment on an ADT basis and in the westbound direction during the Saturday peak hour.

- Segment 12 – Rio Rd between Carmel Rancho Blvd and SR 1

  Under Existing traffic conditions, this segment operates at LOS D in the westbound direction during the peak hours. Under Existing Plus Project conditions, it would continue to operate at LOS D in the westbound direction. This segment would degrade from LOS C to LOS D in the eastbound direction during the weekday PM peak hour. This segment is within the Carmel Valley Master Plan area. Based on the impact criteria, the project **would impact** this segment in the eastbound direction during the weekday PM peak hour.

- Segment 13 – SR 1 between Ribera Rd and Highlands Inn

  Under Existing traffic conditions, this segment operates at LOS D in the northbound and southbound directions during the peak hours. Under Existing Plus Project conditions, although it would continue to operate at LOS D, it will increase the percent time spent following (PTSF) measure of effectiveness. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this segment.

4.4 Existing Plus Project Conditions Mitigation Measures

This section describes the recommended measures to mitigate the project's impacts on the local and regional road network.

Intersections

- Intersection 3 – SR 1 / Rio Road

  The Transportation Agency for Monterey County (TAMC) Regional Transportation Plan (RTP) includes the construction of a northbound climbing lane on SR 1 between Rio Road and Carmel Valley Road and improvements at the SR 1 / Rio Road intersection.

The planned improvements at the SR 1 / Rio Road intersection include converting the northbound SR 1 right-turn lane to a shared through/right-turn lane, and an additional southbound through lane. These improvements, in addition to a second Rio Road westbound left-turn lane that is not included in the TAMC project, would result in acceptable operations at this intersection under Existing Plus Project traffic conditions. The project would be responsible for the addition of the second westbound left turn lane. This is discussed in the Project Access and Internal Circulation section of this report.

- Intersection 8 – SR 1 / Carpenter Street

  The addition of a dedicated northbound SR 1 right-turn lane would improve operations to better than pre-project conditions. This improvement is not planned or funded. It should be implemented as a project-specific mitigation. The right turn lane should be designed to allow conversion into an optional through/right lane in the future to mitigate background, background plus project and cumulative impacts.

Road Segments

- Segment 2 – Southbound SR 1 between Ocean Ave and Carmel Valley Rd

  The construction of a second southbound lane on SR 1 between Ocean Avenue and Carmel Valley Road would result in acceptable traffic operations. However, this improvement is not planned or funded.

- Segment 3 – SR 1 between Carmel Valley Rd and Rio Rd

  The only scheduled segment improvement is the second northbound through lane described for Intersection 3 under Section 2.3 - Existing Intersection Operations. This improvement will improve traffic operations to an acceptable level.

- Segment 4 – SR 1 between Rio Rd and Ribera Rd

  Widening this segment to four lanes would improve operations to an acceptable level. However, this improvement is not planned or funded. It also would not be consistent with California Coastal Act Policy 30254 which states that “it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road.”

- Segment 7 – Carmel Valley Rd between Schulte Rd and Rancho San Carlos Rd

  Widening this segment to two lanes in each direction would result in acceptable traffic operations. However, this improvement is not planned or funded.

- Segment 12 – Rio Rd between Carmel Rancho Blvd and SR 1

  The construction of a third eastbound lane on Rio Road between Carmel Rancho Boulevard and SR 1 would result in acceptable traffic operations. However, this improvement is not planned or funded. Traffic signal optimization along Rio Road,

including the SR 1 intersection, will partially mitigate this impact.

- Segment 13 – SR 1 between Ribera Rd and Highlands Inn

  Widening this segment to four lanes would improve operations to an acceptable level. However, this improvement is not planned or funded. It also would not be consistent with California Coastal Act Policy 30254 which states that "it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road."

5 BACKGROUND TRAFFIC CONDITIONS

This section of the report describes the analyses of the study road network under Background traffic conditions. Background conditions models traffic conditions with traffic from approved but not yet constructed developments added to the study intersections and road segments.

5.1 Background Intersection Operations

Weekday AM, PM, and Saturday peak hour traffic generated by projects approved for development, but not yet constructed or occupied, was estimated based on trip generation rates in the Institute of Transportation Engineers' Trip Generation handbook, 9th Edition, 2012. A trip generation estimate for the approved projects is provided in **Appendix I**. The location of each approved project is shown in **Appendix J**.

The trips generated by the approved but not yet built or occupied projects were assigned to the road network and combined with the existing peak hour volumes to obtain Background traffic volumes. Weekday AM, PM, and Saturday peak hour traffic volumes at the study intersections are shown in **Exhibit 18**. Weekday AM, PM, and Saturday peak hour traffic volumes near the project site, including the commercial driveways on Rio Road, are shown in **Exhibit 19**.

Intersection levels of service are summarized in **Exhibit 7**. LOS calculation worksheets are included as **Appendix F**. The Caltrans peak hour signal warrant worksheet for the Carmel Rancho Boulevard / Clocktower Place intersection is included in **Appendix G.** Based on the level of service standards, all the study intersections are projected to operate at acceptable levels of service under Background conditions with the following exceptions:

- Intersection 3 – SR 1 / Rio Road – Improvements planned and recommended at this intersection are discussed under earlier development scenarios.
- Intersection 8 – SR 1 / Carpenter Street - Recommended improvements at this intersection are discussed under the Existing scenario.
- Intersection 12 – Valley Greens Drive / Carmel Valley Road – The northbound Valley Greens Drive approach will operate at LOS F. A roundabout is recommended, although a traffic signal is an alternative.

These intersections are projected to operate at an unacceptable LOS D, E, or F under Background traffic conditions.

5.2 Background Road Segment Operations

Road segment levels of service are summarized in **Exhibit 20**. LOS calculation worksheets are included as **Appendix H**. Except for segments 6 and 7, the ADT's on the roadways included in the Carmel Valley Master Plan (CVMP) are projected to be below the CVMP ADT thresholds under Background conditions.

Based on the level of service standards, the following study road segments are projected to operate at unacceptable levels of service during the weekday AM, PM, and/or Saturday peak hours:

- Segment 2 – SB SR 1: Ocean Ave to Carmel Valley Rd
- Segment 3 – NB & SB SR 1: Carmel Valley Rd to Rio Rd
- Segment 4 – NB & SB SR 1: Rio Road to Ribera Road
- Segment 6 – EB & WB Carmel Valley Rd: Robinson Canyon Rd to Schulte Rd
- Segment 7 – EB & WB Carmel Valley Rd: Schulte Rd to Rancho San Carlos Rd
- Segment 12 – WB Rio Road: Carmel Rancho Blvd to SR 1
- Segment 13 – NB & SB SR 1: Ribera Rd to Highlands Inn

These road segments are projected to operate at an unacceptable LOS D, E, or F under Background traffic conditions. These are same segments with deficiencies under Existing conditions. The Existing section of this report discusses the status of planned improvements affecting these segments.

6 BACKGROUND PLUS PROJECT TRAFFIC CONDITIONS

This section of the report describes the analyses of the study road network under Background Plus Project traffic conditions.

6.1 Background Plus Project Intersection Operations

The trips generated by the project were assigned to the road network and combined with the Background volumes to obtain Background Plus Project conditions traffic volumes. Background Plus Project weekday AM, PM, and Saturday peak hour traffic volumes are shown in **Exhibit 21**. Weekday AM, PM, and Saturday peak hour traffic volumes near the project site, including the commercial driveways on Rio Road, are shown in **Exhibit 22**.

Intersection levels of service are summarized in **Exhibit 7**. LOS calculation worksheets are included as **Appendix F**. The Caltrans peak hour signal warrant worksheet for the Carmel Rancho Boulevard / Clocktower Place intersection is included in **Appendix G.** Based on the level of service standards, all the study intersections are projected to operate at acceptable levels of service under Background Plus Project conditions with the following exceptions:

- Intersection 2 – Carmel Rancho Boulevard / Carmel Valley Road
- Intersection 3 – SR 1 / Rio Road
- Intersection 8 – SR 1 / Carpenter Street
- Intersection 12 – Valley Greens Drive / Carmel Valley Road

These intersections are projected to operate at an unacceptable LOS D, E, or F under Background Plus Project traffic conditions.

6.2 Background Plus Project Road Segment Operations

Background Plus Project conditions road segment levels of service are summarized in **Exhibit 20**. LOS calculation worksheets are included as **Appendix H**.

Except for segments 6 and 7, the ADT's on the roadways included in the Carmel Valley Master Plan (CVMP) are projected to be below the CVMP ADT thresholds under Background Plus Project conditions.

Based on the level of service standards, the following study road segments are projected to operate at unacceptable levels of service during the weekday AM, PM, and/or Saturday peak hours:

- Segment 2 – SB SR 1: Ocean Ave to Carmel Valley Rd
- Segment 3 – NB & SB SR 1: Carmel Valley Rd to Rio Rd
- Segment 4 – NB & SB SR 1: Rio Road to Ribera Road
- Segment 6 – EB & WB Carmel Valley Rd: Robinson Canyon Rd to Schulte Rd
- Segment 7 – EB & WB Carmel Valley Rd: Schulte Rd to Rancho San Carlos Rd
- Segment 12 – EB & WB Rio Road: Carmel Rancho Blvd to SR 1
- Segment 13 – NB & SB SR 1: Ribera Rd to Highlands Inn

These road segments are projected to operate at an unacceptable LOS D, E, or F under Background Plus Project traffic conditions. These are the same segments identified under all previous development scenarios.

6.3 Background Plus Project Conditions Impacts

Intersections

- Intersection 2 – Carmel Rancho Boulevard / Carmel Valley Road

  Under Background traffic conditions, this intersection is projected to operate at LOS C during the peak hours. Under Background Plus Project conditions, it would operate at LOS C during the AM and Saturday peak hours and LOS D during the PM peak hour. This intersection is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this intersection during the weekday PM peak hour.

- Intersection 3 – SR 1 / Rio Road

  Under Background traffic conditions, this intersection is projected to operate at LOS D during the AM and PM peak hours and LOS E during the Saturday peak hour. Under Background Plus Project conditions, it would operate at LOS D during the AM peak hour and LOS E during the PM and Saturday peak hours. This intersection is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this intersection during the weekday AM, PM, and Saturday peak hours.

- Intersection 8 – SR 1 / Carpenter Street

  Under Background traffic conditions, this intersection is projected to operate at LOS C during the AM and Saturday peak hours and LOS D during the PM peak hour. Under Background Plus Project conditions, it would continue to operate at LOS C during the AM and Saturday peak hours and LOS D during the PM peak hour. This intersection is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this intersection during the weekday PM peak hour.

- Intersection 12 – Valley Greens Drive / Carmel Valley Road

  Under Background traffic conditions, this intersection is projected to operate at LOS E during the AM and Saturday peak hours and LOS F during the PM peak hour. Under Background Plus Project conditions, it would operate at LOS F during the AM, PM, and Saturday peak hours. This intersection is within the Carmel Valley Master Plan area. Based on the impact criteria, the project **would significantly impact** this intersection during the weekday AM, PM, and Saturday peak hours.

Road Segments

- Segment 2 – Southbound SR 1 between Ocean Ave and Carmel Valley Rd

  Under Background traffic conditions, this segment is projected to operate at LOS F in the

southbound direction during the peak hours. Under Background Plus Project conditions, it would continue to operate at LOS F. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this segment in the southbound direction during the weekday AM, PM, and Saturday peak hours.

- Segment 3 – SR 1 between Carmel Valley Rd and Rio Rd

  Under Background traffic conditions, this segment is projected to operate at LOS D and E in the northbound direction and LOS D in the southbound direction during the peak hours. Under Background Plus Project conditions, although it would continue to operate at LOS D and E without the currently planned additional northbound SR 1 through lane, it will increase the percent time spent following (PTSF) measure of effectiveness. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this segment.

- Segment 4 – SR 1 between Rio Rd and Ribera Rd

  Under Background traffic conditions, this segment is projected to operate at LOS D in the northbound and southbound directions during the peak hours. Under Background Plus Project conditions, although it would continue to operate at LOS D, it will increase the percent time spent following (PTSF) measure of effectiveness. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would impact** this segment.

- Segment 6 – Carmel Valley Rd between Robinson Canyon Rd and Schulte Rd

  Under Background traffic conditions, the Average Daily Traffic (ADT) volumes on this segment are projected to exceed the Carmel Valley Master Plan ADT threshold, and it would operate at LOS D and E in the eastbound and westbound directions during the peak hours. Under Background Plus Project conditions, it would continue to exceed the ADT threshold and would operate at LOS D and E during the peak hours. This segment is within the Carmel Valley Master Plan area. Based on the impact criteria, the project **would impact** this segment on an ADT basis.

- Segment 7 – Carmel Valley Rd between Schulte Rd and Rancho San Carlos Rd

  Under Background traffic conditions, the Average Daily Traffic (ADT) volumes on this segment are projected to exceed the Carmel Valley Master Plan ADT threshold, and it would operate at LOS D and E in the eastbound and westbound directions during the peak hours. Under Background Plus Project conditions, it would continue to exceed the ADT threshold and would operate at LOS D and E during the weekday AM and PM peak hours. This segment would degrade from LOS D to LOS E in the westbound direction during the Saturday peak hour. This segment is within the Carmel Valley Master Plan area. Based on the impact criteria, the project **would significantly impact** this segment on an ADT basis and in the westbound direction during the Saturday peak hour.

- Segment 12 – Rio Rd between Carmel Rancho Blvd and SR 1

Under Background traffic conditions, this segment is projected to operate at LOS D in the westbound direction during the peak hours. Under Background Plus Project conditions, it would continue to operate at LOS D in the westbound direction. This segment would degrade from LOS C to LOS D in the eastbound direction during the weekday PM peak hour. This segment is within the Carmel Valley Master Plan area. Based on the impact criteria, the project **would significantly impact** this segment in the eastbound direction during the weekday PM peak hour.

- Segment 13 – SR 1 between Ribera Rd and Highlands Inn

  Under Background traffic conditions, this segment is projected to operate at LOS D in the northbound and southbound directions during the peak hours. Under Background Plus Project conditions, it would degrade from LOS C to LOS D in the southbound direction during the PM peak hour. In addition, it will increase the percent time spent following (PTSF) measure of effectiveness in the PM and Saturday peak hours. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this segment.

6.4 Background Plus Project Conditions Mitigation Measures

This section describes the recommended measures to mitigate the project's impacts on the local and regional road network.

Intersections

- Intersection 2 – Carmel Rancho Boulevard / Carmel Valley Road

  The addition of an eastbound right-turn overlap phase would reduce delay at this intersection, but it would still operate at a deficient LOS D during the PM peak hour under Background Plus Project traffic conditions. This improvement would only partially mitigate this impact. There would be a remaining unmitigated significant impact.

- Intersection 3 – SR 1 / Rio Road

  The Transportation Agency for Monterey County (TAMC) Regional Transportation Plan (RTP) includes the construction of a northbound climbing lane on SR 1 between Rio Road and Carmel Valley Road and improvements at the SR 1 / Rio Road intersection. The planned improvements at the SR 1 / Rio Road intersection include converting the northbound right-turn lane to a shared through/right-turn lane, and an additional southbound through lane. These improvements, in addition to a second westbound left-turn lane, would result in acceptable operations at this intersection under Background Plus Project traffic conditions. The second westbound left turn lane will be the responsibility of the project. This is discussed in more detail in the Project Access and Internal Circulation section of this report.

- Intersection 8 – SR 1 / Carpenter Street

With the addition of a third northbound through lane, this intersection would operate at an acceptable LOS C during the weekday AM, PM, and Saturday peak hours under Background Plus Project traffic conditions. This improvement is not planned or funded.

- Intersection 12 – Valley Greens Drive / Carmel Valley Road

  Converting this intersection from two-way stop control to a roundabout would result in acceptable traffic operations during the weekday AM, PM, and Saturday peak hours under Background Plus Project traffic conditions. A traffic signal is an alternative improvement. The project is responsible for a fair-share contribution to this improvement. Payment of the CVTIP impact fee will satisfy this requirement.

Road Segments

- Segment 2 – Southbound SR 1 between Ocean Ave and Carmel Valley Rd

  The construction of a second southbound lane on SR 1 between Ocean Avenue and Carmel Valley Road would result in acceptable traffic operations. However, this improvement is not planned or funded.

- Segment 3 – SR 1 between Carmel Valley Rd and Rio Rd

  The only scheduled segment improvement is the second northbound through lane described for Intersection 3 under Section 2.3 - Existing Intersection Operations. This improvement will improve traffic operations to an acceptable level.

- Segment 4 – SR 1 between Rio Rd and Ribera Rd

  Widening this segment to four lanes would improve operations to an acceptable level. However, this improvement is not planned or funded. It also would not be consistent with California Coastal Act Policy 30254 which states that “it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road.”

- Segment 6 – Carmel Valley Rd between Robinson Canyon Rd and Schulte Rd

  Widening this segment to two lanes in each direction would result in acceptable traffic operations. However, this improvement is not planned or funded.

- Segment 7 – Carmel Valley Rd between Schulte Rd and Rancho San Carlos Rd

  Widening this segment to two lanes in each direction would result in acceptable traffic operations. However, this improvement is not planned or funded.

- Segment 12 – Rio Rd between Carmel Rancho Blvd and SR 1

  The construction of a third eastbound lane on Rio Road between Carmel Rancho Boulevard and SR 1 would result in acceptable traffic operations. However, this

improvement is not planned or funded.

- Segment 13 – SR 1 between Ribera Rd and Highlands Inn

  Widening SR 1 to four lanes would result in acceptable traffic operations. However, this improvement is not planned or funded. It also would not be consistent with California Coastal Act Policy 30254 which states that “it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road.”

7 CUMULATIVE TRAFFIC CONDITIONS

This section describes the analysis and results for 2035 cumulative conditions.

7.1 Cumulative Conditions Intersection Operations

Cumulative traffic volumes are based on the 2035 traffic volume forecasts from the 2014 AMBAG Regional Traffic Demand Model (RTDM) and proposed but not yet approved projects location within Carmel Valley. Traffic increases due to the list of pending projects were generally given precedence over the RTDM forecasts in the vicinity of the project because they are local in nature, result in higher volume forecasts than the RTDM, can be assigned to the network more accurately than a regional model and provide a more conservative estimate of future traffic volumes. The RTDM forecasts were used in areas where the addition of traffic from pending projects resulted in lower volumes than the RTDM forecasts, again providing a more conservative analysis.

Weekday AM, PM, and Saturday peak hour traffic generated by pending projects was estimated based on trip generation rates in the *Trip Generation* handbook, Institute of Transportation Engineers, 9th Edition, 2012. A trip generation estimate for the cumulative projects is provided in **Appendix K**. The location of each cumulative project is shown in **Appendix L**. The AMBAG 2014 and 2035 daily traffic model plots for the study area are provided in **Appendix M**.

Trips generated by the cumulative projects were assigned to the road network and combined with the Background traffic volumes to estimate Cumulative traffic volumes. Weekday AM, PM, and Saturday peak hour traffic volumes at the study intersections are shown in **Exhibit 23**. Weekday AM, PM, and Saturday peak hour traffic volumes near the project site, including the commercial driveways on Rio Road, are shown in **Exhibit 24**.

Intersection levels of service are summarized in **Exhibit 7**. LOS calculation worksheets are included as **Appendix F**. The Caltrans peak hour signal warrant worksheet for the Carmel Rancho Boulevard / Clocktower Place intersection is included in **Appendix G.** Based on the level of service standards, all the study intersections are forecasted to operate at acceptable levels of service under Cumulative conditions with the following exceptions:

- Intersection 3 – SR 1 / Rio Road
- Intersection 7 – SR 1 / Ocean Avenue
- Intersection 8 – SR 1 / Carpenter Street
- Intersection 12 – Valley Greens Drive / Carmel Valley Road
- Intersection 13 – SR 1 / Ribera Road

These intersections are projected to operate at an unacceptable LOS D, E, or F under Cumulative traffic conditions.

7.2 Cumulative Road Segment Operations

Road segment levels of service are summarized in **Exhibit 25**. LOS calculation worksheets are

included as **Appendix H**. Except for segments 6 and 7, the ADT's on the roadways included in the Carmel Valley Master Plan (CVMP) are projected to be below the CVMP ADT thresholds under Cumulative conditions.

Based on the level of service standards, the following study road segments are projected to operate at unacceptable levels of service during the weekday AM, PM, and/or Saturday peak hours:

- Segment 2 – SB SR 1: Ocean Ave to Carmel Valley Rd
- Segment 3 – NB & SB SR 1: Carmel Valley Rd to Rio Rd
- Segment 4 – NB & SB SR 1: Rio Road to Ribera Road
- Segment 6 – EB & WB Carmel Valley Rd: Robinson Canyon Rd to Schulte Rd
- Segment 7 – EB & WB Carmel Valley Rd: Schulte Rd to Rancho San Carlos Rd
- Segment 12 – WB Rio Road: Carmel Rancho Blvd to SR 1
- Segment 13 – NB & SB SR 1: Ribera Rd to Highlands Inn

These road segments are projected to operate at an unacceptable LOS D, E, or F under Cumulative traffic conditions.

8 CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS

This section describes the analysis and results for 2035 cumulative conditions with the proposed project.

8.1 Cumulative Plus Project Intersection Operations

The trips generated by the project were combined with the Cumulative volumes to obtain Cumulative Plus Project conditions traffic volumes. Cumulative Plus Project weekday AM, PM, and Saturday peak hour traffic volumes are shown in **Exhibit 26**. Weekday AM, PM, and Saturday peak hour traffic volumes near the project site, including the commercial driveways on Rio Road, are shown in **Exhibit 27**.

Intersection levels of service are summarized in **Exhibit 7**. LOS calculation worksheets are included as **Appendix F**. The Caltrans peak hour signal warrant worksheet for the Carmel Rancho Boulevard / Clocktower Place intersection is included in **Appendix G.** Based on the level of service standards, all the study intersections are projected to operate at acceptable levels of service under Cumulative Plus Project conditions with the following exceptions:

- Intersection 2 – Carmel Rancho Boulevard / Carmel Valley Road
- Intersection 3 – SR 1 / Rio Road
- Intersection 7 – SR 1 / Ocean Avenue
- Intersection 8 – SR 1 / Carpenter Street
- Intersection 12 – Valley Greens Drive / Carmel Valley Road
- Intersection 13 – SR 1 / Ribera Road

These intersections are projected to operate at an unacceptable LOS D, E, or F under Cumulative Plus Project traffic conditions.

8.2 Cumulative Plus Project Road Segment Operations

Cumulative Plus Project conditions road segment levels of service are summarized in **Exhibit 25**. LOS calculation worksheets are included as **Appendix H**.

Except for segments 6 and 7, the ADT's on the roadways included in the Carmel Valley Master Plan (CVMP) are projected to be below the CVMP ADT thresholds under Cumulative Plus Project conditions.

Based on the level of service standards, the following study road segments are projected to operate at unacceptable levels of service during the weekday AM, PM, and/or Saturday peak hours:

- Segment 2 – SB SR 1: Ocean Ave to Carmel Valley Rd
- Segment 3 – NB & SB SR 1: Carmel Valley Rd to Rio Rd
- Segment 4 – NB & SB SR 1: Rio Road to Ribera Road
- Segment 6 – EB & WB Carmel Valley Rd: Robinson Canyon Rd to Schulte Rd
- Segment 7 – EB & WB Carmel Valley Rd: Schulte Rd to Rancho San Carlos Rd

- Segment 12 – EB & WB Rio Road: Carmel Rancho Blvd to SR 1
- Segment 13 – NB & SB SR 1: Ribera Rd to Highlands Inn

These road segments are projected to operate at an unacceptable LOS D, E, or F under Cumulative Plus Project traffic conditions.

8.3 Cumulative Plus Project Conditions Impacts

Intersections

- Intersection 2 – Carmel Rancho Boulevard / Carmel Valley Road

  Under Cumulative traffic conditions, this intersection is projected to operate at LOS C during the peak hours. Under Cumulative Plus Project conditions, it would operate at LOS C during the AM and Saturday peak hours and LOS D during the PM peak hour. This intersection is under Caltrans jurisdiction. Based on the impact criteria, the project **would impact** this intersection during the weekday PM peak hour.

- Intersection 3 – SR 1 / Rio Road

  Under Cumulative traffic conditions, this intersection is projected to operate at LOS D during the AM peak hour and LOS E during the PM and Saturday peak hours. Under Cumulative Plus Project conditions, it would operate at LOS D during the AM peak hour, LOS E during the PM peak hour, and LOS F during the Saturday peak hour. This intersection is under Caltrans jurisdiction. Based on the impact criteria, the project **would impact** this intersection during the weekday AM, PM, and Saturday peak hours.

- Intersection 7 – SR 1 / Ocean Avenue

  Under Cumulative traffic conditions, this intersection is projected to operate at LOS D during the AM and Saturday peak hours. Under Cumulative Plus Project conditions, it would operate at LOS D during the AM, PM, and Saturday peak hours. This intersection is under Caltrans jurisdiction. Based on the impact criteria, the project **would impact** this intersection during the weekday PM and Saturday peak hours.

- Intersection 8 – SR 1 / Carpenter Street

  Under Cumulative traffic conditions, this intersection is projected to operate at LOS C during the AM and Saturday peak hours and LOS D during the PM peak hour. Under Cumulative Plus Project conditions, it would continue to operate at LOS C during the AM and Saturday peak hours and LOS D during the PM peak hour. This intersection is under Caltrans jurisdiction. Based on the impact criteria, the project **would impact** this intersection during the weekday PM peak hour.

- Intersection 12 – Valley Greens Drive / Carmel Valley Road

  Under Cumulative traffic conditions, this intersection is projected to operate at LOS F during the AM, PM, and Saturday peak hours. Under Cumulative Plus Project conditions,

it would continue to operate at LOS F during the AM, PM, and Saturday peak hours. This intersection is within the Carmel Valley Master Plan area. Based on the impact criteria, the project **would impact** this intersection during the weekday AM, PM, and Saturday peak hours.

- Intersection 13 – SR 1 / Ribera Road

  Under Cumulative traffic conditions, the worst approach of this intersection is projected to operate at an acceptable LOS C and LOS E during the AM and PM peak hours and an unacceptable LOS F during the Saturday peak hour. Under Cumulative Plus Project conditions, it would continue to operate at LOS C during the AM and would operate at an unacceptable LOS F during the PM and Saturday peak hours. This intersection is under Caltrans jurisdiction. Based on the impact criteria, the project **would impact** this intersection during the weekday PM and Saturday peak hours.

Road Segments

- Segment 2 – Southbound SR 1 between Ocean Ave and Carmel Valley Rd

  Under Cumulative traffic conditions, this segment is projected to operate at LOS F in the southbound direction during the peak hours. Under Cumulative Plus Project conditions, it would continue to operate at LOS F. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this segment in the southbound direction during the weekday AM, PM, and Saturday peak hours.

- Segment 3 – SR 1 between Carmel Valley Rd and Rio Rd

  Under Cumulative conditions, this segment is projected to operate at LOS D and E in the northbound and southbound directions during the peak hours. Under Cumulative Plus Project conditions, it would continue to operate at LOS D and E. However, it will increase the percent time spent following (PTSF) measure of effectiveness. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this segment.

- Segment 4 – SR 1 between Rio Rd and Ribera Rd

  Under Cumulative traffic conditions, this segment is projected to operate at LOS D or E in the northbound and southbound directions during the peak hours. Under Cumulative Plus Project conditions, it would degrade from LOS D to LOS E in the northbound direction during the Saturday peak hour. It will also increase the percent time spent following (PTSF) measure of effectiveness in the PM and Saturday peak hours. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would significantly impact** this segment.

- Segment 6 – Carmel Valley Rd between Robinson Canyon Rd and Schulte Rd

  Under Cumulative traffic conditions, the Average Daily Traffic (ADT) volumes on this

segment are projected to exceed the Carmel Valley Master Plan ADT threshold, and it would operate at LOS D and E in the eastbound and westbound directions during the peak hours. Under Cumulative Plus Project conditions, it would continue to exceed the ADT threshold and would operate at LOS D and E during the peak hours. This segment is within the Carmel Valley Master Plan area. Based on the impact criteria, the project **would impact** this segment on an ADT basis.

- Segment 7 – Carmel Valley Rd between Schulte Rd and Rancho San Carlos Rd

  Under Cumulative traffic conditions, the Average Daily Traffic (ADT) volumes on this segment are projected to exceed the Carmel Valley Master Plan ADT threshold, and it would operate at LOS D and E in the eastbound and westbound directions during the peak hours. Under Cumulative Plus Project conditions, it would degrade from LOS D to LOS E in the westbound direction during the PM peak hour and would continue to exceed the ADT threshold. This segment is within the Carmel Valley Master Plan area. Based on the impact criteria, the project **would impact** this segment on an ADT basis and in the westbound direction during the PM peak hour.

- Segment 12 – Rio Rd between Carmel Rancho Blvd and SR 1

  Under Cumulative traffic conditions, this segment is projected to operate at LOS D in the westbound direction during the peak hours. Under Cumulative Plus Project conditions, it would continue to operate at LOS D in the westbound direction. This segment would degrade from LOS C to LOS D in the eastbound direction during the weekday PM peak hour. This segment is within the Carmel Valley Master Plan area. Based on the impact criteria, the project **would impact** this segment in the eastbound direction during the weekday PM peak hour.

- Segment 13 – SR 1 between Ribera Rd and Highlands Inn

  Under Cumulative traffic conditions, this segment is projected to operate at LOS D and E in the northbound and southbound directions during the peak hours. Under Cumulative Plus Project conditions, it would continue to operate at LOS D and E. However, it will increase the percent time spent following (PTSF) measure of effectiveness. This segment is under Caltrans jurisdiction. Based on the impact criteria, the project **would not impact** this segment.

8.4 Cumulative Plus Project Conditions Mitigation Measures

This section describes the recommended measures to mitigate the project's impacts on the local and regional road network.

Intersections

- Intersection 2 – Carmel Rancho Boulevard / Carmel Valley Road

  The addition of an eastbound right-turn overlap phase would reduce delay at this intersection, but it would still operate at a deficient LOS D during the PM peak hour

under Cumulative Plus Project traffic conditions. The project impact will only be partially mitigated. The project will have an unmitigated significant impact.

- Intersection 3 – SR 1 / Rio Road

  The Transportation Agency for Monterey County (TAMC) Regional Transportation Plan (RTP) includes the construction of a northbound climbing lane on SR 1 between Rio Road and Carmel Valley Road and improvements at the SR 1 / Rio Road intersection. The planned improvements at the SR 1 / Rio Road intersection include converting the northbound right-turn lane to a shared through/right-turn lane, and an additional southbound through lane. These improvements, in addition to a second westbound left-turn lane to be constructed by the project, would result in acceptable operations at this intersection during the AM peak hour under Cumulative Plus Project traffic conditions. The intersection would still operate at a deficient LOS D during the PM and Saturday peak hours, but would have less delay than under Existing conditions. Impacts at this intersection will be fully mitigated.

- Intersection 7 – SR 1 / Ocean Avenue

  There are no planned or funded improvements at this intersection. The project will contribute to a cumulative impact at this location.

- Intersection 8 – SR 1 / Carpenter Street

  With the addition of a third northbound through lane, this intersection would operate at an acceptable LOS C during the weekday AM, PM, and Saturday peak hours under Cumulative Plus Project traffic conditions.

- Intersection 12 – Valley Greens Drive / Carmel Valley Road

  Converting this intersection from two-way stop control to a roundabout would result in acceptable traffic operations during the weekday AM, PM, and Saturday peak hours under Cumulative Plus Project traffic conditions. A traffic signal is an alternative improvement. The project is responsible for a fair-share contribution to this improvement. Payment of the CVTIP impact fee will satisfy this requirement.

- Intersection 13 – SR 1 / Ribera Road

  There are no planned or funded improvements at this intersection. The project will contribute to a cumulative impact at this location.

<u>Road Segments</u>

- Segment 2 – Southbound SR 1 between Ocean Ave and Carmel Valley Rd

  The construction of a second southbound lane on SR 1 between Ocean Avenue and Carmel Valley Road would result in acceptable traffic operations. However, this improvement is not planned or funded. The project will contribute to a cumulative impact at this location.

- Segment 3 – SR 1 between Carmel Valley Rd and Rio Rd

  The only scheduled segment improvement is the second northbound through lane described for Intersection 3 under Section 2.3 - Existing Intersection Operations. This improvement will improve traffic operations to an acceptable level.

- Segment 4 – SR 1 between Rio Rd and Ribera Rd

  Widening this segment to four lanes would improve operations to an acceptable level. However, this improvement is not planned or funded. It also would not be consistent with California Coastal Act Policy 30254 which states that "it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road."

- Segment 6 – Carmel Valley Rd between Robinson Canyon Rd and Schulte Rd

  Widening this segment to two lanes in each direction would result in acceptable traffic operations. However, this improvement is not planned or funded. The project will contribute to a cumulative impact at this location.

- Segment 7 – Carmel Valley Rd between Schulte Rd and Rancho San Carlos Rd

  Widening this segment to two lanes in each direction would result in acceptable traffic operations. However, this improvement is not planned or funded. The project will contribute to a cumulative impact at this location.

- Segment 12 – Rio Rd between Carmel Rancho Blvd and SR 1

  The construction of a third eastbound lane on Rio Road between Carmel Rancho Boulevard and SR 1 would result in acceptable traffic operations. However, this improvement is not planned or funded. The project will contribute to a cumulative impact at this location.

- Segment 13 – SR 1 between Ribera Rd and Highlands Inn

  Widening SR 1 to four lanes would result in acceptable traffic operations. However, this improvement is not planned or funded. It also would not be consistent with California Coastal Act Policy 30254 which states that "it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road."

9 PROJECT ACCESS AND INTERNAL CIRCULATION

The project is proposed to include the main driveway (primary access) as a new north leg at the existing Crossroads Boulevard / Rio Road intersection. Secondary Access 1 will be provided on the west boundary of the project at the existing main driveway to the Carmel Mission Inn along the east side of the existing Chevron Gas Station. Secondary Access 2 will be provided at the north corner of the project that will connect to Clocktower Place in the southwest corner of the existing Barnyard parking lot. Secondary Access 3 will be provided as an extension of the main driveway aisle to the existing traffic circle near the lobby entrance of the Carmel Mission Inn. Each of these driveways are discussed below.

9.1 Rio Road Main Project Driveway (Primary Access)

The main project driveway will be an extension of Crossroads Boulevard, creating the fourth leg at this existing signalized intersection. The driveway will include two inbound lanes, one of which will extend through the main parking lot to the circulation aisle that will connect the two secondary driveways. The second lane will be a right turn only lane that will serve traffic destined for the Grocery Store and Stores A and B, all located along the project's east property line. Two exit lanes will be provided. The inside lane will be a left/through lane. The outside lane will be a right turn only lane.

Impact: The first on-site intersection will experience traffic conflicts that could impede the flow of inbound traffic. There is the potential of queue spillover onto Rio Road.

Mitigations:

a. Install stop signs on the three outbound legs of the first on-site intersection.
b. Provide crosswalks across all three stop-controlled approaches.
c. Incorporate the proposed sidewalk between the Grocery Store and Store B on the westerly corner of the site into the landscape islands.
d. Install all-way stop control at the cross-aisle intersection immediately south of Secondary Access 3.

Right turns entering the site from westbound Rio Road will use the existing outside westbound through lane. The volumes are expected to be low because project traffic from the east will be able to enter the project site from Carmel Rancho Boulevard via Clocktower Place. A right turn lane will not be required.

Traffic volumes between the project and the Crossroads Shopping Center will be low and will not require a separate lane.

Impact: Eastbound left turns into the project will add 128 left turns to the existing U-turn volume of 71 (199 total) in the weekday evening and 200 left turns to the existing U-turn volume 84 (284 total) in the midday on Saturday. Thjs would overflow beyond the existing 135-foot left turn lane, thus blocking the inside eastbound Rio Road through lane and increasing congestion

along Rio Road. The overflow of left turning vehicles into the adjacent travel lane would also create a potentially hazardous condition.

The following mitigations would reduce the impact to less-than-significant:

a. Lengthen the existing left turn lane from its current 170-foot left turn lane (130 feet of striping) to approximately 265 feet.
b. Extending the length of the existing left turn lane will require the existing 265-foot westbound left turn lane onto southbound Highway 1 to be shortened by an equal 95 feet. However, Caltrans and the Transportation Agency for Monterey County (TAMC) are completing the design of a second northbound lane on Highway 1 that will widen Highway 1 by about 30 feet to the east. This will also reduce the length of the westbound Rio Road left turn lane by an equivalent amount. The result will be that the left turn lane will be shortened by a total of 125 feet to about 140 feet, assuming a 60-foot bay taper separating the eastbound left turn lane into the Rio Ranch Shopping Center and the westbound left turn lane onto southbound Highway 1. This will not accommodate the anticipated 178 evening and 220 Saturday midday peak hour left turn volumes. It is recommended that a second westbound left turn lane be added. This will require a 90-foot bay taper, resulting in two left turn lanes each with a length of about 115 feet. The addition of the second left turn lane will require widening Rio Road 11 feet to the south between Highway 1 and the westerly Crossroads driveway, located about 170 feet east of Highway 1. A transition would be provided to match the existing Rio Road southerly curb line on the east side of the middle Crossroads Shopping Center driveway about 250 feet to the east.
c. Remove the existing mid-block painted crosswalk across Rio Road at the Chevron gas station.
d. It is strongly recommended that the modifications along Rio Road be coordinated with the Caltrans/TAMC project that is in final design.

9.2 Carmel Mission Inn Access Road Secondary Driveway – Secondary Access 1

The secondary driveway that will connect with the Carmel Mission Inn access road will have low project traffic volumes. It will allow exiting Carmel Mission Inn and Chevron traffic that is headed eastbound on Rio Road to no longer make a U-turn at Highway 1. Traffic from these adjoining existing uses will be able to travel through the project to Clocktower Lane to access retail centers on the west side of Carmel Rancho Boulevard or Carmel Rancho Boulevard without having to use Rio Road.

Impact: The connection to the Carmel Mission Inn driveway will add cross traffic on the Carmel Mission Inn access road.

Mitigation: Install a stop sign on the project exit at the Carmel Mission Inn driveway.

9.3 Clocktower Lane Secondary Driveway - Secondary Access 2

The secondary driveway that will connect with Clocktower Place will be the route for most project trips to and from Carmel Valley. It will also serve as a route between the Carmel Mission Inn as well as Chevron Station and the Barnyard, Carmel Rancho Boulevard commercial development and Carmel Valley. This will introduce through traffic within the project parking lot. The volume will be low and will not create a congestion problem. However, it will create potential traffic speeds above levels considered acceptable in a parking lot. Traffic conflicts will occur at this project driveway connection to the Barnyard parking lot.

Impact: The connection to the Barnyard parking lot will create vehicular conflicts at this intersection.

Mitigation:

a. Install a stop sign on the project exit at the Barnyard parking lot.

Recommendations:

a. Confirm that there is an easement to use Clocktower Place for project access.
b. Provide an access easement to the Barnyard, Carmel Mission Inn and Chevron.

9.4 Carmel Mission Inn Lobby Area Driveway – Secondary Access 3

The main driveway access aisle is proposed to be extended through the site and into the Carmel Mission Inn parking lot in the immediate vicinity of the hotel lobby. This will only serve Carmel Mission Inn traffic. It will allow traffic entering the Carmel Mission Inn to no longer be required travel a circuitous route between Rio Road and the Carmel Mission Inn. Instead, traffic to the Carmel Mission Inn will be able to turn left at Crossroads Boulevard and continue directly through the project driveway to the traffic circle in the Carmel Mission Inn lobby parking area.

This connection is optional with respect to traffic circulation. Its elimination would accommodate 3 to 4 additional parking spaces.

Impact: Secondary Access 3 will create a four-legged intersection between project parking lot aisles immediately south of the connection to the Carmel Mission Inn.

Mitigation: Install all-way stop control at the four-legged intersection immediately south of the connection to the Carmel Mission Inn.

9.5 Internal Delivery Vehicle Circulation

A loading dock is proposed on the north side of the proposed Grocery Store.

Impact: Semitrailer trucks, other delivery trucks, garbage trucks and emergency vehicles will circulate through the parking lot.

Mitigation: Design the internal circulation aisles that will be used by trucks to accommodate a minimum of a WB-50 semitrailer to the satisfaction of the Monterey County Public Works Department.

9.6 Westbound Rio Road Loading Turnout

A westbound Rio Road loading turnout is proposed on the north side of Rio Road near the southeastern corner of the project, just east of Carmel Center Place. A loading turnout on a four-lane arterial is not a standard method of providing loading facilities for a retail shopping center. The acceptance of this concept by the Monterey County Public Works Department should be confirmed. The design of the turnout should be verified, including length, entering, and exiting transitions, and interface with the Cypress Fire Protection District fire station immediately to the east.

Impact: The proposed loading turnout on Rio Road will create potential vehicular conflicts with westbound Rio Road traffic due to delivery truck drivers being exposed to vehicular traffic and loading activities occurring adjacent to a travel lane.

Mitigation: Either relocate this loading facility to the on-site parking lot near Stores A and B or design to the satisfaction of the Monterey County Public Works Department.

9.7 Westbound Monterey Salinas Transit (MST) Bus Turnout

A westbound Monterey Salinas Transit (MST) bus stop currently exists just east of Carmel Center Place. It does not have a bus turnout, requiring transit buses to stop in the outside westbound Rio Road travel lane. This bus stop is proposed to be relocated to a proposed bus turnout between Crossroads Boulevard and Carmel Center Place. The design of the bus stop should comply with MST standards and be approved by the Monterey County Public Works Department and MST.

Impact: The proposed bus turnout along the project frontage between Crossroads Boulevard and Carmel Center Place will have a beneficial impact on westbound Rio Road traffic operations.

Mitigation: No mitigation is required. However, the design of the bus stop should comply with MST standards and be approved by the Monterey County Public Works Department and MST.

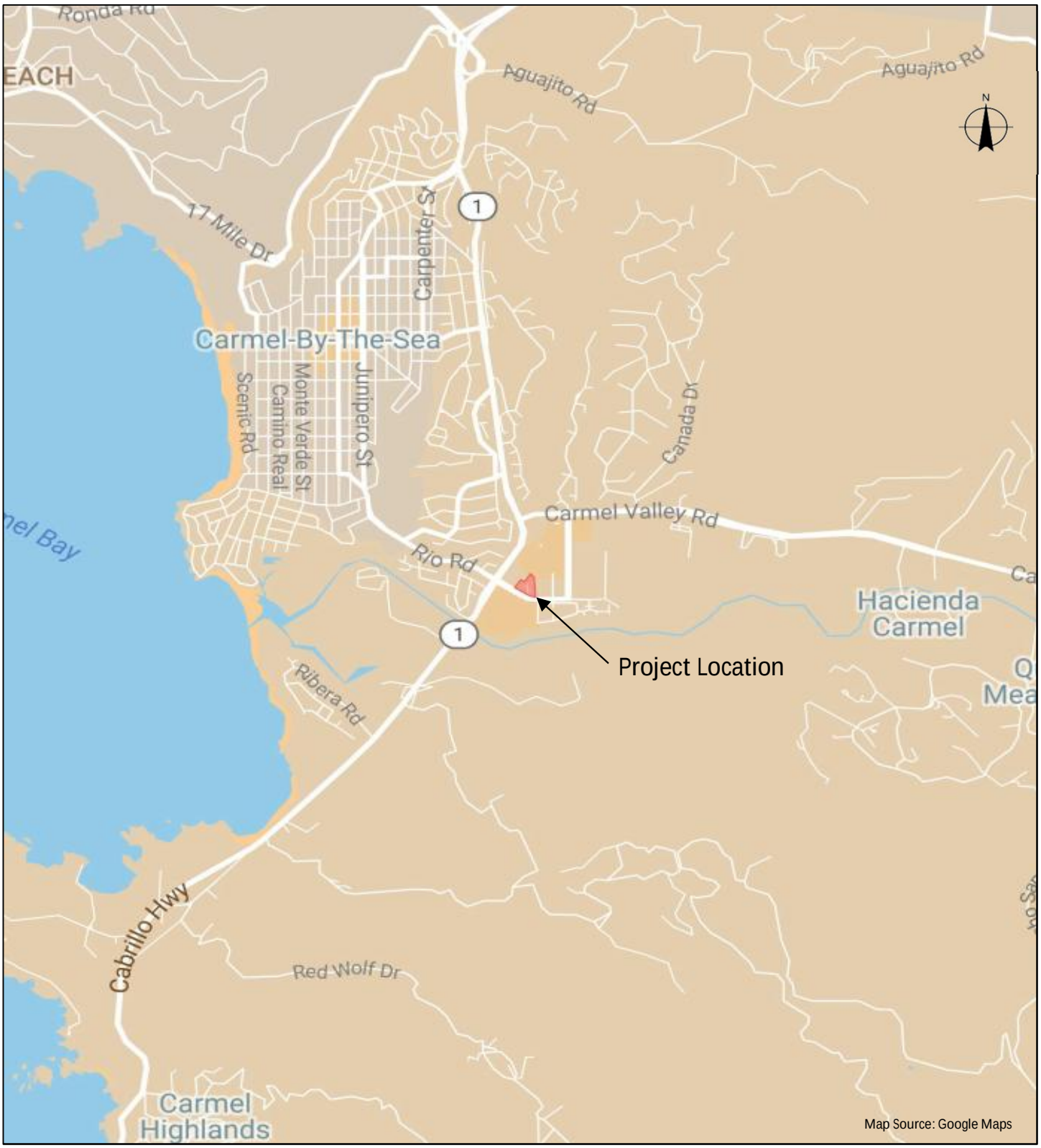
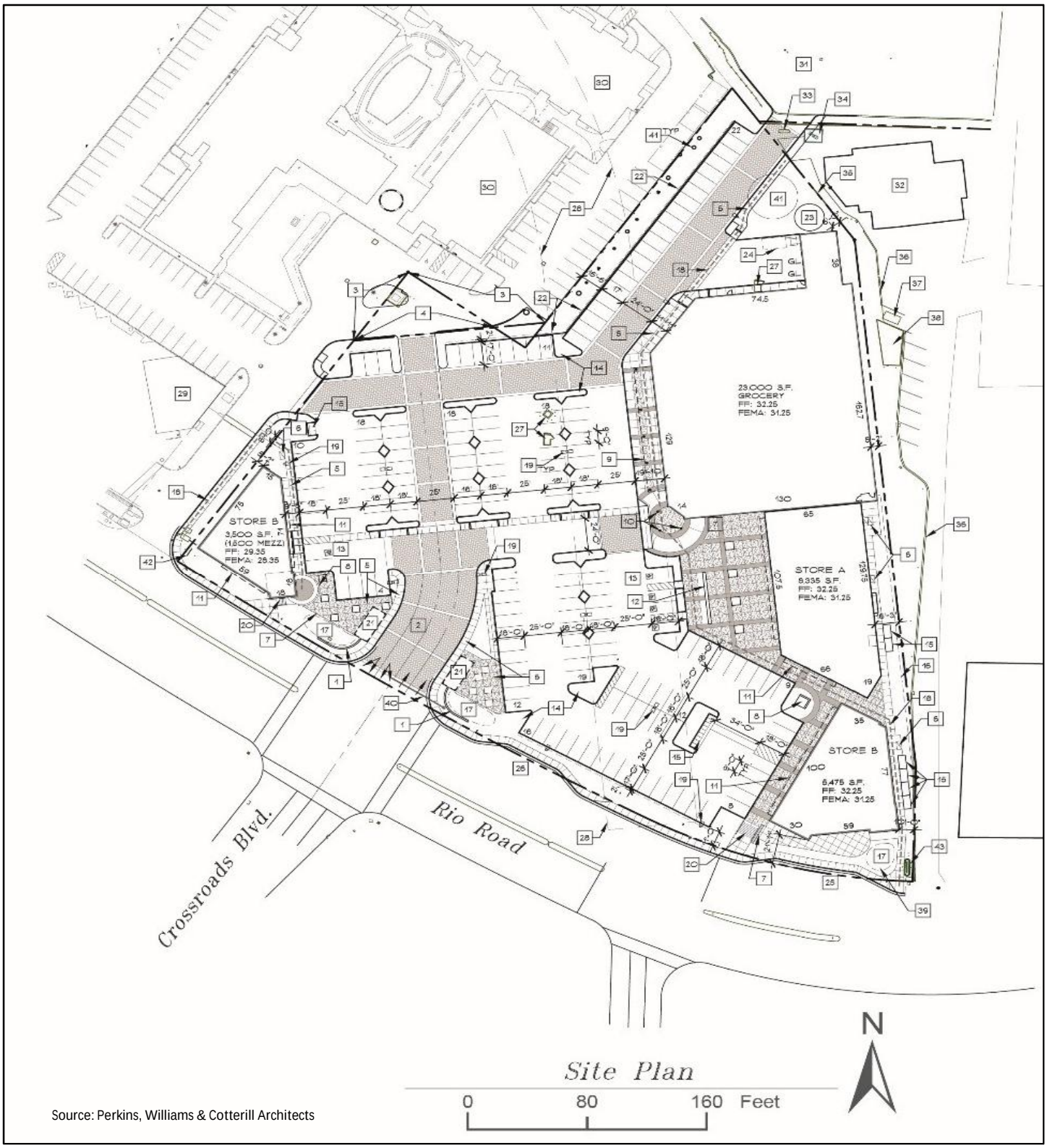


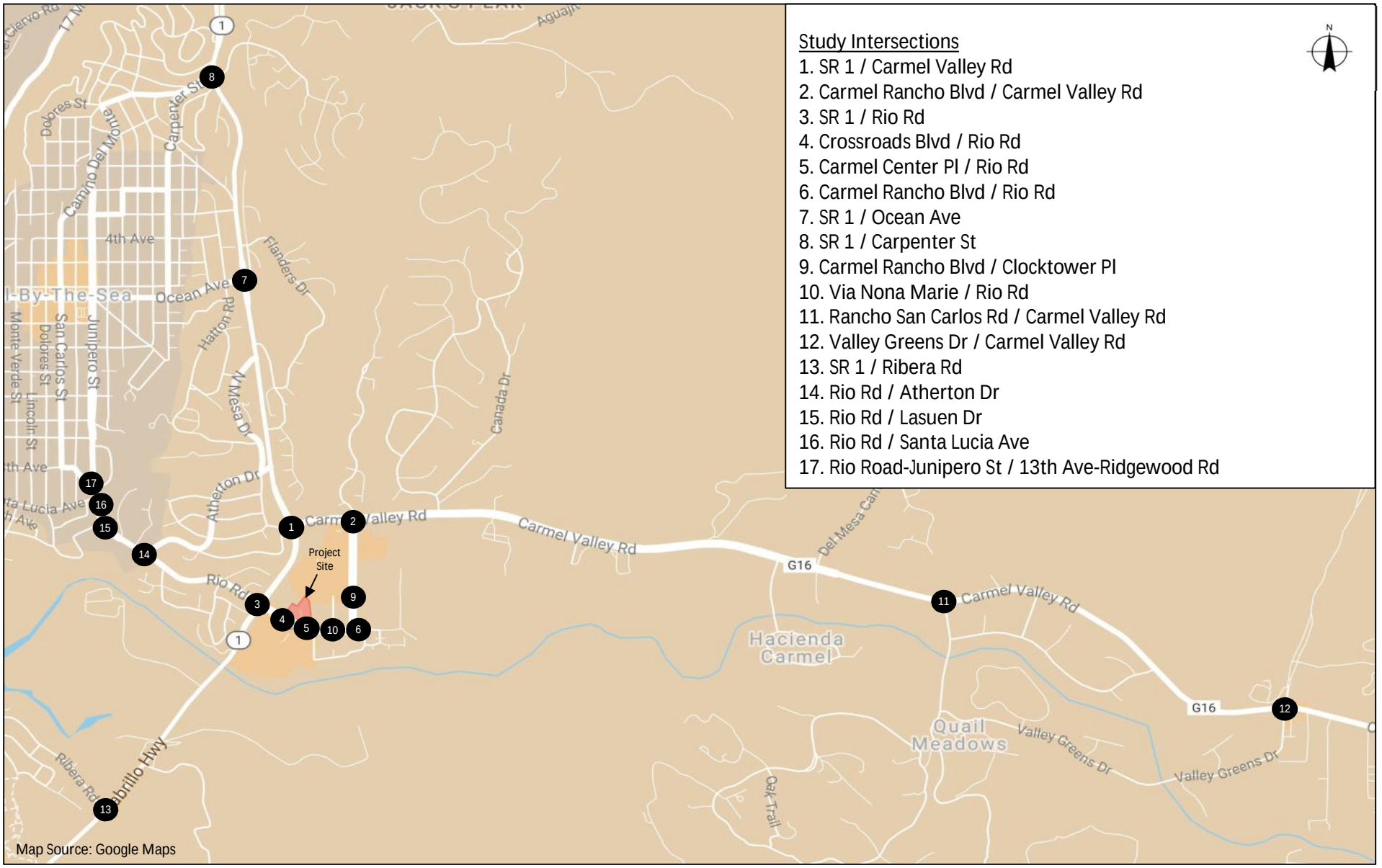
Exhibit 1

Project Location Map



Source: Perkins, Williams & Cotterill Architects

Exhibit 2
Project Site Plan



Legend

(X) Study Intersection #

Exhibit 3

Study Intersections

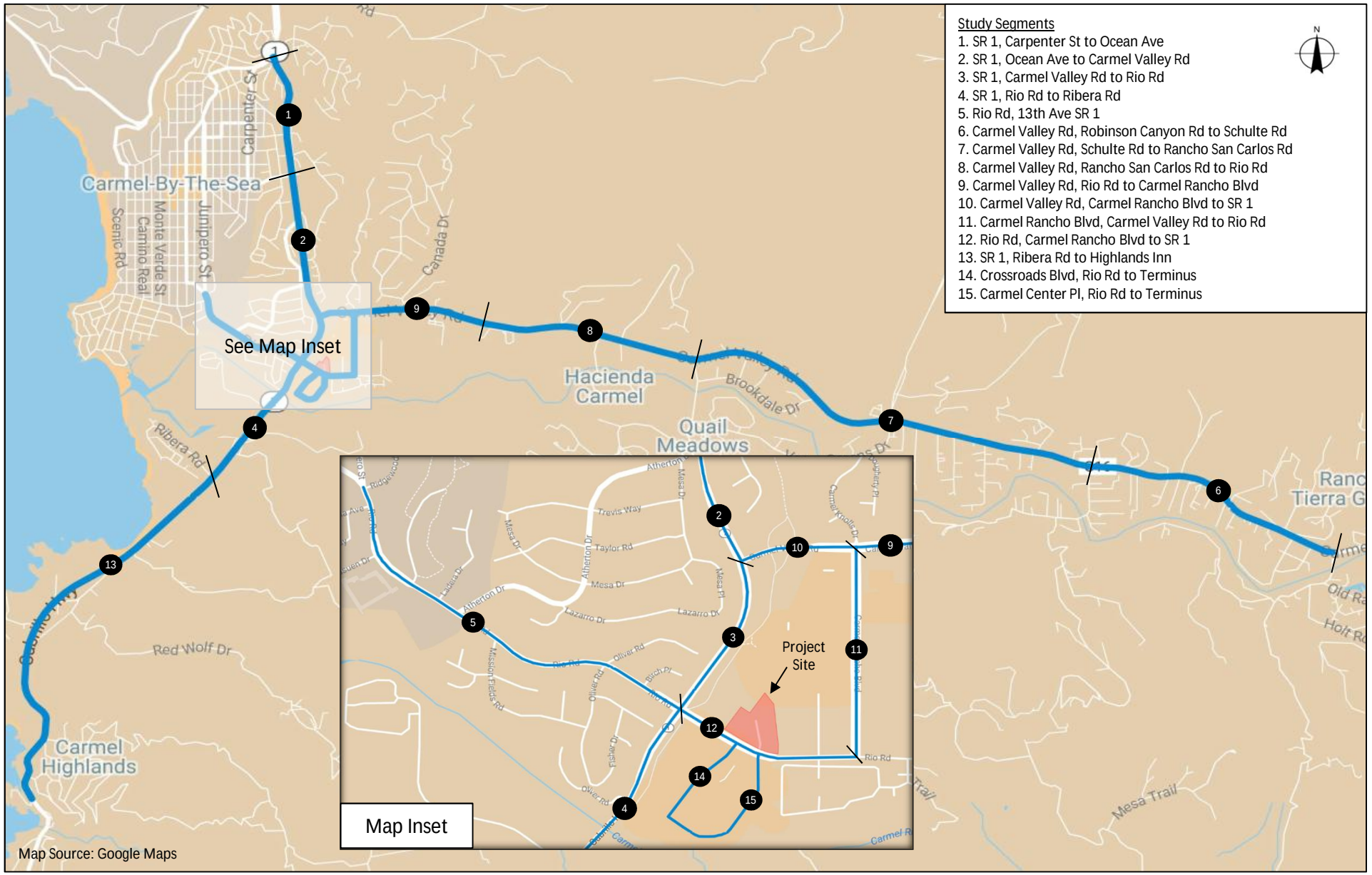


Exhibit 4

Study Segments

Weekday AM and PM Peak Hour

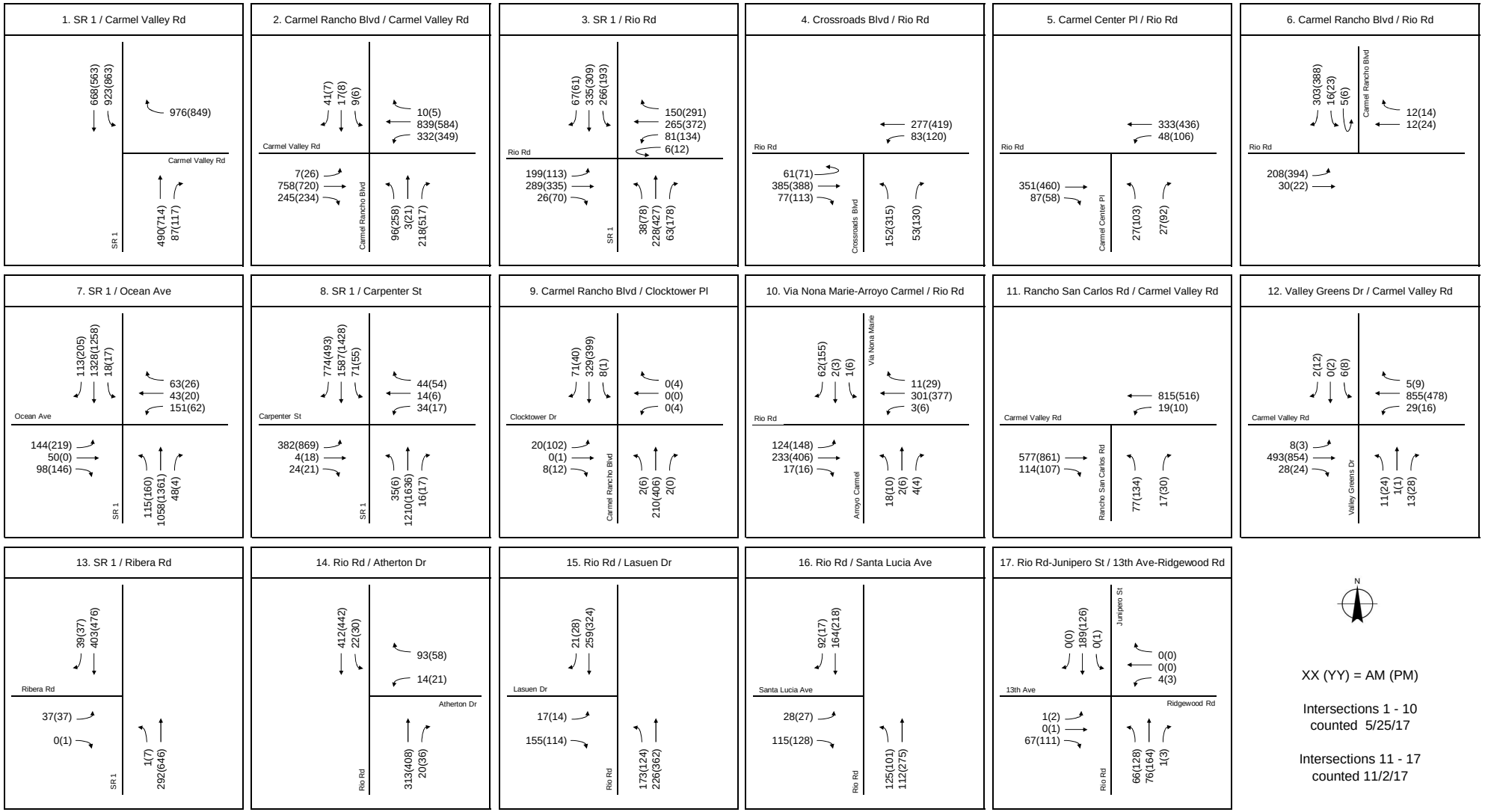
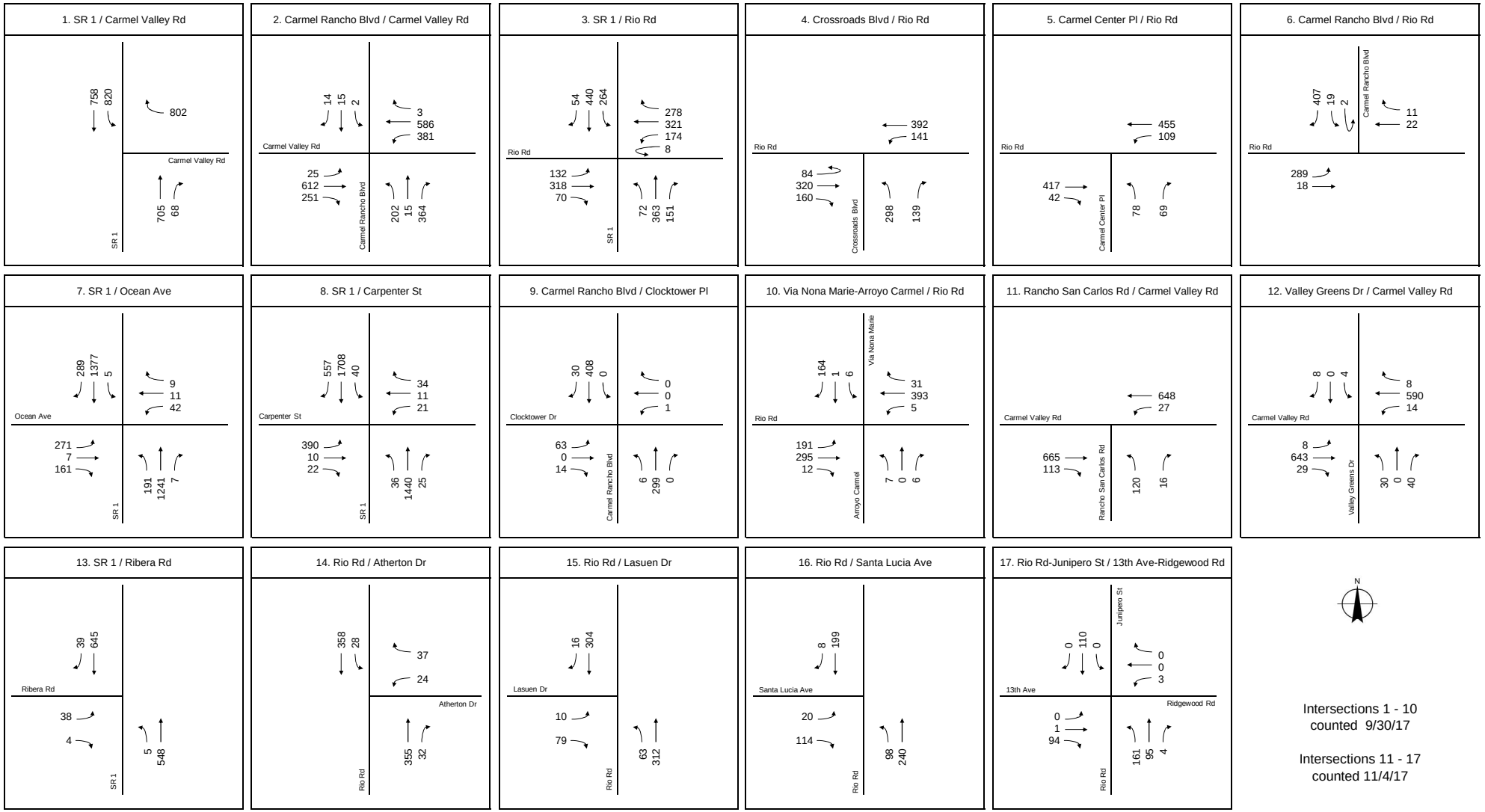


Exhibit 5

Existing Conditions Traffic Volumes

Saturday Peak Hour



Intersections 1 - 10
counted 9/30/17

Intersections 11 - 17
counted 11/4/17

Exhibit 5
Existing Conditions Traffic Volumes

Weekday AM Peak Hour

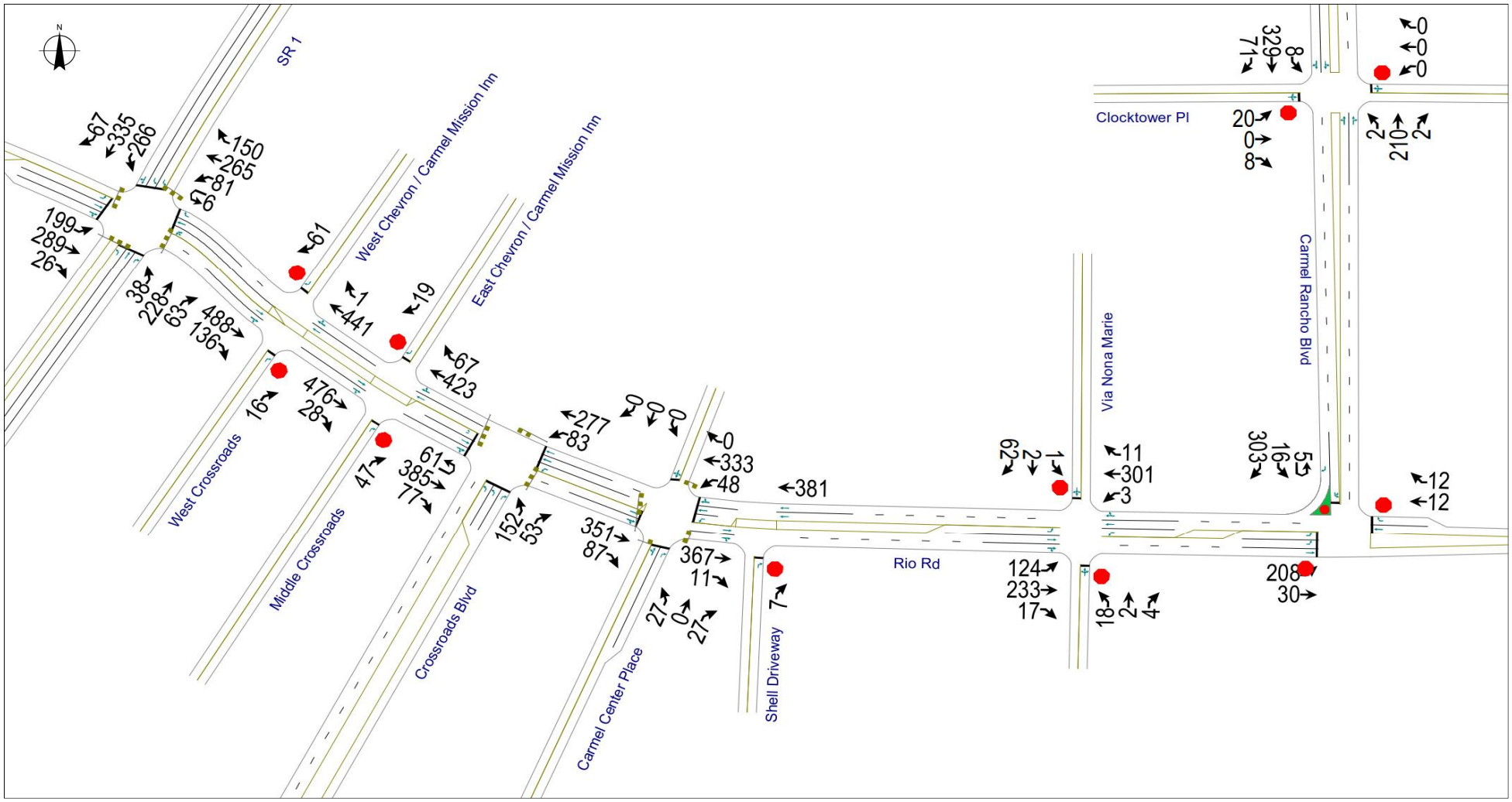


Exhibit 6

Existing Conditions

Rio Road Corridor Traffic Volumes

Weekday PM Peak Hour

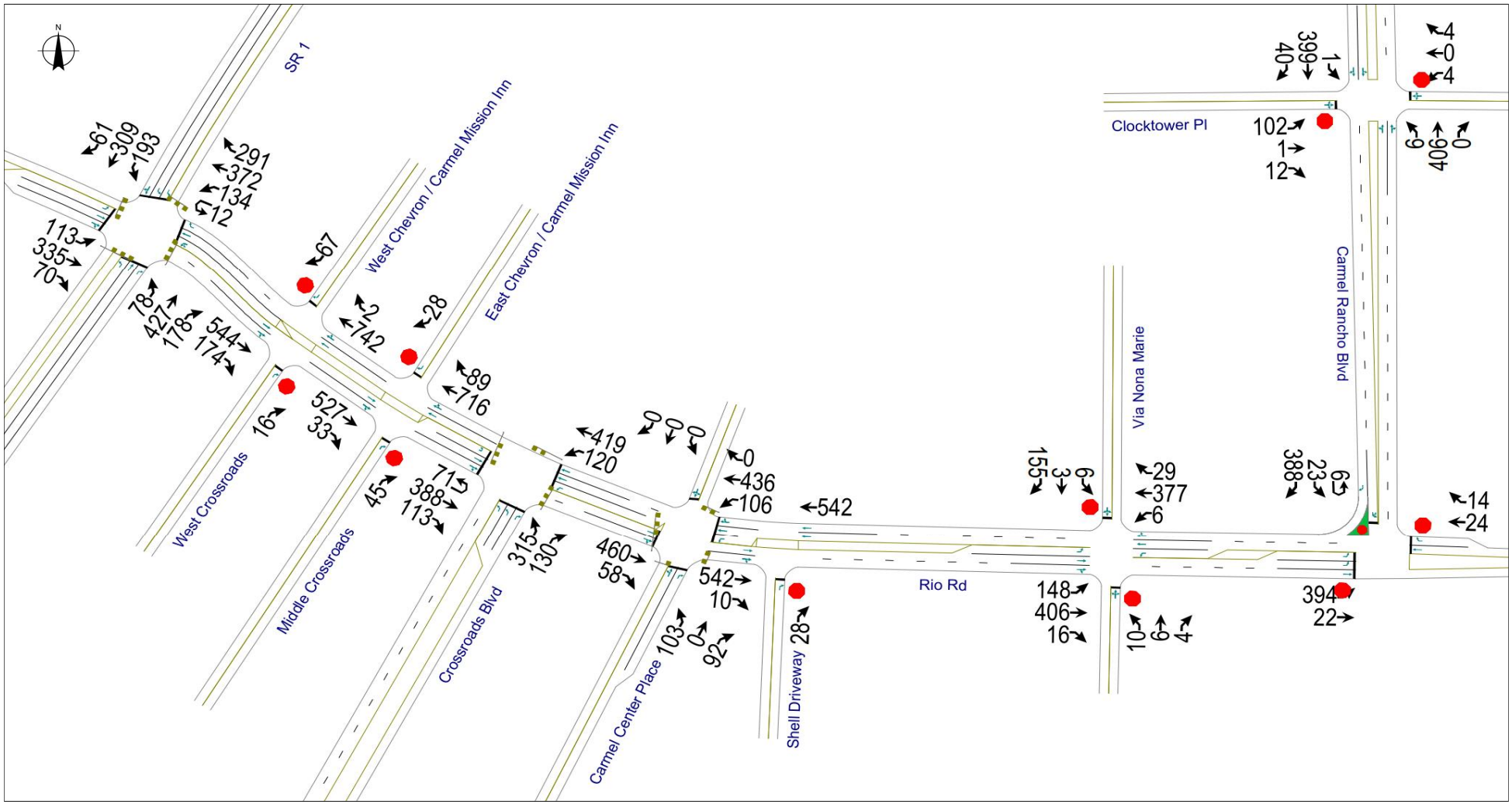


Exhibit 6

Existing Conditions

Rio Road Corridor Traffic Volumes

Saturday Peak Hour

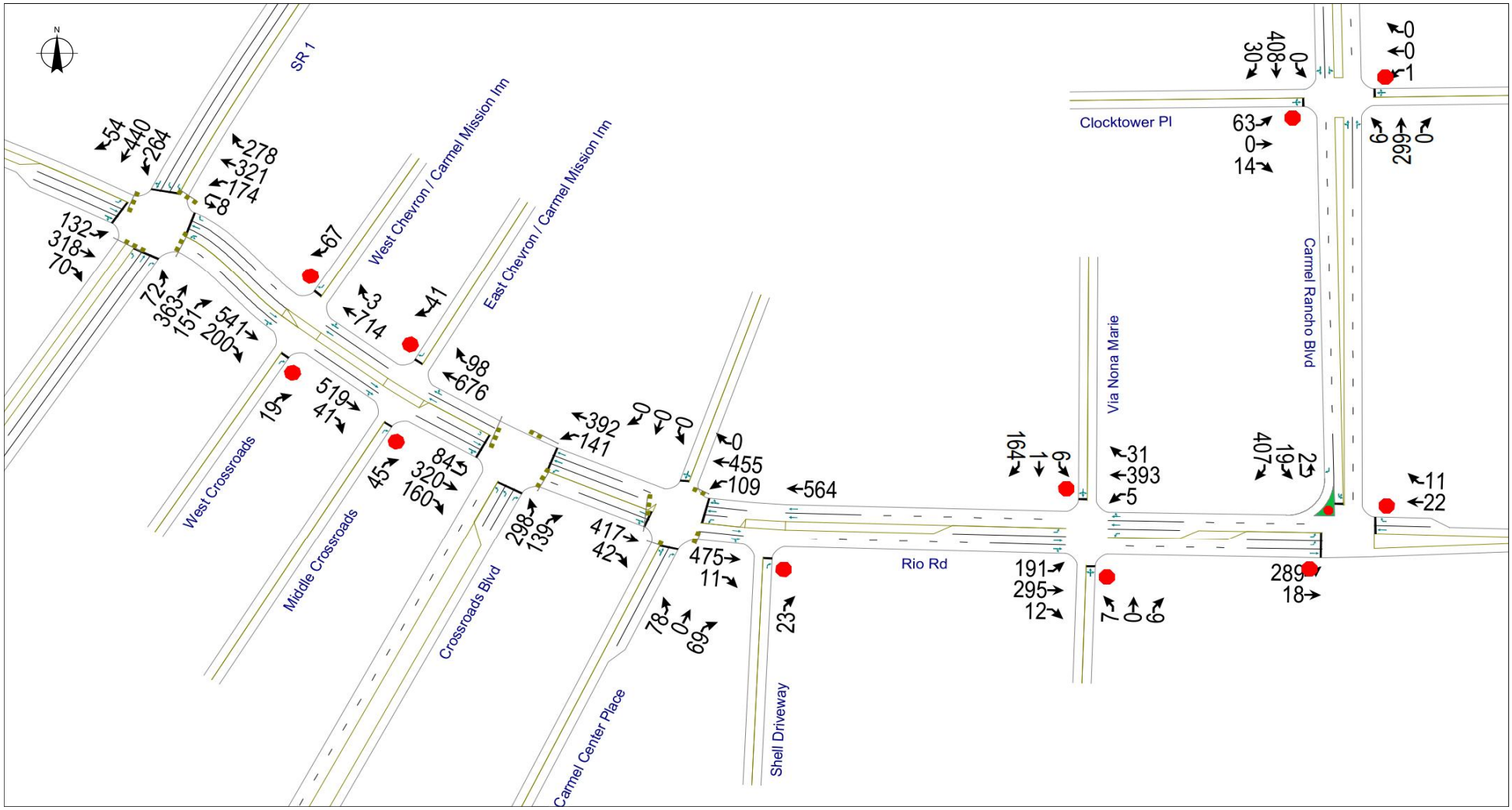


Exhibit 6

Existing Conditions

Rio Road Corridor Traffic Volumes

	N-S Street	E-W Street	Existing Lane Configuration / Proposed Mitigation	Existing Intersection Control	LOS Standard	Existing Conditions									Existing Plus Project Conditions									
						AM Pk Hr.			PM Pk Hr.			Sat Pk Hr.			AM Pk Hr.			PM Pk Hr.			Sat Pk Hr.			
						Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Chng V/C	Delay (sec)	LOS	V/C	Chng V/C	Delay (sec)	LOS	V/C	Chng V/C
1	SR 1	Carmel Valley Road	NB 1-T, 1-R SB 2-L, 1-T WB 2-R	Signal	C/D	12.2	B	0.73	13.2	B	0.79	11.5	B	0.76	11.6	B	0.77	0.04	13.8	B	0.81	0.02	12.0	B	0.80	0.04
2	Carmel Rancho Boulevard	Carmel Valley Road	NB 1-L, 1-L/T, 1-R SB 1-L/T, 1-R EB 1-L, 2-T, 1-R WB 2-L, 1-T, 1-T/R	Signal	C	21.1	C	0.61	24.0	C	0.73	18.1	B	0.53	21.8	C	0.62	0.01	27.0	C	0.76	0.03	20.4	C	0.58	0.05
			With EB RTO												24.0	C	0.65		31.2	C	0.80		21.0	C	0.60	
3	SR 1	Rio Road	NB 1-L, 1-T, 1-R SB 2-L, 1-T/R EB 1-L, 1-T, 1-T/R WB 1-L, 1-T, 1-R	Signal	C/D	35.0	C	0.78	48.9	D	0.86	59.9	E	0.93	37.9	D	0.77	-0.01	57.7	E	0.92	0.06	73.0	E	1.00	0.07
			With RTP Improvements And 2nd WBL												26.1	C	0.61	-0.17	31.3	C	0.72	-0.14	32.9	C	0.75	-0.18
4	Crossroads Blvd	Rio Road	NB 2-L, 1-T/R EB 1-L, 1-T, 1-T/R WB 1-L, 2-T	Signal	C	11.8	B	0.32	13.2	B	0.41	14.1	B	0.39	14.1	B	0.31	-0.01	20.6	C	0.53	0.12	25.0	C	0.61	0.22
5	Carmel Center Place	Rio Road	NB 1-L/T, 1-R SB 1-L/T/R EB 1-T, 1-T/R WB 1-L, 1-T, 1-T/R	Signal	C	8.9	A	0.26	7.7	A	0.41	7.2	A	0.35	7.3	A	0.23	-0.03	10.5	B	0.37	-0.04	14.2	B	0.30	-0.05
6	Carmel Rancho Boulevard	Rio Road	SB 1-L, 1-R EB 2-L, 1-T WB 1-T, 1-R	Two-Way Stop	E C	11.0	B		17.1	C		14.4	B		11.1	B			18.5	C			16.4	C		
7	SR 1	Ocean Avenue	NB 1-L, 1-T, 1-T/R SB 1-L, 2-T, 1-R EB 1-L, 1-L/T/R WB 1-L, 1-L/T/R	Signal	C/D	29.7	C	0.80	26.5	C	0.76	26.8	C	0.80	30.1	C	0.81	0.01	27.3	C	0.77	0.01	28.3	C	0.82	0.02
8	SR 1	Carpenter Street	NB 1-L, 1-T, 1-T/R SB 1-L, 2-T, 1-R EB 2-L, 1-T/R WB 1-L, 1-L/T, 1-R	Signal	C/D	22.3	C	0.88	37.1	D	0.89	20.4	C	0.81	22.4	C	0.88	0.00	37.7	D	0.89	0.00	20.6	C	0.82	0.01
			With NB RT Lane With 3rd NBT												22.3	C	0.88	0.00	37.0	D	0.89	0.00	20.4	C	0.82	0.01
9	Carmel Rancho Boulevard	Clocktower Place	NB 1-L, 1-T, 1-T/R SB 1-L, 1-T, 1-T/R EB 1-L/T/R WB 1-L/T/R	Two-Way Stop	E	13.8	B		22.6	C		17.2	C		14.7	B			32.1	D			26.0	D		

	N-S Street	E-W Street	Background Conditions									Background Plus Project Conditions									Cumulative Conditions								
			AM Pk Hr.			PM Pk Hr.			Sat Pk Hr.			AM Pk Hr.			PM Pk Hr.			Sat Pk Hr.			AM Pk Hr.			PM Pk Hr.			Sat Pk Hr.		
			Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Chng V/C	Delay (sec)	LOS	V/C	Chng V/C	Delay (sec)	LOS	V/C	Chng V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C
1	SR 1	Carmel Valley Road	13.2	B	0.81	15.1	B	0.82	12.9	B	0.80	13.2	B	0.82	0.01	16.1	B	0.84	0.02	13.7	B	0.82	0.02	16.8	B	0.86	25.1	C	0.91	20.1	C	0.90
2	Carmel Rancho Boulevard	Carmel Valley Road	24.0	C	0.65	31.2	C	0.80	21.0	C	0.60	25.7	C	0.67	0.02	37.4	D	0.83	0.03	24.2	C	0.64	0.04	28.4	C	0.68	34.7	C	0.81	22.1	C	0.62
												24.7	C	0.69	0.04	35.6	D	0.85	0.05	22.7	C	0.66	0.06								
3	SR 1	Rio Road	41.3	D	0.91	52.9	D	0.88	63.7	E	0.94	42.8	D	0.93	0.02	61.6	E	0.94	0.06	77.3	E	1.02	0.08	44.9	D	0.89	68.6	E	1.03	73.0	E	1.04
												26.3	C	0.61	-0.30	32.9	C	0.74	-0.14	33.7	C	0.76	-0.18								
4	Crossroads Blvd	Rio Road	11.9	B	0.33	13.6	B	0.42	15.8	B	0.40	14.6	B	0.33	0.00	20.7	C	0.54	0.12	25.5	C	0.63	0.23	11.9	B	0.35	13.7	B	0.44	15.2	B	0.43
5	Carmel Center Place	Rio Road	8.8	A	0.26	7.5	A	0.42	8.9	A	0.36	5.9	A	0.24	-0.02	10.2	B	0.38	-0.04	13.9	B	0.30	-0.06	5.0	A	0.28	7.4	A	0.45	6.6	A	0.37
6	Carmel Rancho Boulevard	Rio Road	11.7	B		19.6	C		16.4	C		11.8	B			21.5	C			18.7	C			13.3	B		22.9	C		18.8	C	
7	SR 1	Ocean Avenue	32.6	C	0.83	27.7	C	0.79	30.9	C	0.85	33.1	C	0.83	0.00	29.1	C	0.80	0.01	32.9	C	0.87	0.02	41.9	D	0.90	33.5	C	0.85	40.2	D	0.91
8	SR 1	Carpenter Street	23.4	C	0.90	39.6	D	0.91	22.1	C	0.83	23.5	C	0.90	0.00	40.5	D	0.92	0.01	22.4	C	0.83	0.00	25.4	C	0.91	49.8	D	0.98	24.7	C	0.87
												22.5	C	0.90	0.00	30.9	C	0.85	-0.06	20.8	C	0.83	0.00								
9	Carmel Rancho Boulevard	Clocktower Place	14.4	B		24.7	C		18.4	C		15.4	C			37.0	E			29.1	D			14.8	B		27.8	D		19.8	C	

	N-S Street	E-W Street	Cumulative Plus Project Conditions									
			AM Pk Hr.			PM Pk Hr.			Sat Pk Hr.			
			Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Chng V/C	Delay (sec)	LOS	V/C	Chng V/C
1	SR 1	Carmel Valley Road	17.1	B	0.86	0.00	27.2	C	0.93	0.02	22.7	C	0.92	0.02
2	Carmel Rancho Boulevard	Carmel Valley Road	31.3	C	0.70	0.02	41.6	D	0.85	0.04	25.6	C	0.66	0.04
			30.3	C	0.72	0.04	39.8	D	0.86	0.05	23.9	C	0.67	0.05
3	SR 1	Rio Road	46.0	D	0.91	0.02	76.9	E	1.09	0.06	88.2	F	1.12	0.08
			28.3	C	0.68	-0.21	36.6	D	0.83	-0.20	40.0	D	0.84	-0.20
4	Crossroads Blvd	Rio Road	14.4	B	0.34	-0.01	21.5	C	0.55	0.11	25.4	C	0.65	0.22
5	Carmel Center Place	Rio Road	5.6	A	0.25	-0.03	10.4	B	0.39	-0.06	11.9	B	0.32	-0.05
6	Carmel Rancho Boulevard	Rio Road	13.5	B			25.4	D			21.6	C		
7	SR 1	Ocean Avenue	42.8	D	0.90	0.00	35.6	D	0.86	0.01	45.7	D	0.93	0.02
8	SR 1	Carpenter Street	25.6	C	0.91	0.00	50.8	D	0.98	0.00	26.4	C	0.87	0.00
			24.2	C	0.91	0.00	34.6	C	0.88	-0.10	23.9	C	0.87	0.00
9	Carmel Rancho Boulevard	Clocktower Place	16.0	C			44.7	E			34.3	D		

Notes:

1 L, T, R = Left, Through, Right
2 NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound
3 V/C = Critical volume/capacity ratio.
4 Chng V/C = Change in critical V/C due to project traffic.
5 Level of service highlighted in red indicates that LOS exceeds the LOS standard.
6 Bold box indicates project impact or cumulative project impact.

Exhibit 7
Intersection Levels of Service

	N-S Street	E-W Street	Existing Lane Configuration	Existing Intersection Control	LOS Standard	Existing Conditions						Existing Plus Project Conditions									Background Conditions						Background Plus Project Conditions									Cumulative Conditions						Cumulative Plus Project Conditions								
						AM Pk Hr.			PM Pk Hr.			Sat Pk Hr.			AM Pk Hr.			PM Pk Hr.			Sat Pk Hr.			AM Pk Hr.			PM Pk Hr.			Sat Pk Hr.			AM Pk Hr.			PM Pk Hr.			Sat Pk Hr.			AM Pk Hr.			PM Pk Hr.			Sat Pk Hr.		
						Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C
10	Via Nona Marie	Rio Road	NB 1-L/T/R SB 1-L/T/R EB 1-L, 1-T, 1-T/R WB 1-L, 1-T, 1-T/R	Two-Way Stop	E	19.0	C		29.9	D		22.7	C		17.1	C		25.6	D		18.4	C		19.8	C		31.9	D		24.0	C		17.7	C		27.4	D		19.3	C		21.6	C		36.6	E		27.2	D		19.1	C		31.1	D		21.4	C	
11	Rancho San Carlos Road	Carmel Valley Road	NB 1-L/R EB 1-T, 1-R WB 1-L, 1-T	Signal	C	9.5	A	0.73	10.2	B	0.80	9.3	A	0.71	9.6	A	0.74	0.01	10.7	B	0.81	0.01	9.1	A	0.73	0.02	9.5	A	0.77	11.4	B	0.84	9.2	A	0.76	9.6	A	0.78	0.01	12.2	B	0.85	0.01	9.7	A	0.77	0.01	9.1	A	0.78	12.3	B	0.86	9.6	A	0.76	9.2	A	0.78	0.00	13.3	B	0.87	0.01	10.3	B	0.79	0.03
12	Valley Greens Drive	Carmel Valley Road	NB 1-L/T, 1-R SB 1-L/T, 1-R EB 1-L, 1-T/R WB 1-L, 1-T/R With Roundabout	Two-Way Stop	E C	42.3	E		39.1	E		27.2	D		43.2	E		45.5	E		34.0	D		47.7	E		76.5	F		45.3	E		51.1 8.0	F A		97.9 8.7	F A		62.9 7.6	F A		53.9	F		94.9	F		53.7	F		59.5 8.3	F A		126.2 9.1	F A		77.0 7.9	F A	
13	SR 1	Ribera Road	NB 1-L/T WB 2-L, 1-T EB 1-T, 1-R	One-Way Stop	E	16.3	C		26.1	D		37.0	E		16.4	C		27.6	D		30.8	D		16.4	C		27.0	D		29.1	D		18.8	C		28.3	D		31.6	D		21.5	C		47.3	E		52.1	F		21.8	C		51.0	F		59.6	F	
14	Rio Road	Atherton Drive	NB 1-T/R SB 1-L/T WB 1-L/R	One-Way Stop	E	14.7	B		14.9	B		13.8	B		15.3	C		16.9	C		16.2	C		14.7	B		15.0	B		13.8	B		15.4	C		16.9	C		16.4	C		15.1	C		15.1	C		14.0	B		15.7	C		17.2	C		16.6	C	
15	Rio Road	Lasuen Drive	NB 1-L, 1-T SB 1-T/R EB 1-L/R	One-Way Stop	E	16.8	C		13.6	B		12.0	B		17.3	C		14.3	B		12.7	B		16.9	C		13.7	B		12.1	B		17.4	C		14.3	B		12.7	B		17.2	C		13.9	B		12.2	B		17.7	C		14.6	B		12.9	B	
16	Rio Road	Santa Lucia Drive	NB 1-L, 1-T SB 1-T/R EB 1-L/R	One-Way Stop	E	12.9	B		12.6	B		11.9	B		13.1	B		13.0	B		12.4	B		13.0	B		13.1	B		11.9	B		13.1	B		13.1	B		12.5	B		13.1	B		12.8	B		12.1	B		13.3	B		13.3	B		12.7	B	
17	Rio Road-Junipero Street	13th Avenue-Ridgewood Road	NB 1-L/T/R SB 1-L/T/R EB 1-L/T/R WB 1-L/T/R	All-Way Stop	C	8.9	A		9.5	A		9.2	A		8.9	A		9.8	A		9.5	A		8.9	A		9.6	A		9.3	A		9.0	A		9.8	A		9.6	A		9.0	A		9.6	A		9.4	A		9.0	A		9.9	A		9.8	A	

Notes:

1 L, T, R = Left, Through, Right
2 NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound
3 V/C = Critical volume/capacity ratio.
4 Chng V/C = Change in critical V/C due to project traffic.
5 Level of service highlighted in red indicates that LOS exceeds the LOS standard.
6 Bold box indicates project impact or cumulative project impact.

Exhibit 7
Intersection Levels of Service

	Segment	From	To	# of Lanes	CVMP ADT Threshold	ADT	Dir	Existing Conditions														
								AM Peak Hour					PM Peak Hour					Saturday Peak Hour				
								Volume	PTSF	Density	% FFS	LOS	Volume	PTSF	Density	% FFS	LOS	Volume	PTSF	Density	% FFS	LOS
1	SR 1	Carpenter St	Ocean Ave	4	N/A	N/A	NB	1,265	-	16.7	-	B	1,659	-	21.0	-	C	1,521	-	19.3	-	C
							SB	1,645	-	20.4	-	C	1,480	-	17.2	-	B	1,751	-	20.2	-	C
2	SR 1	Ocean Ave	Carmel Valley Rd	3	N/A	N/A	NB	1,466	-	20.6	-	C	1,563	-	18.9	-	C	1,507	-	18.8	-	C
							SB	1,591	93.5%	-	-	F	1,466	95.1%	-	-	F	1,580	96.5%	-	-	F
3	SR 1	Carmel Valley Rd	Rio Rd	2	N/A	N/A	NB	577	81.0%	-	-	D	831	89.2%	-	-	E	773	85.2%	-	-	E
							SB	668	78.9%	-	-	D	563	73.0%	-	-	D	758	82.0%	-	-	D
4	SR 1	Rio Rd	Ribera Rd	2	N/A	N/A	NB	329	61.5%	-	-	C	683	81.7%	-	-	D	586	76.4%	-	-	D
							SB	442	72.6%	-	-	D	513	70.4%	-	-	D	684	79.2%	-	-	D
5	Rio Rd	13th Ave	SR 1	2	N/A	N/A	EB	514	-	-	79.6%	B	518	-	-	80.4%	B	520	-	-	80.0%	B
							WB	370	-	-	79.6%	B	511	-	-	80.4%	B	447	-	-	80.0%	B
6	Carmel Valley Rd	Robinson Canyon Rd	Schulte Rd	2	15,499	14,975	EB	380	58.8%	-	-	C	908	88.4%	-	-	E	671	80.5%	-	-	D
							WB	843	88.7%	-	-	E	438	60.8%	-	-	C	538	75.1%	-	-	D
7	Carmel Valley Rd	Schulte Rd	Rancho San Carlos Rd	2	16,340	16,621	EB	533	74.3%	-	-	D	970	91.4%	-	-	E	585	77.2%	-	-	D
							WB	909	93.5%	-	-	E	500	76.4%	-	-	D	735	84.4%	-	-	D
8	Carmel Valley Rd	Rancho San Carlos Rd	Rio Rd	4	48,487	19,818	EB	691	-	8.0	-	A	968	-	10.0	-	A	778	-	7.8	-	A
							WB	892	-	9.4	-	A	650	-	6.4	-	A	768	-	7.5	-	A
9	Carmel Valley Rd	Rio Rd	Carmel Rancho Blvd	4	51,401	24,558	EB	985	-	10.5	-	A	1,243	-	12.0	-	B	978	-	9.3	-	A
							WB	1,181	-	15.9	-	B	938	-	9.7	-	A	970	-	9.4	-	A
10	Carmel Valley Rd	Carmel Rancho Blvd	SR 1	4	27,839	22,654	EB	1,010	-	10.8	-	A	980	-	9.5	-	A	888	-	8.5	-	A
							WB	976	-	11.8	-	B	849	-	8.7	-	A	802	-	7.5	-	A
11	Carmel Rancho Blvd	Carmel Valley Rd	Rio Rd	4	33,495	10,135	NB	317	-	-	93.0%	A	796	-	-	91.5%	A	581	-	-	91.9%	A
							SB	606	-	-	86.4%	A	591	-	-	84.9%	B	647	-	-	84.8%	B
12	Rio Rd	Carmel Rancho Blvd	SR 1	4	33,928	12,099	EB	624	-	-	57.9%	C	718	-	-	52.5%	C	741	-	-	53.2%	C
							WB	502	-	-	46.4%	D	809	-	-	43.9%	D	781	-	-	44.3%	D
13	SR 1	Ribera Rd	Highlands Inn	2	N/A	N/A	NB	293	65.2%	-	-	C	653	81.7%	-	-	D	553	73.5%	-	-	D
							SB	403	70.9%	-	-	D	477	70.2%	-	-	D	649	79.4%	-	-	D
14	Crossroads Blvd	Rio Rd	Terminus	2	N/A	N/A	NB	205	-	-	60.0%	C	445	-	-	55.2%	C	437	-	-	55.2%	C
							SB	160	-	-	60.0%	C	233	-	-	55.2%	C	301	-	-	55.2%	C
15	Carmel Center Place	Rio Rd	Terminus	2	N/A	N/A	NB	54	-	-	87.0%	A	195	-	-	87.2%	A	147	-	-	94.0%	A
							SB	135	-	-	87.0%	A	164	-	-	87.2%	A	151	-	-	94.0%	A

	Segment	From	To	# of Lanes	CVMP ADT Threshold	ADT	Dir	Existing + Project Conditions															
								Project Trips	AM Peak Hour					Project Trips	PM Peak Hour					Project Trips	Saturday Peak Hour				
									Volume	PTSF	Density	% FFS	LOS		Volume	PTSF	Density	% FFS	LOS		Volume	PTSF	Density	% FFS	LOS
1	SR 1	Carpenter St	Ocean Ave	4	N/A	N/A	NB	3	1,268	-	16.7	-	B	15	1,674	-	21.1	-	C	21	1,542	-	19.6	-	C
							SB	5	1,650	-	20.4	-	C	13	1,493	-	17.4	-	B	19	1,770	-	20.4	-	C
2	SR 1	Ocean Ave	Carmel Valley Rd	3	N/A	N/A	NB	5	1,471	-	20.7	-	C	27	1,590	-	19.2	-	C	37	1,544	-	19.3	-	C
							SB	8	1,599	97.2%	-	-	F	22	1,488	95.3%	-	-	F	35	1,615	96.8%	-	-	F
3	SR 1	Carmel Valley Rd	Rio Rd	2	N/A	N/A	NB	5	582	81.1%	-	-	D	27	858	89.4%	-	-	E	38	811	86.5%	-	-	E
							SB	8	676	78.9%	-	-	D	23	586	74.3%	-	-	D	37	795	83.2%	-	-	D
4	SR 1	Rio Rd	Ribera Rd	2	N/A	N/A	NB	5	334	61.9%	-	-	C	14	697	82.0%	-	-	D	24	610	77.4%	-	-	D
							SB	2	444	72.4%	-	-	D	14	527	71.4%	-	-	D	19	703	80.5%	-	-	D
5	Rio Rd	13th Ave	SR 1	2	N/A	N/A	EB	14	528	-	-	79.6%	B	40	558	-	-	80.0%	B	65	585	-	-	79.6%	B
							WB	9	379	-	-	79.6%	B	44	555	-	-	80.0%	B	62	509	-	-	79.6%	B
6	Carmel Valley Rd	Robinson Canyon Rd	Schulte Rd	2	15,499	15,436	EB	4	384	59.0%	-	-	C	21	929	88.6%	-	-	E	28	699	81.4%	-	-	D
							WB	7	850	90.0%	-	-	E	19	457	68.4%	-	-	C	31	569	76.9%	-	-	D
7	Carmel Valley Rd	Schulte Rd	Rancho San Carlos Rd	2	16,340	17,209	EB	5	538	74.4%	-	-	D	27	997	91.7%	-	-	E	36	621	79.3%	-	-	D
							WB	9	918	93.3%	-	-	E	24	524	78.1%	-	-	D	40	775	86.6%	-	-	E
8	Carmel Valley Rd	Rancho San Carlos Rd	Rio Rd	4	48,487	20,498	EB	6	697	-	8.0	-	A	31	999	-	10.4	-	A	40	818	-	8.2	-	A
							WB	10	902	-	9.5	-	A	28	678	-	6.7	-	A	47	815	-	7.9	-	A
9	Carmel Valley Rd	Rio Rd	Carmel Rancho Blvd	4	51,401	25,411	EB	8	993	-	10.6	-	A	39	1,282	-	12.4	-	B	52	1,030	-	9.8	-	A
							WB	11	1,192	-	16.1	-	B	35	973	-	10.1	-	A	58	1,028	-	10.0	-	A
10	Carmel Valley Rd	Carmel Rancho Blvd	SR 1	4	27,839	22,654	EB	0	1,010	-	10.8	-	A	0	980	-	9.5	-	A	0	888	-	8.5	-	A
							WB	0	976	-	11.8	-	B	0	849	-	8.7	-	A	0	802	-	7.5	-	A
11	Carmel Rancho Blvd	Carmel Valley Rd	Rio Rd	4	33,495	11,310	NB	12	329	-	-	93.0%	A	52	848	-	-	91.3%	A	72	653	-	-	91.8%	A
							SB	21	627	-	-	86.2%	A	50	641	-	-	84.8%	B	79	726	-	-	84.5%	B
12	Rio Rd	Carmel Rancho Blvd	SR 1	4	33,928	14,150	EB	29	653	-	-	55.5%	C	85	803	-	-	49.2%	D	136	877	-	-	51.7%	C
							WB	17	519	-	-	47.7%	D	93	902	-	-	42.4%	D	129	910	-	-	43.6%	D
13	SR 1	Ribera Rd	Highlands Inn	2	N/A	N/A	NB	4	297	65.0%	-	-	C	12	665	85.0%	-	-	D	19	572	75.2%	-	-	D
							SB	3	406	70.5%	-	-	D	13	490	70.1%	-	-	D	18	667	79.7%	-	-	D
14	Crossroads Blvd	Rio Rd	Terminus	2	N/A	N/A	NB	3	208	-	-	78.8%	B	9	454	-	-	76.4%	B	13	450	-	-	74.0%	B
							SB	2	162	-	-	78.8%	B	11	244	-	-	76.4%	B	16	317	-	-	74.0%	B
15	Carmel Center Place	Rio Rd	Terminus	2	N/A	N/A	NB	0	54	-	-	87.2%	A	0	195	-	-	87.2%	A	0	147	-	-	94.0%	A
							SB	0	135	-	-	87.2%	A	0	164	-	-	87.2%	A	0	151	-	-	94.0%	A

Notes:
1. LOS = Level of Service
2. Two-lane highway LOS based on percent time spent following (PTSF), Two-Lane Highways, HCM 2010, Exhibit 15-3.
3. Four-lane highway LOS based on density in passenger cars per mile per lane (pc/mi/ln), Multi-Lane Highways, HCM 2010, Exhibit 14-4.
4. Arterial LOS based on travel speed as a percentage of base free-flow speed (% FFS), Urban Street Segments, HCM 2010, Exhibit 17-2.
5. LOS highlighted in red exceeds LOS standard.
6. LOS in bold box indicates project or cumulative project impact.

Exhibit 8
Existing and Existing Plus Project
Road Segment Levels of Service

TRIP GENERATION RATES[1]	ITE Land Use Code	Daily Trip Rate	AM Peak Hour				PM Peak Hour				Sat Daily Trip Rate	Sat Peak Hour			
			Peak Hour Rate	% of ADT	% In	% Out	Peak Hour Rate	% of ADT	% In	% Out		Peak Hour Rate	% of ADT	% In	% Out
Shopping Center[2]	820	91.77	2.17	2%	62%	38%	7.97	9%	48%	52%	127.01	11.82	9%	52%	48%

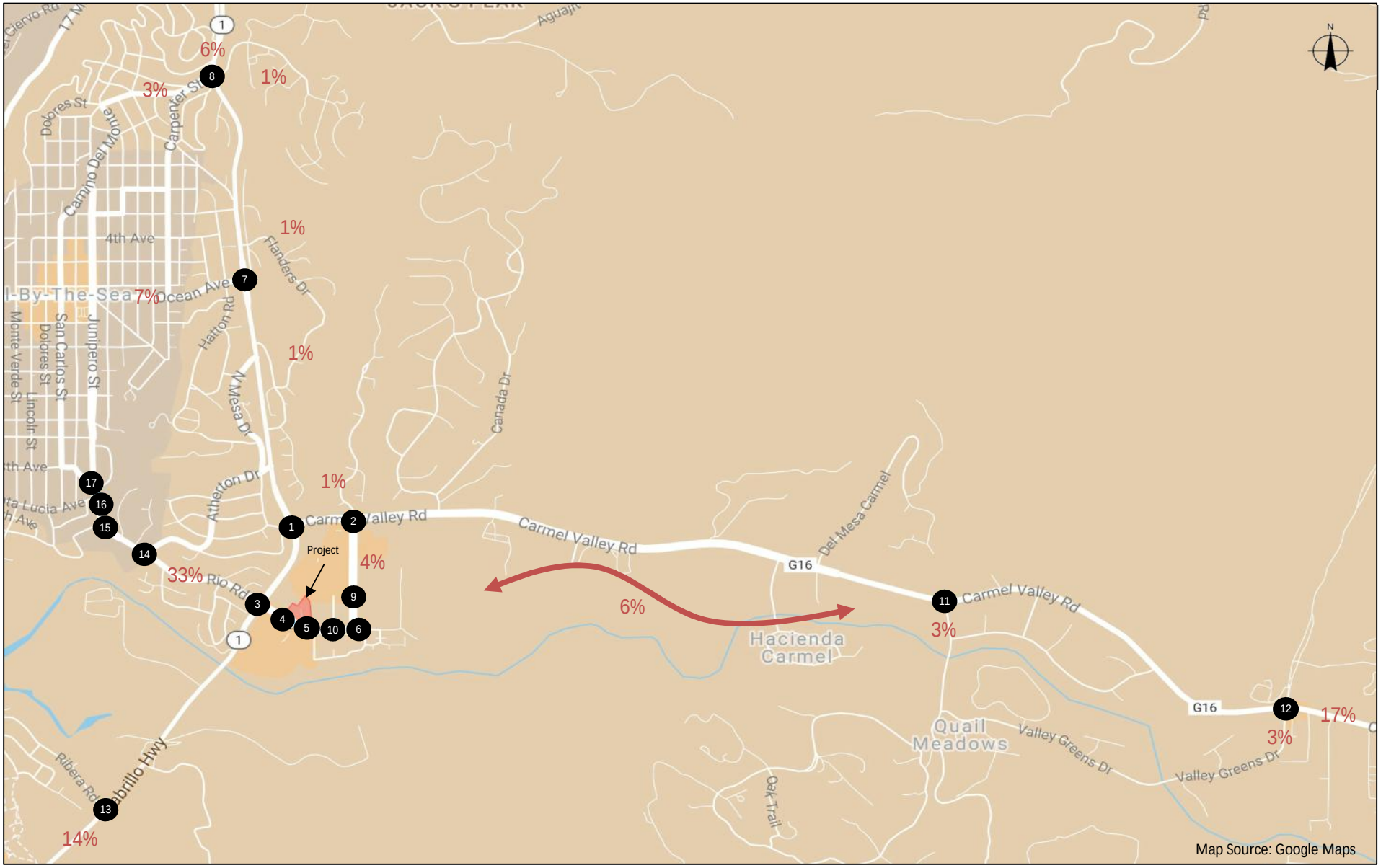
GENERATED TRIPS	Project Size	Daily Trips	Peak Hour Trips	% of ADT	In	Out	Peak Hour Trips	% of ADT	In	Out	Daily Trips	Peak Hour Trips	% of ADT	In	Out
SHOPPING CENTER															
Gross Trips	**42,310 s.f.**	**3,883**	**92**	**2%**	**57**	**35**	**337**	**9%**	**162**	**175**	**5,374**	**500**	**9%**	**260**	**240**
Pass-By and Diverted Linked Trips		**582**	**14**	**2%**	**9**	**5**	**51**	**9%**	**24**	**27**	**806**	**75**	**9%**	**39**	**36**
(15% of Gross Trips)															
Trips to and from Existing Retail		**388**	**9**	**2%**	**6**	**3**	**34**	**9%**	**16**	**18**	**537**	**50**	**9%**	**26**	**24**
(10% of Gross Trips, 4% Barnyard, 6% Crossroads)															
Primary Trips (75% of Gross Trips)		**2,913**	**69**	**2%**	**42**	**27**	**252**	**9%**	**122**	**130**	**4,031**	**375**	**9%**	**195**	**180**

Notes:

1. Trip generation rates published by Institute of Transportation Engineers, "Trip Generation," 9th Edition, 2012.
2. Shopping center trip rates based ITE on fitted curve equation.

Exhibit 9

Project Trip Generation



Legend

X Study Intersection #

X% Trip Distribution %

Exhibit 10

Project Trip Distribution

Weekday AM and PM Peak Hour

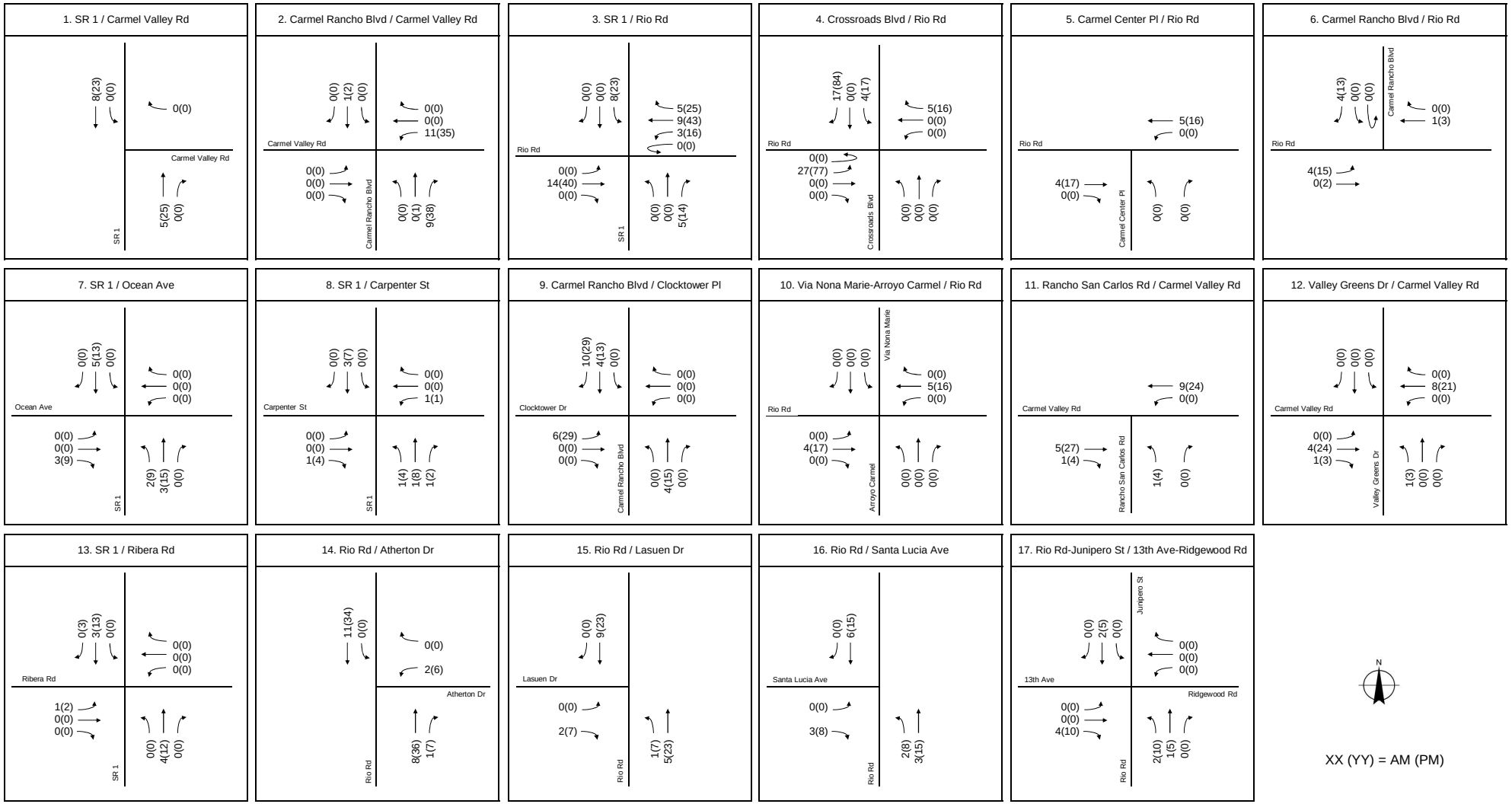


Exhibit 11

Project Trip Assignment - Primary Trips

Saturday Peak Hour

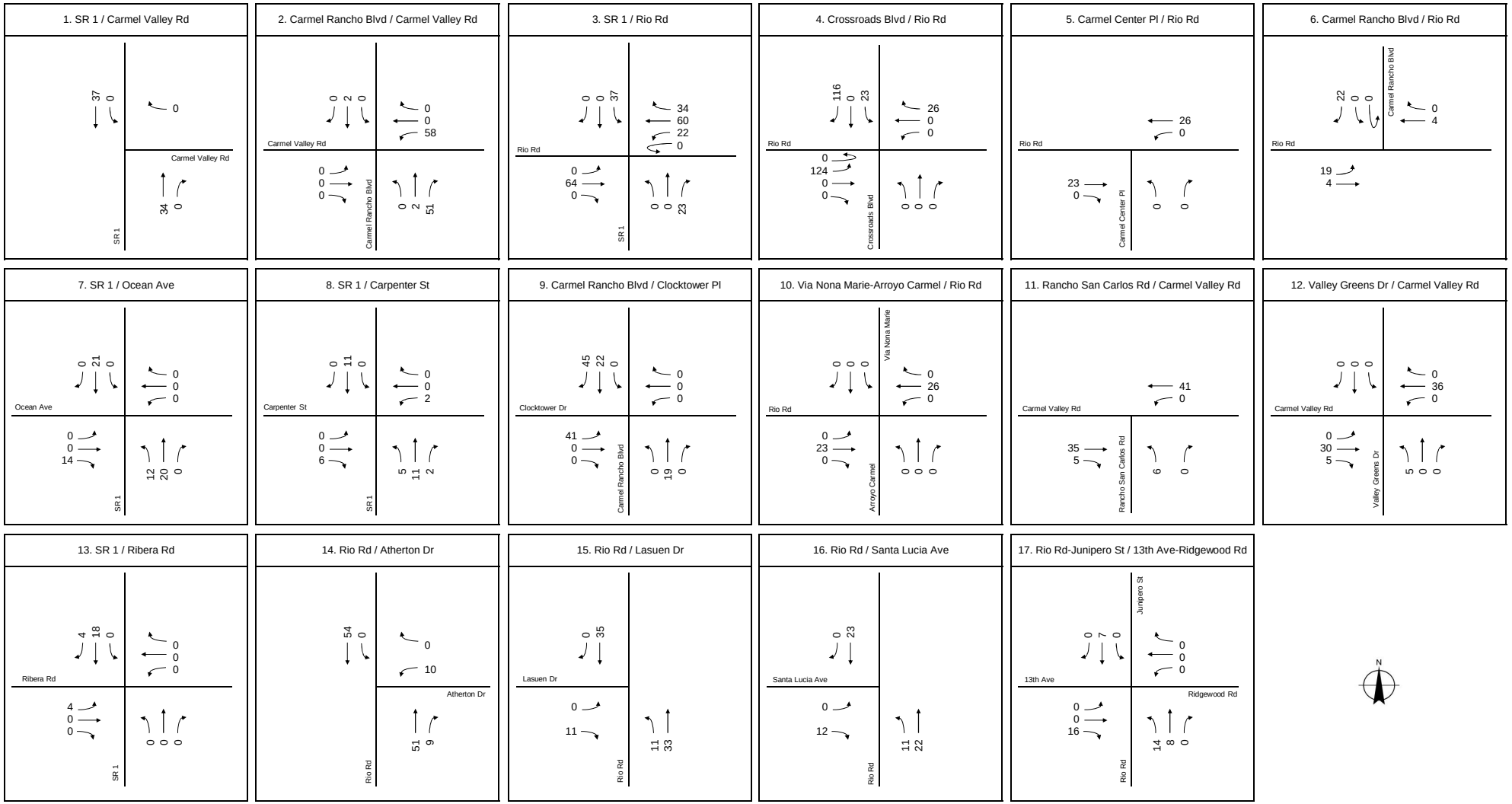


Exhibit 11

Project Trip Assignment - Primary Trips

Weekday AM and PM Peak Hour

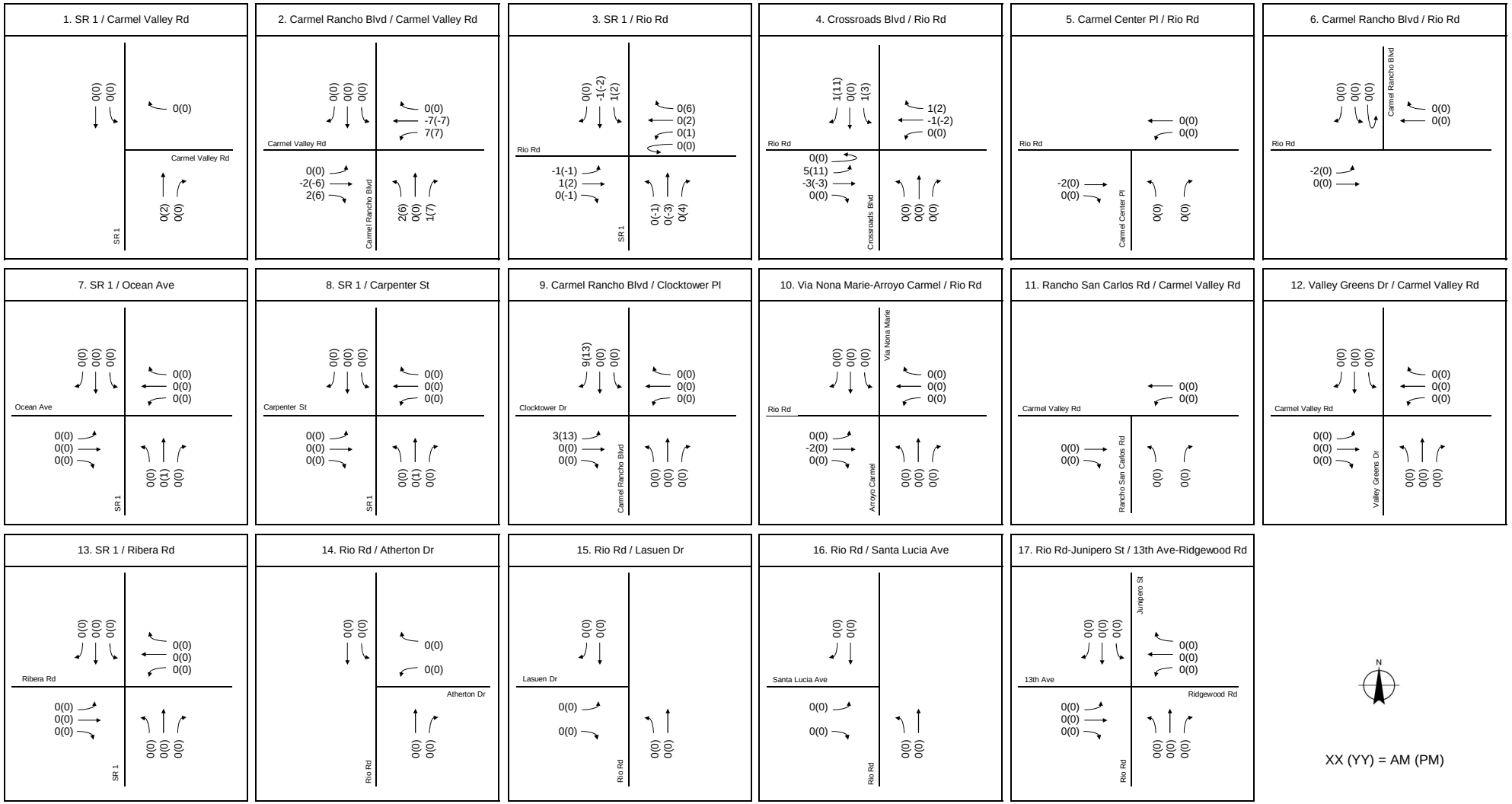


Exhibit 12

Project Trip Assignment - Pass-By and Diverted Linked Trips

Saturday Peak Hour

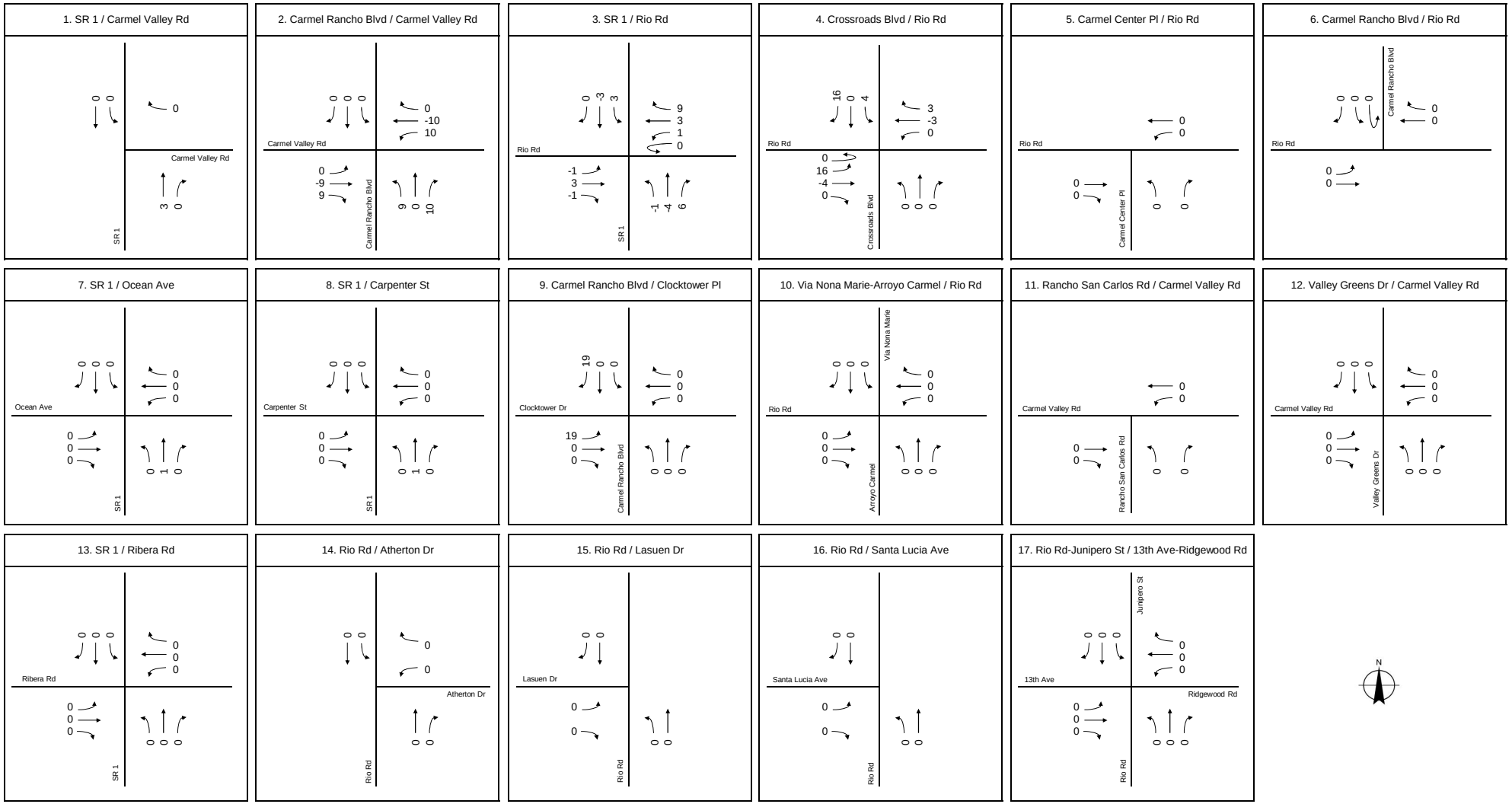


Exhibit 12

Project Trip Assignment - Pass-By and Diverted Linked Trips

Weekday AM and PM Peak Hour

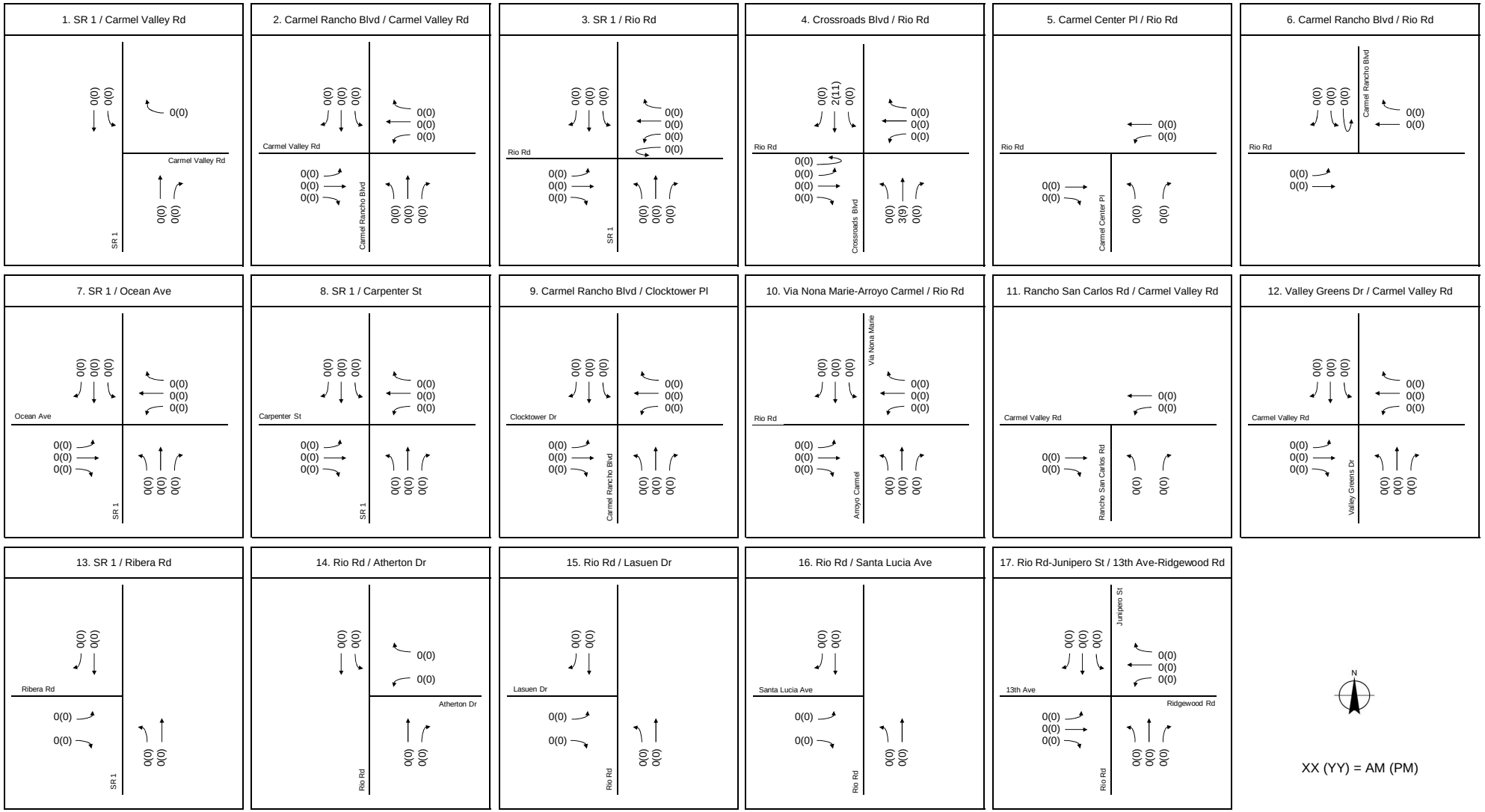


Exhibit 13

Project Trip Assignment - Trips To and From Nearby Retail

Saturday Peak Hour

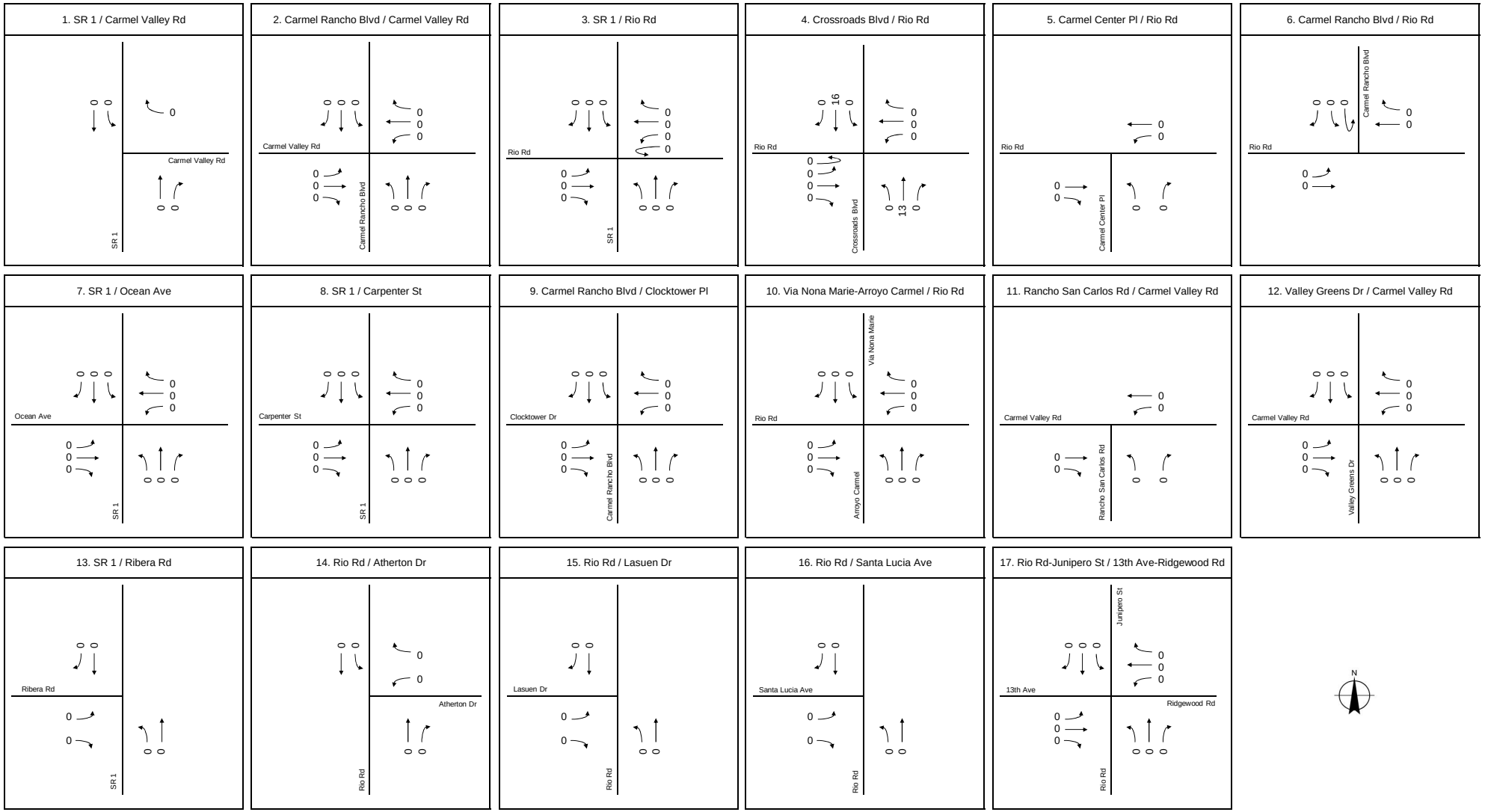


Exhibit 13

Project Trip Assignment - Trips To and From Nearby Retail

Weekday AM and PM Peak Hour

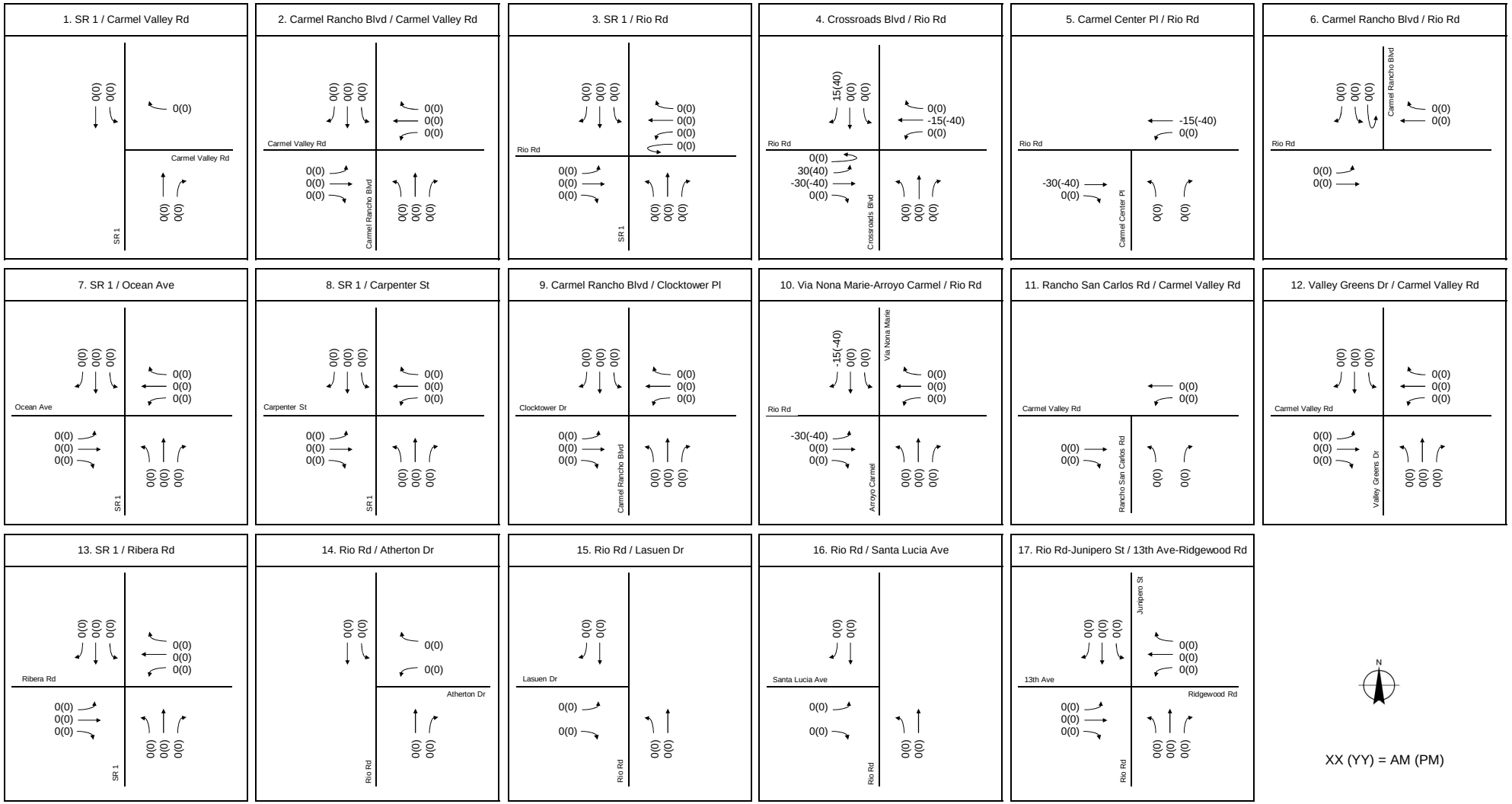


Exhibit 14

Redistributed Existing Traffic Volumes

Saturday Peak Hour

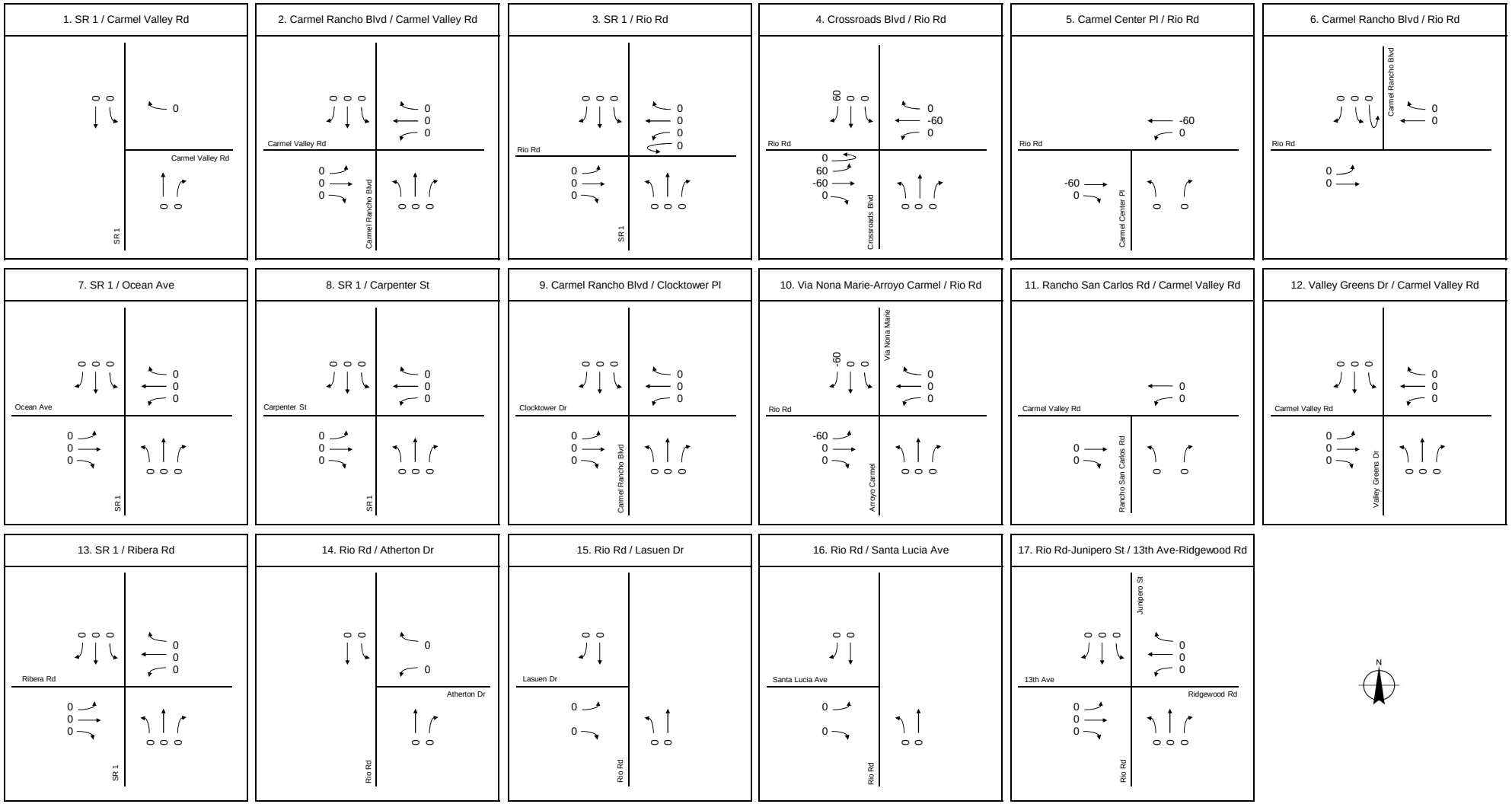


Exhibit 14

Redistributed Existing Traffic Volumes

Weekday AM and PM Peak Hour

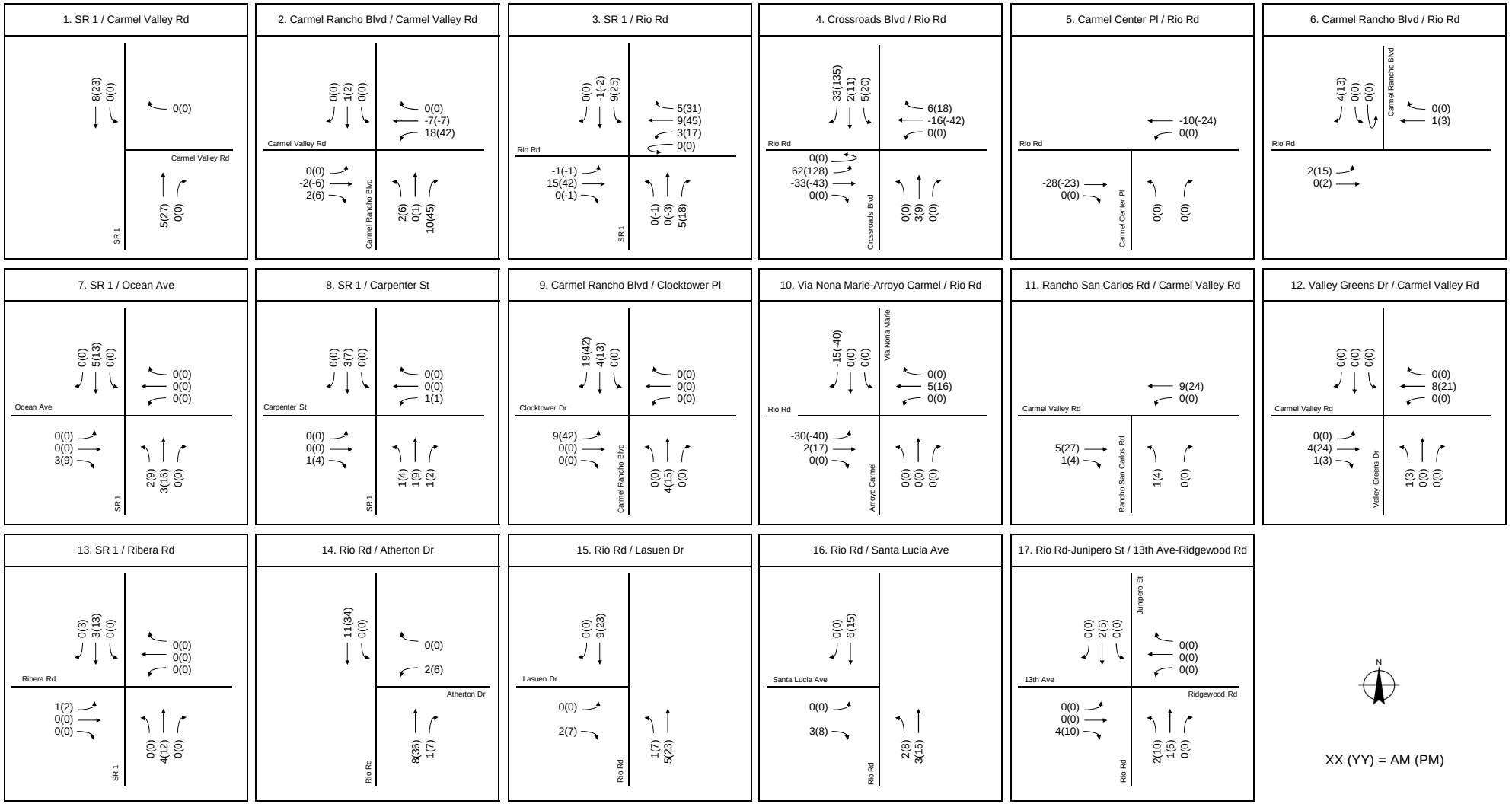


Exhibit 15

Total Net Project Trip Assignment

Saturday Peak Hour

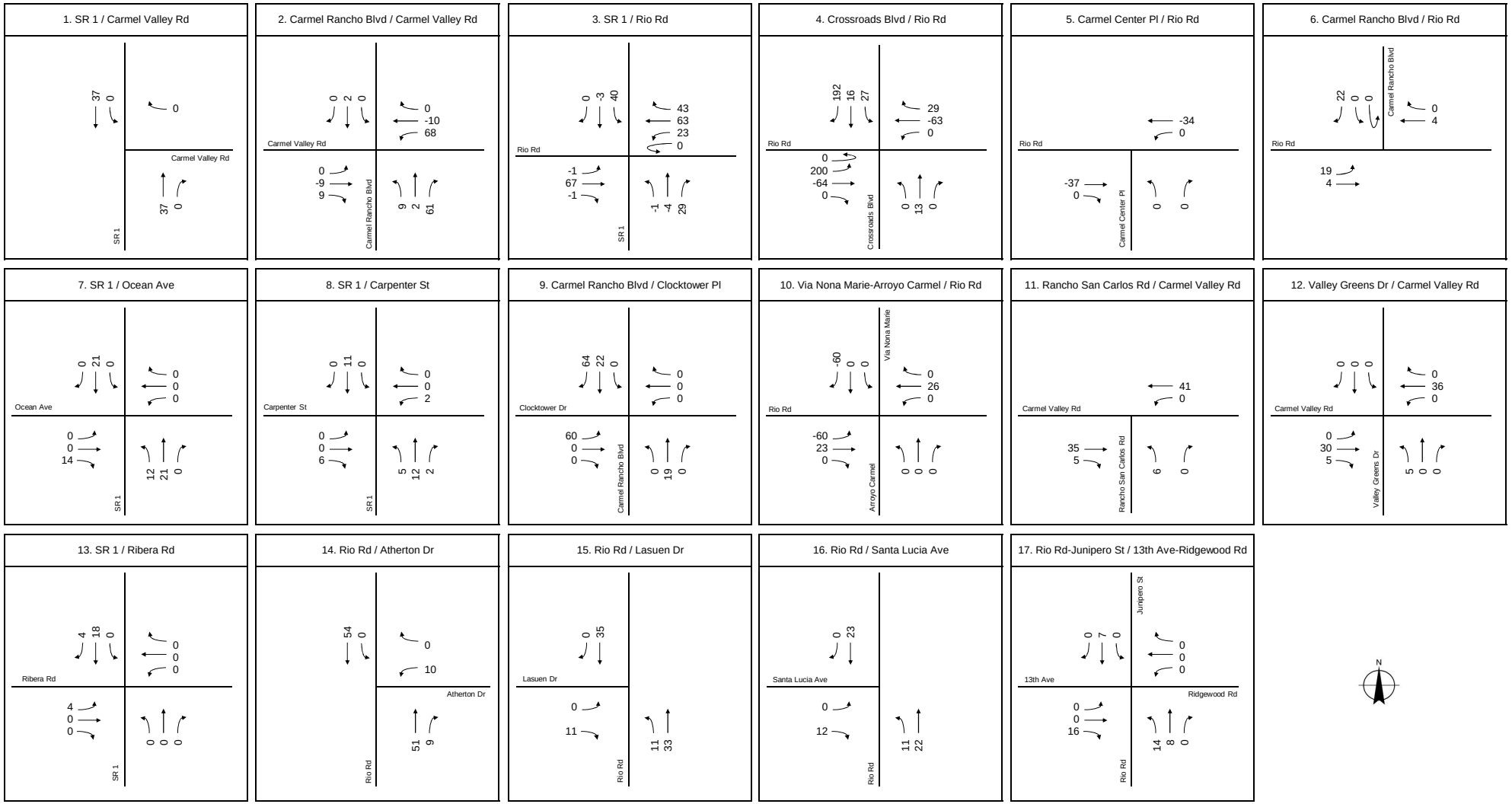


Exhibit 15

Total Net Project Trip Assignment

Weekday AM and PM Peak Hour

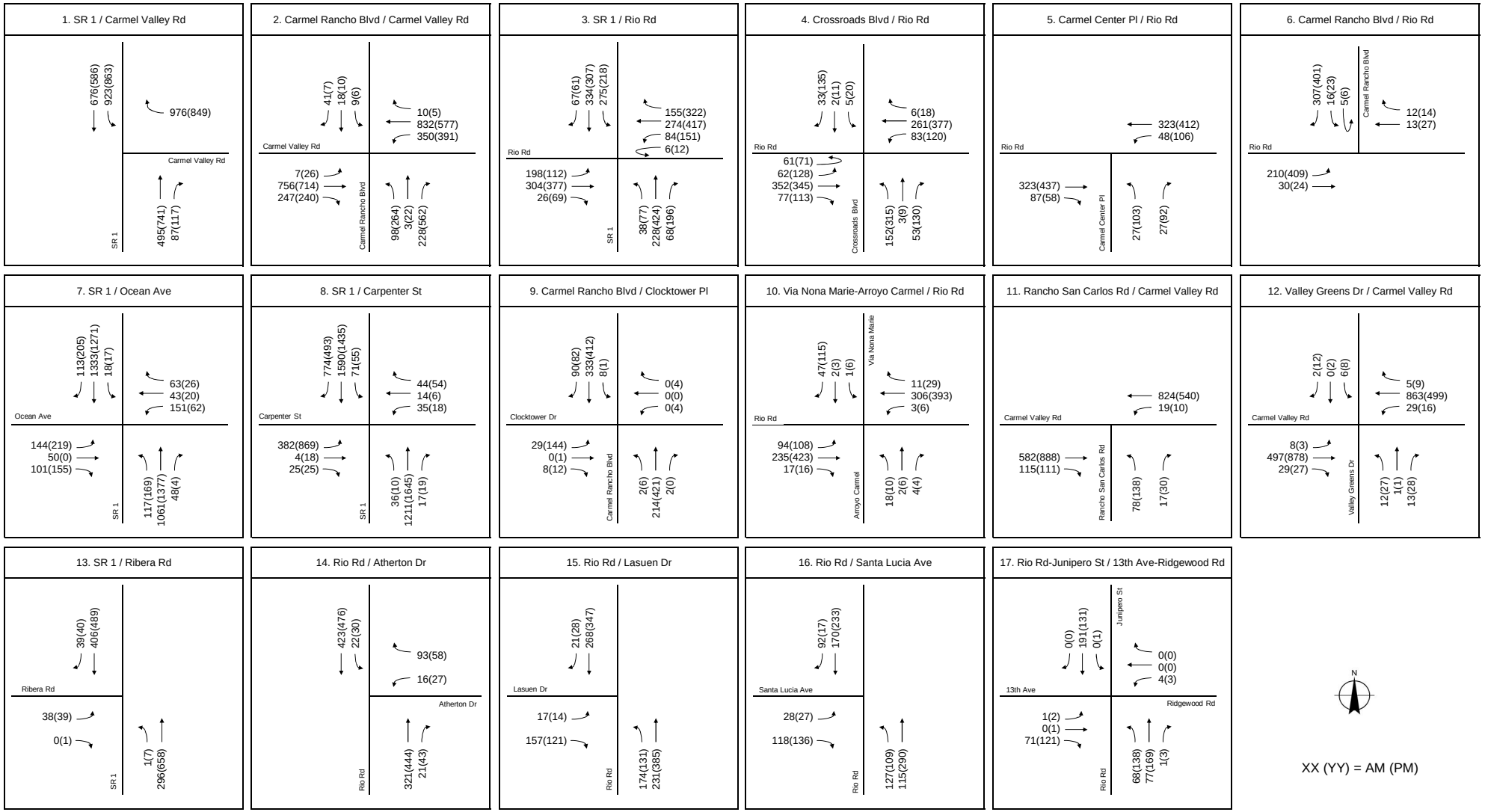


Exhibit 16

Existing Plus Project Traffic Volumes

Saturday Peak Hour

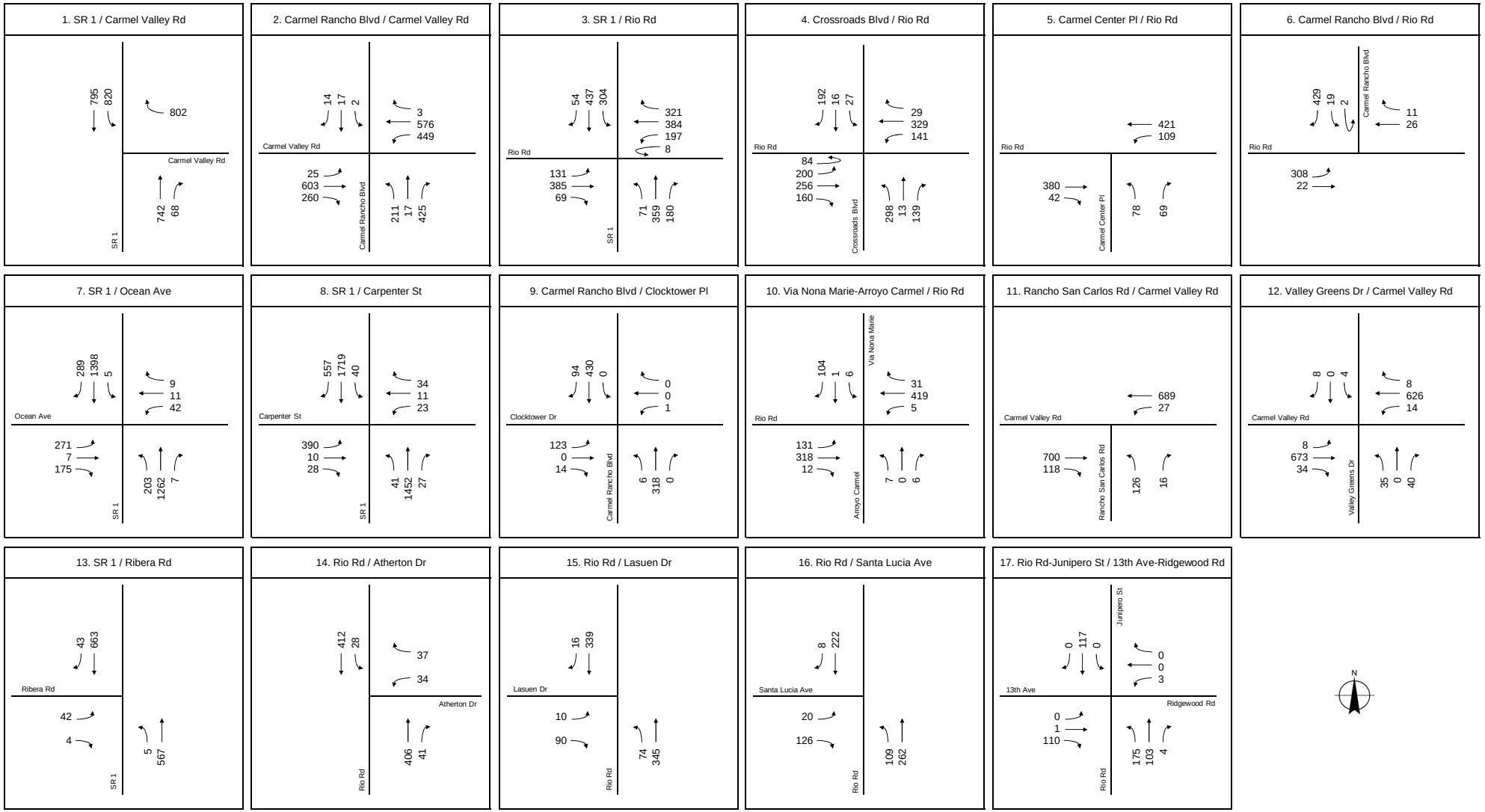


Exhibit 16

Existing Plus Project Traffic Volumes

Weekday AM Peak Hour

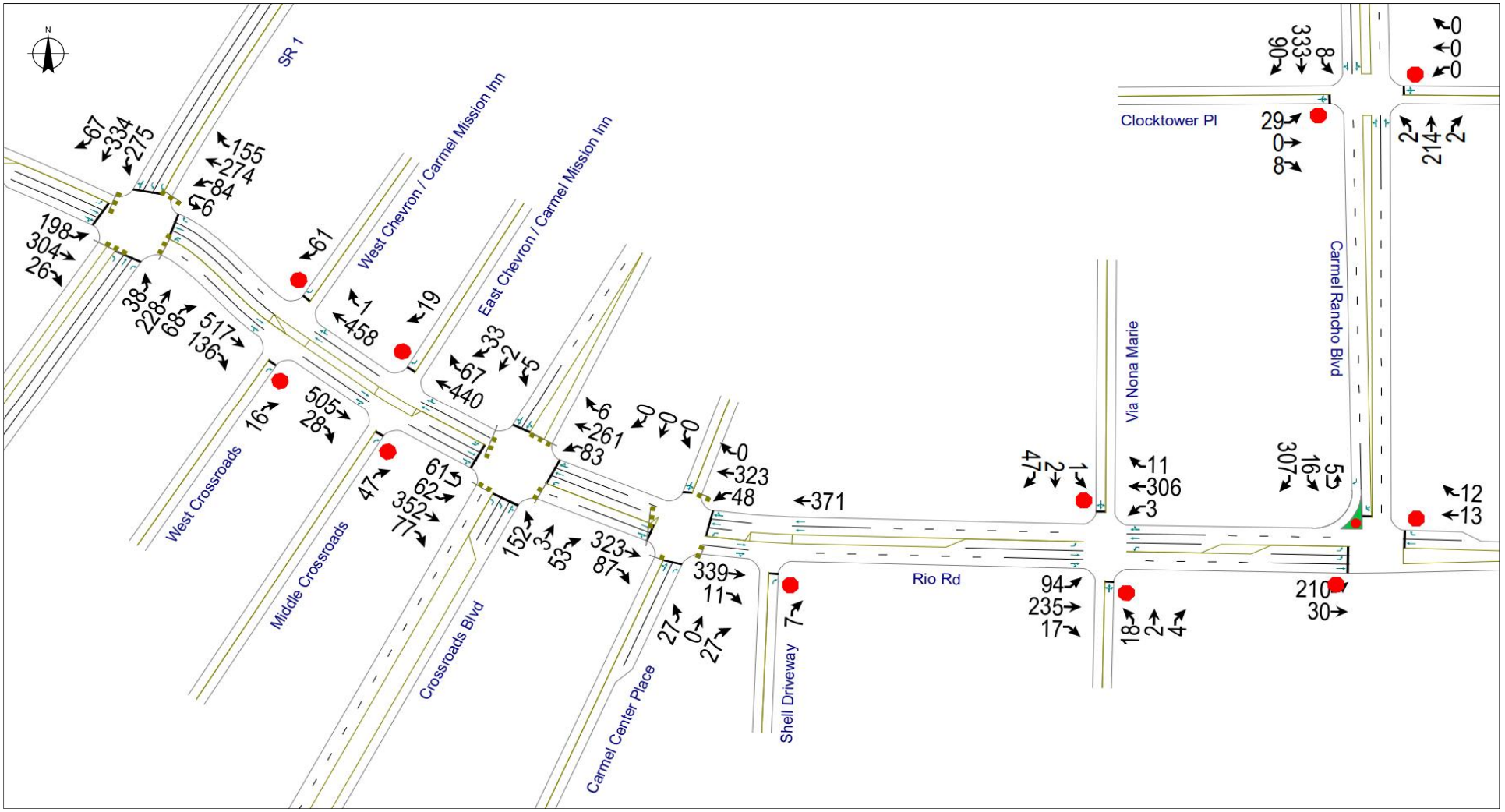


Exhibit 17

Existing Plus Project

Rio Road Corridor Traffic Volumes

Weekday PM Peak Hour

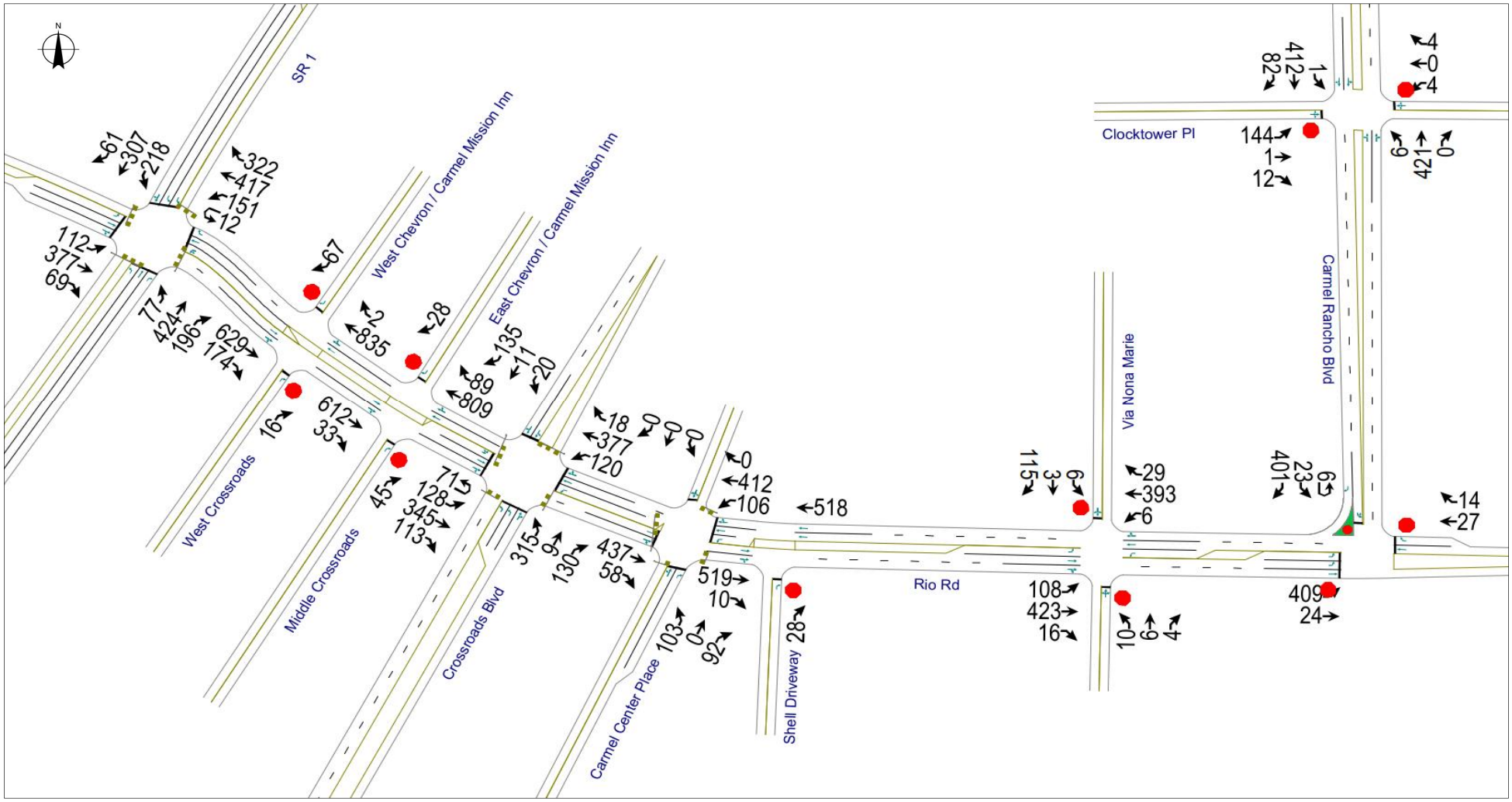


Exhibit 17

Existing Plus Project

Rio Road Corridor Traffic Volumes

Saturday Peak Hour

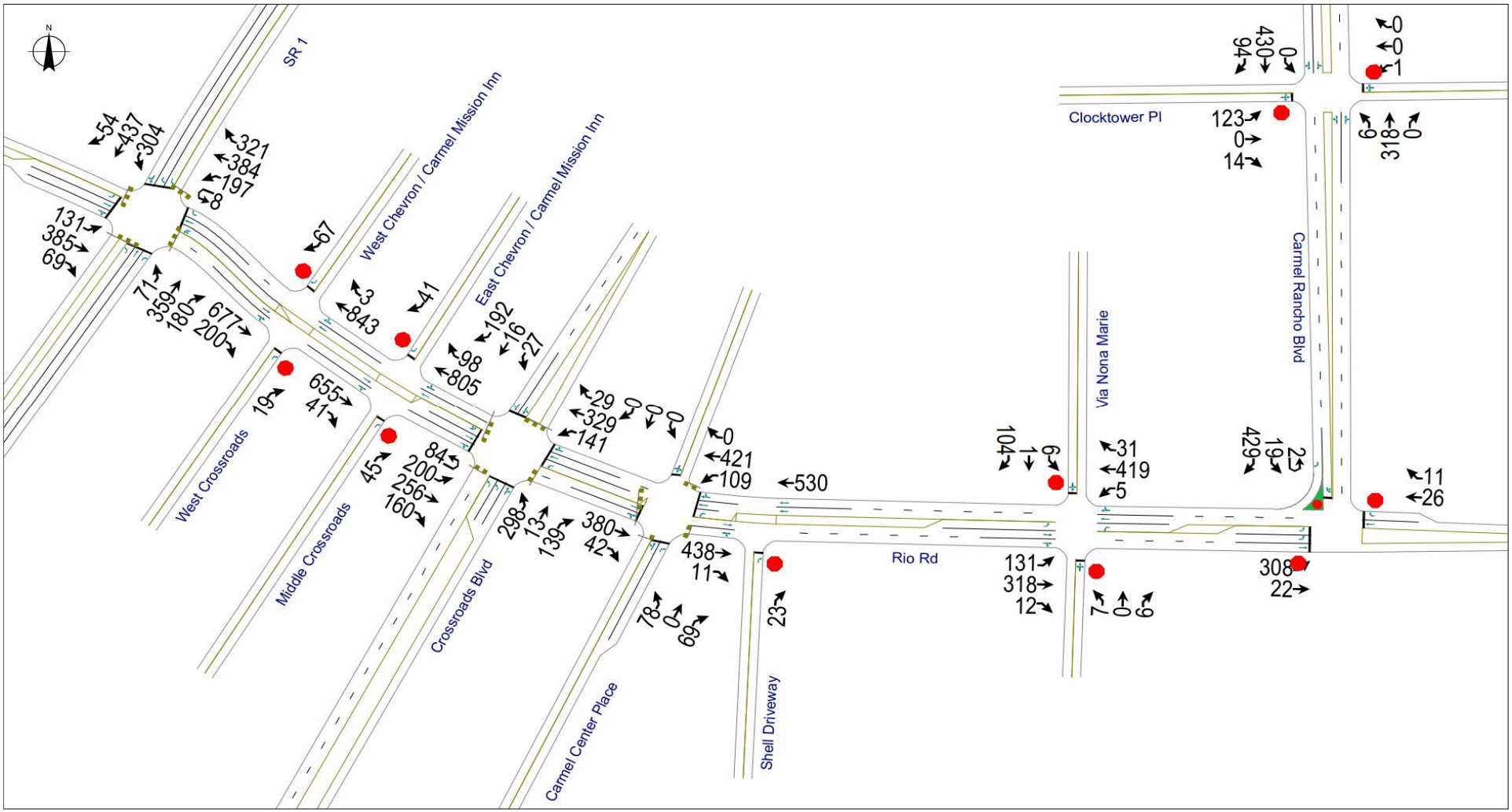


Exhibit 17

Existing Plus Project

Rio Road Corridor Traffic Volumes

Weekday AM and PM Peak Hour

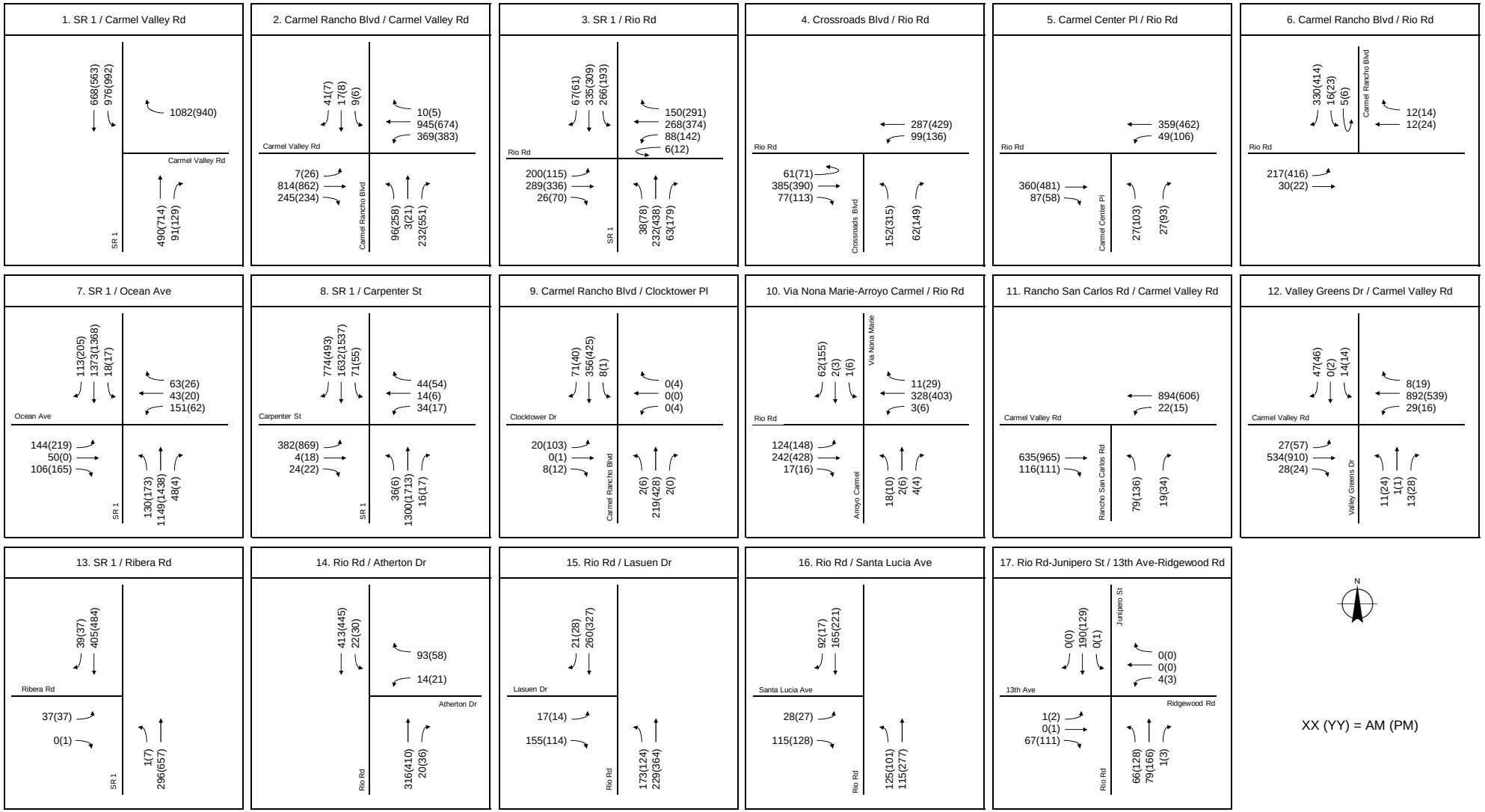


Exhibit 18

Background Conditions Traffic Volumes

Saturday Peak Hour

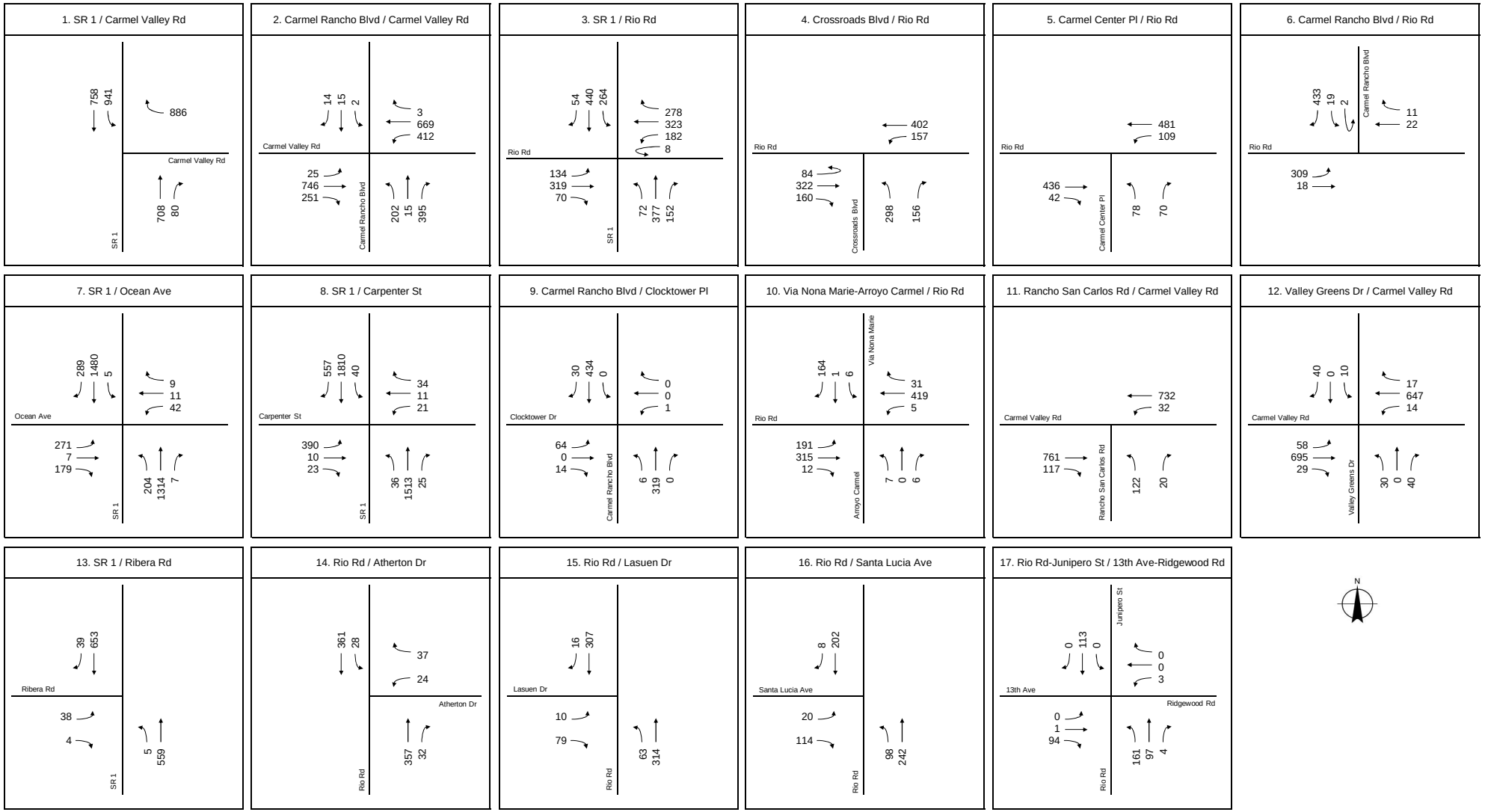


Exhibit 18

Background Conditions Traffic Volumes

Weekday AM Peak Hour

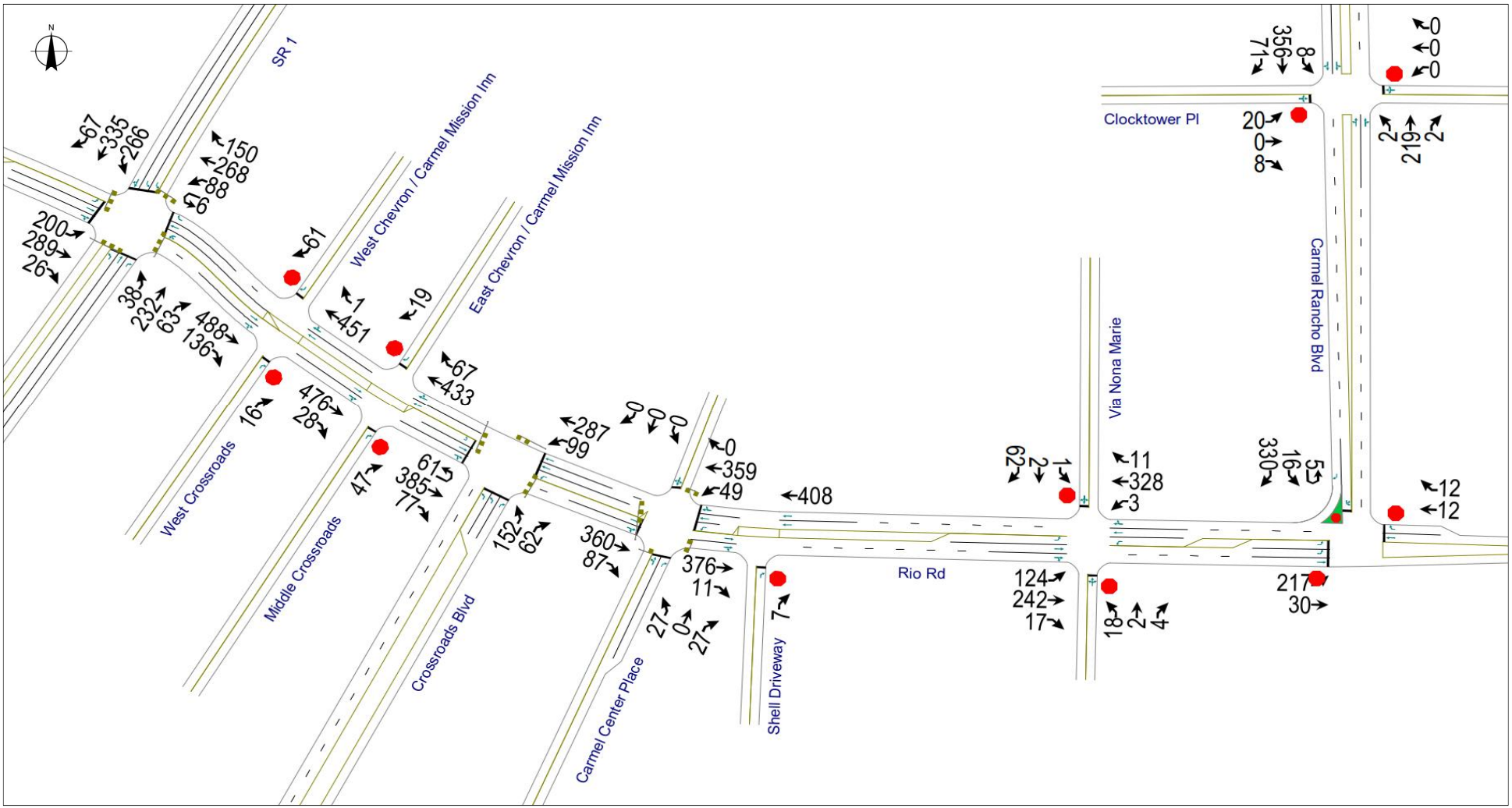


Exhibit 19

Background Conditions

Rio Road Corridor Traffic Volumes

Weekday PM Peak Hour

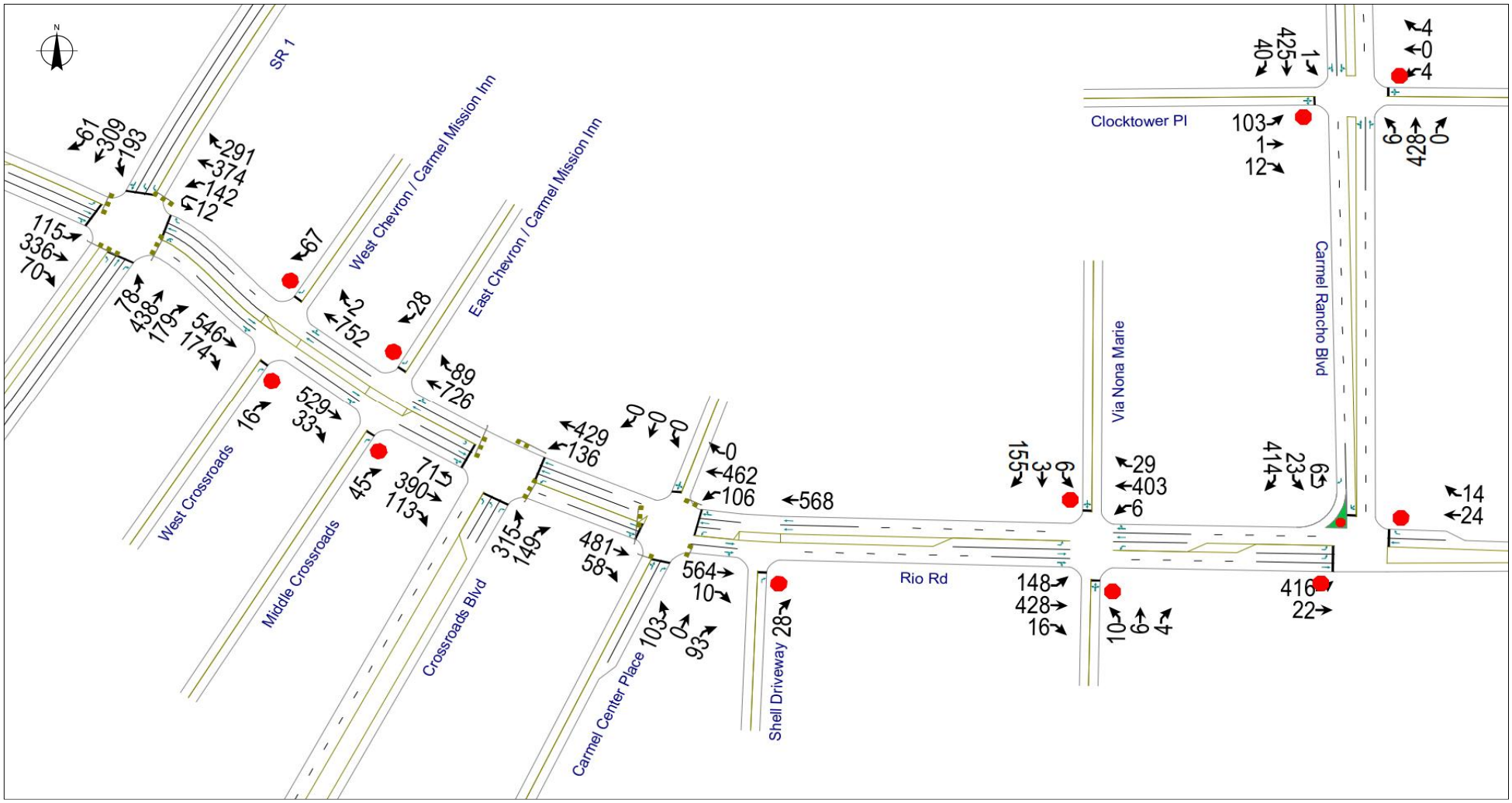


Exhibit 19

Background Conditions

Rio Road Corridor Traffic Volumes

Saturday Peak Hour

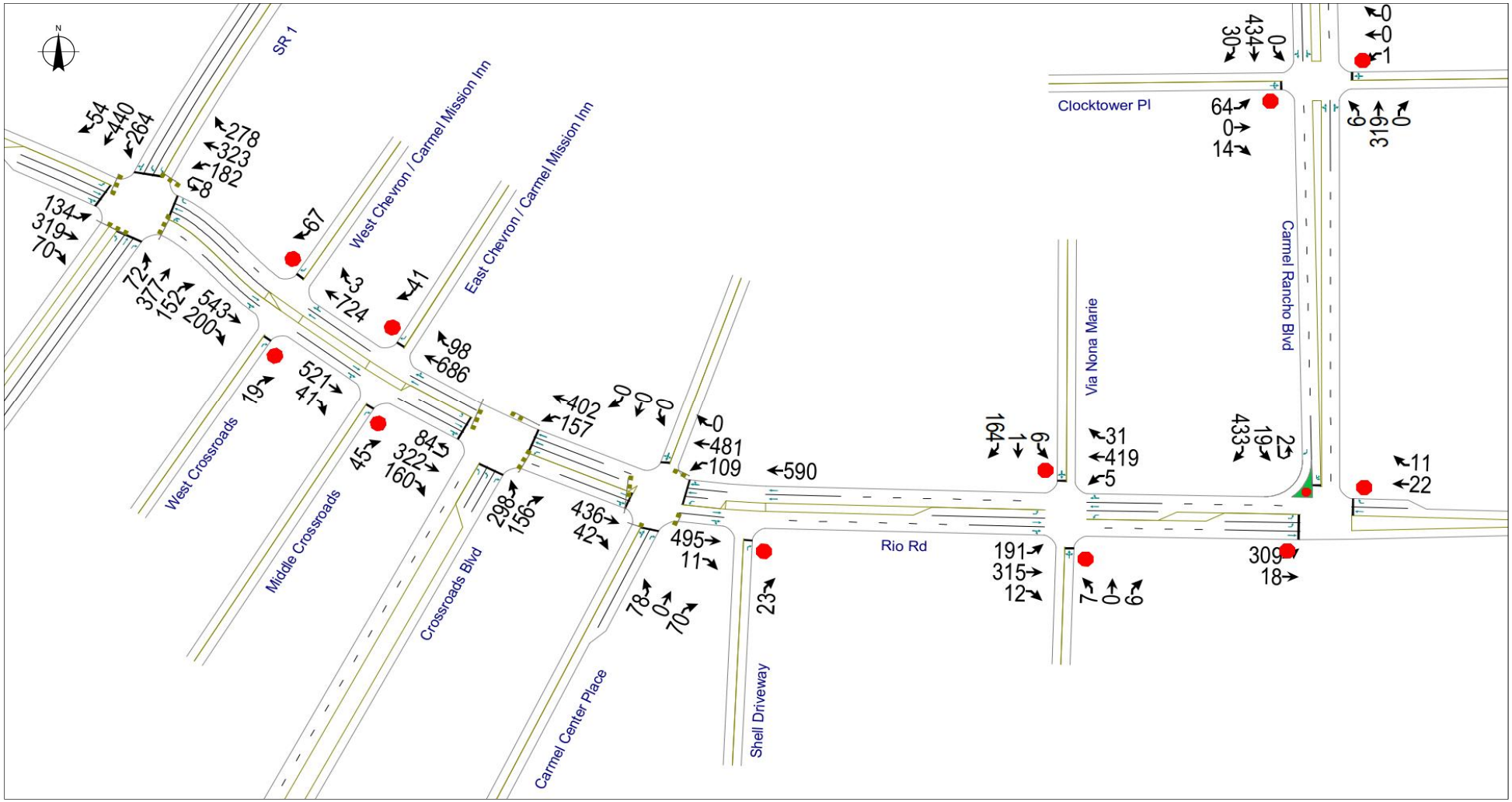


Exhibit 19
Background Conditions
Rio Road Corridor Traffic Volumes

	Segment	From	To	# of Lanes	CVMP ADT Threshold	ADT	Dir	Background Conditions														
								AM Peak Hour					PM Peak Hour					Saturday Peak Hour				
								Volume	PTSF	Density	% FFS	LOS	Volume	PTSF	Density	% FFS	LOS	Volume	PTSF	Density	% FFS	LOS
1	SR 1	Carpenter St	Ocean Ave	4	N/A	N/A	NB	1,356	-	17.9	-	B	1,736	-	21.9	-	C	1,594	-	20.2	-	C
							SB	1,690	-	20.9	-	C	1,590	-	18.5	-	C	1,854	-	21.3	-	C
2	SR 1	Ocean Ave	Carmel Valley Rd	3	N/A	N/A	NB	1,572	-	22.1	-	C	1,654	-	20.0	-	C	1,594	-	19.9	-	C
							SB	1,644	97.4%	-	-	F	1,595	96.3%	-	-	F	1,701	97.7%	-	-	F
3	SR 1	Carmel Valley Rd	Rio Rd	2	N/A	N/A	NB	582	81.3%	-	-	D	844	89.6%	-	-	E	789	83.5%	-	-	D
							SB	668	78.5%	-	-	D	563	72.8%	-	-	D	758	81.7%	-	-	D
4	SR 1	Rio Rd	Ribera Rd	2	N/A	N/A	NB	333	61.2%	-	-	C	695	82.6%	-	-	D	601	77.4%	-	-	D
							SB	449	72.7%	-	-	D	521	71.0%	-	-	D	692	79.4%	-	-	D
5	Rio Rd	13th Ave	SR 1	2	N/A	N/A	EB	515	-	-	75.2%	B	521	-	-	80.0%	B	523	-	-	80.0%	B
							WB	373	-	-	75.2%	B	513	-	-	80.0%	B	449	-	-	80.0%	B
6	Carmel Valley Rd	Robinson Canyon Rd	Schulte Rd	2	15,499	16,305	EB	429	62.4%	-	-	C	970	89.2%	-	-	E	729	82.0%	-	-	D
							WB	883	90.6%	-	-	E	509	72.7%	-	-	D	604	78.9%	-	-	D
7	Carmel Valley Rd	Schulte Rd	Rancho San Carlos Rd	2	16,340	18,121	EB	654	80.7%	-	-	D	999	91.0%	-	-	E	782	85.9%	-	-	E
							WB	950	93.3%	-	-	E	621	83.3%	-	-	D	764	84.7%	-	-	D
8	Carmel Valley Rd	Rancho San Carlos Rd	Rio Rd	4	48,487	21,818	EB	751	-	8.7	-	A	1,076	-	11.2	-	B	878	-	8.8	-	A
							WB	973	-	10.2	-	A	742	-	7.3	-	A	854	-	8.3	-	A
9	Carmel Valley Rd	Rio Rd	Carmel Rancho Blvd	4	51,401	27,558	EB	1,055	-	11.3	-	B	1,419	-	13.7	-	B	1,143	-	10.9	-	A
							WB	1,324	-	17.9	-	B	1,062	-	11.0	-	B	1,084	-	10.5	-	A
10	Carmel Valley Rd	Carmel Rancho Blvd	SR 1	4	27,839	24,984	EB	1,067	-	11.4	-	B	1,122	-	10.8	-	A	1,022	-	9.8	-	A
							WB	1,082	-	13.1	-	B	940	-	9.6	-	A	886	-	8.3	-	A
11	Carmel Rancho Blvd	Carmel Valley Rd	Rio Rd	4	33,495	10,815	NB	331	-	-	93.1%	A	830	-	-	91.4%	A	612	-	-	91.9%	A
							SB	639	-	-	86.2%	A	625	-	-	84.9%	B	678	-	-	84.6%	B
12	Rio Rd	Carmel Rancho Blvd	SR 1	4	33,928	12,219	EB	624	-	-	57.1%	C	720	-	-	52.0%	C	743	-	-	50.9%	C
							WB	512	-	-	46.8%	D	819	-	-	43.7%	D	791	-	-	42.3%	D
13	SR 1	Ribera Rd	Highlands Inn	2	N/A	N/A	NB	297	65.1%	-	-	C	664	81.6%	-	-	D	564	74.6%	-	-	D
							SB	405	70.6%	-	-	D	485	70.0%	-	-	C	657	80.0%	-	-	D
14	Crossroads Blvd	Rio Rd	Terminus	2	N/A	N/A	NB	214	-	-	60.0%	C	464	-	-	55.2%	C	454	-	-	52.8%	C
							SB	176	-	-	60.0%	C	249	-	-	55.2%	C	317	-	-	52.8%	C
15	Carmel Center Place	Rio Rd	Terminus	2	N/A	N/A	NB	54	-	-	87.2%	A	196	-	-	87.2%	A	148	-	-	94.0%	A
							SB	136	-	-	87.2%	A	164	-	-	87.2%	A	151	-	-	94.0%	A

	Segment	From	To	# of Lanes	CVMP ADT Threshold	ADT	Dir	Background + Project Conditions															
								Project Trips	AM Peak Hour					Project Trips	PM Peak Hour					Project Trips	Saturday Peak Hour				
									Volume	PTSF	Density	% FFS	LOS		Volume	PTSF	Density	% FFS	LOS		Volume	PTSF	Density	% FFS	LOS
1	SR 1	Carpenter St	Ocean Ave	4	N/A	N/A	NB	3	1,359	-	17.9	-	B	15	1,751	-	22.1	-	C	21	1,615	-	20.5	-	C
							SB	5	1,695	-	21.0	-	C	13	1,603	-	18.6	-	C	19	1,873	-	21.6	-	C
2	SR 1	Ocean Ave	Carmel Valley Rd	3	N/A	N/A	NB	5	1,577	-	22.2	-	C	27	1,681	-	20.3	-	C	37	1,631	-	20.4	-	C
							SB	8	1,652	97.5%	-	-	F	22	1,617	96.5%	-	-	F	35	1,736	97.9%	-	-	F
3	SR 1	Carmel Valley Rd	Rio Rd	2	N/A	N/A	NB	5	587	81.3%	-	-	D	27	871	89.7%	-	-	E	38	827	84.7%	-	-	D
							SB	8	676	78.4%	-	-	D	23	586	74.1%	-	-	D	37	795	83.0%	-	-	D
4	SR 1	Rio Rd	Ribera Rd	2	N/A	N/A	NB	5	338	61.6%	-	-	C	14	709	83.0%	-	-	D	24	625	78.2%	-	-	D
							SB	2	451	72.6%	-	-	D	14	535	71.7%	-	-	D	19	711	80.7%	-	-	D
5	Rio Rd	13th Ave	SR 1	2	N/A	N/A	EB	14	529	-	-	75.2%	B	40	561	-	-	80.0%	B	65	588	-	-	79.6%	B
							WB	9	382	-	-	75.2%	B	44	557	-	-	80.0%	B	62	511	-	-	79.6%	B
6	Carmel Valley Rd	Robinson Canyon Rd	Schulte Rd	2	15,499	16,766	EB	4	433	63.1%	-	-	C	21	991	90.5%	-	-	E	28	757	83.1%	-	-	D
							WB	7	890	92.4%	-	-	E	19	528	73.7%	-	-	D	31	635	79.8%	-	-	D
7	Carmel Valley Rd	Schulte Rd	Rancho San Carlos Rd	2	16,340	18,709	EB	5	659	80.8%	-	-	D	27	1,026	91.8%	-	-	E	36	818	87.4%	-	-	E
							WB	9	959	93.4%	-	-	E	24	645	84.4%	-	-	D	40	804	85.7%	-	-	E
8	Carmel Valley Rd	Rancho San Carlos Rd	Rio Rd	4	48,487	22,498	EB	6	757	-	8.7	-	A	31	1,107	-	11.5	-	B	40	918	-	9.2	-	A
							WB	10	983	-	10.3	-	A	28	770	-	7.6	-	A	47	901	-	8.7	-	A
9	Carmel Valley Rd	Rio Rd	Carmel Rancho Blvd	4	51,401	28,411	EB	8	1,063	-	11.3	-	B	39	1,458	-	14.1	-	B	52	1,195	-	11.4	-	B
							WB	11	1,335	-	18.0	-	C	35	1,097	-	11.4	-	B	58	1,142	-	11.1	-	B
10	Carmel Valley Rd	Carmel Rancho Blvd	SR 1	4	27,839	24,984	EB	0	1,067	-	11.4	-	B	0	1,122	-	10.8	-	A	0	1,022	-	9.8	-	A
							WB	0	1,082	-	13.4	-	B	0	940	-	9.6	-	A	0	886	-	8.3	-	A
11	Carmel Rancho Blvd	Carmel Valley Rd	Rio Rd	4	33,495	11,990	NB	12	343	-	-	93.1%	A	52	882	-	-	91.3%	A	72	684	-	-	91.8%	A
							SB	21	660	-	-	86.1%	A	50	675	-	-	84.8%	B	79	757	-	-	84.5%	B
12	Rio Rd	Carmel Rancho Blvd	SR 1	4	33,928	14,270	EB	29	653	-	-	55.1%	C	85	805	-	-	49.1%	D	136	879	-	-	51.6%	C
							WB	17	529	-	-	47.7%	D	93	912	-	-	42.7%	D	129	920	-	-	43.6%	D
13	SR 1	Ribera Rd	Highlands Inn	2	N/A	N/A	NB	4	301	65.1%	-	-	C	12	676	81.8%	-	-	D	19	583	75.1%	-	-	D
							SB	3	408	70.1%	-	-	D	13	498	70.9%	-	-	D	18	675	80.7%	-	-	D
14	Crossroads Blvd	Rio Rd	Terminus	2	N/A	N/A	NB	3	217	-	-	79.2%	B	9	473	-	-	76.8%	B	13	467	-	-	74.4%	B
							SB	2	178	-	-	79.2%	B	11	260	-	-	76.8%	B	16	333	-	-	74.4%	B
15	Carmel Center Place	Rio Rd	Terminus	2	N/A	N/A	NB	0	54	-	-	87.2%	A	0	196	-	-	87.2%	A	0	148	-	-	94.0%	A
							SB	0	136	-	-	87.2%	A	0	164	-	-	87.2%	A	0	151	-	-	94.0%	A

Notes:
1. LOS = Level of Service
2. Two-lane highway LOS based on percent time spent following (PTSF), Two-Lane Highways, HCM 2010, Exhibit 15-3.
3. Four-lane highway LOS based on density in passenger cars per mile per lane (pc/mi/ln), Multi-Lane Highways, HCM 2010, Exhibit 14-4.
4. Arterial LOS based on travel speed as a percentage of base free-flow speed (% FFS), Urban Street Segments, HCM 2010, Exhibit 17-2.
5. LOS highlighted in red exceeds LOS standard.
6. LOS in bold box indicates project or cumulative project impact.

Exhibit 20
Background and Background Plus Project
Road Segment Levels of Service

Weekday AM and PM Peak Hour

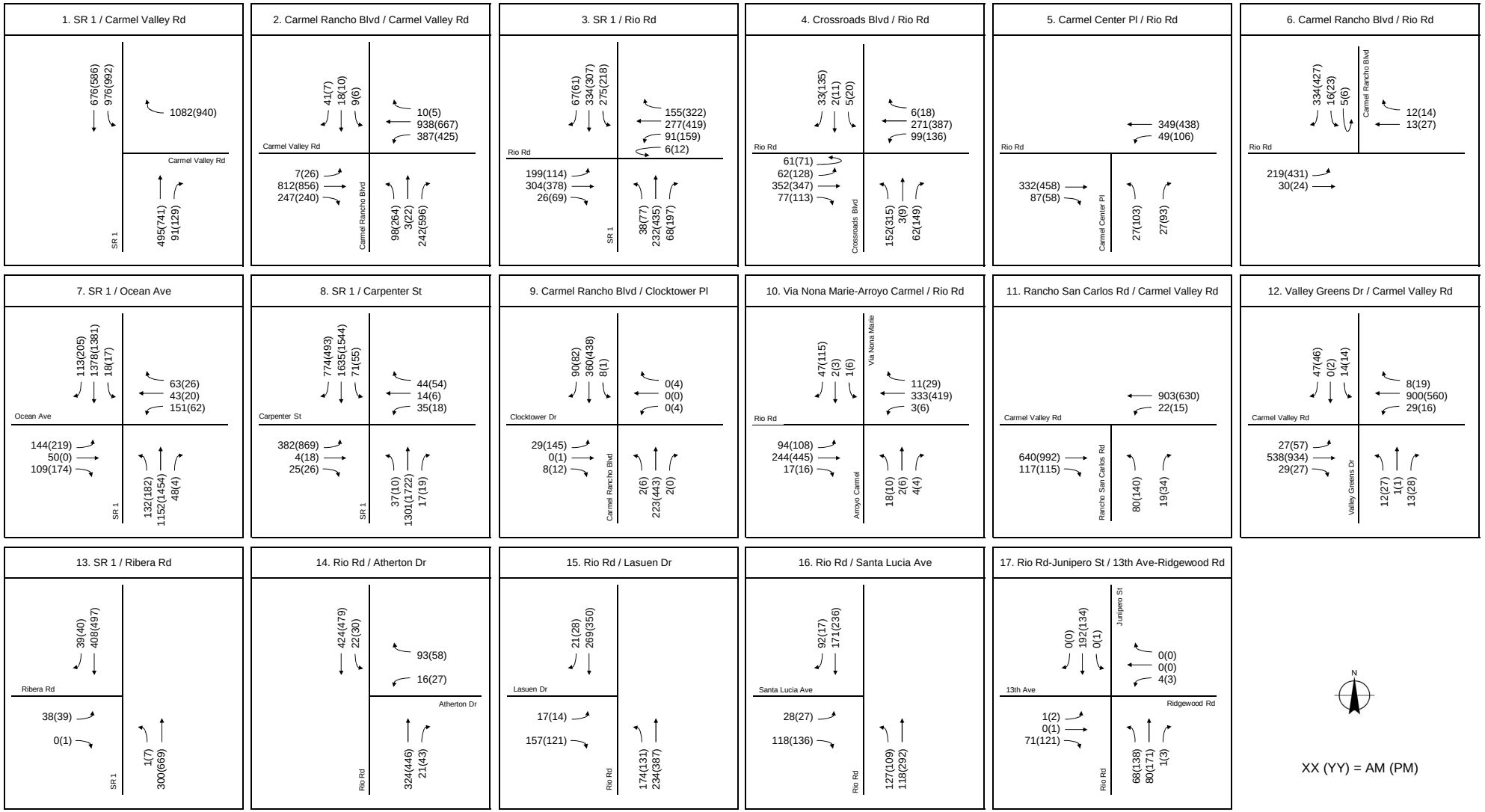


Exhibit 21

Background Plus Project Traffic Volumes

Saturday Peak Hour

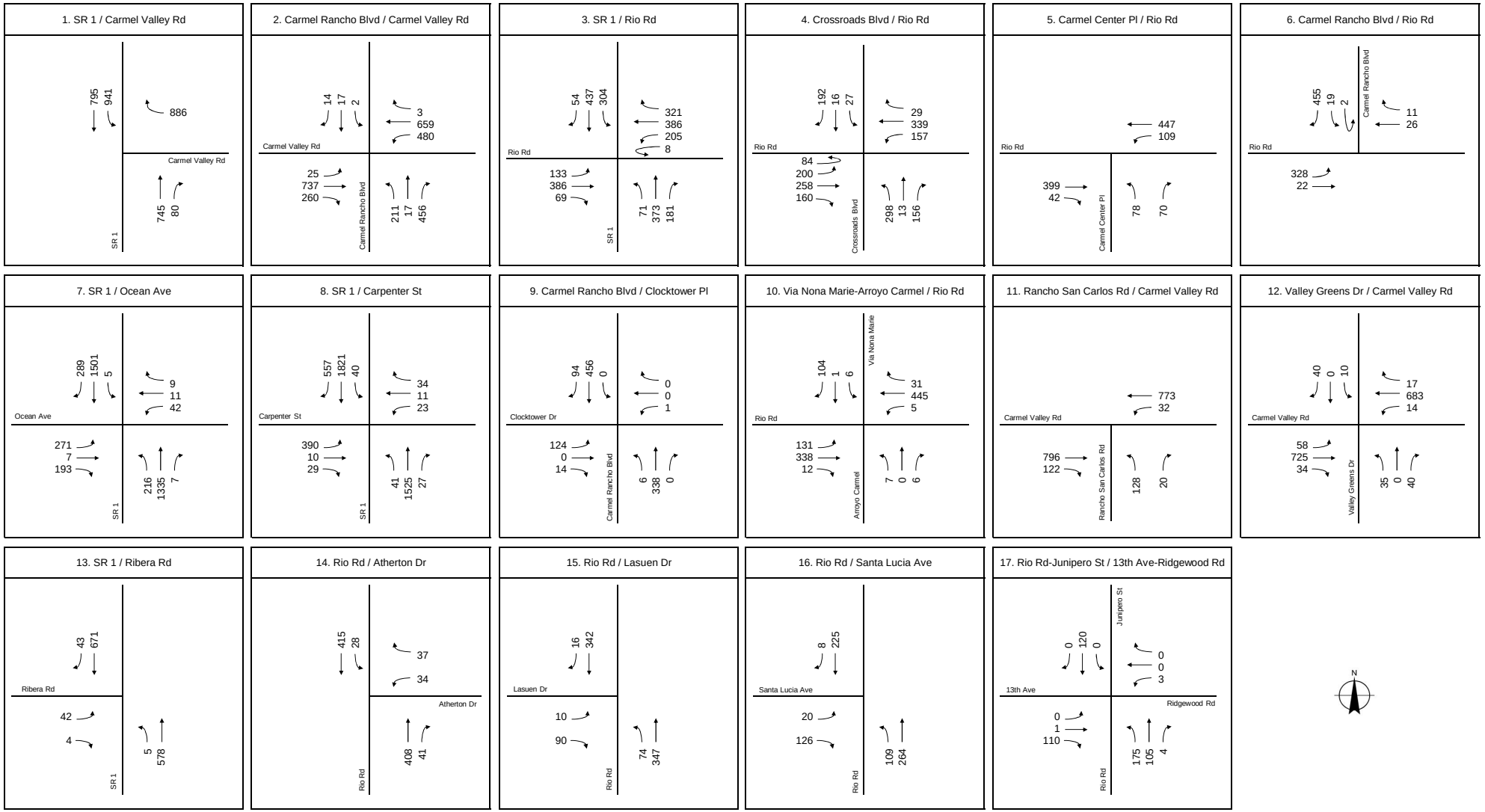


Exhibit 21

Background Plus Project Traffic Volumes

Weekday AM Peak Hour

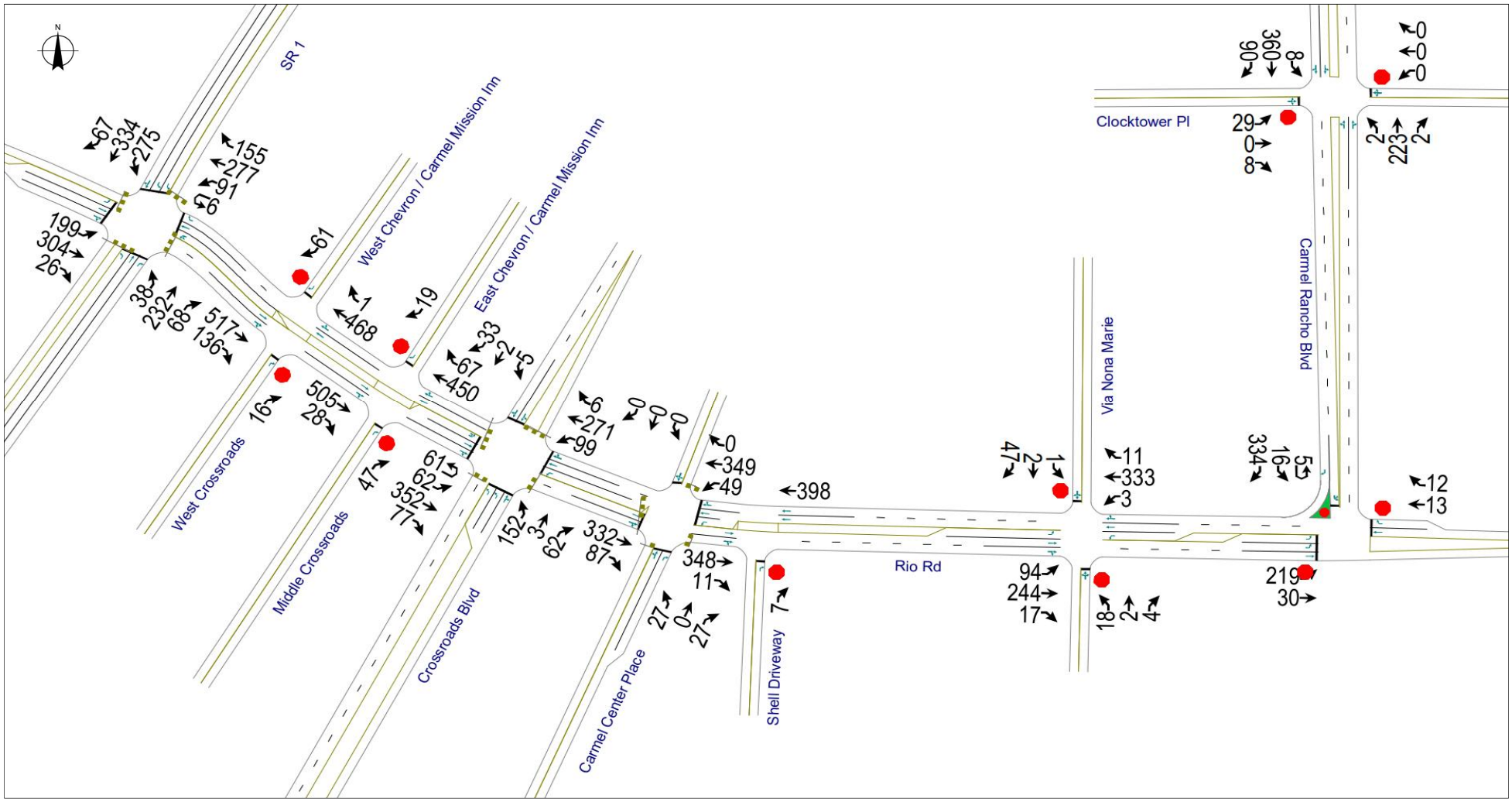


Exhibit 22
Background Plus Project
Rio Road Corridor Traffic Volumes

Weekday PM Peak Hour

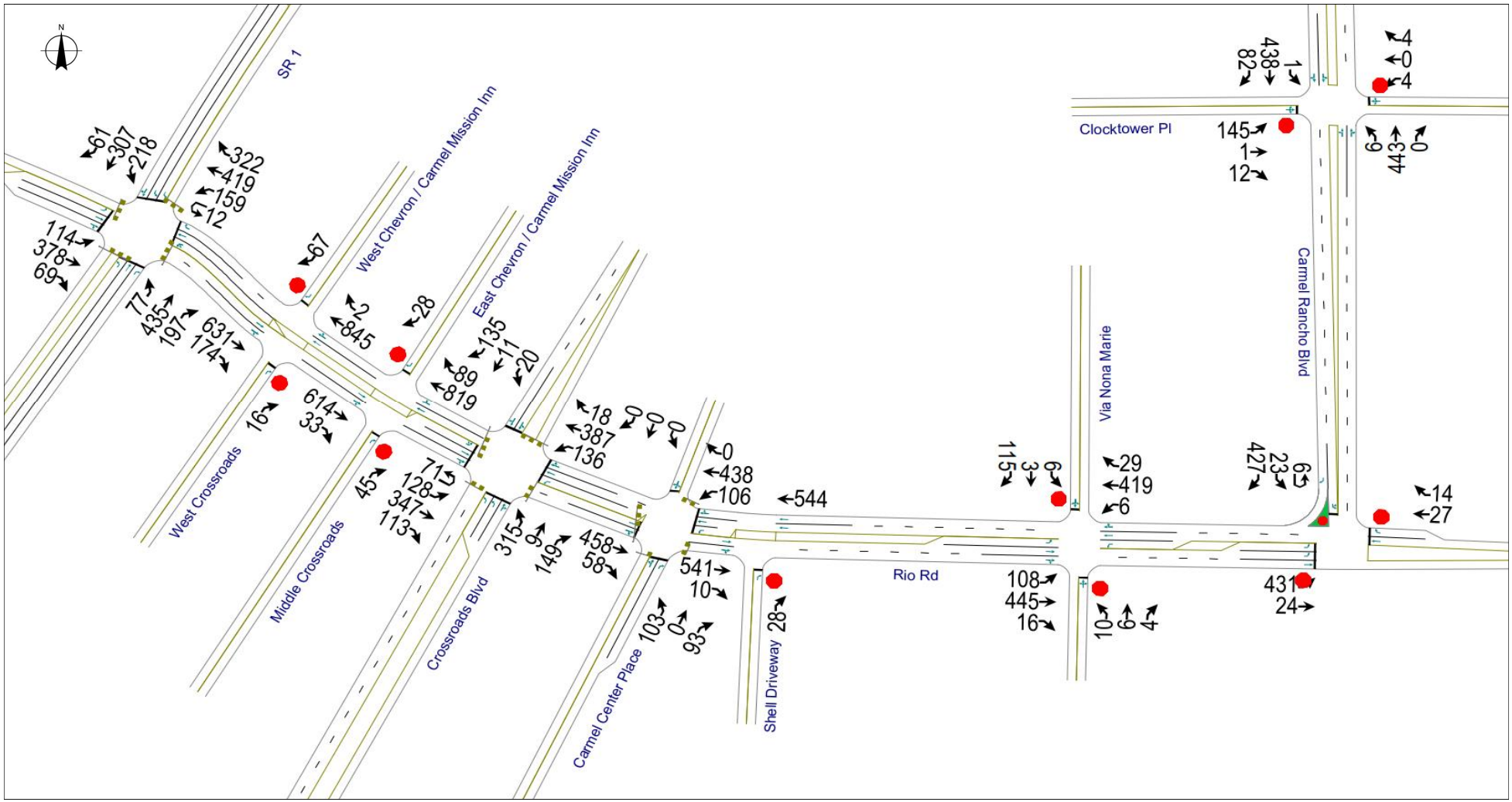


Exhibit 22

Background Plus Project

Rio Road Corridor Traffic Volumes

Saturday Peak Hour

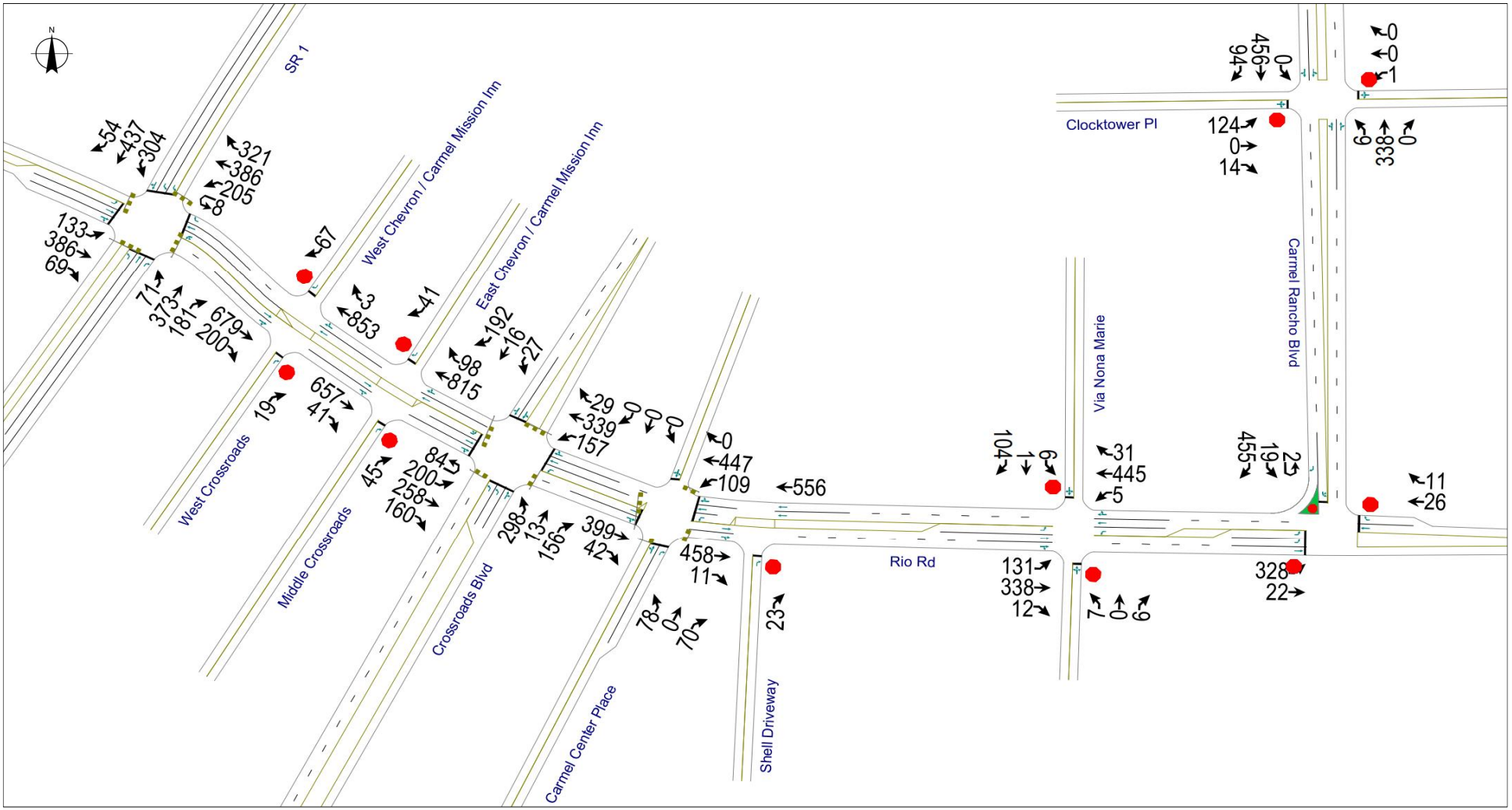


Exhibit 22
Background Plus Project
Rio Road Corridor Traffic Volumes

Weekday AM and PM Peak Hour

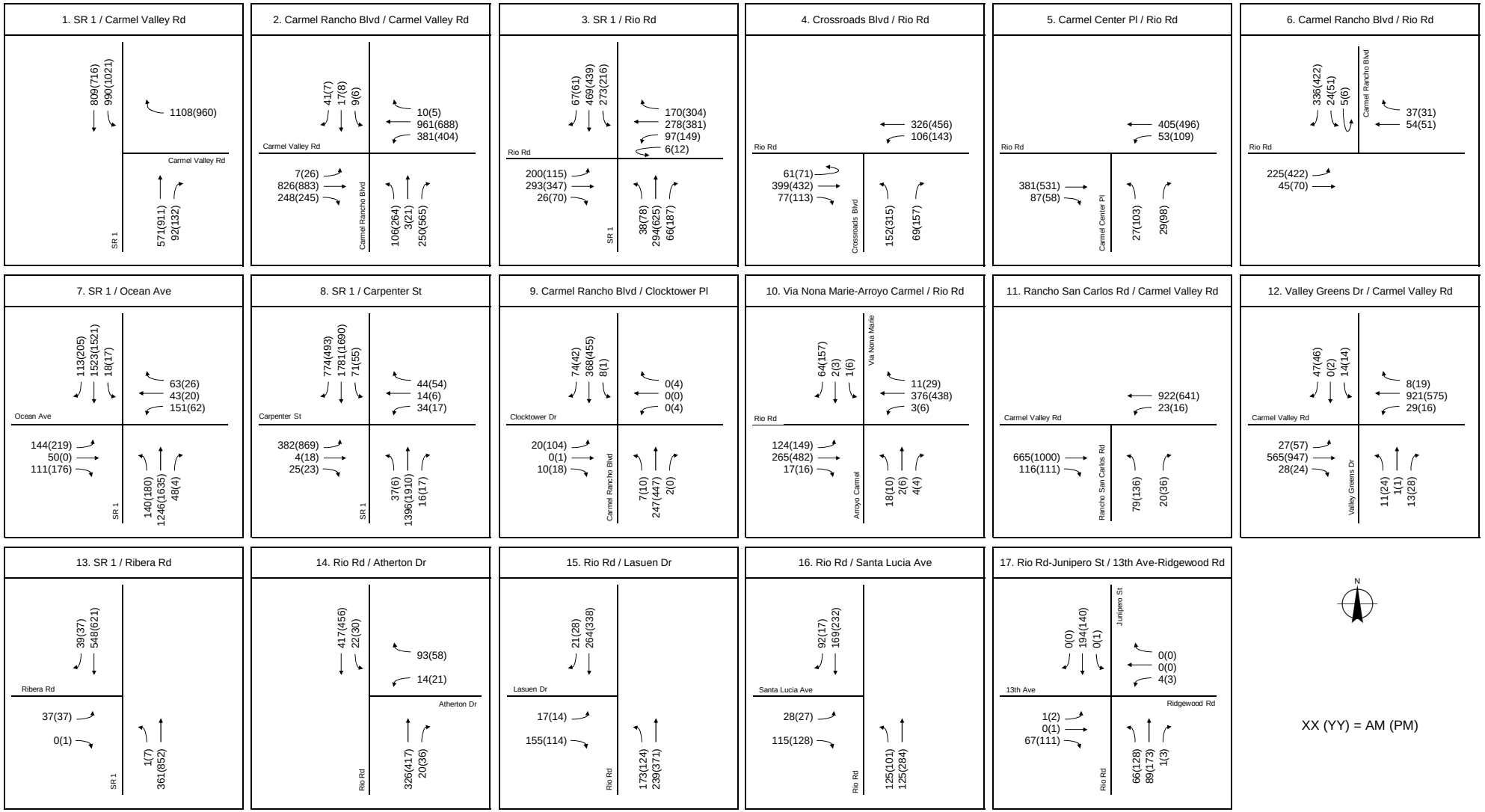


Exhibit 23

Cumulative Conditions Traffic Volumes

Saturday Peak Hour

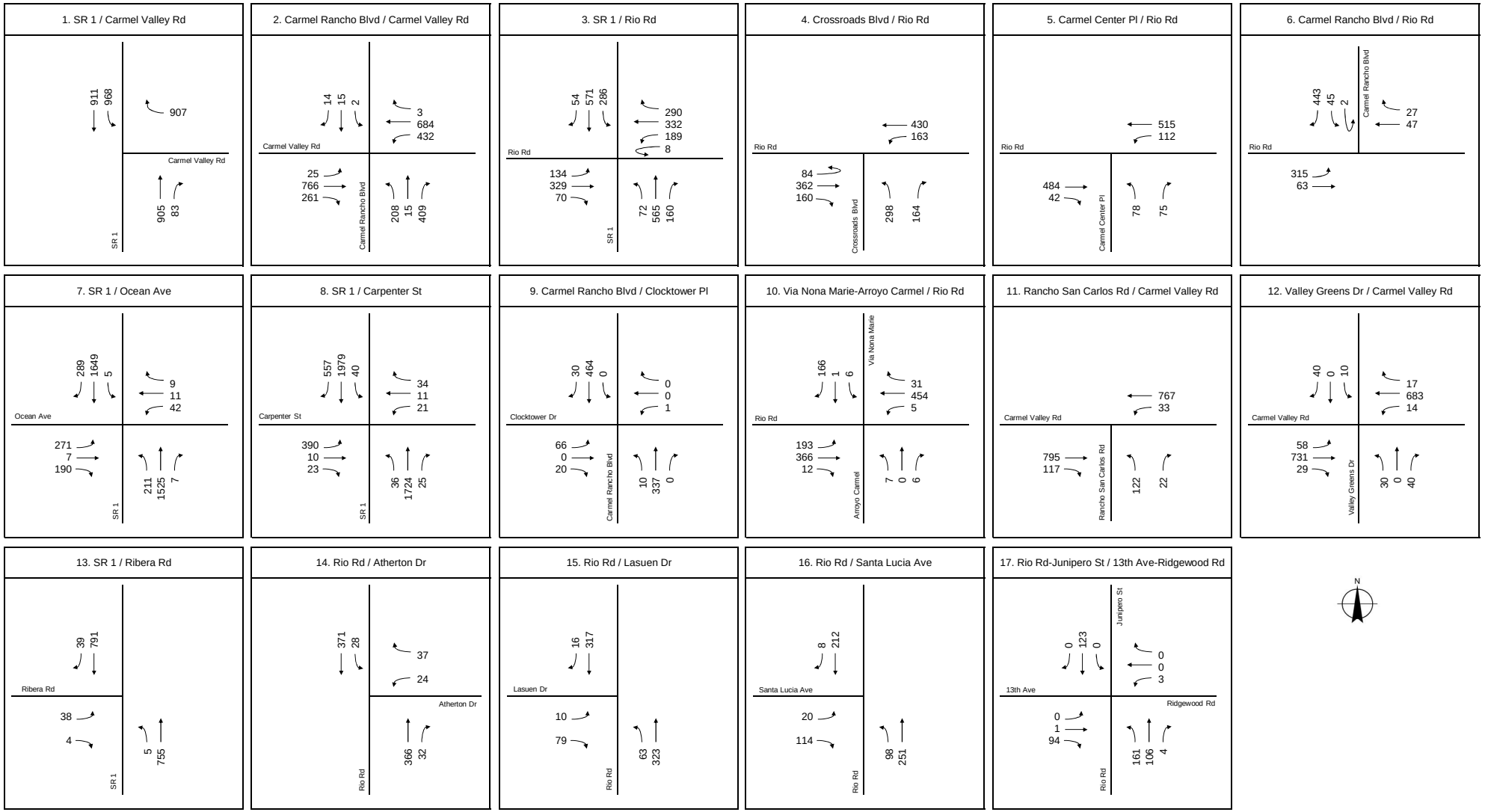


Exhibit 23

Cumulative Conditions Traffic Volumes

Weekday AM Peak Hour

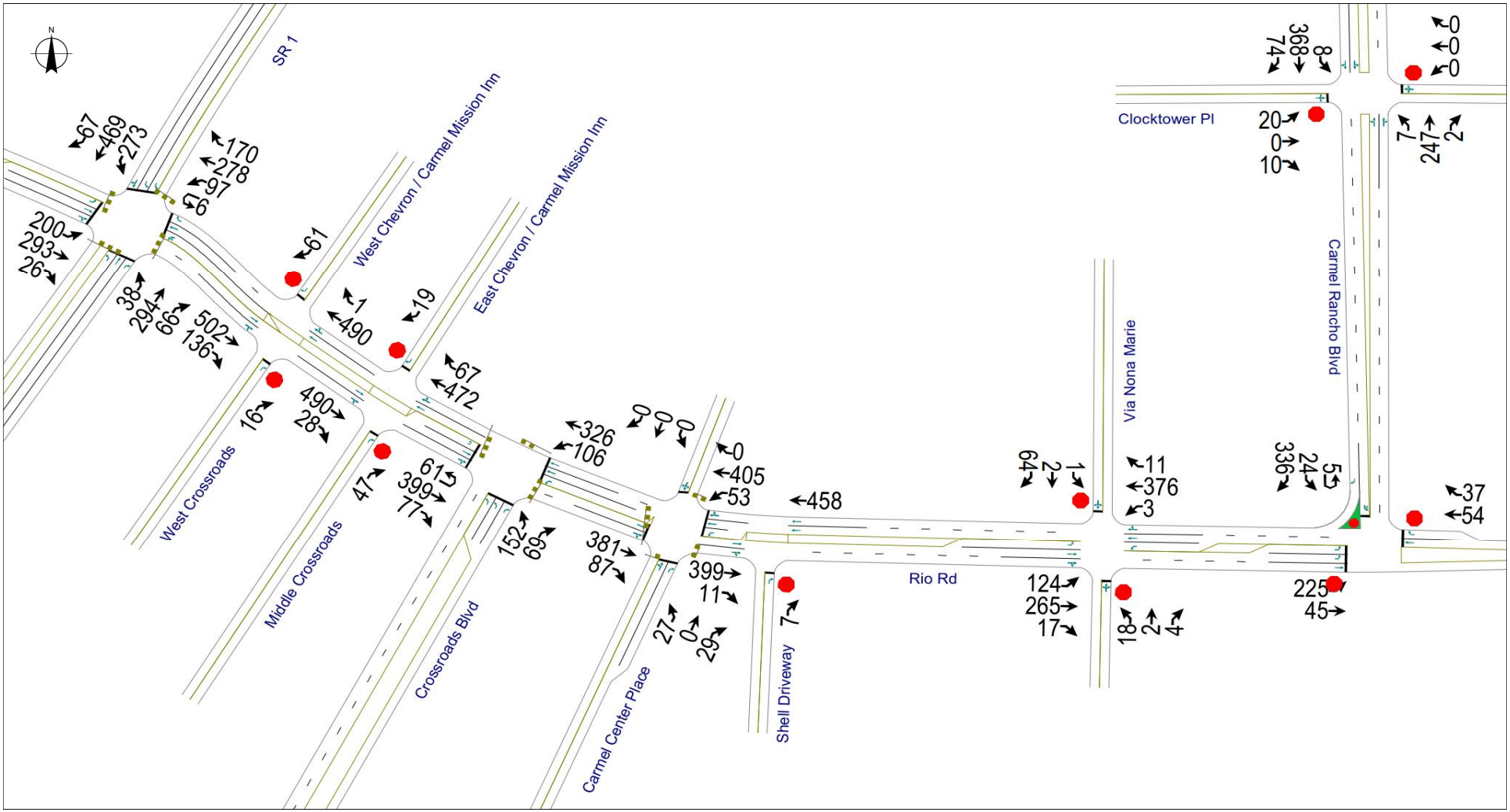


Exhibit 24

Cumulative Conditions

Rio Road Corridor Traffic Volumes

Weekday PM Peak Hour

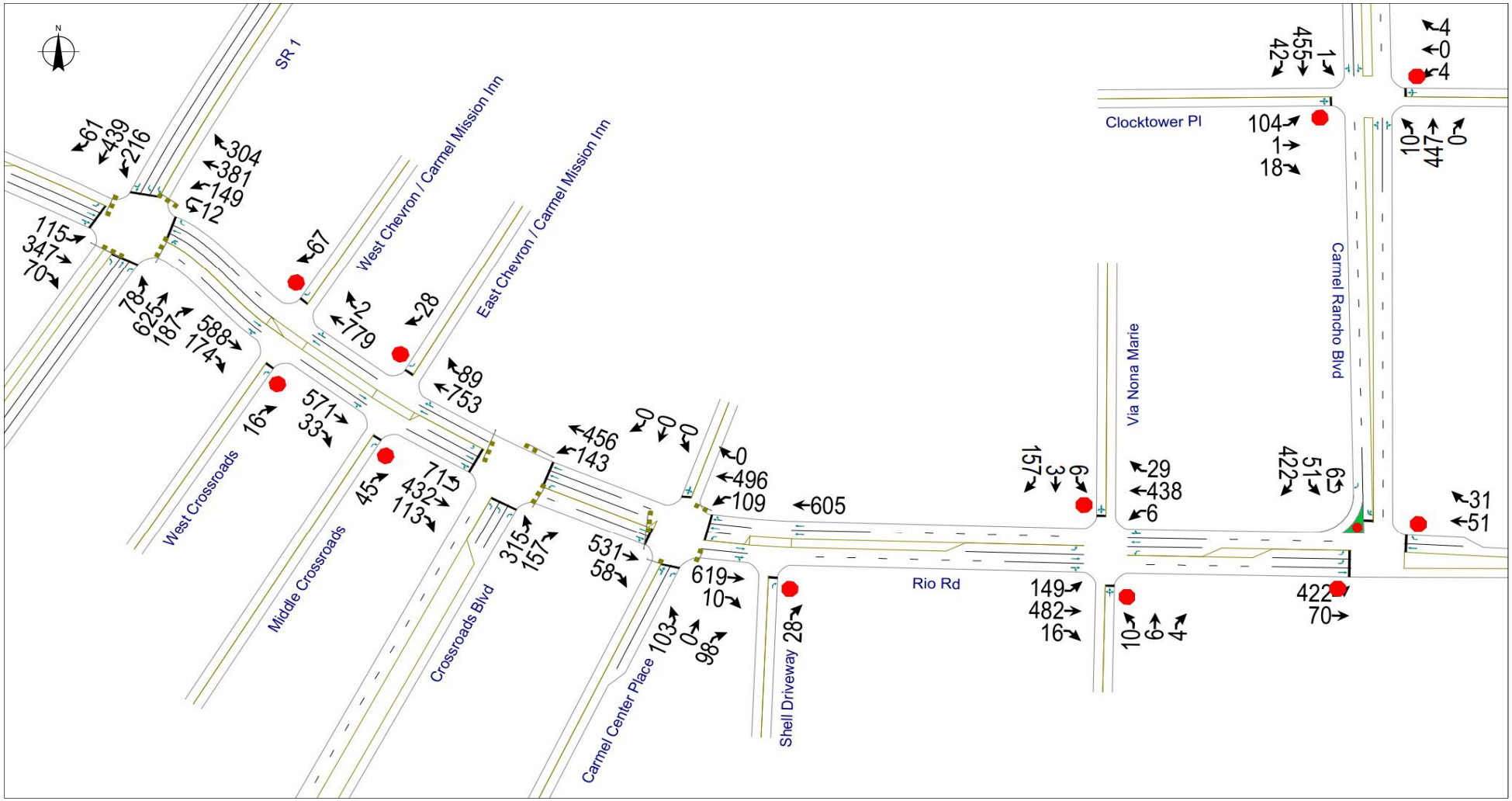


Exhibit 24

Cumulative Conditions

Rio Road Corridor Traffic Volumes

Saturday Peak Hour

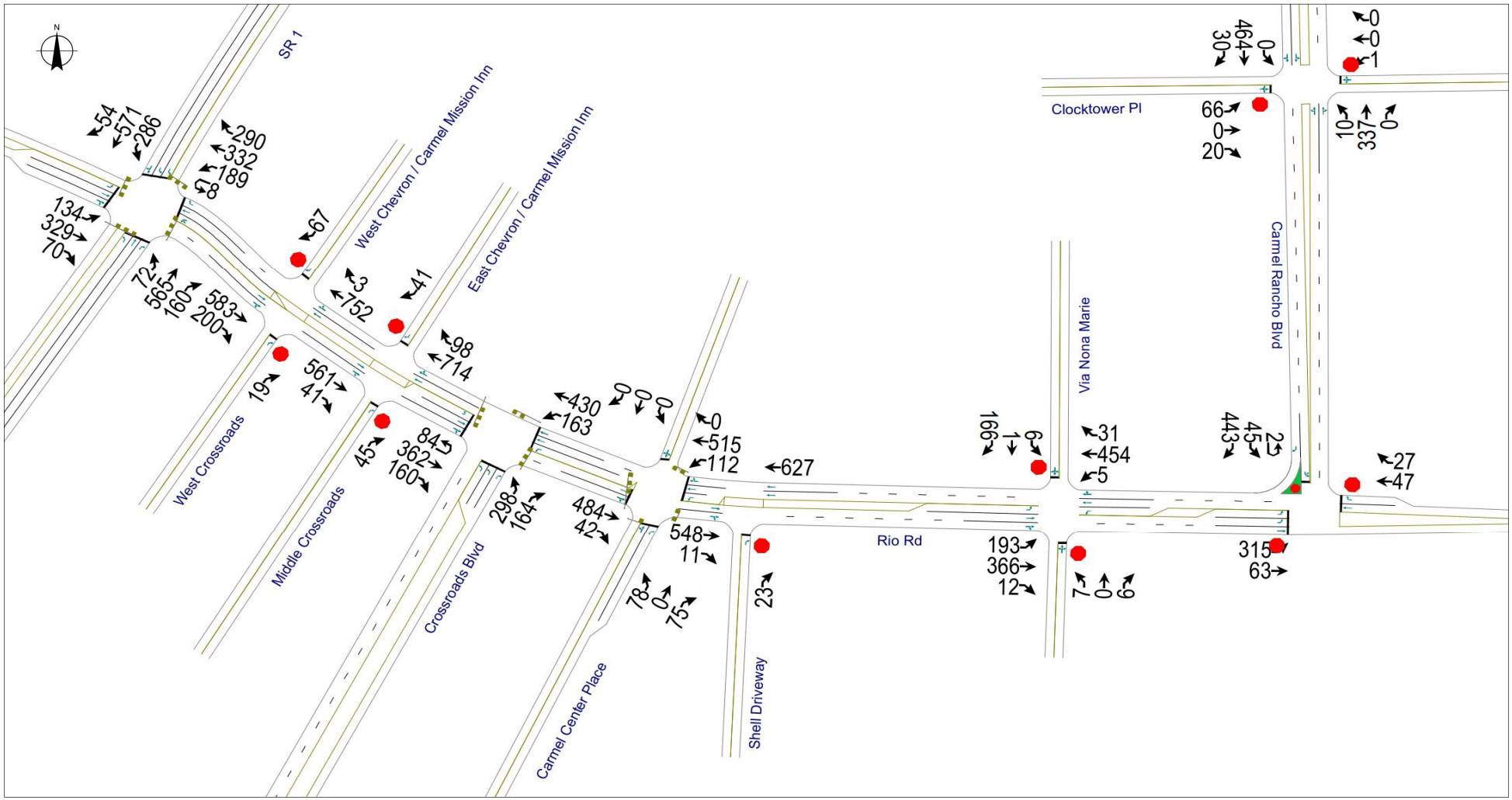


Exhibit 24

Cumulative Conditions

Rio Road Corridor Traffic Volumes

	Segment	From	To	# of Lanes	CVMP ADT Threshold	ADT	Dir	Cumulative Conditions														
								AM Peak Hour					PM Peak Hour					Saturday Peak Hour				
								Volume	PTSF	Density	% FFS	LOS	Volume	PTSF	Density	% FFS	LOS	Volume	PTSF	Density	% FFS	LOS
1	SR 1	Carpenter St	Ocean Ave	4	N/A	N/A	NB	1,453	-	19.2	-	C	1,933	-	24.4	-	C	1,805	-	22.9	-	C
							SB	1,840	-	22.8	-	C	1,743	-	20.3	-	C	2,023	-	23.3	-	C
2	SR 1	Ocean Ave	Carmel Valley Rd	3	N/A	N/A	NB	1,679	-	23.6	-	C	1,871	-	22.6	-	C	1,812	-	22.6	-	C
							SB	1,799	98.7%	-	-	F	1,759	97.8%	-	-	F	1,881	98.7%	-	-	F
3	SR 1	Carmel Valley Rd	Rio Rd	2	N/A	N/A	NB	664	84.0%	-	-	D	1,044	92.5%	-	-	E	989	89.1%	-	-	E
							SB	809	84.0%	-	-	D	716	80.6%	-	-	D	911	86.8%	-	-	E
4	SR 1	Rio Rd	Ribera Rd	2	N/A	N/A	NB	398	65.2%	-	-	C	889	88.2%	-	-	E	797	85.0%	-	-	D
							SB	592	79.6%	-	-	D	658	77.1%	-	-	D	830	83.5%	-	-	D
5	Rio Rd	13th Ave	SR 1	2	N/A	N/A	EB	519	-	-	79.2%	B	532	-	-	80.0%	B	533	-	-	79.2%	B
							WB	383	-	-	79.2%	B	520	-	-	80.0%	B	458	-	-	79.2%	B
6	Carmel Valley Rd	Robinson Canyon Rd	Schulte Rd	2	15,499	17,035	EB	457	64.7%	-	-	C	1,007	90.5%	-	-	E	763	86.5%	-	-	E
							WB	912	91.1%	-	-	E	545	74.9%	-	-	D	638	80.4%	-	-	D
7	Carmel Valley Rd	Schulte Rd	Rancho San Carlos Rd	2	16,340	18,851	EB	685	82.1%	-	-	D	1,036	91.8%	-	-	E	818	87.5%	-	-	E
							WB	979	93.8%	-	-	E	657	84.9%	-	-	D	800	85.5%	-	-	E
8	Carmel Valley Rd	Rancho San Carlos Rd	Rio Rd	4	48,487	22,518	EB	781	-	9.0	-	A	1,111	-	11.5	-	B	912	-	9.1	-	A
							WB	1,001	-	10.5	-	A	777	-	7.6	-	A	889	-	8.6	-	A
9	Carmel Valley Rd	Rio Rd	Carmel Rancho Blvd	4	51,401	28,258	EB	1,085	-	11.6	-	B	1,454	-	14.0	-	B	1,177	-	11.2	-	B
							WB	1,352	-	18.3	-	C	1,097	-	11.4	-	B	1,119	-	10.9	-	A
10	Carmel Valley Rd	Carmel Rancho Blvd	SR 1	4	27,839	25,504	EB	1,082	-	11.5	-	B	1,154	-	11.1	-	B	1,052	-	10.1	-	A
							WB	1,108	-	13.4	-	B	960	-	9.8	-	A	907	-	8.5	-	A
11	Carmel Rancho Blvd	Carmel Valley Rd	Rio Rd	4	33,495	11,335	NB	359	-	-	93.0%	A	850	-	-	91.3%	A	632	-	-	91.9%	A
							SB	653	-	-	86.1%	A	657	-	-	84.7%	B	708	-	-	84.6%	B
12	Rio Rd	Carmel Rancho Blvd	SR 1	4	33,928	12,909	EB	638	-	-	56.8%	C	762	-	-	51.7%	C	783	-	-	52.3%	C
							WB	551	-	-	46.3%	D	846	-	-	43.5%	D	819	-	-	42.3%	D
13	SR 1	Ribera Rd	Highlands Inn	2	N/A	N/A	NB	362	67.6%	-	-	C	859	88.0%	-	-	E	760	81.8%	-	-	D
							SB	548	77.0%	-	-	D	622	75.7%	-	-	D	795	84.2%	-	-	D
14	Crossroads Blvd	Rio Rd	Terminus	2	N/A	N/A	NB	221	-	-	60.0%	C	472	-	-	55.2%	C	462	-	-	52.8%	C
							SB	183	-	-	60.0%	C	256	-	-	55.2%	C	323	-	-	52.8%	C
15	Carmel Center Place	Rio Rd	Terminus	2	N/A	N/A	NB	56	-	-	87.2%	A	201	-	-	87.2%	A	153	-	-	94.0%	A
							SB	140	-	-	87.2%	A	167	-	-	87.2%	A	154	-	-	94.0%	A

	Segment	From	To	# of Lanes	CVMP ADT Threshold	ADT	Dir	Cumulative + Project Conditions														
								Project Trips	AM Peak Hour					Project Trips	PM Peak Hour					Project Trips	Saturday Peak Hour				
									Volume	PTSF	Density	% FFS	LOS		Volume	PTSF	Density	% FFS	LOS		Volume	PTSF	Density	% FFS	LOS
1	SR 1	Carpenter St	Ocean Ave	4	N/A	N/A	NB	3	1,456	-	19.2	-	C	15	1,948	-	24.6	-	C	21	1,826	-	45.0	-	C
							SB	5	1,845	-	22.8	-	C	13	1,756	-	20.4	-	C	19	2,042	-	42.7	-	C
2	SR 1	Ocean Ave	Carmel Valley Rd	3	N/A	N/A	NB	5	1,684	-	45.0	-	C	27	1,898	-	23.0	-	C	37	1,849	-	23.1	-	C
							SB	8	1,807	98.7%	-	-	F	22	1,781	98.0%	-	-	F	35	1,916	98.9%	-	-	F
3	SR 1	Carmel Valley Rd	Rio Rd	2	N/A	N/A	NB	5	669	84.7%	-	-	D	27	1,071	93.1%	-	-	E	38	1,027	89.8%	-	-	E
							SB	8	817	83.8%	-	-	D	23	739	81.7%	-	-	D	37	948	87.7%	-	-	E
4	SR 1	Rio Rd	Ribera Rd	2	N/A	N/A	NB	5	403	65.6%	-	-	C	14	903	88.4%	-	-	E	24	821	86.0%	-	-	E
							SB	2	594	79.4%	-	-	D	14	672	77.5%	-	-	D	19	849	84.3%	-	-	D
5	Rio Rd	13th Ave	SR 1	2	N/A	N/A	EB	14	533	-	-	79.2%	B	40	572	-	-	79.2%	B	65	598	-	-	79.2%	B
							WB	9	392	-	-	79.2%	B	44	564	-	-	79.2%	B	62	520	-	-	79.2%	B
6	Carmel Valley Rd	Robinson Canyon Rd	Schulte Rd	2	15,499	17,496	EB	4	461	65.0%	-	-	C	21	1,028	90.8%	-	-	E	28	791	87.3%	-	-	E
							WB	7	919	90.9%	-	-	E	19	564	75.8%	-	-	D	31	669	81.4%	-	-	D
7	Carmel Valley Rd	Schulte Rd	Rancho San Carlos Rd	2	16,340	19,439	EB	5	690	82.2%	-	-	D	27	1,063	92.5%	-	-	E	36	854	88.4%	-	-	E
							WB	9	988	94.0%	-	-	E	24	681	85.9%	-	-	E	40	840	86.7%	-	-	E
8	Carmel Valley Rd	Rancho San Carlos Rd	Rio Rd	4	48,487	23,198	EB	6	787	-	9.1	-	A	31	1,142	-	11.9	-	B	40	952	-	9.5	-	A
							WB	10	1,011	-	10.6	-	A	28	805	-	7.9	-	A	47	936	-	9.1	-	A
9	Carmel Valley Rd	Rio Rd	Carmel Rancho Blvd	4	51,401	29,111	EB	8	1,093	-	11.7	-	B	39	1,493	-	14.4	-	B	52	1,229	-	11.7	-	B
							WB	11	1,363	-	18.4	-	C	35	1,132	-	11.7	-	B	58	1,177	-	11.4	-	B
10	Carmel Valley Rd	Carmel Rancho Blvd	SR 1	4	27,839	25,504	EB	0	1,082	-	11.5	-	B	0	1,154	-	11.1	-	B	0	1,052	-	10.1	-	A
							WB	0	1,108	-	13.4	-	B	0	960	-	9.8	-	A	0	907	-	8.5	-	A
11	Carmel Rancho Blvd	Carmel Valley Rd	Rio Rd	4	33,495	12,510	NB	12	371	-	-	93.0%	A	52	902	-	-	91.3%	A	72	704	-	-	91.8%	A
							SB	21	674	-	-	86.0%	A	50	707	-	-	84.7%	B	79	787	-	-	84.5%	B
12	Rio Rd	Carmel Rancho Blvd	SR 1	4	33,928	14,960	EB	29	667	-	-	54.7%	C	85	847	-	-	48.5%	D	136	919	-	-	50.4%	C
							WB	17	568	-	-	47.6%	D	93	939	-	-	42.3%	D	129	948	-	-	43.2%	D
13	SR 1	Ribera Rd	Highlands Inn	2	N/A	N/A	NB	4	366	68.0%	-	-	C	12	871	88.2%	-	-	E	19	779	82.2%	-	-	D
							SB	3	551	78.3%	-	-	D	13	635	76.5%	-	-	D	18	813	84.5%	-	-	D
14	Crossroads Blvd	Rio Rd	Terminus	2	N/A	N/A	NB	3	224	-	-	79.2%	B	9	481	-	-	76.0%	B	13	475	-	-	74.4%	B
							SB	2	185	-	-	79.2%	B	11	267	-	-	76.0%	B	16	339	-	-	74.4%	B
15	Carmel Center Place	Rio Rd	Terminus	2	N/A	N/A	NB	0	56	-	-	87.2%	A	0	201	-	-	87.2%	A	0	153	-	-	94.0%	A
							SB	0	140	-	-	87.2%	A	0	167	-	-	87.2%	A	0	154	-	-	94.0%	A

Notes:
1. LOS = Level of Service
2. Two-lane highway LOS based on percent time spent following (PTSF), Two-Lane Highways, HCM 2010, Exhibit 15-3.
3. Four-lane highway LOS based on density in passenger cars per mile per lane (pc/mi/ln), Multi-Lane Highways, HCM 2010, Exhibit 14-4.
4. Arterial LOS based on travel speed as a percentage of base free-flow speed (% FFS), Urban Street Segments, HCM 2010, Exhibit 17-2.
5. LOS highlighted in red exceeds LOS standard.
6. LOS in bold box indicates project or cumulative project impact.

Exhibit 25
Cumulative and Cumulative Plus Project
Road Segment Levels of Service

Weekday AM and PM Peak Hour

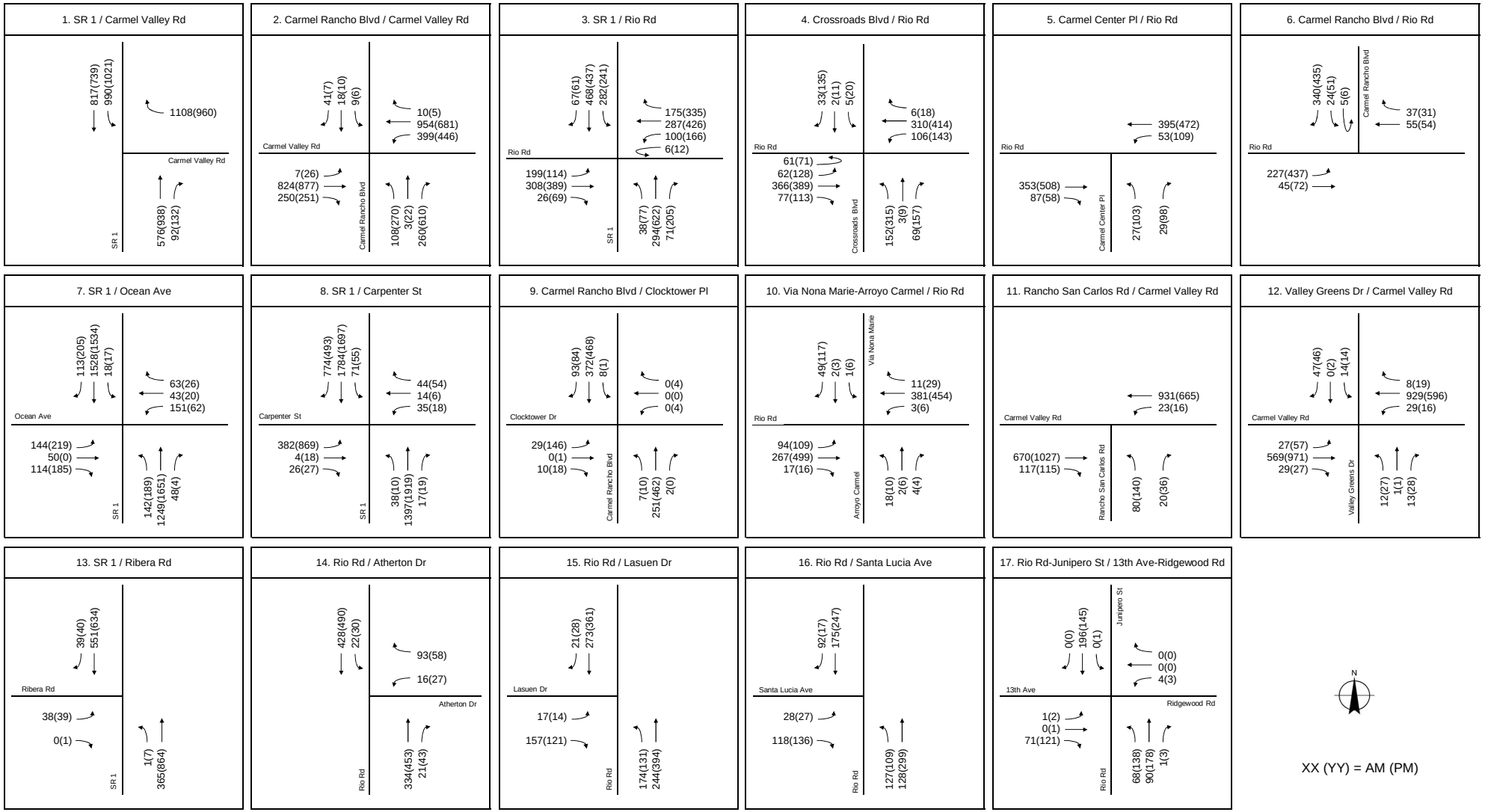


Exhibit 26

Cumulative Plus Project Traffic Volumes

Saturday Peak Hour

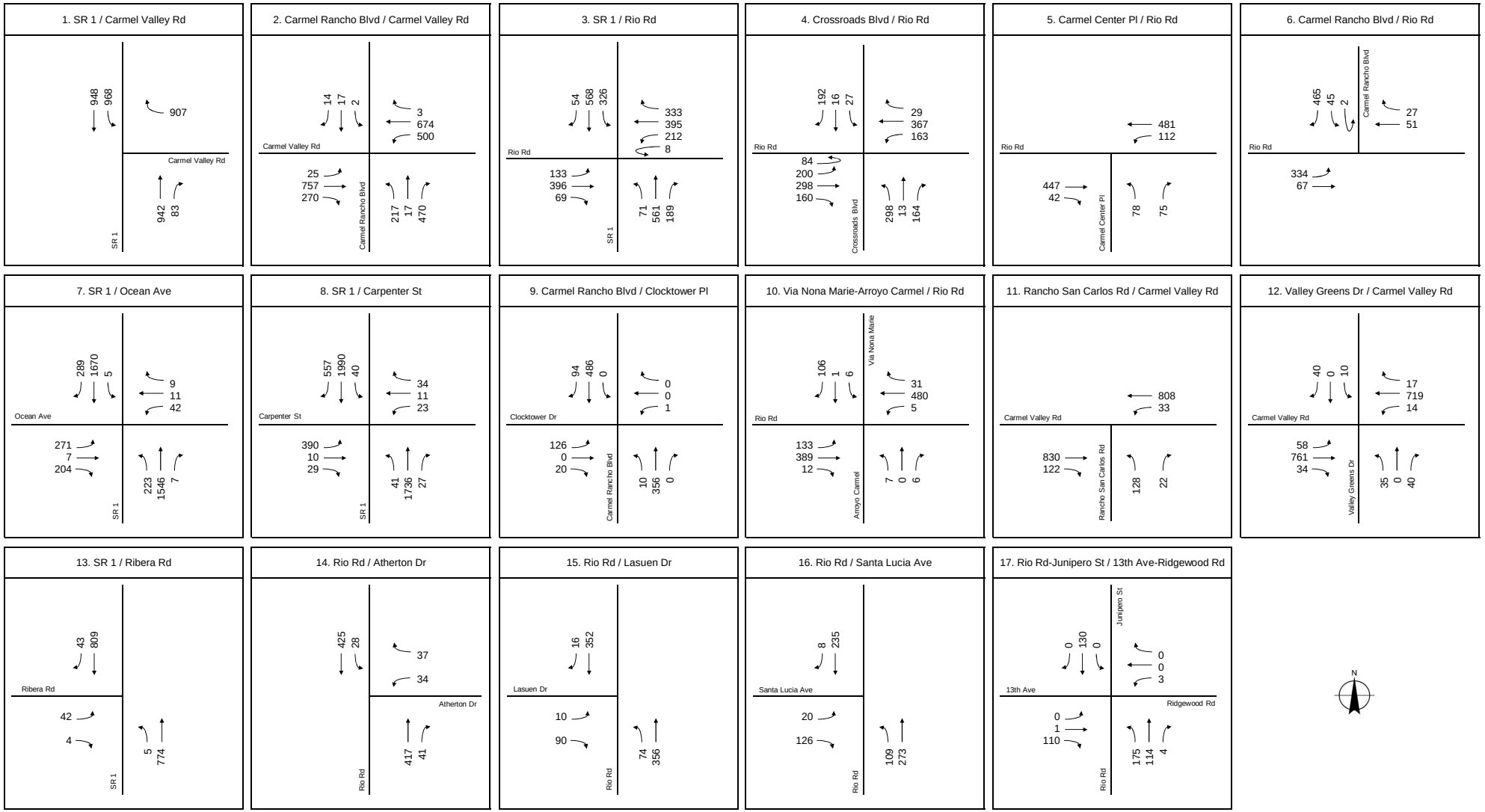


Exhibit 26

Cumulative Plus Project Traffic Volumes

Weekday AM Peak Hour

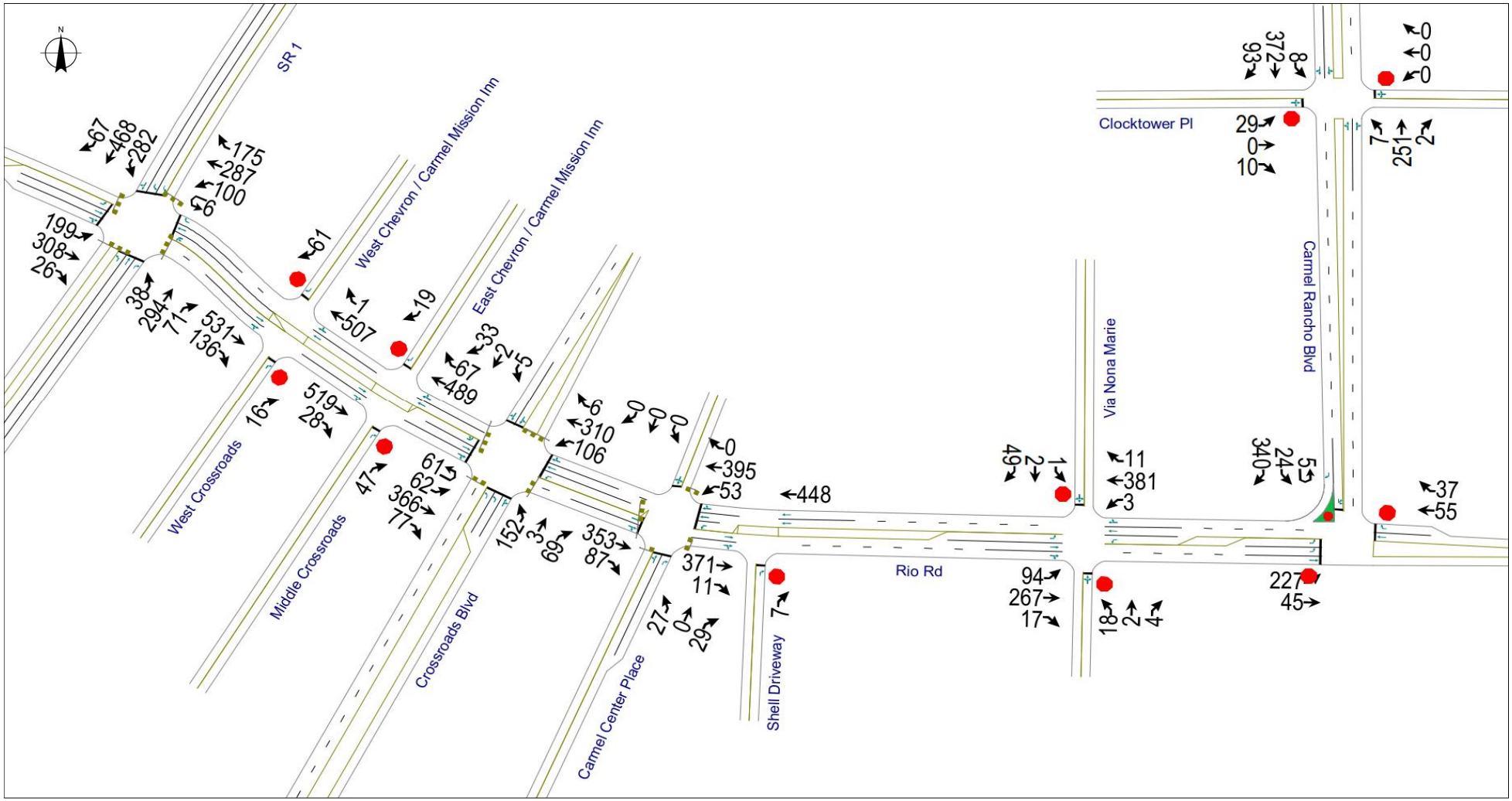


Exhibit 27
Cumulative Plus Project
Rio Road Corridor Traffic Volumes

Weekday PM Peak Hour

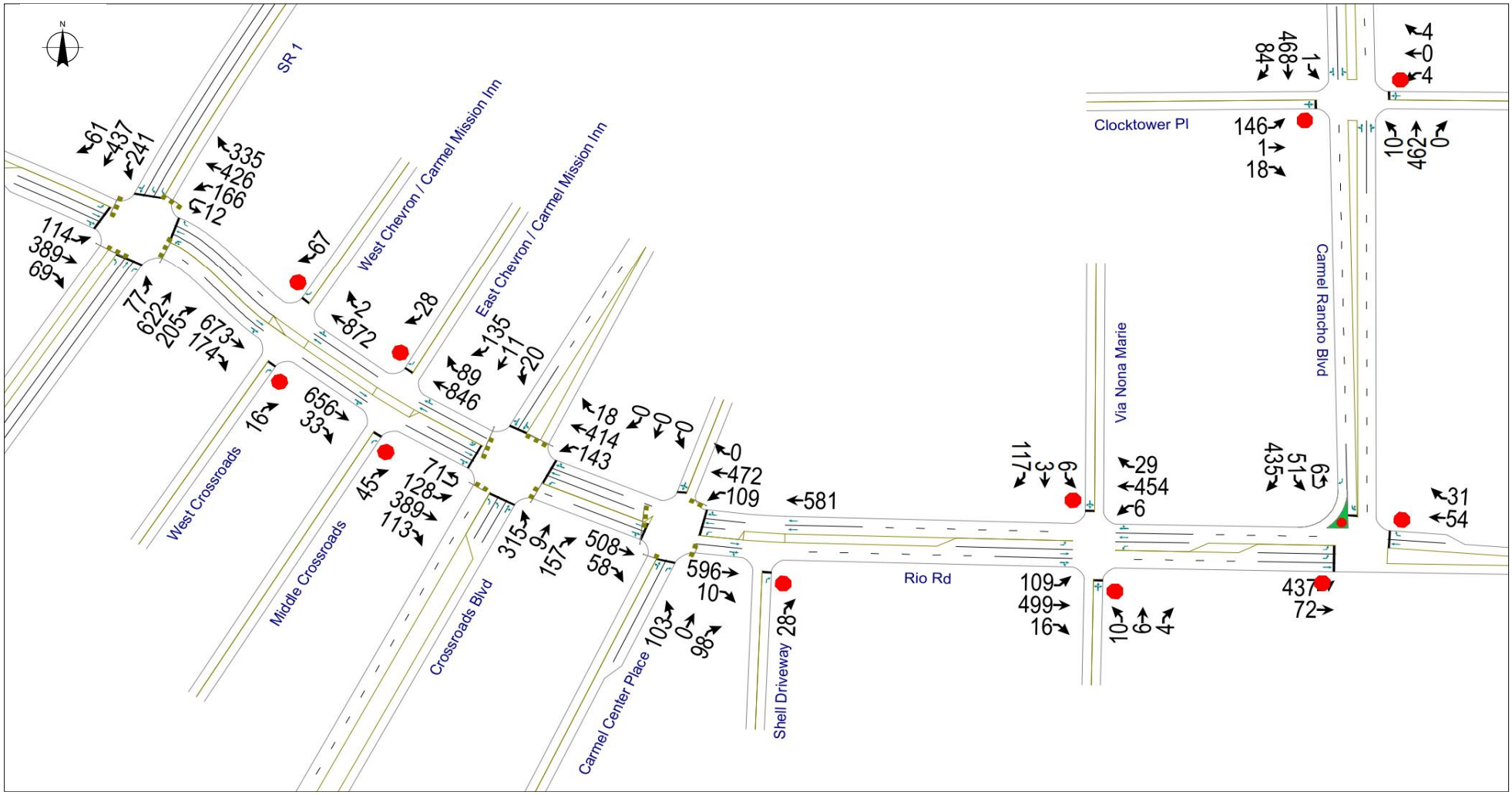


Exhibit 27

Cumulative Plus Project

Rio Road Corridor Traffic Volumes

Saturday Peak Hour

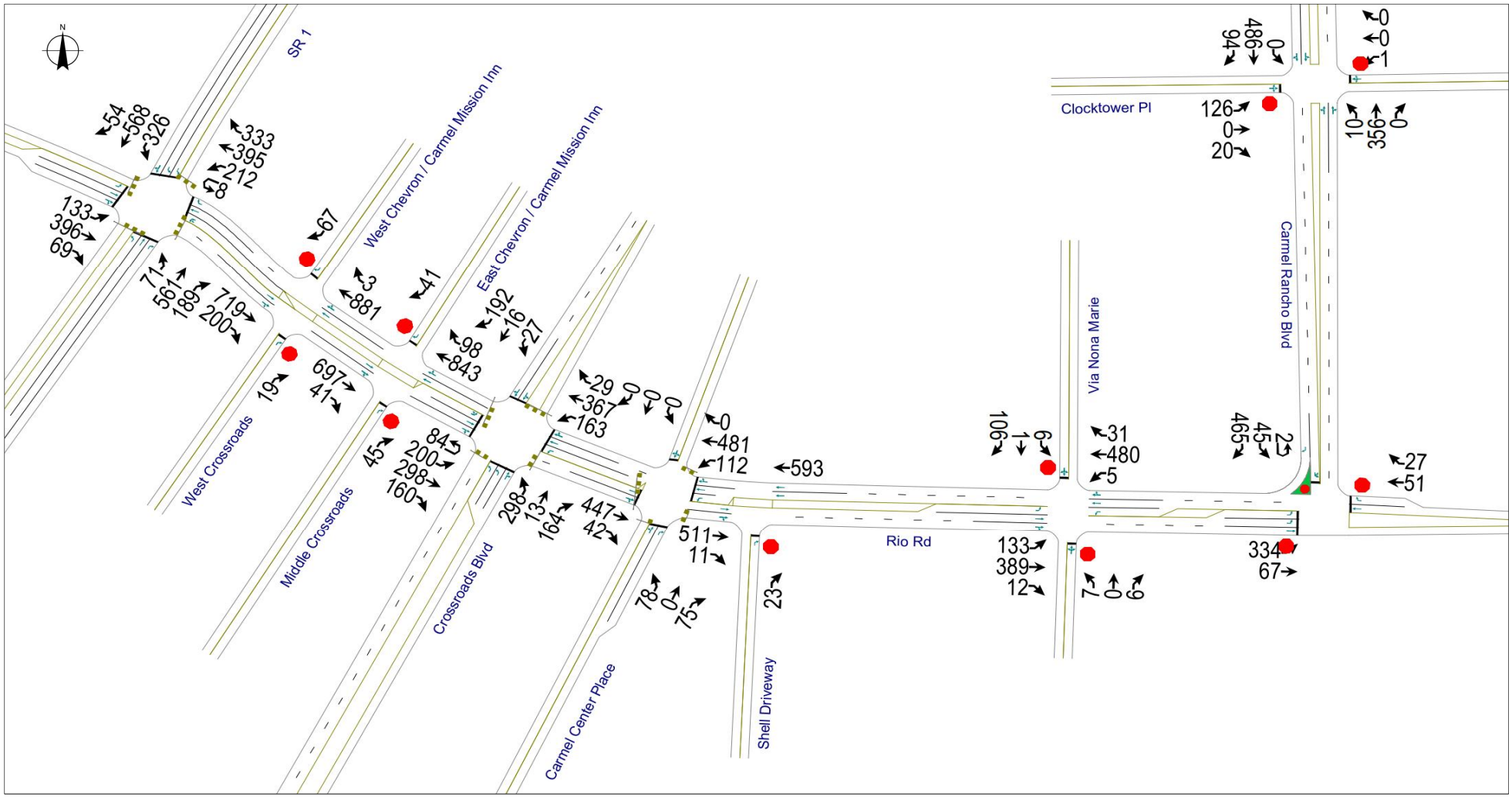


Exhibit 27

Cumulative Plus Project

Rio Road Corridor Traffic Volumes

Appendix A

Level of Service (LOS) Description
Signalized Intersections

The capacity of an urban street is related primarily to the signal timing and the geometric characteristics of the facility as well as to the composition of traffic on the facility. Geometrics are a fixed characteristic of a facility. Thus, while traffic composition may vary somewhat over time, the capacity of a facility is generally a stable value that can be significantly improved only by initiating geometric improvements. A traffic signal essentially allocates time among conflicting traffic movements that seek to use the same space. The way in which time is allocated significantly affects the operation and the capacity of the intersection and its approaches.

The methodology for signalized intersection is designed to consider individual intersection approaches and individual lane groups within approaches. A lane group consists of one or more lanes on an intersection approach. The outputs from application of the method described in the HCM 2010 are reported on the basis of each lane. For a given lane group at a signalized intersection, three indications are displayed: green, yellow and red. The red indication may include a short period during which all indications are red, referred to as an all-red interval and the yellow indication forms the change and clearance interval between two green phases.

The methodology for analyzing the capacity and level of service must consider a wide variety of prevailing conditions, including the amount and distribution of traffic movements, traffic composition, geometric characteristics, and details of intersection signalization. The methodology addresses the capacity, LOS, and other performance measures for lane groups and the intersection approaches and the LOS for the intersection as a whole.

Capacity is evaluated in terms of the ratio of demand flow rate to capacity (v/c ratio), whereas LOS is evaluated on the basis of control delay per vehicle (in seconds per vehicle). The methodology does not take into account the potential impact of downstream congestion on intersection operation, nor does the methodology detect and adjust for the impacts of turn-pocket overflows on through traffic and intersection operation. If the volume-to-capacity (v/c) ratio at the intersection is larger than 1.0, the intersection operates at LOS F, regardless of the actual control delay.

LEVEL OF SERVICE (LOS) CRITERIA FOR SIGNALIZED INTERSECTIONS
(Reference 2010 Highway Capacity Manual)

Level of Service	Control Delay (seconds / vehicle)
A	<10
B	>10 - 20
C	>20 - 35
D	>35 - 55
E	>55 - 80
F	>80; v/c > 1.0

Appendix B

Level of Service (LOS) Description
Unsignalized Intersections with Two-Way Stop Control (TWSC)

TWSC intersections are widely used and stop signs are used to control vehicle movements at such intersections. At TWSC intersections, the stop-controlled approaches are referred to as the minor street approaches; they can be either public streets or private driveways. The intersection approaches that are not controlled by stop signs are referred to as the major street approaches. A three-leg intersection is considered to be a standard type of TWSC intersection if the single minor street approach (i.e., the stem of the T configuration) is controlled by a stop sign. Three-leg intersections where two of the three approaches are controlled by stop signs are a special form of unsignalized intersection control.

At TWSC intersections, drivers on the controlled approaches are required to select gaps in the major street flow through which to execute crossing or turning maneuvers on the basis of judgment. In the presence of a queue, each driver on the controlled approach must use some time to move into the front-of-queue position and prepare to evaluate gaps in the major street flow. Capacity analysis at TWSC intersections depends on a clear description and understanding of the interaction of drivers on the minor or stop-controlled approach with drivers on the major street. Both gap acceptance and empirical models have been developed to describe this interaction.

Thus, the capacity of the controlled legs is based on three factors:

- the distribution of gaps in the major street traffic stream;
- driver judgment in selecting gaps through which to execute the desired maneuvers; and
- the follow-up time required by each driver in a queue.

The delay experienced by a motorist is made up of a number of factors that relate to control, geometrics, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, in the absence of incident, control, traffic or geometric delay. Average control delay for any particular minor movement is a function of the capacity of the approach and the degree of saturation and referred to as level of service.

If the volume-to-capacity (v/c) ratio at the intersection is larger than 1.0, the intersection operates at LOS F, regardless of the actual control delay.

LEVEL OF SERVICE (LOS) CRITERIA FOR TWSC INTERSECTIONS
(Reference 2010 Highway Capacity Manual)

Level of Service	Control Delay (seconds / vehicle)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50; v/c > 1.0

Appendix C

Level of Service (LOS) Description
Unsignalized Intersections with All-Way Stop Control (AWSC)

AWSC intersections require every vehicle to stop at the intersection before proceeding. Since each driver must stop, the judgement as to whether to proceed into the intersection is a function of traffic conditions on the other approaches. While giving priority to the driver on the right is a recognized rule in some areas, it is not a good descriptor of actual intersection operations. What happens is the development of a consensus of right-of-way that alternates between the drivers on the intersection approaches, a consensus that depends primarily on the intersection geometry and the arrival patterns at the stop line.

If no traffic is present on the other approaches, a driver can proceed immediately after the stop is made. If there is traffic on one or more of the other approaches, a driver proceeds only after determining that there are no vehicles currently in the intersection and that it is the driver's turn to proceed. Since no traffic signal controls the stream movement or allocates the right-of-way to each conflicting stream, the rate of departure is controlled by the interaction between the traffic streams themselves.

For AWSC intersections, the average control delay (in seconds per vehicle) is used as the primary measure of performance. Control delay is the increased time of travel for a vehicle approaching and passing through an AWSC intersection, compared with a free-flow vehicle if it were not required to slow down or stop at the intersection.

The criteria for AWSC intersections have different threshold values than do those for signalized intersections, primarily because drivers expect different levels of performance from different kinds of traffic control devices (i.e., traffic signals, two way stop or all way stop, etc.). The expectation is that a signalized intersection is designed to carry higher traffic volumes than an AWSC intersection and a higher level of control delay is acceptable at a signalized intersection for the same LOS.

For AWSC analysis using the HCM 2010 method, the LOS shown reflects the weighted average of the delay on each of the approaches. If the volume-to-capacity (v/c) ratio at the intersection is larger than 1.0, the intersection operates at LOS F, regardless of the actual control delay.

LEVEL OF SERVICE (LOS) CRITERIA FOR AWSC INTERSECTIONS
(Reference 2010 Highway Capacity Manual)

Level of Service	Control Delay (seconds / vehicle)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50; v/c > 1.0

Appendix D

2010 Highway Capacity Manual
LOS Descriptions for Arterial, Two-Lane Highway, and Multi-Lane Highway Road Segments

Automobile LOS is defined by density.

Automobile Mode

Automobile LOS for multilane highway segments are defined in Exhibit 14-4. Because speeds are constant through a broad range of flow rates, LOS are defined on the basis of density, which is a measure of the proximity of vehicles to each other in the traffic stream.

Exhibit 14-4
Automobile LOS for Multilane Highway Segments

LOS	FFS (mi/h)	Density (pc/mi/ln)
A	All	>0–11
B	All	>11–18
C	All	>18–26
D	All	>26–35
E	60	>35–40
	55	>35–41
	50	>35–43
	45	>35–45
F	Demand Exceeds Capacity	
	60	>40
	55	>41
	50	>43
	45	>45

On Class I two-lane highways, speed and delay due to passing restrictions are both important to motorists. Therefore, on these highways, LOS is defined in terms of both ATS and PTSF. On Class II highways, travel speed is not a significant issue to drivers. Therefore, on these highways, LOS is defined in terms of PTSF only. On Class III highways, high speeds are not expected. Because the length of Class III segments is generally limited, passing restrictions are also not a major concern. In these cases, drivers would like to make steady progress at or near the speed limit. Therefore, on these highways, PFFS is used to define LOS. The LOS criteria for two-lane highways are shown in Exhibit 15-3.

Exhibit 15-3
Automobile LOS for Two-Lane Highways

LOS	Class I Highways		Class II Highways	Class III Highways
	ATS (mi/h)	PTSF (%)	PTSF (%)	PFFS (%)
A	>55	≤35	≤40	>91.7
B	>50–55	>35–50	>40–55	>83.3–91.7
C	>45–50	>50–65	>55–70	>75.0–83.3
D	>40–45	>65–80	>70–85	>66.7–75.0
E	≤40	>80	>85	≤66.7

Exhibit 17-2 lists the LOS thresholds established for the automobile mode on urban streets.

Exhibit 17-2
LOS Criteria: Automobile Mode

Travel Speed as a Percentage of Base Free-Flow Speed (%)	LOS by Volume-to-Capacity Ratio[a]	
	≤1.0	> 1.0
>85	A	F
>67–85	B	F
>50–67	C	F
>40–50	D	F
>30–40	E	F
≤30	F	F

Note: [a]Volume-to-capacity ratio of through movement at downstream boundary intersection.

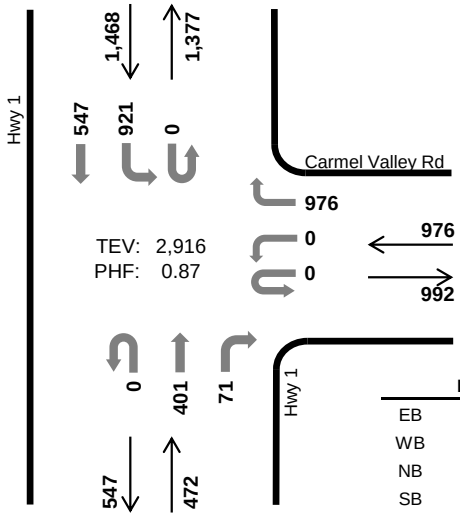
Appendix E
Traffic Count Data

Hwy 1
Carmel Valley Rd

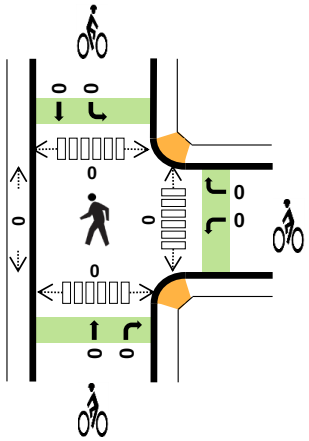
Date: 05/25/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

N

Peak Hour



	HV %:	PHF
EB	-	-
WB	1.5%	0.76
NB	3.0%	0.80
SB	3.6%	0.92
TOTAL	2.8%	0.87



Two-Hour Count Summaries

Interval Start		0 Eastbound				Carmel Valley Rd Westbound				Hwy 1 Northbound				Hwy 1 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	0	0	0	0	119	0	0	46	5	0	133	92	0	395	0
7:15 AM		0	0	0	0	0	0	0	213	0	0	72	20	0	222	97	0	624	0
7:30 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**321**	**0**	**0**	**89**	**29**	**0**	**276**	**125**	**0**	**840**	0
7:45 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**215**	**0**	**0**	**89**	**20**	**0**	**236**	**131**	**0**	**691**	2,550
8:00 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**225**	**0**	**0**	**91**	**7**	**0**	**213**	**144**	**0**	**680**	2,835
8:15 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**215**	**0**	**0**	**132**	**15**	**0**	**196**	**147**	**0**	**705**	**2,916**
8:30 AM		0	0	0	0	0	0	0	166	0	0	107	22	0	221	161	0	677	2,753
8:45 AM		0	0	0	0	0	0	0	200	0	0	102	18	0	239	144	0	703	2,765
Count Total		0	0	0	0	0	0	0	1,674	0	0	728	136	0	1,736	1,041	0	5,315	0
Peak Hour	**All**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**976**	**0**	**0**	**401**	**71**	**0**	**921**	**547**	**0**	**2,916**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**15**	**0**	**0**	**12**	**2**	**0**	**26**	**27**	**0**	**82**	**0**
	HV%	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2%**	**-**	**-**	**3%**	**3%**	**-**	**3%**	**5%**	**-**	**3%**	**0**

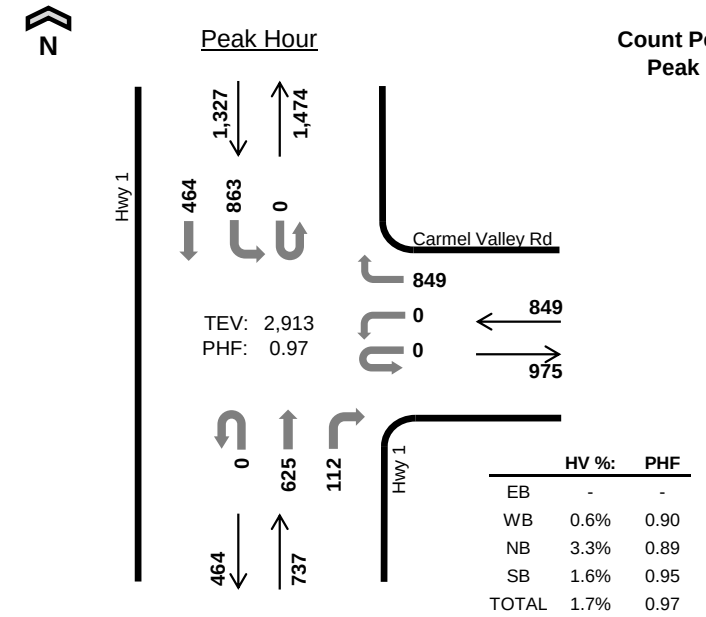
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	4	2	5	*11*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	6	5	12	*23*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	**0**	**2**	**6**	**10**	***18***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**0**	**1**	**2**	**10**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**0**	**7**	**2**	**12**	***21***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**0**	**5**	**4**	**21**	***30***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	0	3	7	19	*29*	0	1	0	0	*1*	0	0	0	0	*0*
8:45 AM	0	2	4	15	*21*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	30	32	104	*166*	0	1	0	0	*1*	0	0	0	0	*0*
Peak Hr	**0**	**15**	**14**	**53**	***82***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

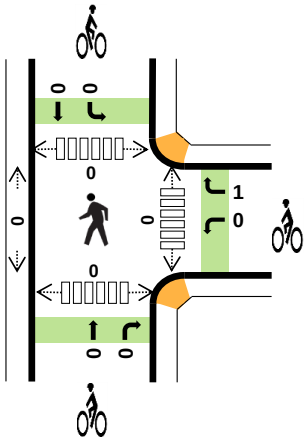
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Hwy 1
Carmel Valley Rd

Date: 05/25/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM



	HV %:	PHF
EB	-	-
WB	0.6%	0.90
NB	3.3%	0.89
SB	1.6%	0.95
TOTAL	1.7%	0.97



Two-Hour Count Summaries

Interval Start		0 Eastbound				Carmel Valley Rd Westbound				Hwy 1 Northbound				Hwy 1 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**235**	**0**	**0**	**146**	**23**	**0**	**215**	**133**	**0**	**752**	0
4:15 PM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**200**	**0**	**0**	**150**	**23**	**0**	**224**	**106**	**0**	**703**	0
4:30 PM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**219**	**0**	**0**	**169**	**39**	**0**	**196**	**112**	**0**	**735**	0
4:45 PM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**195**	**0**	**0**	**160**	**27**	**0**	**228**	**113**	**0**	**723**	**2,913**
5:00 PM		0	0	0	0	0	0	0	245	0	0	175	16	0	189	106	0	731	2,892
5:15 PM		0	0	0	0	0	0	0	214	0	0	125	19	0	236	106	0	700	2,889
5:30 PM		0	0	0	0	0	0	0	175	0	0	151	24	0	192	97	0	639	2,793
5:45 PM		0	0	0	0	0	0	0	178	0	0	165	24	0	168	103	0	638	2,708
Count Total		0	0	0	0	0	0	0	1,661	0	0	1,241	195	0	1,648	876	0	5,621	0
Peak Hour	**All**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**849**	**0**	**0**	**625**	**112**	**0**	**863**	**464**	**0**	**2,913**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**18**	**6**	**0**	**17**	**4**	**0**	**50**	**0**
	HV%	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1%**	**-**	**-**	**3%**	**5%**	**-**	**2%**	**1%**	**-**	**2%**	**0**

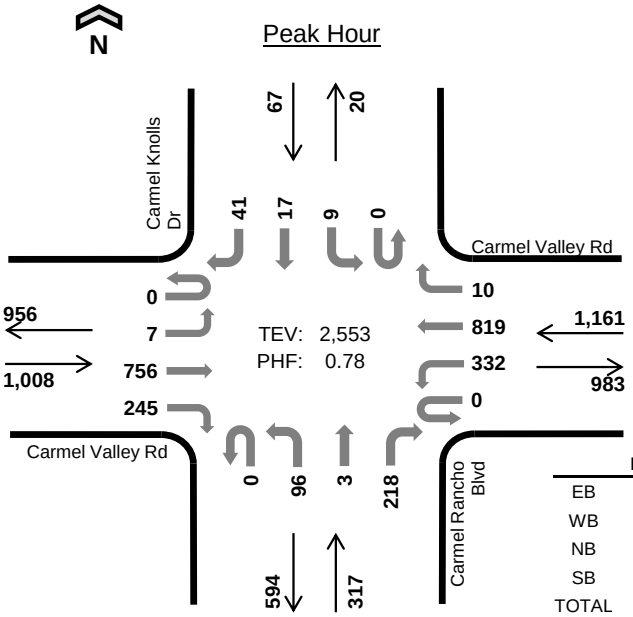
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**0**	**2**	**7**	**7**	***16***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
4:15 PM	**0**	**1**	**7**	**6**	***14***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**0**	**1**	**6**	**4**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:45 PM	**0**	**1**	**4**	**4**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	0	2	2	5	*9*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	0	2	4	3	*9*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	0	2	2	8	*12*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	3	1	4	*8*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	14	33	41	*88*	0	1	0	0	*1*	0	0	0	0	*0*
Peak Hr	**0**	**5**	**24**	**21**	***50***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

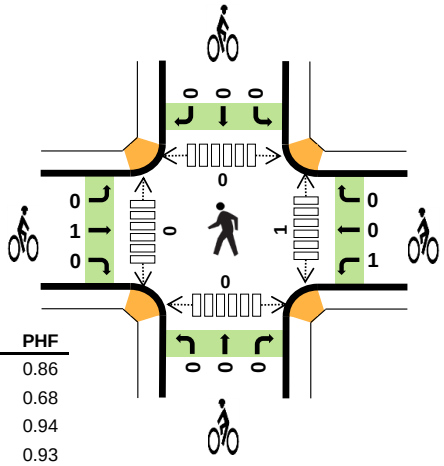
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Carmel Rancho Blvd
Carmel Valley Rd

Date: 05/25/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM



	HV %:	PHF
EB	2.2%	0.86
WB	1.8%	0.68
NB	2.2%	0.94
SB	4.5%	0.93
TOTAL	2.1%	0.78



Two-Hour Count Summaries

Interval Start	Carmel Valley Rd Eastbound				Carmel Valley Rd Westbound				Carmel Rancho Blvd Northbound				Carmel Knolls Dr Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	2	97	40	0	36	104	0	0	13	0	18	0	0	0	5	315	0
7:15 AM	**0**	**1**	**175**	**50**	**0**	**63**	**176**	**0**	**0**	**18**	**0**	**61**	**0**	**1**	**3**	**14**	**562**	0
7:30 AM	**0**	**1**	**226**	**66**	**0**	**134**	**285**	**7**	**0**	**19**	**0**	**65**	**0**	**7**	**2**	**8**	**820**	0
7:45 AM	**0**	**2**	**199**	**64**	**0**	**62**	**185**	**1**	**0**	**31**	**0**	**51**	**0**	**1**	**6**	**7**	**609**	2,306
8:00 AM	**0**	**3**	**156**	**65**	**0**	**73**	**173**	**2**	**0**	**28**	**3**	**41**	**0**	**0**	**6**	**12**	**562**	**2,553**
8:15 AM	0	6	130	61	0	86	165	0	0	35	1	40	0	1	6	12	543	2,534
8:30 AM	0	5	144	95	0	81	149	1	0	23	3	52	0	2	3	8	566	2,280
8:45 AM	0	2	142	101	0	110	162	0	0	21	1	54	0	4	1	5	603	2,274
Count Total	0	22	1,269	542	0	645	1,399	11	0	188	8	382	0	16	27	71	4,580	0
Peak Hour All	**0**	**7**	**756**	**245**	**0**	**332**	**819**	**10**	**0**	**96**	**3**	**218**	**0**	**9**	**17**	**41**	**2,553**	**0**
Peak Hour HV	**0**	**0**	**17**	**5**	**0**	**5**	**15**	**1**	**0**	**1**	**0**	**6**	**0**	**2**	**0**	**1**	**53**	**0**
Peak Hour HV%	**-**	**0%**	**2%**	**2%**	**-**	**2%**	**2%**	**10%**	**-**	**1%**	**0%**	**3%**	**-**	**22%**	**0%**	**2%**	**2%**	**0**

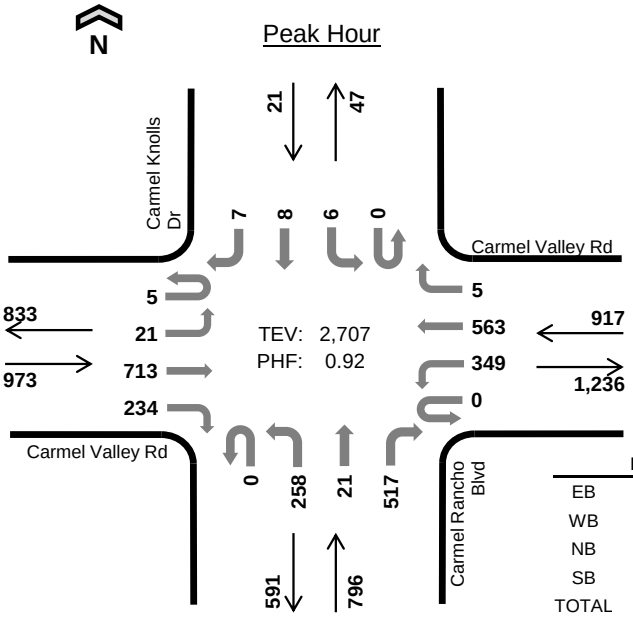
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	2	2	0	*5*	0	0	0	0	*0*	1	0	0	0	*1*
7:15 AM	**8**	**5**	**1**	**1**	***15***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**6**	**3**	**1**	**1**	***11***	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**3**	**4**	**2**	**0**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**5**	**9**	**3**	**1**	***18***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	***1***
8:15 AM	12	3	6	0	*21*	0	0	0	0	*0*	2	0	1	1	*4*
8:30 AM	10	4	2	0	*16*	0	1	0	0	*1*	1	0	0	0	*1*
8:45 AM	11	2	3	0	*16*	0	0	0	0	*0*	1	0	0	0	*1*
Count Total	56	32	20	3	*111*	1	2	0	0	*3*	6	0	1	1	*8*
Peak Hour	**22**	**21**	**7**	**3**	***53***	**1**	**1**	**0**	**0**	***2***	**1**	**0**	**0**	**0**	***1***

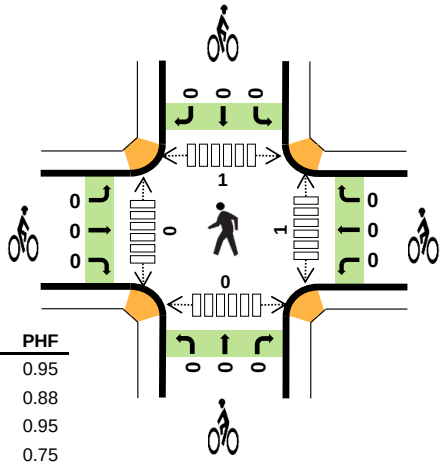
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Carmel Rancho Blvd
Carmel Valley Rd

Date: 05/25/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM



	HV %:	PHF
EB	1.8%	0.95
WB	1.0%	0.88
NB	1.0%	0.95
SB	4.8%	0.75
TOTAL	1.3%	0.92



Two-Hour Count Summaries

Interval Start	Carmel Valley Rd Eastbound				Carmel Valley Rd Westbound				Carmel Rancho Blvd Northbound				Carmel Knolls Dr Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**3**	**3**	**183**	**66**	**0**	**100**	**159**	**2**	**0**	**70**	**3**	**137**	**0**	**3**	**2**	**2**	**733**	0
4:15 PM	**1**	**5**	**157**	**55**	**0**	**90**	**123**	**0**	**0**	**68**	**6**	**136**	**0**	**1**	**2**	**3**	**647**	0
4:30 PM	**0**	**5**	**194**	**55**	**0**	**62**	**150**	**2**	**0**	**63**	**9**	**107**	**0**	**1**	**1**	**1**	**650**	0
4:45 PM	**1**	**8**	**179**	**58**	**0**	**97**	**131**	**1**	**0**	**57**	**3**	**137**	**0**	**1**	**3**	**1**	**677**	**2,707**
5:00 PM	0	7	138	66	0	62	126	4	0	132	2	135	0	2	8	1	683	2,657
5:15 PM	1	5	193	69	0	74	134	1	0	57	1	113	0	2	2	2	654	2,664
5:30 PM	0	2	151	44	0	70	107	1	0	65	3	101	0	1	5	1	551	2,565
5:45 PM	1	4	143	45	0	65	111	2	0	61	4	60	0	0	3	3	502	2,390
Count Total	7	39	1,338	458	0	620	1,041	13	0	573	31	926	0	11	26	14	5,097	0
Peak Hour All	**5**	**21**	**713**	**234**	**0**	**349**	**563**	**5**	**0**	**258**	**21**	**517**	**0**	**6**	**8**	**7**	**2,707**	**0**
Peak Hour HV	**0**	**0**	**18**	**0**	**0**	**4**	**5**	**0**	**0**	**1**	**0**	**7**	**0**	**0**	**1**	**0**	**36**	**0**
Peak Hour HV%	**0%**	**0%**	**3%**	**0%**	**-**	**1%**	**1%**	**0%**	**-**	**0%**	**0%**	**1%**	**-**	**0%**	**13%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

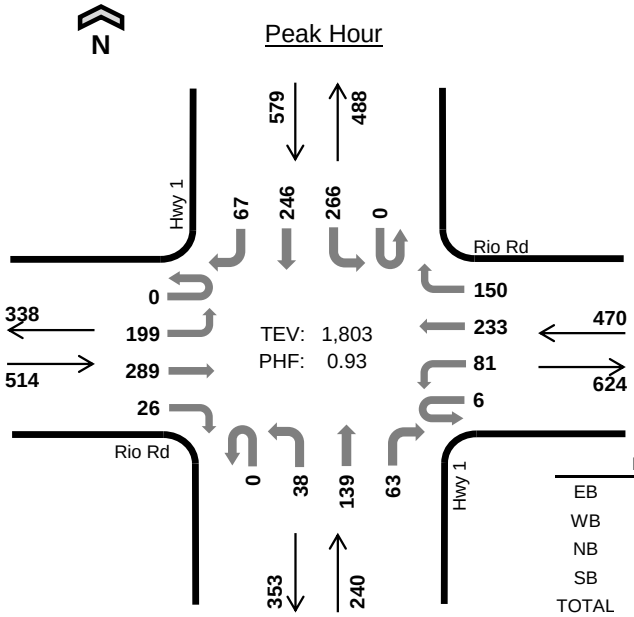
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**6**	**3**	**3**	**0**	***12***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**0**	*1*
4:15 PM	**3**	**3**	**1**	**1**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**6**	**1**	**3**	**0**	***10***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
4:45 PM	**3**	**2**	**1**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	5	1	2	0	*8*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	2	6	0	0	*8*	0	0	1	0	*1*	0	0	0	0	*0*
5:30 PM	7	3	2	0	*12*	0	0	0	0	*0*	1	0	0	0	*1*
5:45 PM	2	2	1	0	*5*	1	0	0	0	*1*	0	0	0	0	*0*
Count Total	34	21	13	1	*69*	1	0	1	0	*2*	2	0	1	0	*3*
Peak Hour	**18**	**9**	**8**	**1**	***36***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**1**	**0**	***2***

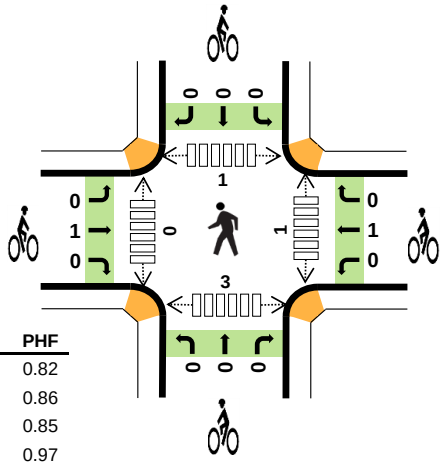
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Hwy 1
Rio Rd

Date: 05/25/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

Peak Hour





	HV %:	PHF
EB	3.1%	0.82
WB	4.3%	0.86
NB	1.3%	0.85
SB	3.6%	0.97
TOTAL	3.3%	0.93

Two-Hour Count Summaries

Interval Start		Rio Rd Eastbound				Rio Rd Westbound				Hwy 1 Northbound				Hwy 1 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	7	28	1	1	8	27	24	0	2	22	16	0	52	32	10	230	0
7:15 AM		0	34	34	1	1	17	31	29	0	3	31	4	0	42	35	11	273	0
7:30 AM		0	48	48	6	3	28	76	36	0	5	29	9	0	54	49	20	411	0
7:45 AM		0	60	63	13	2	22	51	27	0	7	31	10	0	68	50	14	418	1,332
8:00 AM		**0**	**37**	**64**	**4**	**1**	**20**	**45**	**38**	**0**	**7**	**25**	**8**	**0**	**66**	**61**	**14**	**390**	1,492
8:15 AM		**0**	**50**	**58**	**7**	**3**	**25**	**65**	**44**	**0**	**10**	**43**	**18**	**0**	**57**	**60**	**26**	**466**	1,685
8:30 AM		**0**	**73**	**77**	**7**	**1**	**15**	**64**	**38**	**0**	**13**	**32**	**17**	**0**	**71**	**59**	**16**	**483**	1,757
8:45 AM		**0**	**39**	**90**	**8**	**1**	**21**	**59**	**30**	**0**	**8**	**39**	**20**	**0**	**72**	**66**	**11**	**464**	**1,803**
Count Total		0	348	462	47	13	156	418	266	0	55	252	102	0	482	412	122	3,135	0
Peak Hour	**All**	**0**	**199**	**289**	**26**	**6**	**81**	**233**	**150**	**0**	**38**	**139**	**63**	**0**	**266**	**246**	**67**	**1,803**	**0**
	HV	**0**	**11**	**5**	**0**	**2**	**5**	**10**	**3**	**0**	**1**	**2**	**0**	**0**	**5**	**13**	**3**	**60**	**0**
	HV%	**-**	**6%**	**2%**	**0%**	**33%**	**6%**	**4%**	**2%**	**-**	**3%**	**1%**	**0%**	**-**	**2%**	**5%**	**4%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

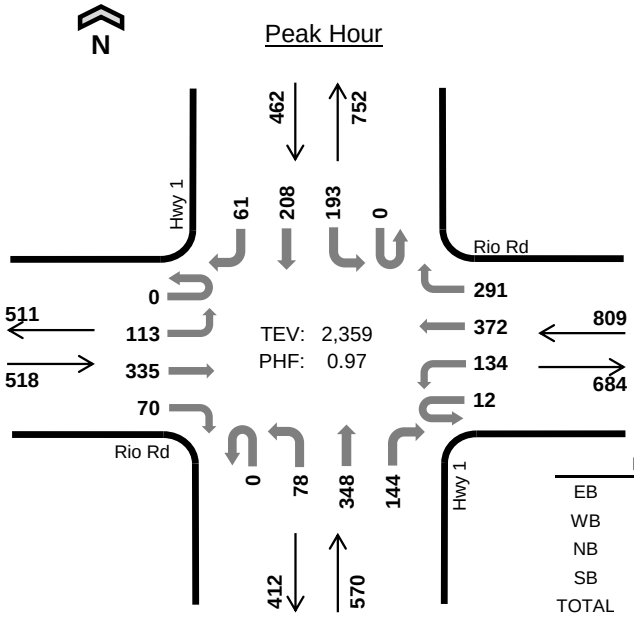
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	4	5	1	4	*14*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	5	5	0	2	*12*	0	0	0	0	*0*	0	0	1	0	*1*
7:30 AM	2	4	1	3	*10*	0	0	0	0	*0*	0	0	0	1	*1*
7:45 AM	4	1	0	3	*8*	0	0	0	0	*0*	1	0	0	0	*1*
8:00 AM	**0**	**7**	**0**	**3**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**6**	**4**	**0**	**5**	***15***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**2**	*2*
8:30 AM	**6**	**5**	**1**	**9**	***21***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**1**	**1**	*2*
8:45 AM	**4**	**4**	**2**	**4**	***14***	**0**	**1**	**0**	**0**	***1***	**1**	**0**	**0**	**0**	***1***
Count Total	31	35	5	33	*104*	1	1	0	0	*2*	2	0	2	4	*8*
Peak Hour	**16**	**20**	**3**	**21**	***60***	**1**	**1**	**0**	**0**	***2***	**1**	**0**	**1**	**3**	***5***

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

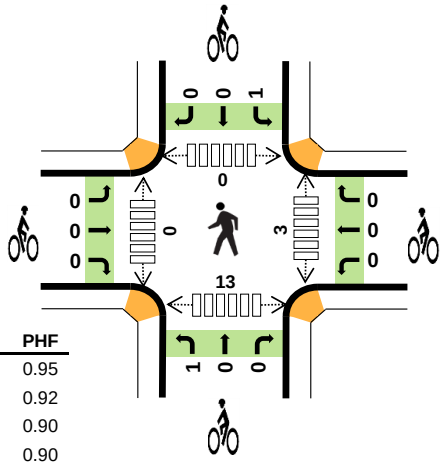
Hwy 1
Rio Rd

Date: 05/25/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Peak Hour



	HV %:	PHF
EB	1.7%	0.95
WB	1.2%	0.92
NB	2.6%	0.90
SB	0.9%	0.90
TOTAL	1.6%	0.97



Two-Hour Count Summaries

Interval Start	Rio Rd Eastbound				Rio Rd Westbound				Hwy 1 Northbound				Hwy 1 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**26**	**79**	**20**	**5**	**40**	**97**	**78**	**0**	**19**	**78**	**34**	**0**	**62**	**50**	**17**	**605**	0
4:15 PM	**0**	**31**	**82**	**23**	**3**	**35**	**91**	**68**	**0**	**21**	**82**	**44**	**0**	**35**	**63**	**15**	**593**	0
4:30 PM	**0**	**31**	**87**	**14**	**4**	**32**	**91**	**66**	**0**	**22**	**101**	**36**	**0**	**42**	**54**	**11**	**591**	0
4:45 PM	**0**	**25**	**87**	**13**	**0**	**27**	**93**	**79**	**0**	**16**	**87**	**30**	**0**	**54**	**41**	**18**	**570**	**2,359**
5:00 PM	0	37	91	9	2	24	70	75	0	14	73	31	0	48	47	14	535	2,289
5:15 PM	0	29	55	11	5	29	86	48	0	7	56	28	0	49	36	21	460	2,156
5:30 PM	0	34	52	14	0	31	79	69	0	13	71	30	0	46	38	14	491	2,056
5:45 PM	0	44	49	12	0	19	65	81	0	19	69	23	0	43	46	18	488	1,974
Count Total	0	257	582	116	19	237	672	564	0	131	617	256	0	379	375	128	4,333	0
Peak Hour All	**0**	**113**	**335**	**70**	**12**	**134**	**372**	**291**	**0**	**78**	**348**	**144**	**0**	**193**	**208**	**61**	**2,359**	**0**
Peak Hour HV	**0**	**3**	**5**	**1**	**0**	**1**	**7**	**2**	**0**	**0**	**14**	**1**	**0**	**0**	**3**	**1**	**38**	**0**
Peak Hour HV%	**-**	**3%**	**1%**	**1%**	**0%**	**1%**	**2%**	**1%**	**-**	**0%**	**4%**	**1%**	**-**	**0%**	**1%**	**2%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**1**	**4**	**5**	**1**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**8**	*8*
4:15 PM	**7**	**2**	**4**	**1**	***14***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**2**	*2*
4:30 PM	**1**	**3**	**4**	**1**	***9***	**0**	**0**	**1**	**0**	***1***	**1**	**0**	**0**	**2**	*3*
4:45 PM	**0**	**1**	**2**	**1**	***4***	**0**	**0**	**0**	**1**	***1***	**2**	**0**	**0**	**1**	***3***
5:00 PM	1	0	1	0	*2*	0	0	1	0	*1*	2	0	0	3	*5*
5:15 PM	2	2	1	0	*5*	0	0	0	0	*0*	1	0	0	3	*4*
5:30 PM	0	2	2	0	*4*	0	0	0	0	*0*	0	0	0	2	*2*
5:45 PM	0	1	1	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	12	15	20	5	*52*	0	0	2	1	*3*	6	0	0	21	*27*
Peak Hour	**9**	**10**	**15**	**4**	***38***	**0**	**0**	**1**	**1**	***2***	**3**	**0**	**0**	**13**	***16***

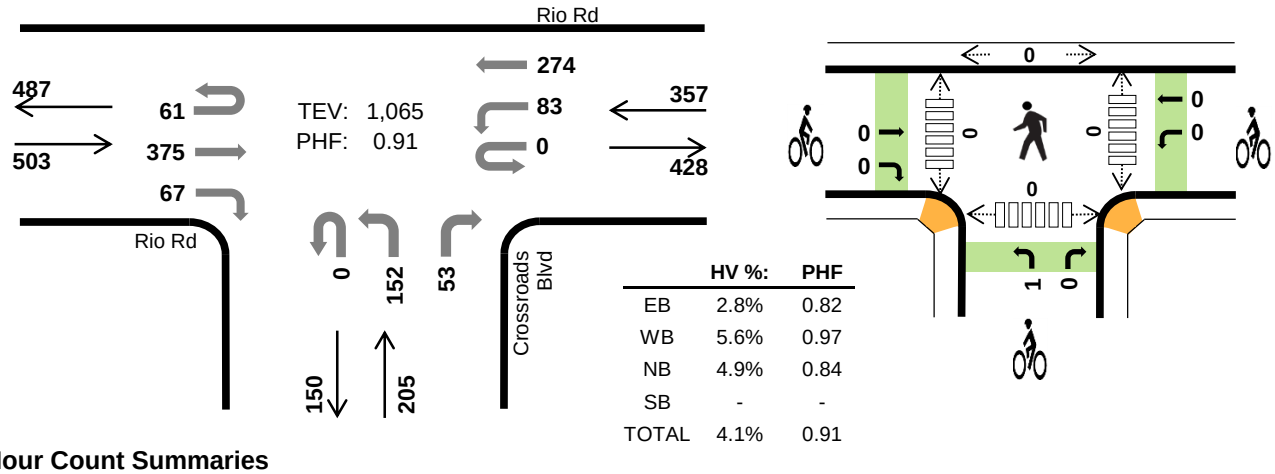
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Crossroads Blvd
Rio Rd

N

Peak Hour

Date: 05/25/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM



	HV %:	PHF
EB	2.8%	0.82
WB	5.6%	0.97
NB	4.9%	0.84
SB	-	-
TOTAL	4.1%	0.91

Two-Hour Count Summaries

Interval Start		Rio Rd Eastbound				Rio Rd Westbound				Crossroads Blvd Northbound				0 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		10	0	44	10	0	10	32	0	0	17	0	6	0	0	0	0	129	0
7:15 AM		5	0	55	6	0	17	48	0	0	26	0	16	0	0	0	0	173	0
7:30 AM		19	0	71	14	0	22	89	0	0	33	0	14	0	0	0	0	262	0
7:45 AM		15	0	77	22	0	15	57	0	0	27	0	6	0	0	0	0	219	783
8:00 AM		**18**	**0**	**77**	**16**	**0**	**21**	**71**	**0**	**0**	**29**	**0**	**10**	**0**	**0**	**0**	**0**	**242**	896
8:15 AM		**15**	**0**	**87**	**10**	**0**	**20**	**72**	**0**	**0**	**48**	**0**	**13**	**0**	**0**	**0**	**0**	**265**	988
8:30 AM		**12**	**0**	**94**	**21**	**0**	**18**	**66**	**0**	**0**	**39**	**0**	**16**	**0**	**0**	**0**	**0**	**266**	992
8:45 AM		**16**	**0**	**117**	**20**	**0**	**24**	**65**	**0**	**0**	**36**	**0**	**14**	**0**	**0**	**0**	**0**	**292**	**1,065**
Count Total		110	0	622	119	0	147	500	0	0	255	0	95	0	0	0	0	1,848	0
Peak Hour	**All**	**61**	**0**	**375**	**67**	**0**	**83**	**274**	**0**	**0**	**152**	**0**	**53**	**0**	**0**	**0**	**0**	**1,065**	**0**
	HV	**1**	**0**	**11**	**2**	**0**	**6**	**14**	**0**	**0**	**6**	**0**	**4**	**0**	**0**	**0**	**0**	**44**	**0**
	HV%	**2%**	**-**	**3%**	**3%**	**-**	**7%**	**5%**	**-**	**-**	**4%**	**-**	**8%**	**-**	**-**	**-**	**-**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	7	5	5	0	*17*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	2	3	0	*5*	1	0	0	0	*1*	1	0	0	0	*1*
7:30 AM	0	5	3	0	*8*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	4	2	4	0	*10*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	**4**	**5**	**3**	**0**	***12***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**4**	**5**	**2**	**0**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:30 AM	**3**	**6**	**2**	**0**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:45 AM	**3**	**4**	**3**	**0**	***10***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***
Count Total	25	34	25	0	*84*	1	0	1	0	*2*	1	0	0	0	*1*
Peak Hr	**14**	**20**	**10**	**0**	***44***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

Deon Fouche: 415 - 757 - 7714

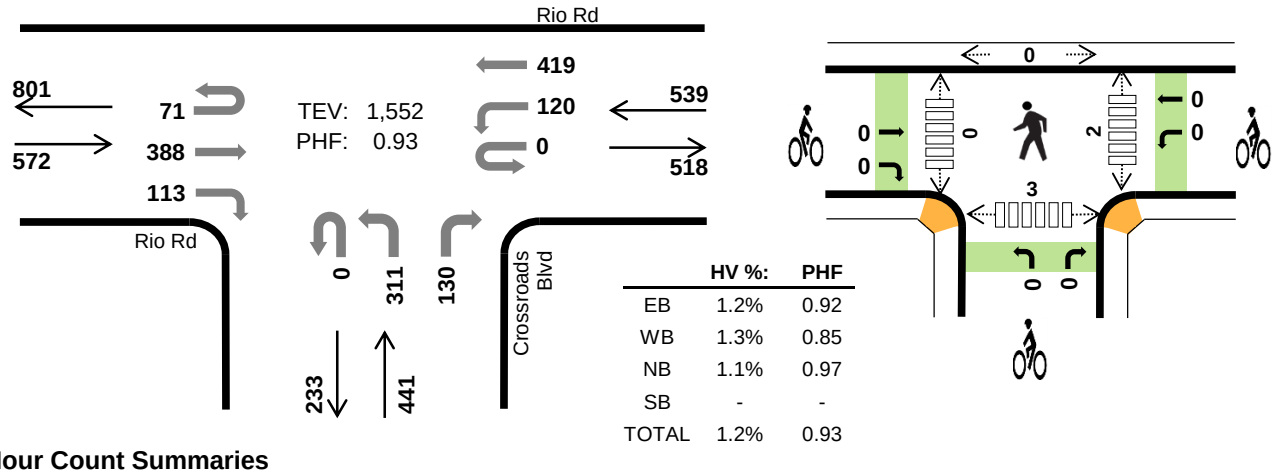
deon.fouche@idaxdata.com

Crossroads Blvd
Rio Rd

N

Peak Hour

Date: 05/25/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM



	HV %:	PHF
EB	1.2%	0.92
WB	1.3%	0.85
NB	1.1%	0.97
SB	-	-
TOTAL	1.2%	0.93

Two-Hour Count Summaries

Interval Start		Rio Rd Eastbound				Rio Rd Westbound				Crossroads Blvd Northbound				0 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		**18**	**0**	**95**	**33**	**0**	**32**	**126**	**0**	**0**	**82**	**0**	**31**	**0**	**0**	**0**	**0**	**417**	0
4:15 PM		**15**	**0**	**103**	**21**	**0**	**30**	**99**	**0**	**0**	**77**	**0**	**37**	**0**	**0**	**0**	**0**	**382**	0
4:30 PM		**16**	**0**	**87**	**29**	**0**	**33**	**89**	**0**	**0**	**75**	**0**	**31**	**0**	**0**	**0**	**0**	**360**	0
4:45 PM		**22**	**0**	**103**	**30**	**0**	**25**	**105**	**0**	**0**	**77**	**0**	**31**	**0**	**0**	**0**	**0**	**393**	**1,552**
5:00 PM		16	0	82	21	0	24	105	0	0	54	0	25	0	0	0	0	327	1,462
5:15 PM		22	0	66	28	0	24	88	0	0	55	0	30	0	0	0	0	313	1,393
5:30 PM		11	0	54	23	0	14	84	0	0	80	0	27	0	0	0	0	293	1,326
5:45 PM		17	0	48	19	0	24	84	0	0	71	0	20	0	0	0	0	283	1,216
Count Total		137	0	638	204	0	206	780	0	0	571	0	232	0	0	0	0	2,768	0
Peak Hour	**All**	**71**	**0**	**388**	**113**	**0**	**120**	**419**	**0**	**0**	**311**	**0**	**130**	**0**	**0**	**0**	**0**	**1,552**	**0**
	HV	**0**	**0**	**7**	**0**	**0**	**2**	**5**	**0**	**0**	**2**	**0**	**3**	**0**	**0**	**0**	**0**	**19**	**0**
	HV%	**0%**	**-**	**2%**	**0%**	**-**	**2%**	**1%**	**-**	**-**	**1%**	**-**	**2%**	**-**	**-**	**-**	**-**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**1**	**3**	**1**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**0**	*2*
4:15 PM	**3**	**2**	**3**	**0**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	*1*
4:45 PM	**2**	**1**	**1**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**2**	***2***
5:00 PM	1	0	2	0	*3*	0	0	0	0	*0*	0	0	0	1	*1*
5:15 PM	0	1	1	0	*2*	0	0	1	0	*1*	0	0	0	0	*0*
5:30 PM	1	2	1	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	9	11	9	0	*29*	0	0	1	0	*1*	2	0	0	4	*6*
Peak Hr	**7**	**7**	**5**	**0**	***19***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**3**	***5***

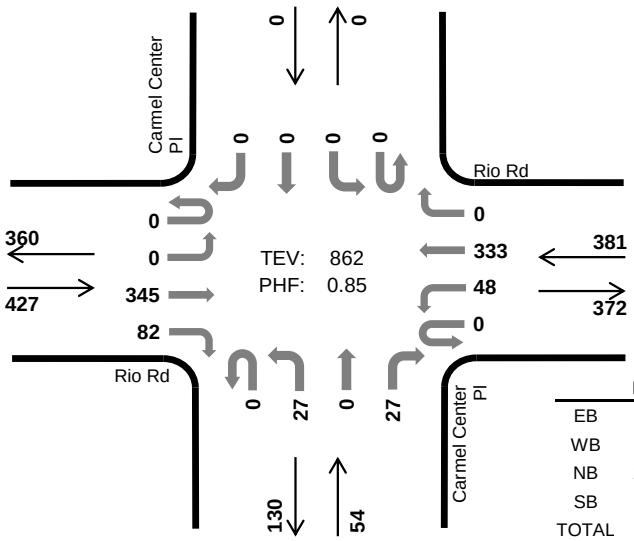
Deon Fouche: 415 - 757 - 7714

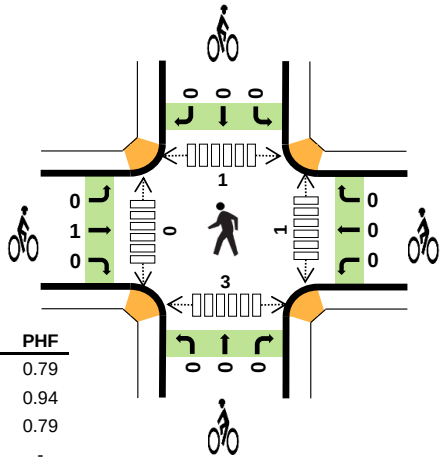
deon.fouche@idaxdata.com

Carmel Center Pl
Rio Rd

Date: 05/25/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

Peak Hour





	HV %:	PHF
EB	2.6%	0.79
WB	3.4%	0.94
NB	14.8%	0.79
SB	-	-
TOTAL	3.7%	0.85

Two-Hour Count Summaries

Interval Start	Rio Rd Eastbound				Rio Rd Westbound				Carmel Center Pl Northbound				Carmel Center Pl Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	38	12	0	5	46	0	0	4	0	7	0	0	0	0	112	0
7:15 AM	0	0	57	8	0	13	65	0	0	6	0	4	0	0	0	0	153	0
7:30 AM	0	0	64	10	0	8	99	1	0	5	0	2	0	0	1	0	190	0
7:45 AM	0	0	69	23	0	11	66	0	0	6	0	10	0	0	0	0	185	640
8:00 AM	**0**	**0**	**63**	**18**	**0**	**8**	**84**	**0**	**0**	**7**	**0**	**7**	**0**	**0**	**0**	**0**	**187**	715
8:15 AM	**0**	**0**	**79**	**21**	**0**	**13**	**87**	**0**	**0**	**8**	**0**	**3**	**0**	**0**	**0**	**0**	**211**	773
8:30 AM	**0**	**0**	**92**	**19**	**0**	**7**	**81**	**0**	**0**	**5**	**0**	**7**	**0**	**0**	**0**	**0**	**211**	794
8:45 AM	**0**	**0**	**111**	**24**	**0**	**20**	**81**	**0**	**0**	**7**	**0**	**10**	**0**	**0**	**0**	**0**	**253**	**862**
Count Total	0	0	573	135	0	85	609	1	0	48	0	50	0	0	1	0	1,502	0
Peak Hour All	**0**	**0**	**345**	**82**	**0**	**48**	**333**	**0**	**0**	**27**	**0**	**27**	**0**	**0**	**0**	**0**	**862**	**0**
Peak Hour HV	**0**	**0**	**9**	**2**	**0**	**0**	**13**	**0**	**0**	**4**	**0**	**4**	**0**	**0**	**0**	**0**	**32**	**0**
Peak Hour HV%	**-**	**-**	**3%**	**2%**	**-**	**0%**	**4%**	**-**	**-**	**15%**	**-**	**15%**	**-**	**-**	**-**	**-**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

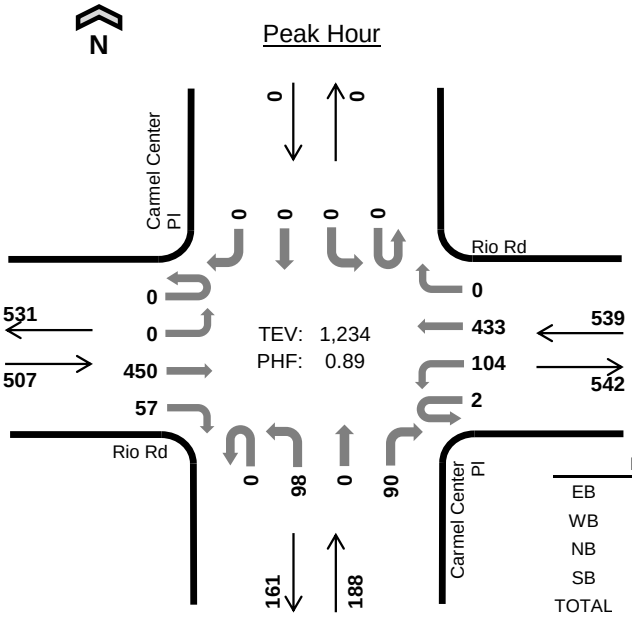
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	3	5	0	0	*8*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	2	0	3	0	*5*	0	0	0	0	*0*	1	0	2	1	*4*
7:30 AM	1	4	0	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	2	3	2	0	*7*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	**3**	**4**	**0**	**0**	***7***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**2**	*3*
8:15 AM	**4**	**4**	**3**	**0**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	*1*
8:30 AM	**1**	**3**	**3**	**0**	***7***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**1**	**0**	*1*
8:45 AM	**3**	**2**	**2**	**0**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	19	25	13	0	*57*	1	0	0	0	*1*	2	0	3	4	*9*
Peak Hour	**11**	**13**	**8**	**0**	***32***	**1**	**0**	**0**	**0**	***1***	**1**	**0**	**1**	**3**	***5***

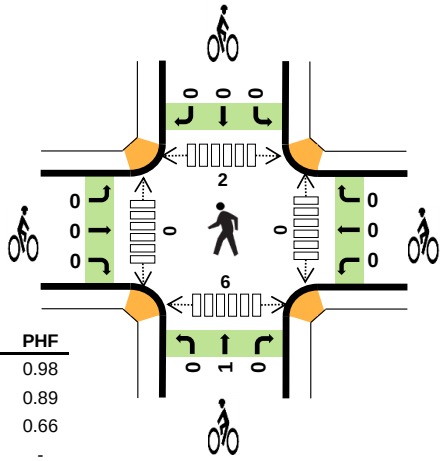
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Carmel Center Pl
Rio Rd

Date: 05/25/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Peak Hour





	HV %:	PHF
EB	1.6%	0.98
WB	1.3%	0.89
NB	2.1%	0.66
SB	-	-
TOTAL	1.5%	0.89

Two-Hour Count Summaries

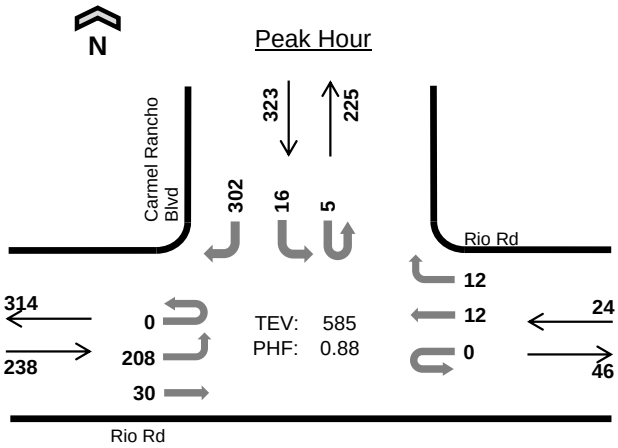
Interval Start	Rio Rd Eastbound				Rio Rd Westbound				Carmel Center Pl Northbound				Carmel Center Pl Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**0**	**107**	**18**	**0**	**29**	**122**	**0**	**0**	**35**	**0**	**36**	**0**	**0**	**0**	**0**	**347**	0
4:15 PM	**0**	**0**	**122**	**6**	**1**	**23**	**113**	**0**	**0**	**18**	**0**	**21**	**0**	**0**	**0**	**0**	**304**	0
4:30 PM	**0**	**0**	**106**	**18**	**0**	**30**	**88**	**0**	**0**	**21**	**0**	**13**	**0**	**0**	**0**	**0**	**276**	0
4:45 PM	**0**	**0**	**115**	**15**	**1**	**22**	**110**	**0**	**0**	**24**	**0**	**20**	**0**	**0**	**0**	**0**	**307**	**1,234**
5:00 PM	0	0	92	12	1	16	103	0	0	23	0	26	0	0	0	0	273	1,160
5:15 PM	0	0	84	8	0	19	91	1	0	21	0	13	0	0	0	0	237	1,093
5:30 PM	0	0	73	9	0	14	82	0	0	26	0	13	0	0	0	1	218	1,035
5:45 PM	0	0	62	4	0	14	76	0	0	27	0	9	0	0	0	0	192	920
Count Total	0	0	761	90	3	167	785	1	0	195	0	151	0	0	0	1	2,154	0
Peak Hour All	**0**	**0**	**450**	**57**	**2**	**104**	**433**	**0**	**0**	**98**	**0**	**90**	**0**	**0**	**0**	**0**	**1,234**	**0**
Peak Hour HV	**0**	**0**	**7**	**1**	**0**	**3**	**4**	**0**	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**19**	**0**
Peak Hour HV%	**-**	**-**	**2%**	**2%**	**0%**	**3%**	**1%**	**-**	**-**	**2%**	**-**	**2%**	**-**	**-**	**-**	**-**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

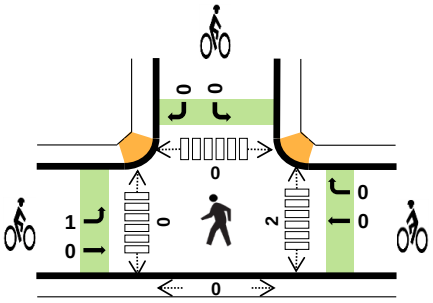
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**1**	**2**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**1**	*3*
4:15 PM	**3**	**3**	**0**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**3**	*3*
4:30 PM	**1**	**2**	**3**	**0**	***6***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**2**	*2*
4:45 PM	**3**	**0**	**1**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	1	*1*
5:15 PM	1	2	0	0	*3*	2	0	0	0	*2*	0	0	4	3	*7*
5:30 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	1	0	1	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	10	10	5	0	*25*	2	0	1	0	*3*	0	0	6	10	*16*
Peak Hour	**8**	**7**	**4**	**0**	***19***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**2**	**6**	***8***

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Carmel Rancho Blvd
Rio Rd



Date: 05/25/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM



	HV %:	PHF
EB	4.2%	0.76
WB	0.0%	0.46
NB	-	-
SB	2.8%	0.96
TOTAL	3.2%	0.88

Two-Hour Count Summaries

Interval Start		Rio Rd Eastbound				Rio Rd Westbound				0 Northbound				Carmel Rancho Blvd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	27	3	0	0	0	6	3	0	0	0	0	3	1	0	33	76	0
7:15 AM		0	50	1	0	0	0	6	7	0	0	0	0	0	1	0	52	117	0
7:30 AM		1	47	3	0	0	0	6	9	0	0	0	0	0	3	0	89	158	0
7:45 AM		0	39	8	0	0	0	1	1	0	0	0	0	0	7	0	61	117	468
8:00 AM		**0**	**38**	**4**	**0**	**0**	**0**	**4**	**1**	**0**	**0**	**0**	**0**	**1**	**6**	**0**	**77**	**131**	523
8:15 AM		**0**	**51**	**7**	**0**	**0**	**0**	**5**	**8**	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**72**	**148**	554
8:30 AM		**0**	**51**	**9**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**75**	**140**	536
8:45 AM		**0**	**68**	**10**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**1**	**5**	**0**	**78**	**166**	**585**
Count Total		1	371	45	0	0	0	31	32	0	0	0	0	8	28	0	537	1,053	0
Peak Hour	**All**	**0**	**208**	**30**	**0**	**0**	**0**	**12**	**12**	**0**	**0**	**0**	**0**	**5**	**16**	**0**	**302**	**585**	**0**
	HV	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**8**	**19**	**0**
	HV%	**-**	**5%**	**0%**	**-**	**-**	**-**	**0%**	**0%**	**-**	**-**	**-**	**-**	**20%**	**0%**	**-**	**3%**	**3%**	**0**

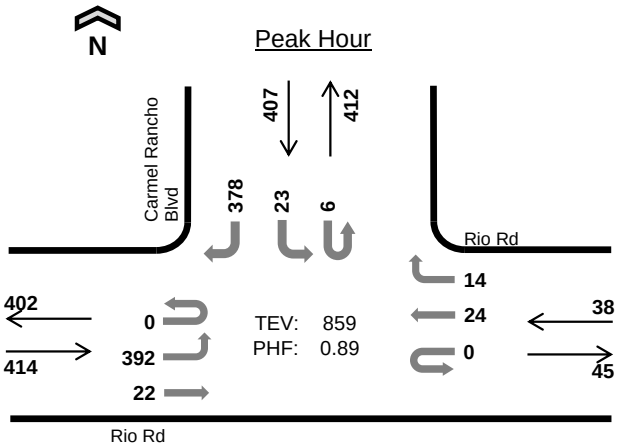
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

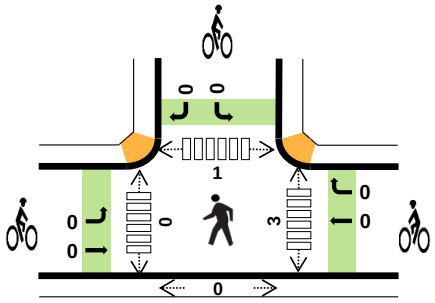
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	1	0	3	*6*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	1	1	0	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	1	1	0	4	*6*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	1	0	0	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	**4**	**0**	**0**	**4**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**2**	**0**	**0**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**0**	*2*
8:30 AM	**2**	**0**	**0**	**2**	***4***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
8:45 AM	**2**	**0**	**0**	**2**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	15	3	0	18	*36*	1	0	0	0	*1*	2	0	0	0	*2*
Peak Hr	**10**	**0**	**0**	**9**	***19***	**1**	**0**	**0**	**0**	***1***	**2**	**0**	**0**	**0**	***2***

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Carmel Rancho Blvd
Rio Rd

Date: 05/25/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM





	HV %:	PHF
EB	2.2%	0.94
WB	0.0%	0.63
NB	-	-
SB	1.7%	0.88
TOTAL	1.9%	0.89

Two-Hour Count Summaries

Interval Start		Rio Rd Eastbound				Rio Rd Westbound				0 Northbound				Carmel Rancho Blvd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		**0**	**103**	**7**	**0**	**0**	**0**	**13**	**2**	**0**	**0**	**0**	**0**	**2**	**5**	**0**	**109**	**241**	0
4:15 PM		**0**	**96**	**5**	**0**	**0**	**0**	**4**	**3**	**0**	**0**	**0**	**0**	**2**	**7**	**0**	**91**	**208**	0
4:30 PM		**0**	**91**	**3**	**0**	**0**	**0**	**4**	**5**	**0**	**0**	**0**	**0**	**1**	**6**	**0**	**87**	**197**	0
4:45 PM		**0**	**102**	**7**	**0**	**0**	**0**	**3**	**4**	**0**	**0**	**0**	**0**	**1**	**5**	**0**	**91**	**213**	**859**
5:00 PM		1	90	6	0	0	0	4	8	0	0	0	0	0	4	0	78	191	809
5:15 PM		0	69	8	0	0	0	5	5	0	0	0	0	1	4	0	85	177	778
5:30 PM		0	60	6	0	0	0	5	4	0	0	0	0	1	3	0	61	140	721
5:45 PM		1	46	6	0	0	0	4	1	0	0	0	0	0	0	0	66	124	632
Count Total		2	657	48	0	0	0	42	32	0	0	0	0	8	34	0	668	1,491	0
Peak Hour	**All**	**0**	**392**	**22**	**0**	**0**	**0**	**24**	**14**	**0**	**0**	**0**	**0**	**6**	**23**	**0**	**378**	**859**	**0**
	HV	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**16**	**0**
	HV%	**-**	**2%**	**0%**	**-**	**-**	**-**	**0%**	**0%**	**-**	**-**	**-**	**-**	**0%**	**0%**	**-**	**2%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

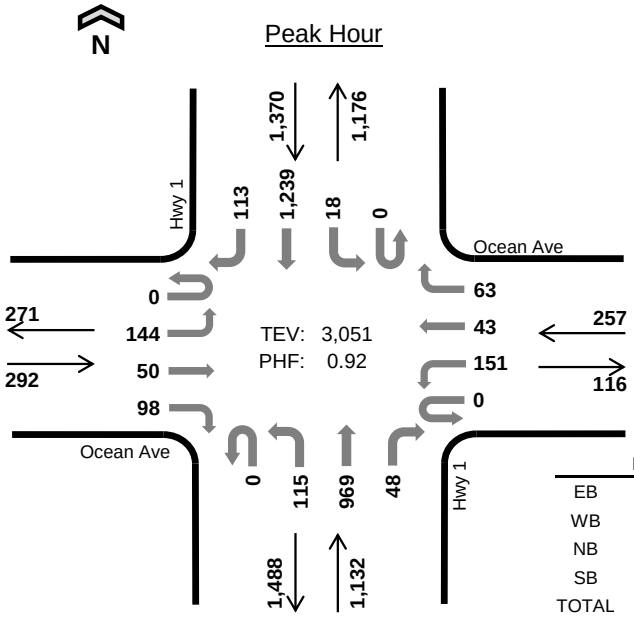
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**1**	**0**	**0**	**2**	***3***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
4:15 PM	**3**	**0**	**0**	**4**	***7***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
4:30 PM	**3**	**0**	**0**	**1**	***4***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**1**	**0**	*2*
4:45 PM	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	4	0	1	0	*5*
5:15 PM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	2	0	0	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	1	1	0	*2*
Count Total	11	0	0	10	*21*	0	0	0	0	*0*	7	1	3	0	*11*
Peak Hr	**9**	**0**	**0**	**7**	***16***	**0**	**0**	**0**	**0**	***0***	**3**	**0**	**1**	**0**	***4***

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

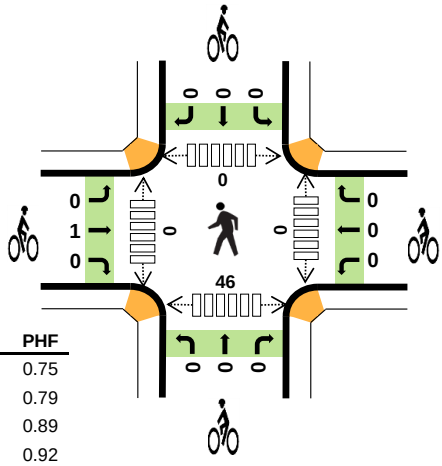
Hwy 1
Ocean Ave

Date: 05/25/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

Peak Hour



	HV %:	PHF
EB	2.7%	0.75
WB	1.9%	0.79
NB	2.6%	0.89
SB	4.0%	0.92
TOTAL	3.2%	0.92



Two-Hour Count Summaries

Interval Start	Ocean Ave Eastbound				Ocean Ave Westbound				Hwy 1 Northbound				Hwy 1 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	20	1	10	0	9	1	5	0	19	143	2	0	4	238	31	483	0
7:15 AM	0	27	9	19	0	29	5	14	0	20	187	1	0	8	261	34	614	0
7:30 AM	**0**	**28**	**7**	**20**	**0**	**47**	**10**	**23**	**0**	**30**	**266**	**21**	**0**	**7**	**340**	**27**	**826**	0
7:45 AM	**0**	**44**	**13**	**22**	**0**	**24**	**16**	**14**	**0**	**22**	**243**	**4**	**0**	**5**	**332**	**25**	**764**	2,687
8:00 AM	**0**	**29**	**6**	**26**	**0**	**29**	**2**	**11**	**0**	**32**	**257**	**9**	**0**	**2**	**310**	**39**	**752**	2,956
8:15 AM	**0**	**43**	**24**	**30**	**0**	**51**	**15**	**15**	**0**	**31**	**203**	**14**	**0**	**4**	**257**	**22**	**709**	**3,051**
8:30 AM	0	44	3	27	0	16	6	6	0	23	249	6	0	1	365	15	761	2,986
8:45 AM	0	56	4	30	0	8	5	2	0	40	238	1	0	1	306	40	731	2,953
Count Total	0	291	67	184	0	213	60	90	0	217	1,786	58	0	32	2,409	233	5,640	0
Peak Hour All	**0**	**144**	**50**	**98**	**0**	**151**	**43**	**63**	**0**	**115**	**969**	**48**	**0**	**18**	**1,239**	**113**	**3,051**	**0**
Peak Hour HV	**0**	**5**	**1**	**2**	**0**	**5**	**0**	**0**	**0**	**2**	**27**	**0**	**0**	**0**	**52**	**3**	**97**	**0**
Peak Hour HV%	**-**	**3%**	**2%**	**2%**	**-**	**3%**	**0%**	**0%**	**-**	**2%**	**3%**	**0%**	**-**	**0%**	**4%**	**3%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

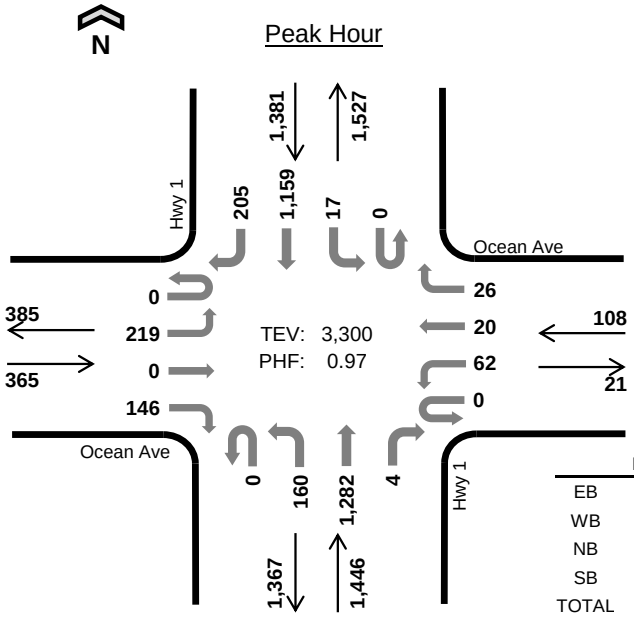
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	5	7	*12*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	4	7	11	*22*	0	0	0	0	*0*	0	0	0	3	*3*
7:30 AM	**2**	**2**	**7**	**10**	***21***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**9**	*9*
7:45 AM	**2**	**1**	**3**	**13**	***19***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**9**	*9*
8:00 AM	**1**	**2**	**10**	**11**	***24***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**6**	*6*
8:15 AM	**3**	**0**	**9**	**21**	***33***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**22**	***22***
8:30 AM	1	0	5	21	*27*	0	0	0	0	*0*	1	0	0	21	*22*
8:45 AM	2	0	6	14	*22*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	11	9	52	108	*180*	1	0	0	0	*1*	1	0	0	70	*71*
Peak Hour	**8**	**5**	**29**	**55**	***97***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**46**	***46***

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

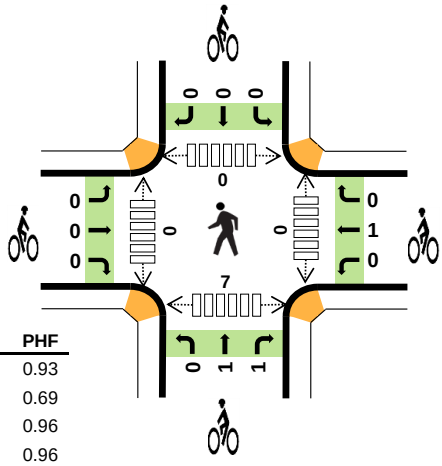
Hwy 1
Ocean Ave

Date: 05/25/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Peak Hour



	HV %:	PHF
EB	2.5%	0.93
WB	0.0%	0.69
NB	0.8%	0.96
SB	1.4%	0.96
TOTAL	1.2%	0.97



Two-Hour Count Summaries

Interval Start		Ocean Ave Eastbound				Ocean Ave Westbound				Hwy 1 Northbound				Hwy 1 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		**0**	**58**	**0**	**37**	**0**	**10**	**7**	**6**	**0**	**52**	**319**	**4**	**0**	**2**	**305**	**53**	**853**	0
4:15 PM		**0**	**57**	**0**	**41**	**0**	**11**	**7**	**3**	**0**	**41**	**318**	**0**	**0**	**5**	**305**	**36**	**824**	0
4:30 PM		**0**	**57**	**0**	**32**	**0**	**27**	**3**	**9**	**0**	**38**	**314**	**0**	**0**	**2**	**251**	**62**	**795**	0
4:45 PM		**0**	**47**	**0**	**36**	**0**	**14**	**3**	**8**	**0**	**29**	**331**	**0**	**0**	**8**	**298**	**54**	**828**	**3,300**
5:00 PM		0	65	9	42	0	23	8	6	0	41	365	0	0	2	253	31	845	3,292
5:15 PM		0	60	3	35	0	7	2	3	0	36	287	1	0	1	286	38	759	3,227
5:30 PM		0	68	1	36	0	8	4	0	0	24	282	0	0	3	258	43	727	3,159
5:45 PM		0	57	3	33	0	14	3	4	0	33	288	3	0	8	245	54	745	3,076
Count Total		0	469	16	292	0	114	37	39	0	294	2,504	8	0	31	2,201	371	6,376	0
Peak Hour	**All**	**0**	**219**	**0**	**146**	**0**	**62**	**20**	**26**	**0**	**160**	**1,282**	**4**	**0**	**17**	**1,159**	**205**	**3,300**	**0**
	HV	**0**	**2**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**15**	**4**	**40**	**0**
	HV%	**-**	**1%**	**-**	**5%**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**1%**	**0%**	**-**	**0%**	**1%**	**2%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

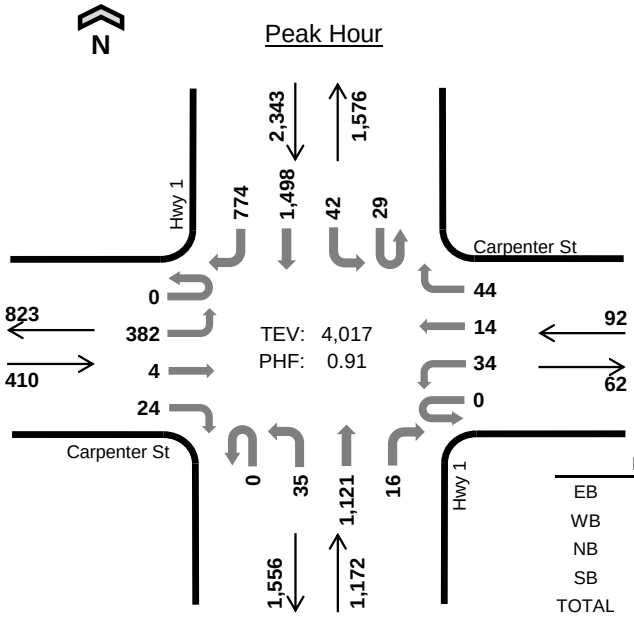
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**5**	**0**	**4**	**3**	***12***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**3**	*3*
4:15 PM	**2**	**0**	**4**	**7**	***13***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**4**	*4*
4:30 PM	**1**	**0**	**2**	**6**	***9***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
4:45 PM	**1**	**0**	**2**	**3**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	1	0	6	5	*12*	0	0	0	0	*0*	0	0	0	2	*2*
5:15 PM	4	0	5	1	*10*	0	0	0	0	*0*	0	0	0	2	*2*
5:30 PM	1	2	5	6	*14*	0	0	0	0	*0*	0	0	0	2	*2*
5:45 PM	1	0	5	5	*11*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	16	2	33	36	*87*	0	1	2	0	*3*	0	0	0	13	*13*
Peak Hour	**9**	**0**	**12**	**19**	***40***	**0**	**1**	**2**	**0**	***3***	**0**	**0**	**0**	**7**	***7***

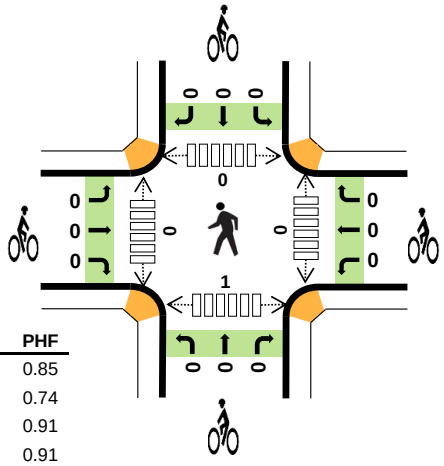
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Hwy 1
Carpenter St

Date: 05/25/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM

Peak Hour





	HV %:	PHF
EB	2.4%	0.85
WB	1.1%	0.74
NB	2.4%	0.91
SB	3.4%	0.91
TOTAL	2.9%	0.91

Two-Hour Count Summaries

Interval Start		Carpenter St Eastbound				Carpenter St Westbound				Hwy 1 Northbound				Hwy 1 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	46	2	3	0	4	2	4	0	0	159	3	6	7	282	65	583	0
7:15 AM		0	54	1	3	0	7	2	8	0	2	244	2	4	7	361	108	803	0
7:30 AM		**0**	**98**	**0**	**3**	**0**	**11**	**2**	**17**	**0**	**6**	**287**	**5**	**5**	**12**	**369**	**197**	**1,012**	0
7:45 AM		**0**	**112**	**1**	**7**	**0**	**7**	**4**	**8**	**0**	**10**	**307**	**4**	**3**	**10**	**370**	**258**	**1,101**	3,499
8:00 AM		**0**	**111**	**2**	**7**	**0**	**4**	**0**	**8**	**0**	**8**	**276**	**4**	**12**	**13**	**393**	**158**	**996**	3,912
8:15 AM		**0**	**61**	**1**	**7**	**0**	**12**	**8**	**11**	**0**	**11**	**251**	**3**	**9**	**7**	**366**	**161**	**908**	**4,017**
8:30 AM		0	77	3	2	0	5	6	7	0	6	308	3	4	8	370	168	967	3,972
8:45 AM		0	86	1	7	0	11	1	15	0	3	308	5	8	9	377	190	1,021	3,892
Count Total		0	645	11	39	0	61	25	78	0	46	2,140	29	51	73	2,888	1,305	7,391	0
Peak Hour	**All**	**0**	**382**	**4**	**24**	**0**	**34**	**14**	**44**	**0**	**35**	**1,121**	**16**	**29**	**42**	**1,498**	**774**	**4,017**	**0**
	HV	**0**	**8**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**27**	**0**	**0**	**4**	**59**	**16**	**118**	**0**
	HV%	**-**	**2%**	**25%**	**4%**	**-**	**0%**	**7%**	**0%**	**-**	**3%**	**2%**	**0%**	**0%**	**10%**	**4%**	**2%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

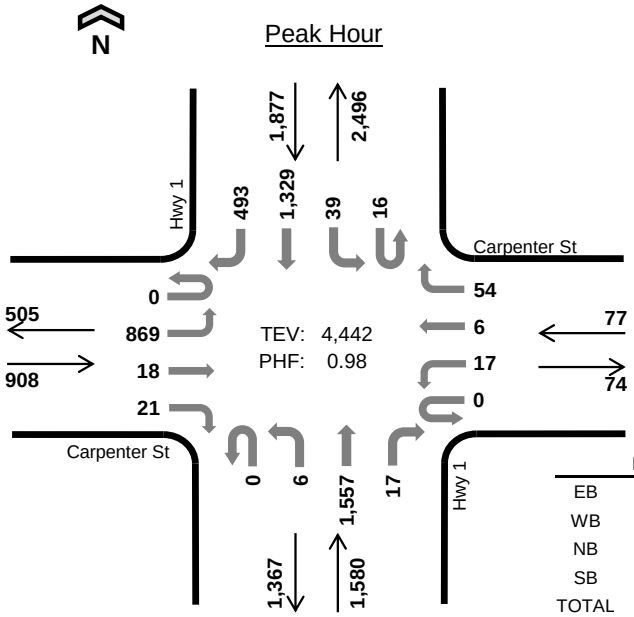
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	1	4	9	*16*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	1	0	7	15	*23*	0	1	0	0	*1*	0	0	0	0	*0*
7:30 AM	**1**	**0**	**6**	**11**	***18***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**3**	**0**	**4**	**17**	***24***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	*1*
8:00 AM	**4**	**0**	**9**	**23**	***36***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**2**	**1**	**9**	**28**	***40***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	2	0	5	20	*27*	0	0	0	0	*0*	0	0	0	1	*1*
8:45 AM	3	1	4	15	*23*	0	0	1	0	*1*	0	0	0	0	*0*
Count Total	18	3	48	138	*207*	0	1	1	0	*2*	0	0	0	2	*2*
Peak Hour	**10**	**1**	**28**	**79**	***118***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	***1***

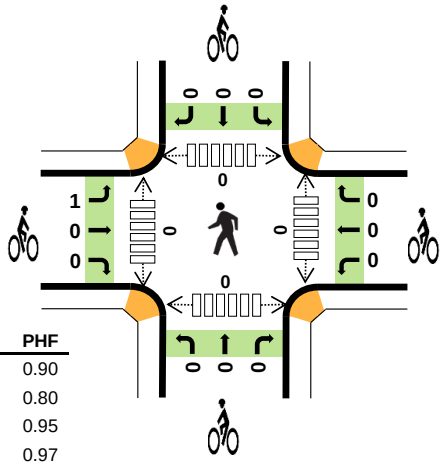
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Hwy 1
Carpenter St

Date: 05/25/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Peak Hour





	HV %:	PHF
EB	1.4%	0.90
WB	3.9%	0.80
NB	2.2%	0.95
SB	1.3%	0.97
TOTAL	1.7%	0.98

Two-Hour Count Summaries

Interval Start		Carpenter St Eastbound				Carpenter St Westbound				Hwy 1 Northbound				Hwy 1 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		**0**	**230**	**4**	**11**	**0**	**5**	**3**	**12**	**0**	**0**	**377**	**5**	**4**	**7**	**315**	**132**	**1,105**	0
4:15 PM		**0**	**207**	**3**	**0**	**0**	**4**	**1**	**15**	**0**	**0**	**413**	**2**	**3**	**15**	**342**	**123**	**1,128**	0
4:30 PM		**0**	**240**	**6**	**6**	**0**	**2**	**1**	**10**	**0**	**3**	**359**	**8**	**8**	**7**	**322**	**132**	**1,104**	0
4:45 PM		**0**	**192**	**5**	**4**	**0**	**6**	**1**	**17**	**0**	**3**	**408**	**2**	**1**	**10**	**350**	**106**	**1,105**	**4,442**
5:00 PM		0	170	4	4	0	2	2	11	0	7	428	6	3	11	312	106	1,066	4,403
5:15 PM		0	145	5	2	0	6	2	7	0	1	402	6	3	11	322	127	1,039	4,314
5:30 PM		0	136	3	5	0	2	3	17	0	3	331	3	1	17	297	107	925	4,135
5:45 PM		0	94	2	5	0	4	3	8	0	4	354	5	2	12	305	116	914	3,944
Count Total		0	1,414	32	37	0	31	16	97	0	21	3,072	37	25	90	2,565	949	8,386	0
Peak Hour	**All**	**0**	**869**	**18**	**21**	**0**	**17**	**6**	**54**	**0**	**6**	**1,557**	**17**	**16**	**39**	**1,329**	**493**	**4,442**	**0**
	HV	**0**	**13**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**33**	**2**	**0**	**0**	**19**	**6**	**76**	**0**
	HV%	**-**	**1%**	**0%**	**0%**	**-**	**0%**	**0%**	**6%**	**-**	**0%**	**2%**	**12%**	**0%**	**0%**	**1%**	**1%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

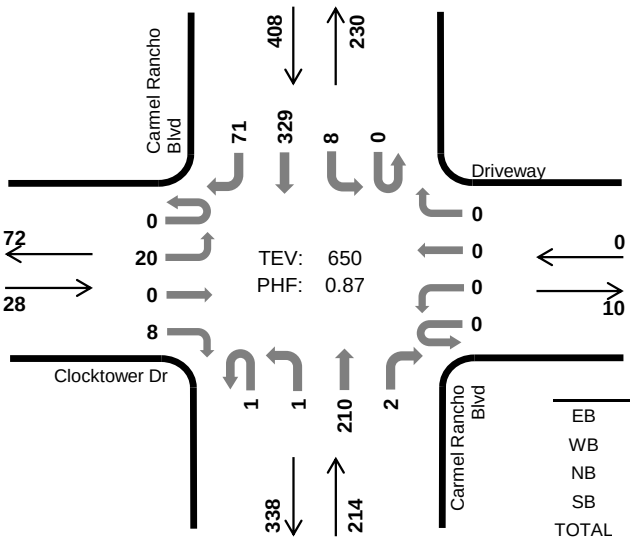
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**3**	**0**	**13**	**5**	***21***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
4:15 PM	**5**	**2**	**12**	**9**	***28***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**2**	**1**	**6**	**6**	***15***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:45 PM	**3**	**0**	**4**	**5**	***12***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	4	0	6	7	*17*	1	0	0	0	*1*	0	0	0	0	*0*
5:15 PM	0	0	9	4	*13*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	3	1	8	6	*18*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	3	0	6	9	*18*	1	0	0	0	*1*	0	0	0	0	*0*
Count Total	23	4	64	51	*142*	3	0	0	0	*3*	0	0	0	0	*0*
Peak Hour	**13**	**3**	**35**	**25**	***76***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

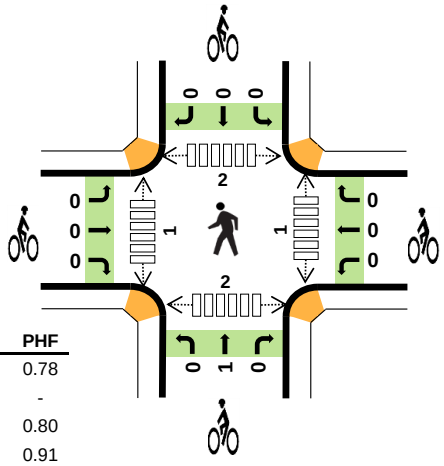
Carmel Rancho Blvd
Clocktower Dr

Date: 05/25/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

Peak Hour



	HV %:	PHF
EB	14.3%	0.78
WB	-	-
NB	3.7%	0.80
SB	2.2%	0.91
TOTAL	3.2%	0.87



Two-Hour Count Summaries

Interval Start		Clocktower Dr Eastbound				Driveway Westbound				Carmel Rancho Blvd Northbound				Carmel Rancho Blvd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	3	0	1	0	0	0	0	0	1	26	0	0	0	34	7	72	0
7:15 AM		0	3	0	0	0	0	0	0	0	0	58	0	0	0	59	11	131	0
7:30 AM		0	6	0	0	0	0	1	0	0	1	53	2	0	0	103	15	181	0
7:45 AM		0	4	0	1	0	0	0	0	0	1	40	0	0	0	74	26	146	530
8:00 AM		**0**	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**34**	**0**	**0**	**2**	**82**	**10**	**132**	590
8:15 AM		**0**	**7**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**1**	**57**	**0**	**0**	**2**	**79**	**18**	**167**	626
8:30 AM		**0**	**6**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**53**	**1**	**0**	**3**	**76**	**24**	**164**	609
8:45 AM		**0**	**6**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**66**	**1**	**0**	**1**	**92**	**19**	**187**	**650**
Count Total		0	36	0	10	0	0	1	0	1	4	387	4	0	8	599	130	1,180	0
Peak Hour	**All**	**0**	**20**	**0**	**8**	**0**	**0**	**0**	**0**	**1**	**1**	**210**	**2**	**0**	**8**	**329**	**71**	**650**	**0**
	HV	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**8**	**1**	**21**	**0**
	HV%	**-**	**10%**	**-**	**25%**	**-**	**-**	**-**	**-**	**0%**	**0%**	**4%**	**0%**	**-**	**0%**	**2%**	**1%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

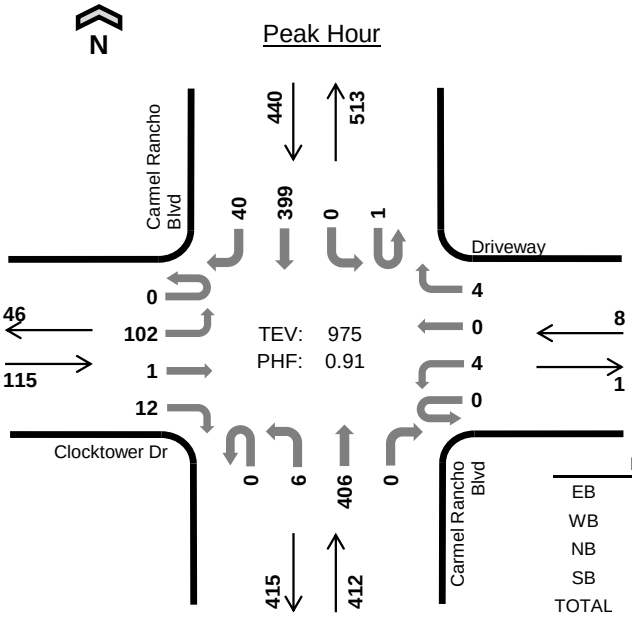
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	3	2	*5*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	0	0	2	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	1	1	2	3	*7*	0	0	0	0	*0*	1	1	0	2	*4*
7:45 AM	1	0	1	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	**0**	**0**	**2**	**4**	***6***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**1**	**0**	*2*
8:15 AM	**2**	**0**	**3**	**1**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	*1*
8:30 AM	**0**	**0**	**2**	**2**	***4***	**0**	**0**	**1**	**0**	***1***	**0**	**1**	**1**	**1**	*3*
8:45 AM	**2**	**0**	**1**	**2**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	6	1	16	16	*39*	0	0	1	0	*1*	2	2	2	4	*10*
Peak Hour	**4**	**0**	**8**	**9**	***21***	**0**	**0**	**1**	**0**	***1***	**1**	**1**	**2**	**2**	***6***

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

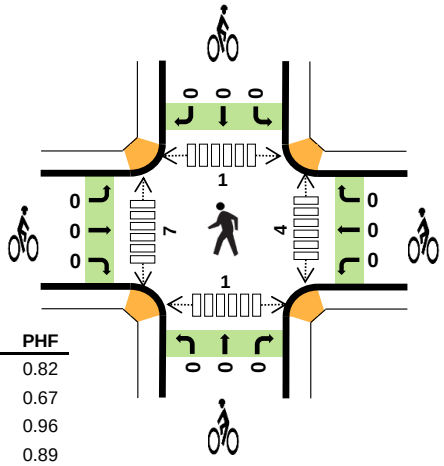
Carmel Rancho Blvd
Clocktower Dr

Date: 05/25/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

Peak Hour



	HV %:	PHF
EB	2.6%	0.82
WB	0.0%	0.67
NB	2.2%	0.96
SB	1.8%	0.89
TOTAL	2.1%	0.91



Two-Hour Count Summaries

Interval Start	Clocktower Dr Eastbound				Driveway Westbound				Carmel Rancho Blvd Northbound				Carmel Rancho Blvd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**33**	**0**	**2**	**0**	**1**	**0**	**2**	**0**	**0**	**107**	**0**	**0**	**0**	**112**	**11**	**268**	0
4:15 PM	**0**	**26**	**0**	**5**	**0**	**1**	**0**	**1**	**0**	**2**	**98**	**0**	**0**	**0**	**103**	**12**	**248**	0
4:30 PM	**0**	**20**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**98**	**0**	**1**	**0**	**94**	**9**	**227**	0
4:45 PM	**0**	**23**	**0**	**3**	**0**	**2**	**0**	**1**	**0**	**2**	**103**	**0**	**0**	**0**	**90**	**8**	**232**	**975**
5:00 PM	0	41	0	3	0	2	0	2	0	2	103	1	0	0	76	10	240	947
5:15 PM	0	21	1	0	0	0	0	0	0	0	70	0	0	0	85	5	182	881
5:30 PM	0	21	0	2	0	0	1	0	0	0	66	0	0	0	59	3	152	806
5:45 PM	0	26	0	3	0	0	0	0	0	2	49	0	0	0	61	8	149	723
Count Total	0	211	2	20	0	6	1	6	0	10	694	1	1	0	680	66	1,698	0
Peak Hour All	**0**	**102**	**1**	**12**	**0**	**4**	**0**	**4**	**0**	**6**	**406**	**0**	**1**	**0**	**399**	**40**	**975**	**0**
Peak Hour HV	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**7**	**1**	**20**	**0**
Peak Hour HV%	**-**	**2%**	**0%**	**8%**	**-**	**0%**	**-**	**0%**	**-**	**0%**	**2%**	**-**	**0%**	**-**	**2%**	**3%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

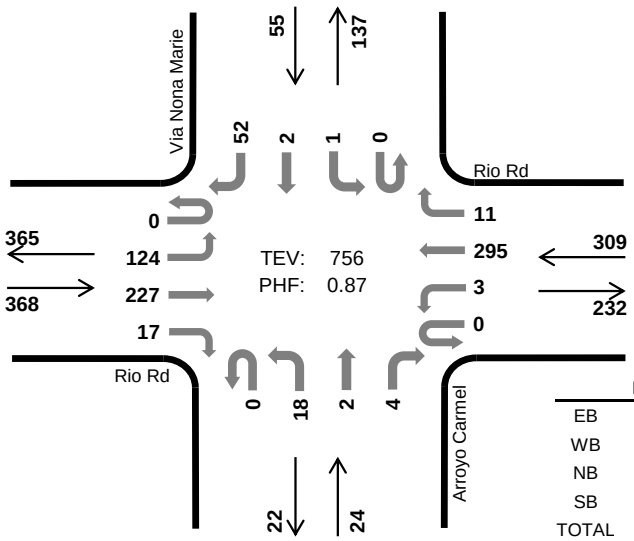
Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	**2**	**0**	**1**	**3**	***6***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**1**	**0**	*2*
4:15 PM	**0**	**0**	**3**	**4**	***7***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**0**	**0**	*2*
4:30 PM	**1**	**0**	**3**	**1**	***5***	**0**	**0**	**0**	**0**	***0***	**1**	**5**	**0**	**0**	*6*
4:45 PM	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**0**	**1**	***3***
5:00 PM	0	0	0	1	*1*	0	0	0	0	*0*	2	1	0	0	*3*
5:15 PM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	1	0	*1*	0	0	0	0	*0*	2	0	0	0	*2*
Count Total	3	0	10	13	*26*	0	0	0	0	*0*	8	8	1	1	*18*
Peak Hour	**3**	**0**	**9**	**8**	***20***	**0**	**0**	**0**	**0**	***0***	**4**	**7**	**1**	**1**	***13***

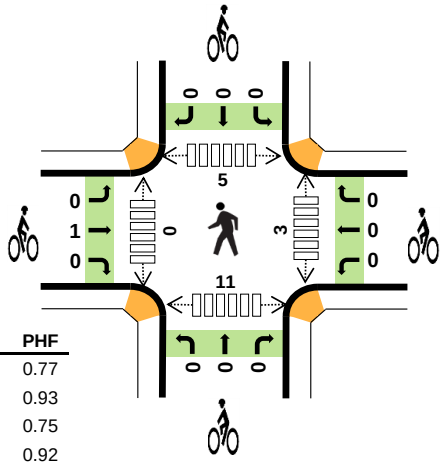
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Arroyo Carmel
Rio Rd

Date: 05/25/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

Peak Hour





	HV %:	PHF
EB	3.8%	0.77
WB	2.9%	0.93
NB	0.0%	0.75
SB	9.1%	0.92
TOTAL	3.7%	0.87

Two-Hour Count Summaries

Interval Start		Rio Rd Eastbound				Rio Rd Westbound				Arroyo Carmel Northbound				Via Nona Marie Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	16	22	1	0	1	31	1	0	2	0	1	0	0	0	10	85	0
7:15 AM		0	12	51	3	0	1	55	2	0	2	1	2	0	1	1	16	147	0
7:30 AM		0	22	52	2	0	0	93	5	0	5	0	1	0	0	1	12	193	0
7:45 AM		0	20	49	2	0	0	64	4	0	3	0	1	0	0	0	12	155	580
8:00 AM		**0**	**23**	**41**	**5**	**0**	**1**	**78**	**4**	**0**	**3**	**1**	**2**	**0**	**0**	**0**	**13**	**171**	666
8:15 AM		**0**	**28**	**53**	**2**	**0**	**0**	**69**	**0**	**0**	**7**	**0**	**1**	**0**	**0**	**1**	**13**	**174**	693
8:30 AM		**0**	**33**	**59**	**4**	**0**	**1**	**75**	**3**	**0**	**4**	**1**	**1**	**0**	**0**	**1**	**12**	**194**	694
8:45 AM		**0**	**40**	**74**	**6**	**0**	**1**	**73**	**4**	**0**	**4**	**0**	**0**	**0**	**1**	**0**	**14**	**217**	**756**
Count Total		0	194	401	25	0	5	538	23	0	30	3	9	0	2	4	102	1,336	0
Peak Hour	**All**	**0**	**124**	**227**	**17**	**0**	**3**	**295**	**11**	**0**	**18**	**2**	**4**	**0**	**1**	**2**	**52**	**756**	**0**
	HV	**0**	**6**	**8**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**28**	**0**
	HV%	**-**	**5%**	**4%**	**0%**	**-**	**0%**	**3%**	**0%**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**0%**	**10%**	**4%**	**0**

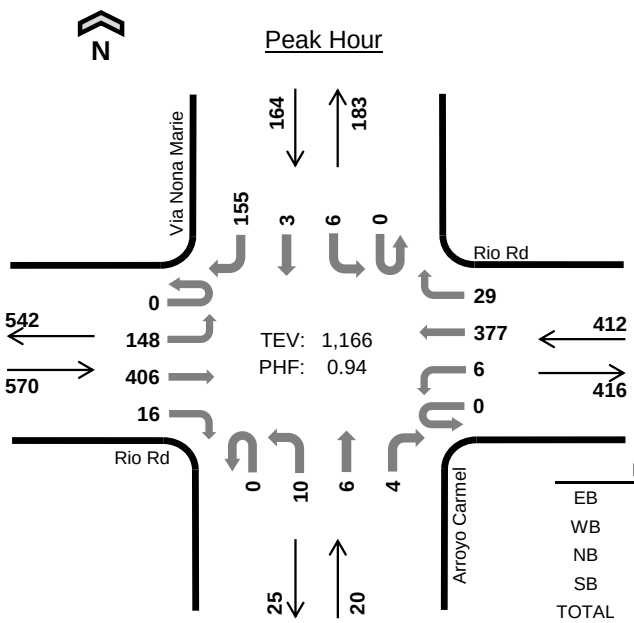
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

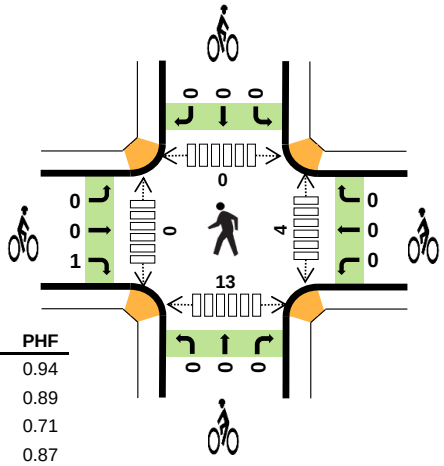
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	3	3	0	1	*7*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	1	1	0	0	*2*	0	0	0	0	*0*	1	0	0	1	*2*
7:30 AM	2	4	0	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	2	1	0	0	*3*	0	0	0	0	*0*	0	0	0	1	*1*
8:00 AM	**4**	**4**	**0**	**1**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**0**	*2*
8:15 AM	**4**	**0**	**0**	**3**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**3**	*3*
8:30 AM	**3**	**3**	**0**	**0**	***6***	**1**	**0**	**0**	**0**	***1***	**2**	**0**	**1**	**4**	*7*
8:45 AM	**3**	**2**	**0**	**1**	***6***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**2**	**4**	***7***
Count Total	22	18	0	6	*46*	1	0	0	0	*1*	4	0	5	13	*22*
Peak Hour	**14**	**9**	**0**	**5**	***28***	**1**	**0**	**0**	**0**	***1***	**3**	**0**	**5**	**11**	***19***

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Arroyo Carmel
Rio Rd

Date: 05/25/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM





	HV %:	PHF
EB	1.8%	0.94
WB	2.2%	0.89
NB	0.0%	0.71
SB	1.8%	0.87
TOTAL	1.9%	0.94

Two-Hour Count Summaries

Interval Start	Rio Rd Eastbound				Rio Rd Westbound				Arroyo Carmel Northbound				Via Nona Marie Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**37**	**108**	**6**	**0**	**1**	**109**	**6**	**0**	**4**	**0**	**0**	**0**	**3**	**0**	**36**	**310**	0
4:15 PM	**0**	**38**	**99**	**3**	**0**	**1**	**97**	**7**	**0**	**2**	**1**	**0**	**0**	**1**	**1**	**39**	**289**	0
4:30 PM	**0**	**35**	**99**	**4**	**0**	**1**	**89**	**8**	**0**	**3**	**2**	**2**	**0**	**0**	**0**	**37**	**280**	0
4:45 PM	**0**	**38**	**100**	**3**	**0**	**3**	**82**	**8**	**0**	**1**	**3**	**2**	**0**	**2**	**2**	**43**	**287**	**1,166**
5:00 PM	1	31	101	3	0	1	83	5	0	3	0	1	0	1	1	38	269	1,125
5:15 PM	0	31	75	2	0	0	82	5	0	1	0	3	0	0	0	27	226	1,062
5:30 PM	0	15	62	4	0	0	55	2	0	2	0	1	0	2	1	25	169	951
5:45 PM	0	17	55	6	0	2	70	3	0	1	1	0	0	1	0	20	176	840
Count Total	1	242	699	31	0	9	667	44	0	17	7	9	0	10	5	265	2,006	0
Peak Hour All	**0**	**148**	**406**	**16**	**0**	**6**	**377**	**29**	**0**	**10**	**6**	**4**	**0**	**6**	**3**	**155**	**1,166**	**0**
Peak Hour HV	**0**	**2**	**8**	**0**	**0**	**0**	**8**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**22**	**0**
Peak Hour HV%	**-**	**1%**	**2%**	**0%**	**-**	**0%**	**2%**	**3%**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**0%**	**2%**	**2%**	**0**

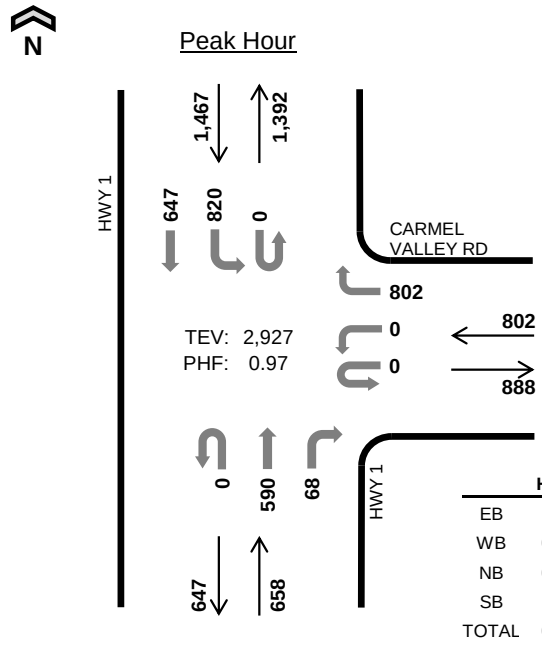
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**1**	**4**	**0**	**1**	***6***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**3**	*5*
4:15 PM	**2**	**4**	**0**	**1**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**5**	*5*
4:30 PM	**4**	**1**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**1**	*2*
4:45 PM	**3**	**0**	**0**	**1**	***4***	**1**	**0**	**0**	**0**	***1***	**1**	**0**	**0**	**4**	***5***
5:00 PM	1	0	0	0	*1*	0	0	0	0	*0*	2	0	1	4	*7*
5:15 PM	1	2	0	0	*3*	0	0	0	0	*0*	0	0	0	2	*2*
5:30 PM	2	0	0	1	*3*	0	0	0	0	*0*	1	0	0	0	*1*
5:45 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	2	*2*
Count Total	14	12	0	4	*30*	1	0	0	0	*1*	7	0	1	21	*29*
Peak Hour	**10**	**9**	**0**	**3**	***22***	**1**	**0**	**0**	**0**	***1***	**4**	**0**	**0**	**13**	***17***

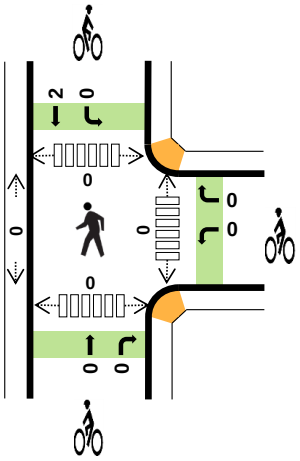
Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

HWY 1
CARMEL VALLEY RD

Date: 09/30/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 11:45 AM to 12:45 PM



	HV %:	PHF
EB	-	-
WB	0.5%	0.98
NB	0.8%	0.92
SB	1.1%	0.94
TOTAL	0.9%	0.97



Two-Hour Count Summaries

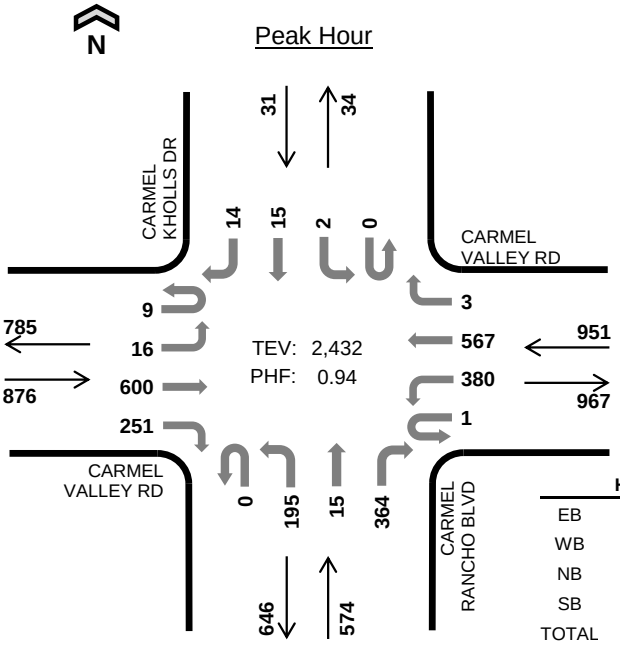
Interval Start		0				CARMEL VALLEY RD				HWY 1				HWY 1				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM		0	0	0	0	0	0	0	184	0	0	139	18	1	185	190	0	717	0
11:15 AM		0	0	0	0	0	0	0	197	0	0	150	16	0	193	191	0	747	0
11:30 AM		0	0	0	0	0	0	0	171	0	0	132	21	0	162	172	0	658	0
11:45 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**204**	**0**	**0**	**139**	**11**	**0**	**205**	**158**	**0**	**717**	2,839
12:00 PM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**202**	**0**	**0**	**144**	**14**	**0**	**210**	**182**	**0**	**752**	2,874
12:15 PM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**201**	**0**	**0**	**158**	**21**	**0**	**204**	**143**	**0**	**727**	2,854
12:30 PM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**195**	**0**	**0**	**149**	**22**	**0**	**201**	**164**	**0**	**731**	**2,927**
12:45 PM		0	0	0	0	0	0	0	182	0	0	177	16	0	148	165	0	688	2,898
Count Total		0	0	0	0	0	0	0	1,536	0	0	1,188	139	1	1,508	1,365	0	5,737	0
Peak Hour	**All**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**802**	**0**	**0**	**590**	**68**	**0**	**820**	**647**	**0**	**2,927**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**5**	**0**	**0**	**11**	**5**	**0**	**25**	**0**
	HV%	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**-**	**1%**	**0%**	**-**	**1%**	**1%**	**-**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

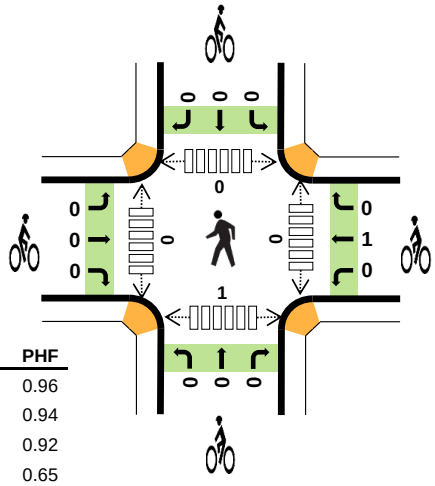
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	0	2	4	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
11:15 AM	0	0	4	4	*8*	0	0	0	0	*0*	0	0	0	0	*0*
11:30 AM	0	2	1	2	*5*	0	0	0	0	*0*	0	0	0	0	*0*
11:45 AM	**0**	**1**	**0**	**3**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:00 PM	**0**	**2**	**2**	**4**	***8***	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**0**	**0**	*0*
12:15 PM	**0**	**0**	**3**	**3**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:30 PM	**0**	**1**	**0**	**6**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
12:45 PM	0	3	3	1	*7*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	11	17	23	*51*	0	0	0	2	*2*	0	0	0	0	*0*
Peak Hr	**0**	**4**	**5**	**16**	***25***	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**0**	**0**	***0***

CARMEL RANCHO BLVD
CARMEL VALLEY RD

Date: 09/30/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 11:45 AM to 12:45 PM



	HV %:	PHF
EB	0.9%	0.96
WB	0.4%	0.94
NB	1.6%	0.92
SB	0.0%	0.65
TOTAL	0.9%	0.94



Two-Hour Count Summaries

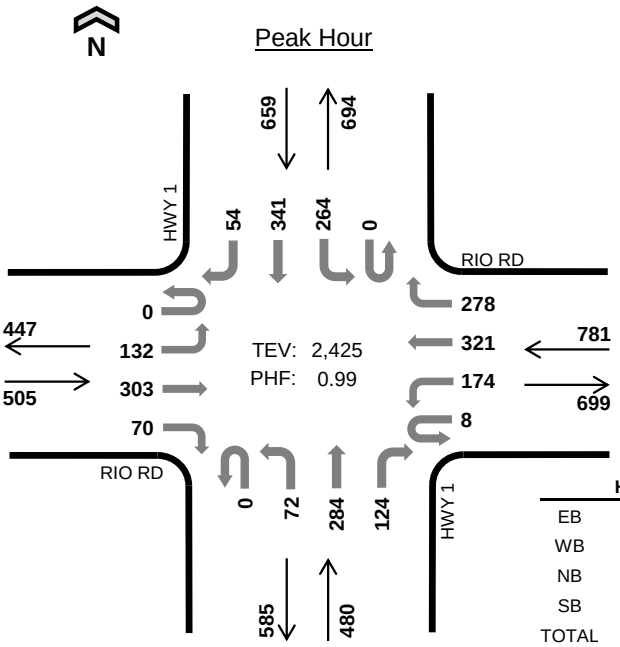
Interval Start	CARMEL VALLEY RD Eastbound				CARMEL VALLEY RD Westbound				CARMEL RANCHO BLVD Northbound				CARMEL KHOLLS DR Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM	0	5	132	62	0	109	120	1	0	60	5	77	0	2	6	5	584	0
11:15 AM	0	2	137	64	0	119	144	1	0	49	3	88	0	0	2	2	611	0
11:30 AM	3	2	139	61	0	83	132	3	0	44	4	95	0	1	3	2	572	0
11:45 AM	**3**	**3**	**149**	**57**	**0**	**91**	**148**	**1**	**0**	**35**	**5**	**99**	**0**	**0**	**2**	**5**	**598**	2,365
12:00 PM	**1**	**5**	**156**	**65**	**0**	**105**	**148**	**1**	**0**	**60**	**5**	**91**	**0**	**1**	**8**	**3**	**649**	2,430
12:15 PM	**3**	**4**	**149**	**65**	**1**	**90**	**139**	**1**	**0**	**54**	**2**	**74**	**0**	**1**	**1**	**2**	**586**	2,405
12:30 PM	**2**	**4**	**146**	**64**	**0**	**94**	**132**	**0**	**0**	**46**	**3**	**100**	**0**	**0**	**4**	**4**	**599**	**2,432**
12:45 PM	0	2	123	62	0	93	136	2	0	59	3	98	0	1	4	3	586	2,420
Count Total	12	27	1,131	500	1	784	1,099	10	0	407	30	722	0	6	30	26	4,785	0
Peak Hour All	**9**	**16**	**600**	**251**	**1**	**380**	**567**	**3**	**0**	**195**	**15**	**364**	**0**	**2**	**15**	**14**	**2,432**	**0**
Peak Hour HV	**0**	**0**	**7**	**1**	**0**	**2**	**2**	**0**	**0**	**2**	**0**	**7**	**0**	**0**	**0**	**0**	**21**	**0**
Peak Hour HV%	**0%**	**0%**	**1%**	**0%**	**0%**	**1%**	**0%**	**0%**	**-**	**1%**	**0%**	**2%**	**-**	**0%**	**0%**	**0%**	**1%**	**0**

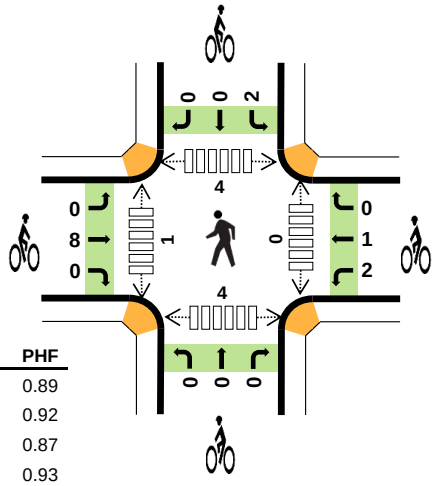
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	2	1	1	0	*4*	0	3	0	0	*3*	0	0	0	1	*1*
11:15 AM	4	3	0	0	*7*	0	0	1	0	*1*	2	0	0	1	*3*
11:30 AM	2	2	3	0	*7*	0	0	0	0	*0*	2	0	0	0	*2*
11:45 AM	**2**	**2**	**1**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:00 PM	**2**	**1**	**2**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:15 PM	**2**	**0**	**2**	**0**	***4***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
12:30 PM	**2**	**1**	**4**	**0**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	***1***
12:45 PM	0	3	3	0	*6*	0	0	2	0	*2*	2	0	0	0	*2*
Count Total	16	13	16	0	*45*	0	4	3	0	*7*	6	0	0	3	*9*
Peak Hour	**8**	**4**	**9**	**0**	***21***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**1**	***1***

HWY 1
RIO RD

Date: 09/30/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 12:00 PM to 1:00 PM





	HV %:	PHF
EB	0.4%	0.89
WB	0.5%	0.92
NB	1.0%	0.87
SB	0.8%	0.93
TOTAL	0.7%	0.99

Two-Hour Count Summaries

Interval Start		RIO RD Eastbound				RIO RD Westbound				HWY 1 Northbound				HWY 1 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM		0	22	69	15	3	37	67	79	0	13	60	40	0	72	92	17	586	0
11:15 AM		0	30	69	30	2	39	67	71	0	13	65	31	0	71	90	24	602	0
11:30 AM		0	35	77	19	2	28	68	64	0	21	53	34	0	69	89	17	576	0
11:45 AM		0	35	87	18	2	32	55	67	0	23	57	31	0	64	91	14	576	2,340
12:00 PM		**0**	**29**	**96**	**17**	**3**	**43**	**67**	**60**	**0**	**8**	**67**	**30**	**0**	**68**	**91**	**18**	**597**	2,351
12:15 PM		**0**	**25**	**72**	**20**	**4**	**45**	**83**	**75**	**0**	**26**	**72**	**40**	**0**	**66**	**69**	**10**	**607**	2,356
12:30 PM		**0**	**41**	**69**	**16**	**1**	**48**	**75**	**65**	**0**	**22**	**72**	**26**	**0**	**73**	**82**	**16**	**606**	2,386
12:45 PM		**0**	**37**	**66**	**17**	**0**	**38**	**96**	**78**	**0**	**16**	**73**	**28**	**0**	**57**	**99**	**10**	**615**	**2,425**
Count Total		0	254	605	152	17	310	578	559	0	142	519	260	0	540	703	126	4,765	0
Peak Hour	**All**	**0**	**132**	**303**	**70**	**8**	**174**	**321**	**278**	**0**	**72**	**284**	**124**	**0**	**264**	**341**	**54**	**2,425**	**0**
	HV	**0**	**1**	**1**	**0**	**0**	**0**	**2**	**2**	**0**	**0**	**5**	**0**	**0**	**1**	**2**	**2**	**16**	**0**
	HV%	**-**	**1%**	**0%**	**0%**	**0%**	**0%**	**1%**	**1%**	**-**	**0%**	**2%**	**0%**	**-**	**0%**	**1%**	**4%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

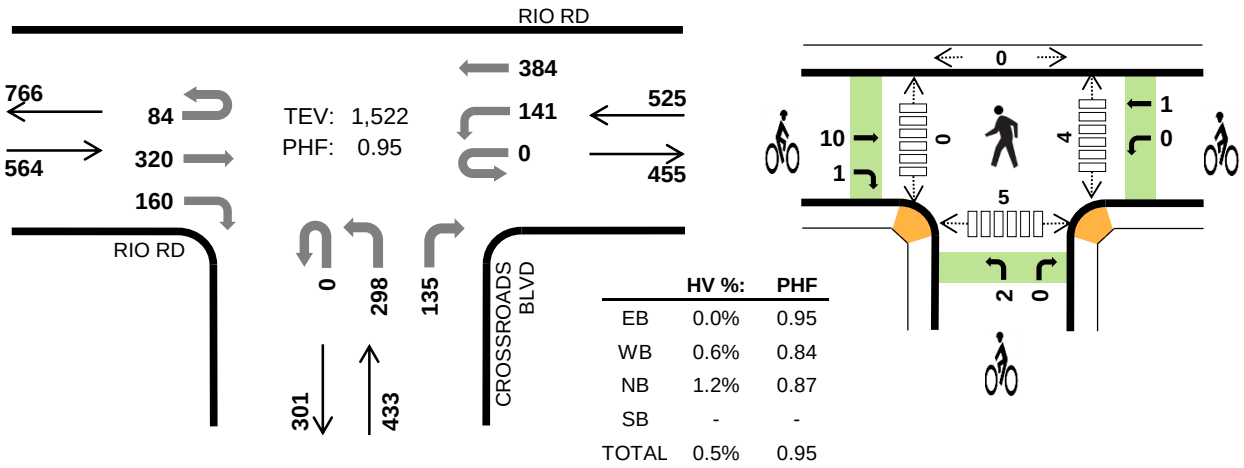
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	2	2	4	0	*8*	0	2	0	0	*2*	0	1	2	2	*5*
11:15 AM	5	3	1	1	*10*	2	0	0	0	*2*	0	0	0	0	*0*
11:30 AM	1	2	1	1	*5*	0	0	0	0	*0*	0	2	1	1	*4*
11:45 AM	1	0	1	1	*3*	0	0	1	0	*1*	1	0	0	3	*4*
12:00 PM	**0**	**3**	**0**	**1**	***4***	**0**	**2**	**0**	**2**	***4***	**0**	**1**	**1**	**1**	*3*
12:15 PM	**0**	**0**	**3**	**2**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**2**	*3*
12:30 PM	**1**	**1**	**0**	**1**	***3***	**5**	**0**	**0**	**0**	***5***	**0**	**0**	**1**	**0**	*1*
12:45 PM	**1**	**0**	**2**	**1**	***4***	**3**	**1**	**0**	**0**	***4***	**0**	**0**	**1**	**1**	***2***
Count Total	11	11	12	8	*42*	10	5	1	2	*18*	1	4	7	10	*22*
Peak Hour	**2**	**4**	**5**	**5**	***16***	**8**	**3**	**0**	**2**	***13***	**0**	**1**	**4**	**4**	***9***

CROSSROADS BLVD
RIO RD

N

Peak Hour

Date: 09/30/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 12:00 PM to 1:00 PM



	HV %:	PHF
EB	0.0%	0.95
WB	0.6%	0.84
NB	1.2%	0.87
SB	-	-
TOTAL	0.5%	0.95

Two-Hour Count Summaries

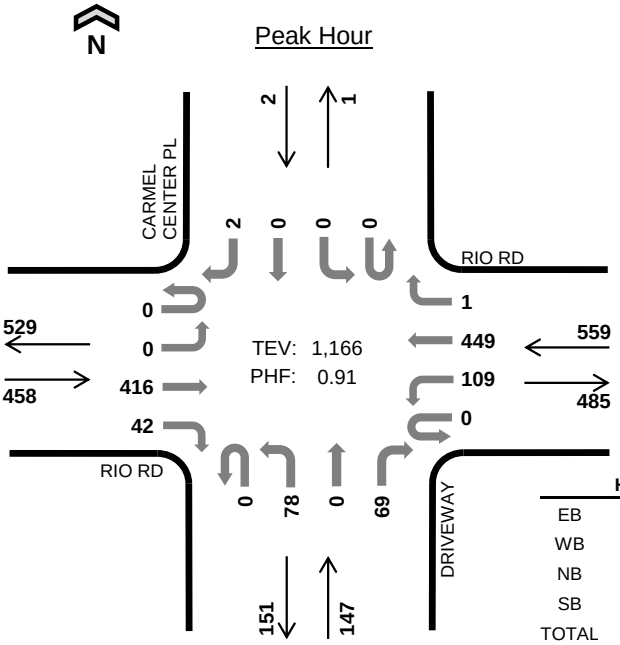
Interval Start	RIO RD Eastbound				RIO RD Westbound				CROSSROADS BLVD Northbound				0 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM	29	0	83	29	0	26	90	0	0	67	0	24	0	0	0	0	348	0
11:15 AM	30	0	77	27	0	36	80	0	0	69	0	30	0	0	0	0	349	0
11:30 AM	20	0	74	43	0	19	75	0	0	64	0	32	0	0	0	0	327	0
11:45 AM	18	0	81	41	0	30	74	0	0	63	0	23	0	0	0	0	330	1,354
12:00 PM	**15**	**0**	**83**	**46**	**0**	**37**	**95**	**0**	**0**	**63**	**0**	**33**	**0**	**0**	**0**	**0**	**372**	1,378
12:15 PM	**22**	**0**	**76**	**44**	**0**	**34**	**91**	**0**	**0**	**74**	**0**	**23**	**0**	**0**	**0**	**0**	**364**	1,393
12:30 PM	**29**	**0**	**86**	**34**	**0**	**29**	**82**	**0**	**0**	**88**	**0**	**36**	**0**	**0**	**0**	**0**	**384**	1,450
12:45 PM	**18**	**0**	**75**	**36**	**0**	**41**	**116**	**0**	**0**	**73**	**0**	**43**	**0**	**0**	**0**	**0**	**402**	**1,522**
Count Total	181	0	635	300	0	252	703	0	0	561	0	244	0	0	0	0	2,876	0
Peak Hour All	**84**	**0**	**320**	**160**	**0**	**141**	**384**	**0**	**0**	**298**	**0**	**135**	**0**	**0**	**0**	**0**	**1,522**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**3**	**0**	**2**	**0**	**0**	**0**	**0**	**8**	**0**
Peak Hour HV%	**0%**	**-**	**0%**	**0%**	**-**	**1%**	**0%**	**-**	**-**	**1%**	**-**	**1%**	**-**	**-**	**-**	**-**	**1%**	**0**

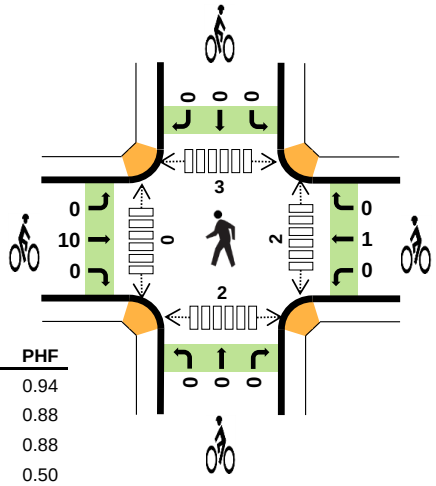
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	0	0	1	0	*1*	1	1	0	0	*2*	2	0	0	0	*2*
11:15 AM	1	3	2	0	*6*	1	0	0	0	*1*	0	0	0	0	*0*
11:30 AM	1	0	5	0	*6*	0	0	0	0	*0*	1	0	0	1	*2*
11:45 AM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
12:00 PM	**0**	**1**	**2**	**0**	***3***	**2**	**0**	**2**	**0**	***4***	**2**	**0**	**0**	**2**	*4*
12:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
12:30 PM	**0**	**1**	**2**	**0**	***3***	**5**	**0**	**0**	**0**	***5***	**1**	**0**	**0**	**3**	*4*
12:45 PM	**0**	**1**	**1**	**0**	***2***	**4**	**1**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***
Count Total	3	7	13	0	*23*	13	2	2	0	*17*	7	0	0	6	*13*
Peak Hr	**0**	**3**	**5**	**0**	***8***	**11**	**1**	**2**	**0**	***14***	**4**	**0**	**0**	**5**	***9***

CARMEL CENTER PL
RIO RD

Date: 09/30/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 12:00 PM to 1:00 PM





	HV %:	PHF
EB	0.4%	0.94
WB	0.5%	0.88
NB	0.7%	0.88
SB	0.0%	0.50
TOTAL	0.5%	0.91

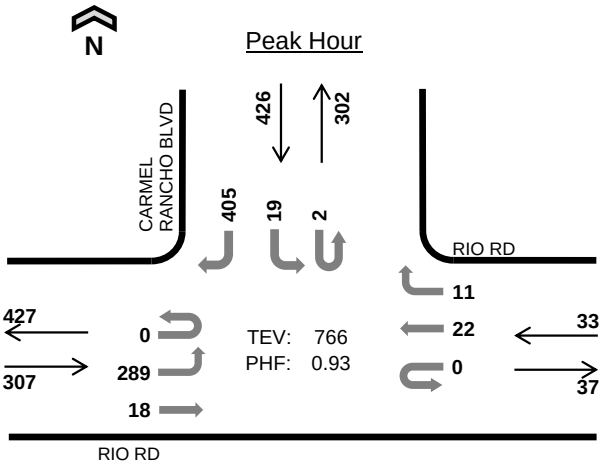
Two-Hour Count Summaries

Interval Start	RIO RD Eastbound				RIO RD Westbound				DRIVEWAY Northbound				CARMEL CENTER PL Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM	0	0	93	13	0	16	97	1	0	18	0	18	0	0	0	0	256	0
11:15 AM	0	0	100	9	0	28	111	0	0	12	0	19	0	0	0	0	279	0
11:30 AM	0	0	96	10	0	29	75	0	0	16	0	23	0	0	0	0	249	0
11:45 AM	0	0	90	14	0	31	89	0	0	16	0	23	0	0	0	0	263	1,047
12:00 PM	**0**	**0**	**105**	**12**	**0**	**29**	**110**	**0**	**0**	**21**	**0**	**18**	**0**	**0**	**0**	**1**	**296**	1,087
12:15 PM	**0**	**0**	**88**	**12**	**0**	**32**	**110**	**0**	**0**	**15**	**0**	**15**	**0**	**0**	**0**	**0**	**272**	1,080
12:30 PM	**0**	**0**	**115**	**7**	**0**	**23**	**96**	**0**	**0**	**18**	**0**	**18**	**0**	**0**	**0**	**0**	**277**	1,108
12:45 PM	**0**	**0**	**108**	**11**	**0**	**25**	**133**	**1**	**0**	**24**	**0**	**18**	**0**	**0**	**0**	**1**	**321**	**1,166**
Count Total	0	0	795	88	0	213	821	2	0	140	0	152	0	0	0	2	2,213	0
Peak Hour All	**0**	**0**	**416**	**42**	**0**	**109**	**449**	**1**	**0**	**78**	**0**	**69**	**0**	**0**	**0**	**2**	**1,166**	**0**
Peak Hour HV	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**6**	**0**
Peak Hour HV%	**-**	**-**	**0%**	**0%**	**-**	**0%**	**1%**	**0%**	**-**	**0%**	**-**	**1%**	**-**	**-**	**-**	**0%**	**1%**	**0**

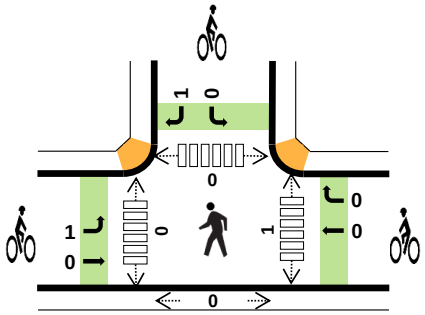
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	0	2	0	0	*2*	1	1	0	0	*2*	1	0	0	0	*1*
11:15 AM	1	2	1	0	*4*	0	0	1	0	*1*	0	0	0	1	*1*
11:30 AM	4	1	1	0	*6*	0	0	0	0	*0*	0	0	1	0	*1*
11:45 AM	1	1	0	0	*2*	0	0	0	0	*0*	0	0	1	2	*3*
12:00 PM	**0**	**1**	**1**	**0**	***2***	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**2**	**1**	*3*
12:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:30 PM	**1**	**1**	**0**	**0**	***2***	**5**	**0**	**0**	**0**	***5***	**2**	**0**	**1**	**0**	*3*
12:45 PM	**1**	**1**	**0**	**0**	***2***	**3**	**1**	**0**	**0**	***4***	**0**	**0**	**0**	**1**	***1***
Count Total	8	9	3	0	*20*	11	2	1	0	*14*	3	0	5	5	*13*
Peak Hour	**2**	**3**	**1**	**0**	***6***	**10**	**1**	**0**	**0**	***11***	**2**	**0**	**3**	**2**	***7***

CARMEL RANCHO BLVD
RIO RD



Date: 09/30/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 12:00 PM to 1:00 PM



	HV %:	PHF
EB	1.0%	0.87
WB	3.0%	0.63
NB	-	-
SB	0.9%	0.89
TOTAL	1.0%	0.93

Two-Hour Count Summaries

Interval Start		RIO RD Eastbound				RIO RD Westbound				0 Northbound				CARMEL RANCHO BLVD Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM		0	64	3	0	0	0	3	3	0	0	0	0	3	5	0	91	172	0
11:15 AM		0	64	7	0	0	0	3	5	0	0	0	0	0	7	0	109	195	0
11:30 AM		0	74	2	0	0	0	0	2	0	0	0	0	2	3	0	82	165	0
11:45 AM		0	65	4	0	0	0	4	3	0	0	0	0	1	4	0	79	160	692
12:00 PM		**0**	**72**	**3**	**0**	**0**	**0**	**4**	**6**	**0**	**0**	**0**	**0**	**2**	**6**	**0**	**109**	**202**	722
12:15 PM		**0**	**64**	**5**	**0**	**0**	**0**	**6**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**97**	**175**	702
12:30 PM		**0**	**82**	**6**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**89**	**182**	719
12:45 PM		**0**	**71**	**4**	**0**	**0**	**0**	**11**	**2**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**110**	**207**	**766**
Count Total		0	556	34	0	0	0	32	24	0	0	0	0	8	38	0	766	1,458	0
Peak Hour	**All**	**0**	**289**	**18**	**0**	**0**	**0**	**22**	**11**	**0**	**0**	**0**	**0**	**2**	**19**	**0**	**405**	**766**	**0**
	HV	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**8**	**0**
	HV%	**-**	**1%**	**0%**	**-**	**-**	**-**	**0%**	**9%**	**-**	**-**	**-**	**-**	**0%**	**0%**	**-**	**1%**	**1%**	**0**

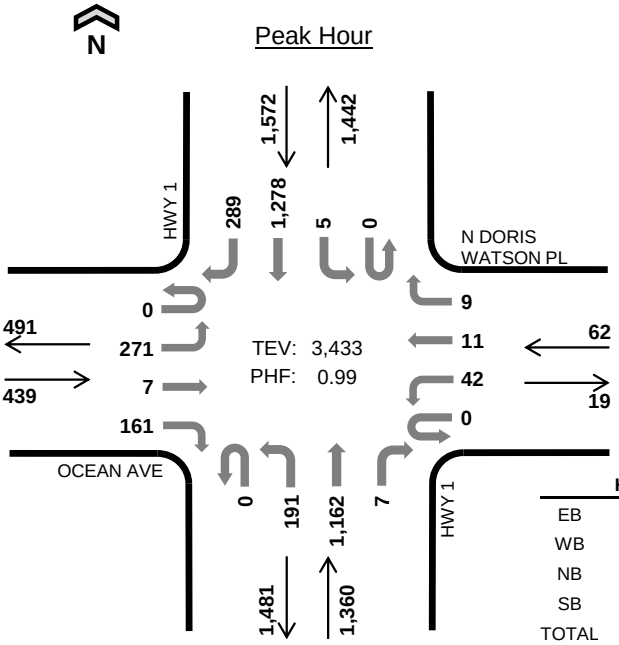
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	0	0	0	1	*1*	0	0	0	1	*1*	0	0	0	0	*0*
11:15 AM	0	0	0	2	*2*	1	0	0	0	*1*	0	0	1	0	*1*
11:30 AM	2	0	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
11:45 AM	1	0	0	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
12:00 PM	**0**	**1**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:15 PM	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:30 PM	**1**	**0**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:45 PM	**1**	**0**	**0**	**2**	***3***	**1**	**0**	**0**	**1**	***2***	**1**	**0**	**0**	**0**	***1***
Count Total	6	1	0	7	*14*	2	0	0	2	*4*	1	0	1	0	*2*
Peak Hr	**3**	**1**	**0**	**4**	***8***	**1**	**0**	**0**	**1**	***2***	**1**	**0**	**0**	**0**	***1***

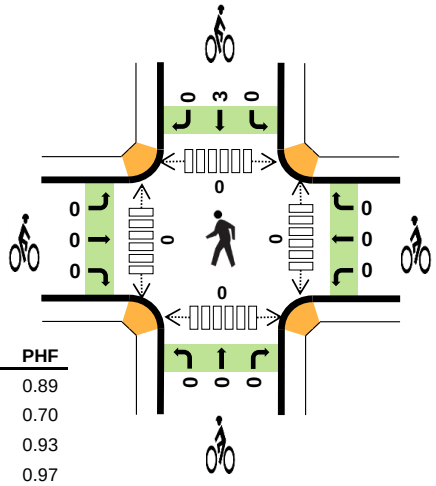
HWY 1
OCEAN AVE

Date: 09/30/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 11:45 AM to 12:45 PM

Peak Hour



	HV %:	PHF
EB	0.7%	0.89
WB	0.0%	0.70
NB	0.8%	0.93
SB	1.1%	0.97
TOTAL	0.9%	0.99



Two-Hour Count Summaries

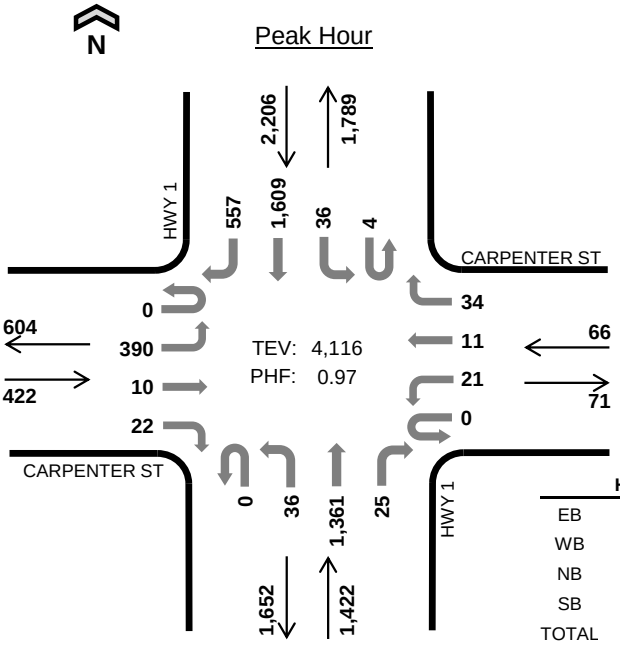
Interval Start		OCEAN AVE Eastbound				N DORIS WATSON PL Westbound				HWY 1 Northbound				HWY 1 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM		0	69	1	61	0	17	1	13	0	39	267	2	0	0	318	84	872	0
11:15 AM		0	55	2	41	0	7	3	10	0	32	308	3	0	1	351	76	889	0
11:30 AM		0	78	4	43	0	3	5	5	0	42	245	3	0	2	288	98	816	0
11:45 AM		**0**	**66**	**2**	**47**	**0**	**16**	**2**	**4**	**0**	**46**	**263**	**1**	**0**	**0**	**340**	**61**	**848**	3,425
12:00 PM		**0**	**71**	**1**	**37**	**0**	**11**	**1**	**1**	**0**	**37**	**305**	**1**	**0**	**0**	**319**	**85**	**869**	3,422
12:15 PM		**0**	**60**	**1**	**30**	**0**	**8**	**2**	**2**	**0**	**57**	**308**	**2**	**0**	**1**	**302**	**75**	**848**	3,381
12:30 PM		**0**	**74**	**3**	**47**	**0**	**7**	**6**	**2**	**0**	**51**	**286**	**3**	**0**	**4**	**317**	**68**	**868**	**3,433**
12:45 PM		0	72	2	36	0	9	3	2	0	52	289	2	0	2	302	61	832	3,417
Count Total		0	545	16	342	0	78	23	39	0	356	2,271	17	0	10	2,537	608	6,842	0
Peak Hour	**All**	**0**	**271**	**7**	**161**	**0**	**42**	**11**	**9**	**0**	**191**	**1,162**	**7**	**0**	**5**	**1,278**	**289**	**3,433**	**0**
	HV	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**9**	**1**	**0**	**0**	**17**	**1**	**32**	**0**
	HV%	**-**	**1%**	**0%**	**0%**	**-**	**0%**	**0%**	**0%**	**-**	**1%**	**1%**	**14%**	**-**	**0%**	**1%**	**0%**	**1%**	**0**

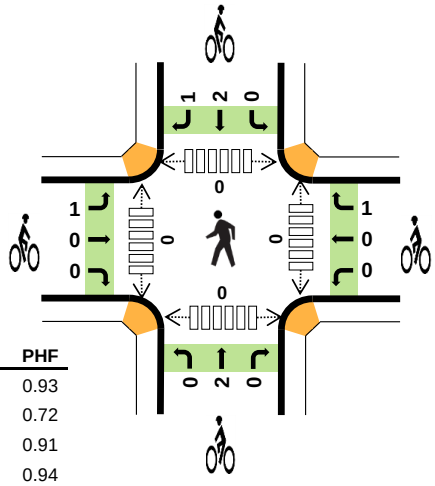
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	3	0	4	0	*7*	0	0	0	0	*0*	0	0	0	0	*0*
11:15 AM	0	0	3	7	*10*	0	0	0	0	*0*	0	0	0	2	*2*
11:30 AM	0	1	2	1	*4*	0	0	0	0	*0*	0	0	0	0	*0*
11:45 AM	**1**	**0**	**3**	**4**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:00 PM	**0**	**0**	**3**	**3**	***6***	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**0**	**0**	*0*
12:15 PM	**1**	**0**	**4**	**6**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:30 PM	**1**	**0**	**1**	**5**	***7***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***
12:45 PM	0	0	6	2	*8*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	6	1	26	28	*61*	0	0	0	3	*3*	0	0	0	2	*2*
Peak Hour	**3**	**0**	**11**	**18**	***32***	**0**	**0**	**0**	**3**	***3***	**0**	**0**	**0**	**0**	***0***

HWY 1
CARPENTER ST

Date: 09/30/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 11:15 AM to 12:15 PM





	HV %:	PHF
EB	1.7%	0.93
WB	0.0%	0.72
NB	0.8%	0.91
SB	1.0%	0.94
TOTAL	1.0%	0.97

Two-Hour Count Summaries

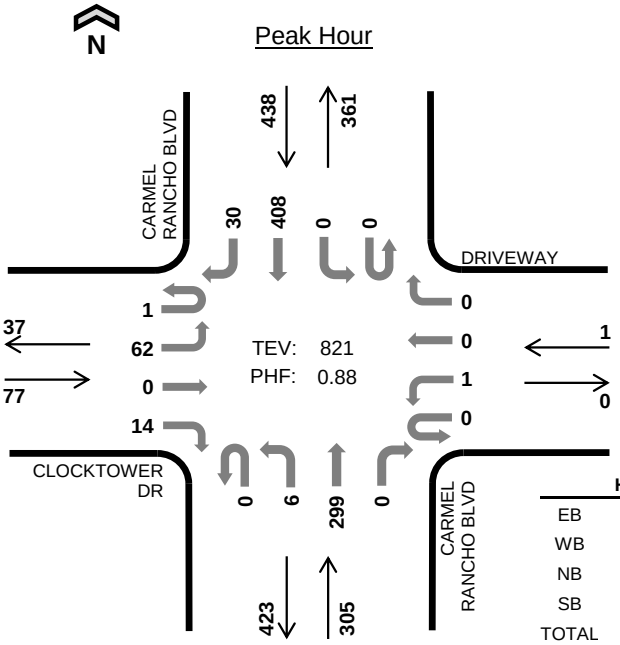
Interval Start		CARPENTER ST Eastbound				CARPENTER ST Westbound				HWY 1 Northbound				HWY 1 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM		0	91	1	5	0	1	0	5	0	11	326	1	1	6	375	120	943	0
11:15 AM		**0**	**88**	**1**	**4**	**0**	**5**	**1**	**7**	**0**	**8**	**359**	**6**	**1**	**12**	**430**	**141**	**1,063**	0
11:30 AM		**0**	**98**	**2**	**5**	**0**	**9**	**2**	**12**	**0**	**3**	**317**	**10**	**1**	**9**	**418**	**153**	**1,039**	0
11:45 AM		**0**	**102**	**2**	**6**	**0**	**2**	**4**	**6**	**0**	**13**	**314**	**3**	**2**	**5**	**366**	**151**	**976**	4,021
12:00 PM		**0**	**102**	**5**	**7**	**0**	**5**	**4**	**9**	**0**	**12**	**371**	**6**	**0**	**10**	**395**	**112**	**1,038**	**4,116**
12:15 PM		0	86	1	6	0	4	3	7	0	3	357	8	1	11	438	114	1,039	4,092
12:30 PM		0	97	3	10	0	5	1	5	0	8	349	3	3	7	349	120	960	4,013
12:45 PM		0	96	2	6	0	5	2	12	0	6	348	6	2	8	362	158	1,013	4,050
Count Total		0	760	17	49	0	36	17	63	0	64	2,741	43	11	68	3,133	1,069	8,071	0
Peak Hour	**All**	**0**	**390**	**10**	**22**	**0**	**21**	**11**	**34**	**0**	**36**	**1,361**	**25**	**4**	**36**	**1,609**	**557**	**4,116**	**0**
	HV	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**15**	**7**	**41**	**0**
	HV%	**-**	**2%**	**0%**	**0%**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**1%**	**0%**	**0%**	**0%**	**1%**	**1%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

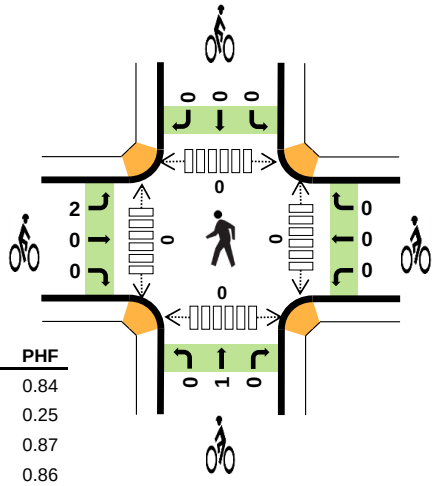
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	0	0	6	1	*7*	0	0	0	0	*0*	0	0	0	0	*0*
11:15 AM	**0**	**0**	**4**	**10**	***14***	**1**	**1**	**0**	**1**	***3***	**0**	**0**	**0**	**0**	*0*
11:30 AM	**4**	**0**	**2**	**3**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
11:45 AM	**1**	**0**	**3**	**5**	***9***	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**0**	**0**	*0*
12:00 PM	**2**	**0**	**3**	**4**	***9***	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**0**	**0**	***0***
12:15 PM	1	0	4	8	*13*	0	0	0	0	*0*	0	0	0	0	*0*
12:30 PM	1	0	2	6	*9*	0	0	0	1	*1*	0	0	0	0	*0*
12:45 PM	4	0	4	9	*17*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	13	0	28	46	*87*	1	1	2	4	*8*	0	0	0	0	*0*
Peak Hour	**7**	**0**	**12**	**22**	***41***	**1**	**1**	**2**	**3**	***7***	**0**	**0**	**0**	**0**	***0***

CARMEL RANCHO BLVD
CLOCKTOWER DR

Date: 09/30/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 12:00 PM to 1:00 PM



	HV %:	PHF
EB	1.3%	0.84
WB	0.0%	0.25
NB	1.3%	0.87
SB	1.1%	0.86
TOTAL	1.2%	0.88



Two-Hour Count Summaries

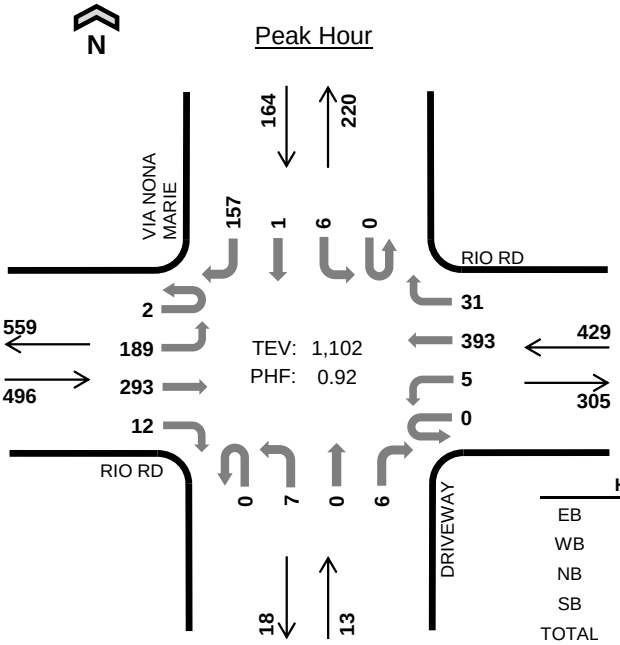
Interval Start	CLOCKTOWER DR Eastbound				DRIVEWAY Westbound				CARMEL RANCHO BLVD Northbound				CARMEL RANCHO BLVD Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM	0	16	0	2	0	0	0	0	0	2	65	0	0	0	97	11	193	0
11:15 AM	0	22	0	2	0	0	0	0	0	0	70	0	0	0	116	8	218	0
11:30 AM	0	17	0	3	0	0	0	0	0	2	77	0	0	0	79	7	185	0
11:45 AM	0	21	0	3	0	1	0	0	0	0	68	0	0	0	80	6	179	775
12:00 PM	**0**	**18**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**2**	**80**	**0**	**0**	**0**	**119**	**8**	**232**	814
12:15 PM	**0**	**14**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**61**	**0**	**0**	**0**	**85**	**5**	**168**	764
12:30 PM	**1**	**13**	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**4**	**84**	**0**	**0**	**0**	**95**	**9**	**209**	788
12:45 PM	**0**	**17**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**74**	**0**	**0**	**0**	**109**	**8**	**212**	**821**
Count Total	1	138	0	24	0	2	0	0	0	10	579	0	0	0	780	62	1,596	0
Peak Hour All	**1**	**62**	**0**	**14**	**0**	**1**	**0**	**0**	**0**	**6**	**299**	**0**	**0**	**0**	**408**	**30**	**821**	**0**
Peak Hour HV	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**4**	**1**	**10**	**0**
Peak Hour HV%	**0%**	**2%**	**-**	**0%**	**-**	**0%**	**-**	**-**	**-**	**0%**	**1%**	**-**	**-**	**-**	**1%**	**3%**	**1%**	**0**

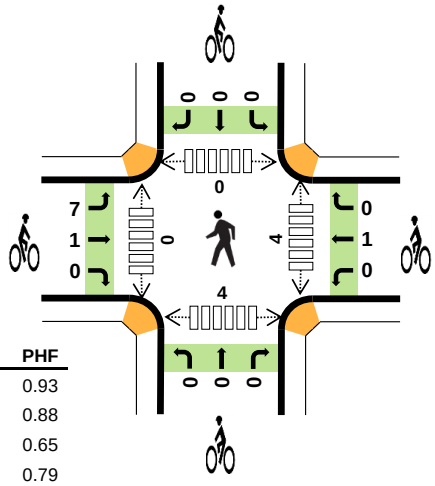
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	0	0	0	1	*1*	0	0	0	1	*1*	0	0	0	0	*0*
11:15 AM	1	0	0	2	*3*	0	0	1	0	*1*	0	0	0	0	*0*
11:30 AM	0	0	2	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
11:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
12:00 PM	**0**	**0**	**1**	**1**	***2***	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	*0*
12:15 PM	**1**	**0**	**1**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:30 PM	**0**	**0**	**1**	**3**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:45 PM	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***
Count Total	2	0	6	8	*16*	2	0	2	1	*5*	0	0	0	0	*0*
Peak Hour	**1**	**0**	**4**	**5**	***10***	**2**	**0**	**1**	**0**	***3***	**0**	**0**	**0**	**0**	***0***

VIA NONA MARIE
RIO RD

Date: 09/30/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 12:00 PM to 1:00 PM





	HV %:	PHF
EB	0.8%	0.93
WB	0.9%	0.88
NB	0.0%	0.65
SB	0.0%	0.79
TOTAL	0.7%	0.92

Two-Hour Count Summaries

Interval Start	RIO RD Eastbound				RIO RD Westbound				DRIVEWAY Northbound				VIA NONA MARIE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM	0	42	62	2	0	0	81	8	0	4	0	1	0	2	1	31	234	0
11:15 AM	0	41	71	4	1	2	104	12	0	1	0	1	0	0	0	27	264	0
11:30 AM	0	41	72	2	1	1	73	5	0	1	0	2	0	0	1	31	230	0
11:45 AM	0	49	67	6	0	1	83	0	0	2	1	3	0	1	0	36	249	977
12:00 PM	**0**	**48**	**72**	**5**	**0**	**1**	**99**	**10**	**0**	**2**	**0**	**1**	**0**	**1**	**0**	**36**	**275**	1,018
12:15 PM	**1**	**46**	**65**	**2**	**0**	**2**	**96**	**6**	**0**	**3**	**0**	**2**	**0**	**1**	**0**	**40**	**264**	1,018
12:30 PM	**1**	**43**	**85**	**5**	**0**	**0**	**87**	**6**	**0**	**2**	**0**	**2**	**0**	**3**	**1**	**30**	**265**	1,053
12:45 PM	**0**	**52**	**71**	**0**	**0**	**2**	**111**	**9**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**51**	**298**	**1,102**
Count Total	2	362	565	26	2	9	734	56	0	15	1	13	0	9	3	282	2,079	0
Peak Hour All	**2**	**189**	**293**	**12**	**0**	**5**	**393**	**31**	**0**	**7**	**0**	**6**	**0**	**6**	**1**	**157**	**1,102**	**0**
Peak Hour HV	**0**	**1**	**3**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**
Peak Hour HV%	**0%**	**1%**	**1%**	**0%**	**-**	**0%**	**1%**	**0%**	**-**	**0%**	**-**	**0%**	**-**	**0%**	**0%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

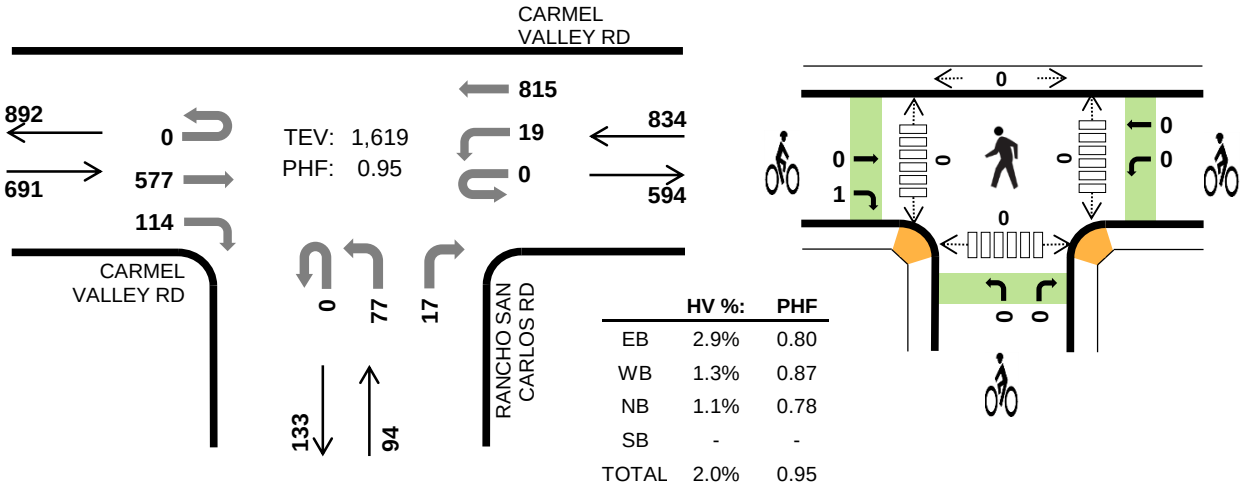
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	0	1	0	0	*1*	0	1	0	0	*1*	2	0	3	2	*7*
11:15 AM	0	2	0	0	*2*	1	0	0	0	*1*	1	0	0	1	*2*
11:30 AM	3	0	0	1	*4*	0	0	0	0	*0*	0	0	1	1	*2*
11:45 AM	2	0	0	0	*2*	0	0	0	0	*0*	1	0	0	2	*3*
12:00 PM	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**1**	*2*
12:15 PM	**1**	**0**	**0**	**0**	***1***	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	*0*
12:30 PM	**1**	**1**	**0**	**0**	***2***	**5**	**0**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	*0*
12:45 PM	**1**	**2**	**0**	**0**	***3***	**1**	**1**	**0**	**0**	***2***	**3**	**0**	**0**	**3**	***6***
Count Total	9	7	0	1	*17*	9	2	0	0	*11*	8	0	4	10	*22*
Peak Hour	**4**	**4**	**0**	**0**	***8***	**8**	**1**	**0**	**0**	***9***	**4**	**0**	**0**	**4**	***8***

RANCHO SAN CARLOS RD
CARMEL VALLEY RD

N

Peak Hour

Date: 11/02/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	2.9%	0.80
WB	1.3%	0.87
NB	1.1%	0.78
SB	-	-
TOTAL	2.0%	0.95

Two-Hour Count Summaries

Interval Start		CARMEL VALLEY RD Eastbound				CARMEL VALLEY RD Westbound				RANCHO SAN CARLOS RD Northbound				0 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	66	20	0	7	107	0	0	9	0	1	0	0	0	0	210	0
7:15 AM		0	0	74	20	0	7	232	0	0	22	0	4	0	0	0	0	359	0
7:30 AM		**0**	**0**	**137**	**27**	**0**	**2**	**239**	**0**	**0**	**19**	**0**	**4**	**0**	**0**	**0**	**0**	**428**	0
7:45 AM		**0**	**0**	**187**	**28**	**0**	**7**	**185**	**0**	**0**	**14**	**0**	**3**	**0**	**0**	**0**	**0**	**424**	1,421
8:00 AM		**0**	**0**	**130**	**31**	**0**	**8**	**205**	**0**	**0**	**25**	**0**	**5**	**0**	**0**	**0**	**0**	**404**	1,615
8:15 AM		**0**	**0**	**123**	**28**	**0**	**2**	**186**	**0**	**0**	**19**	**0**	**5**	**0**	**0**	**0**	**0**	**363**	**1,619**
8:30 AM		0	0	146	40	0	9	196	0	0	14	0	2	0	0	0	0	407	1,598
8:45 AM		0	0	135	41	0	5	205	0	0	23	0	0	0	0	0	0	409	1,583
Count Total		0	0	998	235	0	47	1,555	0	0	145	0	24	0	0	0	0	3,004	0
Peak Hour	**All**	**0**	**0**	**577**	**114**	**0**	**19**	**815**	**0**	**0**	**77**	**0**	**17**	**0**	**0**	**0**	**0**	**1,619**	**0**
	HV	**0**	**0**	**16**	**4**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**32**	**0**
	HV%	**-**	**-**	**3%**	**4%**	**-**	**0%**	**1%**	**-**	**-**	**0%**	**-**	**6%**	**-**	**-**	**-**	**-**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

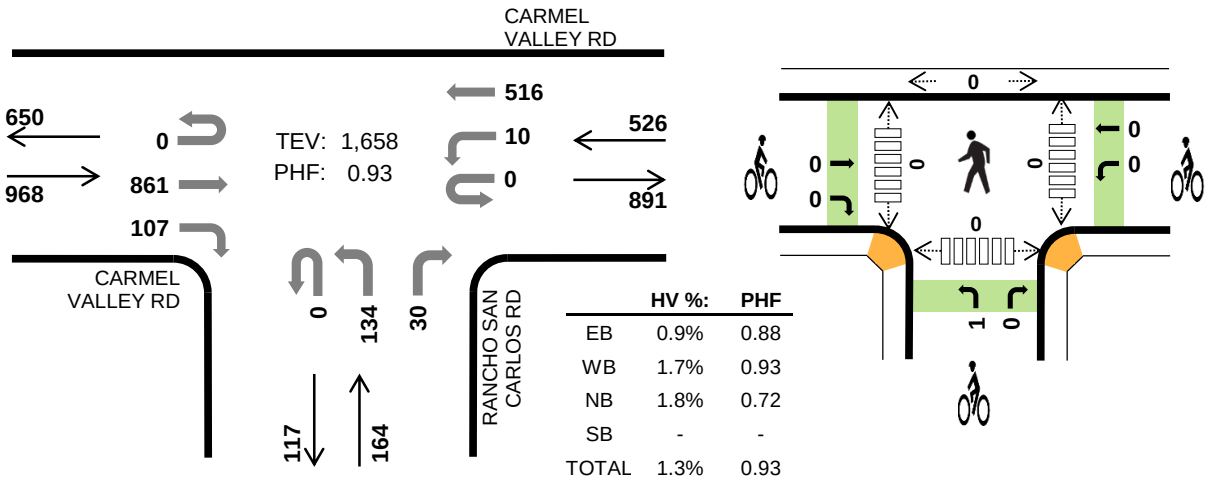
Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	4	2	0	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	3	8	1	0	*12*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	**3**	**2**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**8**	**3**	**1**	**0**	***12***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**4**	**2**	**0**	**0**	***6***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**5**	**4**	**0**	**0**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	4	3	1	0	*8*	0	0	0	0	*0*	1	0	0	0	*1*
8:45 AM	7	6	0	0	*13*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	38	30	3	0	*71*	1	0	0	0	*1*	1	0	0	0	*1*
Peak Hr	**20**	**11**	**1**	**0**	***32***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

RANCHO SAN CARLOS RD
CARMEL VALLEY RD

N

Peak Hour

Date: 11/02/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM



Two-Hour Count Summaries

Interval Start	CARMEL VALLEY RD Eastbound				CARMEL VALLEY RD Westbound				RANCHO SAN CARLOS RD Northbound				0 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	211	27	0	0	143	0	0	46	0	16	0	0	0	0	443	0
4:15 PM	**0**	**0**	**229**	**24**	**0**	**2**	**116**	**0**	**0**	**39**	**0**	**6**	**0**	**0**	**0**	**0**	**416**	0
4:30 PM	**0**	**0**	**197**	**29**	**0**	**3**	**137**	**0**	**0**	**22**	**0**	**7**	**0**	**0**	**0**	**0**	**395**	0
4:45 PM	**0**	**0**	**184**	**31**	**0**	**4**	**123**	**0**	**0**	**45**	**0**	**12**	**0**	**0**	**0**	**0**	**399**	1,653
5:00 PM	**0**	**0**	**251**	**23**	**0**	**1**	**140**	**0**	**0**	**28**	**0**	**5**	**0**	**0**	**0**	**0**	**448**	**1,658**
5:15 PM	0	0	229	17	0	1	112	0	0	37	0	7	0	0	0	0	403	1,645
5:30 PM	0	0	204	21	0	3	126	0	0	23	0	3	0	0	0	0	380	1,630
5:45 PM	0	0	177	26	0	3	112	0	0	28	0	8	0	0	0	0	354	1,585
Count Total	0	0	1,682	198	0	17	1,009	0	0	268	0	64	0	0	0	0	3,238	0
Peak Hour All	**0**	**0**	**861**	**107**	**0**	**10**	**516**	**0**	**0**	**134**	**0**	**30**	**0**	**0**	**0**	**0**	**1,658**	**0**
Peak Hour HV	**0**	**0**	**8**	**1**	**0**	**0**	**9**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**21**	**0**
Peak Hour HV%	**-**	**-**	**1%**	**1%**	**-**	**0%**	**2%**	**-**	**-**	**2%**	**-**	**0%**	**-**	**-**	**-**	**-**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

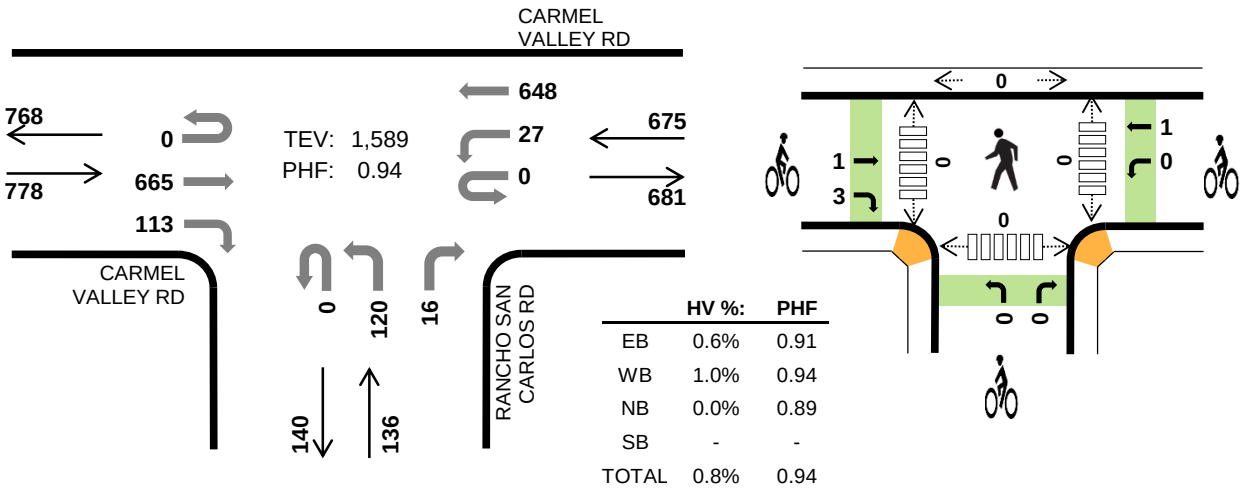
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	3	1	1	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	**0**	**2**	**2**	**0**	***4***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**5**	**2**	**0**	**0**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:45 PM	**2**	**1**	**1**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**2**	**4**	**0**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	3	1	0	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	7	2	0	0	*9*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	3	3	0	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	25	16	4	0	*45*	0	0	1	0	*1*	0	0	0	0	*0*
Peak Hr	**9**	**9**	**3**	**0**	***21***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

RANCHO SAN CARLOS RD
CARMEL VALLEY RD

N

Peak Hour

Date: 11/04/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 11:30 AM to 12:30 PM



	HV %:	PHF
EB	0.6%	0.91
WB	1.0%	0.94
NB	0.0%	0.89
SB	-	-
TOTAL	0.8%	0.94

Two-Hour Count Summaries

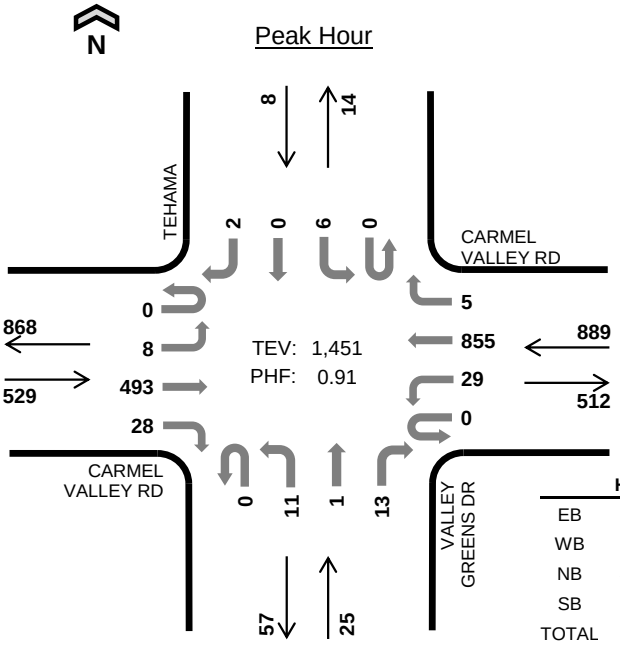
Interval Start		CARMEL VALLEY RD Eastbound				CARMEL VALLEY RD Westbound				RANCHO SAN CARLOS RD Northbound				0 Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM		0	0	155	28	0	4	144	0	0	30	0	10	0	0	0	0	371	0
11:15 AM		0	0	153	15	0	7	135	0	0	37	0	0	0	0	0	0	347	0
11:30 AM		**0**	**0**	**163**	**40**	**0**	**9**	**171**	**0**	**0**	**33**	**0**	**5**	**0**	**0**	**0**	**0**	**421**	0
11:45 AM		**0**	**0**	**185**	**28**	**0**	**7**	**166**	**0**	**0**	**22**	**0**	**5**	**0**	**0**	**0**	**0**	**413**	1,552
12:00 PM		**0**	**0**	**173**	**26**	**0**	**7**	**158**	**0**	**0**	**31**	**0**	**3**	**0**	**0**	**0**	**0**	**398**	1,579
12:15 PM		**0**	**0**	**144**	**19**	**0**	**4**	**153**	**0**	**0**	**34**	**0**	**3**	**0**	**0**	**0**	**0**	**357**	**1,589**
12:30 PM		0	0	149	30	0	4	125	0	0	26	0	3	0	0	0	0	337	1,505
12:45 PM		0	0	177	28	0	2	160	0	0	24	0	7	0	0	0	0	398	1,490
Count Total		0	0	1,299	214	0	44	1,212	0	0	237	0	36	0	0	0	0	3,042	0
Peak Hour	**All**	**0**	**0**	**665**	**113**	**0**	**27**	**648**	**0**	**0**	**120**	**0**	**16**	**0**	**0**	**0**	**0**	**1,589**	**0**
	HV	**0**	**0**	**5**	**0**	**0**	**1**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**
	HV%	**-**	**-**	**1%**	**0%**	**-**	**4%**	**1%**	**-**	**-**	**0%**	**-**	**0%**	**-**	**-**	**-**	**-**	**1%**	**0**

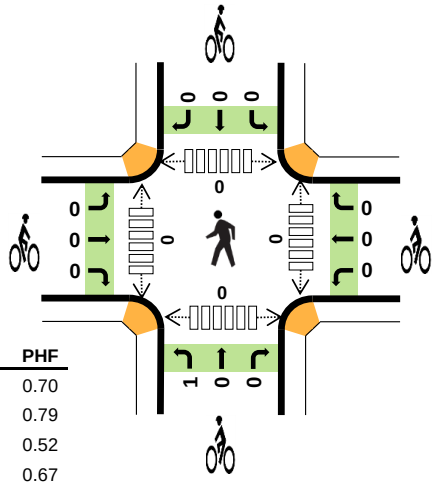
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
11:00 AM	1	1	0	0	*2*	1	0	0	0	*1*	0	0	0	0	*0*
11:15 AM	5	1	0	0	*6*	0	0	1	0	*1*	0	0	0	0	*0*
11:30 AM	**2**	**1**	**0**	**0**	***3***	**1**	**1**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	*0*
11:45 AM	**1**	**2**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:00 PM	**0**	**2**	**0**	**0**	***2***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
12:15 PM	**2**	**2**	**0**	**0**	***4***	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***
12:30 PM	1	0	1	0	*2*	1	0	0	0	*1*	0	0	0	0	*0*
12:45 PM	3	0	1	0	*4*	2	1	0	0	*3*	0	0	0	0	*0*
Count Total	15	9	2	0	*26*	8	2	1	0	*11*	0	0	0	0	*0*
Peak Hr	**5**	**7**	**0**	**0**	***12***	**4**	**1**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***

VALLEY GREENS DR
CARMEL VALLEY RD

Date: 11/02/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM





	HV %:	PHF
EB	2.6%	0.70
WB	1.5%	0.79
NB	4.0%	0.52
SB	0.0%	0.67
TOTAL	1.9%	0.91

Two-Hour Count Summaries

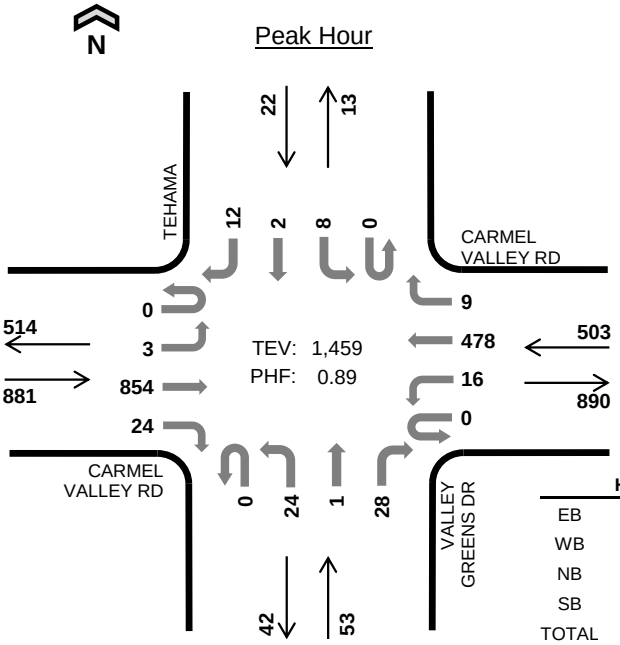
Interval Start	CARMEL VALLEY RD Eastbound				CARMEL VALLEY RD Westbound				VALLEY GREENS DR Northbound				TEHAMA Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	64	4	0	5	114	2	0	2	0	3	0	0	0	1	195	0
7:15 AM	**0**	**1**	**70**	**3**	**0**	**7**	**272**	**1**	**0**	**1**	**0**	**2**	**0**	**2**	**0**	**0**	**359**	0
7:30 AM	**0**	**1**	**130**	**7**	**0**	**5**	**193**	**2**	**0**	**2**	**0**	**3**	**0**	**1**	**0**	**1**	**345**	0
7:45 AM	**0**	**3**	**178**	**8**	**0**	**8**	**187**	**0**	**0**	**7**	**1**	**4**	**0**	**1**	**0**	**0**	**397**	1,296
8:00 AM	**0**	**3**	**115**	**10**	**0**	**9**	**203**	**2**	**0**	**1**	**0**	**4**	**0**	**2**	**0**	**1**	**350**	**1,451**
8:15 AM	0	2	118	3	0	7	171	2	0	4	0	5	0	2	0	2	316	1,408
8:30 AM	0	2	131	9	0	7	197	3	0	3	0	5	0	2	0	3	362	1,425
8:45 AM	0	1	130	3	0	5	201	2	0	6	0	8	0	1	0	1	358	1,386
Count Total	0	13	936	47	0	53	1,538	14	0	26	1	34	0	11	0	9	2,682	0
Peak Hour All	**0**	**8**	**493**	**28**	**0**	**29**	**855**	**5**	**0**	**11**	**1**	**13**	**0**	**6**	**0**	**2**	**1,451**	**0**
Peak Hour HV	**0**	**0**	**13**	**1**	**0**	**1**	**12**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**28**	**0**
Peak Hour HV%	**-**	**0%**	**3%**	**4%**	**-**	**3%**	**1%**	**0%**	**-**	**0%**	**100%**	**0%**	**-**	**0%**	**-**	**0%**	**2%**	**0**

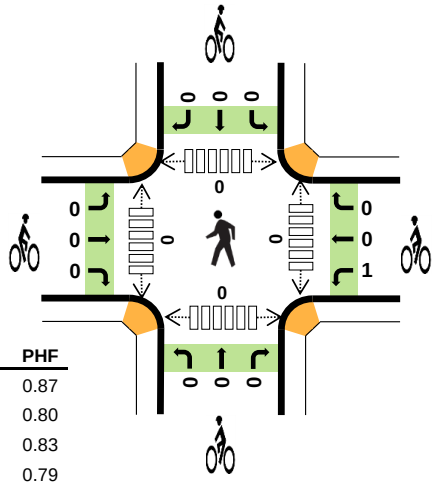
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	3	5	0	0	*8*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	**2**	**5**	**0**	**0**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**2**	**5**	**0**	**0**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**7**	**1**	**1**	**0**	***9***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**3**	**2**	**0**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	4	3	0	0	*7*	0	0	0	0	*0*	0	0	0	0	*0*
8:30 AM	3	4	0	0	*7*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	6	6	1	0	*13*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	30	31	2	0	*63*	0	0	1	0	*1*	0	0	0	0	*0*
Peak Hour	**14**	**13**	**1**	**0**	***28***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

VALLEY GREENS DR
CARMEL VALLEY RD

Date: 11/02/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM





	HV %:	PHF
EB	0.9%	0.87
WB	2.0%	0.80
NB	0.0%	0.83
SB	0.0%	0.79
TOTAL	1.2%	0.89

Two-Hour Count Summaries

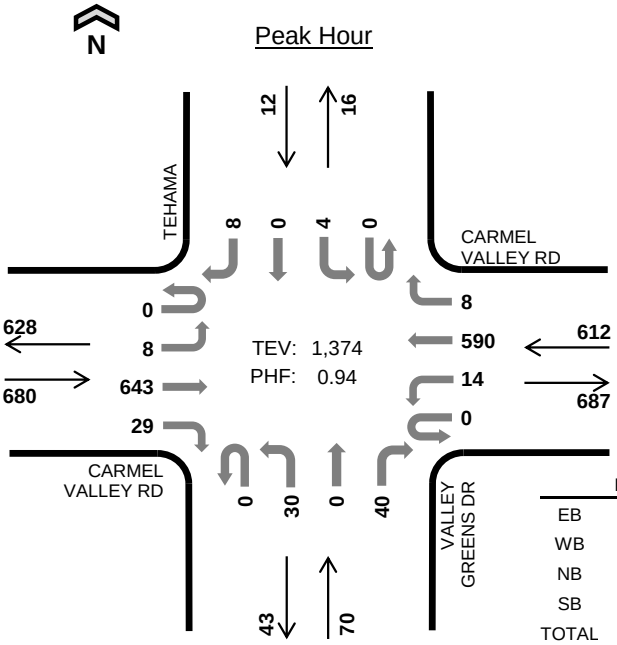
Interval Start	CARMEL VALLEY RD Eastbound				CARMEL VALLEY RD Westbound				VALLEY GREENS DR Northbound				TEHAMA Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	208	9	0	3	124	2	0	5	0	5	0	3	0	2	361	0
4:15 PM	**0**	**1**	**231**	**3**	**0**	**5**	**95**	**4**	**0**	**6**	**0**	**5**	**0**	**3**	**1**	**2**	**356**	0
4:30 PM	**0**	**0**	**198**	**9**	**0**	**6**	**149**	**2**	**0**	**9**	**1**	**6**	**0**	**2**	**0**	**1**	**383**	0
4:45 PM	**0**	**1**	**179**	**5**	**0**	**2**	**102**	**2**	**0**	**3**	**0**	**12**	**0**	**1**	**0**	**5**	**312**	1,412
5:00 PM	**0**	**1**	**246**	**7**	**0**	**3**	**132**	**1**	**0**	**6**	**0**	**5**	**0**	**2**	**1**	**4**	**408**	**1,459**
5:15 PM	0	0	224	5	0	2	110	2	0	4	0	4	0	1	0	1	353	1,456
5:30 PM	0	1	198	5	0	1	121	7	0	2	1	10	0	0	0	0	346	1,419
5:45 PM	0	1	175	6	0	5	95	1	0	5	0	5	0	1	0	1	295	1,402
Count Total	0	5	1,659	49	0	27	928	21	0	40	2	52	0	13	2	16	2,814	0
Peak Hour All	**0**	**3**	**854**	**24**	**0**	**16**	**478**	**9**	**0**	**24**	**1**	**28**	**0**	**8**	**2**	**12**	**1,459**	**0**
Peak Hour HV	**0**	**0**	**8**	**0**	**0**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**0**
Peak Hour HV%	**-**	**0%**	**1%**	**0%**	**-**	**0%**	**2%**	**0%**	**-**	**0%**	**0%**	**0%**	**-**	**0%**	**0%**	**0%**	**1%**	**0**

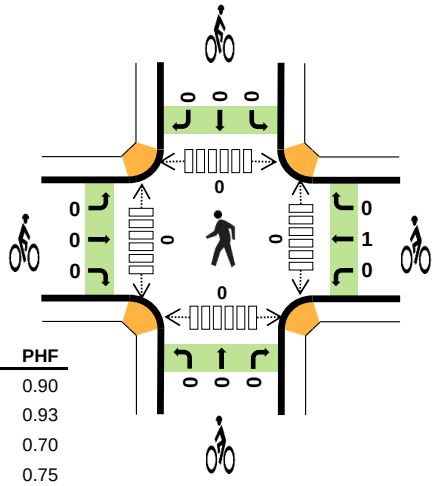
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	3	1	0	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	**0**	**2**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**4**	**2**	**0**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:45 PM	**2**	**2**	**0**	**0**	***4***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**2**	**4**	**0**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	3	2	0	0	*5*	0	0	1	0	*1*	0	0	0	0	*0*
5:30 PM	6	2	0	0	*8*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	4	1	0	0	*5*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	24	16	0	0	*40*	0	1	1	0	*2*	0	0	0	0	*0*
Peak Hour	**8**	**10**	**0**	**0**	***18***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

VALLEY GREENS DR
CARMEL VALLEY RD

Date: 11/04/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 11:15 AM to 12:15 PM





	HV %:	PHF
EB	1.2%	0.90
WB	1.0%	0.93
NB	0.0%	0.70
SB	0.0%	0.75
TOTAL	1.0%	0.94

Two-Hour Count Summaries

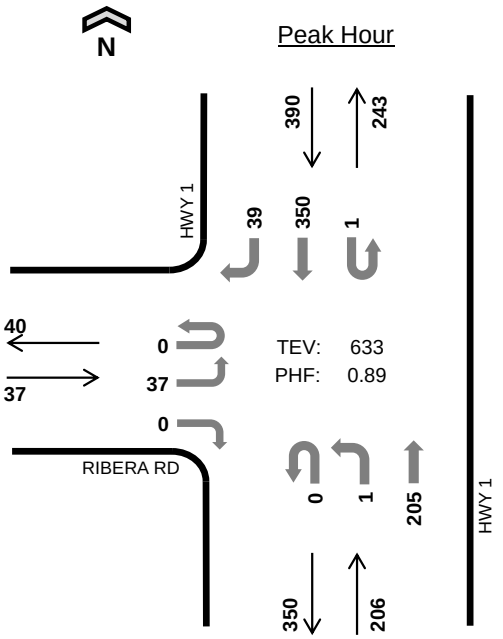
Interval Start	CARMEL VALLEY RD Eastbound				CARMEL VALLEY RD Westbound				VALLEY GREENS DR Northbound				TEHAMA Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM	0	1	147	5	0	2	150	1	0	1	0	4	0	1	0	2	314	0
11:15 AM	**0**	**2**	**144**	**9**	**0**	**5**	**126**	**0**	**0**	**8**	**0**	**6**	**0**	**1**	**0**	**1**	**302**	0
11:30 AM	**0**	**2**	**154**	**8**	**0**	**4**	**156**	**5**	**0**	**5**	**0**	**15**	**0**	**0**	**0**	**4**	**353**	0
11:45 AM	**0**	**3**	**179**	**6**	**0**	**3**	**157**	**2**	**0**	**8**	**0**	**3**	**0**	**3**	**0**	**0**	**364**	1,333
12:00 PM	**0**	**1**	**166**	**6**	**0**	**2**	**151**	**1**	**0**	**9**	**0**	**16**	**0**	**0**	**0**	**3**	**355**	**1,374**
12:15 PM	0	1	135	11	0	4	137	1	0	2	0	5	0	0	0	1	297	1,369
12:30 PM	0	1	135	9	0	3	131	4	0	3	0	9	0	1	0	1	297	1,313
12:45 PM	0	2	163	11	0	4	145	0	0	7	0	10	0	0	0	1	343	1,292
Count Total	0	13	1,223	65	0	27	1,153	14	0	43	0	68	0	6	0	13	2,625	0
Peak Hour All	**0**	**8**	**643**	**29**	**0**	**14**	**590**	**8**	**0**	**30**	**0**	**40**	**0**	**4**	**0**	**8**	**1,374**	**0**
Peak Hour HV	**0**	**0**	**8**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**14**	**0**
Peak Hour HV%	**-**	**0%**	**1%**	**0%**	**-**	**0%**	**1%**	**0%**	**-**	**0%**	**-**	**0%**	**-**	**0%**	**-**	**0%**	**1%**	**0**

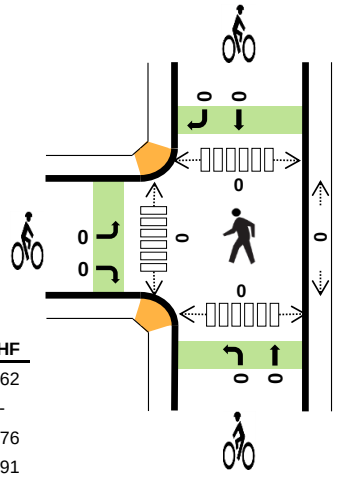
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	1	0	0	0	*1*	1	1	0	0	*2*	0	0	0	0	*0*
11:15 AM	**5**	**1**	**0**	**0**	***6***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
11:30 AM	**2**	**1**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
11:45 AM	**1**	**3**	**0**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:00 PM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
12:15 PM	2	2	1	0	*5*	1	0	1	0	*2*	0	0	0	0	*0*
12:30 PM	1	0	0	0	*1*	1	0	0	0	*1*	0	1	1	1	*3*
12:45 PM	3	1	1	0	*5*	2	1	0	0	*3*	0	0	0	0	*0*
Count Total	15	9	2	0	*26*	5	3	1	0	*9*	0	1	1	1	*3*
Peak Hour	**8**	**6**	**0**	**0**	***14***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***

HWY 1
RIBERA RD

Date: 11/02/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM





	HV %:	PHF
EB	2.7%	0.62
WB	-	-
NB	2.9%	0.76
SB	4.4%	0.91
TOTAL	3.8%	0.89

Two-Hour Count Summaries

Interval Start	RIBERA RD Eastbound				0 Westbound				HWY 1 Northbound				HWY 1 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	3	0	1	0	0	0	0	0	0	27	0	0	0	51	3	85	0
7:15 AM	0	5	0	0	0	0	0	0	0	0	56	0	0	0	66	4	131	0
7:30 AM	0	8	0	0	0	0	0	0	0	0	35	0	0	0	64	6	113	0
7:45 AM	0	9	0	0	0	0	0	0	0	0	39	0	0	0	77	17	142	471
8:00 AM	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**33**	**0**	**0**	**0**	**101**	**6**	**146**	532
8:15 AM	**0**	**15**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**61**	**0**	**1**	**0**	**74**	**10**	**161**	562
8:30 AM	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**68**	**0**	**0**	**0**	**90**	**11**	**177**	626
8:45 AM	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**43**	**0**	**0**	**0**	**85**	**12**	**149**	**633**
Count Total	0	62	0	1	0	0	0	0	0	1	362	0	1	0	608	69	1,104	0
Peak Hour All	**0**	**37**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**205**	**0**	**1**	**0**	**350**	**39**	**633**	**0**
Peak Hour HV	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**16**	**1**	**24**	**0**
Peak Hour HV%	**-**	**3%**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0%**	**3%**	**-**	**0%**	**-**	**5%**	**3%**	**4%**	**0**

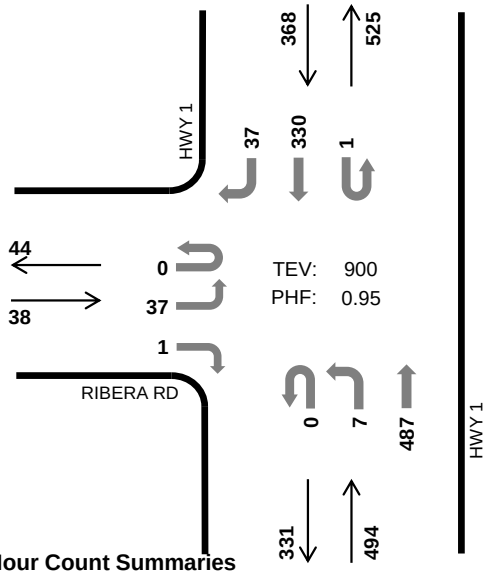
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	2	2	*4*	0	0	0	0	*0*	0	1	0	0	*1*
7:15 AM	0	0	4	2	*6*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	0	0	1	2	*3*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
8:00 AM	**0**	**0**	**1**	**8**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**0**	**0**	**2**	**2**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:30 AM	**1**	**0**	**1**	**5**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:45 AM	**0**	**0**	**2**	**2**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	1	0	13	25	*39*	0	0	0	0	*0*	0	1	0	0	*1*
Peak Hr	**1**	**0**	**6**	**17**	***24***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

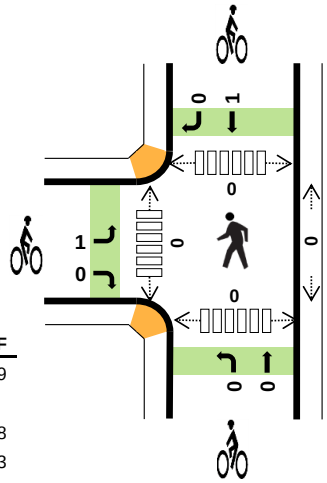
HWY 1
RIBERA RD

Peak Hour

Date: 11/02/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM



	HV %:	PHF
EB	0.0%	0.59
WB	-	-
NB	1.6%	0.88
SB	0.0%	0.93
TOTAL	0.9%	0.95



Two-Hour Count Summaries

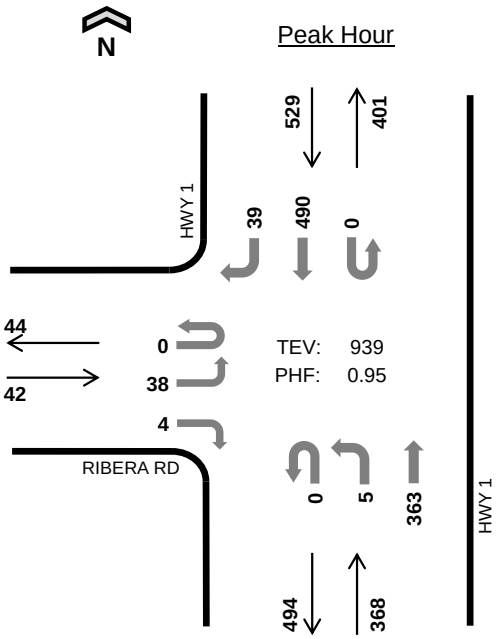
Interval Start	RIBERA RD Eastbound				0 Westbound				HWY 1 Northbound				HWY 1 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**127**	**0**	**1**	**0**	**90**	**8**	**235**	0
4:15 PM	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**138**	**0**	**0**	**0**	**82**	**8**	**238**	0
4:30 PM	**0**	**16**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**123**	**0**	**0**	**0**	**77**	**7**	**224**	0
4:45 PM	**0**	**4**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	**99**	**0**	**0**	**0**	**81**	**14**	**203**	**900**
5:00 PM	0	10	0	0	0	0	0	0	0	1	89	0	0	0	72	9	181	846
5:15 PM	0	11	0	0	0	0	0	0	0	1	89	0	0	0	71	11	183	791
5:30 PM	0	10	0	1	0	0	0	0	0	0	101	0	0	0	70	9	191	758
5:45 PM	0	8	0	1	0	0	0	0	0	0	98	0	0	0	67	5	179	734
Count Total	0	76	0	3	0	0	0	0	0	9	864	0	1	0	610	71	1,634	0
Peak Hour All	**0**	**37**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**7**	**487**	**0**	**1**	**0**	**330**	**37**	**900**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**8**	**0**
Peak Hour HV%	**-**	**0%**	**-**	**0%**	**-**	**-**	**-**	**-**	**-**	**0%**	**2%**	**-**	**0%**	**-**	**0%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

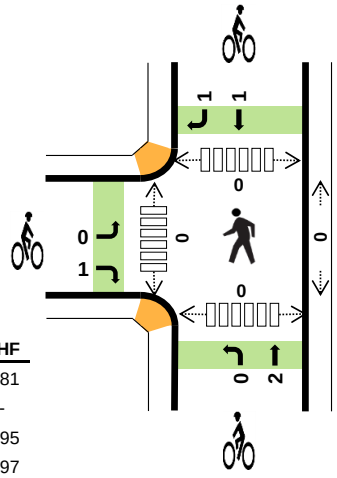
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:15 PM	**0**	**0**	**3**	**0**	***3***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:45 PM	**0**	**0**	**3**	**0**	***3***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***
5:00 PM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	0	0	2	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	1	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	0	12	4	*16*	1	0	0	1	*2*	0	0	0	0	*0*
Peak Hr	**0**	**0**	**8**	**0**	***8***	**1**	**0**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***

HWY 1
RIBERA RD

Peak Hour



Date: 11/04/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 11:45 AM to 12:45 PM



	HV %:	PHF
EB	0.0%	0.81
WB	-	-
NB	0.8%	0.95
SB	0.2%	0.97
TOTAL	0.4%	0.95

Two-Hour Count Summaries

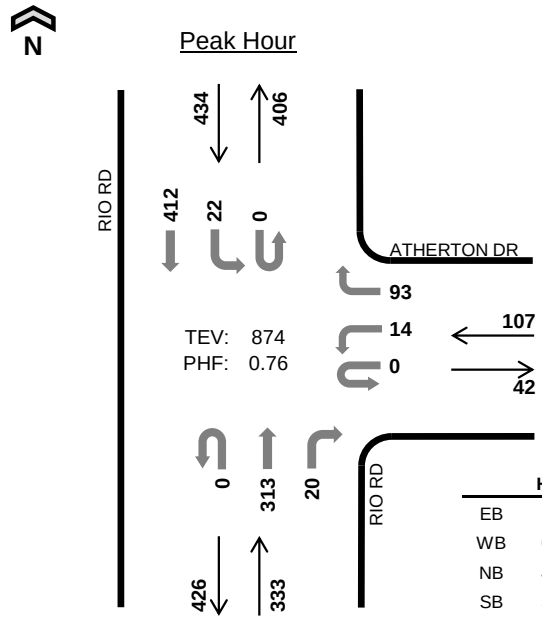
Interval Start	RIBERA RD Eastbound				0 Westbound				HWY 1 Northbound				HWY 1 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM	0	14	0	0	0	0	0	0	0	0	85	0	0	0	126	4	229	0
11:15 AM	0	5	0	0	0	0	0	0	0	0	76	0	0	0	125	12	218	0
11:30 AM	0	15	0	0	0	0	0	0	0	2	95	0	0	0	111	9	232	0
11:45 AM	**0**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**84**	**0**	**0**	**0**	**119**	**9**	**224**	903
12:00 PM	**0**	**11**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**95**	**0**	**0**	**0**	**126**	**11**	**247**	921
12:15 PM	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**89**	**0**	**0**	**0**	**117**	**10**	**225**	928
12:30 PM	**0**	**8**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**95**	**0**	**0**	**0**	**128**	**9**	**243**	**939**
12:45 PM	0	8	0	1	0	0	0	0	0	0	77	0	0	0	120	14	220	935
Count Total	0	80	0	5	0	0	0	0	0	7	696	0	0	0	972	78	1,838	0
Peak Hour All	**0**	**38**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**5**	**363**	**0**	**0**	**0**	**490**	**39**	**939**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**4**	**0**
Peak Hour HV%	**-**	**0%**	**-**	**0%**	**-**	**-**	**-**	**-**	**-**	**0%**	**1%**	**-**	**-**	**-**	**0%**	**0%**	**0%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

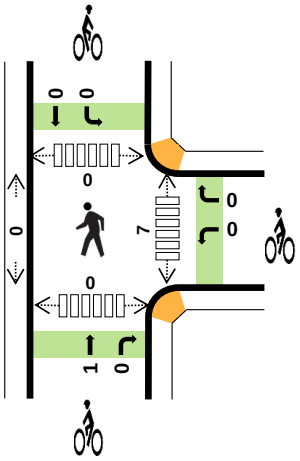
Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
11:00 AM	0	0	2	1	*3*	0	0	0	0	*0*	0	0	0	0	*0*
11:15 AM	0	0	1	1	*2*	0	0	1	1	*2*	0	0	0	0	*0*
11:30 AM	0	0	0	2	*2*	0	0	0	0	*0*	0	0	0	0	*0*
11:45 AM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**0**	**0**	*0*
12:00 PM	**0**	**0**	**1**	**0**	***1***	**1**	**0**	**1**	**0**	***2***	**0**	**0**	**0**	**0**	*0*
12:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	*0*
12:30 PM	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
12:45 PM	0	0	1	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	0	7	6	*13*	1	0	3	3	*7*	0	0	0	0	*0*
Peak Hr	**0**	**0**	**3**	**1**	***4***	**1**	**0**	**2**	**2**	***5***	**0**	**0**	**0**	**0**	***0***

RIO RD
ATHERTON DR

Date: 11/02/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	-	-
WB	0.9%	0.67
NB	4.8%	0.83
SB	3.0%	0.68
TOTAL	3.4%	0.76



Two-Hour Count Summaries

Interval Start		0 Eastbound				ATHERTON DR Westbound				RIO RD Northbound				RIO RD Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	0	0	3	0	8	0	0	32	1	0	1	27	0	72	0
7:15 AM		0	0	0	0	0	9	0	11	0	0	46	6	0	3	34	0	109	0
7:30 AM		0	0	0	0	0	9	0	15	0	0	56	7	0	2	49	0	138	0
7:45 AM		**0**	**0**	**0**	**0**	**0**	**3**	**0**	**17**	**0**	**0**	**76**	**5**	**0**	**1**	**96**	**0**	**198**	517
8:00 AM		**0**	**0**	**0**	**0**	**0**	**3**	**0**	**13**	**0**	**0**	**49**	**6**	**0**	**4**	**83**	**0**	**158**	603
8:15 AM		**0**	**0**	**0**	**0**	**0**	**4**	**0**	**36**	**0**	**0**	**96**	**4**	**0**	**4**	**87**	**0**	**231**	725
8:30 AM		**0**	**0**	**0**	**0**	**0**	**4**	**0**	**27**	**0**	**0**	**92**	**5**	**0**	**13**	**146**	**0**	**287**	**874**
8:45 AM		0	0	0	0	0	5	0	18	0	0	66	1	1	5	88	0	184	860
Count Total		0	0	0	0	0	40	0	145	0	0	513	35	1	33	610	0	1,377	0
Peak Hour	**All**	**0**	**0**	**0**	**0**	**0**	**14**	**0**	**93**	**0**	**0**	**313**	**20**	**0**	**22**	**412**	**0**	**874**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**16**	**0**	**0**	**0**	**13**	**0**	**30**	**0**
	HV%	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**1%**	**-**	**-**	**5%**	**0%**	**-**	**0%**	**3%**	**-**	**3%**	**0**

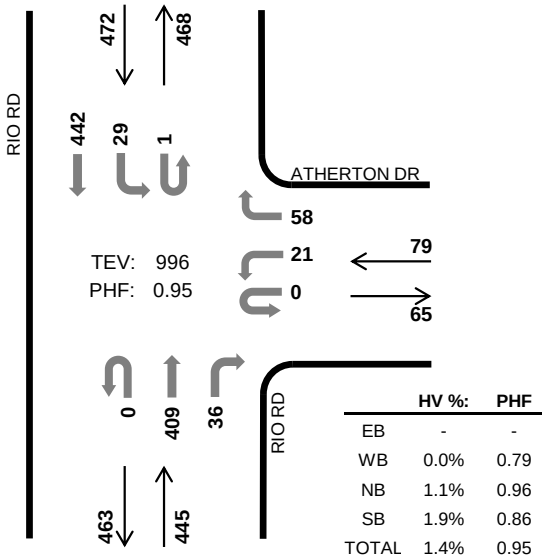
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	3	2	*5*	0	0	0	0	*0*	3	0	0	0	*3*
7:15 AM	0	1	2	4	*7*	0	1	0	2	*3*	0	0	0	0	*0*
7:30 AM	0	0	4	3	*7*	0	0	0	0	*0*	2	0	0	0	*2*
7:45 AM	**0**	**0**	**3**	**2**	***5***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
8:00 AM	**0**	**0**	**3**	**4**	***7***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
8:15 AM	**0**	**1**	**3**	**4**	***8***	**0**	**0**	**1**	**0**	***1***	**4**	**0**	**0**	**0**	*4*
8:30 AM	**0**	**0**	**7**	**3**	***10***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	***1***
8:45 AM	0	1	2	4	*7*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	3	27	26	*56*	0	1	1	2	*4*	12	0	0	0	*12*
Peak Hr	**0**	**1**	**16**	**13**	***30***	**0**	**0**	**1**	**0**	***1***	**7**	**0**	**0**	**0**	***7***

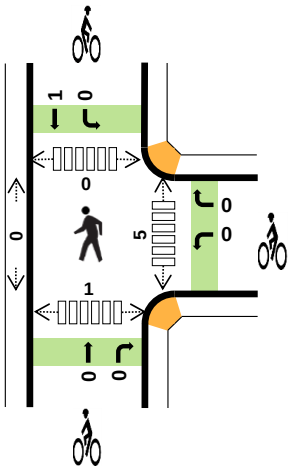
RIO RD
ATHERTON DR

Peak Hour

Date: 11/02/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM



	HV %:	PHF
EB	-	-
WB	0.0%	0.79
NB	1.1%	0.96
SB	1.9%	0.86
TOTAL	1.4%	0.95



Two-Hour Count Summaries

Interval Start	0 Eastbound				ATHERTON DR Westbound				RIO RD Northbound				RIO RD Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**15**	**0**	**0**	**99**	**6**	**0**	**7**	**131**	**0**	**263**	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**10**	**0**	**0**	**98**	**10**	**1**	**5**	**105**	**0**	**233**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**15**	**0**	**0**	**104**	**12**	**0**	**9**	**108**	**0**	**253**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**18**	**0**	**0**	**108**	**8**	**0**	**8**	**98**	**0**	**247**	**996**
5:00 PM	0	0	0	0	0	1	0	17	0	0	100	10	0	8	112	0	248	981
5:15 PM	0	0	0	0	0	6	0	23	0	0	106	2	0	12	91	0	240	988
5:30 PM	0	0	0	0	0	5	0	13	0	0	71	12	0	11	93	0	205	940
5:45 PM	0	0	0	0	0	6	0	9	0	0	55	11	0	9	79	0	169	862
Count Total	0	0	0	0	0	39	0	120	0	0	741	71	1	69	817	0	1,858	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**21**	**0**	**58**	**0**	**0**	**409**	**36**	**1**	**29**	**442**	**0**	**996**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**1**	**0**	**0**	**9**	**0**	**14**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**0%**	**-**	**-**	**1%**	**3%**	**0%**	**0%**	**2%**	**-**	**1%**	**0**

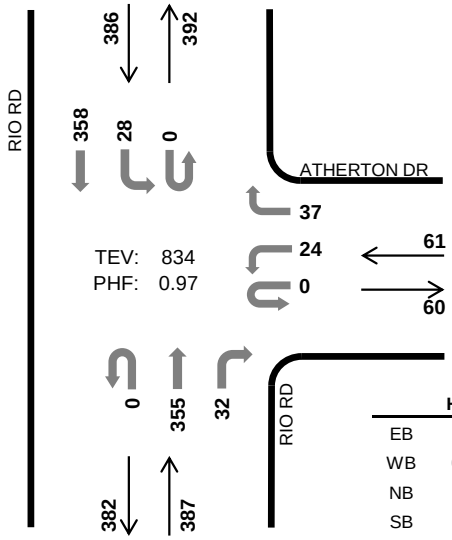
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**0**	**0**	**1**	**3**	***4***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
4:15 PM	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**1**	*3*
4:30 PM	**0**	**0**	**1**	**3**	***4***	**0**	**0**	**0**	**1**	***1***	**1**	**0**	**0**	**0**	*1*
4:45 PM	**0**	**0**	**2**	**2**	***4***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	***1***
5:00 PM	0	0	0	1	*1*	0	0	1	1	*2*	1	0	0	0	*1*
5:15 PM	0	0	1	3	*4*	0	0	0	0	*0*	0	0	1	0	*1*
5:30 PM	0	0	1	1	*2*	0	0	0	1	*1*	0	0	0	0	*0*
5:45 PM	0	1	1	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	1	8	14	*23*	0	0	1	3	*4*	6	0	1	1	*8*
Peak Hr	**0**	**0**	**5**	**9**	***14***	**0**	**0**	**0**	**1**	***1***	**5**	**0**	**0**	**1**	***6***

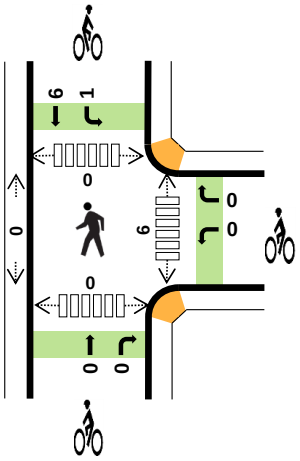
RIO RD
ATHERTON DR

Peak Hour

Date: 11/04/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 12:00 PM to 1:00 PM



	HV %:	PHF
EB	-	-
WB	0.0%	0.85
NB	1.6%	0.96
SB	1.6%	0.94
TOTAL	1.4%	0.97



Two-Hour Count Summaries

Interval Start	0 Eastbound				ATHERTON DR Westbound				RIO RD Northbound				RIO RD Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM	0	0	0	0	0	4	0	8	0	0	61	6	0	5	94	0	178	0
11:15 AM	0	0	0	0	0	8	0	15	0	0	83	6	0	2	100	0	214	0
11:30 AM	0	0	0	0	0	4	0	11	0	0	74	4	0	9	98	0	200	0
11:45 AM	0	0	0	0	0	10	0	8	0	0	73	5	1	7	99	0	203	795
12:00 PM	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**9**	**0**	**0**	**94**	**6**	**0**	**7**	**86**	**0**	**211**	828
12:15 PM	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**11**	**0**	**0**	**92**	**9**	**0**	**5**	**85**	**0**	**208**	822
12:30 PM	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**6**	**0**	**0**	**79**	**8**	**0**	**7**	**96**	**0**	**201**	823
12:45 PM	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**11**	**0**	**0**	**90**	**9**	**0**	**9**	**91**	**0**	**214**	**834**
Count Total	0	0	0	0	0	50	0	79	0	0	646	53	1	51	749	0	1,629	0
Peak Hour **All**	**0**	**0**	**0**	**0**	**0**	**24**	**0**	**37**	**0**	**0**	**355**	**32**	**0**	**28**	**358**	**0**	**834**	**0**
Peak Hour **HV**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**6**	**0**	**12**	**0**
Peak Hour **HV%**	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**0%**	**-**	**-**	**2%**	**0%**	**-**	**0%**	**2%**	**-**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

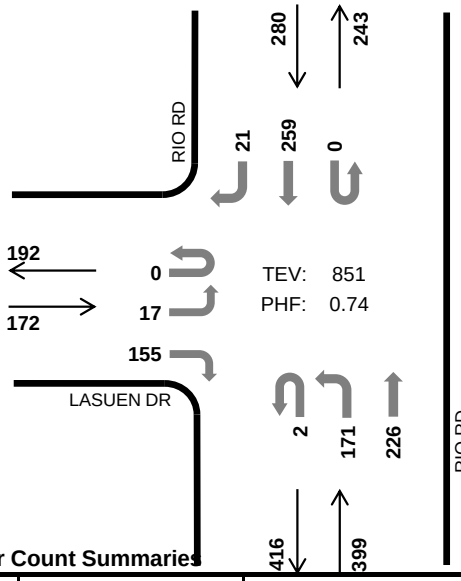
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	0	0	1	5	*6*	0	1	0	1	*2*	2	0	0	0	*2*
11:15 AM	0	0	0	2	*2*	0	0	4	1	*5*	4	0	0	0	*4*
11:30 AM	0	0	1	1	*2*	0	1	3	0	*4*	4	0	0	0	*4*
11:45 AM	0	0	2	0	*2*	0	0	0	0	*0*	1	0	0	0	*1*
12:00 PM	**0**	**0**	**3**	**2**	***5***	**0**	**0**	**0**	**1**	***1***	**3**	**0**	**0**	**0**	*3*
12:15 PM	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**3**	***3***	**1**	**0**	**0**	**0**	*1*
12:30 PM	**0**	**0**	**1**	**2**	***3***	**0**	**0**	**0**	**2**	***2***	**2**	**0**	**0**	**0**	*2*
12:45 PM	**0**	**0**	**1**	**2**	***3***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***
Count Total	0	0	10	14	*24*	0	2	7	9	*18*	17	0	0	0	*17*
Peak Hr	**0**	**0**	**6**	**6**	***12***	**0**	**0**	**0**	**7**	***7***	**6**	**0**	**0**	**0**	***6***

RIO RD
LASUEN DR

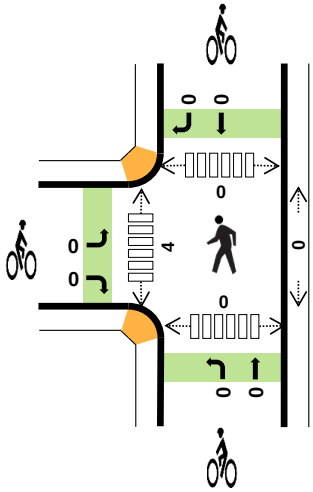
Date: 11/02/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

N

Peak Hour



	HV %:	PHF
EB	2.3%	0.57
WB	-	-
NB	4.0%	0.77
SB	2.9%	0.80
TOTAL	3.3%	0.74



Two-Hour Count Summaries

Interval Start	LASUEN DR Eastbound UT	LT	TH	RT	0 Westbound UT	LT	TH	RT	RIO RD Northbound UT	LT	TH	RT	RIO RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	1	0	9	0	0	0	0	0	14	27	0	0	0	20	1	72	0
7:15 AM	0	0	0	10	0	0	0	0	1	19	37	0	0	0	23	0	90	0
7:30 AM	0	1	0	12	0	0	0	0	0	14	48	0	1	0	38	1	115	0
7:45 AM	**0**	**8**	**0**	**33**	**0**	**0**	**0**	**0**	**0**	**24**	**63**	**0**	**0**	**0**	**67**	**2**	**197**	474
8:00 AM	**0**	**6**	**0**	**19**	**0**	**0**	**0**	**0**	**1**	**23**	**33**	**0**	**0**	**0**	**56**	**3**	**141**	543
8:15 AM	**0**	**1**	**0**	**30**	**0**	**0**	**0**	**0**	**1**	**65**	**64**	**0**	**0**	**0**	**52**	**13**	**226**	679
8:30 AM	**0**	**2**	**0**	**73**	**0**	**0**	**0**	**0**	**0**	**59**	**66**	**0**	**0**	**0**	**84**	**3**	**287**	**851**
8:45 AM	0	2	0	28	0	0	0	0	0	22	49	0	0	0	61	1	163	817
Count Total	0	21	0	214	0	0	0	0	3	240	387	0	1	0	401	24	1,291	0
Peak Hour All	**0**	**17**	**0**	**155**	**0**	**0**	**0**	**0**	**2**	**171**	**226**	**0**	**0**	**0**	**259**	**21**	**851**	**0**
Peak Hour HV	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**6**	**10**	**0**	**0**	**0**	**8**	**0**	**28**	**0**
Peak Hour HV%	**-**	**0%**	**-**	**3%**	**-**	**-**	**-**	**-**	**0%**	**4%**	**4%**	**-**	**-**	**-**	**3%**	**0%**	**3%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

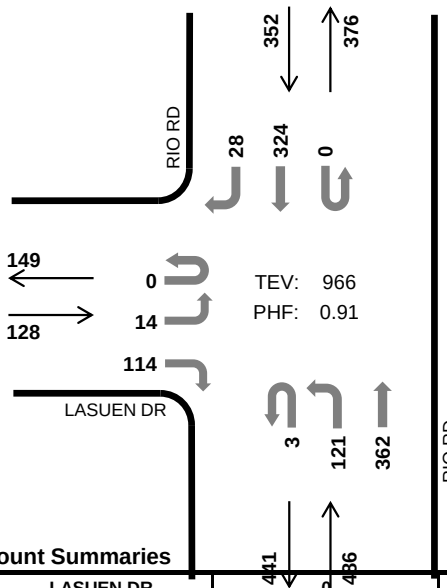
Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	1	0	3	1	*5*	0	0	0	1	*1*	0	1	0	0	*1*
7:15 AM	0	0	4	5	*9*	0	0	0	0	*0*	0	1	0	0	*1*
7:30 AM	2	0	4	2	*8*	0	0	0	0	*0*	0	1	0	0	*1*
7:45 AM	**0**	**0**	**3**	**2**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**0**	*2*
8:00 AM	**0**	**0**	**2**	**3**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
8:15 AM	**2**	**0**	**4**	**2**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
8:30 AM	**2**	**0**	**7**	**1**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:45 AM	3	0	2	3	*8*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	10	0	29	19	*58*	0	0	0	1	*1*	0	7	0	0	*7*
Peak Hr	**4**	**0**	**16**	**8**	***28***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**0**	***4***

RIO RD
LASUEN DR

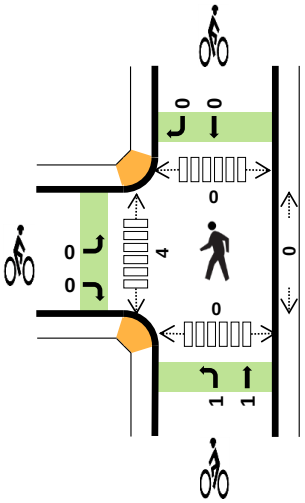
Date: 11/02/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

N

Peak Hour



RIO RD	HV %:	PHF
EB	0.8%	0.68
WB	-	-
NB	0.8%	0.91
SB	2.6%	0.93
TOTAL	1.4%	0.91



Two-Hour Count Summaries

Interval Start	LASUEN DR Eastbound				LASUEN DR Westbound				RIO RD Northbound				RIO RD Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	**0**	**5**	**0**	**42**	**0**	**0**	**0**	**0**	**0**	**21**	**103**	**0**	**0**	**0**	**88**	**7**	**266**	0
4:15 PM	**0**	**4**	**0**	**34**	**0**	**0**	**0**	**0**	**1**	**22**	**85**	**0**	**0**	**0**	**72**	**8**	**226**	0
4:30 PM	**0**	**3**	**0**	**22**	**0**	**0**	**0**	**0**	**2**	**31**	**87**	**0**	**0**	**0**	**83**	**6**	**234**	0
4:45 PM	**0**	**2**	**0**	**16**	**0**	**0**	**0**	**0**	**0**	**47**	**87**	**0**	**0**	**0**	**81**	**7**	**240**	**966**
5:00 PM	0	2	0	30	0	0	0	0	1	38	88	0	0	0	79	6	244	944
5:15 PM	0	3	0	16	0	0	0	0	0	47	84	0	0	0	73	9	232	950
5:30 PM	0	3	0	31	0	0	0	0	0	18	67	0	0	0	67	7	193	909
5:45 PM	0	1	0	28	0	0	0	0	0	11	47	0	0	0	53	2	142	811
Count Total	0	23	0	219	0	0	0	0	4	235	648	0	0	0	596	52	1,777	0
Peak Hour All	**0**	**14**	**0**	**114**	**0**	**0**	**0**	**0**	**3**	**121**	**362**	**0**	**0**	**0**	**324**	**28**	**966**	**0**
Peak Hour HV	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**9**	**0**	**14**	**0**
Peak Hour HV%	**-**	**0%**	**-**	**1%**	**-**	**-**	**-**	**-**	**0%**	**0%**	**1%**	**-**	**-**	**-**	**3%**	**0%**	**1%**	**0**

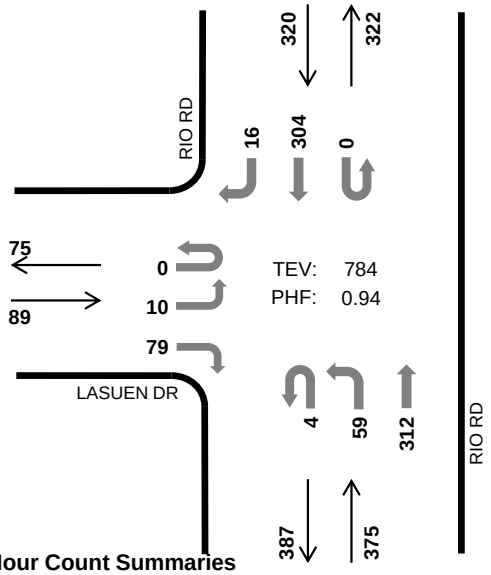
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**1**	**0**	**1**	**2**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:15 PM	**0**	**0**	**1**	**3**	***4***	**0**	**0**	**2**	**0**	***2***	**0**	**1**	**0**	**0**	*1*
4:30 PM	**0**	**0**	**1**	**2**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**3**	**0**	**0**	*3*
4:45 PM	**0**	**0**	**1**	**2**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	0	0	0	1	*1*	1	0	0	0	*1*	0	3	0	0	*3*
5:15 PM	0	0	1	3	*4*	0	0	0	0	*0*	0	5	0	0	*5*
5:30 PM	0	0	2	2	*4*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	1	0	7	15	*23*	1	0	2	0	*3*	0	12	0	0	*12*
Peak Hr	**1**	**0**	**4**	**9**	***14***	**0**	**0**	**2**	**0**	***2***	**0**	**4**	**0**	**0**	***4***

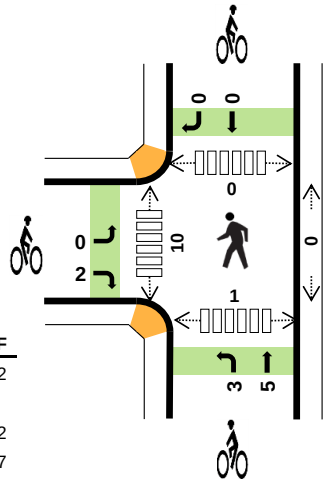
RIO RD
LASUEN DR

Peak Hour

Date: 11/04/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 11:15 AM to 12:15 PM



	HV %:	PHF
EB	2.2%	0.72
WB	-	-
NB	1.6%	0.92
SB	1.3%	0.87
TOTAL	1.5%	0.94



Two-Hour Count Summaries

Interval Start	LASUEN DR Eastbound				0 Westbound				RIO RD Northbound				RIO RD Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM	0	3	0	23	0	0	0	0	1	11	56	0	0	0	71	3	168	0
11:15 AM	**0**	**4**	**0**	**21**	**0**	**0**	**0**	**0**	**1**	**16**	**81**	**0**	**0**	**0**	**79**	**7**	**209**	0
11:30 AM	**0**	**4**	**0**	**27**	**0**	**0**	**0**	**0**	**1**	**17**	**75**	**0**	**0**	**0**	**69**	**3**	**196**	0
11:45 AM	**0**	**1**	**0**	**13**	**0**	**0**	**0**	**0**	**1**	**13**	**68**	**0**	**0**	**0**	**88**	**4**	**188**	761
12:00 PM	**0**	**1**	**0**	**18**	**0**	**0**	**0**	**0**	**1**	**13**	**88**	**0**	**0**	**0**	**68**	**2**	**191**	**784**
12:15 PM	0	1	0	20	0	0	0	0	0	20	86	0	0	0	69	1	197	772
12:30 PM	0	0	0	25	0	0	0	0	1	12	71	0	0	0	66	1	176	752
12:45 PM	0	2	0	20	0	0	0	0	0	17	92	0	0	0	77	6	214	778
Count Total	0	16	0	167	0	0	0	0	6	119	617	0	0	0	587	27	1,539	0
Peak Hour All	**0**	**10**	**0**	**79**	**0**	**0**	**0**	**0**	**4**	**59**	**312**	**0**	**0**	**0**	**304**	**16**	**784**	**0**
Peak Hour HV	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**1**	**5**	**0**	**0**	**0**	**3**	**1**	**12**	**0**
Peak Hour HV%	**-**	**0%**	**-**	**3%**	**-**	**-**	**-**	**-**	**0%**	**2%**	**2%**	**-**	**-**	**-**	**1%**	**6%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

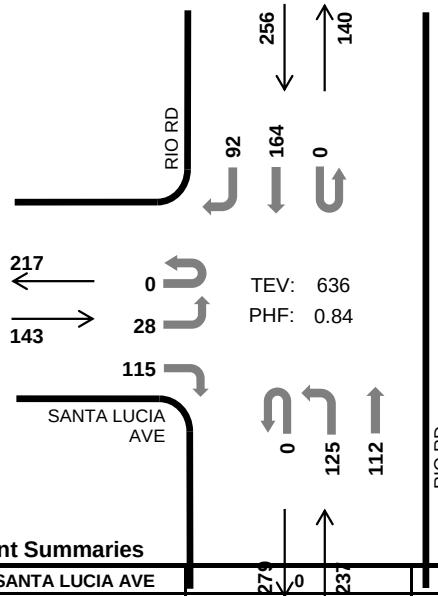
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	2	0	1	3	*6*	0	0	0	1	*1*	0	2	0	0	*2*
11:15 AM	**1**	**0**	**0**	**2**	***3***	**1**	**0**	**4**	**0**	***5***	**0**	**4**	**0**	**0**	*4*
11:30 AM	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**3**	**0**	***3***	**0**	**2**	**0**	**0**	*2*
11:45 AM	**0**	**0**	**2**	**0**	***2***	**0**	**0**	**1**	**0**	***1***	**0**	**2**	**0**	**0**	*2*
12:00 PM	**1**	**0**	**3**	**1**	***5***	**1**	**0**	**0**	**0**	***1***	**0**	**2**	**0**	**1**	***3***
12:15 PM	0	0	0	0	*0*	3	0	0	0	*3*	0	2	0	2	*4*
12:30 PM	1	0	2	1	*4*	2	0	1	0	*3*	0	4	0	0	*4*
12:45 PM	0	0	1	2	*3*	0	0	0	0	*0*	0	1	0	0	*1*
Count Total	5	0	10	10	*25*	7	0	9	1	*17*	0	19	0	3	*22*
Peak Hr	**2**	**0**	**6**	**4**	***12***	**2**	**0**	**8**	**0**	***10***	**0**	**10**	**0**	**1**	***11***

RIO RD
SANTA LUCIA AVE

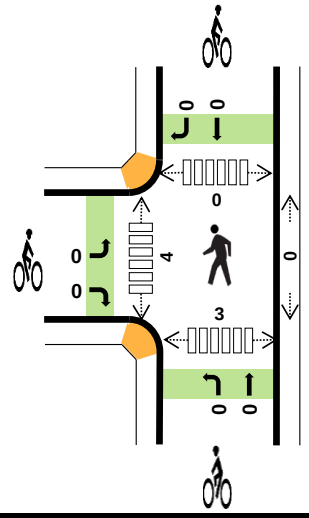
N

Peak Hour

Date: 11/02/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	2.1%	0.52
WB	-	-
NB	4.2%	0.86
SB	2.7%	0.78
TOTAL	3.1%	0.84



Two-Hour Count Summaries

Interval Start	SANTA LUCIA AVE Eastbound UT	LT	TH	RT	Westbound UT	LT	TH	RT	RIO RD Northbound UT	LT	TH	RT	RIO RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	1	0	4	0	0	0	0	0	14	11	0	0	0	13	4	47	0
7:15 AM	0	1	0	11	0	0	0	0	0	15	21	0	0	0	18	7	73	0
7:30 AM	0	3	0	10	0	0	0	0	0	23	33	0	0	0	26	16	111	0
7:45 AM	**0**	**4**	**0**	**14**	**0**	**0**	**0**	**0**	**0**	**26**	**41**	**0**	**0**	**0**	**56**	**26**	**167**	398
8:00 AM	**0**	**3**	**0**	**24**	**0**	**0**	**0**	**0**	**0**	**20**	**17**	**0**	**0**	**0**	**36**	**17**	**117**	468
8:15 AM	**0**	**4**	**0**	**25**	**0**	**0**	**0**	**0**	**0**	**44**	**20**	**0**	**0**	**0**	**43**	**27**	**163**	558
8:30 AM	**0**	**17**	**0**	**52**	**0**	**0**	**0**	**0**	**0**	**35**	**34**	**0**	**0**	**0**	**29**	**22**	**189**	**636**
8:45 AM	0	3	0	24	0	0	0	0	0	24	32	0	0	0	47	3	133	602
Count Total	0	36	0	164	0	0	0	0	0	201	209	0	0	0	268	122	1,000	0
Peak Hour All	**0**	**28**	**0**	**115**	**0**	**0**	**0**	**0**	**0**	**125**	**112**	**0**	**0**	**0**	**164**	**92**	**636**	**0**
Peak Hour HV	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**3**	**7**	**0**	**0**	**0**	**7**	**0**	**20**	**0**
Peak Hour HV%	**-**	**4%**	**-**	**2%**	**-**	**-**	**-**	**-**	**-**	**2%**	**6%**	**-**	**-**	**-**	**4%**	**0%**	**3%**	**0**

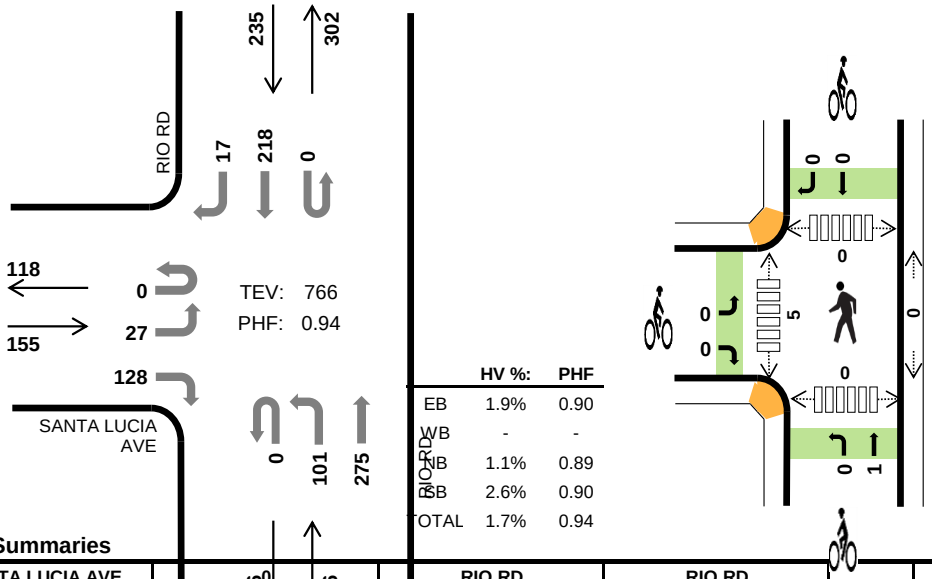
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	2	0	*2*	0	0	0	1	*1*	0	1	0	0	*1*
7:15 AM	2	0	2	3	*7*	0	0	0	0	*0*	0	1	0	0	*1*
7:30 AM	1	0	5	1	*7*	0	0	0	0	*0*	0	1	0	0	*1*
7:45 AM	**2**	**0**	**2**	**2**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**0**	*2*
8:00 AM	**0**	**0**	**2**	**2**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**1**	*2*
8:15 AM	**1**	**0**	**2**	**2**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**2**	*3*
8:30 AM	**0**	**0**	**4**	**1**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:45 AM	1	0	3	2	*6*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	7	0	22	13	*42*	0	0	0	1	*1*	0	7	0	3	*10*
Peak Hr	**3**	**0**	**10**	**7**	***20***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**3**	***7***

RIO RD
SANTA LUCIA AVE

Date: 11/02/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM

N Peak Hour



Two-Hour Count Summaries

Interval Start		SANTA LUCIA AVE Eastbound UT	LT	TH	RT	Westbound UT	LT	TH	RT	RIO RD Northbound UT	LT	TH	RT	RIO RD Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM		**0**	**8**	**0**	**35**	**0**	**0**	**0**	**0**	**0**	**28**	**78**	**0**	**0**	**0**	**53**	**2**	**204**	0
4:15 PM		**0**	**6**	**0**	**28**	**0**	**0**	**0**	**0**	**0**	**30**	**63**	**0**	**0**	**0**	**51**	**2**	**180**	0
4:30 PM		**0**	**6**	**0**	**36**	**0**	**0**	**0**	**0**	**0**	**22**	**66**	**0**	**0**	**0**	**58**	**7**	**195**	0
4:45 PM		**0**	**7**	**0**	**29**	**0**	**0**	**0**	**0**	**0**	**21**	**68**	**0**	**0**	**0**	**56**	**6**	**187**	**766**
5:00 PM		0	4	0	29	0	0	0	0	0	29	57	0	0	0	63	4	186	748
5:15 PM		0	8	0	30	0	0	0	0	0	23	66	0	0	0	49	2	178	746
5:30 PM		0	7	0	22	0	0	0	0	0	18	53	0	0	0	51	1	152	703
5:45 PM		0	3	0	21	0	0	0	0	0	13	34	0	0	0	36	5	112	628
Count Total		0	49	0	230	0	0	0	0	0	184	485	0	0	0	417	29	1,394	0
Peak Hour	**All**	**0**	**27**	**0**	**128**	**0**	**0**	**0**	**0**	**0**	**101**	**275**	**0**	**0**	**0**	**218**	**17**	**766**	**0**
	HV	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**0**	**6**	**0**	**13**	**0**
	HV%	**-**	**0%**	**-**	**2%**	**-**	**-**	**-**	**-**	**-**	**1%**	**1%**	**-**	**-**	**-**	**3%**	**0%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

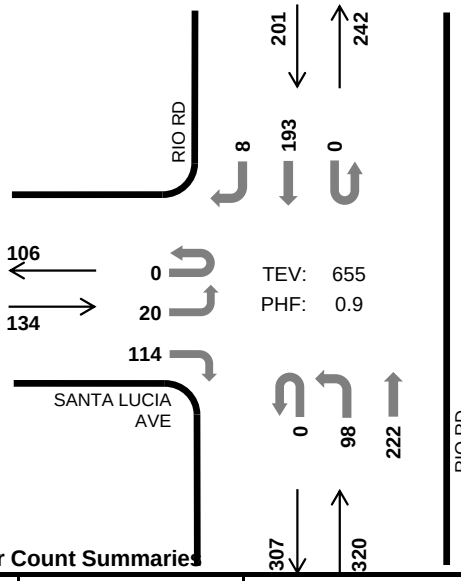
Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	**1**	**0**	**1**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:15 PM	**2**	**0**	**1**	**1**	***4***	**0**	**0**	**1**	**0**	***1***	**0**	**1**	**0**	**0**	*1*
4:30 PM	**0**	**0**	**1**	**2**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**0**	*4*
4:45 PM	**0**	**0**	**1**	**2**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	1	0	0	1	*2*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	0	0	1	2	*3*	0	0	0	0	*0*	0	1	0	1	*2*
5:30 PM	2	0	2	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	6	0	7	9	*22*	0	0	1	0	*1*	0	6	0	1	*7*
Peak Hr	**3**	**0**	**4**	**6**	***13***	**0**	**0**	**1**	**0**	***1***	**0**	**5**	**0**	**0**	***5***

RIO RD
SANTA LUCIA AVE

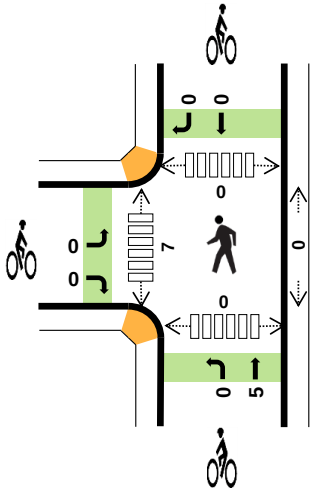
Date: 11/04/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 11:15 AM to 12:15 PM

N

Peak Hour



	HV %:	PHF
EB	0.0%	0.74
WB	-	-
NB	0.9%	0.94
SB	2.0%	0.79
TOTAL	1.1%	0.90



Two-Hour Count Summaries

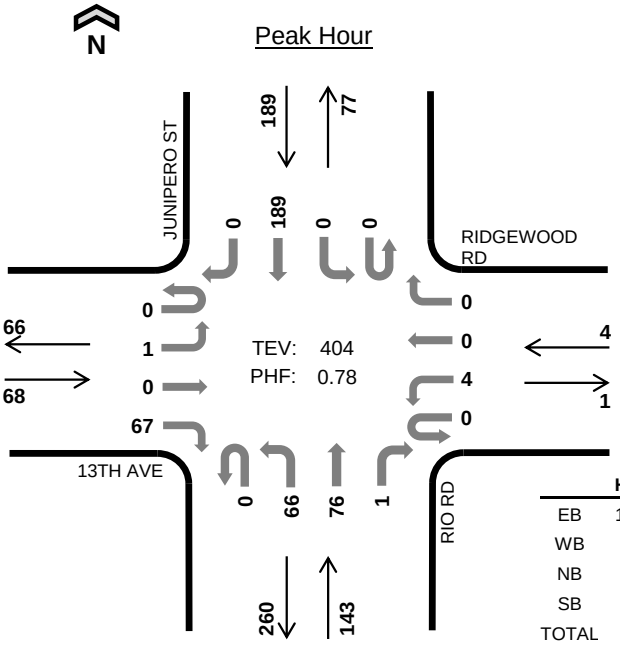
Interval Start	SANTA LUCIA AVE Eastbound				0 Westbound				RIO RD Northbound				RIO RD Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM	0	2	0	36	0	0	0	0	0	23	39	0	0	0	43	1	144	0
11:15 AM	**0**	**7**	**0**	**38**	**0**	**0**	**0**	**0**	**0**	**22**	**63**	**0**	**0**	**0**	**51**	**1**	**182**	0
11:30 AM	**0**	**5**	**0**	**26**	**0**	**0**	**0**	**0**	**0**	**27**	**48**	**0**	**0**	**0**	**40**	**2**	**148**	0
11:45 AM	**0**	**5**	**0**	**28**	**0**	**0**	**0**	**0**	**0**	**23**	**52**	**0**	**0**	**0**	**61**	**3**	**172**	646
12:00 PM	**0**	**3**	**0**	**22**	**0**	**0**	**0**	**0**	**0**	**26**	**59**	**0**	**0**	**0**	**41**	**2**	**153**	**655**
12:15 PM	0	4	0	23	0	0	0	0	0	29	59	0	0	0	49	7	171	644
12:30 PM	0	3	0	36	0	0	0	0	0	18	54	0	0	0	36	4	151	647
12:45 PM	0	0	0	22	0	0	0	0	0	17	73	0	0	0	59	3	174	649
Count Total	0	29	0	231	0	0	0	0	0	185	447	0	0	0	380	23	1,295	0
Peak Hour All	**0**	**20**	**0**	**114**	**0**	**0**	**0**	**0**	**0**	**98**	**222**	**0**	**0**	**0**	**193**	**8**	**655**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**4**	**0**	**7**	**0**
Peak Hour HV%	**-**	**0%**	**-**	**0%**	**-**	**-**	**-**	**-**	**-**	**1%**	**1%**	**-**	**-**	**-**	**2%**	**0%**	**1%**	**0**

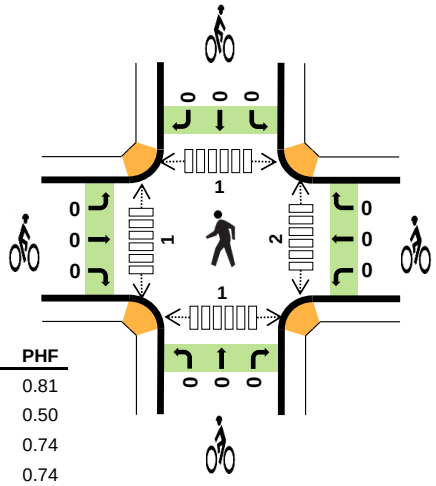
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	1	0	1	2	*4*	0	0	0	1	*1*	0	2	0	1	*3*
11:15 AM	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**3**	**0**	***3***	**0**	**1**	**0**	**0**	*1*
11:30 AM	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**2**	**0**	***2***	**0**	**2**	**0**	**0**	*2*
11:45 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**0**	*2*
12:00 PM	**0**	**0**	**2**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**0**	***2***
12:15 PM	0	0	1	1	*2*	0	0	0	0	*0*	0	2	0	0	*2*
12:30 PM	0	0	1	2	*3*	0	0	0	0	*0*	0	3	0	0	*3*
12:45 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	1	0	0	*1*
Count Total	1	0	7	9	*17*	0	0	5	1	*6*	0	15	0	1	*16*
Peak Hr	**0**	**0**	**3**	**4**	***7***	**0**	**0**	**5**	**0**	***5***	**0**	**7**	**0**	**0**	***7***

RIO RD
13TH AVE

Date: 11/02/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM





	HV %:	PHF
EB	10.3%	0.81
WB	0.0%	0.50
NB	5.6%	0.74
SB	0.0%	0.74
TOTAL	3.7%	0.78

Two-Hour Count Summaries

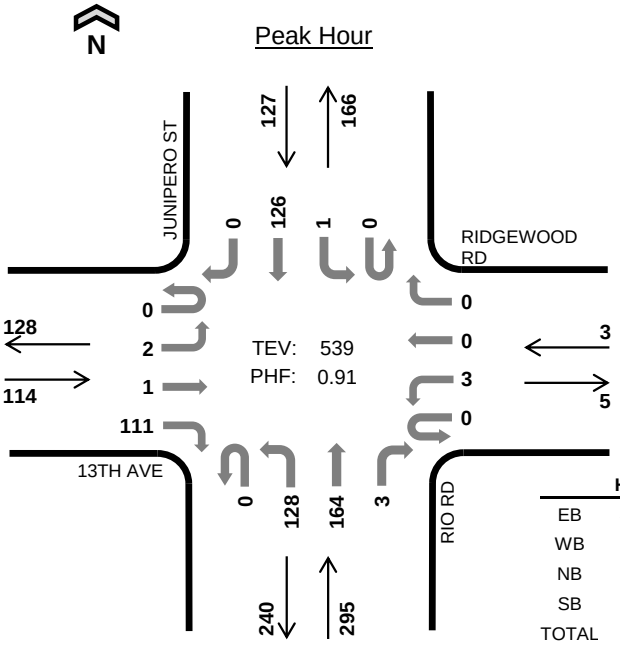
Interval Start		13TH AVE Eastbound				RIDGEWOOD RD Westbound				RIO RD Northbound				JUNIPERO ST Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	6	0	0	0	0	0	8	3	0	0	0	13	0	30	0
7:15 AM		0	0	0	10	0	2	0	0	0	15	7	1	0	0	9	0	44	0
7:30 AM		0	0	0	10	0	1	0	0	0	19	11	0	0	0	31	0	72	0
7:45 AM		**0**	**0**	**0**	**17**	**0**	**1**	**0**	**0**	**0**	**25**	**22**	**0**	**0**	**0**	**64**	**0**	**129**	275
8:00 AM		**0**	**0**	**0**	**17**	**0**	**0**	**0**	**0**	**0**	**9**	**14**	**0**	**0**	**0**	**33**	**0**	**73**	318
8:15 AM		**0**	**0**	**0**	**21**	**0**	**1**	**0**	**0**	**0**	**11**	**13**	**1**	**0**	**0**	**54**	**0**	**101**	375
8:30 AM		**0**	**1**	**0**	**12**	**0**	**2**	**0**	**0**	**0**	**21**	**27**	**0**	**0**	**0**	**38**	**0**	**101**	**404**
8:45 AM		0	1	0	22	0	1	0	0	0	20	15	1	0	0	19	0	79	354
Count Total		0	2	0	115	0	8	0	0	0	128	112	3	0	0	261	0	629	0
Peak Hour	**All**	**0**	**1**	**0**	**67**	**0**	**4**	**0**	**0**	**0**	**66**	**76**	**1**	**0**	**0**	**189**	**0**	**404**	**0**
	HV	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**15**	**0**
	HV%	**-**	**0%**	**-**	**10%**	**-**	**0%**	**-**	**-**	**-**	**12%**	**0%**	**0%**	**-**	**-**	**0%**	**-**	**4%**	**0**

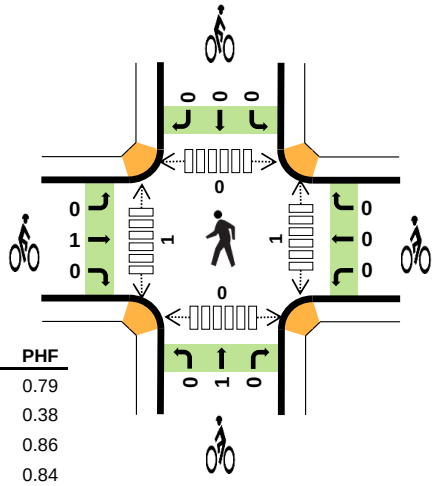
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	0	0	*0*	1	0	0	0	*1*	1	0	0	0	*1*
7:15 AM	3	0	0	0	*3*	0	0	0	0	*0*	0	1	0	0	*1*
7:30 AM	1	0	5	0	*6*	0	0	0	0	*0*	1	0	0	0	*1*
7:45 AM	**1**	**0**	**3**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**1**	**1**	*4*
8:00 AM	**3**	**0**	**1**	**0**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
8:30 AM	**1**	**0**	**4**	**0**	***5***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:45 AM	1	0	2	1	*4*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	12	0	15	1	*28*	1	0	0	0	*1*	4	2	1	1	*8*
Peak Hour	**7**	**0**	**8**	**0**	***15***	**0**	**0**	**0**	**0**	***0***	**2**	**1**	**1**	**1**	***5***

RIO RD
13TH AVE

Date: 11/02/2017
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM





	HV %:	PHF
EB	4.4%	0.79
WB	0.0%	0.38
NB	1.0%	0.86
SB	0.8%	0.84
TOTAL	1.7%	0.91

Two-Hour Count Summaries

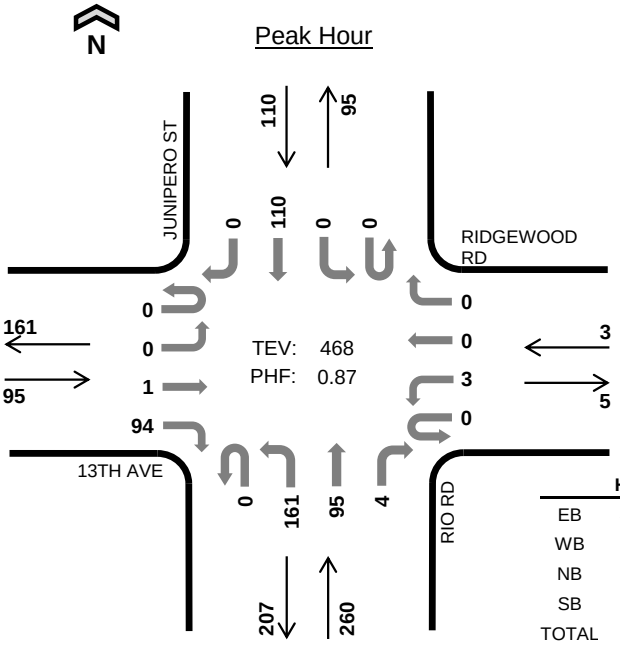
Interval Start		13TH AVE Eastbound				RIDGEWOOD RD Westbound				RIO RD Northbound				JUNIPERO ST Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		**0**	**1**	**1**	**22**	**0**	**0**	**0**	**0**	**0**	**37**	**49**	**0**	**0**	**1**	**37**	**0**	**148**	0
4:15 PM		**0**	**0**	**0**	**24**	**0**	**2**	**0**	**0**	**0**	**31**	**33**	**0**	**0**	**0**	**27**	**0**	**117**	0
4:30 PM		**0**	**1**	**0**	**29**	**0**	**0**	**0**	**0**	**0**	**32**	**37**	**3**	**0**	**0**	**35**	**0**	**137**	0
4:45 PM		**0**	**0**	**0**	**36**	**0**	**1**	**0**	**0**	**0**	**28**	**45**	**0**	**0**	**0**	**27**	**0**	**137**	**539**
5:00 PM		0	0	0	26	0	0	0	0	0	29	38	1	0	0	36	0	130	521
5:15 PM		0	1	0	20	0	1	0	0	0	41	31	1	0	0	34	0	129	533
5:30 PM		0	0	0	22	0	0	0	0	0	32	27	0	0	0	26	0	107	503
5:45 PM		0	0	0	18	0	0	0	0	0	27	13	0	0	0	23	0	81	447
Count Total		0	3	1	197	0	4	0	0	0	257	273	5	0	1	245	0	986	0
Peak Hour	**All**	**0**	**2**	**1**	**111**	**0**	**3**	**0**	**0**	**0**	**128**	**164**	**3**	**0**	**1**	**126**	**0**	**539**	**0**
	HV	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**0**	**9**	**0**
	HV%	**-**	**0%**	**0%**	**5%**	**-**	**0%**	**-**	**-**	**-**	**1%**	**1%**	**0%**	**-**	**0%**	**1%**	**-**	**2%**	**0**

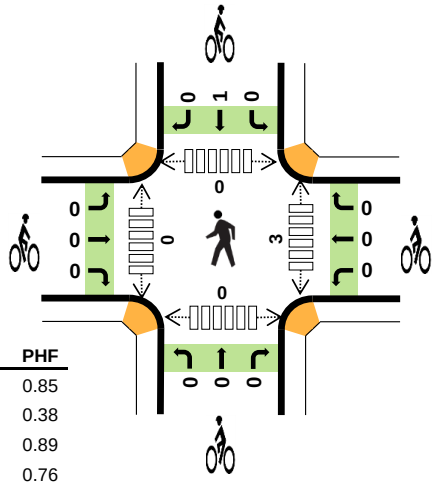
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:15 PM	**1**	**0**	**1**	**0**	***2***	**0**	**0**	**1**	**0**	***1***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**2**	**0**	**1**	**0**	***3***	**1**	**0**	**0**	**0**	***1***	**1**	**1**	**0**	**0**	*2*
4:45 PM	**2**	**0**	**1**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:15 PM	3	0	1	0	*4*	0	0	0	0	*0*	0	0	0	0	*0*
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	8	0	4	1	*13*	1	0	1	0	*2*	1	1	0	0	*2*
Peak Hour	**5**	**0**	**3**	**1**	***9***	**1**	**0**	**1**	**0**	***2***	**1**	**1**	**0**	**0**	***2***

RIO RD
13TH AVE

Date: 11/04/2017
Count Period: 11:00 AM to 1:00 PM
Peak Hour: 12:00 PM to 1:00 PM





	HV %:	PHF
EB	4.2%	0.85
WB	0.0%	0.38
NB	1.2%	0.89
SB	0.9%	0.76
TOTAL	1.7%	0.87

Two-Hour Count Summaries

Interval Start		13TH AVE Eastbound				RIDGEWOOD RD Westbound				RIO RD Northbound				JUNIPERO ST Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
11:00 AM		0	2	0	22	0	0	0	0	0	24	17	0	0	0	25	0	90	0
11:15 AM		0	1	0	22	0	1	0	0	0	33	38	0	0	0	25	1	121	0
11:30 AM		0	0	2	22	0	0	0	0	0	33	22	0	0	0	22	0	101	0
11:45 AM		0	2	0	34	0	1	0	0	0	17	29	1	0	0	25	0	109	421
12:00 PM		**0**	**0**	**1**	**27**	**0**	**1**	**0**	**0**	**0**	**40**	**27**	**1**	**0**	**0**	**22**	**0**	**119**	450
12:15 PM		**0**	**0**	**0**	**19**	**0**	**0**	**0**	**0**	**0**	**38**	**21**	**1**	**0**	**0**	**36**	**0**	**115**	444
12:30 PM		**0**	**0**	**0**	**23**	**0**	**2**	**0**	**0**	**0**	**36**	**22**	**1**	**0**	**0**	**16**	**0**	**100**	443
12:45 PM		**0**	**0**	**0**	**25**	**0**	**0**	**0**	**0**	**0**	**47**	**25**	**1**	**0**	**0**	**36**	**0**	**134**	**468**
Count Total		0	5	3	194	0	5	0	0	0	268	201	5	0	0	207	1	889	0
Peak Hour	**All**	**0**	**0**	**1**	**94**	**0**	**3**	**0**	**0**	**0**	**161**	**95**	**4**	**0**	**0**	**110**	**0**	**468**	**0**
	HV	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**1**	**0**	**8**	**0**
	HV%	**-**	**-**	**0%**	**4%**	**-**	**0%**	**-**	**-**	**-**	**2%**	**0%**	**0%**	**-**	**-**	**1%**	**-**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
11:00 AM	2	0	1	0	*3*	1	1	0	0	*2*	0	0	0	0	*0*
11:15 AM	2	0	0	0	*2*	0	1	3	0	*4*	2	0	0	0	*2*
11:30 AM	1	0	1	0	*2*	0	0	2	0	*2*	0	0	0	0	*0*
11:45 AM	0	0	1	0	*1*	0	0	0	0	*0*	0	0	0	0	*0*
12:00 PM	**1**	**0**	**1**	**0**	***2***	**0**	**0**	**0**	**1**	***1***	**2**	**0**	**0**	**0**	*2*
12:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**0**	*1*
12:30 PM	**1**	**0**	**2**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
12:45 PM	**2**	**0**	**0**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	9	0	6	1	*16*	1	2	5	1	*9*	5	0	0	0	*5*
Peak Hour	**4**	**0**	**3**	**1**	***8***	**0**	**0**	**0**	**1**	***1***	**3**	**0**	**0**	**0**	***3***

Monterey County Resource Management Agency - Public Works

Carmel Valley Road Data Sheet

Carmel Valley Road
Segment 6 - Robinson Canyon Road to Schulte Road
Count Location No. 235 - West of Loma Del Rey Road
Dates: 10/18/2016 to 10/24/2016
Sheet 1

Tuesday, October 18, 2016

	NORTH/EAST		SOUTH/WEST		Combined	
Hour	AM	PM	AM	PM	AM	PM
0:00	2	115	4	116	6	231
0:15	7	128	2	121	9	249
0:30	2	113	2	137	4	250
0:45	2	124	4	149	6	273
1:00	3	123	0	116	3	239
1:15	2	121	0	133	2	254
1:30	3	127	1	107	4	234
1:45	3	121	0	117	3	238
2:00	0	143	1	120	1	263
2:15	2	143	1	125	3	268
2:30	2	161	1	128	3	289
2:45	0	142	1	127	1	269
3:00	5	150	0	129	5	279
3:15	1	183	1	146	2	329
3:30	2	181	2	119	4	300
3:45	2	187	2	124	4	311
4:00	1	198	0	138	1	336
4:15	1	200	4	115	5	315
4:30	2	205	5	126	7	331
4:45	6	205	7	129	13	334
5:00	3	195	9	129	12	324
5:15	9	225	18	97	27	322
5:30	19	192	18	85	37	277
5:45	22	179	28	103	50	282
6:00	22	182	31	94	53	276
6:15	30	154	43	98	73	252
6:30	20	141	78	57	98	198
6:45	31	123	76	56	107	179
7:00	51	78	157	67	208	145
7:15	78	89	250	49	328	138
7:30	102	59	197	38	299	97
7:45	125	72	178	26	303	98
8:00	112	58	162	33	274	91
8:15	108	48	168	22	276	70
8:30	120	40	207	18	327	58
8:45	104	47	242	19	346	66
9:00	103	53	151	16	254	69
9:15	87	42	150	15	237	57
9:30	97	39	146	10	243	49
9:45	87	35	124	15	211	50
10:00	76	27	153	14	229	41
10:15	75	16	129	23	204	39
10:30	102	11	126	11	228	22
10:45	124	17	118	10	242	27
11:00	110	11	121	11	231	22
11:15	95	10	126	2	221	12
11:30	119	11	134	6	253	17
11:45	112	10	148	5	260	15
Total	**2191**	**5234**	**3526**	**3651**	**5717**	**8885**
Day Total	**7425**		**7177**		**14602**	

Wednesday, October 19, 2016

	NORTH/EAST		SOUTH/WEST		Combined	
Hour	AM	PM	AM	PM	AM	PM
0:00	3	117	3	134	6	251
0:15	2	136	1	110	3	246
0:30	4	146	3	134	7	280
0:45	5	106	6	125	11	231
1:00	1	131	0	114	1	245
1:15	0	131	0	121	0	252
1:30	0	129	1	118	1	247
1:45	1	135	1	93	2	228
2:00	0	127	0	128	0	255
2:15	1	152	1	112	2	264
2:30	0	135	0	137	0	272
2:45	3	166	1	134	4	300
3:00	2	185	1	116	3	301
3:15	0	186	0	158	0	344
3:30	1	163	0	126	1	289
3:45	0	187	3	135	3	322
4:00	6	222	2	109	8	331
4:15	4	203	5	116	9	319
4:30	1	213	5	102	6	315
4:45	4	256	9	106	13	362
5:00	4	211	9	127	13	338
5:15	6	204	8	104	14	308
5:30	15	237	20	101	35	338
5:45	25	173	27	100	52	273
6:00	23	166	32	90	55	256
6:15	23	153	45	77	68	230
6:30	31	138	63	69	94	207
6:45	29	119	89	73	118	192
7:00	57	106	129	51	186	157
7:15	69	78	263	42	332	120
7:30	85	75	210	36	295	111
7:45	131	72	194	41	325	113
8:00	108	84	157	25	265	109
8:15	124	81	159	45	283	126
8:30	99	72	195	31	294	103
8:45	113	67	228	55	341	122
9:00	100	32	167	21	267	53
9:15	104	54	133	45	237	99
9:30	100	39	153	27	253	66
9:45	72	15	169	19	241	34
10:00	62	29	140	34	202	63
10:15	95	11	155	19	250	30
10:30	91	18	124	25	215	43
10:45	97	14	146	8	243	22
11:00	122	12	148	12	270	24
11:15	109	12	122	7	231	19
11:30	108	10	149	3	257	13
11:45	110	16	139	4	249	20
	2150	**5524**	**3615**	**3719**	**5765**	**9243**
	7674		**7334**		**15008**	

Thursday, October 20, 2016

	NORTH/EAST		SOUTH/WEST		Combined	
Hour	AM	PM	AM	PM	AM	PM
0:00	7	137	3	123	10	260
0:15	6	123	6	133	12	256
0:30	0	138	2	143	2	281
0:45	2	121	3	143	5	264
1:00	2	108	3	124	5	232
1:15	2	134	3	123	5	257
1:30	1	125	2	150	3	275
1:45	3	129	2	110	5	239
2:00	1	120	3	168	4	288
2:15	0	146	1	138	1	284
2:30	1	171	2	116	3	287
2:45	0	175	2	127	2	302
3:00	2	152	0	123	2	275
3:15	1	181	1	141	2	322
3:30	2	158	0	152	2	310
3:45	2	210	1	111	3	321
4:00	4	205	2	141	6	346
4:15	2	216	4	114	6	330
4:30	4	221	11	123	15	344
4:45	5	209	7	107	12	316
5:00	4	224	7	99	11	323
5:15	7	259	14	79	21	338
5:30	19	201	22	98	41	299
5:45	17	175	26	90	43	265
6:00	19	146	32	97	51	243
6:15	27	168	44	89	71	257
6:30	20	134	79	70	99	204
6:45	44	144	88	71	132	215
7:00	58	109	129	51	187	160
7:15	57	102	258	50	315	152
7:30	87	83	214	40	301	123
7:45	134	64	180	27	314	91
8:00	102	84	191	33	293	117
8:15	120	72	141	29	261	101
8:30	132	57	191	38	323	95
8:45	110	57	210	41	320	98
9:00	116	52	157	37	273	89
9:15	101	48	115	25	216	73
9:30	99	50	136	22	235	72
9:45	87	35	172	26	259	61
10:00	89	33	145	28	234	61
10:15	81	34	141	17	222	51
10:30	85	36	155	11	240	47
10:45	119	24	157	8	276	32
11:00	101	13	136	19	237	32
11:15	113	19	164	7	277	26
11:30	117	12	137	8	254	20
11:45	115	15	135	5	250	20
	2227	**5629**	**3634**	**3825**	**5861**	**9454**
	7856		**7459**		**15315**	

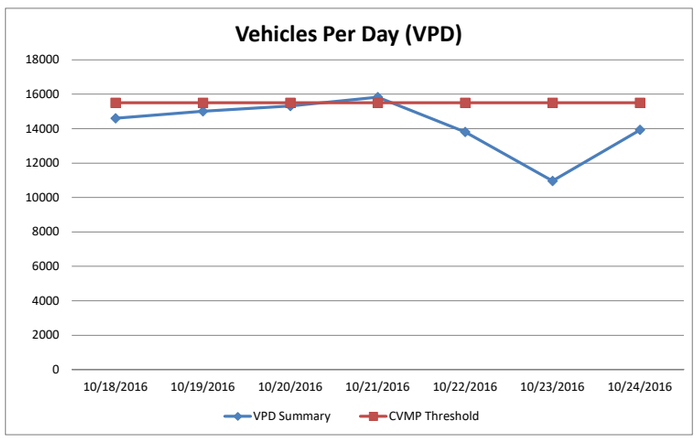
Friday, October 21, 2016

	NORTH/EAST		SOUTH/WEST		Combined	
Hour	AM	PM	AM	PM	AM	PM
0:00	6	125	7	153	13	278
0:15	8	148	2	156	10	304
0:30	8	162	4	138	12	300
0:45	11	126	3	121	14	247
1:00	5	113	2	116	7	229
1:15	3	134	2	116	5	250
1:30	5	142	3	129	8	271
1:45	1	184	2	118	3	302
2:00	2	133	0	135	2	268
2:15	1	154	1	113	2	267
2:30	0	174	0	152	0	326
2:45	3	166	4	150	7	316
3:00	3	170	0	141	3	311
3:15	0	200	1	165	1	365
3:30	0	191	0	144	0	335
3:45	1	200	5	145	6	345
4:00	1	196	3	145	4	341
4:15	3	221	1	128	4	349
4:30	3	231	9	125	12	356
4:45	3	206	7	111	10	317
5:00	5	227	11	116	16	343
5:15	9	236	18	124	27	360
5:30	10	186	19	82	29	268
5:45	30	178	19	101	49	279
6:00	23	147	21	92	44	239
6:15	20	148	44	96	64	244
6:30	31	108	78	104	109	212
6:45	28	124	93	87	121	211
7:00	47	81	162	56	209	137
7:15	72	99	240	43	312	142
7:30	78	88	193	72	271	160
7:45	124	76	168	41	292	117
8:00	129	73	153	40	282	113
8:15	132	69	161	36	293	105
8:30	116	75	199	31	315	106
8:45	140	45	195	39	335	84
9:00	100	69	183	35	283	104
9:15	93	44	156	31	249	75
9:30	82	46	151	34	233	80
9:45	101	47	143	34	244	81
10:00	84	61	137	26	221	87
10:15	112	41	122	33	234	74
10:30	105	28	137	32	242	60
10:45	97	39	157	18	254	57
11:00	118	24	149	16	267	40
11:15	98	20	138	11	236	31
11:30	120	25	129	9	249	34
11:45	131	22	150	6	281	28
	2302	**5802**	**3582**	**4146**	**5884**	**9948**
	8104		**7728**		**15832**	

VPD Summary		CVMP
Date	VPD	Threshold
10/18/2016	14602	15499
10/19/2016	15008	15499
10/20/2016	15315	15499
10/21/2016	15832	15499
10/22/2016	13809	15499
10/23/2016	10961	15499
10/24/2016	13932	15499

ADT (3 Day) = 14975
ADT (5 Day) = 14938
ADT (7 Day) = 14208

Peak Hour Summary				
Date	AM PH Volume	AM PHF	PM PH Volume	PM PHF
10/18/2016	1223	0.88	1316	0.98
10/19/2016	1217	0.92	1346	0.93
10/20/2016	1223	0.97	1341	0.97
10/21/2016	1226	0.91	1391	0.98
10/22/2016	1161	1.03	1209	0.94
10/23/2016	980	0.92	1050	0.96
10/24/2016	1183	0.80	1233	0.97



Saturday, October 22, 2016							Sunday, October 23, 2016							Monday, October 24, 2016						
	NORTH/EAST		SOUTH/WEST		Combined			NORTH/EAST		SOUTH/WEST		Combined			NORTH/EAST		SOUTH/WEST		Combined	
Hour	AM	PM	AM	PM	AM	PM	Hour	AM	PM	AM	PM	AM	PM	Hour	AM	PM	AM	PM	AM	PM
0:00	15	126	12	168	27	294	0:00	10	127	10	141	20	268	0:00	3	111	7	140	10	251
0:15	8	136	7	136	15	272	0:15	20	133	7	118	27	251	0:15	8	101	3	116	11	217
0:30	14	123	5	127	19	250	0:30	9	123	5	151	14	274	0:30	6	114	3	114	9	228
0:45	9	150	1	150	10	300	0:45	15	143	7	114	22	257	0:45	3	115	2	139	5	254
1:00	13	159	6	127	19	286	1:00	16	136	6	111	22	247	1:00	2	111	0	118	2	229
1:15	3	161	4	144	7	305	1:15	10	138	6	127	16	265	1:15	1	138	4	124	5	262
1:30	5	125	5	133	10	258	1:30	5	105	3	134	8	239	1:30	0	128	1	120	1	248
1:45	5	151	2	140	7	291	1:45	2	124	4	132	6	256	1:45	1	133	2	108	3	241
2:00	5	154	2	155	7	309	2:00	5	124	2	109	7	233	2:00	2	128	1	128	3	256
2:15	4	149	0	157	4	306	2:15	5	127	2	115	7	242	2:15	0	121	1	110	1	231
2:30	3	150	2	144	5	294	2:30	2	125	2	128	4	253	2:30	0	156	0	137	0	293
2:45	0	143	0	135	0	278	2:45	4	137	2	94	6	231	2:45	0	127	2	129	2	256
3:00	2	183	0	133	2	316	3:00	2	134	1	104	3	238	3:00	1	140	0	118	1	258
3:15	1	195	1	126	2	321	3:15	1	134	2	112	3	246	3:15	1	184	2	135	3	319
3:30	0	161	0	128	0	289	3:30	0	117	0	124	0	241	3:30	0	185	2	132	2	317
3:45	1	139	1	121	2	260	3:45	2	118	0	96	2	214	3:45	1	187	1	91	2	278
4:00	2	140	0	113	2	253	4:00	3	123	4	95	7	218	4:00	2	184	7	135	9	319
4:15	1	155	4	125	5	280	4:15	2	141	3	98	5	239	4:15	2	178	2	109	4	287
4:30	4	153	2	121	6	274	4:30	1	114	3	90	4	204	4:30	2	223	6	102	8	325
4:45	8	121	6	131	14	252	4:45	8	107	9	93	17	200	4:45	2	185	10	108	12	293
5:00	8	131	8	105	16	236	5:00	5	98	7	109	12	207	5:00	7	193	14	98	21	291
5:15	4	123	5	111	9	234	5:15	6	103	6	127	12	230	5:15	8	182	11	110	19	292
5:30	11	126	11	96	22	222	5:30	8	133	8	88	16	221	5:30	19	178	17	99	36	277
5:45	15	132	17	121	32	253	5:45	15	115	9	70	24	185	5:45	19	162	33	98	52	260
6:00	25	111	11	91	36	202	6:00	6	75	5	57	11	132	6:00	19	142	30	85	49	227
6:15	15	88	36	96	51	184	6:15	13	71	8	50	21	121	6:15	27	138	46	67	73	205
6:30	19	79	31	70	50	149	6:30	13	79	29	47	42	126	6:30	33	134	63	61	96	195
6:45	28	84	32	59	60	143	6:45	21	64	14	53	35	117	6:45	49	104	102	52	151	156
7:00	36	73	37	71	73	144	7:00	24	74	29	46	53	120	7:00	51	75	133	30	184	105
7:15	40	64	49	56	89	120	7:15	19	57	30	29	49	86	7:15	63	74	256	36	319	110
7:30	46	68	52	51	98	119	7:30	36	50	43	28	79	78	7:30	87	78	197	30	284	108
7:45	57	64	75	58	132	122	7:45	46	46	48	29	94	75	7:45	124	70	194	22	318	92
8:00	49	65	73	39	122	104	8:00	41	34	47	31	88	65	8:00	115	83	136	24	251	107
8:15	69	62	81	39	150	101	8:15	48	37	62	28	110	65	8:15	106	75	160	25	266	100
8:30	85	55	124	30	209	85	8:30	45	42	74	22	119	64	8:30	96	56	199	22	295	78
8:45	96	45	129	28	225	73	8:45	69	32	89	27	158	59	8:45	132	36	239	23	371	59
9:00	87	52	125	37	212	89	9:00	69	31	95	25	164	56	9:00	106	39	144	23	250	62
9:15	91	51	124	49	215	100	9:15	68	37	117	26	185	63	9:15	92	46	136	14	228	60
9:30	81	45	173	41	254	86	9:30	76	26	125	27	201	53	9:30	71	28	153	9	224	37
9:45	92	48	174	37	266	85	9:45	102	23	129	24	231	47	9:45	94	30	130	13	224	43
10:00	103	43	160	30	263	73	10:00	69	25	120	17	189	42	10:00	87	16	115	7	202	23
10:15	120	50	151	36	271	86	10:15	91	12	132	17	223	29	10:15	100	21	133	12	233	33
10:30	95	28	160	47	255	75	10:30	95	7	129	11	224	18	10:30	80	11	133	9	213	20
10:45	95	40	178	52	273	92	10:45	107	14	149	21	256	35	10:45	112	12	116	14	228	26
11:00	113	46	199	36	312	82	11:00	87	9	135	14	222	23	11:00	94	6	123	7	217	13
11:15	112	49	182	31	294	80	11:15	107	11	127	10	234	21	11:15	106	9	129	7	235	16
11:30	126	46	156	20	282	66	11:30	96	1	162	10	258	11	11:30	82	9	123	8	205	17
11:45	107	19	140	16	247	35	11:45	125	13	141	7	266	20	11:45	101	5	112	3	213	8
Total	**1928**	**4861**	**2753**	**4267**	**4681**	**9128**		**1629**	**3849**	**2147**	**3336**	**3776**	**7185**		**2117**	**4961**	**3433**	**3421**	**5550**	**8382**
Day Total	**6789**		**7020**		**13809**			**5478**		**5483**		**10961**			**7078**		**6854**		**13932**	

List of Acronyms

ADT = Average Daily Traffic
PH = Peak Hour
VPD = Vehicles per Day
CVMP = Carmel Valley Master Plan

Key

AM Count Data
AM Peak Hour
PM Count Data
PM Peak Hour

Monterey County Resource Management Agency - Public Works

Carmel Valley Road Data Sheet

Carmel Valley Road
Segment 7 - Schulte Road to Rancho San Carlos Road
Count Location No. 192 - West of Carmel Meadows Road
Dates: 10/18/2016 to 10/24/2016
Sheet 1

Tuesday, October 18, 2016

Hour	NORTH/EAST AM	NORTH/EAST PM	SOUTH/WEST AM	SOUTH/WEST PM	Combined AM	Combined PM
0:00	3	122	7	132	10	254
0:15	7	132	5	137	12	269
0:30	3	129	2	148	5	277
0:45	4	131	3	153	7	284
1:00	3	127	0	137	3	264
1:15	3	127	0	125	3	252
1:30	2	136	2	112	4	248
1:45	3	145	0	116	3	261
2:00	1	158	1	143	2	301
2:15	2	161	1	132	3	293
2:30	1	165	2	151	3	316
2:45	1	181	3	131	4	312
3:00	7	186	0	161	7	347
3:15	1	183	2	183	3	366
3:30	3	193	2	154	5	347
3:45	3	200	0	116	3	316
4:00	2	217	4	151	6	368
4:15	1	207	2	136	3	343
4:30	5	223	7	126	12	349
4:45	5	224	8	144	13	368
5:00	4	245	10	129	14	374
5:15	13	217	18	120	31	337
5:30	19	213	20	107	39	320
5:45	26	194	35	111	61	305
6:00	25	193	33	106	58	299
6:15	32	152	46	110	78	262
6:30	26	141	76	70	102	211
6:45	56	148	79	64	135	212
7:00	64	96	136	74	200	170
7:15	110	105	294	63	404	168
7:30	124	74	239	41	363	115
7:45	168	84	168	24	336	108
8:00	131	60	208	48	339	108
8:15	119	57	173	27	292	84
8:30	133	47	212	19	345	66
8:45	113	54	255	20	368	74
9:00	110	62	183	23	293	85
9:15	108	43	182	21	290	64
9:30	107	46	160	12	267	58
9:45	103	35	145	14	248	49
10:00	76	32	164	13	240	45
10:15	98	18	147	19	245	37
10:30	107	11	136	15	243	26
10:45	130	19	131	11	261	30
11:00	120	13	142	11	262	24
11:15	103	8	130	4	233	12
11:30	121	16	150	5	271	21
11:45	123	8	152	4	275	12
Total	**2529**	**5738**	**3875**	**4073**	**6404**	**9811**
Day Total	**8267**		**7948**		**16215**	

Wednesday, October 19, 2016

Hour	NORTH/EAST AM	NORTH/EAST PM	SOUTH/WEST AM	SOUTH/WEST PM	Combined AM	Combined PM
0:00	2	137	6	135	8	272
0:15	2	134	4	137	6	271
0:30	4	143	2	147	6	290
0:45	4	133	6	142	10	275
1:00	3	129	0	111	3	240
1:15	0	147	0	136	0	283
1:30	0	145	1	132	1	277
1:45	1	141	1	116	2	257
2:00	0	139	0	140	0	279
2:15	1	166	1	116	2	282
2:30	1	139	0	159	1	298
2:45	1	202	1	140	2	342
3:00	1	197	1	140	2	337
3:15	1	214	1	183	2	397
3:30	1	202	0	147	1	349
3:45	0	205	3	161	3	366
4:00	7	250	3	112	10	362
4:15	5	226	7	121	12	347
4:30	3	226	8	136	11	362
4:45	6	275	7	117	13	392
5:00	6	243	13	126	19	369
5:15	11	215	8	120	19	335
5:30	15	269	24	129	39	398
5:45	24	202	32	101	56	303
6:00	26	176	37	94	63	270
6:15	21	176	53	92	74	268
6:30	46	151	62	68	108	219
6:45	47	139	95	84	142	223
7:00	65	102	133	49	198	151
7:15	98	83	293	58	391	141
7:30	123	92	235	47	358	139
7:45	157	78	203	46	360	124
8:00	136	86	189	55	325	141
8:15	121	85	179	50	300	135
8:30	106	73	200	48	306	121
8:45	132	58	251	53	383	111
9:00	93	44	191	26	284	70
9:15	102	58	155	43	257	101
9:30	116	41	165	27	281	68
9:45	80	19	189	17	269	36
10:00	80	31	151	34	231	65
10:15	118	18	166	21	284	39
10:30	100	16	154	26	254	42
10:45	113	15	142	11	255	26
11:00	119	10	156	12	275	22
11:15	121	13	145	6	266	19
11:30	126	13	152	5	278	18
11:45	122	17	153	2	275	19
Total	**2467**	**6073**	**3978**	**4178**	**6445**	**10251**
Day Total	**8540**		**8156**		**16696**	

Thursday, October 20, 2016

Hour	NORTH/EAST AM	NORTH/EAST PM	SOUTH/WEST AM	SOUTH/WEST PM	Combined AM	Combined PM
0:00	7	145	5	142	12	287
0:15	6	131	6	150	12	281
0:30	1	141	4	161	5	302
0:45	3	138	3	147	6	285
1:00	3	110	3	142	6	252
1:15	2	135	2	130	4	265
1:30	0	129	3	151	3	280
1:45	3	139	3	142	6	281
2:00	2	144	3	176	5	320
2:15	1	174	1	156	2	330
2:30	1	178	2	150	3	328
2:45	2	194	1	121	3	315
3:00	2	199	1	145	3	344
3:15	1	181	1	173	2	354
3:30	2	183	1	170	3	353
3:45	3	234	1	121	4	355
4:00	5	224	3	146	8	370
4:15	5	219	5	126	10	345
4:30	7	234	7	136	14	370
4:45	4	225	12	138	16	363
5:00	3	267	7	113	10	380
5:15	11	261	12	107	23	368
5:30	19	216	27	111	46	327
5:45	19	188	32	107	51	295
6:00	21	171	29	112	50	283
6:15	34	177	55	95	89	272
6:30	28	135	71	70	99	205
6:45	58	158	87	68	145	226
7:00	69	113	132	56	201	169
7:15	76	117	265	48	341	165
7:30	118	91	246	43	364	134
7:45	192	79	192	31	384	110
8:00	105	88	248	45	353	133
8:15	134	80	165	26	299	106
8:30	140	72	199	37	339	109
8:45	137	64	210	38	347	102
9:00	107	63	175	38	282	101
9:15	103	57	153	22	256	79
9:30	112	59	149	24	261	83
9:45	96	43	182	25	278	68
10:00	89	36	157	33	246	69
10:15	96	36	159	12	255	48
10:30	102	39	154	18	256	57
10:45	120	23	185	23	305	46
11:00	124	13	154	27	278	40
11:15	109	16	175	12	284	28
11:30	136	11	146	9	282	20
11:45	141	15	134	7	275	22
Total	**2559**	**6145**	**3967**	**4280**	**6526**	**10425**
Day Total	**8704**		**8247**		**16951**	

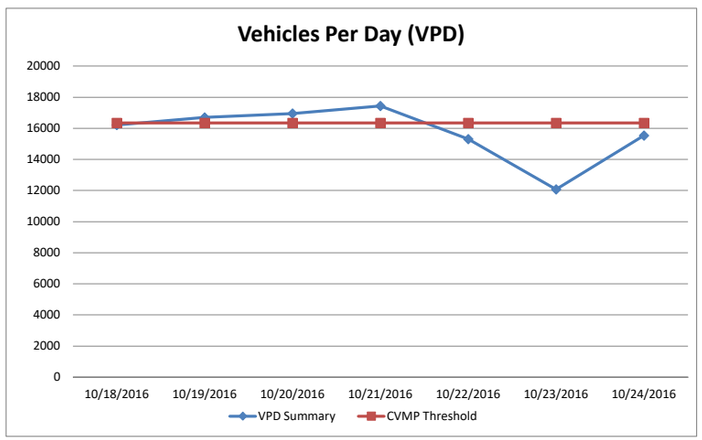
Friday, October 21, 2016

Hour	NORTH/EAST AM	NORTH/EAST PM	SOUTH/WEST AM	SOUTH/WEST PM	Combined AM	Combined PM
0:00	8	152	7	149	15	301
0:15	8	174	6	166	14	340
0:30	10	150	3	152	13	302
0:45	9	139	4	143	13	282
1:00	5	121	5	133	10	254
1:15	4	166	2	131	6	297
1:30	4	149	4	134	8	283
1:45	1	172	2	124	3	296
2:00	2	142	0	142	2	284
2:15	1	190	1	112	2	302
2:30	0	186	1	165	1	351
2:45	3	195	4	165	7	360
3:00	3	192	0	164	3	356
3:15	1	222	1	197	2	419
3:30	0	211	0	154	0	365
3:45	4	223	3	174	7	397
4:00	1	220	5	150	6	370
4:15	2	232	2	148	4	380
4:30	4	225	10	147	14	372
4:45	5	230	8	133	13	363
5:00	7	239	12	117	19	356
5:15	14	256	18	136	32	392
5:30	11	189	20	85	31	274
5:45	35	195	26	110	61	305
6:00	25	162	27	107	52	269
6:15	26	149	40	96	66	245
6:30	40	115	86	103	126	218
6:45	50	140	89	90	139	230
7:00	61	92	155	48	216	140
7:15	91	116	281	49	372	165
7:30	113	89	221	67	334	156
7:45	168	80	162	53	330	133
8:00	159	64	188	52	347	116
8:15	126	77	187	49	313	126
8:30	138	65	187	36	325	101
8:45	147	62	212	35	359	97
9:00	112	80	193	41	305	121
9:15	95	51	189	36	284	87
9:30	87	58	177	32	264	90
9:45	109	54	169	33	278	87
10:00	82	71	145	29	227	100
10:15	117	42	144	38	261	80
10:30	111	35	153	38	264	73
10:45	118	44	159	24	277	68
11:00	132	30	166	19	298	49
11:15	117	24	155	15	272	39
11:30	134	30	160	8	294	38
11:45	135	22	154	5	289	27
Total	**2635**	**6322**	**3943**	**4534**	**6578**	**10856**
Day Total	**8957**		**8477**		**17434**	

VPD Summary		CVMP
Date	VPD	Threshold
10/18/2016	16215	16340
10/19/2016	16696	16340
10/20/2016	16951	16340
10/21/2016	17434	16340
10/22/2016	15304	16340
10/23/2016	12071	16340
10/24/2016	15533	16340

ADT (3 Day) = 14936
ADT (5 Day) = 15459
ADT (7 Day) = 15743

Peak Hour Summary				
Date	AM PH Volume	AM PHF	PM PH Volume	PM PHF
10/18/2016	1041	1.12	1428	0.97
10/19/2016	1291	1.05	1470	1.06
10/20/2016	1119	0.99	1440	1.01
10/21/2016	1029	0.97	1485	1.00
10/22/2016	1320	1.07	1281	1.07
10/23/2016	1068	1.03	1092	1.05
10/24/2016	984	1.06	1335	0.97



Saturday, October 22, 2016						
	NORTH/EAST		SOUTH/WEST		Combined	
Hour	AM	PM	AM	PM	AM	PM
0:00	16	154	15	161	31	315
0:15	10	167	8	157	18	324
0:30	17	157	6	142	23	299
0:45	9	165	0	161	9	326
1:00	12	179	5	132	17	311
1:15	3	157	3	158	6	315
1:30	4	134	5	165	9	299
1:45	8	164	3	171	11	335
2:00	5	160	3	164	8	324
2:15	4	160	1	163	5	323
2:30	3	172	2	160	5	332
2:45	1	180	0	162	1	342
3:00	2	185	1	174	3	359
3:15	1	199	3	157	4	356
3:30	1	164	3	159	4	323
3:45	3	158	1	139	4	297
4:00	1	145	0	127	1	272
4:15	4	161	3	145	7	306
4:30	3	150	1	132	4	282
4:45	9	137	6	137	15	274
5:00	8	141	9	120	17	261
5:15	9	149	4	110	13	259
5:30	12	140	11	114	23	254
5:45	19	138	17	125	36	263
6:00	23	114	10	93	33	207
6:15	18	110	32	93	50	203
6:30	26	77	41	75	67	152
6:45	33	86	40	87	73	173
7:00	36	96	32	73	68	169
7:15	58	63	50	62	108	125
7:30	56	67	60	61	116	128
7:45	56	70	77	56	133	126
8:00	56	69	82	55	138	124
8:15	64	64	90	52	154	116
8:30	84	56	142	31	226	87
8:45	104	57	143	35	247	92
9:00	87	62	125	43	212	105
9:15	113	52	133	50	246	102
9:30	95	46	170	49	265	95
9:45	110	59	190	36	300	95
10:00	121	46	168	38	289	84
10:15	130	46	171	34	301	80
10:30	122	36	173	56	295	92
10:45	113	55	162	54	275	109
11:00	147	47	209	47	356	94
11:15	142	62	192	35	334	97
11:30	143	46	178	21	321	67
11:45	153	22	156	19	309	41
Total	**2254**	**5324**	**2936**	**4790**	**5190**	**10114**
Day Total	**7578**		**7726**		**15304**	

Sunday, October 23, 2016						
	NORTH/EAST		SOUTH/WEST		Combined	
Hour	AM	PM	AM	PM	AM	PM
0:00	16	134	14	161	30	295
0:15	28	123	11	152	39	275
0:30	8	144	5	167	13	311
0:45	16	134	7	138	23	272
1:00	14	147	6	127	20	274
1:15	11	142	9	133	20	275
1:30	5	129	5	154	10	283
1:45	3	127	4	133	7	260
2:00	5	133	2	123	7	256
2:15	6	139	3	130	9	269
2:30	3	139	1	152	4	291
2:45	3	137	3	116	6	253
3:00	2	145	1	120	3	265
3:15	2	133	1	132	3	265
3:30	1	122	0	134	1	256
3:45	2	133	1	114	3	247
4:00	3	131	4	100	7	231
4:15	4	137	5	117	9	254
4:30	4	135	3	98	7	233
4:45	8	117	12	102	20	219
5:00	6	101	7	113	13	214
5:15	10	105	6	119	16	224
5:30	13	160	7	90	20	250
5:45	17	135	8	84	25	219
6:00	8	91	6	70	14	161
6:15	17	85	12	57	29	142
6:30	18	92	27	56	45	148
6:45	27	77	21	55	48	132
7:00	20	82	32	45	52	127
7:15	20	67	30	29	50	96
7:30	38	52	41	25	79	77
7:45	45	54	60	34	105	88
8:00	44	41	53	33	97	74
8:15	47	39	69	30	116	69
8:30	58	47	87	23	145	70
8:45	69	35	90	24	159	59
9:00	79	37	96	21	175	58
9:15	76	36	112	29	188	65
9:30	84	28	135	24	219	52
9:45	138	31	133	30	271	61
10:00	90	21	125	18	215	39
10:15	119	12	155	17	274	29
10:30	116	8	136	18	252	26
10:45	113	13	162	24	275	37
11:00	99	10	133	13	232	23
11:15	107	10	153	12	260	22
11:30	119	4	174	10	293	14
11:45	115	15	168	5	283	20
Total	**1856**	**4169**	**2335**	**3711**	**4191**	**7880**
Day Total	**6025**		**6046**		**12071**	

Monday, October 24, 2016						
	NORTH/EAST		SOUTH/WEST		Combined	
Hour	AM	PM	AM	PM	AM	PM
0:00	9	119	14	152	23	271
0:15	7	109	5	127	12	236
0:30	6	116	3	136	9	252
0:45	2	130	3	138	5	268
1:00	3	120	0	141	3	261
1:15	0	151	4	133	4	284
1:30	0	132	1	138	1	270
1:45	2	149	3	115	5	264
2:00	2	138	1	137	3	275
2:15	0	144	0	132	0	276
2:30	0	158	1	176	1	334
2:45	0	149	3	133	3	282
3:00	2	180	0	118	2	298
3:15	1	192	3	178	4	370
3:30	0	202	2	158	2	360
3:45	2	207	1	119	3	326
4:00	1	203	9	138	10	341
4:15	2	213	4	131	6	344
4:30	6	219	8	105	14	324
4:45	4	204	9	125	13	329
5:00	6	205	17	99	23	304
5:15	12	214	11	124	23	338
5:30	22	183	23	107	45	290
5:45	21	196	31	112	52	308
6:00	20	160	30	91	50	251
6:15	32	153	54	66	86	219
6:30	37	147	59	63	96	210
6:45	66	108	105	52	171	160
7:00	60	82	116	33	176	115
7:15	85	90	305	41	390	131
7:30	118	87	232	39	350	126
7:45	173	70	189	26	362	96
8:00	133	101	188	25	321	126
8:15	117	76	194	33	311	109
8:30	87	53	212	26	299	79
8:45	140	43	222	25	362	68
9:00	107	47	174	23	281	70
9:15	85	52	159	19	244	71
9:30	86	31	171	12	257	43
9:45	102	29	158	12	260	41
10:00	92	22	132	13	224	35
10:15	109	20	159	11	268	31
10:30	96	13	136	11	232	24
10:45	134	9	119	15	253	24
11:00	112	11	135	8	247	19
11:15	114	9	125	8	239	17
11:30	102	12	139	7	241	19
11:45	111	6	136	5	247	11
Total	**2428**	**5464**	**3805**	**3836**	**6233**	**9300**
Day Total	**7892**		**7641**		**15533**	

List of Acronyms

ADT = Average Daily Traffic
PH = Peak Hour
VPD = Vehicles per Day
CVMP = Carmel Valley Master Plan

Key

AM Count Data
AM Peak Hour
PM Count Data
PM Peak Hour

Appendix F

Intersection Level of Service Calculation Worksheets

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	976	490	87	923	668
Future Volume (vph)	0	976	490	87	923	668
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1122	563	100	1061	768
RTOR Reduction (vph)	0	225	0	18	0	0
Lane Group Flow (vph)	0	897	563	82	1061	768
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		25.3	22.9	22.9	25.3	58.0
Effective Green, g (s)		26.2	23.8	23.8	26.2	58.0
Actuated g/C Ratio		0.45	0.41	0.41	0.45	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1258	757	643	1535	1810
v/s Ratio Prot		c0.32	c0.31		0.31	0.42
v/s Ratio Perm				0.05		
v/c Ratio		0.71	0.74	0.13	0.69	0.42
Uniform Delay, d1		12.9	14.5	10.6	12.7	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.2	4.1	0.1	1.6	0.7
Delay (s)		15.1	18.6	10.7	14.3	0.7
Level of Service		B	B	B	B	A
Approach Delay (s)	15.1		17.4			8.6
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	58.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	758	245	332	839	10	96	3	218	9	17	41
Future Volume (vph)	7	758	245	332	839	10	96	3	218	9	17	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1564	3433	3529		1698	1708	1561		1733	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1564	3433	3529		1698	1708	1561		1733	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	972	314	426	1076	13	123	4	279	12	22	53
RTOR Reduction (vph)	0	0	158	0	0	0	0	0	70	0	0	50
Lane Group Flow (vph)	9	972	156	426	1089	0	64	63	209	0	34	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.7	27.3	27.3	11.0	37.6		4.7	4.7	15.7		2.2	2.2
Effective Green, g (s)	1.2	28.3	28.3	11.6	38.6		6.5	6.5	16.9		3.2	3.2
Actuated g/C Ratio	0.02	0.43	0.43	0.18	0.59		0.10	0.10	0.26		0.05	0.05
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	33	1526	674	607	2076		168	169	402		84	75
v/s Ratio Prot	0.00	c0.27		c0.12	0.31		0.04	0.04	c0.09		c0.02	
v/s Ratio Perm			0.10						0.04			0.00
v/c Ratio	0.27	0.64	0.23	0.70	0.52		0.38	0.37	0.52		0.40	0.03
Uniform Delay, d1	31.8	14.6	11.8	25.4	8.0		27.7	27.6	20.9		30.3	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	0.6	0.1	3.0	0.1		0.5	0.5	0.6		1.2	0.1
Delay (s)	33.4	15.3	11.8	28.4	8.1		28.2	28.1	21.4		31.4	29.8
Level of Service	C	B	B	C	A		C	C	C		C	C
Approach Delay (s)		14.6			13.8			23.5			30.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	65.6	Sum of lost time (s)	16.1
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	758	245	332	839	10	96	3	218	9	17	41
Future Volume (veh/h)	7	758	245	332	839	10	96	3	218	9	17	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1763	1863
Adj Flow Rate, veh/h	9	972	314	426	1076	13	126	0	279	12	22	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	30	1188	525	545	1703	21	742	0	541	37	67	94
Arrive On Green	0.02	0.34	0.34	0.16	0.48	0.46	0.21	0.00	0.19	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3578	43	3583	0	1545	611	1121	1575
Grp Volume(v), veh/h	9	972	314	426	532	557	126	0	279	34	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1853	1792	0	1545	1733	0	1575
Q Serve(g_s), s	0.3	16.8	11.2	8.0	15.1	15.1	1.9	0.0	9.6	1.3	0.0	2.2
Cycle Q Clear(g_c), s	0.3	16.8	11.2	8.0	15.1	15.1	1.9	0.0	9.6	1.3	0.0	2.2
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.35		1.00
Lane Grp Cap(c), veh/h	30	1188	525	545	842	882	742	0	541	104	0	94
V/C Ratio(X)	0.30	0.82	0.60	0.78	0.63	0.63	0.17	0.00	0.52	0.33	0.00	0.56
Avail Cap(c_a), veh/h	122	1301	575	596	842	882	1810	0	1001	104	0	94
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.5	20.4	18.5	27.0	13.1	13.2	21.8	0.0	17.4	30.2	0.0	30.6
Incr Delay (d2), s/veh	2.0	3.5	0.8	5.3	1.2	1.1	0.0	0.0	0.3	0.7	0.0	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	8.7	4.9	4.2	7.5	7.9	0.9	0.0	4.1	0.6	0.0	1.1
LnGrp Delay(d),s/veh	34.5	23.9	19.3	32.3	14.3	14.3	21.9	0.0	17.7	30.9	0.0	35.3
LnGrp LOS	C	C	B	C	B	B	C		B	C		D
Approach Vol, veh/h		1295			1515			405			87	
Approach Delay, s/veh		22.8			19.4			19.0			33.6	
Approach LOS		C			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	35.9		17.9	14.6	26.5		8.0
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 11	23.6		3.0
Max Q Clear Time (g_c+I1), s	2.3	17.1		11.6	10.0	18.8		4.2
Green Ext Time (p_c), s	0.0	5.4		0.2	0.1	2.6		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		21.1
HCM 2010 LOS		C

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	199	289	26	6	81	265	150	38	228	63	266	335
Future Volume (vph)	199	289	26	6	81	265	150	38	228	63	266	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3494			1703	1827	1547	1752	1881	1590	3433	1761
Flt Permitted	0.95	1.00			0.32	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3494			578	1827	1547	1752	1881	1590	3433	1761
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	214	311	28	7	87	285	161	41	245	68	286	360
RTOR Reduction (vph)	0	9	0	0	0	0	122	0	0	49	0	8
Lane Group Flow (vph)	214	330	0	0	94	285	39	41	245	19	286	424
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	10.7	16.2			12.7	18.2	18.2	4.2	20.5	20.5	9.5	25.8
Effective Green, g (s)	10.4	16.4			12.4	18.4	18.4	3.9	21.4	21.4	9.2	26.7
Actuated g/C Ratio	0.14	0.22			0.16	0.24	0.24	0.05	0.28	0.28	0.12	0.35
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	234	759			95	445	377	90	533	451	418	623
v/s Ratio Prot	0.13	0.09				c0.16		0.02	0.13		c0.08	c0.24
v/s Ratio Perm					c0.16		0.03			0.01		
v/c Ratio	0.91	0.44			0.99	0.64	0.10	0.46	0.46	0.04	0.68	0.68
Uniform Delay, d1	32.1	25.5			31.4	25.5	22.1	34.7	22.2	19.6	31.7	20.7
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	36.3	0.5			88.0	3.3	0.1	3.6	0.7	0.0	4.6	3.2
Delay (s)	68.3	26.0			119.5	28.8	22.3	38.3	23.0	19.6	36.3	23.9
Level of Service	E	C			F	C	C	D	C	B	D	C
Approach Delay (s)		42.4				42.6			24.1			28.8
Approach LOS		D				D			C			C

Intersection Summary				
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	75.4	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	67.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	61	385	77	83	277	152	53
Future Volume (vph)	61	385	77	83	277	152	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3410		1687	3438	3367	1495
Flt Permitted	0.98	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1817	3410		1687	3438	3367	1495
Peak-hour factor, PHF	0.92	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	66	423	85	91	304	167	58
RTOR Reduction (vph)	0	21	0	0	0	0	51
Lane Group Flow (vph)	66	487	0	91	304	167	7
Confl. Bikes (#/hr)			1				
Heavy Vehicles (%)	2%	3%	3%	7%	5%	4%	8%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.6	28.1		4.5	28.0	5.9	5.9
Effective Green, g (s)	4.1	28.1		4.0	28.0	5.9	5.9
Actuated g/C Ratio	0.08	0.56		0.08	0.56	0.12	0.12
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	148	1916		134	1925	397	176
v/s Ratio Prot		c0.14		c0.05	0.09	c0.05	
v/s Ratio Perm	0.04						0.00
v/c Ratio	0.45	0.25		0.68	0.16	0.42	0.04
Uniform Delay, d1	21.9	5.6		22.4	5.3	20.5	19.5
Progression Factor	1.00	1.00		1.37	0.78	1.00	1.00
Incremental Delay, d2	0.8	0.3		10.2	0.2	0.3	0.0
Delay (s)	22.6	5.9		40.8	4.3	20.7	19.6
Level of Service	C	A		D	A	C	B
Approach Delay (s)		7.8			12.7	20.4	
Approach LOS		A			B	C	

Intersection Summary

HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	351	87	48	333	0	27	0	27	0	0	0
Future Volume (vph)	0	351	87	48	333	0	27	0	27	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		0.99		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.97		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3390		1805	3471			1552	1367			
Flt Permitted		1.00		0.95	1.00			0.98	1.00			
Satd. Flow (perm)		3390		1805	3471			1594	1367			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	413	102	56	392	0	32	0	32	0	0	0
RTOR Reduction (vph)	0	25	0	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	490	0	56	392	0	0	32	3	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		30.8		3.6	37.9			4.1	4.1			
Effective Green, g (s)		30.8		3.1	37.9			4.1	4.1			
Actuated g/C Ratio		0.62		0.06	0.76			0.08	0.08			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2088		111	2631			130	112			
v/s Ratio Prot		c0.14		c0.03	0.11							
v/s Ratio Perm								c0.02	0.00			
v/c Ratio		0.23		0.50	0.15			0.25	0.02			
Uniform Delay, d1		4.3		22.7	1.7			21.5	21.1			
Progression Factor		0.31		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.3		1.3	0.1			0.4	0.0			
Delay (s)		1.6		24.0	1.8			21.9	21.1			
Level of Service		A		C	A			C	C			
Approach Delay (s)		1.6			4.6			21.5			0.0	
Approach LOS		A			A			C			A	

Intersection Summary				
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.26			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	29.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	351	87	48	333	0	27	0	27	0	0	0
Future Volume (veh/h)	0	351	87	48	333	0	27	0	27	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1900	1652	1652	1900	1900	1900
Adj Flow Rate, veh/h	0	413	102	56	392	0	32	0	32	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	0	15	0	0	0
Cap, veh/h	0	1901	465	60	2752	0	202	0	65	0	90	0
Arrive On Green	0.00	0.22	0.22	0.03	0.79	0.00	0.05	0.00	0.05	0.00	0.00	0.00
Sat Flow, veh/h	0	2889	684	1810	3563	0	1236	0	1383	0	1900	0
Grp Volume(v), veh/h	0	258	257	56	392	0	32	0	32	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1726	1810	1736	0	1236	0	1383	0	1900	0
Q Serve(g_s), s	0.0	6.0	6.1	1.5	1.3	0.0	1.3	0.0	1.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.0	6.1	1.5	1.3	0.0	1.3	0.0	1.1	0.0	0.0	0.0
Prop In Lane	0.00		0.40	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1193	1173	60	2752	0	202	0	65	0	90	0
V/C Ratio(X)	0.00	0.22	0.22	0.93	0.14	0.00	0.16	0.00	0.49	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1193	1173	181	2752	0	540	0	443	0	608	0
HCM Platoon Ratio	1.00	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.98	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	8.5	8.6	24.1	1.2	0.0	23.3	0.0	23.2	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.4	19.7	0.1	0.0	0.1	0.0	2.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.1	3.1	1.1	0.6	0.0	0.4	0.0	0.5	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	8.9	9.0	43.8	1.3	0.0	23.4	0.0	25.4	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		515			448			64			0	
Approach Delay, s/veh		9.0			6.6			24.4			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	5.7	38.0		6.4		43.6		6.4
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	5.5	17.0		16.0		26.0		16.0
Max Q Clear Time (g_c+I1), s	3.5	8.1		0.0		3.3		3.3
Green Ext Time (p_c), s	0.0	4.2		0.0		7.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	8.9
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	208	30	0	12	12	5	16	303
Future Vol, veh/h	0	208	30	0	12	12	5	16	303
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	236	34	0	14	14	5	18	344
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	9.9	8.7	11
HCM LOS	A	A	B

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	104	104	30	12	12	21	303
LT Vol	104	104	0	0	0	21	0
Through Vol	0	0	30	12	0	0	0
RT Vol	0	0	0	0	12	0	303
Lane Flow Rate	118	118	34	14	14	24	344
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.2	0.198	0.036	0.023	0.021	0.039	0.445
Departure Headway (Hd)	6.104	6.018	3.8	6.166	5.455	5.885	4.651
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	584	592	929	584	660	607	771
Service Time	3.884	3.799	1.579	3.866	3.155	3.631	2.398
HCM Lane V/C Ratio	0.202	0.199	0.037	0.024	0.021	0.04	0.446
HCM Control Delay	10.4	10.3	6.7	9	8.3	8.9	11.1
HCM Lane LOS	B	B	A	A	A	A	B
HCM 95th-tile Q	0.7	0.7	0.1	0.1	0.1	0.1	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	50	98	151	43	63	115	1058	48	18	1328	113
Future Volume (vph)	144	50	98	151	43	63	115	1058	48	18	1328	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.95		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1517		1665	1649		1770	3465		1805	3471	1568
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1517		1665	1649		1770	3465		1805	3471	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	54	107	164	47	68	125	1150	52	20	1443	123
RTOR Reduction (vph)	0	65	0	0	39	0	0	3	0	0	0	57
Lane Group Flow (vph)	141	112	0	143	97	0	125	1199	0	20	1443	66
Confl. Peds. (#/hr)			46	46					46			
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	12.8	12.8		8.8	8.8		7.3	46.0		2.8	41.5	41.5
Effective Green, g (s)	13.0	13.0		9.0	9.0		7.0	46.9		2.5	42.4	42.4
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.08	0.54		0.03	0.49	0.49
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	247	225		171	169		141	1859		51	1683	760
v/s Ratio Prot	c0.08	0.07		c0.09	0.06		c0.07	0.35		0.01	c0.42	
v/s Ratio Perm												0.04
v/c Ratio	0.57	0.50		0.84	0.57		0.89	0.65		0.39	0.86	0.09
Uniform Delay, d1	34.6	34.2		38.5	37.4		39.8	14.4		41.7	19.8	12.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.4	2.1		29.3	5.5		43.5	1.0		4.9	4.9	0.1
Delay (s)	38.0	36.3		67.8	42.9		83.3	15.3		46.6	24.7	12.2
Level of Service	D	D		E	D		F	B		D	C	B
Approach Delay (s)		37.0			55.6			21.7			24.0	
Approach LOS		D			E			C			C	

Intersection Summary				
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	76.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	50	98	151	43	63	115	1058	48	18	1328	113
Future Volume (veh/h)	144	50	98	151	43	63	115	1058	48	18	1328	113
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.87	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845
Adj Flow Rate, veh/h	157	54	107	140	81	68	125	1150	52	20	1443	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3
Cap, veh/h	282	84	166	190	96	81	149	1744	79	50	1578	713
Arrive On Green	0.16	0.16	0.16	0.11	0.11	0.11	0.08	0.51	0.50	0.03	0.45	0.00
Sat Flow, veh/h	1757	524	1038	1757	886	743	1774	3412	154	1810	3471	1568
Grp Volume(v), veh/h	157	0	161	140	0	149	125	591	611	20	1443	0
Grp Sat Flow(s),veh/h/ln	1757	0	1561	1757	0	1629	1774	1755	1811	1810	1736	1568
Q Serve(g_s), s	6.8	0.0	8.0	6.4	0.0	7.5	5.8	20.6	20.7	0.9	32.3	0.0
Cycle Q Clear(g_c), s	6.8	0.0	8.0	6.4	0.0	7.5	5.8	20.6	20.7	0.9	32.3	0.0
Prop In Lane	1.00		0.66	1.00		0.46	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	282	0	250	190	0	176	149	897	926	50	1578	713
V/C Ratio(X)	0.56	0.00	0.64	0.74	0.00	0.84	0.84	0.66	0.66	0.40	0.91	0.00
Avail Cap(c_a), veh/h	380	0	338	190	0	176	149	897	926	152	1671	755
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.2	0.0	32.7	35.9	0.0	36.4	37.5	15.0	15.0	39.7	21.2	0.0
Incr Delay (d2), s/veh	2.1	0.0	3.3	14.9	0.0	30.4	32.0	2.2	2.1	5.1	8.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	3.7	3.9	0.0	4.8	4.1	10.4	10.7	0.5	17.1	0.0
LnGrp Delay(d),s/veh	34.2	0.0	36.0	50.8	0.0	66.8	69.5	17.2	17.1	44.9	29.5	0.0
LnGrp LOS	C		D	D		E	E	B	B	D	C	
Approach Vol, veh/h		318			289			1327			1463	
Approach Delay, s/veh		35.2			59.0			22.1			29.7	
Approach LOS		D			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		17.3	11.0	41.8		13.0	6.3	46.5
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 18	7.3	39.1		8.8	7.3	39.1
Max Q Clear Time (g_c+I1), s		10.0	7.8	34.3		9.5	2.9	22.7
Green Ext Time (p_c), s		1.0	0.0	2.6		0.0	0.0	15.6

Intersection Summary			
HCM 2010 Ctrl Delay	29.7		
HCM 2010 LOS	C		

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	382	4	24	34	14	44	35	1210	16	71	1587	774
Future Volume (vph)	382	4	24	34	14	44	35	1210	16	71	1587	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	26	37	15	48	38	1330	18	78	1744	851
RTOR Reduction (vph)	0	22	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	26	26	3	38	1347	0	78	1744	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.6	52.7		6.2	54.8	99.3
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.3	53.6		6.4	55.7	99.3
Actuated g/C Ratio	0.16	0.16		0.07	0.07	0.07	0.04	0.54		0.06	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	560	249		122	121	113	75	1906		105	1946	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.38		0.05	c0.50	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.75	0.03		0.21	0.21	0.03	0.51	0.71		0.74	0.90	0.54
Uniform Delay, d1	39.6	35.0		43.5	43.5	42.9	46.5	17.0		45.6	19.2	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.3	0.1		1.5	1.5	0.2	5.3	1.5		24.4	6.3	1.3
Delay (s)	45.9	35.1		45.0	45.0	43.1	51.8	18.5		70.0	25.5	1.3
Level of Service	D	D		D	D	D	D	B		E	C	A
Approach Delay (s)		45.2			44.1			19.4			19.1	
Approach LOS		D			D			B			B	

Intersection Summary					
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.88				
Actuated Cycle Length (s)	99.3	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	78.1%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	0	8	0	0	0	2	210	2	8	329	71
Future Vol, veh/h	20	0	8	0	0	0	2	210	2	8	329	71
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	23	0	9	0	0	0	2	241	2	9	378	82

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	568	691	236	460	731	128	463	0	0	247	0	0
Stage 1	440	440	-	250	250	-	-	-	-	-	-	-
Stage 2	128	251	-	210	481	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	389	370	700	489	351	905	1109	-	-	1331	-	-
Stage 1	545	581	-	738	704	-	-	-	-	-	-	-
Stage 2	840	703	-	778	557	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	384	364	697	476	345	900	1106	-	-	1328	-	-
Mov Cap-2 Maneuver	384	364	-	476	345	-	-	-	-	-	-	-
Stage 1	543	574	-	735	701	-	-	-	-	-	-	-
Stage 2	836	700	-	759	551	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	0	0.1	0.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1106	-	-	441	-	1328	-	-
HCM Lane V/C Ratio	0.002	-	-	0.073	-	0.007	-	-
HCM Control Delay (s)	8.3	0	-	13.8	0	7.7	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	-	0	-	-

Intersection

Int Delay, s/veh 2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	124	233	17	3	301	11	18	2	4	1	2	62
Future Vol, veh/h	124	233	17	3	301	11	18	2	4	1	2	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	143	268	20	3	346	13	21	2	5	1	2	71

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	359	0	0	287	0	0	744	929	144	779	931	179
Stage 1	-	-	-	-	-	-	563	563	-	359	359	-
Stage 2	-	-	-	-	-	-	181	366	-	420	572	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1175	-	-	1287	-	-	307	270	884	289	269	809
Stage 1	-	-	-	-	-	-	483	512	-	637	631	-
Stage 2	-	-	-	-	-	-	809	626	-	587	508	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1175	-	-	1287	-	-	252	237	884	258	236	809
Mov Cap-2 Maneuver	-	-	-	-	-	-	252	237	-	258	236	-
Stage 1	-	-	-	-	-	-	424	450	-	559	630	-
Stage 2	-	-	-	-	-	-	733	625	-	510	446	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.8	0.1	19	10.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	284	1175	-	-	1287	-	-	730
HCM Lane V/C Ratio	0.097	0.121	-	-	0.003	-	-	0.102
HCM Control Delay (s)	19	8.5	-	-	7.8	-	-	10.5
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.4	-	-	0	-	-	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	577	114	19	815	77	17
Future Volume (vph)	577	114	19	815	77	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1761	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1761	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	607	120	20	858	81	18
RTOR Reduction (vph)	0	58	0	0	15	0
Lane Group Flow (vph)	607	63	20	858	84	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	25.0	25.0	0.7	29.9	7.2	
Effective Green, g (s)	25.0	25.0	0.7	29.9	7.2	
Actuated g/C Ratio	0.52	0.52	0.01	0.62	0.15	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	960	808	26	1171	264	
v/s Ratio Prot	0.33		0.01	c0.46	c0.05	
v/s Ratio Perm		0.04				
v/c Ratio	0.63	0.08	0.77	0.73	0.32	
Uniform Delay, d1	8.2	5.7	23.6	6.3	18.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.1	75.0	2.5	0.3	
Delay (s)	9.7	5.8	98.6	8.8	18.5	
Level of Service	A	A	F	A	B	
Approach Delay (s)	9.0			10.8	18.5	
Approach LOS	A			B	B	

Intersection Summary				
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	48.0	Sum of lost time (s)	15.1	
Intersection Capacity Utilization	57.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	577	114	19	815	77	17
Future Volume (veh/h)	577	114	19	815	77	17
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1879	1900
Adj Flow Rate, veh/h	607	120	20	858	81	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	4	0	1	0	0
Cap, veh/h	899	757	36	1139	248	0
Arrive On Green	0.49	0.49	0.02	0.61	0.14	0.00
Sat Flow, veh/h	1845	1553	1810	1881	1769	0
Grp Volume(v), veh/h	607	120	20	858	82	0
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1791	0
Q Serve(g_s), s	10.8	1.8	0.5	14.2	1.8	0.0
Cycle Q Clear(g_c), s	10.8	1.8	0.5	14.2	1.8	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	899	757	36	1139	251	0
V/C Ratio(X)	0.68	0.16	0.56	0.75	0.33	0.00
Avail Cap(c_a), veh/h	987	831	169	1367	753	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.4	6.1	20.8	6.1	16.6	0.0
Incr Delay (d2), s/veh	1.8	0.1	5.0	2.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	0.8	0.3	7.8	0.9	0.0
LnGrp Delay(d),s/veh	10.2	6.2	25.8	8.3	16.9	0.0
LnGrp LOS	B	A	C	A	B	
Approach Vol, veh/h	727			878	82	
Approach Delay, s/veh	9.5			8.7	16.9	
Approach LOS	A			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.0	27.3				32.3		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	22.9				31.1		18.0
Max Q Clear Time (g_c+I1), s	2.5	12.8				16.2		3.8
Green Ext Time (p_c), s	0.0	7.2				9.7		0.1

Intersection Summary		
HCM 2010 Ctrl Delay	9.5	
HCM 2010 LOS	A	

Notes

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	493	28	29	855	5	11	1	13	6	0	2
Future Vol, veh/h	8	493	28	29	855	5	11	1	13	6	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	9	542	31	32	940	5	12	1	14	7	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	945	0	0	542	0	0	1565	1568	542	1566	1565	942
Stage 1	-	-	-	-	-	-	559	559	-	1006	1006	-
Stage 2	-	-	-	-	-	-	1006	1009	-	560	559	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	7.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.9	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	734	-	-	1022	-	-	91	68	544	91	113	322
Stage 1	-	-	-	-	-	-	517	382	-	293	321	-
Stage 2	-	-	-	-	-	-	293	219	-	516	514	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	734	-	-	1022	-	-	87	65	544	85	108	322
Mov Cap-2 Maneuver	-	-	-	-	-	-	87	65	-	85	108	-
Stage 1	-	-	-	-	-	-	511	377	-	289	311	-
Stage 2	-	-	-	-	-	-	282	212	-	495	508	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	32.5	42.3
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	85	544	734	-	-	1022	-	-	85	322
HCM Lane V/C Ratio	0.155	0.026	0.012	-	-	0.031	-	-	0.078	0.007
HCM Control Delay (s)	55	11.8	10	-	-	8.6	-	-	50.9	16.3
HCM Lane LOS	F	B	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.5	0.1	0	-	-	0.1	-	-	0.2	0

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	0	1	292	403	39
Future Vol, veh/h	37	0	1	292	403	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	42	0	1	328	453	44

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	783	453	453	0	-	0
Stage 1	453	-	-	-	-	-
Stage 2	330	-	-	-	-	-
Critical Hdwy	6.43	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	361	611	1118	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	726	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	361	611	1118	-	-	-
Mov Cap-2 Maneuver	361	-	-	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	725	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1118	-	361	-	-
HCM Lane V/C Ratio	0.001	-	0.115	-	-
HCM Control Delay (s)	8.2	0	16.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection

Int Delay, s/veh 2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	93	313	20	22	412
Future Vol, veh/h	14	93	313	20	22	412
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	18	122	412	26	29	542

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1039	439	0	0	445	0
Stage 1	432	-	-	-	-	-
Stage 2	607	-	-	-	-	-
Critical Hdwy	6.4	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	258	620	-	-	1126	-
Stage 1	659	-	-	-	-	-
Stage 2	548	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	246	613	-	-	1119	-
Mov Cap-2 Maneuver	246	-	-	-	-	-
Stage 1	655	-	-	-	-	-
Stage 2	525	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	513	1119	-
HCM Lane V/C Ratio	-	-	0.274	0.026	-
HCM Control Delay (s)	-	-	14.7	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	155	173	226	259	21
Future Vol, veh/h	17	155	173	226	259	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	209	234	305	350	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1131	358	354	0	-	0
Stage 1	354	-	-	-	-	-
Stage 2	777	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	227	684	1194	-	-	-
Stage 1	715	-	-	-	-	-
Stage 2	457	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	181	679	1190	-	-	-
Mov Cap-2 Maneuver	181	-	-	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	366	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.8	3.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1190	-	534	-	-
HCM Lane V/C Ratio	0.196	-	0.435	-	-
HCM Control Delay (s)	8.8	-	16.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.7	-	2.2	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	115	125	112	164	92
Future Vol, veh/h	28	115	125	112	164	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	137	149	133	195	110

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	692	264	312	0	-	0
Stage 1	257	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Critical Hdwy	6.44	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	407	775	1248	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	648	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	354	766	1241	-	-	-
Mov Cap-2 Maneuver	354	-	-	-	-	-
Stage 1	776	-	-	-	-	-
Stage 2	567	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	4.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1241	-	624	-	-
HCM Lane V/C Ratio	0.12	-	0.273	-	-
HCM Control Delay (s)	8.3	-	12.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	1	0	67	0	4	0	0	0	66	76	1
Future Vol, veh/h	0	1	0	67	0	4	0	0	0	66	76	1
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0
Mvmt Flow	0	1	0	86	0	5	0	0	0	85	97	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.8	8.2	9.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	46%	1%	100%	0%
Vol Thru, %	53%	0%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	143	68	4	189
LT Vol	66	1	4	0
Through Vol	76	0	0	189
RT Vol	1	67	0	0
Lane Flow Rate	183	87	5	242
Geometry Grp	1	1	1	1
Degree of Util (X)	0.237	0.104	0.007	0.29
Departure Headway (Hd)	4.647	4.277	5.174	4.308
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	774	839	692	836
Service Time	2.666	2.3	3.205	2.326
HCM Lane V/C Ratio	0.236	0.104	0.007	0.289
HCM Control Delay	9.1	7.8	8.2	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.3	0	1.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	189	0
Future Vol, veh/h	0	0	189	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	242	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.1
HCM LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱↱	↑	↱	↰↰	↑
Traffic Volume (vph)	0	849	714	117	863	563
Future Volume (vph)	0	849	714	117	863	563
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2814	1845	1538	3433	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2814	1845	1538	3433	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	875	736	121	890	580
RTOR Reduction (vph)	0	194	0	13	0	0
Lane Group Flow (vph)	0	681	736	108	890	580
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		15.4	22.3	22.3	15.4	47.5
Effective Green, g (s)		16.3	23.2	23.2	16.3	47.5
Actuated g/C Ratio		0.34	0.49	0.49	0.34	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		965	901	751	1178	1881
v/s Ratio Prot		0.24	c0.40		c0.26	0.31
v/s Ratio Perm				0.07		
v/c Ratio		0.71	0.82	0.14	0.76	0.31
Uniform Delay, d1		13.5	10.3	6.7	13.8	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.7	6.0	0.1	3.2	0.4
Delay (s)		16.2	16.3	6.8	17.0	0.4
Level of Service		B	B	A	B	A
Approach Delay (s)	16.2		15.0			10.5
Approach LOS	B		B			B

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	47.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

Existing PM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	720	234	349	584	5	258	21	517	6	8	7
Future Volume (vph)	26	720	234	349	584	5	258	21	517	6	8	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1732	1590		1733	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1732	1590		1733	1580
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	783	254	379	635	5	280	23	562	7	9	8
RTOR Reduction (vph)	0	0	164	0	1	0	0	0	82	0	0	8
Lane Group Flow (vph)	28	783	90	379	639	0	151	152	480	0	16	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.6	20.5	20.5	10.0	28.9		8.8	8.8	18.8		0.9	0.9
Effective Green, g (s)	2.1	21.5	21.5	10.6	29.9		10.6	10.6	20.0		1.9	1.9
Actuated g/C Ratio	0.03	0.35	0.35	0.17	0.49		0.17	0.17	0.33		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	62	1255	572	606	1761		299	302	524		54	49
v/s Ratio Prot	0.02	c0.22		0.11	0.18		0.09	0.09	c0.16		c0.01	
v/s Ratio Perm			0.06						0.14			0.00
v/c Ratio	0.45	0.62	0.16	0.63	0.36		0.51	0.50	0.92		0.30	0.01
Uniform Delay, d1	28.7	16.2	13.4	23.2	9.5		22.6	22.6	19.5		28.7	28.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.7	0.0	1.5	0.0		0.5	0.5	20.5		1.1	0.0
Delay (s)	30.6	16.9	13.4	24.6	9.5		23.1	23.1	40.0		29.8	28.4
Level of Service	C	B	B	C	A		C	C	D		C	C
Approach Delay (s)		16.4			15.1			34.1			29.4	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	16.1	
Intersection Capacity Utilization	65.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 Signalized Intersection Summary

Existing PM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	720	234	349	584	5	258	21	517	6	8	7
Future Volume (veh/h)	26	720	234	349	584	5	258	21	517	6	8	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1900	1881	1900	1771	1900
Adj Flow Rate, veh/h	28	783	254	379	635	5	296	0	562	7	9	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	55	967	441	489	1390	11	1250	0	751	22	28	46
Arrive On Green	0.03	0.27	0.27	0.14	0.38	0.37	0.35	0.00	0.33	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3635	29	3619	0	1598	758	975	1591
Grp Volume(v), veh/h	28	783	254	379	312	328	296	0	562	16	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1876	1810	0	1598	1733	0	1591
Q Serve(g_s), s	1.2	15.6	10.3	7.9	9.9	9.9	4.4	0.0	21.7	0.7	0.0	0.4
Cycle Q Clear(g_c), s	1.2	15.6	10.3	7.9	9.9	9.9	4.4	0.0	21.7	0.7	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.44		1.00
Lane Grp Cap(c), veh/h	55	967	441	489	683	717	1250	0	751	50	0	46
V/C Ratio(X)	0.51	0.81	0.58	0.77	0.46	0.46	0.24	0.00	0.75	0.32	0.00	0.17
Avail Cap(c_a), veh/h	134	1087	495	598	722	758	1619	0	914	92	0	84
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.1	25.6	23.7	31.3	17.5	17.5	17.6	0.0	16.4	35.9	0.0	35.8
Incr Delay (d2), s/veh	2.7	3.7	0.6	4.0	0.2	0.2	0.0	0.0	2.0	1.3	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.1	4.7	4.1	4.9	5.1	2.2	0.0	9.9	0.3	0.0	0.2
LnGrp Delay(d),s/veh	38.8	29.3	24.3	35.3	17.6	17.6	17.7	0.0	18.4	37.3	0.0	36.5
LnGrp LOS	D	C	C	D	B	B	B		B	D		D
Approach Vol, veh/h		1065			1019			858			24	
Approach Delay, s/veh		28.4			24.2			18.1			37.0	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.4	32.9		30.1	14.6	24.6		6.2
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	22.2		3.0
Max Q Clear Time (g_c+I1), s	3.2	11.9		23.7	9.9	17.6		2.7
Green Ext Time (p_c), s	0.0	3.7		0.5	0.1	2.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	24.0
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	113	335	70	12	134	372	291	78	427	178	193	309
Future Volume (vph)	113	335	70	12	134	372	291	78	427	178	193	309
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3457			1744	1863	1560	1805	1827	1556	3502	1832
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3457			656	1863	1560	1805	1827	1556	3502	1832
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	116	345	72	12	138	384	300	80	440	184	199	319
RTOR Reduction (vph)	0	21	0	0	0	0	214	0	0	128	0	8
Lane Group Flow (vph)	116	396	0	0	150	384	86	80	440	56	199	374
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.4	20.2			11.5	23.3	23.3	6.1	24.1	24.1	9.3	27.3
Effective Green, g (s)	8.1	20.4			11.2	23.5	23.5	5.8	25.0	25.0	9.0	28.2
Actuated g/C Ratio	0.10	0.25			0.14	0.29	0.29	0.07	0.31	0.31	0.11	0.35
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	173	864			90	536	449	128	559	476	386	633
v/s Ratio Prot	0.07	0.11				c0.21		0.04	c0.24		c0.06	c0.20
v/s Ratio Perm					c0.23		0.06			0.04		
v/c Ratio	0.67	0.46			1.67	0.72	0.19	0.62	0.79	0.12	0.52	0.59
Uniform Delay, d1	35.5	25.9			35.2	26.1	21.9	36.8	25.9	20.4	34.2	22.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.8	0.5			343.6	4.7	0.2	9.2	7.4	0.1	1.2	1.6
Delay (s)	45.2	26.4			378.8	30.8	22.1	46.0	33.3	20.5	35.4	23.5
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		30.5				90.3			31.4			27.6
Approach LOS		C				F			C			C

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	48.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	81.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing PM.syn
12/01/2017

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 11-30-17\Existing PM.syn

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	71	388	113	120	419	315	130
Future Volume (vph)	71	388	113	120	419	315	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3423		1770	3574	3467	1552
Flt Permitted	0.91	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1727	3423		1770	3574	3467	1552
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	76	417	122	129	451	339	140
RTOR Reduction (vph)	0	44	0	0	0	0	114
Lane Group Flow (vph)	76	495	0	129	451	339	26
Confl. Peds. (#/hr)			3	5		3	5
Heavy Vehicles (%)	0%	2%	0%	2%	1%	1%	2%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.9	22.8		6.5	24.4	9.2	9.2
Effective Green, g (s)	4.4	22.8		6.0	24.4	9.2	9.2
Actuated g/C Ratio	0.09	0.46		0.12	0.49	0.18	0.18
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	151	1560		212	1744	637	285
v/s Ratio Prot		c0.14		c0.07	0.13	c0.10	
v/s Ratio Perm	0.04						0.02
v/c Ratio	0.50	0.32		0.61	0.26	0.53	0.09
Uniform Delay, d1	21.8	8.7		20.9	7.5	18.5	16.9
Progression Factor	1.00	1.00		1.29	0.77	1.00	1.00
Incremental Delay, d2	1.0	0.5		3.3	0.4	0.4	0.1
Delay (s)	22.7	9.2		30.3	6.2	18.9	17.0
Level of Service	C	A		C	A	B	B
Approach Delay (s)		10.9			11.5	18.3	
Approach LOS		B			B	B	

Intersection Summary				
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	40.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	460	58	106	436	0	103	0	92	0	0	0
Future Volume (vph)	0	460	58	106	436	0	103	0	92	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.98			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3468		1752	3574			1749	1546			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3468		1752	3574			1394	1546			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	517	65	119	490	0	116	0	103	0	0	0
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	87	0	0	0
Lane Group Flow (vph)	0	567	0	119	490	0	0	116	16	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6		6	2		2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		24.7		6.2	34.4			7.6	7.6			
Effective Green, g (s)		24.7		5.7	34.4			7.6	7.6			
Actuated g/C Ratio		0.49		0.11	0.69			0.15	0.15			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		1713		199	2458			211	234			
v/s Ratio Prot		c0.16		c0.07	0.14							
v/s Ratio Perm								c0.08	0.01			
v/c Ratio		0.33		0.60	0.20			0.55	0.07			
Uniform Delay, d1		7.7		21.1	2.8			19.6	18.2			
Progression Factor		0.44		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.5		3.2	0.2			1.6	0.0			
Delay (s)		3.8		24.3	3.0			21.2	18.2			
Level of Service		A		C	A			C	B			
Approach Delay (s)		3.8			7.2			19.8			0.0	
Approach LOS		A			A			B			A	

Intersection Summary				
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center Pl & Rio Rd

Existing PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	460	58	106	436	0	103	0	92	0	0	0
Future Volume (veh/h)	0	460	58	106	436	0	103	0	92	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	517	65	119	490	0	116	0	103	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	1778	223	135	2569	0	314	0	189	0	231	0
Arrive On Green	0.00	1.00	1.00	0.08	0.72	0.00	0.12	0.00	0.12	0.00	0.00	0.00
Sat Flow, veh/h	0	3257	396	1757	3668	0	1405	0	1560	0	1900	0
Grp Volume(v), veh/h	0	288	294	119	490	0	116	0	103	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1790	1757	1787	0	1405	0	1560	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	3.4	2.2	0.0	4.0	0.0	3.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.4	2.2	0.0	4.0	0.0	3.1	0.0	0.0	0.0
Prop In Lane	0.00		0.22	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	995	1006	135	2569	0	314	0	189	0	231	0
V/C Ratio(X)	0.00	0.29	0.29	0.88	0.19	0.00	0.37	0.00	0.54	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	995	1006	211	2569	0	594	0	499	0	608	0
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.95	0.95	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	22.9	2.3	0.0	21.0	0.0	20.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.7	15.5	0.2	0.0	0.3	0.0	0.9	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	2.2	1.1	0.0	1.5	0.0	1.4	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.7	0.7	38.4	2.5	0.0	21.3	0.0	21.6	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		582			609			219			0	
Approach Delay, s/veh		0.7			9.5			21.4			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	7.8	32.1		10.1		39.9		10.1
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	6.5	16.0		16.0		26.0		16.0
Max Q Clear Time (g_c+I1), s	5.4	2.0		0.0		4.2		6.0
Green Ext Time (p_c), s	0.0	6.7		0.0		8.5		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	7.7
HCM 2010 LOS	A

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Existing PM.syn
12/12/2017

Intersection	
Intersection Delay, s/veh	15.1
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	394	22	0	24	14	6	23	388
Future Vol, veh/h	0	394	22	0	24	14	6	23	388
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2	0	0	0	0	2
Mvmt Flow	0	443	25	0	27	16	7	26	436
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	13.5	9.9	17.1
HCM LOS	B	A	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	197	197	22	24	14	29	388
LT Vol	197	197	0	0	0	29	0
Through Vol	0	0	22	24	0	0	0
RT Vol	0	0	0	0	14	0	388
Lane Flow Rate	221	221	25	27	16	33	436
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.407	0.405	0.03	0.053	0.028	0.06	0.651
Departure Headway (Hd)	6.621	6.587	4.358	7.103	6.386	6.574	5.374
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	545	547	820	503	559	545	671
Service Time	4.354	4.32	2.091	4.86	4.142	4.313	3.112
HCM Lane V/C Ratio	0.406	0.404	0.03	0.054	0.029	0.061	0.65
HCM Control Delay	13.8	13.8	7.2	10.3	9.3	9.7	17.6
HCM Lane LOS	B	B	A	B	A	A	C
HCM 95th-tile Q	2	1.9	0.1	0.2	0.1	0.2	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	0	146	62	20	26	160	1361	4	17	1258	205
Future Volume (vph)	219	0	146	62	20	26	160	1361	4	17	1258	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1472		1715	1662		1805	3572		1805	3574	1583
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1472		1715	1662		1805	3572		1805	3574	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	0	151	64	21	27	165	1403	4	18	1297	211
RTOR Reduction (vph)	0	124	0	0	25	0	0	0	0	0	0	118
Lane Group Flow (vph)	197	56	0	57	30	0	165	1407	0	18	1297	93
Confl. Peds. (#/hr)			7	7			7		7			
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	13.7	13.7		5.3	5.3		8.4	40.6		1.4	33.6	33.6
Effective Green, g (s)	13.9	13.9		5.5	5.5		8.1	41.5		1.1	34.5	34.5
Actuated g/C Ratio	0.18	0.18		0.07	0.07		0.10	0.53		0.01	0.44	0.44
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	302	262		120	117		187	1900		25	1580	700
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.09	0.39		0.01	c0.36	
v/s Ratio Perm												0.06
v/c Ratio	0.65	0.21		0.47	0.26		0.88	0.74		0.72	0.82	0.13
Uniform Delay, d1	29.8	27.4		34.9	34.3		34.5	14.1		38.3	19.0	12.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.2	0.5		4.0	1.6		35.1	1.8		67.0	3.9	0.2
Delay (s)	35.0	27.9		38.9	35.9		69.6	15.9		105.3	22.9	13.0
Level of Service	C	C		D	D		E	B		F	C	B
Approach Delay (s)		31.6			37.4			21.5			22.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	0	146	62	20	26	160	1361	4	17	1258	205
Future Volume (veh/h)	219	0	146	62	20	26	160	1361	4	17	1258	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1821	1900	1900	1900	1900	1900	1881	1900	1900	1881	1863
Adj Flow Rate, veh/h	188	52	151	56	32	27	165	1403	4	18	1297	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	1	0	1	2
Cap, veh/h	308	70	204	164	85	72	197	1789	5	46	1450	642
Arrive On Green	0.17	0.17	0.17	0.09	0.09	0.09	0.11	0.49	0.48	0.03	0.41	0.00
Sat Flow, veh/h	1792	408	1186	1810	943	796	1810	3656	10	1810	3574	1583
Grp Volume(v), veh/h	188	0	203	56	0	59	165	686	721	18	1297	0
Grp Sat Flow(s),veh/h/ln	1792	0	1594	1810	0	1739	1810	1787	1879	1810	1787	1583
Q Serve(g_s), s	7.0	0.0	8.7	2.1	0.0	2.3	6.4	22.8	22.8	0.7	24.3	0.0
Cycle Q Clear(g_c), s	7.0	0.0	8.7	2.1	0.0	2.3	6.4	22.8	22.8	0.7	24.3	0.0
Prop In Lane	1.00		0.74	1.00		0.46	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	308	0	274	164	0	157	197	874	919	46	1450	642
V/C Ratio(X)	0.61	0.00	0.74	0.34	0.00	0.37	0.84	0.78	0.78	0.39	0.89	0.00
Avail Cap(c_a), veh/h	435	0	387	182	0	175	202	874	919	177	1565	693
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.5	0.0	28.3	30.6	0.0	30.8	31.3	15.2	15.2	34.4	19.9	0.0
Incr Delay (d2), s/veh	2.4	0.0	5.3	1.7	0.0	2.1	25.2	5.2	4.9	5.4	7.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.2	1.1	0.0	1.2	4.6	12.3	12.9	0.4	13.3	0.0
LnGrp Delay(d),s/veh	29.8	0.0	33.6	32.4	0.0	32.8	56.5	20.4	20.1	39.9	27.0	0.0
LnGrp LOS	C		C	C		C	E	C	C	D	C	
Approach Vol, veh/h		391			115			1572			1315	
Approach Delay, s/veh		31.8			32.6			24.0			27.2	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		16.3	11.8	33.1		10.5	5.8	39.1
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 17	8.3	30.5		7.0	7.3	31.5
Max Q Clear Time (g_c+I1), s		10.7	8.4	26.3		4.3	2.7	24.8
Green Ext Time (p_c), s		1.2	0.0	1.9		0.1	0.0	6.5

Intersection Summary	
HCM 2010 Ctrl Delay	26.5
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	869	18	21	17	6	54	6	1636	17	55	1428	493
Future Volume (vph)	869	18	21	17	6	54	6	1636	17	55	1428	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1747		1715	1761	1524	1805	3530		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1747		1715	1761	1524	1805	3530		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	21	17	6	55	6	1669	17	56	1457	503
RTOR Reduction (vph)	0	15	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	24	0	11	12	3	6	1686	0	56	1457	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	38.6	38.6		6.6	6.6	6.6	1.5	71.6		6.2	76.8	140.9
Effective Green, g (s)	39.2	39.2		6.8	6.8	6.8	1.2	72.5		6.4	77.7	140.9
Actuated g/C Ratio	0.28	0.28		0.05	0.05	0.05	0.01	0.51		0.05	0.55	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	964	486		82	84	73	15	1816		81	1970	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.00	c0.48		c0.03	0.41	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.92	0.05		0.13	0.14	0.04	0.40	0.93		0.69	0.74	0.31
Uniform Delay, d1	49.3	37.2		64.2	64.3	63.9	69.5	31.8		66.3	23.9	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.0	0.1		1.3	1.4	0.4	16.6	9.2		22.5	1.8	0.5
Delay (s)	63.3	37.3		65.5	65.6	64.3	86.1	41.0		88.7	25.8	0.5
Level of Service	E	D		E	E	E	F	D		F	C	A
Approach Delay (s)		62.2			64.7			41.1			21.2	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	102	1	12	4	0	4	6	406	0	1	399	40
Future Vol, veh/h	102	1	12	4	0	4	6	406	0	1	399	40
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	112	1	13	4	0	4	7	446	0	1	438	44

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	715	935	257	694	957	236	490	0	0	451	0	0
Stage 1	471	471	-	464	464	-	-	-	-	-	-	-
Stage 2	244	464	-	230	493	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	318	267	724	333	260	772	1084	-	-	1120	-	-
Stage 1	542	563	-	553	567	-	-	-	-	-	-	-
Stage 2	738	567	-	758	550	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	310	261	714	320	255	764	1077	-	-	1113	-	-
Mov Cap-2 Maneuver	310	261	-	320	255	-	-	-	-	-	-	-
Stage 1	534	559	-	546	560	-	-	-	-	-	-	-
Stage 2	722	560	-	737	546	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.6	13.1	0.1	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1077	-	-	329	451	1113	-	-
HCM Lane V/C Ratio	0.006	-	-	0.384	0.019	0.001	-	-
HCM Control Delay (s)	8.4	0	-	22.6	13.1	8.2	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.8	0.1	0	-	-

Intersection

Int Delay, s/veh 3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	148	406	16	6	377	29	10	6	4	6	3	155
Future Vol, veh/h	148	406	16	6	377	29	10	6	4	6	3	155
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	157	432	17	6	401	31	11	6	4	6	3	165

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	436	0	0	466	0	0	1000	1221	258	984	1214	233
Stage 1	-	-	-	-	-	-	772	772	-	433	433	-
Stage 2	-	-	-	-	-	-	228	449	-	551	781	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1127	-	-	1106	-	-	200	181	747	206	183	769
Stage 1	-	-	-	-	-	-	363	412	-	577	585	-
Stage 2	-	-	-	-	-	-	760	576	-	491	408	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1115	-	-	1090	-	-	133	152	726	173	154	758
Mov Cap-2 Maneuver	-	-	-	-	-	-	133	152	-	173	154	-
Stage 1	-	-	-	-	-	-	307	349	-	494	580	-
Stage 2	-	-	-	-	-	-	582	571	-	406	346	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.1	29.9	12.8
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	166	1115	-	-	1090	-	-	634
HCM Lane V/C Ratio	0.128	0.141	-	-	0.006	-	-	0.275
HCM Control Delay (s)	29.9	8.8	-	-	8.3	-	-	12.8
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0.5	-	-	0	-	-	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	861	107	10	516	134	30
Future Volume (vph)	861	107	10	516	134	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1752	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1752	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	926	115	11	555	144	32
RTOR Reduction (vph)	0	48	0	0	11	0
Lane Group Flow (vph)	926	67	11	555	165	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	36.1	36.1	0.6	40.9	10.5	
Effective Green, g (s)	36.1	36.1	0.6	40.9	10.5	
Actuated g/C Ratio	0.58	0.58	0.01	0.66	0.17	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1089	907	17	1223	295	
v/s Ratio Prot	c0.49		0.01	c0.30	c0.09	
v/s Ratio Perm		0.04				
v/c Ratio	0.85	0.07	0.65	0.45	0.56	
Uniform Delay, d1	10.9	5.8	30.7	5.2	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.7	0.0	49.2	0.3	1.3	
Delay (s)	17.5	5.8	79.9	5.6	25.1	
Level of Service	B	A	E	A	C	
Approach Delay (s)	16.2			7.0	25.1	
Approach LOS	B			A	C	

Intersection Summary

HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	15.1
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	861	107	10	516	134	30
Future Volume (veh/h)	861	107	10	516	134	30
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1869	1900
Adj Flow Rate, veh/h	926	115	11	555	144	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	0	2	0	0
Cap, veh/h	1154	961	20	1298	204	0
Arrive On Green	0.61	0.61	0.01	0.70	0.12	0.00
Sat Flow, veh/h	1881	1566	1810	1863	1769	0
Grp Volume(v), veh/h	926	115	11	555	145	0
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1781	0
Q Serve(g_s), s	21.8	1.8	0.4	7.5	4.6	0.0
Cycle Q Clear(g_c), s	21.8	1.8	0.4	7.5	4.6	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1154	961	20	1298	205	0
V/C Ratio(X)	0.80	0.12	0.54	0.43	0.71	0.00
Avail Cap(c_a), veh/h	1390	1158	125	1640	552	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.5	4.7	28.5	3.8	24.7	0.0
Incr Delay (d2), s/veh	3.1	0.1	8.1	0.3	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.1	0.8	0.2	3.8	2.3	0.0
LnGrp Delay(d),s/veh	11.7	4.7	36.7	4.1	26.4	0.0
LnGrp LOS	B	A	D	A	C	
Approach Vol, veh/h	1041			566	145	
Approach Delay, s/veh	10.9			4.7	26.4	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	4.9	42.0				46.9		11.2
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	42.9				51.1		18.0
Max Q Clear Time (g_c+I1), s	2.4	23.8				9.5		6.6
Green Ext Time (p_c), s	0.0	11.8				18.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.2
HCM 2010 LOS	B

Notes

Intersection

Int Delay, s/veh 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	854	24	16	478	9	24	1	28	8	2	12
Future Vol, veh/h	3	854	24	16	478	9	24	1	28	8	2	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	3	960	27	18	537	10	27	1	31	9	2	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	547	0	0	960	0	0	1545	1549	960	1545	1544	542
Stage 1	-	-	-	-	-	-	966	966	-	578	578	-
Stage 2	-	-	-	-	-	-	579	583	-	967	966	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1033	-	-	725	-	-	94	115	314	94	116	544
Stage 1	-	-	-	-	-	-	309	336	-	505	504	-
Stage 2	-	-	-	-	-	-	504	502	-	308	336	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1033	-	-	725	-	-	88	112	314	82	113	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	88	112	-	82	113	-
Stage 1	-	-	-	-	-	-	308	335	-	504	491	-
Stage 2	-	-	-	-	-	-	477	490	-	275	335	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	39.1	30.3
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	89	314	1033	-	-	725	-	-	87	544
HCM Lane V/C Ratio	0.316	0.1	0.003	-	-	0.025	-	-	0.129	0.025
HCM Control Delay (s)	63.1	17.7	8.5	-	-	10.1	-	-	52.4	11.8
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	1.2	0.3	0	-	-	0.1	-	-	0.4	0.1

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	1	7	646	476	37
Future Vol, veh/h	37	1	7	646	476	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	39	1	7	680	501	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1196	501	501	0	-	0
Stage 1	501	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	208	574	1074	-	-	-
Stage 1	613	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	206	574	1074	-	-	-
Mov Cap-2 Maneuver	206	-	-	-	-	-
Stage 1	613	-	-	-	-	-
Stage 2	494	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.1	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1074	-	210	-	-
HCM Lane V/C Ratio	0.007	-	0.19	-	-
HCM Control Delay (s)	8.4	0	26.1	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Intersection

Int Delay, s/veh 1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	58	408	36	30	442
Future Vol, veh/h	21	58	408	36	30	442
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	22	61	429	38	32	465

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	988	459	0	0	473	0
Stage 1	454	-	-	-	-	-
Stage 2	534	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	276	606	-	-	1099	-
Stage 1	644	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	263	600	-	-	1094	-
Mov Cap-2 Maneuver	263	-	-	-	-	-
Stage 1	641	-	-	-	-	-
Stage 2	566	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	448	1094	-
HCM Lane V/C Ratio	-	-	0.186	0.029	-
HCM Control Delay (s)	-	-	14.9	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	114	124	362	324	28
Future Vol, veh/h	14	114	124	362	324	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	125	136	398	356	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1034	364	360	0	-	0
Stage 1	360	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-	-
Pot Cap-1 Maneuver	259	683	1210	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	228	678	1206	-	-	-
Mov Cap-2 Maneuver	228	-	-	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	451	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.6	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1206	-	558	-	-
HCM Lane V/C Ratio	0.113	-	0.252	-	-
HCM Control Delay (s)	8.4	-	13.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1	-	-

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	128	101	275	218	17
Future Vol, veh/h	27	128	101	275	218	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	136	107	293	232	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	758	251	255	0	-	0
Stage 1	246	-	-	-	-	-
Stage 2	512	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	378	788	1316	-	-	-
Stage 1	800	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	344	781	1311	-	-	-
Mov Cap-2 Maneuver	344	-	-	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	554	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.6	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1311	-	639	-	-
HCM Lane V/C Ratio	0.082	-	0.258	-	-
HCM Control Delay (s)	8	-	12.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1	-	-

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	2	1	111	0	3	0	0	0	128	164	3
Future Vol, veh/h	0	2	1	111	0	3	0	0	0	128	164	3
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0
Mvmt Flow	0	2	1	122	0	3	0	0	0	141	180	3
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.2	8.4	10.4
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	43%	2%	100%	1%
Vol Thru, %	56%	1%	0%	99%
Vol Right, %	1%	97%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	295	114	3	127
LT Vol	128	2	3	1
Through Vol	164	1	0	126
RT Vol	3	111	0	0
Lane Flow Rate	324	125	3	140
Geometry Grp	1	1	1	1
Degree of Util (X)	0.4	0.152	0.005	0.176
Departure Headway (Hd)	4.44	4.371	5.317	4.541
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	810	821	672	790
Service Time	2.464	2.4	3.358	2.569
HCM Lane V/C Ratio	0.4	0.152	0.004	0.177
HCM Control Delay	10.4	8.2	8.4	8.5
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.9	0.5	0	0.6

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing PM.syn
12/01/2017

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	126	0
Future Vol, veh/h	0	1	126	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	138	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.5
HCM LOS	A

Synchro 9 Report
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	802	705	68	820	758
Future Volume (vph)	0	802	705	68	820	758
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	827	727	70	845	781
RTOR Reduction (vph)	0	201	0	16	0	0
Lane Group Flow (vph)	0	626	727	54	845	781
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		15.2	21.8	21.8	15.2	46.8
Effective Green, g (s)		16.1	22.7	22.7	16.1	46.8
Actuated g/C Ratio		0.34	0.49	0.49	0.34	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		977	912	783	1192	1881
v/s Ratio Prot		0.22	c0.39		c0.24	0.42
v/s Ratio Perm				0.03		
v/c Ratio		0.64	0.80	0.07	0.71	0.42
Uniform Delay, d1		12.9	10.1	6.4	13.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.8	5.0	0.0	2.2	0.7
Delay (s)		14.7	15.2	6.5	15.6	0.7
Level of Service		B	B	A	B	A
Approach Delay (s)	14.7		14.4			8.4
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	46.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	612	251	381	586	3	202	15	364	2	15	14
Future Volume (vph)	25	612	251	381	586	3	202	15	364	2	15	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00
Satd. Flow (prot)	1805	3574	1593	3467	3607		1698	1716	1575		1890	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00
Satd. Flow (perm)	1805	3574	1593	3467	3607		1698	1716	1575		1890	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	27	651	267	405	623	3	215	16	387	2	16	15
RTOR Reduction (vph)	0	0	174	0	0	0	0	0	105	0	0	14
Lane Group Flow (vph)	27	651	93	405	626	0	116	115	282	0	18	1
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.5	18.7	18.7	10.6	27.8		6.1	6.1	16.7		0.9	0.9
Effective Green, g (s)	2.0	19.7	19.7	11.2	28.8		7.9	7.9	17.9		1.9	1.9
Actuated g/C Ratio	0.04	0.35	0.35	0.20	0.51		0.14	0.14	0.32		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	63	1241	553	684	1832		236	239	497		63	54
v/s Ratio Prot	0.01	c0.18		c0.12	0.17		c0.07	0.07	0.11		c0.01	
v/s Ratio Perm			0.06						0.07			0.00
v/c Ratio	0.43	0.52	0.17	0.59	0.34		0.49	0.48	0.57		0.29	0.01
Uniform Delay, d1	26.8	14.8	12.8	20.7	8.3		22.5	22.5	16.2		26.7	26.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.7	0.2	0.1	0.9	0.0		0.6	0.6	0.9		0.9	0.0
Delay (s)	28.5	14.9	12.9	21.6	8.3		23.1	23.1	17.1		27.6	26.5
Level of Service	C	B	B	C	A		C	C	B		C	C
Approach Delay (s)		14.7			13.5			19.3			27.1	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	16.1
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	612	251	381	586	3	202	15	364	2	15	14
Future Volume (veh/h)	25	612	251	381	586	3	202	15	364	2	15	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	651	267	405	623	3	226	0	387	2	16	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	59	940	419	548	1423	7	965	0	638	8	64	62
Arrive On Green	0.03	0.26	0.26	0.16	0.39	0.37	0.27	0.00	0.25	0.04	0.04	0.04
Sat Flow, veh/h	1810	3574	1592	3476	3684	18	3583	0	1561	210	1680	1615
Grp Volume(v), veh/h	27	651	267	405	305	321	226	0	387	18	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1592	1738	1805	1896	1792	0	1561	1890	0	1615
Q Serve(g_s), s	0.9	9.7	8.7	6.5	7.4	7.4	2.9	0.0	11.5	0.5	0.0	0.5
Cycle Q Clear(g_c), s	0.9	9.7	8.7	6.5	7.4	7.4	2.9	0.0	11.5	0.5	0.0	0.5
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.11		1.00
Lane Grp Cap(c), veh/h	59	940	419	548	697	733	965	0	638	72	0	62
V/C Ratio(X)	0.46	0.69	0.64	0.74	0.44	0.44	0.23	0.00	0.61	0.25	0.00	0.24
Avail Cap(c_a), veh/h	169	1348	600	826	938	986	2057	0	1114	128	0	110
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	19.5	19.2	23.6	13.3	13.3	16.8	0.0	13.8	27.5	0.0	27.5
Incr Delay (d2), s/veh	2.0	0.3	0.6	0.7	0.2	0.2	0.0	0.0	0.3	0.7	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.7	3.9	3.2	3.7	3.9	1.4	0.0	5.0	0.3	0.0	0.2
LnGrp Delay(d),s/veh	30.0	19.9	19.8	24.4	13.5	13.5	16.8	0.0	14.1	28.2	0.0	28.2
LnGrp LOS	C	B	B	C	B	B	B		B	C		C
Approach Vol, veh/h		945			1031			613			33	
Approach Delay, s/veh		20.2			17.8			15.1			28.2	
Approach LOS		C			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.0	26.7		19.9	13.3	19.5		6.3
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 13	21.2		3.0
Max Q Clear Time (g_c+I1), s	2.9	9.4		13.5	8.5	11.7		2.5
Green Ext Time (p_c), s	0.0	3.3		0.4	0.2	2.7		0.0

Intersection Summary			
HCM 2010 Ctrl Delay		18.1	
HCM 2010 LOS		B	

Notes

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	132	318	70	8	174	321	278	72	363	151	264	440
Future Volume (vph)	132	318	70	8	174	321	278	72	363	151	264	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3486			1795	1881	1556	1805	1863	1590	3502	1838
Flt Permitted	0.95	1.00			0.35	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3486			669	1881	1556	1805	1863	1590	3502	1838
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	133	321	71	8	176	324	281	73	367	153	267	444
RTOR Reduction (vph)	0	23	0	0	0	0	206	0	0	106	0	5
Lane Group Flow (vph)	133	369	0	0	184	324	75	73	367	47	267	494
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.5	17.6			11.6	20.7	20.7	6.1	23.2	23.2	9.4	26.5
Effective Green, g (s)	8.2	17.8			11.3	20.9	20.9	5.8	24.1	24.1	9.1	27.4
Actuated g/C Ratio	0.10	0.23			0.14	0.27	0.27	0.07	0.31	0.31	0.12	0.35
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	187	792			96	502	415	133	573	489	407	643
v/s Ratio Prot	0.07	0.11				c0.17		0.04	0.20		c0.08	c0.27
v/s Ratio Perm					c0.28		0.05			0.03		
v/c Ratio	0.71	0.47			1.92	0.65	0.18	0.55	0.64	0.10	0.66	0.77
Uniform Delay, d1	33.9	26.1			33.5	25.4	22.1	35.0	23.4	19.3	33.1	22.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.0	0.5			448.6	3.0	0.2	4.6	2.6	0.1	3.8	5.7
Delay (s)	45.9	26.7			482.1	28.4	22.4	39.6	25.9	19.4	36.9	28.3
Level of Service	D	C			F	C	C	D	C	B	D	C
Approach Delay (s)		31.5				132.0			25.9			31.3
Approach LOS		C				F			C			C

Intersection Summary				
HCM 2000 Control Delay		59.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio		0.93		
Actuated Cycle Length (s)		78.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization		71.4%	ICU Level of Service	C
Analysis Period (min)		15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	84	320	160	141	392	298	139
Future Volume (vph)	84	320	160	141	392	298	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3405		1787	3610	3467	1535
Flt Permitted	0.67	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1267	3405		1787	3610	3467	1535
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	337	168	148	413	314	146
RTOR Reduction (vph)	0	92	0	0	0	0	120
Lane Group Flow (vph)	88	413	0	148	413	314	26
Confl. Peds. (#/hr)			5	9		5	9
Confl. Bikes (#/hr)			11				11
Heavy Vehicles (%)	0%	0%	0%	1%	0%	1%	1%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	6.5	22.6		7.0	23.1	8.9	8.9
Effective Green, g (s)	6.0	22.6		6.5	23.1	8.9	8.9
Actuated g/C Ratio	0.12	0.45		0.13	0.46	0.18	0.18
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	152	1539		232	1667	617	273
v/s Ratio Prot		c0.12		c0.08	0.11	c0.09	
v/s Ratio Perm	0.07						0.02
v/c Ratio	0.58	0.27		0.64	0.25	0.51	0.10
Uniform Delay, d1	20.8	8.5		20.6	8.2	18.6	17.2
Progression Factor	1.00	1.00		1.38	0.79	1.00	1.00
Incremental Delay, d2	3.3	0.4		4.1	0.4	0.2	0.1
Delay (s)	24.1	9.0		32.6	6.8	18.8	17.2
Level of Service	C	A		C	A	B	B
Approach Delay (s)		11.2			13.7	18.3	
Approach LOS		B			B	B	

Intersection Summary

HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	417	42	109	455	0	78	0	69	0	0	0
Future Volume (vph)	0	417	42	109	455	0	78	0	69	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.96			
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3551		1805	3574			1797	1539			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3551		1805	3574			1432	1539			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	458	46	120	500	0	86	0	76	0	0	0
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	66	0	0	0
Lane Group Flow (vph)	0	493	0	120	500	0	0	86	10	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10						10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		25.8		6.1	35.4			6.6	6.6			
Effective Green, g (s)		25.8		5.6	35.4			6.6	6.6			
Actuated g/C Ratio		0.52		0.11	0.71			0.13	0.13			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		1832		202	2530			189	203			
v/s Ratio Prot		c0.14		c0.07	0.14							
v/s Ratio Perm								c0.06	0.01			
v/c Ratio		0.27		0.59	0.20			0.46	0.05			
Uniform Delay, d1		6.8		21.1	2.5			20.0	19.0			
Progression Factor		0.58		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.4		3.1	0.2			0.6	0.0			
Delay (s)		4.3		24.2	2.7			20.7	19.0			
Level of Service		A		C	A			C	B			
Approach Delay (s)		4.3			6.8			19.9			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	417	42	109	455	0	78	0	69	0	0	0
Future Volume (veh/h)	0	417	42	109	455	0	78	0	69	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	458	46	120	500	0	86	0	76	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	1955	195	137	2671	0	278	0	141	0	176	0
Arrive On Green	0.00	1.00	1.00	0.08	0.75	0.00	0.09	0.00	0.09	0.00	0.00	0.00
Sat Flow, veh/h	0	3400	330	1810	3668	0	1440	0	1522	0	1900	0
Grp Volume(v), veh/h	0	249	255	120	500	0	86	0	76	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1831	1810	1787	0	1440	0	1522	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	3.3	2.1	0.0	2.9	0.0	2.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.3	2.1	0.0	2.9	0.0	2.4	0.0	0.0	0.0
Prop In Lane	0.00		0.18	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1068	1083	137	2671	0	278	0	141	0	176	0
V/C Ratio(X)	0.00	0.23	0.24	0.87	0.19	0.00	0.31	0.00	0.54	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1068	1083	217	2671	0	605	0	487	0	608	0
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.96	0.96	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	22.9	1.9	0.0	21.9	0.0	21.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	13.2	0.2	0.0	0.2	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	2.1	1.0	0.0	1.2	0.0	1.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.5	0.5	36.0	2.0	0.0	22.1	0.0	22.8	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		504			620			162			0	
Approach Delay, s/veh		0.5			8.6			22.5			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	7.8	33.6		8.6		41.4		8.6
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	6.5	16.0		16.0		26.0		16.0
Max Q Clear Time (g_c+I1), s	5.3	2.0		0.0		4.1		4.9
Green Ext Time (p_c), s	0.0	6.5		0.0		8.3		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	7.2
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	13
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	289	18	0	22	11	2	19	407
Future Vol, veh/h	0	289	18	0	22	11	2	19	407
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	311	19	0	24	12	2	20	438
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	11.3	9.5	14.4
HCM LOS	B	A	B

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	145	145	18	22	11	21	407
LT Vol	145	145	0	0	0	21	0
Through Vol	0	0	18	22	0	0	0
RT Vol	0	0	0	0	11	0	407
Lane Flow Rate	155	155	19	24	12	23	438
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.279	0.278	0.023	0.044	0.02	0.038	0.594
Departure Headway (Hd)	6.461	6.444	4.218	6.668	6.11	6.089	4.889
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	559	561	854	539	588	583	731
Service Time	4.163	4.145	1.919	4.384	3.826	3.882	2.681
HCM Lane V/C Ratio	0.277	0.276	0.022	0.045	0.02	0.039	0.599
HCM Control Delay	11.6	11.6	7	9.7	9	9.1	14.7
HCM Lane LOS	B	B	A	A	A	A	B
HCM 95th-tile Q	1.1	1.1	0.1	0.1	0.1	0.1	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	7	161	42	11	9	191	1241	7	5	1377	289
Future Volume (vph)	271	7	161	42	11	9	191	1241	7	5	1377	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1577		1715	1683		1787	3569		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1577		1715	1683		1787	3569		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	163	42	11	9	193	1254	7	5	1391	292
RTOR Reduction (vph)	0	134	0	0	9	0	0	0	0	0	0	138
Lane Group Flow (vph)	233	77	0	31	22	0	193	1261	0	5	1391	154
Confl. Bikes (#/hr)						3						3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.3	15.3		3.9	3.9		11.3	50.3		1.3	40.3	40.3
Effective Green, g (s)	15.5	15.5		4.1	4.1		11.0	51.2		1.0	41.2	41.2
Actuated g/C Ratio	0.18	0.18		0.05	0.05		0.13	0.58		0.01	0.47	0.47
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	299	278		80	78		223	2081		20	1677	740
v/s Ratio Prot	c0.14	0.05		c0.02	0.01		c0.11	0.35		0.00	c0.39	
v/s Ratio Perm												0.10
v/c Ratio	0.78	0.28		0.39	0.29		0.87	0.61		0.25	0.83	0.21
Uniform Delay, d1	34.5	31.3		40.6	40.4		37.7	11.8		43.0	20.2	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.4	0.6		4.2	2.8		27.7	0.7		6.5	3.9	0.2
Delay (s)	46.9	31.9		44.8	43.2		65.3	12.5		49.5	24.1	13.9
Level of Service	D	C		D	D		E	B		D	C	B
Approach Delay (s)		39.8			44.0			19.5			22.5	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	87.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Existing Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	7	161	42	11	9	191	1241	7	5	1377	289
Future Volume (veh/h)	271	7	161	42	11	9	191	1241	7	5	1377	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1896	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	222	80	163	31	26	9	193	1254	7	5	1391	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	318	99	202	125	93	32	224	2009	11	10	1544	698
Arrive On Green	0.18	0.18	0.18	0.07	0.07	0.07	0.13	0.55	0.54	0.01	0.43	0.00
Sat Flow, veh/h	1792	558	1137	1810	1342	465	1792	3642	20	1810	3574	1615
Grp Volume(v), veh/h	222	0	243	31	0	35	193	615	646	5	1391	0
Grp Sat Flow(s),veh/h/ln	1792	0	1696	1810	0	1807	1792	1786	1876	1810	1787	1615
Q Serve(g_s), s	9.5	0.0	11.2	1.3	0.0	1.5	8.6	19.2	19.2	0.2	29.5	0.0
Cycle Q Clear(g_c), s	9.5	0.0	11.2	1.3	0.0	1.5	8.6	19.2	19.2	0.2	29.5	0.0
Prop In Lane	1.00		0.67	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	318	0	301	125	0	125	224	985	1035	10	1544	698
V/C Ratio(X)	0.70	0.00	0.81	0.25	0.00	0.28	0.86	0.62	0.62	0.50	0.90	0.00
Avail Cap(c_a), veh/h	391	0	370	160	0	159	242	985	1035	155	1665	752
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.5	0.0	32.3	36.0	0.0	36.1	35.0	12.5	12.5	40.5	21.5	0.0
Incr Delay (d2), s/veh	4.6	0.0	10.9	1.5	0.0	1.7	24.4	1.6	1.5	34.0	7.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	6.2	0.7	0.0	0.8	5.8	9.8	10.3	0.2	16.0	0.0
LnGrp Delay(d),s/veh	36.0	0.0	43.2	37.4	0.0	37.8	59.3	14.1	14.0	74.5	28.8	0.0
LnGrp LOS	D		D	D		D	E	B	B	E	C	
Approach Vol, veh/h		465			66			1454			1396	
Approach Delay, s/veh		39.8			37.6			20.1			28.9	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.5	14.2	39.2		9.6	4.4	49.0
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 18	11.3	37.1		7.0	7.3	41.1
Max Q Clear Time (g_c+I1), s		13.2	10.6	31.5		3.5	2.2	21.2
Green Ext Time (p_c), s		1.1	0.0	2.8		0.1	0.0	18.7

Intersection Summary		
HCM 2010 Ctrl Delay		26.8
HCM 2010 LOS		C

Notes

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Existing Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	10	22	21	11	34	36	1440	25	40	1708	557
Future Volume (vph)	390	10	22	21	11	34	36	1440	25	40	1708	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1684		1715	1774	1582	1805	3564		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1684		1715	1774	1582	1805	3564		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	23	22	11	35	37	1485	26	41	1761	574
RTOR Reduction (vph)	0	19	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	14	0	16	17	2	37	1510	0	41	1761	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.5	15.5		4.7	4.7	4.7	4.4	53.2		4.3	53.6	95.6
Effective Green, g (s)	16.1	16.1		4.9	4.9	4.9	4.1	54.1		4.5	54.5	95.6
Actuated g/C Ratio	0.17	0.17		0.05	0.05	0.05	0.04	0.57		0.05	0.57	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	578	283		87	90	81	77	2016		84	2037	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.42		0.02	c0.49	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.70	0.05		0.18	0.19	0.02	0.48	0.75		0.49	0.86	0.37
Uniform Delay, d1	37.4	33.3		43.4	43.4	43.1	44.7	15.6		44.4	17.4	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.2	0.1		1.8	1.8	0.2	4.7	1.9		4.4	4.5	0.7
Delay (s)	41.6	33.5		45.2	45.2	43.3	49.4	17.5		48.8	21.9	0.7
Level of Service	D	C		D	D	D	D	B		D	C	A
Approach Delay (s)		41.0			44.2			18.3			17.2	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	95.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	0	14	1	0	0	6	299	0	0	408	30
Future Vol, veh/h	63	0	14	1	0	0	6	299	0	0	408	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	72	0	16	1	0	0	7	340	0	0	464	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	665	834	249	585	851	170	498	0	0	340	0	0
Stage 1	481	481	-	353	353	-	-	-	-	-	-	-
Stage 2	184	353	-	232	498	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	345	306	757	399	299	851	1076	-	-	1230	-	-
Stage 1	535	557	-	642	634	-	-	-	-	-	-	-
Stage 2	800	634	-	756	548	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	343	304	757	388	297	851	1076	-	-	1230	-	-
Mov Cap-2 Maneuver	343	304	-	388	297	-	-	-	-	-	-	-
Stage 1	531	557	-	637	629	-	-	-	-	-	-	-
Stage 2	794	629	-	740	548	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	14.3	0.2	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1076	-	-	381	388	1230	-	-
HCM Lane V/C Ratio	0.006	-	-	0.23	0.003	-	-	-
HCM Control Delay (s)	8.4	0	-	17.2	14.3	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.9	0	0	-	-

Intersection

Int Delay, s/veh 3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	191	295	12	5	393	31	7	0	6	6	1	164
Future Vol, veh/h	191	295	12	5	393	31	7	0	6	6	1	164
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	208	321	13	5	427	34	8	0	7	7	1	178

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	465	0	0	342	0	0	979	1226	183	1043	1216	238
Stage 1	-	-	-	-	-	-	750	750	-	459	459	-
Stage 2	-	-	-	-	-	-	229	476	-	584	757	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1100	-	-	1228	-	-	207	180	834	186	183	769
Stage 1	-	-	-	-	-	-	374	422	-	557	570	-
Stage 2	-	-	-	-	-	-	759	560	-	470	419	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1096	-	-	1220	-	-	133	144	823	156	146	764
Mov Cap-2 Maneuver	-	-	-	-	-	-	133	144	-	156	146	-
Stage 1	-	-	-	-	-	-	301	340	-	450	566	-
Stage 2	-	-	-	-	-	-	576	556	-	375	337	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.5	0.1	22.7	12.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	217	1096	-	-	1220	-	-	658
HCM Lane V/C Ratio	0.065	0.189	-	-	0.004	-	-	0.282
HCM Control Delay (s)	22.7	9.1	-	-	8	-	-	12.6
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.7	-	-	0	-	-	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	665	113	27	648	120	16
Future Volume (vph)	665	113	27	648	120	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1788	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1788	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	707	120	29	689	128	17
RTOR Reduction (vph)	0	62	0	0	8	0
Lane Group Flow (vph)	707	58	29	689	137	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	23.3	23.3	1.3	28.8	8.5	
Effective Green, g (s)	23.3	23.3	1.3	28.8	8.5	
Actuated g/C Ratio	0.48	0.48	0.03	0.60	0.18	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	909	762	46	1123	315	
v/s Ratio Prot	c0.38		0.02	c0.37	c0.08	
v/s Ratio Perm		0.04				
v/c Ratio	0.78	0.08	0.63	0.61	0.43	
Uniform Delay, d1	10.3	6.7	23.2	6.2	17.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.4	0.1	18.8	1.1	0.4	
Delay (s)	14.7	6.7	42.0	7.2	18.1	
Level of Service	B	A	D	A	B	
Approach Delay (s)	13.5			8.6	18.1	
Approach LOS	B			A	B	

Intersection Summary				
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	15.1	
Intersection Capacity Utilization	51.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	665	113	27	648	120	16
Future Volume (veh/h)	665	113	27	648	120	16
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900
Adj Flow Rate, veh/h	707	120	29	689	128	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	4	1	0	0
Cap, veh/h	965	809	47	1188	235	0
Arrive On Green	0.51	0.51	0.03	0.63	0.13	0.00
Sat Flow, veh/h	1881	1578	1740	1881	1796	0
Grp Volume(v), veh/h	707	120	29	689	129	0
Grp Sat Flow(s),veh/h/ln	1881	1578	1740	1881	1810	0
Q Serve(g_s), s	13.4	1.8	0.8	9.8	3.1	0.0
Cycle Q Clear(g_c), s	13.4	1.8	0.8	9.8	3.1	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	965	809	47	1188	237	0
V/C Ratio(X)	0.73	0.15	0.62	0.58	0.54	0.00
Avail Cap(c_a), veh/h	1144	960	152	1481	710	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.7	5.9	22.1	4.9	18.7	0.0
Incr Delay (d2), s/veh	2.2	0.1	4.8	0.6	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	0.8	0.4	5.2	1.6	0.0
LnGrp Delay(d),s/veh	10.9	6.0	26.9	5.5	19.4	0.0
LnGrp LOS	B	A	C	A	B	
Approach Vol, veh/h	827			718	129	
Approach Delay, s/veh	10.2			6.3	19.4	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.4	29.9				35.4		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	27.9				36.1		18.0
Max Q Clear Time (g_c+I1), s	2.8	15.4				11.8		5.1
Green Ext Time (p_c), s	0.0	8.1				12.5		0.1

Intersection Summary		
HCM 2010 Ctrl Delay	9.3	
HCM 2010 LOS	A	

Notes

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	643	29	14	590	8	30	0	40	4	0	8
Future Vol, veh/h	8	643	29	14	590	8	30	0	40	4	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	9	684	31	15	628	9	32	0	43	4	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	636	0	0	684	0	0	1363	1367	684	1363	1363	632
Stage 1	-	-	-	-	-	-	701	701	-	662	662	-
Stage 2	-	-	-	-	-	-	662	666	-	701	701	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	957	-	-	919	-	-	126	148	452	126	149	484
Stage 1	-	-	-	-	-	-	433	444	-	454	462	-
Stage 2	-	-	-	-	-	-	454	460	-	433	444	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	957	-	-	919	-	-	121	144	452	112	145	484
Mov Cap-2 Maneuver	-	-	-	-	-	-	121	144	-	112	145	-
Stage 1	-	-	-	-	-	-	429	440	-	450	454	-
Stage 2	-	-	-	-	-	-	439	452	-	389	440	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	27.2	21.2
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	121	452	957	-	-	919	-	-	112	484
HCM Lane V/C Ratio	0.264	0.094	0.009	-	-	0.016	-	-	0.038	0.018
HCM Control Delay (s)	45.1	13.8	8.8	-	-	9	-	-	38.4	12.6
HCM Lane LOS	E	B	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	1	0.3	0	-	-	0	-	-	0.1	0.1

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	38	4	5	548	645	39
Future Vol, veh/h	38	4	5	548	645	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	40	4	5	577	679	41

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1266	679	679	0	-	0
Stage 1	679	-	-	-	-	-
Stage 2	587	-	-	-	-	-
Critical Hdwy	7.1	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	147	455	923	-	-	-
Stage 1	445	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	146	455	923	-	-	-
Mov Cap-2 Maneuver	146	-	-	-	-	-
Stage 1	441	-	-	-	-	-
Stage 2	495	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	37	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	923	-	156	-	-
HCM Lane V/C Ratio	0.006	-	0.283	-	-
HCM Control Delay (s)	8.9	0	37	-	-
HCM Lane LOS	A	A	E	-	-
HCM 95th %tile Q(veh)	0	-	1.1	-	-

Intersection

Int Delay, s/veh 1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	37	355	32	28	358
Future Vol, veh/h	24	37	355	32	28	358
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	25	38	366	33	29	369

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	821	394	0	0	405	0
Stage 1	388	-	-	-	-	-
Stage 2	433	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	347	659	-	-	1165	-
Stage 1	690	-	-	-	-	-
Stage 2	658	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	333	652	-	-	1159	-
Mov Cap-2 Maneuver	333	-	-	-	-	-
Stage 1	687	-	-	-	-	-
Stage 2	634	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	474	1159	-
HCM Lane V/C Ratio	-	-	0.133	0.025	-
HCM Control Delay (s)	-	-	13.8	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection

Int Delay, s/veh 2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	79	63	312	304	16
Future Vol, veh/h	10	79	63	312	304	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	84	67	332	323	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	810	345	334	0	-	0
Stage 1	334	-	-	-	-	-
Stage 2	476	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.218	-	-	-
Pot Cap-1 Maneuver	352	696	1225	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	327	683	1214	-	-	-
Mov Cap-2 Maneuver	327	-	-	-	-	-
Stage 1	723	-	-	-	-	-
Stage 2	589	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1214	-	609	-	-
HCM Lane V/C Ratio	0.055	-	0.155	-	-
HCM Control Delay (s)	8.1	-	12	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.5	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	114	98	240	199	8
Future Vol, veh/h	20	114	98	240	199	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	127	109	267	221	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	724	240	237	0	-	0
Stage 1	233	-	-	-	-	-
Stage 2	491	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	396	804	1336	-	-	-
Stage 1	810	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	359	795	1328	-	-	-
Mov Cap-2 Maneuver	359	-	-	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	565	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	2.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1328	-	673	-	-
HCM Lane V/C Ratio	0.082	-	0.221	-	-
HCM Control Delay (s)	8	-	11.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.8	-	-

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	94	0	3	0	0	0	161	95	4
Future Vol, veh/h	0	0	1	94	0	3	0	0	0	161	95	4
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0
Mvmt Flow	0	0	1	108	0	3	0	0	0	185	109	5
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	8.3	10
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	62%	0%	100%	0%
Vol Thru, %	37%	1%	0%	100%
Vol Right, %	2%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	260	95	3	110
LT Vol	161	0	3	0
Through Vol	95	1	0	110
RT Vol	4	94	0	0
Lane Flow Rate	299	109	3	126
Geometry Grp	1	1	1	1
Degree of Util (X)	0.37	0.13	0.005	0.158
Departure Headway (Hd)	4.454	4.276	5.207	4.486
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	813	839	687	800
Service Time	2.454	2.301	3.242	2.511
HCM Lane V/C Ratio	0.368	0.13	0.004	0.158
HCM Control Delay	10	7.9	8.3	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.7	0.4	0	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	110	0
Future Vol, veh/h	0	0	110	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	126	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.4
HCM LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱↱	↑	↱	↰↑	↑
Traffic Volume (vph)	0	976	495	87	923	676
Future Volume (vph)	0	976	495	87	923	676
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1122	569	100	1061	777
RTOR Reduction (vph)	0	183	0	22	0	0
Lane Group Flow (vph)	0	939	569	78	1061	777
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		20.2	18.2	18.2	20.2	48.2
Effective Green, g (s)		21.1	19.1	19.1	21.1	48.2
Actuated g/C Ratio		0.44	0.40	0.40	0.44	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1220	731	621	1488	1810
v/s Ratio Prot		c0.34	c0.31		0.31	0.43
v/s Ratio Perm				0.05		
v/c Ratio		0.77	0.78	0.13	0.71	0.43
Uniform Delay, d1		11.5	12.7	9.2	11.1	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.4	5.4	0.1	1.9	0.7
Delay (s)		14.9	18.1	9.4	13.0	0.7
Level of Service		B	B	A	B	A
Approach Delay (s)	14.9		16.8			7.8
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	756	247	350	832	10	98	3	228	9	18	41
Future Volume (vph)	7	756	247	350	832	10	98	3	228	9	18	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1564	3433	3529		1698	1708	1561		1737	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1564	3433	3529		1698	1708	1561		1737	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	969	317	449	1067	13	126	4	292	12	23	53
RTOR Reduction (vph)	0	0	159	0	0	0	0	0	70	0	0	50
Lane Group Flow (vph)	9	969	158	449	1080	0	66	64	222	0	35	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.7	27.4	27.4	11.4	38.1		4.9	4.9	16.3		2.2	2.2
Effective Green, g (s)	1.2	28.4	28.4	12.0	39.1		6.7	6.7	17.5		3.2	3.2
Actuated g/C Ratio	0.02	0.43	0.43	0.18	0.59		0.10	0.10	0.26		0.05	0.05
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	32	1515	669	621	2081		171	172	412		83	75
v/s Ratio Prot	0.00	c0.27		c0.13	0.31		0.04	0.04	c0.10		c0.02	
v/s Ratio Perm			0.10						0.04			0.00
v/c Ratio	0.28	0.64	0.24	0.72	0.52		0.39	0.37	0.54		0.42	0.03
Uniform Delay, d1	32.1	14.9	12.1	25.6	8.0		27.9	27.8	20.9		30.7	30.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.7	0.1	3.5	0.1		0.5	0.5	0.7		1.3	0.1
Delay (s)	33.9	15.6	12.1	29.1	8.1		28.4	28.3	21.6		31.9	30.1
Level of Service	C	B	B	C	A		C	C	C		C	C
Approach Delay (s)		14.9			14.3			23.7			30.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	66.3	Sum of lost time (s)	16.1
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	756	247	350	832	10	98	3	228	9	18	41
Future Volume (veh/h)	7	756	247	350	832	10	98	3	228	9	18	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1767	1863
Adj Flow Rate, veh/h	9	969	317	449	1067	13	129	0	292	12	23	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	30	1159	512	567	1696	21	760	0	558	35	68	93
Arrive On Green	0.02	0.33	0.33	0.16	0.47	0.46	0.21	0.00	0.19	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3578	44	3583	0	1545	596	1141	1575
Grp Volume(v), veh/h	9	969	317	449	527	553	129	0	292	35	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1853	1792	0	1545	1737	0	1575
Q Serve(g_s), s	0.3	17.1	11.6	8.5	15.1	15.1	2.0	0.0	10.1	1.3	0.0	2.2
Cycle Q Clear(g_c), s	0.3	17.1	11.6	8.5	15.1	15.1	2.0	0.0	10.1	1.3	0.0	2.2
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.34		1.00
Lane Grp Cap(c), veh/h	30	1159	512	567	838	879	760	0	558	103	0	93
V/C Ratio(X)	0.30	0.84	0.62	0.79	0.63	0.63	0.17	0.00	0.52	0.34	0.00	0.57
Avail Cap(c_a), veh/h	120	1256	555	621	838	879	1791	0	1003	103	0	93
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.9	21.1	19.2	27.1	13.3	13.3	21.8	0.0	17.1	30.6	0.0	31.0
Incr Delay (d2), s/veh	2.0	4.3	1.2	5.6	1.1	1.1	0.0	0.0	0.3	0.7	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	9.0	5.1	4.4	7.6	7.9	1.0	0.0	4.3	0.6	0.0	1.1
LnGrp Delay(d),s/veh	34.9	25.4	20.4	32.8	14.5	14.4	21.8	0.0	17.4	31.3	0.0	36.1
LnGrp LOS	C	C	C	C	B	B	C		B	C		D
Approach Vol, veh/h		1295			1529			421			88	
Approach Delay, s/veh		24.2			19.8			18.8			34.2	
Approach LOS		C			B			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	36.1		18.3	15.1	26.2		8.0
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 12	23.0		3.0
Max Q Clear Time (g_c+I1), s	2.3	17.1		12.1	10.5	19.1		4.2
Green Ext Time (p_c), s	0.0	5.4		0.3	0.1	2.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	21.8
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	198	304	26	6	84	274	155	38	228	68	275	334
Future Volume (vph)	198	304	26	6	84	274	155	38	228	68	275	334
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3496			1703	1827	1547	1752	1881	1590	3433	1761
Flt Permitted	0.95	1.00			0.32	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3496			578	1827	1547	1752	1881	1590	3433	1761
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	213	327	28	7	90	295	167	41	245	73	296	359
RTOR Reduction (vph)	0	8	0	0	0	0	124	0	0	52	0	8
Lane Group Flow (vph)	213	347	0	0	97	295	43	41	245	21	296	423
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	9.6	15.8			12.7	18.9	18.9	4.2	20.4	20.4	9.5	25.7
Effective Green, g (s)	9.3	16.0			12.4	19.1	19.1	3.9	21.3	21.3	9.2	26.6
Actuated g/C Ratio	0.12	0.21			0.17	0.26	0.26	0.05	0.28	0.28	0.12	0.36
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	211	746			95	465	394	91	534	452	421	625
v/s Ratio Prot	0.13	0.10				c0.16		0.02	0.13		c0.09	c0.24
v/s Ratio Perm					c0.17		0.03			0.01		
v/c Ratio	1.01	0.47			1.02	0.63	0.11	0.45	0.46	0.05	0.70	0.68
Uniform Delay, d1	32.8	25.7			31.3	24.8	21.4	34.5	22.1	19.4	31.5	20.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	64.4	0.5			98.2	3.0	0.1	3.5	0.7	0.0	5.3	3.0
Delay (s)	97.2	26.3			129.4	27.8	21.5	38.0	22.8	19.5	36.8	23.5
Level of Service	F	C			F	C	C	D	C	B	D	C
Approach Delay (s)		52.9				43.5			23.9			28.9
Approach LOS		D				D			C			C

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	74.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project AM.syn
12/01/2017

Synchro 9 Report
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Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	61	62	352	77	83	261	6	152	3	53	5	2
Future Volume (vph)	61	62	352	77	83	261	6	152	3	53	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	1.00		1.00	0.86			0.87
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1770	3403		1687	3428		3367	1512			3077
Flt Permitted		0.57	1.00		0.95	1.00		0.95	1.00			0.92
Satd. Flow (perm)		1066	3403		1687	3428		3367	1512			2835
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92
Adj. Flow (vph)	66	67	387	85	91	287	7	167	3	58	5	2
RTOR Reduction (vph)	0	0	17	0	0	1	0	0	45	0	0	34
Lane Group Flow (vph)	0	133	455	0	91	293	0	167	16	0	0	9
Confl. Bikes (#/hr)				1								
Heavy Vehicles (%)	2%	2%	3%	3%	7%	5%	2%	4%	2%	8%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2									4	
Actuated Green, G (s)		36.1	36.1		6.7	46.3		7.9	15.7			3.8
Effective Green, g (s)		36.1	36.1		6.2	46.3		7.9	15.7			3.8
Actuated g/C Ratio		0.52	0.52		0.09	0.66		0.11	0.22			0.05
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		549	1754		149	2267		379	339			153
v/s Ratio Prot			c0.13		c0.05	0.09		c0.05	c0.01			
v/s Ratio Perm		0.12										0.00
v/c Ratio		0.24	0.26		0.61	0.13		0.44	0.05			0.06
Uniform Delay, d1		9.4	9.5		30.7	4.4		29.0	21.3			31.4
Progression Factor		1.00	1.00		0.93	0.91		1.00	1.00			1.00
Incremental Delay, d2		1.0	0.4		5.1	0.1		0.3	0.1			0.2
Delay (s)		10.4	9.8		33.5	4.1		29.3	21.3			31.6
Level of Service		B	A		C	A		C	C			C
Approach Delay (s)			10.0			11.1			27.2			31.6
Approach LOS			A			B			C			C

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd
Existing + Project AM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	33
Future Volume (vph)	33
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	36
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	323	87	48	323	0	27	0	27	0	0	0
Future Volume (vph)	0	323	87	48	323	0	27	0	27	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		0.99		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.97		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3380		1805	3471			1548	1362			
Flt Permitted		1.00		0.95	1.00			0.89	1.00			
Satd. Flow (perm)		3380		1805	3471			1448	1362			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	380	102	56	380	0	32	0	32	0	0	0
RTOR Reduction (vph)	0	16	0	0	0	0	0	0	30	0	0	0
Lane Group Flow (vph)	0	466	0	56	380	0	0	32	2	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		49.9		4.1	57.5			4.5	4.5			
Effective Green, g (s)		49.9		3.6	57.5			4.5	4.5			
Actuated g/C Ratio		0.71		0.05	0.82			0.06	0.06			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2409		92	2851			93	87			
v/s Ratio Prot		c0.14		c0.03	0.11							
v/s Ratio Perm								c0.02	0.00			
v/c Ratio		0.19		0.61	0.13			0.34	0.02			
Uniform Delay, d1		3.3		32.5	1.3			31.3	30.7			
Progression Factor		0.62		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		7.6	0.1			0.8	0.0			
Delay (s)		2.2		40.1	1.4			32.1	30.7			
Level of Service		A		D	A			C	C			
Approach Delay (s)		2.2			6.3			31.4			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	28.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	323	87	48	323	0	27	0	27	0	0	0
Future Volume (veh/h)	0	323	87	48	323	0	27	0	27	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1900	1652	1652	1900	1900	1900
Adj Flow Rate, veh/h	0	380	102	56	380	0	32	0	32	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	0	15	0	0	0
Cap, veh/h	0	2074	550	59	2933	0	153	0	56	0	77	0
Arrive On Green	0.00	0.76	0.76	0.03	0.85	0.00	0.04	0.00	0.04	0.00	0.00	0.00
Sat Flow, veh/h	0	2838	729	1810	3563	0	1234	0	1375	0	1900	0
Grp Volume(v), veh/h	0	241	241	56	380	0	32	0	32	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1718	1810	1736	0	1234	0	1375	0	1900	0
Q Serve(g_s), s	0.0	2.7	2.8	2.2	1.3	0.0	1.8	0.0	1.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	2.7	2.8	2.2	1.3	0.0	1.8	0.0	1.6	0.0	0.0	0.0
Prop In Lane	0.00		0.42	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1327	1298	59	2933	0	153	0	56	0	77	0
V/C Ratio(X)	0.00	0.18	0.19	0.96	0.13	0.00	0.21	0.00	0.57	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1327	1298	284	2933	0	455	0	393	0	543	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.98	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	2.4	2.4	33.8	0.9	0.0	33.1	0.0	33.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	24.0	0.1	0.0	0.2	0.0	3.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.4	1.4	1.5	0.7	0.0	0.6	0.0	0.7	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	2.7	2.7	57.8	1.0	0.0	33.3	0.0	36.4	0.0	0.0	0.0
LnGrp LOS		A	A	E	A		C		D			
Approach Vol, veh/h		482			436			64			0	
Approach Delay, s/veh		2.7			8.3			34.8			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	6.3	56.9		6.8		63.2		6.8
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	11.5	27.0		20.0		42.0		20.0
Max Q Clear Time (g_c+I1), s	4.2	4.8		0.0		3.3		3.8
Green Ext Time (p_c), s	0.0	6.7		0.0		7.8		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	7.3
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	210	30	0	13	12	5	16	307
Future Vol, veh/h	0	210	30	0	13	12	5	16	307
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	239	34	0	15	14	5	18	349
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	9.9	8.7	11.1
HCM LOS	A	A	B

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	105	30	13	12	21	307
LT Vol	105	105	0	0	0	21	0
Through Vol	0	0	30	13	0	0	0
RT Vol	0	0	0	0	12	0	307
Lane Flow Rate	119	119	34	15	14	24	349
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.203	0.2	0.036	0.025	0.021	0.039	0.452
Departure Headway (Hd)	6.12	6.034	3.816	6.188	5.477	5.899	4.665
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	582	591	924	582	658	606	771
Service Time	3.902	3.817	1.597	3.888	3.177	3.644	2.41
HCM Lane V/C Ratio	0.204	0.201	0.037	0.026	0.021	0.04	0.453
HCM Control Delay	10.5	10.3	6.7	9	8.3	8.9	11.2
HCM Lane LOS	B	B	A	A	A	A	B
HCM 95th-tile Q	0.8	0.7	0.1	0.1	0.1	0.1	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	50	101	151	43	63	117	1061	48	18	1333	113
Future Volume (vph)	144	50	101	151	43	63	117	1061	48	18	1333	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.95		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1515		1665	1649		1770	3465		1805	3471	1568
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1515		1665	1649		1770	3465		1805	3471	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	54	110	164	47	68	127	1153	52	20	1449	123
RTOR Reduction (vph)	0	67	0	0	39	0	0	3	0	0	0	57
Lane Group Flow (vph)	141	113	0	143	97	0	127	1202	0	20	1449	66
Confl. Peds. (#/hr)			46	46					46			
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	12.8	12.8		8.8	8.8		7.3	46.0		2.8	41.5	41.5
Effective Green, g (s)	13.0	13.0		9.0	9.0		7.0	46.9		2.5	42.4	42.4
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.08	0.54		0.03	0.49	0.49
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	247	225		171	169		141	1859		51	1683	760
v/s Ratio Prot	c0.08	0.07		c0.09	0.06		c0.07	0.35		0.01	c0.42	
v/s Ratio Perm												0.04
v/c Ratio	0.57	0.50		0.84	0.57		0.90	0.65		0.39	0.86	0.09
Uniform Delay, d1	34.6	34.2		38.5	37.4		39.9	14.4		41.7	19.9	12.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.4	2.1		29.3	5.5		47.3	1.0		4.9	5.1	0.1
Delay (s)	38.0	36.3		67.8	42.9		87.1	15.3		46.6	25.0	12.2
Level of Service	D	D		E	D		F	B		D	C	B
Approach Delay (s)		37.0			55.6			22.2			24.3	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	87.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	50	101	151	43	63	117	1061	48	18	1333	113
Future Volume (veh/h)	144	50	101	151	43	63	117	1061	48	18	1333	113
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.87	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845
Adj Flow Rate, veh/h	157	54	110	140	81	68	127	1153	52	20	1449	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3
Cap, veh/h	283	83	169	190	96	80	149	1744	79	50	1578	713
Arrive On Green	0.16	0.16	0.16	0.11	0.11	0.11	0.08	0.51	0.50	0.03	0.45	0.00
Sat Flow, veh/h	1757	514	1046	1757	885	743	1774	3412	154	1810	3471	1568
Grp Volume(v), veh/h	157	0	164	140	0	149	127	593	612	20	1449	0
Grp Sat Flow(s),veh/h/ln	1757	0	1560	1757	0	1629	1774	1755	1811	1810	1736	1568
Q Serve(g_s), s	6.9	0.0	8.2	6.4	0.0	7.5	5.9	20.8	20.8	0.9	32.6	0.0
Cycle Q Clear(g_c), s	6.9	0.0	8.2	6.4	0.0	7.5	5.9	20.8	20.8	0.9	32.6	0.0
Prop In Lane	1.00		0.67	1.00		0.46	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	283	0	252	190	0	176	149	897	926	50	1578	713
V/C Ratio(X)	0.55	0.00	0.65	0.74	0.00	0.85	0.85	0.66	0.66	0.40	0.92	0.00
Avail Cap(c_a), veh/h	380	0	337	190	0	176	149	897	926	152	1667	753
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.2	0.0	32.8	36.0	0.0	36.5	37.6	15.0	15.1	39.8	21.3	0.0
Incr Delay (d2), s/veh	2.0	0.0	3.4	15.1	0.0	30.8	35.0	2.2	2.2	5.1	8.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	3.8	3.9	0.0	4.9	4.3	10.6	10.9	0.5	17.4	0.0
LnGrp Delay(d),s/veh	34.2	0.0	36.2	51.1	0.0	67.3	72.6	17.2	17.2	45.0	29.9	0.0
LnGrp LOS	C		D	D		E	E	B	B	D	C	
Approach Vol, veh/h		321			289			1332			1469	
Approach Delay, s/veh		35.2			59.5			22.5			30.2	
Approach LOS		D			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		17.4	11.0	41.9		13.0	6.3	46.6
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 18	7.3	39.1		8.8	7.3	39.1
Max Q Clear Time (g_c+I1), s		10.2	7.9	34.6		9.5	2.9	22.8
Green Ext Time (p_c), s		1.0	0.0	2.4		0.0	0.0	15.5

Intersection Summary		
HCM 2010 Ctrl Delay		30.1
HCM 2010 LOS		C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	382	4	25	35	14	44	36	1211	17	71	1590	774
Future Volume (vph)	382	4	25	35	14	44	36	1211	17	71	1590	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	27	38	15	48	40	1331	19	78	1747	851
RTOR Reduction (vph)	0	23	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	40	1349	0	78	1747	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.6	52.8		6.2	54.9	99.4
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.3	53.7		6.4	55.8	99.4
Actuated g/C Ratio	0.16	0.16		0.07	0.07	0.07	0.04	0.54		0.06	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	559	249		122	121	113	75	1908		105	1948	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.38		0.05	c0.50	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.75	0.03		0.22	0.21	0.03	0.53	0.71		0.74	0.90	0.54
Uniform Delay, d1	39.7	35.0		43.5	43.5	42.9	46.6	17.0		45.7	19.3	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.4	0.1		1.6	1.5	0.2	7.1	1.5		24.4	6.3	1.3
Delay (s)	46.0	35.1		45.1	45.1	43.1	53.7	18.5		70.1	25.5	1.3
Level of Service	D	D		D	D	D	D	B		E	C	A
Approach Delay (s)		45.3			44.2			19.5			19.1	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	99.4	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	78.2%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	0	8	0	0	0	2	214	2	8	333	90
Future Vol, veh/h	29	0	8	0	0	0	2	214	2	8	333	90
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	33	0	9	0	0	0	2	246	2	9	383	103

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	587	712	249	468	763	130	489	0	0	251	0	0
Stage 1	456	456	-	255	255	-	-	-	-	-	-	-
Stage 2	131	256	-	213	508	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	377	360	686	483	337	902	1085	-	-	1326	-	-
Stage 1	533	572	-	733	700	-	-	-	-	-	-	-
Stage 2	836	699	-	775	542	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	372	354	683	470	332	897	1082	-	-	1323	-	-
Mov Cap-2 Maneuver	372	354	-	470	332	-	-	-	-	-	-	-
Stage 1	531	565	-	730	697	-	-	-	-	-	-	-
Stage 2	832	696	-	756	536	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	0	0.1	0.1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1082	-	-	413	-	1323	-	-
HCM Lane V/C Ratio	0.002	-	-	0.103	-	0.007	-	-
HCM Control Delay (s)	8.3	0	-	14.7	0	7.7	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	-	0	-	-

Intersection

Int Delay, s/veh 2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	94	235	17	3	306	11	18	2	4	1	2	47
Future Vol, veh/h	94	235	17	3	306	11	18	2	4	1	2	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	108	270	20	3	352	13	21	2	5	1	2	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	364	0	0	290	0	0	680	867	145	717	871	182
Stage 1	-	-	-	-	-	-	496	496	-	365	365	-
Stage 2	-	-	-	-	-	-	184	371	-	352	506	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1170	-	-	1283	-	-	341	293	882	321	291	805
Stage 1	-	-	-	-	-	-	529	549	-	632	627	-
Stage 2	-	-	-	-	-	-	806	623	-	643	543	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1170	-	-	1283	-	-	293	265	882	294	264	805
Mov Cap-2 Maneuver	-	-	-	-	-	-	293	265	-	294	264	-
Stage 1	-	-	-	-	-	-	480	498	-	574	626	-
Stage 2	-	-	-	-	-	-	747	622	-	578	493	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.1	17.1	10.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	326	1170	-	-	1283	-	-	721
HCM Lane V/C Ratio	0.085	0.092	-	-	0.003	-	-	0.08
HCM Control Delay (s)	17.1	8.4	-	-	7.8	-	-	10.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.3	-	-	0	-	-	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	582	115	19	824	78	17
Future Volume (vph)	582	115	19	824	78	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1762	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1762	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	613	121	20	867	82	18
RTOR Reduction (vph)	0	58	0	0	15	0
Lane Group Flow (vph)	613	64	20	867	85	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	25.4	25.4	0.7	30.3	7.2	
Effective Green, g (s)	25.4	25.4	0.7	30.3	7.2	
Actuated g/C Ratio	0.52	0.52	0.01	0.63	0.15	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	968	815	26	1177	262	
v/s Ratio Prot	0.33		0.01	c0.46	c0.05	
v/s Ratio Perm		0.04				
v/c Ratio	0.63	0.08	0.77	0.74	0.32	
Uniform Delay, d1	8.2	5.7	23.8	6.3	18.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	0.1	75.0	2.5	0.3	
Delay (s)	9.6	5.7	98.8	8.8	18.7	
Level of Service	A	A	F	A	B	
Approach Delay (s)	9.0			10.8	18.7	
Approach LOS	A			B	B	

Intersection Summary				
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	48.4	Sum of lost time (s)	15.1	
Intersection Capacity Utilization	57.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	582	115	19	824	78	17
Future Volume (veh/h)	582	115	19	824	78	17
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1880	1900
Adj Flow Rate, veh/h	613	121	20	867	82	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	4	0	1	0	0
Cap, veh/h	904	761	36	1143	247	0
Arrive On Green	0.49	0.49	0.02	0.61	0.14	0.00
Sat Flow, veh/h	1845	1553	1810	1881	1770	0
Grp Volume(v), veh/h	613	121	20	867	83	0
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1791	0
Q Serve(g_s), s	10.9	1.9	0.5	14.4	1.8	0.0
Cycle Q Clear(g_c), s	10.9	1.9	0.5	14.4	1.8	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	904	761	36	1143	250	0
V/C Ratio(X)	0.68	0.16	0.56	0.76	0.33	0.00
Avail Cap(c_a), veh/h	981	826	168	1359	749	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.4	6.1	20.9	6.2	16.7	0.0
Incr Delay (d2), s/veh	1.9	0.1	5.0	2.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	0.8	0.3	8.0	0.9	0.0
LnGrp Delay(d),s/veh	10.3	6.2	25.9	8.4	17.0	0.0
LnGrp LOS	B	A	C	A	B	
Approach Vol, veh/h	734			887	83	
Approach Delay, s/veh	9.6			8.8	17.0	
Approach LOS	A			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.1	27.5				32.6		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	22.9				31.1		18.0
Max Q Clear Time (g_c+I1), s	2.5	12.9				16.4		3.8
Green Ext Time (p_c), s	0.0	7.2				9.7		0.1

Intersection Summary		
HCM 2010 Ctrl Delay	9.6	
HCM 2010 LOS	A	

Notes

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	497	29	29	863	5	12	1	13	6	0	2
Future Vol, veh/h	8	497	29	29	863	5	12	1	13	6	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	9	546	32	32	948	5	13	1	14	7	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	954	0	0	546	0	0	1579	1582	546	1579	1579	951
Stage 1	-	-	-	-	-	-	564	564	-	1015	1015	-
Stage 2	-	-	-	-	-	-	1015	1018	-	564	564	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	7.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.9	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	729	-	-	1018	-	-	89	66	541	89	110	318
Stage 1	-	-	-	-	-	-	514	380	-	290	318	-
Stage 2	-	-	-	-	-	-	290	216	-	514	512	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	729	-	-	1018	-	-	85	63	541	83	105	318
Mov Cap-2 Maneuver	-	-	-	-	-	-	85	63	-	83	105	-
Stage 1	-	-	-	-	-	-	508	375	-	286	308	-
Stage 2	-	-	-	-	-	-	279	209	-	493	506	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	34.5	43.2
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	83	541	729	-	-	1018	-	-	83	318
HCM Lane V/C Ratio	0.172	0.026	0.012	-	-	0.031	-	-	0.079	0.007
HCM Control Delay (s)	57.2	11.8	10	-	-	8.7	-	-	52.1	16.4
HCM Lane LOS	F	B	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.6	0.1	0	-	-	0.1	-	-	0.3	0

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	38	0	1	296	406	39
Future Vol, veh/h	38	0	1	296	406	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	43	0	1	333	456	44

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	791	456	456	0	-	0
Stage 1	456	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Critical Hdwy	6.43	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	357	609	1115	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	357	609	1115	-	-	-
Mov Cap-2 Maneuver	357	-	-	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	721	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1115	-	357	-	-
HCM Lane V/C Ratio	0.001	-	0.12	-	-
HCM Control Delay (s)	8.2	0	16.4	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection

Int Delay, s/veh 2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	93	321	21	22	423
Future Vol, veh/h	16	93	321	21	22	423
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	21	122	422	28	29	557

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1064	450	0	0	457	0
Stage 1	443	-	-	-	-	-
Stage 2	621	-	-	-	-	-
Critical Hdwy	6.4	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	249	611	-	-	1114	-
Stage 1	651	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	237	604	-	-	1108	-
Mov Cap-2 Maneuver	237	-	-	-	-	-
Stage 1	647	-	-	-	-	-
Stage 2	516	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	492	1108	-
HCM Lane V/C Ratio	-	-	0.292	0.026	-
HCM Control Delay (s)	-	-	15.3	8.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	157	174	231	268	21
Future Vol, veh/h	17	157	174	231	268	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	212	235	312	362	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1152	370	366	0	-	0
Stage 1	366	-	-	-	-	-
Stage 2	786	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	221	673	1182	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	453	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	176	669	1178	-	-	-
Mov Cap-2 Maneuver	176	-	-	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	361	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.3	3.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1178	-	525	-	-
HCM Lane V/C Ratio	0.2	-	0.448	-	-
HCM Control Delay (s)	8.8	-	17.3	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.7	-	2.3	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	118	127	115	170	92
Future Vol, veh/h	28	118	127	115	170	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	140	151	137	202	110

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	707	271	319	0	-	0
Stage 1	264	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Critical Hdwy	6.44	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	399	768	1241	-	-	-
Stage 1	776	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	346	759	1234	-	-	-
Mov Cap-2 Maneuver	346	-	-	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	561	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	4.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1234	-	618	-	-
HCM Lane V/C Ratio	0.123	-	0.281	-	-
HCM Control Delay (s)	8.3	-	13.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	1	0	71	0	4	0	0	0	68	77	1
Future Vol, veh/h	0	1	0	71	0	4	0	0	0	68	77	1
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0
Mvmt Flow	0	1	0	91	0	5	0	0	0	87	99	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.8	8.3	9.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	47%	1%	100%	0%
Vol Thru, %	53%	0%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	72	4	191
LT Vol	68	1	4	0
Through Vol	77	0	0	191
RT Vol	1	71	0	0
Lane Flow Rate	187	92	5	245
Geometry Grp	1	1	1	1
Degree of Util (X)	0.243	0.11	0.007	0.294
Departure Headway (Hd)	4.664	4.294	5.199	4.326
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	771	835	688	833
Service Time	2.683	2.317	3.23	2.344
HCM Lane V/C Ratio	0.243	0.11	0.007	0.294
HCM Control Delay	9.2	7.8	8.3	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.4	0	1.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	191	0
Future Vol, veh/h	0	0	191	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	245	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.1
HCM LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱↱	↑	↱	↰↰	↑
Traffic Volume (vph)	0	849	741	117	863	586
Future Volume (vph)	0	849	741	117	863	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2814	1845	1538	3433	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2814	1845	1538	3433	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	875	764	121	890	604
RTOR Reduction (vph)	0	177	0	14	0	0
Lane Group Flow (vph)	0	698	764	107	890	604
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		15.6	22.8	22.8	15.6	48.2
Effective Green, g (s)		16.5	23.7	23.7	16.5	48.2
Actuated g/C Ratio		0.34	0.49	0.49	0.34	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		963	907	756	1175	1881
v/s Ratio Prot		0.25	c0.41		c0.26	0.32
v/s Ratio Perm				0.07		
v/c Ratio		0.72	0.84	0.14	0.76	0.32
Uniform Delay, d1		13.9	10.6	6.7	14.1	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.1	7.3	0.1	3.2	0.5
Delay (s)		17.0	18.0	6.8	17.3	0.5
Level of Service		B	B	A	B	A
Approach Delay (s)	17.0		16.4			10.5
Approach LOS	B		B			B

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	714	240	391	577	5	264	22	562	6	10	7
Future Volume (vph)	26	714	240	391	577	5	264	22	562	6	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1732	1590		1727	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1732	1590		1727	1580
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	776	261	425	627	5	287	24	611	7	11	8
RTOR Reduction (vph)	0	0	170	0	1	0	0	0	80	0	0	8
Lane Group Flow (vph)	28	776	91	425	631	0	155	156	531	0	18	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.6	20.5	20.5	10.8	29.7		9.0	9.0	19.8		0.9	0.9
Effective Green, g (s)	2.1	21.5	21.5	11.4	30.7		10.8	10.8	21.0		1.9	1.9
Actuated g/C Ratio	0.03	0.35	0.35	0.19	0.50		0.18	0.18	0.34		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	61	1235	563	641	1779		300	303	542		53	48
v/s Ratio Prot	0.02	c0.22		0.12	0.18		0.09	0.09	c0.18		c0.01	
v/s Ratio Perm			0.06						0.15			0.00
v/c Ratio	0.46	0.63	0.16	0.66	0.35		0.52	0.51	0.98		0.34	0.01
Uniform Delay, d1	29.2	16.7	13.8	23.3	9.4		23.0	23.0	20.1		29.2	28.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	0.7	0.0	2.0	0.0		0.6	0.6	32.8		1.4	0.0
Delay (s)	31.2	17.4	13.9	25.3	9.5		23.7	23.6	52.8		30.6	28.9
Level of Service	C	B	B	C	A		C	C	D		C	C
Approach Delay (s)		16.9			15.8			43.0			30.1	
Approach LOS		B			B			D			C	

Intersection Summary				
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	16.1	
Intersection Capacity Utilization	68.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	714	240	391	577	5	264	22	562	6	10	7
Future Volume (veh/h)	26	714	240	391	577	5	264	22	562	6	10	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1900	1881	1900	1760	1900
Adj Flow Rate, veh/h	28	776	261	425	627	5	304	0	611	7	11	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	53	922	420	524	1385	11	1314	0	797	19	30	46
Arrive On Green	0.03	0.26	0.26	0.15	0.38	0.37	0.36	0.00	0.35	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3634	29	3619	0	1598	671	1055	1589
Grp Volume(v), veh/h	28	776	261	425	308	324	304	0	611	18	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1876	1810	0	1598	1727	0	1589
Q Serve(g_s), s	1.2	16.9	11.6	9.6	10.5	10.5	4.7	0.0	25.2	0.8	0.0	0.4
Cycle Q Clear(g_c), s	1.2	16.9	11.6	9.6	10.5	10.5	4.7	0.0	25.2	0.8	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.39		1.00
Lane Grp Cap(c), veh/h	53	922	420	524	681	715	1314	0	797	50	0	46
V/C Ratio(X)	0.53	0.84	0.62	0.81	0.45	0.45	0.23	0.00	0.77	0.36	0.00	0.18
Avail Cap(c_a), veh/h	125	1010	461	556	681	715	1505	0	882	85	0	78
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.9	28.4	26.5	33.4	18.8	18.8	18.0	0.0	16.5	38.7	0.0	38.5
Incr Delay (d2), s/veh	3.0	5.5	1.4	7.7	0.2	0.2	0.0	0.0	3.1	1.6	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	8.9	5.3	5.2	5.2	5.4	2.4	0.0	11.7	0.4	0.0	0.2
LnGrp Delay(d),s/veh	41.9	34.0	27.9	41.0	19.0	19.0	18.0	0.0	19.6	40.4	0.0	39.2
LnGrp LOS	D	C	C	D	B	B	B		B	D		D
Approach Vol, veh/h		1065			1057			915			26	
Approach Delay, s/veh		32.7			27.9			19.1			40.0	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.5	35.0		33.5	16.3	25.2		6.3
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	22.2		3.0
Max Q Clear Time (g_c+I1), s	3.2	12.5		27.2	11.6	18.9		2.8
Green Ext Time (p_c), s	0.0	3.7		0.4	0.0	1.3		0.0

Intersection Summary		
HCM 2010 Ctrl Delay	27.0	
HCM 2010 LOS	C	

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	112	377	69	12	151	417	322	77	424	196	218	307
Future Volume (vph)	112	377	69	12	151	417	322	77	424	196	218	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3469			1746	1863	1560	1805	1827	1556	3502	1831
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3469			656	1863	1560	1805	1827	1556	3502	1831
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	115	389	71	12	156	430	332	79	437	202	225	316
RTOR Reduction (vph)	0	18	0	0	0	0	230	0	0	142	0	8
Lane Group Flow (vph)	115	442	0	0	168	430	102	79	437	60	225	371
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.4	22.0			11.5	25.1	25.1	6.1	24.1	24.1	9.4	27.4
Effective Green, g (s)	8.1	22.2			11.2	25.3	25.3	5.8	25.0	25.0	9.1	28.3
Actuated g/C Ratio	0.10	0.27			0.13	0.30	0.30	0.07	0.30	0.30	0.11	0.34
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	169	922			87	564	472	125	547	465	381	620
v/s Ratio Prot	0.07	0.13				c0.23		0.04	c0.24		c0.06	c0.20
v/s Ratio Perm					c0.26		0.07			0.04		
v/c Ratio	0.68	0.48			1.93	0.76	0.22	0.63	0.80	0.13	0.59	0.60
Uniform Delay, d1	36.4	25.8			36.1	26.4	21.7	37.8	26.9	21.3	35.4	22.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.7	0.5			458.2	6.2	0.3	10.0	8.2	0.2	2.4	1.7
Delay (s)	47.2	26.3			494.4	32.6	22.0	47.8	35.2	21.5	37.9	24.5
Level of Service	D	C			F	C	C	D	D	C	D	C
Approach Delay (s)		30.4				112.2			32.7			29.5
Approach LOS		C				F			C			C

Intersection Summary			
HCM 2000 Control Delay	57.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	83.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project PM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Existing + Project PM.syn

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	71	128	345	113	120	377	18	315	9	130	20	11
Future Volume (vph)	71	128	345	113	120	377	18	315	9	130	20	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	0.98			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.96		1.00	0.99		1.00	0.86			0.88
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1782	3411		1770	3547		3467	1574			3089
Flt Permitted		0.50	1.00		0.95	1.00		0.95	1.00			0.90
Satd. Flow (perm)		945	3411		1770	3547		3467	1574			2790
Peak-hour factor, PHF	0.93	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92
Adj. Flow (vph)	76	139	371	122	129	405	20	339	10	140	22	12
RTOR Reduction (vph)	0	0	35	0	0	3	0	0	98	0	0	133
Lane Group Flow (vph)	0	215	458	0	129	422	0	339	52	0	0	48
Confl. Peds. (#/hr)				3	5			3		5		
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	2%	1%	2%	2%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2									4	
Actuated Green, G (s)		30.7	30.7		10.2	44.4		11.6	22.6			7.0
Effective Green, g (s)		30.7	30.7		9.7	44.4		11.6	22.6			7.0
Actuated g/C Ratio		0.41	0.41		0.13	0.59		0.15	0.30			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		386	1396		228	2099		536	474			260
v/s Ratio Prot			0.13		c0.07	0.12		c0.10	0.03			
v/s Ratio Perm		c0.23										c0.02
v/c Ratio		0.56	0.33		0.57	0.20		0.63	0.11			0.18
Uniform Delay, d1		16.9	15.1		30.7	7.1		29.7	18.9			31.4
Progression Factor		1.00	1.00		0.91	1.31		1.00	1.00			1.00
Incremental Delay, d2		5.7	0.6		1.9	0.2		1.8	0.1			0.3
Delay (s)		22.6	15.7		29.7	9.5		31.5	19.0			31.7
Level of Service		C	B		C	A		C	B			C
Approach Delay (s)			17.8			14.2			27.7			31.7
Approach LOS			B			B			C			C

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Existing + Project PM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	135
Future Volume (vph)	135
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	147
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Existing + Project PM.syn

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	437	58	106	412	0	103	0	92	0	0	0
Future Volume (vph)	0	437	58	106	412	0	103	0	92	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3462		1752	3574			1744	1542			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3462		1752	3574			1390	1542			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	491	65	119	463	0	116	0	103	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	90	0	0	0
Lane Group Flow (vph)	0	548	0	119	463	0	0	116	13	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6		6	2		2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		46.4		7.6	57.5			9.5	9.5			
Effective Green, g (s)		46.4		7.1	57.5			9.5	9.5			
Actuated g/C Ratio		0.62		0.09	0.77			0.13	0.13			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2141		165	2740			176	195			
v/s Ratio Prot		c0.16		c0.07	0.13							
v/s Ratio Perm								c0.08	0.01			
v/c Ratio		0.26		0.72	0.17			0.66	0.07			
Uniform Delay, d1		6.5		33.0	2.3			31.2	28.8			
Progression Factor		0.72		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.3		12.3	0.1			6.6	0.1			
Delay (s)		5.0		45.3	2.5			37.8	28.9			
Level of Service		A		D	A			D	C			
Approach Delay (s)		5.0			11.2			33.6			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	437	58	106	412	0	103	0	92	0	0	0
Future Volume (veh/h)	0	437	58	106	412	0	103	0	92	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	491	65	119	463	0	116	0	103	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	2038	269	139	2793	0	253	0	175	0	213	0
Arrive On Green	0.00	0.86	0.86	0.08	0.78	0.00	0.11	0.00	0.11	0.00	0.00	0.00
Sat Flow, veh/h	0	3236	414	1757	3668	0	1404	0	1558	0	1900	0
Grp Volume(v), veh/h	0	276	280	119	463	0	116	0	103	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1787	1757	1787	0	1404	0	1558	0	1900	0
Q Serve(g_s), s	0.0	2.0	2.0	5.0	2.4	0.0	6.0	0.0	4.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	2.0	2.0	5.0	2.4	0.0	6.0	0.0	4.7	0.0	0.0	0.0
Prop In Lane	0.00		0.23	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1148	1159	139	2793	0	253	0	175	0	213	0
V/C Ratio(X)	0.00	0.24	0.24	0.85	0.17	0.00	0.46	0.00	0.59	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1148	1159	328	2793	0	508	0	457	0	557	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.95	0.95	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.9	2.0	34.1	2.1	0.0	32.2	0.0	31.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	5.5	0.1	0.0	0.5	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.1	1.1	2.7	1.2	0.0	2.4	0.0	2.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	2.4	2.4	39.6	2.2	0.0	32.7	0.0	32.8	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		556			582			219			0	
Approach Delay, s/veh		2.4			9.8			32.8			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	10.0	52.6		12.4		62.6		12.4
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	14.5	27.0		22.0		45.0		22.0
Max Q Clear Time (g_c+I1), s	7.0	4.0		0.0		4.4		8.0
Green Ext Time (p_c), s	0.0	8.2		0.0		9.8		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	10.5
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	16
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	409	24	0	27	14	6	23	401
Future Vol, veh/h	0	409	24	0	27	14	6	23	401
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2	0	0	0	0	2
Mvmt Flow	0	460	27	0	30	16	7	26	451
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	14	10.1	18.5
HCM LOS	B	B	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	205	205	24	27	14	29	401
LT Vol	205	205	0	0	0	29	0
Through Vol	0	0	24	27	0	0	0
RT Vol	0	0	0	0	14	0	401
Lane Flow Rate	230	230	27	30	16	33	451
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.427	0.425	0.033	0.061	0.028	0.06	0.682
Departure Headway (Hd)	6.694	6.66	4.43	7.214	6.496	6.647	5.446
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	538	540	806	495	549	539	662
Service Time	4.432	4.397	2.167	4.977	4.258	4.387	3.187
HCM Lane V/C Ratio	0.428	0.426	0.033	0.061	0.029	0.061	0.681
HCM Control Delay	14.4	14.3	7.3	10.4	9.4	9.8	19.1
HCM Lane LOS	B	B	A	B	A	A	C
HCM 95th-tile Q	2.1	2.1	0.1	0.2	0.1	0.2	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	0	155	62	20	26	169	1377	4	17	1271	205
Future Volume (vph)	219	0	155	62	20	26	169	1377	4	17	1271	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1463		1715	1662		1805	3572		1805	3574	1583
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1463		1715	1662		1805	3572		1805	3574	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	0	160	64	21	27	174	1420	4	18	1310	211
RTOR Reduction (vph)	0	132	0	0	25	0	0	0	0	0	0	117
Lane Group Flow (vph)	203	51	0	57	30	0	174	1424	0	18	1310	94
Confl. Peds. (#/hr)			7	7			7		7			
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	13.7	13.7		5.3	5.3		8.4	41.1		1.4	34.1	34.1
Effective Green, g (s)	13.9	13.9		5.5	5.5		8.1	42.0		1.1	35.0	35.0
Actuated g/C Ratio	0.18	0.18		0.07	0.07		0.10	0.54		0.01	0.45	0.45
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	300	259		120	116		186	1911		25	1593	705
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.10	0.40		0.01	c0.37	
v/s Ratio Perm												0.06
v/c Ratio	0.68	0.20		0.47	0.26		0.94	0.75		0.72	0.82	0.13
Uniform Delay, d1	30.2	27.5		35.1	34.6		34.9	14.1		38.5	19.0	12.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.2	0.4		4.0	1.6		47.4	1.8		67.0	3.9	0.1
Delay (s)	36.4	28.0		39.1	36.2		82.3	15.9		105.5	22.9	13.0
Level of Service	D	C		D	D		F	B		F	C	B
Approach Delay (s)		32.4			37.7			23.2			22.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	0	155	62	20	26	169	1377	4	17	1271	205
Future Volume (veh/h)	219	0	155	62	20	26	169	1377	4	17	1271	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1818	1900	1900	1900	1900	1900	1881	1900	1900	1881	1863
Adj Flow Rate, veh/h	193	46	160	56	32	27	174	1420	4	18	1310	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	1	0	1	2
Cap, veh/h	309	61	212	162	84	71	199	1802	5	46	1459	646
Arrive On Green	0.17	0.17	0.17	0.09	0.09	0.09	0.11	0.49	0.48	0.03	0.41	0.00
Sat Flow, veh/h	1792	354	1230	1810	943	796	1810	3656	10	1810	3574	1583
Grp Volume(v), veh/h	193	0	206	56	0	59	174	694	730	18	1310	0
Grp Sat Flow(s),veh/h/ln	1792	0	1583	1810	0	1739	1810	1787	1879	1810	1787	1583
Q Serve(g_s), s	7.3	0.0	9.0	2.1	0.0	2.3	6.9	23.4	23.4	0.7	24.9	0.0
Cycle Q Clear(g_c), s	7.3	0.0	9.0	2.1	0.0	2.3	6.9	23.4	23.4	0.7	24.9	0.0
Prop In Lane	1.00		0.78	1.00		0.46	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	309	0	273	162	0	156	199	881	926	46	1459	646
V/C Ratio(X)	0.62	0.00	0.75	0.35	0.00	0.38	0.88	0.79	0.79	0.39	0.90	0.00
Avail Cap(c_a), veh/h	413	0	365	179	0	172	199	881	926	174	1571	696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.9	0.0	28.7	31.1	0.0	31.3	31.9	15.3	15.3	34.9	20.1	0.0
Incr Delay (d2), s/veh	2.5	0.0	6.8	1.8	0.0	2.2	32.4	5.3	5.0	5.4	7.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	4.5	1.1	0.0	1.2	5.2	12.7	13.3	0.4	13.7	0.0
LnGrp Delay(d),s/veh	30.4	0.0	35.5	32.9	0.0	33.4	64.3	20.6	20.3	40.4	27.5	0.0
LnGrp LOS	C		D	C		C	E	C	C	D	C	
Approach Vol, veh/h		399			115			1598			1328	
Approach Delay, s/veh		33.0			33.2			25.2			27.7	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		16.6	12.0	33.7		10.5	5.8	39.9
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 17	8.3	31.1		7.0	7.3	32.1
Max Q Clear Time (g_c+I1), s		11.0	8.9	26.9		4.3	2.7	25.4
Green Ext Time (p_c), s		1.1	0.0	1.9		0.1	0.0	6.5

Intersection Summary	
HCM 2010 Ctrl Delay	27.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	869	18	25	18	6	54	10	1645	19	55	1435	493
Future Volume (vph)	869	18	25	18	6	54	10	1645	19	55	1435	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1732		1715	1761	1524	1805	3529		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1732		1715	1761	1524	1805	3529		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	26	18	6	55	10	1679	19	56	1464	503
RTOR Reduction (vph)	0	19	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	25	0	12	12	3	10	1698	0	56	1464	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	38.6	38.6		6.6	6.6	6.6	1.5	71.6		6.2	76.8	140.9
Effective Green, g (s)	39.2	39.2		6.8	6.8	6.8	1.2	72.5		6.4	77.7	140.9
Actuated g/C Ratio	0.28	0.28		0.05	0.05	0.05	0.01	0.51		0.05	0.55	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	964	481		82	84	73	15	1815		81	1970	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	c0.48		c0.03	0.41	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.92	0.05		0.15	0.14	0.04	0.67	0.94		0.69	0.74	0.31
Uniform Delay, d1	49.3	37.2		64.3	64.3	63.9	69.7	32.0		66.3	24.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.0	0.1		1.4	1.4	0.4	75.9	9.9		22.5	1.9	0.5
Delay (s)	63.3	37.3		65.7	65.6	64.3	145.5	41.9		88.7	25.9	0.5
Level of Service	E	D		E	E	E	F	D		F	C	A
Approach Delay (s)		62.1			64.7			42.5			21.3	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	144	1	12	4	0	4	6	421	0	1	412	82
Future Vol, veh/h	144	1	12	4	0	4	6	421	0	1	412	82
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	158	1	13	4	0	4	7	463	0	1	453	90

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	761	989	287	718	1034	244	551	0	0	468	0	0
Stage 1	508	508	-	481	481	-	-	-	-	-	-	-
Stage 2	253	481	-	237	553	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	295	249	692	320	234	763	1029	-	-	1104	-	-
Stage 1	516	542	-	540	557	-	-	-	-	-	-	-
Stage 2	729	557	-	751	518	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	287	244	683	307	229	755	1022	-	-	1097	-	-
Mov Cap-2 Maneuver	287	244	-	307	229	-	-	-	-	-	-	-
Stage 1	508	538	-	533	550	-	-	-	-	-	-	-
Stage 2	713	550	-	729	514	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.1	13.4	0.1	0
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1022	-	-	300	437	1097	-	-
HCM Lane V/C Ratio	0.006	-	-	0.575	0.02	0.001	-	-
HCM Control Delay (s)	8.5	0	-	32.1	13.4	8.3	0	-
HCM Lane LOS	A	A	-	D	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	3.4	0.1	0	-	-

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	108	423	16	6	393	29	10	6	4	6	3	115
Future Vol, veh/h	108	423	16	6	393	29	10	6	4	6	3	115
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	115	450	17	6	418	31	11	6	4	6	3	122

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	453	0	0	484	0	0	941	1171	268	925	1164	241
Stage 1	-	-	-	-	-	-	705	705	-	450	450	-
Stage 2	-	-	-	-	-	-	236	466	-	475	714	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1111	-	-	1089	-	-	221	194	736	227	196	760
Stage 1	-	-	-	-	-	-	398	442	-	564	575	-
Stage 2	-	-	-	-	-	-	752	566	-	545	438	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1099	-	-	1074	-	-	163	170	715	197	171	749
Mov Cap-2 Maneuver	-	-	-	-	-	-	163	170	-	197	171	-
Stage 1	-	-	-	-	-	-	351	390	-	503	570	-
Stage 2	-	-	-	-	-	-	615	561	-	470	387	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0.1	25.6	12.4
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	196	1099	-	-	1074	-	-	615
HCM Lane V/C Ratio	0.109	0.105	-	-	0.006	-	-	0.214
HCM Control Delay (s)	25.6	8.7	-	-	8.4	-	-	12.4
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0.3	-	-	0	-	-	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	888	111	10	540	138	30
Future Volume (vph)	888	111	10	540	138	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1752	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1752	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	955	119	11	581	148	32
RTOR Reduction (vph)	0	48	0	0	11	0
Lane Group Flow (vph)	955	71	11	581	169	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	38.5	38.5	0.6	43.3	10.5	
Effective Green, g (s)	38.5	38.5	0.6	43.3	10.5	
Actuated g/C Ratio	0.60	0.60	0.01	0.67	0.16	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1119	931	16	1246	284	
v/s Ratio Prot	c0.51		0.01	c0.31	c0.10	
v/s Ratio Perm		0.05				
v/c Ratio	0.85	0.08	0.69	0.47	0.60	
Uniform Delay, d1	10.8	5.6	32.0	5.1	25.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.7	0.0	67.5	0.3	2.2	
Delay (s)	17.4	5.6	99.5	5.5	27.4	
Level of Service	B	A	F	A	C	
Approach Delay (s)	16.1			7.2	27.4	
Approach LOS	B			A	C	

Intersection Summary				
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	64.7	Sum of lost time (s)	15.1	
Intersection Capacity Utilization	65.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	888	111	10	540	138	30
Future Volume (veh/h)	888	111	10	540	138	30
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1869	1900
Adj Flow Rate, veh/h	955	119	11	581	148	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	0	2	0	0
Cap, veh/h	1165	970	20	1306	206	0
Arrive On Green	0.62	0.62	0.01	0.70	0.12	0.00
Sat Flow, veh/h	1881	1566	1810	1863	1769	0
Grp Volume(v), veh/h	955	119	11	581	149	0
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1781	0
Q Serve(g_s), s	23.4	1.9	0.4	8.1	4.8	0.0
Cycle Q Clear(g_c), s	23.4	1.9	0.4	8.1	4.8	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1165	970	20	1306	207	0
V/C Ratio(X)	0.82	0.12	0.54	0.44	0.72	0.00
Avail Cap(c_a), veh/h	1351	1125	121	1594	537	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.8	4.7	29.4	3.9	25.4	0.0
Incr Delay (d2), s/veh	3.8	0.1	8.2	0.3	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.2	0.8	0.2	4.1	2.5	0.0
LnGrp Delay(d),s/veh	12.6	4.7	37.6	4.2	27.2	0.0
LnGrp LOS	B	A	D	A	C	
Approach Vol, veh/h	1074			592	149	
Approach Delay, s/veh	11.7			4.8	27.2	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	4.9	43.4				48.3		11.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	42.9				51.1		18.0
Max Q Clear Time (g_c+I1), s	2.4	25.4				10.1		6.8
Green Ext Time (p_c), s	0.0	11.6				19.2		0.1

Intersection Summary		
HCM 2010 Ctrl Delay	10.7	
HCM 2010 LOS	B	

Notes

Intersection

Int Delay, s/veh 2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	878	27	16	499	9	27	1	28	8	2	12
Future Vol, veh/h	3	878	27	16	499	9	27	1	28	8	2	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	3	987	30	18	561	10	30	1	31	9	2	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	571	0	0	987	0	0	1596	1600	987	1596	1595	566
Stage 1	-	-	-	-	-	-	993	993	-	602	602	-
Stage 2	-	-	-	-	-	-	603	607	-	994	993	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1012	-	-	708	-	-	87	107	303	87	108	528
Stage 1	-	-	-	-	-	-	298	326	-	490	492	-
Stage 2	-	-	-	-	-	-	489	489	-	298	326	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1012	-	-	708	-	-	82	104	303	76	105	528
Mov Cap-2 Maneuver	-	-	-	-	-	-	82	104	-	76	105	-
Stage 1	-	-	-	-	-	-	297	325	-	489	479	-
Stage 2	-	-	-	-	-	-	462	477	-	265	325	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	45.5	32.5
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	83	303	1012	-	-	708	-	-	80	528
HCM Lane V/C Ratio	0.379	0.104	0.003	-	-	0.025	-	-	0.14	0.026
HCM Control Delay (s)	72.7	18.3	8.6	-	-	10.2	-	-	57.2	12
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	1.5	0.3	0	-	-	0.1	-	-	0.5	0.1

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	39	1	7	658	489	40
Future Vol, veh/h	39	1	7	658	489	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	41	1	7	693	515	42

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1222	515	515	0	-	0
Stage 1	515	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	200	564	1061	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	198	564	1061	-	-	-
Mov Cap-2 Maneuver	198	-	-	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	488	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.6	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1061	-	201	-	-
HCM Lane V/C Ratio	0.007	-	0.209	-	-
HCM Control Delay (s)	8.4	0	27.6	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Intersection

Int Delay, s/veh 1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	27	58	444	43	30	476
Future Vol, veh/h	27	58	444	43	30	476
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	28	61	467	45	32	501

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1066	501	0	0	519	0
Stage 1	496	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	248	574	-	-	1057	-
Stage 1	616	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	235	569	-	-	1053	-
Mov Cap-2 Maneuver	235	-	-	-	-	-
Stage 1	613	-	-	-	-	-
Stage 2	543	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	392	1053	-
HCM Lane V/C Ratio	-	-	0.228	0.03	-
HCM Control Delay (s)	-	-	16.9	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection

Int Delay, s/veh 3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	121	131	385	347	28
Future Vol, veh/h	14	121	131	385	347	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	133	144	423	381	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1100	389	385	0	-	0
Stage 1	385	-	-	-	-	-
Stage 2	715	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-	-
Pot Cap-1 Maneuver	237	661	1185	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	207	657	1181	-	-	-
Mov Cap-2 Maneuver	207	-	-	-	-	-
Stage 1	690	-	-	-	-	-
Stage 2	427	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1181	-	536	-	-
HCM Lane V/C Ratio	0.122	-	0.277	-	-
HCM Control Delay (s)	8.5	-	14.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	136	109	290	233	17
Future Vol, veh/h	27	136	109	290	233	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	145	116	309	248	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	807	267	271	0	-	0
Stage 1	262	-	-	-	-	-
Stage 2	545	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	354	772	1298	-	-	-
Stage 1	786	-	-	-	-	-
Stage 2	585	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	320	766	1293	-	-	-
Mov Cap-2 Maneuver	320	-	-	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	530	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1293	-	622	-	-
HCM Lane V/C Ratio	0.09	-	0.279	-	-
HCM Control Delay (s)	8.1	-	13	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-

Intersection

Intersection Delay, s/veh 9.8
Intersection LOS A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	2	1	121	0	3	0	0	0	138	169	3
Future Vol, veh/h	0	2	1	121	0	3	0	0	0	138	169	3
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0
Mvmt Flow	0	2	1	133	0	3	0	0	0	152	186	3
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.3	8.5	10.8
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	45%	2%	100%	1%
Vol Thru, %	55%	1%	0%	99%
Vol Right, %	1%	98%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	310	124	3	132
LT Vol	138	2	3	1
Through Vol	169	1	0	131
RT Vol	3	121	0	0
Lane Flow Rate	341	136	3	145
Geometry Grp	1	1	1	1
Degree of Util (X)	0.424	0.167	0.005	0.185
Departure Headway (Hd)	4.479	4.423	5.39	4.591
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	804	809	662	780
Service Time	2.505	2.457	3.438	2.623
HCM Lane V/C Ratio	0.424	0.168	0.005	0.186
HCM Control Delay	10.8	8.3	8.5	8.7
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2.1	0.6	0	0.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	131	0
Future Vol, veh/h	0	1	131	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	144	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.7
HCM LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱↱	↑	↱	↰↰	↑
Traffic Volume (vph)	0	802	742	68	820	795
Future Volume (vph)	0	802	742	68	820	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	827	765	70	845	820
RTOR Reduction (vph)	0	181	0	14	0	0
Lane Group Flow (vph)	0	646	765	56	845	820
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		13.2	20.3	20.3	13.2	43.3
Effective Green, g (s)		14.1	21.2	21.2	14.1	43.3
Actuated g/C Ratio		0.33	0.49	0.49	0.33	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		925	920	790	1128	1881
v/s Ratio Prot		0.23	c0.41		c0.24	0.44
v/s Ratio Perm				0.03		
v/c Ratio		0.70	0.83	0.07	0.75	0.44
Uniform Delay, d1		12.7	9.5	5.8	13.0	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.7	6.6	0.0	3.1	0.7
Delay (s)		15.4	16.2	5.9	16.2	0.7
Level of Service		B	B	A	B	A
Approach Delay (s)	15.4		15.3			8.6
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	43.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	603	260	449	576	3	211	17	425	2	17	14
Future Volume (vph)	25	603	260	449	576	3	211	17	425	2	17	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (prot)	1805	3574	1593	3467	3607		1698	1717	1575		1891	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (perm)	1805	3574	1593	3467	3607		1698	1717	1575		1891	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	27	641	277	478	613	3	224	18	452	2	18	15
RTOR Reduction (vph)	0	0	188	0	1	0	0	0	102	0	0	15
Lane Group Flow (vph)	27	641	89	478	615	0	121	121	350	0	20	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.6	17.9	17.9	11.7	28.0		7.8	7.8	19.5		0.9	0.9
Effective Green, g (s)	2.1	18.9	18.9	12.3	29.0		9.6	9.6	20.7		1.9	1.9
Actuated g/C Ratio	0.04	0.32	0.32	0.21	0.49		0.16	0.16	0.35		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	64	1150	512	726	1781		277	280	555		61	52
v/s Ratio Prot	0.01	c0.18		c0.14	0.17		0.07	0.07	c0.13		c0.01	
v/s Ratio Perm			0.06						0.09			0.00
v/c Ratio	0.42	0.56	0.17	0.66	0.35		0.44	0.43	0.63		0.33	0.01
Uniform Delay, d1	27.7	16.4	14.3	21.3	9.1		22.1	22.1	15.8		27.8	27.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	0.3	0.1	1.7	0.0		0.4	0.4	1.7		1.1	0.0
Delay (s)	29.3	16.8	14.4	22.9	9.1		22.5	22.5	17.5		28.9	27.5
Level of Service	C	B	B	C	A		C	C	B		C	C
Approach Delay (s)		16.4			15.1			19.3			28.3	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	58.7	Sum of lost time (s)	16.1	
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	603	260	449	576	3	211	17	425	2	17	14
Future Volume (veh/h)	25	603	260	449	576	3	211	17	425	2	17	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	641	277	478	613	3	237	0	452	2	18	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	57	891	397	606	1439	7	1047	0	704	7	63	60
Arrive On Green	0.03	0.25	0.25	0.17	0.39	0.38	0.29	0.00	0.27	0.04	0.04	0.04
Sat Flow, veh/h	1810	3574	1592	3476	3683	18	3583	0	1561	189	1701	1615
Grp Volume(v), veh/h	27	641	277	478	300	316	237	0	452	20	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1592	1738	1805	1896	1792	0	1561	1891	0	1615
Q Serve(g_s), s	1.0	10.6	10.2	8.5	7.9	7.9	3.2	0.0	14.6	0.7	0.0	0.6
Cycle Q Clear(g_c), s	1.0	10.6	10.2	8.5	7.9	7.9	3.2	0.0	14.6	0.7	0.0	0.6
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	57	891	397	606	705	741	1047	0	704	70	0	60
V/C Ratio(X)	0.47	0.72	0.70	0.79	0.43	0.43	0.23	0.00	0.64	0.29	0.00	0.25
Avail Cap(c_a), veh/h	154	1170	521	805	853	896	1870	0	1062	117	0	100
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.8	22.2	22.1	25.6	14.4	14.4	17.4	0.0	13.9	30.4	0.0	30.3
Incr Delay (d2), s/veh	2.3	0.9	1.4	2.7	0.2	0.1	0.0	0.0	0.4	0.8	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.4	4.6	4.3	4.0	4.2	1.6	0.0	6.3	0.4	0.0	0.3
LnGrp Delay(d),s/veh	33.1	23.1	23.5	28.3	14.6	14.6	17.4	0.0	14.2	31.2	0.0	31.1
LnGrp LOS	C	C	C	C	B	B	B		B	C		C
Approach Vol, veh/h		945			1094			689			35	
Approach Delay, s/veh		23.5			20.6			15.3			31.1	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.1	29.3		22.9	15.3	20.1		6.4
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 14	20.2		3.0
Max Q Clear Time (g_c+I1), s	3.0	9.9		16.6	10.5	12.6		2.7
Green Ext Time (p_c), s	0.0	3.3		0.4	0.2	2.4		0.0

Intersection Summary		
HCM 2010 Ctrl Delay	20.4	
HCM 2010 LOS	C	

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	131	385	69	8	197	384	321	71	359	180	304	437
Future Volume (vph)	131	385	69	8	197	384	321	71	359	180	304	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3506			1795	1881	1556	1805	1863	1590	3502	1838
Flt Permitted	0.95	1.00			0.35	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3506			669	1881	1556	1805	1863	1590	3502	1838
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	132	389	70	8	199	388	324	72	363	182	307	441
RTOR Reduction (vph)	0	17	0	0	0	0	229	0	0	128	0	5
Lane Group Flow (vph)	132	442	0	0	207	388	95	72	363	54	307	491
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.4	20.4			11.6	23.6	23.6	6.0	23.3	23.3	9.5	26.8
Effective Green, g (s)	8.1	20.6			11.3	23.8	23.8	5.7	24.2	24.2	9.2	27.7
Actuated g/C Ratio	0.10	0.25			0.14	0.29	0.29	0.07	0.30	0.30	0.11	0.34
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	178	888			92	550	455	126	554	473	396	626
v/s Ratio Prot	0.07	0.13				c0.21		0.04	0.19		c0.09	c0.27
v/s Ratio Perm					c0.31		0.06			0.03		
v/c Ratio	0.74	0.50			2.25	0.71	0.21	0.57	0.66	0.11	0.78	0.78
Uniform Delay, d1	35.6	25.9			35.0	25.6	21.7	36.6	24.9	20.8	35.0	24.1
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.3	0.5			595.8	4.3	0.3	6.1	2.9	0.1	9.2	6.6
Delay (s)	50.9	26.4			630.8	29.9	21.9	42.7	27.8	20.9	44.2	30.7
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		31.9				162.4			27.5			35.9
Approach LOS		C				F			C			D

Intersection Summary			
HCM 2000 Control Delay	73.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	81.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Existing + Project Saturday.syn

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	84	200	256	160	141	329	29	298	13	139	27	16
Future Volume (vph)	84	200	256	160	141	329	29	298	13	139	27	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.97			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.94		1.00	0.99		1.00	0.86			0.88
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1780	3369		1787	3558		3467	1569			3087
Flt Permitted		0.53	1.00		0.95	1.00		0.95	1.00			0.90
Satd. Flow (perm)		988	3369		1787	3558		3467	1569			2782
Peak-hour factor, PHF	0.95	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	88	217	269	168	148	346	32	314	14	146	29	17
RTOR Reduction (vph)	0	0	88	0	0	5	0	0	107	0	0	191
Lane Group Flow (vph)	0	305	349	0	148	373	0	314	53	0	0	64
Confl. Peds. (#/hr)				5	9			5		9		
Confl. Bikes (#/hr)				11						11		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	2%	1%	2%	1%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2									4	
Actuated Green, G (s)		42.9	42.9		11.5	57.9		12.4	24.1			7.7
Effective Green, g (s)		42.9	42.9		11.0	57.9		12.4	24.1			7.7
Actuated g/C Ratio		0.48	0.48		0.12	0.64		0.14	0.27			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		470	1605		218	2288		477	420			238
v/s Ratio Prot			0.10		c0.08	0.10		c0.09	0.03			
v/s Ratio Perm		c0.31										c0.02
v/c Ratio		0.65	0.22		0.68	0.16		0.66	0.13			0.27
Uniform Delay, d1		17.8	13.8		37.8	6.4		36.8	25.0			38.5
Progression Factor		1.00	1.00		0.98	1.42		1.00	1.00			1.00
Incremental Delay, d2		6.8	0.3		6.4	0.2		2.5	0.1			0.6
Delay (s)		24.6	14.1		43.4	9.3		39.3	25.1			39.1
Level of Service		C	B		D	A		D	C			D
Approach Delay (s)			18.4			18.9			34.5			39.1
Approach LOS			B			B			C			D

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Existing + Project Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	192
Future Volume (vph)	192
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	209
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Existing + Project Saturday.syn

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	380	42	109	421	0	78	0	69	0	0	0
Future Volume (vph)	0	380	42	109	421	0	78	0	69	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.95			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3545		1805	3574			1794	1525			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3545		1805	3574			1430	1525			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	418	46	120	463	0	86	0	76	0	0	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	69	0	0	0
Lane Group Flow (vph)	0	459	0	120	463	0	0	86	7	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10						10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		60.3		9.4	73.2			8.8	8.8			
Effective Green, g (s)		60.3		8.9	73.2			8.8	8.8			
Actuated g/C Ratio		0.67		0.10	0.81			0.10	0.10			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2375		178	2906			139	149			
v/s Ratio Prot		c0.13		c0.07	0.13							
v/s Ratio Perm								c0.06	0.00			
v/c Ratio		0.19		0.67	0.16			0.62	0.05			
Uniform Delay, d1		5.6		39.2	1.8			39.0	36.8			
Progression Factor		0.95		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		7.7	0.1			5.7	0.1			
Delay (s)		5.6		46.8	1.9			44.6	36.9			
Level of Service		A		D	A			D	D			
Approach Delay (s)		5.6			11.2			41.0			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	380	42	109	421	0	78	0	69	0	0	0
Future Volume (veh/h)	0	380	42	109	421	0	78	0	69	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	418	46	120	463	0	86	0	76	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	2308	252	141	2959	0	200	0	126	0	158	0
Arrive On Green	0.00	0.47	0.47	0.08	0.83	0.00	0.08	0.00	0.08	0.00	0.00	0.00
Sat Flow, veh/h	0	3367	358	1810	3668	0	1440	0	1515	0	1900	0
Grp Volume(v), veh/h	0	229	235	120	463	0	86	0	76	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1825	1810	1787	0	1440	0	1515	0	1900	0
Q Serve(g_s), s	0.0	6.6	6.7	5.9	2.3	0.0	5.2	0.0	4.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.6	6.7	5.9	2.3	0.0	5.2	0.0	4.4	0.0	0.0	0.0
Prop In Lane	0.00		0.20	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1273	1287	141	2959	0	200	0	126	0	158	0
V/C Ratio(X)	0.00	0.18	0.18	0.85	0.16	0.00	0.43	0.00	0.60	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1273	1287	422	2959	0	464	0	404	0	507	0
HCM Platoon Ratio	1.00	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.98	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	8.7	8.8	41.0	1.5	0.0	40.2	0.0	39.8	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	5.3	0.1	0.0	0.5	0.0	1.7	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.4	3.5	3.1	1.1	0.0	2.1	0.0	1.9	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	9.0	9.1	46.2	1.6	0.0	40.8	0.0	41.6	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		D		D			
Approach Vol, veh/h		464			583			162			0	
Approach Delay, s/veh		9.0			10.8			41.1			0.0	
Approach LOS		A			B			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	11.0	67.5		11.5		78.5		11.5
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	21.5	33.0		24.0		58.0		24.0
Max Q Clear Time (g_c+I1), s	7.9	8.7		0.0		4.3		7.2
Green Ext Time (p_c), s	0.0	7.9		0.0		9.5		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	14.2
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	14.2
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	308	22	0	26	11	2	19	429
Future Vol, veh/h	0	308	22	0	26	11	2	19	429
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	331	24	0	28	12	2	20	461
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	11.8	9.8	16.4
HCM LOS	B	A	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	154	154	22	26	11	21	429
LT Vol	154	154	0	0	0	21	0
Through Vol	0	0	22	26	0	0	0
RT Vol	0	0	0	0	11	0	429
Lane Flow Rate	166	166	24	28	12	23	461
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.302	0.301	0.028	0.053	0.021	0.039	0.651
Departure Headway (Hd)	6.566	6.549	4.321	6.825	6.266	6.28	5.08
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	548	550	827	524	570	574	715
Service Time	4.301	4.284	2.055	4.575	4.016	3.98	2.78
HCM Lane V/C Ratio	0.303	0.302	0.029	0.053	0.021	0.04	0.645
HCM Control Delay	12.1	12.1	7.2	10	9.2	9.2	16.7
HCM Lane LOS	B	B	A	A	A	A	C
HCM 95th-tile Q	1.3	1.3	0.1	0.2	0.1	0.1	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	7	175	42	11	9	203	1262	7	5	1398	289
Future Volume (vph)	271	7	175	42	11	9	203	1262	7	5	1398	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1572		1715	1683		1787	3569		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1572		1715	1683		1787	3569		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	177	42	11	9	205	1275	7	5	1412	292
RTOR Reduction (vph)	0	146	0	0	9	0	0	0	0	0	0	136
Lane Group Flow (vph)	238	74	0	31	22	0	205	1282	0	5	1412	156
Confl. Bikes (#/hr)						3						3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.1	15.1		3.9	3.9		12.0	51.2		1.3	40.5	40.5
Effective Green, g (s)	15.3	15.3		4.1	4.1		11.7	52.1		1.0	41.4	41.4
Actuated g/C Ratio	0.17	0.17		0.05	0.05		0.13	0.59		0.01	0.47	0.47
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	293	271		79	77		236	2101		20	1671	738
v/s Ratio Prot	c0.14	0.05		c0.02	0.01		c0.11	0.36		0.00	c0.40	
v/s Ratio Perm												0.10
v/c Ratio	0.81	0.27		0.39	0.29		0.87	0.61		0.25	0.85	0.21
Uniform Delay, d1	35.2	31.8		41.0	40.8		37.6	11.7		43.4	20.7	13.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.0	0.6		4.3	2.9		26.9	0.7		6.5	4.5	0.2
Delay (s)	51.2	32.4		45.3	43.6		64.5	12.3		49.9	25.2	14.2
Level of Service	D	C		D	D		E	B		D	C	B
Approach Delay (s)		42.2			44.5			19.5			23.4	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	79.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Existing + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	7	175	42	11	9	203	1262	7	5	1398	289
Future Volume (veh/h)	271	7	175	42	11	9	203	1262	7	5	1398	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1897	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	229	70	177	31	26	9	205	1275	7	5	1412	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	317	84	214	123	91	32	236	2031	11	10	1541	696
Arrive On Green	0.18	0.18	0.17	0.07	0.07	0.07	0.13	0.56	0.55	0.01	0.43	0.00
Sat Flow, veh/h	1792	477	1207	1810	1342	465	1792	3642	20	1810	3574	1615
Grp Volume(v), veh/h	229	0	247	31	0	35	205	625	657	5	1412	0
Grp Sat Flow(s),veh/h/ln	1792	0	1684	1810	0	1807	1792	1786	1876	1810	1787	1615
Q Serve(g_s), s	10.1	0.0	11.8	1.4	0.0	1.5	9.4	19.9	19.9	0.2	31.0	0.0
Cycle Q Clear(g_c), s	10.1	0.0	11.8	1.4	0.0	1.5	9.4	19.9	19.9	0.2	31.0	0.0
Prop In Lane	1.00		0.72	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	317	0	298	123	0	123	236	996	1046	10	1541	696
V/C Ratio(X)	0.72	0.00	0.83	0.25	0.00	0.28	0.87	0.63	0.63	0.49	0.92	0.00
Avail Cap(c_a), veh/h	361	0	339	156	0	156	258	996	1046	152	1628	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.4	0.0	33.2	36.9	0.0	37.0	35.5	12.6	12.6	41.4	22.3	0.0
Incr Delay (d2), s/veh	6.5	0.0	14.7	1.5	0.0	1.8	24.0	1.6	1.5	32.9	8.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	6.7	0.7	0.0	0.8	6.2	10.2	10.7	0.2	17.0	0.0
LnGrp Delay(d),s/veh	38.9	0.0	47.9	38.4	0.0	38.7	59.5	14.2	14.1	74.3	31.0	0.0
LnGrp LOS	D		D	D		D	E	B	B	E	C	
Approach Vol, veh/h		476			66			1487			1417	
Approach Delay, s/veh		43.6			38.6			20.4			31.1	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.8	15.0	40.0		9.7	4.5	50.5
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 17	12.3	37.1		7.0	7.3	42.1
Max Q Clear Time (g_c+I1), s		13.8	11.4	33.0		3.5	2.2	21.9
Green Ext Time (p_c), s		0.8	0.1	2.1		0.1	0.0	19.1

Intersection Summary			
HCM 2010 Ctrl Delay	28.3		
HCM 2010 LOS	C		

Notes

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Existing + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	10	28	23	11	34	41	1452	27	40	1719	557
Future Volume (vph)	390	10	28	23	11	34	41	1452	27	40	1719	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1670		1715	1771	1582	1805	3564		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1670		1715	1771	1582	1805	3564		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	29	24	11	35	42	1497	28	41	1772	574
RTOR Reduction (vph)	0	24	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	15	0	17	18	2	42	1524	0	41	1772	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.5	15.5		4.7	4.7	4.7	4.4	53.2		4.3	53.6	95.6
Effective Green, g (s)	16.1	16.1		4.9	4.9	4.9	4.1	54.1		4.5	54.5	95.6
Actuated g/C Ratio	0.17	0.17		0.05	0.05	0.05	0.04	0.57		0.05	0.57	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	578	281		87	90	81	77	2016		84	2037	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.43		0.02	c0.50	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.70	0.05		0.20	0.20	0.02	0.55	0.76		0.49	0.87	0.37
Uniform Delay, d1	37.4	33.4		43.5	43.5	43.1	44.8	15.7		44.4	17.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.2	0.1		1.9	1.9	0.2	7.7	2.0		4.4	4.7	0.7
Delay (s)	41.6	33.5		45.4	45.4	43.3	52.5	17.7		48.8	22.2	0.7
Level of Service	D	C		D	D	D	D	B		D	C	A
Approach Delay (s)		40.9			44.3			18.7			17.5	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	95.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	72.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	123	0	14	1	0	0	6	318	0	0	430	94
Future Vol, veh/h	123	0	14	1	0	0	6	318	0	0	430	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	140	0	16	1	0	0	7	361	0	0	489	107

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	736	917	298	619	970	181	595	0	0	361	0	0
Stage 1	542	542	-	375	375	-	-	-	-	-	-	-
Stage 2	194	375	-	244	595	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	307	274	704	377	255	837	991	-	-	1209	-	-
Stage 1	492	523	-	624	621	-	-	-	-	-	-	-
Stage 2	789	621	-	744	496	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	305	272	704	366	253	837	991	-	-	1209	-	-
Mov Cap-2 Maneuver	305	272	-	366	253	-	-	-	-	-	-	-
Stage 1	488	523	-	618	615	-	-	-	-	-	-	-
Stage 2	782	615	-	727	496	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26	14.9	0.2	0
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	991	-	-	324	366	1209	-	-
HCM Lane V/C Ratio	0.007	-	-	0.48	0.003	-	-	-
HCM Control Delay (s)	8.7	0	-	26	14.9	0	-	-
HCM Lane LOS	A	A	-	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.5	0	0	-	-

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	131	318	12	5	419	31	7	0	6	6	1	104
Future Vol, veh/h	131	318	12	5	419	31	7	0	6	6	1	104
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	142	346	13	5	455	34	8	0	7	7	1	113

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	493	0	0	367	0	0	888	1149	195	953	1138	253
Stage 1	-	-	-	-	-	-	645	645	-	487	487	-
Stage 2	-	-	-	-	-	-	243	504	-	466	651	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1074	-	-	1203	-	-	241	200	820	217	203	753
Stage 1	-	-	-	-	-	-	432	471	-	536	554	-
Stage 2	-	-	-	-	-	-	745	544	-	551	468	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1070	-	-	1195	-	-	181	171	809	191	174	748
Mov Cap-2 Maneuver	-	-	-	-	-	-	181	171	-	191	174	-
Stage 1	-	-	-	-	-	-	372	406	-	463	550	-
Stage 2	-	-	-	-	-	-	626	540	-	471	403	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.5	0.1	18.4	12.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	282	1070	-	-	1195	-	-	630
HCM Lane V/C Ratio	0.05	0.133	-	-	0.005	-	-	0.192
HCM Control Delay (s)	18.4	8.9	-	-	8	-	-	12.1
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.5	-	-	0	-	-	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	700	118	27	689	126	16
Future Volume (vph)	700	118	27	689	126	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1789	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1789	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	745	126	29	733	134	17
RTOR Reduction (vph)	0	63	0	0	7	0
Lane Group Flow (vph)	745	63	29	733	144	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	25.4	25.4	1.2	30.8	9.1	
Effective Green, g (s)	25.4	25.4	1.2	30.8	9.1	
Actuated g/C Ratio	0.50	0.50	0.02	0.61	0.18	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	940	789	41	1140	320	
v/s Ratio Prot	c0.40		0.02	c0.39	c0.08	
v/s Ratio Perm		0.04				
v/c Ratio	0.79	0.08	0.71	0.64	0.45	
Uniform Delay, d1	10.5	6.6	24.6	6.5	18.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.8	0.1	36.5	1.3	0.4	
Delay (s)	15.3	6.7	61.2	7.8	19.0	
Level of Service	B	A	E	A	B	
Approach Delay (s)	14.1			9.8	19.0	
Approach LOS	B			A	B	

Intersection Summary				
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	15.1	
Intersection Capacity Utilization	53.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	700	118	27	689	126	16
Future Volume (veh/h)	700	118	27	689	126	16
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900
Adj Flow Rate, veh/h	745	126	29	733	134	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	4	1	0	0
Cap, veh/h	1028	863	46	1238	218	0
Arrive On Green	0.55	0.55	0.03	0.66	0.12	0.00
Sat Flow, veh/h	1881	1578	1740	1881	1797	0
Grp Volume(v), veh/h	745	126	29	733	135	0
Grp Sat Flow(s),veh/h/ln	1881	1578	1740	1881	1810	0
Q Serve(g_s), s	14.7	1.9	0.8	10.8	3.5	0.0
Cycle Q Clear(g_c), s	14.7	1.9	0.8	10.8	3.5	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1028	863	46	1238	220	0
V/C Ratio(X)	0.72	0.15	0.63	0.59	0.61	0.00
Avail Cap(c_a), veh/h	1252	1050	141	1564	659	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.4	5.5	23.8	4.7	20.6	0.0
Incr Delay (d2), s/veh	1.9	0.1	5.1	0.6	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	0.9	0.5	5.7	1.8	0.0
LnGrp Delay(d),s/veh	10.3	5.6	28.9	5.3	21.7	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	871			762	135	
Approach Delay, s/veh	9.6			6.2	21.7	
Approach LOS	A			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.5	33.4				39.0		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	32.9				41.1		18.0
Max Q Clear Time (g_c+I1), s	2.8	16.7				12.8		5.5
Green Ext Time (p_c), s	0.0	10.3				14.6		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.1
HCM 2010 LOS	A

Notes

Intersection

Int Delay, s/veh 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	673	34	14	626	8	35	0	40	4	0	8
Future Vol, veh/h	8	673	34	14	626	8	35	0	40	4	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	9	716	36	15	666	9	37	0	43	4	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	674	0	0	716	0	0	1433	1437	716	1433	1433	670
Stage 1	-	-	-	-	-	-	733	733	-	700	700	-
Stage 2	-	-	-	-	-	-	700	704	-	733	733	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	927	-	-	894	-	-	113	135	434	113	135	460
Stage 1	-	-	-	-	-	-	415	429	-	433	444	-
Stage 2	-	-	-	-	-	-	433	443	-	415	429	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	927	-	-	894	-	-	109	131	434	100	131	460
Mov Cap-2 Maneuver	-	-	-	-	-	-	109	131	-	100	131	-
Stage 1	-	-	-	-	-	-	411	425	-	429	437	-
Stage 2	-	-	-	-	-	-	418	436	-	371	425	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	32.9	22.9
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	109	434	927	-	-	894	-	-	100	460
HCM Lane V/C Ratio	0.342	0.098	0.009	-	-	0.017	-	-	0.043	0.019
HCM Control Delay (s)	54.3	14.2	8.9	-	-	9.1	-	-	42.6	13
HCM Lane LOS	F	B	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	1.4	0.3	0	-	-	0.1	-	-	0.1	0.1

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	4	5	567	663	43
Future Vol, veh/h	42	4	5	567	663	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	44	4	5	597	698	45

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1305	698	698	0	-	0
Stage 1	698	-	-	-	-	-
Stage 2	607	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	178	444	908	-	-	-
Stage 1	497	-	-	-	-	-
Stage 2	548	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	177	444	908	-	-	-
Mov Cap-2 Maneuver	177	-	-	-	-	-
Stage 1	497	-	-	-	-	-
Stage 2	544	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	30.8	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	908	-	187	-	-
HCM Lane V/C Ratio	0.006	-	0.259	-	-
HCM Control Delay (s)	9	0	30.8	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	1	-	-

Intersection

Int Delay, s/veh 1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	37	406	41	28	412
Future Vol, veh/h	34	37	406	41	28	412
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	35	38	419	42	29	425

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	934	452	0	0	467	0
Stage 1	446	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	297	612	-	-	1105	-
Stage 1	649	-	-	-	-	-
Stage 2	621	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	284	606	-	-	1099	-
Mov Cap-2 Maneuver	284	-	-	-	-	-
Stage 1	646	-	-	-	-	-
Stage 2	596	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.2	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	393	1099	-
HCM Lane V/C Ratio	-	-	0.186	0.026	-
HCM Control Delay (s)	-	-	16.2	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection

Int Delay, s/veh 2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	90	74	345	339	16
Future Vol, veh/h	10	90	74	345	339	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	96	79	367	361	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	906	383	372	0	-	0
Stage 1	372	-	-	-	-	-
Stage 2	534	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.218	-	-	-
Pot Cap-1 Maneuver	309	662	1186	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	283	650	1175	-	-	-
Mov Cap-2 Maneuver	283	-	-	-	-	-
Stage 1	696	-	-	-	-	-
Stage 2	547	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1175	-	575	-	-
HCM Lane V/C Ratio	0.067	-	0.185	-	-
HCM Control Delay (s)	8.3	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.7	-	-

Intersection

Int Delay, s/veh	3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	126	109	262	222	8
Future Vol, veh/h	20	126	109	262	222	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	140	121	291	247	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	798	265	263	0	-	0
Stage 1	258	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	358	779	1307	-	-	-
Stage 1	790	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	321	770	1299	-	-	-
Mov Cap-2 Maneuver	321	-	-	-	-	-
Stage 1	785	-	-	-	-	-
Stage 2	530	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	2.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1299	-	646	-	-
HCM Lane V/C Ratio	0.093	-	0.251	-	-
HCM Control Delay (s)	8.1	-	12.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1	-	-

Intersection

Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	110	0	3	0	0	0	175	103	4
Future Vol, veh/h	0	0	1	110	0	3	0	0	0	175	103	4
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0
Mvmt Flow	0	0	1	126	0	3	0	0	0	201	118	5
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.2	8.4	10.5
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	62%	0%	100%	0%
Vol Thru, %	37%	1%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	282	111	3	117
LT Vol	175	0	3	0
Through Vol	103	1	0	117
RT Vol	4	110	0	0
Lane Flow Rate	324	128	3	134
Geometry Grp	1	1	1	1
Degree of Util (X)	0.404	0.154	0.005	0.171
Departure Headway (Hd)	4.491	4.356	5.318	4.566
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	801	823	672	785
Service Time	2.516	2.385	3.359	2.593
HCM Lane V/C Ratio	0.404	0.156	0.004	0.171
HCM Control Delay	10.5	8.2	8.4	8.5
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2	0.5	0	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	117	0
Future Vol, veh/h	0	0	117	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	134	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.5
HCM LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱↱	↑	↱	↰↰	↑
Traffic Volume (vph)	0	1082	490	91	976	668
Future Volume (vph)	0	1082	490	91	976	668
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1244	563	105	1122	768
RTOR Reduction (vph)	0	155	0	27	0	0
Lane Group Flow (vph)	0	1089	563	78	1122	768
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		27.2	20.9	20.9	27.2	57.9
Effective Green, g (s)		28.1	21.8	21.8	28.1	57.9
Actuated g/C Ratio		0.49	0.38	0.38	0.49	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1352	694	590	1650	1810
v/s Ratio Prot		c0.39	c0.31		0.33	0.42
v/s Ratio Perm				0.05		
v/c Ratio		0.81	0.81	0.13	0.68	0.42
Uniform Delay, d1		12.6	16.2	11.8	11.4	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.0	7.3	0.1	1.4	0.7
Delay (s)		16.6	23.5	12.0	12.8	0.7
Level of Service		B	C	B	B	A
Approach Delay (s)	16.6		21.7			7.9
Approach LOS	B		C			A

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	814	245	369	945	10	96	3	232	9	17	41
Future Volume (vph)	7	814	245	369	945	10	96	3	232	9	17	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1564	3433	3530		1698	1708	1562		1733	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1564	3433	3530		1698	1708	1562		1733	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	1044	314	473	1212	13	123	4	297	12	22	53
RTOR Reduction (vph)	0	0	147	0	0	0	0	0	68	0	0	50
Lane Group Flow (vph)	9	1044	167	473	1225	0	64	63	229	0	34	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.7	27.4	27.4	11.9	38.6		4.8	4.8	16.7		2.3	2.3
Effective Green, g (s)	1.2	28.4	28.4	12.5	39.6		6.6	6.6	17.9		3.3	3.3
Actuated g/C Ratio	0.02	0.43	0.43	0.19	0.59		0.10	0.10	0.27		0.05	0.05
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	32	1504	664	642	2092		167	168	418		85	76
v/s Ratio Prot	0.00	c0.29		c0.14	0.35		0.04	0.04	c0.10		c0.02	
v/s Ratio Perm			0.11						0.04			0.00
v/c Ratio	0.28	0.69	0.25	0.74	0.59		0.38	0.38	0.55		0.40	0.03
Uniform Delay, d1	32.4	15.7	12.4	25.6	8.5		28.2	28.2	21.0		30.8	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	1.1	0.1	3.8	0.3		0.5	0.5	0.8		1.1	0.1
Delay (s)	34.1	16.8	12.4	29.4	8.8		28.7	28.7	21.8		31.9	30.3
Level of Service	C	B	B	C	A		C	C	C		C	C
Approach Delay (s)		15.9			14.5			23.8			30.9	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	16.1	
Intersection Capacity Utilization	53.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	814	245	369	945	10	96	3	232	9	17	41
Future Volume (veh/h)	7	814	245	369	945	10	96	3	232	9	17	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1763	1863
Adj Flow Rate, veh/h	9	1044	314	473	1212	13	126	0	297	12	22	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	30	1172	518	585	1732	19	760	0	567	35	64	90
Arrive On Green	0.02	0.33	0.33	0.17	0.48	0.47	0.21	0.00	0.19	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3584	38	3583	0	1545	611	1121	1575
Grp Volume(v), veh/h	9	1044	314	473	598	627	126	0	297	34	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1854	1792	0	1545	1733	0	1575
Q Serve(g_s), s	0.3	19.5	11.7	9.2	18.4	18.4	2.0	0.0	10.5	1.3	0.0	2.3
Cycle Q Clear(g_c), s	0.3	19.5	11.7	9.2	18.4	18.4	2.0	0.0	10.5	1.3	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.35		1.00
Lane Grp Cap(c), veh/h	30	1172	518	585	854	896	760	0	567	99	0	90
V/C Ratio(X)	0.30	0.89	0.61	0.81	0.70	0.70	0.17	0.00	0.52	0.34	0.00	0.59
Avail Cap(c_a), veh/h	117	1219	538	602	854	896	1737	0	989	99	0	90
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.9	22.1	19.5	27.8	14.1	14.1	22.4	0.0	17.4	31.6	0.0	32.0
Incr Delay (d2), s/veh	2.1	7.9	1.2	7.3	2.2	2.1	0.0	0.0	0.3	0.8	0.0	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.7	5.2	4.9	9.5	9.9	1.0	0.0	4.5	0.7	0.0	1.2
LnGrp Delay(d),s/veh	36.0	30.1	20.8	35.1	16.2	16.1	22.5	0.0	17.7	32.3	0.0	38.6
LnGrp LOS	D	C	C	D	B	B	C		B	C		D
Approach Vol, veh/h		1367			1698			423			87	
Approach Delay, s/veh		28.0			21.5			19.1			36.1	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	37.7		18.8	15.8	27.1		8.0
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 12	23.0		3.0
Max Q Clear Time (g_c+I1), s	2.3	20.4		12.5	11.2	21.5		4.3
Green Ext Time (p_c), s	0.0	5.2		0.3	0.0	0.6		0.0

Intersection Summary		
HCM 2010 Ctrl Delay	24.0	
HCM 2010 LOS	C	

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	200	289	26	6	88	268	150	38	232	63	266	335
Future Volume (vph)	200	289	26	6	88	268	150	38	232	63	266	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3494			1703	1827	1547	1752	1881	1589	3433	1761
Flt Permitted	0.95	1.00			0.18	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3494			320	1827	1547	1752	1881	1589	3433	1761
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	215	311	28	7	95	288	161	41	249	68	286	360
RTOR Reduction (vph)	0	7	0	0	0	0	116	0	0	50	0	7
Lane Group Flow (vph)	215	332	0	0	102	288	45	41	249	18	286	425
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	14.4	15.1			22.7	23.4	23.4	4.3	21.5	21.5	9.5	26.7
Effective Green, g (s)	14.1	15.3			22.4	23.6	23.6	4.0	22.4	22.4	9.2	27.6
Actuated g/C Ratio	0.17	0.18			0.26	0.28	0.28	0.05	0.26	0.26	0.11	0.32
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	281	626			84	505	428	82	493	417	370	569
v/s Ratio Prot	0.13	0.09				c0.16		0.02	0.13		c0.08	c0.24
v/s Ratio Perm					c0.32		0.03			0.01		
v/c Ratio	0.77	0.53			1.21	0.57	0.10	0.50	0.51	0.04	0.77	0.75
Uniform Delay, d1	34.0	31.7			31.4	26.5	23.0	39.7	26.7	23.5	37.0	25.7
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.7	0.9			166.7	1.7	0.1	4.7	1.0	0.1	9.7	5.5
Delay (s)	45.7	32.7			198.1	28.2	23.1	44.4	27.7	23.5	46.7	31.2
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		37.7				58.2			28.8			37.4
Approach LOS		D				E			C			D

Intersection Summary			
HCM 2000 Control Delay	41.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Background AM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
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Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	61	385	77	99	287	152	62
Future Volume (vph)	61	385	77	99	287	152	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3410		1687	3438	3367	1495
Flt Permitted	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	3410		1687	3438	3367	1495
Peak-hour factor, PHF	0.92	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	66	423	85	109	315	167	68
RTOR Reduction (vph)	0	23	0	0	0	0	60
Lane Group Flow (vph)	66	485	0	109	315	167	8
Confl. Bikes (#/hr)			1				
Heavy Vehicles (%)	2%	3%	3%	7%	5%	4%	8%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.2	26.6		6.0	28.4	5.9	5.9
Effective Green, g (s)	3.7	26.6		5.5	28.4	5.9	5.9
Actuated g/C Ratio	0.07	0.53		0.11	0.57	0.12	0.12
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	137	1814		185	1952	397	176
v/s Ratio Prot		c0.14		c0.06	0.09	c0.05	
v/s Ratio Perm	0.04						0.01
v/c Ratio	0.48	0.27		0.59	0.16	0.42	0.05
Uniform Delay, d1	22.2	6.4		21.2	5.1	20.5	19.6
Progression Factor	1.00	1.00		1.41	0.76	1.00	1.00
Incremental Delay, d2	1.0	0.4		3.1	0.2	0.3	0.0
Delay (s)	23.2	6.7		32.9	4.1	20.7	19.6
Level of Service	C	A		C	A	C	B
Approach Delay (s)		8.6			11.5	20.4	
Approach LOS		A			B	C	

Intersection Summary				
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	32.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	360	87	49	359	0	27	0	27	0	0	0
Future Volume (vph)	0	360	87	49	359	0	27	0	27	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.97		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3392		1805	3471			1552	1367			
Flt Permitted		1.00		0.95	1.00			0.98	1.00			
Satd. Flow (perm)		3392		1805	3471			1594	1367			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	424	102	58	422	0	32	0	32	0	0	0
RTOR Reduction (vph)	0	25	0	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	501	0	58	422	0	0	32	3	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		30.8		3.6	37.9			4.1	4.1			
Effective Green, g (s)		30.8		3.1	37.9			4.1	4.1			
Actuated g/C Ratio		0.62		0.06	0.76			0.08	0.08			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2089		111	2631			130	112			
v/s Ratio Prot		c0.15		c0.03	0.12							
v/s Ratio Perm								c0.02	0.00			
v/c Ratio		0.24		0.52	0.16			0.25	0.02			
Uniform Delay, d1		4.3		22.7	1.7			21.5	21.1			
Progression Factor		0.34		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.3		2.0	0.1			0.4	0.0			
Delay (s)		1.7		24.8	1.8			21.9	21.1			
Level of Service		A		C	A			C	C			
Approach Delay (s)		1.7			4.6			21.5			0.0	
Approach LOS		A			A			C			A	

Intersection Summary				
HCM 2000 Control Delay	4.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.26			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	29.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	360	87	49	359	0	27	0	27	0	0	0
Future Volume (veh/h)	0	360	87	49	359	0	27	0	27	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1900	1652	1652	1900	1900	1900
Adj Flow Rate, veh/h	0	424	102	58	422	0	32	0	32	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	0	15	0	0	0
Cap, veh/h	0	1909	455	62	2752	0	202	0	65	0	90	0
Arrive On Green	0.00	0.22	0.22	0.03	0.79	0.00	0.05	0.00	0.05	0.00	0.00	0.00
Sat Flow, veh/h	0	2905	671	1810	3563	0	1236	0	1383	0	1900	0
Grp Volume(v), veh/h	0	263	263	58	422	0	32	0	32	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1728	1810	1736	0	1236	0	1383	0	1900	0
Q Serve(g_s), s	0.0	6.1	6.2	1.6	1.4	0.0	1.3	0.0	1.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.1	6.2	1.6	1.4	0.0	1.3	0.0	1.1	0.0	0.0	0.0
Prop In Lane	0.00		0.39	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1192	1173	62	2752	0	202	0	65	0	90	0
V/C Ratio(X)	0.00	0.22	0.22	0.94	0.15	0.00	0.16	0.00	0.49	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1192	1173	181	2752	0	540	0	443	0	608	0
HCM Platoon Ratio	1.00	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.98	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	8.6	8.6	24.1	1.2	0.0	23.3	0.0	23.2	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.4	20.0	0.1	0.0	0.1	0.0	2.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.1	3.1	1.1	0.7	0.0	0.4	0.0	0.5	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	9.0	9.1	44.1	1.3	0.0	23.4	0.0	25.4	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		526			480			64			0	
Approach Delay, s/veh		9.1			6.5			24.4			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	5.7	37.9		6.4		43.6		6.4
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	5.5	17.0		16.0		26.0		16.0
Max Q Clear Time (g_c+I1), s	3.6	8.2		0.0		3.4		3.3
Green Ext Time (p_c), s	0.0	4.4		0.0		7.5		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	8.8
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	217	30	0	12	12	5	16	330
Future Vol, veh/h	0	217	30	0	12	12	5	16	330
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	247	34	0	14	14	5	18	375
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	10.1	8.8	11.7
HCM LOS	B	A	B

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	109	109	30	12	12	21	330
LT Vol	109	109	0	0	0	21	0
Through Vol	0	0	30	12	0	0	0
RT Vol	0	0	0	0	12	0	330
Lane Flow Rate	123	123	34	14	14	24	375
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.212	0.209	0.037	0.024	0.021	0.039	0.489
Departure Headway (Hd)	6.188	6.102	3.883	6.294	5.582	5.926	4.692
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	575	583	907	572	645	603	765
Service Time	3.98	3.894	1.672	3.994	3.282	3.674	2.44
HCM Lane V/C Ratio	0.214	0.211	0.037	0.024	0.022	0.04	0.49
HCM Control Delay	10.7	10.5	6.8	9.1	8.4	8.9	11.9
HCM Lane LOS	B	B	A	A	A	A	B
HCM 95th-tile Q	0.8	0.8	0.1	0.1	0.1	0.1	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	50	106	151	43	63	130	1149	48	18	1373	113
Future Volume (vph)	144	50	106	151	43	63	130	1149	48	18	1373	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.95		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1510		1665	1649		1770	3468		1805	3471	1568
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1510		1665	1649		1770	3468		1805	3471	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	54	115	164	47	68	141	1249	52	20	1492	123
RTOR Reduction (vph)	0	69	0	0	40	0	0	3	0	0	0	57
Lane Group Flow (vph)	141	116	0	143	96	0	141	1298	0	20	1492	66
Confl. Peds. (#/hr)			46	46					46			
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	12.7	12.7		8.8	8.8		8.3	47.0		2.8	41.5	41.5
Effective Green, g (s)	12.9	12.9		9.0	9.0		8.0	47.9		2.5	42.4	42.4
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.09	0.54		0.03	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	243	220		169	168		160	1881		51	1666	752
v/s Ratio Prot	c0.08	0.08		c0.09	0.06		c0.08	0.37		0.01	c0.43	
v/s Ratio Perm												0.04
v/c Ratio	0.58	0.53		0.85	0.57		0.88	0.69		0.39	0.90	0.09
Uniform Delay, d1	35.2	34.9		39.0	37.8		39.7	14.8		42.2	20.9	12.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	2.6		31.3	5.6		39.0	1.3		4.9	7.0	0.1
Delay (s)	38.9	37.5		70.3	43.4		78.7	16.1		47.1	27.9	12.5
Level of Service	D	D		E	D		E	B		D	C	B
Approach Delay (s)		38.1			57.2			22.2			27.0	
Approach LOS		D			E			C			C	

Intersection Summary				
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	78.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	50	106	151	43	63	130	1149	48	18	1373	113
Future Volume (veh/h)	144	50	106	151	43	63	130	1149	48	18	1373	113
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.87	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845
Adj Flow Rate, veh/h	157	54	115	140	81	68	141	1249	52	20	1492	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3
Cap, veh/h	281	80	169	184	93	78	165	1786	74	50	1581	714
Arrive On Green	0.16	0.16	0.16	0.10	0.10	0.10	0.09	0.52	0.51	0.03	0.46	0.00
Sat Flow, veh/h	1757	497	1058	1757	883	741	1774	3426	142	1810	3471	1568
Grp Volume(v), veh/h	157	0	169	140	0	149	141	639	662	20	1492	0
Grp Sat Flow(s),veh/h/ln	1757	0	1555	1757	0	1625	1774	1754	1814	1810	1736	1568
Q Serve(g_s), s	7.1	0.0	8.8	6.7	0.0	7.8	6.7	23.5	23.6	0.9	35.2	0.0
Cycle Q Clear(g_c), s	7.1	0.0	8.8	6.7	0.0	7.8	6.7	23.5	23.6	0.9	35.2	0.0
Prop In Lane	1.00		0.68	1.00		0.46	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	281	0	249	184	0	170	165	915	946	50	1581	714
V/C Ratio(X)	0.56	0.00	0.68	0.76	0.00	0.87	0.85	0.70	0.70	0.40	0.94	0.00
Avail Cap(c_a), veh/h	348	0	308	184	0	170	165	915	946	148	1617	731
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.3	0.0	34.0	37.4	0.0	37.9	38.3	15.5	15.5	41.1	22.3	0.0
Incr Delay (d2), s/veh	2.1	0.0	4.9	17.8	0.0	36.9	32.6	2.8	2.7	5.2	11.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.1	4.1	0.0	5.2	4.8	12.1	12.5	0.5	19.4	0.0
LnGrp Delay(d),s/veh	35.3	0.0	39.0	55.1	0.0	74.8	70.9	18.2	18.2	46.2	34.1	0.0
LnGrp LOS	D		D	E		E	E	B	B	D	C	
Approach Vol, veh/h		326			289			1442			1512	
Approach Delay, s/veh		37.2			65.3			23.4			34.2	
Approach LOS		D			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		17.7	12.0	43.1		13.0	6.4	48.8
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 17	8.3	39.1		8.8	7.3	40.1
Max Q Clear Time (g_c+I1), s		10.8	8.7	37.2		9.8	2.9	25.6
Green Ext Time (p_c), s		0.9	0.0	1.0		0.0	0.0	14.0

Intersection Summary		
HCM 2010 Ctrl Delay	32.6	
HCM 2010 LOS	C	

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	382	4	24	34	14	44	36	1300	16	71	1632	774
Future Volume (vph)	382	4	24	34	14	44	36	1300	16	71	1632	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	26	37	15	48	40	1429	18	78	1793	851
RTOR Reduction (vph)	0	22	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	26	26	3	40	1446	0	78	1793	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.6	53.2		6.2	55.3	99.8
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.3	54.1		6.4	56.2	99.8
Actuated g/C Ratio	0.16	0.16		0.07	0.07	0.07	0.04	0.54		0.06	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	557	248		122	120	113	75	1914		105	1954	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.41		0.05	c0.52	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.75	0.03		0.21	0.22	0.03	0.53	0.76		0.74	0.92	0.54
Uniform Delay, d1	39.9	35.2		43.7	43.7	43.1	46.8	17.7		45.9	19.7	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.5	0.1		1.5	1.6	0.2	7.1	2.1		24.4	7.7	1.3
Delay (s)	46.4	35.3		45.2	45.3	43.3	53.9	19.8		70.3	27.4	1.3
Level of Service	D	D		D	D	D	D	B		E	C	A
Approach Delay (s)		45.6			44.3			20.7			20.5	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	0	8	0	0	0	2	219	2	8	356	71
Future Vol, veh/h	20	0	8	0	0	0	2	219	2	8	356	71
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	23	0	9	0	0	0	2	252	2	9	409	82

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	604	733	251	486	772	133	494	0	0	257	0	0
Stage 1	471	471	-	260	260	-	-	-	-	-	-	-
Stage 2	133	262	-	226	512	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	366	350	683	469	333	898	1080	-	-	1320	-	-
Stage 1	522	563	-	728	697	-	-	-	-	-	-	-
Stage 2	834	695	-	762	540	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	361	344	680	456	327	894	1077	-	-	1317	-	-
Mov Cap-2 Maneuver	361	344	-	456	327	-	-	-	-	-	-	-
Stage 1	520	556	-	725	694	-	-	-	-	-	-	-
Stage 2	830	692	-	742	533	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.4	0	0.1	0.1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1077	-	-	417	-	1317	-	-
HCM Lane V/C Ratio	0.002	-	-	0.077	-	0.007	-	-
HCM Control Delay (s)	8.3	0	-	14.4	0	7.8	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	-	0	-	-

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	124	242	17	3	328	11	18	2	4	1	2	62
Future Vol, veh/h	124	242	17	3	328	11	18	2	4	1	2	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	143	278	20	3	377	13	21	2	5	1	2	71

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	390	0	0	298	0	0	770	970	149	815	973	195
Stage 1	-	-	-	-	-	-	573	573	-	390	390	-
Stage 2	-	-	-	-	-	-	197	397	-	425	583	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1144	-	-	1275	-	-	294	255	877	273	254	789
Stage 1	-	-	-	-	-	-	477	507	-	611	611	-
Stage 2	-	-	-	-	-	-	792	607	-	583	502	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1144	-	-	1275	-	-	240	223	877	243	222	789
Mov Cap-2 Maneuver	-	-	-	-	-	-	240	223	-	243	222	-
Stage 1	-	-	-	-	-	-	417	444	-	535	610	-
Stage 2	-	-	-	-	-	-	716	606	-	505	439	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.8	0.1	19.8	10.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	271	1144	-	-	1275	-	-	709
HCM Lane V/C Ratio	0.102	0.125	-	-	0.003	-	-	0.105
HCM Control Delay (s)	19.8	8.6	-	-	7.8	-	-	10.7
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.4	-	-	0	-	-	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	635	116	22	894	79	19
Future Volume (vph)	635	116	22	894	79	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1758	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1758	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	668	122	23	941	83	20
RTOR Reduction (vph)	0	54	0	0	15	0
Lane Group Flow (vph)	668	68	23	941	88	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	29.3	29.3	0.7	34.2	7.5	
Effective Green, g (s)	29.3	29.3	0.7	34.2	7.5	
Actuated g/C Ratio	0.56	0.56	0.01	0.65	0.14	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1027	865	24	1223	250	
v/s Ratio Prot	0.36		0.01	c0.50	c0.05	
v/s Ratio Perm		0.04				
v/c Ratio	0.65	0.08	0.96	0.77	0.35	
Uniform Delay, d1	8.1	5.4	25.9	6.4	20.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.0	162.4	3.1	0.3	
Delay (s)	9.7	5.4	188.4	9.5	20.7	
Level of Service	A	A	F	A	C	
Approach Delay (s)	9.0			13.8	20.7	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	15.1
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	635	116	22	894	79	19
Future Volume (veh/h)	635	116	22	894	79	19
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1878	1900
Adj Flow Rate, veh/h	668	122	23	941	83	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	4	0	1	0	0
Cap, veh/h	987	831	40	1214	223	0
Arrive On Green	0.54	0.54	0.02	0.65	0.13	0.00
Sat Flow, veh/h	1845	1553	1810	1881	1768	0
Grp Volume(v), veh/h	668	122	23	941	84	0
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1790	0
Q Serve(g_s), s	12.6	1.9	0.6	16.9	2.1	0.0
Cycle Q Clear(g_c), s	12.6	1.9	0.6	16.9	2.1	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	987	831	40	1214	225	0
V/C Ratio(X)	0.68	0.15	0.58	0.78	0.37	0.00
Avail Cap(c_a), veh/h	1080	909	152	1425	676	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.1	5.6	23.1	6.0	19.1	0.0
Incr Delay (d2), s/veh	1.7	0.1	4.8	2.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.8	0.3	9.2	1.0	0.0
LnGrp Delay(d),s/veh	9.7	5.7	27.9	8.5	19.5	0.0
LnGrp LOS	A	A	C	A	B	
Approach Vol, veh/h	790			964	84	
Approach Delay, s/veh	9.1			9.0	19.5	
Approach LOS	A			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.3	31.9				37.2		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	27.9				36.1		18.0
Max Q Clear Time (g_c+I1), s	2.6	14.6				18.9		4.1
Green Ext Time (p_c), s	0.0	9.7				11.8		0.1

Intersection Summary		
HCM 2010 Ctrl Delay		9.5
HCM 2010 LOS		A

Notes

Intersection

Int Delay, s/veh 2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	534	28	29	892	8	11	1	13	14	0	47
Future Vol, veh/h	27	534	28	29	892	8	11	1	13	14	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	30	587	31	32	980	9	12	1	14	15	0	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	989	0	0	587	0	0	1694	1699	587	1695	1694	985
Stage 1	-	-	-	-	-	-	646	646	-	1048	1048	-
Stage 2	-	-	-	-	-	-	1048	1053	-	647	646	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	7.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.9	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	707	-	-	983	-	-	74	55	513	74	94	304
Stage 1	-	-	-	-	-	-	464	344	-	278	307	-
Stage 2	-	-	-	-	-	-	278	207	-	463	470	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	707	-	-	983	-	-	58	51	513	67	87	304
Mov Cap-2 Maneuver	-	-	-	-	-	-	58	51	-	67	87	-
Stage 1	-	-	-	-	-	-	444	329	-	266	297	-
Stage 2	-	-	-	-	-	-	223	200	-	430	450	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	47.7	31.9
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	57	513	707	-	-	983	-	-	67	304
HCM Lane V/C Ratio	0.231	0.028	0.042	-	-	0.032	-	-	0.23	0.17
HCM Control Delay (s)	86.2	12.2	10.3	-	-	8.8	-	-	74.1	19.3
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.8	0.1	0.1	-	-	0.1	-	-	0.8	0.6

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	0	1	296	405	39
Future Vol, veh/h	37	0	1	296	405	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	42	0	1	333	455	44

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	790	455	455	0	-	0
Stage 1	455	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Critical Hdwy	6.43	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	358	609	1116	-	-	-
Stage 1	637	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	358	609	1116	-	-	-
Mov Cap-2 Maneuver	358	-	-	-	-	-
Stage 1	637	-	-	-	-	-
Stage 2	721	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1116	-	358	-	-
HCM Lane V/C Ratio	0.001	-	0.116	-	-
HCM Control Delay (s)	8.2	0	16.4	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	93	316	20	22	413
Future Vol, veh/h	14	93	316	20	22	413
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	18	122	416	26	29	543

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1044	443	0	0	449	0
Stage 1	436	-	-	-	-	-
Stage 2	608	-	-	-	-	-
Critical Hdwy	6.4	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	256	617	-	-	1122	-
Stage 1	656	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	244	610	-	-	1115	-
Mov Cap-2 Maneuver	244	-	-	-	-	-
Stage 1	652	-	-	-	-	-
Stage 2	524	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	510	1115	-
HCM Lane V/C Ratio	-	-	0.276	0.026	-
HCM Control Delay (s)	-	-	14.7	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	155	173	229	260	21
Future Vol, veh/h	17	155	173	229	260	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	209	234	309	351	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1136	359	355	0	-	0
Stage 1	355	-	-	-	-	-
Stage 2	781	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	225	683	1193	-	-	-
Stage 1	714	-	-	-	-	-
Stage 2	455	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	180	678	1189	-	-	-
Mov Cap-2 Maneuver	180	-	-	-	-	-
Stage 1	712	-	-	-	-	-
Stage 2	364	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	3.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1189	-	532	-	-
HCM Lane V/C Ratio	0.197	-	0.437	-	-
HCM Control Delay (s)	8.8	-	16.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.7	-	2.2	-	-

Intersection

Int Delay, s/veh 4.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	115	125	115	165	92
Future Vol, veh/h	28	115	125	115	165	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	137	149	137	196	110

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	697	265	313	0	-	0
Stage 1	258	-	-	-	-	-
Stage 2	439	-	-	-	-	-
Critical Hdwy	6.44	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	404	774	1247	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	646	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	351	765	1240	-	-	-
Mov Cap-2 Maneuver	351	-	-	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	565	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	4.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1240	-	621	-	-
HCM Lane V/C Ratio	0.12	-	0.274	-	-
HCM Control Delay (s)	8.3	-	13	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	1	0	67	0	4	0	0	0	66	79	1
Future Vol, veh/h	0	1	0	67	0	4	0	0	0	66	79	1
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0
Mvmt Flow	0	1	0	86	0	5	0	0	0	85	101	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.8	8.3	9.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	45%	1%	100%	0%
Vol Thru, %	54%	0%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	68	4	190
LT Vol	66	1	4	0
Through Vol	79	0	0	190
RT Vol	1	67	0	0
Lane Flow Rate	187	87	5	244
Geometry Grp	1	1	1	1
Degree of Util (X)	0.242	0.104	0.007	0.292
Departure Headway (Hd)	4.647	4.289	5.187	4.313
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	775	836	690	836
Service Time	2.666	2.312	3.218	2.33
HCM Lane V/C Ratio	0.241	0.104	0.007	0.292
HCM Control Delay	9.1	7.8	8.3	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.3	0	1.2

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background AM.syn
12/01/2017

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	190	0
Future Vol, veh/h	0	0	190	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	244	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.1
HCM LOS	A

Synchro 9 Report
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	940	714	129	992	563
Future Volume (vph)	0	940	714	129	992	563
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2814	1845	1538	3433	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2814	1845	1538	3433	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	969	736	133	1023	580
RTOR Reduction (vph)	0	166	0	13	0	0
Lane Group Flow (vph)	0	803	736	120	1023	580
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		19.2	24.0	24.0	19.2	53.0
Effective Green, g (s)		20.1	24.9	24.9	20.1	53.0
Actuated g/C Ratio		0.38	0.47	0.47	0.38	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1067	866	722	1301	1881
v/s Ratio Prot		0.29	c0.40		c0.30	0.31
v/s Ratio Perm				0.08		
v/c Ratio		0.75	0.85	0.17	0.79	0.31
Uniform Delay, d1		14.3	12.4	8.1	14.6	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.4	8.0	0.1	3.6	0.4
Delay (s)		17.7	20.4	8.2	18.1	0.4
Level of Service		B	C	A	B	A
Approach Delay (s)	17.7		18.6			11.7
Approach LOS	B		B			B

Intersection Summary				
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	53.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	77.1%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	862	234	383	674	5	258	21	551	6	8	7
Future Volume (vph)	26	862	234	383	674	5	258	21	551	6	8	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1732	1590		1733	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1732	1590		1733	1580
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	937	254	416	733	5	280	23	599	7	9	8
RTOR Reduction (vph)	0	0	140	0	0	0	0	0	75	0	0	8
Lane Group Flow (vph)	28	937	114	416	738	0	151	152	524	0	16	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.7	25.0	25.0	10.7	34.0		8.8	8.8	19.5		1.0	1.0
Effective Green, g (s)	2.2	26.0	26.0	11.3	35.0		10.6	10.6	20.7		2.0	2.0
Actuated g/C Ratio	0.03	0.39	0.39	0.17	0.53		0.16	0.16	0.31		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	60	1396	637	594	1896		275	278	499		52	47
v/s Ratio Prot	0.02	c0.26		0.12	0.21		0.09	0.09	c0.18		c0.01	
v/s Ratio Perm			0.07						0.15			0.00
v/c Ratio	0.47	0.67	0.18	0.70	0.39		0.55	0.55	1.05		0.31	0.01
Uniform Delay, d1	31.3	16.4	13.0	25.7	9.1		25.5	25.4	22.6		31.3	31.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	1.0	0.0	3.0	0.0		1.2	1.2	53.8		1.2	0.0
Delay (s)	33.4	17.4	13.0	28.8	9.2		26.7	26.6	76.4		32.5	31.0
Level of Service	C	B	B	C	A		C	C	E		C	C
Approach Delay (s)		16.9			16.2			59.7			32.0	
Approach LOS		B			B			E			C	

Intersection Summary				
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	65.9	Sum of lost time (s)	16.1	
Intersection Capacity Utilization	71.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	862	234	383	674	5	258	21	551	6	8	7
Future Volume (veh/h)	26	862	234	383	674	5	258	21	551	6	8	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1900	1881	1900	1771	1900
Adj Flow Rate, veh/h	28	937	254	416	733	5	296	0	599	7	9	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	52	1009	460	491	1443	10	1297	0	776	21	26	43
Arrive On Green	0.03	0.28	0.28	0.14	0.40	0.38	0.36	0.00	0.34	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3639	25	3619	0	1598	758	975	1588
Grp Volume(v), veh/h	28	937	254	416	360	378	296	0	599	16	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1877	1810	0	1598	1733	0	1588
Q Serve(g_s), s	1.3	21.9	11.3	9.9	12.9	12.9	4.9	0.0	26.2	0.8	0.0	0.4
Cycle Q Clear(g_c), s	1.3	21.9	11.3	9.9	12.9	12.9	4.9	0.0	26.2	0.8	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.44		1.00
Lane Grp Cap(c), veh/h	52	1009	460	491	709	744	1297	0	776	47	0	43
V/C Ratio(X)	0.54	0.93	0.55	0.85	0.51	0.51	0.23	0.00	0.77	0.34	0.00	0.19
Avail Cap(c_a), veh/h	119	1009	460	491	709	744	1440	0	839	82	0	75
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.7	29.5	25.8	35.6	19.4	19.4	19.0	0.0	18.0	40.6	0.0	40.4
Incr Delay (d2), s/veh	3.2	14.1	0.9	12.4	0.2	0.2	0.0	0.0	3.6	1.6	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	12.6	5.1	5.6	6.3	6.7	2.4	0.0	12.2	0.4	0.0	0.2
LnGrp Delay(d),s/veh	43.9	43.6	26.6	47.9	19.6	19.6	19.1	0.0	21.6	42.2	0.0	41.2
LnGrp LOS	D	D	C	D	B	B	B		C	D		D
Approach Vol, veh/h		1219			1154			895			24	
Approach Delay, s/veh		40.1			29.8			20.8			41.8	
Approach LOS		D			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.5	37.7		34.4	16.0	28.2		6.3
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 11	23.2		3.0
Max Q Clear Time (g_c+I1), s	3.3	14.9		28.2	11.9	23.9		2.8
Green Ext Time (p_c), s	0.0	4.4		0.4	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		31.2
HCM 2010 LOS		C

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	115	336	70	12	142	374	291	78	438	179	193	309
Future Volume (vph)	115	336	70	12	142	374	291	78	438	179	193	309
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3457			1744	1863	1560	1805	1827	1556	3502	1832
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3457			656	1863	1560	1805	1827	1556	3502	1832
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	119	346	72	12	146	386	300	80	452	185	199	319
RTOR Reduction (vph)	0	21	0	0	0	0	213	0	0	128	0	8
Lane Group Flow (vph)	119	397	0	0	158	386	87	80	452	57	199	374
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6			3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.4	20.4			11.5	23.5	23.5	6.1	24.4	24.4	9.3	27.6
Effective Green, g (s)	8.1	20.6			11.2	23.7	23.7	5.8	25.3	25.3	9.0	28.5
Actuated g/C Ratio	0.10	0.25			0.14	0.29	0.29	0.07	0.31	0.31	0.11	0.35
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	172	867			89	537	450	127	563	479	383	635
v/s Ratio Prot	0.07	0.11				c0.21		0.04	c0.25		c0.06	c0.20
v/s Ratio Perm					c0.24		0.06			0.04		
v/c Ratio	0.69	0.46			1.78	0.72	0.19	0.63	0.80	0.12	0.52	0.59
Uniform Delay, d1	35.8	26.0			35.4	26.2	22.0	37.1	26.1	20.4	34.5	22.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.4	0.5			390.3	4.7	0.2	9.4	8.3	0.1	1.2	1.5
Delay (s)	47.2	26.5			425.7	30.9	22.2	46.5	34.4	20.5	35.7	23.5
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		31.1				101.8			32.2			27.7
Approach LOS		C				F			C			C

Intersection Summary				
HCM 2000 Control Delay	52.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	70.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	71	390	113	136	429	315	149
Future Volume (vph)	71	390	113	136	429	315	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3423		1770	3574	3467	1552
Flt Permitted	0.91	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1727	3423		1770	3574	3467	1552
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	76	419	122	146	461	339	160
RTOR Reduction (vph)	0	44	0	0	0	0	131
Lane Group Flow (vph)	76	497	0	146	461	339	29
Confl. Peds. (#/hr)			3	5		3	5
Heavy Vehicles (%)	0%	2%	0%	2%	1%	1%	2%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.9	22.4		6.9	24.4	9.2	9.2
Effective Green, g (s)	4.4	22.4		6.4	24.4	9.2	9.2
Actuated g/C Ratio	0.09	0.45		0.13	0.49	0.18	0.18
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	151	1533		226	1744	637	285
v/s Ratio Prot		c0.15		c0.08	0.13	c0.10	
v/s Ratio Perm	0.04						0.02
v/c Ratio	0.50	0.32		0.65	0.26	0.53	0.10
Uniform Delay, d1	21.8	8.9		20.7	7.5	18.5	17.0
Progression Factor	1.00	1.00		1.31	0.76	1.00	1.00
Incremental Delay, d2	1.0	0.6		4.6	0.4	0.4	0.1
Delay (s)	22.7	9.5		31.8	6.1	18.9	17.0
Level of Service	C	A		C	A	B	B
Approach Delay (s)		11.1			12.3	18.3	
Approach LOS		B			B	B	

Intersection Summary

HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	481	58	106	462	0	103	0	93	0	0	0
Future Volume (vph)	0	481	58	106	462	0	103	0	93	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.98			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3470		1752	3574			1749	1546			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3470		1752	3574			1394	1546			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	540	65	119	519	0	116	0	104	0	0	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	0	88	0	0	0
Lane Group Flow (vph)	0	591	0	119	519	0	0	116	16	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6		6	2		2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		24.7		6.2	34.4			7.6	7.6			
Effective Green, g (s)		24.7		5.7	34.4			7.6	7.6			
Actuated g/C Ratio		0.49		0.11	0.69			0.15	0.15			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		1714		199	2458			211	234			
v/s Ratio Prot		c0.17		c0.07	0.15							
v/s Ratio Perm								c0.08	0.01			
v/c Ratio		0.35		0.60	0.21			0.55	0.07			
Uniform Delay, d1		7.7		21.1	2.8			19.6	18.2			
Progression Factor		0.46		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.5		3.2	0.2			1.6	0.0			
Delay (s)		4.1		24.3	3.0			21.2	18.2			
Level of Service		A		C	A			C	B			
Approach Delay (s)		4.1			7.0			19.8			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	481	58	106	462	0	103	0	93	0	0	0
Future Volume (veh/h)	0	481	58	106	462	0	103	0	93	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	540	65	119	519	0	116	0	104	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	1787	214	135	2568	0	315	0	189	0	231	0
Arrive On Green	0.00	1.00	1.00	0.08	0.72	0.00	0.12	0.00	0.12	0.00	0.00	0.00
Sat Flow, veh/h	0	3274	382	1757	3668	0	1405	0	1560	0	1900	0
Grp Volume(v), veh/h	0	300	305	119	519	0	116	0	104	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1793	1757	1787	0	1405	0	1560	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	3.4	2.4	0.0	4.0	0.0	3.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.4	2.4	0.0	4.0	0.0	3.1	0.0	0.0	0.0
Prop In Lane	0.00		0.21	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	994	1007	135	2568	0	315	0	189	0	231	0
V/C Ratio(X)	0.00	0.30	0.30	0.88	0.20	0.00	0.37	0.00	0.55	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	994	1007	211	2568	0	594	0	499	0	608	0
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.95	0.95	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	22.9	2.3	0.0	21.0	0.0	20.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.7	15.5	0.2	0.0	0.3	0.0	0.9	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	2.2	1.2	0.0	1.5	0.0	1.4	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.7	0.7	38.4	2.5	0.0	21.3	0.0	21.6	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		605			638			220			0	
Approach Delay, s/veh		0.7			9.2			21.4			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	7.8	32.1		10.1		39.9		10.1
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	6.5	16.0		16.0		26.0		16.0
Max Q Clear Time (g_c+I1), s	5.4	2.0		0.0		4.4		6.0
Green Ext Time (p_c), s	0.0	7.1		0.0		9.0		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	7.5
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	16.6
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	416	22	0	24	14	6	23	414
Future Vol, veh/h	0	416	22	0	24	14	6	23	414
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2	0	0	0	0	2
Mvmt Flow	0	467	25	0	27	16	7	26	465
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	14.2	10.1	19.6
HCM LOS	B	B	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	208	208	22	24	14	29	414
LT Vol	208	208	0	0	0	29	0
Through Vol	0	0	22	24	0	0	0
RT Vol	0	0	0	0	14	0	414
Lane Flow Rate	234	234	25	27	16	33	465
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.437	0.435	0.031	0.055	0.029	0.06	0.706
Departure Headway (Hd)	6.735	6.7	4.47	7.282	6.563	6.66	5.46
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	535	538	799	490	543	537	661
Service Time	4.474	4.44	2.209	5.05	4.331	4.405	3.204
HCM Lane V/C Ratio	0.437	0.435	0.031	0.055	0.029	0.061	0.703
HCM Control Delay	14.6	14.5	7.4	10.5	9.5	9.8	20.3
HCM Lane LOS	B	B	A	B	A	A	C
HCM 95th-tile Q	2.2	2.2	0.1	0.2	0.1	0.2	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	0	165	62	20	26	173	1438	4	17	1368	205
Future Volume (vph)	219	0	165	62	20	26	173	1438	4	17	1368	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1459		1715	1662		1805	3573		1805	3574	1583
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1459		1715	1662		1805	3573		1805	3574	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	0	170	64	21	27	178	1482	4	18	1410	211
RTOR Reduction (vph)	0	141	0	0	25	0	0	0	0	0	0	100
Lane Group Flow (vph)	203	52	0	57	30	0	178	1486	0	18	1410	111
Confl. Peds. (#/hr)			7	7			7		7			
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	14.7	14.7		5.3	5.3		10.4	47.8		2.7	40.1	40.1
Effective Green, g (s)	14.9	14.9		5.5	5.5		10.1	48.7		2.4	41.0	41.0
Actuated g/C Ratio	0.17	0.17		0.06	0.06		0.12	0.56		0.03	0.47	0.47
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	289	248		107	104		208	1988		49	1674	741
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.10	0.42		0.01	c0.39	
v/s Ratio Perm												0.07
v/c Ratio	0.70	0.21		0.53	0.29		0.86	0.75		0.37	0.84	0.15
Uniform Delay, d1	34.2	31.2		39.8	39.1		38.0	14.7		41.8	20.4	13.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.8	0.5		6.4	2.1		27.4	1.8		4.6	4.4	0.2
Delay (s)	42.0	31.7		46.1	41.2		65.4	16.5		46.4	24.8	13.4
Level of Service	D	C		D	D		E	B		D	C	B
Approach Delay (s)		37.0			43.7			21.7			23.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	87.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	0	165	62	20	26	173	1438	4	17	1368	205
Future Volume (veh/h)	219	0	165	62	20	26	173	1438	4	17	1368	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1818	1900	1900	1900	1900	1900	1881	1900	1900	1881	1863
Adj Flow Rate, veh/h	198	39	170	56	32	27	178	1482	4	18	1410	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	1	0	1	2
Cap, veh/h	302	50	216	146	76	64	208	1946	5	45	1579	700
Arrive On Green	0.17	0.17	0.17	0.08	0.08	0.08	0.12	0.53	0.52	0.03	0.44	0.00
Sat Flow, veh/h	1792	293	1279	1810	942	794	1810	3657	10	1810	3574	1583
Grp Volume(v), veh/h	198	0	209	56	0	59	178	724	762	18	1410	0
Grp Sat Flow(s),veh/h/ln	1792	0	1573	1810	0	1736	1810	1787	1879	1810	1787	1583
Q Serve(g_s), s	8.6	0.0	10.6	2.4	0.0	2.7	8.0	26.4	26.4	0.8	30.1	0.0
Cycle Q Clear(g_c), s	8.6	0.0	10.6	2.4	0.0	2.7	8.0	26.4	26.4	0.8	30.1	0.0
Prop In Lane	1.00		0.81	1.00		0.46	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	302	0	265	146	0	141	208	951	1000	45	1579	700
V/C Ratio(X)	0.66	0.00	0.79	0.38	0.00	0.42	0.85	0.76	0.76	0.40	0.89	0.00
Avail Cap(c_a), veh/h	385	0	338	157	0	151	219	951	1000	153	1683	746
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.2	0.0	33.1	36.1	0.0	36.2	35.9	15.2	15.2	39.8	21.3	0.0
Incr Delay (d2), s/veh	3.1	0.0	9.9	2.3	0.0	2.8	25.7	4.1	3.9	5.5	6.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	5.3	1.3	0.0	1.4	5.5	14.0	14.6	0.5	16.1	0.0
LnGrp Delay(d),s/veh	35.3	0.0	43.0	38.4	0.0	39.1	61.7	19.3	19.1	45.3	27.9	0.0
LnGrp LOS	D		D	D		D	E	B	B	D	C	
Approach Vol, veh/h		407			115			1664			1428	
Approach Delay, s/veh		39.3			38.7			23.8			28.1	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.0	13.5	40.6		10.7	6.1	48.1
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 18	10.3	38.1		7.0	7.3	41.1
Max Q Clear Time (g_c+I1), s		12.6	10.0	32.1		4.7	2.8	28.4
Green Ext Time (p_c), s		1.0	0.0	3.6		0.1	0.0	12.4

Intersection Summary	
HCM 2010 Ctrl Delay	27.7
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	869	18	22	17	6	54	6	1713	17	55	1537	493
Future Volume (vph)	869	18	22	17	6	54	6	1713	17	55	1537	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1743		1715	1761	1524	1805	3531		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1743		1715	1761	1524	1805	3531		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	22	17	6	55	6	1748	17	56	1568	503
RTOR Reduction (vph)	0	16	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	24	0	11	12	3	6	1765	0	56	1568	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	37.5	37.5		6.6	6.6	6.6	1.5	73.1		6.3	78.4	141.4
Effective Green, g (s)	38.1	38.1		6.8	6.8	6.8	1.2	74.0		6.5	79.3	141.4
Actuated g/C Ratio	0.27	0.27		0.05	0.05	0.05	0.01	0.52		0.05	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	934	469		82	84	73	15	1847		82	2004	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.00	c0.50		c0.03	0.44	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.95	0.05		0.13	0.14	0.04	0.40	0.96		0.68	0.78	0.31
Uniform Delay, d1	50.7	38.3		64.5	64.5	64.2	69.7	32.1		66.4	24.3	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.6	0.1		1.3	1.4	0.4	16.6	12.3		20.9	2.4	0.5
Delay (s)	69.3	38.3		65.8	65.9	64.5	86.3	44.4		87.4	26.7	0.5
Level of Service	E	D		E	E	E	F	D		F	C	A
Approach Delay (s)		67.9			64.9			44.6			22.1	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	141.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Vol, veh/h	103	1	12	4	0	4	6	428	0	1	425	40
Future Vol, veh/h	103	1	12	4	0	4	6	428	0	1	425	40
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	113	1	13	4	0	4	7	470	0	1	467	44

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	755	988	271	733	1010	248	519	0	0	475	0	0
Stage 1	499	499	-	489	489	-	-	-	-	-	-	-
Stage 2	256	489	-	244	521	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	298	249	709	312	242	758	1057	-	-	1098	-	-
Stage 1	522	547	-	534	553	-	-	-	-	-	-	-
Stage 2	726	553	-	744	535	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	290	244	700	299	237	750	1050	-	-	1091	-	-
Mov Cap-2 Maneuver	290	244	-	299	237	-	-	-	-	-	-	-
Stage 1	514	543	-	527	546	-	-	-	-	-	-	-
Stage 2	710	546	-	723	531	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.7	13.6	0.1	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1050	-	-	308	428	1091	-	-
HCM Lane V/C Ratio	0.006	-	-	0.414	0.021	0.001	-	-
HCM Control Delay (s)	8.4	0	-	24.7	13.6	8.3	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.9	0.1	0	-	-

Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↔			↔	
Traffic Vol, veh/h	148	428	16	6	403	29	10	6	4	6	3	155
Future Vol, veh/h	148	428	16	6	403	29	10	6	4	6	3	155
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	157	455	17	6	429	31	11	6	4	6	3	165

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	464	0	0	489	0	0	1038	1272	270	1024	1265	247
Stage 1	-	-	-	-	-	-	796	796	-	461	461	-
Stage 2	-	-	-	-	-	-	242	476	-	563	804	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1101	-	-	1085	-	-	188	169	734	192	171	753
Stage 1	-	-	-	-	-	-	351	402	-	555	569	-
Stage 2	-	-	-	-	-	-	746	560	-	483	398	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1089	-	-	1070	-	-	124	141	713	160	143	742
Mov Cap-2 Maneuver	-	-	-	-	-	-	124	141	-	160	143	-
Stage 1	-	-	-	-	-	-	296	339	-	473	564	-
Stage 2	-	-	-	-	-	-	567	555	-	397	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.2	0.1	31.9	13.2
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	155	1089	-	-	1070	-	-	613
HCM Lane V/C Ratio	0.137	0.145	-	-	0.006	-	-	0.285
HCM Control Delay (s)	31.9	8.9	-	-	8.4	-	-	13.2
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.5	-	-	0	-	-	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	965	111	15	606	136	34
Future Volume (vph)	965	111	15	606	136	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1749	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1749	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1038	119	16	652	146	37
RTOR Reduction (vph)	0	45	0	0	11	0
Lane Group Flow (vph)	1038	74	16	652	172	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	45.6	45.6	0.6	50.4	11.8	
Effective Green, g (s)	45.6	45.6	0.6	50.4	11.8	
Actuated g/C Ratio	0.62	0.62	0.01	0.69	0.16	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1173	976	14	1284	282	
v/s Ratio Prot	c0.55		0.01	c0.35	c0.10	
v/s Ratio Perm		0.05				
v/c Ratio	0.88	0.08	1.14	0.51	0.61	
Uniform Delay, d1	11.5	5.4	36.2	5.4	28.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.4	0.0	291.3	0.4	2.7	
Delay (s)	20.0	5.5	327.5	5.8	31.2	
Level of Service	B	A	F	A	C	
Approach Delay (s)	18.5			13.5	31.2	
Approach LOS	B			B	C	

Intersection Summary				
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	73.1	Sum of lost time (s)	15.1	
Intersection Capacity Utilization	69.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	965	111	15	606	136	34
Future Volume (veh/h)	965	111	15	606	136	34
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1870	1900
Adj Flow Rate, veh/h	1038	119	16	652	146	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	0	2	0	0
Cap, veh/h	1240	1032	28	1368	195	0
Arrive On Green	0.66	0.66	0.02	0.73	0.11	0.00
Sat Flow, veh/h	1881	1566	1810	1863	1770	0
Grp Volume(v), veh/h	1038	119	16	652	147	0
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1782	0
Q Serve(g_s), s	29.4	2.0	0.6	10.0	5.6	0.0
Cycle Q Clear(g_c), s	29.4	2.0	0.6	10.0	5.6	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1240	1032	28	1368	197	0
V/C Ratio(X)	0.84	0.12	0.58	0.48	0.75	0.00
Avail Cap(c_a), veh/h	1418	1180	103	1622	457	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.1	4.4	34.3	3.8	30.3	0.0
Incr Delay (d2), s/veh	4.3	0.1	6.9	0.3	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.5	0.8	0.4	5.2	2.9	0.0
LnGrp Delay(d),s/veh	13.4	4.5	41.2	4.1	32.4	0.0
LnGrp LOS	B	A	D	A	C	
Approach Vol, veh/h	1157			668	147	
Approach Delay, s/veh	12.5			5.0	32.4	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.3	52.7				57.9		12.2
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	52.9				61.1		18.0
Max Q Clear Time (g_c+I1), s	2.6	31.4				12.0		7.6
Green Ext Time (p_c), s	0.0	14.8				24.5		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	11.4
HCM 2010 LOS	B

Notes

Intersection

Int Delay, s/veh 4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	57	910	24	16	539	19	24	1	28	14	2	46
Future Vol, veh/h	57	910	24	16	539	19	24	1	28	14	2	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	64	1022	27	18	606	21	27	1	31	16	2	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	627	0	0	1022	0	0	1804	1814	1022	1803	1803	616
Stage 1	-	-	-	-	-	-	1151	1151	-	652	652	-
Stage 2	-	-	-	-	-	-	653	663	-	1151	1151	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	965	-	-	687	-	-	62	79	289	62	80	494
Stage 1	-	-	-	-	-	-	243	275	-	460	467	-
Stage 2	-	-	-	-	-	-	460	462	-	243	275	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	965	-	-	687	-	-	50	72	289	51	73	494
Mov Cap-2 Maneuver	-	-	-	-	-	-	50	72	-	51	73	-
Stage 1	-	-	-	-	-	-	227	257	-	429	455	-
Stage 2	-	-	-	-	-	-	399	450	-	201	257	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	76.5	36.7
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	51	289	965	-	-	687	-	-	53	494
HCM Lane V/C Ratio	0.551	0.109	0.066	-	-	0.026	-	-	0.339	0.105
HCM Control Delay (s)	141	19	9	-	-	10.4	-	-	104.4	13.1
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	2.1	0.4	0.2	-	-	0.1	-	-	1.2	0.3

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	1	7	657	484	37
Future Vol, veh/h	37	1	7	657	484	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	39	1	7	692	509	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1215	509	509	0	-	0
Stage 1	509	-	-	-	-	-
Stage 2	706	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	202	568	1066	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	200	568	1066	-	-	-
Mov Cap-2 Maneuver	200	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	488	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1066	-	203	-	-
HCM Lane V/C Ratio	0.007	-	0.197	-	-
HCM Control Delay (s)	8.4	0	27	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	58	410	36	30	445
Future Vol, veh/h	21	58	410	36	30	445
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	22	61	432	38	32	468

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	995	462	0	0	475	0
Stage 1	457	-	-	-	-	-
Stage 2	538	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	274	604	-	-	1098	-
Stage 1	642	-	-	-	-	-
Stage 2	589	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	260	598	-	-	1093	-
Mov Cap-2 Maneuver	260	-	-	-	-	-
Stage 1	639	-	-	-	-	-
Stage 2	563	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	444	1093	-
HCM Lane V/C Ratio	-	-	0.187	0.029	-
HCM Control Delay (s)	-	-	15	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	114	124	364	327	28
Future Vol, veh/h	14	114	124	364	327	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	125	136	400	359	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1040	367	363	0	-	0
Stage 1	363	-	-	-	-	-
Stage 2	677	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-	-
Pot Cap-1 Maneuver	257	681	1207	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	509	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	226	676	1203	-	-	-
Mov Cap-2 Maneuver	226	-	-	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	450	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.7	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1203	-	555	-	-
HCM Lane V/C Ratio	0.113	-	0.253	-	-
HCM Control Delay (s)	8.4	-	13.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	128	101	277	221	17
Future Vol, veh/h	27	128	101	277	221	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	136	107	295	235	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	764	254	258	0	-	0
Stage 1	249	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Critical Hdwy	7.1	6.22	4.11	-	-	-
Critical Hdwy Stg 1	6.1	-	-	-	-	-
Critical Hdwy Stg 2	6.1	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	323	785	1313	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	546	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	300	778	1308	-	-	-
Mov Cap-2 Maneuver	300	-	-	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	499	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1308	-	609	-	-
HCM Lane V/C Ratio	0.082	-	0.271	-	-
HCM Control Delay (s)	8	-	13.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	2	1	111	0	3	0	0	0	128	166	3
Future Vol, veh/h	0	2	1	111	0	3	0	0	0	128	166	3
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0
Mvmt Flow	0	2	1	122	0	3	0	0	0	141	182	3
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.2	8.4	10.5
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	43%	2%	100%	1%
Vol Thru, %	56%	1%	0%	99%
Vol Right, %	1%	97%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	297	114	3	130
LT Vol	128	2	3	1
Through Vol	166	1	0	129
RT Vol	3	111	0	0
Lane Flow Rate	326	125	3	143
Geometry Grp	1	1	1	1
Degree of Util (X)	0.403	0.153	0.005	0.18
Departure Headway (Hd)	4.443	4.383	5.33	4.544
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	809	818	670	789
Service Time	2.469	2.412	3.372	2.574
HCM Lane V/C Ratio	0.403	0.153	0.004	0.181
HCM Control Delay	10.5	8.2	8.4	8.6
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2	0.5	0	0.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	129	0
Future Vol, veh/h	0	1	129	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	142	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.6
HCM LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱↱	↑	↱	↰↰	↑
Traffic Volume (vph)	0	886	708	80	941	758
Future Volume (vph)	0	886	708	80	941	758
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	913	730	82	970	781
RTOR Reduction (vph)	0	177	0	13	0	0
Lane Group Flow (vph)	0	736	730	69	970	781
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		16.4	21.6	21.6	16.4	47.8
Effective Green, g (s)		17.3	22.5	22.5	17.3	47.8
Actuated g/C Ratio		0.36	0.47	0.47	0.36	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1028	885	760	1254	1881
v/s Ratio Prot		0.26	c0.39		c0.28	0.42
v/s Ratio Perm				0.04		
v/c Ratio		0.72	0.82	0.09	0.77	0.42
Uniform Delay, d1		13.1	10.9	7.0	13.5	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.7	6.5	0.1	3.4	0.7
Delay (s)		15.9	17.4	7.1	16.9	0.7
Level of Service		B	B	A	B	A
Approach Delay (s)	15.9		16.4			9.7
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	47.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	746	251	412	669	3	202	15	395	2	15	14
Future Volume (vph)	25	746	251	412	669	3	202	15	395	2	15	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00
Satd. Flow (prot)	1805	3574	1593	3467	3607		1698	1716	1575		1890	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00
Satd. Flow (perm)	1805	3574	1593	3467	3607		1698	1716	1575		1890	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	27	794	267	438	712	3	215	16	420	2	16	15
RTOR Reduction (vph)	0	0	172	0	0	0	0	0	92	0	0	15
Lane Group Flow (vph)	27	794	95	438	715	0	116	115	328	0	18	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.6	20.7	20.7	11.2	30.3		7.7	7.7	18.9		1.0	1.0
Effective Green, g (s)	2.1	21.7	21.7	11.8	31.3		9.5	9.5	20.1		2.0	2.0
Actuated g/C Ratio	0.03	0.36	0.36	0.19	0.51		0.16	0.16	0.33		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	62	1271	566	670	1850		264	267	518		61	52
v/s Ratio Prot	0.01	c0.22		c0.13	0.20		0.07	0.07	c0.12		c0.01	
v/s Ratio Perm			0.06						0.09			0.00
v/c Ratio	0.44	0.62	0.17	0.65	0.39		0.44	0.43	0.63		0.30	0.01
Uniform Delay, d1	28.9	16.3	13.5	22.7	9.0		23.3	23.3	17.3		28.8	28.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.7	0.1	1.8	0.0		0.4	0.4	1.9		1.0	0.0
Delay (s)	30.6	17.0	13.5	24.5	9.1		23.8	23.7	19.2		29.8	28.6
Level of Service	C	B	B	C	A		C	C	B		C	C
Approach Delay (s)		16.5			14.9			20.8			29.2	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	16.1	
Intersection Capacity Utilization	58.5%	ICU Level of Service	B	
Analysis Period (min)	15			

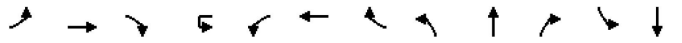
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	746	251	412	669	3	202	15	395	2	15	14
Future Volume (veh/h)	25	746	251	412	669	3	202	15	395	2	15	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	794	267	438	712	3	226	0	420	2	16	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	56	1030	459	560	1536	6	995	0	661	7	59	57
Arrive On Green	0.03	0.29	0.29	0.16	0.42	0.40	0.28	0.00	0.26	0.04	0.04	0.04
Sat Flow, veh/h	1810	3574	1593	3476	3686	16	3583	0	1561	210	1680	1615
Grp Volume(v), veh/h	27	794	267	438	349	366	226	0	420	18	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1593	1738	1805	1897	1792	0	1561	1890	0	1615
Q Serve(g_s), s	1.0	13.7	9.6	8.1	9.4	9.4	3.3	0.0	14.3	0.6	0.0	0.6
Cycle Q Clear(g_c), s	1.0	13.7	9.6	8.1	9.4	9.4	3.3	0.0	14.3	0.6	0.0	0.6
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.11		1.00
Lane Grp Cap(c), veh/h	56	1030	459	560	752	790	995	0	661	67	0	57
V/C Ratio(X)	0.48	0.77	0.58	0.78	0.46	0.46	0.23	0.00	0.64	0.27	0.00	0.26
Avail Cap(c_a), veh/h	148	1232	549	671	821	863	1800	0	1011	112	0	96
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.1	21.9	20.5	27.1	14.2	14.2	18.7	0.0	15.4	31.6	0.0	31.6
Incr Delay (d2), s/veh	2.4	2.0	0.4	4.0	0.2	0.2	0.0	0.0	0.4	0.8	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.0	4.3	4.2	4.7	4.9	1.6	0.0	6.1	0.3	0.0	0.3
LnGrp Delay(d),s/veh	34.4	23.9	20.9	31.1	14.4	14.3	18.8	0.0	15.8	32.4	0.0	32.5
LnGrp LOS	C	C	C	C	B	B	B		B	C		C
Approach Vol, veh/h		1088			1153			646			33	
Approach Delay, s/veh		23.4			20.7			16.9			32.4	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	32.0		22.7	14.8	23.4		6.4
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 12	22.2		3.0
Max Q Clear Time (g_c+I1), s	3.0	11.4		16.3	10.1	15.7		2.6
Green Ext Time (p_c), s	0.0	4.0		0.4	0.1	2.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	21.0
HCM 2010 LOS	C

Notes



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	134	319	70	8	182	323	278	72	377	152	264	440
Future Volume (vph)	134	319	70	8	182	323	278	72	377	152	264	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3486			1795	1881	1556	1805	1863	1590	3502	1838
Flt Permitted	0.95	1.00			0.35	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3486			669	1881	1556	1805	1863	1590	3502	1838
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	135	322	71	8	184	326	281	73	381	154	267	444
RTOR Reduction (vph)	0	23	0	0	0	0	206	0	0	106	0	5
Lane Group Flow (vph)	135	370	0	0	192	326	75	73	381	48	267	494
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.5	17.6			11.6	20.7	20.7	6.1	23.3	23.3	9.4	26.6
Effective Green, g (s)	8.2	17.8			11.3	20.9	20.9	5.8	24.2	24.2	9.1	27.5
Actuated g/C Ratio	0.10	0.23			0.14	0.27	0.27	0.07	0.31	0.31	0.12	0.35
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	186	791			96	501	414	133	575	490	406	644
v/s Ratio Prot	0.08	0.11				c0.17		0.04	0.20		c0.08	c0.27
v/s Ratio Perm					c0.29		0.05			0.03		
v/c Ratio	0.73	0.47			2.00	0.65	0.18	0.55	0.66	0.10	0.66	0.77
Uniform Delay, d1	34.0	26.2			33.6	25.5	22.2	35.0	23.6	19.3	33.2	22.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.1	0.5			484.8	3.1	0.2	4.6	3.0	0.1	3.8	5.6
Delay (s)	47.2	26.7			518.4	28.7	22.4	39.6	26.5	19.4	37.0	28.3
Level of Service	D	C			F	C	C	D	C	B	D	C
Approach Delay (s)		31.9				144.1			26.3			31.3
Approach LOS		C				F			C			C

Intersection Summary			
HCM 2000 Control Delay	63.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	78.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Background Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Background Saturday.syn

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	84	322	160	157	402	298	156
Future Volume (vph)	84	322	160	157	402	298	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3405		1787	3610	3467	1532
Flt Permitted	0.42	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	800	3405		1787	3610	3467	1532
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	339	168	165	423	314	164
RTOR Reduction (vph)	0	81	0	0	0	0	136
Lane Group Flow (vph)	88	426	0	165	423	314	28
Confl. Peds. (#/hr)			5	9		5	9
Confl. Bikes (#/hr)			11				11
Heavy Vehicles (%)	0%	0%	0%	1%	0%	1%	1%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	10.0	26.6		7.6	24.2	9.3	9.3
Effective Green, g (s)	9.5	26.6		7.1	24.2	9.3	9.3
Actuated g/C Ratio	0.17	0.48		0.13	0.44	0.17	0.17
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	138	1646		230	1588	586	259
v/s Ratio Prot		c0.13		0.09	0.12	c0.09	
v/s Ratio Perm	c0.11						0.02
v/c Ratio	0.64	0.26		0.72	0.27	0.54	0.11
Uniform Delay, d1	21.2	8.4		23.0	9.8	20.9	19.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	6.9	0.4		8.6	0.4	0.5	0.1
Delay (s)	28.1	8.8		31.5	10.2	21.4	19.4
Level of Service	C	A		C	B	C	B
Approach Delay (s)		11.6			16.2	20.7	
Approach LOS		B			B	C	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	436	42	109	481	0	78	0	70	0	0	0
Future Volume (vph)	0	436	42	109	481	0	78	0	70	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.96			
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3553		1805	3574			1797	1539			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3553		1805	3574			1432	1539			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	479	46	120	529	0	86	0	77	0	0	0
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	67	0	0	0
Lane Group Flow (vph)	0	515	0	120	529	0	0	86	10	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10						10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		25.8		6.1	35.4			6.6	6.6			
Effective Green, g (s)		25.8		5.6	35.4			6.6	6.6			
Actuated g/C Ratio		0.52		0.11	0.71			0.13	0.13			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		1833		202	2530			189	203			
v/s Ratio Prot		c0.14		c0.07	0.15							
v/s Ratio Perm								c0.06	0.01			
v/c Ratio		0.28		0.59	0.21			0.46	0.05			
Uniform Delay, d1		6.8		21.1	2.5			20.0	19.0			
Progression Factor		1.00		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.4		3.1	0.2			0.6	0.0			
Delay (s)		7.2		24.2	2.7			20.7	19.0			
Level of Service		A		C	A			C	B			
Approach Delay (s)		7.2			6.7			19.9			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	436	42	109	481	0	78	0	70	0	0	0
Future Volume (veh/h)	0	436	42	109	481	0	78	0	70	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	479	46	120	529	0	86	0	77	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	1963	188	137	2670	0	278	0	141	0	177	0
Arrive On Green	0.00	0.59	0.59	0.08	0.75	0.00	0.09	0.00	0.09	0.00	0.00	0.00
Sat Flow, veh/h	0	3416	318	1810	3668	0	1440	0	1522	0	1900	0
Grp Volume(v), veh/h	0	259	266	120	529	0	86	0	77	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1833	1810	1787	0	1440	0	1522	0	1900	0
Q Serve(g_s), s	0.0	3.4	3.5	3.3	2.2	0.0	2.9	0.0	2.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.4	3.5	3.3	2.2	0.0	2.9	0.0	2.4	0.0	0.0	0.0
Prop In Lane	0.00		0.17	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1067	1084	137	2670	0	278	0	141	0	177	0
V/C Ratio(X)	0.00	0.24	0.24	0.87	0.20	0.00	0.31	0.00	0.54	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1067	1084	217	2670	0	605	0	487	0	608	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.96	0.96	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	4.9	4.9	22.9	1.9	0.0	21.9	0.0	21.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	13.2	0.2	0.0	0.2	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.8	1.9	2.1	1.1	0.0	1.2	0.0	1.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	5.4	5.4	36.0	2.0	0.0	22.1	0.0	22.9	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		525			649			163			0	
Approach Delay, s/veh		5.4			8.3			22.5			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	7.8	33.6		8.6		41.4		8.6
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	6.5	16.0		16.0		26.0		16.0
Max Q Clear Time (g_c+I1), s	5.3	5.5		0.0		4.2		4.9
Green Ext Time (p_c), s	0.0	5.7		0.0		8.8		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	8.9
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	14.3
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	309	18	0	22	11	2	19	433
Future Vol, veh/h	0	309	18	0	22	11	2	19	433
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	332	19	0	24	12	2	20	466
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	11.8	9.7	16.4
HCM LOS	B	A	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	155	155	18	22	11	21	433
LT Vol	155	155	0	0	0	21	0
Through Vol	0	0	18	22	0	0	0
RT Vol	0	0	0	0	11	0	433
Lane Flow Rate	166	166	19	24	12	23	466
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.303	0.302	0.023	0.045	0.021	0.039	0.655
Departure Headway (Hd)	6.564	6.547	4.319	6.831	6.272	6.262	5.062
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	548	550	828	524	570	575	717
Service Time	4.297	4.28	2.051	4.581	4.021	3.962	2.762
HCM Lane V/C Ratio	0.303	0.302	0.023	0.046	0.021	0.04	0.65
HCM Control Delay	12.1	12.1	7.2	9.9	9.2	9.2	16.8
HCM Lane LOS	B	B	A	A	A	A	C
HCM 95th-tile Q	1.3	1.3	0.1	0.1	0.1	0.1	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	7	179	42	11	9	204	1314	7	5	1480	289
Future Volume (vph)	271	7	179	42	11	9	204	1314	7	5	1480	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1569		1715	1683		1787	3569		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1569		1715	1683		1787	3569		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	181	42	11	9	206	1327	7	5	1495	292
RTOR Reduction (vph)	0	150	0	0	9	0	0	0	0	0	0	129
Lane Group Flow (vph)	241	71	0	31	22	0	206	1334	0	5	1495	163
Confl. Bikes (#/hr)						3						3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.1	15.1		3.9	3.9		11.4	51.5		1.3	41.4	41.4
Effective Green, g (s)	15.3	15.3		4.1	4.1		11.1	52.4		1.0	42.3	42.3
Actuated g/C Ratio	0.17	0.17		0.05	0.05		0.12	0.59		0.01	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	292	270		79	77		223	2106		20	1702	752
v/s Ratio Prot	c0.14	0.05		c0.02	0.01		c0.12	0.37		0.00	c0.42	
v/s Ratio Perm												0.10
v/c Ratio	0.83	0.26		0.39	0.29		0.92	0.63		0.25	0.88	0.22
Uniform Delay, d1	35.5	31.9		41.1	40.9		38.4	11.9		43.5	20.9	13.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.4	0.6		4.3	2.9		39.6	0.8		6.5	5.8	0.3
Delay (s)	52.9	32.5		45.5	43.8		78.0	12.7		50.0	26.8	13.8
Level of Service	D	C		D	D		E	B		D	C	B
Approach Delay (s)		43.1			44.6			21.4			24.7	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	88.8	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	7	179	42	11	9	204	1314	7	5	1480	289
Future Volume (veh/h)	271	7	179	42	11	9	204	1314	7	5	1480	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1897	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	231	67	181	31	26	9	206	1327	7	5	1495	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	315	80	216	121	90	31	229	2061	11	10	1586	717
Arrive On Green	0.18	0.18	0.17	0.07	0.07	0.06	0.13	0.57	0.56	0.01	0.44	0.00
Sat Flow, veh/h	1792	454	1227	1810	1342	465	1792	3643	19	1810	3574	1615
Grp Volume(v), veh/h	231	0	248	31	0	35	206	650	684	5	1495	0
Grp Sat Flow(s),veh/h/ln	1792	0	1681	1810	0	1807	1792	1786	1877	1810	1787	1615
Q Serve(g_s), s	10.5	0.0	12.3	1.4	0.0	1.6	9.8	21.4	21.4	0.2	34.4	0.0
Cycle Q Clear(g_c), s	10.5	0.0	12.3	1.4	0.0	1.6	9.8	21.4	21.4	0.2	34.4	0.0
Prop In Lane	1.00		0.73	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	315	0	295	121	0	121	229	1010	1062	10	1586	717
V/C Ratio(X)	0.73	0.00	0.84	0.26	0.00	0.29	0.90	0.64	0.64	0.49	0.94	0.00
Avail Cap(c_a), veh/h	350	0	328	151	0	151	229	1010	1062	147	1619	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.6	0.0	34.4	38.1	0.0	38.2	37.0	12.8	12.8	42.7	22.9	0.0
Incr Delay (d2), s/veh	7.4	0.0	16.6	1.6	0.0	1.9	33.9	1.8	1.7	31.6	11.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	0.0	7.1	0.8	0.0	0.9	7.0	11.0	11.5	0.2	19.4	0.0
LnGrp Delay(d),s/veh	40.9	0.0	50.9	39.7	0.0	40.1	70.9	14.5	14.4	74.2	34.5	0.0
LnGrp LOS	D		D	D		D	E	B	B	E	C	
Approach Vol, veh/h		479			66			1540			1500	
Approach Delay, s/veh		46.1			39.9			22.0			34.7	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		19.1	15.0	42.2		9.8	4.5	52.7
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 17	11.3	38.1		7.0	7.3	42.1
Max Q Clear Time (g_c+I1), s		14.3	11.8	36.4		3.6	2.2	23.4
Green Ext Time (p_c), s		0.6	0.0	0.9		0.1	0.0	17.9

Intersection Summary	
HCM 2010 Ctrl Delay	30.9
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	10	23	21	11	34	36	1513	25	40	1810	557
Future Volume (vph)	390	10	23	21	11	34	36	1513	25	40	1810	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1681		1715	1774	1584	1805	3565		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1681		1715	1774	1584	1805	3565		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	24	22	11	35	37	1560	26	41	1866	574
RTOR Reduction (vph)	0	20	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	14	0	16	17	2	37	1585	0	41	1866	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.8	15.8		6.6	6.6	6.6	4.6	62.8		4.5	63.2	107.6
Effective Green, g (s)	16.4	16.4		6.8	6.8	6.8	4.3	63.7		4.7	64.1	107.6
Actuated g/C Ratio	0.15	0.15		0.06	0.06	0.06	0.04	0.59		0.04	0.60	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	523	256		108	112	100	72	2110		78	2129	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.44		0.02	c0.52	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.77	0.05		0.15	0.15	0.02	0.51	0.75		0.53	0.88	0.37
Uniform Delay, d1	43.8	39.0		47.7	47.7	47.3	50.6	16.1		50.4	18.4	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.5	0.2		1.1	1.1	0.2	6.1	1.9		6.3	4.8	0.7
Delay (s)	51.3	39.1		48.8	48.8	47.4	56.7	18.0		56.6	23.2	0.7
Level of Service	D	D		D	D	D	E	B		E	C	A
Approach Delay (s)		50.3			48.1			18.9			18.5	
Approach LOS		D			D			B			B	

Intersection Summary

HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	107.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	0	14	1	0	0	6	319	0	0	434	30
Future Vol, veh/h	64	0	14	1	0	0	6	319	0	0	434	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	73	0	16	1	0	0	7	363	0	0	493	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	705	886	264	623	903	181	527	0	0	363	0	0
Stage 1	510	510	-	376	376	-	-	-	-	-	-	-
Stage 2	195	376	-	247	527	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	323	286	741	375	279	837	1050	-	-	1207	-	-
Stage 1	514	541	-	623	620	-	-	-	-	-	-	-
Stage 2	788	620	-	741	532	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	321	284	741	365	277	837	1050	-	-	1207	-	-
Mov Cap-2 Maneuver	321	284	-	365	277	-	-	-	-	-	-	-
Stage 1	510	541	-	618	615	-	-	-	-	-	-	-
Stage 2	782	615	-	725	532	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.4	14.9	0.2	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1050	-	-	357	365	1207	-	-
HCM Lane V/C Ratio	0.006	-	-	0.248	0.003	-	-	-
HCM Control Delay (s)	8.5	0	-	18.4	14.9	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1	0	0	-	-

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	191	315	12	5	419	31	7	0	6	6	1	164
Future Vol, veh/h	191	315	12	5	419	31	7	0	6	6	1	164
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	208	342	13	5	455	34	8	0	7	7	1	178

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	493	0	0	363	0	0	1015	1276	194	1081	1266	253
Stage 1	-	-	-	-	-	-	772	772	-	487	487	-
Stage 2	-	-	-	-	-	-	243	504	-	594	779	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1074	-	-	1207	-	-	195	168	821	175	171	753
Stage 1	-	-	-	-	-	-	363	412	-	536	554	-
Stage 2	-	-	-	-	-	-	745	544	-	463	409	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1070	-	-	1199	-	-	124	133	810	146	136	748
Mov Cap-2 Maneuver	-	-	-	-	-	-	124	133	-	146	136	-
Stage 1	-	-	-	-	-	-	290	330	-	430	550	-
Stage 2	-	-	-	-	-	-	562	540	-	368	327	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.4	0.1	24	12.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	204	1070	-	-	1199	-	-	639
HCM Lane V/C Ratio	0.069	0.194	-	-	0.005	-	-	0.291
HCM Control Delay (s)	24	9.2	-	-	8	-	-	12.9
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.7	-	-	0	-	-	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	761	117	32	732	122	20
Future Volume (vph)	761	117	32	732	122	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1784	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1784	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	810	124	34	779	130	21
RTOR Reduction (vph)	0	59	0	0	8	0
Lane Group Flow (vph)	810	65	34	779	143	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	28.7	28.7	1.2	34.1	9.5	
Effective Green, g (s)	28.7	28.7	1.2	34.1	9.5	
Actuated g/C Ratio	0.53	0.53	0.02	0.63	0.17	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	990	830	38	1176	310	
v/s Ratio Prot	c0.43		0.02	c0.41	c0.08	
v/s Ratio Perm		0.04				
v/c Ratio	0.82	0.08	0.89	0.66	0.46	
Uniform Delay, d1	10.7	6.4	26.6	6.5	20.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.5	0.0	102.2	1.5	0.4	
Delay (s)	16.2	6.4	128.8	8.0	20.6	
Level of Service	B	A	F	A	C	
Approach Delay (s)	14.9			13.1	20.6	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	15.1
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	761	117	32	732	122	20
Future Volume (veh/h)	761	117	32	732	122	20
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900
Adj Flow Rate, veh/h	810	124	34	779	130	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	4	1	0	0
Cap, veh/h	1093	917	51	1295	199	0
Arrive On Green	0.58	0.58	0.03	0.69	0.11	0.00
Sat Flow, veh/h	1881	1579	1740	1881	1796	0
Grp Volume(v), veh/h	810	124	34	779	131	0
Grp Sat Flow(s),veh/h/ln	1881	1579	1740	1881	1810	0
Q Serve(g_s), s	17.2	1.9	1.0	11.9	3.8	0.0
Cycle Q Clear(g_c), s	17.2	1.9	1.0	11.9	3.8	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1093	917	51	1295	200	0
V/C Ratio(X)	0.74	0.14	0.66	0.60	0.65	0.00
Avail Cap(c_a), veh/h	1316	1104	128	1600	601	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.4	5.2	26.0	4.5	23.1	0.0
Incr Delay (d2), s/veh	2.0	0.1	5.3	0.6	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	0.8	0.6	6.3	1.9	0.0
LnGrp Delay(d),s/veh	10.4	5.2	31.3	5.1	24.4	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	934			813	131	
Approach Delay, s/veh	9.7			6.2	24.4	
Approach LOS	A			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.8	37.9				43.7		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	37.9				46.1		18.0
Max Q Clear Time (g_c+I1), s	3.0	19.2				13.9		5.8
Green Ext Time (p_c), s	0.0	12.3				17.3		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.2
HCM 2010 LOS	A

Notes

Intersection

Int Delay, s/veh 3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	695	29	14	647	17	30	0	40	10	0	40
Future Vol, veh/h	58	695	29	14	647	17	30	0	40	10	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	62	739	31	15	688	18	32	0	43	11	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	706	0	0	739	0	0	1590	1599	739	1590	1590	697
Stage 1	-	-	-	-	-	-	863	863	-	727	727	-
Stage 2	-	-	-	-	-	-	727	736	-	863	863	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	902	-	-	876	-	-	88	107	421	88	109	444
Stage 1	-	-	-	-	-	-	352	374	-	419	432	-
Stage 2	-	-	-	-	-	-	419	428	-	352	374	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	902	-	-	876	-	-	74	98	421	74	100	444
Mov Cap-2 Maneuver	-	-	-	-	-	-	74	98	-	74	100	-
Stage 1	-	-	-	-	-	-	328	348	-	390	425	-
Stage 2	-	-	-	-	-	-	372	421	-	295	348	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	45.3	23.5
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	74	421	902	-	-	876	-	-	74	444
HCM Lane V/C Ratio	0.431	0.101	0.068	-	-	0.017	-	-	0.144	0.096
HCM Control Delay (s)	86.4	14.5	9.3	-	-	9.2	-	-	61.7	14
HCM Lane LOS	F	B	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	1.7	0.3	0.2	-	-	0.1	-	-	0.5	0.3

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	38	4	5	559	653	39
Future Vol, veh/h	38	4	5	559	653	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	40	4	5	588	687	41

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1286	687	687	0	-	0
Stage 1	687	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	183	450	916	-	-	-
Stage 1	503	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	182	450	916	-	-	-
Mov Cap-2 Maneuver	182	-	-	-	-	-
Stage 1	503	-	-	-	-	-
Stage 2	549	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	29.1	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	916	-	193	-	-
HCM Lane V/C Ratio	0.006	-	0.229	-	-
HCM Control Delay (s)	9	0	29.1	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.9	-	-

Intersection

Int Delay, s/veh 1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	37	357	32	28	361
Future Vol, veh/h	24	37	357	32	28	361
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	25	38	368	33	29	372

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	827	397	0	0	407	0
Stage 1	391	-	-	-	-	-
Stage 2	436	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	344	657	-	-	1163	-
Stage 1	688	-	-	-	-	-
Stage 2	656	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	330	650	-	-	1157	-
Mov Cap-2 Maneuver	330	-	-	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	632	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	470	1157	-
HCM Lane V/C Ratio	-	-	0.134	0.025	-
HCM Control Delay (s)	-	-	13.8	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	79	63	314	307	16
Future Vol, veh/h	10	79	63	314	307	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	84	67	334	327	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	816	349	338	0	-	0
Stage 1	338	-	-	-	-	-
Stage 2	478	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.218	-	-	-
Pot Cap-1 Maneuver	349	692	1221	-	-	-
Stage 1	727	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	324	679	1210	-	-	-
Mov Cap-2 Maneuver	324	-	-	-	-	-
Stage 1	720	-	-	-	-	-
Stage 2	588	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1210	-	605	-	-
HCM Lane V/C Ratio	0.055	-	0.156	-	-
HCM Control Delay (s)	8.2	-	12.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	114	98	242	202	8
Future Vol, veh/h	20	114	98	242	202	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	127	109	269	224	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	730	243	240	0	-	0
Stage 1	236	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	392	801	1333	-	-	-
Stage 1	808	-	-	-	-	-
Stage 2	617	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	356	792	1325	-	-	-
Mov Cap-2 Maneuver	356	-	-	-	-	-
Stage 1	803	-	-	-	-	-
Stage 2	563	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	2.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1325	-	670	-	-
HCM Lane V/C Ratio	0.082	-	0.222	-	-
HCM Control Delay (s)	8	-	11.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.8	-	-

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	0	1	94	0	3	0	0	0	161	97	4
Future Vol, veh/h	0	0	1	94	0	3	0	0	0	161	97	4
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0
Mvmt Flow	0	0	1	108	0	3	0	0	0	185	111	5
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8	8.3	10.1
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	61%	0%	100%	0%
Vol Thru, %	37%	1%	0%	100%
Vol Right, %	2%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	262	95	3	113
LT Vol	161	0	3	0
Through Vol	97	1	0	113
RT Vol	4	94	0	0
Lane Flow Rate	301	109	3	130
Geometry Grp	1	1	1	1
Degree of Util (X)	0.373	0.13	0.005	0.162
Departure Headway (Hd)	4.457	4.286	5.218	4.488
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	813	836	685	800
Service Time	2.457	2.313	3.255	2.514
HCM Lane V/C Ratio	0.37	0.13	0.004	0.163
HCM Control Delay	10.1	8	8.3	8.4
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.7	0.4	0	0.6

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd
Background Saturday.syn
12/01/2017

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	113	0
Future Vol, veh/h	0	0	113	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	130	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.4
HCM LOS	A

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Background Saturday.syn

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	1082	495	91	976	676
Future Volume (vph)	0	1082	495	91	976	676
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1244	569	105	1122	777
RTOR Reduction (vph)	0	157	0	24	0	0
Lane Group Flow (vph)	0	1087	569	81	1122	777
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		24.2	19.5	19.5	24.2	53.5
Effective Green, g (s)		25.1	20.4	20.4	25.1	53.5
Actuated g/C Ratio		0.47	0.38	0.38	0.47	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1307	703	597	1595	1810
v/s Ratio Prot		c0.39	c0.31		0.33	0.43
v/s Ratio Perm				0.05		
v/c Ratio		0.83	0.81	0.14	0.70	0.43
Uniform Delay, d1		12.4	14.8	10.8	11.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		5.1	7.0	0.1	1.6	0.7
Delay (s)		17.4	21.8	10.9	12.9	0.7
Level of Service		B	C	B	B	A
Approach Delay (s)	17.4		20.1			7.9
Approach LOS	B		C			A

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	812	247	387	938	10	98	3	242	9	18	41
Future Volume (vph)	7	812	247	387	938	10	98	3	242	9	18	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1564	3433	3530		1698	1708	1561		1737	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1564	3433	3530		1698	1708	1561		1737	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	1041	317	496	1203	13	126	4	310	12	23	53
RTOR Reduction (vph)	0	0	147	0	0	0	0	0	68	0	0	50
Lane Group Flow (vph)	9	1041	170	496	1216	0	66	64	242	0	35	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.7	28.7	28.7	10.6	38.6		4.9	4.9	15.5		2.2	2.2
Effective Green, g (s)	1.2	29.7	29.7	11.2	39.6		6.7	6.7	16.7		3.2	3.2
Actuated g/C Ratio	0.02	0.44	0.44	0.17	0.59		0.10	0.10	0.25		0.05	0.05
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	32	1573	695	575	2092		170	171	390		83	74
v/s Ratio Prot	0.00	c0.29		c0.14	0.34		0.04	0.04	c0.10		c0.02	
v/s Ratio Perm			0.11						0.05			0.00
v/c Ratio	0.28	0.66	0.25	0.86	0.58		0.39	0.37	0.62		0.42	0.03
Uniform Delay, d1	32.4	14.6	11.6	27.1	8.4		28.1	28.1	22.2		30.9	30.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.8	0.1	12.3	0.3		0.5	0.5	2.1		1.3	0.1
Delay (s)	34.1	15.4	11.6	39.3	8.7		28.7	28.6	24.3		32.2	30.4
Level of Service	C	B	B	D	A		C	C	C		C	C
Approach Delay (s)		14.7			17.6			25.6			31.1	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	16.1
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	812	247	387	938	10	98	3	242	9	18	41
Future Volume (veh/h)	7	812	247	387	938	10	98	3	242	9	18	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1767	1863
Adj Flow Rate, veh/h	9	1041	317	496	1203	13	129	0	310	12	23	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	30	1185	524	542	1701	18	792	0	562	34	65	90
Arrive On Green	0.02	0.33	0.33	0.16	0.47	0.46	0.22	0.00	0.20	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3584	39	3583	0	1545	596	1141	1575
Grp Volume(v), veh/h	9	1041	317	496	593	623	129	0	310	35	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1854	1792	0	1545	1737	0	1575
Q Serve(g_s), s	0.3	19.3	11.8	9.9	18.5	18.5	2.0	0.0	11.2	1.4	0.0	2.3
Cycle Q Clear(g_c), s	0.3	19.3	11.8	9.9	18.5	18.5	2.0	0.0	11.2	1.4	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.34		1.00
Lane Grp Cap(c), veh/h	30	1185	524	542	839	880	792	0	562	100	0	90
V/C Ratio(X)	0.30	0.88	0.61	0.91	0.71	0.71	0.16	0.00	0.55	0.35	0.00	0.59
Avail Cap(c_a), veh/h	117	1277	564	542	839	880	1735	0	969	100	0	90
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.9	21.9	19.4	28.9	14.5	14.5	22.0	0.0	17.8	31.7	0.0	32.1
Incr Delay (d2), s/veh	2.1	6.5	1.0	19.8	2.3	2.2	0.0	0.0	0.3	0.8	0.0	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.5	5.3	6.2	9.4	9.9	1.0	0.0	4.7	0.7	0.0	1.2
LnGrp Delay(d),s/veh	36.1	28.3	20.4	48.7	16.8	16.8	22.0	0.0	18.1	32.4	0.0	38.7
LnGrp LOS	D	C	C	D	B	B	C		B	C		D
Approach Vol, veh/h		1367			1712			439			88	
Approach Delay, s/veh		26.5			26.1			19.3			36.2	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	37.1		19.4	15.0	27.4		8.0
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 10	24.2		3.0
Max Q Clear Time (g_c+I1), s	2.3	20.5		13.2	11.9	21.3		4.3
Green Ext Time (p_c), s	0.0	5.2		0.3	0.0	1.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		25.7
HCM 2010 LOS		C

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	199	304	26	6	91	277	155	38	232	68	275	334
Future Volume (vph)	199	304	26	6	91	277	155	38	232	68	275	334
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3496			1703	1827	1547	1752	1881	1589	3433	1761
Flt Permitted	0.95	1.00			0.18	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3496			319	1827	1547	1752	1881	1589	3433	1761
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	214	327	28	7	98	298	167	41	249	73	296	359
RTOR Reduction (vph)	0	7	0	0	0	0	120	0	0	54	0	7
Lane Group Flow (vph)	214	348	0	0	105	298	47	41	249	19	296	424
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	14.4	15.5			22.8	23.9	23.9	4.3	21.5	21.5	9.5	26.7
Effective Green, g (s)	14.1	15.7			22.5	24.1	24.1	4.0	22.4	22.4	9.2	27.6
Actuated g/C Ratio	0.16	0.18			0.26	0.28	0.28	0.05	0.26	0.26	0.11	0.32
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	279	639			83	513	434	81	491	414	368	566
v/s Ratio Prot	0.13	0.10				c0.16		0.02	0.13		c0.09	c0.24
v/s Ratio Perm					c0.33		0.03			0.01		
v/c Ratio	0.77	0.54			1.27	0.58	0.11	0.51	0.51	0.05	0.80	0.75
Uniform Delay, d1	34.3	31.8			31.6	26.5	22.9	39.9	27.0	23.7	37.4	26.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.9	1.1			185.7	1.8	0.1	4.9	1.0	0.1	12.0	5.6
Delay (s)	46.2	32.9			217.4	28.3	23.0	44.8	28.0	23.8	49.5	31.6
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		37.9				61.6			29.0			38.9
Approach LOS		D				E			C			D

Intersection Summary				
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	85.8	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	67.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	61	62	352	77	99	271	6	152	3	62	5	2
Future Volume (vph)	61	62	352	77	99	271	6	152	3	62	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	1.00		1.00	0.86			0.87
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1770	3403		1687	3429		3367	1510			3077
Flt Permitted		0.57	1.00		0.95	1.00		0.95	1.00			0.91
Satd. Flow (perm)		1054	3403		1687	3429		3367	1510			2831
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92
Adj. Flow (vph)	66	67	387	85	109	298	7	167	3	68	5	2
RTOR Reduction (vph)	0	0	17	0	0	1	0	0	53	0	0	34
Lane Group Flow (vph)	0	133	455	0	109	304	0	167	18	0	0	9
Confl. Bikes (#/hr)				1								
Heavy Vehicles (%)	2%	2%	3%	3%	7%	5%	2%	4%	2%	8%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2									4	
Actuated Green, G (s)		35.2	35.2		7.6	46.3		7.9	15.7			3.8
Effective Green, g (s)		35.2	35.2		7.1	46.3		7.9	15.7			3.8
Actuated g/C Ratio		0.50	0.50		0.10	0.66		0.11	0.22			0.05
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		530	1711		171	2268		379	338			153
v/s Ratio Prot			c0.13		c0.06	0.09		c0.05	c0.01			
v/s Ratio Perm		0.13										0.00
v/c Ratio		0.25	0.27		0.64	0.13		0.44	0.05			0.06
Uniform Delay, d1		9.9	10.0		30.2	4.4		29.0	21.3			31.4
Progression Factor		1.00	1.00		0.93	0.89		1.00	1.00			1.00
Incremental Delay, d2		1.1	0.4		5.6	0.1		0.3	0.1			0.2
Delay (s)		11.0	10.4		33.6	4.1		29.3	21.4			31.6
Level of Service		B	B		C	A		C	C			C
Approach Delay (s)			10.5			11.8			26.9			31.6
Approach LOS			B			B			C			C

Intersection Summary

HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	33
Future Volume (vph)	33
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	36
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	332	87	49	349	0	27	0	27	0	0	0
Future Volume (vph)	0	332	87	49	349	0	27	0	27	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		0.99		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.97		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3383		1805	3471			1548	1362			
Flt Permitted		1.00		0.95	1.00			0.89	1.00			
Satd. Flow (perm)		3383		1805	3471			1448	1362			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	391	102	58	411	0	32	0	32	0	0	0
RTOR Reduction (vph)	0	16	0	0	0	0	0	0	30	0	0	0
Lane Group Flow (vph)	0	477	0	58	411	0	0	32	2	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		49.8		4.2	57.5			4.5	4.5			
Effective Green, g (s)		49.8		3.7	57.5			4.5	4.5			
Actuated g/C Ratio		0.71		0.05	0.82			0.06	0.06			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2406		95	2851			93	87			
v/s Ratio Prot		c0.14		c0.03	0.12							
v/s Ratio Perm								c0.02	0.00			
v/c Ratio		0.20		0.61	0.14			0.34	0.02			
Uniform Delay, d1		3.4		32.4	1.3			31.3	30.7			
Progression Factor		0.63		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		7.9	0.1			0.8	0.0			
Delay (s)		2.3		40.3	1.4			32.1	30.7			
Level of Service		A		D	A			C	C			
Approach Delay (s)		2.3			6.2			31.4			0.0	
Approach LOS		A			A			C			A	

Intersection Summary

HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	332	87	49	349	0	27	0	27	0	0	0
Future Volume (veh/h)	0	332	87	49	349	0	27	0	27	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1900	1652	1652	1900	1900	1900
Adj Flow Rate, veh/h	0	391	102	58	411	0	32	0	32	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	0	15	0	0	0
Cap, veh/h	0	2084	538	61	2933	0	153	0	56	0	77	0
Arrive On Green	0.00	1.00	1.00	0.03	0.85	0.00	0.04	0.00	0.04	0.00	0.00	0.00
Sat Flow, veh/h	0	2856	713	1810	3563	0	1234	0	1375	0	1900	0
Grp Volume(v), veh/h	0	247	246	58	411	0	32	0	32	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1721	1810	1736	0	1234	0	1375	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	2.2	1.5	0.0	1.8	0.0	1.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.2	1.5	0.0	1.8	0.0	1.6	0.0	0.0	0.0
Prop In Lane	0.00		0.41	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1324	1297	61	2933	0	153	0	56	0	77	0
V/C Ratio(X)	0.00	0.19	0.19	0.95	0.14	0.00	0.21	0.00	0.57	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1324	1297	284	2933	0	455	0	393	0	543	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.98	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	33.7	1.0	0.0	33.1	0.0	33.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	21.6	0.1	0.0	0.2	0.0	3.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	1.5	0.7	0.0	0.6	0.0	0.7	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.3	0.3	55.4	1.1	0.0	33.3	0.0	36.4	0.0	0.0	0.0
LnGrp LOS		A	A	E	A		C		D			
Approach Vol, veh/h		493			469			64			0	
Approach Delay, s/veh		0.3			7.8			34.8			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	6.4	56.8		6.8		63.2		6.8
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	11.5	27.0		20.0		42.0		20.0
Max Q Clear Time (g_c+I1), s	4.2	2.0		0.0		3.5		3.8
Green Ext Time (p_c), s	0.0	7.5		0.0		8.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	5.9
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	219	30	0	13	12	5	16	334
Future Vol, veh/h	0	219	30	0	13	12	5	16	334
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	249	34	0	15	14	5	18	380
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	10.2	8.8	11.8
HCM LOS	B	A	B

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	110	110	30	13	12	21	334
LT Vol	110	110	0	0	0	21	0
Through Vol	0	0	30	13	0	0	0
RT Vol	0	0	0	0	12	0	334
Lane Flow Rate	124	124	34	15	14	24	380
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.214	0.211	0.037	0.026	0.021	0.039	0.496
Departure Headway (Hd)	6.204	6.118	3.898	6.314	5.603	5.937	4.703
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	574	581	903	570	643	602	763
Service Time	3.998	3.912	1.69	4.014	3.303	3.685	2.451
HCM Lane V/C Ratio	0.216	0.213	0.038	0.026	0.022	0.04	0.498
HCM Control Delay	10.7	10.6	6.8	9.2	8.4	8.9	12
HCM Lane LOS	B	B	A	A	A	A	B
HCM 95th-tile Q	0.8	0.8	0.1	0.1	0.1	0.1	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	50	109	151	43	63	132	1152	48	18	1378	113
Future Volume (vph)	144	50	109	151	43	63	132	1152	48	18	1378	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.95		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1508		1665	1649		1770	3468		1805	3471	1568
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1508		1665	1649		1770	3468		1805	3471	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	54	118	164	47	68	143	1252	52	20	1498	123
RTOR Reduction (vph)	0	71	0	0	40	0	0	3	0	0	0	57
Lane Group Flow (vph)	141	117	0	143	96	0	143	1301	0	20	1498	66
Confl. Peds. (#/hr)			46	46					46			
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	12.7	12.7		8.8	8.8		8.3	47.0		2.8	41.5	41.5
Effective Green, g (s)	12.9	12.9		9.0	9.0		8.0	47.9		2.5	42.4	42.4
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.09	0.54		0.03	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	243	220		169	168		160	1881		51	1666	752
v/s Ratio Prot	c0.08	0.08		c0.09	0.06		c0.08	0.38		0.01	c0.43	
v/s Ratio Perm												0.04
v/c Ratio	0.58	0.53		0.85	0.57		0.89	0.69		0.39	0.90	0.09
Uniform Delay, d1	35.2	34.9		39.0	37.8		39.7	14.8		42.2	21.0	12.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	2.8		31.3	5.6		41.7	1.3		4.9	7.2	0.1
Delay (s)	38.9	37.7		70.3	43.4		81.4	16.1		47.1	28.2	12.5
Level of Service	D	D		E	D		F	B		D	C	B
Approach Delay (s)		38.2			57.2			22.5			27.3	
Approach LOS		D			E			C			C	

Intersection Summary				
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	78.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	50	109	151	43	63	132	1152	48	18	1378	113
Future Volume (veh/h)	144	50	109	151	43	63	132	1152	48	18	1378	113
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.86	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845
Adj Flow Rate, veh/h	157	54	118	140	81	68	143	1252	52	20	1498	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3
Cap, veh/h	283	78	171	184	92	77	165	1786	74	50	1583	715
Arrive On Green	0.16	0.16	0.16	0.10	0.10	0.10	0.09	0.52	0.51	0.03	0.46	0.00
Sat Flow, veh/h	1757	488	1066	1757	883	741	1774	3426	142	1810	3471	1568
Grp Volume(v), veh/h	157	0	172	140	0	149	143	640	664	20	1498	0
Grp Sat Flow(s),veh/h/ln	1757	0	1554	1757	0	1624	1774	1754	1814	1810	1736	1568
Q Serve(g_s), s	7.1	0.0	9.0	6.7	0.0	7.8	6.8	23.7	23.8	0.9	35.6	0.0
Cycle Q Clear(g_c), s	7.1	0.0	9.0	6.7	0.0	7.8	6.8	23.7	23.8	0.9	35.6	0.0
Prop In Lane	1.00		0.69	1.00		0.46	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	283	0	250	184	0	170	165	915	946	50	1583	715
V/C Ratio(X)	0.56	0.00	0.69	0.76	0.00	0.88	0.87	0.70	0.70	0.40	0.95	0.00
Avail Cap(c_a), veh/h	347	0	307	184	0	170	165	915	946	147	1612	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.3	0.0	34.2	37.5	0.0	38.1	38.5	15.5	15.6	41.2	22.4	0.0
Incr Delay (d2), s/veh	2.1	0.0	5.4	18.1	0.0	37.6	35.6	2.8	2.7	5.2	12.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.2	4.2	0.0	5.3	5.0	12.1	12.5	0.5	19.5	0.0
LnGrp Delay(d),s/veh	35.4	0.0	39.5	55.6	0.0	75.7	74.1	18.3	18.3	46.4	34.6	0.0
LnGrp LOS	D		D	E		E	E	B	B	D	C	
Approach Vol, veh/h		329			289			1447			1518	
Approach Delay, s/veh		37.5			66.0			23.8			34.7	
Approach LOS		D			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		17.9	12.0	43.3		13.0	6.4	48.9
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 17	8.3	39.1		8.8	7.3	40.1
Max Q Clear Time (g_c+I1), s		11.0	8.8	37.6		9.8	2.9	25.8
Green Ext Time (p_c), s		0.9	0.0	0.8		0.0	0.0	13.8

Intersection Summary	
HCM 2010 Ctrl Delay	33.1
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	382	4	25	35	14	44	37	1301	17	71	1635	774
Future Volume (vph)	382	4	25	35	14	44	37	1301	17	71	1635	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	27	38	15	48	41	1430	19	78	1797	851
RTOR Reduction (vph)	0	23	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	41	1448	0	78	1797	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.6	53.3		6.2	55.4	99.9
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.3	54.2		6.4	56.3	99.9
Actuated g/C Ratio	0.16	0.16		0.07	0.07	0.07	0.04	0.54		0.06	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	556	247		121	120	112	75	1916		105	1956	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.41		0.05	c0.52	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.76	0.03		0.22	0.22	0.03	0.55	0.76		0.74	0.92	0.54
Uniform Delay, d1	40.0	35.3		43.8	43.8	43.2	46.8	17.7		45.9	19.7	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.5	0.1		1.6	1.6	0.2	7.9	2.1		24.4	7.8	1.3
Delay (s)	46.5	35.4		45.4	45.3	43.4	54.8	19.8		70.3	27.5	1.3
Level of Service	D	D		D	D	D	D	B		E	C	A
Approach Delay (s)		45.7			44.4			20.8			20.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	0	8	0	0	0	2	223	2	8	360	90
Future Vol, veh/h	29	0	8	0	0	0	2	223	2	8	360	90
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	33	0	9	0	0	0	2	256	2	9	414	103

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	623	753	265	493	804	135	520	0	0	262	0	0
Stage 1	487	487	-	265	265	-	-	-	-	-	-	-
Stage 2	136	266	-	228	539	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	354	341	668	464	319	895	1056	-	-	1314	-	-
Stage 1	510	554	-	723	693	-	-	-	-	-	-	-
Stage 2	830	692	-	760	525	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	349	335	665	451	314	891	1053	-	-	1311	-	-
Mov Cap-2 Maneuver	349	335	-	451	314	-	-	-	-	-	-	-
Stage 1	508	547	-	720	690	-	-	-	-	-	-	-
Stage 2	826	689	-	740	518	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.4	0	0.1	0.1
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1053	-	-	389	-	1311	-	-
HCM Lane V/C Ratio	0.002	-	-	0.109	-	0.007	-	-
HCM Control Delay (s)	8.4	0	-	15.4	0	7.8	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	-	0	-	-

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	94	244	17	3	333	11	18	2	4	1	2	47
Future Vol, veh/h	94	244	17	3	333	11	18	2	4	1	2	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	108	280	20	3	383	13	21	2	5	1	2	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	395	0	0	300	0	0	705	908	150	753	912	198
Stage 1	-	-	-	-	-	-	506	506	-	396	396	-
Stage 2	-	-	-	-	-	-	199	402	-	357	516	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1139	-	-	1273	-	-	327	277	876	302	276	786
Stage 1	-	-	-	-	-	-	522	543	-	606	607	-
Stage 2	-	-	-	-	-	-	790	604	-	639	538	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1139	-	-	1273	-	-	280	250	876	276	249	786
Mov Cap-2 Maneuver	-	-	-	-	-	-	280	250	-	276	249	-
Stage 1	-	-	-	-	-	-	473	492	-	549	606	-
Stage 2	-	-	-	-	-	-	731	603	-	573	487	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.2	0.1	17.7	10.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	312	1139	-	-	1273	-	-	700
HCM Lane V/C Ratio	0.088	0.095	-	-	0.003	-	-	0.082
HCM Control Delay (s)	17.7	8.5	-	-	7.8	-	-	10.6
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.3	-	-	0	-	-	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	640	117	22	903	80	19
Future Volume (vph)	640	117	22	903	80	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1759	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1759	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	674	123	23	951	84	20
RTOR Reduction (vph)	0	54	0	0	15	0
Lane Group Flow (vph)	674	69	23	951	89	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	30.0	30.0	0.7	34.9	7.5	
Effective Green, g (s)	30.0	30.0	0.7	34.9	7.5	
Actuated g/C Ratio	0.56	0.56	0.01	0.65	0.14	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1038	874	23	1231	247	
v/s Ratio Prot	0.37		0.01	c0.51	c0.05	
v/s Ratio Perm		0.04				
v/c Ratio	0.65	0.08	1.00	0.77	0.36	
Uniform Delay, d1	8.0	5.3	26.3	6.4	20.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.0	187.7	3.2	0.3	
Delay (s)	9.5	5.4	214.0	9.6	21.0	
Level of Service	A	A	F	A	C	
Approach Delay (s)	8.9			14.4	21.0	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	53.3	Sum of lost time (s)	15.1
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	640	117	22	903	80	19
Future Volume (veh/h)	640	117	22	903	80	19
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1878	1900
Adj Flow Rate, veh/h	674	123	23	951	84	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	4	0	1	0	0
Cap, veh/h	992	835	40	1218	221	0
Arrive On Green	0.54	0.54	0.02	0.65	0.13	0.00
Sat Flow, veh/h	1845	1553	1810	1881	1769	0
Grp Volume(v), veh/h	674	123	23	951	85	0
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1790	0
Q Serve(g_s), s	12.8	1.9	0.6	17.3	2.1	0.0
Cycle Q Clear(g_c), s	12.8	1.9	0.6	17.3	2.1	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	992	835	40	1218	224	0
V/C Ratio(X)	0.68	0.15	0.58	0.78	0.38	0.00
Avail Cap(c_a), veh/h	1073	903	151	1416	672	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.1	5.6	23.2	6.0	19.3	0.0
Incr Delay (d2), s/veh	1.7	0.1	4.8	2.7	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.8	0.4	9.6	1.1	0.0
LnGrp Delay(d),s/veh	9.8	5.7	28.0	8.7	19.7	0.0
LnGrp LOS	A	A	C	A	B	
Approach Vol, veh/h	797			974	85	
Approach Delay, s/veh	9.2			9.1	19.7	
Approach LOS	A			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.3	32.2				37.5		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	27.9				36.1		18.0
Max Q Clear Time (g_c+I1), s	2.6	14.8				19.3		4.1
Green Ext Time (p_c), s	0.0	9.7				11.8		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.6
HCM 2010 LOS	A

Notes

Intersection

Int Delay, s/veh 2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	538	29	29	900	8	12	1	13	14	0	47
Future Vol, veh/h	27	538	29	29	900	8	12	1	13	14	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	30	591	32	32	989	9	13	1	14	15	0	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	998	0	0	591	0	0	1708	1713	591	1708	1708	993
Stage 1	-	-	-	-	-	-	651	651	-	1057	1057	-
Stage 2	-	-	-	-	-	-	1057	1062	-	651	651	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	7.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.9	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	701	-	-	980	-	-	73	53	511	73	92	300
Stage 1	-	-	-	-	-	-	461	342	-	275	304	-
Stage 2	-	-	-	-	-	-	275	204	-	461	468	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	701	-	-	980	-	-	57	49	511	66	85	300
Mov Cap-2 Maneuver	-	-	-	-	-	-	57	49	-	66	85	-
Stage 1	-	-	-	-	-	-	441	327	-	263	294	-
Stage 2	-	-	-	-	-	-	220	197	-	427	448	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	51.1	32.3
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	56	511	701	-	-	980	-	-	66	300
HCM Lane V/C Ratio	0.255	0.028	0.042	-	-	0.033	-	-	0.233	0.172
HCM Control Delay (s)	90	12.2	10.4	-	-	8.8	-	-	75.4	19.5
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.9	0.1	0.1	-	-	0.1	-	-	0.8	0.6

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	38	0	1	300	408	39
Future Vol, veh/h	38	0	1	300	408	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	43	0	1	337	458	44

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	797	458	458	0	-	0
Stage 1	458	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Critical Hdwy	7.13	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.13	-	-	-	-	-
Critical Hdwy Stg 2	6.13	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	303	607	1114	-	-	-
Stage 1	581	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	303	607	1114	-	-	-
Mov Cap-2 Maneuver	303	-	-	-	-	-
Stage 1	580	-	-	-	-	-
Stage 2	672	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1114	-	303	-	-
HCM Lane V/C Ratio	0.001	-	0.141	-	-
HCM Control Delay (s)	8.2	0	18.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection

Int Delay, s/veh 2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	93	324	21	22	424
Future Vol, veh/h	16	93	324	21	22	424
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	21	122	426	28	29	558

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1070	454	0	0	461	0
Stage 1	447	-	-	-	-	-
Stage 2	623	-	-	-	-	-
Critical Hdwy	6.4	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	247	608	-	-	1111	-
Stage 1	649	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	235	601	-	-	1105	-
Mov Cap-2 Maneuver	235	-	-	-	-	-
Stage 1	645	-	-	-	-	-
Stage 2	515	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.4	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	489	1105	-
HCM Lane V/C Ratio	-	-	0.293	0.026	-
HCM Control Delay (s)	-	-	15.4	8.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	157	174	234	269	21
Future Vol, veh/h	17	157	174	234	269	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	212	235	316	364	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1158	372	368	0	-	0
Stage 1	368	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	219	672	1180	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	451	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	174	668	1176	-	-	-
Mov Cap-2 Maneuver	174	-	-	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	360	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.4	3.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1176	-	523	-	-
HCM Lane V/C Ratio	0.2	-	0.45	-	-
HCM Control Delay (s)	8.8	-	17.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.7	-	2.3	-	-

Intersection

Int Delay, s/veh 4.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	118	127	118	171	92
Future Vol, veh/h	28	118	127	118	171	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	140	151	140	204	110

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	712	272	320	0	-	0
Stage 1	265	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Critical Hdwy	6.44	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	396	767	1240	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	343	758	1233	-	-	-
Mov Cap-2 Maneuver	343	-	-	-	-	-
Stage 1	770	-	-	-	-	-
Stage 2	558	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	4.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1233	-	615	-	-
HCM Lane V/C Ratio	0.123	-	0.283	-	-
HCM Control Delay (s)	8.3	-	13.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.2	-	-

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	1	0	71	0	4	0	0	0	68	80	1
Future Vol, veh/h	0	1	0	71	0	4	0	0	0	68	80	1
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0
Mvmt Flow	0	1	0	91	0	5	0	0	0	87	103	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	8.3	9.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	46%	1%	100%	0%
Vol Thru, %	54%	0%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	149	72	4	192
LT Vol	68	1	4	0
Through Vol	80	0	0	192
RT Vol	1	71	0	0
Lane Flow Rate	191	92	5	246
Geometry Grp	1	1	1	1
Degree of Util (X)	0.247	0.11	0.007	0.296
Departure Headway (Hd)	4.664	4.304	5.21	4.33
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	772	834	687	832
Service Time	2.683	2.327	3.241	2.347
HCM Lane V/C Ratio	0.247	0.11	0.007	0.296
HCM Control Delay	9.2	7.9	8.3	9.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.4	0	1.2

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd
Background + Project AM.syn
12/01/2017

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	192	0
Future Vol, veh/h	0	0	192	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	246	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.2
HCM LOS	A

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Background + Project AM.syn

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	940	741	129	992	586
Future Volume (vph)	0	940	741	129	992	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2814	1845	1538	3433	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2814	1845	1538	3433	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	969	764	133	1023	604
RTOR Reduction (vph)	0	170	0	10	0	0
Lane Group Flow (vph)	0	799	764	123	1023	604
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		18.2	24.8	24.8	18.2	52.8
Effective Green, g (s)		19.1	25.7	25.7	19.1	52.8
Actuated g/C Ratio		0.36	0.49	0.49	0.36	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1017	898	748	1241	1881
v/s Ratio Prot		0.28	c0.41		c0.30	0.32
v/s Ratio Perm				0.08		
v/c Ratio		0.79	0.85	0.16	0.82	0.32
Uniform Delay, d1		15.0	11.9	7.6	15.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.5	8.0	0.1	5.0	0.5
Delay (s)		19.6	19.8	7.7	20.3	0.5
Level of Service		B	B	A	C	A
Approach Delay (s)	19.6		18.0			13.0
Approach LOS	B		B			B

Intersection Summary

HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	52.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	856	240	425	667	5	264	22	596	6	10	7
Future Volume (vph)	26	856	240	425	667	5	264	22	596	6	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1732	1590		1727	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1732	1590		1727	1580
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	930	261	462	725	5	287	24	648	7	11	8
RTOR Reduction (vph)	0	0	146	0	0	0	0	0	75	0	0	8
Lane Group Flow (vph)	28	930	115	462	730	0	155	156	573	0	18	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.8	25.2	25.2	11.8	35.2		9.1	9.1	20.9		1.0	1.0
Effective Green, g (s)	2.3	26.2	26.2	12.4	36.2		10.9	10.9	22.1		2.0	2.0
Actuated g/C Ratio	0.03	0.39	0.39	0.18	0.54		0.16	0.16	0.33		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	61	1373	626	636	1914		276	279	520		51	46
v/s Ratio Prot	0.02	c0.26		0.13	0.20		0.09	0.09	c0.20		c0.01	
v/s Ratio Perm			0.07						0.16			0.00
v/c Ratio	0.46	0.68	0.18	0.73	0.38		0.56	0.56	1.10		0.35	0.01
Uniform Delay, d1	32.0	17.1	13.6	26.0	9.1		26.1	26.1	22.7		32.1	31.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	1.1	0.1	3.5	0.0		1.6	1.4	70.5		1.5	0.0
Delay (s)	34.0	18.2	13.7	29.5	9.2		27.7	27.5	93.2		33.6	31.8
Level of Service	C	B	B	C	A		C	C	F		C	C
Approach Delay (s)		17.6			17.0			71.9			33.1	
Approach LOS		B			B			E			C	

Intersection Summary

HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	16.1
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	856	240	425	667	5	264	22	596	6	10	7
Future Volume (veh/h)	26	856	240	425	667	5	264	22	596	6	10	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1900	1881	1900	1760	1900
Adj Flow Rate, veh/h	28	930	261	462	725	5	304	0	648	7	11	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	51	956	436	489	1388	10	1376	0	811	18	29	43
Arrive On Green	0.03	0.27	0.27	0.14	0.38	0.37	0.38	0.00	0.37	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3639	25	3619	0	1598	671	1055	1587
Grp Volume(v), veh/h	28	930	261	462	356	374	304	0	648	18	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1877	1810	0	1598	1727	0	1587
Q Serve(g_s), s	1.3	22.9	12.4	11.6	13.6	13.6	5.0	0.0	29.6	0.9	0.0	0.4
Cycle Q Clear(g_c), s	1.3	22.9	12.4	11.6	13.6	13.6	5.0	0.0	29.6	0.9	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.39		1.00
Lane Grp Cap(c), veh/h	51	956	436	489	682	716	1376	0	811	47	0	43
V/C Ratio(X)	0.55	0.97	0.60	0.94	0.52	0.52	0.22	0.00	0.80	0.38	0.00	0.18
Avail Cap(c_a), veh/h	115	956	436	489	682	716	1388	0	816	78	0	72
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.3	31.8	28.0	37.5	21.0	21.0	18.5	0.0	18.0	42.1	0.0	41.9
Incr Delay (d2), s/veh	3.4	22.5	1.6	27.0	0.3	0.3	0.0	0.0	5.2	1.9	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	14.1	5.7	7.4	6.7	7.0	2.5	0.0	14.0	0.5	0.0	0.2
LnGrp Delay(d),s/veh	45.6	54.3	29.6	64.5	21.4	21.4	18.5	0.0	23.2	44.0	0.0	42.6
LnGrp LOS	D	D	C	E	C	C	B		C	D		D
Approach Vol, veh/h		1219			1192			952			26	
Approach Delay, s/veh		48.8			38.1			21.7			43.6	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	37.6		37.5	16.4	27.8		6.4
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	22.8		3.0
Max Q Clear Time (g_c+I1), s	3.3	15.6		31.6	13.6	24.9		2.9
Green Ext Time (p_c), s	0.0	4.3		0.1	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		37.4
HCM 2010 LOS		D

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	114	378	69	12	159	419	322	77	435	197	218	307
Future Volume (vph)	114	378	69	12	159	419	322	77	435	197	218	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3469			1746	1863	1560	1805	1827	1556	3502	1831
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3469			656	1863	1560	1805	1827	1556	3502	1831
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	118	390	71	12	164	432	332	79	448	203	225	316
RTOR Reduction (vph)	0	18	0	0	0	0	226	0	0	142	0	8
Lane Group Flow (vph)	118	443	0	0	176	432	106	79	448	61	225	371
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6			3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.3	22.1			11.5	25.3	25.3	6.1	24.4	24.4	9.4	27.7
Effective Green, g (s)	8.0	22.3			11.2	25.5	25.5	5.8	25.3	25.3	9.1	28.6
Actuated g/C Ratio	0.10	0.27			0.13	0.30	0.30	0.07	0.30	0.30	0.11	0.34
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	167	922			87	566	474	124	550	469	379	624
v/s Ratio Prot	0.07	0.13				c0.23		0.04	c0.25		c0.06	c0.20
v/s Ratio Perm					c0.27		0.07			0.04		
v/c Ratio	0.71	0.48			2.02	0.76	0.22	0.64	0.81	0.13	0.59	0.59
Uniform Delay, d1	36.8	25.9			36.4	26.5	21.8	38.0	27.1	21.3	35.6	22.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.8	0.5			498.2	6.2	0.3	10.3	9.3	0.1	2.5	1.6
Delay (s)	49.6	26.4			534.5	32.7	22.1	48.3	36.4	21.5	38.1	24.5
Level of Service	D	C			F	C	C	D	D	C	D	C
Approach Delay (s)		31.1				122.9			33.5			29.6
Approach LOS		C				F			C			C

Intersection Summary				
HCM 2000 Control Delay	61.6	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	83.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	72.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	71	128	347	113	136	387	18	315	9	149	20	11
Future Volume (vph)	71	128	347	113	136	387	18	315	9	149	20	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	0.98			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.96		1.00	0.99		1.00	0.86			0.88
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1782	3411		1770	3548		3467	1571			3089
Flt Permitted		0.50	1.00		0.95	1.00		0.95	1.00			0.89
Satd. Flow (perm)		935	3411		1770	3548		3467	1571			2781
Peak-hour factor, PHF	0.93	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92
Adj. Flow (vph)	76	139	373	122	146	416	20	339	10	160	22	12
RTOR Reduction (vph)	0	0	34	0	0	3	0	0	112	0	0	133
Lane Group Flow (vph)	0	215	461	0	146	433	0	339	58	0	0	48
Confl. Peds. (#/hr)				3	5			3		5		
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	2%	1%	2%	2%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2									4	
Actuated Green, G (s)		30.1	30.1		10.8	44.4		11.6	22.6			7.0
Effective Green, g (s)		30.1	30.1		10.3	44.4		11.6	22.6			7.0
Actuated g/C Ratio		0.40	0.40		0.14	0.59		0.15	0.30			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		375	1368		243	2100		536	473			259
v/s Ratio Prot			0.14		c0.08	0.12		c0.10	0.04			
v/s Ratio Perm		c0.23										c0.02
v/c Ratio		0.57	0.34		0.60	0.21		0.63	0.12			0.18
Uniform Delay, d1		17.5	15.5		30.4	7.1		29.7	19.0			31.4
Progression Factor		1.00	1.00		0.90	1.23		1.00	1.00			1.00
Incremental Delay, d2		6.2	0.7		2.8	0.2		1.8	0.1			0.3
Delay (s)		23.7	16.2		30.3	9.0		31.5	19.1			31.7
Level of Service		C	B		C	A		C	B			C
Approach Delay (s)			18.5			14.3			27.4			31.7
Approach LOS			B			B			C			C

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	135
Future Volume (vph)	135
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	147
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	458	58	106	438	0	103	0	93	0	0	0
Future Volume (vph)	0	458	58	106	438	0	103	0	93	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3465		1752	3574			1744	1542			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3465		1752	3574			1390	1542			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	515	65	119	492	0	116	0	104	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	91	0	0	0
Lane Group Flow (vph)	0	572	0	119	492	0	0	116	13	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6		6	2		2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		46.4		7.6	57.5			9.5	9.5			
Effective Green, g (s)		46.4		7.1	57.5			9.5	9.5			
Actuated g/C Ratio		0.62		0.09	0.77			0.13	0.13			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2143		165	2740			176	195			
v/s Ratio Prot		c0.17		c0.07	0.14							
v/s Ratio Perm								c0.08	0.01			
v/c Ratio		0.27		0.72	0.18			0.66	0.07			
Uniform Delay, d1		6.5		33.0	2.4			31.2	28.8			
Progression Factor		0.71		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.3		12.3	0.1			6.6	0.1			
Delay (s)		5.0		45.3	2.5			37.8	28.9			
Level of Service		A		D	A			D	C			
Approach Delay (s)		5.0			10.8			33.6			0.0	
Approach LOS		A			B			C			A	

Intersection Summary

HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	458	58	106	438	0	103	0	93	0	0	0
Future Volume (veh/h)	0	458	58	106	438	0	103	0	93	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	515	65	119	492	0	116	0	104	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	2052	258	139	2794	0	253	0	174	0	212	0
Arrive On Green	0.00	0.86	0.86	0.08	0.78	0.00	0.11	0.00	0.11	0.00	0.00	0.00
Sat Flow, veh/h	0	3255	398	1757	3668	0	1404	0	1558	0	1900	0
Grp Volume(v), veh/h	0	287	293	119	492	0	116	0	104	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1790	1757	1787	0	1404	0	1558	0	1900	0
Q Serve(g_s), s	0.0	2.1	2.1	5.0	2.6	0.0	6.0	0.0	4.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	2.1	2.1	5.0	2.6	0.0	6.0	0.0	4.8	0.0	0.0	0.0
Prop In Lane	0.00		0.22	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1148	1162	139	2794	0	253	0	174	0	212	0
V/C Ratio(X)	0.00	0.25	0.25	0.85	0.18	0.00	0.46	0.00	0.60	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1148	1162	328	2794	0	470	0	415	0	507	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.94	0.94	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.9	1.9	34.1	2.1	0.0	32.3	0.0	31.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	5.5	0.1	0.0	0.5	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.1	1.2	2.7	1.3	0.0	2.4	0.0	2.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	2.4	2.4	39.6	2.2	0.0	32.7	0.0	32.9	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		580			611			220			0	
Approach Delay, s/veh		2.4			9.5			32.8			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	10.0	52.7		12.4		62.6		12.4
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	14.5	29.0		20.0		47.0		20.0
Max Q Clear Time (g_c+I1), s	7.0	4.1		0.0		4.6		8.0
Green Ext Time (p_c), s	0.0	9.1		0.0		10.7		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	10.2
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	17.8
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	431	24	0	27	14	6	23	427
Future Vol, veh/h	0	431	24	0	27	14	6	23	427
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2	0	0	0	0	2
Mvmt Flow	0	484	27	0	30	16	7	26	480
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	14.7	10.4	21.5
HCM LOS	B	B	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	216	216	24	27	14	29	427
LT Vol	216	216	0	0	0	29	0
Through Vol	0	0	24	27	0	0	0
RT Vol	0	0	0	0	14	0	427
Lane Flow Rate	242	242	27	30	16	33	480
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.458	0.456	0.034	0.062	0.029	0.061	0.737
Departure Headway (Hd)	6.81	6.775	4.544	7.396	6.676	6.731	5.53
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	530	533	786	482	534	531	652
Service Time	4.551	4.517	2.284	5.169	4.449	4.479	3.278
HCM Lane V/C Ratio	0.457	0.454	0.034	0.062	0.03	0.062	0.736
HCM Control Delay	15.2	15.1	7.4	10.7	9.7	9.9	22.3
HCM Lane LOS	C	C	A	B	A	A	C
HCM 95th-tile Q	2.4	2.4	0.1	0.2	0.1	0.2	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	0	174	62	20	26	182	1454	4	17	1381	205
Future Volume (vph)	219	0	174	62	20	26	182	1454	4	17	1381	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1458		1715	1662		1805	3573		1805	3574	1583
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1458		1715	1662		1805	3573		1805	3574	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	0	179	64	21	27	188	1499	4	18	1424	211
RTOR Reduction (vph)	0	149	0	0	25	0	0	0	0	0	0	98
Lane Group Flow (vph)	203	53	0	57	30	0	188	1503	0	18	1424	113
Confl. Peds. (#/hr)			7	7			7		7			
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	14.7	14.7		5.3	5.3		11.1	48.1		2.7	39.7	39.7
Effective Green, g (s)	14.9	14.9		5.5	5.5		10.8	49.0		2.4	40.6	40.6
Actuated g/C Ratio	0.17	0.17		0.06	0.06		0.12	0.56		0.03	0.46	0.46
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	288	247		107	104		222	1994		49	1652	732
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.10	0.42		0.01	c0.40	
v/s Ratio Perm												0.07
v/c Ratio	0.70	0.22		0.53	0.29		0.85	0.75		0.37	0.86	0.15
Uniform Delay, d1	34.4	31.4		39.9	39.3		37.7	14.8		42.0	21.1	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.9	0.5		6.4	2.1		24.6	1.9		4.6	5.2	0.2
Delay (s)	42.3	31.9		46.3	41.3		62.3	16.7		46.6	26.3	13.8
Level of Service	D	C		D	D		E	B		D	C	B
Approach Delay (s)		37.1			43.8			21.7			24.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	87.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	0	174	62	20	26	182	1454	4	17	1381	205
Future Volume (veh/h)	219	0	174	62	20	26	182	1454	4	17	1381	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1817	1900	1900	1900	1900	1900	1881	1900	1900	1881	1863
Adj Flow Rate, veh/h	202	33	179	56	32	27	188	1499	4	18	1424	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	1	0	1	2
Cap, veh/h	306	42	226	147	76	64	219	1937	5	45	1549	686
Arrive On Green	0.17	0.17	0.17	0.08	0.08	0.08	0.12	0.53	0.52	0.03	0.43	0.00
Sat Flow, veh/h	1792	244	1321	1810	942	794	1810	3657	10	1810	3574	1583
Grp Volume(v), veh/h	202	0	212	56	0	59	188	732	771	18	1424	0
Grp Sat Flow(s),veh/h/ln	1792	0	1565	1810	0	1736	1810	1787	1879	1810	1787	1583
Q Serve(g_s), s	8.7	0.0	10.8	2.4	0.0	2.7	8.4	27.0	27.0	0.8	31.1	0.0
Cycle Q Clear(g_c), s	8.7	0.0	10.8	2.4	0.0	2.7	8.4	27.0	27.0	0.8	31.1	0.0
Prop In Lane	1.00		0.84	1.00		0.46	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	306	0	267	147	0	141	219	947	996	45	1549	686
V/C Ratio(X)	0.66	0.00	0.79	0.38	0.00	0.42	0.86	0.77	0.77	0.40	0.92	0.00
Avail Cap(c_a), veh/h	385	0	337	157	0	151	241	947	996	153	1641	727
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.1	0.0	33.0	36.1	0.0	36.2	35.7	15.5	15.5	39.7	22.1	0.0
Incr Delay (d2), s/veh	3.3	0.0	10.5	2.3	0.0	2.8	23.6	4.5	4.3	5.5	8.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	5.4	1.3	0.0	1.4	5.7	14.4	15.1	0.5	17.1	0.0
LnGrp Delay(d),s/veh	35.4	0.0	43.5	38.4	0.0	39.0	59.3	20.0	19.8	45.3	30.9	0.0
LnGrp LOS	D		D	D		D	E	B	B	D	C	
Approach Vol, veh/h		414			115			1691			1442	
Approach Delay, s/veh		39.5			38.7			24.2			31.1	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.1	14.0	39.9		10.7	6.1	47.8
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 18	11.3	37.1		7.0	7.3	41.1
Max Q Clear Time (g_c+I1), s		12.8	10.4	33.1		4.7	2.8	29.0
Green Ext Time (p_c), s		1.0	0.0	1.9		0.1	0.0	11.8

Intersection Summary	
HCM 2010 Ctrl Delay	29.1
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	869	18	26	18	6	54	10	1722	19	55	1544	493
Future Volume (vph)	869	18	26	18	6	54	10	1722	19	55	1544	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1729		1715	1761	1524	1805	3530		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1729		1715	1761	1524	1805	3530		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	27	18	6	55	10	1757	19	56	1576	503
RTOR Reduction (vph)	0	20	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	25	0	12	12	3	10	1776	0	56	1576	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	38.1	38.1		6.6	6.6	6.6	1.5	72.5		6.3	77.8	141.4
Effective Green, g (s)	38.7	38.7		6.8	6.8	6.8	1.2	73.4		6.5	78.7	141.4
Actuated g/C Ratio	0.27	0.27		0.05	0.05	0.05	0.01	0.52		0.05	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	948	473		82	84	73	15	1832		82	1989	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	c0.50		c0.03	0.44	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.94	0.05		0.15	0.14	0.04	0.67	0.97		0.68	0.79	0.31
Uniform Delay, d1	50.1	37.9		64.5	64.5	64.2	69.9	32.9		66.4	24.9	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.2	0.1		1.4	1.4	0.4	75.9	14.5		20.9	2.6	0.5
Delay (s)	66.3	37.9		65.9	65.9	64.5	145.8	47.4		87.4	27.5	0.5
Level of Service	E	D		E	E	E	F	D		F	C	A
Approach Delay (s)		65.0			64.9			48.0			22.7	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	141.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	145	1	12	4	0	4	6	443	0	1	438	82
Future Vol, veh/h	145	1	12	4	0	4	6	443	0	1	438	82
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	159	1	13	4	0	4	7	487	0	1	481	90

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	802	1042	302	756	1087	256	579	0	0	492	0	0
Stage 1	537	537	-	505	505	-	-	-	-	-	-	-
Stage 2	265	505	-	251	582	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	275	232	677	301	218	749	1005	-	-	1082	-	-
Stage 1	496	526	-	523	544	-	-	-	-	-	-	-
Stage 2	717	544	-	737	502	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	267	227	668	288	213	741	998	-	-	1075	-	-
Mov Cap-2 Maneuver	267	227	-	288	213	-	-	-	-	-	-	-
Stage 1	488	522	-	516	536	-	-	-	-	-	-	-
Stage 2	701	536	-	715	498	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37	13.9	0.1	0
HCM LOS	E	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	998	-	-	279	415	1075	-	-
HCM Lane V/C Ratio	0.007	-	-	0.622	0.021	0.001	-	-
HCM Control Delay (s)	8.6	0	-	37	13.9	8.4	0	-
HCM Lane LOS	A	A	-	E	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	3.8	0.1	0	-	-

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	108	445	16	6	419	29	10	6	4	6	3	115
Future Vol, veh/h	108	445	16	6	419	29	10	6	4	6	3	115
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	115	473	17	6	446	31	11	6	4	6	3	122

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	481	0	0	507	0	0	979	1222	279	965	1215	255
Stage 1	-	-	-	-	-	-	729	729	-	478	478	-
Stage 2	-	-	-	-	-	-	250	493	-	487	737	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1085	-	-	1068	-	-	207	181	724	212	183	744
Stage 1	-	-	-	-	-	-	385	431	-	543	559	-
Stage 2	-	-	-	-	-	-	738	550	-	536	428	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1073	-	-	1053	-	-	151	158	704	184	160	733
Mov Cap-2 Maneuver	-	-	-	-	-	-	151	158	-	184	160	-
Stage 1	-	-	-	-	-	-	339	379	-	483	554	-
Stage 2	-	-	-	-	-	-	601	545	-	461	377	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0.1	27.4	12.8
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	182	1073	-	-	1053	-	-	595
HCM Lane V/C Ratio	0.117	0.107	-	-	0.006	-	-	0.222
HCM Control Delay (s)	27.4	8.8	-	-	8.4	-	-	12.8
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0.4	-	-	0	-	-	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	992	115	15	630	140	34
Future Volume (vph)	992	115	15	630	140	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1750	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1750	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1067	124	16	677	151	37
RTOR Reduction (vph)	0	45	0	0	10	0
Lane Group Flow (vph)	1067	79	16	677	178	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	48.6	48.6	0.7	53.5	12.1	
Effective Green, g (s)	48.6	48.6	0.7	53.5	12.1	
Actuated g/C Ratio	0.64	0.64	0.01	0.70	0.16	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1194	994	16	1302	276	
v/s Ratio Prot	c0.57		0.01	c0.36	c0.10	
v/s Ratio Perm		0.05				
v/c Ratio	0.89	0.08	1.00	0.52	0.64	
Uniform Delay, d1	11.8	5.4	37.9	5.4	30.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.0	0.0	225.0	0.4	3.8	
Delay (s)	20.8	5.4	262.9	5.9	34.0	
Level of Service	C	A	F	A	C	
Approach Delay (s)	19.2			11.8	34.0	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	15.1
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	992	115	15	630	140	34
Future Volume (veh/h)	992	115	15	630	140	34
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1870	1900
Adj Flow Rate, veh/h	1067	124	16	677	151	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	0	2	0	0
Cap, veh/h	1248	1039	28	1372	199	0
Arrive On Green	0.66	0.66	0.02	0.74	0.11	0.00
Sat Flow, veh/h	1881	1566	1810	1863	1770	0
Grp Volume(v), veh/h	1067	124	16	677	152	0
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1781	0
Q Serve(g_s), s	31.9	2.1	0.6	10.9	6.0	0.0
Cycle Q Clear(g_c), s	31.9	2.1	0.6	10.9	6.0	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1248	1039	28	1372	200	0
V/C Ratio(X)	0.86	0.12	0.58	0.49	0.76	0.00
Avail Cap(c_a), veh/h	1379	1148	100	1577	444	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.5	4.4	35.3	3.9	31.1	0.0
Incr Delay (d2), s/veh	5.3	0.1	7.0	0.3	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.1	0.9	0.4	5.6	3.0	0.0
LnGrp Delay(d),s/veh	14.7	4.5	42.3	4.3	33.3	0.0
LnGrp LOS	B	A	D	A	C	
Approach Vol, veh/h	1191			693	152	
Approach Delay, s/veh	13.7			5.2	33.3	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.3	54.3				59.6		12.6
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	52.9				61.1		18.0
Max Q Clear Time (g_c+I1), s	2.6	33.9				12.9		8.0
Green Ext Time (p_c), s	0.0	14.0				25.8		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.2
HCM 2010 LOS	B

Notes

Intersection

Int Delay, s/veh 5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	57	934	27	16	560	19	27	1	28	14	2	46
Future Vol, veh/h	57	934	27	16	560	19	27	1	28	14	2	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	64	1049	30	18	629	21	30	1	31	16	2	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	651	0	0	1049	0	0	1855	1865	1049	1854	1854	640
Stage 1	-	-	-	-	-	-	1178	1178	-	676	676	-
Stage 2	-	-	-	-	-	-	677	687	-	1178	1178	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	945	-	-	671	-	-	57	74	279	57	75	479
Stage 1	-	-	-	-	-	-	235	267	-	446	456	-
Stage 2	-	-	-	-	-	-	446	450	-	235	267	-
Platoon blocked, %			-			-						
Mov Cap-1 Maneuver	945	-	-	671	-	-	46	67	279	46	68	479
Mov Cap-2 Maneuver	-	-	-	-	-	-	46	67	-	46	68	-
Stage 1	-	-	-	-	-	-	219	249	-	416	444	-
Stage 2	-	-	-	-	-	-	385	438	-	194	249	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	97.9	40.8
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	47	279	945	-	-	671	-	-	48	479
HCM Lane V/C Ratio	0.669	0.113	0.068	-	-	0.027	-	-	0.375	0.108
HCM Control Delay (s)	176.3	19.5	9.1	-	-	10.5	-	-	119.4	13.4
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	2.6	0.4	0.2	-	-	0.1	-	-	1.3	0.4

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	39	1	7	669	497	40
Future Vol, veh/h	39	1	7	669	497	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	41	1	7	704	523	42

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1242	523	523	0	-	0
Stage 1	523	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	195	558	1054	-	-	-
Stage 1	599	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	193	558	1054	-	-	-
Mov Cap-2 Maneuver	193	-	-	-	-	-
Stage 1	599	-	-	-	-	-
Stage 2	481	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.3	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1054	-	196	-	-
HCM Lane V/C Ratio	0.007	-	0.215	-	-
HCM Control Delay (s)	8.4	0	28.3	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Intersection

Int Delay, s/veh 1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	27	58	446	43	30	479
Future Vol, veh/h	27	58	446	43	30	479
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	28	61	469	45	32	504

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1071	503	0	0	521	0
Stage 1	498	-	-	-	-	-
Stage 2	573	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	247	573	-	-	1056	-
Stage 1	615	-	-	-	-	-
Stage 2	568	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	234	568	-	-	1052	-
Mov Cap-2 Maneuver	234	-	-	-	-	-
Stage 1	612	-	-	-	-	-
Stage 2	541	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	391	1052	-
HCM Lane V/C Ratio	-	-	0.229	0.03	-
HCM Control Delay (s)	-	-	16.9	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	121	131	387	350	28
Future Vol, veh/h	14	121	131	387	350	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	133	144	425	385	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1106	393	389	0	-	0
Stage 1	389	-	-	-	-	-
Stage 2	717	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-	-
Pot Cap-1 Maneuver	235	658	1181	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	487	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	205	654	1177	-	-	-
Mov Cap-2 Maneuver	205	-	-	-	-	-
Stage 1	687	-	-	-	-	-
Stage 2	426	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1177	-	533	-	-
HCM Lane V/C Ratio	0.122	-	0.278	-	-
HCM Control Delay (s)	8.5	-	14.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	136	109	292	236	17
Future Vol, veh/h	27	136	109	292	236	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	145	116	311	251	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	813	270	274	0	-	0
Stage 1	265	-	-	-	-	-
Stage 2	548	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	351	769	1295	-	-	-
Stage 1	784	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	317	763	1290	-	-	-
Mov Cap-2 Maneuver	317	-	-	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	528	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1290	-	619	-	-
HCM Lane V/C Ratio	0.09	-	0.28	-	-
HCM Control Delay (s)	8.1	-	13.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	2	1	121	0	3	0	0	0	138	171	3
Future Vol, veh/h	0	2	1	121	0	3	0	0	0	138	171	3
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0
Mvmt Flow	0	2	1	133	0	3	0	0	0	152	188	3
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.4	8.5	10.8
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	44%	2%	100%	1%
Vol Thru, %	55%	1%	0%	99%
Vol Right, %	1%	98%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	312	124	3	135
LT Vol	138	2	3	1
Through Vol	171	1	0	134
RT Vol	3	121	0	0
Lane Flow Rate	343	136	3	148
Geometry Grp	1	1	1	1
Degree of Util (X)	0.427	0.168	0.005	0.189
Departure Headway (Hd)	4.482	4.436	5.403	4.594
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	802	808	660	780
Service Time	2.51	2.469	3.452	2.628
HCM Lane V/C Ratio	0.428	0.168	0.005	0.19
HCM Control Delay	10.8	8.4	8.5	8.7
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2.2	0.6	0	0.7

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd
Background + Project PM.syn
12/01/2017

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	134	0
Future Vol, veh/h	0	1	134	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	147	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.7
HCM LOS	A

Synchro 9 Report
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	886	745	80	941	795
Future Volume (vph)	0	886	745	80	941	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	913	768	82	970	820
RTOR Reduction (vph)	0	164	0	12	0	0
Lane Group Flow (vph)	0	749	768	70	970	820
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		16.2	22.5	22.5	16.2	48.5
Effective Green, g (s)		17.1	23.4	23.4	17.1	48.5
Actuated g/C Ratio		0.35	0.48	0.48	0.35	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1002	907	779	1222	1881
v/s Ratio Prot		0.26	c0.41		c0.28	0.44
v/s Ratio Perm				0.04		
v/c Ratio		0.75	0.85	0.09	0.79	0.44
Uniform Delay, d1		13.8	11.0	6.8	14.1	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.5	7.6	0.1	4.1	0.7
Delay (s)		17.3	18.5	6.8	18.2	0.7
Level of Service		B	B	A	B	A
Approach Delay (s)	17.3		17.4			10.2
Approach LOS	B		B			B

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	48.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	737	260	480	659	3	211	17	456	2	17	14
Future Volume (vph)	25	737	260	480	659	3	211	17	456	2	17	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (prot)	1805	3574	1593	3467	3607		1698	1717	1575		1891	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (perm)	1805	3574	1593	3467	3607		1698	1717	1575		1891	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	27	784	277	511	701	3	224	18	485	2	18	15
RTOR Reduction (vph)	0	0	180	0	0	0	0	0	92	0	0	15
Lane Group Flow (vph)	27	784	97	511	704	0	121	121	393	0	20	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.7	21.2	21.2	12.7	32.2		7.9	7.9	20.6		1.0	1.0
Effective Green, g (s)	2.2	22.2	22.2	13.3	33.2		9.7	9.7	21.8		2.0	2.0
Actuated g/C Ratio	0.03	0.35	0.35	0.21	0.53		0.15	0.15	0.34		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	62	1255	559	729	1894		260	263	543		59	51
v/s Ratio Prot	0.01	c0.22		0.15	0.20		0.07	0.07	c0.15		c0.01	
v/s Ratio Perm			0.06						0.10			0.00
v/c Ratio	0.44	0.62	0.17	0.70	0.37		0.47	0.46	0.72		0.34	0.01
Uniform Delay, d1	29.9	17.0	14.2	23.1	8.8		24.4	24.4	18.1		30.0	29.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.7	0.1	2.5	0.0		0.5	0.5	4.0		1.2	0.0
Delay (s)	31.7	17.7	14.2	25.6	8.9		24.9	24.8	22.1		31.2	29.7
Level of Service	C	B	B	C	A		C	C	C		C	C
Approach Delay (s)		17.2			15.9			23.0			30.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	16.1
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	737	260	480	659	3	211	17	456	2	17	14
Future Volume (veh/h)	25	737	260	480	659	3	211	17	456	2	17	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	784	277	511	701	3	237	0	485	2	18	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	54	963	429	619	1535	7	1079	0	727	6	58	56
Arrive On Green	0.03	0.27	0.27	0.18	0.42	0.40	0.30	0.00	0.28	0.03	0.03	0.03
Sat Flow, veh/h	1810	3574	1593	3476	3686	16	3583	0	1561	189	1701	1615
Grp Volume(v), veh/h	27	784	277	511	343	361	237	0	485	20	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1593	1738	1805	1897	1792	0	1561	1891	0	1615
Q Serve(g_s), s	1.1	15.1	11.3	10.4	10.1	10.1	3.7	0.0	17.8	0.8	0.0	0.7
Cycle Q Clear(g_c), s	1.1	15.1	11.3	10.4	10.1	10.1	3.7	0.0	17.8	0.8	0.0	0.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	54	963	429	619	752	790	1079	0	727	65	0	56
V/C Ratio(X)	0.50	0.81	0.65	0.83	0.46	0.46	0.22	0.00	0.67	0.31	0.00	0.27
Avail Cap(c_a), veh/h	135	1056	471	679	752	790	1642	0	972	103	0	88
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.2	25.2	23.8	29.2	15.5	15.5	19.3	0.0	15.4	34.8	0.0	34.7
Incr Delay (d2), s/veh	2.6	4.1	1.8	6.9	0.2	0.2	0.0	0.0	0.4	1.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.0	5.2	5.6	5.0	5.2	1.8	0.0	7.7	0.4	0.0	0.3
LnGrp Delay(d),s/veh	37.9	29.3	25.7	36.1	15.7	15.7	19.3	0.0	15.8	35.7	0.0	35.7
LnGrp LOS	D	C	C	D	B	B	B		B	D		D
Approach Vol, veh/h		1088			1215			722			35	
Approach Delay, s/veh		28.6			24.3			17.0			35.7	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.3	34.7		26.2	17.1	23.9		6.5
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 14	20.8		3.0
Max Q Clear Time (g_c+I1), s	3.1	12.1		19.8	12.4	17.1		2.8
Green Ext Time (p_c), s	0.0	3.9		0.4	0.1	1.7		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		24.2
HCM 2010 LOS		C

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	133	386	69	8	205	386	321	71	373	181	304	437
Future Volume (vph)	133	386	69	8	205	386	321	71	373	181	304	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3506			1795	1881	1556	1805	1863	1590	3502	1838
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3506			675	1881	1556	1805	1863	1590	3502	1838
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	134	390	70	8	207	390	324	72	377	183	307	441
RTOR Reduction (vph)	0	17	0	0	0	0	230	0	0	128	0	5
Lane Group Flow (vph)	134	443	0	0	215	390	95	72	377	55	307	491
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.5	20.6			11.5	23.6	23.6	6.1	23.5	23.5	9.5	26.9
Effective Green, g (s)	8.2	20.8			11.2	23.8	23.8	5.8	24.4	24.4	9.2	27.8
Actuated g/C Ratio	0.10	0.25			0.14	0.29	0.29	0.07	0.30	0.30	0.11	0.34
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	179	893			92	548	453	128	557	475	394	626
v/s Ratio Prot	0.07	0.13				c0.21		0.04	0.20		c0.09	c0.27
v/s Ratio Perm					c0.32		0.06			0.03		
v/c Ratio	0.75	0.50			2.34	0.71	0.21	0.56	0.68	0.12	0.78	0.78
Uniform Delay, d1	35.7	25.9			35.2	25.8	21.8	36.7	25.1	20.8	35.2	24.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.7	0.5			634.1	4.5	0.3	5.6	3.4	0.1	9.4	6.6
Delay (s)	51.4	26.4			669.3	30.3	22.1	42.2	28.5	20.9	44.6	30.8
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		32.1				175.3			27.9			36.1
Approach LOS		C				F			C			D

Intersection Summary				
HCM 2000 Control Delay	77.3	HCM 2000 Level of Service		E
HCM 2000 Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	81.6	Sum of lost time (s)		16.0
Intersection Capacity Utilization	74.3%	ICU Level of Service		D
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	84	200	258	160	157	339	29	298	13	156	27	16
Future Volume (vph)	84	200	258	160	157	339	29	298	13	156	27	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.97			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.94		1.00	0.99		1.00	0.86			0.88
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1780	3370		1787	3560		3467	1567			3087
Flt Permitted		0.52	1.00		0.95	1.00		0.95	1.00			0.89
Satd. Flow (perm)		978	3370		1787	3560		3467	1567			2774
Peak-hour factor, PHF	0.95	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	88	217	272	168	165	357	32	314	14	164	29	17
RTOR Reduction (vph)	0	0	89	0	0	5	0	0	120	0	0	191
Lane Group Flow (vph)	0	305	351	0	165	384	0	314	58	0	0	64
Confl. Peds. (#/hr)				5	9			5		9		
Confl. Bikes (#/hr)				11						11		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	2%	1%	2%	1%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2									4	
Actuated Green, G (s)		41.6	41.6		12.8	57.9		12.4	24.1			7.7
Effective Green, g (s)		41.6	41.6		12.3	57.9		12.4	24.1			7.7
Actuated g/C Ratio		0.46	0.46		0.14	0.64		0.14	0.27			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		452	1557		244	2290		477	419			237
v/s Ratio Prot			0.10		c0.09	0.11		c0.09	0.04			
v/s Ratio Perm		c0.31										c0.02
v/c Ratio		0.67	0.23		0.68	0.17		0.66	0.14			0.27
Uniform Delay, d1		18.9	14.5		37.0	6.4		36.8	25.1			38.5
Progression Factor		1.00	1.00		0.98	1.44		1.00	1.00			1.00
Incremental Delay, d2		7.8	0.3		5.7	0.2		2.5	0.2			0.6
Delay (s)		26.8	14.9		41.9	9.4		39.3	25.2			39.1
Level of Service		C	B		D	A		D	C			D
Approach Delay (s)			19.7			19.1			34.2			39.1
Approach LOS			B			B			C			D

Intersection Summary

HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	192
Future Volume (vph)	192
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	209
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	399	42	109	447	0	78	0	70	0	0	0
Future Volume (vph)	0	399	42	109	447	0	78	0	70	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.95			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3548		1805	3574			1794	1525			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3548		1805	3574			1430	1525			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	438	46	120	491	0	86	0	77	0	0	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	69	0	0	0
Lane Group Flow (vph)	0	479	0	120	491	0	0	86	8	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10						10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		60.3		9.4	73.2			8.8	8.8			
Effective Green, g (s)		60.3		8.9	73.2			8.8	8.8			
Actuated g/C Ratio		0.67		0.10	0.81			0.10	0.10			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2377		178	2906			139	149			
v/s Ratio Prot		c0.14		c0.07	0.14							
v/s Ratio Perm								c0.06	0.00			
v/c Ratio		0.20		0.67	0.17			0.62	0.05			
Uniform Delay, d1		5.7		39.2	1.8			39.0	36.8			
Progression Factor		0.94		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		7.7	0.1			5.7	0.1			
Delay (s)		5.5		46.8	1.9			44.6	36.9			
Level of Service		A		D	A			D	D			
Approach Delay (s)		5.5			10.8			41.0			0.0	
Approach LOS		A			B			D			A	

Intersection Summary

HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	399	42	109	447	0	78	0	70	0	0	0
Future Volume (veh/h)	0	399	42	109	447	0	78	0	70	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	438	46	120	491	0	86	0	77	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	2320	242	141	2959	0	200	0	126	0	158	0
Arrive On Green	0.00	0.47	0.47	0.08	0.83	0.00	0.08	0.00	0.08	0.00	0.00	0.00
Sat Flow, veh/h	0	3385	344	1810	3668	0	1440	0	1516	0	1900	0
Grp Volume(v), veh/h	0	239	245	120	491	0	86	0	77	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1828	1810	1787	0	1440	0	1516	0	1900	0
Q Serve(g_s), s	0.0	6.9	7.0	5.9	2.5	0.0	5.2	0.0	4.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.9	7.0	5.9	2.5	0.0	5.2	0.0	4.4	0.0	0.0	0.0
Prop In Lane	0.00		0.19	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1273	1289	141	2959	0	200	0	126	0	158	0
V/C Ratio(X)	0.00	0.19	0.19	0.85	0.17	0.00	0.43	0.00	0.61	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1273	1289	402	2959	0	464	0	404	0	507	0
HCM Platoon Ratio	1.00	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.97	0.97	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	8.8	8.8	41.0	1.5	0.0	40.2	0.0	39.8	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	5.3	0.1	0.0	0.5	0.0	1.8	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	3.6	3.1	1.2	0.0	2.1	0.0	1.9	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	9.1	9.2	46.2	1.7	0.0	40.8	0.0	41.6	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		D		D			
Approach Vol, veh/h		484			611			163			0	
Approach Delay, s/veh		9.1			10.4			41.2			0.0	
Approach LOS		A			B			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	11.0	67.5		11.5		78.5		11.5
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	20.5	34.0		24.0		58.0		24.0
Max Q Clear Time (g_c+I1), s	7.9	9.0		0.0		4.5		7.2
Green Ext Time (p_c), s	0.0	8.5		0.0		10.3		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	13.9
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	15.7
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	328	22	0	26	11	2	19	455
Future Vol, veh/h	0	328	22	0	26	11	2	19	455
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	353	24	0	28	12	2	20	489
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	12.3	9.9	18.7
HCM LOS	B	A	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	164	164	22	26	11	21	455
LT Vol	164	164	0	0	0	21	0
Through Vol	0	0	22	26	0	0	0
RT Vol	0	0	0	0	11	0	455
Lane Flow Rate	176	176	24	28	12	23	489
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.327	0.326	0.029	0.054	0.021	0.04	0.702
Departure Headway (Hd)	6.672	6.654	4.425	6.991	6.431	6.362	5.162
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	540	540	807	511	555	566	705
Service Time	4.412	4.395	2.164	4.752	4.192	4.062	2.862
HCM Lane V/C Ratio	0.326	0.326	0.03	0.055	0.022	0.041	0.694
HCM Control Delay	12.6	12.6	7.3	10.2	9.3	9.3	19.1
HCM Lane LOS	B	B	A	B	A	A	C
HCM 95th-tile Q	1.4	1.4	0.1	0.2	0.1	0.1	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	7	193	42	11	9	216	1335	7	5	1501	289
Future Volume (vph)	271	7	193	42	11	9	216	1335	7	5	1501	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1563		1715	1683		1787	3569		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1563		1715	1683		1787	3569		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	195	42	11	9	218	1348	7	5	1516	292
RTOR Reduction (vph)	0	161	0	0	9	0	0	0	0	0	0	128
Lane Group Flow (vph)	247	68	0	31	22	0	218	1355	0	5	1516	164
Confl. Bikes (#/hr)						3						3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.2	15.2		3.9	3.9		11.4	51.7		1.3	41.6	41.6
Effective Green, g (s)	15.4	15.4		4.1	4.1		11.1	52.6		1.0	42.5	42.5
Actuated g/C Ratio	0.17	0.17		0.05	0.05		0.12	0.59		0.01	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	293	270		78	77		222	2106		20	1704	753
v/s Ratio Prot	c0.15	0.04		c0.02	0.01		c0.12	0.38		0.00	c0.42	
v/s Ratio Perm												0.10
v/c Ratio	0.84	0.25		0.40	0.29		0.98	0.64		0.25	0.89	0.22
Uniform Delay, d1	35.7	31.9		41.3	41.1		38.9	12.1		43.7	21.2	13.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.7	0.6		4.5	2.9		55.0	0.8		6.5	6.5	0.3
Delay (s)	55.4	32.4		45.8	43.9		93.9	12.9		50.2	27.6	13.9
Level of Service	E	C		D	D		F	B		D	C	B
Approach Delay (s)		44.3			44.9			24.1			25.5	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	83.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	7	193	42	11	9	216	1335	7	5	1501	289
Future Volume (veh/h)	271	7	193	42	11	9	216	1335	7	5	1501	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1898	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	238	57	195	31	26	9	218	1348	7	5	1516	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	318	67	229	120	89	31	226	2065	11	10	1594	720
Arrive On Green	0.18	0.18	0.17	0.07	0.07	0.06	0.13	0.57	0.56	0.01	0.45	0.00
Sat Flow, veh/h	1792	378	1292	1810	1342	465	1792	3644	19	1810	3574	1615
Grp Volume(v), veh/h	238	0	252	31	0	35	218	661	694	5	1516	0
Grp Sat Flow(s),veh/h/ln	1792	0	1670	1810	0	1807	1792	1786	1877	1810	1787	1615
Q Serve(g_s), s	11.0	0.0	12.7	1.4	0.0	1.6	10.5	22.1	22.1	0.2	35.5	0.0
Cycle Q Clear(g_c), s	11.0	0.0	12.7	1.4	0.0	1.6	10.5	22.1	22.1	0.2	35.5	0.0
Prop In Lane	1.00		0.77	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	318	0	296	120	0	120	226	1012	1064	10	1594	720
V/C Ratio(X)	0.75	0.00	0.85	0.26	0.00	0.29	0.96	0.65	0.65	0.48	0.95	0.00
Avail Cap(c_a), veh/h	342	0	319	150	0	149	226	1012	1064	146	1610	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	34.8	38.6	0.0	38.7	37.8	13.0	13.0	43.1	23.2	0.0
Incr Delay (d2), s/veh	8.7	0.0	18.8	1.6	0.0	1.9	49.1	1.9	1.8	31.1	12.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	0.0	7.4	0.8	0.0	0.9	8.3	11.3	11.9	0.2	20.3	0.0
LnGrp Delay(d),s/veh	42.6	0.0	53.6	40.2	0.0	40.6	86.9	14.8	14.7	74.3	36.0	0.0
LnGrp LOS	D		D	D		D	F	B	B	E	D	
Approach Vol, veh/h		490			66			1573			1521	
Approach Delay, s/veh		48.3			40.4			24.8			36.1	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		19.4	15.0	42.8		9.8	4.5	53.3
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 16	11.3	38.3		7.0	7.3	42.3
Max Q Clear Time (g_c+I1), s		14.7	12.5	37.5		3.6	2.2	24.1
Green Ext Time (p_c), s		0.5	0.0	0.4		0.1	0.0	17.5

Intersection Summary	
HCM 2010 Ctrl Delay	32.9
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	10	29	23	11	34	41	1525	27	40	1821	557
Future Volume (vph)	390	10	29	23	11	34	41	1525	27	40	1821	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1667		1715	1771	1584	1805	3564		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1667		1715	1771	1584	1805	3564		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	30	24	11	35	42	1572	28	41	1877	574
RTOR Reduction (vph)	0	25	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	15	0	17	18	2	42	1599	0	41	1877	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.8	15.8		6.6	6.6	6.6	4.6	62.8		4.5	63.2	107.6
Effective Green, g (s)	16.4	16.4		6.8	6.8	6.8	4.3	63.7		4.7	64.1	107.6
Actuated g/C Ratio	0.15	0.15		0.06	0.06	0.06	0.04	0.59		0.04	0.60	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	523	254		108	111	100	72	2109		78	2129	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.45		0.02	c0.53	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.77	0.06		0.16	0.16	0.02	0.58	0.76		0.53	0.88	0.37
Uniform Delay, d1	43.8	39.0		47.7	47.7	47.3	50.8	16.3		50.4	18.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.5	0.2		1.2	1.2	0.2	11.5	1.9		6.3	5.0	0.7
Delay (s)	51.3	39.2		48.9	48.9	47.4	62.2	18.2		56.6	23.6	0.7
Level of Service	D	D		D	D	D	E	B		E	C	A
Approach Delay (s)		50.2			48.2			19.3			18.8	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	107.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	124	0	14	1	0	0	6	338	0	0	456	94
Future Vol, veh/h	124	0	14	1	0	0	6	338	0	0	456	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	141	0	16	1	0	0	7	384	0	0	518	107

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	778	970	313	657	1023	192	625	0	0	384	0	0
Stage 1	572	572	-	398	398	-	-	-	-	-	-	-
Stage 2	206	398	-	259	625	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	286	255	689	354	238	823	966	-	-	1186	-	-
Stage 1	472	508	-	605	606	-	-	-	-	-	-	-
Stage 2	777	606	-	729	480	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	284	253	689	343	236	823	966	-	-	1186	-	-
Mov Cap-2 Maneuver	284	253	-	343	236	-	-	-	-	-	-	-
Stage 1	468	508	-	600	601	-	-	-	-	-	-	-
Stage 2	770	601	-	712	480	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.1	15.5	0.2	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	966	-	-	302	343	1186	-	-
HCM Lane V/C Ratio	0.007	-	-	0.519	0.003	-	-	-
HCM Control Delay (s)	8.8	0	-	29.1	15.5	0	-	-
HCM Lane LOS	A	A	-	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.8	0	0	-	-

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	131	338	12	5	445	31	7	0	6	6	1	104
Future Vol, veh/h	131	338	12	5	445	31	7	0	6	6	1	104
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	142	367	13	5	484	34	8	0	7	7	1	113

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	521	0	0	388	0	0	924	1199	206	991	1188	267
Stage 1	-	-	-	-	-	-	667	667	-	515	515	-
Stage 2	-	-	-	-	-	-	257	532	-	476	673	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1048	-	-	1182	-	-	227	187	807	203	190	737
Stage 1	-	-	-	-	-	-	419	460	-	516	538	-
Stage 2	-	-	-	-	-	-	731	529	-	544	457	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1045	-	-	1174	-	-	169	159	796	178	162	732
Mov Cap-2 Maneuver	-	-	-	-	-	-	169	159	-	178	162	-
Stage 1	-	-	-	-	-	-	360	395	-	444	534	-
Stage 2	-	-	-	-	-	-	612	525	-	463	392	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0.1	19.3	12.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	266	1045	-	-	1174	-	-	610
HCM Lane V/C Ratio	0.053	0.136	-	-	0.005	-	-	0.198
HCM Control Delay (s)	19.3	9	-	-	8.1	-	-	12.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.5	-	-	0	-	-	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	796	122	32	773	128	20
Future Volume (vph)	796	122	32	773	128	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1785	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1785	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	847	130	34	822	136	21
RTOR Reduction (vph)	0	59	0	0	8	0
Lane Group Flow (vph)	847	71	34	822	149	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	30.9	30.9	1.2	36.3	9.6	
Effective Green, g (s)	30.9	30.9	1.2	36.3	9.6	
Actuated g/C Ratio	0.54	0.54	0.02	0.64	0.17	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1023	858	36	1202	301	
v/s Ratio Prot	c0.45		0.02	c0.44	c0.08	
v/s Ratio Perm		0.04				
v/c Ratio	0.83	0.08	0.94	0.68	0.49	
Uniform Delay, d1	10.7	6.2	27.8	6.6	21.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.8	0.1	125.7	1.7	0.5	
Delay (s)	16.5	6.2	153.5	8.3	21.9	
Level of Service	B	A	F	A	C	
Approach Delay (s)	15.2			14.0	21.9	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	56.8	Sum of lost time (s)	15.1
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	796	122	32	773	128	20
Future Volume (veh/h)	796	122	32	773	128	20
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900
Adj Flow Rate, veh/h	847	130	34	822	136	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	4	1	0	0
Cap, veh/h	1109	930	51	1305	199	0
Arrive On Green	0.59	0.59	0.03	0.69	0.11	0.00
Sat Flow, veh/h	1881	1579	1740	1881	1797	0
Grp Volume(v), veh/h	847	130	34	822	137	0
Grp Sat Flow(s),veh/h/ln	1881	1579	1740	1881	1810	0
Q Serve(g_s), s	18.8	2.1	1.1	13.3	4.1	0.0
Cycle Q Clear(g_c), s	18.8	2.1	1.1	13.3	4.1	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1109	930	51	1305	201	0
V/C Ratio(X)	0.76	0.14	0.67	0.63	0.68	0.00
Avail Cap(c_a), veh/h	1277	1071	125	1553	583	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.6	5.1	26.8	4.6	23.9	0.0
Incr Delay (d2), s/veh	2.6	0.1	5.4	0.7	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.4	0.9	0.6	6.9	2.1	0.0
LnGrp Delay(d),s/veh	11.2	5.2	32.2	5.4	25.4	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	977			856	137	
Approach Delay, s/veh	10.4			6.4	25.4	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.8	39.3				45.2		10.7
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	37.9				46.1		18.0
Max Q Clear Time (g_c+I1), s	3.1	20.8				15.3		6.1
Green Ext Time (p_c), s	0.0	12.1				18.2		0.1

Intersection Summary		
HCM 2010 Ctrl Delay		9.7
HCM 2010 LOS		A

Notes

Intersection
Int Delay, s/veh 4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	725	34	14	683	17	35	0	40	10	0	40
Future Vol, veh/h	58	725	34	14	683	17	35	0	40	10	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	62	771	36	15	727	18	37	0	43	11	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	745	0	0	771	0	0	1660	1669	771	1660	1660	736
Stage 1	-	-	-	-	-	-	895	895	-	765	765	-
Stage 2	-	-	-	-	-	-	765	774	-	895	895	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	872	-	-	853	-	-	78	97	403	78	98	422
Stage 1	-	-	-	-	-	-	338	362	-	399	415	-
Stage 2	-	-	-	-	-	-	399	411	-	338	362	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	872	-	-	853	-	-	65	89	403	65	89	422
Mov Cap-2 Maneuver	-	-	-	-	-	-	65	89	-	65	89	-
Stage 1	-	-	-	-	-	-	314	336	-	371	408	-
Stage 2	-	-	-	-	-	-	352	404	-	281	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	62.9	25.8
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	65	403	872	-	-	853	-	-	65	422
HCM Lane V/C Ratio	0.573	0.106	0.071	-	-	0.017	-	-	0.164	0.101
HCM Control Delay (s)	117.6	15	9.4	-	-	9.3	-	-	70.9	14.5
HCM Lane LOS	F	C	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	2.4	0.4	0.2	-	-	0.1	-	-	0.5	0.3

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	4	5	578	671	43
Future Vol, veh/h	42	4	5	578	671	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	44	4	5	608	706	45

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1325	706	706	0	-	0
Stage 1	706	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	174	439	902	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	541	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	173	439	902	-	-	-
Mov Cap-2 Maneuver	173	-	-	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	537	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.6	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	902	-	183	-	-
HCM Lane V/C Ratio	0.006	-	0.265	-	-
HCM Control Delay (s)	9	0	31.6	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	1	-	-

Intersection

Int Delay, s/veh 1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	37	408	41	28	415
Future Vol, veh/h	34	37	408	41	28	415
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	35	38	421	42	29	428

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	940	454	0	0	469	0
Stage 1	448	-	-	-	-	-
Stage 2	492	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	295	610	-	-	1103	-
Stage 1	648	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	282	604	-	-	1097	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	645	-	-	-	-	-
Stage 2	594	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.4	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	390	1097	-
HCM Lane V/C Ratio	-	-	0.188	0.026	-
HCM Control Delay (s)	-	-	16.4	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection

Int Delay, s/veh 2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	90	74	347	342	16
Future Vol, veh/h	10	90	74	347	342	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	96	79	369	364	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	912	386	375	0	-	0
Stage 1	375	-	-	-	-	-
Stage 2	537	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.218	-	-	-
Pot Cap-1 Maneuver	307	660	1183	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	590	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	281	648	1172	-	-	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	693	-	-	-	-	-
Stage 2	545	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1172	-	573	-	-
HCM Lane V/C Ratio	0.067	-	0.186	-	-
HCM Control Delay (s)	8.3	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.7	-	-

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	126	109	264	225	8
Future Vol, veh/h	20	126	109	264	225	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	140	121	293	250	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	804	268	266	0	-	0
Stage 1	261	-	-	-	-	-
Stage 2	543	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	355	776	1304	-	-	-
Stage 1	787	-	-	-	-	-
Stage 2	586	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	318	767	1296	-	-	-
Mov Cap-2 Maneuver	318	-	-	-	-	-
Stage 1	782	-	-	-	-	-
Stage 2	528	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	2.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1296	-	643	-	-
HCM Lane V/C Ratio	0.093	-	0.252	-	-
HCM Control Delay (s)	8.1	-	12.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1	-	-

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	110	0	3	0	0	0	175	105	4
Future Vol, veh/h	0	0	1	110	0	3	0	0	0	175	105	4
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0
Mvmt Flow	0	0	1	126	0	3	0	0	0	201	121	5
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.2	8.4	10.6
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	62%	0%	100%	0%
Vol Thru, %	37%	1%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	284	111	3	120
LT Vol	175	0	3	0
Through Vol	105	1	0	120
RT Vol	4	110	0	0
Lane Flow Rate	326	128	3	138
Geometry Grp	1	1	1	1
Degree of Util (X)	0.408	0.155	0.005	0.175
Departure Headway (Hd)	4.495	4.37	5.333	4.568
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	800	820	670	785
Service Time	2.521	2.399	3.375	2.599
HCM Lane V/C Ratio	0.407	0.156	0.004	0.176
HCM Control Delay	10.6	8.2	8.4	8.6
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2	0.5	0	0.6

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd
Background + Project Saturday.syn
12/01/2017

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	0	120	0
Future Vol, veh/h	0	0	120	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	138	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.6
HCM LOS	A

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Background + Project Saturday.syn

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	1108	571	92	990	809
Future Volume (vph)	0	1108	571	92	990	809
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1274	656	106	1138	930
RTOR Reduction (vph)	0	142	0	22	0	0
Lane Group Flow (vph)	0	1132	656	84	1138	930
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		33.2	28.8	28.8	33.2	71.8
Effective Green, g (s)		34.1	29.7	29.7	34.1	71.8
Actuated g/C Ratio		0.47	0.41	0.41	0.47	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1323	763	648	1614	1810
v/s Ratio Prot		c0.41	c0.36		0.33	0.51
v/s Ratio Perm				0.05		
v/c Ratio		0.86	0.86	0.13	0.71	0.51
Uniform Delay, d1		16.7	19.2	13.0	14.9	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		6.1	9.8	0.1	1.6	1.0
Delay (s)		22.7	28.9	13.2	16.5	1.0
Level of Service		C	C	B	B	A
Approach Delay (s)	22.7		26.7			9.6
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	826	248	381	961	10	106	3	250	9	17	41
Future Volume (vph)	7	826	248	381	961	10	106	3	250	9	17	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1564	3433	3530		1698	1708	1560		1733	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1564	3433	3530		1698	1708	1560		1733	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	1059	318	488	1232	13	136	4	321	12	22	53
RTOR Reduction (vph)	0	0	144	0	0	0	0	0	68	0	0	50
Lane Group Flow (vph)	9	1059	174	488	1245	0	71	69	253	0	34	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.7	29.3	29.3	9.7	38.3		5.0	5.0	14.7		2.2	2.2
Effective Green, g (s)	1.2	30.3	30.3	10.3	39.3		6.8	6.8	15.9		3.2	3.2
Actuated g/C Ratio	0.02	0.45	0.45	0.15	0.59		0.10	0.10	0.24		0.05	0.05
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	32	1610	711	530	2083		173	174	372		83	74
v/s Ratio Prot	0.00	c0.30		c0.14	0.35		0.04	0.04	c0.11		c0.02	
v/s Ratio Perm			0.11						0.06			0.00
v/c Ratio	0.28	0.66	0.24	0.92	0.60		0.41	0.40	0.68		0.41	0.03
Uniform Delay, d1	32.3	14.1	11.1	27.7	8.6		28.0	28.0	23.0		30.8	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.7	0.1	21.2	0.3		0.6	0.5	4.1		1.2	0.1
Delay (s)	34.0	14.9	11.2	48.9	9.0		28.6	28.5	27.1		32.0	30.3
Level of Service	C	B	B	D	A		C	C	C		C	C
Approach Delay (s)		14.1			20.2			27.5			31.0	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	16.1
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	826	248	381	961	10	106	3	250	9	17	41
Future Volume (veh/h)	7	826	248	381	961	10	106	3	250	9	17	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1763	1863
Adj Flow Rate, veh/h	9	1059	318	488	1232	13	139	0	321	12	22	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	30	1212	535	491	1675	18	823	0	552	35	64	90
Arrive On Green	0.02	0.34	0.34	0.14	0.47	0.45	0.23	0.00	0.21	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3585	38	3583	0	1545	611	1121	1575
Grp Volume(v), veh/h	9	1059	318	488	608	637	139	0	321	34	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1854	1792	0	1545	1733	0	1575
Q Serve(g_s), s	0.3	19.7	11.8	9.9	19.6	19.6	2.2	0.0	11.9	1.3	0.0	2.3
Cycle Q Clear(g_c), s	0.3	19.7	11.8	9.9	19.6	19.6	2.2	0.0	11.9	1.3	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.35		1.00
Lane Grp Cap(c), veh/h	30	1212	535	491	826	867	823	0	552	99	0	90
V/C Ratio(X)	0.31	0.87	0.59	0.99	0.74	0.74	0.17	0.00	0.58	0.34	0.00	0.59
Avail Cap(c_a), veh/h	116	1323	584	491	826	867	1727	0	942	99	0	90
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.1	21.6	19.0	30.0	15.2	15.2	21.6	0.0	18.4	31.8	0.0	32.3
Incr Delay (d2), s/veh	2.1	5.9	0.8	39.0	3.0	2.9	0.0	0.0	0.4	0.8	0.0	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.6	5.2	7.3	10.1	10.6	1.1	0.0	5.1	0.7	0.0	1.2
LnGrp Delay(d),s/veh	36.2	27.5	19.8	69.0	18.2	18.1	21.7	0.0	18.8	32.6	0.0	39.1
LnGrp LOS	D	C	B	E	B	B	C		B	C		D
Approach Vol, veh/h		1386			1733			460			87	
Approach Delay, s/veh		25.8			32.5			19.6			36.5	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	36.8		20.1	14.0	28.0		8.0
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 9.4	25.2		3.0
Max Q Clear Time (g_c+I1), s	2.3	21.6		13.9	11.9	21.7		4.3
Green Ext Time (p_c), s	0.0	4.9		0.3	0.0	1.3		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		28.4
HCM 2010 LOS		C

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	200	293	26	6	97	278	170	38	294	66	273	469
Future Volume (vph)	200	293	26	6	97	278	170	38	294	66	273	469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3494			1702	1827	1547	1752	1881	1590	3433	1773
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3494			583	1827	1547	1752	1881	1590	3433	1773
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	215	315	28	7	104	299	183	41	316	71	294	504
RTOR Reduction (vph)	0	8	0	0	0	0	137	0	0	49	0	5
Lane Group Flow (vph)	215	335	0	0	111	299	46	41	316	22	294	571
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	9.5	16.0			12.6	19.1	19.1	4.3	22.9	22.9	9.4	28.0
Effective Green, g (s)	9.2	16.2			12.3	19.3	19.3	4.0	23.8	23.8	9.1	28.9
Actuated g/C Ratio	0.12	0.21			0.16	0.25	0.25	0.05	0.31	0.31	0.12	0.37
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	202	731			92	455	385	90	578	488	403	662
v/s Ratio Prot	0.13	0.10				c0.16		0.02	0.17		c0.09	c0.32
v/s Ratio Perm					c0.19		0.03			0.01		
v/c Ratio	1.06	0.46			1.21	0.66	0.12	0.46	0.55	0.04	0.73	0.86
Uniform Delay, d1	34.1	26.8			32.6	26.1	22.5	35.6	22.3	18.8	33.0	22.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	81.4	0.5			159.5	3.6	0.2	3.6	1.2	0.0	6.5	11.5
Delay (s)	115.5	27.3			192.1	29.6	22.6	39.3	23.5	18.9	39.5	33.9
Level of Service	F	C			F	C	C	D	C	B	D	C
Approach Delay (s)		61.3				57.9			24.2			35.8
Approach LOS		E				E			C			D

Intersection Summary				
HCM 2000 Control Delay	44.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	77.4	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	75.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	61	399	77	106	326	152	69
Future Volume (vph)	61	399	77	106	326	152	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3413		1687	3438	3367	1495
Flt Permitted	0.98	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1817	3413		1687	3438	3367	1495
Peak-hour factor, PHF	0.92	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	66	438	85	116	358	167	76
RTOR Reduction (vph)	0	22	0	0	0	0	67
Lane Group Flow (vph)	66	501	0	116	358	167	9
Confl. Bikes (#/hr)			1				
Heavy Vehicles (%)	2%	3%	3%	7%	5%	4%	8%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.6	26.4		6.2	28.0	5.9	5.9
Effective Green, g (s)	4.1	26.4		5.7	28.0	5.9	5.9
Actuated g/C Ratio	0.08	0.53		0.11	0.56	0.12	0.12
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	148	1802		192	1925	397	176
v/s Ratio Prot		c0.15		c0.07	0.10	c0.05	
v/s Ratio Perm	0.04						0.01
v/c Ratio	0.45	0.28		0.60	0.19	0.42	0.05
Uniform Delay, d1	21.9	6.5		21.1	5.4	20.5	19.6
Progression Factor	1.00	1.00		1.41	0.76	1.00	1.00
Incremental Delay, d2	0.8	0.4		3.6	0.2	0.3	0.0
Delay (s)	22.6	6.9		33.3	4.3	20.7	19.6
Level of Service	C	A		C	A	C	B
Approach Delay (s)		8.7			11.4	20.4	
Approach LOS		A			B	C	

Intersection Summary

HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	381	87	53	405	0	27	0	29	0	0	0
Future Volume (vph)	0	381	87	53	405	0	27	0	29	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.97		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3397		1805	3471			1552	1367			
Flt Permitted		1.00		0.95	1.00			0.98	1.00			
Satd. Flow (perm)		3397		1805	3471			1594	1367			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	448	102	62	476	0	32	0	34	0	0	0
RTOR Reduction (vph)	0	23	0	0	0	0	0	0	31	0	0	0
Lane Group Flow (vph)	0	527	0	62	476	0	0	32	3	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		30.7		3.7	37.9			4.1	4.1			
Effective Green, g (s)		30.7		3.2	37.9			4.1	4.1			
Actuated g/C Ratio		0.61		0.06	0.76			0.08	0.08			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2085		115	2631			130	112			
v/s Ratio Prot		c0.16		c0.03	0.14							
v/s Ratio Perm								c0.02	0.00			
v/c Ratio		0.25		0.54	0.18			0.25	0.02			
Uniform Delay, d1		4.4		22.7	1.7			21.5	21.1			
Progression Factor		0.33		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.3		2.4	0.2			0.4	0.0			
Delay (s)		1.7		25.1	1.8			21.9	21.1			
Level of Service		A		C	A			C	C			
Approach Delay (s)		1.7			4.5			21.5			0.0	
Approach LOS		A			A			C			A	

Intersection Summary				
HCM 2000 Control Delay	4.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	30.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	381	87	53	405	0	27	0	29	0	0	0
Future Volume (veh/h)	0	381	87	53	405	0	27	0	29	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1900	1652	1652	1900	1900	1900
Adj Flow Rate, veh/h	0	448	102	62	476	0	32	0	34	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	0	15	0	0	0
Cap, veh/h	0	1923	435	65	2749	0	203	0	66	0	91	0
Arrive On Green	0.00	0.90	0.90	0.04	0.79	0.00	0.05	0.00	0.05	0.00	0.00	0.00
Sat Flow, veh/h	0	2938	643	1810	3563	0	1237	0	1383	0	1900	0
Grp Volume(v), veh/h	0	275	275	62	476	0	32	0	34	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1733	1810	1736	0	1237	0	1383	0	1900	0
Q Serve(g_s), s	0.0	1.0	1.0	1.7	1.7	0.0	1.3	0.0	1.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.0	1.0	1.7	1.7	0.0	1.3	0.0	1.2	0.0	0.0	0.0
Prop In Lane	0.00		0.37	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1186	1171	65	2749	0	203	0	66	0	91	0
V/C Ratio(X)	0.00	0.23	0.23	0.95	0.17	0.00	0.16	0.00	0.51	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1186	1171	181	2749	0	540	0	443	0	608	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.97	0.97	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.9	0.9	24.0	1.3	0.0	23.3	0.0	23.2	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.5	20.9	0.1	0.0	0.1	0.0	2.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.6	0.6	1.2	0.8	0.0	0.4	0.0	0.5	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	1.3	1.3	45.0	1.4	0.0	23.4	0.0	25.5	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		550			538			66			0	
Approach Delay, s/veh		1.3			6.4			24.5			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	5.8	37.8		6.4		43.6		6.4
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	5.5	17.0		16.0		26.0		16.0
Max Q Clear Time (g_c+I1), s	3.7	3.0		0.0		3.7		3.3
Green Ext Time (p_c), s	0.0	6.5		0.0		8.3		0.1

Intersection Summary		
HCM 2010 Ctrl Delay	5.0	
HCM 2010 LOS	A	

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	225	45	0	54	37	5	24	336
Future Vol, veh/h	0	225	45	0	54	37	5	24	336
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	256	51	0	61	42	5	27	382
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	10.6	9.6	13.3
HCM LOS	B	A	B

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	113	113	45	54	37	29	336
LT Vol	113	113	0	0	0	29	0
Through Vol	0	0	45	54	0	0	0
RT Vol	0	0	0	0	37	0	336
Lane Flow Rate	128	128	51	61	42	33	382
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.234	0.231	0.061	0.11	0.067	0.057	0.54
Departure Headway (Hd)	6.579	6.493	4.267	6.473	5.76	6.323	5.087
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	546	554	838	554	621	570	714
Service Time	4.314	4.228	2.001	4.218	3.505	4.023	2.787
HCM Lane V/C Ratio	0.234	0.231	0.061	0.11	0.068	0.058	0.535
HCM Control Delay	11.3	11.2	7.3	10	8.9	9.4	13.6
HCM Lane LOS	B	B	A	A	A	A	B
HCM 95th-tile Q	0.9	0.9	0.2	0.4	0.2	0.2	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	50	111	151	43	63	140	1246	48	18	1523	113
Future Volume (vph)	144	50	111	151	43	63	140	1246	48	18	1523	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.95		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1506		1665	1649		1770	3471		1805	3471	1568
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1506		1665	1649		1770	3471		1805	3471	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	54	121	164	47	68	152	1354	52	20	1655	123
RTOR Reduction (vph)	0	73	0	0	40	0	0	3	0	0	0	56
Lane Group Flow (vph)	141	118	0	143	96	0	152	1403	0	20	1655	67
Confl. Peds. (#/hr)			46	46					46			
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	12.7	12.7		7.8	7.8		8.3	48.0		2.8	42.5	42.5
Effective Green, g (s)	12.9	12.9		8.0	8.0		8.0	48.9		2.5	43.4	43.4
Actuated g/C Ratio	0.15	0.15		0.09	0.09		0.09	0.55		0.03	0.49	0.49
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	243	220		150	149		160	1922		51	1706	770
v/s Ratio Prot	c0.08	0.08		c0.09	0.06		c0.09	0.40		0.01	c0.48	
v/s Ratio Perm												0.04
v/c Ratio	0.58	0.54		0.95	0.64		0.95	0.73		0.39	0.97	0.09
Uniform Delay, d1	35.2	34.9		40.0	38.8		40.0	14.8		42.2	21.8	11.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	2.8		59.5	10.2		55.6	1.7		4.9	15.4	0.1
Delay (s)	38.9	37.8		99.4	49.0		95.6	16.4		47.1	37.2	12.0
Level of Service	D	D		F	D		F	B		D	D	B
Approach Delay (s)		38.3			74.8			24.1			35.6	
Approach LOS		D			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	50	111	151	43	63	140	1246	48	18	1523	113
Future Volume (veh/h)	144	50	111	151	43	63	140	1246	48	18	1523	113
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.85	1.00		0.96	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845
Adj Flow Rate, veh/h	157	54	121	140	81	68	152	1354	52	20	1655	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3
Cap, veh/h	283	77	173	162	80	67	163	1842	71	50	1635	739
Arrive On Green	0.16	0.16	0.16	0.09	0.09	0.09	0.09	0.54	0.53	0.03	0.47	0.00
Sat Flow, veh/h	1757	479	1073	1757	873	733	1774	3439	132	1810	3471	1568
Grp Volume(v), veh/h	157	0	175	140	0	149	152	690	716	20	1655	0
Grp Sat Flow(s),veh/h/ln	1757	0	1552	1757	0	1605	1774	1754	1816	1810	1736	1568
Q Serve(g_s), s	7.2	0.0	9.3	6.8	0.0	8.0	7.4	26.2	26.3	0.9	41.0	0.0
Cycle Q Clear(g_c), s	7.2	0.0	9.3	6.8	0.0	8.0	7.4	26.2	26.3	0.9	41.0	0.0
Prop In Lane	1.00		0.69	1.00		0.46	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	283	0	250	162	0	148	163	940	973	50	1635	739
V/C Ratio(X)	0.55	0.00	0.70	0.87	0.00	1.01	0.93	0.73	0.74	0.40	1.01	0.00
Avail Cap(c_a), veh/h	343	0	303	162	0	148	163	940	973	146	1635	739
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.6	0.0	34.6	39.0	0.0	39.6	39.2	15.5	15.5	41.6	23.0	0.0
Incr Delay (d2), s/veh	2.0	0.0	6.0	36.7	0.0	76.7	50.8	3.4	3.4	5.2	25.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.4	5.0	0.0	6.7	5.9	13.5	14.0	0.5	25.3	0.0
LnGrp Delay(d),s/veh	35.7	0.0	40.6	75.7	0.0	116.3	90.0	18.9	18.9	46.8	48.2	0.0
LnGrp LOS	D		D	E		F	F	B	B	D	F	
Approach Vol, veh/h		332			289			1558			1675	
Approach Delay, s/veh		38.3			96.6			25.8			48.2	
Approach LOS		D			F			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.0	12.0	45.0		12.0	6.4	50.6
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 17	8.3	40.1		7.8	7.3	41.1
Max Q Clear Time (g_c+I1), s		11.3	9.4	43.0		10.0	2.9	28.3
Green Ext Time (p_c), s		0.9	0.0	0.0		0.0	0.0	12.5

Intersection Summary		
HCM 2010 Ctrl Delay		41.9
HCM 2010 LOS		D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	382	4	25	34	14	44	37	1396	16	71	1781	774
Future Volume (vph)	382	4	25	34	14	44	37	1396	16	71	1781	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1588	1752	3533		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1588	1752	3533		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	27	37	15	48	41	1534	18	78	1957	851
RTOR Reduction (vph)	0	23	0	0	0	45	0	0	0	0	0	0
Lane Group Flow (vph)	420	8	0	26	26	3	41	1552	0	78	1957	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.3	16.3		7.2	7.2	7.2	6.3	71.4		7.2	72.8	120.0
Effective Green, g (s)	16.9	16.9		7.4	7.4	7.4	6.0	72.3		7.4	73.7	120.0
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.05	0.60		0.06	0.61	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	483	215		105	104	97	87	2128		101	2131	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.44		c0.05	c0.56	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.87	0.04		0.25	0.25	0.03	0.47	0.73		0.77	0.92	0.54
Uniform Delay, d1	50.5	44.5		53.6	53.7	52.9	55.5	16.9		55.5	20.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.2	0.1		2.1	2.2	0.2	4.0	1.6		29.9	7.2	1.3
Delay (s)	66.7	44.6		55.8	55.8	53.1	59.4	18.5		85.3	27.7	1.3
Level of Service	E	D		E	E	D	E	B		F	C	A
Approach Delay (s)		65.2			54.5			19.5			21.5	
Approach LOS		E			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	83.2%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕↔			↕↔	
Traffic Vol, veh/h	20	0	10	0	0	0	7	247	2	8	368	74
Future Vol, veh/h	20	0	10	0	0	0	7	247	2	8	368	74
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	23	0	11	0	0	0	8	284	2	9	423	85

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	648	792	260	537	833	149	511	0	0	289	0	0
Stage 1	487	487	-	304	304	-	-	-	-	-	-	-
Stage 2	161	305	-	233	529	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	340	324	674	431	307	877	1065	-	-	1284	-	-
Stage 1	510	554	-	686	667	-	-	-	-	-	-	-
Stage 2	802	666	-	755	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	333	316	671	415	300	873	1062	-	-	1281	-	-
Mov Cap-2 Maneuver	333	316	-	415	300	-	-	-	-	-	-	-
Stage 1	504	547	-	678	659	-	-	-	-	-	-	-
Stage 2	793	658	-	733	523	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	0	0.2	0.1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1062	-	-	400	-	1281	-	-
HCM Lane V/C Ratio	0.008	-	-	0.086	-	0.007	-	-
HCM Control Delay (s)	8.4	0	-	14.8	0	7.8	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	-	0	-	-

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↔			↔	
Traffic Vol, veh/h	124	265	17	3	376	11	18	2	4	1	2	64
Future Vol, veh/h	124	265	17	3	376	11	18	2	4	1	2	64
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	143	305	20	3	432	13	21	2	5	1	2	74

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	445	0	0	324	0	0	823	1051	162	884	1054	222
Stage 1	-	-	-	-	-	-	599	599	-	445	445	-
Stage 2	-	-	-	-	-	-	224	452	-	439	609	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1091	-	-	1247	-	-	269	229	861	243	228	758
Stage 1	-	-	-	-	-	-	460	494	-	567	578	-
Stage 2	-	-	-	-	-	-	764	574	-	572	488	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1091	-	-	1247	-	-	216	199	861	215	198	758
Mov Cap-2 Maneuver	-	-	-	-	-	-	216	199	-	215	198	-
Stage 1	-	-	-	-	-	-	400	429	-	493	577	-
Stage 2	-	-	-	-	-	-	685	573	-	492	424	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.7	0.1	21.6	11
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	245	1091	-	-	1247	-	-	676
HCM Lane V/C Ratio	0.113	0.131	-	-	0.003	-	-	0.114
HCM Control Delay (s)	21.6	8.8	-	-	7.9	-	-	11
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0.4	-	-	0	-	-	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	665	116	23	922	79	20
Future Volume (vph)	665	116	23	922	79	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1756	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1756	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	700	122	24	971	83	21
RTOR Reduction (vph)	0	52	0	0	15	0
Lane Group Flow (vph)	700	70	24	971	89	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	31.9	31.9	0.7	36.8	7.7	
Effective Green, g (s)	31.9	31.9	0.7	36.8	7.7	
Actuated g/C Ratio	0.58	0.58	0.01	0.66	0.14	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1062	894	22	1249	244	
v/s Ratio Prot	0.38		0.01	c0.52	c0.05	
v/s Ratio Perm		0.05				
v/c Ratio	0.66	0.08	1.09	0.78	0.36	
Uniform Delay, d1	8.0	5.2	27.3	6.5	21.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.0	221.9	3.2	0.3	
Delay (s)	9.6	5.3	249.3	9.7	22.0	
Level of Service	A	A	F	A	C	
Approach Delay (s)	9.0			15.5	22.0	
Approach LOS	A			B	C	

Intersection Summary				
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	55.4	Sum of lost time (s)	15.1	
Intersection Capacity Utilization	63.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	665	116	23	922	79	20
Future Volume (veh/h)	665	116	23	922	79	20
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1877	1900
Adj Flow Rate, veh/h	700	122	24	971	83	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	4	0	1	0	0
Cap, veh/h	1043	878	41	1260	207	0
Arrive On Green	0.57	0.57	0.02	0.67	0.12	0.00
Sat Flow, veh/h	1845	1553	1810	1881	1768	0
Grp Volume(v), veh/h	700	122	24	971	84	0
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1789	0
Q Serve(g_s), s	13.6	1.9	0.7	18.0	2.2	0.0
Cycle Q Clear(g_c), s	13.6	1.9	0.7	18.0	2.2	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1043	878	41	1260	210	0
V/C Ratio(X)	0.67	0.14	0.59	0.77	0.40	0.00
Avail Cap(c_a), veh/h	1185	997	141	1510	629	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.8	5.2	24.8	5.8	20.9	0.0
Incr Delay (d2), s/veh	1.4	0.1	4.9	2.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	0.8	0.4	10.0	1.1	0.0
LnGrp Delay(d),s/veh	9.2	5.3	29.7	8.0	21.4	0.0
LnGrp LOS	A	A	C	A	C	
Approach Vol, veh/h	822			995	84	
Approach Delay, s/veh	8.6			8.5	21.4	
Approach LOS	A			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.4	35.4				40.7		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	32.9				41.1		18.0
Max Q Clear Time (g_c+I1), s	2.7	15.6				20.0		4.2
Green Ext Time (p_c), s	0.0	12.3				14.3		0.1

Intersection Summary		
HCM 2010 Ctrl Delay	9.1	
HCM 2010 LOS	A	

Notes

Intersection

Int Delay, s/veh 2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	565	28	29	921	8	11	1	13	14	0	47
Future Vol, veh/h	27	565	28	29	921	8	11	1	13	14	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	30	621	31	32	1012	9	12	1	14	15	0	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1021	0	0	621	0	0	1760	1765	621	1761	1760	1016
Stage 1	-	-	-	-	-	-	680	680	-	1080	1080	-
Stage 2	-	-	-	-	-	-	1080	1085	-	681	680	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	7.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.9	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	688	-	-	955	-	-	67	49	491	67	85	291
Stage 1	-	-	-	-	-	-	444	330	-	267	297	-
Stage 2	-	-	-	-	-	-	267	198	-	444	454	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	688	-	-	955	-	-	52	45	491	60	79	291
Mov Cap-2 Maneuver	-	-	-	-	-	-	52	45	-	60	79	-
Stage 1	-	-	-	-	-	-	425	316	-	255	287	-
Stage 2	-	-	-	-	-	-	212	191	-	411	434	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	53.9	34.8
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	51	491	688	-	-	955	-	-	60	291
HCM Lane V/C Ratio	0.259	0.029	0.043	-	-	0.033	-	-	0.256	0.177
HCM Control Delay (s)	98.6	12.6	10.5	-	-	8.9	-	-	84.5	20
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.9	0.1	0.1	-	-	0.1	-	-	0.9	0.6

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	0	1	361	548	39
Future Vol, veh/h	37	0	1	361	548	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	42	0	1	406	616	44

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1024	616	616	0	-	0
Stage 1	616	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Critical Hdwy	6.43	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	260	494	974	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	669	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	260	494	974	-	-	-
Mov Cap-2 Maneuver	260	-	-	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	668	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	974	-	260	-	-
HCM Lane V/C Ratio	0.001	-	0.16	-	-
HCM Control Delay (s)	8.7	0	21.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection

Int Delay, s/veh 2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	93	326	20	22	417
Future Vol, veh/h	14	93	326	20	22	417
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	18	122	429	26	29	549

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1063	456	0	0	462	0
Stage 1	449	-	-	-	-	-
Stage 2	614	-	-	-	-	-
Critical Hdwy	6.4	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	249	606	-	-	1110	-
Stage 1	647	-	-	-	-	-
Stage 2	544	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	237	599	-	-	1104	-
Mov Cap-2 Maneuver	237	-	-	-	-	-
Stage 1	643	-	-	-	-	-
Stage 2	520	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	499	1104	-
HCM Lane V/C Ratio	-	-	0.282	0.026	-
HCM Control Delay (s)	-	-	15	8.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	155	173	239	264	21
Future Vol, veh/h	17	155	173	239	264	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	209	234	323	357	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1156	365	361	0	-	0
Stage 1	361	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	219	678	1187	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	448	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	175	673	1183	-	-	-
Mov Cap-2 Maneuver	175	-	-	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	358	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.2	3.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1183	-	525	-	-
HCM Lane V/C Ratio	0.198	-	0.443	-	-
HCM Control Delay (s)	8.8	-	17.2	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.7	-	2.2	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	115	125	125	169	92
Future Vol, veh/h	28	115	125	125	169	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	137	149	149	201	110

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	713	270	318	0	-	0
Stage 1	263	-	-	-	-	-
Stage 2	450	-	-	-	-	-
Critical Hdwy	6.44	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	395	769	1242	-	-	-
Stage 1	776	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	343	760	1235	-	-	-
Mov Cap-2 Maneuver	343	-	-	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	558	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	4.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1235	-	614	-	-
HCM Lane V/C Ratio	0.12	-	0.277	-	-
HCM Control Delay (s)	8.3	-	13.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	1	0	67	0	4	0	0	0	66	89	1
Future Vol, veh/h	0	1	0	67	0	4	0	0	0	66	89	1
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0
Mvmt Flow	0	1	0	86	0	5	0	0	0	85	114	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	8.3	9.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	42%	1%	100%	0%
Vol Thru, %	57%	0%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	156	68	4	194
LT Vol	66	1	4	0
Through Vol	89	0	0	194
RT Vol	1	67	0	0
Lane Flow Rate	200	87	5	249
Geometry Grp	1	1	1	1
Degree of Util (X)	0.258	0.105	0.007	0.299
Departure Headway (Hd)	4.649	4.328	5.229	4.329
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	774	828	684	831
Service Time	2.669	2.353	3.261	2.347
HCM Lane V/C Ratio	0.258	0.105	0.007	0.3
HCM Control Delay	9.3	7.9	8.3	9.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.4	0	1.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	194	0
Future Vol, veh/h	0	0	194	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	249	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.2
HCM LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱↱	↑	↱	↰↰	↑
Traffic Volume (vph)	0	960	911	132	1021	716
Future Volume (vph)	0	960	911	132	1021	716
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2814	1845	1538	3433	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2814	1845	1538	3433	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	990	939	136	1053	738
RTOR Reduction (vph)	0	138	0	7	0	0
Lane Group Flow (vph)	0	852	939	129	1053	738
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		26.2	42.0	42.0	26.2	78.0
Effective Green, g (s)		27.1	42.9	42.9	27.1	78.0
Actuated g/C Ratio		0.35	0.55	0.55	0.35	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		977	1014	845	1192	1881
v/s Ratio Prot		0.30	c0.51		c0.31	0.39
v/s Ratio Perm				0.08		
v/c Ratio		0.87	0.93	0.15	0.88	0.39
Uniform Delay, d1		23.8	16.1	8.6	24.0	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		9.2	13.9	0.1	8.4	0.6
Delay (s)		33.0	30.0	8.7	32.4	0.6
Level of Service		C	C	A	C	A
Approach Delay (s)	33.0		27.3			19.3
Approach LOS	C		C			B

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	883	245	404	688	5	264	21	565	6	8	7
Future Volume (vph)	26	883	245	404	688	5	264	21	565	6	8	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1731	1590		1733	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1731	1590		1733	1580
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	960	266	439	748	5	287	23	614	7	9	8
RTOR Reduction (vph)	0	0	142	0	0	0	0	0	74	0	0	8
Lane Group Flow (vph)	28	960	124	439	753	0	155	155	540	0	16	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.8	26.0	26.0	11.2	35.4		9.1	9.1	20.3		1.0	1.0
Effective Green, g (s)	2.3	27.0	27.0	11.8	36.4		10.9	10.9	21.5		2.0	2.0
Actuated g/C Ratio	0.03	0.40	0.40	0.17	0.54		0.16	0.16	0.32		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	61	1411	644	604	1919		276	278	504		51	46
v/s Ratio Prot	0.02	c0.27		0.13	0.21		0.09	0.09	c0.19		c0.01	
v/s Ratio Perm			0.08						0.15			0.00
v/c Ratio	0.46	0.68	0.19	0.73	0.39		0.56	0.56	1.07		0.31	0.01
Uniform Delay, d1	32.1	16.8	13.2	26.4	9.2		26.2	26.2	23.1		32.2	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	1.1	0.1	3.7	0.0		1.6	1.4	60.3		1.3	0.0
Delay (s)	34.1	17.9	13.3	30.1	9.2		27.8	27.6	83.4		33.5	31.9
Level of Service	C	B	B	C	A		C	C	F		C	C
Approach Delay (s)		17.3			16.9			64.7			32.9	
Approach LOS		B			B			E			C	

Intersection Summary				
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	67.7	Sum of lost time (s)	16.1	
Intersection Capacity Utilization	72.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	883	245	404	688	5	264	21	565	6	8	7
Future Volume (veh/h)	26	883	245	404	688	5	264	21	565	6	8	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1900	1881	1900	1771	1900
Adj Flow Rate, veh/h	28	960	266	439	748	5	303	0	614	7	9	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	52	1004	457	477	1423	10	1327	0	783	20	26	43
Arrive On Green	0.03	0.28	0.28	0.14	0.39	0.38	0.37	0.00	0.35	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3640	24	3619	0	1598	758	975	1587
Grp Volume(v), veh/h	28	960	266	439	367	386	303	0	614	16	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1877	1810	0	1598	1733	0	1587
Q Serve(g_s), s	1.3	22.9	12.2	10.7	13.6	13.6	5.0	0.0	27.4	0.8	0.0	0.4
Cycle Q Clear(g_c), s	1.3	22.9	12.2	10.7	13.6	13.6	5.0	0.0	27.4	0.8	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.44		1.00
Lane Grp Cap(c), veh/h	52	1004	457	477	699	734	1327	0	783	47	0	43
V/C Ratio(X)	0.54	0.96	0.58	0.92	0.53	0.53	0.23	0.00	0.78	0.34	0.00	0.19
Avail Cap(c_a), veh/h	118	1004	457	477	699	734	1421	0	824	81	0	74
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.2	30.3	26.4	36.7	20.1	20.1	18.8	0.0	18.2	41.1	0.0	41.0
Incr Delay (d2), s/veh	3.3	18.6	1.2	22.9	0.4	0.3	0.0	0.0	4.3	1.6	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	13.8	5.6	6.6	6.7	7.0	2.5	0.0	12.8	0.4	0.0	0.2
LnGrp Delay(d),s/veh	44.5	48.9	27.7	59.6	20.4	20.4	18.9	0.0	22.4	42.7	0.0	41.7
LnGrp LOS	D	D	C	E	C	C	B		C	D		D
Approach Vol, veh/h		1254			1192			917			24	
Approach Delay, s/veh		44.3			34.9			21.3			42.4	
Approach LOS		D			C			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	37.6		35.5	15.8	28.4		6.3
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 11	23.4		3.0
Max Q Clear Time (g_c+I1), s	3.3	15.6		29.4	12.7	24.9		2.8
Green Ext Time (p_c), s	0.0	4.4		0.3	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay	34.7	
HCM 2010 LOS	C	

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	115	347	70	12	149	381	304	78	625	187	216	439
Future Volume (vph)	115	347	70	12	149	381	304	78	625	187	216	439
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3460			1742	1863	1560	1805	1827	1555	3502	1845
Flt Permitted	0.95	1.00			0.40	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3460			733	1863	1560	1805	1827	1555	3502	1845
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	119	358	72	12	154	393	313	80	644	193	223	453
RTOR Reduction (vph)	0	20	0	0	0	0	198	0	0	130	0	5
Lane Group Flow (vph)	119	410	0	0	166	393	115	80	644	63	223	511
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.3	22.2			10.3	24.2	24.2	6.3	27.0	27.0	9.3	30.0
Effective Green, g (s)	8.0	22.4			10.0	24.4	24.4	6.0	27.9	27.9	9.0	30.9
Actuated g/C Ratio	0.09	0.26			0.12	0.29	0.29	0.07	0.33	0.33	0.11	0.36
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	164	908			85	532	446	126	597	508	369	668
v/s Ratio Prot	0.07	0.12				c0.21		0.04	c0.35		c0.06	c0.28
v/s Ratio Perm					c0.23		0.07			0.04		
v/c Ratio	0.73	0.45			1.95	0.74	0.26	0.63	1.08	0.12	0.60	0.76
Uniform Delay, d1	37.6	26.3			37.6	27.6	23.5	38.6	28.7	20.1	36.4	24.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.7	0.4			468.5	5.5	0.4	10.0	59.9	0.1	2.8	5.4
Delay (s)	52.3	26.7			506.2	33.1	23.8	48.6	88.6	20.3	39.2	29.4
Level of Service	D	C			F	C	C	D	F	C	D	C
Approach Delay (s)		32.3				119.8			70.7			32.3
Approach LOS		C				F			E			C

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	68.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	85.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative PM.syn
12/01/2017

Synchro 9 Report
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Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	71	432	113	143	456	315	157
Future Volume (vph)	71	432	113	143	456	315	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3432		1770	3574	3467	1552
Flt Permitted	0.91	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1727	3432		1770	3574	3467	1552
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	76	465	122	154	490	339	169
RTOR Reduction (vph)	0	38	0	0	0	0	138
Lane Group Flow (vph)	76	549	0	154	490	339	31
Confl. Peds. (#/hr)			3	5		3	5
Heavy Vehicles (%)	0%	2%	0%	2%	1%	1%	2%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.9	22.2		7.1	24.4	9.2	9.2
Effective Green, g (s)	4.4	22.2		6.6	24.4	9.2	9.2
Actuated g/C Ratio	0.09	0.44		0.13	0.49	0.18	0.18
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	151	1523		233	1744	637	285
v/s Ratio Prot		c0.16		c0.09	0.14	c0.10	
v/s Ratio Perm	0.04						0.02
v/c Ratio	0.50	0.36		0.66	0.28	0.53	0.11
Uniform Delay, d1	21.8	9.2		20.6	7.6	18.5	17.0
Progression Factor	1.00	1.00		1.32	0.75	1.00	1.00
Incremental Delay, d2	1.0	0.7		5.3	0.4	0.4	0.1
Delay (s)	22.7	9.9		32.4	6.1	18.9	17.0
Level of Service	C	A		C	A	B	B
Approach Delay (s)		11.3			12.4	18.3	
Approach LOS		B			B	B	

Intersection Summary				
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	42.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	531	58	109	496	0	103	0	98	0	0	0
Future Volume (vph)	0	531	58	109	496	0	103	0	98	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.98			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3476		1752	3574			1749	1546			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3476		1752	3574			1394	1546			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	597	65	122	557	0	116	0	110	0	0	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	93	0	0	0
Lane Group Flow (vph)	0	650	0	122	557	0	0	116	17	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6		6	2		2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		24.7		6.2	34.4			7.6	7.6			
Effective Green, g (s)		24.7		5.7	34.4			7.6	7.6			
Actuated g/C Ratio		0.49		0.11	0.69			0.15	0.15			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		1717		199	2458			211	234			
v/s Ratio Prot		c0.19		c0.07	0.16							
v/s Ratio Perm								c0.08	0.01			
v/c Ratio		0.38		0.61	0.23			0.55	0.07			
Uniform Delay, d1		7.9		21.1	2.9			19.6	18.2			
Progression Factor		0.44		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.6		3.9	0.2			1.6	0.0			
Delay (s)		4.1		25.0	3.1			21.2	18.2			
Level of Service		A		C	A			C	B			
Approach Delay (s)		4.1			7.0			19.7			0.0	
Approach LOS		A			A			B			A	

Intersection Summary				
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	42.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	531	58	109	496	0	103	0	98	0	0	0
Future Volume (veh/h)	0	531	58	109	496	0	103	0	98	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	597	65	122	557	0	116	0	110	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	1799	196	139	2566	0	315	0	190	0	232	0
Arrive On Green	0.00	1.00	1.00	0.08	0.72	0.00	0.12	0.00	0.12	0.00	0.00	0.00
Sat Flow, veh/h	0	3312	350	1757	3668	0	1405	0	1560	0	1900	0
Grp Volume(v), veh/h	0	328	334	122	557	0	116	0	110	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1799	1757	1787	0	1405	0	1560	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	3.4	2.6	0.0	4.0	0.0	3.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.4	2.6	0.0	4.0	0.0	3.3	0.0	0.0	0.0
Prop In Lane	0.00		0.19	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	989	1006	139	2566	0	315	0	190	0	232	0
V/C Ratio(X)	0.00	0.33	0.33	0.88	0.22	0.00	0.37	0.00	0.58	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	989	1006	211	2566	0	594	0	499	0	608	0
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.94	0.94	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	22.8	2.4	0.0	21.0	0.0	20.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.8	16.5	0.2	0.0	0.3	0.0	1.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	2.3	1.3	0.0	1.5	0.0	1.5	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.8	0.8	39.3	2.6	0.0	21.3	0.0	21.8	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		662			679			226			0	
Approach Delay, s/veh		0.8			9.1			21.5			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	7.9	32.0		10.1		39.9		10.1
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	6.5	16.0		16.0		26.0		16.0
Max Q Clear Time (g_c+I1), s	5.4	2.0		0.0		4.6		6.0
Green Ext Time (p_c), s	0.0	7.6		0.0		9.8		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	7.4
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	18.1
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	422	70	0	51	31	6	51	422
Future Vol, veh/h	0	422	70	0	51	31	6	51	422
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2	0	0	0	0	2
Mvmt Flow	0	474	79	0	57	35	7	57	474
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	14.7	10.9	22.9
HCM LOS	B	B	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	211	211	70	51	31	57	422
LT Vol	211	211	0	0	0	57	0
Through Vol	0	0	70	51	0	0	0
RT Vol	0	0	0	0	31	0	422
Lane Flow Rate	237	237	79	57	35	64	474
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.464	0.462	0.104	0.121	0.066	0.124	0.759
Departure Headway (Hd)	7.049	7.014	4.778	7.577	6.856	6.967	5.764
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	510	512	746	470	519	513	626
Service Time	4.81	4.775	2.538	5.368	4.647	4.73	3.527
HCM Lane V/C Ratio	0.465	0.463	0.106	0.121	0.067	0.125	0.757
HCM Control Delay	15.8	15.7	8.1	11.4	10.1	10.7	24.5
HCM Lane LOS	C	C	A	B	B	B	C
HCM 95th-tile Q	2.4	2.4	0.3	0.4	0.2	0.4	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	0	176	62	20	26	180	1635	4	17	1521	205
Future Volume (vph)	219	0	176	62	20	26	180	1635	4	17	1521	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1457		1715	1662		1805	3573		1805	3574	1583
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1457		1715	1662		1805	3573		1805	3574	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	0	181	64	21	27	186	1686	4	18	1568	211
RTOR Reduction (vph)	0	152	0	0	25	0	0	0	0	0	0	90
Lane Group Flow (vph)	203	52	0	57	30	0	186	1690	0	18	1568	121
Confl. Peds. (#/hr)			7	7			7		7			
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	14.2	14.2		5.4	5.4		10.4	49.9		2.7	42.2	42.2
Effective Green, g (s)	14.4	14.4		5.6	5.6		10.1	50.8		2.4	43.1	43.1
Actuated g/C Ratio	0.16	0.16		0.06	0.06		0.11	0.57		0.03	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	274	235		107	104		204	2034		48	1726	764
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.10	0.47		0.01	c0.44	
v/s Ratio Perm												0.08
v/c Ratio	0.74	0.22		0.53	0.29		0.91	0.83		0.38	0.91	0.16
Uniform Delay, d1	35.6	32.5		40.5	39.9		39.1	15.7		42.7	21.2	12.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.6	0.6		6.4	2.1		39.2	3.3		4.9	7.7	0.2
Delay (s)	46.2	33.1		46.9	42.0		78.4	19.0		47.5	28.9	13.1
Level of Service	D	C		D	D		E	B		D	C	B
Approach Delay (s)		39.6			44.5			24.9			27.2	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	83.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	0	176	62	20	26	180	1635	4	17	1521	205
Future Volume (veh/h)	219	0	176	62	20	26	180	1635	4	17	1521	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1817	1900	1900	1900	1900	1900	1881	1900	1900	1881	1863
Adj Flow Rate, veh/h	204	31	181	56	32	27	186	1686	4	18	1568	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	1	0	1	2
Cap, veh/h	296	38	220	140	73	62	207	2009	5	45	1643	728
Arrive On Green	0.17	0.17	0.16	0.08	0.08	0.08	0.11	0.55	0.54	0.02	0.46	0.00
Sat Flow, veh/h	1792	228	1333	1810	941	794	1810	3658	9	1810	3574	1583
Grp Volume(v), veh/h	204	0	212	56	0	59	186	823	867	18	1568	0
Grp Sat Flow(s),veh/h/ln	1792	0	1562	1810	0	1735	1810	1787	1880	1810	1787	1583
Q Serve(g_s), s	9.4	0.0	11.5	2.6	0.0	2.8	8.9	33.6	33.7	0.9	36.9	0.0
Cycle Q Clear(g_c), s	9.4	0.0	11.5	2.6	0.0	2.8	8.9	33.6	33.7	0.9	36.9	0.0
Prop In Lane	1.00		0.85	1.00		0.46	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	296	0	258	140	0	134	207	982	1033	45	1643	728
V/C Ratio(X)	0.69	0.00	0.82	0.40	0.00	0.44	0.90	0.84	0.84	0.40	0.95	0.00
Avail Cap(c_a), veh/h	332	0	290	149	0	143	207	982	1033	145	1661	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.4	0.0	35.3	38.4	0.0	38.5	38.2	16.5	16.5	41.9	22.7	0.0
Incr Delay (d2), s/veh	5.6	0.0	16.2	2.6	0.0	3.2	36.0	6.9	6.6	5.6	13.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	6.1	1.4	0.0	1.5	6.5	18.4	19.2	0.5	21.0	0.0
LnGrp Delay(d),s/veh	39.9	0.0	51.5	41.0	0.0	41.7	74.1	23.4	23.1	47.5	35.7	0.0
LnGrp LOS	D		D	D		D	E	C	C	D	D	
Approach Vol, veh/h		416			115			1876			1586	
Approach Delay, s/veh		45.9			41.3			28.3			35.8	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.4	14.0	44.2		10.8	6.2	52.0
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 16	10.3	39.7		7.0	7.3	42.7
Max Q Clear Time (g_c+I1), s		13.5	10.9	38.9		4.8	2.9	35.7
Green Ext Time (p_c), s		0.6	0.0	0.4		0.1	0.0	7.0

Intersection Summary	
HCM 2010 Ctrl Delay	33.5
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	869	18	23	17	6	54	6	1910	17	55	1690	493
Future Volume (vph)	869	18	23	17	6	54	6	1910	17	55	1690	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1740		1715	1761	1524	1805	3532		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1740		1715	1761	1524	1805	3532		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	23	17	6	55	6	1949	17	56	1724	503
RTOR Reduction (vph)	0	17	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	24	0	11	12	3	6	1966	0	56	1724	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	36.2	36.2		6.6	6.6	6.6	1.5	74.5		6.2	79.7	141.4
Effective Green, g (s)	36.8	36.8		6.8	6.8	6.8	1.2	75.4		6.4	80.6	141.4
Actuated g/C Ratio	0.26	0.26		0.05	0.05	0.05	0.01	0.53		0.05	0.57	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	902	452		82	84	73	15	1883		81	2037	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.00	c0.56		c0.03	0.48	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.98	0.05		0.13	0.14	0.04	0.40	1.04		0.69	0.85	0.31
Uniform Delay, d1	52.0	39.2		64.5	64.5	64.2	69.7	33.0		66.5	25.3	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	25.9	0.1		1.3	1.4	0.4	16.6	33.2		22.5	3.8	0.5
Delay (s)	77.8	39.3		65.8	65.9	64.5	86.3	66.2		89.0	29.1	0.5
Level of Service	E	D		E	E	E	F	E		F	C	A
Approach Delay (s)		76.1			64.9			66.3			24.3	
Approach LOS		E			E			E			C	

Intersection Summary			
HCM 2000 Control Delay	49.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	141.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	104	1	18	4	0	4	10	447	0	1	455	42
Future Vol, veh/h	104	1	18	4	0	4	10	447	0	1	455	42
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	114	1	20	4	0	4	11	491	0	1	500	46

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	809	1051	289	779	1074	259	554	0	0	496	0	0
Stage 1	533	533	-	518	518	-	-	-	-	-	-	-
Stage 2	276	518	-	261	556	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	272	229	690	289	222	746	1026	-	-	1078	-	-
Stage 1	498	528	-	514	536	-	-	-	-	-	-	-
Stage 2	707	536	-	727	516	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	264	223	681	273	216	738	1019	-	-	1071	-	-
Mov Cap-2 Maneuver	264	223	-	273	216	-	-	-	-	-	-	-
Stage 1	487	524	-	504	526	-	-	-	-	-	-	-
Stage 2	688	526	-	699	512	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.8	14.2	0.3	0
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1019	-	-	290	399	1071	-	-
HCM Lane V/C Ratio	0.011	-	-	0.466	0.022	0.001	-	-
HCM Control Delay (s)	8.6	0.1	-	27.8	14.2	8.4	0	-
HCM Lane LOS	A	A	-	D	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.3	0.1	0	-	-

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	149	482	16	6	438	29	10	6	4	6	3	157
Future Vol, veh/h	149	482	16	6	438	29	10	6	4	6	3	157
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	159	513	17	6	466	31	11	6	4	6	3	167

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	501	0	0	547	0	0	1115	1369	299	1092	1362	265
Stage 1	-	-	-	-	-	-	855	855	-	498	498	-
Stage 2	-	-	-	-	-	-	260	514	-	594	864	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1067	-	-	1033	-	-	165	148	703	172	149	733
Stage 1	-	-	-	-	-	-	323	378	-	528	548	-
Stage 2	-	-	-	-	-	-	728	539	-	463	374	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1055	-	-	1018	-	-	107	123	683	142	124	723
Mov Cap-2 Maneuver	-	-	-	-	-	-	107	123	-	142	124	-
Stage 1	-	-	-	-	-	-	270	316	-	447	543	-
Stage 2	-	-	-	-	-	-	547	534	-	377	313	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0.1	36.6	13.8
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	135	1055	-	-	1018	-	-	585
HCM Lane V/C Ratio	0.158	0.15	-	-	0.006	-	-	0.302
HCM Control Delay (s)	36.6	9	-	-	8.6	-	-	13.8
HCM Lane LOS	E	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.5	-	-	0	-	-	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1000	111	16	641	136	36
Future Volume (vph)	1000	111	16	641	136	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1748	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1748	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1075	119	17	689	146	39
RTOR Reduction (vph)	0	43	0	0	11	0
Lane Group Flow (vph)	1075	76	17	689	174	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	49.4	49.4	1.4	55.0	11.9	
Effective Green, g (s)	49.4	49.4	1.4	55.0	11.9	
Actuated g/C Ratio	0.63	0.63	0.02	0.71	0.15	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1194	994	32	1317	267	
v/s Ratio Prot	c0.57		0.01	c0.37	c0.10	
v/s Ratio Perm		0.05				
v/c Ratio	0.90	0.08	0.53	0.52	0.65	
Uniform Delay, d1	12.1	5.4	37.9	5.3	31.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.6	0.0	8.2	0.4	4.3	
Delay (s)	21.7	5.5	46.1	5.7	35.3	
Level of Service	C	A	D	A	D	
Approach Delay (s)	20.1			6.7	35.3	
Approach LOS	C			A	D	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	77.8	Sum of lost time (s)	15.1
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1000	111	16	641	136	36
Future Volume (veh/h)	1000	111	16	641	136	36
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1870	1900
Adj Flow Rate, veh/h	1075	119	17	689	146	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	0	2	0	0
Cap, veh/h	1252	1043	29	1378	194	0
Arrive On Green	0.67	0.67	0.02	0.74	0.11	0.00
Sat Flow, veh/h	1881	1566	1810	1863	1770	0
Grp Volume(v), veh/h	1075	119	17	689	147	0
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1782	0
Q Serve(g_s), s	32.2	2.0	0.7	11.0	5.8	0.0
Cycle Q Clear(g_c), s	32.2	2.0	0.7	11.0	5.8	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1252	1043	29	1378	195	0
V/C Ratio(X)	0.86	0.11	0.59	0.50	0.75	0.00
Avail Cap(c_a), veh/h	1376	1145	100	1573	443	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.4	4.4	35.4	3.9	31.3	0.0
Incr Delay (d2), s/veh	5.5	0.1	6.8	0.4	2.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.3	0.9	0.4	5.7	3.0	0.0
LnGrp Delay(d),s/veh	14.9	4.4	42.2	4.2	33.5	0.0
LnGrp LOS	B	A	D	A	C	
Approach Vol, veh/h	1194			706	147	
Approach Delay, s/veh	13.8			5.2	33.5	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.4	54.6				59.9		12.4
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	52.9				61.1		18.0
Max Q Clear Time (g_c+I1), s	2.7	34.2				13.0		7.8
Green Ext Time (p_c), s	0.0	13.9				26.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.3
HCM 2010 LOS	B

Notes

Intersection

Int Delay, s/veh 4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	57	947	24	16	575	19	24	1	28	14	2	46
Future Vol, veh/h	57	947	24	16	575	19	24	1	28	14	2	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	64	1064	27	18	646	21	27	1	31	16	2	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	667	0	0	1064	0	0	1886	1895	1064	1886	1885	657
Stage 1	-	-	-	-	-	-	1192	1192	-	693	693	-
Stage 2	-	-	-	-	-	-	694	703	-	1193	1192	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	932	-	-	662	-	-	54	70	273	54	71	468
Stage 1	-	-	-	-	-	-	230	263	-	437	448	-
Stage 2	-	-	-	-	-	-	436	443	-	230	263	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	932	-	-	662	-	-	43	63	273	44	64	468
Mov Cap-2 Maneuver	-	-	-	-	-	-	43	63	-	44	64	-
Stage 1	-	-	-	-	-	-	214	245	-	407	436	-
Stage 2	-	-	-	-	-	-	375	431	-	189	245	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	94.9	42.8
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	44	273	932	-	-	662	-	-	46	468
HCM Lane V/C Ratio	0.638	0.115	0.069	-	-	0.027	-	-	0.391	0.11
HCM Control Delay (s)	179	19.9	9.1	-	-	10.6	-	-	126.6	13.6
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	2.4	0.4	0.2	-	-	0.1	-	-	1.4	0.4

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	1	7	852	621	37
Future Vol, veh/h	37	1	7	852	621	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	39	1	7	897	654	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1566	654	654	0	-	0
Stage 1	654	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	124	470	943	-	-	-
Stage 1	521	-	-	-	-	-
Stage 2	395	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	122	470	943	-	-	-
Mov Cap-2 Maneuver	122	-	-	-	-	-
Stage 1	521	-	-	-	-	-
Stage 2	389	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	47.3	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	943	-	124	-	-
HCM Lane V/C Ratio	0.008	-	0.323	-	-
HCM Control Delay (s)	8.8	0	47.3	-	-
HCM Lane LOS	A	A	E	-	-
HCM 95th %tile Q(veh)	0	-	1.3	-	-

Intersection

Int Delay, s/veh 1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	58	417	36	30	456
Future Vol, veh/h	21	58	417	36	30	456
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	22	61	439	38	32	480

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1013	469	0	0	483	0
Stage 1	464	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	267	598	-	-	1090	-
Stage 1	637	-	-	-	-	-
Stage 2	583	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	254	593	-	-	1085	-
Mov Cap-2 Maneuver	254	-	-	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	557	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	438	1085	-
HCM Lane V/C Ratio	-	-	0.19	0.029	-
HCM Control Delay (s)	-	-	15.1	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	114	124	371	338	28
Future Vol, veh/h	14	114	124	371	338	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	125	136	408	371	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1059	379	375	0	-	0
Stage 1	375	-	-	-	-	-
Stage 2	684	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-	-
Pot Cap-1 Maneuver	251	670	1195	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	505	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	221	666	1191	-	-	-
Mov Cap-2 Maneuver	221	-	-	-	-	-
Stage 1	697	-	-	-	-	-
Stage 2	446	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.9	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1191	-	546	-	-
HCM Lane V/C Ratio	0.114	-	0.258	-	-
HCM Control Delay (s)	8.4	-	13.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1	-	-

Intersection

Int Delay, s/veh 3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	128	101	284	232	17
Future Vol, veh/h	27	128	101	284	232	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	136	107	302	247	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	783	266	270	0	-	0
Stage 1	261	-	-	-	-	-
Stage 2	522	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	365	773	1299	-	-	-
Stage 1	787	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	332	767	1294	-	-	-
Mov Cap-2 Maneuver	332	-	-	-	-	-
Stage 1	784	-	-	-	-	-
Stage 2	547	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1294	-	624	-	-
HCM Lane V/C Ratio	0.083	-	0.264	-	-
HCM Control Delay (s)	8	-	12.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	2	1	111	0	3	0	0	0	128	173	3
Future Vol, veh/h	0	2	1	111	0	3	0	0	0	128	173	3
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0
Mvmt Flow	0	2	1	122	0	3	0	0	0	141	190	3
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.3	8.5	10.6
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	42%	2%	100%	1%
Vol Thru, %	57%	1%	0%	99%
Vol Right, %	1%	97%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	304	114	3	141
LT Vol	128	2	3	1
Through Vol	173	1	0	140
RT Vol	3	111	0	0
Lane Flow Rate	334	125	3	155
Geometry Grp	1	1	1	1
Degree of Util (X)	0.414	0.154	0.005	0.196
Departure Headway (Hd)	4.457	4.427	5.378	4.555
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	808	809	664	787
Service Time	2.484	2.459	3.423	2.586
HCM Lane V/C Ratio	0.413	0.155	0.005	0.197
HCM Control Delay	10.6	8.3	8.5	8.7
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2	0.5	0	0.7

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Cumulative PM.syn
12/01/2017

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	140	0
Future Vol, veh/h	0	1	140	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	154	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.7
HCM LOS	A

Synchro 9 Report
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	907	905	83	968	911
Future Volume (vph)	0	907	905	83	968	911
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	935	933	86	998	939
RTOR Reduction (vph)	0	138	0	7	0	0
Lane Group Flow (vph)	0	797	933	79	998	939
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		20.2	33.4	33.4	20.2	63.4
Effective Green, g (s)		21.1	34.3	34.3	21.1	63.4
Actuated g/C Ratio		0.33	0.54	0.54	0.33	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		945	1017	873	1153	1881
v/s Ratio Prot		0.28	c0.50		c0.29	0.50
v/s Ratio Perm				0.05		
v/c Ratio		0.84	0.92	0.09	0.87	0.50
Uniform Delay, d1		19.6	13.3	7.0	19.8	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		7.5	12.8	0.1	7.4	0.9
Delay (s)		27.1	26.0	7.1	27.3	0.9
Level of Service		C	C	A	C	A
Approach Delay (s)	27.1		24.4			14.5
Approach LOS	C		C			B

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	63.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	766	261	432	684	3	208	15	409	2	15	14
Future Volume (vph)	25	766	261	432	684	3	208	15	409	2	15	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00
Satd. Flow (prot)	1805	3574	1593	3467	3607		1698	1715	1575		1890	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00
Satd. Flow (perm)	1805	3574	1593	3467	3607		1698	1715	1575		1890	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	27	815	278	460	728	3	221	16	435	2	16	15
RTOR Reduction (vph)	0	0	177	0	0	0	0	0	93	0	0	15
Lane Group Flow (vph)	27	815	101	460	731	0	117	120	342	0	18	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.6	21.7	21.7	11.6	31.7		7.8	7.8	19.4		1.0	1.0
Effective Green, g (s)	2.1	22.7	22.7	12.2	32.7		9.6	9.6	20.6		2.0	2.0
Actuated g/C Ratio	0.03	0.36	0.36	0.20	0.52		0.15	0.15	0.33		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	60	1298	578	676	1887		260	263	519		60	51
v/s Ratio Prot	0.01	c0.23		c0.13	0.20		0.07	0.07	c0.13		c0.01	
v/s Ratio Perm			0.06						0.09			0.00
v/c Ratio	0.45	0.63	0.17	0.68	0.39		0.45	0.46	0.66		0.30	0.01
Uniform Delay, d1	29.6	16.4	13.5	23.3	8.9		24.0	24.1	17.9		29.6	29.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.7	0.1	2.3	0.0		0.5	0.5	2.3		1.0	0.0
Delay (s)	31.6	17.1	13.6	25.6	9.0		24.5	24.5	20.3		30.6	29.3
Level of Service	C	B	B	C	A		C	C	C		C	C
Approach Delay (s)		16.6			15.4			21.8			30.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	62.5	Sum of lost time (s)	16.1
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	766	261	432	684	3	208	15	409	2	15	14
Future Volume (veh/h)	25	766	261	432	684	3	208	15	409	2	15	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	815	278	460	728	3	232	0	435	2	16	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	55	1022	455	578	1549	6	1012	0	677	7	58	56
Arrive On Green	0.03	0.29	0.29	0.17	0.42	0.41	0.28	0.00	0.27	0.03	0.03	0.03
Sat Flow, veh/h	1810	3574	1593	3476	3687	15	3583	0	1561	210	1680	1615
Grp Volume(v), veh/h	27	815	278	460	356	375	232	0	435	18	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1593	1738	1805	1897	1792	0	1561	1890	0	1615
Q Serve(g_s), s	1.0	14.6	10.5	8.8	9.9	9.9	3.4	0.0	15.2	0.6	0.0	0.6
Cycle Q Clear(g_c), s	1.0	14.6	10.5	8.8	9.9	9.9	3.4	0.0	15.2	0.6	0.0	0.6
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.11		1.00
Lane Grp Cap(c), veh/h	55	1022	455	578	758	797	1012	0	677	66	0	56
V/C Ratio(X)	0.49	0.80	0.61	0.80	0.47	0.47	0.23	0.00	0.64	0.27	0.00	0.27
Avail Cap(c_a), veh/h	143	1144	510	701	796	837	1746	0	997	109	0	93
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.1	22.9	21.4	27.8	14.5	14.5	19.1	0.0	15.5	32.6	0.0	32.6
Incr Delay (d2), s/veh	2.4	3.2	1.0	4.2	0.2	0.2	0.0	0.0	0.4	0.8	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.6	4.7	4.6	4.9	5.1	1.7	0.0	6.5	0.4	0.0	0.3
LnGrp Delay(d),s/veh	35.5	26.1	22.4	32.0	14.7	14.7	19.1	0.0	15.9	33.5	0.0	33.6
LnGrp LOS	D	C	C	C	B	B	B		B	C		C
Approach Vol, veh/h		1120			1191			667			33	
Approach Delay, s/veh		25.4			21.4			17.0			33.5	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	33.1		23.6	15.5	23.8		6.4
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 13	21.2		3.0
Max Q Clear Time (g_c+I1), s	3.0	11.9		17.2	10.8	16.6		2.6
Green Ext Time (p_c), s	0.0	4.1		0.4	0.1	2.2		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		22.1
HCM 2010 LOS		C

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	134	329	70	8	189	332	290	72	565	160	286	571
Future Volume (vph)	134	329	70	8	189	332	290	72	565	160	286	571
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3489			1794	1881	1555	1805	1863	1590	3502	1847
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3489			681	1881	1555	1805	1863	1590	3502	1847
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	135	332	71	8	191	335	293	73	571	162	289	577
RTOR Reduction (vph)	0	23	0	0	0	0	211	0	0	107	0	4
Lane Group Flow (vph)	135	380	0	0	199	335	82	73	571	55	289	628
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.3	18.2			11.4	21.3	21.3	6.3	27.0	27.0	9.3	30.0
Effective Green, g (s)	8.0	18.4			11.1	21.5	21.5	6.0	27.9	27.9	9.0	30.9
Actuated g/C Ratio	0.10	0.22			0.13	0.26	0.26	0.07	0.34	0.34	0.11	0.37
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	173	779			91	490	405	131	630	538	382	692
v/s Ratio Prot	0.08	0.11				c0.18		0.04	0.31		c0.08	c0.34
v/s Ratio Perm					c0.29		0.05			0.03		
v/c Ratio	0.78	0.49			2.19	0.68	0.20	0.56	0.91	0.10	0.76	0.91
Uniform Delay, d1	36.3	27.9			35.7	27.4	23.8	36.9	26.0	18.7	35.6	24.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.0	0.6			568.3	4.1	0.3	5.1	17.0	0.1	8.3	15.9
Delay (s)	56.4	28.5			604.0	31.5	24.0	42.0	43.0	18.8	43.9	40.3
Level of Service	E	C			F	C	C	D	D	B	D	D
Approach Delay (s)		35.5				166.6			38.0			41.5
Approach LOS		D				F			D			D

Intersection Summary				
HCM 2000 Control Delay	73.0	HCM 2000 Level of Service		E
HCM 2000 Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	82.4	Sum of lost time (s)		16.0
Intersection Capacity Utilization	78.9%	ICU Level of Service		D
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	84	362	160	163	430	298	164
Future Volume (vph)	84	362	160	163	430	298	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3421		1787	3610	3467	1532
Flt Permitted	0.43	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	817	3421		1787	3610	3467	1532
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	381	168	172	453	314	173
RTOR Reduction (vph)	0	67	0	0	0	0	144
Lane Group Flow (vph)	88	482	0	172	453	314	29
Confl. Peds. (#/hr)			5	9		5	9
Confl. Bikes (#/hr)			11				11
Heavy Vehicles (%)	0%	0%	0%	1%	0%	1%	1%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	9.8	26.4		7.8	24.4	9.3	9.3
Effective Green, g (s)	9.3	26.4		7.3	24.4	9.3	9.3
Actuated g/C Ratio	0.17	0.48		0.13	0.44	0.17	0.17
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	138	1642		237	1601	586	259
v/s Ratio Prot		c0.14		0.10	0.13	c0.09	
v/s Ratio Perm	c0.11						0.02
v/c Ratio	0.64	0.29		0.73	0.28	0.54	0.11
Uniform Delay, d1	21.3	8.7		22.9	9.7	20.9	19.4
Progression Factor	1.00	1.00		0.82	0.91	1.00	1.00
Incremental Delay, d2	6.9	0.5		8.9	0.4	0.5	0.1
Delay (s)	28.2	9.1		27.7	9.3	21.4	19.4
Level of Service	C	A		C	A	C	B
Approach Delay (s)		11.7			14.4	20.7	
Approach LOS		B			B	C	

Intersection Summary

HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	484	42	112	515	0	78	0	75	0	0	0
Future Volume (vph)	0	484	42	112	515	0	78	0	75	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.96			
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3558		1805	3574			1796	1537			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3558		1805	3574			1432	1537			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	532	46	123	566	0	86	0	82	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	72	0	0	0
Lane Group Flow (vph)	0	570	0	123	566	0	0	86	10	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10						10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		30.2		6.4	40.1			6.9	6.9			
Effective Green, g (s)		30.2		5.9	40.1			6.9	6.9			
Actuated g/C Ratio		0.55		0.11	0.73			0.13	0.13			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		1953		193	2605			179	192			
v/s Ratio Prot		c0.16		c0.07	0.16							
v/s Ratio Perm								c0.06	0.01			
v/c Ratio		0.29		0.64	0.22			0.48	0.05			
Uniform Delay, d1		6.7		23.5	2.4			22.4	21.2			
Progression Factor		0.65		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.4		5.0	0.2			0.7	0.0			
Delay (s)		4.7		28.5	2.6			23.1	21.2			
Level of Service		A		C	A			C	C			
Approach Delay (s)		4.7			7.2			22.2			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	484	42	112	515	0	78	0	75	0	0	0
Future Volume (veh/h)	0	484	42	112	515	0	78	0	75	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	532	46	123	566	0	86	0	82	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	2050	177	143	2726	0	263	0	140	0	175	0
Arrive On Green	0.00	1.00	1.00	0.08	0.76	0.00	0.09	0.00	0.09	0.00	0.00	0.00
Sat Flow, veh/h	0	3450	289	1810	3668	0	1440	0	1522	0	1900	0
Grp Volume(v), veh/h	0	286	292	123	566	0	86	0	82	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1839	1810	1787	0	1440	0	1522	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	3.7	2.5	0.0	3.2	0.0	2.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.7	2.5	0.0	3.2	0.0	2.8	0.0	0.0	0.0
Prop In Lane	0.00		0.16	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1103	1124	143	2726	0	263	0	140	0	175	0
V/C Ratio(X)	0.00	0.26	0.26	0.86	0.21	0.00	0.33	0.00	0.59	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1103	1124	296	2726	0	550	0	443	0	553	0
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.95	0.95	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	25.0	1.8	0.0	24.1	0.0	24.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	5.7	0.2	0.0	0.3	0.0	1.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	2.1	1.2	0.0	1.3	0.0	1.2	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.5	0.5	30.8	2.0	0.0	24.4	0.0	25.4	0.0	0.0	0.0
LnGrp LOS		A	A	C	A		C		C			
Approach Vol, veh/h		578			689			168			0	
Approach Delay, s/veh		0.5			7.1			24.9			0.0	
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	8.3	37.6		9.1		45.9		9.1
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	9.5	18.0		16.0		31.0		16.0
Max Q Clear Time (g_c+I1), s	5.7	2.0		0.0		4.5		5.2
Green Ext Time (p_c), s	0.0	8.0		0.0		10.4		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	6.6
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	315	63	0	47	27	2	45	443
Future Vol, veh/h	0	315	63	0	47	27	2	45	443
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	339	68	0	51	29	2	48	476
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	12	10.3	18.8
HCM LOS	B	B	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	158	158	63	47	27	47	443
LT Vol	158	158	0	0	0	47	0
Through Vol	0	0	63	47	0	0	0
RT Vol	0	0	0	0	27	0	443
Lane Flow Rate	169	169	68	51	29	51	476
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.322	0.321	0.087	0.1	0.053	0.091	0.703
Departure Headway (Hd)	6.848	6.831	4.598	7.103	6.542	6.516	5.314
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	525	527	777	503	546	550	681
Service Time	4.592	4.574	2.341	4.865	4.304	4.258	3.056
HCM Lane V/C Ratio	0.322	0.321	0.088	0.101	0.053	0.093	0.699
HCM Control Delay	12.8	12.8	7.8	10.7	9.7	9.9	19.7
HCM Lane LOS	B	B	A	B	A	A	C
HCM 95th-tile Q	1.4	1.4	0.3	0.3	0.2	0.3	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	7	190	42	11	9	211	1525	7	5	1649	289
Future Volume (vph)	271	7	190	42	11	9	211	1525	7	5	1649	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1564		1715	1683		1787	3570		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1564		1715	1683		1787	3570		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	192	42	11	9	213	1540	7	5	1666	292
RTOR Reduction (vph)	0	159	0	0	9	0	0	0	0	0	0	116
Lane Group Flow (vph)	247	67	0	31	22	0	213	1547	0	5	1666	176
Confl. Bikes (#/hr)						3						3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.3	15.3		3.9	3.9		10.4	51.5		1.3	42.4	42.4
Effective Green, g (s)	15.5	15.5		4.1	4.1		10.1	52.4		1.0	43.3	43.3
Actuated g/C Ratio	0.17	0.17		0.05	0.05		0.11	0.59		0.01	0.49	0.49
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	295	272		79	77		202	2101		20	1738	768
v/s Ratio Prot	c0.15	0.04		c0.02	0.01		c0.12	0.43		0.00	c0.47	
v/s Ratio Perm												0.11
v/c Ratio	0.84	0.25		0.39	0.29		1.05	0.74		0.25	0.96	0.23
Uniform Delay, d1	35.5	31.7		41.2	41.0		39.5	13.3		43.6	22.0	13.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.7	0.6		4.3	2.9		78.4	1.6		6.5	13.2	0.3
Delay (s)	54.2	32.3		45.6	43.9		117.9	14.8		50.1	35.2	13.5
Level of Service	D	C		D	D		F	B		D	D	B
Approach Delay (s)		43.7			44.7			27.3			32.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	7	190	42	11	9	211	1525	7	5	1649	289
Future Volume (veh/h)	271	7	190	42	11	9	211	1525	7	5	1649	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1898	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	236	59	192	31	26	9	213	1540	7	5	1666	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	317	70	226	120	89	31	205	2070	9	10	1639	741
Arrive On Green	0.18	0.18	0.17	0.07	0.07	0.06	0.11	0.57	0.56	0.01	0.46	0.00
Sat Flow, veh/h	1792	393	1279	1810	1342	465	1792	3647	17	1810	3574	1615
Grp Volume(v), veh/h	236	0	251	31	0	35	213	754	793	5	1666	0
Grp Sat Flow(s),veh/h/ln	1792	0	1672	1810	0	1807	1792	1786	1877	1810	1787	1615
Q Serve(g_s), s	10.9	0.0	12.7	1.4	0.0	1.6	10.0	27.6	27.6	0.2	40.0	0.0
Cycle Q Clear(g_c), s	10.9	0.0	12.7	1.4	0.0	1.6	10.0	27.6	27.6	0.2	40.0	0.0
Prop In Lane	1.00		0.76	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	317	0	296	120	0	120	205	1014	1065	10	1639	741
V/C Ratio(X)	0.74	0.00	0.85	0.26	0.00	0.29	1.04	0.74	0.74	0.48	1.02	0.00
Avail Cap(c_a), veh/h	345	0	322	149	0	149	205	1014	1065	145	1639	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	34.8	38.7	0.0	38.8	38.6	14.1	14.1	43.2	23.6	0.0
Incr Delay (d2), s/veh	8.2	0.0	18.1	1.6	0.0	1.9	72.8	3.4	3.2	31.0	26.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.0	7.3	0.8	0.0	0.9	9.1	14.4	15.1	0.2	25.6	0.0
LnGrp Delay(d),s/veh	42.2	0.0	52.9	40.3	0.0	40.7	111.5	17.5	17.4	74.3	50.0	0.0
LnGrp LOS	D		D	D		D	F	B	B	E	F	
Approach Vol, veh/h		487			66			1760			1671	
Approach Delay, s/veh		47.7			40.5			28.8			50.1	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		19.4	14.0	44.0		9.8	4.5	53.5
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 17	10.3	39.1		7.0	7.3	42.1
Max Q Clear Time (g_c+I1), s		14.7	12.0	42.0		3.6	2.2	29.6
Green Ext Time (p_c), s		0.6	0.0	0.0		0.1	0.0	12.3

Intersection Summary			
HCM 2010 Ctrl Delay	40.2		
HCM 2010 LOS	D		

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	10	23	21	11	34	36	1724	25	40	1979	557
Future Volume (vph)	390	10	23	21	11	34	36	1724	25	40	1979	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1681		1715	1774	1583	1805	3566		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1681		1715	1774	1583	1805	3566		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	24	22	11	35	37	1777	26	41	2040	574
RTOR Reduction (vph)	0	21	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	13	0	16	17	2	37	1802	0	41	2040	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.2	16.2		6.7	6.7	6.7	4.7	73.2		6.1	75.1	120.1
Effective Green, g (s)	16.8	16.8		6.9	6.9	6.9	4.4	74.1		6.3	76.0	120.1
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.04	0.62		0.05	0.63	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	480	235		98	101	90	66	2200		94	2261	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.51		0.02	c0.57	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.84	0.06		0.16	0.17	0.02	0.56	0.82		0.44	0.90	0.37
Uniform Delay, d1	50.3	44.8		53.9	53.9	53.4	56.9	17.8		55.2	18.9	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.1	0.2		1.4	1.4	0.2	10.4	2.8		3.2	5.8	0.7
Delay (s)	63.4	45.0		55.2	55.2	53.6	67.3	20.6		58.4	24.7	0.7
Level of Service	E	D		E	E	D	E	C		E	C	A
Approach Delay (s)		61.9			54.4			21.6			20.0	
Approach LOS		E			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	79.2%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Intersection

Int Delay, s/veh 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Vol, veh/h	66	0	20	1	0	0	10	337	0	0	464	30
Future Vol, veh/h	66	0	20	1	0	0	10	337	0	0	464	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	75	0	23	1	0	0	11	383	0	0	527	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	758	950	281	670	967	191	561	0	0	383	0	0
Stage 1	544	544	-	406	406	-	-	-	-	-	-	-
Stage 2	214	406	-	264	561	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	296	262	722	347	256	825	1020	-	-	1187	-	-
Stage 1	491	522	-	598	601	-	-	-	-	-	-	-
Stage 2	768	601	-	724	513	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	293	258	722	332	252	825	1020	-	-	1187	-	-
Mov Cap-2 Maneuver	293	258	-	332	252	-	-	-	-	-	-	-
Stage 1	484	522	-	590	593	-	-	-	-	-	-	-
Stage 2	757	593	-	701	513	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.8	15.9	0.3	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1020	-	-	340	332	1187	-	-
HCM Lane V/C Ratio	0.011	-	-	0.287	0.003	-	-	-
HCM Control Delay (s)	8.6	0.1	-	19.8	15.9	0	-	-
HCM Lane LOS	A	A	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0	0	-	-

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↔			↔	
Traffic Vol, veh/h	193	366	12	5	454	31	7	0	6	6	1	166
Future Vol, veh/h	193	366	12	5	454	31	7	0	6	6	1	166
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	210	398	13	5	493	34	8	0	7	7	1	180

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	531	0	0	419	0	0	1094	1374	221	1151	1363	272
Stage 1	-	-	-	-	-	-	832	832	-	525	525	-
Stage 2	-	-	-	-	-	-	262	542	-	626	838	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1040	-	-	1151	-	-	171	147	789	155	149	732
Stage 1	-	-	-	-	-	-	334	387	-	509	533	-
Stage 2	-	-	-	-	-	-	726	523	-	443	384	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1037	-	-	1143	-	-	106	116	779	128	117	727
Mov Cap-2 Maneuver	-	-	-	-	-	-	106	116	-	128	117	-
Stage 1	-	-	-	-	-	-	265	307	-	405	529	-
Stage 2	-	-	-	-	-	-	541	519	-	348	304	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.2	0.1	27.2	13.5
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	176	1037	-	-	1143	-	-	610
HCM Lane V/C Ratio	0.08	0.202	-	-	0.005	-	-	0.308
HCM Control Delay (s)	27.2	9.3	-	-	8.2	-	-	13.5
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.8	-	-	0	-	-	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	795	117	33	767	122	22
Future Volume (vph)	795	117	33	767	122	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1782	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1782	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	846	124	35	816	130	23
RTOR Reduction (vph)	0	56	0	0	9	0
Lane Group Flow (vph)	846	68	35	816	144	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	31.8	31.8	1.3	37.3	9.7	
Effective Green, g (s)	31.8	31.8	1.3	37.3	9.7	
Actuated g/C Ratio	0.55	0.55	0.02	0.64	0.17	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1033	866	38	1211	298	
v/s Ratio Prot	c0.45		0.02	c0.43	c0.08	
v/s Ratio Perm		0.04				
v/c Ratio	0.82	0.08	0.92	0.67	0.48	
Uniform Delay, d1	10.7	6.1	28.2	6.5	21.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.3	0.0	113.1	1.6	0.5	
Delay (s)	16.0	6.2	141.3	8.0	22.3	
Level of Service	B	A	F	A	C	
Approach Delay (s)	14.8			13.5	22.3	
Approach LOS	B			B	C	

Intersection Summary				
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	15.1	
Intersection Capacity Utilization	59.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	795	117	33	767	122	22
Future Volume (veh/h)	795	117	33	767	122	22
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900
Adj Flow Rate, veh/h	846	124	35	816	130	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	4	1	0	0
Cap, veh/h	1110	931	52	1309	194	0
Arrive On Green	0.59	0.59	0.03	0.70	0.11	0.00
Sat Flow, veh/h	1881	1579	1740	1881	1796	0
Grp Volume(v), veh/h	846	124	35	816	131	0
Grp Sat Flow(s),veh/h/ln	1881	1579	1740	1881	1810	0
Q Serve(g_s), s	18.6	1.9	1.1	12.9	3.9	0.0
Cycle Q Clear(g_c), s	18.6	1.9	1.1	12.9	3.9	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1110	931	52	1309	196	0
V/C Ratio(X)	0.76	0.13	0.67	0.62	0.67	0.00
Avail Cap(c_a), veh/h	1284	1077	125	1562	587	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.5	5.1	26.7	4.5	23.8	0.0
Incr Delay (d2), s/veh	2.5	0.1	5.4	0.7	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	0.8	0.6	6.8	2.0	0.0
LnGrp Delay(d),s/veh	11.0	5.1	32.0	5.2	25.3	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	970			851	131	
Approach Delay, s/veh	10.3			6.3	25.3	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.9	39.2				45.0		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	37.9				46.1		18.0
Max Q Clear Time (g_c+I1), s	3.1	20.6				14.9		5.9
Green Ext Time (p_c), s	0.0	12.2				18.1		0.1

Intersection Summary		
HCM 2010 Ctrl Delay	9.6	
HCM 2010 LOS	A	

Notes

Intersection

Int Delay, s/veh 3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	731	29	14	683	17	30	0	40	10	0	40
Future Vol, veh/h	58	731	29	14	683	17	30	0	40	10	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	62	778	31	15	727	18	32	0	43	11	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	745	0	0	778	0	0	1666	1675	778	1666	1666	736
Stage 1	-	-	-	-	-	-	901	901	-	765	765	-
Stage 2	-	-	-	-	-	-	765	774	-	901	901	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	872	-	-	848	-	-	78	96	400	78	98	422
Stage 1	-	-	-	-	-	-	335	360	-	399	415	-
Stage 2	-	-	-	-	-	-	399	411	-	335	360	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	872	-	-	848	-	-	65	88	400	65	89	422
Mov Cap-2 Maneuver	-	-	-	-	-	-	65	88	-	65	89	-
Stage 1	-	-	-	-	-	-	311	334	-	371	408	-
Stage 2	-	-	-	-	-	-	352	404	-	278	334	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	53.7	25.8
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	65	400	872	-	-	848	-	-	65	422
HCM Lane V/C Ratio	0.491	0.106	0.071	-	-	0.018	-	-	0.164	0.101
HCM Control Delay (s)	105.1	15.1	9.4	-	-	9.3	-	-	70.9	14.5
HCM Lane LOS	F	C	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	2	0.4	0.2	-	-	0.1	-	-	0.5	0.3

Intersection

Int Delay, s/veh 1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	38	4	5	755	791	39
Future Vol, veh/h	38	4	5	755	791	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	40	4	5	795	833	41

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1638	833	833	0	-	0
Stage 1	833	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	112	372	809	-	-	-
Stage 1	430	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	111	372	809	-	-	-
Mov Cap-2 Maneuver	111	-	-	-	-	-
Stage 1	430	-	-	-	-	-
Stage 2	438	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	52.1	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	809	-	119	-	-
HCM Lane V/C Ratio	0.007	-	0.372	-	-
HCM Control Delay (s)	9.5	0	52.1	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0	-	1.5	-	-

Intersection

Int Delay, s/veh 1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	37	366	32	28	371
Future Vol, veh/h	24	37	366	32	28	371
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	25	38	377	33	29	382

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	846	406	0	0	416	0
Stage 1	400	-	-	-	-	-
Stage 2	446	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	335	649	-	-	1154	-
Stage 1	681	-	-	-	-	-
Stage 2	649	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	321	643	-	-	1148	-
Mov Cap-2 Maneuver	321	-	-	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	625	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	461	1148	-
HCM Lane V/C Ratio	-	-	0.136	0.025	-
HCM Control Delay (s)	-	-	14	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection

Int Delay, s/veh 2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	79	63	323	317	16
Future Vol, veh/h	10	79	63	323	317	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	84	67	344	337	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	836	359	348	0	-	0
Stage 1	348	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.218	-	-	-
Pot Cap-1 Maneuver	340	683	1211	-	-	-
Stage 1	719	-	-	-	-	-
Stage 2	621	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	315	671	1200	-	-	-
Mov Cap-2 Maneuver	315	-	-	-	-	-
Stage 1	712	-	-	-	-	-
Stage 2	581	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1200	-	595	-	-
HCM Lane V/C Ratio	0.056	-	0.159	-	-
HCM Control Delay (s)	8.2	-	12.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

Intersection

Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	114	98	251	212	8
Future Vol, veh/h	20	114	98	251	212	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	127	109	279	236	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	751	254	251	0	-	0
Stage 1	247	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	381	790	1320	-	-	-
Stage 1	799	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	345	781	1312	-	-	-
Mov Cap-2 Maneuver	345	-	-	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	557	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1312	-	657	-	-
HCM Lane V/C Ratio	0.083	-	0.227	-	-
HCM Control Delay (s)	8	-	12.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.9	-	-

Intersection

Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	94	0	3	0	0	0	161	106	4
Future Vol, veh/h	0	0	1	94	0	3	0	0	0	161	106	4
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0
Mvmt Flow	0	0	1	108	0	3	0	0	0	185	122	5
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8	8.3	10.3
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	59%	0%	100%	0%
Vol Thru, %	39%	1%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	271	95	3	123
LT Vol	161	0	3	0
Through Vol	106	1	0	123
RT Vol	4	94	0	0
Lane Flow Rate	311	109	3	141
Geometry Grp	1	1	1	1
Degree of Util (X)	0.387	0.131	0.005	0.177
Departure Headway (Hd)	4.469	4.334	5.269	4.502
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	810	827	678	797
Service Time	2.469	2.364	3.31	2.529
HCM Lane V/C Ratio	0.384	0.132	0.004	0.177
HCM Control Delay	10.3	8	8.3	8.5
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.8	0.4	0	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	123	0
Future Vol, veh/h	0	0	123	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	141	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.5
HCM LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱↱	↑	↱	↰↰	↑
Traffic Volume (vph)	0	1108	576	92	990	817
Future Volume (vph)	0	1108	576	92	990	817
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1274	662	106	1138	939
RTOR Reduction (vph)	0	150	0	19	0	0
Lane Group Flow (vph)	0	1124	662	87	1138	939
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		32.3	29.2	29.2	32.3	71.3
Effective Green, g (s)		33.2	30.1	30.1	33.2	71.3
Actuated g/C Ratio		0.47	0.42	0.42	0.47	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1297	778	661	1583	1810
v/s Ratio Prot		c0.40	c0.36		0.33	0.52
v/s Ratio Perm				0.06		
v/c Ratio		0.87	0.85	0.13	0.72	0.52
Uniform Delay, d1		17.1	18.6	12.6	15.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		6.7	9.1	0.1	1.8	1.1
Delay (s)		23.8	27.6	12.7	17.1	1.1
Level of Service		C	C	B	B	A
Approach Delay (s)	23.8		25.6			9.9
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	824	250	399	954	10	108	3	260	9	18	41
Future Volume (vph)	7	824	250	399	954	10	108	3	260	9	18	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1564	3433	3530		1698	1708	1560		1737	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1564	3433	3530		1698	1708	1560		1737	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	1056	321	512	1223	13	138	4	333	12	23	53
RTOR Reduction (vph)	0	0	146	0	0	0	0	0	68	0	0	50
Lane Group Flow (vph)	9	1056	175	512	1236	0	72	70	265	0	35	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.7	29.2	29.2	9.7	38.2		5.1	5.1	14.8		2.2	2.2
Effective Green, g (s)	1.2	30.2	30.2	10.3	39.2		6.9	6.9	16.0		3.2	3.2
Actuated g/C Ratio	0.02	0.45	0.45	0.15	0.59		0.10	0.10	0.24		0.05	0.05
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	32	1604	709	530	2077		175	176	374		83	74
v/s Ratio Prot	0.00	c0.30		c0.15	0.35		0.04	0.04	c0.11		c0.02	
v/s Ratio Perm			0.11						0.06			0.00
v/c Ratio	0.28	0.66	0.25	0.97	0.59		0.41	0.40	0.71		0.42	0.03
Uniform Delay, d1	32.3	14.2	11.2	28.0	8.7		27.9	27.9	23.2		30.8	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.8	0.1	30.2	0.3		0.6	0.5	5.0		1.3	0.1
Delay (s)	34.0	14.9	11.3	58.1	9.0		28.5	28.4	28.2		32.1	30.3
Level of Service	C	B	B	E	A		C	C	C		C	C
Approach Delay (s)		14.2			23.4			28.3			31.0	
Approach LOS		B			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	16.1	
Intersection Capacity Utilization	54.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	824	250	399	954	10	108	3	260	9	18	41
Future Volume (veh/h)	7	824	250	399	954	10	108	3	260	9	18	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1767	1863
Adj Flow Rate, veh/h	9	1056	321	512	1223	13	141	0	333	12	23	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	29	1203	531	487	1662	18	845	0	560	34	65	89
Arrive On Green	0.02	0.34	0.34	0.14	0.46	0.45	0.24	0.00	0.22	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3584	38	3583	0	1545	596	1141	1575
Grp Volume(v), veh/h	9	1056	321	512	603	633	141	0	333	35	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1854	1792	0	1545	1737	0	1575
Q Serve(g_s), s	0.3	19.9	12.1	10.0	19.6	19.7	2.2	0.0	12.4	1.4	0.0	2.3
Cycle Q Clear(g_c), s	0.3	19.9	12.1	10.0	19.6	19.7	2.2	0.0	12.4	1.4	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.34		1.00
Lane Grp Cap(c), veh/h	29	1203	531	487	820	860	845	0	560	98	0	89
V/C Ratio(X)	0.31	0.88	0.60	1.05	0.74	0.74	0.17	0.00	0.59	0.36	0.00	0.60
Avail Cap(c_a), veh/h	115	1311	579	487	820	860	1712	0	934	98	0	89
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.4	22.0	19.4	30.4	15.4	15.5	21.5	0.0	18.4	32.1	0.0	32.6
Incr Delay (d2), s/veh	2.2	6.2	0.9	55.2	3.1	2.9	0.0	0.0	0.4	0.8	0.0	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.7	5.3	8.4	10.2	10.7	1.1	0.0	5.4	0.7	0.0	1.2
LnGrp Delay(d),s/veh	36.5	28.2	20.3	85.6	18.5	18.4	21.5	0.0	18.8	32.9	0.0	39.9
LnGrp LOS	D	C	C	F	B	B	C		B	C		D
Approach Vol, veh/h		1386			1748			474			88	
Approach Delay, s/veh		26.4			38.1			19.6			37.1	
Approach LOS		C			D			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	36.8		20.7	14.0	28.0		8.0
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 9.4	25.2		3.0
Max Q Clear Time (g_c+I1), s	2.3	21.7		14.4	12.0	21.9		4.3
Green Ext Time (p_c), s	0.0	4.9		0.3	0.0	1.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	199	308	26	6	100	287	175	38	294	71	282	468
Future Volume (vph)	199	308	26	6	100	287	175	38	294	71	282	468
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3496			1702	1827	1547	1752	1881	1590	3433	1773
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3496			583	1827	1547	1752	1881	1590	3433	1773
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	214	331	28	7	108	309	188	41	316	76	303	503
RTOR Reduction (vph)	0	8	0	0	0	0	140	0	0	53	0	5
Lane Group Flow (vph)	214	351	0	0	115	309	48	41	316	23	303	570
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	9.5	16.4			12.6	19.5	19.5	4.3	22.8	22.8	9.5	28.0
Effective Green, g (s)	9.2	16.6			12.3	19.7	19.7	4.0	23.7	23.7	9.2	28.9
Actuated g/C Ratio	0.12	0.21			0.16	0.25	0.25	0.05	0.30	0.30	0.12	0.37
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	201	745			92	462	391	90	573	484	405	658
v/s Ratio Prot	0.13	0.10				c0.17		0.02	0.17		c0.09	c0.32
v/s Ratio Perm					c0.20		0.03			0.01		
v/c Ratio	1.06	0.47			1.25	0.67	0.12	0.46	0.55	0.05	0.75	0.87
Uniform Delay, d1	34.3	26.8			32.8	26.1	22.4	35.8	22.6	19.1	33.2	22.7
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	81.7	0.6			175.3	3.8	0.2	3.6	1.3	0.0	7.4	11.8
Delay (s)	116.0	27.3			208.0	29.9	22.6	39.5	23.9	19.1	40.6	34.4
Level of Service	F	C			F	C	C	D	C	B	D	C
Approach Delay (s)		60.4				61.1			24.5			36.6
Approach LOS		E				E			C			D

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	46.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	77.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project AM.syn
12/01/2017

Synchro 9 Report
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Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	61	62	366	77	106	310	6	152	3	69	5	2
Future Volume (vph)	61	62	366	77	106	310	6	152	3	69	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	1.00		1.00	0.86			0.87
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1770	3406		1687	3430		3367	1509			3077
Flt Permitted		0.54	1.00		0.95	1.00		0.95	1.00			0.91
Satd. Flow (perm)		1012	3406		1687	3430		3367	1509			2828
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92
Adj. Flow (vph)	66	67	402	85	116	341	7	167	3	76	5	2
RTOR Reduction (vph)	0	0	17	0	0	1	0	0	59	0	0	34
Lane Group Flow (vph)	0	133	470	0	116	347	0	167	20	0	0	9
Confl. Bikes (#/hr)				1								
Heavy Vehicles (%)	2%	2%	3%	3%	7%	5%	2%	4%	2%	8%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2									4	
Actuated Green, G (s)		33.8	33.8		9.0	46.3		7.9	15.7			3.8
Effective Green, g (s)		33.8	33.8		8.5	46.3		7.9	15.7			3.8
Actuated g/C Ratio		0.48	0.48		0.12	0.66		0.11	0.22			0.05
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		488	1644		204	2268		379	338			153
v/s Ratio Prot			c0.14		c0.07	0.10		c0.05	c0.01			
v/s Ratio Perm		0.13										0.00
v/c Ratio		0.27	0.29		0.57	0.15		0.44	0.06			0.06
Uniform Delay, d1		10.8	10.9		29.0	4.5		29.0	21.3			31.4
Progression Factor		1.00	1.00		0.93	0.86		1.00	1.00			1.00
Incremental Delay, d2		1.4	0.4		2.2	0.1		0.3	0.1			0.2
Delay (s)		12.2	11.3		29.1	4.0		29.3	21.4			31.6
Level of Service		B	B		C	A		C	C			C
Approach Delay (s)			11.5			10.3			26.8			31.6
Approach LOS			B			B			C			C

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	39.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd
Cumulative + Project AM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	33
Future Volume (vph)	33
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	36
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Cumulative + Project AM.syn

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	353	87	53	395	0	27	0	29	0	0	0
Future Volume (vph)	0	353	87	53	395	0	27	0	29	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		0.99		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.97		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3389		1805	3471			1548	1362			
Flt Permitted		1.00		0.95	1.00			0.89	1.00			
Satd. Flow (perm)		3389		1805	3471			1448	1362			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	415	102	62	465	0	32	0	34	0	0	0
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	32	0	0	0
Lane Group Flow (vph)	0	502	0	62	465	0	0	32	2	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		49.7		4.3	57.5			4.5	4.5			
Effective Green, g (s)		49.7		3.8	57.5			4.5	4.5			
Actuated g/C Ratio		0.71		0.05	0.82			0.06	0.06			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2406		97	2851			93	87			
v/s Ratio Prot		c0.15		c0.03	0.13							
v/s Ratio Perm								c0.02	0.00			
v/c Ratio		0.21		0.64	0.16			0.34	0.03			
Uniform Delay, d1		3.5		32.4	1.3			31.3	30.7			
Progression Factor		0.62		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		9.7	0.1			0.8	0.0			
Delay (s)		2.3		42.2	1.4			32.1	30.7			
Level of Service		A		D	A			C	C			
Approach Delay (s)		2.3			6.2			31.4			0.0	
Approach LOS		A			A			C			A	

Intersection Summary				
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.25			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	29.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	353	87	53	395	0	27	0	29	0	0	0
Future Volume (veh/h)	0	353	87	53	395	0	27	0	29	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1900	1652	1652	1900	1900	1900
Adj Flow Rate, veh/h	0	415	102	62	465	0	32	0	34	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	0	15	0	0	0
Cap, veh/h	0	2101	512	67	2931	0	154	0	57	0	78	0
Arrive On Green	0.00	1.00	1.00	0.04	0.84	0.00	0.04	0.00	0.04	0.00	0.00	0.00
Sat Flow, veh/h	0	2892	682	1810	3563	0	1234	0	1375	0	1900	0
Grp Volume(v), veh/h	0	259	258	62	465	0	32	0	34	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1726	1810	1736	0	1234	0	1375	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	2.4	1.7	0.0	1.8	0.0	1.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.4	1.7	0.0	1.8	0.0	1.7	0.0	0.0	0.0
Prop In Lane	0.00		0.40	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1317	1295	67	2931	0	154	0	57	0	78	0
V/C Ratio(X)	0.00	0.20	0.20	0.93	0.16	0.00	0.21	0.00	0.60	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1317	1295	259	2931	0	455	0	393	0	543	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.97	0.97	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	33.6	1.0	0.0	33.0	0.0	33.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	18.0	0.1	0.0	0.2	0.0	3.7	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	1.5	0.8	0.0	0.6	0.0	0.7	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.3	0.4	51.6	1.1	0.0	33.3	0.0	36.7	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		D			
Approach Vol, veh/h		517			527			66			0	
Approach Delay, s/veh		0.3			7.0			35.0			0.0	
Approach LOS		A			A			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	6.6	56.5		6.9		63.1		6.9
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	10.5	28.0		20.0		42.0		20.0
Max Q Clear Time (g_c+I1), s	4.4	2.0		0.0		3.7		3.8
Green Ext Time (p_c), s	0.0	8.5		0.0		9.6		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	5.6
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	227	45	0	55	37	5	24	340
Future Vol, veh/h	0	227	45	0	55	37	5	24	340
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	258	51	0	63	42	5	27	386
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	10.6	9.7	13.5
HCM LOS	B	A	B

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	114	114	45	55	37	29	340
LT Vol	114	114	0	0	0	29	0
Through Vol	0	0	45	55	0	0	0
RT Vol	0	0	0	0	37	0	340
Lane Flow Rate	129	129	51	62	42	33	386
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.236	0.233	0.061	0.113	0.068	0.058	0.547
Departure Headway (Hd)	6.601	6.515	4.288	6.495	5.782	6.337	5.101
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	544	552	834	551	618	568	711
Service Time	4.336	4.25	2.022	4.239	3.526	4.037	2.801
HCM Lane V/C Ratio	0.237	0.234	0.061	0.113	0.068	0.058	0.543
HCM Control Delay	11.4	11.2	7.3	10.1	9	9.4	13.8
HCM Lane LOS	B	B	A	B	A	A	B
HCM 95th-tile Q	0.9	0.9	0.2	0.4	0.2	0.2	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	50	114	151	43	63	142	1249	48	18	1528	113
Future Volume (vph)	144	50	114	151	43	63	142	1249	48	18	1528	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1504		1665	1649		1770	3471		1805	3471	1568
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1504		1665	1649		1770	3471		1805	3471	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	157	54	124	164	47	68	154	1358	52	20	1661	123
RTOR Reduction (vph)	0	74	0	0	40	0	0	3	0	0	0	56
Lane Group Flow (vph)	141	120	0	143	96	0	154	1407	0	20	1661	67
Confl. Peds. (#/hr)			46	46					46			
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	12.7	12.7		7.8	7.8		8.3	48.0		2.8	42.5	42.5
Effective Green, g (s)	12.9	12.9		8.0	8.0		8.0	48.9		2.5	43.4	43.4
Actuated g/C Ratio	0.15	0.15		0.09	0.09		0.09	0.55		0.03	0.49	0.49
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	243	219		150	149		160	1922		51	1706	770
v/s Ratio Prot	c0.08	0.08		c0.09	0.06		c0.09	0.41		0.01	c0.48	
v/s Ratio Perm												0.04
v/c Ratio	0.58	0.55		0.95	0.64		0.96	0.73		0.39	0.97	0.09
Uniform Delay, d1	35.2	35.0		40.0	38.8		40.0	14.8		42.2	21.9	11.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	3.1		59.5	10.2		59.6	1.7		4.9	16.0	0.1
Delay (s)	38.9	38.1		99.4	49.0		99.6	16.5		47.1	37.9	12.0
Level of Service	D	D		F	D		F	B		D	D	B
Approach Delay (s)		38.4			74.8			24.6			36.2	
Approach LOS		D			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	83.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	50	114	151	43	63	142	1249	48	18	1528	113
Future Volume (veh/h)	144	50	114	151	43	63	142	1249	48	18	1528	113
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.85	1.00		0.96	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845
Adj Flow Rate, veh/h	157	54	124	140	81	68	154	1358	52	20	1661	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3
Cap, veh/h	285	76	175	161	80	67	163	1840	70	50	1634	738
Arrive On Green	0.16	0.16	0.16	0.09	0.09	0.09	0.09	0.54	0.52	0.03	0.47	0.00
Sat Flow, veh/h	1757	470	1080	1757	872	732	1774	3439	131	1810	3471	1568
Grp Volume(v), veh/h	157	0	178	140	0	149	154	692	718	20	1661	0
Grp Sat Flow(s),veh/h/ln	1757	0	1551	1757	0	1605	1774	1754	1816	1810	1736	1568
Q Serve(g_s), s	7.2	0.0	9.5	6.9	0.0	8.0	7.5	26.4	26.5	0.9	41.0	0.0
Cycle Q Clear(g_c), s	7.2	0.0	9.5	6.9	0.0	8.0	7.5	26.4	26.5	0.9	41.0	0.0
Prop In Lane	1.00		0.70	1.00		0.46	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	285	0	251	161	0	147	163	939	972	50	1634	738
V/C Ratio(X)	0.55	0.00	0.71	0.87	0.00	1.01	0.95	0.74	0.74	0.40	1.02	0.00
Avail Cap(c_a), veh/h	343	0	303	161	0	147	163	939	972	145	1634	738
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.6	0.0	34.6	39.0	0.0	39.6	39.3	15.5	15.6	41.7	23.1	0.0
Incr Delay (d2), s/veh	2.0	0.0	6.5	36.9	0.0	77.1	54.4	3.5	3.4	5.2	26.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.5	5.0	0.0	6.7	6.1	13.6	14.1	0.5	25.5	0.0
LnGrp Delay(d),s/veh	35.6	0.0	41.1	76.0	0.0	116.7	93.7	19.0	19.0	46.9	49.6	0.0
LnGrp LOS	D		D	E		F	F	B	B	D	F	
Approach Vol, veh/h		335			289			1564			1681	
Approach Delay, s/veh		38.5			97.0			26.4			49.6	
Approach LOS		D			F			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.1	12.0	45.0		12.0	6.4	50.6
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 17	8.3	40.1		7.8	7.3	41.1
Max Q Clear Time (g_c+I1), s		11.5	9.5	43.0		10.0	2.9	28.5
Green Ext Time (p_c), s		0.9	0.0	0.0		0.0	0.0	12.3

Intersection Summary			
HCM 2010 Ctrl Delay	42.8		
HCM 2010 LOS	D		

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	382	4	26	35	14	44	38	1397	17	71	1784	774
Future Volume (vph)	382	4	26	35	14	44	38	1397	17	71	1784	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1588	1752	3533		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1588	1752	3533		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	29	38	15	48	42	1535	19	78	1960	851
RTOR Reduction (vph)	0	25	0	0	0	45	0	0	0	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	42	1554	0	78	1960	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.3	16.3		7.3	7.3	7.3	6.3	71.4		7.2	72.8	120.1
Effective Green, g (s)	16.9	16.9		7.5	7.5	7.5	6.0	72.3		7.4	73.7	120.1
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.05	0.60		0.06	0.61	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	483	215		107	106	99	87	2126		101	2129	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.44		c0.05	c0.56	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.87	0.04		0.25	0.25	0.03	0.48	0.73		0.77	0.92	0.54
Uniform Delay, d1	50.5	44.6		53.6	53.6	52.9	55.5	17.0		55.5	20.6	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.2	0.1		2.1	2.1	0.2	4.2	1.6		29.9	7.5	1.3
Delay (s)	66.7	44.7		55.8	55.7	53.1	59.7	18.6		85.4	28.1	1.3
Level of Service	E	D		E	E	D	E	B		F	C	A
Approach Delay (s)		65.1			54.5			19.7			21.7	
Approach LOS		E			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	83.2%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	0	10	0	0	0	7	251	2	8	372	93
Future Vol, veh/h	29	0	10	0	0	0	7	251	2	8	372	93
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	33	0	11	0	0	0	8	289	2	9	428	107

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	665	812	273	544	865	151	537	0	0	294	0	0
Stage 1	502	502	-	309	309	-	-	-	-	-	-	-
Stage 2	163	310	-	235	556	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	330	315	660	426	294	875	1041	-	-	1279	-	-
Stage 1	500	545	-	682	663	-	-	-	-	-	-	-
Stage 2	800	663	-	753	516	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	324	308	657	410	287	871	1038	-	-	1276	-	-
Mov Cap-2 Maneuver	324	308	-	410	287	-	-	-	-	-	-	-
Stage 1	494	538	-	674	655	-	-	-	-	-	-	-
Stage 2	791	655	-	731	510	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16	0	0.2	0.1
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1038	-	-	372	-	1276	-	-
HCM Lane V/C Ratio	0.008	-	-	0.121	-	0.007	-	-
HCM Control Delay (s)	8.5	0	-	16	0	7.8	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	-	0	-	-

Intersection

Int Delay, s/veh 2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	94	267	17	3	381	11	18	2	4	1	2	49
Future Vol, veh/h	94	267	17	3	381	11	18	2	4	1	2	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	108	307	20	3	438	13	21	2	5	1	2	56

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	451	0	0	326	0	0	760	990	163	822	994	225
Stage 1	-	-	-	-	-	-	533	533	-	451	451	-
Stage 2	-	-	-	-	-	-	227	457	-	371	543	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1085	-	-	1245	-	-	299	248	859	269	247	754
Stage 1	-	-	-	-	-	-	503	528	-	563	574	-
Stage 2	-	-	-	-	-	-	761	571	-	627	523	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1085	-	-	1245	-	-	253	223	859	245	222	754
Mov Cap-2 Maneuver	-	-	-	-	-	-	253	223	-	245	222	-
Stage 1	-	-	-	-	-	-	453	475	-	507	573	-
Stage 2	-	-	-	-	-	-	700	570	-	559	471	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.2	0.1	19.1	10.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	283	1085	-	-	1245	-	-	666
HCM Lane V/C Ratio	0.097	0.1	-	-	0.003	-	-	0.09
HCM Control Delay (s)	19.1	8.7	-	-	7.9	-	-	10.9
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.3	-	-	0	-	-	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	670	117	23	931	80	20
Future Volume (vph)	670	117	23	931	80	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1757	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1757	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	705	123	24	980	84	21
RTOR Reduction (vph)	0	52	0	0	15	0
Lane Group Flow (vph)	705	71	24	980	90	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	32.4	32.4	0.7	37.3	7.7	
Effective Green, g (s)	32.4	32.4	0.7	37.3	7.7	
Actuated g/C Ratio	0.58	0.58	0.01	0.67	0.14	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1069	900	22	1255	242	
v/s Ratio Prot	0.38		0.01	c0.52	c0.05	
v/s Ratio Perm		0.05				
v/c Ratio	0.66	0.08	1.09	0.78	0.37	
Uniform Delay, d1	8.0	5.2	27.6	6.5	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.0	221.9	3.3	0.4	
Delay (s)	9.6	5.2	249.5	9.8	22.3	
Level of Service	A	A	F	A	C	
Approach Delay (s)	8.9			15.5	22.3	
Approach LOS	A			B	C	

Intersection Summary				
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	55.9	Sum of lost time (s)	15.1	
Intersection Capacity Utilization	63.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	670	117	23	931	80	20
Future Volume (veh/h)	670	117	23	931	80	20
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1877	1900
Adj Flow Rate, veh/h	705	123	24	980	84	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	4	0	1	0	0
Cap, veh/h	1048	882	41	1264	206	0
Arrive On Green	0.57	0.57	0.02	0.67	0.12	0.00
Sat Flow, veh/h	1845	1553	1810	1881	1768	0
Grp Volume(v), veh/h	705	123	24	980	85	0
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1789	0
Q Serve(g_s), s	13.8	1.9	0.7	18.4	2.3	0.0
Cycle Q Clear(g_c), s	13.8	1.9	0.7	18.4	2.3	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1048	882	41	1264	208	0
V/C Ratio(X)	0.67	0.14	0.59	0.78	0.41	0.00
Avail Cap(c_a), veh/h	1178	991	140	1500	625	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.8	5.2	24.9	5.8	21.1	0.0
Incr Delay (d2), s/veh	1.4	0.1	4.9	2.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	0.8	0.4	10.1	1.1	0.0
LnGrp Delay(d),s/veh	9.2	5.3	29.8	8.2	21.6	0.0
LnGrp LOS	A	A	C	A	C	
Approach Vol, veh/h	828			1004	85	
Approach Delay, s/veh	8.6			8.7	21.6	
Approach LOS	A			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.4	35.7				41.0		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	32.9				41.1		18.0
Max Q Clear Time (g_c+I1), s	2.7	15.8				20.4		4.3
Green Ext Time (p_c), s	0.0	12.4				14.3		0.1

Intersection Summary		
HCM 2010 Ctrl Delay	9.2	
HCM 2010 LOS	A	

Notes

Intersection

Int Delay, s/veh 2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	569	29	29	929	8	12	1	13	14	0	47
Future Vol, veh/h	27	569	29	29	929	8	12	1	13	14	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	30	625	32	32	1021	9	13	1	14	15	0	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1030	0	0	625	0	0	1774	1778	625	1774	1774	1025
Stage 1	-	-	-	-	-	-	685	685	-	1089	1089	-
Stage 2	-	-	-	-	-	-	1089	1093	-	685	685	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	7.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.9	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	682	-	-	952	-	-	65	48	488	65	84	288
Stage 1	-	-	-	-	-	-	441	328	-	263	294	-
Stage 2	-	-	-	-	-	-	263	196	-	441	451	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	682	-	-	952	-	-	50	44	488	58	78	288
Mov Cap-2 Maneuver	-	-	-	-	-	-	50	44	-	58	78	-
Stage 1	-	-	-	-	-	-	422	314	-	251	284	-
Stage 2	-	-	-	-	-	-	209	189	-	408	431	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	59.5	35.8
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	49	488	682	-	-	952	-	-	58	288
HCM Lane V/C Ratio	0.292	0.029	0.044	-	-	0.033	-	-	0.265	0.179
HCM Control Delay (s)	106.3	12.6	10.5	-	-	8.9	-	-	88.1	20.2
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	1	0.1	0.1	-	-	0.1	-	-	0.9	0.6

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	38	0	1	365	551	39
Future Vol, veh/h	38	0	1	365	551	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	43	0	1	410	619	44

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1031	619	619	0	-	0
Stage 1	619	-	-	-	-	-
Stage 2	412	-	-	-	-	-
Critical Hdwy	6.43	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	257	492	971	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	257	492	971	-	-	-
Mov Cap-2 Maneuver	257	-	-	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	665	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	971	-	257	-	-
HCM Lane V/C Ratio	0.001	-	0.166	-	-
HCM Control Delay (s)	8.7	0	21.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection

Int Delay, s/veh 2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	93	334	21	22	428
Future Vol, veh/h	16	93	334	21	22	428
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	21	122	439	28	29	563

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1088	467	0	0	474	0
Stage 1	460	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Critical Hdwy	6.4	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	241	598	-	-	1099	-
Stage 1	640	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	229	591	-	-	1093	-
Mov Cap-2 Maneuver	229	-	-	-	-	-
Stage 1	636	-	-	-	-	-
Stage 2	512	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	480	1093	-
HCM Lane V/C Ratio	-	-	0.299	0.026	-
HCM Control Delay (s)	-	-	15.7	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	157	174	244	273	21
Future Vol, veh/h	17	157	174	244	273	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	212	235	330	369	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1177	377	373	0	-	0
Stage 1	373	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-	-
Pot Cap-1 Maneuver	213	667	1175	-	-	-
Stage 1	701	-	-	-	-	-
Stage 2	444	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	169	663	1171	-	-	-
Mov Cap-2 Maneuver	169	-	-	-	-	-
Stage 1	699	-	-	-	-	-
Stage 2	354	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.7	3.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1171	-	516	-	-
HCM Lane V/C Ratio	0.201	-	0.456	-	-
HCM Control Delay (s)	8.8	-	17.7	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.7	-	2.4	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	118	127	128	175	92
Future Vol, veh/h	28	118	127	128	175	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	140	151	152	208	110

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	729	277	325	0	-	0
Stage 1	270	-	-	-	-	-
Stage 2	459	-	-	-	-	-
Critical Hdwy	6.44	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	387	762	1235	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	335	753	1228	-	-	-
Mov Cap-2 Maneuver	335	-	-	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	551	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	4.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1228	-	608	-	-
HCM Lane V/C Ratio	0.123	-	0.286	-	-
HCM Control Delay (s)	8.3	-	13.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.2	-	-

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	1	0	71	0	4	0	0	0	68	90	1
Future Vol, veh/h	0	1	0	71	0	4	0	0	0	68	90	1
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0
Mvmt Flow	0	1	0	91	0	5	0	0	0	87	115	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	8.3	9.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	43%	1%	100%	0%
Vol Thru, %	57%	0%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	159	72	4	196
LT Vol	68	1	4	0
Through Vol	90	0	0	196
RT Vol	1	71	0	0
Lane Flow Rate	204	92	5	251
Geometry Grp	1	1	1	1
Degree of Util (X)	0.264	0.111	0.007	0.303
Departure Headway (Hd)	4.666	4.345	5.254	4.347
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	771	825	681	829
Service Time	2.686	2.37	3.287	2.364
HCM Lane V/C Ratio	0.265	0.112	0.007	0.303
HCM Control Delay	9.4	7.9	8.3	9.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.1	0.4	0	1.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	196	0
Future Vol, veh/h	0	0	196	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	251	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.2
HCM LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱↱	↑	↱	↰↰	↑
Traffic Volume (vph)	0	960	938	132	1021	739
Future Volume (vph)	0	960	938	132	1021	739
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2814	1845	1538	3433	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2814	1845	1538	3433	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	990	967	136	1053	762
RTOR Reduction (vph)	0	138	0	6	0	0
Lane Group Flow (vph)	0	852	967	130	1053	762
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		25.2	43.0	43.0	25.2	78.0
Effective Green, g (s)		26.1	43.9	43.9	26.1	78.0
Actuated g/C Ratio		0.33	0.56	0.56	0.33	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		941	1038	865	1148	1881
v/s Ratio Prot		0.30	c0.52		c0.31	0.41
v/s Ratio Perm				0.08		
v/c Ratio		0.90	0.93	0.15	0.92	0.41
Uniform Delay, d1		24.8	15.7	8.1	24.9	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		12.4	14.5	0.1	11.8	0.7
Delay (s)		37.2	30.2	8.2	36.7	0.7
Level of Service		D	C	A	D	A
Approach Delay (s)	37.2		27.5			21.6
Approach LOS	D		C			C

Intersection Summary				
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	877	251	446	681	5	270	22	610	6	10	7
Future Volume (vph)	26	877	251	446	681	5	270	22	610	6	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1731	1590		1727	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1731	1590		1727	1580
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	953	273	485	740	5	293	24	663	7	11	8
RTOR Reduction (vph)	0	0	147	0	0	0	0	0	74	0	0	8
Lane Group Flow (vph)	28	953	126	485	745	0	158	159	589	0	18	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.8	26.0	26.0	11.8	36.0		9.2	9.2	21.0		1.1	1.1
Effective Green, g (s)	2.3	27.0	27.0	12.4	37.0		11.0	11.0	22.2		2.1	2.1
Actuated g/C Ratio	0.03	0.39	0.39	0.18	0.54		0.16	0.16	0.32		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	60	1394	636	627	1928		275	277	515		52	48
v/s Ratio Prot	0.02	c0.27		0.14	0.21		0.09	0.09	c0.21		c0.01	
v/s Ratio Perm			0.08						0.16			0.00
v/c Ratio	0.47	0.68	0.20	0.77	0.39		0.57	0.57	1.14		0.35	0.01
Uniform Delay, d1	32.5	17.2	13.6	26.7	9.2		26.6	26.6	23.1		32.5	32.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	1.1	0.1	5.4	0.0		1.8	1.8	85.4		1.5	0.0
Delay (s)	34.6	18.3	13.7	32.1	9.2		28.4	28.4	108.6		34.0	32.2
Level of Service	C	B	B	C	A		C	C	F		C	C
Approach Delay (s)		17.7			18.2			82.6			33.4	
Approach LOS		B			B			F			C	

Intersection Summary				
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	68.5	Sum of lost time (s)	16.1	
Intersection Capacity Utilization	75.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	877	251	446	681	5	270	22	610	6	10	7
Future Volume (veh/h)	26	877	251	446	681	5	270	22	610	6	10	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1900	1881	1900	1760	1900
Adj Flow Rate, veh/h	28	953	273	485	740	5	310	0	663	7	11	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	51	961	438	480	1384	9	1384	0	810	18	29	43
Arrive On Green	0.03	0.27	0.27	0.14	0.38	0.37	0.38	0.00	0.37	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3640	25	3619	0	1598	671	1055	1586
Grp Volume(v), veh/h	28	953	273	485	363	382	310	0	663	18	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1877	1810	0	1598	1727	0	1586
Q Serve(g_s), s	1.4	23.7	13.1	12.2	14.0	14.0	5.1	0.0	30.9	0.9	0.0	0.4
Cycle Q Clear(g_c), s	1.4	23.7	13.1	12.2	14.0	14.0	5.1	0.0	30.9	0.9	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.39		1.00
Lane Grp Cap(c), veh/h	51	961	438	480	679	713	1384	0	810	47	0	43
V/C Ratio(X)	0.55	0.99	0.62	1.01	0.53	0.53	0.22	0.00	0.82	0.38	0.00	0.18
Avail Cap(c_a), veh/h	115	961	438	480	679	713	1384	0	810	78	0	72
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.4	32.1	28.2	38.1	21.3	21.3	18.4	0.0	18.4	42.3	0.0	42.0
Incr Delay (d2), s/veh	3.4	27.0	2.1	43.9	0.4	0.4	0.0	0.0	6.2	1.9	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	15.1	6.1	8.7	6.9	7.3	2.5	0.0	15.0	0.5	0.0	0.2
LnGrp Delay(d),s/veh	45.8	59.1	30.3	82.1	21.8	21.7	18.5	0.0	24.6	44.1	0.0	42.8
LnGrp LOS	D	E	C	F	C	C	B		C	D		D
Approach Vol, veh/h		1254			1230			973			26	
Approach Delay, s/veh		52.5			45.5			22.7			43.7	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	37.6		37.8	16.2	28.0		6.4
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	23.0		3.0
Max Q Clear Time (g_c+I1), s	3.4	16.0		32.9	14.2	25.7		2.9
Green Ext Time (p_c), s	0.0	4.3		0.0	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay	41.6	
HCM 2010 LOS	D	

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	114	389	69	12	166	426	335	77	622	205	241	437
Future Volume (vph)	114	389	69	12	166	426	335	77	622	205	241	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3471			1745	1863	1559	1805	1827	1555	3502	1844
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3471			668	1863	1559	1805	1827	1555	3502	1844
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	118	401	71	12	171	439	345	79	641	211	248	451
RTOR Reduction (vph)	0	17	0	0	0	0	194	0	0	143	0	5
Lane Group Flow (vph)	118	455	0	0	183	439	151	79	641	68	248	509
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.3	22.7			11.3	25.7	25.7	6.2	26.9	26.9	9.3	30.0
Effective Green, g (s)	8.0	22.9			11.0	25.9	25.9	5.9	27.8	27.8	9.0	30.9
Actuated g/C Ratio	0.09	0.26			0.13	0.30	0.30	0.07	0.32	0.32	0.10	0.36
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	161	916			84	556	465	122	585	498	363	657
v/s Ratio Prot	0.07	0.13				c0.24		0.04	c0.35		c0.07	c0.28
v/s Ratio Perm					c0.27		0.10			0.04		
v/c Ratio	0.73	0.50			2.18	0.79	0.33	0.65	1.10	0.14	0.68	0.77
Uniform Delay, d1	38.3	27.0			37.9	27.9	23.6	39.4	29.5	20.9	37.5	24.8
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.8	0.5			567.4	7.6	0.5	11.2	66.0	0.1	5.2	5.9
Delay (s)	54.1	27.5			605.2	35.5	24.1	50.6	95.5	21.1	42.7	30.7
Level of Service	D	C			F	D	C	D	F	C	D	C
Approach Delay (s)		32.8				139.2			74.8			34.6
Approach LOS		C				F			E			C

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary			
HCM 2000 Control Delay	76.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	86.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project PM.syn
12/01/2017

Synchro 9 Report
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Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	71	128	389	113	143	414	18	315	9	157	20	11
Future Volume (vph)	71	128	389	113	143	414	18	315	9	157	20	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	0.98			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	0.99		1.00	0.86			0.88
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1782	3422		1770	3550		3467	1570			3089
Flt Permitted		0.48	1.00		0.95	1.00		0.95	1.00			0.89
Satd. Flow (perm)		909	3422		1770	3550		3467	1570			2773
Peak-hour factor, PHF	0.93	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92
Adj. Flow (vph)	76	139	418	122	154	445	20	339	10	169	22	12
RTOR Reduction (vph)	0	0	28	0	0	2	0	0	120	0	0	134
Lane Group Flow (vph)	0	215	512	0	154	463	0	339	59	0	0	47
Confl. Peds. (#/hr)				3	5			3		5		
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	2%	1%	2%	2%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2									4	
Actuated Green, G (s)		33.9	33.9		11.5	48.9		12.1	23.1			7.0
Effective Green, g (s)		33.9	33.9		11.0	48.9		12.1	23.1			7.0
Actuated g/C Ratio		0.42	0.42		0.14	0.61		0.15	0.29			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		385	1450		243	2169		524	453			242
v/s Ratio Prot			0.15		c0.09	0.13		c0.10	0.04			
v/s Ratio Perm		c0.24										c0.02
v/c Ratio		0.56	0.35		0.63	0.21		0.65	0.13			0.19
Uniform Delay, d1		17.4	15.6		32.6	7.0		31.9	21.0			33.9
Progression Factor		1.00	1.00		0.91	1.24		1.00	1.00			1.00
Incremental Delay, d2		5.7	0.7		3.9	0.2		2.1	0.1			0.4
Delay (s)		23.1	16.3		33.4	8.9		34.0	21.2			34.3
Level of Service		C	B		C	A		C	C			C
Approach Delay (s)			18.2			15.0			29.6			34.3
Approach LOS			B			B			C			C

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd
Cumulative + Project PM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	135
Future Volume (vph)	135
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	147
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	508	58	109	472	0	103	0	98	0	0	0
Future Volume (vph)	0	508	58	109	472	0	103	0	98	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.98			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3471		1752	3574			1746	1544			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3471		1752	3574			1392	1544			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	571	65	122	530	0	116	0	110	0	0	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	95	0	0	0
Lane Group Flow (vph)	0	629	0	122	530	0	0	116	15	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6		6	2		2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		49.4		8.1	61.0			11.0	11.0			
Effective Green, g (s)		49.4		7.6	61.0			11.0	11.0			
Actuated g/C Ratio		0.62		0.09	0.76			0.14	0.14			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2143		166	2725			191	212			
v/s Ratio Prot		c0.18		c0.07	0.15							
v/s Ratio Perm								c0.08	0.01			
v/c Ratio		0.29		0.73	0.19			0.61	0.07			
Uniform Delay, d1		7.1		35.2	2.6			32.5	30.1			
Progression Factor		0.74		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.3		13.5	0.2			3.7	0.1			
Delay (s)		5.6		48.7	2.8			36.2	30.1			
Level of Service		A		D	A			D	C			
Approach Delay (s)		5.6			11.4			33.2			0.0	
Approach LOS		A			B			C			A	

Intersection Summary				
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	42.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	508	58	109	472	0	103	0	98	0	0	0
Future Volume (veh/h)	0	508	58	109	472	0	103	0	98	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	571	65	122	530	0	116	0	110	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	2107	239	143	2821	0	245	0	172	0	210	0
Arrive On Green	0.00	0.88	0.88	0.08	0.79	0.00	0.11	0.00	0.11	0.00	0.00	0.00
Sat Flow, veh/h	0	3296	364	1757	3668	0	1404	0	1558	0	1900	0
Grp Volume(v), veh/h	0	315	321	122	530	0	116	0	110	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1797	1757	1787	0	1404	0	1558	0	1900	0
Q Serve(g_s), s	0.0	2.3	2.3	5.5	2.9	0.0	6.4	0.0	5.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	2.3	2.3	5.5	2.9	0.0	6.4	0.0	5.4	0.0	0.0	0.0
Prop In Lane	0.00		0.20	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1164	1182	143	2821	0	245	0	172	0	210	0
V/C Ratio(X)	0.00	0.27	0.27	0.85	0.19	0.00	0.47	0.00	0.64	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1164	1182	351	2821	0	476	0	428	0	523	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.94	0.94	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.9	1.9	36.3	2.1	0.0	34.5	0.0	34.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	5.4	0.1	0.0	0.5	0.0	1.5	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.2	1.3	2.9	1.5	0.0	2.5	0.0	2.4	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	2.4	2.4	41.6	2.2	0.0	35.0	0.0	35.5	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		D		D			
Approach Vol, veh/h		636			652			226			0	
Approach Delay, s/veh		2.4			9.6			35.3			0.0	
Approach LOS		A			A			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	10.5	56.6		12.8		67.2		12.8
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	16.5	30.0		22.0		50.0		22.0
Max Q Clear Time (g_c+I1), s	7.5	4.3		0.0		4.9		8.4
Green Ext Time (p_c), s	0.0	10.1		0.0		12.1		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	10.4
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	19.6
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	437	72	0	54	31	6	51	435
Future Vol, veh/h	0	437	72	0	54	31	6	51	435
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2	0	0	0	0	2
Mvmt Flow	0	491	81	0	61	35	7	57	489
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	15.3	11.2	25.4
HCM LOS	C	B	D

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	219	219	72	54	31	57	435
LT Vol	219	219	0	0	0	57	0
Through Vol	0	0	72	54	0	0	0
RT Vol	0	0	0	0	31	0	435
Lane Flow Rate	246	246	81	61	35	64	489
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.486	0.484	0.109	0.13	0.067	0.125	0.792
Departure Headway (Hd)	7.128	7.093	4.855	7.691	6.969	7.04	5.837
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	503	506	733	463	510	507	616
Service Time	4.892	4.858	2.619	5.49	4.768	4.809	3.605
HCM Lane V/C Ratio	0.489	0.486	0.111	0.132	0.069	0.126	0.794
HCM Control Delay	16.5	16.4	8.2	11.7	10.3	10.8	27.3
HCM Lane LOS	C	C	A	B	B	B	D
HCM 95th-tile Q	2.6	2.6	0.4	0.4	0.2	0.4	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	0	185	62	20	26	189	1651	4	17	1534	205
Future Volume (vph)	219	0	185	62	20	26	189	1651	4	17	1534	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1456		1715	1662		1805	3573		1805	3574	1583
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1456		1715	1662		1805	3573		1805	3574	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	0	191	64	21	27	195	1702	4	18	1581	211
RTOR Reduction (vph)	0	160	0	0	25	0	0	0	0	0	0	90
Lane Group Flow (vph)	203	54	0	57	30	0	195	1706	0	18	1581	121
Confl. Peds. (#/hr)			7	7			7		7			
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	14.4	14.4		5.4	5.4		10.4	49.4		2.7	41.7	41.7
Effective Green, g (s)	14.6	14.6		5.6	5.6		10.1	50.3		2.4	42.6	42.6
Actuated g/C Ratio	0.16	0.16		0.06	0.06		0.11	0.57		0.03	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	278	239		108	104		205	2021		48	1712	758
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.11	0.48		0.01	c0.44	
v/s Ratio Perm												0.08
v/c Ratio	0.73	0.23		0.53	0.29		0.95	0.84		0.38	0.92	0.16
Uniform Delay, d1	35.3	32.3		40.4	39.7		39.2	16.0		42.5	21.6	13.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.8	0.6		5.9	2.1		48.8	3.7		4.9	9.1	0.2
Delay (s)	45.0	32.8		46.3	41.8		88.0	19.7		47.4	30.7	13.2
Level of Service	D	C		D	D		F	B		D	C	B
Approach Delay (s)		38.8			44.1			26.7			28.8	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	88.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	219	0	185	62	20	26	189	1651	4	17	1534	205
Future Volume (veh/h)	219	0	185	62	20	26	189	1651	4	17	1534	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1817	1900	1900	1900	1900	1900	1881	1900	1900	1881	1863
Adj Flow Rate, veh/h	208	24	191	56	32	27	195	1702	4	18	1581	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	1	0	1	2
Cap, veh/h	301	29	232	140	73	61	207	1999	5	45	1634	724
Arrive On Green	0.17	0.17	0.17	0.08	0.08	0.08	0.11	0.55	0.54	0.02	0.46	0.00
Sat Flow, veh/h	1792	173	1379	1810	941	794	1810	3658	9	1810	3574	1583
Grp Volume(v), veh/h	208	0	215	56	0	59	195	831	875	18	1581	0
Grp Sat Flow(s),veh/h/ln	1792	0	1553	1810	0	1735	1810	1787	1880	1810	1787	1583
Q Serve(g_s), s	9.6	0.0	11.7	2.6	0.0	2.8	9.4	34.5	34.5	0.9	37.7	0.0
Cycle Q Clear(g_c), s	9.6	0.0	11.7	2.6	0.0	2.8	9.4	34.5	34.5	0.9	37.7	0.0
Prop In Lane	1.00		0.89	1.00		0.46	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	301	0	261	140	0	134	207	977	1027	45	1634	724
V/C Ratio(X)	0.69	0.00	0.82	0.40	0.00	0.44	0.94	0.85	0.85	0.40	0.97	0.00
Avail Cap(c_a), veh/h	344	0	298	149	0	143	207	977	1027	145	1634	724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.2	0.0	35.2	38.4	0.0	38.6	38.5	16.8	16.8	42.0	23.1	0.0
Incr Delay (d2), s/veh	5.3	0.0	15.7	2.6	0.0	3.2	46.5	7.7	7.4	5.6	15.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	6.2	1.4	0.0	1.5	7.3	18.9	19.8	0.5	21.9	0.0
LnGrp Delay(d),s/veh	39.6	0.0	51.0	41.0	0.0	41.8	85.0	24.5	24.2	47.6	38.5	0.0
LnGrp LOS	D		D	D		D	F	C	C	D	D	
Approach Vol, veh/h		423			115			1901			1599	
Approach Delay, s/veh		45.4			41.4			30.6			38.6	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.7	14.0	44.0		10.8	6.2	51.8
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 17	10.3	39.1		7.0	7.3	42.1
Max Q Clear Time (g_c+I1), s		13.7	11.4	39.7		4.8	2.9	36.5
Green Ext Time (p_c), s		0.7	0.0	0.0		0.1	0.0	5.5

Intersection Summary	
HCM 2010 Ctrl Delay	35.6
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	869	18	27	18	6	54	10	1919	19	55	1697	493
Future Volume (vph)	869	18	27	18	6	54	10	1919	19	55	1697	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1727		1715	1761	1524	1805	3531		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1727		1715	1761	1524	1805	3531		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	28	18	6	55	10	1958	19	56	1732	503
RTOR Reduction (vph)	0	21	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	25	0	12	12	3	10	1977	0	56	1732	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	36.2	36.2		6.6	6.6	6.6	1.5	74.5		6.2	79.7	141.4
Effective Green, g (s)	36.8	36.8		6.8	6.8	6.8	1.2	75.4		6.4	80.6	141.4
Actuated g/C Ratio	0.26	0.26		0.05	0.05	0.05	0.01	0.53		0.05	0.57	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	902	449		82	84	73	15	1882		81	2037	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	c0.56		c0.03	0.48	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.98	0.06		0.15	0.14	0.04	0.67	1.05		0.69	0.85	0.31
Uniform Delay, d1	52.0	39.3		64.5	64.5	64.2	69.9	33.0		66.5	25.4	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	25.9	0.1		1.4	1.4	0.4	75.9	35.4		22.5	4.0	0.5
Delay (s)	77.8	39.4		65.9	65.9	64.5	145.8	68.4		89.0	29.3	0.5
Level of Service	E	D		E	E	E	F	E		F	C	A
Approach Delay (s)		76.0			64.9			68.8			24.5	
Approach LOS		E			E			E			C	

Intersection Summary			
HCM 2000 Control Delay	50.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	141.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection

Int Delay, s/veh 6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Vol, veh/h	146	1	18	4	0	4	10	462	0	1	468	84
Future Vol, veh/h	146	1	18	4	0	4	10	462	0	1	468	84
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	160	1	20	4	0	4	11	508	0	1	514	92

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	855	1106	319	803	1152	267	615	0	0	513	0	0
Stage 1	571	571	-	535	535	-	-	-	-	-	-	-
Stage 2	284	535	-	268	617	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	252	212	659	278	199	737	974	-	-	1063	-	-
Stage 1	473	508	-	502	527	-	-	-	-	-	-	-
Stage 2	699	527	-	720	484	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	244	206	650	262	194	729	968	-	-	1056	-	-
Mov Cap-2 Maneuver	244	206	-	262	194	-	-	-	-	-	-	-
Stage 1	462	504	-	492	516	-	-	-	-	-	-	-
Stage 2	679	516	-	691	480	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	44.7	14.6	0.3	0
HCM LOS	E	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	968	-	-	262	385	1056	-	-
HCM Lane V/C Ratio	0.011	-	-	0.692	0.023	0.001	-	-
HCM Control Delay (s)	8.8	0.1	-	44.7	14.6	8.4	0	-
HCM Lane LOS	A	A	-	E	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	4.6	0.1	0	-	-

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↔			↔	
Traffic Vol, veh/h	109	499	16	6	454	29	10	6	4	6	3	117
Future Vol, veh/h	109	499	16	6	454	29	10	6	4	6	3	117
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	116	531	17	6	483	31	11	6	4	6	3	124

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	518	0	0	565	0	0	1057	1319	308	1033	1312	274
Stage 1	-	-	-	-	-	-	788	788	-	515	515	-
Stage 2	-	-	-	-	-	-	269	531	-	518	797	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1051	-	-	1017	-	-	182	158	694	189	160	724
Stage 1	-	-	-	-	-	-	355	405	-	516	538	-
Stage 2	-	-	-	-	-	-	719	529	-	514	401	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1040	-	-	1003	-	-	131	137	674	162	139	714
Mov Cap-2 Maneuver	-	-	-	-	-	-	131	137	-	162	139	-
Stage 1	-	-	-	-	-	-	311	355	-	457	533	-
Stage 2	-	-	-	-	-	-	580	524	-	439	351	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0.1	31.1	13.3
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	159	1040	-	-	1003	-	-	566
HCM Lane V/C Ratio	0.134	0.111	-	-	0.006	-	-	0.237
HCM Control Delay (s)	31.1	8.9	-	-	8.6	-	-	13.3
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.4	-	-	0	-	-	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1027	115	16	665	140	36
Future Volume (vph)	1027	115	16	665	140	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1749	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1749	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1104	124	17	715	151	39
RTOR Reduction (vph)	0	44	0	0	11	0
Lane Group Flow (vph)	1104	80	17	715	179	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	52.5	52.5	1.4	58.1	12.2	
Effective Green, g (s)	52.5	52.5	1.4	58.1	12.2	
Actuated g/C Ratio	0.65	0.65	0.02	0.72	0.15	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1216	1012	31	1333	262	
v/s Ratio Prot	c0.59		0.01	c0.38	c0.10	
v/s Ratio Perm		0.05				
v/c Ratio	0.91	0.08	0.55	0.54	0.68	
Uniform Delay, d1	12.3	5.3	39.6	5.3	32.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.1	0.0	10.2	0.5	5.7	
Delay (s)	22.4	5.4	49.8	5.8	38.4	
Level of Service	C	A	D	A	D	
Approach Delay (s)	20.7			6.8	38.4	
Approach LOS	C			A	D	

Intersection Summary				
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	81.2	Sum of lost time (s)	15.1	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1027	115	16	665	140	36
Future Volume (veh/h)	1027	115	16	665	140	36
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1870	1900
Adj Flow Rate, veh/h	1104	124	17	715	151	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	0	2	0	0
Cap, veh/h	1258	1047	29	1381	198	0
Arrive On Green	0.67	0.67	0.02	0.74	0.11	0.00
Sat Flow, veh/h	1881	1566	1810	1863	1770	0
Grp Volume(v), veh/h	1104	124	17	715	152	0
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1782	0
Q Serve(g_s), s	34.9	2.1	0.7	11.9	6.1	0.0
Cycle Q Clear(g_c), s	34.9	2.1	0.7	11.9	6.1	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1258	1047	29	1381	199	0
V/C Ratio(X)	0.88	0.12	0.59	0.52	0.76	0.00
Avail Cap(c_a), veh/h	1343	1118	98	1536	433	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.8	4.4	36.2	4.0	32.0	0.0
Incr Delay (d2), s/veh	6.8	0.1	6.9	0.4	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.2	0.9	0.4	6.1	3.1	0.0
LnGrp Delay(d),s/veh	16.6	4.5	43.1	4.4	34.3	0.0
LnGrp LOS	B	A	D	A	C	
Approach Vol, veh/h	1228			732	152	
Approach Delay, s/veh	15.4			5.3	34.3	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.4	55.9				61.3		12.8
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	52.9				61.1		18.0
Max Q Clear Time (g_c+I1), s	2.7	36.9				13.9		8.1
Green Ext Time (p_c), s	0.0	12.6				27.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Notes

Intersection

Int Delay, s/veh 5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	57	971	27	16	596	19	27	1	28	14	2	46
Future Vol, veh/h	57	971	27	16	596	19	27	1	28	14	2	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	64	1091	30	18	670	21	30	1	31	16	2	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	691	0	0	1091	0	0	1936	1946	1091	1936	1935	680
Stage 1	-	-	-	-	-	-	1219	1219	-	716	716	-
Stage 2	-	-	-	-	-	-	717	727	-	1220	1219	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	913	-	-	647	-	-	50	66	264	50	67	454
Stage 1	-	-	-	-	-	-	223	255	-	424	437	-
Stage 2	-	-	-	-	-	-	424	432	-	222	255	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	913	-	-	647	-	-	40	60	264	40	61	454
Mov Cap-2 Maneuver	-	-	-	-	-	-	40	60	-	40	61	-
Stage 1	-	-	-	-	-	-	207	237	-	394	425	-
Stage 2	-	-	-	-	-	-	363	420	-	181	237	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	126.2	47.4
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	40	264	913	-	-	647	-	-	42	454
HCM Lane V/C Ratio	0.787	0.119	0.07	-	-	0.028	-	-	0.428	0.114
HCM Control Delay (s)	231.8	20.5	9.2	-	-	10.7	-	-	143.9	13.9
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	2.9	0.4	0.2	-	-	0.1	-	-	1.5	0.4

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	39	1	7	864	634	40
Future Vol, veh/h	39	1	7	864	634	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	41	1	7	909	667	42

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1591	667	667	0	-	0
Stage 1	667	-	-	-	-	-
Stage 2	924	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	119	462	932	-	-	-
Stage 1	514	-	-	-	-	-
Stage 2	390	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	117	462	932	-	-	-
Mov Cap-2 Maneuver	117	-	-	-	-	-
Stage 1	514	-	-	-	-	-
Stage 2	384	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	51	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	932	-	119	-	-
HCM Lane V/C Ratio	0.008	-	0.354	-	-
HCM Control Delay (s)	8.9	0	51	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0	-	1.4	-	-

Intersection

Int Delay, s/veh 1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	27	58	453	43	30	490
Future Vol, veh/h	27	58	453	43	30	490
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	28	61	477	45	32	516

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1090	510	0	0	528	0
Stage 1	505	-	-	-	-	-
Stage 2	585	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	240	567	-	-	1049	-
Stage 1	610	-	-	-	-	-
Stage 2	561	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	227	562	-	-	1045	-
Mov Cap-2 Maneuver	227	-	-	-	-	-
Stage 1	607	-	-	-	-	-
Stage 2	534	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.2	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	383	1045	-
HCM Lane V/C Ratio	-	-	0.234	0.03	-
HCM Control Delay (s)	-	-	17.2	8.6	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	121	131	394	361	28
Future Vol, veh/h	14	121	131	394	361	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	133	144	433	397	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1126	405	401	0	-	0
Stage 1	401	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-	-
Pot Cap-1 Maneuver	229	648	1169	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	483	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	199	644	1165	-	-	-
Mov Cap-2 Maneuver	199	-	-	-	-	-
Stage 1	679	-	-	-	-	-
Stage 2	422	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1165	-	523	-	-
HCM Lane V/C Ratio	0.124	-	0.284	-	-
HCM Control Delay (s)	8.5	-	14.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.2	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	136	109	299	247	17
Future Vol, veh/h	27	136	109	299	247	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	145	116	318	263	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	832	282	286	0	-	0
Stage 1	277	-	-	-	-	-
Stage 2	555	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	342	757	1282	-	-	-
Stage 1	774	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	308	751	1277	-	-	-
Mov Cap-2 Maneuver	308	-	-	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	524	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1277	-	607	-	-
HCM Lane V/C Ratio	0.091	-	0.286	-	-
HCM Control Delay (s)	8.1	-	13.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.2	-	-

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	2	1	121	0	3	0	0	0	138	178	3
Future Vol, veh/h	0	2	1	121	0	3	0	0	0	138	178	3
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0
Mvmt Flow	0	2	1	133	0	3	0	0	0	152	196	3
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.4	8.5	11
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	43%	2%	100%	1%
Vol Thru, %	56%	1%	0%	99%
Vol Right, %	1%	98%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	319	124	3	146
LT Vol	138	2	3	1
Through Vol	178	1	0	145
RT Vol	3	121	0	0
Lane Flow Rate	351	136	3	160
Geometry Grp	1	1	1	1
Degree of Util (X)	0.438	0.17	0.005	0.205
Departure Headway (Hd)	4.495	4.479	5.451	4.605
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	799	800	654	778
Service Time	2.527	2.516	3.505	2.642
HCM Lane V/C Ratio	0.439	0.17	0.005	0.206
HCM Control Delay	11	8.4	8.5	8.8
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2.2	0.6	0	0.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	145	0
Future Vol, veh/h	0	1	145	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	159	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.8
HCM LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱↱	↑	↱	↰↑	↑
Traffic Volume (vph)	0	907	942	83	968	948
Future Volume (vph)	0	907	942	83	968	948
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	935	971	86	998	977
RTOR Reduction (vph)	0	138	0	6	0	0
Lane Group Flow (vph)	0	797	971	80	998	977
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		19.1	34.7	34.7	19.1	63.6
Effective Green, g (s)		20.0	35.6	35.6	20.0	63.6
Actuated g/C Ratio		0.31	0.56	0.56	0.31	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		893	1052	903	1090	1881
v/s Ratio Prot		0.28	c0.52		c0.29	0.52
v/s Ratio Perm				0.05		
v/c Ratio		0.89	0.92	0.09	0.92	0.52
Uniform Delay, d1		20.8	12.8	6.5	21.0	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		11.7	13.2	0.1	12.1	1.0
Delay (s)		32.5	25.9	6.5	33.1	1.0
Level of Service		C	C	A	C	A
Approach Delay (s)	32.5		24.4			17.2
Approach LOS	C		C			B

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	63.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	757	270	500	674	3	217	17	470	2	17	14
Future Volume (vph)	25	757	270	500	674	3	217	17	470	2	17	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (prot)	1805	3574	1593	3467	3607		1698	1716	1575		1891	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (perm)	1805	3574	1593	3467	3607		1698	1716	1575		1891	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	27	805	287	532	717	3	231	18	500	2	18	15
RTOR Reduction (vph)	0	0	185	0	0	0	0	0	93	0	0	15
Lane Group Flow (vph)	27	805	102	532	720	0	125	124	407	0	20	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.7	21.8	21.8	13.2	33.3		8.0	8.0	21.2		1.0	1.0
Effective Green, g (s)	2.2	22.8	22.8	13.8	34.3		9.8	9.8	22.4		2.0	2.0
Actuated g/C Ratio	0.03	0.35	0.35	0.21	0.53		0.15	0.15	0.35		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	61	1265	563	742	1921		258	261	547		58	50
v/s Ratio Prot	0.01	c0.23		0.15	0.20		0.07	0.07	c0.16		c0.01	
v/s Ratio Perm			0.06						0.10			0.00
v/c Ratio	0.44	0.64	0.18	0.72	0.37		0.48	0.48	0.74		0.34	0.01
Uniform Delay, d1	30.5	17.3	14.4	23.5	8.8		25.0	24.9	18.5		30.6	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.8	0.1	2.8	0.0		0.5	0.5	4.8		1.3	0.0
Delay (s)	32.4	18.1	14.4	26.3	8.8		25.5	25.4	23.3		31.9	30.3
Level of Service	C	B	B	C	A		C	C	C		C	C
Approach Delay (s)		17.5			16.2			24.0			31.2	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	64.4	Sum of lost time (s)	16.1	
Intersection Capacity Utilization	63.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	757	270	500	674	3	217	17	470	2	17	14
Future Volume (veh/h)	25	757	270	500	674	3	217	17	470	2	17	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	805	287	532	717	3	244	0	500	2	18	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	54	942	420	637	1534	6	1097	0	743	6	58	55
Arrive On Green	0.03	0.26	0.26	0.18	0.42	0.40	0.31	0.00	0.29	0.03	0.03	0.03
Sat Flow, veh/h	1810	3574	1592	3476	3686	15	3583	0	1562	189	1701	1615
Grp Volume(v), veh/h	27	805	287	532	351	369	244	0	500	20	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1592	1738	1805	1897	1792	0	1562	1891	0	1615
Q Serve(g_s), s	1.1	16.1	12.2	11.1	10.6	10.6	3.8	0.0	18.6	0.8	0.0	0.7
Cycle Q Clear(g_c), s	1.1	16.1	12.2	11.1	10.6	10.6	3.8	0.0	18.6	0.8	0.0	0.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	54	942	420	637	751	789	1097	0	743	64	0	55
V/C Ratio(X)	0.50	0.85	0.68	0.83	0.47	0.47	0.22	0.00	0.67	0.31	0.00	0.27
Avail Cap(c_a), veh/h	132	1008	449	694	751	789	1611	0	967	101	0	86
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.9	26.3	24.9	29.6	15.9	15.9	19.4	0.0	15.3	35.5	0.0	35.4
Incr Delay (d2), s/veh	2.7	6.4	3.0	7.4	0.2	0.2	0.0	0.0	0.5	1.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.8	5.7	6.0	5.3	5.6	1.9	0.0	8.1	0.4	0.0	0.3
LnGrp Delay(d),s/veh	38.6	32.7	27.9	37.0	16.1	16.1	19.5	0.0	15.9	36.5	0.0	36.4
LnGrp LOS	D	C	C	D	B	B	B		B	D		D
Approach Vol, veh/h		1119			1252			744			35	
Approach Delay, s/veh		31.6			25.0			17.0			36.4	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.3	35.3		27.0	17.8	23.8		6.6
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 14	20.2		3.0
Max Q Clear Time (g_c+I1), s	3.1	12.6		20.6	13.1	18.1		2.8
Green Ext Time (p_c), s	0.0	4.1		0.5	0.1	0.7		0.0

Intersection Summary			
HCM 2010 Ctrl Delay	25.6		
HCM 2010 LOS	C		

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	133	396	69	8	212	395	333	71	561	189	326	568
Future Volume (vph)	133	396	69	8	212	395	333	71	561	189	326	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3508			1795	1881	1555	1805	1863	1589	3502	1847
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3508			687	1881	1555	1805	1863	1589	3502	1847
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	134	400	70	8	214	399	336	72	567	191	329	574
RTOR Reduction (vph)	0	17	0	0	0	0	204	0	0	129	0	4
Lane Group Flow (vph)	134	453	0	0	222	399	132	72	567	62	329	625
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.3	21.4			11.3	24.4	24.4	6.3	27.0	27.0	9.3	30.0
Effective Green, g (s)	8.0	21.6			11.0	24.6	24.6	6.0	27.9	27.9	9.0	30.9
Actuated g/C Ratio	0.09	0.25			0.13	0.29	0.29	0.07	0.33	0.33	0.11	0.36
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	167	886			88	541	447	126	607	518	368	667
v/s Ratio Prot	0.07	0.13				c0.21		0.04	0.30		c0.09	c0.34
v/s Ratio Perm					c0.32		0.08			0.04		
v/c Ratio	0.80	0.51			2.52	0.74	0.29	0.57	0.93	0.12	0.89	0.94
Uniform Delay, d1	38.0	27.4			37.2	27.5	23.7	38.5	27.9	20.2	37.8	26.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.5	0.6			717.6	5.4	0.4	6.1	21.8	0.1	23.0	20.9
Delay (s)	61.5	28.0			754.8	32.9	24.1	44.6	49.7	20.3	60.7	47.3
Level of Service	E	C			F	C	C	D	D	C	E	D
Approach Delay (s)		35.4				197.3			42.5			51.9
Approach LOS		D				F			D			D

Intersection Summary			
HCM 2000 Control Delay	88.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	85.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Cumulative + Project Saturday.syn

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	84	200	298	160	163	367	29	298	13	164	27	16
Future Volume (vph)	84	200	298	160	163	367	29	298	13	164	27	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.97			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.95		1.00	0.99		1.00	0.86			0.88
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1780	3391		1787	3563		3467	1565			3087
Flt Permitted		0.51	1.00		0.95	1.00		0.95	1.00			0.89
Satd. Flow (perm)		951	3391		1787	3563		3467	1565			2769
Peak-hour factor, PHF	0.95	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	88	217	314	168	172	386	32	314	14	173	29	17
RTOR Reduction (vph)	0	0	67	0	0	4	0	0	127	0	0	191
Lane Group Flow (vph)	0	305	415	0	172	414	0	314	60	0	0	64
Confl. Peds. (#/hr)				5	9			5		9		
Confl. Bikes (#/hr)				11						11		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	2%	1%	2%	1%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2									4	
Actuated Green, G (s)		40.8	40.8		13.6	57.9		12.4	24.1			7.7
Effective Green, g (s)		40.8	40.8		13.1	57.9		12.4	24.1			7.7
Actuated g/C Ratio		0.45	0.45		0.15	0.64		0.14	0.27			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		431	1537		260	2292		477	419			236
v/s Ratio Prot			0.12		c0.10	0.12		c0.09	0.04			
v/s Ratio Perm		c0.32										c0.02
v/c Ratio		0.71	0.27		0.66	0.18		0.66	0.14			0.27
Uniform Delay, d1		19.8	15.3		36.4	6.5		36.8	25.1			38.5
Progression Factor		1.00	1.00		0.98	1.37		1.00	1.00			1.00
Incremental Delay, d2		9.4	0.4		4.8	0.2		2.5	0.2			0.6
Delay (s)		29.2	15.8		40.2	9.1		39.3	25.3			39.1
Level of Service		C	B		D	A		D	C			D
Approach Delay (s)			21.0			18.2			34.1			39.1
Approach LOS			C			B			C			D

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd
Cumulative + Project Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	192
Future Volume (vph)	192
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	209
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Cumulative + Project Saturday.syn

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	447	42	112	481	0	78	0	75	0	0	0
Future Volume (vph)	0	447	42	112	481	0	78	0	75	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.95			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3554		1805	3574			1794	1525			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3554		1805	3574			1430	1525			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	491	46	123	529	0	86	0	82	0	0	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	74	0	0	0
Lane Group Flow (vph)	0	533	0	123	529	0	0	86	8	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10						10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		60.1		9.6	73.2			8.8	8.8			
Effective Green, g (s)		60.1		9.1	73.2			8.8	8.8			
Actuated g/C Ratio		0.67		0.10	0.81			0.10	0.10			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2373		182	2906			139	149			
v/s Ratio Prot		c0.15		c0.07	0.15							
v/s Ratio Perm								c0.06	0.01			
v/c Ratio		0.22		0.68	0.18			0.62	0.05			
Uniform Delay, d1		5.8		39.0	1.8			39.0	36.8			
Progression Factor		0.92		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		7.6	0.1			5.7	0.1			
Delay (s)		5.6		46.6	2.0			44.6	36.9			
Level of Service		A		D	A			D	D			
Approach Delay (s)		5.6			10.4			40.9			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	34.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	447	42	112	481	0	78	0	75	0	0	0
Future Volume (veh/h)	0	447	42	112	481	0	78	0	75	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	491	46	123	529	0	86	0	82	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	2341	219	145	2959	0	200	0	126	0	158	0
Arrive On Green	0.00	0.70	0.70	0.08	0.83	0.00	0.08	0.00	0.08	0.00	0.00	0.00
Sat Flow, veh/h	0	3424	311	1810	3668	0	1440	0	1516	0	1900	0
Grp Volume(v), veh/h	0	265	272	123	529	0	86	0	82	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1835	1810	1787	0	1440	0	1516	0	1900	0
Q Serve(g_s), s	0.0	4.6	4.6	6.0	2.7	0.0	5.2	0.0	4.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	4.6	4.6	6.0	2.7	0.0	5.2	0.0	4.7	0.0	0.0	0.0
Prop In Lane	0.00		0.17	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1269	1291	145	2959	0	200	0	126	0	158	0
V/C Ratio(X)	0.00	0.21	0.21	0.85	0.18	0.00	0.43	0.00	0.65	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1269	1291	402	2959	0	448	0	387	0	486	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.96	0.96	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	4.6	4.7	40.9	1.6	0.0	40.2	0.0	40.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.4	5.2	0.1	0.0	0.5	0.0	2.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.4	2.5	3.2	1.4	0.0	2.1	0.0	2.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	5.0	5.0	46.1	1.7	0.0	40.8	0.0	42.1	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		D		D			
Approach Vol, veh/h		537			652			168			0	
Approach Delay, s/veh		5.0			10.1			41.4			0.0	
Approach LOS		A			B			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	11.2	67.3		11.5		78.5		11.5
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	20.5	35.0		23.0		59.0		23.0
Max Q Clear Time (g_c+I1), s	8.0	6.6		0.0		4.7		7.2
Green Ext Time (p_c), s	0.0	9.9		0.0		11.5		0.4

Intersection Summary	
HCM 2010 Ctrl Delay	11.9
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	17.1
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations									
Traffic Vol, veh/h	0	334	67	0	51	27	2	45	465
Future Vol, veh/h	0	334	67	0	51	27	2	45	465
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	359	72	0	55	29	2	48	500
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	12.5	10.6	21.6
HCM LOS	B	B	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	167	167	67	51	27	47	465
LT Vol	167	167	0	0	0	47	0
Through Vol	0	0	67	51	0	0	0
RT Vol	0	0	0	0	27	0	465
Lane Flow Rate	180	180	72	55	29	51	500
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.347	0.346	0.094	0.111	0.054	0.093	0.752
Departure Headway (Hd)	6.963	6.945	4.71	7.267	6.705	6.616	5.414
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	515	517	758	491	532	541	665
Service Time	4.713	4.696	2.459	5.039	4.476	4.362	3.159
HCM Lane V/C Ratio	0.35	0.348	0.095	0.112	0.055	0.094	0.752
HCM Control Delay	13.4	13.4	8	11	9.9	10	22.8
HCM Lane LOS	B	B	A	B	A	A	C
HCM 95th-tile Q	1.5	1.5	0.3	0.4	0.2	0.3	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	7	204	42	11	9	223	1546	7	5	1670	289
Future Volume (vph)	271	7	204	42	11	9	223	1546	7	5	1670	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1562		1715	1683		1787	3570		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1562		1715	1683		1787	3570		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	206	42	11	9	225	1562	7	5	1687	292
RTOR Reduction (vph)	0	170	0	0	9	0	0	0	0	0	0	115
Lane Group Flow (vph)	247	70	0	31	22	0	225	1569	0	5	1687	177
Confl. Bikes (#/hr)						3						3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.2	15.2		3.9	3.9		11.4	51.7		1.3	41.6	41.6
Effective Green, g (s)	15.4	15.4		4.1	4.1		11.1	52.6		1.0	42.5	42.5
Actuated g/C Ratio	0.17	0.17		0.05	0.05		0.12	0.59		0.01	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	293	269		78	77		222	2107		20	1704	753
v/s Ratio Prot	c0.15	0.04		c0.02	0.01		c0.13	0.44		0.00	c0.47	
v/s Ratio Perm												0.11
v/c Ratio	0.84	0.26		0.40	0.29		1.01	0.74		0.25	0.99	0.24
Uniform Delay, d1	35.7	31.9		41.3	41.1		39.0	13.3		43.7	23.1	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.7	0.6		4.5	2.9		63.9	1.7		6.5	19.4	0.3
Delay (s)	55.4	32.5		45.8	43.9		102.9	15.0		50.2	42.5	14.0
Level of Service	E	C		D	D		F	B		D	D	B
Approach Delay (s)		44.1			44.9			26.0			38.3	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	7	204	42	11	9	223	1546	7	5	1670	289
Future Volume (veh/h)	271	7	204	42	11	9	223	1546	7	5	1670	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1898	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	244	50	206	31	26	9	225	1562	7	5	1687	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	321	58	240	120	89	31	225	2066	9	10	1597	722
Arrive On Green	0.18	0.18	0.18	0.07	0.07	0.06	0.13	0.57	0.56	0.01	0.45	0.00
Sat Flow, veh/h	1792	325	1337	1810	1342	465	1792	3647	16	1810	3574	1615
Grp Volume(v), veh/h	244	0	256	31	0	35	225	765	804	5	1687	0
Grp Sat Flow(s),veh/h/ln	1792	0	1662	1810	0	1807	1792	1786	1877	1810	1787	1615
Q Serve(g_s), s	11.4	0.0	13.1	1.4	0.0	1.6	11.0	28.5	28.5	0.2	39.2	0.0
Cycle Q Clear(g_c), s	11.4	0.0	13.1	1.4	0.0	1.6	11.0	28.5	28.5	0.2	39.2	0.0
Prop In Lane	1.00		0.80	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	321	0	298	120	0	119	225	1012	1064	10	1597	722
V/C Ratio(X)	0.76	0.00	0.86	0.26	0.00	0.29	1.00	0.76	0.76	0.48	1.06	0.00
Avail Cap(c_a), veh/h	339	0	315	149	0	148	225	1012	1064	144	1597	722
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.2	0.0	35.0	38.9	0.0	39.0	38.4	14.4	14.4	43.5	24.3	0.0
Incr Delay (d2), s/veh	9.6	0.0	20.3	1.6	0.0	1.9	60.4	3.7	3.5	30.8	39.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	7.7	0.8	0.0	0.9	9.1	14.8	15.6	0.2	27.7	0.0
LnGrp Delay(d),s/veh	43.8	0.0	55.4	40.5	0.0	40.9	98.7	18.1	17.9	74.3	63.2	0.0
LnGrp LOS	D		E	D		D	F	B	B	E	F	
Approach Vol, veh/h		500			66			1794			1692	
Approach Delay, s/veh		49.7			40.7			28.1			63.3	
Approach LOS		D			D			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		19.7	15.0	43.2		9.8	4.5	53.7
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 16	11.3	38.3		7.0	7.3	42.3
Max Q Clear Time (g_c+I1), s		15.1	13.0	41.2		3.6	2.2	30.5
Green Ext Time (p_c), s		0.4	0.0	0.0		0.1	0.0	11.7

Intersection Summary			
HCM 2010 Ctrl Delay	45.7		
HCM 2010 LOS	D		

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	10	29	23	11	34	41	1736	27	40	1990	557
Future Volume (vph)	390	10	29	23	11	34	41	1736	27	40	1990	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1667		1715	1771	1583	1805	3565		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1667		1715	1771	1583	1805	3565		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	30	24	11	35	42	1790	28	41	2052	574
RTOR Reduction (vph)	0	26	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	14	0	17	18	2	42	1817	0	41	2052	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.2	16.2		6.7	6.7	6.7	6.3	72.6		6.1	72.9	119.5
Effective Green, g (s)	16.8	16.8		6.9	6.9	6.9	6.0	73.5		6.3	73.8	119.5
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.05	0.62		0.05	0.62	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	482	234		99	102	91	90	2192		95	2207	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.51		0.02	c0.57	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.83	0.06		0.17	0.18	0.02	0.47	0.83		0.43	0.93	0.37
Uniform Delay, d1	50.0	44.5		53.6	53.6	53.1	55.2	18.1		54.9	20.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.8	0.2		1.4	1.4	0.2	3.8	3.1		3.1	7.9	0.7
Delay (s)	62.8	44.7		55.0	55.0	53.3	59.0	21.1		58.0	28.5	0.7
Level of Service	E	D		E	E	D	E	C		E	C	A
Approach Delay (s)		61.1			54.2			22.0			22.9	
Approach LOS		E			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	119.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	79.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Intersection

Int Delay, s/veh 4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	126	0	20	1	0	0	10	356	0	0	486	94
Future Vol, veh/h	126	0	20	1	0	0	10	356	0	0	486	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	143	0	23	1	0	0	11	405	0	0	552	107

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	831	1033	330	703	1086	202	659	0	0	405	0	0
Stage 1	606	606	-	427	427	-	-	-	-	-	-	-
Stage 2	225	427	-	276	659	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	262	234	672	328	218	811	939	-	-	1165	-	-
Stage 1	451	490	-	581	589	-	-	-	-	-	-	-
Stage 2	757	589	-	712	464	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	259	230	672	313	215	811	939	-	-	1165	-	-
Mov Cap-2 Maneuver	259	230	-	313	215	-	-	-	-	-	-	-
Stage 1	444	490	-	572	580	-	-	-	-	-	-	-
Stage 2	746	580	-	688	464	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34.3	16.5	0.3	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	939	-	-	283	313	1165	-	-
HCM Lane V/C Ratio	0.012	-	-	0.586	0.004	-	-	-
HCM Control Delay (s)	8.9	0.1	-	34.3	16.5	0	-	-
HCM Lane LOS	A	A	-	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	3.4	0	0	-	-

Intersection

Int Delay, s/veh 2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	133	389	12	5	480	31	7	0	6	6	1	106
Future Vol, veh/h	133	389	12	5	480	31	7	0	6	6	1	106
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	145	423	13	5	522	34	8	0	7	7	1	115

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	559	0	0	444	0	0	1002	1296	234	1062	1286	286
Stage 1	-	-	-	-	-	-	726	726	-	553	553	-
Stage 2	-	-	-	-	-	-	276	570	-	509	733	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1015	-	-	1127	-	-	200	164	774	180	166	717
Stage 1	-	-	-	-	-	-	387	433	-	490	518	-
Stage 2	-	-	-	-	-	-	712	509	-	520	429	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1012	-	-	1119	-	-	146	138	764	157	140	712
Mov Cap-2 Maneuver	-	-	-	-	-	-	146	138	-	157	140	-
Stage 1	-	-	-	-	-	-	329	368	-	418	514	-
Stage 2	-	-	-	-	-	-	591	505	-	439	365	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.1	21.4	12.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	233	1012	-	-	1119	-	-	582
HCM Lane V/C Ratio	0.061	0.143	-	-	0.005	-	-	0.211
HCM Control Delay (s)	21.4	9.1	-	-	8.2	-	-	12.8
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.5	-	-	0	-	-	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	830	122	33	808	128	22
Future Volume (vph)	830	122	33	808	128	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1783	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1783	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	883	130	35	860	136	23
RTOR Reduction (vph)	0	57	0	0	9	0
Lane Group Flow (vph)	883	73	35	860	150	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	33.2	33.2	1.3	38.7	9.8	
Effective Green, g (s)	33.2	33.2	1.3	38.7	9.8	
Actuated g/C Ratio	0.56	0.56	0.02	0.65	0.16	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1051	881	37	1225	294	
v/s Ratio Prot	c0.47		0.02	c0.46	c0.08	
v/s Ratio Perm		0.05				
v/c Ratio	0.84	0.08	0.95	0.70	0.51	
Uniform Delay, d1	10.9	6.1	29.0	6.6	22.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.3	0.0	124.3	1.9	0.5	
Delay (s)	17.2	6.1	153.3	8.6	23.1	
Level of Service	B	A	F	A	C	
Approach Delay (s)	15.8			14.2	23.1	
Approach LOS	B			B	C	

Intersection Summary				
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	15.1	
Intersection Capacity Utilization	61.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	830	122	33	808	128	22
Future Volume (veh/h)	830	122	33	808	128	22
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900
Adj Flow Rate, veh/h	883	130	35	860	136	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	4	1	0	0
Cap, veh/h	1121	941	52	1316	198	0
Arrive On Green	0.60	0.60	0.03	0.70	0.11	0.00
Sat Flow, veh/h	1881	1579	1740	1881	1797	0
Grp Volume(v), veh/h	883	130	35	860	137	0
Grp Sat Flow(s),veh/h/ln	1881	1579	1740	1881	1810	0
Q Serve(g_s), s	20.4	2.1	1.1	14.5	4.2	0.0
Cycle Q Clear(g_c), s	20.4	2.1	1.1	14.5	4.2	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1121	941	52	1316	199	0
V/C Ratio(X)	0.79	0.14	0.67	0.65	0.69	0.00
Avail Cap(c_a), veh/h	1247	1046	122	1516	570	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.8	5.1	27.5	4.8	24.5	0.0
Incr Delay (d2), s/veh	3.3	0.1	5.5	0.9	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	0.9	0.6	7.5	2.1	0.0
LnGrp Delay(d),s/veh	12.1	5.2	33.0	5.7	26.1	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	1013			895	137	
Approach Delay, s/veh	11.2			6.8	26.1	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.9	40.5				46.4		10.8
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	37.9				46.1		18.0
Max Q Clear Time (g_c+I1), s	3.1	22.4				16.5		6.2
Green Ext Time (p_c), s	0.0	11.6				18.8		0.1

Intersection Summary			
HCM 2010 Ctrl Delay	10.3		
HCM 2010 LOS	B		

Notes

Intersection

Int Delay, s/veh 4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	761	34	14	719	17	35	0	40	10	0	40
Future Vol, veh/h	58	761	34	14	719	17	35	0	40	10	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	62	810	36	15	765	18	37	0	43	11	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	783	0	0	810	0	0	1737	1746	810	1737	1737	774
Stage 1	-	-	-	-	-	-	933	933	-	804	804	-
Stage 2	-	-	-	-	-	-	804	813	-	933	933	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	844	-	-	825	-	-	69	87	383	69	88	402
Stage 1	-	-	-	-	-	-	322	348	-	380	398	-
Stage 2	-	-	-	-	-	-	380	395	-	322	348	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	844	-	-	825	-	-	57	79	383	57	80	402
Mov Cap-2 Maneuver	-	-	-	-	-	-	57	79	-	57	80	-
Stage 1	-	-	-	-	-	-	298	322	-	352	391	-
Stage 2	-	-	-	-	-	-	334	388	-	265	322	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	77	28.4
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	57	383	844	-	-	825	-	-	57	402
HCM Lane V/C Ratio	0.653	0.111	0.073	-	-	0.018	-	-	0.187	0.106
HCM Control Delay (s)	147.1	15.6	9.6	-	-	9.4	-	-	82.1	15
HCM Lane LOS	F	C	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	2.7	0.4	0.2	-	-	0.1	-	-	0.6	0.4

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	42	4	5	774	809	43
Future Vol, veh/h	42	4	5	774	809	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	44	4	5	815	852	45

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1677	852	852	0	-	0
Stage 1	852	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	106	362	795	-	-	-
Stage 1	421	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	105	362	795	-	-	-
Mov Cap-2 Maneuver	105	-	-	-	-	-
Stage 1	421	-	-	-	-	-
Stage 2	429	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	59.6	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	795	-	112	-	-
HCM Lane V/C Ratio	0.007	-	0.432	-	-
HCM Control Delay (s)	9.6	0	59.6	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0	-	1.9	-	-

Intersection

Int Delay, s/veh 1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	37	417	41	28	425
Future Vol, veh/h	34	37	417	41	28	425
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	35	38	430	42	29	438

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	959	463	0	0	478	0
Stage 1	457	-	-	-	-	-
Stage 2	502	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	288	603	-	-	1095	-
Stage 1	642	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	275	597	-	-	1090	-
Mov Cap-2 Maneuver	275	-	-	-	-	-
Stage 1	639	-	-	-	-	-
Stage 2	588	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.6	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	383	1090	-
HCM Lane V/C Ratio	-	-	0.191	0.026	-
HCM Control Delay (s)	-	-	16.6	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	90	74	356	352	16
Future Vol, veh/h	10	90	74	356	352	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	96	79	379	374	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	931	396	385	0	-	0
Stage 1	385	-	-	-	-	-
Stage 2	546	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.218	-	-	-
Pot Cap-1 Maneuver	299	651	1173	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	584	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	274	639	1162	-	-	-
Mov Cap-2 Maneuver	274	-	-	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	539	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1162	-	564	-	-
HCM Lane V/C Ratio	0.068	-	0.189	-	-
HCM Control Delay (s)	8.3	-	12.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.7	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	126	109	273	235	8
Future Vol, veh/h	20	126	109	273	235	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	140	121	303	261	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	826	280	277	0	-	0
Stage 1	273	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	345	764	1292	-	-	-
Stage 1	778	-	-	-	-	-
Stage 2	580	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	309	755	1284	-	-	-
Mov Cap-2 Maneuver	309	-	-	-	-	-
Stage 1	773	-	-	-	-	-
Stage 2	522	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	2.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1284	-	630	-	-
HCM Lane V/C Ratio	0.094	-	0.257	-	-
HCM Control Delay (s)	8.1	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1	-	-

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	0	1	110	0	3	0	0	0	175	114	4
Future Vol, veh/h	0	0	1	110	0	3	0	0	0	175	114	4
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0
Mvmt Flow	0	0	1	126	0	3	0	0	0	201	131	5
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.3	8.5	10.8
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	60%	0%	100%	0%
Vol Thru, %	39%	1%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	293	111	3	130
LT Vol	175	0	3	0
Through Vol	114	1	0	130
RT Vol	4	110	0	0
Lane Flow Rate	337	128	3	149
Geometry Grp	1	1	1	1
Degree of Util (X)	0.422	0.157	0.005	0.19
Departure Headway (Hd)	4.506	4.417	5.385	4.582
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	798	811	663	781
Service Time	2.535	2.449	3.431	2.616
HCM Lane V/C Ratio	0.422	0.158	0.005	0.191
HCM Control Delay	10.8	8.3	8.5	8.7
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2.1	0.6	0	0.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	130	0
Future Vol, veh/h	0	0	130	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	149	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.7
HCM LOS	A

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	198	304	26	6	84	274	155	38	228	68	275	334
Future Volume (vph)	198	304	26	6	84	274	155	38	228	68	275	334
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	0.97		1.00	0.97
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1703	3496			3303	1827	1548	1752	3447		3433	3345
Flt Permitted	0.95	1.00			0.51	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1703	3496			1783	1827	1548	1752	3447		3433	3345
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	213	327	28	7	90	295	167	41	245	73	296	359
RTOR Reduction (vph)	0	7	0	0	0	0	123	0	34	0	0	19
Lane Group Flow (vph)	213	348	0	0	97	295	44	41	284	0	296	412
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6			3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	10.5	20.6			8.1	18.2	18.2	4.4	14.5		9.4	19.5
Effective Green, g (s)	10.2	20.8			7.8	18.4	18.4	4.1	15.4		9.1	20.4
Actuated g/C Ratio	0.15	0.30			0.11	0.27	0.27	0.06	0.22		0.13	0.30
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	251	1052			201	486	412	103	768		452	987
v/s Ratio Prot	c0.13	0.10				c0.16		0.02	0.08		c0.09	c0.12
v/s Ratio Perm					0.05		0.03					
v/c Ratio	0.85	0.33			0.48	0.61	0.11	0.40	0.37		0.65	0.42
Uniform Delay, d1	28.7	18.7			28.8	22.2	19.2	31.3	22.7		28.5	19.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	22.5	0.2			1.8	2.3	0.1	2.5	0.4		3.4	0.3
Delay (s)	51.2	19.0			30.6	24.4	19.3	33.8	23.1		31.9	19.9
Level of Service	D	B			C	C	B	C	C		C	B
Approach Delay (s)		31.0				24.0			24.3			24.8
Approach LOS		C				C			C			C

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	69.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	112	377	69	12	151	417	322	77	424	196	218	307
Future Volume (vph)	112	377	69	12	151	417	322	77	424	196	218	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1752	3469			3391	1863	1560	1805	3309		3502	3479
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1752	3469			1161	1863	1560	1805	3309		3502	3479
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	115	389	71	12	156	430	332	79	437	202	225	316
RTOR Reduction (vph)	0	17	0	0	0	0	220	0	63	0	0	19
Lane Group Flow (vph)	115	443	0	0	168	430	112	79	576	0	225	360
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6			3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	7.0	21.4			12.6	27.0	27.0	6.1	20.7		9.4	24.0
Effective Green, g (s)	6.7	21.6			12.3	27.2	27.2	5.8	21.6		9.1	24.9
Actuated g/C Ratio	0.08	0.27			0.15	0.34	0.34	0.07	0.27		0.11	0.31
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	145	929			177	628	526	129	886		395	1074
v/s Ratio Prot	0.07	0.13				c0.23		0.04	c0.17		c0.06	c0.10
v/s Ratio Perm					c0.14		0.07					
v/c Ratio	0.79	0.48			0.95	0.68	0.21	0.61	0.65		0.57	0.34
Uniform Delay, d1	36.3	24.8			33.8	23.0	19.1	36.3	26.2		33.9	21.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	25.0	0.5			52.3	3.2	0.2	8.3	1.8		1.9	0.2
Delay (s)	61.3	25.2			86.1	26.2	19.3	44.6	27.9		35.8	21.7
Level of Service	E	C			F	C	B	D	C		D	C
Approach Delay (s)		32.4				34.6			29.8			26.9
Approach LOS		C				C			C			C

Intersection Summary

HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	131	385	69	8	197	384	321	71	359	180	304	437
Future Volume (vph)	131	385	69	8	197	384	321	71	359	180	304	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1787	3506			3485	1881	1556	1805	3367		3502	3493
Flt Permitted	0.95	1.00			0.30	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1787	3506			1103	1881	1556	1805	3367		3502	3493
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	132	389	70	8	199	388	324	72	363	182	307	441
RTOR Reduction (vph)	0	17	0	0	0	0	226	0	75	0	0	11
Lane Group Flow (vph)	132	442	0	0	207	388	98	72	470	0	307	485
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	9.2	18.2			13.6	22.6	22.6	6.5	17.5		9.5	20.5
Effective Green, g (s)	8.9	18.4			13.3	22.8	22.8	6.2	18.4		9.2	21.4
Actuated g/C Ratio	0.12	0.24			0.18	0.30	0.30	0.08	0.24		0.12	0.28
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	211	856			194	569	471	148	822		427	992
v/s Ratio Prot	0.07	0.13				c0.21		0.04	c0.14		c0.09	c0.14
v/s Ratio Perm					c0.19		0.06					
v/c Ratio	0.63	0.52			1.07	0.68	0.21	0.49	0.57		0.72	0.49
Uniform Delay, d1	31.6	24.6			31.0	23.1	19.5	33.0	25.0		31.8	22.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.7	0.6			83.5	3.5	0.3	2.5	1.0		5.7	0.5
Delay (s)	37.3	25.2			114.5	26.6	19.8	35.5	26.0		37.5	22.9
Level of Service	D	C			F	C	B	D	C		D	C
Approach Delay (s)		27.9				44.0			27.1			28.5
Approach LOS		C				D			C			C

Intersection Summary

HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	382	4	25	35	14	44	36	1211	17	71	1590	774
Future Volume (vph)	382	4	25	35	14	44	36	1211	17	71	1590	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.9	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	3539	1578	1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	3539	1578	1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	27	38	15	48	40	1331	19	78	1747	851
RTOR Reduction (vph)	0	23	0	0	0	45	0	0	9	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	40	1331	10	78	1747	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6			8			Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.6	52.7	52.7	6.1	54.7	99.2
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.3	53.6	52.7	6.3	55.6	99.2
Actuated g/C Ratio	0.16	0.16		0.07	0.07	0.07	0.04	0.54	0.53	0.06	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9	4.9	4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	560	249		122	121	113	75	1912	838	104	1945	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.38		0.05	c0.50	
v/s Ratio Perm						0.00			0.01			c0.54
v/c Ratio	0.75	0.03		0.22	0.21	0.03	0.53	0.70	0.01	0.75	0.90	0.54
Uniform Delay, d1	39.6	34.9		43.4	43.4	42.8	46.5	16.8	11.0	45.7	19.3	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	0.1		1.6	1.5	0.2	7.1	1.4	0.0	25.8	6.4	1.3
Delay (s)	45.9	35.0		45.0	45.0	43.0	53.6	18.2	11.0	71.4	25.7	1.3
Level of Service	D	D		D	D	D	D	B	B	E	C	A
Approach Delay (s)		45.1			44.1			19.1			19.3	
Approach LOS		D			D			B			B	

Intersection Summary

HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	99.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — Existing + Project PM - Mitigated.syn
8: SR 1 & Carpenter St — 12/29/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	869	18	25	18	6	54	10	1645	19	55	1435	493
Future Volume (vph)	869	18	25	18	6	54	10	1645	19	55	1435	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.9	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	1732		1715	1761	1524	1805	3539	1442	1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	1732		1715	1761	1524	1805	3539	1442	1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	26	18	6	55	10	1679	19	56	1464	503
RTOR Reduction (vph)	0	19	0	0	0	52	0	0	9	0	0	0
Lane Group Flow (vph)	887	25	0	12	12	3	10	1679	10	56	1464	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6			8			Free
Actuated Green, G (s)	38.6	38.6		6.6	6.6	6.6	1.5	71.6	71.6	6.2	76.8	140.9
Effective Green, g (s)	39.2	39.2		6.8	6.8	6.8	1.2	72.5	71.6	6.4	77.7	140.9
Actuated g/C Ratio	0.28	0.28		0.05	0.05	0.05	0.01	0.51	0.51	0.05	0.55	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9	4.9	4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	964	481		82	84	73	15	1820	732	81	1970	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	c0.47		c0.03	0.41	
v/s Ratio Perm						0.00			0.01			c0.31
v/c Ratio	0.92	0.05		0.15	0.14	0.04	0.67	0.92	0.01	0.69	0.74	0.31
Uniform Delay, d1	49.3	37.2		64.3	64.3	63.9	69.7	31.6	17.2	66.3	24.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.0	0.1		1.4	1.4	0.4	75.9	8.7	0.0	22.5	1.9	0.5
Delay (s)	63.3	37.3		65.7	65.6	64.3	145.5	40.3	17.2	88.7	25.9	0.5
Level of Service	E	D		E	E	E	F	D	B	F	C	A
Approach Delay (s)		62.1			64.7			40.6			21.3	
Approach LOS		E			E			D			C	

Intersection Summary				
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	140.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — Existing + Project Saturday - Mitigated.syn
8: SR 1 & Carpenter St — 12/29/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	10	28	23	11	34	41	1452	27	40	1719	557
Future Volume (vph)	390	10	28	23	11	34	41	1452	27	40	1719	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.9	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1670		1715	1771	1582	1805	3574	1581	1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1670		1715	1771	1582	1805	3574	1581	1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	29	24	11	35	42	1497	28	41	1772	574
RTOR Reduction (vph)	0	24	0	0	0	33	0	0	12	0	0	0
Lane Group Flow (vph)	402	15	0	17	18	2	42	1497	16	41	1772	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6			8			Free
Actuated Green, G (s)	15.5	15.5		4.7	4.7	4.7	4.4	53.2	53.2	4.3	53.6	95.6
Effective Green, g (s)	16.1	16.1		4.9	4.9	4.9	4.1	54.1	53.2	4.5	54.5	95.6
Actuated g/C Ratio	0.17	0.17		0.05	0.05	0.05	0.04	0.57	0.56	0.05	0.57	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9	4.9	4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	578	281		87	90	81	77	2022	879	84	2037	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.42		0.02	c0.50	
v/s Ratio Perm						0.00			0.01			c0.37
v/c Ratio	0.70	0.05		0.20	0.20	0.02	0.55	0.74	0.02	0.49	0.87	0.37
Uniform Delay, d1	37.4	33.4		43.5	43.5	43.1	44.8	15.5	9.5	44.4	17.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.2	0.1		1.9	1.9	0.2	7.7	1.8	0.0	4.4	4.7	0.7
Delay (s)	41.6	33.5		45.4	45.4	43.3	52.5	17.3	9.5	48.8	22.2	0.7
Level of Service	D	C		D	D	D	D	B	A	D	C	A
Approach Delay (s)		40.9			44.3			18.1			17.5	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	95.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	72.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	812	247	387	938	10	98	3	242	9	18	41
Future Volume (vph)	7	812	247	387	938	10	98	3	242	9	18	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1567	3433	3530		1698	1708	1560		1737	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1567	3433	3530		1698	1708	1560		1737	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	1041	317	496	1203	13	126	4	310	12	23	53
RTOR Reduction (vph)	0	0	83	0	0	0	0	0	67	0	0	50
Lane Group Flow (vph)	9	1041	234	496	1216	0	66	64	243	0	35	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6	4	5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.8	28.1	34.1	10.5	37.8		6.0	6.0	16.5		2.3	2.3
Effective Green, g (s)	1.3	29.1	36.1	11.1	38.8		7.8	7.8	17.7		3.3	3.3
Actuated g/C Ratio	0.02	0.43	0.54	0.16	0.58		0.12	0.12	0.26		0.05	0.05
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	34	1530	840	566	2035		196	197	410		85	76
v/s Ratio Prot	0.00	c0.29	0.03	c0.14	0.34		0.04	0.04	c0.10		c0.02	
v/s Ratio Perm			0.12						0.06			0.00
v/c Ratio	0.26	0.68	0.28	0.88	0.60		0.34	0.32	0.59		0.41	0.03
Uniform Delay, d1	32.5	15.4	8.5	27.4	9.2		27.4	27.3	21.7		31.1	30.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	1.0	0.1	13.8	0.3		0.4	0.4	1.5		1.2	0.1
Delay (s)	34.0	16.4	8.6	41.3	9.5		27.7	27.7	23.2		32.2	30.5
Level of Service	C	B	A	D	A		C	C	C		C	C
Approach Delay (s)		14.7			18.7			24.5			31.2	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	67.3	Sum of lost time (s)	16.9
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	812	247	387	938	10	98	3	242	9	18	41
Future Volume (veh/h)	7	812	247	387	938	10	98	3	242	9	18	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1767	1863
Adj Flow Rate, veh/h	9	1041	317	496	1203	13	129	0	310	12	23	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	30	1185	855	542	1701	18	792	0	562	34	65	90
Arrive On Green	0.02	0.33	0.33	0.16	0.47	0.46	0.22	0.00	0.20	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3584	39	3583	0	1545	596	1141	1575
Grp Volume(v), veh/h	9	1041	317	496	593	623	129	0	310	35	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1854	1792	0	1545	1737	0	1575
Q Serve(g_s), s	0.3	19.3	8.1	9.9	18.5	18.5	2.0	0.0	11.2	1.4	0.0	2.3
Cycle Q Clear(g_c), s	0.3	19.3	8.1	9.9	18.5	18.5	2.0	0.0	11.2	1.4	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.34		1.00
Lane Grp Cap(c), veh/h	30	1185	855	542	839	880	792	0	562	100	0	90
V/C Ratio(X)	0.30	0.88	0.37	0.91	0.71	0.71	0.16	0.00	0.55	0.35	0.00	0.59
Avail Cap(c_a), veh/h	117	1277	896	542	839	880	1735	0	969	100	0	90
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.9	21.9	9.1	28.9	14.5	14.5	22.0	0.0	17.8	31.7	0.0	32.1
Incr Delay (d2), s/veh	2.1	6.5	0.1	19.8	2.3	2.2	0.0	0.0	0.3	0.8	0.0	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.5	5.1	6.2	9.4	9.9	1.0	0.0	4.7	0.7	0.0	1.2
LnGrp Delay(d),s/veh	36.1	28.3	9.2	48.7	16.8	16.8	22.0	0.0	18.1	32.4	0.0	38.7
LnGrp LOS	D	C	A	D	B	B	C		B	C		D
Approach Vol, veh/h		1367			1712			439			88	
Approach Delay, s/veh		24.0			26.1			19.3			36.2	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	37.1		19.4	15.0	27.4		8.0
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 10	24.2		3.0
Max Q Clear Time (g_c+I1), s	2.3	20.5		13.2	11.9	21.3		4.3
Green Ext Time (p_c), s	0.0	5.2		0.3	0.0	1.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	199	304	26	6	91	277	155	38	232	68	275	334
Future Volume (vph)	199	304	26	6	91	277	155	38	232	68	275	334
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	0.97		1.00	0.97
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1703	3496			3302	1827	1548	1752	3449		3433	3345
Flt Permitted	0.95	1.00			0.54	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1703	3496			1879	1827	1548	1752	3449		3433	3345
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	214	327	28	7	98	298	167	41	249	73	296	359
RTOR Reduction (vph)	0	7	0	0	0	0	122	0	33	0	0	19
Lane Group Flow (vph)	214	348	0	0	105	298	45	41	289	0	296	412
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	10.5	21.1			7.7	18.3	18.3	4.4	14.5		9.4	19.5
Effective Green, g (s)	10.2	21.3			7.4	18.5	18.5	4.1	15.4		9.1	20.4
Actuated g/C Ratio	0.15	0.31			0.11	0.27	0.27	0.06	0.22		0.13	0.29
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	251	1076			200	488	413	103	767		451	986
v/s Ratio Prot	c0.13	c0.10				c0.16		0.02	0.08		c0.09	c0.12
v/s Ratio Perm					0.06		0.03					
v/c Ratio	0.85	0.32			0.53	0.61	0.11	0.40	0.38		0.66	0.42
Uniform Delay, d1	28.8	18.4			29.2	22.2	19.1	31.4	22.8		28.6	19.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	23.3	0.2			2.5	2.4	0.1	2.5	0.4		3.4	0.3
Delay (s)	52.1	18.6			31.7	24.6	19.3	33.9	23.2		32.0	20.0
Level of Service	D	B			C	C	B	C	C		C	B
Approach Delay (s)		31.2				24.3			24.4			24.9
Approach LOS		C				C			C			C

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd
Background + Project AM - Mitigated.syn
12/13/2017

HCM Signalized Intersection Capacity Analysis — Background + Project AM - Mitigated.syn
8: SR 1 & Carpenter St — 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	382	4	25	35	14	44	37	1301	17	71	1635	774
Future Volume (vph)	382	4	25	35	14	44	37	1301	17	71	1635	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	5075		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	5075		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	27	38	15	48	41	1430	19	78	1797	851
RTOR Reduction (vph)	0	23	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	41	1448	0	78	1797	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.5	50.0		7.6	53.6	98.0
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.2	50.9		7.8	54.5	98.0
Actuated g/C Ratio	0.17	0.17		0.07	0.07	0.07	0.04	0.52		0.08	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	567	252		124	123	115	75	2635		130	1930	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.29		0.05	c0.52	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.74	0.03		0.22	0.21	0.03	0.55	0.55		0.60	0.93	0.54
Uniform Delay, d1	38.9	34.3		42.8	42.8	42.2	46.0	15.8		43.6	20.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.8	0.1		1.5	1.5	0.2	7.9	0.4		7.3	9.1	1.3
Delay (s)	44.7	34.4		44.4	44.3	42.4	53.9	16.3		50.9	29.1	1.3
Level of Service	D	C		D	D	D	D	B		D	C	A
Approach Delay (s)		44.0			43.4			17.3			21.0	
Approach LOS		D			D			B			C	

Intersection Summary

HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — Background + Project PM - Mitigated.syn
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd — 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	856	240	425	667	5	264	22	596	6	10	7
Future Volume (vph)	26	856	240	425	667	5	264	22	596	6	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1732	1590		1727	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1732	1590		1727	1580
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	930	261	462	725	5	287	24	648	7	11	8
RTOR Reduction (vph)	0	0	104	0	0	0	0	0	74	0	0	8
Lane Group Flow (vph)	28	930	157	462	730	0	155	156	574	0	18	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6	4	5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.8	25.0	34.2	11.8	35.0		9.2	9.2	21.0		1.0	1.0
Effective Green, g (s)	2.3	26.0	36.2	12.4	36.0		11.0	11.0	22.2		2.0	2.0
Actuated g/C Ratio	0.03	0.39	0.54	0.18	0.53		0.16	0.16	0.33		0.03	0.03
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	61	1365	867	637	1906		279	282	523		51	46
v/s Ratio Prot	0.02	c0.26	0.03	0.13	0.20		0.09	0.09	c0.20		c0.01	
v/s Ratio Perm			0.07						0.16			0.00
v/c Ratio	0.46	0.68	0.18	0.73	0.38		0.56	0.55	1.10		0.35	0.01
Uniform Delay, d1	31.9	17.2	8.0	25.9	9.2		26.0	25.9	22.6		32.1	31.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	1.1	0.0	3.5	0.0		1.4	1.3	68.4		1.5	0.0
Delay (s)	33.9	18.4	8.0	29.4	9.2		27.3	27.3	91.0		33.6	31.8
Level of Service	C	B	A	C	A		C	C	F		C	C
Approach Delay (s)		16.5			17.0			70.3			33.0	
Approach LOS		B			B			E			C	

Intersection Summary

HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	67.4	Sum of lost time (s)	16.9
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	856	240	425	667	5	264	22	596	6	10	7
Future Volume (veh/h)	26	856	240	425	667	5	264	22	596	6	10	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1900	1881	1900	1760	1900
Adj Flow Rate, veh/h	28	930	261	462	725	5	304	0	648	7	11	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	51	956	1035	489	1388	10	1376	0	811	18	29	43
Arrive On Green	0.03	0.27	0.27	0.14	0.38	0.37	0.38	0.00	0.37	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3639	25	3619	0	1598	671	1055	1587
Grp Volume(v), veh/h	28	930	261	462	356	374	304	0	648	18	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1877	1810	0	1598	1727	0	1587
Q Serve(g_s), s	1.3	22.9	6.1	11.6	13.6	13.6	5.0	0.0	29.6	0.9	0.0	0.4
Cycle Q Clear(g_c), s	1.3	22.9	6.1	11.6	13.6	13.6	5.0	0.0	29.6	0.9	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.39		1.00
Lane Grp Cap(c), veh/h	51	956	1035	489	682	716	1376	0	811	47	0	43
V/C Ratio(X)	0.55	0.97	0.25	0.94	0.52	0.52	0.22	0.00	0.80	0.38	0.00	0.18
Avail Cap(c_a), veh/h	115	956	1035	489	682	716	1388	0	816	78	0	72
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.3	31.8	6.8	37.5	21.0	21.0	18.5	0.0	18.0	42.1	0.0	41.9
Incr Delay (d2), s/veh	3.4	22.5	0.0	27.0	0.3	0.3	0.0	0.0	5.2	1.9	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	14.1	5.5	7.4	6.7	7.0	2.5	0.0	14.0	0.5	0.0	0.2
LnGrp Delay(d),s/veh	45.6	54.3	6.8	64.5	21.4	21.4	18.5	0.0	23.2	44.0	0.0	42.6
LnGrp LOS	D	D	A	E	C	C	B		C	D		D
Approach Vol, veh/h		1219			1192			952			26	
Approach Delay, s/veh		44.0			38.1			21.7			43.6	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	37.6		37.5	16.4	27.8		6.4
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	22.8		3.0
Max Q Clear Time (g_c+I1), s	3.3	15.6		31.6	13.6	24.9		2.9
Green Ext Time (p_c), s	0.0	4.3		0.1	0.0	0.0		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		35.6
HCM 2010 LOS		D

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	114	378	69	12	159	419	322	77	435	197	218	307
Future Volume (vph)	114	378	69	12	159	419	322	77	435	197	218	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1752	3469			3391	1863	1560	1805	3311		3502	3479
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1752	3469			1161	1863	1560	1805	3311		3502	3479
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	118	390	71	12	164	432	332	79	448	203	225	316
RTOR Reduction (vph)	0	17	0	0	0	0	220	0	61	0	0	19
Lane Group Flow (vph)	118	444	0	0	176	432	112	79	590	0	225	360
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6			3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	7.1	21.6			12.6	27.1	27.1	6.1	21.1		9.4	24.4
Effective Green, g (s)	6.8	21.8			12.3	27.3	27.3	5.8	22.0		9.1	25.3
Actuated g/C Ratio	0.08	0.27			0.15	0.34	0.34	0.07	0.27		0.11	0.31
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	146	931			175	626	524	128	897		392	1083
v/s Ratio Prot	0.07	0.13				c0.23		0.04	c0.18		c0.06	c0.10
v/s Ratio Perm					c0.15		0.07					
v/c Ratio	0.81	0.48			1.01	0.69	0.21	0.62	0.66		0.57	0.33
Uniform Delay, d1	36.6	24.9			34.5	23.3	19.3	36.6	26.3		34.2	21.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	26.9	0.5			69.5	3.4	0.2	8.6	1.8		2.0	0.2
Delay (s)	63.5	25.4			104.0	26.7	19.5	45.2	28.1		36.2	21.7
Level of Service	E	C			F	C	B	D	C		D	C
Approach Delay (s)		33.1				38.6			29.9			27.1
Approach LOS		C				D			C			C

Intersection Summary				
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	81.2	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	69.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	869	18	26	18	6	54	10	1722	19	55	1544	493
Future Volume (vph)	869	18	26	18	6	54	10	1722	19	55	1544	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1729		1715	1761	1524	1805	5072		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1729		1715	1761	1524	1805	5072		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	27	18	6	55	10	1757	19	56	1576	503
RTOR Reduction (vph)	0	19	0	0	0	52	0	1	0	0	0	0
Lane Group Flow (vph)	887	26	0	12	12	3	10	1775	0	56	1576	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	33.5	33.5		6.5	6.5	6.5	1.5	57.3		6.2	62.5	121.4
Effective Green, g (s)	34.1	34.1		6.7	6.7	6.7	1.2	58.2		6.4	63.4	121.4
Actuated g/C Ratio	0.28	0.28		0.06	0.06	0.06	0.01	0.48		0.05	0.52	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	973	485		94	97	84	17	2431		95	1866	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	0.35		0.03	c0.44	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.91	0.05		0.13	0.12	0.04	0.59	0.73		0.59	0.84	0.31
Uniform Delay, d1	42.2	31.9		54.6	54.6	54.3	59.9	25.3		56.2	24.8	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.9	0.1		1.1	1.0	0.3	42.8	1.4		9.0	4.1	0.5
Delay (s)	55.1	31.9		55.6	55.6	54.6	102.6	26.7		65.2	28.9	0.5
Level of Service	E	C		E	E	D	F	C		E	C	A
Approach Delay (s)		53.9			54.9			27.1			23.2	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	121.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	737	260	480	659	3	211	17	456	2	17	14
Future Volume (vph)	25	737	260	480	659	3	211	17	456	2	17	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (prot)	1805	3574	1600	3467	3607		1698	1717	1575		1891	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (perm)	1805	3574	1600	3467	3607		1698	1717	1575		1891	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	27	784	277	511	701	3	224	18	485	2	18	15
RTOR Reduction (vph)	0	0	87	0	0	0	0	0	92	0	0	15
Lane Group Flow (vph)	27	784	190	511	704	0	121	121	393	0	20	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6	4	5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.6	20.6	28.5	12.8	31.8		7.9	7.9	20.7		1.0	1.0
Effective Green, g (s)	2.1	21.6	30.5	13.4	32.8		9.7	9.7	21.9		2.0	2.0
Actuated g/C Ratio	0.03	0.34	0.49	0.21	0.52		0.15	0.15	0.35		0.03	0.03
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	60	1231	778	740	1886		262	265	550		60	51
v/s Ratio Prot	0.01	c0.22	0.03	0.15	0.20		0.07	0.07	c0.15		c0.01	
v/s Ratio Perm			0.08						0.10			0.00
v/c Ratio	0.45	0.64	0.24	0.69	0.37		0.46	0.46	0.71		0.33	0.01
Uniform Delay, d1	29.7	17.3	9.4	22.7	8.9		24.1	24.1	17.7		29.7	29.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.8	0.1	2.3	0.0		0.5	0.5	3.7		1.2	0.0
Delay (s)	31.7	18.1	9.4	25.0	8.9		24.6	24.6	21.4		30.9	29.4
Level of Service	C	B	A	C	A		C	C	C		C	C
Approach Delay (s)		16.2			15.7			22.4			30.3	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	62.7	Sum of lost time (s)	16.9	
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	737	260	480	659	3	211	17	456	2	17	14
Future Volume (veh/h)	25	737	260	480	659	3	211	17	456	2	17	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	784	277	511	701	3	237	0	485	2	18	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	54	963	898	619	1535	7	1079	0	727	6	58	56
Arrive On Green	0.03	0.27	0.27	0.18	0.42	0.40	0.30	0.00	0.28	0.03	0.03	0.03
Sat Flow, veh/h	1810	3574	1593	3476	3686	16	3583	0	1561	189	1701	1615
Grp Volume(v), veh/h	27	784	277	511	343	361	237	0	485	20	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1593	1738	1805	1897	1792	0	1561	1891	0	1615
Q Serve(g_s), s	1.1	15.1	6.8	10.4	10.1	10.1	3.7	0.0	17.8	0.8	0.0	0.7
Cycle Q Clear(g_c), s	1.1	15.1	6.8	10.4	10.1	10.1	3.7	0.0	17.8	0.8	0.0	0.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	54	963	898	619	752	790	1079	0	727	65	0	56
V/C Ratio(X)	0.50	0.81	0.31	0.83	0.46	0.46	0.22	0.00	0.67	0.31	0.00	0.27
Avail Cap(c_a), veh/h	135	1056	940	679	752	790	1642	0	972	103	0	88
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.2	25.2	8.7	29.2	15.5	15.5	19.3	0.0	15.4	34.8	0.0	34.7
Incr Delay (d2), s/veh	2.6	4.1	0.1	6.9	0.2	0.2	0.0	0.0	0.4	1.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.0	5.0	5.6	5.0	5.2	1.8	0.0	7.7	0.4	0.0	0.3
LnGrp Delay(d),s/veh	37.9	29.3	8.7	36.1	15.7	15.7	19.3	0.0	15.8	35.7	0.0	35.7
LnGrp LOS	D	C	A	D	B	B	B		B	D		D
Approach Vol, veh/h		1088			1215			722			35	
Approach Delay, s/veh		24.3			24.3			17.0			35.7	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.3	34.7		26.2	17.1	23.9		6.5
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 14	20.8		3.0
Max Q Clear Time (g_c+I1), s	3.1	12.1		19.8	12.4	17.1		2.8
Green Ext Time (p_c), s	0.0	3.9		0.4	0.1	1.7		0.0

Intersection Summary		
HCM 2010 Ctrl Delay	22.7	
HCM 2010 LOS	C	

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	133	386	69	8	205	386	321	71	373	181	304	437
Future Volume (vph)	133	386	69	8	205	386	321	71	373	181	304	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1787	3506			3485	1881	1556	1805	3370		3502	3493
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1787	3506			1193	1881	1556	1805	3370		3502	3493
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	134	390	70	8	207	390	324	72	377	183	307	441
RTOR Reduction (vph)	0	17	0	0	0	0	226	0	70	0	0	11
Lane Group Flow (vph)	134	443	0	0	215	390	98	72	490	0	307	485
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	8.5	18.3			12.6	22.4	22.4	6.2	17.9		9.5	21.2
Effective Green, g (s)	8.2	18.5			12.3	22.6	22.6	5.9	18.8		9.2	22.1
Actuated g/C Ratio	0.11	0.25			0.16	0.30	0.30	0.08	0.25		0.12	0.30
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	195	867			196	568	470	142	847		430	1032
v/s Ratio Prot	0.07	0.13				c0.21		0.04	c0.15		c0.09	c0.14
v/s Ratio Perm					c0.18		0.06					
v/c Ratio	0.69	0.51			1.10	0.69	0.21	0.51	0.58		0.71	0.47
Uniform Delay, d1	32.1	24.3			31.2	23.0	19.4	33.1	24.5		31.5	21.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	9.6	0.6			92.6	3.6	0.3	2.8	1.0		5.5	0.4
Delay (s)	41.7	24.8			123.8	26.6	19.7	35.9	25.6		37.1	22.0
Level of Service	D	C			F	C	B	D	C		D	C
Approach Delay (s)		28.6				46.7			26.7			27.7
Approach LOS		C				D			C			C

Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	74.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Background + Project Saturday - Mitigated.syn
3: SR 1 & Rio Rd 12/13/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis Background + Project Saturday - Mitigated.syn

8: SR 1 & Carpenter St 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	10	29	23	11	34	41	1525	27	40	1821	557
Future Volume (vph)	390	10	29	23	11	34	41	1525	27	40	1821	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1667		1715	1771	1584	1805	5121		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1667		1715	1771	1584	1805	5121		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	30	24	11	35	42	1572	28	41	1877	574
RTOR Reduction (vph)	0	25	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	15	0	17	18	2	42	1599	0	41	1877	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.8	15.8		6.6	6.6	6.6	4.6	62.7		4.5	63.1	107.5
Effective Green, g (s)	16.4	16.4		6.8	6.8	6.8	4.3	63.6		4.7	64.0	107.5
Actuated g/C Ratio	0.15	0.15		0.06	0.06	0.06	0.04	0.59		0.04	0.60	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	523	254		108	112	100	72	3029		78	2127	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.31		0.02	c0.53	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.77	0.06		0.16	0.16	0.02	0.58	0.53		0.53	0.88	0.37
Uniform Delay, d1	43.7	38.9		47.6	47.6	47.2	50.7	13.0		50.3	18.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.5	0.2		1.2	1.2	0.2	11.5	0.3		6.3	5.1	0.7
Delay (s)	51.2	39.1		48.8	48.8	47.4	62.2	13.4		56.6	23.6	0.7
Level of Service	D	D		D	D	D	E	B		E	C	A
Approach Delay (s)		50.1			48.1			14.6			18.9	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	107.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	74.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis Cumulative + Project Saturday - Miti.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	757	270	500	674	3	217	17	470	2	17	14
Future Volume (vph)	25	757	270	500	674	3	217	17	470	2	17	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (prot)	1805	3574	1600	3467	3607		1698	1716	1575		1891	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (perm)	1805	3574	1600	3467	3607		1698	1716	1575		1891	1615
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	27	805	287	532	717	3	231	18	500	2	18	15
RTOR Reduction (vph)	0	0	83	0	0	0	0	0	92	0	0	15
Lane Group Flow (vph)	27	805	204	532	720	0	125	124	408	0	20	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6	4	5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.7	21.6	29.6	13.2	33.1		8.0	8.0	21.2		1.0	1.0
Effective Green, g (s)	2.2	22.6	31.6	13.8	34.1		9.8	9.8	22.4		2.0	2.0
Actuated g/C Ratio	0.03	0.35	0.49	0.21	0.53		0.15	0.15	0.35		0.03	0.03
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	61	1258	787	745	1915		259	261	549		58	50
v/s Ratio Prot	0.01	c0.23	0.04	0.15	0.20		0.07	0.07	c0.16		c0.01	
v/s Ratio Perm			0.09						0.10			0.00
v/c Ratio	0.44	0.64	0.26	0.71	0.38		0.48	0.48	0.74		0.34	0.01
Uniform Delay, d1	30.4	17.4	9.5	23.4	8.8		24.9	24.9	18.4		30.5	30.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.8	0.1	2.7	0.0		0.5	0.5	4.7		1.3	0.0
Delay (s)	32.3	18.2	9.6	26.1	8.9		25.4	25.3	23.1		31.8	30.2
Level of Service	C	B	A	C	A		C	C	C		C	C
Approach Delay (s)		16.3			16.2			23.8			31.1	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	16.9	
Intersection Capacity Utilization	63.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	757	270	500	674	3	217	17	470	2	17	14
Future Volume (veh/h)	25	757	270	500	674	3	217	17	470	2	17	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	805	287	532	717	3	244	0	500	2	18	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	54	942	897	637	1534	6	1097	0	743	6	58	55
Arrive On Green	0.03	0.26	0.26	0.18	0.42	0.40	0.31	0.00	0.29	0.03	0.03	0.03
Sat Flow, veh/h	1810	3574	1592	3476	3686	15	3583	0	1562	189	1701	1615
Grp Volume(v), veh/h	27	805	287	532	351	369	244	0	500	20	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1592	1738	1805	1897	1792	0	1562	1891	0	1615
Q Serve(g_s), s	1.1	16.1	7.3	11.1	10.6	10.6	3.8	0.0	18.6	0.8	0.0	0.7
Cycle Q Clear(g_c), s	1.1	16.1	7.3	11.1	10.6	10.6	3.8	0.0	18.6	0.8	0.0	0.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	54	942	897	637	751	789	1097	0	743	64	0	55
V/C Ratio(X)	0.50	0.85	0.32	0.83	0.47	0.47	0.22	0.00	0.67	0.31	0.00	0.27
Avail Cap(c_a), veh/h	132	1008	926	694	751	789	1611	0	967	101	0	86
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.9	26.3	8.9	29.6	15.9	15.9	19.4	0.0	15.3	35.5	0.0	35.4
Incr Delay (d2), s/veh	2.7	6.4	0.1	7.4	0.2	0.2	0.0	0.0	0.5	1.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.8	5.4	6.0	5.3	5.6	1.9	0.0	8.1	0.4	0.0	0.3
LnGrp Delay(d),s/veh	38.6	32.7	9.0	37.0	16.1	16.1	19.5	0.0	15.9	36.5	0.0	36.4
LnGrp LOS	D	C	A	D	B	B	B		B	D		D
Approach Vol, veh/h		1119			1252			744			35	
Approach Delay, s/veh		26.8			25.0			17.0			36.4	
Approach LOS		C			C			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.3	35.3		27.0	17.8	23.8		6.6
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 14	20.2		3.0
Max Q Clear Time (g_c+I1), s	3.1	12.6		20.6	13.1	18.1		2.8
Green Ext Time (p_c), s	0.0	4.1		0.5	0.1	0.7		0.0

Intersection Summary			
HCM 2010 Ctrl Delay		23.9	
HCM 2010 LOS		C	

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	133	396	69	8	212	395	333	71	561	189	326	568
Future Volume (vph)	133	396	69	8	212	395	333	71	561	189	326	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.96		1.00	0.99
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1787	3508			3483	1881	1556	1805	3409		3502	3510
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1787	3508			1202	1881	1556	1805	3409		3502	3510
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	134	400	70	8	214	399	336	72	567	191	329	574
RTOR Reduction (vph)	0	17	0	0	0	0	212	0	37	0	0	7
Lane Group Flow (vph)	134	453	0	0	222	399	124	72	721	0	329	622
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	8.4	19.7			12.5	23.8	23.8	6.5	23.3		9.4	26.2
Effective Green, g (s)	8.1	19.9			12.2	24.0	24.0	6.2	24.2		9.1	27.1
Actuated g/C Ratio	0.10	0.24			0.15	0.29	0.29	0.08	0.30		0.11	0.33
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	177	857			180	554	458	137	1013		391	1168
v/s Ratio Prot	0.07	0.13				c0.21		0.04	c0.21		c0.09	c0.18
v/s Ratio Perm					c0.18		0.08					
v/c Ratio	0.76	0.53			1.23	0.72	0.27	0.53	0.71		0.84	0.53
Uniform Delay, d1	35.7	26.7			34.6	25.7	22.0	36.2	25.5		35.4	22.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	16.8	0.7			143.6	4.7	0.4	3.6	2.5		15.0	0.5
Delay (s)	52.5	27.4			178.2	30.4	22.4	39.8	28.0		50.5	22.5
Level of Service	D	C			F	C	C	D	C		D	C
Approach Delay (s)		32.9				61.9			29.0			32.1
Approach LOS		C				E			C			C

Intersection Summary				
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	81.4	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	72.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	10	29	23	11	34	41	1736	27	40	1990	557
Future Volume (vph)	390	10	29	23	11	34	41	1736	27	40	1990	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1667		1715	1771	1583	1805	5123		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1667		1715	1771	1583	1805	5123		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	30	24	11	35	42	1790	28	41	2052	574
RTOR Reduction (vph)	0	26	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	14	0	17	18	2	42	1817	0	41	2052	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.2	16.2		6.7	6.7	6.7	6.3	72.5		6.1	72.8	119.4
Effective Green, g (s)	16.8	16.8		6.9	6.9	6.9	6.0	73.4		6.3	73.7	119.4
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.05	0.61		0.05	0.62	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	483	234		99	102	91	90	3149		95	2206	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.35		0.02	c0.57	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.83	0.06		0.17	0.18	0.02	0.47	0.58		0.43	0.93	0.37
Uniform Delay, d1	49.9	44.5		53.5	53.5	53.1	55.1	13.7		54.8	20.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.6	0.2		1.4	1.4	0.2	3.8	0.4		3.1	8.0	0.7
Delay (s)	62.5	44.7		55.0	55.0	53.2	58.9	14.1		57.9	28.6	0.7
Level of Service	E	D		D	D	D	E	B		E	C	A
Approach Delay (s)		60.9			54.1			15.2			23.0	
Approach LOS		E			D			B			C	

Intersection Summary

HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	119.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	824	250	399	954	10	108	3	260	9	18	41
Future Volume (vph)	7	824	250	399	954	10	108	3	260	9	18	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1568	3433	3530		1698	1708	1559		1737	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1568	3433	3530		1698	1708	1559		1737	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	1056	321	512	1223	13	138	4	333	12	23	53
RTOR Reduction (vph)	0	0	90	0	0	0	0	0	67	0	0	50
Lane Group Flow (vph)	9	1056	231	512	1236	0	72	70	266	0	35	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6	4	5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.7	28.9	35.1	9.5	37.7		6.2	6.2	15.7		2.3	2.3
Effective Green, g (s)	1.2	29.9	37.1	10.1	38.7		8.0	8.0	16.9		3.3	3.3
Actuated g/C Ratio	0.02	0.44	0.55	0.15	0.58		0.12	0.12	0.25		0.05	0.05
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	32	1572	864	515	2029		201	203	391		85	76
v/s Ratio Prot	0.00	c0.30	0.03	c0.15	0.35		0.04	0.04	c0.10		c0.02	
v/s Ratio Perm			0.12						0.07			0.00
v/c Ratio	0.28	0.67	0.27	0.99	0.61		0.36	0.34	0.68		0.41	0.03
Uniform Delay, d1	32.6	14.8	7.9	28.6	9.4		27.3	27.2	22.8		31.1	30.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.9	0.1	37.9	0.4		0.4	0.4	3.9		1.2	0.1
Delay (s)	34.4	15.7	8.0	66.5	9.7		27.7	27.6	26.6		32.2	30.5
Level of Service	C	B	A	E	A		C	C	C		C	C
Approach Delay (s)		14.0			26.3			26.9			31.2	
Approach LOS		B			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	67.3	Sum of lost time (s)	16.9	
Intersection Capacity Utilization	54.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	824	250	399	954	10	108	3	260	9	18	41
Future Volume (veh/h)	7	824	250	399	954	10	108	3	260	9	18	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1767	1863
Adj Flow Rate, veh/h	9	1056	321	512	1223	13	141	0	333	12	23	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	29	1203	887	487	1662	18	845	0	560	34	65	89
Arrive On Green	0.02	0.34	0.34	0.14	0.46	0.45	0.24	0.00	0.22	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3584	38	3583	0	1545	596	1141	1575
Grp Volume(v), veh/h	9	1056	321	512	603	633	141	0	333	35	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1854	1792	0	1545	1737	0	1575
Q Serve(g_s), s	0.3	19.9	8.0	10.0	19.6	19.7	2.2	0.0	12.4	1.4	0.0	2.3
Cycle Q Clear(g_c), s	0.3	19.9	8.0	10.0	19.6	19.7	2.2	0.0	12.4	1.4	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.34		1.00
Lane Grp Cap(c), veh/h	29	1203	887	487	820	860	845	0	560	98	0	89
V/C Ratio(X)	0.31	0.88	0.36	1.05	0.74	0.74	0.17	0.00	0.59	0.36	0.00	0.60
Avail Cap(c_a), veh/h	115	1311	935	487	820	860	1712	0	934	98	0	89
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.4	22.0	8.4	30.4	15.4	15.5	21.5	0.0	18.4	32.1	0.0	32.6
Incr Delay (d2), s/veh	2.2	6.2	0.1	55.2	3.1	2.9	0.0	0.0	0.4	0.8	0.0	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.7	5.2	8.4	10.2	10.7	1.1	0.0	5.4	0.7	0.0	1.2
LnGrp Delay(d),s/veh	36.5	28.2	8.5	85.6	18.5	18.4	21.5	0.0	18.8	32.9	0.0	39.9
LnGrp LOS	D	C	A	F	B	B	C		B	C		D
Approach Vol, veh/h		1386			1748			474			88	
Approach Delay, s/veh		23.7			38.1			19.6			37.1	
Approach LOS		C			D			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	36.8		20.7	14.0	28.0		8.0
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 9.4	25.2		3.0
Max Q Clear Time (g_c+I1), s	2.3	21.7		14.4	12.0	21.9		4.3
Green Ext Time (p_c), s	0.0	4.9		0.3	0.0	1.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.3
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	199	308	26	6	100	287	175	38	294	71	282	468
Future Volume (vph)	199	308	26	6	100	287	175	38	294	71	282	468
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	0.97		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1703	3496			3301	1827	1547	1752	3467		3433	3369
Flt Permitted	0.95	1.00			0.42	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1703	3496			1448	1827	1547	1752	3467		3433	3369
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	214	331	28	7	108	309	188	41	316	76	303	503
RTOR Reduction (vph)	0	7	0	0	0	0	140	0	24	0	0	12
Lane Group Flow (vph)	214	352	0	0	115	309	48	41	368	0	303	563
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	10.6	19.0			9.9	18.3	18.3	4.3	17.9		9.5	23.1
Effective Green, g (s)	10.3	19.2			9.6	18.5	18.5	4.0	18.8		9.2	24.0
Actuated g/C Ratio	0.14	0.26			0.13	0.25	0.25	0.05	0.26		0.13	0.33
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	240	922			190	464	393	96	895		433	1110
v/s Ratio Prot	c0.13	0.10				c0.17		0.02	0.11		c0.09	c0.17
v/s Ratio Perm					0.08		0.03					
v/c Ratio	0.89	0.38			0.61	0.67	0.12	0.43	0.41		0.70	0.51
Uniform Delay, d1	30.7	21.9			29.8	24.4	20.9	33.3	22.4		30.5	19.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	31.1	0.3			5.4	3.7	0.2	3.0	0.4		4.9	0.4
Delay (s)	61.8	22.3			35.2	28.1	21.1	36.3	22.8		35.4	20.1
Level of Service	E	C			D	C	C	D	C		D	C
Approach Delay (s)		37.0				27.3			24.1			25.4
Approach LOS		D				C			C			C

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd
Cumulative + Project AM - Mitigated.syn
12/13/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Synchro 9 Report
I:\2017\Jobs\383280 - Misc Traffic Engr 2017\383280AN01 - Rio Ranch\Synchro\Synchro 12-01-17\Mitigated Synchro\Cumulative + Project AM - Mitigate

HCM Signalized Intersection Capacity Analysis — Cumulative + Project AM - Mitigated.syn
8: SR 1 & Carpenter St — 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	382	4	26	35	14	44	38	1397	17	71	1784	774
Future Volume (vph)	382	4	26	35	14	44	38	1397	17	71	1784	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1588	1752	5076		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1588	1752	5076		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	29	38	15	48	42	1535	19	78	1960	851
RTOR Reduction (vph)	0	25	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	42	1553	0	78	1960	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.3	16.3		7.3	7.3	7.3	6.3	69.8		8.9	72.9	120.2
Effective Green, g (s)	16.9	16.9		7.5	7.5	7.5	6.0	70.7		9.1	73.8	120.2
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.05	0.59		0.08	0.61	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	482	214		107	106	99	87	2985		124	2131	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.31		0.05	c0.56	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.87	0.04		0.25	0.25	0.03	0.48	0.52		0.63	0.92	0.54
Uniform Delay, d1	50.6	44.6		53.7	53.7	52.9	55.6	14.7		53.9	20.6	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.6	0.1		2.1	2.1	0.2	4.2	0.3		9.6	7.3	1.3
Delay (s)	67.2	44.8		55.8	55.7	53.1	59.8	15.0		63.5	27.9	1.3
Level of Service	E	D		E	E	D	E	B		E	C	A
Approach Delay (s)		65.5			54.5			16.2			21.0	
Approach LOS		E			D			B			C	

Intersection Summary

HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis — Cumulative + Project PM - Mitigated.syn
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd — 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	877	251	446	681	5	270	22	610	6	10	7
Future Volume (vph)	26	877	251	446	681	5	270	22	610	6	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1731	1590		1727	1579
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1731	1590		1727	1579
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	953	273	485	740	5	293	24	663	7	11	8
RTOR Reduction (vph)	0	0	103	0	0	0	0	0	74	0	0	8
Lane Group Flow (vph)	28	953	170	485	745	0	158	159	589	0	18	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6	4	5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.8	25.8	35.1	11.8	35.8		9.3	9.3	21.1		1.0	1.0
Effective Green, g (s)	2.3	26.8	37.1	12.4	36.8		11.1	11.1	22.3		2.0	2.0
Actuated g/C Ratio	0.03	0.39	0.54	0.18	0.54		0.16	0.16	0.33		0.03	0.03
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	60	1388	877	629	1923		278	281	519		50	46
v/s Ratio Prot	0.02	c0.27	0.03	0.14	0.21		0.09	0.09	c0.21		c0.01	
v/s Ratio Perm			0.08						0.16			0.00
v/c Ratio	0.47	0.69	0.19	0.77	0.39		0.57	0.57	1.13		0.36	0.01
Uniform Delay, d1	32.4	17.3	8.0	26.6	9.2		26.4	26.4	23.0		32.5	32.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	1.1	0.0	5.3	0.0		1.6	1.6	82.2		1.6	0.0
Delay (s)	34.5	18.4	8.0	31.9	9.2		28.0	27.9	105.2		34.1	32.2
Level of Service	C	B	A	C	A		C	C	F		C	C
Approach Delay (s)		16.5			18.2			80.2			33.5	
Approach LOS		B			B			F			C	

Intersection Summary

HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	68.3	Sum of lost time (s)	16.9
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	877	251	446	681	5	270	22	610	6	10	7
Future Volume (veh/h)	26	877	251	446	681	5	270	22	610	6	10	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1900	1881	1900	1760	1900
Adj Flow Rate, veh/h	28	953	273	485	740	5	310	0	663	7	11	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	51	961	1041	480	1384	9	1384	0	810	18	29	43
Arrive On Green	0.03	0.27	0.27	0.14	0.38	0.37	0.38	0.00	0.37	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3640	25	3619	0	1598	671	1055	1586
Grp Volume(v), veh/h	28	953	273	485	363	382	310	0	663	18	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1877	1810	0	1598	1727	0	1586
Q Serve(g_s), s	1.4	23.7	6.4	12.2	14.0	14.0	5.1	0.0	30.9	0.9	0.0	0.4
Cycle Q Clear(g_c), s	1.4	23.7	6.4	12.2	14.0	14.0	5.1	0.0	30.9	0.9	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.39		1.00
Lane Grp Cap(c), veh/h	51	961	1041	480	679	713	1384	0	810	47	0	43
V/C Ratio(X)	0.55	0.99	0.26	1.01	0.53	0.53	0.22	0.00	0.82	0.38	0.00	0.18
Avail Cap(c_a), veh/h	115	961	1041	480	679	713	1384	0	810	78	0	72
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.4	32.1	6.7	38.1	21.3	21.3	18.4	0.0	18.4	42.3	0.0	42.0
Incr Delay (d2), s/veh	3.4	27.0	0.0	43.9	0.4	0.4	0.0	0.0	6.2	1.9	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	15.1	5.9	8.7	6.9	7.3	2.5	0.0	15.0	0.5	0.0	0.2
LnGrp Delay(d),s/veh	45.8	59.1	6.8	82.1	21.8	21.7	18.5	0.0	24.6	44.1	0.0	42.8
LnGrp LOS	D	E	A	F	C	C	B		C	D		D
Approach Vol, veh/h		1254			1230			973			26	
Approach Delay, s/veh		47.4			45.5			22.7			43.7	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.6	37.6		37.8	16.2	28.0		6.4
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	23.0		3.0
Max Q Clear Time (g_c+I1), s	3.4	16.0		32.9	14.2	25.7		2.9
Green Ext Time (p_c), s	0.0	4.3		0.0	0.0	0.0		0.0

Intersection Summary			
HCM 2010 Ctrl Delay		39.8	
HCM 2010 LOS		D	

Notes

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	114	389	69	12	166	426	335	77	622	205	241	437
Future Volume (vph)	114	389	69	12	166	426	335	77	622	205	241	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.96		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1752	3471			3388	1863	1560	1805	3343		3502	3504
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1752	3471			1179	1863	1560	1805	3343		3502	3504
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	118	401	71	12	171	439	345	79	641	211	248	451
RTOR Reduction (vph)	0	17	0	0	0	0	200	0	35	0	0	12
Lane Group Flow (vph)	118	455	0	0	183	439	145	79	817	0	248	502
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	9.1	21.9			12.4	25.2	25.2	6.2	25.2		9.3	28.3
Effective Green, g (s)	8.8	22.1			12.1	25.4	25.4	5.9	26.1		9.0	29.2
Actuated g/C Ratio	0.10	0.26			0.14	0.30	0.30	0.07	0.31		0.11	0.34
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	180	899			167	554	464	124	1022		369	1199
v/s Ratio Prot	0.07	0.13				c0.24		0.04	c0.24		c0.07	c0.14
v/s Ratio Perm					c0.16		0.09					
v/c Ratio	0.66	0.51			1.10	0.79	0.31	0.64	0.80		0.67	0.42
Uniform Delay, d1	36.8	26.9			36.6	27.5	23.2	38.7	27.2		36.7	21.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	8.3	0.5			97.6	7.8	0.5	10.3	4.6		4.8	0.3
Delay (s)	45.1	27.5			134.2	35.4	23.6	48.9	31.8		41.5	21.8
Level of Service	D	C			F	D	C	D	C		D	C
Approach Delay (s)		31.0				49.9			33.2			28.2
Approach LOS		C				D			C			C

Intersection Summary					
HCM 2000 Control Delay		36.6	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio		0.83			
Actuated Cycle Length (s)		85.3	Sum of lost time (s)		16.0
Intersection Capacity Utilization		74.1%	ICU Level of Service		D
Analysis Period (min)		15			
c Critical Lane Group					

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

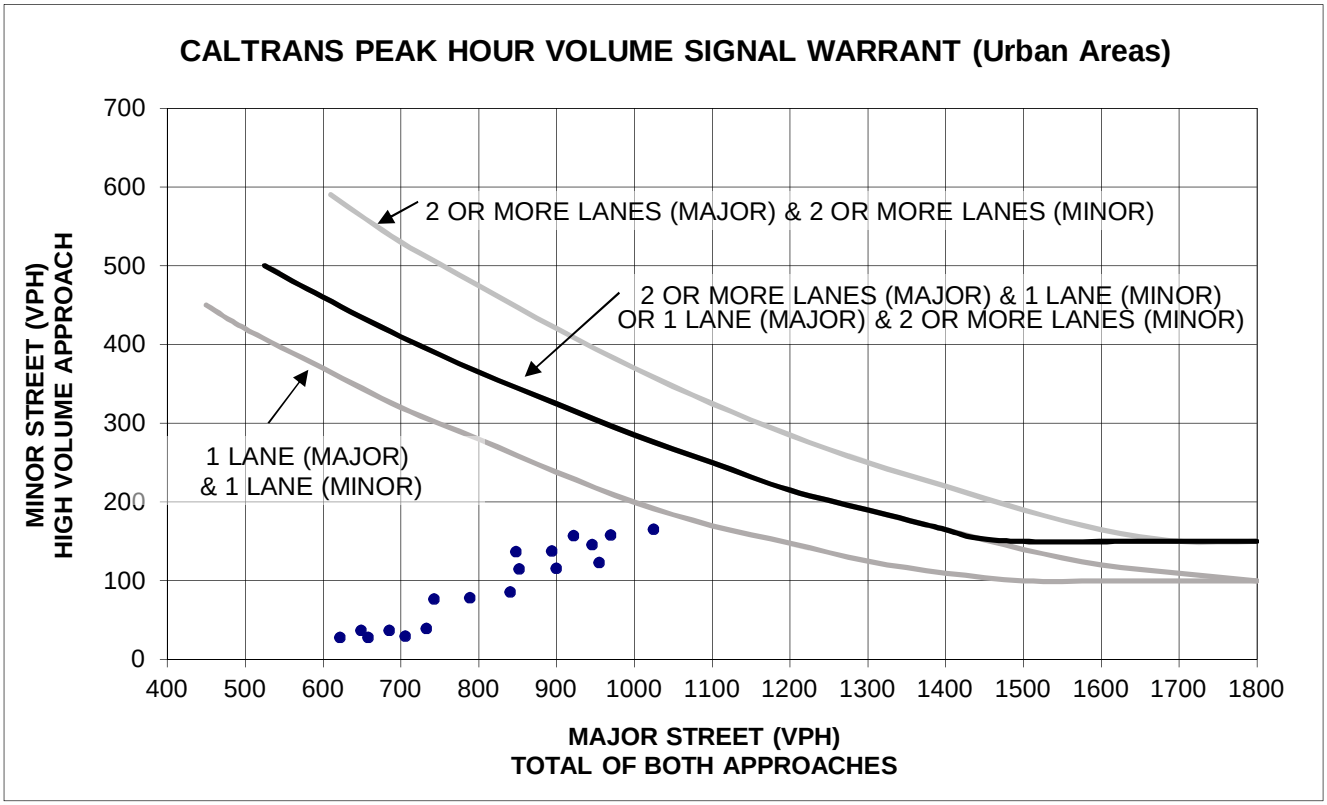
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	869	18	27	18	6	54	10	1919	19	55	1697	493
Future Volume (vph)	869	18	27	18	6	54	10	1919	19	55	1697	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1727		1715	1761	1524	1805	5073		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1727		1715	1761	1524	1805	5073		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	28	18	6	55	10	1958	19	56	1732	503
RTOR Reduction (vph)	0	20	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	26	0	12	12	3	10	1977	0	56	1732	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	38.4	38.4		6.6	6.6	6.6	1.5	72.2		6.3	77.5	141.4
Effective Green, g (s)	39.0	39.0		6.8	6.8	6.8	1.2	73.1		6.5	78.4	141.4
Actuated g/C Ratio	0.28	0.28		0.05	0.05	0.05	0.01	0.52		0.05	0.55	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	956	476		82	84	73	15	2622		82	1981	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	0.39		c0.03	c0.48	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.93	0.05		0.15	0.14	0.04	0.67	0.75		0.68	0.87	0.31
Uniform Delay, d1	49.8	37.6		64.5	64.5	64.2	69.9	27.0		66.4	27.2	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.0	0.1		1.4	1.4	0.4	75.9	1.5		20.9	5.0	0.5
Delay (s)	64.8	37.7		65.9	65.9	64.5	145.8	28.5		87.4	32.3	0.5
Level of Service	E	D		E	E	E	F	C		F	C	A
Approach Delay (s)		63.5			64.9			29.1			26.6	
Approach LOS		E			E			C			C	

Intersection Summary

HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	141.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix G
Carmel Rancho Blvd / Clocktower Place
Peak Hour Signal Warrant



Scenario	Carmel Rancho North/South	Clocktower East/West	Warrant Met?
A. Existing AM	622	28	No
B. Existing PM	852	115	No
C. Existing Sat	743	77	No
D. Ex+Proj AM	649	37	No
E. Ex+Proj PM	922	157	No
F. Ex+Proj Sat	848	137	No
G. Background AM	658	28	No
H. Background PM	900	116	No
I. Background Sat	789	78	No
J. Back+Proj AM	685	37	No
K. Back+Proj PM	970	158	No
L. Back+Proj Sat	894	138	No
M. Cumulative AM	706	30	No
N. Cumulative PM	955	123	No
O. Cumulative Sat	841	86	No
P. Cumul+Proj AM	733	39	No
Q. Cumul+Proj PM	1025	165	No
R. Cumul+Proj Sat	946	146	No

Notes:

1. 100 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 75 VPH applies as the lower threshold volume for a minor street approaching with one lane.

2. Bold line applies to intersection geometry.

Appendix H

Road Segment Level of Service Calculations Worksheets

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst: JO
Agency/Co: Mott MacDonald
Date: 12/6/17
Analysis Period: Existing AM
Highway: SR 1
From/To: Carpenter / Ocean
Jurisdiction: Unincorporated Monterey County
Analysis Year: 2017
Project ID: Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1265	vph	1645	vph
Peak-hour factor, PHF	0.91		0.91	
Peak 15-minute volume, v15	348		452	
Trucks and buses	2	%	3	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.985	
Flow rate, vp	750	pcphpl	917	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	750	pcphpl	917	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	B		C	
Density, D	16.7	pc/mi/ln	20.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	695.1	903.8
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.14	3.52
Bicycle LOS	C	D

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing PM
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1659	vph	1480	vph
Peak-hour factor, PHF	0.95		0.96	
Peak 15-minute volume, v15	437		385	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.995	
Flow rate, vp	943	pcphpl	774	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	943	pcphpl	774	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		B	
Density, D	21.0	pc/mi/ln	17.2	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	873.2	770.8
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.25	2.96
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing Saturday
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1521	vph	1751	vph
Peak-hour factor, PHF	0.91		0.97	
Peak 15-minute volume, v15	418		451	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.962		0.995	
Flow rate, vp	869	pcphpl	907	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	869	pcphpl	907	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	19.3	pc/mi/ln	20.2	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	835.7	902.6
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.00	3.04
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing AM
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1466	vph	1591	vph
Peak-hour factor, PHF	0.89		0.92	
Peak 15-minute volume, v15	412		432	
Trucks and buses	3	%	4	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.3		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.887		0.980	
Flow rate, vp	928	pcphpl	881	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	928	pcphpl	881	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	20.6	pc/mi/ln	19.6	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	823.6	864.7
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.47	3.77
Bicycle LOS	C	D

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing PM
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1563	vph	1466	vph
Peak-hour factor, PHF	0.96		0.95	
Peak 15-minute volume, v15	407		386	
Trucks and buses	1	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.990	
Flow rate, vp	850	pcphpl	779	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	850	pcphpl	779	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		B	
Density, D	18.9	pc/mi/ln	17.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	814.1	771.6
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.99	3.19
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing Saturday
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1507	vph	1580	vph
Peak-hour factor, PHF	0.93		0.94	
Peak 15-minute volume, v15	405		420	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.995	
Flow rate, vp	846	pcphpl	844	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	846	pcphpl	844	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	18.8	pc/mi/ln	18.8	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	810.2	840.4
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.98	3.00
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing AM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd 1591 veh/h
Opposing direction volume, Vo 1466 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.742	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1729	pc/h	2148	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	6.6	mi/h
Percent Free Flow Speed, PFFS	16.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.995	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1729	pc/h	1601	pc/h
Base percent time-spent-following,(note-4) BPTSFd	93.5	%		
Adjustment for no-passing zones, fnp	6.9			
Percent time-spent-following, PTSFd	97.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.02	
Peak 15-min vehicle-miles of travel, VMT15	389	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1432	veh-mi
Peak 15-min total travel time, TT15	59.3	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	6.6	mi/h
Percent time-spent-following, PTSFd (from above)	97.1	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1729.3
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.97
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing PM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95	
Shoulder width	5.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd	1466	veh/h
Opposing direction volume, Vo	1563	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.852	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1543	pc/h	1931	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	9.7	mi/h
Percent Free Flow Speed, PFFS	24.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.998	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1543	pc/h	1649	pc/h
Base percent time-spent-following,(note-4) BPTSFd	91.8	%		
Adjustment for no-passing zones, fnp	6.8			
Percent time-spent-following, PTSFd	95.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	0.91	
Peak 15-min vehicle-miles of travel, VMT15	347	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1319	veh-mi
Peak 15-min total travel time, TT15	35.8	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	9.7	mi/h
Percent time-spent-following, PTSFd (from above)	95.1	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1543.2
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.43
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing Saturday
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	5.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd 1580 veh/h
Opposing direction volume, Vo 1507 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.920	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1681	pc/h	1743	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	10.1	mi/h
Percent Free Flow Speed, PFFS	25.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.999	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1681	pc/h	1605	pc/h
Base percent time-spent-following,(note-4) BPTSFd	93.1	%		
Adjustment for no-passing zones, fnp	6.6			
Percent time-spent-following, PTSFd	96.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	0.99	
Peak 15-min vehicle-miles of travel, VMT15	378	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1422	veh-mi
Peak 15-min total travel time, TT15	37.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	10.1	mi/h
Percent time-spent-following, PTSFd (from above)	96.5	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1680.9
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.26
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing AM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	577	veh/h
Opposing direction volume, Vo	668	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	738	pc/h	838	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.5	mi/h
Percent Free Flow Speed, PFFS	67.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	782	pc/h	835	pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.1	%		
Adjustment for no-passing zones, fnp	24.6			
Percent time-spent-following, PTSFd	81.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.46	
Peak 15-min vehicle-miles of travel, VMT15	54	veh-mi
Peak-hour vehicle-miles of travel, VMT60	173	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	1678	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.5	mi/h
Percent time-spent-following, PTSFd (from above)	81.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	721.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.82
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing PM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	831	veh/h
Opposing direction volume, Vo	563	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	941	pc/h	634	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.5	mi/h
Percent Free Flow Speed, PFFS	67.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1013	pc/h	633	pc/h
Base percent time-spent-following,(note-4) BPTSFd	74.9	%		
Adjustment for no-passing zones, fnp	23.3			
Percent time-spent-following, PTSFd	89.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.60	
Peak 15-min vehicle-miles of travel, VMT15	70	veh-mi
Peak-hour vehicle-miles of travel, VMT60	249	veh-mi
Peak 15-min total travel time, TT15	2.3	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.5	mi/h
Percent time-spent-following, PTSFd (from above)	89.2	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	933.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.00
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing Saturday
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	773	veh/h
Opposing direction volume, Vo	758	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	844	pc/h	825	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.7	mi/h
Percent Free Flow Speed, PFFS	66.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	911	pc/h	824	pc/h
Base percent time-spent-following,(note-4) BPTSFd	73.1	%		
Adjustment for no-passing zones, fnp	23.1			
Percent time-spent-following, PTSFd	85.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.54	
Peak 15-min vehicle-miles of travel, VMT15	63	veh-mi
Peak-hour vehicle-miles of travel, VMT60	232	veh-mi
Peak 15-min total travel time, TT15	2.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	85.2	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	840.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.45
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing AM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97	
Shoulder width	6.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	668	veh/h
Opposing direction volume, Vo	577	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		2.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.963	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	691	pc/h	618	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	32.5	mi/h
Percent Free Flow Speed, PFFS	72.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	689	pc/h	645	pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.5	%		
Adjustment for no-passing zones, fnp	29.9			
Percent time-spent-following, PTSFd	78.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.41	
Peak 15-min vehicle-miles of travel, VMT15	52	veh-mi
Peak-hour vehicle-miles of travel, VMT60	200	veh-mi
Peak 15-min total travel time, TT15	1.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.5	mi/h
Percent time-spent-following, PTSFd (from above)	78.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	688.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.04
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing PM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	563	veh/h
Opposing direction volume, Vo	831	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	626	pc/h	926	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.7	mi/h
Percent Free Flow Speed, PFFS	68.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	626	pc/h	1001	pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.9	%		
Adjustment for no-passing zones, fnp	23.6			
Percent time-spent-following, PTSFd	73.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	47	veh-mi
Peak-hour vehicle-miles of travel, VMT60	169	veh-mi
Peak 15-min total travel time, TT15	1.5	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.7	mi/h
Percent time-spent-following, PTSFd (from above)	73.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	625.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.30
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing Saturday
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	758	veh/h
Opposing direction volume, Vo	773	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.996	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	816	pc/h	835	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.9	mi/h
Percent Free Flow Speed, PFFS	66.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	815	pc/h	901	pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.9	%		
Adjustment for no-passing zones, fnp	23.4			
Percent time-spent-following, PTSFd	82.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.48	
Peak 15-min vehicle-miles of travel, VMT15	61	veh-mi
Peak-hour vehicle-miles of travel, VMT60	227	veh-mi
Peak 15-min total travel time, TT15	2.0	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	82.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	815.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.45
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing AM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.85		
Shoulder width	6.0	ft	% Trucks and buses	1	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	3	/mi	

Analysis direction volume, Vd	329	veh/h
Opposing direction volume, Vo	442	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.997		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	388	pc/h	521	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	34.9	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.999		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	387	pc/h	520	pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.4	%		
Adjustment for no-passing zones, fnp	40.0			
Percent time-spent-following, PTSFd	61.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	29	veh-mi
Peak-hour vehicle-miles of travel, VMT60	99	veh-mi
Peak 15-min total travel time, TT15	0.8	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.9	mi/h
Percent time-spent-following, PTSFd (from above)	61.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	387.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.06
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing PM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	683	veh/h
Opposing direction volume, Vo	513	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.997		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	761	pc/h	572	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.6	mi/h
Percent Free Flow Speed, PFFS	71.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	759	pc/h	570	pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.9	%		
Adjustment for no-passing zones, fnp	29.5			
Percent time-spent-following, PTSFd	81.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.45	
Peak 15-min vehicle-miles of travel, VMT15	57	veh-mi
Peak-hour vehicle-miles of travel, VMT60	205	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.6	mi/h
Percent time-spent-following, PTSFd (from above)	81.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	758.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.84
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing Saturday
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.87		
Shoulder width	6.0	ft	% Trucks and buses	1	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	3	/mi	

Analysis direction volume, Vd	586	veh/h
Opposing direction volume, Vo	684	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	674	pc/h	787	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.6	mi/h
Percent Free Flow Speed, PFFS	69.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	674	pc/h	786	pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.9	%		
Adjustment for no-passing zones, fnp	27.1			
Percent time-spent-following, PTSFd	76.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.40	
Peak 15-min vehicle-miles of travel, VMT15	51	veh-mi
Peak-hour vehicle-miles of travel, VMT60	176	veh-mi
Peak 15-min total travel time, TT15	1.7	veh-h
Capacity from ATS, CdATS	1698	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.6	mi/h
Percent time-spent-following, PTSFd (from above)	76.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	673.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.34
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing AM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91	
Shoulder width	6.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	442	veh/h
Opposing direction volume, Vo	329	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	490	pc/h	366	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	35.3	mi/h
Percent Free Flow Speed, PFFS	79.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.996	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	486	pc/h	363	pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.8	%		
Adjustment for no-passing zones, fnp	41.5			
Percent time-spent-following, PTSFd	72.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.29	
Peak 15-min vehicle-miles of travel, VMT15	36	veh-mi
Peak-hour vehicle-miles of travel, VMT60	133	veh-mi
Peak 15-min total travel time, TT15	1.0	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1693	veh/h
Directional Capacity	1693	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.3	mi/h
Percent time-spent-following, PTSFd (from above)	72.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	485.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.87
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing PM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	6.0	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	513	veh/h
Opposing direction volume, Vo	683	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	552	pc/h	734	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	32.0	mi/h
Percent Free Flow Speed, PFFS	72.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	552	pc/h	734	pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.3	%		
Adjustment for no-passing zones, fnp	30.6			
Percent time-spent-following, PTSFd	70.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.32	
Peak 15-min vehicle-miles of travel, VMT15	41	veh-mi
Peak-hour vehicle-miles of travel, VMT60	154	veh-mi
Peak 15-min total travel time, TT15	1.3	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.0	mi/h
Percent time-spent-following, PTSFd (from above)	70.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	551.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.05
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing Saturday
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97	
Shoulder width	6.0	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	684	veh/h
Opposing direction volume, Vo	586	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	705	pc/h	604	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.8	mi/h
Percent Free Flow Speed, PFFS	71.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	705	pc/h	604	pc/h
Base percent time-spent-following,(note-4) BPTSFd	62.7	%		
Adjustment for no-passing zones, fnp	30.6			
Percent time-spent-following, PTSFd	79.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.41	
Peak 15-min vehicle-miles of travel, VMT15	53	veh-mi
Peak-hour vehicle-miles of travel, VMT60	205	veh-mi
Peak 15-min total travel time, TT15	1.7	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.8	mi/h
Percent time-spent-following, PTSFd (from above)	79.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	705.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.19
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing AM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91		
Shoulder width	6.0	ft	% Trucks and buses	8	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	1	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	26	/mi	

Analysis direction volume, Vd	380	veh/h
Opposing direction volume, Vo	843	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	427	pc/h	926	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.7	mi/h
Percent Free Flow Speed, PFFS	70.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	418	pc/h	926	pc/h
Base percent time-spent-following,(note-4) BPTSFd	51.3	%		
Adjustment for no-passing zones, fnp	24.1			
Percent time-spent-following, PTSFd	58.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.25	
Peak 15-min vehicle-miles of travel, VMT15	157	veh-mi
Peak-hour vehicle-miles of travel, VMT60	570	veh-mi
Peak 15-min total travel time, TT15	5.1	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.7	mi/h
Percent time-spent-following, PTSFd (from above)	58.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	417.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.16
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing PM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	908	veh/h
Opposing direction volume, Vo	438	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.984	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	987	pc/h	484	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.8	mi/h
Percent Free Flow Speed, PFFS	68.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	987	pc/h	476	pc/h
Base percent time-spent-following,(note-4) BPTSFd	73.1	%		
Adjustment for no-passing zones, fnp	22.7			
Percent time-spent-following, PTSFd	88.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.58	
Peak 15-min vehicle-miles of travel, VMT15	370	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1362	veh-mi
Peak 15-min total travel time, TT15	12.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.8	mi/h
Percent time-spent-following, PTSFd (from above)	88.4	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	987.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.56
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing Saturday
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92		
Shoulder width	6.0	ft	% Trucks and buses	8	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	1	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	26	/mi	

Analysis direction volume, Vd	671	veh/h
Opposing direction volume, Vo	538	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	735	pc/h	589	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.9	mi/h
Percent Free Flow Speed, PFFS	71.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	729	pc/h	585	pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.8	%		
Adjustment for no-passing zones, fnp	30.1			
Percent time-spent-following, PTSFd	80.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.43	
Peak 15-min vehicle-miles of travel, VMT15	274	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1007	veh-mi
Peak 15-min total travel time, TT15	8.9	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.9	mi/h
Percent time-spent-following, PTSFd (from above)	80.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	729.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.40
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing AM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	843	veh/h
Opposing direction volume, Vo	380	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.984	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1028	pc/h	471	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.6	mi/h
Percent Free Flow Speed, PFFS	68.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1028	pc/h	463	pc/h
Base percent time-spent-following,(note-4) BPTSFd	73.8	%		
Adjustment for no-passing zones, fnp	21.6			
Percent time-spent-following, PTSFd	88.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.60	
Peak 15-min vehicle-miles of travel, VMT15	386	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1265	veh-mi
Peak 15-min total travel time, TT15	13.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.6	mi/h
Percent time-spent-following, PTSFd (from above)	88.7	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1028.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.57
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing PM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82		
Shoulder width	6.0	ft	% Trucks and buses	8	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	1	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	26	/mi	

Analysis direction volume, Vd	438	veh/h
Opposing direction volume, Vo	908	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.984		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	543	pc/h	1107	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.4	mi/h
Percent Free Flow Speed, PFFS	65.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	534	pc/h	1107	pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.8	%		
Adjustment for no-passing zones, fnp	20.2			
Percent time-spent-following, PTSFd	67.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.31	
Peak 15-min vehicle-miles of travel, VMT15	200	veh-mi
Peak-hour vehicle-miles of travel, VMT60	657	veh-mi
Peak 15-min total travel time, TT15	7.0	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.4	mi/h
Percent time-spent-following, PTSFd (from above)	67.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	534.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.24
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing Saturday
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	538	veh/h
Opposing direction volume, Vo	671	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	661	pc/h	825	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	50.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	6.5	mi/h	
Free-flow speed, FFSd	43.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	29.7	mi/h	
Percent Free Flow Speed, PFFS	68.2	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	656	pc/h	818	pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.2	%		
Adjustment for no-passing zones, fnp	26.7			
Percent time-spent-following, PTSFd	75.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.39	
Peak 15-min vehicle-miles of travel, VMT15	246	veh-mi
Peak-hour vehicle-miles of travel, VMT60	807	veh-mi
Peak 15-min total travel time, TT15	8.3	veh-h
Capacity from ATS, CdATS	1686	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	75.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	656.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.34
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing AM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	533	veh/h
Opposing direction volume, Vo	909	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	655	pc/h	1117	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	35.9	mi/h
Percent Free Flow Speed, PFFS	69.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	650	pc/h	1205	pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.7	%		
Adjustment for no-passing zones, fnp	18.7			
Percent time-spent-following, PTSFd	74.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.38	
Peak 15-min vehicle-miles of travel, VMT15	390	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1279	veh-mi
Peak 15-min total travel time, TT15	10.8	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.9	mi/h
Percent time-spent-following, PTSFd (from above)	74.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	650.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.28
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing PM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	970	veh/h
Opposing direction volume, Vo	500	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.941	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1183	pc/h	648	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	35.5	mi/h
Percent Free Flow Speed, PFFS	68.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	1183	pc/h	663	pc/h
Base percent time-spent-following,(note-4) BPTSFd	79.9	%		
Adjustment for no-passing zones, fnp	17.9			
Percent time-spent-following, PTSFd	91.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.70	
Peak 15-min vehicle-miles of travel, VMT15	710	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2328	veh-mi
Peak 15-min total travel time, TT15	20.0	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.5	mi/h
Percent time-spent-following, PTSFd (from above)	91.4	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1182.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.64
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing Saturday
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	585	veh/h
Opposing direction volume, Vo	735	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.991	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	719	pc/h	904	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	37.1	mi/h
Percent Free Flow Speed, PFFS	72.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	713	pc/h	974	pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.4	%		
Adjustment for no-passing zones, fnp	23.1			
Percent time-spent-following, PTSFd	77.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.42	
Peak 15-min vehicle-miles of travel, VMT15	428	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1404	veh-mi
Peak 15-min total travel time, TT15	11.5	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	37.1	mi/h
Percent time-spent-following, PTSFd (from above)	77.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	713.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.39
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing AM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	909	veh/h
Opposing direction volume, Vo	533	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1190	pc/h	698	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	35.0	mi/h
Percent Free Flow Speed, PFFS	68.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1283	pc/h	692	pc/h
Base percent time-spent-following,(note-4) BPTSFd	82.6	%		
Adjustment for no-passing zones, fnp	16.8			
Percent time-spent-following, PTSFd	93.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.75	
Peak 15-min vehicle-miles of travel, VMT15	708	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2182	veh-mi
Peak 15-min total travel time, TT15	20.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.0	mi/h
Percent time-spent-following, PTSFd (from above)	93.5	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1180.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.64
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing PM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	500	veh/h
Opposing direction volume, Vo	970	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.943		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	689	pc/h	1260	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	34.6	mi/h
Percent Free Flow Speed, PFFS	67.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	706	pc/h	1260	pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.6	%		
Adjustment for no-passing zones, fnp	16.1			
Percent time-spent-following, PTSFd	76.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.42	
Peak 15-min vehicle-miles of travel, VMT15	390	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1200	veh-mi
Peak 15-min total travel time, TT15	11.3	veh-h
Capacity from ATS, CdATS	1686	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.6	mi/h
Percent time-spent-following, PTSFd (from above)	76.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	649.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.34
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing Saturday
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	735	veh/h
Opposing direction volume, Vo	585	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	785	pc/h	623	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	38.8	mi/h
Percent Free Flow Speed, PFFS	75.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	850	pc/h	622	pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.0	%		
Adjustment for no-passing zones, fnp	26.7			
Percent time-spent-following, PTSFd	84.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.50	
Peak 15-min vehicle-miles of travel, VMT15	469	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1764	veh-mi
Peak 15-min total travel time, TT15	12.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	38.8	mi/h
Percent time-spent-following, PTSFd (from above)	84.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	781.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	2.46
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing AM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	691	vph	892	vph
Peak-hour factor, PHF	0.80		0.87	
Peak 15-minute volume, v15	216		256	
Trucks and buses	3	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.985		0.995	
Flow rate, vp	438	pcphpl	515	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	438	pcphpl	515	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	8.0	pc/mi/ln	9.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	431.9	512.6
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.69	2.29
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing PM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	968	vph	650	vph
Peak-hour factor, PHF	0.88		0.93	
Peak 15-minute volume, v15	275		175	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	552	pcphpl	351	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	552	pcphpl	351	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	10.0	pc/mi/ln	6.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	550.0	349.5
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.33	2.13
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing Saturday
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	778	vph	768	vph
Peak-hour factor, PHF	0.91		0.94	
Peak 15-minute volume, v15	214		204	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	429	pcphpl	410	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	429	pcphpl	410	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	7.8	pc/mi/ln	7.5	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	427.5	408.5
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.22	2.18
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing AM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	985	vph	1181	vph
Peak-hour factor, PHF	0.86		0.68	
Peak 15-minute volume, v15	286		434	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	578	pcphpl	877	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	578	pcphpl	877	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		B	
Density, D	10.5	pc/mi/ln	15.9	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	572.7	868.4
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.58	2.79
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing PM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1243	vph	938	vph
Peak-hour factor, PHF	0.95		0.88	
Peak 15-minute volume, v15	327		266	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.995	
Flow rate, vp	660	pcphpl	535	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	660	pcphpl	535	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		A	
Density, D	12.0	pc/mi/ln	9.7	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	654.2	533.0
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.65	2.31
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing Saturday
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	978	vph	970	vph
Peak-hour factor, PHF	0.96		0.94	
Peak 15-minute volume, v15	255		258	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	511	pcphpl	518	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	511	pcphpl	518	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	9.3	pc/mi/ln	9.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	509.4	516.0
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.29	2.30
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing AM
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1010	vph	976	vph
Peak-hour factor, PHF	0.86		0.76	
Peak 15-minute volume, v15	294		321	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	593	pcphpl	648	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	593	pcphpl	648	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		B	
Density, D	10.8	pc/mi/ln	11.8	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	587.2	642.1
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.59	2.64
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing PM
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	980	vph	849	vph
Peak-hour factor, PHF	0.95		0.90	
Peak 15-minute volume, v15	258		236	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	520	pcphpl	476	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	520	pcphpl	476	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	9.5	pc/mi/ln	8.7	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	515.8	471.7
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.58	2.57
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing Saturday
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	888	vph	802	vph
Peak-hour factor, PHF	0.96		0.98	
Peak 15-minute volume, v15	231		205	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	467	pcphpl	413	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	467	pcphpl	413	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	8.5	pc/mi/ln	7.5	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	462.5	409.2
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.48	2.45
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.76	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	293	veh/h
Opposing direction volume, Vo	403	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.0		1.8	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.977	
Grade adj. factor,(note-1) fg	0.89		0.96	
Directional flow rate,(note-2) vi	446	pc/h	565	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	32.3	mi/h
Percent Free Flow Speed, PFFS	76.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.982		0.994	
Grade adjustment factor,(note-1) fg	0.89		0.96	
Directional flow rate,(note-2) vi	441	pc/h	556	pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.6	%		
Adjustment for no-passing zones, fnp	37.5			
Percent time-spent-following, PTSFd	65.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.26	
Peak 15-min vehicle-miles of travel, VMT15	251	veh-mi
Peak-hour vehicle-miles of travel, VMT60	762	veh-mi
Peak 15-min total travel time, TT15	7.8	veh-h
Capacity from ATS, CdATS	1598	veh/h
Capacity from PTSF, CdPTSF	1639	veh/h
Directional Capacity	1639	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	65.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	385.5
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.96
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.88	
Shoulder width	5.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	653	veh/h
Opposing direction volume, Vo	477	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.8	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.990		0.984	
Grade adj. factor,(note-1) fg	0.98		0.96	
Directional flow rate,(note-2) vi	765	pc/h	574	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.8	mi/h
Percent Free Flow Speed, PFFS	70.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.996	
Grade adjustment factor,(note-1) fg	0.99		0.96	
Directional flow rate,(note-2) vi	750	pc/h	567	pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.8	%		
Adjustment for no-passing zones, fnp	29.6			
Percent time-spent-following, PTSFd	81.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.44	
Peak 15-min vehicle-miles of travel, VMT15	482	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1698	veh-mi
Peak 15-min total travel time, TT15	16.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1642	veh/h
Directional Capacity	1642	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.8	mi/h
Percent time-spent-following, PTSFd (from above)	81.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	742.0
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.06
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95		
Shoulder width	5.0	ft	% Trucks and buses	1	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	553	veh/h
Opposing direction volume, Vo	649	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.993		0.994	
Grade adj. factor,(note-1) fg	0.97		0.98	
Directional flow rate,(note-2) vi	604	pc/h	701	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.0	mi/h
Percent Free Flow Speed, PFFS	70.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.998		1.000	
Grade adjustment factor,(note-1) fg	0.97		0.99	
Directional flow rate,(note-2) vi	601	pc/h	690	pc/h
Base percent time-spent-following,(note-4) BPTSFd	59.0	%		
Adjustment for no-passing zones, fnp	31.1			
Percent time-spent-following, PTSFd	73.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.35	
Peak 15-min vehicle-miles of travel, VMT15	378	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1438	veh-mi
Peak 15-min total travel time, TT15	12.6	veh-h
Capacity from ATS, CdATS	1656	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	73.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	582.1
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.73
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	403	veh/h
Opposing direction volume, Vo	293	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		2.1	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.974		0.968	
Grade adj. factor,(note-1) fg	0.92		0.84	
Directional flow rate,(note-2) vi	489	pc/h	392	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	33.3	mi/h
Percent Free Flow Speed, PFFS	78.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.988		0.982	
Grade adjustment factor,(note-1) fg	0.92		0.86	
Directional flow rate,(note-2) vi	482	pc/h	377	pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.9	%		
Adjustment for no-passing zones, fnp	41.0			
Percent time-spent-following, PTSFd	70.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	285	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1048	veh-mi
Peak 15-min total travel time, TT15	8.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1486	veh/h
Directional Capacity	1486	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.3	mi/h
Percent time-spent-following, PTSFd (from above)	70.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	438.0
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.12
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93		
Shoulder width	5.0	ft	% Trucks and buses	3	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	477	veh/h
Opposing direction volume, Vo	653	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	0.95		0.98	
Directional flow rate,(note-2) vi	553	pc/h	730	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.2	mi/h
Percent Free Flow Speed, PFFS	71.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	0.96		0.99	
Directional flow rate,(note-2) vi	537	pc/h	709	pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.7	%		
Adjustment for no-passing zones, fnp	31.4			
Percent time-spent-following, PTSFd	70.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.32	
Peak 15-min vehicle-miles of travel, VMT15	333	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1240	veh-mi
Peak 15-min total travel time, TT15	11.0	veh-h
Capacity from ATS, CdATS	1636	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.2	mi/h
Percent time-spent-following, PTSFd (from above)	70.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	512.9
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.11
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	649	veh/h
Opposing direction volume, Vo	553	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.979	
Grade adj. factor,(note-1) fg	0.98		0.97	
Directional flow rate,(note-2) vi	733	pc/h	633	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.5	mi/h
Percent Free Flow Speed, PFFS	69.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.99		0.97	
Directional flow rate,(note-2) vi	713	pc/h	620	pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.4	%		
Adjustment for no-passing zones, fnp	29.9			
Percent time-spent-following, PTSFd	79.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.42	
Peak 15-min vehicle-miles of travel, VMT15	459	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1687	veh-mi
Peak 15-min total travel time, TT15	15.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1649	veh/h
Directional Capacity	1649	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	79.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	705.4
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.26
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project AM
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1268	vph	1650	vph
Peak-hour factor, PHF	0.91		0.91	
Peak 15-minute volume, v15	348		453	
Trucks and buses	2	%	3	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.985	
Flow rate, vp	752	pcphpl	920	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	752	pcphpl	920	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	B		C	
Density, D	16.7	pc/mi/ln	20.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	696.7	906.6
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.14	3.52
Bicycle LOS	C	D

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project PM
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1674	vph	1493	vph
Peak-hour factor, PHF	0.95		0.96	
Peak 15-minute volume, v15	441		389	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.995	
Flow rate, vp	951	pcphpl	781	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	951	pcphpl	781	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		B	
Density, D	21.1	pc/mi/ln	17.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	881.1	777.6
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.26	2.96
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project Saturday
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1542	vph	1770	vph
Peak-hour factor, PHF	0.91		0.97	
Peak 15-minute volume, v15	424		456	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.962		0.995	
Flow rate, vp	881	pcphpl	916	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	881	pcphpl	916	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	19.6	pc/mi/ln	20.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	847.3	912.4
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.01	3.04
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project AM
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1471	vph	1599	vph
Peak-hour factor, PHF	0.89		0.92	
Peak 15-minute volume, v15	413		435	
Trucks and buses	3	%	4	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.3		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.887		0.980	
Flow rate, vp	931	pcphpl	886	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	931	pcphpl	886	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	20.7	pc/mi/ln	19.7	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	826.4	869.0
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.47	3.77
Bicycle LOS	C	D

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project PM
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1590	vph	1488	vph
Peak-hour factor, PHF	0.96		0.95	
Peak 15-minute volume, v15	414		392	
Trucks and buses	1	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.990	
Flow rate, vp	865	pcphpl	790	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	865	pcphpl	790	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		B	
Density, D	19.2	pc/mi/ln	17.6	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	828.1	783.2
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.00	3.20
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project Saturday
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1544	vph	1615	vph
Peak-hour factor, PHF	0.93		0.94	
Peak 15-minute volume, v15	415		430	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.995	
Flow rate, vp	867	pcphpl	863	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	867	pcphpl	863	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	19.3	pc/mi/ln	19.2	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	830.1	859.0
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.00	3.01
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project AM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd 1599 veh/h
Opposing direction volume, Vo 1471 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.742	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1738	pc/h	2155	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	6.4	mi/h
Percent Free Flow Speed, PFFS	16.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.995	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1738	pc/h	1607	pc/h
Base percent time-spent-following,(note-4) BPTSFd	93.6	%		
Adjustment for no-passing zones, fnp	7.0			
Percent time-spent-following, PTSFd	97.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.02	
Peak 15-min vehicle-miles of travel, VMT15	391	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1439	veh-mi
Peak 15-min total travel time, TT15	60.7	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	6.4	mi/h
Percent time-spent-following, PTSFd (from above)	97.2	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1738.0
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.97
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project PM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95	
Shoulder width	5.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd	1488	veh/h
Opposing direction volume, Vo	1590	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.852	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1566	pc/h	1964	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	9.3	mi/h
Percent Free Flow Speed, PFFS	23.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.998	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1566	pc/h	1678	pc/h
Base percent time-spent-following,(note-4) BPTSFd	92.0	%		
Adjustment for no-passing zones, fnp	6.8			
Percent time-spent-following, PTSFd	95.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	0.92	
Peak 15-min vehicle-miles of travel, VMT15	352	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1339	veh-mi
Peak 15-min total travel time, TT15	38.0	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	9.3	mi/h
Percent time-spent-following, PTSFd (from above)	95.3	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1566.3
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.44
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project Saturday
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	5.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd	1615	veh/h
Opposing direction volume, Vo	1544	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.920	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1718	pc/h	1785	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	9.5	mi/h
Percent Free Flow Speed, PFFS	24.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.999	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1718	pc/h	1645	pc/h
Base percent time-spent-following,(note-4) BPTSFd	93.4	%		
Adjustment for no-passing zones, fnp	6.6			
Percent time-spent-following, PTSFd	96.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.01	
Peak 15-min vehicle-miles of travel, VMT15	387	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1453	veh-mi
Peak 15-min total travel time, TT15	40.9	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	9.5	mi/h
Percent time-spent-following, PTSFd (from above)	96.8	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1718.1
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.27
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project AM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	582	veh/h
Opposing direction volume, Vo	676	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	745	pc/h	848	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.3	mi/h
Percent Free Flow Speed, PFFS	67.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	789	pc/h	845	pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.4	%		
Adjustment for no-passing zones, fnp	24.3			
Percent time-spent-following, PTSFd	81.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.46	
Peak 15-min vehicle-miles of travel, VMT15	55	veh-mi
Peak-hour vehicle-miles of travel, VMT60	175	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.3	mi/h
Percent time-spent-following, PTSFd (from above)	81.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	727.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.82
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project PM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	858	veh/h
Opposing direction volume, Vo	586	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	972	pc/h	660	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.0	mi/h
Percent Free Flow Speed, PFFS	66.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1046	pc/h	658	pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.7	%		
Adjustment for no-passing zones, fnp	22.3			
Percent time-spent-following, PTSFd	89.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.62	
Peak 15-min vehicle-miles of travel, VMT15	72	veh-mi
Peak-hour vehicle-miles of travel, VMT60	257	veh-mi
Peak 15-min total travel time, TT15	2.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	89.4	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	964.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.96
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project Saturday
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd 811 veh/h
Opposing direction volume, Vo 795 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.997		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	884	pc/h	864	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.1	mi/h
Percent Free Flow Speed, PFFS	64.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	956	pc/h	864	pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.1	%		
Adjustment for no-passing zones, fnp	21.7			
Percent time-spent-following, PTSFd	86.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.56	
Peak 15-min vehicle-miles of travel, VMT15	66	veh-mi
Peak-hour vehicle-miles of travel, VMT60	243	veh-mi
Peak 15-min total travel time, TT15	2.3	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.1	mi/h
Percent time-spent-following, PTSFd (from above)	86.5	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	881.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.48
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project AM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97	
Shoulder width	6.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	676	veh/h
Opposing direction volume, Vo	582	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		2.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.963	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	700	pc/h	623	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	32.4	mi/h
Percent Free Flow Speed, PFFS	72.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	697	pc/h	651	pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.6	%		
Adjustment for no-passing zones, fnp	29.5			
Percent time-spent-following, PTSFd	78.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.41	
Peak 15-min vehicle-miles of travel, VMT15	52	veh-mi
Peak-hour vehicle-miles of travel, VMT60	203	veh-mi
Peak 15-min total travel time, TT15	1.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	78.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	696.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.05
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project PM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd 586 veh/h
Opposing direction volume, Vo 858 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	652	pc/h	956	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.2	mi/h
Percent Free Flow Speed, PFFS	67.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	651	pc/h	1034	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.6	%		
Adjustment for no-passing zones, fnp	22.6			
Percent time-spent-following, PTSFd	74.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.38	
Peak 15-min vehicle-miles of travel, VMT15	49	veh-mi
Peak-hour vehicle-miles of travel, VMT60	176	veh-mi
Peak 15-min total travel time, TT15	1.6	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.2	mi/h
Percent time-spent-following, PTSFd (from above)	74.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	651.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.32
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project Saturday
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	795	veh/h
Opposing direction volume, Vo	811	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	855	pc/h	875	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.3	mi/h
Percent Free Flow Speed, PFFS	65.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	855	pc/h	946	pc/h
Base percent time-spent-following,(note-4) BPTSFd	72.8	%		
Adjustment for no-passing zones, fnp	22.0			
Percent time-spent-following, PTSFd	83.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.50	
Peak 15-min vehicle-miles of travel, VMT15	64	veh-mi
Peak-hour vehicle-miles of travel, VMT60	239	veh-mi
Peak 15-min total travel time, TT15	2.2	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.3	mi/h
Percent time-spent-following, PTSFd (from above)	83.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	854.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.46
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project AM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.85	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	334	veh/h
Opposing direction volume, Vo	444	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.997		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	394	pc/h	523	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	45.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	0.8	mi/h	
Free-flow speed, FFSd	44.3	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	34.8	mi/h	
Percent Free Flow Speed, PFFS	78.7	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.999		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	393	pc/h	522	pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.8	%		
Adjustment for no-passing zones, fnp	39.9			
Percent time-spent-following, PTSFd	61.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	29	veh-mi
Peak-hour vehicle-miles of travel, VMT60	100	veh-mi
Peak 15-min total travel time, TT15	0.8	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.8	mi/h
Percent time-spent-following, PTSFd (from above)	61.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	392.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.07
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project PM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	697	veh/h
Opposing direction volume, Vo	527	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.997		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	777	pc/h	587	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.4	mi/h
Percent Free Flow Speed, PFFS	70.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	774	pc/h	586	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.7	%		
Adjustment for no-passing zones, fnp	28.7			
Percent time-spent-following, PTSFd	82.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.46	
Peak 15-min vehicle-miles of travel, VMT15	58	veh-mi
Peak-hour vehicle-miles of travel, VMT60	209	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.4	mi/h
Percent time-spent-following, PTSFd (from above)	82.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	774.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.85
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project Saturday
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.87	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	610	veh/h
Opposing direction volume, Vo	703	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	702	pc/h	809	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.2	mi/h
Percent Free Flow Speed, PFFS	68.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	701	pc/h	808	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.2	%		
Adjustment for no-passing zones, fnp	26.3			
Percent time-spent-following, PTSFd	77.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.41	
Peak 15-min vehicle-miles of travel, VMT15	53	veh-mi
Peak-hour vehicle-miles of travel, VMT60	183	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	1698	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.2	mi/h
Percent time-spent-following, PTSFd (from above)	77.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	701.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.36
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project AM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91		
Shoulder width	6.0	ft	% Trucks and buses	4	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	3	/mi	

Analysis direction volume, Vd	444	veh/h
Opposing direction volume, Vo	334	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	492	pc/h	371	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	35.3	mi/h
Percent Free Flow Speed, PFFS	79.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.996	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	488	pc/h	369	pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.8	%		
Adjustment for no-passing zones, fnp	41.4			
Percent time-spent-following, PTSFd	72.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.29	
Peak 15-min vehicle-miles of travel, VMT15	37	veh-mi
Peak-hour vehicle-miles of travel, VMT60	133	veh-mi
Peak 15-min total travel time, TT15	1.0	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1693	veh/h
Directional Capacity	1693	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.3	mi/h
Percent time-spent-following, PTSFd (from above)	72.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	487.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.87
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project PM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	6.0	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	527	veh/h
Opposing direction volume, Vo	694	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	567	pc/h	746	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.8	mi/h
Percent Free Flow Speed, PFFS	71.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	567	pc/h	746	pc/h
Base percent time-spent-following,(note-4) BPTSFd	58.5	%		
Adjustment for no-passing zones, fnp	29.9			
Percent time-spent-following, PTSFd	71.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.33	
Peak 15-min vehicle-miles of travel, VMT15	43	veh-mi
Peak-hour vehicle-miles of travel, VMT60	158	veh-mi
Peak 15-min total travel time, TT15	1.4	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.8	mi/h
Percent time-spent-following, PTSFd (from above)	71.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	566.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.06
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project Saturday
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97		
Shoulder width	6.0	ft	% Trucks and buses	0	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	3	/mi	

Analysis direction volume, Vd	703	veh/h
Opposing direction volume, Vo	610	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	725	pc/h	629	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.4	mi/h
Percent Free Flow Speed, PFFS	71.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	725	pc/h	629	pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.8	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	80.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.43	
Peak 15-min vehicle-miles of travel, VMT15	54	veh-mi
Peak-hour vehicle-miles of travel, VMT60	211	veh-mi
Peak 15-min total travel time, TT15	1.7	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.4	mi/h
Percent time-spent-following, PTSFd (from above)	80.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	724.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.18
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project AM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	384	veh/h
Opposing direction volume, Vo	850	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	432	pc/h	934	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	50.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	6.5	mi/h	
Free-flow speed, FFSd	43.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	30.6	mi/h	
Percent Free Flow Speed, PFFS	70.3	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	422	pc/h	934	pc/h
Base percent time-spent-following,(note-4) BPTSFd	51.6	%		
Adjustment for no-passing zones, fnp	23.8			
Percent time-spent-following, PTSFd	59.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.25	
Peak 15-min vehicle-miles of travel, VMT15	158	veh-mi
Peak-hour vehicle-miles of travel, VMT60	576	veh-mi
Peak 15-min total travel time, TT15	5.2	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.6	mi/h
Percent time-spent-following, PTSFd (from above)	59.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	422.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.12
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project PM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	929	veh/h
Opposing direction volume, Vo	457	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.984	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1010	pc/h	505	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.4	mi/h
Percent Free Flow Speed, PFFS	67.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1010	pc/h	497	pc/h
Base percent time-spent-following,(note-4) BPTSFd	73.7	%		
Adjustment for no-passing zones, fnp	22.3			
Percent time-spent-following, PTSFd	88.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.59	
Peak 15-min vehicle-miles of travel, VMT15	379	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1394	veh-mi
Peak 15-min total travel time, TT15	12.9	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.4	mi/h
Percent time-spent-following, PTSFd (from above)	88.6	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1009.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.56
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project Saturday
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	699	veh/h
Opposing direction volume, Vo	569	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	766	pc/h	623	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.4	mi/h
Percent Free Flow Speed, PFFS	69.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	760	pc/h	618	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.7	%		
Adjustment for no-passing zones, fnp	28.5			
Percent time-spent-following, PTSFd	81.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.45	
Peak 15-min vehicle-miles of travel, VMT15	285	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1049	veh-mi
Peak 15-min total travel time, TT15	9.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.4	mi/h
Percent time-spent-following, PTSFd (from above)	81.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	759.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.42
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project AM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	850	veh/h
Opposing direction volume, Vo	384	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.984	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1037	pc/h	476	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.5	mi/h
Percent Free Flow Speed, PFFS	67.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1037	pc/h	468	pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.2	%		
Adjustment for no-passing zones, fnp	21.5			
Percent time-spent-following, PTSFd	90.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.61	
Peak 15-min vehicle-miles of travel, VMT15	389	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1275	veh-mi
Peak 15-min total travel time, TT15	13.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	90.0	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1036.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.58
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project PM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	457	veh/h
Opposing direction volume, Vo	929	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	562	pc/h	1133	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	50.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	6.5	mi/h	
Free-flow speed, FFSd	43.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	28.0	mi/h	
Percent Free Flow Speed, PFFS	64.5	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	557	pc/h	1133	pc/h
Base percent time-spent-following,(note-4) BPTSFd	61.9	%		
Adjustment for no-passing zones, fnp	19.7			
Percent time-spent-following, PTSFd	68.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.33	
Peak 15-min vehicle-miles of travel, VMT15	209	veh-mi
Peak-hour vehicle-miles of travel, VMT60	686	veh-mi
Peak 15-min total travel time, TT15	7.5	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.0	mi/h
Percent time-spent-following, PTSFd (from above)	68.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	557.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.26
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project Saturday
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82		
Shoulder width	6.0	ft	% Trucks and buses	8	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	1	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	26	/mi	

Analysis direction volume, Vd	569	veh/h
Opposing direction volume, Vo	699	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	699	pc/h	852	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.2	mi/h
Percent Free Flow Speed, PFFS	67.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	694	pc/h	852	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.5	%		
Adjustment for no-passing zones, fnp	25.5			
Percent time-spent-following, PTSFd	76.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.41	
Peak 15-min vehicle-miles of travel, VMT15	260	veh-mi
Peak-hour vehicle-miles of travel, VMT60	854	veh-mi
Peak 15-min total travel time, TT15	8.9	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.2	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	693.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.37
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project AM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82			
Shoulder width	6.0	ft	% Trucks and buses	8	%		
Lane width	12.0	ft	% Trucks crawling	0.0	%		
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr		
Terrain type	Specific Grade		% Recreational vehicles	1	%		
Grade: Length	0.25	mi	% No-passing zones	100	%		
Up/down	-3.0	%	Access point density	14	/mi		

Analysis direction volume, Vd	538	veh/h
Opposing direction volume, Vo	918	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	661	pc/h	1129	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	35.8	mi/h
Percent Free Flow Speed, PFFS	69.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	656	pc/h	1217	pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.0	%		
Adjustment for no-passing zones, fnp	18.4			
Percent time-spent-following, PTSFd	74.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.39	
Peak 15-min vehicle-miles of travel, VMT15	394	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1291	veh-mi
Peak 15-min total travel time, TT15	11.0	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.8	mi/h
Percent time-spent-following, PTSFd (from above)	74.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	656.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.34
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project PM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	997	veh/h
Opposing direction volume, Vo	524	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.943	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1216	pc/h	678	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	35.0	mi/h
Percent Free Flow Speed, PFFS	68.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	1216	pc/h	695	pc/h
Base percent time-spent-following,(note-4) BPTSFd	80.9	%		
Adjustment for no-passing zones, fnp	17.0			
Percent time-spent-following, PTSFd	91.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.72	
Peak 15-min vehicle-miles of travel, VMT15	730	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2393	veh-mi
Peak 15-min total travel time, TT15	20.9	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.0	mi/h
Percent time-spent-following, PTSFd (from above)	91.7	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1215.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.66
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project Saturday
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	621	veh/h
Opposing direction volume, Vo	775	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	763	pc/h	953	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	36.4	mi/h
Percent Free Flow Speed, PFFS	70.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	757	pc/h	1027	pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.2	%		
Adjustment for no-passing zones, fnp	21.5			
Percent time-spent-following, PTSFd	79.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.45	
Peak 15-min vehicle-miles of travel, VMT15	454	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1490	veh-mi
Peak 15-min total travel time, TT15	12.5	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	36.4	mi/h
Percent time-spent-following, PTSFd (from above)	79.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	757.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.42
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project AM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	918	veh/h
Opposing direction volume, Vo	538	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1202	pc/h	704	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	34.9	mi/h
Percent Free Flow Speed, PFFS	67.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1296	pc/h	699	pc/h
Base percent time-spent-following,(note-4) BPTSFd	82.6	%		
Adjustment for no-passing zones, fnp	16.5			
Percent time-spent-following, PTSFd	93.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.76	
Peak 15-min vehicle-miles of travel, VMT15	715	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2203	veh-mi
Peak 15-min total travel time, TT15	20.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.9	mi/h
Percent time-spent-following, PTSFd (from above)	93.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1192.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.65
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project PM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	524	veh/h
Opposing direction volume, Vo	997	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.946		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	719	pc/h	1295	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	55.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	3.5	mi/h	
Free-flow speed, FFSd	51.5	mi/h	
Adjustment for no-passing zones, fnp	1.8*	mi/h	
Average travel speed, ATSd	34.1	mi/h	
Percent Free Flow Speed, PFFS	66.2	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	740	pc/h	1295	pc/h
Base percent time-spent-following,(note-4) BPTSFd	72.4	%		
Adjustment for no-passing zones, fnp	15.6			
Percent time-spent-following, PTSFd	78.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.44	
Peak 15-min vehicle-miles of travel, VMT15	408	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1258	veh-mi
Peak 15-min total travel time, TT15	12.0	veh-h
Capacity from ATS, CdATS	1686	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.1	mi/h
Percent time-spent-following, PTSFd (from above)	78.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	680.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.36
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project Saturday
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	775	veh/h
Opposing direction volume, Vo	621	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.997		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	827	pc/h	661	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	38.2	mi/h
Percent Free Flow Speed, PFFS	74.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	896	pc/h	661	pc/h
Base percent time-spent-following,(note-4) BPTSFd	72.0	%		
Adjustment for no-passing zones, fnp	25.3			
Percent time-spent-following, PTSFd	86.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.53	
Peak 15-min vehicle-miles of travel, VMT15	495	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1860	veh-mi
Peak 15-min total travel time, TT15	13.0	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	38.2	mi/h
Percent time-spent-following, PTSFd (from above)	86.6	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	824.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	2.49
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project AM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	697	vph	902	vph
Peak-hour factor, PHF	0.80		0.87	
Peak 15-minute volume, v15	218		259	
Trucks and buses	3	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.985		0.995	
Flow rate, vp	442	pcphpl	520	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	442	pcphpl	520	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	8.0	pc/mi/ln	9.5	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	435.6	518.4
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.69	2.30
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project PM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	999	vph	678	vph
Peak-hour factor, PHF	0.88		0.93	
Peak 15-minute volume, v15	284		182	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	570	pcphpl	366	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	570	pcphpl	366	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	10.4	pc/mi/ln	6.7	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	567.6	364.5
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.34	2.12
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project Saturday
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	818	vph	815	vph
Peak-hour factor, PHF	0.91		0.94	
Peak 15-minute volume, v15	225		217	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	451	pcphpl	435	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	451	pcphpl	435	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	8.2	pc/mi/ln	7.9	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	449.5	433.5
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.23	2.21
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project AM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	993	vph	1192	vph
Peak-hour factor, PHF	0.86		0.68	
Peak 15-minute volume, v15	289		438	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	583	pcphpl	885	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	583	pcphpl	885	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		B	
Density, D	10.6	pc/mi/ln	16.1	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	577.3	876.5
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.58	2.79
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project PM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1282	vph	973	vph
Peak-hour factor, PHF	0.95		0.88	
Peak 15-minute volume, v15	337		276	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.995	
Flow rate, vp	681	pcphpl	555	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	681	pcphpl	555	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		A	
Density, D	12.4	pc/mi/ln	10.1	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	674.7	552.8
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.66	2.33
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project Saturday
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1030	vph	1028	vph
Peak-hour factor, PHF	0.96		0.94	
Peak 15-minute volume, v15	268		273	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	539	pcphpl	549	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	539	pcphpl	549	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	9.8	pc/mi/ln	10.0	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	536.5	546.8
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.32	2.33
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project AM
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1010	vph	976	vph
Peak-hour factor, PHF	0.86		0.76	
Peak 15-minute volume, v15	294		321	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	593	pcphpl	648	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	593	pcphpl	648	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		B	
Density, D	10.8	pc/mi/ln	11.8	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	587.2	642.1
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.59	2.64
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst: JO
Agency/Co: Mott MacDonald
Date: 12/6/17
Analysis Period: Existing + Project PM
Highway: Carmel Valley Road
From/To: SR 1 / Carmel Rancho
Jurisdiction: Unincorporated Monterey County
Analysis Year: 2017
Project ID: Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	980	vph	849	vph
Peak-hour factor, PHF	0.95		0.90	
Peak 15-minute volume, v15	258		236	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	520	pcphpl	476	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	520	pcphpl	476	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	9.5	pc/mi/ln	8.7	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	515.8	471.7
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.53	2.48
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Existing + Project Saturday
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	888	vph	802	vph
Peak-hour factor, PHF	0.96		0.98	
Peak 15-minute volume, v15	231		205	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	467	pcphpl	413	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	467	pcphpl	413	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	8.5	pc/mi/ln	7.5	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	462.5	409.2
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.47	2.41
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.76	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd 297 veh/h
Opposing direction volume, Vo 406 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.0		1.8	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.977	
Grade adj. factor,(note-1) fg	0.89		0.96	
Directional flow rate,(note-2) vi	452	pc/h	570	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	32.2	mi/h
Percent Free Flow Speed, PFFS	75.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.982		0.994	
Grade adjustment factor,(note-1) fg	0.90		0.96	
Directional flow rate,(note-2) vi	442	pc/h	560	pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.5	%		
Adjustment for no-passing zones, fnp	37.5			
Percent time-spent-following, PTSFd	65.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.26	
Peak 15-min vehicle-miles of travel, VMT15	254	veh-mi
Peak-hour vehicle-miles of travel, VMT60	772	veh-mi
Peak 15-min total travel time, TT15	7.9	veh-h
Capacity from ATS, CdATS	1598	veh/h
Capacity from PTSF, CdPTSF	1639	veh/h
Directional Capacity	1639	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.2	mi/h
Percent time-spent-following, PTSFd (from above)	65.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	390.8
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.97
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.88	
Shoulder width	5.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	5	/mi

Analysis direction volume, Vd	665	veh/h
Opposing direction volume, Vo	490	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.991		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	763	pc/h	558	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.9	mi/h
Percent Free Flow Speed, PFFS	70.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	821	pc/h	557	pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.2	%		
Adjustment for no-passing zones, fnp	28.2			
Percent time-spent-following, PTSFd	85.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.48	
Peak 15-min vehicle-miles of travel, VMT15	491	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1729	veh-mi
Peak 15-min total travel time, TT15	16.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	85.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	755.7
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.07
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95	
Shoulder width	5.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	572	veh/h
Opposing direction volume, Vo	667	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.993		0.994	
Grade adj. factor,(note-1) fg	0.97		0.98	
Directional flow rate,(note-2) vi	625	pc/h	721	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.7	mi/h
Percent Free Flow Speed, PFFS	70.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.97		0.99	
Directional flow rate,(note-2) vi	621	pc/h	709	pc/h
Base percent time-spent-following,(note-4) BPTSFd	61.2	%		
Adjustment for no-passing zones, fnp	30.0			
Percent time-spent-following, PTSFd	75.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	391	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1487	veh-mi
Peak 15-min total travel time, TT15	13.2	veh-h
Capacity from ATS, CdATS	1656	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	75.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	602.1
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.74
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92		
Shoulder width	5.0	ft	% Trucks and buses	3	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	406	veh/h
Opposing direction volume, Vo	297	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		2.1	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.974		0.968	
Grade adj. factor,(note-1) fg	0.92		0.85	
Directional flow rate,(note-2) vi	492	pc/h	392	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	33.3	mi/h
Percent Free Flow Speed, PFFS	78.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.988		0.982	
Grade adjustment factor,(note-1) fg	0.92		0.86	
Directional flow rate,(note-2) vi	485	pc/h	382	pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.7	%		
Adjustment for no-passing zones, fnp	40.8			
Percent time-spent-following, PTSFd	70.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.29	
Peak 15-min vehicle-miles of travel, VMT15	287	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1056	veh-mi
Peak 15-min total travel time, TT15	8.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1486	veh/h
Directional Capacity	1486	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.3	mi/h
Percent time-spent-following, PTSFd (from above)	70.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	441.3
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.03
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd 490 veh/h
Opposing direction volume, Vo 665 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	0.96		0.98	
Directional flow rate,(note-2) vi	562	pc/h	743	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.0	mi/h
Percent Free Flow Speed, PFFS	70.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	0.96		0.99	
Directional flow rate,(note-2) vi	552	pc/h	722	pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.8	%		
Adjustment for no-passing zones, fnp	30.8			
Percent time-spent-following, PTSFd	70.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.32	
Peak 15-min vehicle-miles of travel, VMT15	342	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1274	veh-mi
Peak 15-min total travel time, TT15	11.4	veh-h
Capacity from ATS, CdATS	1636	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	70.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	526.9
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.12
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Existing + Project Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92		
Shoulder width	5.0	ft	% Trucks and buses	3	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	667	veh/h
Opposing direction volume, Vo	572	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.979	
Grade adj. factor,(note-1) fg	0.98		0.97	
Directional flow rate,(note-2) vi	753	pc/h	655	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.2	mi/h
Percent Free Flow Speed, PFFS	68.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.99		0.97	
Directional flow rate,(note-2) vi	732	pc/h	641	pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.3	%		
Adjustment for no-passing zones, fnp	28.8			
Percent time-spent-following, PTSFd	79.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.43	
Peak 15-min vehicle-miles of travel, VMT15	471	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1734	veh-mi
Peak 15-min total travel time, TT15	16.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1666	veh/h
Directional Capacity	1666	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.2	mi/h
Percent time-spent-following, PTSFd (from above)	79.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	725.0
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.28
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background AM
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1356	vph	1690	vph
Peak-hour factor, PHF	0.91		0.91	
Peak 15-minute volume, v15	373		464	
Trucks and buses	2	%	3	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.985	
Flow rate, vp	804	pcphpl	942	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	804	pcphpl	942	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	B		C	
Density, D	17.9	pc/mi/ln	20.9	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	745.1	928.6
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.17	3.53
Bicycle LOS	C	D

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background PM
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1736	vph	1590	vph
Peak-hour factor, PHF	0.95		0.96	
Peak 15-minute volume, v15	457		414	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.995	
Flow rate, vp	986	pcphpl	832	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	986	pcphpl	832	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	21.9	pc/mi/ln	18.5	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	913.7	828.1
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.28	3.00
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background Saturday
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1594	vph	1854	vph
Peak-hour factor, PHF	0.91		0.97	
Peak 15-minute volume, v15	438		478	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.962		0.995	
Flow rate, vp	910	pcphpl	960	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	910	pcphpl	960	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	20.2	pc/mi/ln	21.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	875.8	955.7
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.02	3.07
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background AM
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1572	vph	1644	vph
Peak-hour factor, PHF	0.89		0.92	
Peak 15-minute volume, v15	442		447	
Trucks and buses	3	%	4	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.3		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.887		0.980	
Flow rate, vp	995	pcphpl	911	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	995	pcphpl	911	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	22.1	pc/mi/ln	20.2	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	883.1	893.5
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.51	3.79
Bicycle LOS	D	D

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst: JO
Agency/Co: Mott MacDonald
Date: 12/6/17
Analysis Period: Background PM
Highway: SR 1
From/To: Ocean / Carmel Valley Rd
Jurisdiction: Unincorporated Monterey County
Analysis Year: 2017
Project ID: Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1654	vph	1595	vph
Peak-hour factor, PHF	0.96		0.95	
Peak 15-minute volume, v15	431		420	
Trucks and buses	1	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.990	
Flow rate, vp	900	pcphpl	847	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	900	pcphpl	847	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	20.0	pc/mi/ln	18.8	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	861.5	839.5
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.02	3.23
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background Saturday
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1594	vph	1701	vph
Peak-hour factor, PHF	0.93		0.94	
Peak 15-minute volume, v15	428		452	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.995	
Flow rate, vp	895	pcphpl	909	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	895	pcphpl	909	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	19.9	pc/mi/ln	20.2	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	857.0	904.8
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.01	3.04
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background AM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd	1644	veh/h
Opposing direction volume, Vo	1572	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.742	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1787	pc/h	2303	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	4.9	mi/h
Percent Free Flow Speed, PFFS	12.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.995	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1787	pc/h	1717	pc/h
Base percent time-spent-following,(note-4) BPTSFd	94.0	%		
Adjustment for no-passing zones, fnp	6.6			
Percent time-spent-following, PTSFd	97.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.05	
Peak 15-min vehicle-miles of travel, VMT15	402	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1480	veh-mi
Peak 15-min total travel time, TT15	81.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	4.9	mi/h
Percent time-spent-following, PTSFd (from above)	97.4	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1787.0
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.99
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background PM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95	
Shoulder width	5.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	6.0	%	Access point density	19	/mi

Analysis direction volume, Vd	1595	veh/h
Opposing direction volume, Vo	1654	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	9.7		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.852		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1971	pc/h	1741	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	7.8	mi/h
Percent Free Flow Speed, PFFS	20.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.998		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1683	pc/h	1741	pc/h
Base percent time-spent-following,(note-4) BPTSFd	93.1	%		
Adjustment for no-passing zones, fnp	6.5			
Percent time-spent-following, PTSFd	96.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	0.99	
Peak 15-min vehicle-miles of travel, VMT15	378	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1435	veh-mi
Peak 15-min total travel time, TT15	48.2	veh-h
Capacity from ATS, CdATS	1448	veh/h
Capacity from PTSF, CdPTSF	1696	veh/h
Directional Capacity	1696	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	7.8	mi/h
Percent time-spent-following, PTSFd (from above)	96.3	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1678.9
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.47
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background Saturday
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	5.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd 1701 veh/h
Opposing direction volume, Vo 1594 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.920	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1810	pc/h	1843	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	8.3	mi/h
Percent Free Flow Speed, PFFS	21.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.999	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1810	pc/h	1698	pc/h
Base percent time-spent-following,(note-4) BPTSFd	94.2	%		
Adjustment for no-passing zones, fnp	6.8			
Percent time-spent-following, PTSFd	97.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.06	
Peak 15-min vehicle-miles of travel, VMT15	407	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1531	veh-mi
Peak 15-min total travel time, TT15	49.0	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	8.3	mi/h
Percent time-spent-following, PTSFd (from above)	97.7	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1809.6
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.30
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background AM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	582	veh/h
Opposing direction volume, Vo	668	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	745	pc/h	838	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.4	mi/h
Percent Free Flow Speed, PFFS	67.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	789	pc/h	835	pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.4	%		
Adjustment for no-passing zones, fnp	24.5			
Percent time-spent-following, PTSFd	81.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.46	
Peak 15-min vehicle-miles of travel, VMT15	55	veh-mi
Peak-hour vehicle-miles of travel, VMT60	175	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	1678	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.4	mi/h
Percent time-spent-following, PTSFd (from above)	81.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	727.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.82
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background PM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	844	veh/h
Opposing direction volume, Vo	563	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	956	pc/h	634	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.4	mi/h
Percent Free Flow Speed, PFFS	67.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1029	pc/h	633	pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.4	%		
Adjustment for no-passing zones, fnp	22.9			
Percent time-spent-following, PTSFd	89.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.61	
Peak 15-min vehicle-miles of travel, VMT15	71	veh-mi
Peak-hour vehicle-miles of travel, VMT60	253	veh-mi
Peak 15-min total travel time, TT15	2.3	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.4	mi/h
Percent time-spent-following, PTSFd (from above)	89.6	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	948.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.96
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background Saturday
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	789	veh/h
Opposing direction volume, Vo	758	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.996	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	858	pc/h	827	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.6	mi/h
Percent Free Flow Speed, PFFS	65.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	858	pc/h	894	pc/h
Base percent time-spent-following,(note-4) BPTSFd	72.4	%		
Adjustment for no-passing zones, fnp	22.7			
Percent time-spent-following, PTSFd	83.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.50	
Peak 15-min vehicle-miles of travel, VMT15	64	veh-mi
Peak-hour vehicle-miles of travel, VMT60	237	veh-mi
Peak 15-min total travel time, TT15	2.2	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.6	mi/h
Percent time-spent-following, PTSFd (from above)	83.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	857.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.46
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background AM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97	
Shoulder width	6.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd 668 veh/h
Opposing direction volume, Vo 582 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		2.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.963	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	691	pc/h	623	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	32.5	mi/h
Percent Free Flow Speed, PFFS	72.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	689	pc/h	651	pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.2	%		
Adjustment for no-passing zones, fnp	29.8			
Percent time-spent-following, PTSFd	78.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.41	
Peak 15-min vehicle-miles of travel, VMT15	52	veh-mi
Peak-hour vehicle-miles of travel, VMT60	200	veh-mi
Peak 15-min total travel time, TT15	1.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.5	mi/h
Percent time-spent-following, PTSFd (from above)	78.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	688.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.04
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background PM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	563	veh/h
Opposing direction volume, Vo	844	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	626	pc/h	941	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.5	mi/h
Percent Free Flow Speed, PFFS	67.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	626	pc/h	1017	pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.9	%		
Adjustment for no-passing zones, fnp	23.3			
Percent time-spent-following, PTSFd	72.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	47	veh-mi
Peak-hour vehicle-miles of travel, VMT60	169	veh-mi
Peak 15-min total travel time, TT15	1.5	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.5	mi/h
Percent time-spent-following, PTSFd (from above)	72.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	625.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.30
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background Saturday
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2			Peak hour factor, PHF	0.93		
Shoulder width	6.0	ft		% Trucks and buses	1	%	
Lane width	12.0	ft		% Trucks crawling	0.0	%	
Segment length	0.3	mi		Truck crawl speed	0.0	mi/hr	
Terrain type	Specific Grade			% Recreational vehicles	0	%	
Grade: Length	0.30	mi		% No-passing zones	100	%	
Up/down	-3.0	%		Access point density	0	/mi	

Analysis direction volume, Vd	758	veh/h
Opposing direction volume, Vo	789	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.996	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	816	pc/h	852	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.8	mi/h
Percent Free Flow Speed, PFFS	66.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	815	pc/h	920	pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.9	%		
Adjustment for no-passing zones, fnp	23.0			
Percent time-spent-following, PTSFd	81.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.48	
Peak 15-min vehicle-miles of travel, VMT15	61	veh-mi
Peak-hour vehicle-miles of travel, VMT60	227	veh-mi
Peak 15-min total travel time, TT15	2.0	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.8	mi/h
Percent time-spent-following, PTSFd (from above)	81.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	815.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.44
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background AM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.85	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	333	veh/h
Opposing direction volume, Vo	449	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.997		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	393	pc/h	529	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	34.8	mi/h
Percent Free Flow Speed, PFFS	78.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.999		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	392	pc/h	528	pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.3	%		
Adjustment for no-passing zones, fnp	39.7			
Percent time-spent-following, PTSFd	61.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	29	veh-mi
Peak-hour vehicle-miles of travel, VMT60	100	veh-mi
Peak 15-min total travel time, TT15	0.8	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.8	mi/h
Percent time-spent-following, PTSFd (from above)	61.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	391.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.06
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background PM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	695	veh/h
Opposing direction volume, Vo	521	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.997		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	775	pc/h	581	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.4	mi/h
Percent Free Flow Speed, PFFS	71.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	772	pc/h	579	pc/h
Base percent time-spent-following,(note-4) BPTSFd	66.1	%		
Adjustment for no-passing zones, fnp	28.9			
Percent time-spent-following, PTSFd	82.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.45	
Peak 15-min vehicle-miles of travel, VMT15	58	veh-mi
Peak-hour vehicle-miles of travel, VMT60	209	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.4	mi/h
Percent time-spent-following, PTSFd (from above)	82.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	772.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.85
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background Saturday
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.87	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	601	veh/h
Opposing direction volume, Vo	692	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	691	pc/h	796	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.4	mi/h
Percent Free Flow Speed, PFFS	68.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	691	pc/h	795	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.0	%		
Adjustment for no-passing zones, fnp	26.7			
Percent time-spent-following, PTSFd	77.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.41	
Peak 15-min vehicle-miles of travel, VMT15	52	veh-mi
Peak-hour vehicle-miles of travel, VMT60	180	veh-mi
Peak 15-min total travel time, TT15	1.7	veh-h
Capacity from ATS, CdATS	1698	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.4	mi/h
Percent time-spent-following, PTSFd (from above)	77.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	690.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.35
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background AM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91	
Shoulder width	6.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd 449 veh/h
Opposing direction volume, Vo 333 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	497	pc/h	370	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	35.2	mi/h
Percent Free Flow Speed, PFFS	79.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.996	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	493	pc/h	367	pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.1	%		
Adjustment for no-passing zones, fnp	41.2			
Percent time-spent-following, PTSFd	72.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.29	
Peak 15-min vehicle-miles of travel, VMT15	37	veh-mi
Peak-hour vehicle-miles of travel, VMT60	135	veh-mi
Peak 15-min total travel time, TT15	1.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1693	veh/h
Directional Capacity	1693	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.2	mi/h
Percent time-spent-following, PTSFd (from above)	72.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	493.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.87
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background PM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	6.0	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	521	veh/h
Opposing direction volume, Vo	695	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	560	pc/h	747	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.8	mi/h
Percent Free Flow Speed, PFFS	71.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	560	pc/h	747	pc/h
Base percent time-spent-following,(note-4) BPTSFd	58.1	%		
Adjustment for no-passing zones, fnp	30.0			
Percent time-spent-following, PTSFd	71.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.33	
Peak 15-min vehicle-miles of travel, VMT15	42	veh-mi
Peak-hour vehicle-miles of travel, VMT60	156	veh-mi
Peak 15-min total travel time, TT15	1.3	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.8	mi/h
Percent time-spent-following, PTSFd (from above)	71.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	560.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.05
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background Saturday
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97	
Shoulder width	6.0	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	692	veh/h
Opposing direction volume, Vo	601	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	713	pc/h	620	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	45.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	0.8	mi/h	
Free-flow speed, FFSd	44.3	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	31.6	mi/h	
Percent Free Flow Speed, PFFS	71.4	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	713	pc/h	620	pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.4	%		
Adjustment for no-passing zones, fnp	30.0			
Percent time-spent-following, PTSFd	79.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.42	
Peak 15-min vehicle-miles of travel, VMT15	54	veh-mi
Peak-hour vehicle-miles of travel, VMT60	208	veh-mi
Peak 15-min total travel time, TT15	1.7	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.6	mi/h
Percent time-spent-following, PTSFd (from above)	79.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	713.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.18
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background AM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91		
Shoulder width	6.0	ft	% Trucks and buses	8	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	1	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	26	/mi	

Analysis direction volume, Vd	429	veh/h
Opposing direction volume, Vo	883	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.984		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	479	pc/h	970	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.0	mi/h
Percent Free Flow Speed, PFFS	68.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	471	pc/h	970	pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.8	%		
Adjustment for no-passing zones, fnp	23.1			
Percent time-spent-following, PTSFd	62.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	177	veh-mi
Peak-hour vehicle-miles of travel, VMT60	644	veh-mi
Peak 15-min total travel time, TT15	5.9	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	62.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	471.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.18
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background PM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	970	veh/h
Opposing direction volume, Vo	509	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1054	pc/h	558	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.7	mi/h
Percent Free Flow Speed, PFFS	66.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1054	pc/h	553	pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.1	%		
Adjustment for no-passing zones, fnp	21.5			
Percent time-spent-following, PTSFd	89.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.62	
Peak 15-min vehicle-miles of travel, VMT15	395	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1455	veh-mi
Peak 15-min total travel time, TT15	13.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.7	mi/h
Percent time-spent-following, PTSFd (from above)	89.2	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1054.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.58
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background Saturday
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92		
Shoulder width	6.0	ft	% Trucks and buses	8	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	1	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	26	/mi	

Analysis direction volume, Vd	729	veh/h
Opposing direction volume, Vo	604	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	799	pc/h	662	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.9	mi/h
Percent Free Flow Speed, PFFS	68.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	792	pc/h	657	pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.1	%		
Adjustment for no-passing zones, fnp	27.2			
Percent time-spent-following, PTSFd	82.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.47	
Peak 15-min vehicle-miles of travel, VMT15	297	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1094	veh-mi
Peak 15-min total travel time, TT15	9.9	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	82.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	792.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.44
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background AM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	883	veh/h
Opposing direction volume, Vo	429	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.984	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1077	pc/h	532	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.7	mi/h
Percent Free Flow Speed, PFFS	66.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1077	pc/h	523	pc/h
Base percent time-spent-following,(note-4) BPTSFd	76.5	%		
Adjustment for no-passing zones, fnp	20.9			
Percent time-spent-following, PTSFd	90.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.63	
Peak 15-min vehicle-miles of travel, VMT15	404	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1325	veh-mi
Peak 15-min total travel time, TT15	14.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.7	mi/h
Percent time-spent-following, PTSFd (from above)	90.6	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1076.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.60
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background PM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82		
Shoulder width	6.0	ft	% Trucks and buses	8	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	1	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	26	/mi	

Analysis direction volume, Vd	509	veh/h
Opposing direction volume, Vo	970	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	626	pc/h	1183	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	27.2	mi/h
Percent Free Flow Speed, PFFS	62.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	621	pc/h	1183	pc/h
Base percent time-spent-following,(note-4) BPTSFd	66.3	%		
Adjustment for no-passing zones, fnp	18.6			
Percent time-spent-following, PTSFd	72.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	233	veh-mi
Peak-hour vehicle-miles of travel, VMT60	764	veh-mi
Peak 15-min total travel time, TT15	8.6	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.2	mi/h
Percent time-spent-following, PTSFd (from above)	72.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	620.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.32
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background Saturday
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	604	veh/h
Opposing direction volume, Vo	729	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	743	pc/h	889	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	50.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	6.5	mi/h	
Free-flow speed, FFSd	43.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	28.5	mi/h	
Percent Free Flow Speed, PFFS	65.6	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	737	pc/h	889	pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.9	%		
Adjustment for no-passing zones, fnp	24.3			
Percent time-spent-following, PTSFd	78.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.43	
Peak 15-min vehicle-miles of travel, VMT15	276	veh-mi
Peak-hour vehicle-miles of travel, VMT60	906	veh-mi
Peak 15-min total travel time, TT15	9.7	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.5	mi/h
Percent time-spent-following, PTSFd (from above)	78.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	736.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.40
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background AM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	654	veh/h
Opposing direction volume, Vo	950	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	804	pc/h	1168	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	34.4	mi/h
Percent Free Flow Speed, PFFS	66.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	798	pc/h	1259	pc/h
Base percent time-spent-following,(note-4) BPTSFd	74.2	%		
Adjustment for no-passing zones, fnp	16.7			
Percent time-spent-following, PTSFd	80.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.47	
Peak 15-min vehicle-miles of travel, VMT15	479	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1570	veh-mi
Peak 15-min total travel time, TT15	13.9	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.4	mi/h
Percent time-spent-following, PTSFd (from above)	80.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	797.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.44
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background PM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd 999 veh/h
Opposing direction volume, Vo 621 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.964	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1218	pc/h	786	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	34.1	mi/h
Percent Free Flow Speed, PFFS	66.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	1218	pc/h	823	pc/h
Base percent time-spent-following,(note-4) BPTSFd	81.2	%		
Adjustment for no-passing zones, fnp	16.4			
Percent time-spent-following, PTSFd	91.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.72	
Peak 15-min vehicle-miles of travel, VMT15	731	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2398	veh-mi
Peak 15-min total travel time, TT15	21.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.1	mi/h
Percent time-spent-following, PTSFd (from above)	91.0	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1218.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.66
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background Saturday
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	782	veh/h
Opposing direction volume, Vo	764	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	954	pc/h	939	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	35.0	mi/h
Percent Free Flow Speed, PFFS	68.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	954	pc/h	1013	pc/h
Base percent time-spent-following,(note-4) BPTSFd	76.5	%		
Adjustment for no-passing zones, fnp	19.3			
Percent time-spent-following, PTSFd	85.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.56	
Peak 15-min vehicle-miles of travel, VMT15	572	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1877	veh-mi
Peak 15-min total travel time, TT15	16.3	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.0	mi/h
Percent time-spent-following, PTSFd (from above)	85.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	953.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.53
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background AM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd 950 veh/h
Opposing direction volume, Vo 654 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1244	pc/h	856	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	33.4	mi/h
Percent Free Flow Speed, PFFS	64.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1341	pc/h	849	pc/h
Base percent time-spent-following,(note-4) BPTSFd	84.1	%		
Adjustment for no-passing zones, fnp	15.1			
Percent time-spent-following, PTSFd	93.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.79	
Peak 15-min vehicle-miles of travel, VMT15	740	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2280	veh-mi
Peak 15-min total travel time, TT15	22.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.4	mi/h
Percent time-spent-following, PTSFd (from above)	93.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1233.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.66
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background PM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	621	veh/h
Opposing direction volume, Vo	999	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	825	pc/h	1297	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	33.2	mi/h
Percent Free Flow Speed, PFFS	64.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	877	pc/h	1297	pc/h
Base percent time-spent-following,(note-4) BPTSFd	77.2	%		
Adjustment for no-passing zones, fnp	15.1			
Percent time-spent-following, PTSFd	83.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.52	
Peak 15-min vehicle-miles of travel, VMT15	484	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1490	veh-mi
Peak 15-min total travel time, TT15	14.6	veh-h
Capacity from ATS, CdATS	1686	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.2	mi/h
Percent time-spent-following, PTSFd (from above)	83.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	806.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.45
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background Saturday
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	764	veh/h
Opposing direction volume, Vo	782	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.997		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	815	pc/h	833	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	36.9	mi/h
Percent Free Flow Speed, PFFS	71.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	883	pc/h	832	pc/h
Base percent time-spent-following,(note-4) BPTSFd	72.7	%		
Adjustment for no-passing zones, fnp	23.4			
Percent time-spent-following, PTSFd	84.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.52	
Peak 15-min vehicle-miles of travel, VMT15	488	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1834	veh-mi
Peak 15-min total travel time, TT15	13.2	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	36.9	mi/h
Percent time-spent-following, PTSFd (from above)	84.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	812.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	2.48
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background AM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	751	vph	973	vph
Peak-hour factor, PHF	0.80		0.87	
Peak 15-minute volume, v15	235		280	
Trucks and buses	3	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.985		0.995	
Flow rate, vp	476	pcphpl	561	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	476	pcphpl	561	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	8.7	pc/mi/ln	10.2	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	469.4	559.2
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.73	2.34
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background PM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	1076	vph	742	vph
Peak-hour factor, PHF	0.88		0.93	
Peak 15-minute volume, v15	306		199	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	614	pcphpl	400	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	614	pcphpl	400	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		A	
Density, D	11.2	pc/mi/ln	7.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	611.4	398.9
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.38	2.17
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background Saturday
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	878	vph	854	vph
Peak-hour factor, PHF	0.91		0.94	
Peak 15-minute volume, v15	241		227	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	484	pcphpl	456	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	484	pcphpl	456	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	8.8	pc/mi/ln	8.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	482.4	454.3
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.26	2.23
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background AM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1055	vph	1324	vph
Peak-hour factor, PHF	0.86		0.68	
Peak 15-minute volume, v15	307		487	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	619	pcphpl	983	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	619	pcphpl	983	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		B	
Density, D	11.3	pc/mi/ln	17.9	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	613.4	973.5
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.61	2.85
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background PM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1419	vph	1062	vph
Peak-hour factor, PHF	0.95		0.88	
Peak 15-minute volume, v15	373		302	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.995	
Flow rate, vp	754	pcphpl	606	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	754	pcphpl	606	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		B	
Density, D	13.7	pc/mi/ln	11.0+	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	746.8	603.4
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.71	2.37
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background Saturday
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1143	vph	1084	vph
Peak-hour factor, PHF	0.96		0.94	
Peak 15-minute volume, v15	298		288	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	598	pcphpl	579	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	598	pcphpl	579	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	10.9	pc/mi/ln	10.5	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	595.3	576.6
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.37	2.35
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background AM
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1067	vph	1082	vph
Peak-hour factor, PHF	0.86		0.76	
Peak 15-minute volume, v15	310		356	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	626	pcphpl	718	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	626	pcphpl	718	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		B	
Density, D	11.4	pc/mi/ln	13.1	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	620.3	711.8
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.62	2.69
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background PM
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1122	vph	940	vph
Peak-hour factor, PHF	0.95		0.90	
Peak 15-minute volume, v15	295		261	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	596	pcphpl	527	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	596	pcphpl	527	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	10.8	pc/mi/ln	9.6	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	590.5	522.2
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.59	2.53
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background Saturday
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1022	vph	886	vph
Peak-hour factor, PHF	0.96		0.98	
Peak 15-minute volume, v15	266		226	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	537	pcphpl	456	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	537	pcphpl	456	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	9.8	pc/mi/ln	8.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	532.3	452.0
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.54	2.46
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.76	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	297	veh/h
Opposing direction volume, Vo	405	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.0		1.8	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.977	
Grade adj. factor,(note-1) fg	0.89		0.96	
Directional flow rate,(note-2) vi	452	pc/h	568	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	32.2	mi/h
Percent Free Flow Speed, PFFS	75.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.982		0.994	
Grade adjustment factor,(note-1) fg	0.90		0.96	
Directional flow rate,(note-2) vi	442	pc/h	558	pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.5	%		
Adjustment for no-passing zones, fnp	37.5			
Percent time-spent-following, PTSFd	65.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.26	
Peak 15-min vehicle-miles of travel, VMT15	254	veh-mi
Peak-hour vehicle-miles of travel, VMT60	772	veh-mi
Peak 15-min total travel time, TT15	7.9	veh-h
Capacity from ATS, CdATS	1598	veh/h
Capacity from PTSF, CdPTSF	1639	veh/h
Directional Capacity	1639	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.2	mi/h
Percent time-spent-following, PTSFd (from above)	65.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	390.8
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.97
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.88	
Shoulder width	5.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	664	veh/h
Opposing direction volume, Vo	485	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.990		0.986	
Grade adj. factor,(note-1) fg	0.99		0.96	
Directional flow rate,(note-2) vi	770	pc/h	582	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.7	mi/h
Percent Free Flow Speed, PFFS	69.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.996	
Grade adjustment factor,(note-1) fg	1.00		0.97	
Directional flow rate,(note-2) vi	755	pc/h	570	pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.8	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	81.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.44	
Peak 15-min vehicle-miles of travel, VMT15	490	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1726	veh-mi
Peak 15-min total travel time, TT15	16.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1642	veh/h
Directional Capacity	1642	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	81.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	754.5
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.07
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95		
Shoulder width	5.0	ft	% Trucks and buses	1	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	564	veh/h
Opposing direction volume, Vo	657	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.993		0.994	
Grade adj. factor,(note-1) fg	0.97		0.98	
Directional flow rate,(note-2) vi	616	pc/h	710	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.9	mi/h
Percent Free Flow Speed, PFFS	70.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.998		1.000	
Grade adjustment factor,(note-1) fg	0.97		0.99	
Directional flow rate,(note-2) vi	613	pc/h	699	pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.3	%		
Adjustment for no-passing zones, fnp	30.5			
Percent time-spent-following, PTSFd	74.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.36	
Peak 15-min vehicle-miles of travel, VMT15	386	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1466	veh-mi
Peak 15-min total travel time, TT15	12.9	veh-h
Capacity from ATS, CdATS	1656	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	74.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	593.7
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.74
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	405	veh/h
Opposing direction volume, Vo	297	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		2.1	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.974		0.968	
Grade adj. factor,(note-1) fg	0.92		0.85	
Directional flow rate,(note-2) vi	491	pc/h	392	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	33.3	mi/h
Percent Free Flow Speed, PFFS	78.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.988		0.982	
Grade adjustment factor,(note-1) fg	0.92		0.86	
Directional flow rate,(note-2) vi	484	pc/h	382	pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.7	%		
Adjustment for no-passing zones, fnp	40.9			
Percent time-spent-following, PTSFd	70.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	286	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1053	veh-mi
Peak 15-min total travel time, TT15	8.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1486	veh/h
Directional Capacity	1486	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.3	mi/h
Percent time-spent-following, PTSFd (from above)	70.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	440.2
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.03
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93		
Shoulder width	5.0	ft	% Trucks and buses	3	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	485	veh/h
Opposing direction volume, Vo	664	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	0.95		0.98	
Directional flow rate,(note-2) vi	562	pc/h	742	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.0	mi/h
Percent Free Flow Speed, PFFS	70.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	0.96		0.99	
Directional flow rate,(note-2) vi	546	pc/h	721	pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.7	%		
Adjustment for no-passing zones, fnp	30.9			
Percent time-spent-following, PTSFd	70.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.32	
Peak 15-min vehicle-miles of travel, VMT15	339	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1261	veh-mi
Peak 15-min total travel time, TT15	11.3	veh-h
Capacity from ATS, CdATS	1636	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	70.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	521.5
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.11
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	657	veh/h
Opposing direction volume, Vo	564	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.979	
Grade adj. factor,(note-1) fg	0.98		0.97	
Directional flow rate,(note-2) vi	742	pc/h	646	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.4	mi/h
Percent Free Flow Speed, PFFS	69.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.99		0.97	
Directional flow rate,(note-2) vi	721	pc/h	632	pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.3	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	80.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.42	
Peak 15-min vehicle-miles of travel, VMT15	464	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1708	veh-mi
Peak 15-min total travel time, TT15	15.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1666	veh/h
Directional Capacity	1666	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.4	mi/h
Percent time-spent-following, PTSFd (from above)	80.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	714.1
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.27
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project AM
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1359	vph	1695	vph
Peak-hour factor, PHF	0.91		0.91	
Peak 15-minute volume, v15	373		466	
Trucks and buses	2	%	3	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.985	
Flow rate, vp	806	pcphpl	945	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	806	pcphpl	945	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	B		C	
Density, D	17.9	pc/mi/ln	21.0	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	746.7	931.3
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.17	3.54
Bicycle LOS	C	D

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project PM
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1751	vph	1603	vph
Peak-hour factor, PHF	0.95		0.96	
Peak 15-minute volume, v15	461		417	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.995	
Flow rate, vp	995	pcphpl	839	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	995	pcphpl	839	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	22.1	pc/mi/ln	18.6	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	921.6	834.9
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.28	3.00
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project Saturday
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1615	vph	1873	vph
Peak-hour factor, PHF	0.91		0.97	
Peak 15-minute volume, v15	444		483	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.962		0.995	
Flow rate, vp	922	pcphpl	970	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	922	pcphpl	970	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	20.5	pc/mi/ln	21.6	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	887.4	965.5
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.03	3.07
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project AM
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1577	vph	1652	vph
Peak-hour factor, PHF	0.89		0.92	
Peak 15-minute volume, v15	443		449	
Trucks and buses	3	%	4	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.3		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.887		0.980	
Flow rate, vp	998	pcphpl	915	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	998	pcphpl	915	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	22.2	pc/mi/ln	20.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	886.0	897.8
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.51	3.79
Bicycle LOS	D	D

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project PM
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1681	vph	1617	vph
Peak-hour factor, PHF	0.96		0.95	
Peak 15-minute volume, v15	438		426	
Trucks and buses	1	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.990	
Flow rate, vp	914	pcphpl	859	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	914	pcphpl	859	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	20.3	pc/mi/ln	19.1	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	875.5	851.1
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.02	3.24
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project Saturday
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1631	vph	1736	vph
Peak-hour factor, PHF	0.93		0.94	
Peak 15-minute volume, v15	438		462	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.995	
Flow rate, vp	916	pcphpl	928	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	916	pcphpl	928	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	20.4	pc/mi/ln	20.6	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	876.9	923.4
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.02	3.05
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project AM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd	1652	veh/h
Opposing direction volume, Vo	1577	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.742	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1796	pc/h	2310	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	4.8	mi/h
Percent Free Flow Speed, PFFS	12.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.995	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1796	pc/h	1722	pc/h
Base percent time-spent-following,(note-4) BPTSFd	94.1	%		
Adjustment for no-passing zones, fnp	6.6			
Percent time-spent-following, PTSFd	97.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.06	
Peak 15-min vehicle-miles of travel, VMT15	404	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1487	veh-mi
Peak 15-min total travel time, TT15	84.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	4.8	mi/h
Percent time-spent-following, PTSFd (from above)	97.5	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1795.7
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.99
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project PM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95	
Shoulder width	5.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	6.0	%	Access point density	19	/mi

Analysis direction volume, Vd 1617 veh/h
Opposing direction volume, Vo 1681 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	9.7		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.852		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1998	pc/h	1769	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	7.4	mi/h
Percent Free Flow Speed, PFFS	19.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.998		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1706	pc/h	1769	pc/h
Base percent time-spent-following,(note-4) BPTSFd	93.3	%		
Adjustment for no-passing zones, fnp	6.5			
Percent time-spent-following, PTSFd	96.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.00	
Peak 15-min vehicle-miles of travel, VMT15	383	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1455	veh-mi
Peak 15-min total travel time, TT15	51.6	veh-h
Capacity from ATS, CdATS	1448	veh/h
Capacity from PTSF, CdPTSF	1696	veh/h
Directional Capacity	1696	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	7.4	mi/h
Percent time-spent-following, PTSFd (from above)	96.5	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1702.1
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.48
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project Saturday
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	5.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd	1736	veh/h
Opposing direction volume, Vo	1631	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.920	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1847	pc/h	1886	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	7.7	mi/h
Percent Free Flow Speed, PFFS	19.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.999
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1847 pc/h	1737 pc/h

Base percent time-spent-following,(note-4) BPTSFd	94.4	%
Adjustment for no-passing zones, fnp	6.7	
Percent time-spent-following, PTSFd	97.9	%

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.09	
Peak 15-min vehicle-miles of travel, VMT15	416	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1562	veh-mi
Peak 15-min total travel time, TT15	54.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	7.7	mi/h
Percent time-spent-following, PTSFd (from above)	97.9	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1846.8
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.31
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project AM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd 587 veh/h
Opposing direction volume, Vo 676 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.978		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	750	pc/h	848	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.3	mi/h
Percent Free Flow Speed, PFFS	67.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	796	pc/h	845	pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.6	%		
Adjustment for no-passing zones, fnp	24.2			
Percent time-spent-following, PTSFd	81.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.47	
Peak 15-min vehicle-miles of travel, VMT15	55	veh-mi
Peak-hour vehicle-miles of travel, VMT60	176	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.3	mi/h
Percent time-spent-following, PTSFd (from above)	81.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	733.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.83
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project PM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	871	veh/h
Opposing direction volume, Vo	586	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	987	pc/h	660	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.9	mi/h
Percent Free Flow Speed, PFFS	66.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1061	pc/h	658	pc/h
Base percent time-spent-following,(note-4) BPTSFd	76.1	%		
Adjustment for no-passing zones, fnp	22.0			
Percent time-spent-following, PTSFd	89.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.62	
Peak 15-min vehicle-miles of travel, VMT15	73	veh-mi
Peak-hour vehicle-miles of travel, VMT60	261	veh-mi
Peak 15-min total travel time, TT15	2.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	89.7	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	978.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.97
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project Saturday
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	827	veh/h
Opposing direction volume, Vo	795	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.996	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	899	pc/h	868	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.0	mi/h
Percent Free Flow Speed, PFFS	64.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	899	pc/h	937	pc/h
Base percent time-spent-following,(note-4) BPTSFd	74.3	%		
Adjustment for no-passing zones, fnp	21.3			
Percent time-spent-following, PTSFd	84.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.53	
Peak 15-min vehicle-miles of travel, VMT15	67	veh-mi
Peak-hour vehicle-miles of travel, VMT60	248	veh-mi
Peak 15-min total travel time, TT15	2.3	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.0	mi/h
Percent time-spent-following, PTSFd (from above)	84.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	898.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.49
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project AM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97	
Shoulder width	6.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	676	veh/h
Opposing direction volume, Vo	587	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		2.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.963	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	700	pc/h	628	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	32.4	mi/h
Percent Free Flow Speed, PFFS	72.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	697	pc/h	656	pc/h
Base percent time-spent-following,(note-4) BPTSFd	63.3	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	78.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.41	
Peak 15-min vehicle-miles of travel, VMT15	52	veh-mi
Peak-hour vehicle-miles of travel, VMT60	203	veh-mi
Peak 15-min total travel time, TT15	1.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	78.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	696.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.05
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project PM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90			
Shoulder width	6.0	ft	% Trucks and buses	1	%		
Lane width	12.0	ft	% Trucks crawling	0.0	%		
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr		
Terrain type	Specific Grade		% Recreational vehicles	0	%		
Grade: Length	0.30	mi	% No-passing zones	100	%		
Up/down	-3.0	%	Access point density	0	/mi		

Analysis direction volume, Vd	586	veh/h
Opposing direction volume, Vo	871	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	652	pc/h	971	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.1	mi/h
Percent Free Flow Speed, PFFS	66.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	651	pc/h	1050	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.6	%		
Adjustment for no-passing zones, fnp	22.3			
Percent time-spent-following, PTSFd	74.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.38	
Peak 15-min vehicle-miles of travel, VMT15	49	veh-mi
Peak-hour vehicle-miles of travel, VMT60	176	veh-mi
Peak 15-min total travel time, TT15	1.6	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.1	mi/h
Percent time-spent-following, PTSFd (from above)	74.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	651.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.32
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project Saturday
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	795	veh/h
Opposing direction volume, Vo	827	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	855	pc/h	892	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.1	mi/h
Percent Free Flow Speed, PFFS	64.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	855	pc/h	964	pc/h
Base percent time-spent-following,(note-4) BPTSFd	72.8	%		
Adjustment for no-passing zones, fnp	21.6			
Percent time-spent-following, PTSFd	83.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.50	
Peak 15-min vehicle-miles of travel, VMT15	64	veh-mi
Peak-hour vehicle-miles of travel, VMT60	239	veh-mi
Peak 15-min total travel time, TT15	2.2	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.1	mi/h
Percent time-spent-following, PTSFd (from above)	83.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	854.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.46
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project AM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.85	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	338	veh/h
Opposing direction volume, Vo	451	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.997		0.998	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	399	pc/h	532	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	45.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	0.8	mi/h	
Free-flow speed, FFSd	44.3	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	34.7	mi/h	
Percent Free Flow Speed, PFFS	78.5	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.999		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	398	pc/h	531	pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.6	%		
Adjustment for no-passing zones, fnp	39.6			
Percent time-spent-following, PTSFd	61.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	30	veh-mi
Peak-hour vehicle-miles of travel, VMT60	101	veh-mi
Peak 15-min total travel time, TT15	0.9	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.7	mi/h
Percent time-spent-following, PTSFd (from above)	61.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	397.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.07
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project PM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90		
Shoulder width	6.0	ft	% Trucks and buses	3	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	3	/mi	

Analysis direction volume, Vd	709	veh/h
Opposing direction volume, Vo	535	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.997		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	790	pc/h	596	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.2	mi/h
Percent Free Flow Speed, PFFS	70.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	788	pc/h	594	pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.0	%		
Adjustment for no-passing zones, fnp	28.1			
Percent time-spent-following, PTSFd	83.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.46	
Peak 15-min vehicle-miles of travel, VMT15	59	veh-mi
Peak-hour vehicle-miles of travel, VMT60	213	veh-mi
Peak 15-min total travel time, TT15	1.9	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.2	mi/h
Percent time-spent-following, PTSFd (from above)	83.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	787.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.86
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project Saturday
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.87	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	625	veh/h
Opposing direction volume, Vo	711	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	719	pc/h	818	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.0	mi/h
Percent Free Flow Speed, PFFS	67.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	718	pc/h	817	pc/h
Base percent time-spent-following,(note-4) BPTSFd	66.0	%		
Adjustment for no-passing zones, fnp	26.0			
Percent time-spent-following, PTSFd	78.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.42	
Peak 15-min vehicle-miles of travel, VMT15	54	veh-mi
Peak-hour vehicle-miles of travel, VMT60	188	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	1698	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	78.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	718.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.37
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project AM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91	
Shoulder width	6.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	451	veh/h
Opposing direction volume, Vo	338	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	500	pc/h	376	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	35.2	mi/h
Percent Free Flow Speed, PFFS	79.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.996	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	496	pc/h	373	pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.1	%		
Adjustment for no-passing zones, fnp	41.1			
Percent time-spent-following, PTSFd	72.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.29	
Peak 15-min vehicle-miles of travel, VMT15	37	veh-mi
Peak-hour vehicle-miles of travel, VMT60	135	veh-mi
Peak 15-min total travel time, TT15	1.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1693	veh/h
Directional Capacity	1693	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.2	mi/h
Percent time-spent-following, PTSFd (from above)	72.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	495.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.88
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project PM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	6.0	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	535	veh/h
Opposing direction volume, Vo	709	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	575	pc/h	762	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.6	mi/h
Percent Free Flow Speed, PFFS	71.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	575	pc/h	762	pc/h
Base percent time-spent-following,(note-4) BPTSFd	59.1	%		
Adjustment for no-passing zones, fnp	29.3			
Percent time-spent-following, PTSFd	71.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.34	
Peak 15-min vehicle-miles of travel, VMT15	43	veh-mi
Peak-hour vehicle-miles of travel, VMT60	161	veh-mi
Peak 15-min total travel time, TT15	1.4	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.6	mi/h
Percent time-spent-following, PTSFd (from above)	71.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	575.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.07
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project Saturday
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97	
Shoulder width	6.0	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	711	veh/h
Opposing direction volume, Vo	625	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	733	pc/h	644	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.3	mi/h
Percent Free Flow Speed, PFFS	70.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	733	pc/h	644	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.4	%		
Adjustment for no-passing zones, fnp	28.8			
Percent time-spent-following, PTSFd	80.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.43	
Peak 15-min vehicle-miles of travel, VMT15	55	veh-mi
Peak-hour vehicle-miles of travel, VMT60	213	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.3	mi/h
Percent time-spent-following, PTSFd (from above)	80.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	733.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.19
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project AM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	433	veh/h
Opposing direction volume, Vo	890	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.984		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	484	pc/h	978	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	50.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	6.5	mi/h	
Free-flow speed, FFSd	43.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	29.9	mi/h	
Percent Free Flow Speed, PFFS	68.6	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	476	pc/h	978	pc/h
Base percent time-spent-following,(note-4) BPTSFd	55.6	%		
Adjustment for no-passing zones, fnp	22.9			
Percent time-spent-following, PTSFd	63.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	178	veh-mi
Peak-hour vehicle-miles of travel, VMT60	650	veh-mi
Peak 15-min total travel time, TT15	6.0	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	63.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	475.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.18
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project PM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	991	veh/h
Opposing direction volume, Vo	528	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1077	pc/h	579	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.3	mi/h
Percent Free Flow Speed, PFFS	65.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1077	pc/h	574	pc/h
Base percent time-spent-following,(note-4) BPTSFd	76.8	%		
Adjustment for no-passing zones, fnp	21.0			
Percent time-spent-following, PTSFd	90.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.63	
Peak 15-min vehicle-miles of travel, VMT15	404	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1487	veh-mi
Peak 15-min total travel time, TT15	14.3	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.3	mi/h
Percent time-spent-following, PTSFd (from above)	90.5	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1077.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.60
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project Saturday
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	757	veh/h
Opposing direction volume, Vo	635	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	829	pc/h	696	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.4	mi/h
Percent Free Flow Speed, PFFS	67.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	823	pc/h	690	pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.8	%		
Adjustment for no-passing zones, fnp	26.2			
Percent time-spent-following, PTSFd	83.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.48	
Peak 15-min vehicle-miles of travel, VMT15	309	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1136	veh-mi
Peak 15-min total travel time, TT15	10.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.4	mi/h
Percent time-spent-following, PTSFd (from above)	83.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	822.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.46
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project AM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	26	/mi

Analysis direction volume, Vd	890	veh/h
Opposing direction volume, Vo	433	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.984	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1094	pc/h	536	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.6	mi/h
Percent Free Flow Speed, PFFS	65.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	0.92	1.00
Directional flow rate,(note-2) vi	1180 pc/h	528 pc/h
Base percent time-spent-following,(note-4) BPTSFd	79.0 %	
Adjustment for no-passing zones, fnp	19.4	
Percent time-spent-following, PTSFd	92.4 %	

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.69	
Peak 15-min vehicle-miles of travel, VMT15	407	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1335	veh-mi
Peak 15-min total travel time, TT15	14.3	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.6	mi/h
Percent time-spent-following, PTSFd (from above)	92.4	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1085.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.60
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project PM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	528	veh/h
Opposing direction volume, Vo	991	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	649	pc/h	1209	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.8	mi/h
Percent Free Flow Speed, PFFS	61.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	644	pc/h	1209	pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.4	%		
Adjustment for no-passing zones, fnp	18.0			
Percent time-spent-following, PTSFd	73.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.38	
Peak 15-min vehicle-miles of travel, VMT15	241	veh-mi
Peak-hour vehicle-miles of travel, VMT60	792	veh-mi
Peak 15-min total travel time, TT15	9.0	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.8	mi/h
Percent time-spent-following, PTSFd (from above)	73.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	643.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.33
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project Saturday
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82		
Shoulder width	6.0	ft	% Trucks and buses	8	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	1	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	26	/mi	

Analysis direction volume, Vd	635	veh/h
Opposing direction volume, Vo	757	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	781	pc/h	923	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.0	mi/h
Percent Free Flow Speed, PFFS	64.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	774	pc/h	923	pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.3	%		
Adjustment for no-passing zones, fnp	23.1			
Percent time-spent-following, PTSFd	79.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.46	
Peak 15-min vehicle-miles of travel, VMT15	290	veh-mi
Peak-hour vehicle-miles of travel, VMT60	953	veh-mi
Peak 15-min total travel time, TT15	10.4	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.0	mi/h
Percent time-spent-following, PTSFd (from above)	79.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	774.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.43
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project AM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	659	veh/h
Opposing direction volume, Vo	959	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	810	pc/h	1179	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	34.3	mi/h
Percent Free Flow Speed, PFFS	66.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	804	pc/h	1271	pc/h
Base percent time-spent-following,(note-4) BPTSFd	74.4	%		
Adjustment for no-passing zones, fnp	16.5			
Percent time-spent-following, PTSFd	80.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.47	
Peak 15-min vehicle-miles of travel, VMT15	482	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1582	veh-mi
Peak 15-min total travel time, TT15	14.1	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.3	mi/h
Percent time-spent-following, PTSFd (from above)	80.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	803.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.45
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project PM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	1026	veh/h
Opposing direction volume, Vo	645	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.973	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1251	pc/h	808	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	33.7	mi/h
Percent Free Flow Speed, PFFS	65.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	1251	pc/h	855	pc/h
Base percent time-spent-following,(note-4) BPTSFd	82.4	%		
Adjustment for no-passing zones, fnp	15.8			
Percent time-spent-following, PTSFd	91.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.74	
Peak 15-min vehicle-miles of travel, VMT15	751	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2462	veh-mi
Peak 15-min total travel time, TT15	22.3	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.7	mi/h
Percent time-spent-following, PTSFd (from above)	91.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1251.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.67
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project Saturday
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82			
Shoulder width	6.0	ft	% Trucks and buses	8	%		
Lane width	12.0	ft	% Trucks crawling	0.0	%		
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr		
Terrain type	Specific Grade		% Recreational vehicles	1	%		
Grade: Length	0.25	mi	% No-passing zones	100	%		
Up/down	-3.0	%	Access point density	14	/mi		

Analysis direction volume, Vd	818	veh/h
Opposing direction volume, Vo	804	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	998	pc/h	988	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	34.3	mi/h
Percent Free Flow Speed, PFFS	66.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	998	pc/h	1066	pc/h
Base percent time-spent-following,(note-4) BPTSFd	78.8	%		
Adjustment for no-passing zones, fnp	17.8			
Percent time-spent-following, PTSFd	87.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.59	
Peak 15-min vehicle-miles of travel, VMT15	599	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1963	veh-mi
Peak 15-min total travel time, TT15	17.5	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.3	mi/h
Percent time-spent-following, PTSFd (from above)	87.4	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	997.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.56
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project AM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	959	veh/h
Opposing direction volume, Vo	659	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1255	pc/h	856	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	33.3	mi/h
Percent Free Flow Speed, PFFS	64.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1354	pc/h	856	pc/h
Base percent time-spent-following,(note-4) BPTSFd	84.3	%		
Adjustment for no-passing zones, fnp	14.9			
Percent time-spent-following, PTSFd	93.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.80	
Peak 15-min vehicle-miles of travel, VMT15	747	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2302	veh-mi
Peak 15-min total travel time, TT15	22.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.3	mi/h
Percent time-spent-following, PTSFd (from above)	93.4	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1245.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.67
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project PM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd 645 veh/h
Opposing direction volume, Vo 1026 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	853	pc/h	1332	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	32.7	mi/h
Percent Free Flow Speed, PFFS	63.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	911	pc/h	1332	pc/h
Base percent time-spent-following,(note-4) BPTSFd	78.6	%		
Adjustment for no-passing zones, fnp	14.4			
Percent time-spent-following, PTSFd	84.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.54	
Peak 15-min vehicle-miles of travel, VMT15	503	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1548	veh-mi
Peak 15-min total travel time, TT15	15.4	veh-h
Capacity from ATS, CdATS	1686	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	84.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	837.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.47
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project Saturday
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	804	veh/h
Opposing direction volume, Vo	818	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	857	pc/h	870	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	36.3	mi/h
Percent Free Flow Speed, PFFS	70.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	930	pc/h	870	pc/h
Base percent time-spent-following,(note-4) BPTSFd	74.3	%		
Adjustment for no-passing zones, fnp	22.0			
Percent time-spent-following, PTSFd	85.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.55	
Peak 15-min vehicle-miles of travel, VMT15	513	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1930	veh-mi
Peak 15-min total travel time, TT15	14.1	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	36.3	mi/h
Percent time-spent-following, PTSFd (from above)	85.7	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	855.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	2.51
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project AM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	757	vph	983	vph
Peak-hour factor, PHF	0.80		0.87	
Peak 15-minute volume, v15	237		282	
Trucks and buses	3	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.985		0.995	
Flow rate, vp	480	pcphpl	567	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	480	pcphpl	567	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	8.7	pc/mi/ln	10.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	473.1	564.9
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.73	2.34
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

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OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project PM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	1107	vph	770	vph
Peak-hour factor, PHF	0.88		0.93	
Peak 15-minute volume, v15	314		207	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	632	pcphpl	416	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	632	pcphpl	416	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		A	
Density, D	11.5	pc/mi/ln	7.6	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	629.0	414.0
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.40	2.18
Bicycle LOS	B	B

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HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
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OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project Saturday
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	918	vph	901	vph
Peak-hour factor, PHF	0.91		0.94	
Peak 15-minute volume, v15	252		240	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	506	pcphpl	481	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	506	pcphpl	481	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	9.2	pc/mi/ln	8.7	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	504.4	479.3
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.28	2.26
Bicycle LOS	B	B

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HCS 2010: Multilane Highways Release 6.70

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OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project AM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1063	vph	1335	vph
Peak-hour factor, PHF	0.86		0.68	
Peak 15-minute volume, v15	309		491	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	624	pcphpl	991	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	624	pcphpl	991	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		C	
Density, D	11.3	pc/mi/ln	18.0+	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	618.0	981.6
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.62	2.85
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

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OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project PM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1458	vph	1097	vph
Peak-hour factor, PHF	0.95		0.88	
Peak 15-minute volume, v15	384		312	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.995	
Flow rate, vp	775	pcphpl	626	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	775	pcphpl	626	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		B	
Density, D	14.1	pc/mi/ln	11.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	767.4	623.3
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.73	2.39
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
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OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project Saturday
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1195	vph	1142	vph
Peak-hour factor, PHF	0.96		0.94	
Peak 15-minute volume, v15	311		304	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	625	pcphpl	610	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	625	pcphpl	610	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		B	
Density, D	11.4	pc/mi/ln	11.1	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	622.4	607.4
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.39	2.38
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

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Date:	12/6/17
Analysis Period:	Background + Project AM
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1067	vph	1082	vph
Peak-hour factor, PHF	0.86		0.76	
Peak 15-minute volume, v15	310		356	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	626	pcphpl	718	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	626	pcphpl	718	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		B	
Density, D	11.4	pc/mi/ln	13.1	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	620.3	711.8
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.62	2.69
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

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Date:	12/6/17
Analysis Period:	Background + Project PM
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1122	vph	940	vph
Peak-hour factor, PHF	0.95		0.90	
Peak 15-minute volume, v15	295		261	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	596	pcphpl	527	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	596	pcphpl	527	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	10.8	pc/mi/ln	9.6	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	590.5	522.2
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.59	2.53
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
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OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Background + Project Saturday
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1022	vph	886	vph
Peak-hour factor, PHF	0.96		0.98	
Peak 15-minute volume, v15	266		226	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	537	pcphpl	456	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	537	pcphpl	456	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	9.8	pc/mi/ln	8.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	532.3	452.0
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.54	2.46
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.76	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	297	veh/h
Opposing direction volume, Vo	405	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.0		1.8	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.977	
Grade adj. factor,(note-1) fg	0.89		0.96	
Directional flow rate,(note-2) vi	452	pc/h	568	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	45.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h	
Adj. for access point density,(note-3) fA	1.3	mi/h	
Free-flow speed, FFSd	42.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	32.2	mi/h	
Percent Free Flow Speed, PFFS	75.9	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.982		0.994	
Grade adjustment factor,(note-1) fg	0.90		0.96	
Directional flow rate,(note-2) vi	442	pc/h	558	pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.5	%		
Adjustment for no-passing zones, fnp	37.5			
Percent time-spent-following, PTSFd	65.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.26	
Peak 15-min vehicle-miles of travel, VMT15	254	veh-mi
Peak-hour vehicle-miles of travel, VMT60	772	veh-mi
Peak 15-min total travel time, TT15	7.9	veh-h
Capacity from ATS, CdATS	1598	veh/h
Capacity from PTSF, CdPTSF	1639	veh/h
Directional Capacity	1639	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.2	mi/h
Percent time-spent-following, PTSFd (from above)	65.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	390.8
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.97
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.88		
Shoulder width	5.0	ft	% Trucks and buses	2	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	676	veh/h
Opposing direction volume, Vo	498	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.990		0.986	
Grade adj. factor,(note-1) fg	0.99		0.96	
Directional flow rate,(note-2) vi	784	pc/h	598	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.4	mi/h
Percent Free Flow Speed, PFFS	69.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.996	
Grade adjustment factor,(note-1) fg	1.00		0.97	
Directional flow rate,(note-2) vi	768	pc/h	586	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.5	%		
Adjustment for no-passing zones, fnp	28.8			
Percent time-spent-following, PTSFd	81.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.45	
Peak 15-min vehicle-miles of travel, VMT15	499	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1758	veh-mi
Peak 15-min total travel time, TT15	17.0	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1642	veh/h
Directional Capacity	1642	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.4	mi/h
Percent time-spent-following, PTSFd (from above)	81.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	768.2
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.08
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95	
Shoulder width	5.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	583	veh/h
Opposing direction volume, Vo	675	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.993		0.994	
Grade adj. factor,(note-1) fg	0.97		0.98	
Directional flow rate,(note-2) vi	637	pc/h	729	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	45.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h	
Adj. for access point density,(note-3) fA	1.3	mi/h	
Free-flow speed, FFSd	42.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	29.5	mi/h	
Percent Free Flow Speed, PFFS	69.6	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.97		0.99	
Directional flow rate,(note-2) vi	633	pc/h	718	pc/h
Base percent time-spent-following,(note-4) BPTSFd	61.3	%		
Adjustment for no-passing zones, fnp	29.5			
Percent time-spent-following, PTSFd	75.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	399	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1516	veh-mi
Peak 15-min total travel time, TT15	13.5	veh-h
Capacity from ATS, CdATS	1656	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt		2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-		mi
Length of passing lane including tapers, Lpl	-		mi
Average travel speed, ATSd (from above)		29.5	mi/h
Percent time-spent-following, PTSFd (from above)		75.1	
Level of service, LOSd (from above)		D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	613.7
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.75
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92		
Shoulder width	5.0	ft	% Trucks and buses	3	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	408	veh/h
Opposing direction volume, Vo	301	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		2.1	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.974		0.968	
Grade adj. factor,(note-1) fg	0.92		0.85	
Directional flow rate,(note-2) vi	495	pc/h	398	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	33.2	mi/h
Percent Free Flow Speed, PFFS	78.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.988		0.982	
Grade adjustment factor,(note-1) fg	0.93		0.86	
Directional flow rate,(note-2) vi	483	pc/h	387	pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.4	%		
Adjustment for no-passing zones, fnp	40.9			
Percent time-spent-following, PTSFd	70.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	288	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1061	veh-mi
Peak 15-min total travel time, TT15	8.7	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1486	veh/h
Directional Capacity	1486	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.2	mi/h
Percent time-spent-following, PTSFd (from above)	70.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	443.5
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.03
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	498	veh/h
Opposing direction volume, Vo	676	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.5	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.985	
Grade adj. factor,(note-1) fg	0.96		0.98	
Directional flow rate,(note-2) vi	571	pc/h	753	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.9	mi/h
Percent Free Flow Speed, PFFS	70.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	0.96		0.99	
Directional flow rate,(note-2) vi	561	pc/h	734	pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.8	%		
Adjustment for no-passing zones, fnp	30.2			
Percent time-spent-following, PTSFd	70.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.33	
Peak 15-min vehicle-miles of travel, VMT15	348	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1295	veh-mi
Peak 15-min total travel time, TT15	11.6	veh-h
Capacity from ATS, CdATS	1641	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	70.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	535.5
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.13
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Background + Project Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92		
Shoulder width	5.0	ft	% Trucks and buses	3	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	675	veh/h
Opposing direction volume, Vo	583	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.985		0.979	
Grade adj. factor,(note-1) fg	0.98		0.97	
Directional flow rate,(note-2) vi	760	pc/h	667	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.1	mi/h
Percent Free Flow Speed, PFFS	68.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.99		0.98	
Directional flow rate,(note-2) vi	741	pc/h	647	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.5	%		
Adjustment for no-passing zones, fnp	28.5			
Percent time-spent-following, PTSFd	80.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.44	
Peak 15-min vehicle-miles of travel, VMT15	477	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1755	veh-mi
Peak 15-min total travel time, TT15	16.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1666	veh/h
Directional Capacity	1666	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.1	mi/h
Percent time-spent-following, PTSFd (from above)	80.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	733.7
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.29
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst: JO
Agency/Co: Mott MacDonald
Date: 12/6/17
Analysis Period: Cumulative AM
Highway: SR 1
From/To: Carpenter / Ocean
Jurisdiction: Unincorporated Monterey County
Analysis Year: 2017
Project ID: Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1453	vph	1840	vph
Peak-hour factor, PHF	0.91		0.91	
Peak 15-minute volume, v15	399		505	
Trucks and buses	2	%	3	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.985	
Flow rate, vp	862	pcphpl	1026	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	862	pcphpl	1026	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	19.2	pc/mi/ln	22.8	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	798.4	1011.0
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.21	3.58
Bicycle LOS	C	D

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst: JO
Agency/Co: Mott MacDonald
Date: 12/6/17
Analysis Period: Cumulative PM
Highway: SR 1
From/To: Carpenter / Ocean
Jurisdiction: Unincorporated Monterey County
Analysis Year: 2017
Project ID: Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1933	vph	1743	vph
Peak-hour factor, PHF	0.95		0.96	
Peak 15-minute volume, v15	509		454	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.995	
Flow rate, vp	1098	pcphpl	912	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	1098	pcphpl	912	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	24.4	pc/mi/ln	20.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	1017.4	907.8
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.33	3.04
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative Saturday
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1805	vph	2023	vph
Peak-hour factor, PHF	0.91		0.97	
Peak 15-minute volume, v15	496		521	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.962		0.995	
Flow rate, vp	1031	pcphpl	1047	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	1031	pcphpl	1047	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	22.9	pc/mi/ln	23.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	991.8	1042.8
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.09	3.11
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative AM
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1679	vph	1799	vph
Peak-hour factor, PHF	0.89		0.92	
Peak 15-minute volume, v15	472		489	
Trucks and buses	3	%	4	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.3		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.887		0.980	
Flow rate, vp	1063	pcphpl	997	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	1063	pcphpl	997	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	23.6	pc/mi/ln	22.2	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	943.3	977.7
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.54	3.83
Bicycle LOS	D	D

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative PM
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1871	vph	1759	vph
Peak-hour factor, PHF	0.96		0.95	
Peak 15-minute volume, v15	487		463	
Trucks and buses	1	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.990	
Flow rate, vp	1018	pcphpl	935	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	1018	pcphpl	935	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	22.6	pc/mi/ln	20.8	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	974.5	925.8
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.08	3.28
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative Saturday
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1812	vph	1881	vph
Peak-hour factor, PHF	0.93		0.94	
Peak 15-minute volume, v15	487		500	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.995	
Flow rate, vp	1018	pcphpl	1005	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	1018	pcphpl	1005	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	22.6	pc/mi/ln	22.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	974.2	1000.5
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.08	3.09
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative AM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd 1799 veh/h
Opposing direction volume, Vo 1679 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.742	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1955	pc/h	2460	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	2.4	mi/h
Percent Free Flow Speed, PFFS	6.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.995	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1955	pc/h	1834	pc/h
Base percent time-spent-following,(note-4) BPTSFd	95.2	%		
Adjustment for no-passing zones, fnp	6.8			
Percent time-spent-following, PTSFd	98.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.15	
Peak 15-min vehicle-miles of travel, VMT15	440	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1619	veh-mi
Peak 15-min total travel time, TT15	184.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	2.4	mi/h
Percent time-spent-following, PTSFd (from above)	98.7	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1955.4
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	4.03
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative PM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95	
Shoulder width	5.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	6.0	%	Access point density	19	/mi

Analysis direction volume, Vd	1759	veh/h
Opposing direction volume, Vo	1871	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	9.7		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.852		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	2173	pc/h	1969	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	4.5	mi/h
Percent Free Flow Speed, PFFS	11.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.998		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1856	pc/h	1969	pc/h
Base percent time-spent-following,(note-4) BPTSFd	94.5	%		
Adjustment for no-passing zones, fnp	6.7			
Percent time-spent-following, PTSFd	97.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.09	
Peak 15-min vehicle-miles of travel, VMT15	417	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1583	veh-mi
Peak 15-min total travel time, TT15	92.5	veh-h
Capacity from ATS, CdATS	1448	veh/h
Capacity from PTSF, CdPTSF	1696	veh/h
Directional Capacity	1696	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	4.5	mi/h
Percent time-spent-following, PTSFd (from above)	97.8	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1851.6
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.52
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative Saturday
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	5.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd 1881 veh/h
Opposing direction volume, Vo 1812 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.920	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	2001	pc/h	2095	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	4.9	mi/h
Percent Free Flow Speed, PFFS	12.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.999	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	2001	pc/h	1930	pc/h
Base percent time-spent-following,(note-4) BPTSFd	95.4	%		
Adjustment for no-passing zones, fnp	6.5			
Percent time-spent-following, PTSFd	98.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.18	
Peak 15-min vehicle-miles of travel, VMT15	450	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1693	veh-mi
Peak 15-min total travel time, TT15	92.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	4.9	mi/h
Percent time-spent-following, PTSFd (from above)	98.7	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	2001.1
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.35
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative AM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	664	veh/h
Opposing direction volume, Vo	809	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.987		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	841	pc/h	1011	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.3	mi/h
Percent Free Flow Speed, PFFS	63.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	900	pc/h	1011	pc/h
Base percent time-spent-following,(note-4) BPTSFd	74.8	%		
Adjustment for no-passing zones, fnp	19.5			
Percent time-spent-following, PTSFd	84.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.53	
Peak 15-min vehicle-miles of travel, VMT15	62	veh-mi
Peak-hour vehicle-miles of travel, VMT60	199	veh-mi
Peak 15-min total travel time, TT15	2.2	veh-h
Capacity from ATS, CdATS	1686	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.3	mi/h
Percent time-spent-following, PTSFd (from above)	84.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	830.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.89
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative PM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd 1044 veh/h
Opposing direction volume, Vo 716 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1182	pc/h	807	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	27.3	mi/h
Percent Free Flow Speed, PFFS	60.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1272	pc/h	804	pc/h
Base percent time-spent-following,(note-4) BPTSFd	82.4	%		
Adjustment for no-passing zones, fnp	16.5			
Percent time-spent-following, PTSFd	92.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.75	
Peak 15-min vehicle-miles of travel, VMT15	88	veh-mi
Peak-hour vehicle-miles of travel, VMT60	313	veh-mi
Peak 15-min total travel time, TT15	3.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.3	mi/h
Percent time-spent-following, PTSFd (from above)	92.5	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1173.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.06
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative Saturday
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	989	veh/h
Opposing direction volume, Vo	911	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1075	pc/h	993	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.7	mi/h
Percent Free Flow Speed, PFFS	59.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	0.92
Directional flow rate,(note-2) vi	1075 pc/h	1074 pc/h

Base percent time-spent-following,(note-4) BPTSFd	80.8	%
Adjustment for no-passing zones, fnp	16.5	
Percent time-spent-following, PTSFd	89.1	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.63	
Peak 15-min vehicle-miles of travel, VMT15	81	veh-mi
Peak-hour vehicle-miles of travel, VMT60	297	veh-mi
Peak 15-min total travel time, TT15	3.0	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.7	mi/h
Percent time-spent-following, PTSFd (from above)	89.1	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1075.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.58
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative AM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97	
Shoulder width	6.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd 809 veh/h
Opposing direction volume, Vo 664 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.966	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	837	pc/h	709	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.7	mi/h
Percent Free Flow Speed, PFFS	68.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	834	pc/h	742	pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.7	%		
Adjustment for no-passing zones, fnp	25.1			
Percent time-spent-following, PTSFd	84.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.49	
Peak 15-min vehicle-miles of travel, VMT15	63	veh-mi
Peak-hour vehicle-miles of travel, VMT60	243	veh-mi
Peak 15-min total travel time, TT15	2.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.7	mi/h
Percent time-spent-following, PTSFd (from above)	84.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	834.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.14
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative PM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	716	veh/h
Opposing direction volume, Vo	1044	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	796	pc/h	1163	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	27.5	mi/h
Percent Free Flow Speed, PFFS	61.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	0.92
Directional flow rate,(note-2) vi	796 pc/h	1258 pc/h

Base percent time-spent-following,(note-4) BPTSFd	74.1	%
Adjustment for no-passing zones, fnp	16.8	
Percent time-spent-following, PTSFd	80.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.47	
Peak 15-min vehicle-miles of travel, VMT15	60	veh-mi
Peak-hour vehicle-miles of travel, VMT60	215	veh-mi
Peak 15-min total travel time, TT15	2.2	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.5	mi/h
Percent time-spent-following, PTSFd (from above)	80.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	795.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.42
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative Saturday
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd 911 veh/h
Opposing direction volume, Vo 989 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	980	pc/h	1067	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.8	mi/h
Percent Free Flow Speed, PFFS	59.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	980	pc/h	1153	pc/h
Base percent time-spent-following,(note-4) BPTSFd	79.1	%		
Adjustment for no-passing zones, fnp	16.7			
Percent time-spent-following, PTSFd	86.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.58	
Peak 15-min vehicle-miles of travel, VMT15	73	veh-mi
Peak-hour vehicle-miles of travel, VMT60	273	veh-mi
Peak 15-min total travel time, TT15	2.7	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.8	mi/h
Percent time-spent-following, PTSFd (from above)	86.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	979.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.53
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative AM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.85		
Shoulder width	6.0	ft	% Trucks and buses	1	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	3	/mi	

Analysis direction volume, Vd	398	veh/h
Opposing direction volume, Vo	592	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	469	pc/h	697	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	32.9	mi/h
Percent Free Flow Speed, PFFS	74.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	468	pc/h	696	pc/h
Base percent time-spent-following,(note-4) BPTSFd	52.0	%		
Adjustment for no-passing zones, fnp	32.9			
Percent time-spent-following, PTSFd	65.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	35	veh-mi
Peak-hour vehicle-miles of travel, VMT60	119	veh-mi
Peak 15-min total travel time, TT15	1.1	veh-h
Capacity from ATS, CdATS	1698	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.9	mi/h
Percent time-spent-following, PTSFd (from above)	65.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	468.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.15
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative PM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	889	veh/h
Opposing direction volume, Vo	658	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	988	pc/h	733	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.6	mi/h
Percent Free Flow Speed, PFFS	64.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	988	pc/h	731	pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.4	%		
Adjustment for no-passing zones, fnp	22.3			
Percent time-spent-following, PTSFd	88.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.58	
Peak 15-min vehicle-miles of travel, VMT15	74	veh-mi
Peak-hour vehicle-miles of travel, VMT60	267	veh-mi
Peak 15-min total travel time, TT15	2.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.6	mi/h
Percent time-spent-following, PTSFd (from above)	88.2	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	987.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.98
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative Saturday
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.87	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	797	veh/h
Opposing direction volume, Vo	830	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	916	pc/h	954	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	27.4	mi/h
Percent Free Flow Speed, PFFS	62.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	916	pc/h	954	pc/h
Base percent time-spent-following,(note-4) BPTSFd	74.8	%		
Adjustment for no-passing zones, fnp	20.8			
Percent time-spent-following, PTSFd	85.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.54	
Peak 15-min vehicle-miles of travel, VMT15	69	veh-mi
Peak-hour vehicle-miles of travel, VMT60	239	veh-mi
Peak 15-min total travel time, TT15	2.5	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.4	mi/h
Percent time-spent-following, PTSFd (from above)	85.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	916.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.50
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative AM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91	
Shoulder width	6.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd 592 veh/h
Opposing direction volume, Vo 398 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	653	pc/h	443	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	33.4	mi/h
Percent Free Flow Speed, PFFS	75.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	651	pc/h	437	pc/h
Base percent time-spent-following,(note-4) BPTSFd	58.9	%		
Adjustment for no-passing zones, fnp	34.6			
Percent time-spent-following, PTSFd	79.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.38	
Peak 15-min vehicle-miles of travel, VMT15	49	veh-mi
Peak-hour vehicle-miles of travel, VMT60	178	veh-mi
Peak 15-min total travel time, TT15	1.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.4	mi/h
Percent time-spent-following, PTSFd (from above)	79.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	650.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.01
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative PM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93		
Shoulder width	6.0	ft	% Trucks and buses	0	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	3	/mi	

Analysis direction volume, Vd	658	veh/h
Opposing direction volume, Vo	889	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	708	pc/h	956	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.0	mi/h
Percent Free Flow Speed, PFFS	65.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	708	pc/h	956	pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.2	%		
Adjustment for no-passing zones, fnp	23.3			
Percent time-spent-following, PTSFd	77.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.42	
Peak 15-min vehicle-miles of travel, VMT15	53	veh-mi
Peak-hour vehicle-miles of travel, VMT60	197	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.0	mi/h
Percent time-spent-following, PTSFd (from above)	77.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	707.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.17
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative Saturday
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97	
Shoulder width	6.0	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	830	veh/h
Opposing direction volume, Vo	797	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	856	pc/h	822	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.9	mi/h
Percent Free Flow Speed, PFFS	65.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	856	pc/h	822	pc/h
Base percent time-spent-following,(note-4) BPTSFd	71.3	%		
Adjustment for no-passing zones, fnp	23.9			
Percent time-spent-following, PTSFd	83.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.50	
Peak 15-min vehicle-miles of travel, VMT15	64	veh-mi
Peak-hour vehicle-miles of travel, VMT60	249	veh-mi
Peak 15-min total travel time, TT15	2.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.9	mi/h
Percent time-spent-following, PTSFd (from above)	83.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	855.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.27
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative AM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	457	veh/h
Opposing direction volume, Vo	912	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.984		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	510	pc/h	1002	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.5	mi/h
Percent Free Flow Speed, PFFS	67.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	502	pc/h	1002	pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.2	%		
Adjustment for no-passing zones, fnp	22.5			
Percent time-spent-following, PTSFd	64.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.30	
Peak 15-min vehicle-miles of travel, VMT15	188	veh-mi
Peak-hour vehicle-miles of travel, VMT60	686	veh-mi
Peak 15-min total travel time, TT15	6.4	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	64.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	502.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.21
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative PM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	1007	veh/h
Opposing direction volume, Vo	545	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1095	pc/h	597	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.1	mi/h
Percent Free Flow Speed, PFFS	64.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1095	pc/h	592	pc/h
Base percent time-spent-following,(note-4) BPTSFd	77.1	%		
Adjustment for no-passing zones, fnp	20.6			
Percent time-spent-following, PTSFd	90.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.64	
Peak 15-min vehicle-miles of travel, VMT15	410	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1511	veh-mi
Peak 15-min total travel time, TT15	14.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.1	mi/h
Percent time-spent-following, PTSFd (from above)	90.5	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1094.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.60
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative Saturday
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	26	/mi

Analysis direction volume, Vd	763	veh/h
Opposing direction volume, Vo	638	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.981		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	845	pc/h	699	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	29.2	mi/h
Percent Free Flow Speed, PFFS	67.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	901	pc/h	693	pc/h
Base percent time-spent-following,(note-4) BPTSFd	72.5	%		
Adjustment for no-passing zones, fnp	24.8			
Percent time-spent-following, PTSFd	86.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.53	
Peak 15-min vehicle-miles of travel, VMT15	311	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1145	veh-mi
Peak 15-min total travel time, TT15	10.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.2	mi/h
Percent time-spent-following, PTSFd (from above)	86.5	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	829.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.46
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative AM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	912	veh/h
Opposing direction volume, Vo	457	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1112	pc/h	562	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	50.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	6.5	mi/h	
Free-flow speed, FFSd	43.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	28.2	mi/h	
Percent Free Flow Speed, PFFS	64.9	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1112	pc/h	557	pc/h
Base percent time-spent-following,(note-4) BPTSFd	77.6	%		
Adjustment for no-passing zones, fnp	20.2			
Percent time-spent-following, PTSFd	91.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.65	
Peak 15-min vehicle-miles of travel, VMT15	417	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1368	veh-mi
Peak 15-min total travel time, TT15	14.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.2	mi/h
Percent time-spent-following, PTSFd (from above)	91.1	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1112.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.61
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative PM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	545	veh/h
Opposing direction volume, Vo	1007	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	670	pc/h	1228	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.5	mi/h
Percent Free Flow Speed, PFFS	60.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	665	pc/h	1228	pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.8	%		
Adjustment for no-passing zones, fnp	17.5			
Percent time-spent-following, PTSFd	74.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.39	
Peak 15-min vehicle-miles of travel, VMT15	249	veh-mi
Peak-hour vehicle-miles of travel, VMT60	818	veh-mi
Peak 15-min total travel time, TT15	9.4	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.5	mi/h
Percent time-spent-following, PTSFd (from above)	74.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	664.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.35
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative Saturday
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	638	veh/h
Opposing direction volume, Vo	763	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	784	pc/h	930	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	50.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	6.5	mi/h	
Free-flow speed, FFSd	43.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	27.9	mi/h	
Percent Free Flow Speed, PFFS	64.1	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	778	pc/h	930	pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.0	%		
Adjustment for no-passing zones, fnp	22.9			
Percent time-spent-following, PTSFd	80.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.46	
Peak 15-min vehicle-miles of travel, VMT15	292	veh-mi
Peak-hour vehicle-miles of travel, VMT60	957	veh-mi
Peak 15-min total travel time, TT15	10.5	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.9	mi/h
Percent time-spent-following, PTSFd (from above)	80.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	778.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.43
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative AM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	685	veh/h
Opposing direction volume, Vo	979	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	842	pc/h	1204	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	33.8	mi/h
Percent Free Flow Speed, PFFS	65.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	835	pc/h	1298	pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.9	%		
Adjustment for no-passing zones, fnp	15.9			
Percent time-spent-following, PTSFd	82.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.49	
Peak 15-min vehicle-miles of travel, VMT15	501	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1644	veh-mi
Peak 15-min total travel time, TT15	14.8	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.8	mi/h
Percent time-spent-following, PTSFd (from above)	82.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	835.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.47
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative PM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd 1036 veh/h
Opposing direction volume, Vo 657 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1263	pc/h	820	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	33.5	mi/h
Percent Free Flow Speed, PFFS	65.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	1263	pc/h	871	pc/h
Base percent time-spent-following,(note-4) BPTSFd	82.6	%		
Adjustment for no-passing zones, fnp	15.6			
Percent time-spent-following, PTSFd	91.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.74	
Peak 15-min vehicle-miles of travel, VMT15	758	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2486	veh-mi
Peak 15-min total travel time, TT15	22.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.5	mi/h
Percent time-spent-following, PTSFd (from above)	91.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1263.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.68
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative Saturday
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	818	veh/h
Opposing direction volume, Vo	800	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	998	pc/h	983	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	34.3	mi/h
Percent Free Flow Speed, PFFS	66.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	998	pc/h	1060	pc/h
Base percent time-spent-following,(note-4) BPTSFd	78.8	%		
Adjustment for no-passing zones, fnp	17.9			
Percent time-spent-following, PTSFd	87.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.59	
Peak 15-min vehicle-miles of travel, VMT15	599	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1963	veh-mi
Peak 15-min total travel time, TT15	17.4	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.3	mi/h
Percent time-spent-following, PTSFd (from above)	87.5	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	997.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.56
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative AM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd 979 veh/h
Opposing direction volume, Vo 685 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1282	pc/h	890	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	32.8	mi/h
Percent Free Flow Speed, PFFS	63.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1382	pc/h	890	pc/h
Base percent time-spent-following,(note-4) BPTSFd	85.2	%		
Adjustment for no-passing zones, fnp	14.2			
Percent time-spent-following, PTSFd	93.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.81	
Peak 15-min vehicle-miles of travel, VMT15	763	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2350	veh-mi
Peak 15-min total travel time, TT15	23.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.8	mi/h
Percent time-spent-following, PTSFd (from above)	93.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1271.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.68
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative PM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	657	veh/h
Opposing direction volume, Vo	1036	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.985		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	866	pc/h	1345	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	32.5	mi/h
Percent Free Flow Speed, PFFS	63.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	927	pc/h	1345	pc/h
Base percent time-spent-following,(note-4) BPTSFd	79.1	%		
Adjustment for no-passing zones, fnp	14.1			
Percent time-spent-following, PTSFd	84.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.55	
Peak 15-min vehicle-miles of travel, VMT15	512	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1577	veh-mi
Peak 15-min total travel time, TT15	15.7	veh-h
Capacity from ATS, CdATS	1686	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.5	mi/h
Percent time-spent-following, PTSFd (from above)	84.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	853.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.48
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative Saturday
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	800	veh/h
Opposing direction volume, Vo	818	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	853	pc/h	870	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	36.3	mi/h
Percent Free Flow Speed, PFFS	70.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	925	pc/h	870	pc/h
Base percent time-spent-following,(note-4) BPTSFd	74.1	%		
Adjustment for no-passing zones, fnp	22.1			
Percent time-spent-following, PTSFd	85.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.54	
Peak 15-min vehicle-miles of travel, VMT15	511	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1920	veh-mi
Peak 15-min total travel time, TT15	14.1	veh-h
Capacity from ATS, CdATS	1697	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	36.3	mi/h
Percent time-spent-following, PTSFd (from above)	85.5	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	851.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	2.51
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative AM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	781	vph	1001	vph
Peak-hour factor, PHF	0.80		0.87	
Peak 15-minute volume, v15	244		288	
Trucks and buses	3	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.985		0.995	
Flow rate, vp	495	pcphpl	578	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	495	pcphpl	578	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	9.0	pc/mi/ln	10.5	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	488.1	575.3
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.75	2.35
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative PM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	1111	vph	777	vph
Peak-hour factor, PHF	0.88		0.93	
Peak 15-minute volume, v15	316		209	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	634	pcphpl	419	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	634	pcphpl	419	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		A	
Density, D	11.5	pc/mi/ln	7.6	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	631.3	417.7
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.40	2.19
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative Saturday
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	912	vph	889	vph
Peak-hour factor, PHF	0.91		0.94	
Peak 15-minute volume, v15	251		236	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	503	pcphpl	475	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	503	pcphpl	475	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	9.1	pc/mi/ln	8.6	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	501.1	472.9
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.28	2.25
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative AM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1085	vph	1352	vph
Peak-hour factor, PHF	0.86		0.68	
Peak 15-minute volume, v15	315		497	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	637	pcphpl	1004	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	637	pcphpl	1004	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		C	
Density, D	11.6	pc/mi/ln	18.3	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	630.8	994.1
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.63	2.86
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative PM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1454	vph	1097	vph
Peak-hour factor, PHF	0.95		0.88	
Peak 15-minute volume, v15	383		312	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.995	
Flow rate, vp	772	pcphpl	626	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	772	pcphpl	626	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		B	
Density, D	14.0	pc/mi/ln	11.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	765.3	623.3
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.73	2.39
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative Saturday
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1177	vph	1119	vph
Peak-hour factor, PHF	0.96		0.94	
Peak 15-minute volume, v15	307		298	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	616	pcphpl	598	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	616	pcphpl	598	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		A	
Density, D	11.2	pc/mi/ln	10.9	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	613.0	595.2
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.38	2.37
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative AM
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1082	vph	1108	vph
Peak-hour factor, PHF	0.86		0.76	
Peak 15-minute volume, v15	315		364	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	635	pcphpl	736	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	635	pcphpl	736	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		B	
Density, D	11.5	pc/mi/ln	13.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	629.1	728.9
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.63	2.70
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative PM
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1154	vph	960	vph
Peak-hour factor, PHF	0.95		0.90	
Peak 15-minute volume, v15	304		267	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	613	pcphpl	538	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	613	pcphpl	538	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		A	
Density, D	11.1	pc/mi/ln	9.8	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	607.4	533.3
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.61	2.54
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative Saturday
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1052	vph	907	vph
Peak-hour factor, PHF	0.96		0.98	
Peak 15-minute volume, v15	274		231	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	553	pcphpl	467	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	553	pcphpl	467	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	10.1	pc/mi/ln	8.5	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	547.9	462.8
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.56	2.47
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.76	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	362	veh/h
Opposing direction volume, Vo	548	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	0.94		0.98	
Directional flow rate,(note-2) vi	519	pc/h	749	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.3	mi/h
Percent Free Flow Speed, PFFS	71.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.988		1.000	
Grade adjustment factor,(note-1) fg	0.95		0.99	
Directional flow rate,(note-2) vi	507	pc/h	728	pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.9	%		
Adjustment for no-passing zones, fnp	31.0			
Percent time-spent-following, PTSFd	67.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.30	
Peak 15-min vehicle-miles of travel, VMT15	310	veh-mi
Peak-hour vehicle-miles of travel, VMT60	941	veh-mi
Peak 15-min total travel time, TT15	10.2	veh-h
Capacity from ATS, CdATS	1641	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.3	mi/h
Percent time-spent-following, PTSFd (from above)	67.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	476.3
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.07
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.88	
Shoulder width	5.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	859	veh/h
Opposing direction volume, Vo	622	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.988	
Grade adj. factor,(note-1) fg	1.00		0.98	
Directional flow rate,(note-2) vi	982	pc/h	730	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.9	mi/h
Percent Free Flow Speed, PFFS	63.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.99	
Directional flow rate,(note-2) vi	976	pc/h	714	pc/h
Base percent time-spent-following,(note-4) BPTSFd	74.9	%		
Adjustment for no-passing zones, fnp	22.7			
Percent time-spent-following, PTSFd	88.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.57	
Peak 15-min vehicle-miles of travel, VMT15	634	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2233	veh-mi
Peak 15-min total travel time, TT15	23.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.9	mi/h
Percent time-spent-following, PTSFd (from above)	88.0	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	976.1
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.20
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95		
Shoulder width	5.0	ft	% Trucks and buses	1	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	760	veh/h
Opposing direction volume, Vo	795	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.996	
Grade adj. factor,(note-1) fg	0.99		0.99	
Directional flow rate,(note-2) vi	811	pc/h	849	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	27.3	mi/h
Percent Free Flow Speed, PFFS	64.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	800	pc/h	837	pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.8	%		
Adjustment for no-passing zones, fnp	24.6			
Percent time-spent-following, PTSFd	81.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.47	
Peak 15-min vehicle-miles of travel, VMT15	520	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1976	veh-mi
Peak 15-min total travel time, TT15	19.1	veh-h
Capacity from ATS, CdATS	1676	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.3	mi/h
Percent time-spent-following, PTSFd (from above)	81.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	800.0
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.89
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	548	veh/h
Opposing direction volume, Vo	362	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		2.0	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.979		0.971	
Grade adj. factor,(note-1) fg	0.97		0.90	
Directional flow rate,(note-2) vi	627	pc/h	450	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.8	mi/h
Percent Free Flow Speed, PFFS	74.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.982	
Grade adjustment factor,(note-1) fg	0.97		0.90	
Directional flow rate,(note-2) vi	618	pc/h	445	pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.7	%		
Adjustment for no-passing zones, fnp	35.0			
Percent time-spent-following, PTSFd	77.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.36	
Peak 15-min vehicle-miles of travel, VMT15	387	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1425	veh-mi
Peak 15-min total travel time, TT15	12.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1562	veh/h
Directional Capacity	1562	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.8	mi/h
Percent time-spent-following, PTSFd (from above)	77.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	595.7
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.18
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93		
Shoulder width	5.0	ft	% Trucks and buses	3	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	622	veh/h
Opposing direction volume, Vo	859	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.3	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.991	
Grade adj. factor,(note-1) fg	0.98		1.00	
Directional flow rate,(note-2) vi	695	pc/h	932	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	27.5	mi/h
Percent Free Flow Speed, PFFS	64.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.98		1.00	
Directional flow rate,(note-2) vi	682	pc/h	924	pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.5	%		
Adjustment for no-passing zones, fnp	24.1			
Percent time-spent-following, PTSFd	75.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.40	
Peak 15-min vehicle-miles of travel, VMT15	435	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1617	veh-mi
Peak 15-min total travel time, TT15	15.8	veh-h
Capacity from ATS, CdATS	1685	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.5	mi/h
Percent time-spent-following, PTSFd (from above)	75.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	668.8
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.24
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	795	veh/h
Opposing direction volume, Vo	760	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.4	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.991		0.988	
Grade adj. factor,(note-1) fg	1.00		0.99	
Directional flow rate,(note-2) vi	872	pc/h	845	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.8	mi/h
Percent Free Flow Speed, PFFS	63.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	864	pc/h	826	pc/h
Base percent time-spent-following,(note-4) BPTSFd	72.1	%		
Adjustment for no-passing zones, fnp	23.7			
Percent time-spent-following, PTSFd	84.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.51	
Peak 15-min vehicle-miles of travel, VMT15	562	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2067	veh-mi
Peak 15-min total travel time, TT15	20.9	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.8	mi/h
Percent time-spent-following, PTSFd (from above)	84.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	864.1
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.37
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project AM
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1456	vph	1845	vph
Peak-hour factor, PHF	0.91		0.91	
Peak 15-minute volume, v15	400		507	
Trucks and buses	2	%	3	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.985	
Flow rate, vp	863	pcphpl	1028	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	863	pcphpl	1028	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	19.2	pc/mi/ln	22.8	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	800.0	1013.7
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.21	3.58
Bicycle LOS	C	D

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project PM
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1948	vph	1756	vph
Peak-hour factor, PHF	0.95		0.96	
Peak 15-minute volume, v15	513		457	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.926		0.995	
Flow rate, vp	1107	pcphpl	919	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	1107	pcphpl	919	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	24.6	pc/mi/ln	20.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	1025.3	914.6
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.33	3.05
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project Saturday
Highway:	SR 1
From/To:	Carpenter / Ocean
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 1

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	1		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.3	mph	0.5	mph
Free-flow speed	43.0	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1826	vph	2042	vph
Peak-hour factor, PHF	0.91		0.97	
Peak 15-minute volume, v15	502		526	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.73	mi	0.73	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.0		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.962		0.995	
Flow rate, vp	1043	pcphpl	1057	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	1043	pcphpl	1057	pcphpl
Free-flow speed, FFS	43.0	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	23.2	pc/mi/ln	23.5	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp		55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	1003.3	1052.6
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.09	3.12
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project AM
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1684	vph	1807	vph
Peak-hour factor, PHF	0.89		0.92	
Peak 15-minute volume, v15	473		491	
Trucks and buses	3	%	4	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.3		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.887		0.980	
Flow rate, vp	1066	pcphpl	1001	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	1066	pcphpl	1001	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	23.7	pc/mi/ln	22.2	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	946.1	982.1
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.54	3.83
Bicycle LOS	D	D

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project PM
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1898	vph	1781	vph
Peak-hour factor, PHF	0.96		0.95	
Peak 15-minute volume, v15	494		469	
Trucks and buses	1	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.990	
Flow rate, vp	1033	pcphpl	946	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	1033	pcphpl	946	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	23.0	pc/mi/ln	21.0	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	988.5	937.4
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.09	3.29
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project Saturday
Highway:	SR 1
From/To:	Ocean / Carmel Valley Rd
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 2 NB

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	5.0	ft	5.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	11.0	ft	11.0	ft
Access points per mile	2		2	
Median type	Undivided		Undivided	
Free-flow speed:	Base		Base	
FFS or BFFS	45.0	mph	45.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.2	mph	0.2	mph
Median type adjustment, FM	1.6	mph	1.6	mph
Access points adjustment, FA	0.5	mph	0.5	mph
Free-flow speed	42.7	mph	42.7	mph

VOLUME

Direction	1		2	
Volume, V	1849	vph	1916	vph
Peak-hour factor, PHF	0.93		0.94	
Peak 15-minute volume, v15	497		510	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Grade		Grade	
Grade	6.00	%	-6.00	%
Segment length	0.87	mi	0.87	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	5.5		1.5	
Recreational vehicles PCE, ER	6.0		1.2	
Heavy vehicle adjustment, fHV	0.957		0.995	
Flow rate, vp	1038	pcphpl	1024	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	1038	pcphpl	1024	pcphpl
Free-flow speed, FFS	42.7	mph	42.7	mph
Avg. passenger-car travel speed, S	45.0	mph	45.0	mph
Level of service, LOS	C		C	
Density, D	23.1	pc/mi/ln	22.8	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	994.1	1019.1
Effective width of outside lane, We	22.00	22.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	3.09	3.10
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project AM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	5.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd	1807	veh/h
Opposing direction volume, Vo	1684	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.742	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1964	pc/h	2467	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	2.3	mi/h
Percent Free Flow Speed, PFFS	5.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.995	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1964	pc/h	1839	pc/h
Base percent time-spent-following,(note-4) BPTSFd	95.2	%		
Adjustment for no-passing zones, fnp	6.8			
Percent time-spent-following, PTSFd	98.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.16	
Peak 15-min vehicle-miles of travel, VMT15	442	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1626	veh-mi
Peak 15-min total travel time, TT15	195.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	2.3	mi/h
Percent time-spent-following, PTSFd (from above)	98.7	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1964.1
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	4.03
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project PM
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95	
Shoulder width	5.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	6.0	%	Access point density	19	/mi

Analysis direction volume, Vd	1781	veh/h
Opposing direction volume, Vo	1898	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	9.7		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.852		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	2200	pc/h	1998	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	45.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h	
Adj. for access point density,(note-3) fA	4.8	mi/h	
Free-flow speed, FFSd	39.0	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	4.1	mi/h	
Percent Free Flow Speed, PFFS	10.5	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.998		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1879	pc/h	1998	pc/h
Base percent time-spent-following,(note-4) BPTSFd	94.7	%		
Adjustment for no-passing zones, fnp	6.8			
Percent time-spent-following, PTSFd	98.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.11	
Peak 15-min vehicle-miles of travel, VMT15	422	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1603	veh-mi
Peak 15-min total travel time, TT15	103.6	veh-h
Capacity from ATS, CdATS	1448	veh/h
Capacity from PTSF, CdPTSF	1696	veh/h
Directional Capacity	1696	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	4.1	mi/h
Percent time-spent-following, PTSFd (from above)	98.0	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1874.7
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.53
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project Saturday
Highway	SR 1
From/To	Ocean / CVR
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 2 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	5.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.9	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.90	mi	% No-passing zones	100	%
Up/down	-6.0	%	Access point density	19	/mi

Analysis direction volume, Vd	1916	veh/h
Opposing direction volume, Vo	1849	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		9.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.920	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	2038	pc/h	2138	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	4.8	mi/h
Free-flow speed, FFSd	39.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	4.2	mi/h
Percent Free Flow Speed, PFFS	10.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.999
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	2038 pc/h	1969 pc/h
Base percent time-spent-following,(note-4) BPTSFd	95.6 %	
Adjustment for no-passing zones, fnp	6.5	
Percent time-spent-following, PTSFd	98.9 %	

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.20	
Peak 15-min vehicle-miles of travel, VMT15	459	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1724	veh-mi
Peak 15-min total travel time, TT15	108.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.9	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	4.2	mi/h
Percent time-spent-following, PTSFd (from above)	98.9	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	2038.3
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.36
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project AM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.80	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd 669 veh/h
Opposing direction volume, Vo 817 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	846	pc/h	1021	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.2	mi/h
Percent Free Flow Speed, PFFS	62.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	907	pc/h	1021	pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.7	%		
Adjustment for no-passing zones, fnp	19.2			
Percent time-spent-following, PTSFd	84.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.53	
Peak 15-min vehicle-miles of travel, VMT15	63	veh-mi
Peak-hour vehicle-miles of travel, VMT60	201	veh-mi
Peak 15-min total travel time, TT15	2.2	veh-h
Capacity from ATS, CdATS	1686	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.2	mi/h
Percent time-spent-following, PTSFd (from above)	84.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	836.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.89
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project PM
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.89	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	1071	veh/h
Opposing direction volume, Vo	739	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1213	pc/h	833	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.8	mi/h
Percent Free Flow Speed, PFFS	59.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1305	pc/h	830	pc/h
Base percent time-spent-following,(note-4) BPTSFd	83.4	%		
Adjustment for no-passing zones, fnp	15.8			
Percent time-spent-following, PTSFd	93.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.77	
Peak 15-min vehicle-miles of travel, VMT15	90	veh-mi
Peak-hour vehicle-miles of travel, VMT60	321	veh-mi
Peak 15-min total travel time, TT15	3.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1567	veh/h
Directional Capacity	1567	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.8	mi/h
Percent time-spent-following, PTSFd (from above)	93.1	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1203.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.08
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project Saturday
Highway	SR 1
From/To	Rio Rd / Carmel Valley Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd 1027 veh/h
Opposing direction volume, Vo 948 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1116	pc/h	1034	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.0	mi/h
Percent Free Flow Speed, PFFS	57.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	1116	pc/h	1118	pc/h
Base percent time-spent-following,(note-4) BPTSFd	82.2	%		
Adjustment for no-passing zones, fnp	15.3			
Percent time-spent-following, PTSFd	89.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.66	
Peak 15-min vehicle-miles of travel, VMT15	84	veh-mi
Peak-hour vehicle-miles of travel, VMT60	308	veh-mi
Peak 15-min total travel time, TT15	3.2	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.0	mi/h
Percent time-spent-following, PTSFd (from above)	89.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1116.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.60
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project AM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97	
Shoulder width	6.0	ft	% Trucks and buses	4	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	817	veh/h
Opposing direction volume, Vo	669	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.966	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	846	pc/h	714	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.6	mi/h
Percent Free Flow Speed, PFFS	68.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	842	pc/h	748	pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.7	%		
Adjustment for no-passing zones, fnp	24.8			
Percent time-spent-following, PTSFd	83.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.50	
Peak 15-min vehicle-miles of travel, VMT15	63	veh-mi
Peak-hour vehicle-miles of travel, VMT60	245	veh-mi
Peak 15-min total travel time, TT15	2.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.6	mi/h
Percent time-spent-following, PTSFd (from above)	83.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	842.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.14
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project PM
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd 739 veh/h
Opposing direction volume, Vo 1071 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	822	pc/h	1194	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	27.1	mi/h
Percent Free Flow Speed, PFFS	60.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	821	pc/h	1291	pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.4	%		
Adjustment for no-passing zones, fnp	16.1			
Percent time-spent-following, PTSFd	81.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.48	
Peak 15-min vehicle-miles of travel, VMT15	62	veh-mi
Peak-hour vehicle-miles of travel, VMT60	222	veh-mi
Peak 15-min total travel time, TT15	2.3	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.1	mi/h
Percent time-spent-following, PTSFd (from above)	81.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	821.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.44
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project Saturday
Highway	SR 1
From/To	Carmel Valley Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 3 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	0	%
Grade: Length	0.30	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	0	/mi

Analysis direction volume, Vd	948	veh/h
Opposing direction volume, Vo	1027	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1019	pc/h	1108	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	45.0	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.2	mi/h
Percent Free Flow Speed, PFFS	58.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	1019	pc/h	1198	pc/h
Base percent time-spent-following,(note-4) BPTSFd	80.6	%		
Adjustment for no-passing zones, fnp	15.5			
Percent time-spent-following, PTSFd	87.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.60	
Peak 15-min vehicle-miles of travel, VMT15	76	veh-mi
Peak-hour vehicle-miles of travel, VMT60	284	veh-mi
Peak 15-min total travel time, TT15	2.9	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.2	mi/h
Percent time-spent-following, PTSFd (from above)	87.7	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1019.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.55
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project AM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.85	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	403	veh/h
Opposing direction volume, Vo	594	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.999	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	475	pc/h	700	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	45.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	0.8	mi/h	
Free-flow speed, FFSd	44.3	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	32.8	mi/h	
Percent Free Flow Speed, PFFS	74.2	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	474	pc/h	699	pc/h
Base percent time-spent-following,(note-4) BPTSFd	52.4	%		
Adjustment for no-passing zones, fnp	32.7			
Percent time-spent-following, PTSFd	65.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	36	veh-mi
Peak-hour vehicle-miles of travel, VMT60	121	veh-mi
Peak 15-min total travel time, TT15	1.1	veh-h
Capacity from ATS, CdATS	1698	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.8	mi/h
Percent time-spent-following, PTSFd (from above)	65.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	474.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.16
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project PM
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.90	
Shoulder width	6.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	903	veh/h
Opposing direction volume, Vo	672	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.997	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1003	pc/h	749	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.4	mi/h
Percent Free Flow Speed, PFFS	64.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1003	pc/h	747	pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.9	%		
Adjustment for no-passing zones, fnp	21.8			
Percent time-spent-following, PTSFd	88.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.59	
Peak 15-min vehicle-miles of travel, VMT15	75	veh-mi
Peak-hour vehicle-miles of travel, VMT60	271	veh-mi
Peak 15-min total travel time, TT15	2.6	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.4	mi/h
Percent time-spent-following, PTSFd (from above)	88.4	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1003.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.98
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project Saturday
Highway	SR 1
From/To	Ribera Rd / Rio Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.87	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	821	veh/h
Opposing direction volume, Vo	849	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	944	pc/h	976	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	27.1	mi/h
Percent Free Flow Speed, PFFS	61.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	944	pc/h	976	pc/h
Base percent time-spent-following,(note-4) BPTSFd	76.2	%		
Adjustment for no-passing zones, fnp	20.0			
Percent time-spent-following, PTSFd	86.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.56	
Peak 15-min vehicle-miles of travel, VMT15	71	veh-mi
Peak-hour vehicle-miles of travel, VMT60	246	veh-mi
Peak 15-min total travel time, TT15	2.6	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.1	mi/h
Percent time-spent-following, PTSFd (from above)	86.0	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	943.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.51
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project AM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91		
Shoulder width	6.0	ft	% Trucks and buses	4	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	3	/mi	

Analysis direction volume, Vd	594	veh/h
Opposing direction volume, Vo	403	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	655	pc/h	448	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	33.4	mi/h
Percent Free Flow Speed, PFFS	75.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	653	pc/h	443	pc/h
Base percent time-spent-following,(note-4) BPTSFd	58.8	%		
Adjustment for no-passing zones, fnp	34.5			
Percent time-spent-following, PTSFd	79.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.38	
Peak 15-min vehicle-miles of travel, VMT15	49	veh-mi
Peak-hour vehicle-miles of travel, VMT60	178	veh-mi
Peak 15-min total travel time, TT15	1.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.4	mi/h
Percent time-spent-following, PTSFd (from above)	79.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	652.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.02
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project PM
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	6.0	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	672	veh/h
Opposing direction volume, Vo	903	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	723	pc/h	971	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.8	mi/h
Percent Free Flow Speed, PFFS	65.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	723	pc/h	971	pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.8	%		
Adjustment for no-passing zones, fnp	22.8			
Percent time-spent-following, PTSFd	77.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.43	
Peak 15-min vehicle-miles of travel, VMT15	54	veh-mi
Peak-hour vehicle-miles of travel, VMT60	202	veh-mi
Peak 15-min total travel time, TT15	1.9	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.8	mi/h
Percent time-spent-following, PTSFd (from above)	77.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	722.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.18
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project Saturday
Highway	SR 1
From/To	Rio Rd / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 4 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.97	
Shoulder width	6.0	ft	% Trucks and buses	0	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	3	/mi

Analysis direction volume, Vd	849	veh/h
Opposing direction volume, Vo	821	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	875	pc/h	846	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.8	mi/h
Free-flow speed, FFSd	44.3	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.6	mi/h
Percent Free Flow Speed, PFFS	64.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	875	pc/h	846	pc/h
Base percent time-spent-following,(note-4) BPTSFd	72.5	%		
Adjustment for no-passing zones, fnp	23.2			
Percent time-spent-following, PTSFd	84.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.51	
Peak 15-min vehicle-miles of travel, VMT15	66	veh-mi
Peak-hour vehicle-miles of travel, VMT60	255	veh-mi
Peak 15-min total travel time, TT15	2.3	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.6	mi/h
Percent time-spent-following, PTSFd (from above)	84.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	875.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.28
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project AM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.91	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	461	veh/h
Opposing direction volume, Vo	919	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.984		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	515	pc/h	1010	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	50.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	6.5	mi/h	
Free-flow speed, FFSd	43.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	29.4	mi/h	
Percent Free Flow Speed, PFFS	67.5	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	507	pc/h	1010	pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.5	%		
Adjustment for no-passing zones, fnp	22.3			
Percent time-spent-following, PTSFd	65.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.30	
Peak 15-min vehicle-miles of travel, VMT15	190	veh-mi
Peak-hour vehicle-miles of travel, VMT60	692	veh-mi
Peak 15-min total travel time, TT15	6.5	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.4	mi/h
Percent time-spent-following, PTSFd (from above)	65.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	506.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.21
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project PM
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	1028	veh/h
Opposing direction volume, Vo	564	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1117	pc/h	618	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	27.7	mi/h
Percent Free Flow Speed, PFFS	63.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1117	pc/h	613	pc/h
Base percent time-spent-following,(note-4) BPTSFd	77.8	%		
Adjustment for no-passing zones, fnp	20.1			
Percent time-spent-following, PTSFd	90.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.66	
Peak 15-min vehicle-miles of travel, VMT15	419	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1542	veh-mi
Peak 15-min total travel time, TT15	15.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.7	mi/h
Percent time-spent-following, PTSFd (from above)	90.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1117.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.61
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project Saturday
Highway	Carmel Valley Road
From/To	Schulte / Robinson Canyon
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	26	/mi

Analysis direction volume, Vd	791	veh/h
Opposing direction volume, Vo	669	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.986		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	872	pc/h	733	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	50.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h	
Adj. for access point density,(note-3) fA	6.5	mi/h	
Free-flow speed, FFSd	43.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	28.7	mi/h	
Percent Free Flow Speed, PFFS	66.1	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	935	pc/h	727	pc/h
Base percent time-spent-following,(note-4) BPTSFd	74.0	%		
Adjustment for no-passing zones, fnp	23.7			
Percent time-spent-following, PTSFd	87.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.55	
Peak 15-min vehicle-miles of travel, VMT15	322	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1187	veh-mi
Peak 15-min total travel time, TT15	11.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.7	mi/h
Percent time-spent-following, PTSFd (from above)	87.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	859.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.48
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project AM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82		
Shoulder width	6.0	ft	% Trucks and buses	8	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Level		% Recreational vehicles	1	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	26	/mi	

Analysis direction volume, Vd	919	veh/h
Opposing direction volume, Vo	461	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1121	pc/h	567	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	28.1	mi/h
Percent Free Flow Speed, PFFS	64.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1121	pc/h	562	pc/h
Base percent time-spent-following,(note-4) BPTSFd	77.6	%		
Adjustment for no-passing zones, fnp	20.0			
Percent time-spent-following, PTSFd	90.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.66	
Peak 15-min vehicle-miles of travel, VMT15	420	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1379	veh-mi
Peak 15-min total travel time, TT15	14.9	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.1	mi/h
Percent time-spent-following, PTSFd (from above)	90.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1120.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.62
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project PM
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	564	veh/h
Opposing direction volume, Vo	1028	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	693	pc/h	1254	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.1	mi/h
Percent Free Flow Speed, PFFS	60.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	688	pc/h	1254	pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.8	%		
Adjustment for no-passing zones, fnp	16.9			
Percent time-spent-following, PTSFd	75.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.40	
Peak 15-min vehicle-miles of travel, VMT15	258	veh-mi
Peak-hour vehicle-miles of travel, VMT60	846	veh-mi
Peak 15-min total travel time, TT15	9.9	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.1	mi/h
Percent time-spent-following, PTSFd (from above)	75.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	687.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.37
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project Saturday
Highway	Carmel Valley Road
From/To	Robinson Canyon / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 6 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	1	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	26	/mi

Analysis direction volume, Vd	669	veh/h
Opposing direction volume, Vo	791	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	822	pc/h	965	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	6.5	mi/h
Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	27.3	mi/h
Percent Free Flow Speed, PFFS	62.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	816	pc/h	965	pc/h
Base percent time-spent-following,(note-4) BPTSFd	71.4	%		
Adjustment for no-passing zones, fnp	21.8			
Percent time-spent-following, PTSFd	81.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.48	
Peak 15-min vehicle-miles of travel, VMT15	306	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1004	veh-mi
Peak 15-min total travel time, TT15	11.2	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.3	mi/h
Percent time-spent-following, PTSFd (from above)	81.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	815.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.45
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project AM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd 690 veh/h
Opposing direction volume, Vo 988 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	848	pc/h	1215	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	33.7	mi/h
Percent Free Flow Speed, PFFS	65.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	841	pc/h	1310	pc/h
Base percent time-spent-following,(note-4) BPTSFd	76.1	%		
Adjustment for no-passing zones, fnp	15.6			
Percent time-spent-following, PTSFd	82.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.49	
Peak 15-min vehicle-miles of travel, VMT15	505	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1656	veh-mi
Peak 15-min total travel time, TT15	15.0	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.7	mi/h
Percent time-spent-following, PTSFd (from above)	82.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	841.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.47
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project PM
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	1063	veh/h
Opposing direction volume, Vo	681	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.981	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1296	pc/h	847	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	33.1	mi/h
Percent Free Flow Speed, PFFS	64.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	1296	pc/h	903	pc/h
Base percent time-spent-following,(note-4) BPTSFd	83.7	%		
Adjustment for no-passing zones, fnp	14.9			
Percent time-spent-following, PTSFd	92.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.76	
Peak 15-min vehicle-miles of travel, VMT15	778	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2551	veh-mi
Peak 15-min total travel time, TT15	23.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.1	mi/h
Percent time-spent-following, PTSFd (from above)	92.5	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1296.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.69
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project Saturday
Highway	Carmel Valley Road
From/To	Rancho San Carlos / Schulte
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 EB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.82	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	-3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	854	veh/h
Opposing direction volume, Vo	840	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1041	pc/h	1033	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	33.6	mi/h
Percent Free Flow Speed, PFFS	65.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	1041	pc/h	1113	pc/h
Base percent time-spent-following,(note-4) BPTSFd	80.4	%		
Adjustment for no-passing zones, fnp	16.6			
Percent time-spent-following, PTSFd	88.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.61	
Peak 15-min vehicle-miles of travel, VMT15	625	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2050	veh-mi
Peak 15-min total travel time, TT15	18.6	veh-h
Capacity from ATS, CdATS	1700	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	33.6	mi/h
Percent time-spent-following, PTSFd (from above)	88.4	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1041.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.58
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project AM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	988	veh/h
Opposing direction volume, Vo	690	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1293	pc/h	896	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	32.7	mi/h
Percent Free Flow Speed, PFFS	63.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	1395	pc/h	896	pc/h
Base percent time-spent-following,(note-4) BPTSFd	85.5	%		
Adjustment for no-passing zones, fnp	13.9			
Percent time-spent-following, PTSFd	94.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.82	
Peak 15-min vehicle-miles of travel, VMT15	770	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2371	veh-mi
Peak 15-min total travel time, TT15	23.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	94.0	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1283.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.68
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project PM
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.77	
Shoulder width	6.0	ft	% Trucks and buses	8	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd 681 veh/h
Opposing direction volume, Vo 1063 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.990		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	893	pc/h	1381	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	32.1	mi/h
Percent Free Flow Speed, PFFS	62.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	961	pc/h	1381	pc/h
Base percent time-spent-following,(note-4) BPTSFd	80.4	%		
Adjustment for no-passing zones, fnp	13.4			
Percent time-spent-following, PTSFd	85.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.57	
Peak 15-min vehicle-miles of travel, VMT15	531	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1634	veh-mi
Peak 15-min total travel time, TT15	16.6	veh-h
Capacity from ATS, CdATS	1686	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	32.1	mi/h
Percent time-spent-following, PTSFd (from above)	85.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	884.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	4.50
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project Saturday
Highway	Carmel Valley Road
From/To	Schulte / Rancho San Carlos
Jurisdiction	Unincorporated Monterey County
Analysis Year	Oct 2016
Description	Rio Ranch Seg 7 WB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	6.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.4	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Specific Grade		% Recreational vehicles	1	%
Grade: Length	0.25	mi	% No-passing zones	100	%
Up/down	3.0	%	Access point density	14	/mi

Analysis direction volume, Vd	840	veh/h
Opposing direction volume, Vo	854	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.999		1.000	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	895	pc/h	909	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	55.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	3.5	mi/h
Free-flow speed, FFSd	51.5	mi/h
Adjustment for no-passing zones, fnp	1.8*	mi/h
Average travel speed, ATSd	35.7	mi/h
Percent Free Flow Speed, PFFS	69.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.92		1.00	
Directional flow rate,(note-2) vi	971	pc/h	909	pc/h
Base percent time-spent-following,(note-4) BPTSFd	76.0	%		
Adjustment for no-passing zones, fnp	20.7			
Percent time-spent-following, PTSFd	86.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.57	
Peak 15-min vehicle-miles of travel, VMT15	536	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2016	veh-mi
Peak 15-min total travel time, TT15	15.0	veh-h
Capacity from ATS, CdATS	1698	veh/h
Capacity from PTSF, CdPTSF	1564	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.4	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.7	mi/h
Percent time-spent-following, PTSFd (from above)	86.7	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	50
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	893.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.62
Bicycle LOS Score, BLOS	2.53
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project AM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	787	vph	1011	vph
Peak-hour factor, PHF	0.80		0.87	
Peak 15-minute volume, v15	246		291	
Trucks and buses	3	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.985		0.995	
Flow rate, vp	499	pcphpl	583	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	499	pcphpl	583	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	9.1	pc/mi/ln	10.6	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	491.9	581.0
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.75	2.36
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project PM
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	1142	vph	805	vph
Peak-hour factor, PHF	0.88		0.93	
Peak 15-minute volume, v15	324		216	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	652	pcphpl	434	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	652	pcphpl	434	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		A	
Density, D	11.9	pc/mi/ln	7.9	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	648.9	432.8
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.41	2.21
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project Saturday
Highway:	Carmel Valley Road
From/To:	Rio to Rancho San Carlos
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 8

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		4	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	1.0	mph
Free-flow speed	53.0	mph	54.0	mph

VOLUME

Direction	1		2	
Volume, V	952	vph	936	vph
Peak-hour factor, PHF	0.91		0.94	
Peak 15-minute volume, v15	262		249	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	525	pcphpl	500	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	525	pcphpl	500	pcphpl
Free-flow speed, FFS	53.0	mph	54.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	9.5	pc/mi/ln	9.1	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	523.1	497.9
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.30	2.28
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project AM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1093	vph	1363	vph
Peak-hour factor, PHF	0.86		0.68	
Peak 15-minute volume, v15	318		501	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	641	pcphpl	1012	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	641	pcphpl	1012	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		C	
Density, D	11.7	pc/mi/ln	18.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	635.5	1002.2
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.63	2.86
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project PM
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1493	vph	1132	vph
Peak-hour factor, PHF	0.95		0.88	
Peak 15-minute volume, v15	393		322	
Trucks and buses	2	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.995	
Flow rate, vp	793	pcphpl	646	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	793	pcphpl	646	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		B	
Density, D	14.4	pc/mi/ln	11.7	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	785.8	643.2
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.74	2.41
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project Saturday
Highway:	Carmel Valley Road
From/To:	Carmel Rancho to Rio
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 9

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	8		8	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	2.0	mph	2.0	mph
Free-flow speed	53.0	mph	53.0	mph

VOLUME

Direction	1		2	
Volume, V	1229	vph	1177	vph
Peak-hour factor, PHF	0.96		0.94	
Peak 15-minute volume, v15	320		313	
Trucks and buses	1	%	1	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.995		0.995	
Flow rate, vp	643	pcphpl	629	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	643	pcphpl	629	pcphpl
Free-flow speed, FFS	53.0	mph	53.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		B	
Density, D	11.7	pc/mi/ln	11.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	640.1	626.1
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.41	2.39
Bicycle LOS	B	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project AM
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1082	vph	1108	vph
Peak-hour factor, PHF	0.86		0.76	
Peak 15-minute volume, v15	315		364	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	635	pcphpl	736	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	635	pcphpl	736	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		B	
Density, D	11.5	pc/mi/ln	13.4	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	629.1	728.9
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.63	2.70
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project PM
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1154	vph	960	vph
Peak-hour factor, PHF	0.95		0.90	
Peak 15-minute volume, v15	304		267	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	613	pcphpl	538	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	613	pcphpl	538	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	B		A	
Density, D	11.1	pc/mi/ln	9.8	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	607.4	533.3
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.61	2.54
Bicycle LOS	C	C

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Multilane Highways Release 6.70

Phone: Fax:
E-mail:

OPERATIONAL ANALYSIS

Analyst:	JO
Agency/Co:	Mott MacDonald
Date:	12/6/17
Analysis Period:	Cumulative + Project Saturday
Highway:	Carmel Valley Road
From/To:	SR 1 / Carmel Rancho
Jurisdiction:	Unincorporated Monterey County
Analysis Year:	2017
Project ID:	Rio Ranch Seg 10

FREE-FLOW SPEED

Direction	1		2	
Lane width	12.0	ft	12.0	ft
Lateral clearance:				
Right edge	6.0	ft	6.0	ft
Left edge	6.0	ft	6.0	ft
Total lateral clearance	12.0	ft	12.0	ft
Access points per mile	0		0	
Median type	Divided		Divided	
Free-flow speed:	Base		Base	
FFS or BFFS	55.0	mph	55.0	mph
Lane width adjustment, FLW	0.0	mph	0.0	mph
Lateral clearance adjustment, FLC	0.0	mph	0.0	mph
Median type adjustment, FM	0.0	mph	0.0	mph
Access points adjustment, FA	0.0	mph	0.0	mph
Free-flow speed	55.0	mph	55.0	mph

VOLUME

Direction	1		2	
Volume, V	1052	vph	907	vph
Peak-hour factor, PHF	0.96		0.98	
Peak 15-minute volume, v15	274		231	
Trucks and buses	2	%	2	%
Recreational vehicles	0	%	0	%
Terrain type	Level		Level	
Grade	0.00	%	0.00	%
Segment length	0.00	mi	0.00	mi
Number of lanes	2		2	
Driver population adjustment, fP	1.00		1.00	
Trucks and buses PCE, ET	1.5		1.5	
Recreational vehicles PCE, ER	1.2		1.2	
Heavy vehicle adjustment, fHV	0.990		0.990	
Flow rate, vp	553	pcphpl	467	pcphpl

RESULTS

Direction	1		2	
Flow rate, vp	553	pcphpl	467	pcphpl
Free-flow speed, FFS	55.0	mph	55.0	mph
Avg. passenger-car travel speed, S	55.0	mph	55.0	mph
Level of service, LOS	A		A	
Density, D	10.1	pc/mi/ln	8.5	pc/mi/ln

Bicycle Level of Service

Posted speed limit, Sp	55	55
Percent of segment with occupied on-highway parking	0	0
Pavement rating, P	3	3
Flow rate in outside lane, vOL	547.9	462.8
Effective width of outside lane, We	24.00	24.00
Effective speed factor, St	4.79	4.79
Bicycle LOS Score, BLOS	2.56	2.47
Bicycle LOS	C	B

Overall results are not computed when free-flow speed is less than 45 mph.

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.76	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	366	veh/h
Opposing direction volume, Vo	551	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	0.94		0.98	
Directional flow rate,(note-2) vi	524	pc/h	753	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	30.2	mi/h
Percent Free Flow Speed, PFFS	71.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.988		1.000	
Grade adjustment factor,(note-1) fg	0.95		0.99	
Directional flow rate,(note-2) vi	513	pc/h	732	pc/h
Base percent time-spent-following,(note-4) BPTSFd	55.3	%		
Adjustment for no-passing zones, fnp	30.9			
Percent time-spent-following, PTSFd	68.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.30	
Peak 15-min vehicle-miles of travel, VMT15	313	veh-mi
Peak-hour vehicle-miles of travel, VMT60	952	veh-mi
Peak 15-min total travel time, TT15	10.4	veh-h
Capacity from ATS, CdATS	1641	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.2	mi/h
Percent time-spent-following, PTSFd (from above)	68.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	481.6
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.07
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.88		
Shoulder width	5.0	ft	% Trucks and buses	2	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	871	veh/h
Opposing direction volume, Vo	635	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.988	
Grade adj. factor,(note-1) fg	1.00		0.98	
Directional flow rate,(note-2) vi	996	pc/h	745	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.6	mi/h
Percent Free Flow Speed, PFFS	62.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.99	
Directional flow rate,(note-2) vi	990	pc/h	729	pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.4	%		
Adjustment for no-passing zones, fnp	22.3			
Percent time-spent-following, PTSFd	88.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.58	
Peak 15-min vehicle-miles of travel, VMT15	643	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2265	veh-mi
Peak 15-min total travel time, TT15	24.1	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1683	veh/h
Directional Capacity	1683	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.6	mi/h
Percent time-spent-following, PTSFd (from above)	88.2	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	989.8
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.21
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 NB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.95	
Shoulder width	5.0	ft	% Trucks and buses	1	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	779	veh/h
Opposing direction volume, Vo	813	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.3	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.996		0.997	
Grade adj. factor,(note-1) fg	0.99		1.00	
Directional flow rate,(note-2) vi	832	pc/h	858	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	45.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h	
Adj. for access point density,(note-3) fA	1.3	mi/h	
Free-flow speed, FFSd	42.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	27.0	mi/h	
Percent Free Flow Speed, PFFS	63.7	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	820	pc/h	856	pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.5	%		
Adjustment for no-passing zones, fnp	23.9			
Percent time-spent-following, PTSFd	82.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.48	
Peak 15-min vehicle-miles of travel, VMT15	533	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2025	veh-mi
Peak 15-min total travel time, TT15	19.7	veh-h
Capacity from ATS, CdATS	1695	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.0	mi/h
Percent time-spent-following, PTSFd (from above)	82.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	820.0
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.90
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project AM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92		
Shoulder width	5.0	ft	% Trucks and buses	3	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	551	veh/h
Opposing direction volume, Vo	366	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		2.0	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.979		0.971	
Grade adj. factor,(note-1) fg	0.97		0.90	
Directional flow rate,(note-2) vi	631	pc/h	455	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	31.7	mi/h
Percent Free Flow Speed, PFFS	74.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.982	
Grade adjustment factor,(note-1) fg	0.97		0.90	
Directional flow rate,(note-2) vi	621	pc/h	450	pc/h
Base percent time-spent-following,(note-4) BPTSFd	58.1	%		
Adjustment for no-passing zones, fnp	34.9			
Percent time-spent-following, PTSFd	78.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	389	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1433	veh-mi
Peak 15-min total travel time, TT15	12.3	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1562	veh/h
Directional Capacity	1562	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	31.7	mi/h
Percent time-spent-following, PTSFd (from above)	78.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	598.9
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.18
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS 2010: Two-Lane Highways Release 6.70

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project PM
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.93	
Shoulder width	5.0	ft	% Trucks and buses	3	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	5	/mi

Analysis direction volume, Vd	635	veh/h
Opposing direction volume, Vo	871	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.3	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.991	
Grade adj. factor,(note-1) fg	0.98		1.00	
Directional flow rate,(note-2) vi	710	pc/h	945	pc/h

Free-Flow Speed from Field Measurement:			
Field measured speed,(note-3) S FM	-	mi/h	
Observed total demand,(note-3) V	-	veh/h	
Estimated Free-Flow Speed:			
Base free-flow speed,(note-3) BFFS	45.0	mi/h	
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h	
Adj. for access point density,(note-3) fA	1.3	mi/h	
Free-flow speed, FFSd	42.5	mi/h	
Adjustment for no-passing zones, fnp	2.3*	mi/h	
Average travel speed, ATSd	27.3	mi/h	
Percent Free Flow Speed, PFFS	64.3	%	

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	0.99		1.00	
Directional flow rate,(note-2) vi	690	pc/h	937	pc/h
Base percent time-spent-following,(note-4) BPTSFd	66.4	%		
Adjustment for no-passing zones, fnp	23.8			
Percent time-spent-following, PTSFd	76.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.41	
Peak 15-min vehicle-miles of travel, VMT15	444	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1651	veh-mi
Peak 15-min total travel time, TT15	16.3	veh-h
Capacity from ATS, CdATS	1685	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.3	mi/h
Percent time-spent-following, PTSFd (from above)	76.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	682.8
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.25
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	JO
Agency/Co.	Mott MacDonald
Date Performed	12/6/17
Analysis Time Period	Cumulative + Project Saturday
Highway	SR 1
From/To	Highlands Dr / Ribera Rd
Jurisdiction	Unincorporated Monterey County
Analysis Year	2017
Description	Rio Ranch Seg 13 SB

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92		
Shoulder width	5.0	ft	% Trucks and buses	3	%	
Lane width	12.0	ft	% Trucks crawling	0.0	%	
Segment length	2.6	mi	Truck crawl speed	0.0	mi/hr	
Terrain type	Rolling		% Recreational vehicles	0	%	
Grade: Length	-	mi	% No-passing zones	100	%	
Up/down	-	%	Access point density	5	/mi	

Analysis direction volume, Vd	813	veh/h
Opposing direction volume, Vo	779	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.4	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.991		0.988	
Grade adj. factor,(note-1) fg	1.00		0.99	
Directional flow rate,(note-2) vi	892	pc/h	866	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	1.3	mi/h
Free-flow speed, FFSd	42.5	mi/h
Adjustment for no-passing zones, fnp	2.3*	mi/h
Average travel speed, ATSd	26.5	mi/h
Percent Free Flow Speed, PFFS	62.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	884	pc/h	847	pc/h
Base percent time-spent-following,(note-4) BPTSFd	72.8	%		
Adjustment for no-passing zones, fnp	23.0			
Percent time-spent-following, PTSFd	84.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.52	
Peak 15-min vehicle-miles of travel, VMT15	574	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2114	veh-mi
Peak 15-min total travel time, TT15	21.7	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	2.6	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.5	mi/h
Percent time-spent-following, PTSFd (from above)	84.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	883.7
Effective width of outside lane, We	22.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.38
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

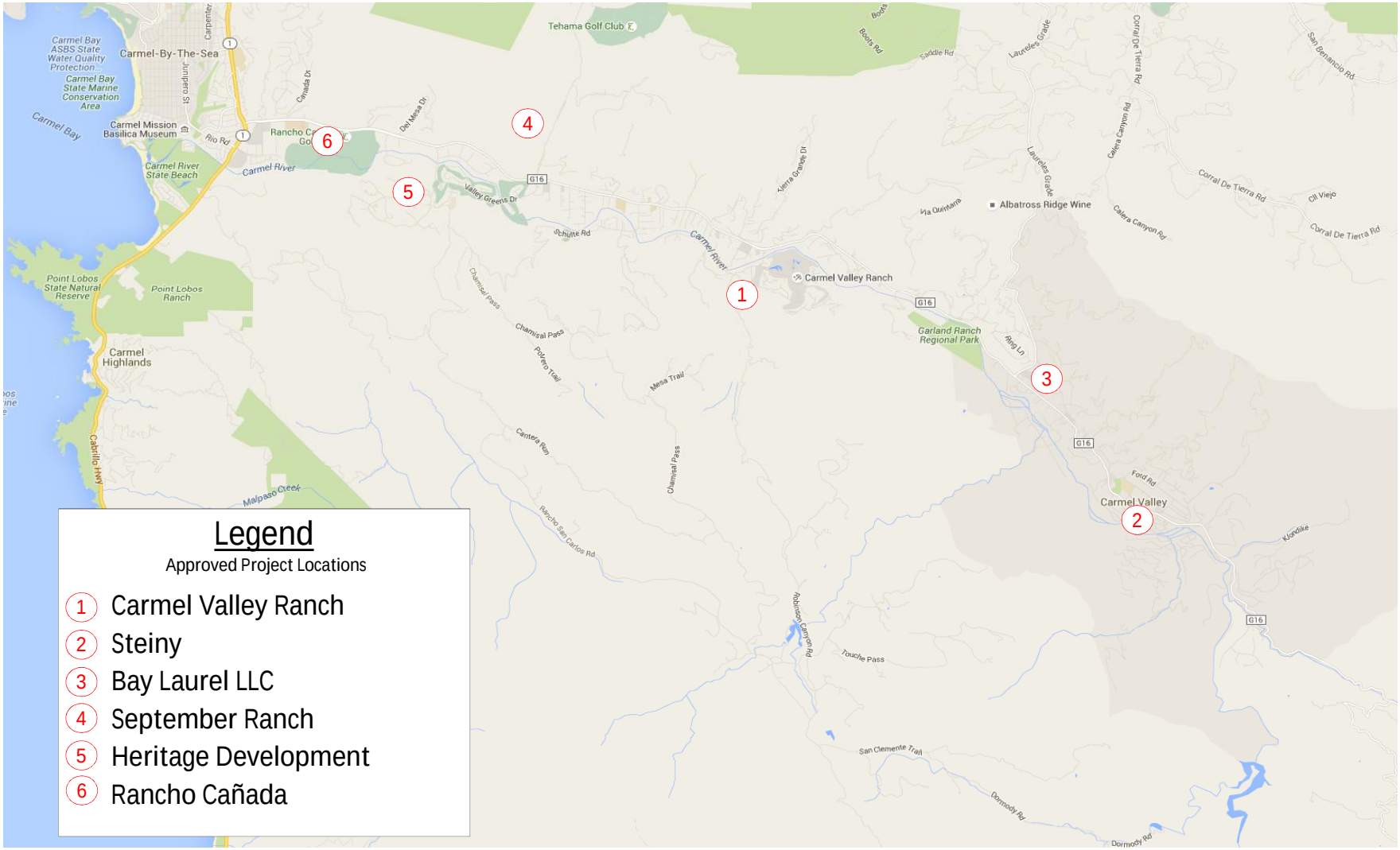
Appendix I
Approved Projects Trip Generation

TRIP GENERATION FOR APPROVED PROJECTS

PROJECT	SIZE	DAILY TRIP RATE	DAILY TRIPS	AM PEAK HOUR PEAK HOUR VOL.	(% OF DAILY)	AM IN	AM OUT	PM PEAK HOUR PEAK HOUR VOL.	(% OF DAILY)	PM IN	PM OUT	SAT TRIP RATE	SAT DAILY TRIPS	SAT PEAK HOUR PEAK HOUR VOL.	(% OF DAILY)	SAT IN	SAT OUT
1. Carmel Valley Ranch	47 units	8.92	419	17	(4%)	12	5	23	(5%)	10	13	8.92	419	23	(5%)	10	13
2. Steiny	-																
Commercial Retail	15,500 S.F.	0.04	687	19	(3%)	11	8	59	(9%)	26	33	0.04	652	59	(9%)	26	33
Apartments	16 units	6.65	106	8	(8%)	2	6	10	(9%)	7	3	6.39	102	8	(8%)	4	4
3. Bay Laurel LLC[2]	16 rooms	8.92	143	11	(8%)	6	5	11	(8%)	5	6	8.92	143	11	(8%)	5	6
4. September Ranch	-																
Residential lots	95 units	9.52	904	71	(8%)	18	53	95	(11%)	60	35	9.91	941	88	(9%)	48	40
Equestrian center[3]	50 stables	2.21	111	7	(6%)	5	2	14	(13%)	7	7	2.21	111	14	(13%)	7	7
5. Heritage Development	4 units	9.52	38	3	(8%)	1	2	4	(11%)	3	1	9.91	40	4	(10%)	2	2
6. Rancho Cañada	130 lots	-	911	81	(9%)	6	75	100	(11%)	78	22	-	838	86	(10%)	58	28
TOTAL APPROVED PROJECTS			3,319	217		61	156	316		196	120		3,246	293		160	133

Notes:
1. Traffic volumes are based on trip generation rates quoted by the Institute of Transportation Engineers, Trip Generation Manual, 9th Edition, 2012, unless otherwise noted.
2. Weekday trip rate from *Bernardus Lodge Expansion Traffic Impact Analysis* , Higgins Associates, September 15, 2008.
3. *Monterey Downs and Monterey Horse Park and Central Coast Veterans Cemetary Specific Plan* , RBF Consulting, March 2015.

Appendix J
Approved Projects Location Map



Map Source: Google Maps

Appendix K
Cumulative Projects Trip Generation

TRIP GENERATION FOR CUMULATIVE PROJECTS

				AM PEAK HOUR				PM PEAK HOUR						SAT PEAK HOUR			
PROJECT	SIZE	DAILY TRIP RATE	DAILY TRIPS	PEAK HOUR VOL.	(% OF DAILY)	IN	OUT	PEAK HOUR VOL.	(% OF DAILY)	IN	OUT	SAT TRIP RATE	SAT DAILY TRIPS	PEAK HOUR VOL.	(% OF DAILY)	IN	OUT
7. Stemler Minor Subdivision	2 units	9.52	19	2	(11%)	0	2	2	(11%)	2	0	9.91	20	2	(10%)	1	1
8. Loan Portfolio 8 LLC	-																
Demolition of exisiting hotel/spa	-22 units	8.92	-196	-8	(4%)	-6	-2	-11	(6%)	-5	-6	8.92	-196	-11	(6%)	-5	-6
Development of resort hotel	60 units	8.92	535	22	(4%)	16	6	29	(5%)	12	17	8.92	535	29	(5%)	12	17
9. Agha	20 lots	9.52	190	15	(8%)	4	11	20	(11%)	13	7	9.91	198	19	(10%)	10	9
10. Mary Delfino Trust	-																
Single Family Lots	18 units	9.52	171	14	(8%)	4	10	18	(11%)	11	7	9.91	178	17	(10%)	9	8
Multi-Family Lots	6 units	6.65	40	3	(8%)	1	2	4	(10%)	1	3	6.39	38	3	(8%)	2	1
11. Carmel Valley Affordable Housing	120 units	9.52	1,142	90	(8%)	23	67	120	(11%)	76	44	9.91	1,189	112	(9%)	60	52
TOTAL CUMULATIVE PROJECTS			1,902	138	7%	42	96	182	10%	110	72		1,963	171	178%	89	82

Notes:

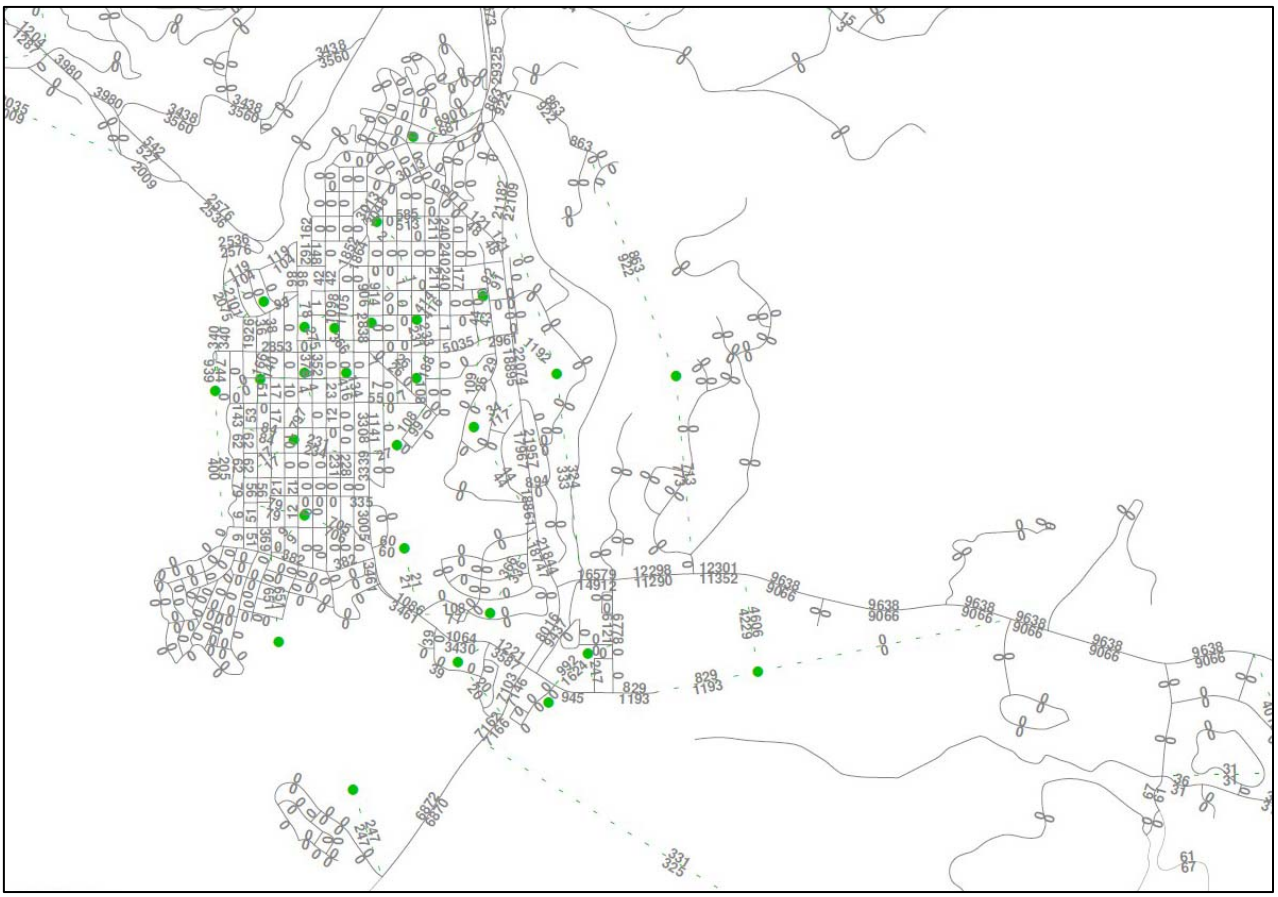
1. Traffic volumes are based on trip generation rates quoted by the Institute of Transportation Engineers, Trip Generation Manual, 9th Edition, 2012, unless otherwise noted.

Appendix L
Cumulative Projects Location Map

Map Source: Google Maps

Appendix M

AMBAG 2014 Daily Traffic Volumes Model Plot



AMBAG 2035 Daily Traffic Volumes Model Plot