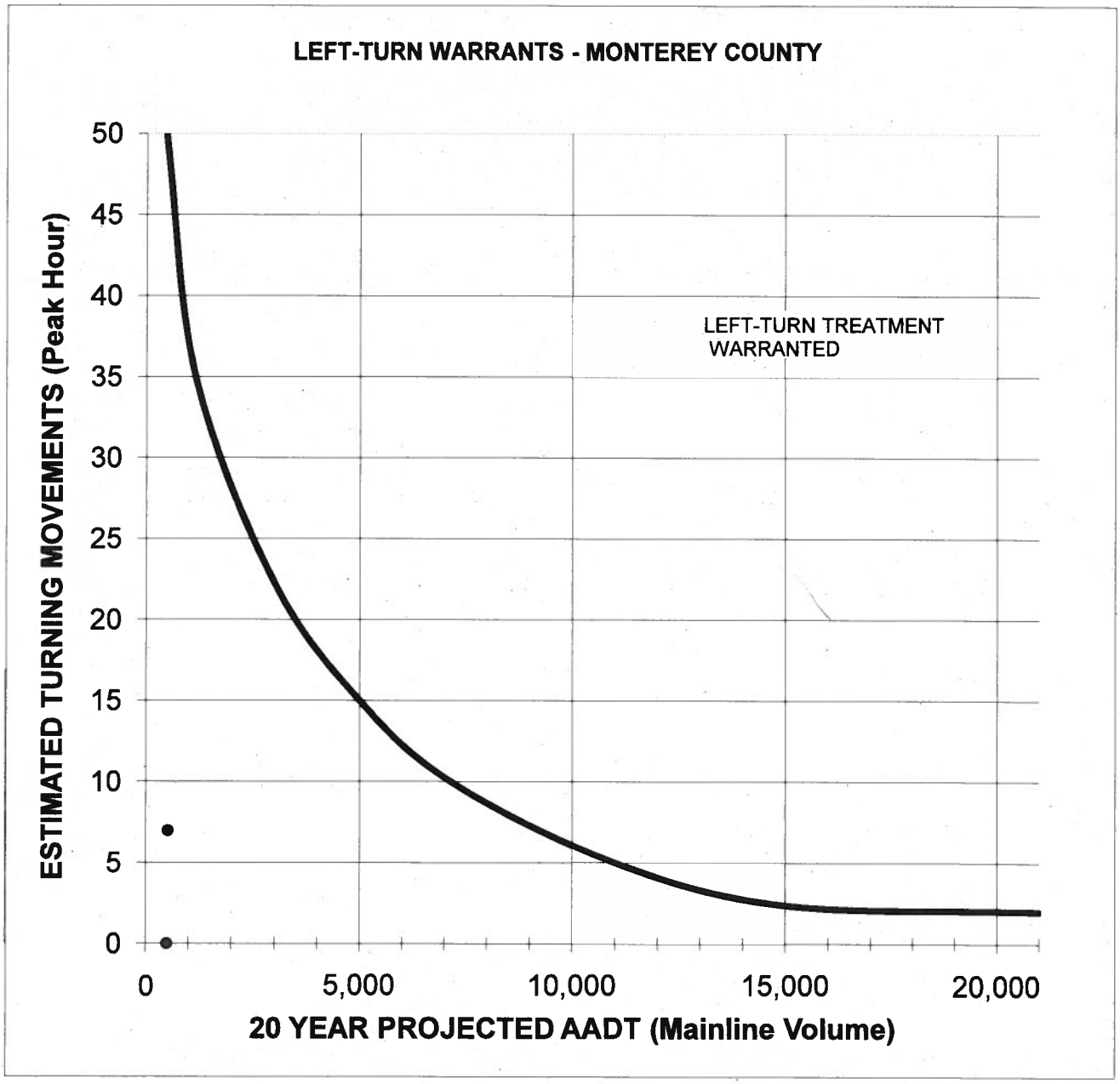
ATTACHMENT A
INTERSECTION CHANNELIZATION WARRANT WORKSHEETS

Paraiso Springs Road/Clark Road

Paraiso Springs Road/Clark Road
Southbound Direction



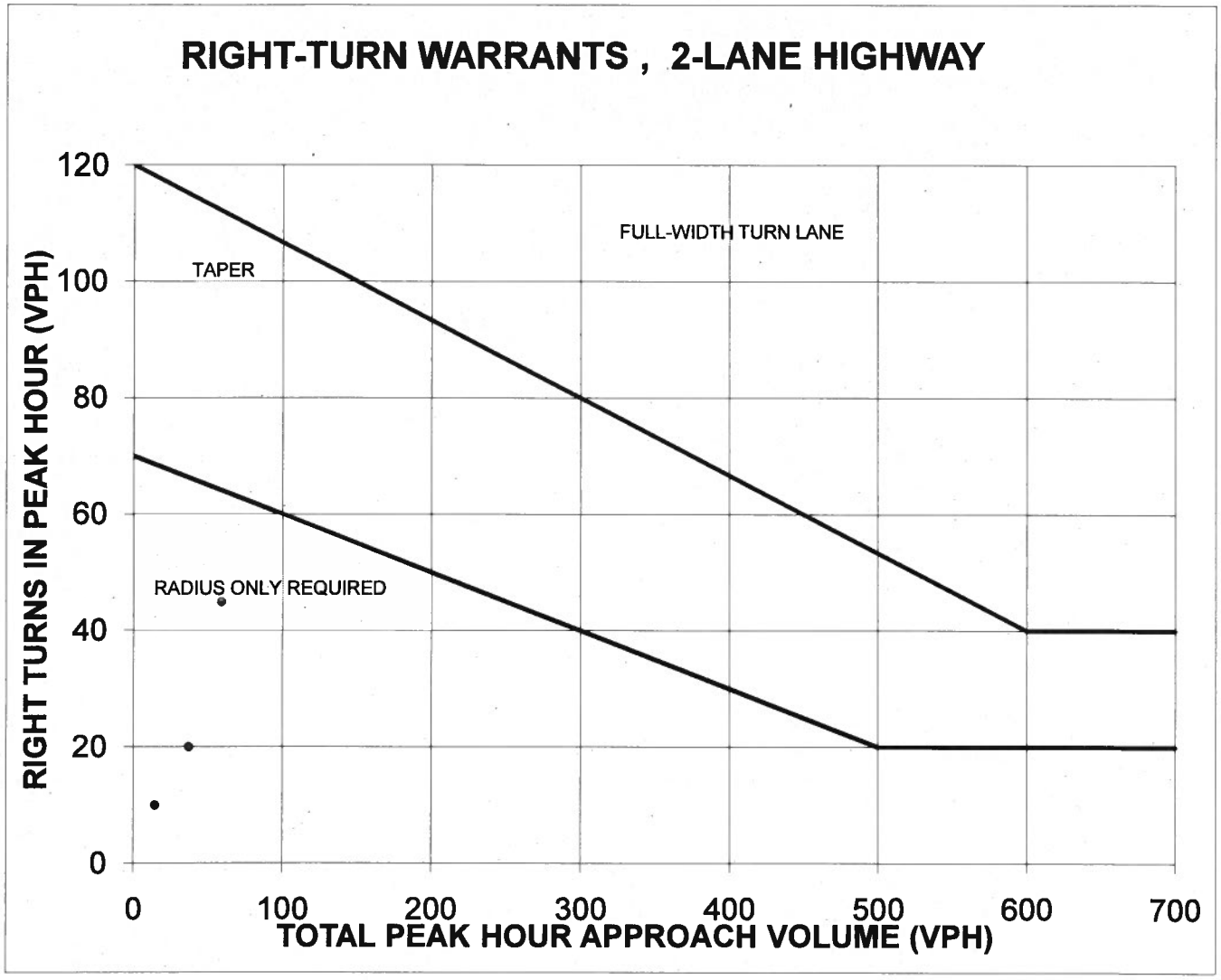
Analysis Scenario	Left Turn Volume	20-Yr. Mainline Volume	Warrant Met?
A. Cumulative AM	0	500	No
B. Cumulative PM	0	500	No
C. Cumulative Saturday	7	500	No

Adapted from Monterey County Left Turn Policy, adopted on February 26, 1980.

Note: Warrant is met if dot is above and to the left of curve shown above.

Hatch Mott MacDonald

Paraiso Springs Road/Clark Road
Northbound Direction



Scenario	Total	Right-Turning	Warrant Met?
A. Cumulative AM	14	10	No
B. Cumulative PM	37	20	No
C. Cumulative Sat	59	45	No

Source: Transportation Research Board, "Intersection Channelization Guide", NCHRP Report 287, November, 1985, p. 64.

Note: For posted speeds at or under 45 mph, peak hour right turns greater than 40 vph, and total peak hour approach less than 300 vph, adjust right turn volumes.

Adjust peak hour right turns = peak hour right turns - 20.

Hatch Mott MacDonald

ATTACHMENT B
PREDICTED AVERAGE CRASH FREQUENCY CALCULATION WORKSHEETS

Arroyo Seco Road/Clark Road Intersection

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	1991

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				--	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	--	1,000			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	--	83			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.107	0.54	1.000	0.107	1.11	1.00	0.118
Fatal and Injury (FI)	--	--	0.415	0.044	1.11	1.00	0.049
Property Damage Only (PDO)	--	--	0.585	0.062	1.11	1.00	0.069

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) (8)$_{TOTAL}$ from Worksheet 2C	(4) Proportion of $Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) (8)$_{FI}$ from Worksheet 2C	(6) Proportion of $Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) (8)$_{PDO}$ from Worksheet 2C
Total	1.000	0.118	1.000	0.049	1.000	0.069
		(2)x(3)$_{TOTAL}$		(4)x(5)$_{FI}$		(6)x(7)$_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.019	0.002	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.000
Ran off road	0.244	0.029	0.240	0.012	0.247	0.017
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.001
Total single-vehicle crashes	0.294	0.035	0.283	0.014	0.302	0.021
MULTIPLE-VEHICLE						
Angle collision	0.237	0.028	0.275	0.013	0.210	0.014
Head-on collision	0.052	0.006	0.081	0.004	0.032	0.002
Rear-end collision	0.278	0.033	0.260	0.013	0.292	0.020
Sideswipe collision	0.097	0.011	0.051	0.002	0.131	0.009
Other multiple-vehicle collision	0.042	0.005	0.050	0.002	0.033	0.002
Total multiple-vehicle crashes	0.706	0.083	0.717	0.035	0.698	0.048

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.0
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	1992

Input Data			Base Conditions	Site Conditions
Intersection type (3ST, 4ST, 4SG)			–	3ST
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ = 19,500	(veh/day)	–	1,000
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ = 4,300	(veh/day)	–	83
Intersection skew angle (degrees) [if 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All): 25 / Skew for Leg 2 (4ST only): 0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)			0	0
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)			0	0
Intersection lighting (present/not present)			Not Present	Not Present
Calibration Factor, C_i			1.00	1.00

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.107	0.54	1.000	0.107	1.11	1.00	0.118
Fatal and Injury (FI)	–	–	0.415	0.044	1.11	1.00	0.049
Property Damage Only (PDO)	–	–	0.585	0.062	1.11	1.00	0.069

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C; $(2)x(3)_{TOTAL}$	(4) Proportion of Collision $Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C; $(4)x(5)_{FI}$	(6) Proportion of Collision $Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C; $(6)x(7)_{PDO}$
Total	1.000	0.118	1.000	0.049	1.000	0.069
SINGLE-VEHICLE						
Collision with animal	0.019	0.002	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.000
Ran off road	0.244	0.029	0.240	0.012	0.247	0.017
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.001
Total single-vehicle crashes	0.294	0.035	0.283	0.014	0.302	0.021
MULTIPLE-VEHICLE						
Angle collision	0.237	0.028	0.275	0.013	0.210	0.014
Head-on collision	0.052	0.006	0.081	0.004	0.032	0.002
Rear-end collision	0.278	0.033	0.260	0.013	0.292	0.020
Sideswipe collision	0.097	0.011	0.051	0.002	0.131	0.009
Other multiple-vehicle collision	0.042	0.005	0.050	0.002	0.033	0.002
Total multiple-vehicle crashes	0.706	0.083	0.717	0.035	0.698	0.048

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.0
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	1993

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				–	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	–	1,000			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	–	83			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		N_O	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.107	0.54	1.000	0.107	1.11	1.00	0.118
Fatal and Injury (FI)	–	–	0.415	0.044	1.11	1.00	0.049
Property Damage Only (PDO)	–	–	0.585	0.062	1.11	1.00	0.069

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C	(4) Proportion of Collision $Type_{(FI)}$ from Table 10-8	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C	(6) Proportion of Collision $Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C
Total	1.000	0.118	1.000	0.049	1.000	0.069
		$(2)x(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)x(7)_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.019	0.002	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.000
Ran off road	0.244	0.029	0.240	0.012	0.247	0.017
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.001
Total single-vehicle crashes	0.294	0.035	0.283	0.014	0.302	0.021
MULTIPLE-VEHICLE						
Angle collision	0.237	0.028	0.275	0.013	0.210	0.014
Head-on collision	0.052	0.006	0.081	0.004	0.032	0.002
Rear-end collision	0.278	0.033	0.260	0.013	0.292	0.020
Sideswipe collision	0.097	0.011	0.051	0.002	0.131	0.009
Other multiple-vehicle collision	0.042	0.005	0.050	0.002	0.033	0.002
Total multiple-vehicle crashes	0.706	0.083	0.717	0.035	0.698	0.048

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.0
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	1994

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				–	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	–	1,000			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	–	83			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.107	0.54	1.000	0.107	1.11	1.00	0.118
Fatal and Injury (FI)	–	–	0.415	0.044	1.11	1.00	0.049
Property Damage Only (PDO)	–	–	0.585	0.062	1.11	1.00	0.069

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C $(2)x(3)_{TOTAL}$	(4) Proportion of $Collision\ Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C $(4)x(5)_{FI}$	(6) Proportion of $Collision\ Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C $(6)x(7)_{PDO}$
Total	1.000	0.118	1.000	0.049	1.000	0.069
SINGLE-VEHICLE						
Collision with animal	0.019	0.002	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.000
Ran off road	0.244	0.029	0.240	0.012	0.247	0.017
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.001
Total single-vehicle crashes	0.294	0.035	0.283	0.014	0.302	0.021
MULTIPLE-VEHICLE						
Angle collision	0.237	0.028	0.275	0.013	0.210	0.014
Head-on collision	0.052	0.006	0.081	0.004	0.032	0.002
Rear-end collision	0.278	0.033	0.260	0.013	0.292	0.020
Sideswipe collision	0.097	0.011	0.051	0.002	0.131	0.009
Other multiple-vehicle collision	0.042	0.005	0.050	0.002	0.033	0.002
Total multiple-vehicle crashes	0.706	0.083	0.717	0.035	0.698	0.048

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.0
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	1995

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				--	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	--	1,000			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	--	83			
Intersection skew angle (degrees)	[if 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.107	0.54	1.000	0.107	1.11	1.00	0.118
Fatal and Injury (FI)	--	--	0.415	0.044	1.11	1.00	0.049
Property Damage Only (PDO)	--	--	0.585	0.062	1.11	1.00	0.069

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C	(4) Proportion of $Collision\ Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C	(6) Proportion of $Collision\ Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C
Total	1.000	0.118	1.000	0.049	1.000	0.069
		$(2)x(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)x(7)_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.019	0.002	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.000
Ran off road	0.244	0.029	0.240	0.012	0.247	0.017
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.001
Total single-vehicle crashes	0.294	0.035	0.283	0.014	0.302	0.021
MULTIPLE-VEHICLE						
Angle collision	0.237	0.028	0.275	0.013	0.210	0.014
Head-on collision	0.052	0.006	0.081	0.004	0.032	0.002
Rear-end collision	0.278	0.033	0.260	0.013	0.292	0.020
Sideswipe collision	0.097	0.011	0.051	0.002	0.131	0.009
Other multiple-vehicle collision	0.042	0.005	0.050	0.002	0.033	0.002
Total multiple-vehicle crashes	0.706	0.083	0.717	0.035	0.698	0.048

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.0
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	1996

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				–	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	–	1,300			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	–	83			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.131	0.54	1.000	0.131	1.11	1.00	0.145
Fatal and Injury (FI)	–	–	0.415	0.054	1.11	1.00	0.060
Property Damage Only (PDO)	–	–	0.585	0.077	1.11	1.00	0.085

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C; $(2)x(3)_{TOTAL}$	(4) Proportion of $Collision\ Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C; $(4)x(5)_{FI}$	(6) Proportion of $Collision\ Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C; $(6)x(7)_{PDO}$
Total	1.000	0.145	1.000	0.060	1.000	0.085
SINGLE-VEHICLE						
Collision with animal	0.019	0.003	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.001
Ran off road	0.244	0.035	0.240	0.014	0.247	0.021
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.002
Total single-vehicle crashes	0.294	0.043	0.283	0.017	0.302	0.026
MULTIPLE-VEHICLE						
Angle collision	0.237	0.034	0.275	0.017	0.210	0.018
Head-on collision	0.052	0.008	0.081	0.005	0.032	0.003
Rear-end collision	0.278	0.040	0.260	0.016	0.292	0.025
Sideswipe collision	0.097	0.014	0.051	0.003	0.131	0.011
Other multiple-vehicle collision	0.042	0.006	0.050	0.003	0.033	0.003
Total multiple-vehicle crashes	0.706	0.102	0.717	0.043	0.698	0.059

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	1997

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 4ST, 4SG)		–	3ST
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ = 19,500 (veh/day)	–	1,200
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ = 4,300 (veh/day)	–	83
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?] No	0	Skew for Leg 1 (All): 25 Skew for Leg 2 (4ST only): 0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)		0	0
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)		0	0
Intersection lighting (present/not present)		Not Present	Not Present
Calibration Factor, C_i		1.00	1.00

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_1 from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_2 from Table 10-13	(3) CMF for Right-Turn Lanes CMF_3 from Table 10-14	(4) CMF for Lighting CMF_4 from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.123	0.54	1.000	0.123	1.11	1.00	0.136
Fatal and Injury (FI)	–	–	0.415	0.051	1.11	1.00	0.057
Property Damage Only (PDO)	–	–	0.585	0.072	1.11	1.00	0.080

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C; $(2)x(3)_{TOTAL}$	(4) Proportion of Collision $Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C; $(4)x(5)_{FI}$	(6) Proportion of Collision $Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C; $(6)x(7)_{PDO}$
Total	1.000	0.136	1.000	0.057	1.000	0.080
SINGLE-VEHICLE						
Collision with animal	0.019	0.003	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.001
Ran off road	0.244	0.033	0.240	0.014	0.247	0.020
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.002
Total single-vehicle crashes	0.294	0.040	0.283	0.016	0.302	0.024
MULTIPLE-VEHICLE						
Angle collision	0.237	0.032	0.275	0.016	0.210	0.017
Head-on collision	0.052	0.007	0.081	0.005	0.032	0.003
Rear-end collision	0.278	0.038	0.260	0.015	0.292	0.023
Sideswipe collision	0.097	0.013	0.051	0.003	0.131	0.010
Other multiple-vehicle collision	0.042	0.006	0.050	0.003	0.033	0.003
Total multiple-vehicle crashes	0.706	0.096	0.717	0.041	0.698	0.056

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	1998

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				--	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	--	1,900			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	--	83			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.177	0.54	1.000	0.177	1.11	1.00	0.196
Fatal and Injury (FI)	--	--	0.415	0.074	1.11	1.00	0.081
Property Damage Only (PDO)	--	--	0.585	0.104	1.11	1.00	0.115

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C	(4) Proportion of $Collision\ Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C	(6) Proportion of $Collision\ Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C
Total	1.000	0.196	1.000	0.081	1.000	0.115
		$(2)x(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)x(7)_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.019	0.004	0.008	0.001	0.026	0.003
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.003	0.022	0.002	0.007	0.001
Ran off road	0.244	0.048	0.240	0.020	0.247	0.028
Other single-vehicle collision	0.016	0.003	0.011	0.001	0.020	0.002
Total single-vehicle crashes	0.294	0.058	0.283	0.023	0.302	0.035
MULTIPLE-VEHICLE						
Angle collision	0.237	0.046	0.275	0.022	0.210	0.024
Head-on collision	0.052	0.010	0.081	0.007	0.032	0.004
Rear-end collision	0.278	0.054	0.260	0.021	0.292	0.033
Sideswipe collision	0.097	0.019	0.051	0.004	0.131	0.015
Other multiple-vehicle collision	0.042	0.008	0.050	0.004	0.033	0.004
Total multiple-vehicle crashes	0.706	0.138	0.717	0.058	0.698	0.080

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.2
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	1999

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				–	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	–	1,200			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	–	83			
Intersection skew angle (degrees) [If 4ST, does skew differ for minor legs?]			No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spt\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spt\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.123	0.54	1.000	0.123	1.11	1.00	0.136
Fatal and Injury (FI)	–	–	0.415	0.051	1.11	1.00	0.057
Property Damage Only (PDO)	–	–	0.585	0.072	1.11	1.00	0.080

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C $(2)x(3)_{TOTAL}$	(4) Proportion of Collision $Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C $(4)x(5)_{FI}$	(6) Proportion of Collision $Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C $(6)x(7)_{PDO}$
Total	1.000	0.136	1.000	0.057	1.000	0.080
SINGLE-VEHICLE						
Collision with animal	0.019	0.003	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.001
Ran off road	0.244	0.033	0.240	0.014	0.247	0.020
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.002
Total single-vehicle crashes	0.294	0.040	0.283	0.016	0.302	0.024
MULTIPLE-VEHICLE						
Angle collision	0.237	0.032	0.275	0.016	0.210	0.017
Head-on collision	0.052	0.007	0.081	0.005	0.032	0.003
Rear-end collision	0.278	0.038	0.260	0.015	0.292	0.023
Sideswipe collision	0.097	0.013	0.051	0.003	0.131	0.010
Other multiple-vehicle collision	0.042	0.006	0.050	0.003	0.033	0.003
Total multiple-vehicle crashes	0.706	0.096	0.717	0.041	0.698	0.056

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	2000

Input Data			Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)			–	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ = 19,500	(veh/day)	–	1,300			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ = 4,300	(veh/day)	–	83			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]	No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)			0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)			0	0			
Intersection lighting (present/not present)			Not Present	Not Present			
Calibration Factor, C_i			1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.131	0.54	1.000	0.131	1.11	1.00	0.145
Fatal and Injury (FI)	–	–	0.415	0.054	1.11	1.00	0.060
Property Damage Only (PDO)	–	–	0.585	0.077	1.11	1.00	0.085

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) (8)$_{TOTAL}$ from Worksheet 2C (2)x(3)$_{TOTAL}$	(4) Proportion of $Collision\ Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) (8)$_{FI}$ from Worksheet 2C (4)x(5)$_{FI}$	(6) Proportion of $Collision\ Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) (8)$_{PDO}$ from Worksheet 2C (6)x(7)$_{PDO}$
Total	1.000	0.145	1.000	0.060	1.000	0.085
SINGLE-VEHICLE						
Collision with animal	0.019	0.003	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.001
Ran off road	0.244	0.035	0.240	0.014	0.247	0.021
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.002
Total single-vehicle crashes	0.294	0.043	0.283	0.017	0.302	0.026
MULTIPLE-VEHICLE						
Angle collision	0.237	0.034	0.275	0.017	0.210	0.018
Head-on collision	0.052	0.008	0.081	0.005	0.032	0.003
Rear-end collision	0.278	0.040	0.260	0.016	0.292	0.025
Sideswipe collision	0.097	0.014	0.051	0.003	0.131	0.011
Other multiple-vehicle collision	0.042	0.006	0.050	0.003	0.033	0.003
Total multiple-vehicle crashes	0.706	0.102	0.717	0.043	0.698	0.059

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	2001

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				--	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	--	1,400			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	--	83			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.139	0.54	1.000	0.139	1.11	1.00	0.154
Fatal and Injury (FI)	--	--	0.415	0.058	1.11	1.00	0.064
Property Damage Only (PDO)	--	--	0.585	0.081	1.11	1.00	0.090

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C	(4) Proportion of $Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C	(6) Proportion of $Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C
Total	1.000	0.154	1.000	0.064	1.000	0.090
		$(2)x(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)x(7)_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.019	0.003	0.008	0.001	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.001
Ran off road	0.244	0.038	0.240	0.015	0.247	0.022
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.002
Total single-vehicle crashes	0.294	0.045	0.283	0.018	0.302	0.027
MULTIPLE-VEHICLE						
Angle collision	0.237	0.036	0.275	0.018	0.210	0.019
Head-on collision	0.052	0.008	0.081	0.005	0.032	0.003
Rear-end collision	0.278	0.043	0.260	0.017	0.292	0.026
Sideswipe collision	0.097	0.015	0.051	0.003	0.131	0.012
Other multiple-vehicle collision	0.042	0.006	0.050	0.003	0.033	0.003
Total multiple-vehicle crashes	0.706	0.109	0.717	0.046	0.698	0.063

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.2
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	2002

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				--	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	--	1,100			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	--	83			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.115	0.54	1.000	0.115	1.11	1.00	0.127
Fatal and Injury (FI)	--	--	0.415	0.048	1.11	1.00	0.053
Property Damage Only (PDO)	--	--	0.585	0.067	1.11	1.00	0.074

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) (8)$_{TOTAL}$ from Worksheet 2C	(4) Proportion of $Collision\ Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) (8)$_{FI}$ from Worksheet 2C	(6) Proportion of $Collision\ Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) (8)$_{PDO}$ from Worksheet 2C
Total	1.000	0.127	1.000	0.053	1.000	0.074
		(2)x(3)$_{TOTAL}$		(4)x(5)$_{FI}$		(6)x(7)$_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.019	0.002	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.001
Ran off road	0.244	0.031	0.240	0.013	0.247	0.018
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.001
Total single-vehicle crashes	0.294	0.037	0.283	0.015	0.302	0.022
MULTIPLE-VEHICLE						
Angle collision	0.237	0.030	0.275	0.015	0.210	0.016
Head-on collision	0.052	0.007	0.081	0.004	0.032	0.002
Rear-end collision	0.278	0.035	0.260	0.014	0.292	0.022
Sideswipe collision	0.097	0.012	0.051	0.003	0.131	0.010
Other multiple-vehicle collision	0.042	0.005	0.050	0.003	0.033	0.002
Total multiple-vehicle crashes	0.706	0.090	0.717	0.038	0.698	0.052

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	2003

Input Data			Base Conditions	Site Conditions
Intersection type (3ST, 4ST, 4SG)			–	3ST
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ = 19,500	(veh/day)	–	1,300
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ = 4,300	(veh/day)	–	83
Intersection skew angle (degrees) [If 4ST, does skew differ for minor legs?]	No		0	Skew for Leg 1 (All): 25 Skew for Leg 2 (4ST only): 0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)			0	0
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)			0	0
Intersection lighting (present/not present)			Not Present	Not Present
Calibration Factor, C_i			1.00	1.00

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.131	0.54	1.000	0.131	1.11	1.00	0.145
Fatal and Injury (FI)	–	–	0.415	0.054	1.11	1.00	0.060
Property Damage Only (PDO)	–	–	0.585	0.077	1.11	1.00	0.085

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C $(2)x(3)_{TOTAL}$	(4) Proportion of Collision $Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C $(4)x(5)_{FI}$	(6) Proportion of Collision $Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C $(6)x(7)_{PDO}$
Total	1.000	0.145	1.000	0.060	1.000	0.085
SINGLE-VEHICLE						
Collision with animal	0.019	0.003	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.001
Ran off road	0.244	0.035	0.240	0.014	0.247	0.021
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.002
Total single-vehicle crashes	0.294	0.043	0.283	0.017	0.302	0.026
MULTIPLE-VEHICLE						
Angle collision	0.237	0.034	0.275	0.017	0.210	0.018
Head-on collision	0.052	0.008	0.081	0.005	0.032	0.003
Rear-end collision	0.278	0.040	0.260	0.016	0.292	0.025
Sideswipe collision	0.097	0.014	0.051	0.003	0.131	0.011
Other multiple-vehicle collision	0.042	0.006	0.050	0.003	0.033	0.003
Total multiple-vehicle crashes	0.706	0.102	0.717	0.043	0.698	0.059

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	2004

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				--	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	--	1,800			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	--	83			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.170	0.54	1.000	0.170	1.11	1.00	0.188
Fatal and Injury (FI)	--	--	0.415	0.070	1.11	1.00	0.078
Property Damage Only (PDO)	--	--	0.585	0.099	1.11	1.00	0.110

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C	(4) Proportion of Collision $Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C	(6) Proportion of Collision $Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C
Total	1.000	0.188	1.000	0.078	1.000	0.110
		$(2)x(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)x(7)_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.019	0.004	0.008	0.001	0.026	0.003
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.002	0.007	0.001
Ran off road	0.244	0.046	0.240	0.019	0.247	0.027
Other single-vehicle collision	0.016	0.003	0.011	0.001	0.020	0.002
Total single-vehicle crashes	0.294	0.055	0.283	0.022	0.302	0.033
MULTIPLE-VEHICLE						
Angle collision	0.237	0.044	0.275	0.021	0.210	0.023
Head-on collision	0.052	0.010	0.081	0.006	0.032	0.004
Rear-end collision	0.278	0.052	0.260	0.020	0.292	0.032
Sideswipe collision	0.097	0.018	0.051	0.004	0.131	0.014
Other multiple-vehicle collision	0.042	0.008	0.050	0.004	0.033	0.004
Total multiple-vehicle crashes	0.706	0.132	0.717	0.056	0.698	0.077

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.2
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	2005

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				--	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	--	1,900			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	--	83			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		N_O	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.177	0.54	1.000	0.177	1.11	1.00	0.196
Fatal and Injury (FI)	--	--	0.415	0.074	1.11	1.00	0.081
Property Damage Only (PDO)	--	--	0.585	0.104	1.11	1.00	0.115

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C $(2)x(3)_{TOTAL}$	(4) Proportion of $Collision\ Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C $(4)x(5)_{FI}$	(6) Proportion of $Collision\ Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C $(6)x(7)_{PDO}$
Total	1.000	0.196	1.000	0.081	1.000	0.115
SINGLE-VEHICLE						
Collision with animal	0.019	0.004	0.008	0.001	0.026	0.003
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.003	0.022	0.002	0.007	0.001
Ran off road	0.244	0.048	0.240	0.020	0.247	0.028
Other single-vehicle collision	0.016	0.003	0.011	0.001	0.020	0.002
Total single-vehicle crashes	0.294	0.058	0.283	0.023	0.302	0.035
MULTIPLE-VEHICLE						
Angle collision	0.237	0.046	0.275	0.022	0.210	0.024
Head-on collision	0.052	0.010	0.081	0.007	0.032	0.004
Rear-end collision	0.278	0.054	0.260	0.021	0.292	0.033
Sideswipe collision	0.097	0.019	0.051	0.004	0.131	0.015
Other multiple-vehicle collision	0.042	0.008	0.050	0.004	0.033	0.004
Total multiple-vehicle crashes	0.706	0.138	0.717	0.056	0.698	0.080

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.2
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	2006

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				--	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	--	1,900			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	--	20			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.088	0.54	1.000	0.088	1.11	1.00	0.098
Fatal and Injury (FI)	--	--	0.415	0.037	1.11	1.00	0.040
Property Damage Only (PDO)	--	--	0.585	0.052	1.11	1.00	0.057

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision Type$_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C $(2)x(3)_{TOTAL}$	(4) Proportion of Collision Type$_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C $(4)x(5)_{FI}$	(6) Proportion of Collision Type$_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C $(6)x(7)_{PDO}$
Total	1.000	0.098	1.000	0.040	1.000	0.057
SINGLE-VEHICLE						
Collision with animal	0.019	0.002	0.008	0.000	0.026	0.001
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.001	0.022	0.001	0.007	0.000
Ran off road	0.244	0.024	0.240	0.010	0.247	0.014
Other single-vehicle collision	0.016	0.002	0.011	0.000	0.020	0.001
Total single-vehicle crashes	0.294	0.029	0.283	0.011	0.302	0.017
MULTIPLE-VEHICLE						
Angle collision	0.237	0.023	0.275	0.011	0.210	0.012
Head-on collision	0.052	0.005	0.081	0.003	0.032	0.002
Rear-end collision	0.278	0.027	0.260	0.011	0.292	0.017
Sideswipe collision	0.097	0.009	0.051	0.002	0.131	0.007
Other multiple-vehicle collision	0.042	0.004	0.050	0.002	0.033	0.002
Total multiple-vehicle crashes	0.706	0.069	0.717	0.029	0.698	0.040

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.0
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	2007

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				–	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	–	1,850			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	–	20			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.086	0.54	1.000	0.086	1.11	1.00	0.095
Fatal and Injury (FI)	–	–	0.415	0.036	1.11	1.00	0.040
Property Damage Only (PDO)	–	–	0.585	0.051	1.11	1.00	0.056

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C	(4) Proportion of $Collision\ Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C	(6) Proportion of $Collision\ Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C
Total	1.000	0.095	1.000	0.040	1.000	0.056
		$(2)x(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)x(7)_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.019	0.002	0.008	0.000	0.026	0.001
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.001	0.022	0.001	0.007	0.000
Ran off road	0.244	0.023	0.240	0.010	0.247	0.014
Other single-vehicle collision	0.016	0.002	0.011	0.000	0.020	0.001
Total single-vehicle crashes	0.294	0.028	0.283	0.011	0.302	0.017
MULTIPLE-VEHICLE						
Angle collision	0.237	0.023	0.275	0.011	0.210	0.012
Head-on collision	0.052	0.005	0.081	0.003	0.032	0.002
Rear-end collision	0.278	0.027	0.260	0.010	0.292	0.016
Sideswipe collision	0.097	0.009	0.051	0.002	0.131	0.007
Other multiple-vehicle collision	0.042	0.004	0.050	0.002	0.033	0.002
Total multiple-vehicle crashes	0.706	0.067	0.717	0.028	0.698	0.039

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.0
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	2008

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				--	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	--	1,800			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	--	20			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.085	0.54	1.000	0.085	1.11	1.00	0.093
Fatal and Injury (FI)	--	--	0.415	0.035	1.11	1.00	0.039
Property Damage Only (PDO)	--	--	0.585	0.049	1.11	1.00	0.055

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C $(2)x(3)_{TOTAL}$	(4) Proportion of Collision $Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C $(4)x(5)_{FI}$	(6) Proportion of Collision $Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C $(6)x(7)_{PDO}$
Total	1.000	0.093	1.000	0.039	1.000	0.055
SINGLE-VEHICLE						
Collision with animal	0.019	0.002	0.008	0.000	0.026	0.001
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.001	0.022	0.001	0.007	0.000
Ran off road	0.244	0.023	0.240	0.009	0.247	0.013
Other single-vehicle collision	0.016	0.001	0.011	0.000	0.020	0.001
Total single-vehicle crashes	0.294	0.027	0.283	0.011	0.302	0.017
MULTIPLE-VEHICLE						
Angle collision	0.237	0.022	0.275	0.011	0.210	0.011
Head-on collision	0.052	0.005	0.081	0.003	0.032	0.002
Rear-end collision	0.278	0.026	0.260	0.010	0.292	0.016
Sideswipe collision	0.097	0.009	0.051	0.002	0.131	0.007
Other multiple-vehicle collision	0.042	0.004	0.050	0.002	0.033	0.002
Total multiple-vehicle crashes	0.706	0.066	0.717	0.028	0.698	0.038

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.0
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	2009

Input Data			Base Conditions	Site Conditions
Intersection type (3ST, 4ST, 4SG)			–	3ST
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ = 19,500	(veh/day)	–	1,500
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ = 4,300	(veh/day)	–	20
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]	No	0	Skew for Leg 1 (All): 25 / Skew for Leg 2 (4ST only): 0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)			0	0
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)			0	0
Intersection lighting (present/not present)			Not Present	Not Present
Calibration Factor, C_i			1.00	1.00

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.073	0.54	1.000	0.073	1.11	1.00	0.081
Fatal and Injury (FI)	–	–	0.415	0.030	1.11	1.00	0.034
Property Damage Only (PDO)	–	–	0.585	0.043	1.11	1.00	0.047

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C; $(2)x(3)_{TOTAL}$	(4) Proportion of Collision $Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C; $(4)x(5)_{FI}$	(6) Proportion of Collision $Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C; $(6)x(7)_{PDO}$
Total	1.000	0.081	1.000	0.034	1.000	0.047
SINGLE-VEHICLE						
Collision with animal	0.019	0.002	0.008	0.000	0.026	0.001
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.001	0.022	0.001	0.007	0.000
Ran off road	0.244	0.020	0.240	0.008	0.247	0.012
Other single-vehicle collision	0.016	0.001	0.011	0.000	0.020	0.001
Total single-vehicle crashes	0.294	0.024	0.283	0.010	0.302	0.014
MULTIPLE-VEHICLE						
Angle collision	0.237	0.019	0.275	0.009	0.210	0.010
Head-on collision	0.052	0.004	0.081	0.003	0.032	0.002
Rear-end collision	0.278	0.022	0.260	0.009	0.292	0.014
Sideswipe collision	0.097	0.008	0.051	0.002	0.131	0.006
Other multiple-vehicle collision	0.042	0.003	0.050	0.002	0.033	0.002
Total multiple-vehicle crashes	0.706	0.057	0.717	0.024	0.698	0.033

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.0
Property Damage Only (PDO)	0.585	0.0

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr		Analysis Year	2010

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				–	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	–	1,500			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	–	20			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.073	0.54	1.000	0.073	1.11	1.00	0.081
Fatal and Injury (FI)	--	--	0.415	0.030	1.11	1.00	0.034
Property Damage Only (PDO)	--	--	0.585	0.043	1.11	1.00	0.047

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C $(2)x(3)_{TOTAL}$	(4) Proportion of $Collision\ Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C $(4)x(5)_{FI}$	(6) Proportion of $Collision\ Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C $(6)x(7)_{PDO}$
Total	1.000	0.081	1.000	0.034	1.000	0.047
SINGLE-VEHICLE						
Collision with animal	0.019	0.002	0.008	0.000	0.026	0.001
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.001	0.022	0.001	0.007	0.000
Ran off road	0.244	0.020	0.240	0.008	0.247	0.012
Other single-vehicle collision	0.016	0.001	0.011	0.000	0.020	0.001
Total single-vehicle crashes	0.294	0.024	0.283	0.010	0.302	0.014
MULTIPLE-VEHICLE						
Angle collision	0.237	0.019	0.275	0.009	0.210	0.010
Head-on collision	0.052	0.004	0.081	0.003	0.032	0.002
Rear-end collision	0.278	0.022	0.260	0.009	0.292	0.014
Sideswipe collision	0.097	0.008	0.051	0.002	0.131	0.006
Other multiple-vehicle collision	0.042	0.003	0.050	0.002	0.033	0.002
Total multiple-vehicle crashes	0.706	0.057	0.717	0.024	0.698	0.033

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.0
Property Damage Only (PDO)	0.585	0.0

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr	Base Period Accident Prediction	Analysis Year	

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				–	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	–	1,398			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	–	67			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?]		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.125	0.54	1.000	0.125	1.11	1.00	0.138
Fatal and Injury (FI)	–	–	0.415	0.052	1.11	1.00	0.057
Property Damage Only (PDO)	–	–	0.585	0.073	1.11	1.00	0.081

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C	(4) Proportion of $Collision\ Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C	(6) Proportion of $Collision\ Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C
Total	1.000	0.138	1.000	0.057	1.000	0.081
		(2)x(3)$_{TOTAL}$		(4)x(5)$_{FI}$		(6)x(7)$_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.019	0.003	0.008	0.000	0.026	0.002
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.002	0.022	0.001	0.007	0.001
Ran off road	0.244	0.034	0.240	0.014	0.247	0.020
Other single-vehicle collision	0.016	0.002	0.011	0.001	0.020	0.002
Total single-vehicle crashes	0.294	0.041	0.283	0.016	0.302	0.024
MULTIPLE-VEHICLE						
Angle collision	0.237	0.033	0.275	0.016	0.210	0.017
Head-on collision	0.052	0.007	0.081	0.005	0.032	0.003
Rear-end collision	0.278	0.038	0.260	0.015	0.292	0.024
Sideswipe collision	0.097	0.013	0.051	0.003	0.131	0.011
Other multiple-vehicle collision	0.042	0.006	0.050	0.003	0.033	0.003
Total multiple-vehicle crashes	0.706	0.098	0.717	0.041	0.698	0.056

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.1
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.1

Worksheet 2A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Intersections

General Information		Location Information	
Analyst	DT	Roadway	Arroyo Seco Road
Agency or Company	HMM	Intersection	Clark Road
Date Performed	08/25/11	Jurisdiction	Monterey County
Unsignalized three-leg (stop control on minor-road appr	Project Buildout Predicted Accidents	Analysis Year	

Input Data				Base Conditions	Site Conditions			
Intersection type (3ST, 4ST, 4SG)				–	3ST			
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	19,500	(veh/day)	–	1,829			
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	4,300	(veh/day)	–	258			
Intersection skew angle (degrees)	[If 4ST, does skew differ for minor legs?		No	0	Skew for Leg 1 (All):	25	Skew for Leg 2 (4ST only):	0
Number of signalized or uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0	0			
Number of signalized or uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0	0			
Intersection lighting (present/not present)				Not Present	Not Present			
Calibration Factor, C_i				1.00	1.00			

Worksheet 2B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Intersections

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.11	1.00	1.00	1.00	1.11

Worksheet 2C – Intersection Crashes for Rural Two-Lane Two-Way Roadway Intersections

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	0.300	0.54	1.000	0.300	1.11	1.00	0.331
Fatal and Injury (FI)	–	–	0.415	0.124	1.11	1.00	0.137
Property Damage Only (PDO)	–	–	0.585	0.175	1.11	1.00	0.194

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Road Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 10-6	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(8)_{TOTAL}$ from Worksheet 2C	(4) Proportion of $Collision\ Type_{(FI)}$ from Table 10-6	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(8)_{FI}$ from Worksheet 2C	(6) Proportion of $Collision\ Type_{(PDO)}$ from Table 10-6	(7) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(8)_{PDO}$ from Worksheet 2C
Total	1.000	0.331	1.000	0.137	1.000	0.194
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.019	0.006	0.008	0.001	0.026	0.005
Collision with bicycle	0.001	0.000	0.001	0.000	0.001	0.000
Collision with pedestrian	0.001	0.000	0.001	0.000	0.001	0.000
Overturned	0.013	0.004	0.022	0.003	0.007	0.001
Ran off road	0.244	0.081	0.240	0.033	0.247	0.048
Other single-vehicle collision	0.016	0.005	0.011	0.002	0.020	0.004
Total single-vehicle crashes	0.294	0.097	0.283	0.039	0.302	0.059
MULTIPLE-VEHICLE						
Angle collision	0.237	0.079	0.275	0.038	0.210	0.041
Head-on collision	0.052	0.017	0.081	0.011	0.032	0.006
Rear-end collision	0.278	0.092	0.260	0.036	0.292	0.057
Sideswipe collision	0.097	0.032	0.051	0.007	0.131	0.025
Other multiple-vehicle collision	0.042	0.014	0.050	0.007	0.033	0.006
Total multiple-vehicle crashes	0.706	0.234	0.717	0.099	0.698	0.135

Worksheet 2E – Summary Results for Rural Two-Lane Two-Way Road Intersections

(1) Crash severity level	(2) Crash Severity Distribution (proportion) (4) from Worksheet 2C	(3) Predicted average crash frequency (crashes / year) (8) from Worksheet 2C
Total	1.000	0.3
Fatal and Injury (FI)	0.415	0.1
Property Damage Only (PDO)	0.585	0.2

ATTACHMENT C
PREDICTED AVERAGE CRASH FREQUENCY CALCULATION WORKSHEETS

Paraiso Springs Road Segment A

Paraiso Springs Road - Segment A
1991-2005

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -A
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment A
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	1991-2005	Analysis Year	1991

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	–	0.131					
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	463				AADT OK
Lane width (ft)	12	10.5					
Shoulder width (ft)	6	Right Shld:	2	Left Shld:	2		
Shoulder type	Paved	Right Shld:	Gravel	Left Shld:	Gravel		
Length of horizontal curve (mi)	0	0.11					
Radius of curvature (ft)	0	450					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	0					
Driveway density (driveways/mile)	5	5					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes [present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	2					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1) CMF for Lane Width	(2) CMF for Shoulder Width and Type	(3) CMF for Horizontal Curves	(4) CMF for Super-elevation	(5) CMF for Grades	(6) CMF for Driveway Density	(7) CMF for Centerline Rumble Strips	(8) CMF for Passing Lanes	(9) CMF for Two-Way Left-Turn Lane	(10) CMF for Roadside Design	(11) CMF for Lighting	(12) CMF for Automated Speed Enforcement	(13) Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.01	1.05	2.05	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	2.036

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)$_{TOTAL}$ x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.016	1.80	1.000	0.016	2.04	1.00	0.033
Fatal and Injury (FI)	–	–	0.321	0.005	2.04	1.00	0.011
Property Damage Only (PDO)	–	–	0.679	0.011	2.04	1.00	0.022

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type$_{(TOTAL)}$	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type$_{(FI)}$	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type$_{(PDO)}$	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)$_{TOTAL}$ from Worksheet 1C	from Table 10-4	(8)$_{FI}$ from Worksheet 1C	from Table 10-4	(8)$_{PDO}$ from Worksheet 1C
Total	1.000	0.033	1.000	0.011	1.000	0.022
		(2)x(3)$_{TOTAL}$		(4)x(5)$_{FI}$		(6)x(7)$_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.121	0.004	0.038	0.000	0.184	0.004
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.017	0.545	0.006	0.505	0.011
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.023	0.638	0.007	0.735	0.016
MULTIPLE-VEHICLE						
Angle collision	0.085	0.003	0.100	0.001	0.072	0.002
Head-on collision	0.016	0.001	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.005	0.184	0.002	0.122	0.003
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.010	0.362	0.004	0.265	0.006

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.131	0.3
Fatal and Injury (FI)	0.321	0.0	0.131	0.1
Property Damage Only (PDO)	0.679	0.0	0.131	0.2

Paraiso Springs Road - Segment A
2006-2010

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -A
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment A
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	2006-2010	Analysis Year	2006

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	–	0.131					
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	150				AADT OK
Lane width (ft)	12	10.5					
Shoulder width (ft)	6	Right Shld:	2	Left Shld:	2		
Shoulder type	Paved	Right Shld:	Gravel	Left Shld:	Gravel		
Length of horizontal curve (mi)	0	0.11					
Radius of curvature (ft)	0	450					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	0					
Driveway density (driveways/mile)	5	0					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes [present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	2					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.01	1.05	2.05	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	2.019

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	N spf rs	Overdispersion Parameter, k	Crash Severity Distribution	N spf rs by Severity Distribution	Combined CMFs	Calibration Factor, Cr	Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.005	1.80	1.000	0.005	2.02	1.00	0.011
Fatal and Injury (FI)	–	–	0.321	0.002	2.02	1.00	0.003
Property Damage Only (PDO)	–	–	0.679	0.004	2.02	1.00	0.007

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collision Type	Proportion of Collision Type(TOTAL)	$N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	Proportion of Collision Type(FI)	$N_{predicted\ rs\ (FI)}$ (crashes/year)	Proportion of Collision Type(PDO)	$N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.011	1.000	0.003	1.000	0.007
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.001	0.038	0.000	0.184	0.001
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.000	0.037	0.000	0.015	0.000
Ran off road	0.521	0.006	0.545	0.002	0.505	0.004
Other single-vehicle collision	0.021	0.000	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.007	0.638	0.002	0.735	0.005
MULTIPLE-VEHICLE						
Angle collision	0.085	0.001	0.100	0.000	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.002	0.164	0.001	0.122	0.001
Sideswipe collision	0.037	0.000	0.038	0.000	0.038	0.000
Other multiple-vehicle collision	0.027	0.000	0.026	0.000	0.030	0.000
Total multiple-vehicle crashes	0.307	0.003	0.362	0.001	0.265	0.002

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)
Crash severity level	Crash Severity Distribution (proportion)	Predicted average crash frequency (crashes/year)	Roadway segment length (mi)	Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.131	0.1
Fatal and Injury (FI)	0.321	0.0	0.131	0.0
Property Damage Only (PDO)	0.679	0.0	0.131	0.1

Paraiso Springs Road - Segment A
Phase 4 - Buildout

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -A
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment A
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	Phase 4 - Buildout	Analysis Year	

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	--	0.131					
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	--	482				AADT OK
Lane width (ft)	12	10.5					
Shoulder width (ft)	6	Right Shld:	2	Left Shld:	2		
Shoulder type	Paved	Right Shld:	Gravel	Left Shld:	Gravel		
Length of horizontal curve (mi)	0	0.11					
Radius of curvature (ft)	0	450					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	0					
Driveway density (driveways/mile)	5	0					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes (present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	2					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.01	1.05	2.05	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	2.042

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	N spf rs	Overdispersion Parameter, k	Crash Severity Distribution	N spf rs by Severity Distribution	Combined CMFs	Calibration Factor, Cr	Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.017	1.80	1.000	0.017	2.04	1.00	0.034
Fatal and Injury (FI)	--	--	0.321	0.005	2.04	1.00	0.011
Property Damage Only (PDO)	--	--	0.679	0.011	2.04	1.00	0.023

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collision Type	Proportion of Collision $Type_{(TOTAL)}$	$N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	Proportion of Collision $Type_{(FI)}$	$N_{predicted\ rs\ (FI)}$ (crashes/year)	Proportion of Collision $Type_{(PDO)}$	$N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	$(8)_{TOTAL}$ from Worksheet 1C	from Table 10-4	$(8)_{FI}$ from Worksheet 1C	from Table 10-4	$(8)_{PDO}$ from Worksheet 1C
Total	1.000	0.034	1.000	0.011	1.000	0.023
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.004	0.038	0.000	0.184	0.004
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.018	0.545	0.006	0.505	0.012
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.024	0.838	0.007	0.735	0.017
MULTIPLE-VEHICLE						
Angle collision	0.085	0.003	0.100	0.001	0.072	0.002
Head-on collision	0.016	0.001	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.005	0.184	0.002	0.122	0.003
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.028	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.011	0.362	0.004	0.265	0.006

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)
Crash severity level	Crash Severity Distribution (proportion)	Predicted average crash frequency (crashes/year)	Roadway segment length (mi)	Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.131	0.3
Fatal and Injury (FI)	0.321	0.0	0.131	0.1
Property Damage Only (PDO)	0.679	0.0	0.131	0.2

Paraiso Springs Road - Segment A
Base Prediction
(1991-2010)

Worksheet 1A -- General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -A
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment A
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	Hist. Base Calc. (1991-2010 Avg ADT)	Analysis Year	

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	--	0.131					
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	--	385				AADT OK
Lane width (ft)	12	10.5					
Shoulder width (ft)	6	Right Shld:	2		Left Shld:	2	
Shoulder type	Paved	Right Shld:	Gravel		Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.11					
Radius of curvature (ft)	0	450					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	0					
Driveway density (driveways/mile)	5	0					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes [present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	2					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B -- Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1) CMF for Lane Width	(2) CMF for Shoulder Width and Type	(3) CMF for Horizontal Curves	(4) CMF for Super-elevation	(5) CMF for Grades	(6) CMF for Driveway Density	(7) CMF for Centerline Rumble Strips	(8) CMF for Passing Lanes	(9) CMF for Two-Way Left-Turn Lane	(10) CMF for Roadside Design	(11) CMF for Lighting	(12) CMF for Automated Speed Enforcement	(13) Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.01	1.05	2.05	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	2.019

Worksheet 1C -- Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.013	1.80	1.000	0.013	2.02	1.00	0.027
Fatal and Injury (FI)	--	--	0.321	0.004	2.02	1.00	0.009
Property Damage Only (PDO)	--	--	0.679	0.009	2.02	1.00	0.018

Worksheet 1D -- Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.027	1.000	0.009	1.000	0.018
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.003	0.038	0.000	0.184	0.003
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.014	0.545	0.005	0.505	0.009
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.019	0.638	0.006	0.735	0.014
MULTIPLE-VEHICLE						
Angle collision	0.085	0.002	0.100	0.001	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.004	0.184	0.001	0.122	0.002
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.008	0.362	0.003	0.265	0.005

Worksheet 1E -- Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.131	0.2
Fatal and Injury (FI)	0.321	0.0	0.131	0.1
Property Damage Only (PDO)	0.679	0.0	0.131	0.1

ATTACHMENT D
PREDICTED AVERAGE CRASH FREQUENCY CALCULATION WORKSHEETS

Paraiso Springs Road Segment B

Paraiso Springs Road - Segment B
1991-2005

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -B
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment B
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	1991-2005	Analysis Year	1991

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	–	0.568					
AADT (veh/day) ($AADT_{MAX}$ = 17,800 (veh/day))	–	431					AADT OK
Lane width (ft)	12	9					
Shoulder width (ft)	6	Right Shld:	1	Left Shld:	1		
Shoulder type	Paved	Right Shld:	Gravel	Left Shld:	Gravel		
Length of horizontal curve (mi)	0	0.00					
Radius of curvature (ft)	0	0					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	0					
Driveway density (driveways/mile)	5	5					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes (present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	2					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.03	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.017

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.065	0.42	1.000	0.065	1.02	1.00	0.067
Fatal and Injury (FI)	–	–	0.321	0.021	1.02	1.00	0.021
Property Damage Only (PDO)	–	–	0.679	0.044	1.02	1.00	0.045

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) N predicted rs (TOTAL) (crashes/year)	(4) Proportion of Collision Type(FI)	(5) N predicted rs (FI) (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) N predicted rs (PDO) (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.067	1.000	0.021	1.000	0.045
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.008	0.038	0.001	0.184	0.008
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.002	0.037	0.001	0.015	0.001
Ran off road	0.521	0.035	0.545	0.012	0.505	0.023
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.046	0.638	0.014	0.735	0.033
MULTIPLE-VEHICLE						
Angle collision	0.085	0.006	0.100	0.002	0.072	0.003
Head-on collision	0.016	0.001	0.034	0.001	0.003	0.000
Rear-end collision	0.142	0.009	0.164	0.004	0.122	0.006
Sideswipe collision	0.037	0.002	0.038	0.001	0.038	0.002
Other multiple-vehicle collision	0.027	0.002	0.026	0.001	0.030	0.001
Total multiple-vehicle crashes	0.307	0.020	0.362	0.008	0.265	0.012

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.1	0.568	0.1
Fatal and Injury (FI)	0.321	0.0	0.568	0.0
Property Damage Only (PDO)	0.679	0.0	0.568	0.1

Paraiso Springs Road - Segment B
2006-2010

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -B
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment B
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	2006-2010	Analysis Year	2006

Input Data	Base Conditions	Site Conditions				
Length of segment, L (mi)	–	0.568				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	118			AADT OK
Lane width (ft)	12	9				
Shoulder width (ft)	8	Right Shld:	1	Left Shld:	1	
Shoulder type	Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.00				
Radius of curvature (ft)	0	0				Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present				
Superelevation variance (ft/ft)	< 0.01	0				
Grade (%)	0	0				
Driveway density (driveways/mile)	5	0				
Centerline rumble strips (present/not present)	Not Present	Not Present				
Passing lanes [present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present				
Two-way left-turn lane (present/not present)	Not Present	Not Present				
Roadside hazard rating (1-7 scale)	3	2				
Segment lighting (present/not present)	Not Present	Not Present				
Auto speed enforcement (present/not present)	Not Present	Not Present				
Calibration Factor, Cr	1	1.00				

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.03	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.009

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.018	0.42	1.000	0.018	1.01	1.00	0.018
Fatal and Injury (FI)	–	–	0.321	0.006	1.01	1.00	0.006
Property Damage Only (PDO)	–	–	0.679	0.012	1.01	1.00	0.012

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.018	1.000	0.006	1.000	0.012
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.002	0.038	0.000	0.184	0.002
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.000	0.037	0.000	0.015	0.000
Ran off road	0.521	0.009	0.545	0.003	0.505	0.006
Other single-vehicle collision	0.021	0.000	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.013	0.838	0.004	0.735	0.009
MULTIPLE-VEHICLE						
Angle collision	0.085	0.002	0.100	0.001	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.003	0.184	0.001	0.122	0.001
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.000
Other multiple-vehicle collision	0.027	0.000	0.026	0.000	0.030	0.000
Total multiple-vehicle crashes	0.307	0.006	0.362	0.002	0.265	0.003

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.568	0.0
Fatal and Injury (FI)	0.321	0.0	0.568	0.0
Property Damage Only (PDO)	0.679	0.0	0.568	0.0

Paraiso Springs Road - Segment B
Phase 4 - Buildout

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -B
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment B
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	Phase 4 - Buildout	Analysis Year	

Input Data	Base Conditions	Site Conditions				
Length of segment, L (mi)	–	0.568				
AADT (veh/day)	–	450				AADT OK
Lane width (ft)	12	9				
Shoulder width (ft)	6	Right Shld:	1	Left Shld:	1	
Shoulder type	Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.00				
Radius of curvature (ft)	0	0				Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present				
Superelevation variance (ft/ft)	< 0.01	0				
Grade (%)	0	0				
Driveway density (driveways/mile)	5	0				
Centerline rumble strips (present/not present)	Not Present	Not Present				
Passing lanes [present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present				
Two-way left-turn lane (present/not present)	Not Present	Not Present				
Roadside hazard rating (1-7 scale)	3	2				
Segment lighting (present/not present)	Not Present	Not Present				
Auto speed enforcement (present/not present)	Not Present	Not Present				
Calibration Factor, Cr	1	1.00				

$AADT_{MAX}$ = 17,800 (veh/day)

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1) CMF for Lane Width	(2) CMF for Shoulder Width and Type	(3) CMF for Horizontal Curves	(4) CMF for Super-elevation	(5) CMF for Grades	(6) CMF for Driveway Density	(7) CMF for Centerline Rumble Strips	(8) CMF for Passing Lanes	(9) CMF for Two-Way Left-Turn Lane	(10) CMF for Roadside Design	(11) CMF for Lighting	(12) CMF for Automated Speed Enforcement	(13) Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.04	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.023

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.068	0.42	1.000	0.068	1.02	1.00	0.070
Fatal and Injury (FI)	–	–	0.321	0.022	1.02	1.00	0.022
Property Damage Only (PDO)	–	–	0.679	0.046	1.02	1.00	0.047

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.070	1.000	0.022	1.000	0.047
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.008	0.038	0.001	0.184	0.009
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.002	0.037	0.001	0.015	0.001
Ran off road	0.521	0.036	0.545	0.012	0.505	0.024
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.048	0.638	0.014	0.735	0.035
MULTIPLE-VEHICLE						
Angle collision	0.085	0.006	0.100	0.002	0.072	0.003
Head-on collision	0.016	0.001	0.034	0.001	0.003	0.000
Rear-end collision	0.142	0.010	0.164	0.004	0.122	0.006
Sideswipe collision	0.037	0.003	0.038	0.001	0.038	0.002
Other multiple-vehicle collision	0.027	0.002	0.028	0.001	0.030	0.001
Total multiple-vehicle crashes	0.307	0.021	0.362	0.008	0.265	0.013

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.1	0.568	0.1
Fatal and Injury (FI)	0.321	0.0	0.568	0.0
Property Damage Only (PDO)	0.679	0.0	0.568	0.1

Paraiso Springs Road - Segment B
Base Prediction
(1991-2010)

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -B
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment B
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	Hist. Base Calc. (1991-2010 Avg ADT)	Analysis Year	

Input Data		Base Conditions	Site Conditions				
Length of segment, L (mi)		–	0.568				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	352				AADT OK
Lane width (ft)		12	9				
Shoulder width (ft)		6	Right Shld:	1	Left Shld:	1	
Shoulder type		Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)		0	0.00				
Radius of curvature (ft)		0	0				Radius Value OK
Spiral transition curve (present/not present)		Not Present	Not Present				
Superelevation variance (ft/ft)		< 0.01	0				
Grade (%)		0	0				
Driveway density (driveways/mile)		5	0				
Centerline rumble strips (present/not present)		Not Present	Not Present				
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present	Not Present				
Two-way left-turn lane (present/not present)		Not Present	Not Present				
Roadside hazard rating (1-7 scale)		3	2				
Segment lighting (present/not present)		Not Present	Not Present				
Auto speed enforcement (present/not present)		Not Present	Not Present				
Calibration Factor, Cr		1	1.00				

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.009

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.053	0.42	1.000	0.053	1.01	1.00	0.054
Fatal and Injury (FI)	–	–	0.321	0.017	1.01	1.00	0.017
Property Damage Only (PDO)	–	–	0.679	0.036	1.01	1.00	0.037

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.054	1.000	0.017	1.000	0.037
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.007	0.038	0.001	0.184	0.007
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.001	0.015	0.001
Ran off road	0.521	0.028	0.545	0.009	0.505	0.018
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.037	0.838	0.011	0.735	0.027
MULTIPLE-VEHICLE						
Angle collision	0.085	0.005	0.100	0.002	0.072	0.003
Head-on collision	0.018	0.001	0.034	0.001	0.003	0.000
Rear-end collision	0.142	0.008	0.164	0.003	0.122	0.004
Sideswipe collision	0.037	0.002	0.038	0.001	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.017	0.362	0.006	0.265	0.010

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.1	0.568	0.1
Fatal and Injury (FI)	0.321	0.0	0.568	0.0
Property Damage Only (PDO)	0.679	0.0	0.568	0.1

ATTACHMENT E
PREDICTED AVERAGE CRASH FREQUENCY CALCULATION WORKSHEETS

Paraiso Springs Road Segment C

Paraiso Springs Road - Segment C
1991-2005

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -C
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment C
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	1991-2005	Analysis Year	1991

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	–	0.208					
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	398				AADT OK
Lane width (ft)	12	9					
Shoulder width (ft)	6	Right Shld:	1		Left Shld:	1	
Shoulder type	Paved	Right Shld:	Gravel		Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.00					
Radius of curvature (ft)	0	0					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	0					
Driveway density (driveways/mile)	5	5					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes (present (1 lane) /present (2 lane) / not present))	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	3					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.079

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	N spf rs	Overdispersion Parameter, k	Crash Severity Distribution	N spf rs by Severity Distribution	Combined CMFs	Calibration Factor, Cr	Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.022	1.13	1.000	0.022	1.08	1.00	0.024
Fatal and Injury (FI)	–	–	0.321	0.007	1.08	1.00	0.008
Property Damage Only (PDO)	–	–	0.679	0.015	1.08	1.00	0.016

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collision Type	Proportion of Collision Type(TOTAL)	N predicted rs (TOTAL) (crashes/year)	Proportion of Collision Type(FI)	N predicted rs (FI) (crashes/year)	Proportion of Collision Type(PDO)	N predicted rs (PDO) (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.024	1.000	0.008	1.000	0.016
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.003	0.038	0.000	0.184	0.003
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.012	0.545	0.004	0.505	0.008
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.017	0.638	0.005	0.735	0.012
MULTIPLE-VEHICLE						
Angle collision	0.085	0.002	0.100	0.001	0.072	0.001
Head-on collision	0.018	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.003	0.164	0.001	0.122	0.002
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.000
Total multiple-vehicle crashes	0.307	0.007	0.362	0.003	0.265	0.004

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)
Crash severity level	Crash Severity Distribution (proportion)	Predicted average crash frequency (crashes/year)	Roadway segment length (mi)	Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.208	0.1
Fatal and Injury (FI)	0.321	0.0	0.208	0.0
Property Damage Only (PDO)	0.679	0.0	0.208	0.1

Paraiso Springs Road - Segment C
2006-2010

Worksheet 1A -- General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -C
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment C
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	2006-2010	Analysis Year	2006

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	--	0.208					
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	--	85				AADT OK
Lane width (ft)	12	9					
Shoulder width (ft)	6	Right Shld:	1		Left Shld:	1	
Shoulder type	Paved	Right Shld:	Gravel		Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.00					
Radius of curvature (ft)	0	0					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	0					
Driveway density (driveways/mile)	5	0					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes (present (1 lane) /present (2 lane) / not present)	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	3					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B -- Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.03	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.079

Worksheet 1C -- Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.005	1.13	1.000	0.005	1.08	1.00	0.005
Fatal and Injury (FI)	--	--	0.321	0.002	1.08	1.00	0.002
Property Damage Only (PDO)	--	--	0.679	0.003	1.08	1.00	0.003

Worksheet 1D -- Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision $Type_{(FI)}$	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision $Type_{(PDO)}$	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	$(8)_{TOTAL}$ from Worksheet 1C	from Table 10-4	$(8)_{FI}$ from Worksheet 1C	from Table 10-4	$(8)_{PDO}$ from Worksheet 1C
Total	1.000	0.005	1.000	0.002	1.000	0.003
		$(2)x(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)x(7)_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.121	0.001	0.038	0.000	0.184	0.001
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.000	0.037	0.000	0.015	0.000
Ran off road	0.521	0.003	0.545	0.001	0.505	0.002
Other single-vehicle collision	0.021	0.000	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.004	0.638	0.001	0.735	0.003
MULTIPLE-VEHICLE						
Angle collision	0.085	0.000	0.100	0.000	0.072	0.000
Head-on collision	0.018	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.001	0.184	0.000	0.122	0.000
Sideswipe collision	0.037	0.000	0.038	0.000	0.038	0.000
Other multiple-vehicle collision	0.027	0.000	0.026	0.000	0.030	0.000
Total multiple-vehicle crashes	0.307	0.002	0.362	0.001	0.265	0.001

Worksheet 1E -- Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.208	0.0
Fatal and Injury (FI)	0.321	0.0	0.208	0.0
Property Damage Only (PDO)	0.679	0.0	0.208	0.0

Paraiso Springs Road - Segment C
Phase 4 - Buildout

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information						
Analyst	DT	Roadway	Paraiso Springs Rd -C					
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment C					
Date Performed	07/29/11	Jurisdiction	Monterey County, CA					
Analysis Condition	Phase 4 - Buildout	Analysis Year						
Input Data		**Base Conditions**	**Site Conditions**					
Length of segment, L (mi)		–	0.208					
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	417					AADT OK
Lane width (ft)		12	9					
Shoulder width (ft)		6	Right Shld:	1		Left Shld:	1	
Shoulder type		Paved	Right Shld:	Gravel		Left Shld:	Gravel	
Length of horizontal curve (mi)		0	0.00					
Radius of curvature (ft)		0	0					Radius Value OK
Spiral transition curve (present/not present)		Not Present	Not Present					
Superelevation variance (ft/ft)		< 0.01	0					
Grade (%)		0	0					
Driveway density (driveways/mile)		5	0					
Centerline rumble strips (present/not present)		Not Present	Not Present					
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present	Not Present					
Two-way left-turn lane (present/not present)		Not Present	Not Present					
Roadside hazard rating (1-7 scale)		3	3					
Segment lighting (present/not present)		Not Present	Not Present					
Auto speed enforcement (present/not present)		Not Present	Not Present					
Calibration Factor, Cr		1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.03	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.084

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	N spf rs	Overdispersion Parameter, k	Crash Severity Distribution	N spf rs by Severity Distribution	Combined CMFs	Calibration Factor, Cr	Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.023	1.13	1.000	0.023	1.08	1.00	0.025
Fatal and Injury (FI)	–	–	0.321	0.007	1.08	1.00	0.008
Property Damage Only (PDO)	–	–	0.679	0.016	1.08	1.00	0.017

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collision Type	Proportion of Collision Type(TOTAL)	N predicted rs (TOTAL) (crashes/year)	Proportion of Collision Type(FI)	N predicted rs (FI) (crashes/year)	Proportion of Collision Type(PDO)	N predicted rs (PDO) (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.025	1.000	0.008	1.000	0.017
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.003	0.038	0.000	0.184	0.003
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.013	0.545	0.004	0.505	0.009
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.017	0.638	0.005	0.735	0.013
MULTIPLE-VEHICLE						
Angle collision	0.085	0.002	0.100	0.001	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.004	0.164	0.001	0.122	0.002
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.008	0.362	0.003	0.265	0.005

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)
Crash severity level	Crash Severity Distribution (proportion)	Predicted average crash frequency (crashes/year)	Roadway segment length (mi)	Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.208	0.1
Fatal and Injury (FI)	0.321	0.0	0.208	0.0
Property Damage Only (PDO)	0.679	0.0	0.208	0.1

Paraiso Springs Road - Segment C
Base Prediction
(1991-2010)

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information		
Analyst	DT	Roadway	Paraiso Springs Rd -C	
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment C	
Date Performed	07/29/11	Jurisdiction	Monterey County, CA	
Analysis Condition	Hist. Base Calc. (1991-2010 Avg ADT)	Analysis Year		

Input Data		Base Conditions	Site Conditions				
Length of segment, L (mi)		–	0.208				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	320				AADT OK
Lane width (ft)		12	9				
Shoulder width (ft)		8	Right Shld:	1	Left Shld:	1	
Shoulder type		Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)		0	0.00				
Radius of curvature (ft)		0	0				Radius Value OK
Spiral transition curve (present/not present)		Not Present	Not Present				
Superelevation variance (ft/ft)		< 0.01	0				
Grade (%)		0	0				
Driveway density (driveways/mile)		5	0				
Centerline rumble strips (present/not present)		Not Present	Not Present				
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present	Not Present				
Two-way left-turn lane (present/not present)		Not Present	Not Present				
Roadside hazard rating (1-7 scale)		3	3				
Segment lighting (present/not present)		Not Present	Not Present				
Auto speed enforcement (present/not present)		Not Present	Not Present				
Calibration Factor, Cr		1	1.00				

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.079

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.018	1.13	1.000	0.018	1.08	1.00	0.019
Fatal and Injury (FI)	–	–	0.321	0.006	1.08	1.00	0.006
Property Damage Only (PDO)	–	–	0.679	0.012	1.08	1.00	0.013

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.019	1.000	0.006	1.000	0.013
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.002	0.038	0.000	0.184	0.002
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.000	0.037	0.000	0.015	0.000
Ran off road	0.521	0.010	0.545	0.003	0.505	0.007
Other single-vehicle collision	0.021	0.000	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.013	0.838	0.004	0.735	0.010
MULTIPLE-VEHICLE						
Angle collision	0.085	0.002	0.100	0.001	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.003	0.164	0.001	0.122	0.002
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.000
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.000
Total multiple-vehicle crashes	0.307	0.006	0.362	0.002	0.265	0.003

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.208	0.1
Fatal and Injury (FI)	0.321	0.0	0.208	0.0
Property Damage Only (PDO)	0.679	0.0	0.208	0.1

ATTACHMENT F
PREDICTED AVERAGE CRASH FREQUENCY CALCULATION WORKSHEETS

Paraiso Springs Road Segment D

Paraiso Springs Road - Segment D
1991-2005

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -D
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment D
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	1991-2005	Analysis Year	1991

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	–	0.247					
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	368				AADT OK
Lane width (ft)	12	9					
Shoulder width (ft)	6	Right Shld:	0		Left Shld:	0	
Shoulder type	Paved	Right Shld:	Gravel		Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.00					
Radius of curvature (ft)	0	0					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	0					
Driveway density (driveways/mile)	5	5					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes [present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	6					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	1.329

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.024	0.95	1.000	0.024	1.33	1.00	0.032
Fatal and Injury (FI)	–	–	0.321	0.008	1.33	1.00	0.010
Property Damage Only (PDO)	–	–	0.679	0.016	1.33	1.00	0.022

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.032	1.000	0.010	1.000	0.022
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.004	0.038	0.000	0.184	0.004
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.017	0.545	0.006	0.505	0.011
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.022	0.638	0.007	0.735	0.016
MULTIPLE-VEHICLE						
Angle collision	0.085	0.003	0.100	0.001	0.072	0.002
Head-on collision	0.016	0.001	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.005	0.184	0.002	0.122	0.003
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.010	0.362	0.004	0.285	0.006

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.247159091	0.1
Fatal and Injury (FI)	0.321	0.0	0.247159091	0.0
Property Damage Only (PDO)	0.679	0.0	0.247159091	0.1

Paraiso Springs Road - Segment D
2006-2010

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -D
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment D
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	2006-2010	Analysis Year	2006

Input Data		Base Conditions	Site Conditions				
Length of segment, L (mi)		–	0.247				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	53				AADT OK
Lane width (ft)		12	9				
Shoulder width (ft)		6	Right Shld:	0	Left Shld:	0	
Shoulder type		Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)		0	0.00				
Radius of curvature (ft)		0	0				Radius Value OK
Spiral transition curve (present/not present)		Not Present	Not Present				
Superelevation variance (ft/ft)		< 0.01	0				
Grade (%)		0	0				
Driveway density (driveways/mile)		5	0				
Centerline rumble strips (present/not present)		Not Present	Not Present				
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present	Not Present				
Two-way left-turn lane (present/not present)		Not Present	Not Present				
Roadside hazard rating (1-7 scale)		3	6				
Segment lighting (present/not present)		Not Present	Not Present				
Auto speed enforcement (present/not present)		Not Present	Not Present				
Calibration Factor, Cr		1	1.00				

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	1.329

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	$(2)_{TOTAL}$ x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.003	0.95	1.000	0.003	1.33	1.00	0.005
Fatal and Injury (FI)	–	–	0.321	0.001	1.33	1.00	0.001
Property Damage Only (PDO)	–	–	0.679	0.002	1.33	1.00	0.003

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type$_{(TOTAL)}$	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type$_{(FI)}$	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type$_{(PDO)}$	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	$(8)_{TOTAL}$ from Worksheet 1C	from Table 10-4	$(8)_{FI}$ from Worksheet 1C	from Table 10-4	$(8)_{PDO}$ from Worksheet 1C
Total	1.000	0.005	1.000	0.001	1.000	0.003
		$(2)x(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)x(7)_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.121	0.001	0.038	0.000	0.184	0.001
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.000	0.037	0.000	0.015	0.000
Ran off road	0.521	0.002	0.545	0.001	0.505	0.002
Other single-vehicle collision	0.021	0.000	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.003	0.638	0.001	0.735	0.002
MULTIPLE-VEHICLE						
Angle collision	0.085	0.000	0.100	0.000	0.072	0.000
Head-on collision	0.018	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.001	0.164	0.000	0.122	0.000
Sideswipe collision	0.037	0.000	0.038	0.000	0.038	0.000
Other multiple-vehicle collision	0.027	0.000	0.026	0.000	0.030	0.000
Total multiple-vehicle crashes	0.307	0.001	0.362	0.001	0.265	0.001

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.247159091	0.0
Fatal and Injury (FI)	0.321	0.0	0.247159091	0.0
Property Damage Only (PDO)	0.679	0.0	0.247159091	0.0

Paraiso Springs Road - Segment D
Phase 4 - Buildout

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -D
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment D
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	Phase 4 - Buildout	Analysis Year	

Input Data		Base Conditions	Site Conditions				
Length of segment, L (mi)		–	0.247				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	385				AADT OK
Lane width (ft)		12	9				
Shoulder width (ft)		6	Right Shld:	0	Left Shld:	0	
Shoulder type		Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)		0	0.00				
Radius of curvature (ft)		0	0				Radius Value OK
Spiral transition curve (present/not present)		Not Present	Not Present				
Superelevation variance (ft/ft)		< 0.01	0				
Grade (%)		0	0				
Driveway density (driveways/mile)		5	0				
Centerline rumble strips (present/not present)		Not Present	Not Present				
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present	Not Present				
Two-way left-turn lane (present/not present)		Not Present	Not Present				
Roadside hazard rating (1-7 scale)		3	6				
Segment lighting (present/not present)		Not Present	Not Present				
Auto speed enforcement (present/not present)		Not Present	Not Present				
Calibration Factor, Cr		1	1.00				

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	1.329

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	N spf rs	Overdispersion Parameter, k	Crash Severity Distribution	N spf rs by Severity Distribution	Combined CMFs	Calibration Factor, Cr	Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.025	0.95	1.000	0.025	1.33	1.00	0.034
Fatal and Injury (FI)	–	–	0.321	0.008	1.33	1.00	0.011
Property Damage Only (PDO)	–	–	0.679	0.017	1.33	1.00	0.023

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collision Type	Proportion of Collision Type(TOTAL)	N predicted rs (TOTAL) (crashes/year)	Proportion of Collision Type(FI)	N predicted rs (FI) (crashes/year)	Proportion of Collision Type(PDO)	N predicted rs (PDO) (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.034	1.000	0.011	1.000	0.023
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.004	0.038	0.000	0.184	0.004
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.018	0.545	0.006	0.505	0.012
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.023	0.638	0.007	0.735	0.017
MULTIPLE-VEHICLE						
Angle collision	0.085	0.003	0.100	0.001	0.072	0.002
Head-on collision	0.016	0.001	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.005	0.164	0.002	0.122	0.003
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.010	0.362	0.004	0.265	0.006

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)
Crash severity level	Crash Severity Distribution (proportion)	Predicted average crash frequency (crashes/year)	Roadway segment length (mi)	Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.247159091	0.1
Fatal and Injury (FI)	0.321	0.0	0.247159091	0.0
Property Damage Only (PDO)	0.679	0.0	0.247159091	0.1

Paraiso Springs Road - Segment D
Base Prediction
(1991-2010)

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information					
Analyst	DT	Roadway	Paraiso Springs Rd -D				
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment D				
Date Performed	07/29/11	Jurisdiction	Monterey County, CA				
Analysis Condition	Hist. Base Calc. (1991-2010 Avg ADT)	Analysis Year					
Input Data		**Base Conditions**	**Site Conditions**				
Length of segment, L (mi)		–	0.247				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	287				AADT OK
Lane width (ft)		12	9				
Shoulder width (ft)		6	Right Shld:	0	Left Shld:	0	
Shoulder type		Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)		0	0.00				
Radius of curvature (ft)		0	0				Radius Value OK
Spiral transition curve (present/not present)		Not Present	Not Present				
Superelevation variance (ft/ft)		< 0.01	0				
Grade (%)		0	0				
Driveway density (driveways/mile)		5	0				
Centerline rumble strips (present/not present)		Not Present	Not Present				
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present	Not Present				
Two-way left-turn lane (present/not present)		Not Present	Not Present				
Roadside hazard rating (1-7 scale)		3	6				
Segment lighting (present/not present)		Not Present	Not Present				
Auto speed enforcement (present/not present)		Not Present	Not Present				
Calibration Factor, Cr		1	1.00				

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	1.329

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	N spf rs	Overdispersion Parameter, k	Crash Severity Distribution	N spf rs by Severity Distribution	Combined CMFs	Calibration Factor, Cr	Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.019	0.95	1.000	0.019	1.33	1.00	0.025
Fatal and Injury (FI)	–	–	0.321	0.006	1.33	1.00	0.008
Property Damage Only (PDO)	–	–	0.679	0.013	1.33	1.00	0.017

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collision Type	Proportion of Collision $Type_{(TOTAL)}$	$N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	Proportion of $Collision\ Type_{(FI)}$	$N_{predicted\ rs\ (FI)}$ (crashes/year)	Proportion of $Collision\ Type_{(PDO)}$	$N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	$(8)_{TOTAL}$ from Worksheet 1C	from Table 10-4	$(8)_{FI}$ from Worksheet 1C	from Table 10-4	$(8)_{PDO}$ from Worksheet 1C
Total	1.000	0.025	1.000	0.008	1.000	0.017
		$(2)x(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)x(7)_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.121	0.003	0.038	0.000	0.184	0.003
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.013	0.545	0.004	0.505	0.009
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.017	0.638	0.005	0.735	0.013
MULTIPLE-VEHICLE						
Angle collision	0.085	0.002	0.100	0.001	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.004	0.164	0.001	0.122	0.002
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.008	0.362	0.003	0.265	0.005

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)
Crash severity level	Crash Severity Distribution (proportion)	Predicted average crash frequency (crashes/year)	Roadway segment length (mi)	Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.247159091	0.1
Fatal and Injury (FI)	0.321	0.0	0.247159091	0.0
Property Damage Only (PDO)	0.679	0.0	0.247159091	0.1

ATTACHMENT G
PREDICTED AVERAGE CRASH FREQUENCY CALCULATION WORKSHEETS

Paraiso Springs Road Segment E

Paraiso Springs Road - Segment E
1991-2005

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -E
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment E
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	1991-2005	Analysis Year	1991

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	–	0.237					
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	333				AADT OK
Lane width (ft)	12	9					
Shoulder width (ft)	6	Right Shld:	0		Left Shld:	0	
Shoulder type	Paved	Right Shld:	Gravel		Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.00					
Radius of curvature (ft)	0	0					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	0					
Driveway density (driveways/mile)	5	5					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes [present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	5					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.14	1.00	1.00	1.243

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.021	1.00	1.000	0.021	1.24	1.00	0.026
Fatal and Injury (FI)	–	–	0.321	0.007	1.24	1.00	0.008
Property Damage Only (PDO)	–	–	0.679	0.014	1.24	1.00	0.018

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.026	1.000	0.008	1.000	0.018
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.003	0.038	0.000	0.184	0.003
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.014	0.545	0.005	0.505	0.009
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.018	0.638	0.005	0.735	0.013
MULTIPLE-VEHICLE						
Angle collision	0.085	0.002	0.100	0.001	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.004	0.164	0.001	0.122	0.002
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.008	0.362	0.003	0.265	0.005

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.237	0.1
Fatal and Injury (FI)	0.321	0.0	0.237	0.0
Property Damage Only (PDO)	0.679	0.0	0.237	0.1

Paraiso Springs Road - Segment E
2006-2010

Worksheet 1A -- General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -E
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment E
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	2006-2010	Analysis Year	2006

Input Data		Base Conditions	Site Conditions				
Length of segment, L (mi)		–	0.237				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	20				AADT OK
Lane width (ft)		12	9				
Shoulder width (ft)		6	Right Shld:	0	Left Shld:	0	
Shoulder type		Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)		0	0.00				
Radius of curvature (ft)		0	0				Radius Value OK
Spiral transition curve (present/not present)		Not Present	Not Present				
Superelevation variance (ft/ft)		< 0.01	0				
Grade (%)		0	0				
Driveway density (driveways/mile)		5	0				
Centerline rumble strips (present/not present)		Not Present	Not Present				
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present	Not Present				
Two-way left-turn lane (present/not present)		Not Present	Not Present				
Roadside hazard rating (1-7 scale)		3	5				
Segment lighting (present/not present)		Not Present	Not Present				
Auto speed enforcement (present/not present)		Not Present	Not Present				
Calibration Factor, Cr		1	1.00				

Worksheet 1B -- Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.14	1.00	1.00	1.243

Worksheet 1C -- Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	N spf rs	Overdispersion Parameter, k	Crash Severity Distribution	N spf rs by Severity Distribution	Combined CMFs	Calibration Factor, Cr	Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.001	1.00	1.000	0.001	1.24	1.00	0.002
Fatal and Injury (FI)	–	–	0.321	0.000	1.24	1.00	0.001
Property Damage Only (PDO)	–	–	0.679	0.001	1.24	1.00	0.001

Worksheet 1D -- Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collision Type	Proportion of Collision Type(TOTAL)	N predicted rs (TOTAL) (crashes/year)	Proportion of Collision Type(FI)	N predicted rs (FI) (crashes/year)	Proportion of Collision Type(PDO)	N predicted rs (PDO) (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.002	1.000	0.001	1.000	0.001
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.000	0.038	0.000	0.184	0.000
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.000	0.037	0.000	0.015	0.000
Ran off road	0.521	0.001	0.545	0.000	0.505	0.001
Other single-vehicle collision	0.021	0.000	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.001	0.638	0.000	0.735	0.001
MULTIPLE-VEHICLE						
Angle collision	0.085	0.000	0.100	0.000	0.072	0.000
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.000	0.184	0.000	0.122	0.000
Sideswipe collision	0.037	0.000	0.038	0.000	0.038	0.000
Other multiple-vehicle collision	0.027	0.000	0.026	0.000	0.030	0.000
Total multiple-vehicle crashes	0.307	0.000	0.362	0.000	0.265	0.000

Worksheet 1E -- Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)
Crash severity level	Crash Severity Distribution (proportion)	Predicted average crash frequency (crashes/year)	Roadway segment length (mi)	Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.237	0.0
Fatal and Injury (FI)	0.321	0.0	0.237	0.0
Property Damage Only (PDO)	0.679	0.0	0.237	0.0

Paraiso Springs Road - Segment E
Phase 4 - Buildout

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -E
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment E
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	Phase 4 - Buildout	Analysis Year	

Input Data		Base Conditions	Site Conditions				
Length of segment, L (mi)		–	0.237				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	352				AADT OK
Lane width (ft)		12	9				
Shoulder width (ft)		6	Right Shld:	0	Left Shld:	0	
Shoulder type		Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)		0	0.00				
Radius of curvature (ft)		0	0				Radius Value OK
Spiral transition curve (present/not present)		Not Present	Not Present				
Superelevation variance (ft/ft)		< 0.01	0				
Grade (%)		0	0				
Driveway density (driveways/mile)		5	0				
Centerline rumble strips (present/not present)		Not Present	Not Present				
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present	Not Present				
Two-way left-turn lane (present/not present)		Not Present	Not Present				
Roadside hazard rating (1-7 scale)		3	5				
Segment lighting (present/not present)		Not Present	Not Present				
Auto speed enforcement (present/not present)		Not Present	Not Present				
Calibration Factor, Cr		1	1.00				

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1) CMF for Lane Width	(2) CMF for Shoulder Width and Type	(3) CMF for Horizontal Curves	(4) CMF for Super-elevation	(5) CMF for Grades	(6) CMF for Driveway Density	(7) CMF for Centerline Rumble Strips	(8) CMF for Passing Lanes	(9) CMF for Two-Way Left-Turn Lane	(10) CMF for Roadside Design	(11) CMF for Lighting	(12) CMF for Automated Speed Enforcement	(13) Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.14	1.00	1.00	1.243

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.022	1.00	1.000	0.022	1.24	1.00	0.028
Fatal and Injury (FI)	–	–	0.321	0.007	1.24	1.00	0.009
Property Damage Only (PDO)	–	–	0.679	0.015	1.24	1.00	0.019

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.028	1.000	0.009	1.000	0.019
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.003	0.038	0.000	0.184	0.003
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.014	0.545	0.005	0.505	0.010
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.019	0.638	0.006	0.735	0.014
MULTIPLE-VEHICLE						
Angle collision	0.085	0.002	0.100	0.001	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.004	0.184	0.001	0.122	0.002
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.009	0.362	0.003	0.285	0.005

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.237	0.1
Fatal and Injury (FI)	0.321	0.0	0.237	0.0
Property Damage Only (PDO)	0.679	0.0	0.237	0.1

Paraiso Springs Road - Segment E
Base Prediction
(1991-2010)

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information					
Analyst	DT	Roadway	Paraiso Springs Rd -E				
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment E				
Date Performed	07/29/11	Jurisdiction	Monterey County, CA				
Analysis Condition	Hist. Base Calc. (1991-2010 Avg ADT)	Analysis Year					
Input Data		**Base Conditions**	**Site Conditions**				
Length of segment, L (mi)		–	0.237				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	255				AADT OK
Lane width (ft)		12	9				
Shoulder width (ft)		8	Right Shld:	0	Left Shld:	0	
Shoulder type		Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)		0	0.00				
Radius of curvature (ft)		0	0				Radius Value OK
Spiral transition curve (present/not present)		Not Present	Not Present				
Superelevation variance (ft/ft)		< 0.01	0				
Grade (%)		0	0				
Driveway density (driveways/mile)		5	0				
Centerline rumble strips (present/not present)		Not Present	Not Present				
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present	Not Present				
Two-way left-turn lane (present/not present)		Not Present	Not Present				
Roadside hazard rating (1-7 scale)		3	5				
Segment lighting (present/not present)		Not Present	Not Present				
Auto speed enforcement (present/not present)		Not Present	Not Present				
Calibration Factor, Cr		1	1.00				

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.14	1.00	1.00	1.243

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	N spf rs	Overdispersion Parameter, k	Crash Severity Distribution	N spf rs by Severity Distribution	Combined CMFs	Calibration Factor, Cr	Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.016	1.00	1.000	0.018	1.24	1.00	0.020
Fatal and Injury (FI)	–	–	0.321	0.005	1.24	1.00	0.006
Property Damage Only (PDO)	–	–	0.679	0.011	1.24	1.00	0.014

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collision Type	Proportion of Collision Type(TOTAL)	$N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	Proportion of Collision Type(FI)	$N_{predicted\ rs\ (FI)}$ (crashes/year)	Proportion of Collision Type(PDO)	$N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.020	1.000	0.006	1.000	0.014
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.002	0.038	0.000	0.184	0.003
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.010	0.545	0.004	0.505	0.007
Other single-vehicle collision	0.021	0.000	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.014	0.638	0.004	0.735	0.010
MULTIPLE-VEHICLE						
Angle collision	0.085	0.002	0.100	0.001	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.003	0.164	0.001	0.122	0.002
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.000
Total multiple-vehicle crashes	0.307	0.008	0.362	0.002	0.265	0.004

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)
Crash severity level	Crash Severity Distribution (proportion)	Predicted average crash frequency (crashes/year)	Roadway segment length (mi)	Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.237	0.1
Fatal and Injury (FI)	0.321	0.0	0.237	0.0
Property Damage Only (PDO)	0.679	0.0	0.237	0.1

ATTACHMENT H
PREDICTED AVERAGE CRASH FREQUENCY CALCULATION WORKSHEETS

Paraiso Springs Road Segment F

Paraiso Springs Road - Segment F
1991-2005

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -F
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment F
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	1991-2005	Analysis Year	1991

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	–	0.0275					
AADT (veh/day)	$AADT_{MAX}$ = 17,600 (veh/day)	–	388				AADT OK
Lane width (ft)	12	9					
Shoulder width (ft)	6	Right Shld:	0		Left Shld:	0	
Shoulder type	Paved	Right Shld:	Gravel		Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.03					
Radius of curvature (ft)	0	100					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	0					
Driveway density (driveways/mile)	5	5					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes [present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	6					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.06	19.84	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	26.371

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.003	8.58	1.000	0.003	26.37	1.00	0.071
Fatal and Injury (FI)	–	–	0.321	0.001	26.37	1.00	0.023
Property Damage Only (PDO)	–	–	0.679	0.002	26.37	1.00	0.048

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.071	1.000	0.023	1.000	0.048
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.009	0.038	0.001	0.184	0.009
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.002	0.037	0.001	0.015	0.001
Ran off road	0.521	0.037	0.545	0.012	0.505	0.024
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.049	0.638	0.015	0.735	0.035
MULTIPLE-VEHICLE						
Angle collision	0.085	0.006	0.100	0.002	0.072	0.003
Head-on collision	0.016	0.001	0.034	0.001	0.003	0.000
Rear-end collision	0.142	0.010	0.184	0.004	0.122	0.006
Sideswipe collision	0.037	0.003	0.038	0.001	0.038	0.002
Other multiple-vehicle collision	0.027	0.002	0.026	0.001	0.030	0.001
Total multiple-vehicle crashes	0.307	0.022	0.362	0.008	0.265	0.013

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.1	0.0275	2.6
Fatal and Injury (FI)	0.321	0.0	0.0275	0.8
Property Damage Only (PDO)	0.679	0.0	0.0275	1.8

Paraiso Springs Road - Segment F
2006-2010

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -F
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment F
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	2006-2010	Analysis Year	2006

Input Data		Base Conditions	Site Conditions				
Length of segment, L (mi)		–	0.0275				
AADT (veh/day)	$AADT_{MAX}$ = 17,600 (veh/day)	–	53				AADT OK
Lane width (ft)		12	9				
Shoulder width (ft)		6	Right Shld:	0	Left Shld:	0	
Shoulder type		Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)		0	0.03				
Radius of curvature (ft)		0	100				Radius Value OK
Spiral transition curve (present/not present)		Not Present	Not Present				
Superelevation variance (ft/ft)		< 0.01	0				
Grade (%)		0	0				
Driveway density (driveways/mile)		5	0				
Centerline rumble strips (present/not present)		Not Present	Not Present				
Passing lanes (present (1 lane) /present (2 lane) / not present)		Not Present	Not Present				
Two-way left-turn lane (present/not present)		Not Present	Not Present				
Roadside hazard rating (1-7 scale)		3	6				
Segment lighting (present/not present)		Not Present	Not Present				
Auto speed enforcement (present/not present)		Not Present	Not Present				
Calibration Factor, Cr		1	1.00				

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1) CMF for Lane Width	(2) CMF for Shoulder Width and Type	(3) CMF for Horizontal Curves	(4) CMF for Super-elevation	(5) CMF for Grades	(6) CMF for Driveway Density	(7) CMF for Centerline Rumble Strips	(8) CMF for Passing Lanes	(9) CMF for Two-Way Left-Turn Lane	(10) CMF for Roadside Design	(11) CMF for Lighting	(12) CMF for Automated Speed Enforcement	(13) Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.06	19.84	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	26.371

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.000	8.58	1.000	0.000	26.37	1.00	0.010
Fatal and Injury (FI)	–	–	0.321	0.000	26.37	1.00	0.003
Property Damage Only (PDO)	–	–	0.679	0.000	26.37	1.00	0.007

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.010	1.000	0.003	1.000	0.007
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.001	0.038	0.000	0.184	0.001
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.000	0.037	0.000	0.015	0.000
Ran off road	0.521	0.005	0.545	0.002	0.505	0.004
Other single-vehicle collision	0.021	0.000	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.007	0.638	0.002	0.735	0.005
MULTIPLE-VEHICLE						
Angle collision	0.085	0.001	0.100	0.000	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.001	0.184	0.001	0.122	0.001
Sideswipe collision	0.037	0.000	0.038	0.000	0.038	0.000
Other multiple-vehicle collision	0.027	0.000	0.026	0.000	0.030	0.000
Total multiple-vehicle crashes	0.307	0.003	0.362	0.001	0.285	0.002

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	0.0275	0.4
Fatal and Injury (FI)	0.321	0.0	0.0275	0.1
Property Damage Only (PDO)	0.679	0.0	0.0275	0.3

Paraiso Springs Road - Segment F
Phase 4 - Buildout

Worksheet 1A -- General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -F
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment F
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	Phase 4 - Buildout	Analysis Year	

Input Data		Base Conditions	Site Conditions				
Length of segment, L (mi)		--	0.0275				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	--	385				AADT OK
Lane width (ft)		12	9				
Shoulder width (ft)		6	Right Shld:	0	Left Shld:	0	
Shoulder type		Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)		0	0.03				
Radius of curvature (ft)		0	100				Radius Value OK
Spiral transition curve (present/not present)		Not Present	Not Present				
Superelevation variance (ft/ft)		< 0.01	0				
Grade (%)		0	0				
Driveway density (driveways/mile)		5	0				
Centerline rumble strips (present/not present)		Not Present	Not Present				
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present	Not Present				
Two-way left-turn lane (present/not present)		Not Present	Not Present				
Roadside hazard rating (1-7 scale)		3	6				
Segment lighting (present/not present)		Not Present	Not Present				
Auto speed enforcement (present/not present)		Not Present	Not Present				
Calibration Factor, Cr		1	1.00				

Worksheet 1B -- Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1) CMF for Lane Width	(2) CMF for Shoulder Width and Type	(3) CMF for Horizontal Curves	(4) CMF for Super-elevation	(5) CMF for Grades	(6) CMF for Driveway Density	(7) CMF for Centerline Rumble Strips	(8) CMF for Passing Lanes	(9) CMF for Two-Way Left-Turn Lane	(10) CMF for Roadside Design	(11) CMF for Lighting	(12) CMF for Automated Speed Enforcement	(13) Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.03	1.06	19.84	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	26.371

Worksheet 1C -- Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.003	8.58	1.000	0.003	26.37	1.00	0.075
Fatal and Injury (FI)	--	--	0.321	0.001	26.37	1.00	0.024
Property Damage Only (PDO)	--	--	0.679	0.002	26.37	1.00	0.051

Worksheet 1D -- Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision $Type_{(FI)}$	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision $Type_{(PDO)}$	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	$(8)_{TOTAL}$ from Worksheet 1C	from Table 10-4	$(8)_{FI}$ from Worksheet 1C	from Table 10-4	$(8)_{PDO}$ from Worksheet 1C
Total	1.000	0.075	1.000	0.024	1.000	0.051
		$(2)x(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)x(7)_{PDO}$
SINGLE-VEHICLE						
Collision with animal	0.121	0.009	0.038	0.001	0.184	0.009
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.002	0.037	0.001	0.015	0.001
Ran off road	0.521	0.039	0.545	0.013	0.505	0.026
Other single-vehicle collision	0.021	0.002	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.052	0.838	0.015	0.735	0.037
MULTIPLE-VEHICLE						
Angle collision	0.085	0.006	0.100	0.002	0.072	0.004
Head-on collision	0.018	0.001	0.034	0.001	0.003	0.000
Rear-end collision	0.142	0.011	0.184	0.004	0.122	0.006
Sideswipe collision	0.037	0.003	0.038	0.001	0.038	0.002
Other multiple-vehicle collision	0.027	0.002	0.026	0.001	0.030	0.002
Total multiple-vehicle crashes	0.307	0.023	0.362	0.009	0.265	0.013

Worksheet 1E -- Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.1	0.0275	2.7
Fatal and Injury (FI)	0.321	0.0	0.0275	0.9
Property Damage Only (PDO)	0.679	0.1	0.0275	1.8

Paraiso Springs Road - Segment F
Base Prediction
(1991-2010)

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Paraiso Springs Rd -F
Agency or Company	Hatch Mott MacDonald	Roadway Section	Segment F
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	Hist. Base Calc. (1991-2010 Avg ADT)	Analysis Year	

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	–	0.0275					
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	287				AADT OK
Lane width (ft)	12	9					
Shoulder width (ft)	6	Right Shld:	0		Left Shld:	0	
Shoulder type	Paved	Right Shld:	Gravel		Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.03					
Radius of curvature (ft)	0	100					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	0					
Driveway density (driveways/mile)	5	0					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes [present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	6					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.06	19.84	1.00	1.00	1.00	1.00	1.00	1.00	1.22	1.00	1.00	26.371

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	N spf rs	Overdispersion Parameter, k	Crash Severity Distribution	N spf rs by Severity Distribution	Combined CMFs	Calibration Factor, Cr	Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.002	8.58	1.000	0.002	26.37	1.00	0.056
Fatal and Injury (FI)	–	–	0.321	0.001	26.37	1.00	0.018
Property Damage Only (PDO)	–	–	0.679	0.001	26.37	1.00	0.038

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Collision Type	Proportion of Collision Type(TOTAL)	$N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	Proportion of Collision Type(FI)	$N_{predicted\ rs\ (FI)}$ (crashes/year)	Proportion of Collision Type(PDO)	$N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.056	1.000	0.018	1.000	0.038
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.007	0.038	0.001	0.184	0.007
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.001	0.015	0.001
Ran off road	0.521	0.029	0.545	0.010	0.505	0.019
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.039	0.638	0.011	0.735	0.028
MULTIPLE-VEHICLE						
Angle collision	0.085	0.005	0.100	0.002	0.072	0.003
Head-on collision	0.016	0.001	0.034	0.001	0.003	0.000
Rear-end collision	0.142	0.008	0.184	0.003	0.122	0.005
Sideswipe collision	0.037	0.002	0.038	0.001	0.038	0.001
Other multiple-vehicle collision	0.027	0.002	0.026	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.017	0.362	0.008	0.265	0.010

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)
Crash severity level	Crash Severity Distribution (proportion)	Predicted average crash frequency (crashes/year)	Roadway segment length (mi)	Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.1	0.0275	2.0
Fatal and Injury (FI)	0.321	0.0	0.0275	0.6
Property Damage Only (PDO)	0.679	0.0	0.0275	1.4

ATTACHMENT I
PREDICTED AVERAGE CRASH FREQUENCY CALCULATION WORKSHEETS

Clark Road

Clark Road
1991-2005

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Clark Road
Agency or Company	Hatch Mott MacDonald	Roadway Section	MP 0.0 to MP 1.352
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	1991-2005	Analysis Year	1991

Input Data	Base Conditions	Site Conditions				
Length of segment, L (mi)	–	1.352				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	83			AADT OK
Lane width (ft)	12	9				
Shoulder width (ft)	6	Right Shld:	0	Left Shld:	0	
Shoulder type	Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.0				
Radius of curvature (ft)	0	0				Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present				
Superelevation variance (ft/ft)	< 0.01	0				
Grade (%)	0	2				
Driveway density (driveways/mile)	5	5				
Centerline rumble strips (present/not present)	Not Present	Not Present				
Passing lanes (present (1 lane) /present (2 lane) / not present))	Not Present	Not Present				
Two-way left-turn lane (present/not present)	Not Present	Not Present				
Roadside hazard rating (1-7 scale)	3	2				
Segment lighting (present/not present)	Not Present	Not Present				
Auto speed enforcement (present/not present)	Not Present	Not Present				
Calibration Factor, Cr	1	1.00				

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1) CMF for Lane Width	(2) CMF for Shoulder Width and Type	(3) CMF for Horizontal Curves	(4) CMF for Super-elevation	(5) CMF for Grades	(6) CMF for Driveway Density	(7) CMF for Centerline Rumble Strips	(8) CMF for Passing Lanes	(9) CMF for Two-Way Left-Turn Lane	(10) CMF for Roadside Design	(11) CMF for Lighting	(12) CMF for Automated Speed Enforcement	(13) Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.017

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.030	0.17	1.000	0.030	1.02	1.00	0.031
Fatal and Injury (FI)	–	–	0.321	0.010	1.02	1.00	0.010
Property Damage Only (PDO)	–	–	0.679	0.020	1.02	1.00	0.021

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.031	1.000	0.010	1.000	0.021
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.004	0.038	0.000	0.184	0.004
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.016	0.545	0.005	0.505	0.010
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.001
Total single-vehicle crashes	0.693	0.021	0.638	0.006	0.735	0.015
MULTIPLE-VEHICLE						
Angle collision	0.085	0.003	0.100	0.001	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.004	0.184	0.002	0.122	0.003
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.026	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.009	0.362	0.004	0.265	0.005

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	1.352	0.0
Fatal and Injury (FI)	0.321	0.0	1.352	0.0
Property Damage Only (PDO)	0.679	0.0	1.352	0.0

Clark Road
2006-2010

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information		
Analyst	DT	Roadway	Clark Road	
Agency or Company	Hatch Mott MacDonald	Roadway Section	MP 0.0 to MP 1.352	
Date Performed	07/29/11	Jurisdiction	Monterey County, CA	
Analysis Condition	2006-2010	Analysis Year	2006	

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	–	1.352					
AADT (veh/day) ($AADT_{MAX}$ = 17,800 (veh/day))	–	20					AADT OK
Lane width (ft)	12	9					
Shoulder width (ft)	8	Right Shld:	0		Left Shld:	0	
Shoulder type	Paved	Right Shld:	Gravel		Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.0					
Radius of curvature (ft)	0	0					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	2					
Driveway density (driveways/mile)	5	5					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes (present (1 lane) /present (2 lane) / not present)	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	2					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.017

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.007	0.17	1.000	0.007	1.02	1.00	0.007
Fatal and Injury (FI)	–	–	0.321	0.002	1.02	1.00	0.002
Property Damage Only (PDO)	–	–	0.679	0.005	1.02	1.00	0.005

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.007	1.000	0.002	1.000	0.005
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.001	0.038	0.000	0.184	0.001
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.000	0.037	0.000	0.015	0.000
Ran off road	0.521	0.004	0.545	0.001	0.505	0.003
Other single-vehicle collision	0.021	0.000	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.693	0.005	0.638	0.002	0.735	0.004
MULTIPLE-VEHICLE						
Angle collision	0.085	0.001	0.100	0.000	0.072	0.000
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.001	0.184	0.000	0.122	0.001
Sideswipe collision	0.037	0.000	0.038	0.000	0.038	0.000
Other multiple-vehicle collision	0.027	0.000	0.026	0.000	0.030	0.000
Total multiple-vehicle crashes	0.307	0.002	0.362	0.001	0.285	0.001

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	1.352	0.0
Fatal and Injury (FI)	0.321	0.0	1.352	0.0
Property Damage Only (PDO)	0.679	0.0	1.352	0.0

Clark Road
Phase 4 - Buildout

Worksheet 1A -- General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information		
Analyst	DT	Roadway	Clark Road	
Agency or Company	Hatch Mott MacDonald	Roadway Section	MP 0.0 to MP 1.352	
Date Performed	07/29/11	Jurisdiction	Monterey County, CA	
Analysis Condition	Phase 4 - Buildout	Analysis Year	1991	

Input Data	Base Conditions	Site Conditions				
Length of segment, L (mi)	--	1.352				
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	--	320			AADT OK
Lane width (ft)	12	9				
Shoulder width (ft)	6	Right Shld:	0	Left Shld:	0	
Shoulder type	Paved	Right Shld:	Gravel	Left Shld:	Gravel	
Length of horizontal curve (mi)	0	0.0				
Radius of curvature (ft)	0	0				Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present				
Superelevation variance (ft/ft)	< 0.01	0				
Grade (%)	0	2				
Driveway density (driveways/mile)	5	5				
Centerline rumble strips (present/not present)	Not Present	Not Present				
Passing lanes (present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present				
Two-way left-turn lane (present/not present)	Not Present	Not Present				
Roadside hazard rating (1-7 scale)	3	2				
Segment lighting (present/not present)	Not Present	Not Present				
Auto speed enforcement (present/not present)	Not Present	Not Present				
Calibration Factor, Cr	1	1.00				

Worksheet 1B -- Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x ... x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.017

Worksheet 1C -- Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-8	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.116	0.17	1.000	0.116	1.02	1.00	0.118
Fatal and Injury (FI)	--	--	0.321	0.037	1.02	1.00	0.038
Property Damage Only (PDO)	--	--	0.679	0.078	1.02	1.00	0.080

Worksheet 1D -- Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.118	1.000	0.038	1.000	0.080
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.014	0.038	0.001	0.184	0.015
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.003	0.037	0.001	0.015	0.001
Ran off road	0.521	0.061	0.545	0.021	0.505	0.040
Other single-vehicle collision	0.021	0.002	0.007	0.000	0.029	0.002
Total single-vehicle crashes	0.693	0.082	0.638	0.024	0.735	0.059
MULTIPLE-VEHICLE						
Angle collision	0.085	0.010	0.100	0.004	0.072	0.006
Head-on collision	0.016	0.002	0.034	0.001	0.003	0.000
Rear-end collision	0.142	0.017	0.184	0.006	0.122	0.010
Sideswipe collision	0.037	0.004	0.038	0.001	0.038	0.003
Other multiple-vehicle collision	0.027	0.003	0.026	0.001	0.030	0.002
Total multiple-vehicle crashes	0.307	0.038	0.362	0.014	0.265	0.021

Worksheet 1E -- Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.1	1.352	0.1
Fatal and Injury (FI)	0.321	0.0	1.352	0.0
Property Damage Only (PDO)	0.679	0.1	1.352	0.1

Clark Road
Base Prediction
(1991-2010)

Worksheet 1A – General Information and Input Data for Rural Two-Lane Two-Way Roadway Segments

General Information		Location Information	
Analyst	DT	Roadway	Clark Road
Agency or Company	Hatch Mott MacDonald	Roadway Section	MP 0.0 to MP 1.352
Date Performed	07/29/11	Jurisdiction	Monterey County, CA
Analysis Condition	Hist. Base Calculation (91-10 Avg ADT)	Analysis Year	1991

Input Data	Base Conditions	Site Conditions					
Length of segment, L (mi)	–	1.352					
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	–	67				AADT OK
Lane width (ft)	12	9					
Shoulder width (ft)	6	Right Shld:	0	Left Shld:	0		
Shoulder type	Paved	Right Shld:	Gravel	Left Shld:	Gravel		
Length of horizontal curve (mi)	0	0.0					
Radius of curvature (ft)	0	0					Radius Value OK
Spiral transition curve (present/not present)	Not Present	Not Present					
Superelevation variance (ft/ft)	< 0.01	0					
Grade (%)	0	2					
Driveway density (driveways/mile)	5	5					
Centerline rumble strips (present/not present)	Not Present	Not Present					
Passing lanes (present (1 lane) /present (2 lane) / not present))	Not Present	Not Present					
Two-way left-turn lane (present/not present)	Not Present	Not Present					
Roadside hazard rating (1-7 scale)	3	2					
Segment lighting (present/not present)	Not Present	Not Present					
Auto speed enforcement (present/not present)	Not Present	Not Present					
Calibration Factor, Cr	1	1.00					

Worksheet 1B – Crash Modification Factors for Rural Two-Lane Two-Way Roadway Segments

(1) CMF for Lane Width	(2) CMF for Shoulder Width and Type	(3) CMF for Horizontal Curves	(4) CMF for Super-elevation	(5) CMF for Grades	(6) CMF for Driveway Density	(7) CMF for Centerline Rumble Strips	(8) CMF for Passing Lanes	(9) CMF for Two-Way Left-Turn Lane	(10) CMF for Roadside Design	(11) CMF for Lighting	(12) CMF for Automated Speed Enforcement	(13) Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.03	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.017

Worksheet 1C – Roadway Segment Crashes for Rural Two-Lane Two-Way Roadway Segments

(1) Crash Severity Level	(2) N spf rs	(3) Overdispersion Parameter, k	(4) Crash Severity Distribution	(5) N spf rs by Severity Distribution	(6) Combined CMFs	(7) Calibration Factor, Cr	(8) Predicted average crash frequency, N
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.024	0.17	1.000	0.024	1.02	1.00	0.025
Fatal and Injury (FI)	–	–	0.321	0.008	1.02	1.00	0.008
Property Damage Only (PDO)	–	–	0.679	0.016	1.02	1.00	0.017

Worksheet 1D – Crashes by Severity Level and Collision Type for Rural Two-Lane Two-Way Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type(TOTAL)	(3) $N_{predicted\ rs\ (TOTAL)}$ (crashes/year)	(4) Proportion of Collision Type(FI)	(5) $N_{predicted\ rs\ (FI)}$ (crashes/year)	(6) Proportion of Collision Type(PDO)	(7) $N_{predicted\ rs\ (PDO)}$ (crashes/year)
	from Table 10-4	(8)TOTAL from Worksheet 1C	from Table 10-4	(8)FI from Worksheet 1C	from Table 10-4	(8)PDO from Worksheet 1C
Total	1.000	0.025	1.000	0.008	1.000	0.017
		(2)x(3)TOTAL		(4)x(5)FI		(6)x(7)PDO
SINGLE-VEHICLE						
Collision with animal	0.121	0.003	0.038	0.000	0.184	0.003
Collision with bicycle	0.002	0.000	0.004	0.000	0.001	0.000
Collision with pedestrian	0.003	0.000	0.007	0.000	0.001	0.000
Overturned	0.025	0.001	0.037	0.000	0.015	0.000
Ran off road	0.521	0.013	0.545	0.004	0.505	0.008
Other single-vehicle collision	0.021	0.001	0.007	0.000	0.029	0.000
Total single-vehicle crashes	0.893	0.017	0.838	0.005	0.735	0.012
MULTIPLE-VEHICLE						
Angle collision	0.085	0.002	0.100	0.001	0.072	0.001
Head-on collision	0.016	0.000	0.034	0.000	0.003	0.000
Rear-end collision	0.142	0.003	0.164	0.001	0.122	0.002
Sideswipe collision	0.037	0.001	0.038	0.000	0.038	0.001
Other multiple-vehicle collision	0.027	0.001	0.028	0.000	0.030	0.001
Total multiple-vehicle crashes	0.307	0.008	0.362	0.003	0.285	0.004

Worksheet 1E – Summary Results for Rural Two-Lane Two-Way Roadway Segments

(1) Crash severity level	(2) Crash Severity Distribution (proportion)	(3) Predicted average crash frequency (crashes/year)	(4) Roadway segment length (mi)	(5) Crash rate (crashes/mi/year)
	(4) from Worksheet 1C	(8) from Worksheet 1C		(3)/(4)
Total	1.000	0.0	1.352	0.0
Fatal and Injury (FI)	0.321	0.0	1.352	0.0
Property Damage Only (PDO)	0.679	0.0	1.352	0.0

Hatch Mott MacDonald

1300-B First Street
Gilroy, CA 95020
T 408-848-3122 www.hatchmott.com

September 27, 2011

Mr. John Thompson
Thompson Holdings, LLC
PO Box 2015
Horsham, PA 19044

Subject: Paraiso Hot Springs Resort, Monterey County, California
Traffic Analysis Response to Comments

Dear John,

Below is our response to the peer review comment letter for the *Paraiso Hot Springs Resort Traffic Analysis Report* prepared by Hatch Mott MacDonald on January 21, 2011. The traffic analysis report will be revised to incorporate the responses to comments presented below.

Comment 1- Introduction - The purpose of this review is to ensure that the traffic report conforms to Monterey County standards, to confirm that accepted traffic study methods were used, and to ensure that the findings and recommendations contained in the report adequately address project impacts.

Response: Comment acknowledged.

Comment 2 - Adequacy of the Study Area - Analyzing the one intersection and 13 individual roadway segments included in the traffic analysis is sufficient to accurately identify the potentially significant project impacts associated with the proposed project.

Response: Comment acknowledged.

Comment 3- General Plan Buildout Analysis - Hexagon was not able to verify the 69% growth factor cited in the traffic study for General Plan conditions. Data contained in Appendix C "Traffic Data" of the *2007 Monterey County General Plan Draft EIR* indicates that the traffic growth from existing to 2030 buildout conditions would be approximately 75% (based on existing to existing plus project buildout ADT volumes on Arroyo Seco Road, 4,100 to 7,200). This difference likely will have only a minor effect on the level of service analysis and safety analysis and likely would not change the conclusions of the report. It is recommended that the values or methodology used to derive the 69% growth factor be documented in the report.

Response: The intent of the cumulative condition analysis was to model cumulative traffic conditions for at least a 20-year time horizon. Information from the 2004 AMBAG model was used for this study because the Paraiso Hot Springs traffic study was begun and completed prior to the release of the 2007 Monterey County General Plan Draft EIR. The cumulative conditions reflected in the analysis reflect 2030 cumulative conditions based on the AMBAG 2030 land use and traffic forecasts with buildout of the project.

The Monterey County General Plan traffic analysis evaluated a number of future development scenarios. The 75% growth factor cited in the peer review letter is based on Existing Plus Project Buildout Conditions forecast for the Monterey County General Plan.

These volumes do not reflect forecasts of 2030 conditions, but do reflect a buildout condition for the County. The Monterey County General Plan 2030 Cumulative Conditions analysis scenario better reflects year 2030 traffic volumes compared to the Existing Plus Buildout forecasts referenced in the peer review letter.

The Monterey County General Plan EIR 2030 Cumulative Condition forecast volume for Arroyo Seco Road between Fort Romie Road and US 101 is 5,800 vehicles. Using the 2030 Cumulative Condition volume (5,800) to develop a cumulative condition growth factor would result in a growth factor of 42%, 40% less than the 69% value used in the Paraiso Hot Springs traffic study.

Using a 75% growth factor rather than a 69% growth factor would not change the conclusions of the study. Exhibit 1 shows the segment volume forecasts and includes a cumulative condition forecast using the 75% growth factor. Segment levels of service using the 75% growth factor are the same as the segment levels of service using the 69% growth factor.

Comment 4 - Trip Generation Analysis – A review of the site traffic projections finds that the trip generation land-use categories and rates appear to be consistent with the project description. However, a number of assumptions used in the trip generation analysis are not documented in the traffic study.

Response: The trip generation analysis documented in the traffic study provides a reasonable worst-case analysis of project generation based on the description of the project provided at the time the study was prepared and using established trip generation rates and relationships. Understanding that the trip generation for the project is complex as it involves a number of assumptions, the trip generation calculation worksheet for the project was expanded to provide a more detailed presentation of the project assumptions and the trip generation assumptions. In some cases, assumptions were modified to better reflect the project description and generally accepted trip generation factors. The revised trip generation analysis results in trip generation estimates that are lower than presented in the traffic study.

The revised trip generation worksheet by project phase is presented on Exhibits 2A – 2D. The assumptions used to derive the trip generation estimates are provided below.

1. ITE trip generation rates were used to estimate the trips for the total project trips.
2. The total project trip generation was reduced to account for employee trips that will occur not by passenger vehicle, but by the employee shuttle that will operate between Soledad and the project.
3. The total project trip generation was also reduced to account for off-site guest trips that will be served by shuttle rather than personal vehicle.
4. The employee and guest shuttle trips were estimated and are included in the project trip generation.
5. At project buildout, the applicant anticipates that the facility will be staffed by 218 employees per day operating within three general work shifts when the facility is fully occupied. ITE trip generation data for the Resort Hotel land use indicate that resort hotels are staffed at the rate of 1.7 employees per room. For the project, this rate was used to estimate the total number of employees that will be employed (306) at buildout and was adjusted to a five day work week to estimate the number of employees that will be employed on a daily basis at the project (218). The number of employees that will be employed by project phase is as follows:

	Units	Payroll Employees	Daily Employees
Phase 1	85	145	104
Phase 2	118	201	144
Phase 3	151	257	184
Phase 4	180	306	218

6. It was assumed that 50% of the employees would work the day shift, 37.5% would work the swing shift and 12.5% would work the night shift. On this basis, the number of employees working each shift would be as follows:

	Phase 1	Phase 2	Phase 3	Phase 4
Day Shift	52	72	92	109
Swing Shift	39	54	69	82
Night Shift	13	18	23	27
Total	104	144	184	218

7. Not all of the employees in any one shift will arrive at the site during the same one hour period. Employees for any one shift are expected to arrive and depart over a 2 to 3 hour period. Within a peak traffic period on a weekday, there is usually a peak hour for the generator, which is the highest one-hour trip generation for the use, and a street peak hour, which is the highest trip generation for the use that coincides with the highest one-hour volume on the adjacent street network. The peak for the proposed project would generally occur an hour or more prior to the peak hour for the roadway network because shift changes for hotels usually occur at 7 AM, 3 PM and 11 PM. On weekdays, street peaks usually occur after 7 AM and between 4 PM and 6 PM.
8. The project trip generation estimates for the AM and PM weekday conditions represent conditions for the "street peak hour." The Saturday peak hour volumes represent the peak hour of the project trip generation because these are the only trip rates available from ITE. An analysis of the weekday peak hour trip generation for the resort hotel on the basis of the "peak hour of the generator" would yield peak hour trip generation estimates very similar to the street peak analysis because the trip generation rates for the street peak and the peak hour of the project are not significantly different in magnitude and because the project will implement a shuttle system that will require 90% of the employees to use the shuttle to access the project site, thus significantly reducing the volume of trips generated by the project during the peak periods .
9. A daily trip generation rate for the employees of 2.5 trips per employee was used to estimate the total volume of vehicle trips that would be generated by the employees on a daily basis without the shuttle program. The 2.5 trip rate assumes that most, if not all, employees would drive via single-occupant vehicle and that a small percentage of employees would make multiple trips on and off the site during the day. Given the remote location of the site, it is not expected that many employees would leave the site during the day. However, the additional 0.5 trips per day per employee included in the daily trip generation rate accounts for multiple trips made by a portion of the employees, additional trips made by employees working split shifts, and additional trips associated with employees that work part-time.
10. The estimated number of employees that will arrive and depart during the peak hours are shown on in Section A of Exhibits 2A – 2D. During the AM weekday, 32% of the day shift employees are assumed to arrive and 60% of the night shift employees

are assumed to leave the site. During the weekday PM peak hour, 37% of the day shift were assumed to depart and 37% of the swing shift were assumed to arrive. For the Saturday peak hour, 45% of the day shift employees were assumed to depart and 45% of the swing shift employees were assumed to arrive. These relationships are based on trip generation data presented in the ITE Trip Generation Handbook for the Resort Hotel land use for the peak hour of the generator and the peak hour for the adjacent street. Also, it was assumed that 45% of the peak period project trip generation would occur during the peak hour of the generator (i.e., the project).

11. Ninety percent of the employees working on-site will be required to use the employee shuttle. The shuttle would replace the following number of single-occupant vehicle trips that would otherwise be made by employees:

	Phase 1	Phase 2	Phase 3	Phase 4
Daily	235	325	415	492
Weekday AM	22	30	38	46
Weekday PM	30	42	54	63
Saturday	37	51	65	77

12. Section B on the trip generation calculation worksheets shows the number of guest trips that will be replaced by guest shuttle trips. Guest shuttle trips consist of day trips and trips to and from the airport. Section C of the worksheet shows the estimated number of shuttle trips on a daily basis and during the peak hours. The guest day trips that would be transported by shuttle are described in No. 13 below. The guest trips to the airport are described in No. 14 below.
13. Guest Day Trips - One quarter of the guest parties are assumed to make an off-site trip per day and 20% of these trips are assumed to be served by the shuttle bus. Each guest party is assumed to consist of two people. The tables below tabulate the estimated number of off-site guest trips that would be replaced by shuttle trips and the number of shuttle trips that would replace the off-site guest trips. The values in the tables below are not displayed in the tables on Exhibits 2A-2D.

	Guest Parties Daily Off-Site Trips Replaced by Shuttle Trips			
	Phase 1	Phase 2	Phase 3	Phase 4
Inbound	4	6	8	9
Outbound	4	6	8	9
Total	8	12	16	18

	Daily Shuttle Trips For Off-Site Guest Trips			
	Phase 1	Phase 2	Phase 3	Phase 4
Inbound	2	2	3	3
Outbound	2	2	3	3
Total	4	4	6	6

14. The Resort will provide shuttle service to the Monterey Airport. It was assumed that peak day check-in and check-out would involve 25% of the guest units and 25% of the guests would arrive by air. On this basis, the guest party trips that would be replaced by shuttle trips and the shuttle trips to and from the airport are presented below. The values in the tables below are not displayed in the tables on Exhibits 2A-2D.

Total Vehicle Trips Replaced by Shuttle Trips (Daily)

	Phase 1	Phase 2	Phase 3	Phase 4
Inbound	5	8	10	11
Outbound	5	8	10	11
Total	10	16	20	22

Shuttle Trips That Replace Off-Site and Airport Trips (Daily)

	Phase 1	Phase 2	Phase 3	Phase 4
Inbound	2	3	4	5
Outbound	2	3	4	5
Total	4	6	8	10

15. The following tables provide a summary of the total shuttle trips that will be made by guests and the total guest vehicle trips that the shuttle trips replace. The top table shows the guest vehicle trips that are replaced by the shuttle and the bottom table shows the shuttle trips that replace the trips in the upper table.

Total Vehicle Trips Replaced by Shuttle Trips (Daily)

	Phase 1	Phase 2	Phase 3	Phase 4
Inbound	9	14	18	20
Outbound	9	14	18	20
Total	18	28	36	40

Shuttle Trips That Replace Off-Site and Airport Trips (Daily)

	Phase 1	Phase 2	Phase 3	Phase 4
Inbound	4	5	7	8
Outbound	4	5	7	8
Total	8	10	14	16

16. It was assumed that the employee shuttle would make 6 round trips per each shift change between the project site and Soledad at the buildout of the project (Phase 4). This would allow for about a 45 minute round trip over an approximate 3½ hour period. It is not likely that 6 round trips would be required between the swing shift and the night shift. Therefore, the calculation provides an allowance for additional mid-day employee related shuttle trips between the project site and Soledad. The employee shuttle trips for the other project phases was estimated based on the proportion of employees in each phase to the total employees at buildout.
17. The number of weekday AM and PM peak hour trips generated by the guests that would be reduced due to shuttle usage was determined by taking 20% of the remainder of the peak hour project trip generation (after the 10% internal trip reduction calculation) less the peak hour trips generated by the employees that would use the shuttle. For the Saturday peak hour, it was assumed that two inbound and two outbound airport related trips and that three inbound and three outbound off-site guest trips would be replaced by the shuttle at project buildout (Phase 4). The peak hour Saturday trips replaced by the shuttle for the other project phases is proportional to the total number of units by phase to the total project buildout units.

18. On the basis of the calculations described above, the employee and guest shuttle program will reduce the project trip generation by the following amounts by phase:

	Phase 1	Phase 2	Phase 3	Phase 4
Daily	227	319	407	480
AM Peak Hour	18	26	34	42
PM Peak Hour	26	38	50	60
Saturday PH	33	49	65	79

19. The total project trip generation is summarized on Exhibits 2A-2D in the box labeled Net Project Trip Generation. At buildout with 100 percent occupancy, the project would generate 406 trips daily, with 12 trips during the AM peak hour, 15 trips during the PM peak hour and 69 trips during the Saturday peak hour over the existing trip generation for the site.

    The net new project trips after accounting for the existing traffic generation of the site is summarized at the bottom of Exhibits 2A-2D (Project Net Trip Generation Above Existing Use). Based on the calculation procedures summarized above, the project at buildout with 100 percent occupancy would generate 386 trips daily, with 10 trips during the AM peak hour, 13 trips during the PM peak hour and 67 trips during the Saturday peak hour over the existing trip generation for the site. This compares to the project trip generation evaluated in the January 2011 traffic study of 482 daily trips, with 23 trips during the AM peak hour, 42 trips during the PM peak hour and 91 trips during the Saturday peak hour over the existing trip generation for the site at buildout with 100% occupancy. The trip generation evaluated in the January 2011 traffic study is greater than the trip generation based on the detailed trip generation analysis presented in the sections above. Therefore, the traffic analysis presented in the January 2011 traffic report provides a conservative, worst-case analysis of traffic impacts. Nevertheless, the trip generation estimates described above will be incorporated into an updated traffic report.

Comment 5 - Trip Generation Analysis, Hotel Trip Generation Rates - Trips attributable to hotel employees make up a sizable portion of the overall project trips. The source of the hotel employee trip rates or the assumptions used to develop these rates should be documented.

Response: The assumptions used in the revised trip generation calculation are described in #5-#11 above. The peak hour trip generation rates in the traffic study for the hotel employees are trip generation rates for ITE Land Use Code 140, Manufacturing. The trips generated by the Manufacturing land use are primarily employee trips because this use does not generate significant volumes of non-employee trips during the day. The Manufacturing land use trip generation rates provide a good surrogate for estimating the number of employee trips generated by a land use. For the revised calculations presented on Exhibits 2A –2D attached to this letter, the estimated number of employees arriving and departing during the peak hours was used for the peak hour trip generation rather than a trip generation calculation using ITE trip generation rates for the manufacturing land use. Since three work shifts are proposed at the hotel, the calculation based on the estimated employees arriving and departing during the peak hours provides a more precise estimate of the employee trip generation during the peak hours than the manufacturing land use trip generation rate. A daily trip rate of 4.5 trips per employee was inadvertently used for the hotel employees rather than 2.5 trips per employee, which is slightly higher than the daily trip generation rate for the manufacturing land use.

Comment 6 - Trip Generation Analysis, Employees to be Shuttled, Phase 3 -The number of employees to be shuttled to the site does not appear to match assumptions documented in Footnote 4 of the trip generation table. Additionally, some of the employee numbers fluctuate from one phase to the next. For example, the number of weekday day employees shuttled with various phases is 34 with Phase 1, 42 with Phase 2, and 35 with Phase 3.

Response: The number of employees per phase is proportional to the number of hotel rooms per phase. The number of employees arriving by shuttle for Phase 3 shown on Exhibit 6C of the January 21, 2011 report was incorrectly calculated and was underestimated. The corrected trip generation calculation for Phase 3 is attached as Exhibit 3 using the trip generation worksheet provided in the January traffic study. In the January 2011 study, the number of employees using the shuttle was underestimated with 44 employees estimated using the employee shuttle for Phase 3 on a weekday. The correct number of employees using the shuttle using the trip generation methodology documented in the January 2011 report is 63. The underestimation of employee shuttle trips for Phase 3 resulted in an overestimation of the total project trip generation for the January 2011 study. In the January report, the maximum project Phase 3 net trip generation above the existing use was 455 daily trips and the corrected value is 385 daily trips, a difference of 70 vehicle trips per day. In the January report, the average Phase 3 net trip generation above the existing use was indicated to be 313 daily trips versus the corrected value of 264 daily trips, a difference of 49 vehicle trips per day. These comparisons are based on the trip generation methodology described in the January 2011 report.

Comment 7 - Trip Generation Analysis, Allocation of Employee Trips to the Peak Hours - The assumptions used to allocate trips associated with the various employee shifts to the various study peak hours should be documented for clarity.

Response: The allocation of trips associated with the various employee shifts to the various peak hours is described in #7-#10 in response to Comment 4.

Comment 8 - It is not clear from our review of the trip generation table, how the 20% guest trip reduction (due to the shuttle) is calculated. Also, this number is lower under buildout than under Phase 3 conditions.

Response: The methodology for calculating the estimate of guest shuttle use for the peak hours is described in #17 in response to Comment 4. The methodology for calculating the estimate of daily guest shuttle use is described in #12-#15 in response to Comment 4.

The number of employees arriving by shuttle, which effects the calculation of the guest trip reduction, has been corrected for Phase 3.

Comment 9 – The safety analysis does not consider intersections. Two intersections should be added – Clark Road/Paraiso Springs Road and Clark Road/Arroyo Seco Road.

Response:

<u>Clark Road/Paraiso Springs Road Intersection</u>

The Clark Road/ Paraiso Springs Road is an uncontrolled, three-leg intersection. The HSM does not currently contain prediction algorithms for uncontrolled or YIELD controlled intersections. Application of the three-leg, stop control accident prediction equations that are

included in the HSM would not provide a valid analysis of the potential safety impacts of the project to the intersection.

The comparison of the historical crash rates to statewide average crash rates is typically used in traffic impact studies to determine whether an existing safety related problem exists at an intersection. In addition, the need for safety related improvements at an intersection based on existing or future traffic volumes is typically assessed in traffic impact studies by evaluating the following:

1. Warrants for traffic control
2. Warrants for left and right turn channelization
3. Warrants for road lighting

The HSM provides a methodology to estimate future accident rates for rural two-lane roads and intersections, but in the case of the Paraiso Springs Road/Clark Road intersection, the predictive equations and methodology do not apply. Therefore, warrants for traffic control, channelization and road lighting were evaluated at the Paraiso Springs Road/Clark Road intersection as a substitute to a safety analysis based on the HSM predictive equations.

Between 1991 and 2010, there were no reported accidents at the Paraiso Springs Road/Clark Road intersection. This compares to an average statewide accident rate for three-leg, uncontrolled intersections that is documented by Caltrans of 0.15 accidents per million entering vehicles. Based on a 20-year accident history, there have been no accidents and, therefore, there is no demonstrated safety problem at the Paraiso Springs/Clark Road intersection.

The California MUTCD provides the following guidance for the installation of STOP signs on low-volume rural roads:

> STOP (R-1) and YIELD (R1-2) signs should be considered for use on low-volume roads where engineering judgment or study, consistent with the provisions of Sections 2B.04 to 2B.10, indicates that either of the following conditions applies:
>
> A. An intersection of a less-important road with a main road where application of the normal right-of-way rule might not be readily apparent.
> B. An intersection that has restricted sight distance for the prevailing vehicle speeds.

There is no indication that application of the normal right-of-way rule is a problem at the intersection or will be a problem in the future with the project developed. There have been no accidents at the intersection over the last 20-year period. The corner sight distance looking from the Clark Road approach to the Paraiso Springs Road approaches is not constrained. The sight distance looking from the Clark Road approach to the south is about 500 feet and the sight distance looking to the north is about 660 feet. Therefore, no change to the existing traffic control is recommended in conjunction with development of the project.

The County of Monterey has an adopted policy for evaluating the need for left turn lanes. The warrant worksheet is provided in Attachment A. The left turn warrant was evaluated using the cumulative condition peak hour volumes documented in the January 2011 traffic study for the project. As shown on the worksheet, a left turn lane is not warranted on the southbound Paraiso Springs Road approach to Clark Road. The cumulative condition traffic volumes in the January 2011 study represent 20-year forecast traffic condition and

approximate General Plan Buildout traffic forecasts as documented in the Monterey County General Plan Circulation Study.

Right-turn lane warrants documented in NCHRP Report 287, *Intersection Channelization Guide*, were used to evaluate the need for right turn channelization on the northbound Paraiso Springs approach to Clark Road. As shown on the worksheet contained in Attachment A, a right turn lane would not be warranted on the northbound Paraiso Springs approach to Clark Road based on the cumulative traffic volumes presented in the January 2011 traffic report.

Widening to provide separate left and right turn channelization on the Clark Road approach to Paraiso Springs Road is not required because the intersection is projected to continue to operate at an excellent LOS A with the project developed. The Paraiso Springs Road/Clark Road intersection is projected to operate at LOS A for the long-range cumulative condition as documented in the January 2011 traffic impact study for the project.
Warrants for intersection lighting are published in the Caltrans Traffic Manual. At existing intersections, safety lighting may be provided if one of the following conditions is met:

1. A Minimum Vehicular Volume, an Interruption of Continuous Traffic or Minimum Pedestrian Volume traffic signal warrant is satisfied for any single hour which may be in darkness in winter months.
2. Four or more nighttime accidents in any recent consecutive 12-month interval or six or more nighttime accidents in any recent consecutive 24-month interval.
3. Where a traffic signal or an intersection flashing beacon is installed.
4. Where combinations of sight distance, or horizontal or vertical curvature of the roadway, channelization or other factors constitute a confusing or unsatisfactory condition that may be improved with lighting. The project report covering such lighting should include an explanation of the factors constituting the confusing or unsatisfactory condition.

To meet the warrant described in No. 1 would require peak hour volumes entering the intersection of at least 400 vehicles. Peak hour volumes with the project fully developed are not anticipated to exceed 100 vehicles on any of the intersection approaches. Therefore the first warrant is not met. No accidents have been reported in the last 20 years at the intersection. There is no flashing beacon or traffic signal installed at the intersection. The horizontal and vertical alignments of the intersecting roadways and the sight distance conditions at the intersection do not create confusing or unsatisfactory conditions that would require the installation of lighting. The criteria required for the installation of intersection lighting is not met.

On the basis of the analyses described above, safety related improvements consisting of traffic control, left and right turn lanes and roadway lighting are not required at the Paraiso Springs Road/Clark Road intersection under existing conditions or with the project developed.

Clark Road/Arroyo Seco Road Intersection

The Arroyo Seco Road/Clark Road intersection is outside the original study area and beyond the scope of work as verified in Comment 2 of the peer review. Nevertheless, the HSM safety analysis was applied to the Arroyo Seco Road/Clark Road intersection to verify that the project would not have a safety related impact to the intersection. According to Monterey

County accident records, no accidents have occurred at the Arroyo Seco Road/Clark Road intersection between 1991 and 2010.

Exhibit 4 shows the results of the HSM accident prediction analysis for the Arroyo Seco Road/Clark Road intersection. The HSM safety model predicts 2.6 accidents should have occurred at the Arroyo Seco Road/Clark Road intersection between 1991 and 2010, or 0.13 accidents per year on average. The HSM accident prediction worksheets for the 1991 to 2010 period are provided in Attachment B. Because no accidents occurred at the intersection between 1991 and 2010, the Empirical Bayes adjustment results in an expected crash frequency of about 1 crash over the 20-year period or 0.54 crashes per year.

The expected accident frequency at the Arroyo Seco Road/Clark Road intersection at project buildout is 0.13 crashes per year. This calculation utilizes traffic forecasts based on project buildout as reflected in the project trip generation estimate provided on Exhibit 2D. The HSM calculation worksheets for the predicted accidents during the base (1991-2010) period and the forecast period are contained in Attachment B.

Exhibit 5 presents a summary of the crash history and expected crash frequency at project buildout at the Arroyo Seco/Clark Road intersection. Also, the expected accident rate at project buildout is summarized and compared to the statewide average accident rate on Exhibit 5. The columns that are labeled "Predicted Accident Frequency" display the predicted accident statistics derived from the HSM model that are not adjusted for the Empirical Bayes procedures. The columns labeled "Expected Accident Frequency" show the expected accident statistics after the Empirical Bayes adjustment. According to Caltrans statistics, the statewide average accident rate for a rural "T" intersection with stop control on the minor road approach is 0.20 accidents per million entering vehicles. The expected accident rate at the Arroyo Seco Road/Clark Road intersection at project buildout is 0.18 accidents per million entering vehicles. The expected accident rate is less than the statewide average accident rate. Therefore, the safety related impact of the project would not be significant and no improvements would be required at the intersection.

Comment 10 – The Highway Safety Manual (HSM) analysis should have considered Crash Modification Factors including grade, horizontal curvature and vertical curvature.

Response: At the time the safety analysis was performed, the Highway Safety Manual had just been released and no software was available to perform a comprehensive analysis. In order to determine the relative change in accident frequency associated with potential road improvements, the only roadway characteristics subject to change were included. These include lane width, shoulder width, striping and delineation and roadside barriers. Attached is a new safety analysis that uses a spreadsheet analysis tool that is provided on the HSM website. The results are summarized on Exhibits 6 through 11. The analysis tool includes all of the roadway characteristics and the Empirical Bayes procedures have been applied to derive expected accident frequencies from the predicted frequencies. There are no quantitative or qualitative changes in conclusions documented in the January 2011 traffic study resulting from the use of the HSM spreadsheets and the Empirical Bayes adjustment.

Exhibit 6 provides a summary of the safety analysis using the HSM analysis spreadsheet and the Empirical Bayes adjustments for Paraiso Springs Road. The left portion of the table on Exhibit 6 provides an analysis of the predicted accidents on Paraiso Springs Road over the last 20 year period. A sixth segment, F, has been added to the analysis. Segment F is the curve located at the Panziera driveway.

The HSM model predicts 4 crashes should have occurred on Paraiso Springs Road over the last 20-year period. Over the last 20 year period, 2 crashes have been recorded. Applying the Empirical Bayes adjustment to the study roadway, the expected crash frequency is about 3 crashes over the 20-year period or 0.145 crashes per year.

The last three columns on Exhibit 6 show the predicted and expected crashes for the project buildout condition. The HSM model predicts 0.266 crashes per year would occur on Paraiso Springs Road at project buildout. The last column in the table provides the expected accident rate at project buildout after applying the 1991-2010 condition Empirical Bayes adjustment. At project buildout, the expected accident frequency for the study roadway is 0.193 crashes per year. This is based on the ADT estimates presented in the traffic study, which are conservatively high.

Exhibit 7 provides a summary of the safety analysis for Clark Road using the HSM analysis spreadsheet and the Empirical Bayes adjustments. The HSM model predicts 0.5 crashes should have occurred on Clark Road over the last 20-year period. Over the last 20 year period, no crashes have been recorded. Applying the Empirical Bayes adjustment to the study roadway, the expected crash frequency is about 0.433 crashes over the 20-year period or 0.022 crashes per year.

The HSM model predicts 0.118 crashes per year would occur on Clark Road at project buildout. The last column in the table provides the expected accident rate at project buildout after applying the 1991-2010 condition Empirical Bayes adjustment. At project buildout, the expected accident frequency for the study roadway is 0.102 crashes per year.

The HSM crash frequency calculation worksheets for the segment analysis are presented in Attachments C through I.

Comment 11 - The sharp curve in Paraiso Springs Road, near the Panziera property driveway, should be evaluated as a curved segment. If the accident frequency is substantially higher with this segment evaluated as a curve, then stop signs should be added at this location to create a stop-controlled intersection as a way to reduce the accident frequency.

Response: A new segment for this curve has been added in the safety analysis. This segment was analyzed in conjunction with the other Paraiso Springs Road segment to assess the crash frequency for the road in total. The analysis procedure that was used is consistent with the Predictive Method for Rural Two-Lane, Two-Way Roads methodology that is documented in the Highway Safety Manual. Impact significance is determined on the basis of comparisons to statewide accident rates for the roadway as a whole, as opposed to individual elements of the roadway. This is standard practice for evaluating safety impacts. Therefore, the conclusion remains that there is no safety impact.

Comment 12 – Hexagon was able to reproduce the predicted accident frequencies calculated in Exhibits 13 and 15. Therefore, it appears as though the CMFs for lane and shoulder widths were applied correctly. However, we were not able to reproduce the lane and shoulder width CMFs calculated in Exhibits 14 and 16. We recommend adding additional discussion to the text of the report indicating how these CMFs were calculated.

Response: Comment acknowledged. Based on the new analysis using HSM software described in the response to Comment 10, CMF values documented in the Highway Safety Manual have been utilized. The CMF values used in the analysis are shown on Exhibits 8 and 9.

Comment 13 – The calculated predicted crash frequency results were not weighted using the Empirical Bayes Method.

Response: The predicted number of crashes at project buildout based on the HSM equations has been adjusted using the Empirical Bayes analysis. The results of the analysis are described in the response to Comment 10 and are summarized on Exhibits 6 and 7. The HSM model predicted 4.05 crashes (0.203 crashes per year) should have occurred on Paraiso Springs Road between 1991 and 2010. During this period, two accidents occurred (0.10 crashes per year). The expected number of crashes during the 1991 to 2010 period after applying the Empirical Bayes method is 2.9 (0.15 crashes per year). The Empirical Bayes analysis was applied to future conditions with the project built out. During the 20-year period with Phase 4, project buildout, 3.8 crashes are expected to occur, or 0.193 crashes per year.

The HSM model predicted 0.50 crashes (0.025 crashes per year) should have occurred on Clark Road between 1991 and 2010. During this period, no accidents occurred. The expected number of crashes during the 1991 to 2010 period after applying the Empirical Bayes method is 0.433 (0.022 per year). During the 20-year period with Phase 4, project buildout, 2.0 crashes are expected to occur, or 0.10 crashes per year.

Comment 14 – The traffic study does not identify thresholds used for determining what magnitude increase in accident frequency would be considered significant. The risk assessment thresholds identified in *Guidelines for Geometric Design of Very Low-Volume Roads* as described in Comment 16 should be considered for use as the thresholds.

Response: The traffic study does identify thresholds used for determining what magnitude increase in accident frequency would be considered significant – Statewide Average Accident Rates. This is described on Page 13 of the January 2011 traffic study. This is the standard method used for determining whether a roadway or intersection has safety issues that need to be remediated. The response to Comment 16 describes that the use of the risk assessment thresholds in *Guidelines for Geometric Design of Very Low-Volume Roads* result in the same conclusion that the Project does not require improvements.

Comment 15 – The traffic analysis compares the projected accident frequencies with the project to accident frequencies associated with "historic" conditions when the site was previously in operation (i.e., pre-2005 conditions). This comparison is useful to gain perspective on how the projected traffic volumes and accident conditions will compare to previous times when roadway volumes were similar. However, we recommend using existing conditions for the baseline to which project conditions are compared for the purpose of determining significant changes in accident frequency. Existing conditions rather than historical conditions should be used for the determination of impacts.

Response: The analysis of impact significance is discussed in the response to Comment 16. The impact significance test used in the traffic study was a comparison of the predicted accident rate versus the Statewide Average Accident Rates for similar facilities. Historical crash frequency over the last 20-year period was used to derive historical crash rates for the study roadways. This is appropriate because roadway design elements have remained

relatively unchanged over this period, crash statistics are available for this period of time and traffic volumes on the roadway for 15 of the last 20-year period are comparable to the volumes that the project will generate. The crash history for the last 20-year period provides a good indication of the expected future crash frequency with the project developed.

Comment 16 - Safety Analysis Thresholds of Significance – The traffic study does not cite a threshold for evaluating existing roadways in which traffic volumes would increase due to a proposed development project. A risk assessment threshold of one additional traffic crash per mile of roadway every 6 to 9 years could be used as the basis for assessing the magnitude of likely safety impacts on an existing road associated with a new development project in which the action or proposed action would be the change in traffic volume attributable to the proposed development project. Note that the risk assessment threshold is not a threshold for identifying significant environmental impacts.

Response: Comparison of predicted accident rates with the project to state-wide average accident rates was the methodology used in the traffic study to evaluate safety impact significance.

Exhibit 10 presents a summary of the crash history and expected crash frequency at project buildout on Paraiso Springs Road. Accident rates are also summarized and compared to statewide accident averages. Exhibit 10 is a revised version of Exhibit 13 presented in the January 2011 traffic study.

The build-out of the Paraiso Hot Springs Resort is expected to result in 0.193 crashes per year along the 1.419 mile segment of Paraiso Springs Road between the Project Site and Clark Road. The historical expected accident rate over the last 20 year period is 0.145 crashes per year. This is an increase of 0.048 crashes per year, or about 0.034 accidents per mile per year. This is an increase of 1 accident per mile every 29.6 years, which is less frequent than the peer review suggested threshold of one accident per mile every 6 to 9 years. A comparison of the most recent 5-year period to conditions at project buildout indicates that the project will result in an increase of 1 accident every 10.0 years. Therefore, the Project does not create a need for improvements on Paraiso Springs Road.

Exhibit 11 presents a summary of the crash history and expected crash frequency at project buildout on Clark Road. Accident rates are also summarized and compared to statewide accident averages. Exhibit 11 is a revised version of Exhibit 14 presented in the January 2011 traffic study.

The build-out of the project is expected to result in 0.102 accidents per year along the 1.352 mile segment of Clark Road between Paraiso Springs Road and Arroyo Seco Road. The historical expected accident rate over the last 20 years is 0.022 accidents per year. This is an increase of 0.080 accidents per year, or about 0.056 accidents per mile per year. This is an increase of 1 accident per mile every 17.7 years, which is less frequent than the peer review suggested threshold of one accident per mile every 6 to 9 years. A comparison of the most recent 5-year period to conditions at project buildout indicates that the project will result in an increase of 1 accident every 14.9 years. Therefore, on the basis of the peer review suggested threshold criteria, the Project does not create a need for improvements on Clark Road.

The use of the state-wide average accident rates result in the determination that the Project will not result in a significant safety impact. The expected accident rate of 0.89 accidents per million miles of travel on Paraiso Springs Road is less than the statewide average of 1.02 accidents per million miles of travel. The expected accident rate of 0.65 accidents per million miles of travel on Clark Road is less than the statewide average of 1.02 accidents per million miles of travel for similar roadways. Therefore, the proposed project will not have a significant safety impact to Paraiso Springs Road or Clark Road.

Application of the suggested significance criteria (change in accidents over a 6 to 9 year period) as suggested in the peer review comment letter would not change the conclusions of the analysis. In addition, it should be noted that the threshold of acceptable risk levels referenced from the AASHTO Guidelines for Geometric Design of Very Low-Volume Local Roads were developed for new road construction, not existing roads. In the case of a traffic impact analysis such as this, the suggested criteria does not apply.

Comment 17- Roadway Design Standards – The project will represent many new travelers who are not familiar with the road that the Rural Recreational and Scenic Roads functional classification should be used. This would result in 20 foot roadway width for design speeds of 40mph or more, a clear zone of 6 feet where feasible, selective use of roadside barriers such as guardrail where clearly warranted, provision of sight distance and vertical and horizontal alignment in compliance with AASHTO Guidelines for Very Low Volume Roads.

Response: The comment relates to mitigations, of which the project needs none. In addition, the HSM safety analysis does not differentiate functional subclass (road type). Also, driver familiarity is not a consideration in the HSM analysis. This comment is therefore moot.

Comment 18 – Conclusions and Recommendations – The peer review of the traffic study identified the following key issues and observations:

1. It is recommended that the values or methodology used to derive the 69% cumulative traffic growth factor be documented in the report. **Response:** The 69% growth factor was derived from traffic forecasts from the 2004 AMBAG traffic model. The analysis has been updated to use a worst case 75% increase, which does not change any conclusion documented in the January 2011 study. See response to Comment 3.

2. The various assumptions, methodologies, and calculations used in the trip generation analysis should be verified for accuracy and correctness. It is recommended that additional documentation be added to the traffic study to support the trip generation analysis. **Response:** A description of the methodology and assumptions are included in the response to Comment 4. Revised trip generation worksheets that include additional detail are attached.

3. It is recommended that the effects of other geometric features on the study route be considered, such as grade, vertical curvature, horizontal curvature and key intersections. It is recommended that additional documentation be added to the report with respect to the calculated crash modification factors used in the analysis. Consideration should be given to weighting the accident analysis results with actual observed crash data for the study route. The various assumptions in the safety analysis should be documented in the traffic study. **Response:** The safety analysis has been revised to include all roadway characteristics as described in the response to Comment 10. The Empirical Bayes Method has been used to weight the accident

analysis results based on the actual observed crash data as described in the response to Comment 13. The safety analysis worksheets provide a description of each road segment that was analyzed.

4. The traffic analysis compares the projected accident frequencies with the project to accident frequencies associate with "historic" conditions when the site was previously in operation. It is recommended that existing conditions be used for the baseline to which project conditions are compared. This procedure should be combined with engineering judgment and consultation with County traffic engineers to determine if roadway improvements are necessary to remedy a potentially significant increase in accident frequency. **Response:** As described in the response to Comment 15, the expected accident rates are compared to the Statewide Average Accident Rates for similar facilities to evaluate impact significance, not historical accident rates. The historical accident rates are provided for comparison. The historical accident history was used in the Empirical Bayes adjustments to adjust the predicted accident frequency with the historical actual accident frequency. The historical accident data are used in the analysis for calibration of the HSM model results and are not used to test the significance of project safety impacts.

5. The traffic study does not identify the thresholds used for determining what magnitude of increase in accident frequency would be considered significant, thereby warranting roadway improvements. It is recommended that the risk assessment thresholds contained in Guidelines for Geometric Design of Very Low-Volume Local Roads be considered as the thresholds for determining if roadway improvements are warranted as a result of the added traffic volume associated with the project. **Response:** This comment is addressed in the response to Comment 16. Comparison of predicted accident rates with the project to state-wide average accident rates was the methodology used in the traffic study to evaluate safety impact significance. On this basis, the proposed project will not have a significant safety impact to Paraiso Springs Road or Clark Road roadway segments. Application of the suggested threshold criteria of adding no more than one additional traffic crash per mile of roadway every 6 to 9 years would not change the conclusion of the analysis.

6. Any roadway improvement made should meet the design standards for Rural Recreational and Scenic Roads. County traffic engineers should be consulted and engineering judgment should be exercised on a case-by-case basis to determine the extent and timing of necessary roadway improvements. The appropriate roadway design standard should be determined in consultation with County traffic engineers. **Response:** The comment relates to mitigations, of which the project needs none. In addition, the HSM safety analysis does not differentiate functional subclass (road type) or include driver familiarity as a consideration in the analysis. The project will not result in significant safety impacts on the basis of the safety analysis conducted for the project.

The responses provided in this letter address the comments provided in the peer review of the January 21, 2011 traffic study prepared for the Paraiso Hot Springs project. Additional discussion of analysis assumptions and procedures as well as additional analysis of potential project impacts are provided in this letter. The conclusions documented in the January 2011 study remain unchanged. The project will not result in significant safety and capacity impacts.

Please do not hesitate to contact me or Dan Takacs if you have any questions regarding this information.

Sincerely,

Keith B. Higgins, CE, TE
Vice President

Exhibit 1
Daily Segment Traffic Volumes and Levels of Service
(Based on Average Daily Traffic (ADT))

Location	2004 Volumes	Source	Existing (2009) Conditions		Historic Project Traffic	Existing + Historic Project Conditions		70% Project Traffic	Existing + 70% Project Conditions		100% Project Traffic	Existing + 100% Project Conditions		Long Term Cumulative Conditions (69% Growth Factor)		Long Term Cumulative Conditions (75% Growth Factor)	
			Volumes (ADT)	LOS	Volumes (ADT)	Volumes (ADT)	LOS	Volumes (ADT)	Volumes (ADT)	LOS	Volumes (ADT)	Volumes (ADT)	LOS	Volumes (ADT)	LOS	Volumes (ADT)	LOS
Arroyo Seco Rd. from Thorne Rd. to Clark Rd.	1,800	1	1,800	A	63	1,863	A	66	1,866	A	96	1,896	A	3,100	A	3,150	A
Arroyo Seco Rd. from Fort Romie Rd. to State Highway 101	4,200	1	4,400	B	219	4,619	B	234	4,634	B	338	4,738	B	7,100	B	7,350	B
Fort Romie Rd. from Foothill Rd. to Arroyo Seco Rd.	2,100	1	2,200	A	16	2,216	A	16	2,216	A	24	2,224	A	3,600	A	3,700	A
Foothill Rd. from Fort Romie Rd. to Paraiso Springs Rd.	160	1	220	A	16	236	A	16	236	A	24	244	A	260	A	280	A
Paraiso Springs Rd. from Clark Rd. to Arroyo Seco Rd.	NA	2	150	A	250	400	A	32	182	A	48	198	A	300	A	300	A
Paraiso Springs Rd. southwest of Clark Rd. (Segment A)	NA	2	150	A	313	463	A	332	482	A	482	632	A	700	A	700	A
Paraiso Springs Rd. from Project Site to Clark Rd. (Segment C)	NA	2	85	A	313	398	A	332	417	A	482	567	A	580	A	580	A
Paraiso Springs Rd. at Project Site Entrance (Segment E)	NA	2	20	A	313	333	A	332	352	A	482	502	A	500	A	500	A
Clark Rd. from Paraiso Springs Rd. to Arroyo Seco Rd.	NA	2	20	A	63	83	A	300	320	A	434	454	A	450	A	450	A
Arroyo Seco Hwy. 101 SB Off-Ramp	1,680	3	2,000	A	94	2,094	A	100	2,100	A	145	2,145	A	2,840	A	2,940	A
Arroyo Seco Hwy. 101 SB On-Ramp	450	3	550	A	16	566	A	17	567	A	24	574	A	760	A	790	A
Arroyo Seco Hwy. 101 NB Off-Ramp	390	3	400	A	15	415	A	17	417	A	24	424	A	660	A	690	A
Arroyo Seco Hwy. 101 NB On-Ramp	1,680	3	1,500	A	94	1,594	A	100	1,600	A	145	1,645	A	2,840	A	2,940	A
County Volume Totals	8,260		8,620														
Percentage Change from 2004 to 2009			4%														

Notes:
1. * - The sources of volumes are as follows:
   1. 2009 Monterey County Traffic Counts
   2. Estmates from peak hour manual counts.
   3. 2009 Ramp Volumes on the California State Freeway System - District 5, Caltrans.
2. NA - Traffic Counts are not provided by Monterey County.

Paraiso Hot Springs, Monterey County
Project Trip Generation
Phase 1

	TRIP RATE SOURCE	INDEPENDENT SIZE	AVG. DAILY TRIPS [1]	AM PEAK HOUR TOTAL PEAK HOUR	AM IN	AM OUT	PM PEAK HOUR TOTAL PEAK HOUR	PM IN	PM OUT	SAT. PEAK HOUR TOTAL PEAK HOUR	SAT IN	SAT OUT
GROSS TRIP GENERATION RATES												
Proposed Project												
Resort Hotel [2]	ITE 330	Per Occupied Room	6.13	0.37	72%	28%	0.49	43%	57%	1.23	50%	50%
Residential (Single-Family Detached) [3]	ITE 210	Per Unit	9.57	0.75	25%	75%	1.01	63%	37%	0.93	53%	47%
Recreational Homes [3]	ITE 260	Per Unit	3.16	0.16	67%	33%	0.26	41%	59%	0.36	48%	52%
Hotel Employee		Per Employee	2.50	-	-	-	-	-	-	-	-	-
Previous Use												
Day Guests		Per Day Guest	5.00	0.4	94%	6%	0.4	6%	94%	0.2	50%	50%
Visitor Units and Campground/Recreational Vehicle Park		Per Occupied Unit	6.13	0.2	42%	58%	0.37	69%	31%	0.74	60%	40%

	TRIP RATE SOURCE	PROJECT SIZE	AVG. DAILY TRIPS [1]	AM PEAK HOUR TOTAL PEAK HOUR	AM IN	AM OUT	PM PEAK HOUR TOTAL PEAK HOUR	PM IN	PM OUT	SAT. PEAK HOUR TOTAL PEAK HOUR	SAT IN	SAT OUT
PROJECT GROSS TRIP GENERATION												
Resort Hotel (100% Occupied)	ITE 330	62 Units	380	23	17	6	30	13	17	76	38	38
Residential Homes (100% Occupied)	ITE 210	5 Units	48	4	1	3	5	3	2	5	3	2
Recreational Homes (100% Occupied)	ITE 260	18 Units	57	3	2	1	5	2	3	6	3	3
Gross Total		85 Units	485	30	20	10	40	18	22	87	44	43
Net Total Assuming 10% Internal Reduction between Residential and Resort			436	27	18	9	36	16	20	78	40	39
EMPLOYEES[4]												
Employees per room	1.7											
Total Payroll Employees (1.7 x 85)	145											
Workweek reduction factor (5 day work week, 5/7)	0.71											
Employees per day (all shifts)	104											
TRIP REDUCTION STRATEGIES	Total Employees	Shuttle Employees										
A. Employee Shuttle Trip Reduction[5]												
Employee Shuttle (Weekday Day)	52	47 Employees		15	15	0	17	0	17			
Employee Shuttle (Weekday Swing)	39	35 Employees					13	13	0			
Employee Shuttle (Weekday Night)	13	12 Employees		7	0	7						
Employee Shuttle (Weekend Day)	52	47 Employees								21	0	21
Employee Shuttle (Weekend Swing)	39	35 Employees								16	16	0
Employee Shuttle (Weekend Night)	13	12 Employees										
Total Employee Shuttle Related Trip Reduction	104	94 Employees	235	22	15	7	30	13	17	37	16	21
B. Guest Vehicle Trip Reduction[5]			18	1	1	0	2	1	1	4	2	2
C. Shuttle Trips Added[7]												
Employee Shuttles			18	4	2	2	4	2	2	4	2	2
Guest Shuttle			8	1	0	1	2	1	1	4	2	2
Total Shuttle Trips			26	5	2	3	6	3	3	8	4	4
Proposed Project Shuttle Related Trip Reduction Subtotal			227	18	14	4	26	11	15	33	14	19
NET PROJECT TRIP GENERATION												
Proposed Net Project Trips Subtotal - 100% Occupancy			209	9	4	5	10	5	5	45	26	20
Proposed Net Project Trips Subtotal - 70% Occupancy			146	6	3	3	7	3	4	32	18	14
PREVIOUS PARAISO HOT SPRINGS PROJECT TRAFFIC GENERATION (PRE-2005)												
Visitor Units and Campground/Recreational Vehicle Park		61 Units	374	12	5	7	23	16	7	45	27	18
Day Guests		5 Day Guests	25	2	2	0	2	0	2	8	4	4
Previous Project Subtotal (when in full operation pre-2005)			399	14	7	7	25	16	9	53	31	22
EXISTING PARAISO HOT SPRINGS PROJECT TRAFFIC GENERATION			20	2	1	1	2	1	1	2	1	1
PROJECT NET TRIP GENERATION ABOVE PREVIOUS (PRE-2005) USE												
MAXIMUM - PROPOSED PROJECT 100% OCCUPIED			-190	-5	-3	-2	-15	-11	-4	-8	-5	-2
AVERAGE - PROPOSED PROJECT 70% OCCUPIED			-253	-8	-4	-4	-18	-13	-5	-21	-13	-8
PROJECT NET TRIP GENERATION ABOVE EXISTING USE												
MAXIMUM - PROPOSED PROJECT 100% OCCUPIED			189	7	3	4	8	4	4	43	25	19
AVERAGE - PROPOSED PROJECT 70% OCCUPIED			126	4	2	2	5	2	3	30	17	13

Notes:

1. ITE daily rates are not available for Resort Hotel. Daily traffic is estimated based on 8% of the daily trips occuring in the evening peak hour.
2. Resort hotel gross trip generation rates are based on *Trip Generation*, 8th Edition, published by Institute of Transportation Engineers, 2008. Land Use code 330, Resort Hotel. This trip generation rate includes trips generated by all facilities and activites at the site associated with the hotel, such as restaurants, gift shops, conference facilities and recreational facilities.
3. Residential and Recreational Homes gross trip generation rates are based on *Trip Generation*, 8th Edition, published by Institute of Transportation Engineers, 2008. Land Use code 260, Recreational Homes.
4. ITE trip generation data indicate a resort hotel employs 1.7 people per room. (ITE Land Use Code 330, Resort Hotel, AM & PM Peak Hour of Generator, Trips per Empl. Vs. Trips per Room). The project applicant will be providing 306 employees to facilitate the entire project operation. Staffing will be provided 7 days per week, 24 hours per day. For Phase 1, 145 employees will be provided. Allowing for a 5 day work week, 104 employees will be scheduled to work each day. The employees will be scheduled to work during one of three work shifts, ~~although specific work hours (i.e., arrival/departure times) will vary depending specific job requirements.~~ It is anticipated that 52 employees will work the day shift, 39 employees will work the swing shift and 13 employees will work the night shift.
5. All non-management employees, approximately 90% of the total number of employees, are required to use the employee shuttle. Not all employees will arrive within the same one-hour period. Employee arrivals and departures are expected to be distributed over a 2 to 3 hour period. During the AM weekday, 32% of the of the day shift employees were assumed to arrive and 60% of the night shift employees were assumed to depart. During the PM weekday, 37% of the day shift were assumed to depart and 37% of the swing shift were assumed to arrive. For the Saturday peak hour, 45% of the day shift employees were assumed to depart and 45% of the swing shift employees were assumed to arrive.
6. Section B shows the number of guest vehicle trips that will be made by shuttle. These trips consist of guest day trips and guest trips to and from the airport. One-quarter of the guests are assumed to make an off-site trip per day: 21 round trips, 42 one-way trips. 20% of the day trips would be made via shuttle: 4 round trips, 8 one-way trips. 5 arrivals and 5 departures via the Monterey Airport are assumed to occur via the shuttle bus each day. 8 day trips + 10 airport trips = 18 total trip reduction.
7. The off-site day trips would be served in 2 shuttle trips: 6 people per shuttle, 8 people total, 4 guest parties. Two round trips per day by the shuttle between the resort and the airport are assumed. 4 shuttle trips for guest day trips + 4 airport trips = 8 guest related shuttle trips. It was assumed that the employee shuttle would made 3 round trips per shift change between the project site and Soledad each day, or 18 total trips per day.

EXHIBIT 2A
REVISED EXHIBIT 6A
PROJECT PHASE 1
TRIP GENERATION

Paraiso Hot Springs, Monterey County
Project Trip Generation
Phase 2

	TRIP RATE SOURCE	INDEPENDENT SIZE	AVG. DAILY TRIPS [1]	AM PEAK HOUR TOTAL PEAK HOUR	AM IN	AM OUT	PM PEAK HOUR TOTAL PEAK HOUR	PM IN	PM OUT	SAT. PEAK HOUR TOTAL PEAK HOUR	SAT IN	SAT OUT
GROSS TRIP GENERATION RATES												
Proposed Project												
Resort Hotel [2]	ITE 330	Per Occupied Room	6.13	0.37	72%	28%	0.49	43%	57%	1.23	50%	50%
Residential (Single-Family Detached) [3]	ITE 210	Per Unit	9.57	0.75	25%	75%	1.01	63%	37%	0.93	53%	47%
Recreational Homes [3]	ITE 260	Per Unit	3.16	0.16	67%	33%	0.26	41%	59%	0.36	48%	52%
Hotel Employee		Per Employee	2.50	-	-	-	-	-	-	-	-	-
Previous Use												
Day Guests		Per Day Guest	5.00	0.4	94%	6%	0.4	6%	94%	0.2	50%	50%
Visitor Units and Campground/Recreational Vehicle Park		Per Occupied Unit	6.13	0.2	42%	58%	0.37	69%	31%	0.74	60%	40%

	TRIP RATE SOURCE	PROJECT SIZE	AVG. DAILY TRIPS [1]	AM PEAK HOUR TOTAL PEAK HOUR	AM IN	AM OUT	PM PEAK HOUR TOTAL PEAK HOUR	PM IN	PM OUT	SAT. PEAK HOUR TOTAL PEAK HOUR	SAT IN	SAT OUT
PROJECT GROSS TRIP GENERATION												
Resort Hotel (100% Occupied)	ITE 330	77 Units	472	28	20	8	38	16	22	95	48	47
Residential Homes (100% Occupied)	ITE 210	9 Units	86	7	2	5	9	6	3	8	4	4
Recreational Homes (100% Occupied)	ITE 260	32 Units	101	5	3	2	8	3	5	12	6	6
Gross Total		118 Units	659	40	25	15	55	25	30	115	58	57
Net Total Assuming 10% Internal Reduction between Residential and Resort			593	36	23	14	50	23	27	104	52	51
EMPLOYEES[4]												
Employees per room	1.7											
Total Payroll Employees (1.7 x 118)	201											
Workweek reduction factor (5 day work week, 5/7)	0.71											
Employees per day (all shifts)	144											
TRIP REDUCTION STRATEGIES	Total Employees	Shuttle Employees										
A. Employee Shuttle Trip Reduction[5]												
Employee Shuttle (Weekday Day)	72	65 Employees		20	20	0	24	0	24			
Employee Shuttle (Weekday Swing)	54	49 Employees					18	18	0			
Employee Shuttle (Weekday Night)	18	16 Employees		10	0	10						
Employee Shuttle (Weekend Day)	72	65 Employees								29	0	29
Employee Shuttle (Weekend Swing)	54	49 Employees								22	22	0
Employee Shuttle (Weekend Night)	18	16 Employees										
Total Employee Shuttle Related Trip Reduction	144	130 Employees	325	30	20	10	42	18	24	51	22	29
B. Guest Vehicle Trip Reduction[6]			28	1	0	1	2	1	1	6	3	3
C. Shuttle Trips Added[7]												
Employee Shuttles			24	4	2	2	4	2	2	4	2	2
Guest Shuttle			10	1	0	1	2	1	1	4	2	2
Total Shuttle Trips			34	5	2	3	6	3	3	8	4	4
Proposed Project Shuttle Related Trip Reduction Subtotal			319	26	18	8	38	16	22	49	21	28
NET PROJECT TRIP GENERATION												
Proposed Net Project Trips Subtotal - 100% Occupancy			274	10	4	6	12	7	5	54	31	23
Proposed Net Project Trips Subtotal - 70% Occupancy			192	7	3	4	8	5	3	38	22	16
PREVIOUS PARAISO HOT SPRINGS PROJECT TRAFFIC GENERATION (PRE-2005)												
Visitor Units and Campground/Recreational Vehicle Park		61 Units	374	12	5	7	23	16	7	45	27	18
Day Guests		5 Day Guests	25	2	2	0	2	0	2	8	4	4
Previous Project Subtotal (when in full operation pre-2005)			399	14	7	7	25	16	9	53	31	22
EXISTING PARAISO HOT SPRINGS PROJECT TRAFFIC GENERATION			20	2	1	1	2	1	1	2	1	1
PROJECT NET TRIP GENERATION ABOVE PREVIOUS (PRE-2005) USE												
MAXIMUM - PROPOSED PROJECT 100% OCCUPIED			-125	-4	-3	-1	-13	-9	-4	1	0	1
AVERAGE - PROPOSED PROJECT 70% OCCUPIED			-207	-7	-4	-3	-17	-11	-6	-15	-9	-6
PROJECT NET TRIP GENERATION ABOVE EXISTING USE												
MAXIMUM - PROPOSED PROJECT 100% OCCUPIED			254	8	3	5	10	6	4	52	30	22
AVERAGE - PROPOSED PROJECT 70% OCCUPIED			172	5	2	3	6	4	2	36	21	15

Notes:

1. ITE daily rates are not available for Resort Hotel. Daily traffic is estimated based on 8% of the daily trips occuring in the evening peak hour.
2. Resort hotel gross trip generation rates are based on *Trip Generation*, 8th Edition, published by Institute of Transportation Engineers, 2008. Land Use code 330, Resort Hotel. This trip generation rate includes trips generated by all facilities and activites at the site associated with the hotel, such as restaurants, gift shops, conference facilities and recreational facilities.
3. Residential and Recreational Homes gross trip generation rates are based on *Trip Generation*, 8th Edition, published by Institute of Transportation Engineers, 2008. Land Use code 260, Recreational Homes.
4. ITE trip generation data indicate a resort hotel employs 1.7 people per room. (ITE Land Use Code 330, Resort Hotel, AM & PM Peak Hour of Generator, Trips per Empl. Vs. Trips per Room). The project applicant will be providing 306 employees to facilitate the entire project operation. Staffing will be provided 7 days per week, 24 hours per day. For Phase 2, 201 employees will be provided. Allowing for a 5 day work week, 144 employees will be scheduled to work each day. The employees will be scheduled to work during one of three work shifts, ~~although specific work hours (i.e., arrival/departure times) will vary depending specific job requirements. It is anticipated that 72 employees will work the day shift, 54 employees will work~~ the swing shift and 18 employees will work the night shift.
5. All non-management employees, approximately 90% of the total number of employees, are required to use the employee shuttle. Not all employees will arrive within the same one-hour period. Employee arrivals and departures are expected to be distributed over a 2 to 3 hour period. During the AM weekday, 32% of the of the day shift employees were assumed to arrive and 60% of the night shift employees were assumed to depart. During the PM weekday, 37% of the day shift were assumed to depart and 37% of the swing shift were assumed to arrive. For the Saturday peak hour, 45% of the day shift employees were assumed to depart and 45% of the swing shift employees were assumed to arrive.
6. Section B shows the number of guest vehicle trips that will be made by shuttle. These trips consist of guest day trips and guest trips to and from the airport. One-quarter of the guests are assumed to make an off-site trip per day: 30 round trips, 60 one-way trips. 20% of the day trips would be made via shuttle: 6 round trips, 12 one-way trips. 8 arrivals and 8 departures via the Monterey Airport are assumed to occur via the shuttle bus each day. 12 day trips + 16 airport trips = 28 total trip reduction.
7. The off-site day trips would be served in 2 shuttle trips: 6 people per shuttle, 12 people total, 6 guest parties. Three round trips per day by the shuttle between the resort and the airport are assumed. 4 shuttle trips for guest day trips + 6 airport trips = 10 guest related shuttle trips. It was assumed that the employee shuttle would made 4 round trips per shift change between the project site and Soledad each day, or 24 total trips per day.

EXHIBIT 2B
REVISED EXHIBIT 6B
PROJECT PHASE 2
TRIP GENERATION

Paraiso Hot Springs, Monterey County
Project Trip Generation
Phase 3

	TRIP RATE SOURCE	INDEPENDENT SIZE	AVG. DAILY TRIPS [1]	AM PEAK HOUR TOTAL PEAK HOUR	AM IN	AM OUT	PM PEAK HOUR TOTAL PEAK HOUR	PM IN	PM OUT	SAT. PEAK HOUR TOTAL PEAK HOUR	SAT IN	SAT OUT
GROSS TRIP GENERATION RATES												
Proposed Project												
Resort Hotel [2]	ITE 330	Per Occupied Room	6.13	0.37	72%	28%	0.49	43%	57%	1.23	50%	50%
Residential (Single-Family Detached) [3]	ITE 210	Per Unit	9.57	0.75	25%	75%	1.01	63%	37%	0.93	53%	47%
Recreational Homes [3]	ITE 260	Per Unit	3.16	0.16	67%	33%	0.26	41%	59%	0.36	48%	52%
Hotel Employee		Per Employee	2.50	-	-	-	-	-	-	-	-	-
Previous Use												
Day Guests		Per Day Guest	5.00	0.4	94%	6%	0.4	6%	94%	0.2	50%	50%
Visitor Units and Campground/Recreational Vehicle Park		Per Occupied Unit	6.13	0.2	42%	58%	0.37	69%	31%	0.74	60%	40%

	TRIP RATE SOURCE	PROJECT SIZE	AVG. DAILY TRIPS [1]	AM PEAK HOUR TOTAL PEAK HOUR	AM IN	AM OUT	PM PEAK HOUR TOTAL PEAK HOUR	PM IN	PM OUT	SAT. PEAK HOUR TOTAL PEAK HOUR	SAT IN	SAT OUT
PROJECT GROSS TRIP GENERATION												
Resort Hotel (100% Occupied)	ITE 330	92 Units	564	34	24	10	45	19	26	113	57	56
Residential Homes (100% Occupied)	ITE 210	13 Units	124	10	3	7	13	8	5	12	6	6
Recreational Homes (100% Occupied)	ITE 260	46 Units	145	7	5	2	12	5	7	17	8	9
Gross Total		151 Units	834	51	32	19	70	32	38	142	71	71
Net Total Assuming 10% Internal Reduction between Residential and Resort			750	46	29	17	63	29	34	128	64	64

EMPLOYEES[4]												
Employees per room	1.7											
Total Payroll Employees (1.7 x 151)	257											
Workweek reduction factor (5 day work week, 5/7)	0.71											
Employees per day (all shifts)	184											
TRIP REDUCTION STRATEGIES	Total Employees	Shuttle Employees										
A. Employee Shuttle Trip Reduction[5]												
Employee Shuttle (Weekday Day)	92	83 Employees		26	26	0	31	0	31			
Employee Shuttle (Weekday Swing)	69	62 Employees					23	23	0			
Employee Shuttle (Weekday Night)	23	21 Employees		12	0	12						
Employee Shuttle (Weekend Day)	92	83 Employees								37	0	37
Employee Shuttle (Weekend Swing)	69	62 Employees								28	28	0
Employee Shuttle (Weekend Night)	23	21 Employees										
Total Employee Shuttle Related Trip Reduction	184	166 Employees	415	38	26	12	54	23	31	65	28	37
B. Guest Vehicle Trip Reduction[6]			36	1	0	1	2	1	1	8	4	4
C. Shuttle Trips Added[7]												
Employee Shuttles			30	4	2	2	4	2	2	4	2	2
Guest Shuttle			14	1	0	1	2	1	1	4	2	2
Total Shuttle Trips			44	5	2	3	6	3	3	8	4	4
Proposed Project Shuttle Related Trip Reduction Subtotal			407	34	24	10	50	21	29	65	28	37
NET PROJECT TRIP GENERATION												
Proposed Net Project Trips Subtotal - 100% Occupancy			343	12	5	7	13	8	5	63	36	27
Proposed Net Project Trips Subtotal - 70% Occupancy			240	9	3	5	9	6	3	44	25	19
PREVIOUS PARAISO HOT SPRINGS PROJECT TRAFFIC GENERATION (PRE-2005)												
Visitor Units and Campground/Recreational Vehicle Park		61 Units	374	12	5	7	23	16	7	45	27	18
Day Guests		5 Day Guests	25	2	2	0	2	0	2	8	4	4
Previous Project Subtotal (when in full operation pre-2005)			399	14	7	7	25	16	9	53	31	22
EXISTING PARAISO HOT SPRINGS PROJECT TRAFFIC GENERATION			20	2	1	1	2	1	1	2	1	1
PROJECT NET TRIP GENERATION ABOVE PREVIOUS (PRE-2005) USE												
MAXIMUM - PROPOSED PROJECT 100% OCCUPIED			-56	-2	-2	0	-12	-8	-4	10	5	5
AVERAGE - PROPOSED PROJECT 70% OCCUPIED			-159	-5	-4	-2	-16	-10	-6	-9	-6	-3
PROJECT NET TRIP GENERATION ABOVE EXISTING USE												
MAXIMUM - PROPOSED PROJECT 100% OCCUPIED			323	10	4	6	11	7	4	61	35	26
AVERAGE - PROPOSED PROJECT 70% OCCUPIED			220	7	2	4	7	5	2	42	24	18

Notes:

1. ITE daily rates are not available for Resort Hotel. Daily traffic is estimated based on 8% of the daily trips occuring in the evening peak hour.
2. Resort hotel gross trip generation rates are based on *Trip Generation*, 8th Edition, published by Institute of Transportation Engineers, 2008. Land Use code 330, Resort Hotel. This trip generation rate includes trips generated by all facilities and activites at the site associated with the hotel, such as restaurants, gift shops, conference facilities and recreational facilities.
3. Residential and Recreational Homes gross trip generation rates are based on *Trip Generation*, 8th Edition, published by Institute of Transportation Engineers, 2008. Land Use code 260, Recreational Homes.
4. ITE trip generation data indicate a resort hotel employs 1.7 people per room. (ITE Land Use Code 330, Resort Hotel, AM & PM Peak Hour of Generator, Trips per Empl. Vs. Trips per Room). The project applicant will be providing 306 employees to facilitate the entire project operation. Staffing will be provided 7 days per week, 24 hours per day. For Phase 3, 257 employees will be provided. Allowing for a 5 day work week, 184 employees will be scheduled to work each day. The employees will be scheduled to work during one of three work shifts, ~~although specific work hours (i.e., arrival/departure times) will vary depending specific job requirements. It is anticipated that 92 employees will work the day shift, 69 employees will work~~ the swing shift and 21 employees will work the night shift.
5. All non-management employees, approximately 90% of the total number of employees, are required to use the employee shuttle. Not all employees will arrive within the same one-hour period. Employee arrivals and departures are expected to be distributed over a 2 to 3 hour period. During the AM weekday, 32% of the of the day shift employees were assumed to arrive and 60% of the night shift employees were assumed to depart. During the PM weekday, 37% of the day shift were assumed to depart and 37% of the swing shift were assumed to arrive. For the Saturday peak hour, 45% of the day shift employees were assumed to depart and 45% of the swing shift employees were assumed to arrive.
6. Section B shows the number of guest vehicle trips that will be made by shuttle. These trips consist of guest day trips and guest trips to and from the airport. One-quarter of the guests are assumed to make an off-site trip per day: 38 round trips, 76 one-way trips. 20% of the day trips would be made via shuttle: 8 round trips, 16 one-way trips. 10 arrivals and 10 departures via the Monterey Airport are assumed to occur via the shuttle bus each day. 16 day trips + 20 airport trips = 36 total trip reduction.
7. The off-site day trips would be served in 3 shuttle trips: 6 people per shuttle, 16 people total, 8 guest parties. Four round trips per day by the shuttle between the resort and the airport are assumed. 6 shuttle trips for guest day trips + 8 airport trips = 14 guest related shuttle trips. It was assumed that the employee shuttle would made 5 round trips per shift change between the project site and Soledad each day, or 30 total trips per day.

EXHIBIT 2C
REVISED EXHIBIT 6C
PROJECT PHASE 3
TRIP GENERATION

Paraiso Hot Springs, Monterey County
Project Trip Generation
Phase 4 (Project Buildout)

	TRIP RATE SOURCE	INDEPENDENT SIZE	AVG. DAILY TRIPS [1]	AM PEAK HOUR TOTAL PEAK HOUR	AM IN	AM OUT	PM PEAK HOUR TOTAL PEAK HOUR	PM IN	PM OUT	SAT. PEAK HOUR TOTAL PEAK HOUR	SAT IN	SAT OUT
GROSS TRIP GENERATION RATES												
Proposed Project												
Resort Hotel [2]	ITE 330	Per Occupied Room	6.13	0.37	72%	28%	0.49	43%	57%	1.23	50%	50%
Residential (Single-Family Detached) [3]	ITE 210	Per Unit	9.57	0.75	25%	75%	1.01	63%	37%	0.93	53%	47%
Recreational Homes [3]	ITE 260	Per Unit	3.16	0.16	67%	33%	0.26	41%	59%	0.36	48%	52%
Hotel Employee		Per Employee	2.50	-	-	-	-	-	-	-	-	-
Previous Use												
Day Guests		Per Day Guest	5.00	0.4	94%	6%	0.4	6%	94%	0.2	50%	50%
Visitor Units and Campground/Recreational Vehicle Park		Per Occupied Unit	6.13	0.2	42%	58%	0.37	69%	31%	0.74	60%	40%

	TRIP RATE SOURCE	PROJECT SIZE	AVG. DAILY TRIPS [1]	AM PEAK HOUR TOTAL PEAK HOUR	AM IN	AM OUT	PM PEAK HOUR TOTAL PEAK HOUR	PM IN	PM OUT	SAT. PEAK HOUR TOTAL PEAK HOUR	SAT IN	SAT OUT
PROJECT GROSS TRIP GENERATION												
Resort Hotel (100% Occupied)	ITE 330	103 Units	631	38	27	11	50	22	28	127	64	63
Residential Homes (100% Occupied)	ITE 210	17 Units	163	13	3	10	17	11	6	16	8	8
Recreational Homes (100% Occupied)	ITE 260	60 Units	190	10	7	3	16	7	9	22	11	11
Gross Total		180 Units	984	61	37	24	83	40	43	165	83	82
Net Total Assuming 10% Internal Reduction between Residential and Resort			885	55	33	22	75	36	39	149	75	74
EMPLOYEES[4]												
Employees per room	1.7											
Total Payroll Employees (1.7 x 180)	306											
Workweek reduction factor (5 day work week, 5/7)	0.71											
Employees per day (all shifts)	218											
TRIP REDUCTION STRATEGIES	Total Employees	Shuttle Employees										
A. Employee Shuttle Trip Reduction[5]												
Employee Shuttle (Weekday Day)	109	98 Employees		31	31	0	36	0	36			
Employee Shuttle (Weekday Swing)	82	74 Employees					27	27	0			
Employee Shuttle (Weekday Night)	27	24 Employees		15	0	15						
Employee Shuttle (Weekend Day)	109	98 Employees								44	0	44
Employee Shuttle (Weekend Swing)	82	74 Employees								33	33	0
Employee Shuttle (Weekend Night)	27	24 Employees										
Total Employee Shuttle Related Trip Reduction	218	196 Employees	492	46	31	15	63	27	36	77	33	44
B. Guest Vehicle Trip Reduction[6]			40	1	0	1	2	2	0	10	5	5
C. Shuttle Trips Added[7]												
Employee Shuttles			36	4	2	2	4	2	2	4	2	2
Guest Shuttle			16	1	0	1	2	1	1	4	2	2
Total Shuttle Trips			52	5	2	3	6	3	3	8	4	4
Proposed Project Shuttle Related Trip Reduction Subtotal			480	42	29	13	60	26	33	79	34	45
NET PROJECT TRIP GENERATION												
Proposed Net Project Trips Subtotal - 100% Occupancy			406	12	4	9	15	10	6	69	40	29
Proposed Net Project Trips Subtotal - 70% Occupancy			284	9	3	6	11	7	4	48	28	20
PREVIOUS PARAISO HOT SPRINGS PROJECT TRAFFIC GENERATION (PRE-2005)												
Visitor Units and Campground/Recreational Vehicle Park		61 Units	374	12	5	7	23	16	7	45	27	18
Day Guests		5 Day Guests	25	2	2	0	2	0	2	8	4	4
Previous Project Subtotal (when in full operation pre-2005)			399	14	7	7	25	16	9	53	31	22
EXISTING PARAISO HOT SPRINGS PROJECT TRAFFIC GENERATION			20	2	1	1	2	1	1	2	1	1
PROJECT NET TRIP GENERATION ABOVE PREVIOUS (PRE-2005) USE												
MAXIMUM - PROPOSED PROJECT 100% OCCUPIED			7	-2	-3	2	-10	-6	-3	16	9	7
AVERAGE - PROPOSED PROJECT 70% OCCUPIED			-115	-5	-4	-1	-14	-9	-5	-5	-3	-2
PROJECT NET TRIP GENERATION ABOVE EXISTING USE												
MAXIMUM - PROPOSED PROJECT 100% OCCUPIED			386	10	3	8	13	9	5	67	39	28
AVERAGE - PROPOSED PROJECT 70% OCCUPIED			264	7	2	5	9	6	3	46	27	19

Notes:

1. ITE daily rates are not available for Resort Hotel. Daily traffic is estimated based on 8% of the daily trips occuring in the evening peak hour.
2. Resort hotel gross trip generation rates are based on *Trip Generation*, 8th Edition, published by Institute of Transportation Engineers, 2008. Land Use code 330, Resort Hotel. This trip generation rate includes trips generated by all facilities and activites at the site associated with the hotel, such as restaurants, gift shops, conference facilities and recreational facilities.
3. Residential and Recreational Homes gross trip generation rates are based on *Trip Generation*, 8th Edition, published by Institute of Transportation Engineers, 2008. Land Use code 260, Recreational Homes.
4. ITE trip generation data indicate a resort hotel employs 1.7 people per room. (ITE Land Use Code 330, Resort Hotel, AM & PM Peak Hour of Generator, Trips per Empl. Vs. Trips per Room). The project applicant will be providing 306 employees to facilitate the entire project operation at project buildout. Staffing will be provided 7 days per week, 24 hours per day. Allowing for a 5 day work week, 218 employees will be scheduled to work each day. The employees will be scheduled to work during one of three work shifts, ~~although specific work hours (i.e., arrival/departure times) will vary depending specific job requirements. It is anticipated that 109 employees will work the day shift, 82 employees will work~~ the swing shift and 27 employees will work the night shift.
5. All non-management employees, approximately 90% of the total number of employees, are required to use the employee shuttle. Not all employees will arrive within the same one-hour period. Employee arrivals and departures are expected to be distributed over a 2 to 3 hour period. During the AM weekday, 32% of the of the day shift employees were assumed to arrive and 60% of the night shift employees were assumed to depart. During the PM weekday, 37% of the day shift were assumed to depart and 37% of the swing shift were assumed to arrive. For the Saturday peak hour, 45% of the day shift employees were assumed to depart and 45% of the swing shift employees were assumed to arrive.
6. Section B shows the number of guest vehicle trips that will be made by shuttle. These trips consist of guest day trips and guest trips to and from the airport. One-quarter of the guests are assumed to make an off-site trip per day: 45 round trips, 90 one-way trips. 20% of the day trips would be made via shuttle: 9 round trips, 18 one-way trips. 11 arrivals and 11 departures via the Monterey Airport are assumed to occur via the shuttle bus each day. 18 day trips + 22 airport trips = 40 total trip reduction.
7. The off-site day trips would be served in three shuttle trips: 6 people per shuttle, 18 people total, 9 guest parties. Five round trips per day by the shuttle between the resort and the airport are assumed. 6 shuttle trips for guest day trips + 10 airport trips = 16 guest related shuttle trips. It was assumed that the employee shuttle would made 6 round trips per shift change between the project site and Soledad each day, or 36 total trips per day.

EXHIBIT 2D
REVISED EXHIBIT 6D
PROJECT BUILDOUT
TRIP GENERATION

Paraiso Hot Springs, Monterey County
Project Trip Generation

	TRIP RATE SOURCE	INDEPENDENT SIZE	AVG. DAILY TRIPS [1]	AM PEAK HOUR TOTAL PEAK HOUR	AM IN	AM OUT	PM PEAK HOUR TOTAL PEAK HOUR	PM IN	PM OUT	SAT. PEAK HOUR TOTAL PEAK HOUR	SAT IN	SAT OUT
GROSS TRIP GENERATION RATES												
Resort Hotel [2]	ITE 330	Per Occupied Room	6.13	0.37	72%	28%	0.49	43%	57%	1.23	50%	50%
Residential (Single-Family Detached) [3]	ITE 210	Per Unit	9.57	0.75	25%	75%	1.01	63%	37%	0.94	54%	46%
Recreational Homes [3]	ITE 260	Per Unit	3.16	0.16	67%	33%	0.26	41%	59%	0.36	48%	52%
Day Guests		Per Day Guest	5.00	0.4	94%	6%	0.4	6%	94%	0.2	50%	50%
Hotel Employee		Per Employee	4.50	0.4	73%	27%	0.36	44%	56%	0.4	60%	40%
Existing Visitor Units and Campground/Recreational Vehicle Park		Per Occupied Unit	4.72	0.2	42%	58%	0.37	69%	31%	0.74	60%	40%

	TRIP RATE SOURCE	PROJECT SIZE	AVG. DAILY TRIPS [1]	AM PEAK HOUR TOTAL PEAK HOUR	AM IN	AM OUT	PM PEAK HOUR TOTAL PEAK HOUR	PM IN	PM OUT	SAT. PEAK HOUR TOTAL PEAK HOUR	SAT IN	SAT OUT
PROJECT GROSS TRIP GENERATION												
Resort Hotel (100% Occupied)	ITE 330	92 Units	564	34	24	10	45	19	26	113	57	56
Residential Homes (100% Occupied)	ITE 210	13 Units	124	10	3	7	13	8	5	12	6	6
Recreational Homes (100% Occupied)	ITE 260	46 Units	145	7	5	2	12	5	7	17	8	9
Gross Total		151 Units	834	51	32	19	70	32	38	142	71	71
Net Total Assuming 10% Internal Reduction between Residential and Resort			750	46	29	17	63	29	34	128	64	64
TRIP REDUCTION STRATEGIES												
A. Employee Shuttle [4]												
Employee Shuttle (Weekday Day)		50 Employees		20	15	5	18	8	10			
Employee Shuttle (Weekday Night)		13 Employees		5	2	3	5	4	1			
Employee Shuttle (Weekend Day)		67 Employees								27	16	11
Employee Shuttle (Weekend Night)		17 Employees								7	3	4
Total Employee Shuttle Related Trip Reduction			290	25	17	8	23	12	11	34	19	15
B. Guest Shuttle (20% of Guests)			55	2	1	0	4	1	3	16	8	8
Proposed Project Shuttle Related Trip Reduction Subtotal			345	27	19	9	28	13	14	50	27	23
Proposed Net Project Trips Subtotal - 100% Occupancy			405	19	10	9	35	16	20	78	37	41
Proposed Net Project Trips Subtotal - 70% Occupancy			284	13	7	6	25	11	14	55	26	29
HISTORIC PARAISO HOT SPRINGS PROJECT TRAFFIC GENERATION												
Historic Visitor Units and Campground/Recreational Vehicle Park		61 Units	288	12	5	7	23	16	7	45	27	18
Day Guests		5 Day Guests	25	2	2	0	2	0	2	8	4	4
Historic Project Subtotal (when in full operation)			313	14	7	7	25	16	9	53	31	22
EXISTING PARAISO HOT SPRINGS PROJECT TRAFFIC GENERATION			20	2	1	1	2	1	1	2	1	1
MAXIMUM PROJECT NET TRIP GENERATION ABOVE HISTORIC - 100% OCCUPANCY			92	5	3	2	10	0	11	25	6	19
AVERAGE PROJECT NET TRIP GENERATION ABOVE HISTORIC - 70% OCCUPANCY			0	0	0	0	0	0	5	2	0	7
MAXIMUM PROJECT NET TRIP GENERATION ABOVE EXISTING - 100% OCCUPANCY			385	17	9	8	33	15	19	76	36	40
AVERAGE PROJECT NET TRIP GENERATION ABOVE EXISTING - 70% OCCUPANCY			264	11	6	5	23	10	13	53	25	28

Notes:
1. ITE daily rates are not available for Resort Hotel. Daily traffic is estimated based on 8% of the daily trips occuring in the evening peak hour.
2. Resort hotel gross trip generation rates are based on *Trip Generation*, 7th Edition, published by Institute of Transportation Engineers, 2003. Land Use code 330, Resort Hotel. This trip generation rate includes trips generated by all facilities and activites at the site associated with the hotel, such as restaurants, gift shops, conference facilities and recreational facilities.
3. Residential and Recreational Homes gross trip generation rates are based on *Trip Generation*, 7th Edition, published by Institute of Transportation Engineers, 2003. Land Use code 260, Recreational Homes.
4. For Phase 3, 50 people are anticipated to be employed during the weekday day shift, 13 people during the weekday night shift, 67 people during the weekend day shift and 17 people during the weekend night shift. All non-management employees, approximately 90% of the employees, will be required to use the employee shuttle. This information is provided by the project applicant.

EXHIBIT 3
PROJECT PHASE 3
TRIP GENERATION
(REVISED EXHIBIT 6C OF JANUARY 2011 REPORT)

ARROYO SECO/CLARK ROAD INTERSECTION SAFETY ANALYSIS
(PROJECT BUILDOUT)

	Predicted Crashes				Actual Accidents		Expected Before Period Accident Frequency (Accidents/20 years)		Predicted Accidents		Expected Accident Frequency
Intersection	1991-2005	2006-2010	TOTAL	Percentage	1991-2010	Weights	Total		Future ADT (Nbf)	Base ADT (Nbp)	(20 years)
Arroyo Seco/Clark Road	2.158	0.448	2.606	100%	0	0.415	1.083		0.331	0.138	2.597
Avg. Per Year	0.144	0.090	0.130				0.054				0.130

EXHIBIT 4
BEFORE CONDITION VERSUS AFTER CONDITION
CRASH FREQUENCY COMPARISON
ARROYO SECO ROAD/CLARK ROAD

Exhibit 5 - Arroyo Seco/Clark Road Accident Frequency Prediction Calculations

ARROYO SECO/CLARK ROAD TRAFFIC VOLUMES			
	PREVIOUS (BEFORE HOT SPRINGS CLOSURE) (1991-2005)	EXISTING (2006-2010)	PROJECT PHASE 4
ANNUAL AVE TRIP GEN (DAY GUESTS FOR 6 MOS-EXISTING, 70% ANNUAL AVE HOTEL OCCUPANCY)	301	20	284
INTERSECTION LEG		AADT	
Arroyo Seco (Entering Vehicles Per Day)	1300	1710	1829
Clark Road (Entering Vehicles Per Day)	42	10	129

ACCIDENT FREQUENCY CALCULATIONS						
		PREDICTED ACCIDENT FREQUENCY			EXPECTED ACCIDENT FREQUENCY	
INTERSECTION		(1991-2005)	(2006-2010)	(1991-2010)	(1991-2010)	PHASE 4
EXISTING INTERSECTION						
A Existing		0.144	0.090	0.130	0.054	0.130
TOTAL	ACCIDENTS PREDICTED IN 1 YEAR	0.144	0.090	0.130	0.054	0.130
	ACCIDENTS PREDICTED IN 3 YEARS	0.432	0.270	0.390	0.162	0.390
	ACCIDENTS PREDICTED IN 5 YEARS	0.720	0.450	0.650	0.270	0.650
	NO. OF YEARS FOR ONE ACCIDENT	7	11	8	19	8
	ACCIDENTS PREDICTED DURING PERIOD	2.160	0.450	2.610		
	ACCIDENTS EXPECTED 1991-2010				1.08	
	ACCIDENTS PREDICTED 1991-2010		2.6			
	ACTUAL NUMBER 1991-2010		0			
	LAST 20 YEARS - NO. OF YEARS PER ACCIDENT:					
	PREDICTED		**8**			
	EXPECTED		**19**			
	YEARS PER ACTUAL ACCIDENT 1991-2010		**0**			

ACCIDENT RATE CALCULATIONS					
ROADWAY SEGMENT	DAILY ENTERING VEHICLES	DAILY ENTERING VEHICLES			DAILY ENTERING VEHICLES
A	1342 ANNUAL ENTERING VEHICLES 489,830	1720 ANNUAL ENTERING VEHICLES 627,800			1958 ANNUAL ENTERING VEHICLES 714,670
ENTERING VEHICLES IN 20 YRS 10,486,450					
		PREVIOUS ACCIDENT RATE (20-YEAR PERIOD) (ACCIDENTS PER MILLION VEHICLES ENTERING THE INTERSECTION)			**EXPECTED ACCIDENT RATE** (ACCIDENTS PER MILLION VEHICLES ENTERING THE INTERSECTION)
CALCULATED ACCIDENT RATE		**0.00**			**0.18**
STATEWIDE AVERAGE RATE		**0.20**			**0.20**
CALCULATED RATE AS PERCENTAGE OF AVG RATE		**0%**			**91%**
PREDICTED RATE IS BELOW STATEWIDE AVERAGE RATES. THERE WILL BE NO SIGNIFICANT IMPACT ON TRAFFIC SAFETY FROM THE PROJECT AT THE ARROYO SECO/CLARK INTERSECTION.					

PARAISO SPRINGS ROAD SAFETY ANALYSIS
(PROJECT BUILDOUT)

	Predicted Crashes				Actual Accidents		Expected Before Period Accident Frequency (Accidents/20 years)		Predicted Accidents		Expected Accident Frequency
Segment	1991-2005	2006-2010	TOTAL	Percentage	1991-2010	Weights	Total	By Segment	Future ADT (Nbf)	Base ADT (Nbp)	(20 years)
A	0.495	0.055	0.55	14%	0			0.395	0.034	0.027	0.497
B	1.005	0.09	1.095	27%	1			0.786	0.07	0.054	1.020
C	0.36	0.025	0.385	10%	0			0.277	0.025	0.019	0.364
D	0.48	0.025	0.505	12%	0			0.363	0.034	0.025	0.493
E	0.39	0.01	0.4	10%	1			0.287	0.028	0.02	0.402
F	1.065	0.05	1.115	28%	0			0.801	0.075	0.056	1.073
Total	3.795	0.255	4.05	100%	2	0.443	2.909	2.909	0.266	0.201	3.849
Avg. Per Year	0.253	0.051	0.203					0.145			0.193

EXHIBIT 6
BEFORE CONDITION VERSUS AFTER CONDITION
CRASH FREQUENCY COMPARISON
PARAISO SPRINGS ROAD

CLARK ROAD SAFETY ANALYSIS
(PROJECT BUILDOUT)

	Predicted Crashes				Actual Accidents		Expected Before Period Accident Frequency (Accidents/20 years)		Predicted Accidents		Expected Accident
Segment	1991-2005	2006-2010	TOTAL	Percentage	1991-2010	Weights	Total	By Segment	Future ADT (Nbf)	Base ADT (Nbp)	Frequency (20 years)
Clark Road	0.465	0.035	0.500	100%	0	0.866	0.433	0.433	0.118	0.025	2.043
Avg. Per Year	0.031	0.007	0.025					0.022			0.102

EXHIBIT 7
BEFORE CONDITION VERSUS AFTER CONDITION
CRASH FREQUENCY COMPARISON
CLARK ROAD

Exhibit 8 - Paraiso Springs Road Accident Frequency Prediction

Crash Modification Factors

		PRE-2005 (BEFORE HOT SPRINGS CLOSURE)	EXISTING (2009-2010)	PROJECT PHASE 1	PROJECT PHASE 2	PROJECT PHASE 3	PROJECT PHASE 4
LANE WIDTH							
SEGMENT	A	1.01	1.01	1.01	1.01	1.01	1.01
SEGMENT	B	1.03	1.03	1.03	1.03	1.03	1.04
SEGMENT	C	1.03	1.03	1.03	1.03	1.03	1.03
SEGMENT	D	1.03	1.03	1.03	1.03	1.03	1.03
SEGMENT	E	1.03	1.03	1.03	1.03	1.03	1.03
SEGMENT	F	1.03	1.03	1.03	1.03	1.03	1.03
SHOULDER WIDTH & TYPE							
SEGMENT	A	1.05	1.05	1.05	1.05	1.05	1.05
SEGMENT	B	1.05	1.05	1.05	1.05	1.05	1.05
SEGMENT	C	1.05	1.05	1.05	1.05	1.05	1.05
SEGMENT	D	1.06	1.06	1.06	1.06	1.06	1.06
SEGMENT	E	1.06	1.06	1.06	1.06	1.06	1.06
SEGMENT	F	1.06	1.06	1.06	1.06	1.06	1.06
HORIZONTAL CURVES							
SEGMENT	A	2.05	2.05	2.05	2.05	2.05	2.05
SEGMENT	B	1.00	1.00	1.00	1.00	1.00	1.00
SEGMENT	C	1.00	1.00	1.00	1.00	1.00	1.00
SEGMENT	D	1.00	1.00	1.00	1.00	1.00	1.00
SEGMENT	E	1.00	1.00	1.00	1.00	1.00	1.00
SEGMENT	F	19.84	19.84	19.84	19.84	19.84	19.84
ROADSIDE DESIGN							
SEGMENT	A	0.94	0.94	0.94	0.94	0.94	0.94
SEGMENT	B	0.94	0.94	0.94	0.94	0.94	0.94
SEGMENT	C	1.00	1.00	1.00	1.00	1.00	1.00
SEGMENT	D	1.22	1.22	1.22	1.22	1.22	1.22
SEGMENT	E	1.14	1.14	1.14	1.14	1.14	1.14
SEGMENT	F	1.22	1.22	1.22	1.22	1.22	1.22

Exhibit 9 - Clark Road Accident Frequency Prediction
Crash Modification Factors

		PRE-2005 (BEFORE HOT SPRINGS CLOSURE)	EXISTING (2006-2010)	PROJECT PHASE 1	PROJECT PHASE 2	PROJECT PHASE 3	PROJECT PHASE 4
LANE WIDTH							
SEGMENT	A	1.03	1.03	1.03	1.03	1.03	1.03
SHOULDER WIDTH & TYPE							
SEGMENT	A	1.06	1.06	1.06	1.06	1.06	1.06
ROADSIDE DESIGN							
SEGMENT	A	0.94	0.94	0.94	0.94	0.94	0.94

Exhibit 10 - Paraiso Springs Road Accident Frequency Prediction Calculations

PARAISO SPRINGS ROAD TRAFFIC VOLUMES

	NO.	SEGMENT LIMITS			PREVIOUS (BEFORE HOT SPRINGS CLOSURE) (1991-2005)	EXISTING (2006-2010)	PROJECT PHASE 4
ANNUAL AVE TRIP GEN (DAY GUESTS FOR 6 MOS-EXISTING, 70% ANNUAL AVE HOTEL OCCUPANCY)					313	20	352
					AADT		
	A	Clark Road to west of parking area	SEGMENT	A	463	150	482
	B	West of parking area to east of horse corral	SEGMENT	B	431	118	450
	C	East of horse corral to west of horse corral	SEGMENT	C	398	85	417
	D	West of horse corral to Panziera driveway	SEGMENT	D	366	53	385
	E	Panziera driveway to Project	SEGMENT	E	333	20	352
	F	Curve at Panziera driveway	SEGMENT	F	366	53	385

ACCIDENT FREQUENCY CALCULATIONS

ROADWAY SEGMENT		LENGTH FEET	LENGTH MILES	AVE. PAVED WIDTH (FT)	AVE. LANE WIDTH (FT)	AVE. SHOULDER WIDTH (FT)		PREDICTED ACCIDENT FREQUENCY (1991-2005)	PREDICTED ACCIDENT FREQUENCY (2006-2010)	PREDICTED ACCIDENT FREQUENCY (1991-2010)	EXPECTED ACCIDENT FREQUENCY (1991-2010)	EXPECTED ACCIDENT FREQUENCY PHASE 4
EXISTING ROADWAY												
A	Existing	690	0.131	21	10.5	2	Curve	0.033	0.011	0.028	0.020	0.025
B	Existing	3,000	0.568	18.5	9.25	1	Tangent	0.067	0.018	0.055	0.039	0.051
C	Existing	1,100	0.208	17	8.5	1	Tangent	0.024	0.005	0.019	0.014	0.018
D	Existing	1,305	0.247	16	8	0	Tangent	0.032	0.005	0.025	0.018	0.025
E	Existing	1,250	0.237	15.5	7.75	0	Tangent	0.026	0.002	0.020	0.014	0.020
F	Existing	145	0.027	15.5	7.75	0	Curve	0.071	0.010	0.056	0.040	0.054
TOTAL		7,490	1.419		ACCIDENTS PREDICTED IN 1 YEAR			0.253	0.051	0.203	0.145	0.193
					ACCIDENTS PREDICTED IN 3 YEARS			0.759	0.153	0.608	0.435	0.579
					ACCIDENTS PREDICTED IN 5 YEARS			1.265	0.255	1.013	0.725	0.965
					NO. OF YEARS FOR ONE ACCIDENT			4	20	5	7	5
					ACCIDENTS PREDICTED DURING PERIOD			3.8	0.3	4.05		
					ACCIDENTS EXPECTED 1991-2010						2.9	
					ACCIDENTS PREDICTED 1991-2010				4.1			
					ACTUAL NUMBER 1991-2010				2			
					LAST 20 YEARS - NO. OF YEARS PER ACCIDENT:							
					PREDICTED				5			
					EXPECTED				7			
					YEARS PER ACTUAL ACCIDENT 1991-2010				10			

Change in Accident Frequency
Based on Expected Frequency Over 20 Years

Base crashes per year =	0.145 crashes per year
Crashes per year at buildout =	0.193 crashes per year
Change in crashes per year =	0.048 crashes per year
Change per mile of roadway =	0.034 crashes per year
One additional crash per mile in	29.6 years

Change in Accident Frequency
Based on Predicted Frequency Over Last 5 Years

Base crashes per year =	0.051 crashes per year
Crashes per year at buildout =	0.193 crashes per year
Change in crashes per year =	0.142 crashes per year
Change per mile of roadway =	0.100 crashes per year
One additional crash per mile in	10.0 years

ACCIDENT RATE CALCULATIONS

ROADWAY SEGMENT	DAILY VEHICLE MI TRAVELLED (DAILY VMT)	DAILY VEHICLE MI TRAVELLED (DAILY VMT)			DAILY VEHICLE MI TRAVELLED (DAILY VMT)
A	61	20			63
B	245	67			255
C	83	18			87
D	90	13			95
E	79	5			83
F	10	1			11
TOTAL	568	124			594
	ANNUAL VMT 207,320	ANNUAL VMT 45,260			ANNUAL VMT 216,810
		VMT IN 19 YRS 3,290,840			
		HISTORICAL ACCIDENT RATE (ACCIDENTS PER MILLION VEHICLE MILES TRAVELLED)			EXPECTED ACCIDENT RATE (ACCIDENTS PER MILLION VEHICLE MILES TRAVELLED)
CALCULATED ACCIDENT RATE		0.61			0.89
STATEWIDE AVERAGE RATE		1.02			1.02
CALCULATED RATE AS PERCENTAGE OF AVG RATE		60%			87%

PREDICTED RATE IS BELOW STATEWIDE AVERAGE RATES AT PROJECT BUILDOUT. THERE WILL BE NO SIGNIFICANT IMPACT ON TRAFFIC SAFETY FROM THE PROJECT ON PARAISO SPRINGS ROAD.

Exhibit 11 - Clark Road Accident Frequency Prediction Calculations

CLARK ROAD TRAFFIC VOLUMES

NO.	SEGMENT LIMITS		PREVIOUS (BEFORE HOT SPRINGS CLOSURE) (1991-2005)	EXISTING (2006-2010)	PROJECT PHASE 4
ANNUAL AVE TRIP GEN (DAY GUESTS FOR 6 MOS-EXISTING, 70% ANNUAL AVE HOTEL OCCUPANCY)			301	20	352
				AADT	
A	Paraiso Springs Rd to Arroyo Seco Rd	SEGMENT A	83	20	320

ACCIDENT FREQUENCY CALCULATIONS

ROADWAY SEGMENT		LENGTH FEET	LENGTH MILES	AVE. PAVED WIDTH (FT)	AVE. LANE WIDTH (FT)	AVE. SHOULDER WIDTH (FT)		PREDICTED ACCIDENT FREQUENCY (1991-2005)	PREDICTED ACCIDENT FREQUENCY (2006-2010)	PREDICTED ACCIDENT FREQUENCY (1991-2010)	EXPECTED ACCIDENT FREQUENCY (1991-2010)	EXPECTED ACCIDENT FREQUENCY PHASE 4
EXISTING ROADWAY												
A	Existing	7,140	1.352	18	9	0	Tangent	0.031	0.007	0.025	0.022	0.102
TOTAL		7,140	1.352				ACCIDENTS PREDICTED IN 1 YEAR	0.031	0.007	0.025	0.022	0.102
							ACCIDENTS PREDICTED IN 3 YEARS	0.093	0.021	0.075	0.066	0.306
							ACCIDENTS PREDICTED IN 5 YEARS	0.155	0.035	0.125	0.110	0.510
							NO. OF YEARS FOR ONE ACCIDENT	32	143	40	45	10
							ACCIDENTS PREDICTED DURING PERIOD	0.5	0.0	0.5		
							ACCIDENTS EXPECTED 1991-2010				0.44	
							ACCIDENTS PREDICTED 1991-2010		0.5			
							ACTUAL NUMBER 1991-2010		0			
							LAST 20 YEARS - NO. OF YEARS PER ACCIDENT:					
							PREDICTED		**40**			
							EXPECTED		**45**			
							YEARS PER ACTUAL ACCIDENT 1991-2010		**-**			

Change in Accident Frequency
Based on Expected Frequency Over 20 Years

Base crashes per year =	0.022 crashes per year
Crashes per year at buildout =	0.102 crashes per year
Change in crashes per year =	0.080 crashes per year
Change per mile of roadway =	0.056 crashes per year
One additional crash per mile in	17.7 years

Change in Accident Frequency
Based on Predicted Frequency Over Last 5 Years

Base crashes per year =	0.007 crashes per year
Crashes per year at buildout =	0.102 crashes per year
Change in crashes per year =	0.095 crashes per year
Change per mile of roadway =	0.067 crashes per year
One additional crash per mile in	14.9 years

ACCIDENT RATE CALCULATIONS

ROADWAY SEGMENT	DAILY VEHICLE MI TRAVELLED (DAILY VMT)	DAILY VEHICLE MI TRAVELLED (DAILY VMT)			DAILY VEHICLE MI TRAVELLED (DAILY VMT)
A	112	27			432
	ANNUAL VMT 40,880	ANNUAL VMT 9,855			ANNUAL VMT 157,680
		VMT IN 19 YRS 652,620			
		HISTORICAL ACCIDENT RATE (ACCIDENTS PER MILLION VEHICLE MILES TRAVELLED)			**EXPECTED ACCIDENT RATE** (ACCIDENTS PER MILLION VEHICLE MILES TRAVELLED)
	CALCULATED ACCIDENT RATE	**0.00**			**0.65**
	STATEWIDE AVERAGE RATE	**1.02**			**1.02**
	CALCULATED RATE AS PERCENTAGE OF AVG RATE	**0%**			**63%**

PREDICTED RATE IS BELOW STATEWIDE AVERAGE RATES THROUGH PROJECT BUILDOUT. THERE WILL BE NO SIGNIFICANT IMPACT ON TRAFFIC SAFETY FROM THE PROJECT ON CLARK ROAD.