Appendix E

Traffic Modeling Data

E1 Existing Conditions Technical Calculations

E2 Existing Plus Project Conditions Technical Calculations

E3 Cumulative Conditions Technical Calculations

E4 Cumulative Plus Project Conditions Technical Calculations

E5 Supplemental Tahoe Basin VMT Data

E1

Existing Conditions
Technical Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	186	336	107	166	37	151	72	81	18	94	60
Future Volume (veh/h)	54	186	336	107	166	37	151	72	81	18	94	60
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	59	202	365	122	189	42	162	77	87	20	103	66
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	458	647	159	562	478	290	304	258	57	297	194
Arrive On Green	0.04	0.25	0.25	0.09	0.30	0.30	0.16	0.16	0.16	0.17	0.16	0.16
Sat Flow, veh/h	1774	1863	1581	1774	1863	1583	1774	1863	1583	366	1891	1233
Grp Volume(v), veh/h	59	202	365	122	189	42	162	77	87	101	0	88
Grp Sat Flow(s),veh/h/ln	1774	1863	1581	1774	1863	1583	1774	1863	1583	1844	0	1645
Q Serve(g_s), s	2.0	5.6	10.8	4.1	4.8	1.2	5.1	2.2	3.0	3.0	0.0	2.9
Cycle Q Clear(g_c), s	2.0	5.6	10.8	4.1	4.8	1.2	5.1	2.2	3.0	3.0	0.0	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.20		0.75
Lane Grp Cap(c), veh/h	74	458	647	159	562	478	290	304	258	290	0	259
V/C Ratio(X)	0.79	0.44	0.56	0.77	0.34	0.09	0.56	0.25	0.34	0.35	0.00	0.34
Avail Cap(c_a), veh/h	436	1068	1165	1017	1068	908	872	916	778	756	0	674
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.0	19.5	13.8	27.2	16.6	15.3	23.5	22.3	22.6	22.8	0.0	22.9
Incr Delay (d2), s/veh	6.9	0.2	0.3	2.9	0.1	0.0	0.6	0.2	0.3	0.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.9	6.0	2.1	2.5	0.5	2.6	1.1	1.3	1.5	0.0	1.3
LnGrp Delay(d),s/veh	35.9	19.7	14.1	30.1	16.7	15.3	24.1	22.5	22.9	23.1	0.0	23.2
LnGrp LOS	D	B	B	C	B	B	C	C	C	C		C
Approach Vol, veh/h		626			353			326			189	
Approach Delay, s/veh		18.0			21.2			23.4			23.1	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.5	20.5		14.6	7.1	23.9		15.5
Change Period (Y+Rc), s	5.0	5.5		5.0	4.5	5.5		5.5
Max Green Setting (Gmax), s	35.0	35.0		25.0	15.0	35.0		30.0
Max Q Clear Time (g_c+I1), s	6.1	12.8		5.0	4.0	6.8		7.1
Green Ext Time (p_c), s	0.2	2.1		0.6	0.0	2.1		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	20.6
HCM 2010 LOS	C

MOVEMENT SUMMARY

Site: 2. Existing AM

SR 89 / I-80 WB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
3	L2	142	3.0	0.168	4.8	LOS A	0.0	0.0	0.00	0.00	25.5
8	T1	226	3.0	0.168	4.8	LOS A	0.0	0.0	0.00	0.00	25.9
Approach		368	3.0	0.168	4.8	LOS A	0.0	0.0	0.00	0.00	25.8
East: I-80 WB off-ramp											
1	L2	215	3.0	0.256	7.0	LOS A	0.7	19.1	0.37	0.34	23.5
6	T1	1	3.0	0.256	7.0	LOS A	0.7	19.1	0.37	0.34	25.7
16	R2	112	3.0	0.136	5.7	LOS A	0.4	9.6	0.35	0.30	23.6
Approach		328	3.0	0.256	6.6	LOS A	0.7	19.1	0.36	0.32	23.5
North: HWY 89											
4	T1	544	3.0	0.388	9.7	LOS A	1.7	42.9	0.54	0.51	23.5
14	R2	45	3.0	0.388	9.7	LOS A	1.7	42.9	0.54	0.51	22.9
Approach		589	3.0	0.388	9.7	LOS A	1.7	42.9	0.54	0.51	23.5
All Vehicles		1285	3.0	0.388	7.5	LOS A	1.7	42.9	0.34	0.32	24.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3. Existing AM

SR 89 / I-80 EB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
8	T1	349	3.0	0.280	6.7	LOS A	1.2	30.4	0.32	0.21	24.2
18	R2	183	3.0	0.280	6.7	LOS A	1.2	30.4	0.32	0.21	23.4
Approach		532	3.0	0.280	6.7	LOS A	1.2	30.4	0.32	0.21	24.0
North: HWY 89											
7	L2	105	3.0	0.340	6.7	LOS A	0.0	0.0	0.00	0.00	26.3
4	T1	640	3.0	0.340	6.7	LOS A	0.0	0.0	0.00	0.00	28.0
Approach		746	3.0	0.340	6.7	LOS A	0.0	0.0	0.00	0.00	27.7
West: I-80 EB off-ramp											
5	L2	35	3.0	0.432	12.4	LOS B	1.6	40.1	0.59	0.62	25.8
12	R2	509	3.0	0.432	12.2	LOS B	1.6	40.1	0.57	0.61	28.1
Approach		544	3.0	0.432	12.2	LOS B	1.6	40.1	0.57	0.61	27.9
All Vehicles		1821	3.0	0.432	8.3	LOS A	1.6	40.1	0.27	0.24	26.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	173	44	71	183	35	763	194
Future Volume (veh/h)	173	44	71	183	35	763	194
Number	3	18	1	6		2	12
Initial Q (Qb), veh	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863		1863	1863
Adj Flow Rate, veh/h	204	52	88	226		867	220
Adj No. of Lanes	2	1	1	2		2	1
Peak Hour Factor	0.85	0.85	0.81	0.81		0.88	0.88
Percent Heavy Veh, %	2	2	2	2		2	2
Cap, veh/h	268	222	111	2978		2142	1306
Arrive On Green	0.08	0.08	0.12	1.00		0.75	0.75
Sat Flow, veh/h	3442	1583	1774	3632		3297	1583
Grp Volume(v), veh/h	204	52	88	226		867	220
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1770		1434	1583
Q Serve(g_s), s	7.2	3.6	6.0	0.0		13.6	3.5
Cycle Q Clear(g_c), s	7.2	3.6	6.0	0.0		13.6	3.5
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	268	222	111	2978		2142	1306
V/C Ratio(X)	0.76	0.23	0.79	0.08		0.40	0.17
Avail Cap(c_a), veh/h	971	546	358	2978		2142	1306
HCM Platoon Ratio	1.00	1.00	2.00	2.00		1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	56.0	47.4	53.5	0.0		5.7	2.2
Incr Delay (d2), s/veh	1.7	0.2	12.0	0.0		0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	1.6	3.3	0.0		5.5	2.3
LnGrp Delay(d),s/veh	57.7	47.6	65.5	0.0		6.3	2.5
LnGrp LOS	E	D	E	A		A	A
Approach Vol, veh/h	256			314		1087	
Approach Delay, s/veh	55.7			18.4		5.5	
Approach LOS	E			B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.7	98.1				109.8		14.2
Change Period (Y+Rc), s	4.0	5.5				5.5		4.5
Max Green Setting (Gmax), s	25.0	50.0				50.0		35.0
Max Q Clear Time (g_c+I1), s	8.0	15.6				2.0		9.2
Green Ext Time (p_c), s	0.2	9.6				10.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	15.7
HCM 2010 LOS	B

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	271	50	204	32	25	783
Future Volume (veh/h)	271	50	204	32	25	783
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	366	68	296	46	28	870
Adj No. of Lanes	1	1	2	1	1	1
Peak Hour Factor	0.74	0.74	0.69	0.69	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	391	380	1844	1367	35	1287
Arrive On Green	0.22	0.22	0.64	0.64	0.04	1.00
Sat Flow, veh/h	1774	1583	3297	1583	1774	1863
Grp Volume(v), veh/h	366	68	296	46	28	870
Grp Sat Flow(s),veh/h/ln	1774	1583	1434	1583	1774	1863
Q Serve(g_s), s	25.1	4.2	5.1	0.5	1.9	0.0
Cycle Q Clear(g_c), s	25.1	4.2	5.1	0.5	1.9	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	391	380	1844	1367	35	1287
V/C Ratio(X)	0.94	0.18	0.16	0.03	0.79	0.68
Avail Cap(c_a), veh/h	415	402	1844	1367	429	1287
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.5	37.4	8.8	1.2	59.3	0.0
Incr Delay (d2), s/veh	27.3	0.1	0.2	0.0	13.5	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.3	1.9	2.1	0.6	1.1	1.0
LnGrp Delay(d),s/veh	74.8	37.5	9.0	1.2	72.7	2.9
LnGrp LOS	E	D	A	A	E	A
Approach Vol, veh/h	434		342			898
Approach Delay, s/veh	69.0		8.0			5.0
Approach LOS	E		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.0	85.7				91.7		32.3
Change Period (Y+Rc), s	3.5	6.0				6.0		5.0
Max Green Setting (Gmax), s	30.0	50.0				50.0		29.0
Max Q Clear Time (g_c+I1), s	13.9	7.1				2.0		27.1
Green Ext Time (p_c), s	0.0	5.6				5.6		0.2

Intersection Summary		
HCM 2010 Ctrl Delay		22.2
HCM 2010 LOS		C

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBU	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	37	1	0	1	2	35	40
Future Vol, veh/h	37	1	0	1	2	35	40
Peak Hour Factor	0.68	0.68	0.25	0.25	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	54	1	0	4	2	39	45
Number of Lanes	0	1	0	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.6	6.6	7.2
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	97%	0%	47%
Vol Thru, %	3%	0%	0%
Vol Right, %	0%	100%	53%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	38	1	77
LT Vol	37	0	36
Through Vol	1	0	0
RT Vol	0	1	41
Lane Flow Rate	56	4	87
Geometry Grp	1	1	1
Degree of Util (X)	0.066	0.004	0.092
Departure Headway (Hd)	4.284	3.528	3.813
Convergence, Y/N	Yes	Yes	Yes
Cap	835	1008	938
Service Time	2.314	1.572	1.844
HCM Lane V/C Ratio	0.067	0.004	0.093
HCM Control Delay	7.6	6.6	7.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0	0.3

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	13	38	4	277	84	18	11
Future Vol, veh/h	13	38	4	277	84	18	11
Conflicting Peds, #/hr	0	0	0	0	0	0	8
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	-	0	0	-
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	72	72	89	89	89	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	18	53	4	311	94	21	13

Major/Minor	Major1		Major2			Minor2	
Conflicting Flow All	311	0	-	-	0	400	319
Stage 1	-	-	-	-	-	311	-
Stage 2	-	-	-	-	-	89	-
Critical Hdwy	4.12	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1249	-	-	-	-	606	722
Stage 1	-	-	-	-	-	743	-
Stage 2	-	-	-	-	-	934	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	1241	-	-	-	-	597	717
Mov Cap-2 Maneuver	-	-	-	-	-	597	-
Stage 1	-	-	-	-	-	743	-
Stage 2	-	-	-	-	-	920	-

Approach	EB	WB	SB
HCM Control Delay, s	2		11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1241	-	-	-	637
HCM Lane V/C Ratio	0.015	-	-	-	0.052
HCM Control Delay (s)	7.9	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	55	9	2	541	392	12	54
Future Vol, veh/h	55	9	2	541	392	12	54
Conflicting Peds, #/hr	0	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	72	72	89	89	89	79	79
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	76	13	2	608	440	15	68

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	-	89	0	1739	84
Stage 1	-	-	-	-	-	83	-
Stage 2	-	-	-	-	-	1656	-
Critical Hdwy	-	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	-	1506	-	96	975
Stage 1	-	-	-	-	-	940	-
Stage 2	-	-	-	-	-	171	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	~ -331	~ -331	-	96	974
Mov Cap-2 Maneuver	-	-	-	-	-	96	-
Stage 1	-	-	-	-	-	940	-
Stage 2	-	-	-	-	-	171	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	96	974	-	-	+	-
HCM Lane V/C Ratio	0.158	0.07	-	-	-	-
HCM Control Delay (s)	49.4	9	-	-	1.1	-
HCM Lane LOS	E	A	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0.2	-	-	-	-

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	16.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	101	6	411	905	8	4	3	49	6	13	31
Future Vol, veh/h	6	101	6	411	905	8	4	3	49	6	13	31
Conflicting Peds, #/hr	1	0	1	1	0	1	4	0	5	5	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	89	89	89	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	140	8	462	1017	9	4	3	53	6	14	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1027	0	0	150	0	0	1605	2112	150	2140	2112	518
Stage 1	-	-	-	-	-	-	162	162	-	1946	1946	-
Stage 2	-	-	-	-	-	-	1443	1950	-	194	166	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	674	-	-	1430	-	-	77	51	896	31	51	503
Stage 1	-	-	-	-	-	-	839	763	-	67	111	-
Stage 2	-	-	-	-	-	-	139	110	-	807	760	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	672	-	-	1424	-	-	-	12	892	9	~ 12	501
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	12	-	9	~ 12	-
Stage 1	-	-	-	-	-	-	828	753	-	66	27	-
Stage 2	-	-	-	-	-	-	15	27	-	744	750	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	3.9		$ 429.5
HCM LOS			-	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	672	-	-	1424	-	-	9	38
HCM Lane V/C Ratio	-	0.012	-	-	0.324	-	-	0.717	1.245
HCM Control Delay (s)	-	10.4	-	-	8.7	1.7	-	$ 706.1	$ 391.8
HCM Lane LOS	-	B	-	-	A	A	-	F	F
HCM 95th %tile Q(veh)	-	0	-	-	1.4	-	-	1.4	4.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	159	0	0	1302	6	0	0	0	11	0	7
Future Volume (veh/h)	2	159	0	0	1302	6	0	0	0	11	0	7
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	0	0	1863	1900				1900	1863	1900
Adj Flow Rate, veh/h	3	221	0	0	1463	7				12	0	8
Adj No. of Lanes	0	1	0	0	2	0				0	1	0
Peak Hour Factor	0.72	0.72	0.92	0.92	0.89	0.89				0.89	0.92	0.89
Percent Heavy Veh, %	2	2	0	0	2	2				0	2	0
Cap, veh/h	98	968	0	0	1901	9				267	0	178
Arrive On Green	0.53	0.53	0.00	0.00	0.53	0.53				0.26	0.00	0.26
Sat Flow, veh/h	5	1839	0	0	3705	17				1015	0	677
Grp Volume(v), veh/h	224	0	0	0	717	753				20	0	0
Grp Sat Flow(s),veh/h/ln	1844	0	0	0	1770	1860				1693	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	12.2	12.3				0.3	0.0	0.0
Cycle Q Clear(g_c), s	2.5	0.0	0.0	0.0	12.2	12.3				0.3	0.0	0.0
Prop In Lane	0.01		0.00	0.00		0.01				0.60		0.40
Lane Grp Cap(c), veh/h	1066	0	0	0	931	979				445	0	0
V/C Ratio(X)	0.21	0.00	0.00	0.00	0.77	0.77				0.04	0.00	0.00
Avail Cap(c_a), veh/h	1066	0	0	0	931	979				445	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	1.00	1.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	4.8	0.0	0.0	0.0	7.2	7.2				10.4	0.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.0	6.1	5.8				0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.0	0.0	7.3	7.7				0.2	0.0	0.0
LnGrp Delay(d),s/veh	5.3	0.0	0.0	0.0	13.3	13.0				10.6	0.0	0.0
LnGrp LOS	A				B	B				B		
Approach Vol, veh/h		224			1470						20	
Approach Delay, s/veh		5.3			13.1						10.6	
Approach LOS		A			B						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		24.0		14.0		24.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		20.0		10.0		20.0		
Max Q Clear Time (g_c+I1), s		4.5		2.3		14.3		
Green Ext Time (p_c), s		9.9		0.0		4.4		

Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	88	68	190	567	4	408	25	210	12	22	4
Future Volume (veh/h)	2	88	68	190	567	4	408	25	210	12	22	4
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	3	122	0	221	659	5	453	0	0	19	35	6
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	0
Peak Hour Factor	0.72	0.72	0.72	0.86	0.86	0.86	0.94	0.94	0.94	0.63	0.63	0.63
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	9	684	306	449	1147	9	707	0	315	54	100	17
Arrive On Green	0.00	0.19	0.00	0.13	0.32	0.32	0.20	0.00	0.00	0.10	0.10	0.10
Sat Flow, veh/h	1774	3539	1583	3442	3600	27	3548	0	1583	571	1051	180
Grp Volume(v), veh/h	3	122	0	221	324	340	453	0	0	60	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1858	1774	0	1583	1802	0	0
Q Serve(g_s), s	0.1	1.2	0.0	2.5	6.5	6.5	5.0	0.0	0.0	1.3	0.0	0.0
Cycle Q Clear(g_c), s	0.1	1.2	0.0	2.5	6.5	6.5	5.0	0.0	0.0	1.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.32		0.10
Lane Grp Cap(c), veh/h	9	684	306	449	564	592	707	0	315	172	0	0
V/C Ratio(X)	0.34	0.18	0.00	0.49	0.57	0.57	0.64	0.00	0.00	0.35	0.00	0.00
Avail Cap(c_a), veh/h	623	2487	1113	1209	1658	1741	2161	0	964	1098	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.2	14.4	0.0	17.3	12.1	12.1	15.7	0.0	0.0	18.1	0.0	0.0
Incr Delay (d2), s/veh	8.4	0.0	0.0	0.3	0.3	0.3	0.4	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.6	0.0	1.2	3.2	3.4	2.5	0.0	0.0	0.7	0.0	0.0
LnGrp Delay(d),s/veh	29.6	14.4	0.0	17.6	12.5	12.5	16.1	0.0	0.0	18.5	0.0	0.0
LnGrp LOS	C	B		B	B	B	B			B		
Approach Vol, veh/h		125			885			453			60	
Approach Delay, s/veh		14.8			13.7			16.1			18.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	12.9		8.1	3.9	18.2		12.5
Change Period (Y+Rc), s	* 3.7	4.6		4.0	* 3.7	* 4.6		4.0
Max Green Setting (Gmax), s	* 15	30.0		26.0	* 15	* 40		26.0
Max Q Clear Time (g_c+I1), s	4.5	3.2		3.3	2.1	8.5		7.0
Green Ext Time (p_c), s	0.1	1.9		0.1	0.0	2.0		0.3

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Notes

SimTraffic Post-Processor | **Squaw Alpine Gondola Phase 2**
Average Results from 10 Runs | **Existing Conditions**
Volume and Delay by Movement | **AM Peak Hour**

Intersection 11 **Squaw Valley Rd/Squaw Creek Rd** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	28	23	83.2%	14.2	6.5	B
	Through						
	Right Turn	22	20	90.0%	2.9	1.1	A
	Subtotal	50	43	86.2%	8.8	3.7	A
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	153	155	101.0%	1.7	0.6	A
	Right Turn	17	16	93.5%	1.9	2.0	A
	Subtotal	170	171	100.3%	1.8	0.6	A
WB	Left Turn	48	50	104.6%	4.3	1.1	A
	Through	1,260	1,266	100.5%	3.9	0.3	A
	Right Turn						
	Subtotal	1,308	1,316	100.6%	3.9	0.3	A
Total		1,528	1,530	100.1%	3.8	0.2	A

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	577	584	101.2%	36.6	5.7	D
	Through	139	136	98.0%	3.3	0.8	A
	Right Turn						
	Subtotal	716	720	100.6%	30.0	4.3	C
SB	Left Turn						
	Through	342	333	97.3%	57.1	17.4	E
	Right Turn	712	713	100.2%	32.7	14.8	C
	Subtotal	1,054	1,046	99.2%	40.3	15.7	D
EB	Left Turn	97	97	99.7%	36.3	4.5	D
	Through						
	Right Turn	90	91	100.6%	2.4	0.5	A
	Subtotal	187	187	100.1%	19.7	2.0	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,957	1,953	99.8%	34.2	8.6	C

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Squaw Alpine Gondola Phase 2
Existing Conditions
AM Peak Hour

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	328	336	102.3%	22.2	3.0	C
	Through	651	659	101.2%	18.7	5.3	B
	Right Turn						
	Subtotal	979	994	101.6%	19.9	3.5	B
SB	Left Turn						
	Through	124	124	100.1%	19.0	6.4	B
	Right Turn	308	300	97.5%	11.2	3.2	B
	Subtotal	432	425	98.3%	13.5	3.7	B
EB	Left Turn	65	58	88.6%	24.6	3.1	C
	Through						
	Right Turn	34	34	98.5%	2.4	1.2	A
	Subtotal	99	91	92.0%	15.8	2.9	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,510	1,510	100.0%	17.9	2.7	B

Intersection 11 **Squaw Valley Rd/Squaw Creek Rd** **Side-street Stop**

Direction	Lane Group	Storage (ft)	Average Queue (ft)		95th Queue (ft)		Maximum Queue (ft)		Block Time	
			Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Through/Right	2,125	25	0	25	2	25	5	0%	0%
NB	Left Turn	75	25	4	50	4	75	7	1%	0%
	Right Turn	1,425	25	3	50	5	50	11	0%	0%
WB	Left/Through	750	25	10	75	30	125	48	0%	0%
	Through	750	25	7	50	37	75	72	0%	0%
0										

SimTraffic Post-Processor | **Squaw Alpine Gondola Phase 2**
Average Results from 10 Runs | **Existing Conditions**
Queue Length | **AM Peak Hour**

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	475	25	4	75	8	100	14	0%	0%
	Left/Through	1,600	75	2	100	5	100	12	0%	0%
NB	Left Turn	425	325	26	525	31	575	29	6%	0%
	Through	650	50	18	150	118	400	258	0%	0%
	Through/Right	75	25	2	25	11	50	25	0%	0%
SB	Through	150	150	12	225	4	225	7	15%	15%
	Right Turn	3,725	300	56	750	99	1,025	109	0%	0%
0										

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	150	50	6	75	10	100	22	0%	0%
	Right Turn	1,825	25	4	50	9	50	19	0%	0%
NB	Left Turn	375	150	18	250	55	350	125	0%	0%
	Through	3,700	200	30	350	63	450	115	1%	0%
SB	Through	1,450	75	9	125	21	150	34	0%	0%
	Right Turn	625	100	6	175	13	200	34	0%	0%
0										

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	188	199	131	180	37	333	123	182	37	90	60
Future Volume (veh/h)	44	188	199	131	180	37	333	123	182	37	90	60
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	54	232	246	147	202	42	370	137	202	44	107	71
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	0	2	0
Peak Hour Factor	0.81	0.81	0.81	0.89	0.89	0.89	0.90	0.90	0.90	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	68	345	684	188	485	402	438	460	391	100	246	168
Arrive On Green	0.04	0.19	0.19	0.11	0.26	0.26	0.25	0.25	0.25	0.15	0.15	0.15
Sat Flow, veh/h	1774	1863	1578	1774	1863	1541	1774	1863	1583	679	1672	1139
Grp Volume(v), veh/h	54	232	246	147	202	42	370	137	202	118	0	104
Grp Sat Flow(s),veh/h/ln	1774	1863	1578	1774	1863	1541	1774	1863	1583	1829	0	1662
Q Serve(g_s), s	2.0	7.7	7.0	5.4	6.0	1.4	13.3	4.0	7.4	3.9	0.0	3.8
Cycle Q Clear(g_c), s	2.0	7.7	7.0	5.4	6.0	1.4	13.3	4.0	7.4	3.9	0.0	3.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.37		0.69
Lane Grp Cap(c), veh/h	68	345	684	188	485	402	438	460	391	269	0	245
V/C Ratio(X)	0.79	0.67	0.36	0.78	0.42	0.10	0.84	0.30	0.52	0.44	0.00	0.42
Avail Cap(c_a), veh/h	398	976	1218	929	976	807	797	836	711	684	0	622
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.9	25.3	12.8	29.1	20.5	18.8	23.9	20.4	21.7	26.0	0.0	25.9
Incr Delay (d2), s/veh	7.6	0.9	0.1	2.7	0.2	0.0	1.7	0.1	0.4	0.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	4.1	4.4	2.8	3.1	0.6	6.7	2.1	3.3	2.0	0.0	1.8
LnGrp Delay(d),s/veh	39.4	26.2	12.9	31.8	20.7	18.8	25.7	20.6	22.1	26.4	0.0	26.3
LnGrp LOS	D	C	B	C	C	B	C	C	C	C		C
Approach Vol, veh/h		532			391			709			222	
Approach Delay, s/veh		21.4			24.7			23.7			26.4	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.1	17.9		14.8	7.1	22.9		22.0
Change Period (Y+Rc), s	5.0	5.5		5.0	4.5	5.5		5.5
Max Green Setting (Gmax), s	35.0	35.0		25.0	15.0	35.0		30.0
Max Q Clear Time (g_c+I1), s	7.4	9.7		5.9	4.0	8.0		15.3
Green Ext Time (p_c), s	0.2	2.0		0.8	0.0	2.0		1.2

Intersection Summary	
HCM 2010 Ctrl Delay	23.5
HCM 2010 LOS	C

MOVEMENT SUMMARY

Site: int_2_Existing_WinterPM

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
3	L2	399	3.0	0.470	8.5	LOS A	0.0	0.0	0.00	0.00	25.5
8	T1	633	3.0	0.470	8.5	LOS A	0.0	0.0	0.00	0.00	25.9
Approach		1031	3.0	0.470	8.5	LOS A	0.0	0.0	0.00	0.00	25.8
East: I-80 WB off-ramp											
1	L2	245	3.0	0.469	15.2	LOS C	1.6	41.3	0.67	0.74	21.7
16	R2	149	3.0	0.302	11.9	LOS B	0.9	23.1	0.63	0.66	22.1
Approach		394	3.0	0.469	14.0	LOS B	1.6	41.3	0.66	0.71	21.8
North: HWY 89											
4	T1	422	3.0	0.446	13.6	LOS B	2.0	51.2	0.67	0.73	22.6
14	R2	83	3.0	0.446	13.6	LOS B	2.0	51.2	0.67	0.73	21.9
Approach		505	3.0	0.446	13.6	LOS B	2.0	51.2	0.67	0.73	22.5
All Vehicles		1930	3.0	0.470	11.0	LOS B	2.0	51.2	0.31	0.34	24.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: int_3_Existing_WinterPM

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
8	T1	1020	3.0	0.875	28.7	LOS D	14.3	365.9	0.96	0.95	19.6
18	R2	573	3.0	0.875	28.7	LOS D	14.3	365.9	0.96	0.95	19.0
Approach		1593	3.0	0.875	28.7	LOS D	14.3	365.9	0.96	0.95	19.4
North: HWY 89											
7	L2	169	3.0	0.304	6.2	LOS A	0.0	0.0	0.00	0.00	25.9
4	T1	498	3.0	0.304	6.2	LOS A	0.0	0.0	0.00	0.00	27.9
Approach		666	3.0	0.304	6.2	LOS A	0.0	0.0	0.00	0.00	27.3
West: I-80 EB off-ramp											
5	L2	13	3.0	0.176	7.5	LOS A	0.5	12.5	0.47	0.47	27.4
12	R2	222	3.0	0.176	7.4	LOS A	0.5	12.5	0.46	0.46	29.9
Approach		235	3.0	0.176	7.4	LOS A	0.5	12.5	0.46	0.46	29.8
All Vehicles		2494	3.0	0.875	20.7	LOS C	14.3	365.9	0.65	0.65	21.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	230	42	158	1126	62	358	166
Future Volume (veh/h)	230	42	158	1126	62	358	166
Number	3	18	1	6		2	12
Initial Q (Qb), veh	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863		1863	1863
Adj Flow Rate, veh/h	261	48	163	1161		398	184
Adj No. of Lanes	2	1	1	2		2	1
Peak Hour Factor	0.88	0.88	0.97	0.97		0.90	0.90
Percent Heavy Veh, %	2	2	2	2		2	2
Cap, veh/h	326	322	192	2918		1962	1233
Arrive On Green	0.09	0.09	0.11	0.82		0.68	0.68
Sat Flow, veh/h	3442	1583	1774	3632		3297	1583
Grp Volume(v), veh/h	261	48	163	1161		398	184
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1770		1434	1583
Q Serve(g_s), s	9.2	3.1	11.2	10.6		6.3	3.6
Cycle Q Clear(g_c), s	9.2	3.1	11.2	10.6		6.3	3.6
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	326	322	192	2918		1962	1233
V/C Ratio(X)	0.80	0.15	0.85	0.40		0.20	0.15
Avail Cap(c_a), veh/h	971	619	358	2918		1962	1233
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	55.0	40.6	54.3	2.8		7.2	3.4
Incr Delay (d2), s/veh	1.7	0.1	9.8	0.4		0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	1.4	6.0	5.2		2.6	2.3
LnGrp Delay(d),s/veh	56.7	40.7	64.1	3.2		7.4	3.7
LnGrp LOS	E	D	E	A		A	A
Approach Vol, veh/h	309			1324		582	
Approach Delay, s/veh	54.2			10.7		6.2	
Approach LOS	D			B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	17.4	90.3				107.7		16.3
Change Period (Y+Rc), s	4.0	5.5				5.5		4.5
Max Green Setting (Gmax), s	25.0	50.0				50.0		35.0
Max Q Clear Time (g_c+I1), s	13.2	8.3				12.6		11.2
Green Ext Time (p_c), s	0.3	16.0				15.4		0.6

Intersection Summary		
HCM 2010 Ctrl Delay		15.6
HCM 2010 LOS		B

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	45	72	1212	148	106	294
Future Volume (veh/h)	45	72	1212	148	106	294
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	57	91	1262	154	113	313
Adj No. of Lanes	1	1	2	1	1	1
Peak Hour Factor	0.79	0.79	0.96	0.96	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	123	232	2113	1276	137	1569
Arrive On Green	0.07	0.07	0.74	0.74	0.15	1.00
Sat Flow, veh/h	1774	1583	3297	1583	1774	1863
Grp Volume(v), veh/h	57	91	1262	154	113	313
Grp Sat Flow(s),veh/h/ln	1774	1583	1434	1583	1774	1863
Q Serve(g_s), s	3.8	6.5	25.7	2.6	7.7	0.0
Cycle Q Clear(g_c), s	3.8	6.5	25.7	2.6	7.7	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	123	232	2113	1276	137	1569
V/C Ratio(X)	0.46	0.39	0.60	0.12	0.83	0.20
Avail Cap(c_a), veh/h	415	493	2113	1276	429	1569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.5	47.9	7.7	2.6	51.6	0.0
Incr Delay (d2), s/veh	1.0	0.4	1.3	0.2	4.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.9	10.4	1.6	3.9	0.1
LnGrp Delay(d),s/veh	56.5	48.3	8.9	2.8	56.3	0.3
LnGrp LOS	E	D	A	A	E	A
Approach Vol, veh/h	148		1416			426
Approach Delay, s/veh	51.5		8.3			15.1
Approach LOS	D		A			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.1	97.3				110.4		13.6
Change Period (Y+Rc), s	3.5	6.0				6.0		5.0
Max Green Setting (Gmax), s	30.0	50.0				50.0		29.0
Max Q Clear Time (g_c+I1), s	9.7	27.7				2.0		8.5
Green Ext Time (p_c), s	0.1	7.6				8.8		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	13.0
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	61	6	0	0	23	28
Future Vol, veh/h	61	6	0	0	23	28
Peak Hour Factor	0.80	0.80	0.85	0.85	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	8	0	0	25	30
Number of Lanes	0	1	0	1	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.7	0	7.1
HCM LOS	A	-	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	91%	0%	45%
Vol Thru, %	9%	100%	0%
Vol Right, %	0%	0%	55%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	67	0	51
LT Vol	61	0	23
Through Vol	6	0	0
RT Vol	0	0	28
Lane Flow Rate	84	0	55
Geometry Grp	1	1	1
Degree of Util (X)	0.098	0	0.058
Departure Headway (Hd)	4.213	4.094	3.84
Convergence, Y/N	Yes	Yes	Yes
Cap	853	0	927
Service Time	2.23	2.132	1.887
HCM Lane V/C Ratio	0.098	0	0.059
HCM Control Delay	7.7	7.1	7.1
HCM Lane LOS	A	N	A
HCM 95th-tile Q	0.3	0	0.2

Intersection	
Int Delay, s/veh	10.4

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	19	305	5	133	40	210	74
Future Vol, veh/h	19	305	5	133	40	210	74
Conflicting Peds, #/hr	0	0	0	0	0	27	9
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	-	0	0	-
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	80	80	93	93	93	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	24	381	5	143	43	273	96

Major/Minor	Major1		Major2			Minor2	
Conflicting Flow All	143	0	-	-	0	599	152
Stage 1	-	-	-	-	-	143	-
Stage 2	-	-	-	-	-	456	-
Critical Hdwy	4.12	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1440	-	-	-	-	465	894
Stage 1	-	-	-	-	-	884	-
Stage 2	-	-	-	-	-	638	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	1429	-	-	-	-	455	887
Mov Cap-2 Maneuver	-	-	-	-	-	455	-
Stage 1	-	-	-	-	-	884	-
Stage 2	-	-	-	-	-	625	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4		26.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1429	-	-	-	521
HCM Lane V/C Ratio	0.017	-	-	-	0.708
HCM Control Delay (s)	7.6	0	-	-	26.9
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	5.6

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	507	13	3	99	166	12	379
Future Vol, veh/h	507	13	3	99	166	12	379
Conflicting Peds, #/hr	0	8	0	8	0	3	5
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	Free
Storage Length	-	-	-	300	-	0	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	80	80	93	93	93	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	634	16	3	106	178	13	403

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	-	658	0	1044	-
Stage 1	-	-	-	-	-	650	-
Stage 2	-	-	-	-	-	394	-
Critical Hdwy	-	-	-	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	-	930	-	254	0
Stage 1	-	-	-	-	-	520	0
Stage 2	-	-	-	-	-	681	0
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	~ -35	~ -35	-	252	-
Mov Cap-2 Maneuver	-	-	-	-	-	252	-
Stage 1	-	-	-	-	-	517	-
Stage 2	-	-	-	-	-	679	-

Approach	EB	WB	NB
HCM Control Delay, s	0		20
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	252	-	-	-	+	-
HCM Lane V/C Ratio	0.051	-	-	-	-	-
HCM Control Delay (s)	20	0	-	-	-	-
HCM Lane LOS	C	A	-	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection												
Int Delay, s/veh	0.9											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	23	866	0	0	260	6	0	0	0	18	0	8
Future Vol, veh/h	23	866	0	0	260	6	0	0	0	18	0	8
Conflicting Peds, #/hr	13	0	0	0	0	13	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	93	93	93	98	98	98	54	54	54
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	1083	0	0	280	6	0	0	0	33	0	15
Major/Minor	**Major1**			**Major2**			**Minor1**			**Minor2**		
Conflicting Flow All	299	0	0	1083	0	0	1430	1439	541	895	1436	296
Stage 1	-	-	-	-	-	-	1140	1140	-	296	296	-
Stage 2	-	-	-	-	-	-	290	299	-	599	1140	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.93	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1261	-	-	642	-	-	103	132	486	248	133	743
Stage 1	-	-	-	-	-	-	215	275	-	712	668	-
Stage 2	-	-	-	-	-	-	717	666	-	456	275	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1261	-	-	642	-	-	96	123	486	234	124	735
Mov Cap-2 Maneuver	-	-	-	-	-	-	96	123	-	234	124	-
Stage 1	-	-	-	-	-	-	203	259	-	663	661	-
Stage 2	-	-	-	-	-	-	703	659	-	430	259	-
Approach	**EB**			**WB**			**NB**			**SB**		
HCM Control Delay, s	0.4			0			0			18.9		
HCM LOS							A			C		
Minor Lane/Major Mvmt	**NBLn1**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**SBLn1**	**SBLn2**			
Capacity (veh/h)	-	1261	-	-	642	-	-	234	735			
HCM Lane V/C Ratio	-	0.023	-	-	-	-	-	0.142	0.02			
HCM Control Delay (s)	0	7.9	0.2	-	0	-	-	22.9	10			
HCM Lane LOS	A	A	A	-	A	-	-	C	B			
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.5	0.1			

HCM 2010 Signalized Intersection Summary
10: Squaw Valley Rd & Wayne Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	875	0	0	250	7	0	0	0	12	0	5
Future Volume (veh/h)	9	875	0	0	250	7	0	0	0	12	0	5
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	0	0	1863	1900				1900	1863	1900
Adj Flow Rate, veh/h	11	1094	0	0	269	8				14	0	6
Adj No. of Lanes	0	2	0	0	1	0				0	1	0
Peak Hour Factor	0.80	0.80	0.92	0.92	0.93	0.93				0.85	0.92	0.85
Percent Heavy Veh, %	2	2	0	0	2	2				0	2	0
Cap, veh/h	101	1820	0	0	947	28				315	0	135
Arrive On Green	0.53	0.53	0.00	0.00	0.53	0.53				0.26	0.00	0.26
Sat Flow, veh/h	9	3542	0	0	1800	54				1198	0	513
Grp Volume(v), veh/h	592	513	0	0	0	277				20	0	0
Grp Sat Flow(s),veh/h/ln	1856	1610	0	0	0	1853				1711	0	0
Q Serve(g_s), s	0.0	8.4	0.0	0.0	0.0	3.2				0.3	0.0	0.0
Cycle Q Clear(g_c), s	8.4	8.4	0.0	0.0	0.0	3.2				0.3	0.0	0.0
Prop In Lane	0.02		0.00	0.00		0.03				0.70		0.30
Lane Grp Cap(c), veh/h	1073	848	0	0	0	975				450	0	0
V/C Ratio(X)	0.55	0.61	0.00	0.00	0.00	0.28				0.04	0.00	0.00
Avail Cap(c_a), veh/h	1073	848	0	0	0	975				450	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	6.3	6.3	0.0	0.0	0.0	5.0				10.4	0.0	0.0
Incr Delay (d2), s/veh	2.0	3.2	0.0	0.0	0.0	0.7				0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	4.3	0.0	0.0	0.0	1.7				0.2	0.0	0.0
LnGrp Delay(d),s/veh	8.3	9.5	0.0	0.0	0.0	5.7				10.6	0.0	0.0
LnGrp LOS	A	A				A				B		
Approach Vol, veh/h		1105			277						20	
Approach Delay, s/veh		8.8			5.7						10.6	
Approach LOS		A			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		24.0		14.0		24.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		20.0		10.0		20.0		
Max Q Clear Time (g_c+I1), s		10.4		2.3		5.2		
Green Ext Time (p_c), s		5.7		0.0		7.6		

Intersection Summary	
HCM 2010 Ctrl Delay	8.2
HCM 2010 LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	449	262	152	173	8	167	37	194	15	48	8
Future Volume (veh/h)	4	449	262	152	173	8	167	37	194	15	48	8
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	5	516	0	181	206	10	218	0	0	19	59	10
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	0
Peak Hour Factor	0.87	0.87	0.87	0.84	0.84	0.84	0.89	0.89	0.89	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	14	803	359	411	1162	56	616	0	275	46	143	24
Arrive On Green	0.01	0.23	0.00	0.12	0.34	0.34	0.17	0.00	0.00	0.12	0.12	0.12
Sat Flow, veh/h	1774	3539	1583	3442	3436	166	3548	0	1583	390	1211	205
Grp Volume(v), veh/h	5	516	0	181	106	110	218	0	0	88	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1833	1774	0	1583	1806	0	0
Q Serve(g_s), s	0.1	5.9	0.0	2.2	1.9	1.9	2.4	0.0	0.0	2.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	5.9	0.0	2.2	1.9	1.9	2.4	0.0	0.0	2.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.09	1.00		1.00	0.22		0.11
Lane Grp Cap(c), veh/h	14	803	359	411	598	620	616	0	275	214	0	0
V/C Ratio(X)	0.35	0.64	0.00	0.44	0.18	0.18	0.35	0.00	0.00	0.41	0.00	0.00
Avail Cap(c_a), veh/h	590	2355	1054	1145	1570	1626	2361	0	1054	1041	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.2	15.8	0.0	18.5	10.5	10.5	16.4	0.0	0.0	18.4	0.0	0.0
Incr Delay (d2), s/veh	5.3	0.3	0.0	0.3	0.1	0.1	0.1	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.9	0.0	1.0	0.9	1.0	1.2	0.0	0.0	1.0	0.0	0.0
LnGrp Delay(d),s/veh	27.5	16.1	0.0	18.7	10.6	10.6	16.5	0.0	0.0	18.9	0.0	0.0
LnGrp LOS	C	B		B	B	B	B			B		
Approach Vol, veh/h		521			397			218			88	
Approach Delay, s/veh		16.2			14.3			16.5			18.9	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.1	14.8		9.3	4.1	19.8		11.8
Change Period (Y+Rc), s	* 3.7	4.6		4.0	* 3.7	* 4.6		4.0
Max Green Setting (Gmax), s	* 15	30.0		26.0	* 15	* 40		30.0
Max Q Clear Time (g_c+I1), s	4.2	7.9		4.0	2.1	3.9		4.4
Green Ext Time (p_c), s	0.1	2.0		0.2	0.0	2.0		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	15.8
HCM 2010 LOS	B

Notes

SimTraffic Post-Processor | **Squaw Alpine Gondola Phase 2**
Average Results from 10 Runs | **Existing Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 11 **Squaw Valley Rd/Squaw Creek Rd** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	19	18	95.3%	29.8	15.8	D
	Through						
	Right Turn	56	54	96.1%	8.5	2.1	A
	Subtotal	75	72	95.9%	15.8	7.3	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	823	824	100.1%	2.4	0.2	A
	Right Turn	33	32	97.6%	2.0	0.9	A
	Subtotal	856	856	100.0%	2.4	0.2	A
WB	Left Turn	41	42	103.2%	12.0	4.4	B
	Through	252	255	101.0%	1.7	0.4	A
	Right Turn						
	Subtotal	293	297	101.3%	3.5	1.0	A
Total		1,224	1,224	100.0%	3.4	0.6	A

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	151	149	98.8%	39.2	4.2	D
	Through	698	700	100.3%	41.4	11.4	D
	Right Turn						
	Subtotal	849	849	100.0%	41.0	9.8	D
SB	Left Turn						
	Through	196	202	102.8%	22.2	4.5	C
	Right Turn	142	146	103.1%	4.1	0.9	A
	Subtotal	338	348	102.9%	14.5	2.9	B
EB	Left Turn	662	659	99.5%	66.3	35.6	E
	Through						
	Right Turn	217	221	101.9%	2.6	0.8	A
	Subtotal	879	880	100.1%	52.4	28.1	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,066	2,077	100.5%	41.9	14.3	D

SimTraffic Post-Processor | **Squaw Alpine Gondola Phase 2**
Average Results from 10 Runs | **Existing Conditions**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 13 **SR 89/Alpine Meadows** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	41	41	100.0%	29.0	6.5	C
	Through	293	290	98.8%	14.5	3.3	B
	Right Turn						
	Subtotal	334	331	99.0%	16.4	2.6	B
SB	Left Turn						
	Through	354	366	103.3%	26.0	4.3	C
	Right Turn	59	60	101.4%	4.2	0.4	A
	Subtotal	413	425	103.0%	23.0	3.4	C
EB	Left Turn	556	565	101.6%	52.1	18.4	D
	Through						
	Right Turn	314	320	102.0%	28.0	13.1	C
	Subtotal	870	885	101.7%	43.4	16.4	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,617	1,641	101.5%	32.7	9.7	C

Intersection 11 **Squaw Valley Rd/Squaw Creek Rd** **Side-street Stop**

Direction	Lane Group	Storage (ft)	Average Queue (ft)		95th Queue (ft)		Maximum Queue (ft)		Block Time	
			Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Through	1,925	25	1	25	7	25	20	0%	0%
	Through/Right	1,925	25	1	25	8	50	23	0%	0%
NB	Left Turn	75	25	3	50	5	75	11	1%	0%
	Right Turn	1,400	50	3	75	5	75	15	1%	0%
WB	Left Turn	100	25	3	75	3	75	10	0%	0%
0										

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	825	175	32	350	90	400	89	0%	0%
	Left/Through	1,625	200	30	350	87	400	88	0%	0%
	Right Turn	1,625	25	3	25	29	50	84	0%	0%
NB	Left Turn	425	125	14	225	72	325	197	0%	0%
	Through	650	275	13	500	43	600	88	35%	1%
	Through/Right	75	75	2	100	3	100	0	21%	0%
SB	Through	3,450	100	7	175	12	175	14	2%	0%
	Right Turn	150	25	1	25	4	50	10	0%	0%
0										

Intersection 13 **SR 89/Alpine Meadows** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	325	250	17	375	16	325	0	11%	0%
	Right Turn	2,150	250	88	700	227	1,000	226	0%	0%
NB	Left Turn	375	50	7	75	11	100	19	0%	0%
	Through	3,775	100	11	200	30	250	69	0%	0%
SB	Through	1,450	175	18	275	25	325	45	0%	0%
	Right Turn	625	25	3	50	5	75	8	0%	0%
0										

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Phone:                                   Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                  Fehr & Peers
Agency/Co.
Date Performed           3/4/2017
Analysis Time Period     Winter AM
Highway                  SR-89 SB
From/To                  Deerfield Dr to W River St
Jurisdiction             Nevada/Placer County
Analysis Year            Existing Conditions
Description  Squaw Valley Olympic Village

__________________________________Input Data__________________________________

Highway class  Class 1             Peak hour factor, PHF    0.89
Shoulder width       4.7     ft     % Trucks and buses       2       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.2     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  0       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     0       /mi

Analysis direction volume, Vd  808     veh/h
Opposing direction volume, Vo  254     veh/h

____________________________Average Travel Speed______________________________

Direction                                    Analysis(d)         Opposing (o)
PCE for trucks, ET                               1.0                 1.4
PCE for RVs, ER                                  1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV           1.000               0.992
Grade adj. factor,(note-1) fg                    1.00                1.00
Directional flow rate,(note-2) vi                908     pc/h        288     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                    -      mi/h
Observed total demand,(note-3) V                      -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS                   45.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS        1.3     mi/h
Adj. for access point density,(note-3) fA            0.0     mi/h

Free-flow speed, FFSd                                43.7    mi/h

Adjustment for no-passing zones, fnp                 3.4     mi/h
Average travel speed, ATSd                           31.0    mi/h
Percent Free Flow Speed, PFFS                        70.9    %
```

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_________________________Percent Time-Spent-Following_________________________

Direction                              Analysis(d)        Opposing (o)
PCE for trucks, ET                         1.0                1.1
PCE for RVs, ER                            1.0                1.0
Heavy-vehicle adjustment factor, fHV       1.000              0.998
Grade adjustment factor,(note-1) fg        1.00               1.00
Directional flow rate,(note-2) vi          908    pc/h        286     pc/h
Base percent time-spent-following,(note-4) BPTSFd  66.9   %
Adjustment for no-passing zones, fnp               29.6
Percent time-spent-following, PTSFd                89.4   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.31
Peak 15-min vehicle-miles of travel, VMT15         45      veh-mi
Peak-hour vehicle-miles of travel, VMT60           162     veh-mi
Peak 15-min total travel time, TT15                1.5     veh-h
Capacity from ATS, CdATS                           1686    veh/h
Capacity from PTSF, CdPTSF                         1697    veh/h
Directional Capacity                               3907    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.2     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      31.0    mi/h
Percent time-spent-following, PTSFd (from above)             89.4
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     -
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	907.9
Effective width of outside lane, We	21.40
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.29
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.2

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 SB
From/To	W River St to Squaw Valley Rd
Jurisdiction	Placer County
Analysis Year	Existing Conditions
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.90	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	7.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	55	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	1054	veh/h
Opposing direction volume, Vo	236	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		2.2	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.977	
Grade adj. factor,(note-1) fg	1.00		0.80	
Directional flow rate,(note-2) vi	1178	pc/h	335	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	59.8	mi/h
Adjustment for no-passing zones, fnp	2.7	mi/h
Average travel speed, ATSd	45.3	mi/h
Percent Free Flow Speed, PFFS	75.8	%

```
_________________________Percent Time-Spent-Following_________________________

Direction                               Analysis(d)        Opposing (o)
PCE for trucks, ET                          1.0                1.7
PCE for RVs, ER                             1.0                1.0
Heavy-vehicle adjustment factor, fHV        1.000              0.986
Grade adjustment factor,(note-1) fg         1.00               0.83
Directional flow rate,(note-2) vi           1171   pc/h        320     pc/h
Base percent time-spent-following,(note-4) BPTSFd  77.4   %
Adjustment for no-passing zones, fnp               13.9
Percent time-spent-following, PTSFd                88.3   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.81
Peak 15-min vehicle-miles of travel, VMT15         2284    veh-mi
Peak-hour vehicle-miles of travel, VMT60           8221    veh-mi
Peak 15-min total travel time, TT15                50.4    veh-h
Capacity from ATS, CdATS                           1463    veh/h
Capacity from PTSF, CdPTSF                         1445    veh/h
Directional Capacity                               1839    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         7.8     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      45.3    mi/h
Percent time-spent-following, PTSFd (from above)             88.3
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     -
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1171.1
Effective width of outside lane, We	28.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	1.90
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 NB
From/To	A. Meadows Rd to S. Valley Rd
Jurisdiction	Placer County
Analysis Year	Existing Conditions
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	716	veh/h
Opposing direction volume, Vo	432	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.9	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.982	
Grade adj. factor,(note-1) fg	0.99		0.94	
Directional flow rate,(note-2) vi	792	pc/h	509	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	50.0	mi/h
Adjustment for no-passing zones, fnp	2.3	mi/h
Average travel speed, ATSd	37.6	mi/h
Percent Free Flow Speed, PFFS	75.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.992	
Grade adjustment factor,(note-1) fg	1.00		0.94	
Directional flow rate,(note-2) vi	778	pc/h	504	pc/h

Base percent time-spent-following,(note-4) BPTSFd	66.1	%
Adjustment for no-passing zones, fnp	28.8	
Percent time-spent-following, PTSFd	83.6	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.50	
Peak 15-min vehicle-miles of travel, VMT15	253	veh-mi
Peak-hour vehicle-miles of travel, VMT60	931	veh-mi
Peak 15-min total travel time, TT15	6.7	veh-h
Capacity from ATS, CdATS	1589	veh/h
Capacity from PTSF, CdPTSF	1625	veh/h
Directional Capacity	2610	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	37.6	mi/h
Percent time-spent-following, PTSFd (from above)	83.6	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	778.3
Effective width of outside lane, We	28.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	1.58
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 NB
From/To	SR 28 to A. Meadows Rd
Jurisdiction	Placer County
Analysis Year	Existing Conditions
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	979	veh/h
Opposing direction volume, Vo	158	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		2.4	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.973	
Grade adj. factor,(note-1) fg	1.00		0.73	
Directional flow rate,(note-2) vi	1071	pc/h	242	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	49.8	mi/h
Adjustment for no-passing zones, fnp	3.7	mi/h
Average travel speed, ATSd	35.8	mi/h
Percent Free Flow Speed, PFFS	72.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.984	
Grade adjustment factor,(note-1) fg	1.00		0.78	
Directional flow rate,(note-2) vi	1064	pc/h	224	pc/h
Base percent time-spent-following,(note-4) BPTSFd	71.9	%		
Adjustment for no-passing zones, fnp	20.6			
Percent time-spent-following, PTSFd	88.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.84	
Peak 15-min vehicle-miles of travel, VMT15	984	veh-mi
Peak-hour vehicle-miles of travel, VMT60	3622	veh-mi
Peak 15-min total travel time, TT15	27.5	veh-h
Capacity from ATS, CdATS	1276	veh/h
Capacity from PTSF, CdPTSF	1358	veh/h
Directional Capacity	1564	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.8	mi/h
Percent time-spent-following, PTSFd (from above)	88.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1064.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.78
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR89 NB
From/To	At Transit Center
Jurisdiction	Caltrans
Analysis Year	
Description	Squaw Valley Olympic Villlage

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	2.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	64	%
Up/down	-	%	Access point density	11	/mi

Analysis direction volume, Vd	643	veh/h
Opposing direction volume, Vo	281	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	685	pc/h	301	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	2.6	mi/h
Adj. for access point density,(note-3) fA	2.8	mi/h
Free-flow speed, FFSd	39.7	mi/h
Adjustment for no-passing zones, fnp	2.7	mi/h
Average travel speed, ATSd	29.3	mi/h
Percent Free Flow Speed, PFFS	74.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.998	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	684	pc/h	300	pc/h

Base percent time-spent-following,(note-4) BPTSFd	58.4	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	79.2	%

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.40	
Peak 15-min vehicle-miles of travel, VMT15	51	veh-mi
Peak-hour vehicle-miles of travel, VMT60	193	veh-mi
Peak 15-min total travel time, TT15	1.7	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	2440	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.3	mi/h
Percent time-spent-following, PTSFd (from above)	79.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	684.0
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.57
Bicycle LOS	E

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 NB
From/To	W River St to Deerfield Dr
Jurisdiction	Nevada/Placer County
Analysis Year	Existing Conditions
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.96	
Shoulder width	4.7	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	1284	veh/h
Opposing direction volume, Vo	400	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.994	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1338	pc/h	419	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSd	27.5	mi/h
Percent Free Flow Speed, PFFS	62.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1338	pc/h	417	pc/h
Base percent time-spent-following,(note-4) BPTSFd	81.8	%		
Adjustment for no-passing zones, fnp	18.8			
Percent time-spent-following, PTSFd	96.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.85	
Peak 15-min vehicle-miles of travel, VMT15	67	veh-mi
Peak-hour vehicle-miles of travel, VMT60	257	veh-mi
Peak 15-min total travel time, TT15	2.4	veh-h
Capacity from ATS, CdATS	1572	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	2063	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	27.5	mi/h
Percent time-spent-following, PTSFd (from above)	96.1	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1337.5
Effective width of outside lane, We	21.40
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.49
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                  Fehr & Peers
Agency/Co.
Date Performed           4/9/2017
Analysis Time Period     Winter PM
Highway                  SR-89 NB
From/To                  Squaw Valley Rd to W River St
Jurisdiction             Placer County
Analysis Year            Existing Conditions
Description  Squaw Valley Olympic Village

__________________________________Input Data__________________________________

Highway class  Class 1             Peak hour factor, PHF    0.93
Shoulder width       8.0     ft     % Trucks and buses       2       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       7.8     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Rolling        % Recreational vehicles  0       %
Grade:  Length       -       mi     % No-passing zones       55      %
        Up/down      -       %      Access point density     1       /mi

Analysis direction volume, Vd  1360    veh/h
Opposing direction volume, Vo  338     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)        Opposing (o)
PCE for trucks, ET                        1.3                2.0
PCE for RVs, ER                           1.1                1.1
Heavy-vehicle adj. factor,(note-5) fHV    0.994              0.980
Grade adj. factor,(note-1) fg             1.00               0.87
Directional flow rate,(note-2) vi         1471    pc/h       426     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  0.0     mi/h
Adj. for access point density,(note-3) fA      0.3     mi/h

Free-flow speed, FFSd                         59.8    mi/h

Adjustment for no-passing zones, fnp          2.3     mi/h
Average travel speed, ATSd                    42.8    mi/h
Percent Free Flow Speed, PFFS                 71.6    %
```

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.988	
Grade adjustment factor,(note-1) fg	1.00		0.88	
Directional flow rate,(note-2) vi	1462	pc/h	418	pc/h

Base percent time-spent-following,(note-4) BPTSFd	84.3	%
Adjustment for no-passing zones, fnp	10.9	
Percent time-spent-following, PTSFd	92.8	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.97	
Peak 15-min vehicle-miles of travel, VMT15	2852	veh-mi
Peak-hour vehicle-miles of travel, VMT60	10608	veh-mi
Peak 15-min total travel time, TT15	66.7	veh-h
Capacity from ATS, CdATS	1516	veh/h
Capacity from PTSF, CdPTSF	1535	veh/h
Directional Capacity	1955	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	7.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.8	mi/h
Percent time-spent-following, PTSFd (from above)	92.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1462.4
Effective width of outside lane, We	28.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.01
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.2

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 NB
From/To	A. Meadows Rd to S. Valley Rd
Jurisdiction	Placer County
Analysis Year	Existing Conditions
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	849	veh/h
Opposing direction volume, Vo	413	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.9	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.982	
Grade adj. factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	928	pc/h	497	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	50.0	mi/h
Adjustment for no-passing zones, fnp	2.3	mi/h
Average travel speed, ATSd	36.6	mi/h
Percent Free Flow Speed, PFFS	73.3	%

```
_________________________Percent Time-Spent-Following_________________________

Direction                               Analysis(d)        Opposing (o)
PCE for trucks, ET                          1.0                1.4
PCE for RVs, ER                             1.0                1.0
Heavy-vehicle adjustment factor, fHV        1.000              0.992
Grade adjustment factor,(note-1) fg         1.00               0.93
Directional flow rate,(note-2) vi           923    pc/h        487     pc/h
Base percent time-spent-following,(note-4) BPTSFd  71.6   %
Adjustment for no-passing zones, fnp               23.5
Percent time-spent-following, PTSFd                87.0   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.59
Peak 15-min vehicle-miles of travel, VMT15         300     veh-mi
Peak-hour vehicle-miles of travel, VMT60           1104    veh-mi
Peak 15-min total travel time, TT15                8.2     veh-h
Capacity from ATS, CdATS                           1572    veh/h
Capacity from PTSF, CdPTSF                         1602    veh/h
Directional Capacity                               2414    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         1.3     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      36.6    mi/h
Percent time-spent-following, PTSFd (from above)             87.0
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     -
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	922.8
Effective width of outside lane, We	28.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	1.67
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 SB
From/To	A. Meadows Rd to SR 28
Jurisdiction	Placer County
Analysis Year	Existing Conditions
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.87	
Shoulder width	5.5	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	715	veh/h
Opposing direction volume, Vo	334	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		2.0	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.980	
Grade adj. factor,(note-1) fg	0.99		0.89	
Directional flow rate,(note-2) vi	837	pc/h	440	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	48.5	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSd	36.0	mi/h
Percent Free Flow Speed, PFFS	74.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.988	
Grade adjustment factor,(note-1) fg	1.00		0.89	
Directional flow rate,(note-2) vi	822	pc/h	437	pc/h

Base percent time-spent-following,(note-4) BPTSFd	66.7	%
Adjustment for no-passing zones, fnp	26.4	
Percent time-spent-following, PTSFd	83.9	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.54	
Peak 15-min vehicle-miles of travel, VMT15	760	veh-mi
Peak-hour vehicle-miles of travel, VMT60	2646	veh-mi
Peak 15-min total travel time, TT15	21.1	veh-h
Capacity from ATS, CdATS	1536	veh/h
Capacity from PTSF, CdPTSF	1552	veh/h
Directional Capacity	2343	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	36.0	mi/h
Percent time-spent-following, PTSFd (from above)	83.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	821.8
Effective width of outside lane, We	23.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.89
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                  Fehr & Peers
Agency/Co.
Date Performed           4/9/2017
Analysis Time Period     Winter PM
Highway                  SR89 SB
From/To                  At Transit Center
Jurisdiction             Caltrans
Analysis Year
Description  Squaw Valley Olympic Villlage

__________________________________Input Data__________________________________

Highway class  Class 2              Peak hour factor, PHF    0.85
Shoulder width       2.0     ft     % Trucks and buses       2       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       0.3     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Level          % Recreational vehicles  0       %
Grade:  Length       -       mi     % No-passing zones       64      %
        Up/down      -       %      Access point density     11      /mi

Analysis direction volume, Vd  462     veh/h
Opposing direction volume, Vo  398     veh/h

____________________________Average Travel Speed______________________________

Direction                             Analysis(d)        Opposing (o)
PCE for trucks, ET                        1.2                1.2
PCE for RVs, ER                           1.0                1.0
Heavy-vehicle adj. factor,(note-5) fHV    0.996              0.996
Grade adj. factor,(note-1) fg             1.00               1.00
Directional flow rate,(note-2) vi         546     pc/h       470     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM             -      mi/h
Observed total demand,(note-3) V               -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS            45.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS  2.6     mi/h
Adj. for access point density,(note-3) fA     2.8     mi/h

Free-flow speed, FFSd                         39.7    mi/h

Adjustment for no-passing zones, fnp          1.8     mi/h
Average travel speed, ATSd                    29.9    mi/h
Percent Free Flow Speed, PFFS                 75.5    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                               Analysis(d)        Opposing (o)
PCE for trucks, ET                          1.0                1.0
PCE for RVs, ER                             1.0                1.0
Heavy-vehicle adjustment factor, fHV        1.000              1.000
Grade adjustment factor,(note-1) fg         1.00               1.00
Directional flow rate,(note-2) vi           544    pc/h        468     pc/h
Base percent time-spent-following,(note-4) BPTSFd  54.0   %
Adjustment for no-passing zones, fnp                36.5
Percent time-spent-following, PTSFd                 73.6   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                               D
Volume to capacity ratio, v/c                       0.32
Peak 15-min vehicle-miles of travel, VMT15          41      veh-mi
Peak-hour vehicle-miles of travel, VMT60            139     veh-mi
Peak 15-min total travel time, TT15                 1.4     veh-h
Capacity from ATS, CdATS                            0       veh/h
Capacity from PTSF, CdPTSF                          1700    veh/h
Directional Capacity                                3162    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                          0.3     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                  -       mi
Average travel speed, ATSd (from above)                       29.9    mi/h
Percent time-spent-following, PTSFd (from above)              73.6
Level of service, LOSd (from above)                           D

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                     -
Average travel speed including passing lane, ATSpl            -

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                      -
Percent time-spent-following
    including passing lane, PTSFpl                            -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     -
Peak 15-min total travel time, TT15                 -       veh-h

__________________________ Bicycle Level of Service __________________________
```

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	543.5
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.45
Bicycle LOS	D

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Squaw Valley Road West of SR 89

	Sun 2/26/17 EB	WB	Sun 1/29/17 EB	WB
12	54	50	54	50
1	51	34	51	34
2	37	32	37	32
3	27	20	27	20
4	27	25	27	25
5	32	47	32	47
6	49	270	49	270
7	132	1125	132	1354.502
8	228	988	228	1189.554
9	233	469	233	564.6768
10	286	370	286	445.4806
11	416	382	416	459.9287
12	695	289	836.7812	289
1	659	249	793.4371	249
2	815	306	879	293
3	862	226	978	211
4	622	174	911	193
5	399	128	480.3967	128
6	183	84	220.3323	84
7	102	67	102	67
8	90	61	90	61
9	38	28	38	28
10	45	20	45	20
11	40	20	40	20
SUM	6122	5464	6985.947	6135.142
	11586		13121.09	

Three Hour Sums				Three Hour Growth	
EB	EB	WB	WB	EB Inc	WB Inc
2299	2768	706	697	1.204002	0.987252

= volume same as 2/26 because hour/direction not materially affected by number of skiers

= volume increased by 20% based on 3-hour eb increase

= volume observed on 1/29

Prepared by NDS/ATD

VOLUME

Squaw Valley Road West-Of SR 89

Day: Sunday **City:** Squaw Valley
Date: 2/26/2017 **Project #:** CA17_7164_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,122	5,464	11,586

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
0:00	0	0	11		11		22		12:00	0	0	178		77		255	
0:15	0	0	19		9		28		12:15	0	0	142		81		223	
0:30	0	0	12		15		27		12:30	0	0	196		68		264	
0:45	0	0	12	54	15	50	27	104	12:45	0	0	179	695	63	289	242	984
1:00	0	0	17		7		24		13:00	0	0	157		63		220	
1:15	0	0	15		11		26		13:15	0	0	169		44		213	
1:30	0	0	8		6		14		13:30	0	0	170		66		236	
1:45	0	0	11	51	10	34	21	85	13:45	0	0	163	659	76	249	239	908
2:00	0	0	9		7		16		14:00	0	0	179		57		236	
2:15	0	0	12		5		17		14:15	0	0	165		84		249	
2:30	0	0	9		9		18		14:30	0	0	205		84		289	
2:45	0	0	7	37	11	32	18	69	14:45	0	0	266	815	81	306	347	1121
3:00	0	0	9		5		14		15:00	0	0	237		45		282	
3:15	0	0	6		3		9		15:15	0	0	214		67		281	
3:30	0	0	4		7		11		15:30	0	0	221		58		279	
3:45	0	0	8	27	5	20	13	47	15:45	0	0	190	862	56	226	246	1088
4:00	0	0	9		7		16		16:00	0	0	186		37		223	
4:15	0	0	5		6		11		16:15	0	0	164		56		220	
4:30	0	0	8		7		15		16:30	0	0	170		47		217	
4:45	0	0	5	27	5	25	10	52	16:45	0	0	102	622	34	174	136	796
5:00	0	0	5		6		11		17:00	0	0	130		39		169	
5:15	0	0	10		8		18		17:15	0	0	112		25		137	
5:30	0	0	8		15		23		17:30	0	0	76		29		105	
5:45	0	0	9	32	18	47	27	79	17:45	0	0	81	399	35	128	116	527
6:00	0	0	8		24		32		18:00	0	0	78		25		103	
6:15	0	0	12		26		38		18:15	0	0	43		17		60	
6:30	0	0	14		67		81		18:30	0	0	42		20		62	
6:45	0	0	15	49	153	270	168	319	18:45	0	0	20	183	22	84	42	267
7:00	0	0	16		171		187		19:00	0	0	34		17		51	
7:15	0	0	29		282		311		19:15	0	0	28		11		39	
7:30	0	0	38		321		359		19:30	0	0	24		25		49	
7:45	0	0	49	132	351	1125	400	1257	19:45	0	0	16	102	14	67	30	169
8:00	0	0	43		332		375		20:00	0	0	28		18		46	
8:15	0	0	57		279		336		20:15	0	0	24		17		41	
8:30	0	0	53		192		245		20:30	0	0	20		11		31	
8:45	0	0	75	228	185	988	260	1216	20:45	0	0	18	90	15	61	33	151
9:00	0	0	55		161		216		21:00	0	0	5		9		14	
9:15	0	0	42		122		164		21:15	0	0	10		4		14	
9:30	0	0	60		98		158		21:30	0	0	12		3		15	
9:45	0	0	76	233	88	469	164	702	21:45	0	0	11	38	12	28	23	66
10:00	0	0	69		89		158		22:00	0	0	9		8		17	
10:15	0	0	86		103		189		22:15	0	0	9		7		16	
10:30	0	0	65		90		155		22:30	0	0	14		2		16	
10:45	0	0	66	286	88	370	154	656	22:45	0	0	13	45	3	20	16	65
11:00	0	0	97		86		183		23:00	0	0	12		4		16	
11:15	0	0	89		101		190		23:15	0	0	14		5		19	
11:30	0	0	119		117		236		23:30	0	0	9		3		12	
11:45	0	0	111	416	78	382	189	798	23:45	0	0	5	40	8	20	13	60
TOTALS				1572		3812		5384	TOTALS				4550		1652		6202
SPLIT %				29.2%		70.8%		46.5%	SPLIT %				73.4%		26.6%		53.5%

Hour Starting	Total EB	% Skiers	
12	54	0	0
1	51	0	0
2	37	0	0
3	27	0	0
4	27	0	0
5	32	0	0
6	49	0	0
7	132	0	0
8	228	0	0
9	233	0	0
10	286	0	0
11	416	0.1	41.6
12	695	0.1	69.5
1	659	0.63	415.17
2	815	1	815
3	862	0.63	543.06
4	622	0.63	391.86
5	399	0.25	99.75
6	183	0	0
7	102	0	0
8	90	0	0
9	38	0	0
10	45	0	0
11	40	0	0
	6122		2375.9
			34.30%

Percent of all Skiers Exitir
During 2-3 PM Peak Hour

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,122	5,464	11,586

E2

Existing Plus Project Conditions
Technical Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	186	346	110	166	37	151	72	81	18	94	60
Future Volume (veh/h)	54	186	346	110	166	37	151	72	81	18	94	60
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	59	202	376	125	189	42	162	77	87	20	103	66
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	468	653	163	576	489	286	301	255	57	294	192
Arrive On Green	0.04	0.25	0.25	0.09	0.31	0.31	0.16	0.16	0.16	0.17	0.16	0.16
Sat Flow, veh/h	1774	1863	1581	1774	1863	1583	1774	1863	1583	366	1891	1233
Grp Volume(v), veh/h	59	202	376	125	189	42	162	77	87	101	0	88
Grp Sat Flow(s),veh/h/ln	1774	1863	1581	1774	1863	1583	1774	1863	1583	1844	0	1645
Q Serve(g_s), s	2.0	5.6	11.3	4.3	4.8	1.2	5.2	2.2	3.0	3.0	0.0	2.9
Cycle Q Clear(g_c), s	2.0	5.6	11.3	4.3	4.8	1.2	5.2	2.2	3.0	3.0	0.0	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.20		0.75
Lane Grp Cap(c), veh/h	74	468	653	163	576	489	286	301	255	287	0	256
V/C Ratio(X)	0.79	0.43	0.58	0.77	0.33	0.09	0.57	0.26	0.34	0.35	0.00	0.34
Avail Cap(c_a), veh/h	431	1056	1152	1006	1056	897	862	905	769	747	0	666
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.3	19.4	14.0	27.4	16.4	15.1	23.9	22.7	23.0	23.2	0.0	23.3
Incr Delay (d2), s/veh	6.9	0.2	0.3	2.9	0.1	0.0	0.7	0.2	0.3	0.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.9	6.3	2.2	2.5	0.5	2.6	1.1	1.3	1.6	0.0	1.4
LnGrp Delay(d),s/veh	36.2	19.6	14.3	30.3	16.5	15.2	24.6	22.8	23.3	23.5	0.0	23.6
LnGrp LOS	D	B	B	C	B	B	C	C	C	C		C
Approach Vol, veh/h		637			356			326			189	
Approach Delay, s/veh		18.0			21.2			23.8			23.5	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.7	21.0		14.6	7.1	24.6		15.5
Change Period (Y+Rc), s	5.0	5.5		5.0	4.5	5.5		5.5
Max Green Setting (Gmax), s	35.0	35.0		25.0	15.0	35.0		30.0
Max Q Clear Time (g_c+I1), s	6.3	13.3		5.0	4.0	6.8		7.2
Green Ext Time (p_c), s	0.2	2.1		0.6	0.0	2.1		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	20.7
HCM 2010 LOS	C

MOVEMENT SUMMARY

Site: 2. E+P AM

SR 89 / I-80 WB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
3	L2	142	3.0	0.168	4.8	LOS A	0.0	0.0	0.00	0.00	25.5
8	T1	226	3.0	0.168	4.8	LOS A	0.0	0.0	0.00	0.00	25.9
Approach		368	3.0	0.168	4.8	LOS A	0.0	0.0	0.00	0.00	25.8
East: I-80 WB off-ramp											
1	L2	219	3.0	0.260	7.1	LOS A	0.8	19.4	0.37	0.34	23.4
6	T1	1	3.0	0.001	4.4	LOS A	0.0	0.1	0.32	0.17	32.5
16	R2	112	3.0	0.136	5.7	LOS A	0.4	9.6	0.35	0.30	23.5
Approach		333	3.0	0.260	6.6	LOS A	0.8	19.4	0.36	0.33	23.5
North: HWY 89											
4	T1	558	3.0	0.399	9.9	LOS A	1.8	45.1	0.55	0.53	23.5
14	R2	45	3.0	0.399	9.9	LOS A	1.8	45.1	0.55	0.53	22.8
Approach		603	3.0	0.399	9.9	LOS A	1.8	45.1	0.55	0.53	23.4
All Vehicles		1304	3.0	0.399	7.6	LOS A	1.8	45.1	0.35	0.33	24.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3. E+P AM

SR 89 / I-80 EB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
8	T1	351	3.0	0.281	6.7	LOS A	1.2	30.5	0.32	0.21	24.2
18	R2	183	3.0	0.281	6.7	LOS A	1.2	30.5	0.32	0.21	23.4
Approach		533	3.0	0.281	6.7	LOS A	1.2	30.5	0.32	0.21	24.0
North: HWY 89											
7	L2	105	3.0	0.350	6.8	LOS A	0.0	0.0	0.00	0.00	26.3
4	T1	662	3.0	0.350	6.8	LOS A	0.0	0.0	0.00	0.00	28.0
Approach		767	3.0	0.350	6.8	LOS A	0.0	0.0	0.00	0.00	27.7
West: I-80 EB off-ramp											
5	L2	35	3.0	0.448	12.9	LOS B	1.6	42.2	0.60	0.64	25.7
12	R2	519	3.0	0.448	12.7	LOS B	1.6	42.2	0.59	0.63	27.9
Approach		554	3.0	0.448	12.7	LOS B	1.6	42.2	0.59	0.63	27.8
All Vehicles		1855	3.0	0.448	8.5	LOS A	1.6	42.2	0.27	0.25	26.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	173	44	71	185	27	793	194
Future Volume (veh/h)	173	44	71	185	27	793	194
Number	3	18	1	6		2	12
Initial Q (Qb), veh	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863		1863	1863
Adj Flow Rate, veh/h	204	52	88	228		901	220
Adj No. of Lanes	2	1	1	2		2	1
Peak Hour Factor	0.85	0.85	0.81	0.81		0.88	0.88
Percent Heavy Veh, %	2	2	2	2		2	2
Cap, veh/h	268	222	111	2978		2142	1306
Arrive On Green	0.08	0.08	0.12	1.00		0.75	0.75
Sat Flow, veh/h	3442	1583	1774	3632		3297	1583
Grp Volume(v), veh/h	204	52	88	228		901	220
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1770		1434	1583
Q Serve(g_s), s	7.2	3.6	6.0	0.0		14.4	3.5
Cycle Q Clear(g_c), s	7.2	3.6	6.0	0.0		14.4	3.5
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	268	222	111	2978		2142	1306
V/C Ratio(X)	0.76	0.23	0.79	0.08		0.42	0.17
Avail Cap(c_a), veh/h	971	546	358	2978		2142	1306
HCM Platoon Ratio	1.00	1.00	2.00	2.00		1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	56.0	47.4	53.5	0.0		5.8	2.2
Incr Delay (d2), s/veh	1.7	0.2	12.0	0.1		0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	1.6	3.3	0.0		5.8	2.3
LnGrp Delay(d),s/veh	57.7	47.6	65.5	0.1		6.4	2.5
LnGrp LOS	E	D	E	A		A	A
Approach Vol, veh/h	256			316		1121	
Approach Delay, s/veh	55.7			18.3		5.6	
Approach LOS	E			B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.7	98.1				109.8		14.2
Change Period (Y+Rc), s	4.0	5.5				5.5		4.5
Max Green Setting (Gmax), s	25.0	50.0				50.0		35.0
Max Q Clear Time (g_c+I1), s	8.0	16.4				2.0		9.2
Green Ext Time (p_c), s	0.2	10.0				10.7		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	278	50	206	32	25	813
Future Volume (veh/h)	278	50	206	32	25	813
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	376	68	299	46	28	903
Adj No. of Lanes	1	1	2	1	1	1
Peak Hour Factor	0.74	0.74	0.69	0.69	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	400	388	1829	1367	35	1278
Arrive On Green	0.23	0.23	0.64	0.64	0.04	1.00
Sat Flow, veh/h	1774	1583	3297	1583	1774	1863
Grp Volume(v), veh/h	376	68	299	46	28	903
Grp Sat Flow(s),veh/h/ln	1774	1583	1434	1583	1774	1863
Q Serve(g_s), s	25.8	4.2	5.2	0.5	1.9	0.0
Cycle Q Clear(g_c), s	25.8	4.2	5.2	0.5	1.9	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	400	388	1829	1367	35	1278
V/C Ratio(X)	0.94	0.18	0.16	0.03	0.79	0.71
Avail Cap(c_a), veh/h	415	402	1829	1367	429	1278
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.2	36.9	9.1	1.2	59.3	0.0
Incr Delay (d2), s/veh	28.5	0.1	0.2	0.0	13.5	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.8	1.9	2.1	0.6	1.1	1.2
LnGrp Delay(d),s/veh	75.7	37.0	9.3	1.2	72.7	3.3
LnGrp LOS	E	D	A	A	E	A
Approach Vol, veh/h	444		345			931
Approach Delay, s/veh	69.8		8.2			5.4
Approach LOS	E		A			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.0	85.1				91.1		32.9
Change Period (Y+Rc), s	3.5	6.0				6.0		5.0
Max Green Setting (Gmax), s	30.0	50.0				50.0		29.0
Max Q Clear Time (g_c+I1), s	13.9	7.2				2.0		27.8
Green Ext Time (p_c), s	0.0	5.9				5.9		0.1

Intersection Summary		
HCM 2010 Ctrl Delay		22.6
HCM 2010 LOS		C

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	37	1	0	1	35	40
Future Vol, veh/h	37	1	0	1	35	40
Peak Hour Factor	0.68	0.68	0.25	0.25	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	1	0	4	39	45
Number of Lanes	0	1	0	1	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.6	6.6	7.2
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	97%	0%	47%
Vol Thru, %	3%	0%	0%
Vol Right, %	0%	100%	53%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	38	1	75
LT Vol	37	0	35
Through Vol	1	0	0
RT Vol	0	1	40
Lane Flow Rate	56	4	84
Geometry Grp	1	1	1
Degree of Util (X)	0.066	0.004	0.089
Departure Headway (Hd)	4.28	3.524	3.813
Convergence, Y/N	Yes	Yes	Yes
Cap	837	1010	938
Service Time	2.308	1.566	1.844
HCM Lane V/C Ratio	0.067	0.004	0.09
HCM Control Delay	7.6	6.6	7.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0	0.3

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	40	277	84	18	11
Future Vol, veh/h	13	40	277	84	18	11
Conflicting Peds, #/hr	0	0	0	0	0	8
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	72	72	89	89	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	56	311	94	21	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	311	0	-	0	403	319
Stage 1	-	-	-	-	311	-
Stage 2	-	-	-	-	92	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1249	-	-	-	603	722
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	932	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1241	-	-	-	594	717
Mov Cap-2 Maneuver	-	-	-	-	594	-
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	918	-

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1241	-	-	-	635
HCM Lane V/C Ratio	0.015	-	-	-	0.052
HCM Control Delay (s)	7.9	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	6.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	55	9	541	392	12	55
Future Vol, veh/h	55	9	541	392	12	55
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	72	72	89	89	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	13	608	440	15	70

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	89	0	1739	84
Stage 1	-	-	-	-	83	-
Stage 2	-	-	-	-	1656	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1506	-	96	975
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	171	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1505	-	57	974
Mov Cap-2 Maneuver	-	-	-	-	57	-
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	102	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.2	23.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	57	974	-	-	1505	-
HCM Lane V/C Ratio	0.266	0.071	-	-	0.404	-
HCM Control Delay (s)	89.7	9	-	-	9	-
HCM Lane LOS	F	A	-	-	A	-
HCM 95th %tile Q(veh)	0.9	0.2	-	-	2	-

Intersection	
Int Delay, s/veh	16.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	104	6	411	905	8	4	3	49	6	13	31
Future Vol, veh/h	6	104	6	411	905	8	4	3	49	6	13	31
Conflicting Peds, #/hr	1	0	1	1	0	1	4	0	5	5	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	89	89	89	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	144	8	462	1017	9	4	3	53	6	14	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1027	0	0	154	0	0	1609	2116	155	2144	2116	518
Stage 1	-	-	-	-	-	-	166	166	-	1946	1946	-
Stage 2	-	-	-	-	-	-	1443	1950	-	198	170	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	674	-	-	1425	-	-	77	50	890	31	50	503
Stage 1	-	-	-	-	-	-	835	760	-	67	111	-
Stage 2	-	-	-	-	-	-	139	110	-	803	757	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	672	-	-	1419	-	-	-	12	886	9	~ 12	501
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	12	-	9	~ 12	-
Stage 1	-	-	-	-	-	-	824	750	-	66	27	-
Stage 2	-	-	-	-	-	-	15	26	-	740	747	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	3.9		$ 429.5
HCM LOS			-	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	672	-	-	1419	-	-	9	38
HCM Lane V/C Ratio	-	0.012	-	-	0.325	-	-	0.717	1.245
HCM Control Delay (s)	-	10.4	-	-	8.8	1.7	-	$ 706.1	$ 391.8
HCM Lane LOS	-	B	-	-	A	A	-	F	F
HCM 95th %tile Q(veh)	-	0	-	-	1.4	-	-	1.4	4.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	162	0	0	1302	6	0	0	0	11	0	7
Future Volume (veh/h)	2	162	0	0	1302	6	0	0	0	11	0	7
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	0	0	1863	1900				1900	1863	1900
Adj Flow Rate, veh/h	3	225	0	0	1463	7				12	0	8
Adj No. of Lanes	0	1	0	0	2	0				0	1	0
Peak Hour Factor	0.72	0.72	0.72	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	0	2	2				0	2	0
Cap, veh/h	98	968	0	0	1901	9				267	0	178
Arrive On Green	0.53	0.53	0.00	0.00	0.53	0.53				0.26	0.00	0.26
Sat Flow, veh/h	4	1839	0	0	3705	17				1015	0	677
Grp Volume(v), veh/h	228	0	0	0	717	753				20	0	0
Grp Sat Flow(s),veh/h/ln	1844	0	0	0	1770	1860				1693	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	12.2	12.3				0.3	0.0	0.0
Cycle Q Clear(g_c), s	2.5	0.0	0.0	0.0	12.2	12.3				0.3	0.0	0.0
Prop In Lane	0.01		0.00	0.00		0.01				0.60		0.40
Lane Grp Cap(c), veh/h	1066	0	0	0	931	979				445	0	0
V/C Ratio(X)	0.21	0.00	0.00	0.00	0.77	0.77				0.04	0.00	0.00
Avail Cap(c_a), veh/h	1066	0	0	0	931	979				445	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	1.00	1.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	4.9	0.0	0.0	0.0	7.2	7.2				10.4	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.0	6.1	5.8				0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.0	0.0	7.3	7.7				0.2	0.0	0.0
LnGrp Delay(d),s/veh	5.3	0.0	0.0	0.0	13.3	13.0				10.6	0.0	0.0
LnGrp LOS	A				B	B				B		
Approach Vol, veh/h		228			1470						20	
Approach Delay, s/veh		5.3			13.1						10.6	
Approach LOS		A			B						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		24.0		14.0		24.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		20.0		10.0		20.0		
Max Q Clear Time (g_c+I1), s		4.5		2.3		14.3		
Green Ext Time (p_c), s		9.9		0.0		4.4		

Intersection Summary	
HCM 2010 Ctrl Delay	12.1
HCM 2010 LOS	B

Intersection 11 **Squaw Creek Rd/Squaw Valley Rd** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	28	29	102.7%	11.2	3.4	B
	Through						
	Right Turn	22	22	98.4%	2.8	0.6	A
	Subtotal	50	50	100.8%	6.8	1.8	A
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	156	160	102.5%	1.2	0.4	A
	Right Turn	17	16	95.9%	1.5	1.3	A
	Subtotal	173	176	101.8%	1.3	0.4	A
WB	Left Turn	48	46	95.9%	4.8	1.3	A
	Through	1,260	1,282	101.7%	3.8	0.3	A
	Right Turn						
	Subtotal	1,308	1,328	101.5%	3.9	0.3	A
Total		1,531	1,555	101.5%	3.6	0.3	A

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	545	545	99.9%	35.8	8.8	D
	Through	139	144	103.7%	11.3	2.1	B
	Right Turn						
	Subtotal	684	689	100.7%	30.4	7.5	C
SB	Left Turn						
	Through	347	357	102.7%	63.6	24.7	E
	Right Turn	744	767	103.1%	43.0	24.8	D
	Subtotal	1,091	1,123	103.0%	49.3	24.5	D
EB	Left Turn	99	103	103.7%	36.7	16.0	D
	Through						
	Right Turn	91	92	100.6%	2.4	0.7	A
	Subtotal	190	194	102.2%	20.5	6.0	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,965	2,006	102.1%	40.0	15.7	D

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	394	388	98.5%	26.9	4.7	C
	Through	619	618	99.9%	19.8	5.1	B
	Right Turn						
	Subtotal	1,013	1,007	99.4%	22.6	4.1	C
SB	Left Turn						
	Through	125	132	105.7%	16.0	4.3	B
	Right Turn	313	311	99.5%	12.9	1.5	B
	Subtotal	438	443	101.2%	13.8	1.8	B
EB	Left Turn	65	65	100.1%	26.4	5.0	C
	Through						
	Right Turn	35	39	110.6%	2.3	1.1	A
	Subtotal	100	104	103.8%	17.1	3.1	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,551	1,554	100.2%	19.7	2.8	B

Intersection 11 **Squaw Creek Rd/Squaw Valley Rd** **Side-street Stop**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
NB	Left Turn	75	25	4	50	4	75	8	1%	0%
	Right Turn	1,425	25	4	50	5	50	11	0%	0%
WB	Left/Through	750	25	5	75	19	100	33	0%	0%
	Through	750	25	6	50	35	75	76	0%	0%
EB	Through	3,000	25	0	25	0	25	0	0%	0%
	Through/Right	2,000	25	0	25	0	25	0	0%	0%
0										

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	475	25	5	75	14	100	29	0%	0%
	Left/Through	1,600	75	5	100	9	125	23	0%	0%
	Right Turn	1,600	25	0	25	0	25	0	0%	0%
NB	Left Turn	3,150	300	40	475	69	500	92	5%	0%
	Through	650	100	56	375	159	600	90	0%	1%
	Through/Right	75	25	2	25	11	75	24	0%	0%
SB	Left Turn	150	25	0	25	0	25	0	0%	0%
	Through	150	175	8	225	6	200	1	18%	18%
	Right Turn	3,725	375	78	800	124	975	145	0%	0%
WB	Shared	1,675	25	0	25	0	25	0	0%	0%

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	150	50	6	100	12	125	20	0%	0%
	Right Turn	1,825	25	3	50	4	50	13	0%	0%
NB	Left Turn	375	175	15	275	39	375	47	0%	0%
	Through	3,700	175	18	350	59	500	114	1%	0%
SB	Through	1,450	75	6	125	13	150	27	0%	0%
	Right Turn	625	125	15	200	18	250	29	0%	0%
0										

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	90	68	190	590	4	415	25	210	12	22	8
Future Volume (veh/h)	2	90	68	190	590	4	415	25	210	12	22	8
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	3	125	0	221	686	5	460	0	0	19	35	13
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	0
Peak Hour Factor	0.72	0.72	0.72	0.86	0.86	0.86	0.94	0.94	0.94	0.63	0.63	0.63
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	9	679	304	446	1139	8	701	0	313	52	95	35
Arrive On Green	0.00	0.19	0.00	0.13	0.32	0.32	0.20	0.00	0.00	0.10	0.10	0.10
Sat Flow, veh/h	1774	3539	1583	3442	3601	26	3548	0	1583	504	928	345
Grp Volume(v), veh/h	3	125	0	221	337	354	460	0	0	67	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1858	1774	0	1583	1777	0	0
Q Serve(g_s), s	0.1	1.3	0.0	2.6	6.9	6.9	5.1	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear(g_c), s	0.1	1.3	0.0	2.6	6.9	6.9	5.1	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.28		0.19
Lane Grp Cap(c), veh/h	9	679	304	446	560	588	701	0	313	182	0	0
V/C Ratio(X)	0.34	0.18	0.00	0.50	0.60	0.60	0.66	0.00	0.00	0.37	0.00	0.00
Avail Cap(c_a), veh/h	618	2467	1103	1199	1644	1727	2143	0	956	1073	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	21.3	14.6	0.0	17.4	12.4	12.4	15.9	0.0	0.0	18.0	0.0	0.0
Incr Delay (d2), s/veh	8.4	0.0	0.0	0.3	0.4	0.4	0.4	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.6	0.0	1.2	3.4	3.6	2.5	0.0	0.0	0.8	0.0	0.0
LnGrp Delay(d),s/veh	29.8	14.6	0.0	17.7	12.8	12.8	16.3	0.0	0.0	18.5	0.0	0.0
LnGrp LOS	C	B		B	B	B	B			B		
Approach Vol, veh/h		128			912			460			67	
Approach Delay, s/veh		15.0			14.0			16.3			18.5	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	12.9		8.4	3.9	18.2		12.5
Change Period (Y+Rc), s	* 3.7	4.6		4.0	* 3.7	* 4.6		4.0
Max Green Setting (Gmax), s	* 15	30.0		26.0	* 15	* 40		26.0
Max Q Clear Time (g_c+I1), s	4.6	3.3		3.5	2.1	8.9		7.1
Green Ext Time (p_c), s	0.1	2.0		0.1	0.0	2.0		0.3

Intersection Summary		
HCM 2010 Ctrl Delay		15.0
HCM 2010 LOS		B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	188	199	131	180	37	333	134	189	37	90	60
Future Volume (veh/h)	44	188	199	131	180	37	333	134	189	37	90	60
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	54	232	246	147	202	42	370	149	210	44	107	71
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	0	2	0
Peak Hour Factor	0.81	0.81	0.81	0.89	0.89	0.89	0.90	0.90	0.90	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	384	747	213	523	433	472	496	422	112	275	187
Arrive On Green	0.05	0.21	0.21	0.12	0.28	0.28	0.27	0.27	0.27	0.16	0.16	0.15
Sat Flow, veh/h	1774	1863	1579	1774	1863	1542	1774	1863	1583	679	1672	1139
Grp Volume(v), veh/h	54	232	246	147	202	42	370	149	210	118	0	104
Grp Sat Flow(s),veh/h/ln	1774	1863	1579	1774	1863	1542	1774	1863	1583	1829	0	1662
Q Serve(g_s), s	2.0	7.4	6.4	5.2	5.8	1.3	12.7	4.2	7.4	3.8	0.0	3.7
Cycle Q Clear(g_c), s	2.0	7.4	6.4	5.2	5.8	1.3	12.7	4.2	7.4	3.8	0.0	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.37		0.69
Lane Grp Cap(c), veh/h	81	384	747	213	523	433	472	496	422	301	0	273
V/C Ratio(X)	0.67	0.60	0.33	0.69	0.39	0.10	0.78	0.30	0.50	0.39	0.00	0.38
Avail Cap(c_a), veh/h	417	1032	1296	969	1032	854	848	891	757	722	0	656
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.9	23.7	10.9	27.8	19.1	17.5	22.4	19.3	20.4	24.6	0.0	24.8
Incr Delay (d2), s/veh	3.5	0.6	0.1	1.5	0.2	0.0	1.1	0.1	0.3	0.3	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	3.9	4.2	2.7	3.0	0.6	6.3	2.2	3.3	1.9	0.0	1.7
LnGrp Delay(d),s/veh	34.4	24.3	10.9	29.3	19.3	17.6	23.5	19.4	20.8	24.9	0.0	25.2
LnGrp LOS	C	C	B	C	B	B	C	B	C	C		C
Approach Vol, veh/h		532			391			729			222	
Approach Delay, s/veh		19.1			22.9			21.9			25.0	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.9	17.6		14.8	7.0	22.5		21.5
Change Period (Y+Rc), s	5.0	5.5		5.0	4.5	5.5		5.5
Max Green Setting (Gmax), s	35.0	35.0		25.0	15.0	35.0		30.0
Max Q Clear Time (g_c+I1), s	7.2	9.4		5.8	4.0	7.8		14.7
Green Ext Time (p_c), s	0.2	2.0		0.8	0.0	2.1		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	21.7
HCM 2010 LOS	C

MOVEMENT SUMMARY

Site: 2. E+P PM

SR 89 / I-80 WB Ramp
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
3	L2	482	3.0	0.517	9.3	LOS A	0.0	0.0	0.00	0.00	25.4
8	T1	653	3.0	0.517	9.3	LOS A	0.0	0.0	0.00	0.00	26.0
Approach		1135	3.0	0.517	9.3	LOS A	0.0	0.0	0.00	0.00	25.7
East: I-80 WB off-ramp											
1	L2	245	3.0	0.505	17.3	LOS C	1.8	45.2	0.71	0.80	21.3
16	R2	149	3.0	0.327	13.3	LOS B	1.0	25.4	0.67	0.71	21.8
Approach		394	3.0	0.505	15.8	LOS C	1.8	45.2	0.70	0.77	21.5
North: HWY 89											
4	T1	422	3.0	0.486	15.8	LOS C	2.2	56.9	0.70	0.79	22.1
14	R2	83	3.0	0.486	15.8	LOS C	2.2	56.9	0.70	0.79	21.5
Approach		505	3.0	0.486	15.8	LOS C	2.2	56.9	0.70	0.79	22.0
All Vehicles		2034	3.0	0.517	12.2	LOS B	2.2	56.9	0.31	0.34	23.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3. E+P PM

SR 89 / I-80 EB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
8	T1	1058	3.0	0.905	32.6	LOS D	17.1	436.9	1.00	1.04	19.0
18	R2	589	3.0	0.905	32.6	LOS D	17.1	436.9	1.00	1.04	18.4
Approach		1647	3.0	0.905	32.6	LOS D	17.1	436.9	1.00	1.04	18.8
North: HWY 89											
7	L2	169	3.0	0.304	6.2	LOS A	0.0	0.0	0.00	0.00	25.9
4	T1	499	3.0	0.304	6.2	LOS A	0.0	0.0	0.00	0.00	27.9
Approach		667	3.0	0.304	6.2	LOS A	0.0	0.0	0.00	0.00	27.3
West: I-80 EB off-ramp											
5	L2	13	3.0	0.176	7.5	LOS A	0.5	12.5	0.47	0.47	27.4
12	R2	222	3.0	0.176	7.4	LOS A	0.5	12.5	0.46	0.46	29.9
Approach		235	3.0	0.176	7.4	LOS A	0.5	12.5	0.46	0.46	29.8
All Vehicles		2549	3.0	0.905	23.4	LOS C	17.1	436.9	0.69	0.72	21.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	230	42	158	1174	62	359	166
Future Volume (veh/h)	230	42	158	1174	62	359	166
Number	3	18	1	6		2	12
Initial Q (Qb), veh	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863		1863	1863
Adj Flow Rate, veh/h	261	48	163	1210		399	184
Adj No. of Lanes	2	1	1	2		2	1
Peak Hour Factor	0.88	0.88	0.97	0.97		0.90	0.90
Percent Heavy Veh, %	2	2	2	2		2	2
Cap, veh/h	339	321	192	2962		1997	1246
Arrive On Green	0.10	0.09	0.11	0.84		0.70	0.69
Sat Flow, veh/h	3442	1583	1774	3632		3297	1583
Grp Volume(v), veh/h	261	48	163	1210		399	184
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1770		1434	1583
Q Serve(g_s), s	9.2	3.1	11.2	10.5		6.1	3.5
Cycle Q Clear(g_c), s	9.2	3.1	11.2	10.5		6.1	3.5
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	339	321	192	2962		1997	1246
V/C Ratio(X)	0.77	0.15	0.85	0.41		0.20	0.15
Avail Cap(c_a), veh/h	985	619	358	2962		1997	1246
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	54.5	40.6	54.3	2.5		6.6	3.2
Incr Delay (d2), s/veh	1.4	0.1	9.8	0.4		0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	1.4	6.0	5.2		2.4	2.3
LnGrp Delay(d),s/veh	55.9	40.7	64.1	2.9		6.9	3.4
LnGrp LOS	E	D	E	A		A	A
Approach Vol, veh/h	309			1373		583	
Approach Delay, s/veh	53.5			10.2		5.8	
Approach LOS	D			B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	17.4	90.3				107.8		16.2
Change Period (Y+Rc), s	4.0	5.5				5.5		4.5
Max Green Setting (Gmax), s	25.0	50.0				50.0		35.0
Max Q Clear Time (g_c+I1), s	13.2	8.1				12.5		11.2
Green Ext Time (p_c), s	0.3	16.8				16.1		0.6

Intersection Summary		
HCM 2010 Ctrl Delay		15.0
HCM 2010 LOS		B

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	45	72	1260	156	106	295
Future Volume (veh/h)	45	72	1260	156	106	295
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	57	91	1312	162	113	314
Adj No. of Lanes	1	1	2	1	1	1
Peak Hour Factor	0.79	0.79	0.96	0.96	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	138	221	2157	1301	131	1598
Arrive On Green	0.08	0.07	0.75	0.74	0.15	1.00
Sat Flow, veh/h	1774	1583	3297	1583	1774	1863
Grp Volume(v), veh/h	57	91	1312	162	113	314
Grp Sat Flow(s),veh/h/ln	1774	1583	1434	1583	1774	1863
Q Serve(g_s), s	3.8	6.5	25.9	2.5	7.7	0.0
Cycle Q Clear(g_c), s	3.8	6.5	25.9	2.5	7.7	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	138	221	2157	1301	131	1598
V/C Ratio(X)	0.41	0.41	0.61	0.12	0.86	0.20
Avail Cap(c_a), veh/h	429	481	2157	1301	422	1598
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.5	48.7	7.0	2.2	52.3	0.0
Incr Delay (d2), s/veh	0.7	0.5	1.3	0.2	6.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.9	10.4	1.6	4.0	0.1
LnGrp Delay(d),s/veh	55.2	49.2	8.3	2.4	58.7	0.3
LnGrp LOS	E	D	A	A	E	A
Approach Vol, veh/h	148		1474			427
Approach Delay, s/veh	51.5		7.7			15.7
Approach LOS	D		A			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.1	97.2				110.4		13.6
Change Period (Y+Rc), s	3.5	6.0				6.0		5.0
Max Green Setting (Gmax), s	30.0	50.0				50.0		29.0
Max Q Clear Time (g_c+I1), s	9.7	27.9				2.0		8.5
Green Ext Time (p_c), s	0.1	8.0				9.3		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.5
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	61	6	0	0	23	28
Future Vol, veh/h	61	6	0	0	23	28
Peak Hour Factor	0.80	0.80	0.85	0.85	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	8	0	0	25	30
Number of Lanes	0	1	0	1	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.7	0	7.1
HCM LOS	A	-	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	91%	0%	45%
Vol Thru, %	9%	100%	0%
Vol Right, %	0%	0%	55%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	67	0	51
LT Vol	61	0	23
Through Vol	6	0	0
RT Vol	0	0	28
Lane Flow Rate	84	0	55
Geometry Grp	1	1	1
Degree of Util (X)	0.098	0	0.058
Departure Headway (Hd)	4.213	4.094	3.84
Convergence, Y/N	Yes	Yes	Yes
Cap	853	0	927
Service Time	2.23	2.132	1.887
HCM Lane V/C Ratio	0.098	0	0.059
HCM Control Delay	7.7	7.1	7.1
HCM Lane LOS	A	N	A
HCM 95th-tile Q	0.3	0	0.2

Intersection	
Int Delay, s/veh	14.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	416	133	40	210	74
Future Vol, veh/h	19	416	133	40	210	74
Conflicting Peds, #/hr	0	0	0	0	27	9
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	93	93	77	77
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	520	143	43	273	96

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	143	0	-	0	738	152
Stage 1	-	-	-	-	143	-
Stage 2	-	-	-	-	595	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1440	-	-	-	385	894
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	551	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1429	-	-	-	376	887
Mov Cap-2 Maneuver	-	-	-	-	376	-
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	538	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	42.6
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1429	-	-	-	442
HCM Lane V/C Ratio	0.017	-	-	-	0.834
HCM Control Delay (s)	7.6	0	-	-	42.6
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.1	-	-	-	8

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	617	13	100	166	12	462
Future Vol, veh/h	617	13	100	166	12	462
Conflicting Peds, #/hr	0	8	8	0	3	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	300	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	93	93	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	771	16	108	178	13	491

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	796	0	1184	-
Stage 1	-	-	-	-	787	-
Stage 2	-	-	-	-	397	-
Critical Hdwy	-	-	4.12	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	-
Pot Cap-1 Maneuver	-	-	826	-	209	0
Stage 1	-	-	-	-	449	0
Stage 2	-	-	-	-	679	0
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	826	-	180	-
Mov Cap-2 Maneuver	-	-	-	-	180	-
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	589	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		3.8		26.5	
HCM LOS					D	

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	180	-	-	-	826	-
HCM Lane V/C Ratio	0.071	-	-	-	0.13	-
HCM Control Delay (s)	26.5	0	-	-	10	-
HCM Lane LOS	D	A	-	-	B	-
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	1061	0	0	260	6	0	0	0	18	0	8
Future Vol, veh/h	23	1061	0	0	260	6	0	0	0	18	0	8
Conflicting Peds, #/hr	13	0	0	0	0	13	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	93	93	93	98	98	98	54	54	54
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	1326	0	0	280	6	0	0	0	33	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	299	0	0	1326	0	0	1674	1683	663	1017	1680	296
Stage 1	-	-	-	-	-	-	1384	1384	-	296	296	-
Stage 2	-	-	-	-	-	-	290	299	-	721	1384	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.93	7.33	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1261	-	-	519	-	-	69	94	405	204	94	743
Stage 1	-	-	-	-	-	-	152	210	-	712	668	-
Stage 2	-	-	-	-	-	-	717	666	-	385	210	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1261	-	-	519	-	-	63	85	405	188	85	735
Mov Cap-2 Maneuver	-	-	-	-	-	-	63	85	-	188	85	-
Stage 1	-	-	-	-	-	-	139	192	-	643	661	-
Stage 2	-	-	-	-	-	-	703	659	-	352	192	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0	0	22.6
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1261	-	-	519	-	-	188	735
HCM Lane V/C Ratio	-	0.023	-	-	-	-	-	0.177	0.02
HCM Control Delay (s)	0	7.9	0.3	-	0	-	-	28.2	10
HCM Lane LOS	A	A	A	-	A	-	-	D	B
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.6	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1070	0	0	250	7	0	0	0	12	0	5
Future Volume (veh/h)	9	1070	0	0	250	7	0	0	0	12	0	5
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	0	0	1863	1900				1900	1863	1900
Adj Flow Rate, veh/h	11	1338	0	0	269	8				14	0	6
Adj No. of Lanes	0	2	0	0	1	0				0	1	0
Peak Hour Factor	0.80	0.80	0.92	0.92	0.93	0.93				0.85	0.92	0.85
Percent Heavy Veh, %	2	2	0	0	2	2				0	2	0
Cap, veh/h	100	1821	0	0	947	28				315	0	135
Arrive On Green	0.53	0.53	0.00	0.00	0.53	0.53				0.26	0.00	0.26
Sat Flow, veh/h	8	3545	0	0	1800	54				1198	0	513
Grp Volume(v), veh/h	723	626	0	0	0	277				20	0	0
Grp Sat Flow(s),veh/h/ln	1857	1610	0	0	0	1853				1711	0	0
Q Serve(g_s), s	0.0	11.4	0.0	0.0	0.0	3.2				0.3	0.0	0.0
Cycle Q Clear(g_c), s	11.4	11.4	0.0	0.0	0.0	3.2				0.3	0.0	0.0
Prop In Lane	0.02		0.00	0.00		0.03				0.70		0.30
Lane Grp Cap(c), veh/h	1074	848	0	0	0	975				450	0	0
V/C Ratio(X)	0.67	0.74	0.00	0.00	0.00	0.28				0.04	0.00	0.00
Avail Cap(c_a), veh/h	1074	848	0	0	0	975				450	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	7.0	7.0	0.0	0.0	0.0	5.0				10.4	0.0	0.0
Incr Delay (d2), s/veh	3.4	5.7	0.0	0.0	0.0	0.7				0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	6.2	0.0	0.0	0.0	1.7				0.2	0.0	0.0
LnGrp Delay(d),s/veh	10.3	12.7	0.0	0.0	0.0	5.7				10.6	0.0	0.0
LnGrp LOS	B	B				A				B		
Approach Vol, veh/h		1349			277						20	
Approach Delay, s/veh		11.4			5.7						10.6	
Approach LOS		B			A						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		24.0		14.0		24.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		20.0		10.0		20.0		
Max Q Clear Time (g_c+I1), s		13.4		2.3		5.2		
Green Ext Time (p_c), s		4.8		0.0		9.1		

Intersection Summary	
HCM 2010 Ctrl Delay	10.5
HCM 2010 LOS	B

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Squaw Alpine Gondola Phase 2
Existing + Project
PM Peak Hour

Intersection 11 **Squaw Creek Rd/Squaw Valley Rd** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	19	19	98.9%	41.9	13.7	E
	Through						
	Right Turn	56	56	100.5%	11.9	3.5	B
	Subtotal	75	75	100.1%	19.5	6.6	C
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	1,048	1,054	100.5%	2.9	0.1	A
	Right Turn	33	32	98.3%	3.4	0.9	A
	Subtotal	1,081	1,086	100.5%	2.9	0.1	A
WB	Left Turn	41	41	100.9%	24.3	7.8	C
	Through	254	258	101.7%	1.5	0.3	A
	Right Turn						
	Subtotal	295	300	101.6%	5.1	1.6	A
Total		1,451	1,461	100.7%	4.2	0.4	A

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	149	146	98.2%	37.9	6.6	D
	Through	548	560	102.3%	26.4	3.6	C
	Right Turn						
	Subtotal	697	707	101.4%	28.8	3.5	C
SB	Left Turn						
	Through	196	196	100.2%	28.0	4.3	C
	Right Turn	143	148	103.7%	4.1	0.6	A
	Subtotal	339	345	101.7%	18.2	3.2	B
EB	Left Turn	868	850	97.9%	119.5	39.5	F
	Through						
	Right Turn	206	212	103.0%	3.1	0.5	A
	Subtotal	1,074	1,062	98.9%	96.7	31.1	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,110	2,114	100.2%	61.6	16.1	E

SimTraffic Post-Processor | **Squaw Alpine Gondola Phase 2**
Average Results from 10 Runs | **Existing + Project**
Volume and Delay by Movement | **PM Peak Hour**

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	41	37	90.5%	27.9	4.1	C
	Through	294	293	99.8%	14.4	2.5	B
	Right Turn						
	Subtotal	335	331	98.7%	16.0	2.4	B
SB	Left Turn						
	Through	346	358	103.4%	23.9	3.7	C
	Right Turn	56	56	100.4%	4.1	0.8	A
	Subtotal	402	414	103.0%	21.2	3.7	C
EB	Left Turn	403	420	104.2%	27.6	8.3	C
	Through						
	Right Turn	344	354	102.8%	13.1	3.6	B
	Subtotal	747	774	103.5%	21.0	5.9	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,484	1,518	102.3%	20.0	3.2	C

Intersection 11 **Squaw Creek Rd/Squaw Valley Rd** **Side-street Stop**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Through	1,925	25	0	25	2	25	5	0%	0%
	Through/Right	1,925	25	1	25	6	25	14	0%	0%
NB	Left Turn	75	25	4	50	8	75	14	3%	0%
	Right Turn	1,400	50	3	75	6	100	13	3%	0%
WB	Left Turn	100	50	5	75	5	75	17	0%	0%
	Through	100	25	0	25	0	25	0	0%	0%
0										

SimTraffic Post-Processor
Average Results from 10 Runs
Queue Length

Squaw Alpine Gondola Phase 2
Existing + Project
PM Peak Hour

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	825	325	49	675	101	725	103	0%	0%
	Left/Through	1,625	350	53	700	144	800	220	1%	0%
	Right Turn	1,625	25	24	100	168	275	358	0%	0%
NB	Left Turn	425	125	14	200	45	275	103	0%	0%
	Through	650	200	20	350	53	425	103	37%	0%
	Through/Right	75	75	3	100	6	100	0	22%	0%
SB	Left Turn	150	25	0	25	0	25	0	0%	0%
	Through	3,450	100	7	175	14	175	20	2%	0%
	Right Turn	150	25	2	50	11	75	24	0%	0%
WB	Shared	200	25	0	25	0	25	0	0%	0%

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	325	175	16	300	36	325	35	2%	0%
	Right Turn	2,150	125	41	275	157	400	238	0%	0%
NB	Left Turn	375	50	2	75	5	75	13	0%	0%
	Through	3,775	100	6	175	14	225	27	0%	0%
SB	Through	1,450	150	21	250	44	300	51	0%	0%
	Right Turn	625	25	3	50	6	75	11	0%	0%
0										

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	465	268	152	174	8	167	37	194	15	48	8
Future Volume (veh/h)	4	465	268	152	174	8	167	37	194	15	48	8
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	5	534	0	181	207	10	218	0	0	19	59	10
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	0
Peak Hour Factor	0.87	0.87	0.87	0.84	0.84	0.84	0.89	0.89	0.89	0.81	0.81	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	862	386	386	1187	57	614	0	274	46	143	24
Arrive On Green	0.00	0.24	0.00	0.11	0.35	0.34	0.17	0.00	0.00	0.12	0.12	0.12
Sat Flow, veh/h	1774	3539	1583	3442	3437	165	3548	0	1583	390	1211	205
Grp Volume(v), veh/h	5	534	0	181	106	111	218	0	0	88	0	0
Grp Sat Flow(s),veh/h/ln	1774	1770	1583	1721	1770	1833	1774	0	1583	1806	0	0
Q Serve(g_s), s	0.1	6.1	0.0	2.2	1.9	1.9	2.5	0.0	0.0	2.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	6.1	0.0	2.2	1.9	1.9	2.5	0.0	0.0	2.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.09	1.00		1.00	0.22		0.11
Lane Grp Cap(c), veh/h	4	862	386	386	611	633	614	0	274	213	0	0
V/C Ratio(X)	1.28	0.62	0.00	0.47	0.17	0.18	0.36	0.00	0.00	0.41	0.00	0.00
Avail Cap(c_a), veh/h	575	2390	1069	1116	1570	1626	2349	0	1048	1036	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	22.6	15.3	0.0	18.8	10.3	10.3	16.5	0.0	0.0	18.5	0.0	0.0
Incr Delay (d2), s/veh	220.6	0.3	0.0	0.3	0.0	0.0	0.1	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	29.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.0	0.0	1.1	0.9	1.0	1.2	0.0	0.0	1.0	0.0	0.0
LnGrp Delay(d),s/veh	273.0	15.5	0.0	19.2	10.4	10.4	16.6	0.0	0.0	19.0	0.0	0.0
LnGrp LOS	F	B		B	B	B	B			B		
Approach Vol, veh/h		539			398			218			88	
Approach Delay, s/veh		17.9			14.4			16.6			19.0	
Approach LOS		B			B			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.1	15.0		9.4	4.1	20.1		11.8
Change Period (Y+Rc), s	* 3.7	4.6		4.0	* 3.7	* 4.6		4.0
Max Green Setting (Gmax), s	* 15	30.0		26.0	* 15	* 40		30.0
Max Q Clear Time (g_c+I1), s	4.2	8.1		4.0	2.1	3.9		4.5
Green Ext Time (p_c), s	0.1	2.0		0.2	0.0	2.1		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.6
HCM 2010 LOS	B

Notes

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 SB
From/To	Deerfield Dr to W River St
Jurisdiction	Nevada/Placer County
Analysis Year	Existing + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.89	
Shoulder width	4.7	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	838	veh/h
Opposing direction volume, Vo	256	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	942	pc/h	290	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSd	30.7	mi/h
Percent Free Flow Speed, PFFS	70.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.998	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	942	pc/h	288	pc/h

Base percent time-spent-following,(note-4) BPTSFd	70.2	%
Adjustment for no-passing zones, fnp	29.7	
Percent time-spent-following, PTSFd	92.9	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.32	
Peak 15-min vehicle-miles of travel, VMT15	47	veh-mi
Peak-hour vehicle-miles of travel, VMT60	168	veh-mi
Peak 15-min total travel time, TT15	1.5	veh-h
Capacity from ATS, CdATS	1686	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	3891	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.7	mi/h
Percent time-spent-following, PTSFd (from above)	92.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	941.6
Effective width of outside lane, We	21.40
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.31
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.2

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 SB
From/To	W River St to Squaw Valley Rd
Jurisdiction	Placer County
Analysis Year	Existing + Project

Description Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.90	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	7.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	55	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	1091	veh/h
Opposing direction volume, Vo	238	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		2.2	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.977	
Grade adj. factor,(note-1) fg	1.00		0.80	
Directional flow rate,(note-2) vi	1220	pc/h	338	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	59.8	mi/h
Adjustment for no-passing zones, fnp	2.7	mi/h
Average travel speed, ATSd	44.9	mi/h
Percent Free Flow Speed, PFFS	75.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.986	
Grade adjustment factor,(note-1) fg	1.00		0.83	
Directional flow rate,(note-2) vi	1212	pc/h	323	pc/h

Base percent time-spent-following,(note-4) BPTSFd	78.2	%
Adjustment for no-passing zones, fnp	13.4	
Percent time-spent-following, PTSFd	88.8	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.86	
Peak 15-min vehicle-miles of travel, VMT15	2364	veh-mi
Peak-hour vehicle-miles of travel, VMT60	8510	veh-mi
Peak 15-min total travel time, TT15	52.6	veh-h
Capacity from ATS, CdATS	1413	veh/h
Capacity from PTSF, CdPTSF	1445	veh/h
Directional Capacity	1804	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	7.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	44.9	mi/h
Percent time-spent-following, PTSFd (from above)	88.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1212.2
Effective width of outside lane, We	28.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	1.92
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 NB
From/To	A. Meadows Rd to S. Valley Rd
Jurisdiction	Placer County
Analysis Year	Existing + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	684	veh/h
Opposing direction volume, Vo	438	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.8	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.990		0.984	
Grade adj. factor,(note-1) fg	0.98		0.94	
Directional flow rate,(note-2) vi	766	pc/h	515	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	50.0	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSd	37.8	mi/h
Percent Free Flow Speed, PFFS	75.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.992	
Grade adjustment factor,(note-1) fg	0.99		0.95	
Directional flow rate,(note-2) vi	751	pc/h	505	pc/h

Base percent time-spent-following,(note-4) BPTSFd	65.0	%
Adjustment for no-passing zones, fnp	30.2	
Percent time-spent-following, PTSFd	83.1	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.48	
Peak 15-min vehicle-miles of travel, VMT15	242	veh-mi
Peak-hour vehicle-miles of travel, VMT60	889	veh-mi
Peak 15-min total travel time, TT15	6.4	veh-h
Capacity from ATS, CdATS	1589	veh/h
Capacity from PTSF, CdPTSF	1625	veh/h
Directional Capacity	2657	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	37.8	mi/h
Percent time-spent-following, PTSFd (from above)	83.1	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	743.5
Effective width of outside lane, We	28.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	1.56
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.2

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 NB
From/To	SR 28 to A. Meadows Rd
Jurisdiction	Placer County
Analysis Year	Existing + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	1013	veh/h
Opposing direction volume, Vo	160	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		2.4	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.973	
Grade adj. factor,(note-1) fg	1.00		0.73	
Directional flow rate,(note-2) vi	1108	pc/h	245	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	49.8	mi/h
Adjustment for no-passing zones, fnp	3.7	mi/h
Average travel speed, ATSd	35.5	mi/h
Percent Free Flow Speed, PFFS	71.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.984	
Grade adjustment factor,(note-1) fg	1.00		0.78	
Directional flow rate,(note-2) vi	1101	pc/h	227	pc/h
Base percent time-spent-following,(note-4) BPTSFd	72.8	%		
Adjustment for no-passing zones, fnp	19.9			
Percent time-spent-following, PTSFd	89.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.87	
Peak 15-min vehicle-miles of travel, VMT15	1019	veh-mi
Peak-hour vehicle-miles of travel, VMT60	3748	veh-mi
Peak 15-min total travel time, TT15	28.7	veh-h
Capacity from ATS, CdATS	1279	veh/h
Capacity from PTSF, CdPTSF	1358	veh/h
Directional Capacity	1561	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.5	mi/h
Percent time-spent-following, PTSFd (from above)	89.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1101.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.80
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR89 NB
From/To	At Transit Center
Jurisdiction	Caltrans
Analysis Year	Existing + Project
Description	Squaw Valley Olympic Villlage

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	2.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	64	%
Up/down	-	%	Access point density	11	/mi

Analysis direction volume, Vd	650	veh/h
Opposing direction volume, Vo	280	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.992	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	693	pc/h	300	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	2.6	mi/h
Adj. for access point density,(note-3) fA	2.8	mi/h
Free-flow speed, FFSd	39.7	mi/h
Adjustment for no-passing zones, fnp	2.7	mi/h
Average travel speed, ATSd	29.3	mi/h
Percent Free Flow Speed, PFFS	73.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.998	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	691	pc/h	298	pc/h
Base percent time-spent-following,(note-4) BPTSFd	58.7	%		
Adjustment for no-passing zones, fnp	29.6			
Percent time-spent-following, PTSFd	79.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.41	
Peak 15-min vehicle-miles of travel, VMT15	52	veh-mi
Peak-hour vehicle-miles of travel, VMT60	195	veh-mi
Peak 15-min total travel time, TT15	1.8	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	2428	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.3	mi/h
Percent time-spent-following, PTSFd (from above)	79.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	691.5
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.57
Bicycle LOS	E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 NB
From/To	W River St to Deerfield Dr
Jurisdiction	Nevada/Placer County
Analysis Year	Existing + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.96	
Shoulder width	4.7	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	1364	veh/h
Opposing direction volume, Vo	401	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.994	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1421	pc/h	420	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSd	26.8	mi/h
Percent Free Flow Speed, PFFS	61.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1421	pc/h	418	pc/h

Base percent time-spent-following,(note-4) BPTSFd	83.5	%
Adjustment for no-passing zones, fnp	16.5	
Percent time-spent-following, PTSFd	96.2	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.47	
Peak 15-min vehicle-miles of travel, VMT15	71	veh-mi
Peak-hour vehicle-miles of travel, VMT60	273	veh-mi
Peak 15-min total travel time, TT15	2.6	veh-h
Capacity from ATS, CdATS	1690	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	3879	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	26.8	mi/h
Percent time-spent-following, PTSFd (from above)	96.2	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1420.8
Effective width of outside lane, We	21.40
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.52
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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                    HCS 2010: Two-Lane Highways Release 6.2




Phone:                                   Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 Fehr & Peers
Agency/Co.
Date Performed          4/9/2017
Analysis Time Period    Winter PM
Highway                 SR-89 NB
From/To                 Squaw Valley Rd to W River St
Jurisdiction            Placer County
Analysis Year           Existing + Project
Description  Squaw Valley Olympic Village

__________________________________Input Data__________________________________

Highway class  Class 1             Peak hour factor, PHF    0.93
Shoulder width       8.0     ft     % Trucks and buses       2       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       7.8     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Rolling        % Recreational vehicles  0       %
Grade:  Length       -       mi     % No-passing zones       55      %
        Up/down      -       %      Access point density     1       /mi

Analysis direction volume, Vd  1416    veh/h
Opposing direction volume, Vo  339     veh/h

____________________________Average Travel Speed______________________________

Direction                                Analysis(d)        Opposing (o)
PCE for trucks, ET                           1.3                2.0
PCE for RVs, ER                              1.1                1.1
Heavy-vehicle adj. factor,(note-5) fHV       0.994              0.980
Grade adj. factor,(note-1) fg                1.00               0.88
Directional flow rate,(note-2) vi            1532    pc/h       423     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                -      mi/h
Observed total demand,(note-3) V                  -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS               60.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS    0.0     mi/h
Adj. for access point density,(note-3) fA        0.3     mi/h

Free-flow speed, FFSd                            59.8    mi/h

Adjustment for no-passing zones, fnp             2.3     mi/h
Average travel speed, ATSd                       42.3    mi/h
Percent Free Flow Speed, PFFS                    70.8    %
```

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.988	
Grade adjustment factor,(note-1) fg	1.00		0.88	
Directional flow rate,(note-2) vi	1523	pc/h	419	pc/h

Base percent time-spent-following,(note-4) BPTSFd	85.3	%
Adjustment for no-passing zones, fnp	10.3	
Percent time-spent-following, PTSFd	93.4	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	1.01	
Peak 15-min vehicle-miles of travel, VMT15	2969	veh-mi
Peak-hour vehicle-miles of travel, VMT60	11045	veh-mi
Peak 15-min total travel time, TT15	70.2	veh-h
Capacity from ATS, CdATS	1516	veh/h
Capacity from PTSF, CdPTSF	1535	veh/h
Directional Capacity	1934	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	7.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.3	mi/h
Percent time-spent-following, PTSFd (from above)	93.4	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1522.6
Effective width of outside lane, We	28.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.03
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.2

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 NB
From/To	A. Meadows Rd to S. Valley Rd
Jurisdiction	Placer County
Analysis Year	Existing + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	697	veh/h
Opposing direction volume, Vo	402	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.9	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.990		0.982	
Grade adj. factor,(note-1) fg	0.99		0.92	
Directional flow rate,(note-2) vi	773	pc/h	484	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	50.0	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSd	37.9	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.992	
Grade adjustment factor,(note-1) fg	1.00		0.92	
Directional flow rate,(note-2) vi	758	pc/h	479	pc/h

Base percent time-spent-following,(note-4) BPTSFd	64.3	%
Adjustment for no-passing zones, fnp	29.3	
Percent time-spent-following, PTSFd	82.3	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.49	
Peak 15-min vehicle-miles of travel, VMT15	246	veh-mi
Peak-hour vehicle-miles of travel, VMT60	906	veh-mi
Peak 15-min total travel time, TT15	6.5	veh-h
Capacity from ATS, CdATS	1572	veh/h
Capacity from PTSF, CdPTSF	1602	veh/h
Directional Capacity	2556	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	37.9	mi/h
Percent time-spent-following, PTSFd (from above)	82.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	757.6
Effective width of outside lane, We	28.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	1.57
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 SB
From/To	A. Meadows Rd to SR 28
Jurisdiction	Placer County
Analysis Year	Existing + Project

Description Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.87	
Shoulder width	5.5	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	737	veh/h
Opposing direction volume, Vo	335	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		2.0	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.992		0.980	
Grade adj. factor,(note-1) fg	0.99		0.89	
Directional flow rate,(note-2) vi	863	pc/h	441	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	48.5	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSd	35.8	mi/h
Percent Free Flow Speed, PFFS	73.9	%

```
_________________________Percent Time-Spent-Following_________________________

Direction                                   Analysis(d)        Opposing (o)
PCE for trucks, ET                              1.0                 1.6
PCE for RVs, ER                                 1.0                 1.0
Heavy-vehicle adjustment factor, fHV            1.000               0.988
Grade adjustment factor,(note-1) fg             1.00                0.89
Directional flow rate,(note-2) vi               847    pc/h         438     pc/h
Base percent time-spent-following,(note-4) BPTSFd  67.7   %
Adjustment for no-passing zones, fnp                   25.5
Percent time-spent-following, PTSFd                    84.5   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                                  E
Volume to capacity ratio, v/c                          0.56
Peak 15-min vehicle-miles of travel, VMT15             784     veh-mi
Peak-hour vehicle-miles of travel, VMT60               2727    veh-mi
Peak 15-min total travel time, TT15                    21.9    veh-h
Capacity from ATS, CdATS                               1536    veh/h
Capacity from PTSF, CdPTSF                             1552    veh/h
Directional Capacity                                   2320    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                             3.7       mi
Length of two-lane highway upstream of the passing lane, Lu      -         mi
Length of passing lane including tapers, Lpl                     -         mi
Average travel speed, ATSd (from above)                          35.8      mi/h
Percent time-spent-following, PTSFd (from above)                 84.5
Level of service, LOSd (from above)                              E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde         -         mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld      -         mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                        -
Average travel speed including passing lane, ATSpl               -

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde        -         mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld        -         mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                         -
Percent time-spent-following
    including passing lane, PTSFpl                               -        %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl         -
Peak 15-min total travel time, TT15                    -       veh-h

__________________________ Bicycle Level of Service __________________________
```

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	847.1
Effective width of outside lane, We	23.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.90
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.2

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR89 SB
From/To	At Transit Center
Jurisdiction	Caltrans
Analysis Year	Existing + Project
Description	Squaw Valley Olympic Villlage

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.85	
Shoulder width	2.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	64	%
Up/down	-	%	Access point density	11	/mi

Analysis direction volume, Vd 468 veh/h
Opposing direction volume, Vo 398 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.996	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	552	pc/h	470	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	2.6	mi/h
Adj. for access point density,(note-3) fA	2.8	mi/h
Free-flow speed, FFSd	39.7	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSd	29.9	mi/h
Percent Free Flow Speed, PFFS	75.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	551	pc/h	468	pc/h

Base percent time-spent-following,(note-4) BPTSFd	54.5	%
Adjustment for no-passing zones, fnp	36.2	
Percent time-spent-following, PTSFd	74.1	%

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.32	
Peak 15-min vehicle-miles of travel, VMT15	41	veh-mi
Peak-hour vehicle-miles of travel, VMT60	140	veh-mi
Peak 15-min total travel time, TT15	1.4	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	3143	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	74.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	550.6
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.46
Bicycle LOS	D

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

VMT Estimates **Plus Project Conditions**

Scenario 1 = 100% New Trips

Saturday VMT

	%	ADT	Trip Length	VMT
Squaw Valley		284		
Inbound Trips		142		
Truckee	31.0%	44.02	12	528.24
Reno	12.0%	17.04	44	749.76
Tahoe North Shore	28.0%	39.76	11	437.36
Bay Area	9.0%	12.78	185	2364.3
Tahoe South Shore	5.0%	7.1	39	276.9
Tahoe West Shore	7.0%	9.94	15	149.1
Sacramento/Central Valley	8.0%	11.36	130	1476.8
	100.0%	142	SUM	**5982.46**
		Average trip length	42.13	
Outbound Trips		142		
Truckee	31.0%	44.02	12	528.24
Reno	12.0%	17.04	44	749.76
Tahoe North Shore	28.0%	39.76	11	437.36
Bay Area	9.0%	12.78	185	2364.3
Tahoe South Shore	5.0%	7.1	39	276.9
Tahoe West Shore	7.0%	9.94	15	149.1
Sacramento/Central Valley	8.0%	11.36	130	1476.8
	100.0%	142	SUM	**5982.46**

	%	ADT	Trip Length	VMT
Alpine Meadows		122		
Inbound Trips		61		
Truckee	29.0%	17.69	14	247.66
Reno	11.0%	6.71	46	308.66
Tahoe North Shore	32.0%	19.52	10	195.2
Bay Area	8.0%	4.88	187	912.56
Tahoe South Shore	5.0%	3.05	38	115.9
Tahoe West Shore	8.0%	4.88	14	68.32
Sacramento/Central Valley	7.0%	4.27	132	563.64
	100.0%	61	SUM	**2411.94**
		Average trip length	39.54	
Outbound Trips		61		
Truckee	29.0%	17.69	14	247.66
Reno	11.0%	6.71	46	308.66
Tahoe North Shore	32.0%	19.52	10	195.2
Bay Area	8.0%	4.88	187	912.56
Tahoe South Shore	5.0%	3.05	38	115.9
Tahoe West Shore	8.0%	4.88	14	68.32
Sacramento/Central Valley	7.0%	4.27	132	563.64
	100.0%	61	SUM	**2411.94**

VMT Generated by New Skiers	16788.8				
VMT Chagne due to Skier Redistribution	-83				
Employee VMT	272	daily trips to both resorts=	16	Weighted Avg Trip length =	17
Reduced Shuttle VMT	-336	eliminated shuttle round trips =	-24	trip dist =	14
				shuttles run every 20 minutes from 8:30 am to 4:30 p.m.	
TOTAL CHANGE IN VMT on Saturday	16642				

Sunday VMT

	%	ADT	Trip Length	VMT
Squaw Valley		290		
Inbound Trips		145		
Truckee	31.0%	44.95	12	539.4
Reno	12.0%	17.4	44	765.6
Tahoe North Shore	28.0%	40.6	11	446.6
Bay Area	9.0%	13.05	185	2414.25
Tahoe South Shore	5.0%	7.25	39	282.75
Tahoe West Shore	7.0%	10.15	15	152.25
Sacramento/Central Valley	8.0%	11.6	130	1508
	100.0%	145	SUM	**6108.85**
Outbound Trips		145		
Truckee	33.0%	47.85	12	574.2
Reno	14.0%	20.3	44	893.2
Tahoe North Shore	22.0%	31.9	11	350.9
Bay Area	12.0%	17.4	185	3219
Tahoe South Shore	3.0%	4.35	39	169.65
Tahoe West Shore	5.0%	7.25	15	108.75
Sacramento/Central Valley	11.0%	15.95	130	2073.5
	100.0%	145	SUM	**7389.2**

	%	ADT	Trip Length	VMT
Alpine Meadows		126		
Inbound Trips		63		
Truckee	29.0%	18.27	14	255.78
Reno	11.0%	6.93	46	318.78
Tahoe North Shore	32.0%	20.16	10	201.6
Bay Area	8.0%	5.04	187	942.48
Tahoe South Shore	5.0%	3.15	38	119.7
Tahoe West Shore	8.0%	5.04	14	70.56
Sacramento/Central Valley	7.0%	4.41	132	582.12
	100.0%	63	SUM	**2491.02**
Outbound Trips		63		
Truckee	30.0%	18.9	14	264.6
Reno	12.0%	7.56	46	347.76
Tahoe North Shore	29.0%	18.27	10	182.7
Bay Area	9.0%	5.67	187	1060.29
Tahoe South Shore	4.0%	2.52	38	95.76
Tahoe West Shore	7.0%	4.41	14	61.74
Sacramento/Central Valley	9.0%	5.67	132	748.44
	100.0%	63	SUM	**2761.29**

VMT Generated by New Skiers	18750.36				
VMT Chagne due to Skier Redistribution	-1363	Greater than Saturday due to greater shifts to Squaw Valley.			
Employee VMT	272	daily trips to both resorts=	16	Weighted Avg Trip length =	17
Reduced Shuttle VMT	-336	eliminated shuttle round trips =	-24	trip dist =	14
TOTAL CHANGE IN VMT on Sunday	17323				

E3

Cumulative Conditions
Technical Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	215	408	139	188	37	181	72	110	18	94	60
Future Volume (veh/h)	54	215	408	139	188	37	181	72	110	18	94	60
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	59	234	443	158	214	42	195	77	118	20	103	66
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	534	687	201	679	578	261	275	233	52	271	177
Arrive On Green	0.04	0.29	0.29	0.11	0.36	0.36	0.15	0.15	0.15	0.16	0.14	0.14
Sat Flow, veh/h	1774	1863	1582	1774	1863	1583	1774	1863	1583	366	1891	1233
Grp Volume(v), veh/h	59	234	443	158	214	42	195	77	118	101	0	88
Grp Sat Flow(s),veh/h/ln	1774	1863	1582	1774	1863	1583	1774	1863	1583	1844	0	1645
Q Serve(g_s), s	2.2	7.0	14.9	5.9	5.6	1.2	7.1	2.5	4.7	3.4	0.0	3.3
Cycle Q Clear(g_c), s	2.2	7.0	14.9	5.9	5.6	1.2	7.1	2.5	4.7	3.4	0.0	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.20		0.75
Lane Grp Cap(c), veh/h	75	534	687	201	679	578	261	275	233	264	0	236
V/C Ratio(X)	0.79	0.44	0.65	0.79	0.31	0.07	0.75	0.28	0.51	0.38	0.00	0.37
Avail Cap(c_a), veh/h	392	962	1050	916	962	817	785	824	701	680	0	607
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.2	19.7	15.1	29.3	15.5	14.1	27.7	25.7	26.6	26.2	0.0	26.3
Incr Delay (d2), s/veh	6.7	0.2	0.4	2.6	0.1	0.0	1.6	0.2	0.6	0.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.6	8.2	3.0	2.9	0.5	3.6	1.3	2.1	1.7	0.0	1.5
LnGrp Delay(d),s/veh	38.8	19.9	15.5	31.9	15.6	14.1	29.3	25.9	27.3	26.6	0.0	26.7
LnGrp LOS	D	B	B	C	B	B	C	C	C	C		C
Approach Vol, veh/h		736			414			390			189	
Approach Delay, s/veh		18.8			21.6			28.0			26.6	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.7	24.9		14.7	7.4	30.2		15.5
Change Period (Y+Rc), s	5.0	5.5		5.0	4.5	5.5		5.5
Max Green Setting (Gmax), s	35.0	35.0		25.0	15.0	35.0		30.0
Max Q Clear Time (g_c+I1), s	7.9	16.9		5.4	4.2	7.6		9.1
Green Ext Time (p_c), s	0.2	2.4		0.6	0.0	2.5		0.7

Intersection Summary			
HCM 2010 Ctrl Delay			22.4
HCM 2010 LOS			C

MOVEMENT SUMMARY

Site: 2. C no P AM

SR 89 / I-80 WB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
3	L2	182	3.0	0.214	5.2	LOS A	0.0	0.0	0.00	0.00	25.5
8	T1	288	3.0	0.214	5.2	LOS A	0.0	0.0	0.00	0.00	25.9
Approach		470	3.0	0.214	5.2	LOS A	0.0	0.0	0.00	0.00	25.8
East: I-80 WB off-ramp											
1	L2	283	3.0	0.362	9.0	LOS A	1.2	29.8	0.45	0.46	23.0
6	T1	1	3.0	0.001	4.7	LOS A	0.0	0.1	0.36	0.21	32.4
16	R2	133	3.0	0.174	6.6	LOS A	0.5	12.6	0.41	0.39	23.3
Approach		417	3.0	0.362	8.2	LOS A	1.2	29.8	0.44	0.44	23.1
North: HWY 89											
4	T1	641	3.0	0.525	13.6	LOS B	2.8	72.1	0.66	0.73	22.6
14	R2	71	3.0	0.525	13.6	LOS B	2.8	72.1	0.66	0.73	22.0
Approach		712	3.0	0.525	13.6	LOS B	2.8	72.1	0.66	0.73	22.5
All Vehicles		1599	3.0	0.525	9.8	LOS A	2.8	72.1	0.41	0.44	23.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3. C no P AM

SR 89 / I-80 EB Ramp
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
8	T1	430	3.0	0.362	8.0	LOS A	1.6	42.1	0.40	0.30	23.9
18	R2	225	3.0	0.362	8.0	LOS A	1.6	42.1	0.40	0.30	23.1
Approach		655	3.0	0.362	8.0	LOS A	1.6	42.1	0.40	0.30	23.6
North: HWY 89											
7	L2	124	3.0	0.414	7.6	LOS A	0.0	0.0	0.00	0.00	26.3
4	T1	784	3.0	0.414	7.6	LOS A	0.0	0.0	0.00	0.00	28.0
Approach		908	3.0	0.414	7.6	LOS A	0.0	0.0	0.00	0.00	27.7
West: I-80 EB off-ramp											
5	L2	63	3.0	0.615	19.7	LOS C	2.7	69.3	0.72	0.81	23.8
12	R2	623	3.0	0.615	19.3	LOS C	2.7	69.3	0.71	0.79	25.8
Approach		686	3.0	0.615	19.3	LOS C	2.7	69.3	0.71	0.80	25.6
All Vehicles		2249	3.0	0.615	11.3	LOS B	2.7	69.3	0.33	0.33	25.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	267	65	92	268	35	966	206
Future Volume (veh/h)	267	65	92	268	35	966	206
Number	3	18	1	6		2	12
Initial Q (Qb), veh	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863		1863	1863
Adj Flow Rate, veh/h	314	76	114	331		1098	234
Adj No. of Lanes	2	1	1	2		2	1
Peak Hour Factor	0.85	0.85	0.81	0.81		0.88	0.88
Percent Heavy Veh, %	2	2	2	2		2	2
Cap, veh/h	382	300	139	2861		2001	1280
Arrive On Green	0.11	0.11	0.16	1.00		0.70	0.70
Sat Flow, veh/h	3442	1583	1774	3632		3297	1583
Grp Volume(v), veh/h	314	76	114	331		1098	234
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1770		1434	1583
Q Serve(g_s), s	11.1	5.1	7.7	0.0		23.3	4.1
Cycle Q Clear(g_c), s	11.1	5.1	7.7	0.0		23.3	4.1
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	382	300	139	2861		2001	1280
V/C Ratio(X)	0.82	0.25	0.82	0.12		0.55	0.18
Avail Cap(c_a), veh/h	971	571	358	2861		2001	1280
HCM Platoon Ratio	1.00	1.00	2.00	2.00		1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	53.9	42.8	51.4	0.0		9.2	2.7
Incr Delay (d2), s/veh	1.7	0.2	11.1	0.1		1.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	2.2	4.2	0.0		9.5	2.9
LnGrp Delay(d),s/veh	55.6	42.9	62.5	0.1		10.3	3.0
LnGrp LOS	E	D	E	A		B	A
Approach Vol, veh/h	390			445		1332	
Approach Delay, s/veh	53.1			16.1		9.0	
Approach LOS	D			B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.7	92.0				105.7		18.3
Change Period (Y+Rc), s	4.0	5.5				5.5		4.5
Max Green Setting (Gmax), s	25.0	50.0				50.0		35.0
Max Q Clear Time (g_c+I1), s	9.7	25.3				2.0		13.1
Green Ext Time (p_c), s	0.2	11.8				15.1		0.7

Intersection Summary		
HCM 2010 Ctrl Delay		18.4
HCM 2010 LOS		B

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	319	77	283	44	27	1004		
Future Volume (veh/h)	319	77	283	44	27	1004		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	431	104	410	64	30	1116		
Adj No. of Lanes	1	1	2	1	1	1		
Peak Hour Factor	0.74	0.74	0.69	0.69	0.90	0.90		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	415	404	1801	1364	38	1262		
Arrive On Green	0.23	0.23	0.63	0.63	0.04	1.00		
Sat Flow, veh/h	1774	1583	3297	1583	1774	1863		
Grp Volume(v), veh/h	431	104	410	64	30	1116		
Grp Sat Flow(s),veh/h/ln	1774	1583	1434	1583	1774	1863		
Q Serve(g_s), s	29.0	6.5	7.7	0.7	2.1	0.0		
Cycle Q Clear(g_c), s	29.0	6.5	7.7	0.7	2.1	0.0		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	415	404	1801	1364	38	1262		
V/C Ratio(X)	1.04	0.26	0.23	0.05	0.79	0.88		
Avail Cap(c_a), veh/h	415	404	1801	1364	429	1262		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	47.5	36.8	10.0	1.2	59.1	0.0		
Incr Delay (d2), s/veh	54.6	0.1	0.3	0.1	12.9	9.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	20.5	2.9	3.1	0.9	1.2	3.2		
LnGrp Delay(d),s/veh	102.1	36.9	10.3	1.3	72.0	9.3		
LnGrp LOS	F	D	B	A	E	A		
Approach Vol, veh/h	535		474			1146		
Approach Delay, s/veh	89.4		9.1			10.9		
Approach LOS	F		A			B		
Timer	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.1	83.9				90.0		34.0
Change Period (Y+Rc), s	3.5	6.0				6.0		5.0
Max Green Setting (Gmax), s	30.0	50.0				50.0		29.0
Max Q Clear Time (g_c+I1), s	4.1	9.7				2.0		31.0
Green Ext Time (p_c), s	0.0	9.2				9.4		0.0
Intersection Summary								
HCM 2010 Ctrl Delay			30.0					
HCM 2010 LOS			C					

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBU	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	37	1	0	1	2	35	60
Future Vol, veh/h	37	1	0	1	2	35	60
Peak Hour Factor	0.68	0.68	0.25	0.25	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	54	1	0	4	2	39	67
Number of Lanes	0	1	0	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.7	6.6	7.2
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	97%	0%	37%
Vol Thru, %	3%	0%	0%
Vol Right, %	0%	100%	63%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	38	1	97
LT Vol	37	0	36
Through Vol	1	0	0
RT Vol	0	1	61
Lane Flow Rate	56	4	109
Geometry Grp	1	1	1
Degree of Util (X)	0.067	0.004	0.113
Departure Headway (Hd)	4.324	3.568	3.734
Convergence, Y/N	Yes	Yes	Yes
Cap	827	996	957
Service Time	2.356	1.614	1.767
HCM Lane V/C Ratio	0.068	0.004	0.114
HCM Control Delay	7.7	6.6	7.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0	0.4

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	13	58	4	403	105	18	11
Future Vol, veh/h	13	58	4	403	105	18	11
Conflicting Peds, #/hr	0	0	0	0	0	0	8
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	-	0	0	-
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	72	72	89	89	89	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	18	81	4	453	118	21	13

Major/Minor	Major1		Major2			Minor2	
Conflicting Flow All	453	0	-	-	0	570	461
Stage 1	-	-	-	-	-	453	-
Stage 2	-	-	-	-	-	117	-
Critical Hdwy	4.12	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1108	-	-	-	-	483	600
Stage 1	-	-	-	-	-	640	-
Stage 2	-	-	-	-	-	908	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	1101	-	-	-	-	475	596
Mov Cap-2 Maneuver	-	-	-	-	-	475	-
Stage 1	-	-	-	-	-	640	-
Stage 2	-	-	-	-	-	893	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5		12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1101	-	-	-	515
HCM Lane V/C Ratio	0.016	-	-	-	0.065
HCM Control Delay (s)	8.3	0	-	-	12.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection							
Int Delay, s/veh	2.1						

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	85	9	2	595	500	12	84
Future Vol, veh/h	85	9	2	595	500	12	84
Conflicting Peds, #/hr	0	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	72	72	89	89	89	79	79
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	118	13	2	669	562	15	106

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	-	131	0	2023	125
Stage 1	-	-	-	-	-	124	-
Stage 2	-	-	-	-	-	1899	-
Critical Hdwy	-	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	-	1454	-	64	926
Stage 1	-	-	-	-	-	902	-
Stage 2	-	-	-	-	-	129	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	~ -375	~ -375	-	64	925
Mov Cap-2 Maneuver	-	-	-	-	-	64	-
Stage 1	-	-	-	-	-	902	-
Stage 2	-	-	-	-	-	129	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	64	925	-	-	+	-
HCM Lane V/C Ratio	0.237	0.115	-	-	-	-
HCM Control Delay (s)	77.9	9.4	-	-	1.5	-
HCM Lane LOS	F	A	-	-	A	-
HCM 95th %tile Q(veh)	0.8	0.4	-	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	161	6	550	1062	8	4	3	79	6	13	31
Future Vol, veh/h	6	161	6	550	1062	8	4	3	79	6	13	31
Conflicting Peds, #/hr	1	0	1	1	0	1	4	0	5	5	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	89	89	89	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	224	8	618	1193	9	4	3	85	6	14	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1203	0	0	233	0	0	2089	2684	234	2729	2685	606
Stage 1	-	-	-	-	-	-	245	245	-	2435	2435	-
Stage 2	-	-	-	-	-	-	1844	2439	-	294	250	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	578	-	-	1333	-	-	34	22	804	11	22	441
Stage 1	-	-	-	-	-	-	758	703	-	32	62	-
Stage 2	-	-	-	-	-	-	78	62	-	713	699	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	576	-	-	1327	-	-	-	0	800	-	0	439
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-	-	0	-
Stage 1	-	-	-	-	-	-	747	693	-	32	0	-
Stage 2	-	-	-	-	-	-	-	0	-	623	689	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	5.1		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	576	-	-	1327	-	-	-	439
HCM Lane V/C Ratio	-	0.014	-	-	0.466	-	-	-	0.108
HCM Control Delay (s)	-	11.3	-	-	10.1	2.5	-	-	14.2
HCM Lane LOS	-	B	-	-	B	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	2.5	-	-	-	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	248	0	0	1613	6	0	0	0	11	0	7
Future Volume (veh/h)	2	248	0	0	1613	6	0	0	0	11	0	7
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	0	0	1863	1900				1900	1863	1900
Adj Flow Rate, veh/h	3	344	0	0	1812	7				12	0	8
Adj No. of Lanes	0	1	0	0	2	0				0	1	0
Peak Hour Factor	0.72	0.72	0.72	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	0	2	2				0	2	0
Cap, veh/h	96	878	0	0	1903	7				267	0	178
Arrive On Green	0.53	0.53	0.00	0.00	0.53	0.53				0.26	0.00	0.26
Sat Flow, veh/h	1	1669	0	0	3709	14				1015	0	677
Grp Volume(v), veh/h	347	0	0	0	886	933				20	0	0
Grp Sat Flow(s),veh/h/ln	1671	0	0	0	1770	1860				1693	0	0
Q Serve(g_s), s	0.5	0.0	0.0	0.0	18.1	18.1				0.3	0.0	0.0
Cycle Q Clear(g_c), s	18.6	0.0	0.0	0.0	18.1	18.1				0.3	0.0	0.0
Prop In Lane	0.01		0.00	0.00		0.01				0.60		0.40
Lane Grp Cap(c), veh/h	975	0	0	0	931	979				445	0	0
V/C Ratio(X)	0.36	0.00	0.00	0.00	0.95	0.95				0.04	0.00	0.00
Avail Cap(c_a), veh/h	975	0	0	0	931	979				445	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	1.00	1.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	5.3	0.0	0.0	0.0	8.5	8.5				10.4	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.0	19.9	19.4				0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	0.0	13.8	14.3				0.2	0.0	0.0
LnGrp Delay(d),s/veh	6.3	0.0	0.0	0.0	28.4	27.9				10.6	0.0	0.0
LnGrp LOS	A				C	C				B		
Approach Vol, veh/h		347			1819						20	
Approach Delay, s/veh		6.3			28.2						10.6	
Approach LOS		A			C						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		24.0		14.0		24.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		20.0		10.0		20.0		
Max Q Clear Time (g_c+I1), s		20.6		2.3		20.1		
Green Ext Time (p_c), s		0.0		0.0		0.0		

Intersection Summary		
HCM 2010 Ctrl Delay		24.5
HCM 2010 LOS		C

SimTraffic Post-Processor **Squaw Alpine Gondola Phase 2**
Average Results from 10 Runs **Cumulative No Project**
Volume and Delay by Movement **AM Peak Hour**

Intersection 11 **Squaw Valley Rd/Squaw Creek Rd** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	43	42	97.0%	16.4	6.6	C
	Through						
	Right Turn	35	37	106.0%	2.9	0.6	A
	Subtotal	78	79	101.0%	10.8	4.4	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	242	240	99.3%	1.8	0.6	A
	Right Turn	23	22	95.2%	1.8	1.6	A
	Subtotal	265	262	98.9%	1.8	0.6	A
WB	Left Turn	68	59	86.3%	4.3	0.9	A
	Through	1,571	1,371	87.3%	4.0	0.2	A
	Right Turn						
	Subtotal	1,639	1,430	87.2%	4.0	0.2	A
Total		1,982	1,771	89.3%	4.0	0.2	A

Intersection 12 **SR 89 /Squaw Valley Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	737	700	95.0%	229.0	62.2	F
	Through	164	153	93.0%	148.7	61.2	F
	Right Turn						
	Subtotal	901	853	94.7%	215.7	62.1	F
SB	Left Turn						
	Through	440	358	81.4%	288.7	15.7	F
	Right Turn	883	713	80.7%	255.5	11.1	F
	Subtotal	1,323	1,071	80.9%	266.5	12.4	F
EB	Left Turn	163	167	102.5%	42.8	5.5	D
	Through						
	Right Turn	126	122	96.4%	2.1	0.3	A
	Subtotal	289	289	99.8%	24.8	3.8	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,513	2,212	88.0%	215.0	25.3	F

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Squaw Alpine Gondola Phase 2
Cumulative No Project
AM Peak Hour

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	344	342	99.5%	26.2	3.9	C
	Through	833	846	101.6%	20.6	3.2	C
	Right Turn						
	Subtotal	1,177	1,189	101.0%	22.2	2.9	C
SB	Left Turn						
	Through	246	204	82.9%	20.7	5.3	C
	Right Turn	320	273	85.4%	11.5	2.3	B
	Subtotal	566	477	84.3%	15.4	3.5	B
EB	Left Turn	68	69	100.9%	27.9	5.8	C
	Through						
	Right Turn	40	39	96.5%	2.8	1.4	A
	Subtotal	108	107	99.3%	18.9	4.1	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,851	1,773	95.8%	20.2	2.5	C

Intersection 11 **Squaw Valley Rd/Squaw Creek Rd** **Side-street Stop**

Direction	Lane Group	Storage (ft)	Average Queue (ft)		95th Queue (ft)		Maximum Queue (ft)		Block Time	
			Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Through/Right	2,125	25	0	25	3	25	8	0%	0%
NB	Left Turn	75	50	2	75	4	75	8	3%	0%
	Right Turn	1,425	25	3	75	4	75	16	0%	0%
WB	Left/Through	750	50	7	100	22	175	58	0%	0%
	Through	750	25	9	100	49	225	127	0%	0%
0										

SimTraffic Post-Processor
Average Results from 10 Runs
Queue Length

Squaw Alpine Gondola Phase 2
Cumulative No Project
AM Peak Hour

Intersection 12 **SR 89 /Squaw Valley Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft)		95th Queue (ft)		Maximum Queue (ft)		Block Time	
			Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Left Turn	475	75	7	125	13	150	26	0%	0%
	Left/Through	1,600	100	6	125	13	175	26	0%	0%
NB	Left Turn	3,150	1,225	279	2,175	446	2,250	429	53%	0%
	Through	650	600	89	925	113	725	12	0%	40%
	Through/Right	75	25	2	25	11	50	23	0%	0%
SB	Through	150	200	4	225	13	225	11	38%	38%
	Right Turn	3,725	3,400	250	4,575	229	3,825	47	0%	10%
0										

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft)		95th Queue (ft)		Maximum Queue (ft)		Block Time	
			Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Left Turn	150	50	5	100	10	125	24	0%	0%
	Right Turn	1,825	25	2	50	4	50	7	0%	0%
NB	Left Turn	375	175	17	300	48	425	102	0%	0%
	Through	3,700	225	17	425	45	600	148	3%	0%
SB	Through	1,450	100	11	200	23	225	35	0%	0%
	Right Turn	625	100	8	175	11	225	24	0%	0%
0										

MOVEMENT SUMMARY

Site: 14A C no P AM

SR 28/89
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: SR 89											
3x	L2	16	3.0	0.357	8.3	LOS A	1.6	40.2	0.45	0.37	23.8
8x	T1	27	3.0	0.357	8.3	LOS A	1.6	40.2	0.45	0.37	23.5
18x	R2	262	3.0	0.357	8.3	LOS A	1.6	40.2	0.45	0.37	22.9
Approach		304	3.0	0.357	8.3	LOS A	1.6	40.2	0.45	0.37	23.0
NorthEast: SR 28											
1x	L2	242	3.0	0.995	46.6	LOS E	48.5	1242.7	1.00	0.54	16.9
6x	T1	795	3.0	0.995	46.6	LOS E	48.5	1242.7	1.00	0.54	16.7
16x	R2	5	3.0	0.995	46.6	LOS E	48.5	1242.7	1.00	0.54	16.5
Approach		1042	3.0	0.995	46.6	LOS E	48.5	1242.7	1.00	0.54	16.8
NorthWest: SR 28											
7x	L2	19	3.0	0.163	12.4	LOS B	0.5	13.0	0.70	0.70	17.5
4x	T1	35	3.0	0.163	12.4	LOS B	0.5	13.0	0.70	0.70	17.2
14x	R2	6	3.0	0.163	12.4	LOS B	0.5	13.0	0.70	0.70	16.9
Approach		60	3.0	0.163	12.4	LOS B	0.5	13.0	0.70	0.70	17.3
SouthWest: SR 89											
5x	L2	3	3.0	0.297	7.8	LOS A	1.2	30.9	0.46	0.40	24.4
2x	T1	224	3.0	0.297	7.8	LOS A	1.2	30.9	0.46	0.40	23.9
12x	R2	14	3.0	0.297	7.8	LOS A	1.2	30.9	0.46	0.40	23.3
Approach		240	3.0	0.297	7.8	LOS A	1.2	30.9	0.46	0.40	23.9
All Vehicles		1647	3.0	0.995	32.6	LOS D	48.5	1242.7	0.81	0.49	18.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 14B C no P AM

SR 28/89 Western Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: SR 89											
3x	L2	524	3.0	0.616	13.6	LOS B	4.3	109.7	0.60	0.54	21.9
18x	R2	11	3.0	0.616	13.6	LOS B	4.3	109.7	0.60	0.54	21.1
Approach		535	3.0	0.616	13.6	LOS B	4.3	109.7	0.60	0.54	21.9
NorthEast: SR 28											
1x	L2	12	3.0	1.262	151.5	LOS F	66.1	1691.7	1.00	4.54	9.6
6x	T1	795	3.0	1.262	151.5	LOS F	66.1	1691.7	1.00	4.54	9.5
Approach		807	3.0	1.262	151.5	LOS F	66.1	1691.7	1.00	4.54	9.5
SouthWest: SR 89											
2x	T1	226	3.0	0.368	7.1	LOS A	1.9	47.7	0.08	0.02	25.4
12x	R2	174	3.0	0.368	7.1	LOS A	1.9	47.7	0.08	0.02	24.7
Approach		400	3.0	0.368	7.1	LOS A	1.9	47.7	0.08	0.02	25.1
All Vehicles		1742	3.0	1.262	76.0	LOS F	66.1	1691.7	0.67	2.27	14.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 14C C no P AM

SR 28/89 Eastern Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 28											
3	L2	524	3.0	0.752	16.4	LOS C	8.8	224.0	0.23	0.07	24.2
8	T1	288	3.0	0.752	16.4	LOS C	8.8	224.0	0.23	0.07	23.7
Approach		813	3.0	0.752	16.4	LOS C	8.8	224.0	0.23	0.07	24.0
North: SR 28											
4	T1	267	3.0	0.446	12.3	LOS B	2.1	53.0	0.64	0.69	22.8
14	R2	17	3.0	0.446	12.3	LOS B	2.1	53.0	0.64	0.69	22.3
Approach		285	3.0	0.446	12.3	LOS B	2.1	53.0	0.64	0.69	22.8
West: SR 89											
5	L2	14	3.0	0.225	6.7	LOS A	0.9	22.2	0.41	0.33	24.4
12	R2	174	3.0	0.225	6.7	LOS A	0.9	22.2	0.41	0.33	23.3
Approach		188	3.0	0.225	6.7	LOS A	0.9	22.2	0.41	0.33	23.4
All Vehicles		1285	3.0	0.752	14.1	LOS B	8.8	224.0	0.35	0.24	23.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	229	277	217	240	37	492	123	242	37	90	60
Future Volume (veh/h)	44	229	277	217	240	37	492	123	242	37	90	60
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	54	283	342	244	270	42	547	137	269	44	107	71
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	0	2	0
Peak Hour Factor	0.81	0.81	0.81	0.89	0.89	0.89	0.90	0.90	0.90	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	369	814	281	601	498	562	590	501	71	176	120
Arrive On Green	0.04	0.20	0.20	0.16	0.32	0.32	0.32	0.32	0.32	0.12	0.11	0.11
Sat Flow, veh/h	1774	1863	1579	1774	1863	1543	1774	1863	1583	679	1672	1139
Grp Volume(v), veh/h	54	283	342	244	270	42	547	137	269	118	0	104
Grp Sat Flow(s),veh/h/ln	1774	1863	1579	1774	1863	1543	1774	1863	1583	1829	0	1662
Q Serve(g_s), s	2.9	13.6	12.7	12.7	10.9	1.8	28.9	5.1	13.3	5.9	0.0	5.6
Cycle Q Clear(g_c), s	2.9	13.6	12.7	12.7	10.9	1.8	28.9	5.1	13.3	5.9	0.0	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.37		0.69
Lane Grp Cap(c), veh/h	69	369	814	281	601	498	562	590	501	192	0	175
V/C Ratio(X)	0.78	0.77	0.42	0.87	0.45	0.08	0.97	0.23	0.54	0.62	0.00	0.59
Avail Cap(c_a), veh/h	281	688	1084	655	688	570	562	590	501	483	0	438
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.1	35.9	14.2	38.9	25.4	22.3	32.0	23.9	26.7	40.4	0.0	40.4
Incr Delay (d2), s/veh	6.8	1.3	0.1	3.2	0.2	0.0	31.1	0.1	0.6	1.2	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	7.1	8.9	6.5	5.6	0.8	19.0	2.6	5.9	3.0	0.0	2.6
LnGrp Delay(d),s/veh	51.9	37.2	14.4	42.1	25.6	22.4	63.1	24.0	27.3	41.6	0.0	41.6
LnGrp LOS	D	D	B	D	C	C	E	C	C	D		D
Approach Vol, veh/h		679			556			953			222	
Approach Delay, s/veh		26.9			32.6			47.4			41.6	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.0	24.3		15.0	8.2	36.1		35.5
Change Period (Y+Rc), s	5.0	5.5		5.0	4.5	5.5		5.5
Max Green Setting (Gmax), s	35.0	35.0		25.0	15.0	35.0		30.0
Max Q Clear Time (g_c+I1), s	14.7	15.6		7.9	4.9	12.9		30.9
Green Ext Time (p_c), s	0.3	2.6		0.7	0.0	2.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	37.7
HCM 2010 LOS	D

MOVEMENT SUMMARY

Site: 2. C no P PM

SR 89 / I-80 WB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
3	L2	553	3.0	0.651	12.4	LOS B	0.0	0.0	0.00	0.00	25.5
8	T1	875	3.0	0.651	12.4	LOS B	0.0	0.0	0.00	0.00	25.9
Approach		1428	3.0	0.651	12.4	LOS B	0.0	0.0	0.00	0.00	25.8
East: I-80 WB off-ramp											
1	L2	311	3.0	0.793	40.4	LOS E	3.7	95.8	0.89	1.16	17.6
16	R2	180	3.0	0.493	21.6	LOS C	1.6	42.1	0.79	0.89	20.2
Approach		490	3.0	0.793	33.5	LOS D	3.7	95.8	0.85	1.06	18.4
North: HWY 89											
4	T1	600	3.0	0.805	37.5	LOS E	5.6	144.5	0.87	1.21	18.2
14	R2	125	3.0	0.805	37.5	LOS E	5.6	144.5	0.87	1.21	17.8
Approach		725	3.0	0.805	37.5	LOS E	5.6	144.5	0.87	1.21	18.2
All Vehicles		2644	3.0	0.805	23.2	LOS C	5.6	144.5	0.40	0.53	21.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3. C no P PM

SR 89 / I-80 EB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
8	T1	1403	3.0	1.264	145.3	LOS F	96.2	2463.5	1.00	4.04	9.8
18	R2	787	3.0	1.264	145.3	LOS F	96.2	2463.5	1.00	4.04	9.6
Approach		2190	3.0	1.264	145.3	LOS F	96.2	2463.5	1.00	4.04	9.7
North: HWY 89											
7	L2	201	3.0	0.415	7.7	LOS A	0.0	0.0	0.00	0.00	26.0
4	T1	710	3.0	0.415	7.7	LOS A	0.0	0.0	0.00	0.00	27.9
Approach		911	3.0	0.415	7.7	LOS A	0.0	0.0	0.00	0.00	27.5
West: I-80 EB off-ramp											
5	L2	28	3.0	0.310	11.1	LOS B	0.9	24.2	0.59	0.61	26.2
12	R2	317	3.0	0.310	10.9	LOS B	0.9	24.2	0.58	0.60	28.5
Approach		345	3.0	0.310	10.9	LOS B	0.9	24.2	0.58	0.60	28.3
All Vehicles		3446	3.0	1.264	95.5	LOS F	96.2	2463.5	0.69	2.63	12.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Volume (veh/h)	466	64	217	1421	62	459	316	
Future Volume (veh/h)	466	64	217	1421	62	459	316	
Number	3	18	1	6		2	12	
Initial Q (Qb), veh	0	0	0	0		0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00	
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863		1863	1863	
Adj Flow Rate, veh/h	530	73	224	1465		510	351	
Adj No. of Lanes	2	1	1	2		2	1	
Peak Hour Factor	0.88	0.88	0.97	0.97		0.90	0.90	
Percent Heavy Veh, %	2	2	2	2		2	2	
Cap, veh/h	602	506	256	2634		1628	1176	
Arrive On Green	0.18	0.18	0.05	0.25		0.57	0.57	
Sat Flow, veh/h	3442	1583	1774	3632		3297	1583	
Grp Volume(v), veh/h	530	73	224	1465		510	351	
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1770		1434	1583	
Q Serve(g_s), s	18.6	4.1	15.6	44.8		11.6	9.1	
Cycle Q Clear(g_c), s	18.6	4.1	15.6	44.8		11.6	9.1	
Prop In Lane	1.00	1.00	1.00				1.00	
Lane Grp Cap(c), veh/h	602	506	256	2634		1628	1176	
V/C Ratio(X)	0.88	0.14	0.87	0.56		0.31	0.30	
Avail Cap(c_a), veh/h	971	676	358	2634		1628	1176	
HCM Platoon Ratio	1.00	1.00	0.33	0.33		1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00	
Uniform Delay (d), s/veh	49.9	30.1	57.9	28.9		14.1	5.3	
Incr Delay (d2), s/veh	3.4	0.0	15.8	0.9		0.5	0.6	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0	
%ile BackOfQ(50%),veh/ln	9.1	1.8	8.8	22.4		4.7	6.8	
LnGrp Delay(d),s/veh	53.3	30.2	73.7	29.7		14.6	5.9	
LnGrp LOS	D	C	E	C		B	A	
Approach Vol, veh/h	603			1689		861		
Approach Delay, s/veh	50.5			35.6		11.1		
Approach LOS	D			D		B		
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	21.9	75.9				97.8		26.2
Change Period (Y+Rc), s	4.0	5.5				5.5		4.5
Max Green Setting (Gmax), s	25.0	50.0				50.0		35.0
Max Q Clear Time (g_c+I1), s	17.6	13.6				46.8		20.6
Green Ext Time (p_c), s	0.4	22.1				2.8		1.1
Intersection Summary								
HCM 2010 Ctrl Delay			31.7					
HCM 2010 LOS			C					
Notes								

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	57	92	1546	192	142	381
Future Volume (veh/h)	57	92	1546	192	142	381
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	72	116	1610	200	151	405
Adj No. of Lanes	1	1	2	1	1	1
Peak Hour Factor	0.79	0.79	0.96	0.96	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	147	288	2012	1241	176	1544
Arrive On Green	0.08	0.08	0.70	0.70	0.20	1.00
Sat Flow, veh/h	1774	1583	3297	1583	1774	1863
Grp Volume(v), veh/h	72	116	1610	200	151	405
Grp Sat Flow(s),veh/h/ln	1774	1583	1434	1583	1774	1863
Q Serve(g_s), s	4.8	8.0	47.4	3.9	10.2	0.0
Cycle Q Clear(g_c), s	4.8	8.0	47.4	3.9	10.2	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	147	288	2012	1241	176	1544
V/C Ratio(X)	0.49	0.40	0.80	0.16	0.86	0.26
Avail Cap(c_a), veh/h	415	527	2012	1241	429	1544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	44.8	12.6	3.3	48.9	0.0
Incr Delay (d2), s/veh	0.9	0.3	3.5	0.3	4.7	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	3.5	19.5	2.4	5.2	0.2
LnGrp Delay(d),s/veh	55.3	45.1	16.1	3.6	53.5	0.4
LnGrp LOS	E	D	B	A	D	A
Approach Vol, veh/h	188		1810			556
Approach Delay, s/veh	49.0		14.7			14.8
Approach LOS	D		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	15.8	93.0				108.8		15.2
Change Period (Y+Rc), s	3.5	6.0				6.0		5.0
Max Green Setting (Gmax), s	30.0	50.0				50.0		29.0
Max Q Clear Time (g_c+I1), s	12.2	49.4				2.0		10.0
Green Ext Time (p_c), s	0.2	0.5				13.8		0.2

Intersection Summary		
HCM 2010 Ctrl Delay		17.2
HCM 2010 LOS		B

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	61	6	0	0	23	42
Future Vol, veh/h	61	6	0	0	23	42
Peak Hour Factor	0.80	0.80	0.85	0.85	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	8	0	0	25	45
Number of Lanes	0	1	0	1	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.7	0	7.1
HCM LOS	A	-	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	91%	0%	35%
Vol Thru, %	9%	100%	0%
Vol Right, %	0%	0%	65%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	67	0	65
LT Vol	61	0	23
Through Vol	6	0	0
RT Vol	0	0	42
Lane Flow Rate	84	0	70
Geometry Grp	1	1	1
Degree of Util (X)	0.099	0	0.073
Departure Headway (Hd)	4.238	4.12	3.762
Convergence, Y/N	Yes	Yes	Yes
Cap	847	0	946
Service Time	2.26	2.164	1.811
HCM Lane V/C Ratio	0.099	0	0.074
HCM Control Delay	7.7	7.2	7.1
HCM Lane LOS	A	N	A
HCM 95th-tile Q	0.3	0	0.2

Intersection	
Int Delay, s/veh	19.2

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	19	421	5	154	50	224	74
Future Vol, veh/h	19	421	5	154	50	224	74
Conflicting Peds, #/hr	0	0	0	0	0	27	9
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	-	0	0	-
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	80	80	93	93	93	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	24	526	5	166	54	291	96

Major/Minor	Major1		Major2			Minor2	
Conflicting Flow All	166	0	-	-	0	767	175
Stage 1	-	-	-	-	-	166	-
Stage 2	-	-	-	-	-	601	-
Critical Hdwy	4.12	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1412	-	-	-	-	370	868
Stage 1	-	-	-	-	-	863	-
Stage 2	-	-	-	-	-	547	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	1401	-	-	-	-	361	861
Mov Cap-2 Maneuver	-	-	-	-	-	361	-
Stage 1	-	-	-	-	-	863	-
Stage 2	-	-	-	-	-	534	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3		57.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1401	-	-	-	422
HCM Lane V/C Ratio	0.017	-	-	-	0.917
HCM Control Delay (s)	7.6	0	-	-	57.1
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	10.1

Intersection	
Int Delay, s/veh	179.9

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	632	13	3	120	209	12	692
Future Vol, veh/h	632	13	3	120	209	12	692
Conflicting Peds, #/hr	0	8	0	8	0	3	5
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	80	80	93	93	93	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	790	16	3	129	225	13	736

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	-	814	0	1292	811
Stage 1	-	-	-	-	-	806	-
Stage 2	-	-	-	-	-	486	-
Critical Hdwy	-	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	-	813	-	180	~ 379
Stage 1	-	-	-	-	-	439	-
Stage 2	-	-	-	-	-	618	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	~ -91	~ -91	-	178	~ 375
Mov Cap-2 Maneuver	-	-	-	-	-	178	-
Stage 1	-	-	-	-	-	436	-
Stage 2	-	-	-	-	-	616	-

Approach	EB	WB	NB
HCM Control Delay, s	0		$ 459.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	178	375	-	-	+	-
HCM Lane V/C Ratio	0.072	1.963	-	-	-	-
HCM Control Delay (s)	26.8	$ 466.8	-	-	-	-
HCM Lane LOS	D	F	-	-	-	-
HCM 95th %tile Q(veh)	0.2	50.6	-	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	1301	0	0	321	6	0	0	0	18	0	8
Future Vol, veh/h	23	1301	0	0	321	6	0	0	0	18	0	8
Conflicting Peds, #/hr	13	0	0	0	0	13	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	93	93	93	98	98	98	54	54	54
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	1626	0	0	345	6	0	0	0	33	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	365	0	0	1626	0	0	1857	2049	1626	2045	2045	189
Stage 1	-	-	-	-	-	-	1684	1684	-	361	361	-
Stage 2	-	-	-	-	-	-	173	365	-	1684	1684	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1192	-	-	398	-	-	51	55	126	37	56	821
Stage 1	-	-	-	-	-	-	119	150	-	631	625	-
Stage 2	-	-	-	-	-	-	812	623	-	119	150	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1192	-	-	398	-	-	49	53	126	36	54	812
Mov Cap-2 Maneuver	-	-	-	-	-	-	49	53	-	36	54	-
Stage 1	-	-	-	-	-	-	116	146	-	609	618	-
Stage 2	-	-	-	-	-	-	797	616	-	116	146	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	0	205.8
HCM LOS			A	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1192	-	-	398	-	-	36	812
HCM Lane V/C Ratio	-	0.024	-	-	-	-	-	0.926	0.018
HCM Control Delay (s)	0	8.1	-	-	0	-	-	293.1	9.5
HCM Lane LOS	A	A	-	-	A	-	-	F	A
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	3.4	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1310	0	0	322	7	0	0	0	12	0	5
Future Volume (veh/h)	9	1310	0	0	322	7	0	0	0	12	0	5
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	0	0	1863	1900				1900	1863	1900
Adj Flow Rate, veh/h	11	1638	0	0	346	8				14	0	6
Adj No. of Lanes	0	1	0	0	2	0				0	1	0
Peak Hour Factor	0.80	0.80	0.80	0.93	0.93	0.93				0.85	0.85	0.85
Percent Heavy Veh, %	2	2	0	0	2	2				0	2	0
Cap, veh/h	54	1546	0	0	2947	68				66	0	28
Arrive On Green	0.83	0.83	0.00	0.00	0.83	0.83				0.06	0.00	0.06
Sat Flow, veh/h	4	1856	0	0	3629	82				1196	0	513
Grp Volume(v), veh/h	1649	0	0	0	173	181				20	0	0
Grp Sat Flow(s),veh/h/ln	1860	0	0	0	1770	1848				1709	0	0
Q Serve(g_s), s	18.9	0.0	0.0	0.0	1.3	1.3				0.8	0.0	0.0
Cycle Q Clear(g_c), s	60.0	0.0	0.0	0.0	1.3	1.3				0.8	0.0	0.0
Prop In Lane	0.01		0.00	0.00		0.04				0.70		0.30
Lane Grp Cap(c), veh/h	1600	0	0	0	1475	1540				95	0	0
V/C Ratio(X)	1.03	0.00	0.00	0.00	0.12	0.12				0.21	0.00	0.00
Avail Cap(c_a), veh/h	1600	0	0	0	1475	1540				95	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	1.00	1.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	6.9	0.0	0.0	0.0	1.1	1.1				32.5	0.0	0.0
Incr Delay (d2), s/veh	30.8	0.0	0.0	0.0	0.2	0.2				5.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	45.2	0.0	0.0	0.0	0.7	0.7				0.5	0.0	0.0
LnGrp Delay(d),s/veh	37.7	0.0	0.0	0.0	1.3	1.3				37.5	0.0	0.0
LnGrp LOS	F				A	A				D		
Approach Vol, veh/h		1649			354						20	
Approach Delay, s/veh		37.7			1.3						37.5	
Approach LOS		D			A						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		64.0		8.0		64.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		60.0		4.0		30.0		
Max Q Clear Time (g_c+I1), s		62.0		2.8		3.3		
Green Ext Time (p_c), s		0.0		0.0		23.9		

Intersection Summary		
HCM 2010 Ctrl Delay		31.3
HCM 2010 LOS		C

SimTraffic Post-Processor **Squaw Alpine Gondola Phase 2**
Average Results from 10 Runs **Cumulative No Project**
Volume and Delay by Movement **PM Peak Hour**

Intersection 11 **Squaw Creek Rd/Squaw Valley Rd** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	34	22	65.6%	370.6	116.0	F
	Through						
	Right Turn	72	51	71.5%	407.4	105.8	F
	Subtotal	106	74	69.6%	268.6	211.9	F
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	1,278	1,103	86.3%	253.7	20.8	F
	Right Turn	42	33	78.7%	244.3	47.2	F
	Subtotal	1,320	1,136	86.1%	253.5	20.8	F
WB	Left Turn	61	59	96.7%	6.3	1.8	A
	Through	309	307	99.3%	1.5	0.2	A
	Right Turn						
	Subtotal	370	366	98.8%	2.2	0.4	A
Total		1,796	1,575	87.7%	188.6	10.7	F

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	178	169	95.1%	83.4	15.3	F
	Through	771	716	92.8%	125.9	19.4	F
	Right Turn						
	Subtotal	949	885	93.2%	118.6	19.2	F
SB	Left Turn						
	Through	246	240	97.4%	33.6	3.8	C
	Right Turn	192	196	102.0%	1.1	0.4	A
	Subtotal	438	435	99.4%	18.9	2.4	B
EB	Left Turn	967	723	74.7%	306.8	10.1	F
	Through						
	Right Turn	353	279	79.1%	105.3	7.4	F
	Subtotal	1,320	1,002	75.9%	256.5	13.6	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,707	2,322	85.8%	156.0	10.0	F

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Squaw Alpine Gondola Phase 2
Cumulative No Project
PM Peak Hour

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	51	50	98.6%	36.5	6.3	D
	Through	371	380	102.5%	14.1	1.9	B
	Right Turn						
	Subtotal	422	431	102.1%	16.8	2.1	B
SB	Left Turn						
	Through	535	463	86.6%	29.1	4.7	C
	Right Turn	64	54	85.0%	4.7	0.6	A
	Subtotal	599	517	86.4%	26.4	4.0	C
EB	Left Turn	578	577	99.8%	53.2	22.2	D
	Through						
	Right Turn	329	321	97.6%	29.4	16.1	C
	Subtotal	907	898	99.0%	44.6	20.6	D
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,928	1,846	95.8%	33.0	11.1	C

Intersection 11 **Squaw Creek Rd/Squaw Valley Rd** **Side-street Stop**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Through	1,925	725	114	2,025	226	1,950	39	0%	17%
	Through/Right	1,925	725	115	2,000	236	1,950	94	0%	16%
NB	Left Turn	75	50	9	75	13	75	2	13%	0%
	Right Turn	1,400	275	90	700	252	850	223	49%	0%
WB	Left Turn	100	50	4	75	12	100	17	1%	0%
	Through	725	25	5	50	45	75	120	0%	0%
0										

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	3,450	1,975	70	3,650	97	3,475	38	18%	0%
	Left/Through	4,250	2,650	85	4,325	101	4,250	59	57%	16%
	Right Turn	1,625	1,325	72	2,400	21	1,725	9	0%	59%
NB	Left Turn	425	275	36	500	38	425	0	0%	0%
	Through	650	550	80	825	65	725	14	32%	24%
	Through/Right	375	350	23	450	17	400	0	24%	0%
SB	Through	250	150	10	225	14	275	37	4%	0%
	Right Turn	250	25	5	50	18	75	25	0%	0%
0										

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	325	300	22	400	9	325	0	22%	0%
	Right Turn	2,150	425	163	975	376	1,150	442	0%	0%
NB	Left Turn	375	50	7	100	29	125	94	0%	0%
	Through	3,775	125	14	225	46	300	105	0%	0%
SB	Through	1,450	250	15	425	39	500	60	0%	0%
	Right Turn	625	25	4	50	6	75	9	0%	0%
0										

MOVEMENT SUMMARY

Site: 14A C no P PM

SR 28/89
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: SR 89											
3x	L2	11	3.0	0.543	16.5	LOS C	2.8	70.6	0.71	0.82	21.9
8x	T1	42	3.0	0.543	16.5	LOS C	2.8	70.6	0.71	0.82	21.7
18x	R2	252	3.0	0.543	16.5	LOS C	2.8	70.6	0.71	0.82	21.2
Approach		304	3.0	0.543	16.5	LOS C	2.8	70.6	0.71	0.82	21.3
NorthEast: SR 28											
1x	L2	198	3.0	0.455	8.6	LOS A	2.5	65.0	0.25	0.12	23.4
6x	T1	263	3.0	0.455	8.6	LOS A	2.5	65.0	0.25	0.12	23.0
16x	R2	10	3.0	0.455	8.6	LOS A	2.5	65.0	0.25	0.12	22.6
Approach		470	3.0	0.455	8.6	LOS A	2.5	65.0	0.25	0.12	23.1
NorthWest: SR 28											
7x	L2	19	3.0	0.130	6.8	LOS A	0.4	11.4	0.49	0.46	18.3
4x	T1	59	3.0	0.130	6.8	LOS A	0.4	11.4	0.49	0.46	18.0
14x	R2	10	3.0	0.130	6.8	LOS A	0.4	11.4	0.49	0.46	17.6
Approach		88	3.0	0.130	6.8	LOS A	0.4	11.4	0.49	0.46	18.0
SouthWest: SR 89											
5x	L2	5	3.0	0.779	21.8	LOS C	8.2	209.0	0.82	0.90	21.2
2x	T1	628	3.0	0.779	21.8	LOS C	8.2	209.0	0.82	0.90	20.9
12x	R2	11	3.0	0.779	21.8	LOS C	8.2	209.0	0.82	0.90	20.4
Approach		644	3.0	0.779	21.8	LOS C	8.2	209.0	0.82	0.90	20.9
All Vehicles		1506	3.0	0.779	15.7	LOS C	8.2	209.0	0.60	0.62	21.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 14B C no P PM

SR 28/89 Western Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: SR 89											
3x	L2	226	3.0	0.424	13.0	LOS B	1.9	47.4	0.66	0.71	22.1
18x	R2	17	3.0	0.424	13.0	LOS B	1.9	47.4	0.66	0.71	21.2
Approach		243	3.0	0.424	13.0	LOS B	1.9	47.4	0.66	0.71	22.1
NorthEast: SR 28											
1x	L2	12	3.0	0.316	7.6	LOS A	1.3	34.5	0.42	0.33	24.1
6x	T1	263	3.0	0.316	7.6	LOS A	1.3	34.5	0.42	0.33	23.9
Approach		275	3.0	0.316	7.6	LOS A	1.3	34.5	0.42	0.33	23.9
SouthWest: SR 89											
2x	T1	632	3.0	0.921	31.2	LOS D	25.7	658.2	0.50	0.14	20.0
12x	R2	366	3.0	0.921	31.2	LOS D	25.7	658.2	0.50	0.14	19.5
Approach		998	3.0	0.921	31.2	LOS D	25.7	658.2	0.50	0.14	19.8
All Vehicles		1515	3.0	0.921	24.0	LOS C	25.7	658.2	0.51	0.26	20.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 14C C no P PM

SR 28/89 Eastern Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 28											
3	L2	226	3.0	0.482	8.8	LOS A	2.9	74.5	0.13	0.04	26.6
8	T1	293	3.0	0.482	8.8	LOS A	2.9	74.5	0.13	0.04	26.0
Approach		519	3.0	0.482	8.8	LOS A	2.9	74.5	0.13	0.04	26.3
North: SR 28											
4	T1	198	3.0	0.241	6.7	LOS A	1.0	24.4	0.39	0.30	24.2
14	R2	12	3.0	0.241	6.7	LOS A	1.0	24.4	0.39	0.30	23.6
Approach		210	3.0	0.241	6.7	LOS A	1.0	24.4	0.39	0.30	24.2
West: SR 89											
5	L2	17	3.0	0.428	9.1	LOS A	2.1	53.4	0.45	0.34	23.8
12	R2	366	3.0	0.428	9.1	LOS A	2.1	53.4	0.45	0.34	22.7
Approach		383	3.0	0.428	9.1	LOS A	2.1	53.4	0.45	0.34	22.8
All Vehicles		1111	3.0	0.482	8.5	LOS A	2.9	74.5	0.29	0.19	24.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 SB
From/To	Deerfield Dr to W River St
Jurisdiction	Nevada/Placer County
Analysis Year	Cumulative No Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.89	
Shoulder width	4.7	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	1031	veh/h
Opposing direction volume, Vo	360	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.994	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1158	pc/h	407	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	2.7	mi/h
Average travel speed, ATSd	28.9	mi/h
Percent Free Flow Speed, PFFS	66.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1158	pc/h	404	pc/h

Base percent time-spent-following,(note-4) BPTSFd	77.0	%
Adjustment for no-passing zones, fnp	22.7	
Percent time-spent-following, PTSFd	93.8	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.39	
Peak 15-min vehicle-miles of travel, VMT15	58	veh-mi
Peak-hour vehicle-miles of travel, VMT60	206	veh-mi
Peak 15-min total travel time, TT15	2.0	veh-h
Capacity from ATS, CdATS	1690	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	3973	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.9	mi/h
Percent time-spent-following, PTSFd (from above)	93.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1158.4
Effective width of outside lane, We	21.40
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.42
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 SB
From/To	W River St to Squaw Valley Rd
Jurisdiction	Placer County
Analysis Year	Cumulative + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.90	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	7.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	55	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	1323	veh/h
Opposing direction volume, Vo	327	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		2.0	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.980	
Grade adj. factor,(note-1) fg	1.00		0.87	
Directional flow rate,(note-2) vi	1479	pc/h	426	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	59.8	mi/h
Adjustment for no-passing zones, fnp	2.3	mi/h
Average travel speed, ATSd	42.7	mi/h
Percent Free Flow Speed, PFFS	71.5	%

```
_________________________Percent Time-Spent-Following_________________________

Direction                                  Analysis(d)         Opposing (o)
PCE for trucks, ET                             1.0                 1.6
PCE for RVs, ER                                1.0                 1.0
Heavy-vehicle adjustment factor, fHV           1.000               0.988
Grade adjustment factor,(note-1) fg            1.00                0.88
Directional flow rate,(note-2) vi              1470   pc/h         418     pc/h
Base percent time-spent-following,(note-4) BPTSFd  84.4   %
Adjustment for no-passing zones, fnp               10.8
Percent time-spent-following, PTSFd                92.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.98
Peak 15-min vehicle-miles of travel, VMT15         2867    veh-mi
Peak-hour vehicle-miles of travel, VMT60           10319   veh-mi
Peak 15-min total travel time, TT15                67.1    veh-h
Capacity from ATS, CdATS                           1516    veh/h
Capacity from PTSF, CdPTSF                         1535    veh/h
Directional Capacity                               1952    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         7.8     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      42.7    mi/h
Percent time-spent-following, PTSFd (from above)             92.8
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     -
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1470.0
Effective width of outside lane, We	28.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.02
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 NB
From/To	A. Meadows Rd to S. Valley Rd
Jurisdiction	Placer County
Analysis Year	Cumulative + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	901	veh/h
Opposing direction volume, Vo	566	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.986	
Grade adj. factor,(note-1) fg	1.00		0.97	
Directional flow rate,(note-2) vi	985	pc/h	643	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	50.0	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSd	35.6	mi/h
Percent Free Flow Speed, PFFS	71.2	%

```
_________________________Percent Time-Spent-Following_________________________

Direction                                Analysis(d)          Opposing (o)
PCE for trucks, ET                           1.0                  1.0
PCE for RVs, ER                              1.0                  1.0
Heavy-vehicle adjustment factor, fHV         1.000                1.000
Grade adjustment factor,(note-1) fg          1.00                 0.97
Directional flow rate,(note-2) vi            979    pc/h          634     pc/h
Base percent time-spent-following,(note-4) BPTSFd  73.9   %
Adjustment for no-passing zones, fnp               23.2
Percent time-spent-following, PTSFd                88.0   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.38
Peak 15-min vehicle-miles of travel, VMT15         318      veh-mi
Peak-hour vehicle-miles of travel, VMT60           1171     veh-mi
Peak 15-min total travel time, TT15                8.9      veh-h
Capacity from ATS, CdATS                           1626     veh/h
Capacity from PTSF, CdPTSF                         1666     veh/h
Directional Capacity                               4313     veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         1.3       mi
Length of two-lane highway upstream of the passing lane, Lu  -         mi
Length of passing lane including tapers, Lpl                 -         mi
Average travel speed, ATSd (from above)                      35.6      mi/h
Percent time-spent-following, PTSFd (from above)             88.0
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -         mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -         mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -         mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -         mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -        %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     -
Peak 15-min total travel time, TT15                -        veh-h

__________________________ Bicycle Level of Service __________________________
```

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	979.3
Effective width of outside lane, We	28.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	1.70
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.2

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 NB
From/To	SR 28 to A. Meadows Rd
Jurisdiction	Placer County
Analysis Year	Cumulative + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	1177	veh/h
Opposing direction volume, Vo	287	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		2.1	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.978	
Grade adj. factor,(note-1) fg	1.00		0.84	
Directional flow rate,(note-2) vi	1287	pc/h	380	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	49.8	mi/h
Adjustment for no-passing zones, fnp	2.8	mi/h
Average travel speed, ATSd	34.0	mi/h
Percent Free Flow Speed, PFFS	68.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.988	
Grade adjustment factor,(note-1) fg	1.00		0.86	
Directional flow rate,(note-2) vi	1279	pc/h	367	pc/h

Base percent time-spent-following,(note-4) BPTSFd	80.6	%
Adjustment for no-passing zones, fnp	22.9	
Percent time-spent-following, PTSFd	98.4	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.88	
Peak 15-min vehicle-miles of travel, VMT15	1183	veh-mi
Peak-hour vehicle-miles of travel, VMT60	4355	veh-mi
Peak 15-min total travel time, TT15	34.8	veh-h
Capacity from ATS, CdATS	1466	veh/h
Capacity from PTSF, CdPTSF	1478	veh/h
Directional Capacity	1898	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	98.4	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1279.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.88
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone:                                    Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                  Fehr & Peers
Agency/Co.
Date Performed           3/4/2017
Analysis Time Period     Winter AM
Highway                  SR89 NB
From/To                  At Transit Center
Jurisdiction             Caltrans
Analysis Year            Cumulative + Project
Description  Squaw Valley Olympic Villlage

__________________________________Input Data__________________________________

Highway class  Class 2             Peak hour factor, PHF      0.94
Shoulder width       2.0     ft    % Trucks and buses         2       %
Lane width           12.0    ft    % Trucks crawling          0.0     %
Segment length       0.3     mi    Truck crawl speed          0.0     mi/hr
Terrain type         Level         % Recreational vehicles    0       %
Grade:  Length       -       mi    % No-passing zones         64      %
        Up/down      -       %     Access point density       11      /mi

Analysis direction volume, Vd  764     veh/h
Opposing direction volume, Vo  355     veh/h

____________________________Average Travel Speed______________________________

Direction                                 Analysis(d)         Opposing (o)
PCE for trucks, ET                            1.1                 1.3
PCE for RVs, ER                               1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV        0.998               0.994
Grade adj. factor,(note-1) fg                 1.00                1.00
Directional flow rate,(note-2) vi             814     pc/h        380     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                 -      mi/h
Observed total demand,(note-3) V                   -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS               45.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS    2.6     mi/h
Adj. for access point density,(note-3) fA        2.8     mi/h

Free-flow speed, FFSd                            39.7    mi/h

Adjustment for no-passing zones, fnp             2.2     mi/h
Average travel speed, ATSd                       28.2    mi/h
Percent Free Flow Speed, PFFS                    71.0    %
```

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.998	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	813	pc/h	378	pc/h

Base percent time-spent-following,(note-4) BPTSFd	65.1	%
Adjustment for no-passing zones, fnp	26.2	
Percent time-spent-following, PTSFd	83.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.48	
Peak 15-min vehicle-miles of travel, VMT15	61	veh-mi
Peak-hour vehicle-miles of travel, VMT60	229	veh-mi
Peak 15-min total travel time, TT15	2.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	2485	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.2	mi/h
Percent time-spent-following, PTSFd (from above)	83.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	812.8
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.66
Bicycle LOS	E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 NB
From/To	W River St to Deerfield Dr
Jurisdiction	Nevada/Placer County
Analysis Year	Cumulative No Project

Description Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.96	
Shoulder width	4.7	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	1638	veh/h
Opposing direction volume, Vo	523	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.996	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1706	pc/h	547	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSd	24.2	mi/h
Percent Free Flow Speed, PFFS	55.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1706	pc/h	545	pc/h

Base percent time-spent-following,(note-4) BPTSFd	88.6	%
Adjustment for no-passing zones, fnp	12.3	
Percent time-spent-following, PTSFd	97.9	%

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	0.57	
Peak 15-min vehicle-miles of travel, VMT15	85	veh-mi
Peak-hour vehicle-miles of travel, VMT60	328	veh-mi
Peak 15-min total travel time, TT15	3.5	veh-h
Capacity from ATS, CdATS	1693	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	3929	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	24.2	mi/h
Percent time-spent-following, PTSFd (from above)	97.9	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1706.3
Effective width of outside lane, We	21.40
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.61
Bicycle LOS	D

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 NB
From/To	Squaw Valley Rd to W River St
Jurisdiction	Placer County
Analysis Year	Cumulative No Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.93	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	7.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	55	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	1738	veh/h
Opposing direction volume, Vo	438	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.9	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.982	
Grade adj. factor,(note-1) fg	1.00		0.94	
Directional flow rate,(note-2) vi	1880	pc/h	510	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	59.8	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSd	39.3	mi/h
Percent Free Flow Speed, PFFS	65.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.992
Grade adjustment factor,(note-1) fg	1.00	0.94
Directional flow rate,(note-2) vi	1869 pc/h	505 pc/h

Base percent time-spent-following,(note-4) BPTSFd	90.7	%
Adjustment for no-passing zones, fnp	9.8	
Percent time-spent-following, PTSFd	98.4	%

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.18	
Peak 15-min vehicle-miles of travel, VMT15	3644	veh-mi
Peak-hour vehicle-miles of travel, VMT60	13556	veh-mi
Peak 15-min total travel time, TT15	92.7	veh-h
Capacity from ATS, CdATS	1589	veh/h
Capacity from PTSF, CdPTSF	1625	veh/h
Directional Capacity	2020	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	7.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	39.3	mi/h
Percent time-spent-following, PTSFd (from above)	98.4	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1868.8
Effective width of outside lane, We	28.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.14
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 NB
From/To	A. Meadows Rd to S. Valley Rd
Jurisdiction	Placer County
Analysis Year	Cumulative No Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	949	veh/h
Opposing direction volume, Vo	599	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.988	
Grade adj. factor,(note-1) fg	1.00		0.98	
Directional flow rate,(note-2) vi	1038	pc/h	672	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	50.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	35.0	mi/h
Percent Free Flow Speed, PFFS	70.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.98	
Directional flow rate,(note-2) vi	1032	pc/h	664	pc/h
Base percent time-spent-following,(note-4) BPTSFd	76.0	%		
Adjustment for no-passing zones, fnp	21.9			
Percent time-spent-following, PTSFd	89.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.39	
Peak 15-min vehicle-miles of travel, VMT15	335	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1234	veh-mi
Peak 15-min total travel time, TT15	9.6	veh-h
Capacity from ATS, CdATS	1646	veh/h
Capacity from PTSF, CdPTSF	1666	veh/h
Directional Capacity	4357	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.0	mi/h
Percent time-spent-following, PTSFd (from above)	89.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1031.5
Effective width of outside lane, We	28.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	1.73
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 SB
From/To	A. Meadows Rd to SR 28
Jurisdiction	Placer County
Analysis Year	Cumulative No Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.87	
Shoulder width	5.5	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	868	veh/h
Opposing direction volume, Vo	422	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.8	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.984	
Grade adj. factor,(note-1) fg	1.00		0.94	
Directional flow rate,(note-2) vi	1004	pc/h	524	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	48.5	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSd	34.4	mi/h
Percent Free Flow Speed, PFFS	71.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.992	
Grade adjustment factor,(note-1) fg	1.00		0.95	
Directional flow rate,(note-2) vi	998	pc/h	515	pc/h

Base percent time-spent-following,(note-4) BPTSFd	73.7	%
Adjustment for no-passing zones, fnp	22.1	
Percent time-spent-following, PTSFd	88.3	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.63	
Peak 15-min vehicle-miles of travel, VMT15	923	veh-mi
Peak-hour vehicle-miles of travel, VMT60	3212	veh-mi
Peak 15-min total travel time, TT15	26.8	veh-h
Capacity from ATS, CdATS	1589	veh/h
Capacity from PTSF, CdPTSF	1625	veh/h
Directional Capacity	2418	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	3.7	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	34.4	mi/h
Percent time-spent-following, PTSFd (from above)	88.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	997.7
Effective width of outside lane, We	23.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.99
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR89 SB
From/To	At Transit Center
Jurisdiction	Caltrans
Analysis Year	Cumulative No Project
Description	Squaw Valley Olympic Villlage

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.85	
Shoulder width	2.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	64	%
Up/down	-	%	Access point density	11	/mi

Analysis direction volume, Vd	484	veh/h
Opposing direction volume, Vo	462	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.996	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	571	pc/h	546	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	2.6	mi/h
Adj. for access point density,(note-3) fA	2.8	mi/h
Free-flow speed, FFSd	39.7	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	29.4	mi/h
Percent Free Flow Speed, PFFS	74.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	569	pc/h	544	pc/h

Base percent time-spent-following,(note-4) BPTSFd	56.1	%
Adjustment for no-passing zones, fnp	34.6	
Percent time-spent-following, PTSFd	73.8	%

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.36	
Peak 15-min vehicle-miles of travel, VMT15	43	veh-mi
Peak-hour vehicle-miles of travel, VMT60	145	veh-mi
Peak 15-min total travel time, TT15	1.5	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	3129	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	29.4	mi/h
Percent time-spent-following, PTSFd (from above)	73.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	569.4
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.48
Bicycle LOS	D

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

E4

Cumulative Plus Project Conditions Technical Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	215	418	142	188	37	181	72	110	18	94	60
Future Volume (veh/h)	54	215	418	142	188	37	181	72	110	18	94	60
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	59	234	454	161	214	42	195	77	118	20	103	66
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.88	0.88	0.88	0.93	0.93	0.93	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	544	692	204	693	589	258	271	230	52	268	175
Arrive On Green	0.04	0.29	0.29	0.11	0.37	0.37	0.15	0.15	0.15	0.16	0.14	0.14
Sat Flow, veh/h	1774	1863	1582	1774	1863	1583	1774	1863	1583	366	1891	1233
Grp Volume(v), veh/h	59	234	454	161	214	42	195	77	118	101	0	88
Grp Sat Flow(s),veh/h/ln	1774	1863	1582	1774	1863	1583	1774	1863	1583	1844	0	1645
Q Serve(g_s), s	2.3	7.0	15.5	6.1	5.6	1.2	7.2	2.5	4.7	3.4	0.0	3.3
Cycle Q Clear(g_c), s	2.3	7.0	15.5	6.1	5.6	1.2	7.2	2.5	4.7	3.4	0.0	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.20		0.75
Lane Grp Cap(c), veh/h	75	544	692	204	693	589	258	271	230	261	0	233
V/C Ratio(X)	0.79	0.43	0.66	0.79	0.31	0.07	0.76	0.28	0.51	0.39	0.00	0.38
Avail Cap(c_a), veh/h	388	950	1037	904	950	807	775	814	692	672	0	599
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.6	19.7	15.2	29.6	15.3	13.9	28.2	26.1	27.1	26.7	0.0	26.7
Incr Delay (d2), s/veh	6.6	0.2	0.4	2.6	0.1	0.0	1.7	0.2	0.7	0.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.6	8.5	3.1	2.9	0.5	3.6	1.3	2.1	1.8	0.0	1.5
LnGrp Delay(d),s/veh	39.2	19.9	15.6	32.2	15.4	13.9	29.9	26.4	27.7	27.0	0.0	27.1
LnGrp LOS	D	B	B	C	B	B	C	C	C	C		C
Approach Vol, veh/h		747			417			390			189	
Approach Delay, s/veh		18.8			21.7			28.5			27.0	
Approach LOS		B			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.9	25.5		14.7	7.4	31.0		15.5
Change Period (Y+Rc), s	5.0	5.5		5.0	4.5	5.5		5.5
Max Green Setting (Gmax), s	35.0	35.0		25.0	15.0	35.0		30.0
Max Q Clear Time (g_c+I1), s	8.1	17.5		5.4	4.3	7.6		9.2
Green Ext Time (p_c), s	0.2	2.4		0.6	0.0	2.6		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	22.6
HCM 2010 LOS	C

MOVEMENT SUMMARY

Site: 2. C+P AM

SR 89 / I-80 WB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
3	L2	182	3.0	0.214	5.2	LOS A	0.0	0.0	0.00	0.00	25.5
8	T1	288	3.0	0.214	5.2	LOS A	0.0	0.0	0.00	0.00	25.9
Approach		470	3.0	0.214	5.2	LOS A	0.0	0.0	0.00	0.00	25.8
East: I-80 WB off-ramp											
1	L2	288	3.0	0.368	9.1	LOS A	1.2	30.6	0.46	0.46	23.0
6	T1	1	3.0	0.001	4.7	LOS A	0.0	0.1	0.36	0.21	32.4
16	R2	133	3.0	0.174	6.6	LOS A	0.5	12.6	0.41	0.39	23.3
Approach		421	3.0	0.368	8.3	LOS A	1.2	30.6	0.44	0.44	23.1
North: HWY 89											
4	T1	655	3.0	0.538	14.0	LOS B	2.9	75.3	0.67	0.75	22.5
14	R2	71	3.0	0.538	14.0	LOS B	2.9	75.3	0.67	0.75	21.9
Approach		726	3.0	0.538	14.0	LOS B	2.9	75.3	0.67	0.75	22.4
All Vehicles		1618	3.0	0.538	10.0	LOS A	2.9	75.3	0.42	0.45	23.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3. C+P AM

SR 89 / I-80 EB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
8	T1	430	3.0	0.362	8.0	LOS A	1.6	42.1	0.40	0.30	23.9
18	R2	225	3.0	0.362	8.0	LOS A	1.6	42.1	0.40	0.30	23.1
Approach		655	3.0	0.362	8.0	LOS A	1.6	42.1	0.40	0.30	23.6
North: HWY 89											
7	L2	124	3.0	0.433	7.9	LOS A	0.0	0.0	0.00	0.00	26.3
4	T1	827	3.0	0.433	7.9	LOS A	0.0	0.0	0.00	0.00	28.0
Approach		951	3.0	0.433	7.9	LOS A	0.0	0.0	0.00	0.00	27.7
West: I-80 EB off-ramp											
5	L2	63	3.0	0.645	21.7	LOS C	2.9	74.6	0.74	0.85	23.3
12	R2	633	3.0	0.645	21.2	LOS C	2.9	74.6	0.73	0.83	25.2
Approach		696	3.0	0.645	21.2	LOS C	2.9	74.6	0.73	0.84	25.0
All Vehicles		2302	3.0	0.645	12.0	LOS B	2.9	74.6	0.34	0.34	25.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	267	65	92	270	35	996	206
Future Volume (veh/h)	267	65	92	270	35	996	206
Number	3	18	1	6		2	12
Initial Q (Qb), veh	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863		1863	1863
Adj Flow Rate, veh/h	314	76	114	333		1132	234
Adj No. of Lanes	2	1	1	2		2	1
Peak Hour Factor	0.85	0.85	0.81	0.81		0.88	0.88
Percent Heavy Veh, %	2	2	2	2		2	2
Cap, veh/h	382	300	139	2861		2001	1280
Arrive On Green	0.11	0.11	0.16	1.00		0.70	0.70
Sat Flow, veh/h	3442	1583	1774	3632		3297	1583
Grp Volume(v), veh/h	314	76	114	333		1132	234
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1770		1434	1583
Q Serve(g_s), s	11.1	5.1	7.7	0.0		24.4	4.1
Cycle Q Clear(g_c), s	11.1	5.1	7.7	0.0		24.4	4.1
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	382	300	139	2861		2001	1280
V/C Ratio(X)	0.82	0.25	0.82	0.12		0.57	0.18
Avail Cap(c_a), veh/h	971	571	358	2861		2001	1280
HCM Platoon Ratio	1.00	1.00	2.00	2.00		1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	53.9	42.8	51.4	0.0		9.4	2.7
Incr Delay (d2), s/veh	1.7	0.2	11.1	0.1		1.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	2.2	4.2	0.0		9.9	2.9
LnGrp Delay(d),s/veh	55.6	42.9	62.5	0.1		10.5	3.0
LnGrp LOS	E	D	E	A		B	A
Approach Vol, veh/h	390			447		1366	
Approach Delay, s/veh	53.1			16.0		9.2	
Approach LOS	D			B		A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	13.7	92.0				105.7		18.3
Change Period (Y+Rc), s	4.0	5.5				5.5		4.5
Max Green Setting (Gmax), s	25.0	50.0				50.0		35.0
Max Q Clear Time (g_c+I1), s	13.1	26.4				2.0		13.1
Green Ext Time (p_c), s	0.2	11.9				15.7		0.7

Intersection Summary		
HCM 2010 Ctrl Delay		18.4
HCM 2010 LOS		B

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations								
Traffic Volume (veh/h)	326	77	285	44	27	1034		
Future Volume (veh/h)	326	77	285	44	27	1034		
Number	3	18	2	12	1	6		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	441	104	413	64	30	1149		
Adj No. of Lanes	1	1	2	1	1	1		
Peak Hour Factor	0.74	0.74	0.69	0.69	0.90	0.90		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	415	404	1801	1364	38	1262		
Arrive On Green	0.23	0.23	0.63	0.63	0.04	1.00		
Sat Flow, veh/h	1774	1583	3297	1583	1774	1863		
Grp Volume(v), veh/h	441	104	413	64	30	1149		
Grp Sat Flow(s),veh/h/ln	1774	1583	1434	1583	1774	1863		
Q Serve(g_s), s	29.0	6.5	7.8	0.7	2.1	0.0		
Cycle Q Clear(g_c), s	29.0	6.5	7.8	0.7	2.1	0.0		
Prop In Lane	1.00	1.00		1.00	1.00			
Lane Grp Cap(c), veh/h	415	404	1801	1364	38	1262		
V/C Ratio(X)	1.06	0.26	0.23	0.05	0.79	0.91		
Avail Cap(c_a), veh/h	415	404	1801	1364	429	1262		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	47.5	36.8	10.0	1.2	59.1	0.0		
Incr Delay (d2), s/veh	61.9	0.1	0.3	0.1	12.9	11.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	21.3	2.9	3.1	0.9	1.2	4.0		
LnGrp Delay(d),s/veh	109.4	36.9	10.3	1.3	72.0	11.3		
LnGrp LOS	F	D	B	A	E	B		
Approach Vol, veh/h	545		477			1179		
Approach Delay, s/veh	95.5		9.1			12.9		
Approach LOS	F		A			B		
Timer	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	6.1	83.9				90.0		34.0
Change Period (Y+Rc), s	3.5	6.0				6.0		5.0
Max Green Setting (Gmax), s	30.0	50.0				50.0		29.0
Max Q Clear Time (g_c+I1), s	4.1	9.8				2.0		31.0
Green Ext Time (p_c), s	0.0	9.7				9.9		0.0
Intersection Summary								
HCM 2010 Ctrl Delay			32.5					
HCM 2010 LOS			C					

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBU	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	37	1	0	1	2	35	60
Future Vol, veh/h	37	1	0	1	2	35	60
Peak Hour Factor	0.68	0.68	0.25	0.25	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	54	1	0	4	2	39	67
Number of Lanes	0	1	0	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.7	6.6	7.2
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	97%	0%	37%
Vol Thru, %	3%	0%	0%
Vol Right, %	0%	100%	63%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	38	1	97
LT Vol	37	0	36
Through Vol	1	0	0
RT Vol	0	1	61
Lane Flow Rate	56	4	109
Geometry Grp	1	1	1
Degree of Util (X)	0.067	0.004	0.113
Departure Headway (Hd)	4.324	3.568	3.734
Convergence, Y/N	Yes	Yes	Yes
Cap	827	996	957
Service Time	2.356	1.614	1.767
HCM Lane V/C Ratio	0.068	0.004	0.114
HCM Control Delay	7.7	6.6	7.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0	0.4

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	13	60	4	403	105	18	11
Future Vol, veh/h	13	60	4	403	105	18	11
Conflicting Peds, #/hr	0	0	0	0	0	0	8
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	-	0	0	-
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	72	72	89	89	89	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	18	83	4	453	118	21	13

Major/Minor	Major1		Major2			Minor2	
Conflicting Flow All	453	0	-	-	0	572	461
Stage 1	-	-	-	-	-	453	-
Stage 2	-	-	-	-	-	119	-
Critical Hdwy	4.12	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1108	-	-	-	-	482	600
Stage 1	-	-	-	-	-	640	-
Stage 2	-	-	-	-	-	906	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	1101	-	-	-	-	474	596
Mov Cap-2 Maneuver	-	-	-	-	-	474	-
Stage 1	-	-	-	-	-	640	-
Stage 2	-	-	-	-	-	891	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5		12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1101	-	-	-	514
HCM Lane V/C Ratio	0.016	-	-	-	0.065
HCM Control Delay (s)	8.3	0	-	-	12.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	87	9	2	606	500	12	85
Future Vol, veh/h	87	9	2	606	500	12	85
Conflicting Peds, #/hr	0	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	72	72	89	89	89	79	79
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	121	13	2	681	562	15	108

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	-	133	0	2051	128
Stage 1	-	-	-	-	-	127	-
Stage 2	-	-	-	-	-	1924	-
Critical Hdwy	-	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	-	1452	-	61	922
Stage 1	-	-	-	-	-	899	-
Stage 2	-	-	-	-	-	125	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	~ -384	~ -384	-	61	921
Mov Cap-2 Maneuver	-	-	-	-	-	61	-
Stage 1	-	-	-	-	-	899	-
Stage 2	-	-	-	-	-	125	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	18.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	61	921	-	-	+	-
HCM Lane V/C Ratio	0.249	0.117	-	-	-	-
HCM Control Delay (s)	82.6	9.4	-	-	1.6	-
HCM Lane LOS	F	A	-	-	A	-
HCM 95th %tile Q(veh)	0.9	0.4	-	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	164	6	554	1094	8	4	3	79	6	13	31
Future Vol, veh/h	6	164	6	554	1094	8	4	3	79	6	13	31
Conflicting Peds, #/hr	1	0	1	1	0	1	4	0	5	5	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	89	89	89	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	228	8	622	1229	9	4	3	85	6	14	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1239	0	0	237	0	0	2121	2734	238	2778	2734	624
Stage 1	-	-	-	-	-	-	250	250	-	2480	2480	-
Stage 2	-	-	-	-	-	-	1871	2484	-	298	254	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	560	-	-	1329	-	-	32	20	800	10	20	429
Stage 1	-	-	-	-	-	-	753	699	-	30	59	-
Stage 2	-	-	-	-	-	-	75	58	-	710	696	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	558	-	-	1323	-	-	-	0	796	-	0	427
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-	-	0	-
Stage 1	-	-	-	-	-	-	742	688	-	30	0	-
Stage 2	-	-	-	-	-	-	-	0	-	620	685	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	5		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	558	-	-	1323	-	-	-	427
HCM Lane V/C Ratio	-	0.015	-	-	0.471	-	-	-	0.111
HCM Control Delay (s)	-	11.5	-	-	10.1	2.5	-	-	14.5
HCM Lane LOS	-	B	-	-	B	A	-	-	B
HCM 95th %tile Q(veh)	-	0	-	-	2.6	-	-	-	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	251	0	0	1613	6	0	0	0	11	0	7
Future Volume (veh/h)	2	251	0	0	1613	6	0	0	0	11	0	7
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	0	0	1863	1900				1900	1863	1900
Adj Flow Rate, veh/h	3	349	0	0	1812	7				12	0	8
Adj No. of Lanes	0	1	0	0	2	0				0	1	0
Peak Hour Factor	0.72	0.72	0.72	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	2	2	0	0	2	2				0	2	0
Cap, veh/h	96	879	0	0	1903	7				267	0	178
Arrive On Green	0.53	0.53	0.00	0.00	0.53	0.53				0.26	0.00	0.26
Sat Flow, veh/h	1	1669	0	0	3709	14				1015	0	677
Grp Volume(v), veh/h	352	0	0	0	886	933				20	0	0
Grp Sat Flow(s),veh/h/ln	1671	0	0	0	1770	1860				1693	0	0
Q Serve(g_s), s	0.5	0.0	0.0	0.0	18.1	18.1				0.3	0.0	0.0
Cycle Q Clear(g_c), s	18.6	0.0	0.0	0.0	18.1	18.1				0.3	0.0	0.0
Prop In Lane	0.01		0.00	0.00		0.01				0.60		0.40
Lane Grp Cap(c), veh/h	975	0	0	0	931	979				445	0	0
V/C Ratio(X)	0.36	0.00	0.00	0.00	0.95	0.95				0.04	0.00	0.00
Avail Cap(c_a), veh/h	975	0	0	0	931	979				445	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	1.00	1.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	5.3	0.0	0.0	0.0	8.5	8.5				10.4	0.0	0.0
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.0	19.9	19.4				0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.0	0.0	13.8	14.3				0.2	0.0	0.0
LnGrp Delay(d),s/veh	6.4	0.0	0.0	0.0	28.4	27.9				10.6	0.0	0.0
LnGrp LOS	A				C	C				B		
Approach Vol, veh/h		352			1819						20	
Approach Delay, s/veh		6.4			28.2						10.6	
Approach LOS		A			C						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		24.0		14.0		24.0						
Change Period (Y+Rc), s		4.0		4.0		4.0						
Max Green Setting (Gmax), s		20.0		10.0		20.0						
Max Q Clear Time (g_c+I1), s		20.6		2.3		20.1						
Green Ext Time (p_c), s		0.0		0.0		0.0						
Intersection Summary												
HCM 2010 Ctrl Delay			24.5									
HCM 2010 LOS			C									

Intersection 11 **Squaw Valley Rd/Squaw Creek Rd** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	43	41	94.9%	16.1	5.8	C
	Through						
	Right Turn	35	34	96.3%	3.1	0.4	A
	Subtotal	78	75	95.5%	10.9	3.8	B
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	245	241	98.2%	1.4	0.4	A
	Right Turn	23	23	100.0%	1.6	1.1	A
	Subtotal	268	264	98.3%	1.4	0.4	A
WB	Left Turn	68	57	84.4%	4.4	1.0	A
	Through	1,571	1,372	87.3%	3.9	0.2	A
	Right Turn						
	Subtotal	1,639	1,429	87.2%	4.0	0.2	A
Total		1,985	1,767	89.0%	3.9	0.3	A

Intersection 12 **SR 89 /Squaw Valley Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	705	677	96.0%	152.1	76.7	F
	Through	164	161	98.2%	74.9	60.2	E
	Right Turn						
	Subtotal	869	838	96.4%	137.4	73.2	F
SB	Left Turn						
	Through	445	357	80.2%	273.2	18.4	F
	Right Turn	915	733	80.1%	244.5	16.4	F
	Subtotal	1,360	1,090	80.1%	254.0	17.4	F
EB	Left Turn	165	155	93.6%	47.6	6.0	D
	Through						
	Right Turn	127	129	101.9%	2.3	0.5	A
	Subtotal	292	284	97.2%	26.8	4.4	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,521	2,211	87.7%	181.9	26.1	F

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Squaw Alpine Gondola Phase 2
Cumulative + Project
AM Peak Hour

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	400	397	99.3%	26.9	4.1	C
	Through	801	793	99.0%	19.8	6.2	B
	Right Turn						
	Subtotal	1,201	1,190	99.1%	22.2	5.0	C
SB	Left Turn						
	Through	247	207	83.9%	18.1	4.6	B
	Right Turn	325	276	84.9%	11.4	2.4	B
	Subtotal	572	483	84.5%	14.4	3.0	B
EB	Left Turn	68	66	97.5%	24.4	4.4	C
	Through						
	Right Turn	41	40	97.8%	3.6	1.8	A
	Subtotal	109	106	97.6%	17.3	3.8	B
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,882	1,779	94.5%	19.8	4.0	B

Intersection 11 **Squaw Valley Rd/Squaw Creek Rd** **Side-street Stop**

		Storage	Average Queue (ft)		95th Queue (ft)		Maximum Queue (ft)		Block Time	
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Through/Right	2,125	25	0	25	3	25	7	0%	0%
NB	Left Turn	75	50	4	75	6	75	8	2%	0%
	Right Turn	1,425	25	3	75	5	75	17	0%	0%
WB	Left/Through	750	50	10	125	41	200	121	0%	0%
	Through	750	25	9	125	42	225	106	0%	0%
0										

Intersection 12 **SR 89 /Squaw Valley Rd** **Signal**

		Storage	Average Queue (ft)		95th Queue (ft)		Maximum Queue (ft)		Block Time	
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Left Turn	475	50	7	125	8	125	17	0%	0%
	Left/Through	1,600	100	7	125	6	150	7	0%	0%
NB	Left Turn	3,150	900	259	1,475	369	1,600	367	47%	0%
	Through	650	525	152	925	75	725	14	0%	29%
	Through/Right	75	25	2	25	9	50	21	0%	0%
SB	Through	150	200	2	225	7	225	7	36%	36%
	Right Turn	3,725	3,475	221	4,475	244	3,825	48	0%	11%
0										

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

		Storage	Average Queue (ft)		95th Queue (ft)		Maximum Queue (ft)		Block Time	
Direction	Lane Group	(ft)	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.	Pocket	Upstream
EB	Left Turn	150	50	5	100	11	100	15	0%	0%
	Right Turn	1,825	25	2	50	4	50	11	0%	0%
NB	Left Turn	375	175	12	300	31	375	25	0%	0%
	Through	3,700	175	30	400	97	600	252	1%	0%
SB	Through	1,450	100	12	200	26	250	42	0%	0%
	Right Turn	625	100	14	175	31	200	33	0%	0%
0										

MOVEMENT SUMMARY

Site: 14A C+P AM

SR 28/89
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: SR 89											
3x	L2	16	3.0	0.367	8.5	LOS A	1.6	41.7	0.46	0.38	23.8
8x	T1	34	3.0	0.367	8.5	LOS A	1.6	41.7	0.46	0.38	23.5
18x	R2	262	3.0	0.367	8.5	LOS A	1.6	41.7	0.46	0.38	22.9
Approach		312	3.0	0.367	8.5	LOS A	1.6	41.7	0.46	0.38	23.0
NorthEast: SR 28											
1x	L2	242	3.0	1.028	55.4	LOS F	78.8	2018.5	1.00	0.72	15.9
6x	T1	822	3.0	1.028	55.4	LOS F	78.8	2018.5	1.00	0.72	15.7
16x	R2	5	3.0	1.028	55.4	LOS F	78.8	2018.5	1.00	0.72	15.5
Approach		1069	3.0	1.028	55.4	LOS F	78.8	2018.5	1.00	0.72	15.7
NorthWest: SR 28											
7x	L2	19	3.0	0.162	12.4	LOS B	0.5	13.0	0.70	0.70	17.5
4x	T1	35	3.0	0.162	12.4	LOS B	0.5	13.0	0.70	0.70	17.2
14x	R2	6	3.0	0.162	12.4	LOS B	0.5	13.0	0.70	0.70	16.9
Approach		60	3.0	0.162	12.4	LOS B	0.5	13.0	0.70	0.70	17.3
SouthWest: SR 89											
5x	L2	3	3.0	0.298	7.8	LOS A	1.2	31.2	0.46	0.39	24.4
2x	T1	226	3.0	0.298	7.8	LOS A	1.2	31.2	0.46	0.39	23.9
12x	R2	14	3.0	0.298	7.8	LOS A	1.2	31.2	0.46	0.39	23.3
Approach		243	3.0	0.298	7.8	LOS A	1.2	31.2	0.46	0.39	23.9
All Vehicles		1684	3.0	1.028	38.3	LOS E	78.8	2018.5	0.81	0.61	17.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 14B C+P AM

SR 28/89 Western Intersection
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: SR 89											
3x	L2	524	3.0	0.618	13.7	LOS B	4.3	110.5	0.61	0.55	21.9
18x	R2	11	3.0	0.618	13.7	LOS B	4.3	110.5	0.61	0.55	21.1
Approach		535	3.0	0.618	13.7	LOS B	4.3	110.5	0.61	0.55	21.9
NorthEast: SR 28											
1x	L2	12	3.0	1.304	168.5	LOS F	74.4	1904.1	1.00	4.91	8.9
6x	T1	822	3.0	1.304	168.5	LOS F	74.4	1904.1	1.00	4.91	8.9
Approach		834	3.0	1.304	168.5	LOS F	74.4	1904.1	1.00	4.91	8.9
SouthWest: SR 89											
2x	T1	229	3.0	0.376	7.2	LOS A	1.9	49.2	0.08	0.02	25.4
12x	R2	179	3.0	0.376	7.2	LOS A	1.9	49.2	0.08	0.02	24.7
Approach		408	3.0	0.376	7.2	LOS A	1.9	49.2	0.08	0.02	25.1
All Vehicles		1777	3.0	1.304	84.8	LOS F	74.4	1904.1	0.67	2.47	13.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 14C C+P AM

SR 28/89 Eastern Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 28											
3	L2	524	3.0	0.758	16.7	LOS C	9.0	231.5	0.23	0.07	24.1
8	T1	296	3.0	0.758	16.7	LOS C	9.0	231.5	0.23	0.07	23.7
Approach		820	3.0	0.758	16.7	LOS C	9.0	231.5	0.23	0.07	23.9
North: SR 28											
4	T1	267	3.0	0.446	12.3	LOS B	2.1	53.0	0.64	0.69	22.8
14	R2	17	3.0	0.446	12.3	LOS B	2.1	53.0	0.64	0.69	22.3
Approach		285	3.0	0.446	12.3	LOS B	2.1	53.0	0.64	0.69	22.8
West: SR 89											
5	L2	14	3.0	0.232	6.8	LOS A	0.9	23.0	0.42	0.34	24.4
12	R2	179	3.0	0.232	6.8	LOS A	0.9	23.0	0.42	0.34	23.3
Approach		193	3.0	0.232	6.8	LOS A	0.9	23.0	0.42	0.34	23.3
All Vehicles		1298	3.0	0.758	14.3	LOS B	9.0	231.5	0.35	0.24	23.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	229	277	217	240	37	492	134	249	37	90	60
Future Volume (veh/h)	44	229	277	217	240	37	492	134	249	37	90	60
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	54	283	342	244	270	42	547	149	277	44	107	71
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	0	2	0
Peak Hour Factor	0.81	0.81	0.81	0.89	0.89	0.89	0.90	0.90	0.90	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	369	814	281	601	498	562	590	501	71	176	120
Arrive On Green	0.04	0.20	0.20	0.16	0.32	0.32	0.32	0.32	0.32	0.12	0.11	0.11
Sat Flow, veh/h	1774	1863	1579	1774	1863	1543	1774	1863	1583	679	1672	1139
Grp Volume(v), veh/h	54	283	342	244	270	42	547	149	277	118	0	104
Grp Sat Flow(s),veh/h/ln	1774	1863	1579	1774	1863	1543	1774	1863	1583	1829	0	1662
Q Serve(g_s), s	2.9	13.6	12.7	12.7	10.9	1.8	28.9	5.6	13.7	5.9	0.0	5.6
Cycle Q Clear(g_c), s	2.9	13.6	12.7	12.7	10.9	1.8	28.9	5.6	13.7	5.9	0.0	5.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.37		0.69
Lane Grp Cap(c), veh/h	69	369	814	281	601	498	562	590	501	192	0	175
V/C Ratio(X)	0.78	0.77	0.42	0.87	0.45	0.08	0.97	0.25	0.55	0.62	0.00	0.59
Avail Cap(c_a), veh/h	281	688	1084	655	688	570	562	590	501	483	0	438
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.1	35.9	14.2	38.9	25.4	22.3	32.0	24.0	26.8	40.4	0.0	40.4
Incr Delay (d2), s/veh	6.8	1.3	0.1	3.2	0.2	0.0	31.1	0.1	0.8	1.2	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	7.1	8.9	6.5	5.6	0.8	19.0	2.9	6.1	3.0	0.0	2.6
LnGrp Delay(d),s/veh	51.9	37.2	14.4	42.1	25.6	22.4	63.1	24.1	27.6	41.6	0.0	41.6
LnGrp LOS	D	D	B	D	C	C	E	C	C	D		D
Approach Vol, veh/h		679			556			973			222	
Approach Delay, s/veh		26.9			32.6			47.0			41.6	
Approach LOS		C			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.0	24.3		15.0	8.2	36.1		35.5
Change Period (Y+Rc), s	5.0	5.5		5.0	4.5	5.5		5.5
Max Green Setting (Gmax), s	35.0	35.0		25.0	15.0	35.0		30.0
Max Q Clear Time (g_c+I1), s	14.7	15.6		7.9	4.9	12.9		30.9
Green Ext Time (p_c), s	0.3	2.6		0.7	0.0	2.7		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	37.6
HCM 2010 LOS	D

MOVEMENT SUMMARY

Site: 2. C+P PM

SR 89 / I-80 WB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
3	L2	571	3.0	0.668	13.0	LOS B	0.0	0.0	0.00	0.00	25.5
8	T1	896	3.0	0.668	13.0	LOS B	0.0	0.0	0.00	0.00	25.9
Approach		1466	3.0	0.668	13.0	LOS B	0.0	0.0	0.00	0.00	25.8
East: I-80 WB off-ramp											
1	L2	311	3.0	0.816	44.0	LOS E	4.0	101.8	0.90	1.20	17.1
16	R2	180	3.0	0.508	22.8	LOS C	1.7	43.5	0.81	0.91	20.0
Approach		490	3.0	0.816	36.3	LOS E	4.0	101.8	0.87	1.09	18.0
North: HWY 89											
4	T1	601	3.0	0.821	40.0	LOS E	5.9	151.6	0.88	1.25	17.9
14	R2	125	3.0	0.821	40.0	LOS E	5.9	151.6	0.88	1.25	17.5
Approach		727	3.0	0.821	40.0	LOS E	5.9	151.6	0.88	1.25	17.8
All Vehicles		2683	3.0	0.821	24.5	LOS C	5.9	151.6	0.40	0.54	21.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3. C+P PM

SR 89 / I-80 EB Ramp
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: HWY 89											
8	T1	1442	3.0	1.295	158.2	LOS F	104.8	2682.7	1.00	4.29	9.3
18	R2	802	3.0	1.295	158.2	LOS F	104.8	2682.7	1.00	4.29	9.1
Approach		2244	3.0	1.295	158.2	LOS F	104.8	2682.7	1.00	4.29	9.2
North: HWY 89											
7	L2	201	3.0	0.416	7.7	LOS A	0.0	0.0	0.00	0.00	26.0
4	T1	711	3.0	0.416	7.7	LOS A	0.0	0.0	0.00	0.00	27.9
Approach		912	3.0	0.416	7.7	LOS A	0.0	0.0	0.00	0.00	27.5
West: I-80 EB off-ramp											
5	L2	28	3.0	0.310	11.2	LOS B	0.9	24.3	0.59	0.61	26.2
12	R2	317	3.0	0.310	10.9	LOS B	0.9	24.3	0.58	0.60	28.5
Approach		345	3.0	0.310	10.9	LOS B	0.9	24.3	0.58	0.60	28.3
All Vehicles		3501	3.0	1.295	104.5	LOS F	104.8	2682.7	0.70	2.81	12.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	466	64	217	1469	62	460	316
Future Volume (veh/h)	466	64	217	1469	62	460	316
Number	3	18	1	6		2	12
Initial Q (Qb), veh	0	0	0	0		0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863		1863	1863
Adj Flow Rate, veh/h	530	73	224	1514		511	351
Adj No. of Lanes	2	1	1	2		2	1
Peak Hour Factor	0.88	0.88	0.97	0.97		0.90	0.90
Percent Heavy Veh, %	2	2	2	2		2	2
Cap, veh/h	602	506	256	2634		1628	1176
Arrive On Green	0.18	0.18	0.05	0.25		0.57	0.57
Sat Flow, veh/h	3442	1583	1774	3632		3297	1583
Grp Volume(v), veh/h	530	73	224	1514		511	351
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1770		1434	1583
Q Serve(g_s), s	18.6	4.1	15.6	46.6		11.6	9.1
Cycle Q Clear(g_c), s	18.6	4.1	15.6	46.6		11.6	9.1
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	602	506	256	2634		1628	1176
V/C Ratio(X)	0.88	0.14	0.87	0.57		0.31	0.30
Avail Cap(c_a), veh/h	971	676	358	2634		1628	1176
HCM Platoon Ratio	1.00	1.00	0.33	0.33		1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	49.9	30.1	57.9	29.5		14.1	5.3
Incr Delay (d2), s/veh	3.4	0.0	15.8	0.9		0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	1.8	8.8	23.3		4.7	6.8
LnGrp Delay(d),s/veh	53.3	30.2	73.7	30.4		14.6	5.9
LnGrp LOS	D	C	E	C		B	A
Approach Vol, veh/h	603			1738		862	
Approach Delay, s/veh	50.5			36.0		11.1	
Approach LOS	D			D		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	21.9	75.9				97.8		26.2
Change Period (Y+Rc), s	4.0	5.5				5.5		4.5
Max Green Setting (Gmax), s	25.0	50.0				50.0		35.0
Max Q Clear Time (g_c+I1), s	17.6	13.6				48.6		20.6
Green Ext Time (p_c), s	0.4	22.7				1.3		1.1

Intersection Summary		
HCM 2010 Ctrl Delay		32.0
HCM 2010 LOS		C

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	57	92	1594	200	142	382
Future Volume (veh/h)	57	92	1594	200	142	382
Number	3	18	2	12	1	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	72	116	1660	208	151	406
Adj No. of Lanes	1	1	2	1	1	1
Peak Hour Factor	0.79	0.79	0.96	0.96	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	147	288	2012	1241	176	1544
Arrive On Green	0.08	0.08	0.70	0.70	0.20	1.00
Sat Flow, veh/h	1774	1583	3297	1583	1774	1863
Grp Volume(v), veh/h	72	116	1660	208	151	406
Grp Sat Flow(s),veh/h/ln	1774	1583	1434	1583	1774	1863
Q Serve(g_s), s	4.8	8.0	50.9	4.1	10.2	0.0
Cycle Q Clear(g_c), s	4.8	8.0	50.9	4.1	10.2	0.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	147	288	2012	1241	176	1544
V/C Ratio(X)	0.49	0.40	0.83	0.17	0.86	0.26
Avail Cap(c_a), veh/h	415	527	2012	1241	429	1544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	44.8	13.1	3.3	48.9	0.0
Incr Delay (d2), s/veh	0.9	0.3	4.0	0.3	4.7	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	3.5	21.0	2.5	5.2	0.2
LnGrp Delay(d),s/veh	55.3	45.1	17.1	3.6	53.5	0.4
LnGrp LOS	E	D	B	A	D	A
Approach Vol, veh/h	188		1868			557
Approach Delay, s/veh	49.0		15.6			14.8
Approach LOS	D		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	15.8	93.0				108.8		15.2
Change Period (Y+Rc), s	3.5	6.0				6.0		5.0
Max Green Setting (Gmax), s	30.0	50.0				50.0		29.0
Max Q Clear Time (g_c+I1), s	12.2	52.9				2.0		10.0
Green Ext Time (p_c), s	0.2	0.0				14.6		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	17.9
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	61	6	0	0	23	42
Future Vol, veh/h	61	6	0	0	23	42
Peak Hour Factor	0.80	0.80	0.85	0.85	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	8	0	0	25	45
Number of Lanes	0	1	0	1	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.7	0	7.1
HCM LOS	A	-	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	91%	0%	35%
Vol Thru, %	9%	100%	0%
Vol Right, %	0%	0%	65%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	67	0	65
LT Vol	61	0	23
Through Vol	6	0	0
RT Vol	0	0	42
Lane Flow Rate	84	0	70
Geometry Grp	1	1	1
Degree of Util (X)	0.099	0	0.073
Departure Headway (Hd)	4.238	4.12	3.762
Convergence, Y/N	Yes	Yes	Yes
Cap	847	0	946
Service Time	2.26	2.164	1.811
HCM Lane V/C Ratio	0.099	0	0.074
HCM Control Delay	7.7	7.2	7.1
HCM Lane LOS	A	N	A
HCM 95th-tile Q	0.3	0	0.2

Intersection							
Int Delay, s/veh	22.2						

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Vol, veh/h	19	452	5	154	50	224	74
Future Vol, veh/h	19	452	5	154	50	224	74
Conflicting Peds, #/hr	0	0	0	0	0	27	9
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	-	0	0	-
Veh in Median Storage, #	-	0	-	0	-	0	-
Grade, %	-	0	-	0	-	0	-
Peak Hour Factor	80	80	93	93	93	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	24	565	5	166	54	291	96

Major/Minor	Major1		Major2			Minor2	
Conflicting Flow All	166	0	-	-	0	806	175
Stage 1	-	-	-	-	-	166	-
Stage 2	-	-	-	-	-	640	-
Critical Hdwy	4.12	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1412	-	-	-	-	351	868
Stage 1	-	-	-	-	-	863	-
Stage 2	-	-	-	-	-	525	-
Platoon blocked, %		-		-	-		
Mov Cap-1 Maneuver	1401	-	-	-	-	342	861
Mov Cap-2 Maneuver	-	-	-	-	-	342	-
Stage 1	-	-	-	-	-	863	-
Stage 2	-	-	-	-	-	512	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3		68.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1401	-	-	-	402
HCM Lane V/C Ratio	0.017	-	-	-	0.963
HCM Control Delay (s)	7.6	0	-	-	68.4
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.1	-	-	-	11.1

Intersection	
Int Delay, s/veh	194.2

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	663	13	3	121	209	12	692
Future Vol, veh/h	663	13	3	121	209	12	692
Conflicting Peds, #/hr	0	8	0	8	0	3	5
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	-	-	0	0
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	80	80	93	93	93	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	829	16	3	130	225	13	736

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	-	853	0	1333	850
Stage 1	-	-	-	-	-	845	-
Stage 2	-	-	-	-	-	488	-
Critical Hdwy	-	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	-	786	-	170	~ 360
Stage 1	-	-	-	-	-	421	-
Stage 2	-	-	-	-	-	617	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	~ -92	~ -92	-	168	~ 356
Mov Cap-2 Maneuver	-	-	-	-	-	168	-
Stage 1	-	-	-	-	-	418	-
Stage 2	-	-	-	-	-	615	-

Approach	EB	WB	NB
HCM Control Delay, s	0		$ 506.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	168	356	-	-	+	-
HCM Lane V/C Ratio	0.076	2.068	-	-	-	-
HCM Control Delay (s)	28.2	$ 514.5	-	-	-	-
HCM Lane LOS	D	F	-	-	-	-
HCM 95th %tile Q(veh)	0.2	52.8	-	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	1355	0	0	322	6	0	0	0	18	0	8
Future Vol, veh/h	23	1355	0	0	322	6	0	0	0	18	0	8
Conflicting Peds, #/hr	13	0	0	0	0	13	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	93	93	93	98	98	98	54	54	54
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	1694	0	0	346	6	0	0	0	33	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	366	0	0	1694	0	0	1924	2117	1694	2113	2113	189
Stage 1	-	-	-	-	-	-	1751	1751	-	362	362	-
Stage 2	-	-	-	-	-	-	173	366	-	1751	1751	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1191	-	-	374	-	-	45	50	114	~ 33	51	821
Stage 1	-	-	-	-	-	-	108	139	-	630	624	-
Stage 2	-	-	-	-	-	-	812	622	-	108	139	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1191	-	-	374	-	-	43	48	114	~ 32	49	812
Mov Cap-2 Maneuver	-	-	-	-	-	-	43	48	-	~ 32	49	-
Stage 1	-	-	-	-	-	-	105	136	-	608	617	-
Stage 2	-	-	-	-	-	-	797	615	-	105	136	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	0	249.9
HCM LOS			A	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1191	-	-	374	-	-	32	812
HCM Lane V/C Ratio	-	0.024	-	-	-	-	-	1.042	0.018
HCM Control Delay (s)	0	8.1	-	-	0	-	-	$ 356.7	9.5
HCM Lane LOS	A	A	-	-	A	-	-	F	A
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	3.6	0.1

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1364	0	0	324	7	0	0	0	12	0	5
Future Volume (veh/h)	9	1364	0	0	324	7	0	0	0	12	0	5
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	0	0	1863	1900				1900	1863	1900
Adj Flow Rate, veh/h	11	1705	0	0	348	8				14	0	6
Adj No. of Lanes	0	1	0	0	2	0				0	1	0
Peak Hour Factor	0.80	0.80	0.80	0.93	0.93	0.93				0.85	0.85	0.85
Percent Heavy Veh, %	2	2	0	0	2	2				0	2	0
Cap, veh/h	55	1591	0	0	3032	70				34	0	15
Arrive On Green	0.86	0.86	0.00	0.00	0.86	0.86				0.03	0.00	0.03
Sat Flow, veh/h	4	1856	0	0	3630	81				1194	0	512
Grp Volume(v), veh/h	1716	0	0	0	174	182				20	0	0
Grp Sat Flow(s),veh/h/ln	1860	0	0	0	1770	1848				1706	0	0
Q Serve(g_s), s	18.7	0.0	0.0	0.0	1.1	1.1				0.8	0.0	0.0
Cycle Q Clear(g_c), s	60.0	0.0	0.0	0.0	1.1	1.1				0.8	0.0	0.0
Prop In Lane	0.01		0.00	0.00		0.04				0.70		0.30
Lane Grp Cap(c), veh/h	1646	0	0	0	1517	1584				49	0	0
V/C Ratio(X)	1.04	0.00	0.00	0.00	0.11	0.11				0.41	0.00	0.00
Avail Cap(c_a), veh/h	1646	0	0	0	1517	1584				49	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	1.00	1.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	5.9	0.0	0.0	0.0	0.8	0.8				33.4	0.0	0.0
Incr Delay (d2), s/veh	34.2	0.0	0.0	0.0	0.2	0.1				23.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	47.2	0.0	0.0	0.0	0.5	0.6				0.7	0.0	0.0
LnGrp Delay(d),s/veh	40.1	0.0	0.0	0.0	0.9	0.9				57.0	0.0	0.0
LnGrp LOS	F				A	A				E		
Approach Vol, veh/h		1716			356						20	
Approach Delay, s/veh		40.1			0.9						57.0	
Approach LOS		D			A						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		64.0		6.0		64.0		
Change Period (Y+Rc), s		4.0		4.0		4.0		
Max Green Setting (Gmax), s		60.0		2.0		30.0		
Max Q Clear Time (g_c+I1), s		62.0		2.8		3.1		
Green Ext Time (p_c), s		0.0		0.0		25.0		

Intersection Summary			
HCM 2010 Ctrl Delay			33.6
HCM 2010 LOS			C

Intersection 11 **Squaw Creek Rd/Squaw Valley Rd** **Side-street Stop**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	34	23	68.8%	342.1	171.5	F
	Through						
	Right Turn	72	52	72.8%	383.0	182.0	F
	Subtotal	106	76	71.5%	376.6	173.0	F
SB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
EB	Left Turn						
	Through	1,473	1,110	75.4%	294.6	20.6	F
	Right Turn	42	32	75.0%	311.1	66.0	F
	Subtotal	1,515	1,142	75.3%	294.8	20.6	F
WB	Left Turn	61	64	105.2%	8.1	3.0	A
	Through	309	311	100.7%	1.8	0.2	A
	Right Turn						
	Subtotal	370	375	101.5%	2.9	0.6	A
Total		1,991	1,593	80.0%	220.8	9.6	F

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	176	183	103.9%	54.7	5.3	D
	Through	621	633	102.0%	41.8	8.9	D
	Right Turn						
	Subtotal	797	816	102.4%	44.5	7.3	D
SB	Left Turn						
	Through	246	254	103.2%	33.9	2.9	C
	Right Turn	193	191	98.8%	1.1	0.4	A
	Subtotal	439	445	101.3%	19.9	2.7	B
EB	Left Turn	1,173	805	68.7%	282.4	20.9	F
	Through						
	Right Turn	342	245	71.7%	99.8	12.1	F
	Subtotal	1,515	1,050	69.3%	242.9	22.2	F
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		2,751	2,311	84.0%	130.0	7.2	F

SimTraffic Post-Processor
Average Results from 10 Runs
Volume and Delay by Movement

Squaw Alpine Gondola Phase 2
Cumulative + Project
PM Peak Hour

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Movement	Demand Volume (vph)	Served Volume (vph) Average	Served Volume (vph) Percent	Total Delay (sec/veh) Average	Total Delay (sec/veh) Std. Dev.	LOS
NB	Left Turn	51	53	104.5%	29.4	9.1	C
	Through	372	376	101.2%	14.6	3.3	B
	Right Turn						
	Subtotal	423	430	101.6%	16.5	2.9	B
SB	Left Turn						
	Through	527	447	84.8%	22.1	5.6	C
	Right Turn	61	49	80.1%	4.1	1.1	A
	Subtotal	588	496	84.3%	20.1	4.9	C
EB	Left Turn	425	435	102.3%	27.4	5.8	C
	Through						
	Right Turn	359	354	98.6%	11.8	2.8	B
	Subtotal	784	789	100.6%	20.3	4.3	C
WB	Left Turn						
	Through						
	Right Turn						
	Subtotal						
Total		1,795	1,714	95.5%	19.3	3.1	B

Intersection 11 **Squaw Creek Rd/Squaw Valley Rd** **Side-street Stop**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Through	1,925	1,200	63	2,575	63	1,975	9	0%	44%
	Through/Right	1,925	1,200	65	2,575	69	1,975	9	0%	43%
NB	Left Turn	75	50	8	100	10	75	0	19%	0%
	Right Turn	1,400	350	186	775	390	825	361	66%	0%
WB	Left Turn	100	50	4	75	9	100	15	0%	0%
	Through	100	25	0	25	0	25	0	0%	0%
0										

Intersection 12 **SR 89/Squaw Valley Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	3,450	2,600	56	4,125	57	3,525	23	20%	0%
	Left/Through	4,250	3,400	61	4,875	120	4,300	25	60%	22%
	Right Turn	1,625	1,600	63	2,025	214	1,725	9	0%	75%
NB	Left Turn	425	150	22	250	45	275	55	0%	0%
	Through	650	200	35	300	76	325	110	1%	0%
	Through/Right	375	200	28	300	45	325	50	1%	0%
SB	Left Turn	200	25	0	25	0	25	0	0%	0%
	Through	250	150	20	250	26	275	28	6%	1%
	Right Turn	250	25	3	50	9	75	20	0%	0%
WB	Shared	200	25	0	25	0	25	0	0%	0%

Intersection 13 **SR 89/Alpine Meadows Rd** **Signal**

Direction	Lane Group	Storage (ft)	Average Queue (ft) Average	Average Queue (ft) Std. Dev.	95th Queue (ft) Average	95th Queue (ft) Std. Dev.	Maximum Queue (ft) Average	Maximum Queue (ft) Std. Dev.	Block Time Pocket	Block Time Upstream
EB	Left Turn	325	225	18	325	33	325	14	2%	0%
	Right Turn	2,150	125	24	275	91	400	176	0%	0%
NB	Left Turn	375	50	4	100	7	100	18	0%	0%
	Through	3,775	125	13	225	40	275	67	0%	0%
SB	Through	1,450	200	29	350	51	400	71	0%	0%
	Right Turn	625	25	3	50	3	50	10	0%	0%
0										

MOVEMENT SUMMARY

Site: 14A C+P PM

SR 28/89
Roundabout

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: SR 89											
3x	L2	11	3.0	0.553	17.1	LOS C	2.8	72.4	0.72	0.83	21.8
8x	T1	42	3.0	0.553	17.1	LOS C	2.8	72.4	0.72	0.83	21.6
18x	R2	252	3.0	0.553	17.1	LOS C	2.8	72.4	0.72	0.83	21.1
Approach		304	3.0	0.553	17.1	LOS C	2.8	72.4	0.72	0.83	21.2
NorthEast: SR 28											
1x	L2	198	3.0	0.456	8.6	LOS A	2.6	65.3	0.25	0.12	23.4
6x	T1	264	3.0	0.456	8.6	LOS A	2.6	65.3	0.25	0.12	23.0
16x	R2	10	3.0	0.456	8.6	LOS A	2.6	65.3	0.25	0.12	22.6
Approach		471	3.0	0.456	8.6	LOS A	2.6	65.3	0.25	0.12	23.1
NorthWest: SR 28											
7x	L2	19	3.0	0.130	6.8	LOS A	0.4	11.4	0.49	0.46	18.3
4x	T1	59	3.0	0.130	6.8	LOS A	0.4	11.4	0.49	0.46	18.0
14x	R2	10	3.0	0.130	6.8	LOS A	0.4	11.4	0.49	0.46	17.6
Approach		88	3.0	0.130	6.8	LOS A	0.4	11.4	0.49	0.46	18.0
SouthWest: SR 89											
5x	L2	5	3.0	0.801	23.4	LOS C	9.0	230.4	0.85	0.96	20.9
2x	T1	646	3.0	0.801	23.4	LOS C	9.0	230.4	0.85	0.96	20.6
12x	R2	11	3.0	0.801	23.4	LOS C	9.0	230.4	0.85	0.96	20.1
Approach		662	3.0	0.801	23.4	LOS C	9.0	230.4	0.85	0.96	20.5
All Vehicles		1526	3.0	0.801	16.6	LOS C	9.0	230.4	0.62	0.64	21.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 14B C+P PM

SR 28/89 Western Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: SR 89											
3x	L2	226	3.0	0.432	13.4	LOS B	1.9	48.5	0.66	0.72	22.0
18x	R2	17	3.0	0.432	13.4	LOS B	1.9	48.5	0.66	0.72	21.2
Approach		243	3.0	0.432	13.4	LOS B	1.9	48.5	0.66	0.72	22.0
NorthEast: SR 28											
1x	L2	12	3.0	0.318	7.6	LOS A	1.4	34.7	0.42	0.33	24.1
6x	T1	264	3.0	0.318	7.6	LOS A	1.4	34.7	0.42	0.33	23.9
Approach		276	3.0	0.318	7.6	LOS A	1.4	34.7	0.42	0.33	23.9
SouthWest: SR 89											
2x	T1	651	3.0	0.944	35.1	LOS E	32.6	834.3	0.61	0.17	19.3
12x	R2	372	3.0	0.944	35.1	LOS E	32.6	834.3	0.61	0.17	18.9
Approach		1023	3.0	0.944	35.1	LOS E	32.6	834.3	0.61	0.17	19.2
All Vehicles		1542	3.0	0.944	26.7	LOS D	32.6	834.3	0.59	0.29	20.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 14C C+P PM

SR 28/89 Eastern Intersection
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SR 28											
3	L2	226	3.0	0.482	8.8	LOS A	2.9	74.5	0.13	0.04	26.6
8	T1	293	3.0	0.482	8.8	LOS A	2.9	74.5	0.13	0.04	26.0
Approach		519	3.0	0.482	8.8	LOS A	2.9	74.5	0.13	0.04	26.3
North: SR 28											
4	T1	198	3.0	0.241	6.7	LOS A	1.0	24.4	0.39	0.30	24.2
14	R2	12	3.0	0.241	6.7	LOS A	1.0	24.4	0.39	0.30	23.6
Approach		210	3.0	0.241	6.7	LOS A	1.0	24.4	0.39	0.30	24.2
West: SR 89											
5	L2	17	3.0	0.435	9.3	LOS A	2.1	54.9	0.45	0.35	23.8
12	R2	372	3.0	0.435	9.3	LOS A	2.1	54.9	0.45	0.35	22.7
Approach		390	3.0	0.435	9.3	LOS A	2.1	54.9	0.45	0.35	22.7
All Vehicles		1118	3.0	0.482	8.6	LOS A	2.9	74.5	0.29	0.20	24.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 SB
From/To	Deerfield Dr to W River St
Jurisdiction	Nevada/Placer County
Analysis Year	Cumulative + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.89	
Shoulder width	4.7	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	1061	veh/h
Opposing direction volume, Vo	362	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	1.000		0.994	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1192	pc/h	409	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	1.3	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	43.7	mi/h
Adjustment for no-passing zones, fnp	2.7	mi/h
Average travel speed, ATSd	28.6	mi/h
Percent Free Flow Speed, PFFS	65.5	%

```
_________________________Percent Time-Spent-Following_________________________

Direction                                Analysis(d)        Opposing (o)
PCE for trucks, ET                           1.0                1.0
PCE for RVs, ER                              1.0                1.0
Heavy-vehicle adjustment factor, fHV         1.000              1.000
Grade adjustment factor,(note-1) fg          1.00               1.00
Directional flow rate,(note-2) vi            1192   pc/h        407     pc/h
Base percent time-spent-following,(note-4) BPTSFd  77.7   %
Adjustment for no-passing zones, fnp               22.2
Percent time-spent-following, PTSFd                94.2   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.40
Peak 15-min vehicle-miles of travel, VMT15         60      veh-mi
Peak-hour vehicle-miles of travel, VMT60           212     veh-mi
Peak 15-min total travel time, TT15                2.1     veh-h
Capacity from ATS, CdATS                           1690    veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               3959    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.2     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      28.6    mi/h
Percent time-spent-following, PTSFd (from above)             94.2
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     -
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1192.1
Effective width of outside lane, We	21.40
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.43
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.2

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 SB
From/To	W River St to Squaw Valley Rd
Jurisdiction	Placer County
Analysis Year	Cumulative + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.90	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	7.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	55	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	1360	veh/h
Opposing direction volume, Vo	329	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		2.0	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.980	
Grade adj. factor,(note-1) fg	1.00		0.88	
Directional flow rate,(note-2) vi	1520	pc/h	424	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	59.8	mi/h
Adjustment for no-passing zones, fnp	2.3	mi/h
Average travel speed, ATSd	42.4	mi/h
Percent Free Flow Speed, PFFS	71.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.988	
Grade adjustment factor,(note-1) fg	1.00		0.88	
Directional flow rate,(note-2) vi	1511	pc/h	420	pc/h

Base percent time-spent-following,(note-4) BPTSFd	85.1	%
Adjustment for no-passing zones, fnp	10.4	
Percent time-spent-following, PTSFd	93.2	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	1.00	
Peak 15-min vehicle-miles of travel, VMT15	2947	veh-mi
Peak-hour vehicle-miles of travel, VMT60	10608	veh-mi
Peak 15-min total travel time, TT15	69.5	veh-h
Capacity from ATS, CdATS	1516	veh/h
Capacity from PTSF, CdPTSF	1535	veh/h
Directional Capacity	1938	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	7.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	42.4	mi/h
Percent time-spent-following, PTSFd (from above)	93.2	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1511.1
Effective width of outside lane, We	28.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.03
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone:                                   Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 Fehr & Peers
Agency/Co.
Date Performed          3/4/2017
Analysis Time Period    Winter AM
Highway                 SR-89 NB
From/To                 A. Meadows Rd to S. Valley Rd
Jurisdiction            Placer County
Analysis Year           Cumulative + Project
Description  Squaw Valley Olympic Village

__________________________________Input Data__________________________________

Highway class  Class 1             Peak hour factor, PHF    0.92
Shoulder width       8.0     ft     % Trucks and buses       2       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       1.3     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Rolling        % Recreational vehicles  0       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     0       /mi

Analysis direction volume, Vd  869     veh/h
Opposing direction volume, Vo  572     veh/h

____________________________Average Travel Speed______________________________

Direction                                     Analysis(d)        Opposing (o)
PCE for trucks, ET                                1.3                1.7
PCE for RVs, ER                                   1.1                1.1
Heavy-vehicle adj. factor,(note-5) fHV            0.994              0.986
Grade adj. factor,(note-1) fg                     1.00               0.97
Directional flow rate,(note-2) vi                 950     pc/h       650     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                     -      mi/h
Observed total demand,(note-3) V                       -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS                    50.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS         0.0     mi/h
Adj. for access point density,(note-3) fA             0.0     mi/h

Free-flow speed, FFSd                                 50.0    mi/h

Adjustment for no-passing zones, fnp                  1.8     mi/h
Average travel speed, ATSd                            35.8    mi/h
Percent Free Flow Speed, PFFS                         71.7    %
```

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	0.97
Directional flow rate,(note-2) vi	945 pc/h	641 pc/h

Base percent time-spent-following,(note-4) BPTSFd	72.3	%
Adjustment for no-passing zones, fnp	24.1	
Percent time-spent-following, PTSFd	86.7	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.37	
Peak 15-min vehicle-miles of travel, VMT15	307	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1130	veh-mi
Peak 15-min total travel time, TT15	8.6	veh-h
Capacity from ATS, CdATS	1626	veh/h
Capacity from PTSF, CdPTSF	1666	veh/h
Directional Capacity	4364	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	35.8	mi/h
Percent time-spent-following, PTSFd (from above)	86.7	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	944.6
Effective width of outside lane, We	28.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	1.68
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR-89 NB
From/To	SR 28 to A. Meadows Rd
Jurisdiction	Placer County
Analysis Year	Cumulative + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	3.7	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	1201	veh/h
Opposing direction volume, Vo	572	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.986	
Grade adj. factor,(note-1) fg	1.00		0.97	
Directional flow rate,(note-2) vi	1313	pc/h	650	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	49.8	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	32.8	mi/h
Percent Free Flow Speed, PFFS	65.9	%

```
_________________________Percent Time-Spent-Following_________________________

Direction                                     Analysis(d)        Opposing (o)
PCE for trucks, ET                                1.0                1.0
PCE for RVs, ER                                   1.0                1.0
Heavy-vehicle adjustment factor, fHV              1.000              1.000
Grade adjustment factor,(note-1) fg               1.00               0.97
Directional flow rate,(note-2) vi                 1305   pc/h        641     pc/h
Base percent time-spent-following,(note-4) BPTSFd  81.7   %
Adjustment for no-passing zones, fnp                       15.9
Percent time-spent-following, PTSFd                        92.4   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                                      E
Volume to capacity ratio, v/c                              0.48
Peak 15-min vehicle-miles of travel, VMT15                 1208    veh-mi
Peak-hour vehicle-miles of travel, VMT60                   4444    veh-mi
Peak 15-min total travel time, TT15                        36.9    veh-h
Capacity from ATS, CdATS                                   1626    veh/h
Capacity from PTSF, CdPTSF                                 1666    veh/h
Directional Capacity                                       4056    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                                 3.7      mi
Length of two-lane highway upstream of the passing lane, Lu          -        mi
Length of passing lane including tapers, Lpl                         -        mi
Average travel speed, ATSd (from above)                              32.8     mi/h
Percent time-spent-following, PTSFd (from above)                     92.4
Level of service, LOSd (from above)                                  E

___________________Average Travel Speed  with Passing Lane___________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde             -        mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld          -        mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                            -
Average travel speed including passing lane, ATSpl                   -

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde            -        mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld            -        mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                             -
Percent time-spent-following
    including passing lane, PTSFpl                                   -        %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl             -
Peak 15-min total travel time, TT15                        -       veh-h

__________________________ Bicycle Level of Service __________________________
```

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1305.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.89
Bicycle LOS	C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	3/4/2017
Analysis Time Period	Winter AM
Highway	SR89 NB
From/To	At Transit Center
Jurisdiction	Caltrans
Analysis Year	Cumulative + Project
Description	Squaw Valley Olympic Villlage

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.94	
Shoulder width	2.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	64	%
Up/down	-	%	Access point density	11	/mi

Analysis direction volume, Vd 771 veh/h
Opposing direction volume, Vo 359 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.994	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	822	pc/h	384	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	2.6	mi/h
Adj. for access point density,(note-3) fA	2.8	mi/h
Free-flow speed, FFSd	39.7	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSd	28.1	mi/h
Percent Free Flow Speed, PFFS	70.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.998	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	820	pc/h	383	pc/h

Base percent time-spent-following,(note-4) BPTSFd	65.2	%
Adjustment for no-passing zones, fnp	26.0	
Percent time-spent-following, PTSFd	82.9	%

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.48	
Peak 15-min vehicle-miles of travel, VMT15	62	veh-mi
Peak-hour vehicle-miles of travel, VMT60	231	veh-mi
Peak 15-min total travel time, TT15	2.2	veh-h
Capacity from ATS, CdATS	0	veh/h
Capacity from PTSF, CdPTSF	1697	veh/h
Directional Capacity	2489	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	28.1	mi/h
Percent time-spent-following, PTSFd (from above)	82.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	820.2
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.66
Bicycle LOS	E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

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_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 Fehr & Peers
Agency/Co.
Date Performed          4/9/2017
Analysis Time Period    Winter PM
Highway                 SR-89 NB
From/To                 W River St to Deerfield Dr
Jurisdiction            Nevada/Placer County
Analysis Year
Description  Squaw Valley Olympic Village

__________________________________Input Data__________________________________

Highway class  Class 1             Peak hour factor, PHF    0.96
Shoulder width       4.7     ft    % Trucks and buses       2       %
Lane width           12.0    ft    % Trucks crawling        0.0     %
Segment length       0.2     mi    Truck crawl speed        0.0     mi/hr
Terrain type         Level         % Recreational vehicles  0       %
Grade:  Length       -       mi    % No-passing zones       100     %
        Up/down      -       %     Access point density     0       /mi

Analysis direction volume, Vd  1686    veh/h
Opposing direction volume, Vo  524     veh/h

____________________________Average Travel Speed______________________________

Direction                               Analysis(d)         Opposing (o)
PCE for trucks, ET                          1.0                 1.2
PCE for RVs, ER                             1.0                 1.0
Heavy-vehicle adj. factor,(note-5) fHV      1.000               0.996
Grade adj. factor,(note-1) fg               1.00                1.00
Directional flow rate,(note-2) vi           1756    pc/h        548     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                 -      mi/h
Observed total demand,(note-3) V                   -      veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS               45.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS    1.3     mi/h
Adj. for access point density,(note-3) fA        0.0     mi/h

Free-flow speed, FFSd                            43.7    mi/h

Adjustment for no-passing zones, fnp             2.0     mi/h
Average travel speed, ATSd                       23.8    mi/h
Percent Free Flow Speed, PFFS                    54.4    %
```

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	1756	pc/h	546	pc/h

Base percent time-spent-following,(note-4) BPTSFd	89.1	%
Adjustment for no-passing zones, fnp	12.1	
Percent time-spent-following, PTSFd	98.3	%

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	0.59	
Peak 15-min vehicle-miles of travel, VMT15	88	veh-mi
Peak-hour vehicle-miles of travel, VMT60	337	veh-mi
Peak 15-min total travel time, TT15	3.7	veh-h
Capacity from ATS, CdATS	1693	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	3914	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	23.8	mi/h
Percent time-spent-following, PTSFd (from above)	98.3	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1756.3
Effective width of outside lane, We	21.40
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	3.63
Bicycle LOS	D

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 NB
From/To	Squaw Valley Rd to W River St
Jurisdiction	Placer County
Analysis Year	Existing + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.93	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	7.8	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	55	%
Up/down	-	%	Access point density	1	/mi

Analysis direction volume, Vd	1794	veh/h
Opposing direction volume, Vo	43	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		2.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.967	
Grade adj. factor,(note-1) fg	1.00		0.67	
Directional flow rate,(note-2) vi	1941	pc/h	71	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.3	mi/h
Free-flow speed, FFSd	59.8	mi/h
Adjustment for no-passing zones, fnp	2.3	mi/h
Average travel speed, ATSd	41.9	mi/h
Percent Free Flow Speed, PFFS	70.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.982	
Grade adjustment factor,(note-1) fg	1.00		0.73	
Directional flow rate,(note-2) vi	1929	pc/h	64	pc/h

Base percent time-spent-following,(note-4) BPTSFd	88.9	%
Adjustment for no-passing zones, fnp	10.3	
Percent time-spent-following, PTSFd	98.9	%

Level of Service and Other Performance Measures

Level of service, LOS	F	
Volume to capacity ratio, v/c	1.76	
Peak 15-min vehicle-miles of travel, VMT15	3762	veh-mi
Peak-hour vehicle-miles of travel, VMT60	13993	veh-mi
Peak 15-min total travel time, TT15	89.9	veh-h
Capacity from ATS, CdATS	1101	veh/h
Capacity from PTSF, CdPTSF	1219	veh/h
Directional Capacity	1141	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	7.8	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	41.9	mi/h
Percent time-spent-following, PTSFd (from above)	98.9	
Level of service, LOSd (from above)	F	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	1929.0
Effective width of outside lane, We	28.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.15
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR-89 NB
From/To	A. Meadows Rd to S. Valley Rd
Jurisdiction	Placer County
Analysis Year	Cumulative + Project
Description	Squaw Valley Olympic Village

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	8.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	0	/mi

Analysis direction volume, Vd	797	veh/h
Opposing direction volume, Vo	588	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.986	
Grade adj. factor,(note-1) fg	1.00		0.97	
Directional flow rate,(note-2) vi	872	pc/h	668	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	50.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	0.0	mi/h
Free-flow speed, FFSd	50.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	36.4	mi/h
Percent Free Flow Speed, PFFS	72.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		0.98	
Directional flow rate,(note-2) vi	866	pc/h	652	pc/h

Base percent time-spent-following,(note-4) BPTSFd	70.2	%
Adjustment for no-passing zones, fnp	25.7	
Percent time-spent-following, PTSFd	84.9	%

Level of Service and Other Performance Measures

Level of service, LOS	E	
Volume to capacity ratio, v/c	0.34	
Peak 15-min vehicle-miles of travel, VMT15	282	veh-mi
Peak-hour vehicle-miles of travel, VMT60	1036	veh-mi
Peak 15-min total travel time, TT15	7.8	veh-h
Capacity from ATS, CdATS	1646	veh/h
Capacity from PTSF, CdPTSF	1666	veh/h
Directional Capacity	4552	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.3	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	36.4	mi/h
Percent time-spent-following, PTSFd (from above)	84.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	-	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	866.3
Effective width of outside lane, We	28.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	1.64
Bicycle LOS	B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

```
Phone:                                  Fax:
E-Mail:

_________________Directional Two-Lane Highway Segment Analysis________________

Analyst                 Fehr & Peers
Agency/Co.
Date Performed          4/9/2017
Analysis Time Period    Winter PM
Highway                 SR-89 SB
From/To                 A. Meadows Rd to SR 28
Jurisdiction            Placer County
Analysis Year
Description  Squaw Valley Olympic Village

__________________________________Input Data__________________________________

Highway class  Class 1              Peak hour factor, PHF    0.87
Shoulder width       5.5     ft     % Trucks and buses       2       %
Lane width           12.0    ft     % Trucks crawling        0.0     %
Segment length       3.7     mi     Truck crawl speed        0.0     mi/hr
Terrain type         Rolling        % Recreational vehicles  0       %
Grade:  Length       -       mi     % No-passing zones       100     %
        Up/down      -       %      Access point density     1       /mi

Analysis direction volume, Vd  868     veh/h
Opposing direction volume, Vo  423     veh/h

____________________________Average Travel Speed______________________________

Direction                                     Analysis(d)        Opposing (o)
PCE for trucks, ET                                1.3                1.8
PCE for RVs, ER                                   1.1                1.1
Heavy-vehicle adj. factor,(note-5) fHV            0.994              0.984
Grade adj. factor,(note-1) fg                     1.00               0.94
Directional flow rate,(note-2) vi                 1004    pc/h       526     pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM                     -       mi/h
Observed total demand,(note-3) V                       -       veh/h
Estimated Free-Flow Speed:
Base free-flow speed,(note-3) BFFS                   50.0    mi/h
Adj. for lane and shoulder width,(note-3) fLS        1.3     mi/h
Adj. for access point density,(note-3) fA            0.3     mi/h

Free-flow speed, FFSd                                48.5    mi/h

Adjustment for no-passing zones, fnp                 2.2     mi/h
Average travel speed, ATSd                           34.4    mi/h
Percent Free Flow Speed, PFFS                        71.0    %
```

```
_________________________Percent Time-Spent-Following_________________________

Direction                                 Analysis(d)        Opposing (o)
PCE for trucks, ET                            1.0                1.4
PCE for RVs, ER                               1.0                1.0
Heavy-vehicle adjustment factor, fHV          1.000              0.992
Grade adjustment factor,(note-1) fg           1.00               0.95
Directional flow rate,(note-2) vi             998    pc/h        516     pc/h
Base percent time-spent-following,(note-4) BPTSFd  73.4   %
Adjustment for no-passing zones, fnp               22.1
Percent time-spent-following, PTSFd                88.0   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              E
Volume to capacity ratio, v/c                      0.63
Peak 15-min vehicle-miles of travel, VMT15         923     veh-mi
Peak-hour vehicle-miles of travel, VMT60           3212    veh-mi
Peak 15-min total travel time, TT15                26.8    veh-h
Capacity from ATS, CdATS                           1589    veh/h
Capacity from PTSF, CdPTSF                         1625    veh/h
Directional Capacity                               2421    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         3.7     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      34.4    mi/h
Percent time-spent-following, PTSFd (from above)             88.0
Level of service, LOSd (from above)                          E

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -       %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     -
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

Posted speed limit, Sp	45
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	997.7
Effective width of outside lane, We	23.00
Effective speed factor, St	4.42
Bicycle LOS Score, BLOS	2.99
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Fehr & Peers
Agency/Co.	
Date Performed	4/9/2017
Analysis Time Period	Winter PM
Highway	SR89 SB
From/To	At Transit Center
Jurisdiction	Caltrans
Analysis Year	Cumulative + Project
Description	Squaw Valley Olympic Villlage

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.85	
Shoulder width	2.0	ft	% Trucks and buses	2	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.3	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	0	%
Grade: Length	-	mi	% No-passing zones	64	%
Up/down	-	%	Access point density	11	/mi

Analysis direction volume, Vd	484	veh/h
Opposing direction volume, Vo	462	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.998		0.996	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	571	pc/h	546	pc/h

Free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h
Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	2.6	mi/h
Adj. for access point density,(note-3) fA	2.8	mi/h
Free-flow speed, FFSd	39.7	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	29.4	mi/h
Percent Free Flow Speed, PFFS	74.2	%

```
_________________________Percent Time-Spent-Following_________________________

Direction                                Analysis(d)        Opposing (o)
PCE for trucks, ET                           1.0                1.0
PCE for RVs, ER                              1.0                1.0
Heavy-vehicle adjustment factor, fHV         1.000              1.000
Grade adjustment factor,(note-1) fg          1.00               1.00
Directional flow rate,(note-2) vi            569    pc/h        544     pc/h
Base percent time-spent-following,(note-4) BPTSFd  56.1   %
Adjustment for no-passing zones, fnp               34.6
Percent time-spent-following, PTSFd                73.8   %

________________Level of Service and Other Performance Measures_______________

Level of service, LOS                              D
Volume to capacity ratio, v/c                      0.36
Peak 15-min vehicle-miles of travel, VMT15         43      veh-mi
Peak-hour vehicle-miles of travel, VMT60           145     veh-mi
Peak 15-min total travel time, TT15                1.5     veh-h
Capacity from ATS, CdATS                           0       veh/h
Capacity from PTSF, CdPTSF                         1700    veh/h
Directional Capacity                               3129    veh/h

_____________________________Passing Lane Analysis____________________________

Total length of analysis segment, Lt                         0.3     mi
Length of two-lane highway upstream of the passing lane, Lu  -       mi
Length of passing lane including tapers, Lpl                 -       mi
Average travel speed, ATSd (from above)                      29.4    mi/h
Percent time-spent-following, PTSFd (from above)             73.8
Level of service, LOSd (from above)                          D

___________________Average Travel Speed  with Passing Lane____________________

Downstream length of two-lane highway within effective
    length of passing lane for average travel speed, Lde     -       mi
Length of two-lane highway downstream of effective
    length of the passing lane for average travel speed, Ld  -       mi
Adj. factor for the effect of passing lane
    on average speed, fpl                                    -
Average travel speed including passing lane, ATSpl           -

________________Percent Time-Spent-Following with Passing Lane________________

Downstream length of two-lane highway within effective length
    of passing lane for percent time-spent-following, Lde    -       mi
Length of two-lane highway downstream of effective length of
    the passing lane for percent time-spent-following, Ld    -       mi
Adj. factor for the effect of passing lane
    on percent time-spent-following, fpl                     -
Percent time-spent-following
    including passing lane, PTSFpl                           -      %

______Level of Service and Other Performance Measures with Passing Lane ______

Level of service including passing lane, LOSpl     -
Peak 15-min total travel time, TT15                -       veh-h

__________________________ Bicycle Level of Service __________________________
```

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	569.4
Effective width of outside lane, We	14.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	4.48
Bicycle LOS	D

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

E5

Supplemental Tahoe Basin VMT Data

Saturday VMT Within TRPA Boundary Under Scenario 1

Start	End	ADT	Trip Length	VMT
SR 89/Alpine Meadows Rd	Tahoe North Shore	119	7.0	829.9
SR 89/Alpine Meadows Rd	Tahoe South Shore	20	35.0	710.5
SR 89/Alpine Meadows Rd	Tahoe West Shore	30	11.0	326.0
Total		169		1,866.5

Sunday VMT Within TRPA Boundary Under Scenario 1

Start	End	ADT	Trip Length	VMT
SR 89/Alpine Meadows Rd	Tahoe North Shore	111	7.0	776.5
SR 89/Alpine Meadows Rd	Tahoe South Shore	17	35.0	604.5
SR 89/Alpine Meadows Rd	Tahoe West Shore	27	11.0	295.4
Total		155		1,676.3

See the last page of Section E2, "Existing Plus Project Conditions Technical Calculations " (126th page of this appendix) for VMT calculations and data supporting these tables.

Appendix F

Noise Modeling Data

Site Preparation

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	1,066	50.0
Residence 1	25	91.2
Residence 2	50	83.2

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Dump Truck	84	0.4
Chain Saw	85	0.2
Front End Loader	80	0.4
chipper	75	0.2

Ground Type	Soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Dump Truck	80.0
Chain Saw	78.0
Front End Loader	76.0
chipper	68.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
83.2

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Site Preparation

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	1,725	50.0
Residence 1	25	96.4
Residence 2	50	88.4

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Dump Truck	84	1
Chain Saw	85	1
Front End Loader	80	1
chipper	75	1

Ground Type	Soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Dump Truck	84.0
Chain Saw	85.0
Front End Loader	80.0
chipper	75.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
88.4

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Night Cable Crossing Equipment

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	846	55.0
SF Base Term. Res.	175	71.4
Residence 2	1500	46.8

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Excavator	85	0.4
Grader	85	0.4
Pickup Truck	55	0.4
Front End Loader	80	0.4
Generator	82	0.5

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Excavator	81.0
Grader	81.0
Pickup Truck	51.0
Front End Loader	76.0
Generator	79.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
86

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Night Cable Crossing Equipment

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	301	70.0
SF Term. Residence.	175	75.2
Residence 2	1500	50.6

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Excavator	85	1
Grader	85	1
Pickup Truck	55	1
Front End Loader	80	1
Generator	82	1

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Excavator	85.0
Grader	85.0
Pickup Truck	55.0
Front End Loader	80.0
Generator	82.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
90

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Day Cable Crossing Equipment (no helicopter)

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	921	50.0
Residence 1	600	53.2
Residence 2	100	73.7

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Crane	85	0.16
Pickup Truck	55	0.4
Rock Drill	85	0.2
Concrete Pump Truck	82	0.2
Generator	82	0.5

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Crane	77.0
Pickup Truck	51.0
Rock Drill	78.0
Concrete Pump Truck	75.0
Generator	79.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
81.6

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Day Cable Crossing Equipment (no helicopter)

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)
Threshold	1,813	50.0
Residence 1	100	81.1
Residence 2	100	81.1

Equipment	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Crane	85	1
Pickup Truck	55	1
Rock Drill	85	1
Concrete Pump Truck	82	1
Generator	82	1

Ground Type	soft
Source Height	8
Receiver Height	5
Ground Factor[2]	0.63

Predicted Noise Level [3]	L_{eq} dBA at 50 feet[3]
Crane	85.0
Pickup Truck	55.0
Rock Drill	85.0
Concrete Pump Truck	82.0
Generator	82.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
89.0

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

[2] Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

[3] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Attenuation Calculations for Stationary Noise Sources

ASCENT ENVIRONMENTAL

KEY: Orange cells are for input.

Grey cells are intermediate calculations performed by the model.

Green cells are data to present in a written analysis (output).

STEP 1: Identify the noise source and enter the reference noise level (dBA and distance).

STEP 2: Select the ground type (hard or soft), and enter the source and receiver heights.

STEP 3: Select the distance to the receiver.

Noise Source/ID	Reference Noise Level			Attenuation Characteristics				Attenuated Noise Level at Receptor		
	noise level (dBA)	@	distance (ft)	Ground Type (soft/hard)	Source Height (ft)	Receiver Height (ft)	Ground Factor	noise level (dBA)	@	distance (ft)
Helicopter	68.0	@	492	soft	6	5	0.65	94.3	@	50
chipper	99.0	@	3	soft	6	5	0.65	67.7	@	50
blasting (night lmax)	94.0	@	50	soft	6	5	0.65	65.0	@	620
helicopter (night leq)	68.0	@	492.00	soft	6	5	0.65	45.1	@	3600
blasting (day lmax)	94.0	@	50	soft	6	5	0.65	70.1	@	400
helicopter (day leq)	68.0	@	492	soft	6	5	0.65	55.0	@	1520
Blasting (SF Res)	94.0	@	50	soft	6	5	0.65	79.6	@	175
blasting	94.0	@	50	soft	6	5	0.65	86.0	@	100
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			

Notes:

Estimates of attenuated noise levels do not account for reductions from intervening barriers, including walls, trees, vegetation, or structures of any type.

Computation of the attenuated noise level is based on the equation presented on pg. 12-3 and 12-4 of FTA 2006.

Computation of the ground factor is based on the equation presentd in Figure 6-23 on pg. 6-23 of FTA 2006, where the distance of the reference noise leve can be adjusted and the usage factor is not applied (i.e., the usage factor is equal to 1).

Sources:

Federal Transit Association (FTA). 2006 (May). Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. Washington, D.C. Available: <http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf>. Accessed: September 24, 2010.

Equipment Description	Acoustical Usage Factor (%)	Spec 721.560 Lmax @ 50ft (dBA slow)	Actual Measured Lmax @ 50ft (dBA slow)	No. of Actual Data Samples (count)	Spec 721.560 LmaxCalc	Spec 721.560 Leq	Distance	Actual Measured LmaxCalc	Actual Measured Leq
Auger Drill Rig	20	85	84	36	79.0	72.0	100	78.0	71.0
Backhoe	40	80	78	372	74.0	70.0	100	72.0	68.0
Bar Bender	20	80	na	0	74.0	67.0	100		
Blasting	na	94	na	0	88.0		100		
Boring Jack Power Unit	50	80	83	1	74.0	71.0	100	77.0	74.0
Chain Saw	20	85	84	46	79.0	72.0	100	78.0	71.0
Clam Shovel (dropping)	20	93	87	4	87.0	80.0	100	81.0	74.0
Compactor (ground)	20	80	83	57	74.0	67.0	100	77.0	70.0
Compressor (air)	40	80	78	18	74.0	70.0	100	72.0	68.0
Concrete Batch Plant	15	83	na	0	77.0	68.7	100		
Concrete Mixer Truck	40	85	79	40	79.0	75.0	100	73.0	69.0
Concrete Pump Truck	20	82	81	30	76.0	69.0	100	75.0	68.0
Concrete Saw	20	90	90	55	84.0	77.0	100	84.0	77.0
Crane	16	85	81	405	79.0	71.0	100	75.0	67.0
Dozer	40	85	82	55	79.0	75.0	100	76.0	72.0
Drill Rig Truck	20	84	79	22	78.0	71.0	100	73.0	66.0
Drum Mixer	50	80	80	1	74.0	71.0	100	74.0	71.0
Dump Truck	40	84	76	31	78.0	74.0	100	70.0	66.0
Excavator	40	85	81	170	79.0	75.0	100	75.0	71.0
Flat Bed Truck	40	84	74	4	78.0	74.0	100	68.0	64.0
Front End Loader	40	80	79	96	74.0	70.0	100	73.0	69.0
Generator	50	82	81	19	76.0	73.0	100	75.0	72.0
Generator (<25KVA, VMS si	50	70	73	74	64.0	61.0	100	67.0	64.0
Gradall	40	85	83	70	79.0	75.0	100	77.0	73.0
Grader	40	85	na	0	79.0	75.0	100		
Grapple (on Backhoe)	40	85	87	1	79.0	75.0	100	81.0	77.0
Horizontal Boring Hydr. Jac	25	80	82	6	74.0	68.0	100	76.0	70.0
Hydra Break Ram	10	90	na	0	84.0	74.0	100		
Impact Pile Driver	20	95	101	11	89.0	82.0	100	95.0	88.0
Jackhammer	20	85	89	133	79.0	72.0	100	83.0	76.0
Man Lift	20	85	75	23	79.0	72.0	100	69.0	62.0
Mounted Impact Hammer (	20	90	90	212	84.0	77.0	100	84.0	77.0
Pavement Scarafier	20	85	90	2	79.0	72.0	100	84.0	77.0
Paver	50	85	77	9	79.0	76.0	100	71.0	68.0
Pickup Truck	40	55	75	1	49.0	45.0	100	69.0	65.0

Equipment Description	Acoustical Usage Factor (%)	Spec 721.560 Lmax @ 50ft (dBA slow)	Actual Measured Lmax @ 50ft (dBA slow)	No. of Actual Data Samples (count)	Spec 721.560 LmaxCalc	Spec 721.560 Leq	Distance	Actual Measured LmaxCalc	Actual Measured Leq
Pneumatic Tools	50	85	85	90	79.0	76.0	100	79.0	76.0
Pumps	50	77	81	17	71.0	68.0	100	75.0	72.0
Refrigerator Unit	100	82	73	3	76.0	76.0	100	67.0	67.0
Rivit Buster/chipping gun	20	85	79	19	79.0	72.0	100	73.0	66.0
Rock Drill	20	85	81	3	79.0	72.0	100	75.0	68.0
Roller	20	85	80	16	79.0	72.0	100	74.0	67.0
Sand Blasting (Single Nozzle	20	85	96	9	79.0	72.0	100	90.0	83.0
Scraper	40	85	84	12	79.0	75.0	100	78.0	74.0
Shears (on backhoe)	40	85	96	5	79.0	75.0	100	90.0	86.0
Slurry Plant	100	78	78	1	72.0	72.0	100	72.0	72.0
Slurry Trenching Machine	50	82	80	75	76.0	73.0	100	74.0	71.0
Soil Mix Drill Rig	50	80	na	0	74.0	71.0	100		
Tractor	40	84	na	0	78.0	74.0	100		
Vacuum Excavator (Vac-tru	40	85	85	149	79.0	75.0	100	79.0	75.0
Vacuum Street Sweeper	10	80	82	19	74.0	64.0	100	76.0	66.0
Ventilation Fan	100	85	79	13	79.0	79.0	100	73.0	73.0
Vibrating Hopper	50	85	87	1	79.0	76.0	100	81.0	78.0
Vibratory Concrete Mixer	20	80	80	1	74.0	67.0	100	74.0	67.0
Vibratory Pile Driver	20	95	101	44	89.0	82.0	100	95.0	88.0
Warning Horn	5	85	83	12	79.0	66.0	100	77.0	64.0
Welder / Torch	40	73	74	5	67.0	63.0	100	68.0	64.0
chipper		75							

Source:
FHWA Roadway Construction Noise Model, January 2006. Table 9.1
U.S. Department of Transportation
CA/T Construction Spec. 721.560

Distance Propagation Calculations for Stationary Sources of Ground Vibration

KEY: Orange cells are for input.

Grey cells are intermediate calculations performed by the model.

Green cells are data to present in a written analysis (output).

STEP 1: Determine units in which to perform calculation.

— If vibration decibels (VdB), then use Table A and proceed to Steps 2A and 3A.

— If peak particle velocity (PPV), then use Table B and proceed to Steps 2B and 3B.

STEP 2A: Identify the vibration source and enter the reference vibration level (VdB) and distance.

STEP 3A: Select the distance to the receiver.

Table A. Propagation of vibration decibels (VdB) with distance

Noise Source/ID	Reference Noise Level			Attenuated Noise Level at Receptor		
	vibration level (VdB)	@	distance (ft)	vibration level (VdB)	@	distance (ft)
blasting	100	@	50	80.0	@	232

Notes:

Computation of propagated vibration levels is based on the equations presented on pg. 12-11 of FTA 2006. Estimates of attenuated vibration levels do not account for reductions from intervening underground barriers or other underground structures of any type, or changes in soil type.

Sources:

Federal Transit Association (FTA). 2006 (May). Transit Noise and Vibration Impact Assessment.

Vdb level from Figure 7-3 Typical Levels of Ground-Borne Vibration

Attenuation Calculations for Stationary Noise Sources

KEY: Orange cells are for input.

Grey cells are intermediate calculations performed by the model.

Green cells are data to present in a written analysis (output).

STEP 1: Identify the noise source and enter the reference noise level (dBA and distance).

STEP 2: Select the ground type (hard or soft), and enter the source and receiver heights.

STEP 3: Select the distance to the receiver.

Noise Source/ID	Reference Noise Level			Attenuation Characteristics				Attenuated Noise Level at Receptor		
	noise level (dBA)	@	distance (ft)	Ground Type (soft/hard)	Source Height (ft)	Receiver Height (ft)	Ground Factor	noise level (dBA)	@	distance (ft)
Gondola (leq, day)	69.6	@	54	soft	12	5	0.60	54.8	@	200
Gondola (lmax, day)	73.5	@	54	soft	12	5	0.60	69.1	@	80
Gondola (leq, day)	69.6	@	54	soft	12	5	0.60	56.3	@	175
Gondola (lmax, day)	73.5	@	54	soft	12	5	0.60	60.2	@	175
Gondola (leq, day)	69.6	@	54	soft	12	5	0.60	59.7	@	130
Gondola (lmax, day)	73.5	@	54	soft	12	5	0.60	63.6	@	130
Gondola (leqday)	69.6	@	54	soft	12	5	0.60	56.0	@	180
Gondola (lmax, day)	73.5	@	54	soft	12	5	0.60	59.9	@	180
Gondola (leq, day)	69.6	@	54	soft	12	5	0.60	62.6	@	100
Gondola (leq, day)	69.6	@	54	soft	12	5	0.60	52.0	@	258
Gondola (leq, day)	69.6	@	54	soft	12	5	0.60	35.6	@	1100
							0.66			
							0.66			
							0.66			

Notes:

Estimates of attenuated noise levels do not account for reductions from intervening barriers, including walls, trees, vegetation, or structures of any type.

Computation of the attenuated noise level is based on the equation presented on pg. 12-3 and 12-4 of FTA 2006.

Computation of the ground factor is based on the equation presentd in Figure 6-23 on pg. 6-23 of FTA 2006, where the distance of the reference noise leve can be adjusted and the usage factor is not applied (i.e., the usage factor is equal to 1).

Sources:

Federal Transit Association (FTA). 2006 (May). Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. Washington, D.C. Available: <http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf>. Accessed: September 24, 2010.

Avalanche Control

SLM: LXT Date: 4/22/2016

105 MM HOWITZER

TIME	EVENT	LEVEL	Lmax		DISTANCE (ft)
7:18:43	FIRE	115.1	dBA	@	25
7:18:51	EXPLOSION	96.5	dBA	@	2,690

Duration: 8 seconds

GAZEX

TIME	EVENT	LEVEL	Lmax		DISTANCE (ft)
8:10:06	EXPLOSION	105.4	dBA	@	850

Durations: 8 seconds

2 LB HAND CHARGE

TIME	EVENT	LEVEL	Lmax		DISTANCE (ft)
7:44:32	EXPLOSION	109.1	dBA	@	80

4 LB HAND CHARGE

TIME	EVENT	LEVEL	Lmax		DISTANCE (ft)
7:41:55	EXPLOSION	109.7	dBA	@	80

	TIME	EVENT	LEVEL	Lmax	DISTANCE (ft)
105 MM HOWITZER	7:18:43	FIRE	115.1	dBA	25
105 MM HOWITZER	7:18:51	EXPLOSION	96.5	dBA	2,690
GAZEX	8:10:06	EXPLOSION	105.4	dBA	850
2 LB HAND CHARGE	7:44:32	EXPLOSION	109.1	dBA	80
4 LB HAND CHARGE	7:41:55	EXPLOSION	109.7	dBA	80

	dBA @ 100 feet
105 MM HOWITZER FIRE	103.1
105 MM HOWITZER EXPLOSION	125.1
GAZEX EXPLOSION	124
2 LB HAND CHARGE EXPLOSION	107.2
4 LB HAND CHARGE EXPLOSION	107.8

Attenuation Calculations for Stationary Noise Sources

KEY: Orange cells are for input.

Grey cells are intermediate calculations performed by the model.

Green cells are data to present in a written analysis (output).

STEP 1: Identify the noise source and enter the reference noise level (dBA and distance).

STEP 2: Select the ground type (hard or soft), and enter the source and receiver heights.

STEP 3: Select the distance to the receiver.

Noise Source/ID	Reference Noise Level			Attenuation Characteristics				Attenuated Noise Level at Receptor		
	noise level (dBA)	@	distance (ft)	Ground Type (soft/hard)	Source Height (ft)	Receiver Height (ft)	Ground Factor	noise level (dBA)	@	distance (ft)
Howitzer fire	115.1	@	25	hard	12	5	0.00	103.1	@	100
howitzer explosion	96.5	@	2,690	hard	12	5	0.00	125.1	@	100
gazex	105.4	@	850	hard	12	5	0.00	124.0	@	100
2 lb hand charge	109.1	@	80	hard	12	5	0.00	107.2	@	100
4 lb hand charge	109.7	@	80	hard	12	5	0.00	107.8	@	100
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			
							0.66			

Notes:

Estimates of attenuated noise levels do not account for reductions from intervening barriers, including walls, trees, vegetation, or structures of any type.

Computation of the attenuated noise level is based on the equation presented on pg. 12-3 and 12-4 of FTA 2006.

Computation of the ground factor is based on the equation presentd in Figure 6-23 on pg. 6-23 of FTA 2006, where the distance of the reference noise leve can be adjusted and the usage factor is not applied (i.e., the usage factor is equal to 1).

Sources:

Federal Transit Association (FTA). 2006 (May). Transit Noise and Vibration Impact Assessment. FTA-VA-90-1003-06. Washington, D.C. Available: <http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf>. Accessed: September 24, 2010.

Proposed Project- Winter Saturday

Project:

Number	Segment Description and Location: Name	From	To	Existing Conditions	Existing + Project Conditions	Δ Existing – Existing + Project
Summary of Net Changes						
1	Squaw Valey Road	west of SR 89		60.2	60.1	-0.02
4	Alpine Meadows Road	west of SR 89		58.0	58.3	0.3

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Input										Output				
		Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics							Distance to Contour, (feet)[3]			
ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	CNEL, (dBA)[5,6,7]	70 dBA	65 dBA	60 dBA	55 dBA
12,750	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.2	22	48	103	221
5,450	40	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	58.0	16	34	73	158

ıy type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Proposed Project- Saturday Existing + Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

Segment Description and Location				Input										Output				
						Distance to Directional Centerline, (feet)[4]		Traffic Distribution Characteristics						CNEL,	Distance to Contour, (feet)[3]			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	(dBA)[5,6,7]	70 dBA	65 dBA	60 dBA	55 dBA
Existing + Project Conditions																		
1	Squaw Valey Road	west of SR 89		12,700	35	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	60.1	22	47	102	220
2	Alpine Meadows Road	west of SR 89		5,850	40	100	100	96.0%	2.0%	2.0%	88.2%	6.5%	5.3%	58.3	17	36	77	165

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Proposed Project- Sunday Summary

Project:

Number	Name	From	To	Existing Conditions	Existing + Project Conditions	Δ Existing – Existing + Project
Summary of Net Changes						
1	Squaw Valey Road	west of SR 89		63.0	63.4	0.4
2	Alpine Meadows Road	west of SR 89		62.3	61.9	-0.4

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Proposed Project- Sunday Existing

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

				Input										Output				
	Segment Description and Location				Speed	Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics						CNEL,	Distance to Contour, (feet)3			
Number	Name	From	To	ADT	(mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	(dBA)5,6,7	70 dBA	65 dBA	60 dBA	55 dBA
Cumulative Conditions																		
1	Squaw Valley Road	west of SR 89		13,100	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	63.0	34	74	159	342
2	Alpine Meadows Road	west of SR 89		8,550	40	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	62.3	31	66	143	308

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Proposed Project- Saturday Existing + Project

Project:

Noise Level Descriptor: CNEL
Site Conditions: Soft
Traffic Input: ADT
Traffic K-Factor:

	Segment Description and Location			Input										Output				
						Distance to Directional Centerline, (feet)4		Traffic Distribution Characteristics							Distance to Contour, (feet)3			
Number	Name	From	To	ADT	Speed (mph)	Near	Far	% Auto	% Medium	% Heavy	% Day	% Eve	% Night	CNEL, (dBA)5,6,7	70 dBA	65 dBA	60 dBA	55 dBA
Cumulative +Project Conditions																		
1	Squaw Valley Road	west of SR 89		14,250	35	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	63.4	36	78	168	362
2	Alpine Meadows Road	west of SR 89		7,750	40	100	100	85.2%	7.4%	7.4%	88.2%	6.5%	5.3%	61.9	29	62	134	289

*All modeling assumes average pavement, level roadways (less than 1.5% grade), constant traffic flow and does not account for shielding of any type or finite roadway adjustments. All levels are reported as A-weighted noise levels.

Citation	Reference
1	Caltrans Technical Noise Supplement. 2009 (November). Table (5-11), Pg 5-60.
2	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-26), Pg 5-60.
3	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-16), Pg 2-32.
4	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-11), Pg 5-47, 48.
5	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-26), Pg 2-55, 56.
6	Caltrans Technical Noise Supplement. 2009 (November). Equation (2-27), Pg 2-57.
7	Caltrans Technical Noise Supplement. 2009 (November). Pg 2-53.
8	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-7), Pg 5-45.
9	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-8), Pg 5-45.
10	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-9), Pg 5-45.
11	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-13), Pg 5-49.
12	Caltrans Technical Noise Supplement. 2009 (November). Equation (5-14), Pg 5-49.
13	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (16), Pg 67
14	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (20), Pg 69
15	Federal Highway Administration Traffic Noise Model Technical Manual. Report No. FHWA-PD-96-010. 1998 (January). Equation (18), Pg 69

Appendix G

Air Quality and Greenhouse Gas Modeling Data

Emissions Summary

Air Quality

Construction

Activity	Source	ROG (lb/day)	NOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Helicopter Max Daily Construction	Helicopter Construction Emissions Sheet	35.51	13.4	<1	<1
off-road equipment and worker commute	CalEEMod Summer Construction Output	4.7	54.8	18.2	9.6
		40.21	**68.2**	**18.200**	**9.600**

		ROG (ton/yr)	NOX (ton/yr)
Helicopter Annual Emissions	Helicopter Construction Emissions Sheet	0.4	0.1
off-road equipment and worker commute	CalEEMod Annual Construction Ouput	0.3	2.9
		0.7	3.0

Operations

Activity	Source	ROG (lb/day)	NOX (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)
Mobile	CalEEMod Winter Operational Output	1.34	9.70	4.20	1.20
Maintenance (off-road equipment)	CalEEMod Winter Operational Output	1.55	17.20	0.60	0.60
Total		**2.9**	**26.9**	**4.8**	**1.8**

Greenhouse Gas

Activity	Source	MT CO2E	
Helicopter (Construction)	Helicopter Construction Emissions Sheet	38	mtco2e in 200 day construction period
Offroad Equipment (Construction)	CalEEMod Construction Annual Output	421	mtco2e in 200 day construction period
Tree Removal (Construction)	CalEEMod Construction Annual Output	3.6	mtco2e in 200 day construction period
Mobile Sources (operations)	CalEEMod Annual Operational Output	430	mtco2e/yr
Gondola "building Energy" (Operations)	Building Energy Summary Sheet	313	mtco2e/yr
Off-road Maintenance Vehicles (Operations)	CalEEMod Annual Operational Ouput	12	mtco2e/yr
Building Energy (construction trailer)	Building Energy Summary Sheet	8.5	mtco2e/yr
construction total		**472**	mtco2e in 200 day construction period
operational total		**755**	mtco2e/yr

Helicopter Construction Emissions

Annual GHG Emissions

Helicopter operation	**Value**	Source
Fuel Used	Jet A	
Gallons of jet fuel used per hour	30	Bell 206B Specifications: http://www.deltahelicopters.com
gallons of fuel used per LTO	5.9	FOCA 2009
Average hours/day (assumes 2 LTO/hr)	6.00	assumption
Max hours/day (assumes 2 LTO/hr)	8.00	assumption
Total Days Helicopter Used	20.00	assumption
hours in construction phase	122	Calculated
gallons used for LTO	244	Calculated
Gallons used for cruising	3660	Calculated
Total gallons used in construction phase	3904	Calculated
Jet A Emissions Factor (kg CO2/gal)	9.7497	Climate Registry 2015 Emission Factors
Jet A Emissions Factor (kg N2O/gal)	0.000308	Climate Registry 2015 Emission Factors
GWP N2O	298	
LTO MTCO2E	2	Calculated
Cruising MTCO2E	36	Calculated
Total MTCO2E	38	Calculated
Note: No emission factor available for CH4 helicopter emissions.		

Emissions Calculations					
	HC	**ROG (6)**	**NOX**	**PM Non-Volatile**	**Source**
LTO EF (g/LTO)*	385	488	75	3	
Cruising EF (g/hour)*	820	1038	610	19	
Max Cruising Emissions per day (lbs/day)	14.5	18.3	10.8	0.335	
Max LTO Emissions per day (lb/day)	14	17.2	2.6	0.106	
Totam Maximum Daily emissions (lb/day)	28.0	35.5	13.4	0.441	
** Assumes Bell 206B with single DDA250-c20 Engine*					

Sources

The Climate Registry 2015 Emission Factors

Bell Helicopters (http://www.bellhelicopter.com/MungoBlobs/179/863/429STD_SPCP_150116-R01_EN_WEB.pdf)

FOCA 2009.
(http://www.bafu.admin.ch/klima/13879/13880/14577/15536/index.html?lang=en&download=NHzLpZeg7t,lnp6I0NTU042l2Z6ln1ad1IZn4Z2qZpnO2Yuq2Z6gpJCGd4N8hGym162epYbg2c_JjKbNoKSn6A--)

Building Energy Summary Sheeet

Gondola "Building Energy" Operations

			source
Daily Energy Use	7164	kwh/day	Leitner Poma (applicant)
Hourly Energy Use	716.4	kwh	Leitner Poma (applicant)
Daily Hours in Operation	10	hours	
days in season (4 months*31 days)	124		
Maintenance hours (off-season)	100	hours	

Season Energy Use	888336	kwh	
Off-Season Energy Use (100 hours)	71640	kwh	Leitner Poma (applicant)
Total Annual Energy Use	959,976	kwh	
	959.98	mwh	

Operational Building Energy (electricity) Emissions Summary	
Annual MTCO2E	
co2	312.17
ch4	0.01
n20	0.00
Total CO2E/yr	**313.27**

Utility Intensity Factors

Electricity

			Source
Co2	716.92	lb/mwh	Sierra Pacific Resources Utility (now Liberty
Ch4	0.029	lb/mwh	Utilities) Factor from CalEEMod adjusted based
N20	0.006	lb/mwh	on meeting 2020 RPS of 33% renewable
Co2	0.325189442	mt/mwh	
Ch4	1.31542E-05	mt/mwh	
N20	2.72155E-06	mt/mwh	

Natural Gas

					Source
NOx	94	lb/10^6 scf	0.09215686	lb/MMBtu	EPA AP-42 1.4 Natural Gas Combu:
ROG/VOC	5.5	lb/10^6 scf	0.00539216	lb/MMBtu	EPA AP-42 1.4 Natural Gas Combu:
PM (Total)	7.6	lb/10^6 scf	0.00745098	lb/MMBtu	EPA AP-42 1.4 Natural Gas Combu:
methane	2.3	lb/10^6 scf	0.0022549	lb/MMBtu	EPA AP-42 1.4 Natural Gas Combu:
co2	120000	lb/10^6 scf	117.647059	lb/MMBtu	EPA AP-42 1.4 Natural Gas Combu:
n20	2.2	lb/10^6 scf	0.00215686	lb/MMBtu	EPA AP-42 1.4 Natural Gas Combu:

Construction Office Building Energy Emissions

Land Use	Size	unit
General Office Building	3,200	sf

Energy Use

Electricity (CalEEMod use data)	kwh/size//yr	kwh/yr	MWH/yr	MWH for 200 day construction	
Title 24 Electricity	3.22	10,304			
Non Title 24 Electricity	3.62	11,584			
Lighting Energy	3.17	10,144			
Total		32,032	32.03	**18**	
Natual Gas*	**KBTU/Size/yr**	**KBTU/yr**		**KBTU for 200 day construction**	**BTU**
Title 24 Natural Gas	15.99	51168			
NonTitle 24 Natural Gas	0.47	1504			
Total		52672		**28,861**	28861369.863

Construction Building Emissions Summary

GHG Emissions			
Electricity	**mt/yr**	MWH (lighting)	18
co2	8.458	Kwh Heating/Cooling	8458.431643
ch4	0.00034	MWH Heating/Cooling	8.458431643
n20	0.00007	**Total MWH**	26
Total Electricity Co2e/yr	**8.49**		
TOTAL CO2E	**8.49**		

*natural gas consumption used to determine energy need for construction trailer likely to use electricity only.

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Alpine B2B Construction

Placer-Lake Tahoe County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	5.50	Acre	5.50	239,580.00	0
Enclosed Parking Structure	8.26	1000sqft	0.19	8,260.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	14			**Operational Year**	2020

Utility Company Not Applicable for construction run- see off-model calcs for construction building emissions estimates

CO2 Intensity (lb/MWhr)	**CH4 Intensity (lb/MWhr)**	**N2O Intensity (lb/MWhr)**

1.3 User Entered Comments & Non-Default Data

Alpine B2B Construction - Placer-Lake Tahoe County, Summer

Project Characteristics -

Land Use - park used to represent recreational area (Squaw/Alpine). Parking structure used to represent combined sf of terminals. mid-stations, and shelters being constructed

Construction Phase - 200 days construction based on information in PD.

Grading - total acreage based on total combined disturbance area for all components being constructed

Vehicle Trips - run used for construction only

Consumer Products - run being used for construction only

Energy Use - run being used for construction only- see off-model calcs for construction building energy estimates

Water And Wastewater - run being used for construction only

Solid Waste - run being used for construction only

Land Use Change - 500 trees to be removed: assumed 560 trees/acre based on average spacing for purposes of reforestation (South Carolina Forestry Commission)

Sequestration -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	230.00	150.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	10.00	30.00
tblConstructionPhase	PhaseEndDate	3/1/2019	11/14/2019
tblConstructionPhase	PhaseEndDate	4/26/2019	12/12/2019
tblConstructionPhase	PhaseEndDate	3/29/2019	11/28/2019
tblConstructionPhase	PhaseEndDate	4/13/2018	4/18/2019
tblConstructionPhase	PhaseStartDate	4/14/2018	4/19/2019
tblConstructionPhase	PhaseStartDate	3/30/2019	11/29/2019
tblConstructionPhase	PhaseStartDate	3/2/2019	11/15/2019
tblConstructionPhase	PhaseStartDate	4/2/2018	3/8/2019
tblEnergyUse	LightingElect	1.75	0.00

tblEnergyUse	T24E	3.92	0.00
tblGrading	AcresOfGrading	0.00	5.50
tblGrading	MaterialExported	0.00	7,500.00
tblGrading	MaterialSiltContent	6.90	4.30
tblGrading	MeanVehicleSpeed	7.10	40.00
tblSolidWaste	SolidWasteGenerationRate	0.47	0.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TTP	48.00	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TTP	33.00	0.00
tblVehicleTrips	DV_TP	28.00	0.00
tblVehicleTrips	PB_TP	6.00	0.00
tblVehicleTrips	PR_TP	66.00	0.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	1.89	0.00
tblWater	OutdoorWaterUseRate	6,553,147.42	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.6887	54.7531	24.0864	0.0657	15.7820	2.4304	18.2124	7.4052	2.2374	9.6426	0.0000	6,655.8720	6,655.8720	1.2871	0.0000	6,688.0504
Maximum	**4.6887**	**54.7531**	**24.0864**	**0.0657**	**15.7820**	**2.4304**	**18.2124**	**7.4052**	**2.2374**	**9.6426**	**0.0000**	**6,655.8720**	**6,655.8720**	**1.2871**	**0.0000**	**6,688.0504**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.6887	54.7531	24.0864	0.0657	15.7820	2.4304	18.2124	7.4052	2.2374	9.6426	0.0000	6,655.8720	6,655.8720	1.2871	0.0000	6,688.0504
Maximum	**4.6887**	**54.7531**	**24.0864**	**0.0657**	**15.7820**	**2.4304**	**18.2124**	**7.4052**	**2.2374**	**9.6426**	**0.0000**	**6,655.8720**	**6,655.8720**	**1.2871**	**0.0000**	**6,688.0504**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0160	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0160**	**1.0000e-005**	**1.4100e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**3.0100e-003**	**3.0100e-003**	**1.0000e-005**	**0.0000**	**3.2100e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0160	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0160**	**1.0000e-005**	**1.4100e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**3.0100e-003**	**3.0100e-003**	**1.0000e-005**	**0.0000**	**3.2100e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

<u>Construction Phase</u>

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/8/2019	4/18/2019	5	30	
2	Building Construction	Building Construction	4/19/2019	11/14/2019	5	150	
3	Paving	Paving	11/15/2019	11/28/2019	5	10	
4	arch	Architectural Coating	11/29/2019	12/12/2019	5	10	

Acres of Grading (Site Preparation Phase): 5.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.19

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 496 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
arch	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
arch	1	21.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	938.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	104.00	41.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					15.0871	0.0000	15.0871	7.2160	0.0000	7.2160			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991		3,766.452 9	3,766.452 9	1.1917		3,796.244 5
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**15.0871**	**2.3904**	**17.4775**	**7.2160**	**2.1991**	**9.4152**		**3,766.452 9**	**3,766.452 9**	**1.1917**		**3,796.244 5**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2774	9.1370	1.4368	0.0261	0.5470	0.0391	0.5861	0.1500	0.0374	0.1873		2,737.199 6	2,737.199 6	0.0913		2,739.482 9
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0763	0.0434	0.5866	1.5300e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		152.2195	152.2195	4.1400e-003		152.3229
Total	**0.3537**	**9.1804**	**2.0234**	**0.0277**	**0.6949**	**0.0400**	**0.7349**	**0.1892**	**0.0383**	**0.2274**		**2,889.419 1**	**2,889.419 1**	**0.0955**		**2,891.805 9**

3.2 Site Preparation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					15.0871	0.0000	15.0871	7.2160	0.0000	7.2160			0.0000			0.0000
Off-Road	4.3350	45.5727	22.0630	0.0380		2.3904	2.3904		2.1991	2.1991	0.0000	3,766.4529	3,766.4529	1.1917		3,796.2445
Total	**4.3350**	**45.5727**	**22.0630**	**0.0380**	**15.0871**	**2.3904**	**17.4775**	**7.2160**	**2.1991**	**9.4152**	**0.0000**	**3,766.4529**	**3,766.4529**	**1.1917**		**3,796.2445**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2774	9.1370	1.4368	0.0261	0.5470	0.0391	0.5861	0.1500	0.0374	0.1873		2,737.1996	2,737.1996	0.0913		2,739.4829
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0763	0.0434	0.5866	1.5300e-003	0.1479	9.6000e-004	0.1488	0.0392	8.8000e-004	0.0401		152.2195	152.2195	4.1400e-003		152.3229
Total	**0.3537**	**9.1804**	**2.0234**	**0.0277**	**0.6949**	**0.0400**	**0.7349**	**0.1892**	**0.0383**	**0.2274**		**2,889.4191**	**2,889.4191**	**0.0955**		**2,891.8059**

3.3 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127		2,591.5802	2,591.5802	0.6313		2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**		**2,591.5802**	**2,591.5802**	**0.6313**		**2,607.3635**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1776	5.1925	0.9974	0.0122	0.2777	0.0317	0.3094	0.0800	0.0303	0.1102		1,275.1875	1,275.1875	0.0626		1,276.7528
Worker	0.4409	0.2508	3.3893	8.8300e-003	0.8543	5.5500e-003	0.8599	0.2266	5.1100e-003	0.2317		879.4905	879.4905	0.0239		880.0880
Total	**0.6185**	**5.4433**	**4.3868**	**0.0210**	**1.1321**	**0.0372**	**1.1693**	**0.3066**	**0.0354**	**0.3420**		**2,154.6780**	**2,154.6780**	**0.0865**		**2,156.8408**

3.3 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127	0.0000	2,591.580 2	2,591.580 2	0.6313		2,607.363 5
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**	**0.0000**	**2,591.580 2**	**2,591.580 2**	**0.6313**		**2,607.363 5**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1776	5.1925	0.9974	0.0122	0.2777	0.0317	0.3094	0.0800	0.0303	0.1102		1,275.187 5	1,275.187 5	0.0626		1,276.752 8
Worker	0.4409	0.2508	3.3893	8.8300e-003	0.8543	5.5500e-003	0.8599	0.2266	5.1100e-003	0.2317		879.4905	879.4905	0.0239		880.0880
Total	**0.6185**	**5.4433**	**4.3868**	**0.0210**	**1.1321**	**0.0372**	**1.1693**	**0.3066**	**0.0354**	**0.3420**		**2,154.678 0**	**2,154.678 0**	**0.0865**		**2,156.840 8**

3.4 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586		2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**		**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0636	0.0362	0.4889	1.2700e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		126.8496	126.8496	3.4500e-003		126.9358
Total	**0.0636**	**0.0362**	**0.4889**	**1.2700e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**126.8496**	**126.8496**	**3.4500e-003**		**126.9358**

3.4 Paving - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4544	15.2441	14.6648	0.0228		0.8246	0.8246		0.7586	0.7586	0.0000	2,257.0025	2,257.0025	0.7141		2,274.8548
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.4544**	**15.2441**	**14.6648**	**0.0228**		**0.8246**	**0.8246**		**0.7586**	**0.7586**	**0.0000**	**2,257.0025**	**2,257.0025**	**0.7141**		**2,274.8548**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0636	0.0362	0.4889	1.2700e-003	0.1232	8.0000e-004	0.1240	0.0327	7.4000e-004	0.0334		126.8496	126.8496	3.4500e-003		126.9358
Total	**0.0636**	**0.0362**	**0.4889**	**1.2700e-003**	**0.1232**	**8.0000e-004**	**0.1240**	**0.0327**	**7.4000e-004**	**0.0334**		**126.8496**	**126.8496**	**3.4500e-003**		**126.9358**

3.5 arch - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.2299					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**0.4963**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0890	0.0506	0.6844	1.7800e-003	0.1725	1.1200e-003	0.1736	0.0458	1.0300e-003	0.0468		177.5894	177.5894	4.8300e-003		177.7101
Total	**0.0890**	**0.0506**	**0.6844**	**1.7800e-003**	**0.1725**	**1.1200e-003**	**0.1736**	**0.0458**	**1.0300e-003**	**0.0468**		**177.5894**	**177.5894**	**4.8300e-003**		**177.7101**

3.5 arch - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.2299					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**0.4963**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0890	0.0506	0.6844	1.7800e-003	0.1725	1.1200e-003	0.1736	0.0458	1.0300e-003	0.0468		177.5894	177.5894	4.8300e-003		177.7101
Total	**0.0890**	**0.0506**	**0.6844**	**1.7800e-003**	**0.1725**	**1.1200e-003**	**0.1736**	**0.0458**	**1.0300e-003**	**0.0468**		**177.5894**	**177.5894**	**4.8300e-003**		**177.7101**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Enclosed Parking Structure	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Enclosed Parking Structure	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0160	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Unmitigated	0.0160	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	6.3000e-004					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0153					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Total	**0.0160**	**1.0000e-005**	**1.4100e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.0100e-003**	**3.0100e-003**	**1.0000e-005**		**3.2100e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	6.3000e-004					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0153					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Total	**0.0160**	**1.0000e-005**	**1.4100e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.0100e-003**	**3.0100e-003**	**1.0000e-005**		**3.2100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Alpine B2B Construction

Placer-Lake Tahoe County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	5.50	Acre	5.50	239,580.00	0
Enclosed Parking Structure	8.26	1000sqft	0.19	8,260.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	14			**Operational Year**	2020

Utility Company Not applicable for construction run- see off-model calcs for construction building energy emissions estimates

CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - park used to represent recreational area (Squaw/Alpine). Parking structure used to represent combined sf of terminals. mid-stations, and shelters being constructed

Construction Phase - 200 days construction based on information in PD.

Grading - total acreage based on total combined disturbance area for all components being constructed

Vehicle Trips - run used for construction only

Consumer Products - run being used for construction only

Energy Use - run being used for construction only- see off-model calcs for construction building energy estimates

Water And Wastewater - run being used for construction only

Solid Waste - run being used for construction only

Land Use Change - 500 trees to be removed: assumed 560 trees/acre based on average spacing for purposes of reforestation (South Carolina Forestry Commission)

Sequestration -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	230.00	150.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	10.00	30.00
tblConstructionPhase	PhaseEndDate	3/1/2019	11/14/2019
tblConstructionPhase	PhaseEndDate	4/26/2019	12/12/2019
tblConstructionPhase	PhaseEndDate	3/29/2019	11/28/2019
tblConstructionPhase	PhaseEndDate	4/13/2018	4/18/2019
tblConstructionPhase	PhaseStartDate	4/14/2018	4/19/2019
tblConstructionPhase	PhaseStartDate	3/30/2019	11/29/2019
tblConstructionPhase	PhaseStartDate	3/2/2019	11/15/2019
tblConstructionPhase	PhaseStartDate	4/2/2018	3/8/2019
tblEnergyUse	LightingElect	1.75	0.00

tblEnergyUse	T24E	3.92	0.00
tblGrading	AcresOfGrading	0.00	5.50
tblGrading	MaterialExported	0.00	7,500.00
tblGrading	MaterialSiltContent	6.90	4.30
tblGrading	MeanVehicleSpeed	7.10	40.00
tblSolidWaste	SolidWasteGenerationRate	0.47	0.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TTP	48.00	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TTP	33.00	0.00
tblVehicleTrips	DV_TP	28.00	0.00
tblVehicleTrips	PB_TP	6.00	0.00
tblVehicleTrips	PR_TP	66.00	0.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	1.89	0.00
tblWater	OutdoorWaterUseRate	6,553,147.42	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.3009	2.9094	2.0447	4.6500e-003	0.3191	0.1408	0.4599	0.1335	0.1316	0.2651	0.0000	419.2994	419.2994	0.0699	0.0000	421.0473
Maximum	**0.3009**	**2.9094**	**2.0447**	**4.6500e-003**	**0.3191**	**0.1408**	**0.4599**	**0.1335**	**0.1316**	**0.2651**	**0.0000**	**419.2994**	**419.2994**	**0.0699**	**0.0000**	**421.0473**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.3009	2.9094	2.0447	4.6500e-003	0.3191	0.1408	0.4599	0.1335	0.1316	0.2651	0.0000	419.2991	419.2991	0.0699	0.0000	421.0470
Maximum	**0.3009**	**2.9094**	**2.0447**	**4.6500e-003**	**0.3191**	**0.1408**	**0.4599**	**0.1335**	**0.1316**	**0.2651**	**0.0000**	**419.2991**	**419.2991**	**0.0699**	**0.0000**	**421.0470**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	1-2-2019	4-1-2019	0.5330	0.5330
5	4-2-2019	7-1-2019	1.1406	1.1406
6	7-2-2019	9-30-2019	0.9588	0.9588
		Highest	1.1406	1.1406

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.9100e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.9100e-003**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.9100e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.9100e-003**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
New Trees	0.0000
Vegetation Land Change	-99.9000
Total	**-99.9000**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/8/2019	4/18/2019	5	30	
2	Building Construction	Building Construction	4/19/2019	11/14/2019	5	150	
3	Paving	Paving	11/15/2019	11/28/2019	5	10	
4	arch	Architectural Coating	11/29/2019	12/12/2019	5	10	

Acres of Grading (Site Preparation Phase): 5.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.19

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 496 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
arch	Air Compressors	1	6.00	78	0.48
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
arch	1	21.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	938.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	104.00	41.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2263	0.0000	0.2263	0.1082	0.0000	0.1082	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0650	0.6836	0.3310	5.7000e-004		0.0359	0.0359		0.0330	0.0330	0.0000	51.2530	51.2530	0.0162	0.0000	51.6584
Total	**0.0650**	**0.6836**	**0.3310**	**5.7000e-004**	**0.2263**	**0.0359**	**0.2622**	**0.1082**	**0.0330**	**0.1412**	**0.0000**	**51.2530**	**51.2530**	**0.0162**	**0.0000**	**51.6584**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.2300e-003	0.1408	0.0228	3.9000e-004	7.8900e-003	5.9000e-004	8.4800e-003	2.1700e-003	5.7000e-004	2.7400e-003	0.0000	36.8882	36.8882	1.3100e-003	0.0000	36.9209
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0200e-003	7.4000e-004	7.8200e-003	2.0000e-005	2.1200e-003	1.0000e-005	2.1300e-003	5.6000e-004	1.0000e-005	5.8000e-004	0.0000	1.8905	1.8905	5.0000e-005	0.0000	1.8918
Total	**5.2500e-003**	**0.1415**	**0.0307**	**4.1000e-004**	**0.0100**	**6.0000e-004**	**0.0106**	**2.7300e-003**	**5.8000e-004**	**3.3200e-003**	**0.0000**	**38.7786**	**38.7786**	**1.3600e-003**	**0.0000**	**38.8127**

3.2 Site Preparation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2263	0.0000	0.2263	0.1082	0.0000	0.1082	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0650	0.6836	0.3309	5.7000e-004		0.0359	0.0359		0.0330	0.0330	0.0000	51.2530	51.2530	0.0162	0.0000	51.6584
Total	**0.0650**	**0.6836**	**0.3309**	**5.7000e-004**	**0.2263**	**0.0359**	**0.2622**	**0.1082**	**0.0330**	**0.1412**	**0.0000**	**51.2530**	**51.2530**	**0.0162**	**0.0000**	**51.6584**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.2300e-003	0.1408	0.0228	3.9000e-004	7.8900e-003	5.9000e-004	8.4800e-003	2.1700e-003	5.7000e-004	2.7400e-003	0.0000	36.8882	36.8882	1.3100e-003	0.0000	36.9209
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0200e-003	7.4000e-004	7.8200e-003	2.0000e-005	2.1200e-003	1.0000e-005	2.1300e-003	5.6000e-004	1.0000e-005	5.8000e-004	0.0000	1.8905	1.8905	5.0000e-005	0.0000	1.8918
Total	**5.2500e-003**	**0.1415**	**0.0307**	**4.1000e-004**	**0.0100**	**6.0000e-004**	**0.0106**	**2.7300e-003**	**5.8000e-004**	**3.3200e-003**	**0.0000**	**38.7786**	**38.7786**	**1.3600e-003**	**0.0000**	**38.8127**

3.3 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1771	1.5809	1.2873	2.0200e-003		0.0967	0.0967		0.0910	0.0910	0.0000	176.3282	176.3282	0.0430	0.0000	177.4020
Total	**0.1771**	**1.5809**	**1.2873**	**2.0200e-003**		**0.0967**	**0.0967**		**0.0910**	**0.0910**	**0.0000**	**176.3282**	**176.3282**	**0.0430**	**0.0000**	**177.4020**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0136	0.3962	0.0821	9.0000e-004	0.0201	2.4000e-003	0.0225	5.8100e-003	2.3000e-003	8.1100e-003	0.0000	85.5515	85.5515	4.5100e-003	0.0000	85.6641
Worker	0.0295	0.0214	0.2260	6.0000e-004	0.0613	4.2000e-004	0.0617	0.0163	3.8000e-004	0.0167	0.0000	54.6136	54.6136	1.5000e-003	0.0000	54.6510
Total	**0.0431**	**0.4175**	**0.3081**	**1.5000e-003**	**0.0813**	**2.8200e-003**	**0.0842**	**0.0221**	**2.6800e-003**	**0.0248**	**0.0000**	**140.1651**	**140.1651**	**6.0100e-003**	**0.0000**	**140.3151**

3.3 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1771	1.5809	1.2873	2.0200e-003		0.0967	0.0967		0.0910	0.0910	0.0000	176.3279	176.3279	0.0430	0.0000	177.4018
Total	**0.1771**	**1.5809**	**1.2873**	**2.0200e-003**		**0.0967**	**0.0967**		**0.0910**	**0.0910**	**0.0000**	**176.3279**	**176.3279**	**0.0430**	**0.0000**	**177.4018**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0136	0.3962	0.0821	9.0000e-004	0.0201	2.4000e-003	0.0225	5.8100e-003	2.3000e-003	8.1100e-003	0.0000	85.5515	85.5515	4.5100e-003	0.0000	85.6641
Worker	0.0295	0.0214	0.2260	6.0000e-004	0.0613	4.2000e-004	0.0617	0.0163	3.8000e-004	0.0167	0.0000	54.6136	54.6136	1.5000e-003	0.0000	54.6510
Total	**0.0431**	**0.4175**	**0.3081**	**1.5000e-003**	**0.0813**	**2.8200e-003**	**0.0842**	**0.0221**	**2.6800e-003**	**0.0248**	**0.0000**	**140.1651**	**140.1651**	**6.0100e-003**	**0.0000**	**140.3151**

3.4 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.2700e-003	0.0762	0.0733	1.1000e-004		4.1200e-003	4.1200e-003		3.7900e-003	3.7900e-003	0.0000	10.2376	10.2376	3.2400e-003	0.0000	10.3186
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.2700e-003**	**0.0762**	**0.0733**	**1.1000e-004**		**4.1200e-003**	**4.1200e-003**		**3.7900e-003**	**3.7900e-003**	**0.0000**	**10.2376**	**10.2376**	**3.2400e-003**	**0.0000**	**10.3186**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	2.1000e-004	2.1700e-003	1.0000e-005	5.9000e-004	0.0000	5.9000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5251	0.5251	1.0000e-005	0.0000	0.5255
Total	**2.8000e-004**	**2.1000e-004**	**2.1700e-003**	**1.0000e-005**	**5.9000e-004**	**0.0000**	**5.9000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5251**	**0.5251**	**1.0000e-005**	**0.0000**	**0.5255**

3.4 Paving - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.2700e-003	0.0762	0.0733	1.1000e-004		4.1200e-003	4.1200e-003		3.7900e-003	3.7900e-003	0.0000	10.2376	10.2376	3.2400e-003	0.0000	10.3186
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**7.2700e-003**	**0.0762**	**0.0733**	**1.1000e-004**		**4.1200e-003**	**4.1200e-003**		**3.7900e-003**	**3.7900e-003**	**0.0000**	**10.2376**	**10.2376**	**3.2400e-003**	**0.0000**	**10.3186**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.8000e-004	2.1000e-004	2.1700e-003	1.0000e-005	5.9000e-004	0.0000	5.9000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5251	0.5251	1.0000e-005	0.0000	0.5255
Total	**2.8000e-004**	**2.1000e-004**	**2.1700e-003**	**1.0000e-005**	**5.9000e-004**	**0.0000**	**5.9000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5251**	**0.5251**	**1.0000e-005**	**0.0000**	**0.5255**

3.5 arch - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3300e-003	9.1800e-003	9.2100e-003	1.0000e-005		6.4000e-004	6.4000e-004		6.4000e-004	6.4000e-004	0.0000	1.2766	1.2766	1.1000e-004	0.0000	1.2793
Total	**2.4800e-003**	**9.1800e-003**	**9.2100e-003**	**1.0000e-005**		**6.4000e-004**	**6.4000e-004**		**6.4000e-004**	**6.4000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.1000e-004**	**0.0000**	**1.2793**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-004	2.9000e-004	3.0400e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7352	0.7352	2.0000e-005	0.0000	0.7357
Total	**4.0000e-004**	**2.9000e-004**	**3.0400e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.7352**	**0.7352**	**2.0000e-005**	**0.0000**	**0.7357**

3.5 arch - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3300e-003	9.1800e-003	9.2100e-003	1.0000e-005		6.4000e-004	6.4000e-004		6.4000e-004	6.4000e-004	0.0000	1.2766	1.2766	1.1000e-004	0.0000	1.2793
Total	**2.4800e-003**	**9.1800e-003**	**9.2100e-003**	**1.0000e-005**		**6.4000e-004**	**6.4000e-004**		**6.4000e-004**	**6.4000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.1000e-004**	**0.0000**	**1.2793**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-004	2.9000e-004	3.0400e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.2000e-004	0.0000	0.7352	0.7352	2.0000e-005	0.0000	0.7357
Total	**4.0000e-004**	**2.9000e-004**	**3.0400e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.2000e-004**	**0.0000**	**0.7352**	**0.7352**	**2.0000e-005**	**0.0000**	**0.7357**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Enclosed Parking Structure	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Enclosed Parking Structure	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Enclosed Parking Structure	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.9100e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Unmitigated	2.9100e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.1000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.7900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Total	**2.9100e-003**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.1000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.7900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Total	**2.9100e-003**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Out door Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	-99.9000	0.0000	0.0000	-99.9000

11.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Trees	1 / 0.1	-99.9000	0.0000	0.0000	-99.9000
Total		**-99.9000**	**0.0000**	**0.0000**	**-99.9000**

11.2 Net New Trees

Species Class

	Number of Trees	Total CO2	CH4	N2O	CO2e
		MT			
Mixed Hardwood	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

B2B Operational

Placer-Lake Tahoe County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking Structure	8.26	1000sqft	0.19	8,260.00	0
City Park	5.50	Acre	5.50	239,580.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	14			**Operational Year**	2020
Utility Company	Sierra Pacific Resources				
CO2 Intensity (lb/MWhr)	716.92	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Sierra Resources 2010 factor used to estimate Liberty Utilities factor, who acquired Sierra Pacific and is set to meet 33% RPS by 2020

Land Use - park represents land use and parking structure represented buildings

Construction Phase - run used for operations only

Off-road Equipment - run used for operations only

Trips and VMT - run used for operations only

Vehicle Trips - All trips are assumed to be primary originating from homes and traveling to squaw/alpine consistent with traffic analysis assumptions. VMT based on traffic analysis.

Consumer Products - no new parking, residential, or fertilizers

Area Coating - no parking

Landscape Equipment - no landscape equipment

Energy Use - KWH/yr based on applicant-provided daily energy use of 7164 kwh for 10 hour days and 100 hours of maintenence activity during off-season. Assumed operation of 10 hours every day for a 4 month ski season- see appendix for off-model calcs

Water And Wastewater - no water use associated with gondola operations

Solid Waste - no permanant land use development

Operational Off-Road Equipment - 100 hours of maintennce during the off-season may result in use of off-highway vehocles to access gondola tower/station locations

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Parking	100	0
tblConstructionPhase	NumDays	10.00	0.00
tblEnergyUse	LightingElect	1.75	0.00
tblEnergyUse	T24E	3.92	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	10.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	10.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	10.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	10.00

tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	CO2IntensityFactor	1328.16	716.92
tblSolidWaste	SolidWasteGenerationRate	0.47	0.00
tblVehicleTrips	CC_TTP	48.00	0.00
tblVehicleTrips	CC_TTP	0.00	100.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TTP	33.00	0.00
tblVehicleTrips	DV_TP	28.00	0.00
tblVehicleTrips	PB_TP	6.00	0.00
tblVehicleTrips	PR_TP	66.00	0.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	0.00	84.92
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	0.00	88.40
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	0.00	22.70
tblWater	OutdoorWaterUseRate	6,553,147.42	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.1160	0.8070	1.3287	4.6700e-003	0.3343	5.1400e-003	0.3394	0.0899	4.8500e-003	0.0948	0.0000	429.4976	429.4976	0.0181	0.0000	429.9499
Offroad	7.7600e-003	0.0861	0.0394	1.3000e-004		3.1900e-003	3.1900e-003		2.9400e-003	2.9400e-003	0.0000	11.5610	11.5610	3.7400e-003	0.0000	11.6545
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1238**	**0.8931**	**1.3683**	**4.8000e-003**	**0.3343**	**8.3300e-003**	**0.3426**	**0.0899**	**7.7900e-003**	**0.0977**	**0.0000**	**441.0588**	**441.0588**	**0.0218**	**0.0000**	**441.6047**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.1160	0.8070	1.3287	4.6700e-003	0.3343	5.1400e-003	0.3394	0.0899	4.8500e-003	0.0948	0.0000	429.4976	429.4976	0.0181	0.0000	429.9499
Offroad	7.7600e-003	0.0861	0.0394	1.3000e-004		3.1900e-003	3.1900e-003		2.9400e-003	2.9400e-003	0.0000	11.5610	11.5610	3.7400e-003	0.0000	11.6545
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1238**	**0.8931**	**1.3683**	**4.8000e-003**	**0.3343**	**8.3300e-003**	**0.3426**	**0.0899**	**7.7900e-003**	**0.0977**	**0.0000**	**441.0588**	**441.0588**	**0.0218**	**0.0000**	**441.6047**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/27/2018	3/26/2018	5	0	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.19

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

<u>Trips and VMT</u>

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Site Preparation - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1160	0.8070	1.3287	4.6700e-003	0.3343	5.1400e-003	0.3394	0.0899	4.8500e-003	0.0948	0.0000	429.4976	429.4976	0.0181	0.0000	429.9499
Unmitigated	0.1160	0.8070	1.3287	4.6700e-003	0.3343	5.1400e-003	0.3394	0.0899	4.8500e-003	0.0948	0.0000	429.4976	429.4976	0.0181	0.0000	429.9499

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Enclosed Parking Structure	187.50	701.44	730.18	899,323	899,323
Total	187.50	701.44	730.18	899,323	899,323

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	0.00	7.30	0.00	0.00	0.00	0.00	0	0	0
Enclosed Parking Structure	0.00	7.30	0.00	0.00	100.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Enclosed Parking Structure	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Unmitigated	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Total	**1.0000e-005**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Total	**1.0000e-005**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Crawler Tractors	1	10.00	10	212	0.43	Diesel
Off-Highway Trucks	1	10.00	10	402	0.38	Diesel

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Crawler Tractors	3.6200e-003	0.0466	0.0156	5.0000e-005		1.7500e-003	1.7500e-003		1.6100e-003	1.6100e-003	0.0000	4.3113	4.3113	1.3900e-003	0.0000	4.3462
Off-Highway Trucks	4.1400e-003	0.0395	0.0238	8.0000e-005		1.4400e-003	1.4400e-003		1.3200e-003	1.3200e-003	0.0000	7.2497	7.2497	2.3400e-003	0.0000	7.3083
Total	**7.7600e-003**	**0.0861**	**0.0394**	**1.3000e-004**		**3.1900e-003**	**3.1900e-003**		**2.9300e-003**	**2.9300e-003**	**0.0000**	**11.5610**	**11.5610**	**3.7300e-003**	**0.0000**	**11.6545**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

B2B Operational

Placer-Lake Tahoe County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking Structure	8.26	1000sqft	0.19	8,260.00	0
City Park	5.50	Acre	5.50	239,580.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	14			**Operational Year**	2020
Utility Company	Sierra Pacific Resources				
CO2 Intensity (lb/MWhr)	716.92	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Sierra Resources 2010 factor used to estimate Liberty Utilities factor, who acquired Sierra Pacific and is set to meet 33% RPS by 2020

Land Use - park represents land use and parking structure represented buildings

Construction Phase - run used for operations only

Off-road Equipment - run used for operations only

Trips and VMT - run used for operations only

Vehicle Trips - All trips are assumed to be primary originating from homes and traveling to squaw/alpine consistent with traffic analysis assumptions. VMT based on traffic analysis.

Consumer Products - no new parking, residential, or fertilizers

Area Coating - no parking

Landscape Equipment - no landscape equipment

Energy Use - KWH/yr based on applicant-provided daily energy use of 7164 kwh for 10 hour days and 100 hours of maintenence activity during off-season. Assumed operation of 10 hours every day for a 4 month ski season- see appendix for off-model calcs

Water And Wastewater - no water use associated with gondola operations

Solid Waste - no permanant land use development

Operational Off-Road Equipment - 100 hours of maintennce during the off-season may result in use of off-highway vehocles to access gondola tower/station locations

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Parking	100	0
tblConstructionPhase	NumDays	10.00	0.00
tblEnergyUse	LightingElect	1.75	0.00
tblEnergyUse	T24E	3.92	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	10.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	10.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	10.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	10.00

tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblProjectCharacteristics	CO2IntensityFactor	1328.16	716.92
tblSolidWaste	SolidWasteGenerationRate	0.47	0.00
tblVehicleTrips	CC_TTP	48.00	0.00
tblVehicleTrips	CC_TTP	0.00	100.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	19.00	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TTP	33.00	0.00
tblVehicleTrips	DV_TP	28.00	0.00
tblVehicleTrips	PB_TP	6.00	0.00
tblVehicleTrips	PR_TP	66.00	0.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	0.00	84.92
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	0.00	88.40
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	0.00	22.70
tblWater	OutdoorWaterUseRate	6,553,147.42	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.3000e-004	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	1.3401	9.6855	16.4359	0.0542	4.1414	0.0616	4.2029	1.1098	0.0581	1.1679		5,494.174 2	5,494.174 2	0.2452		5,500.304 5
Offroad	1.5525	17.2130	7.8876	0.0263		0.6388	0.6388		0.5877	0.5877		2,548.763 0	2,548.763 0	0.8243		2,569.371 0
Total	**2.8927**	**26.8985**	**24.3249**	**0.0806**	**4.1414**	**0.7003**	**4.8417**	**1.1098**	**0.6458**	**1.7556**		**8,042.940 2**	**8,042.940 2**	**1.0695**	**0.0000**	**8,069.678 7**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.3000e-004	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	1.3401	9.6855	16.4359	0.0542	4.1414	0.0616	4.2029	1.1098	0.0581	1.1679		5,494.174 2	5,494.174 2	0.2452		5,500.304 5
Offroad	1.5525	17.2130	7.8876	0.0263		0.6388	0.6388		0.5877	0.5877		2,548.763 0	2,548.763 0	0.8243		2,569.371 0
Total	**2.8927**	**26.8985**	**24.3249**	**0.0806**	**4.1414**	**0.7003**	**4.8417**	**1.1098**	**0.6458**	**1.7556**		**8,042.940 2**	**8,042.940 2**	**1.0695**	**0.0000**	**8,069.678 7**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/27/2018	3/26/2018	5	0	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.19

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.3401	9.6855	16.4359	0.0542	4.1414	0.0616	4.2029	1.1098	0.0581	1.1679		5,494.1742	5,494.1742	0.2452		5,500.3045
Unmitigated	1.3401	9.6855	16.4359	0.0542	4.1414	0.0616	4.2029	1.1098	0.0581	1.1679		5,494.1742	5,494.1742	0.2452		5,500.3045

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Enclosed Parking Structure	187.50	701.44	730.18	899,323	899,323
Total	187.50	701.44	730.18	899,323	899,323

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	0.00	7.30	0.00	0.00	0.00	0.00	0	0	0
Enclosed Parking Structure	0.00	7.30	0.00	0.00	100.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Enclosed Parking Structure	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.3000e-004	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Unmitigated	1.3000e-004	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Total	**1.3000e-004**	**1.0000e-005**	**1.4100e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.0100e-003**	**3.0100e-003**	**1.0000e-005**		**3.2100e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Total	**1.3000e-004**	**1.0000e-005**	**1.4100e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.0100e-003**	**3.0100e-003**	**1.0000e-005**		**3.2100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Crawler Tractors	1	10.00	10	212	0.43	Diesel
Off-Highway Trucks	1	10.00	10	402	0.38	Diesel

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Crawler Tractors	0.7236	9.3096	3.1250	9.8100e-003		0.3508	0.3508		0.3227	0.3227		950.4855	950.4855	0.3074		958.1707
Off-Highway Trucks	0.8289	7.9034	4.7626	0.0165		0.2880	0.2880		0.2649	0.2649		1,598.2775	1,598.2775	0.5169		1,611.2004
Total	**1.5525**	**17.2130**	**7.8876**	**0.0263**		**0.6388**	**0.6388**		**0.5877**	**0.5877**		**2,548.7630**	**2,548.7630**	**0.8243**		**2,569.3710**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Tree Hauling Emissions Run
Placer-Lake Tahoe County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking Structure	8.26	1000sqft	0.19	8,260.00	0
City Park	5.50	Acre	5.50	239,580.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	14			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - schedule adjusted based on anticipated project construction duration

Off-road Equipment - run used for hauling only

Off-road Equipment - run used for tree hauling only

Off-road Equipment - run used for tree hauling only

Off-road Equipment - run used for tree hauling only

Trips and VMT - Run is used to quantify 46 round trip (92 one-way) haul trips from tree off-hauling

Grading - Tree hauling would require 23 truck loads using a 26-ton truck. CalEEMod assumes a truck capacity of 16 CY. So, material export was adjusted to result in 92 trips (i.e., 736 cy/16 cy truck=92 one-way trips)

Architectural Coating - run used for tree hauling only

Vehicle Trips - run used for tree hauling only

Energy Use - run used for tree hauling only

Water And Wastewater - run used for tree hauling only

Solid Waste - run used for tree hauling only

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Residential_Exterior	100.00	0.00
tblArchitecturalCoating	EF_Residential_Interior	100.00	0.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	230.00	150.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	10.00	30.00
tblEnergyUse	LightingElect	1.75	0.00
tblEnergyUse	T24E	3.92	0.00
tblGrading	MaterialExported	0.00	736.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblSolidWaste	SolidWasteGenerationRate	0.47	0.00
tblTripsAndVMT	HaulingTripNumber	79.00	92.00
tblTripsAndVMT	VendorTripNumber	41.00	0.00
tblTripsAndVMT	WorkerTripNumber	104.00	0.00
tblTripsAndVMT	WorkerTripNumber	21.00	0.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	1.89	0.00
tblWater	OutdoorWaterUseRate	6,553,147.42	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	1.5600e-003	0.0138	2.2400e-003	4.0000e-005	8.2000e-004	6.0000e-005	8.7000e-004	2.2000e-004	6.0000e-005	2.7000e-004	0.0000	3.6180	3.6180	1.3000e-004	0.0000	3.6212
Maximum	**1.5600e-003**	**0.0138**	**2.2400e-003**	**4.0000e-005**	**8.2000e-004**	**6.0000e-005**	**8.7000e-004**	**2.2000e-004**	**6.0000e-005**	**2.7000e-004**	**0.0000**	**3.6180**	**3.6180**	**1.3000e-004**	**0.0000**	**3.6212**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	1.5600e-003	0.0138	2.2400e-003	4.0000e-005	8.2000e-004	6.0000e-005	8.7000e-004	2.2000e-004	6.0000e-005	2.7000e-004	0.0000	3.6180	3.6180	1.3000e-004	0.0000	3.6212
Maximum	**1.5600e-003**	**0.0138**	**2.2400e-003**	**4.0000e-005**	**8.2000e-004**	**6.0000e-005**	**8.7000e-004**	**2.2000e-004**	**6.0000e-005**	**2.7000e-004**	**0.0000**	**3.6180**	**3.6180**	**1.3000e-004**	**0.0000**	**3.6212**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
3	**1-13-2019**	**4-12-2019**	0.0121	0.0121
4	**4-13-2019**	**7-12-2019**	0.0020	0.0020
		Highest	0.0121	0.0121

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.9100e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.9100e-003**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.9100e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.9100e-003**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/8/2019	4/18/2019	5	30	
2	Building Construction	Building Construction	4/19/2019	11/14/2019	5	150	
3	Paving	Paving	11/15/2019	11/28/2019	5	10	
4	Architectural Coating	Architectural Coating	11/29/2019	12/12/2019	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.19

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 496 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	0.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Construction	Cranes	0	7.00	231	0.29
Building Construction	Forklifts	0	8.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Paving	Pavers	0	8.00	130	0.42
Paving	Paving Equipment	0	8.00	132	0.36
Paving	Rollers	0	8.00	80	0.38
Architectural Coating	Air Compressors	0	0.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	92.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.1000e-004	0.0138	2.2400e-003	4.0000e-005	7.7000e-004	6.0000e-005	8.3000e-004	2.1000e-004	6.0000e-005	2.7000e-004	0.0000	3.6180	3.6180	1.3000e-004	0.0000	3.6212
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.1000e-004**	**0.0138**	**2.2400e-003**	**4.0000e-005**	**7.7000e-004**	**6.0000e-005**	**8.3000e-004**	**2.1000e-004**	**6.0000e-005**	**2.7000e-004**	**0.0000**	**3.6180**	**3.6180**	**1.3000e-004**	**0.0000**	**3.6212**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.1000e-004	0.0138	2.2400e-003	4.0000e-005	7.7000e-004	6.0000e-005	8.3000e-004	2.1000e-004	6.0000e-005	2.7000e-004	0.0000	3.6180	3.6180	1.3000e-004	0.0000	3.6212
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.1000e-004**	**0.0138**	**2.2400e-003**	**4.0000e-005**	**7.7000e-004**	**6.0000e-005**	**8.3000e-004**	**2.1000e-004**	**6.0000e-005**	**2.7000e-004**	**0.0000**	**3.6180**	**3.6180**	**1.3000e-004**	**0.0000**	**3.6212**

3.3 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Paving - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.4 Paving - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1500e-003**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.1500e-003**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.5 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Enclosed Parking Structure	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Enclosed Parking Structure	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Enclosed Parking Structure	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.9100e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Unmitigated	2.9100e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.1000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.7900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Total	**2.9100e-003**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.1000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.7900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.5000e-004	2.5000e-004	0.0000	0.0000	2.6000e-004
Total	**2.9100e-003**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.5000e-004**	**2.5000e-004**	**0.0000**	**0.0000**	**2.6000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Tree Hauling Emissions Run

Placer-Lake Tahoe County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking Structure	8.26	1000sqft	0.19	8,260.00	0
City Park	5.50	Acre	5.50	239,580.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	74
Climate Zone	14			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Tree Hauling Emissions Run - Placer-Lake Tahoe County, Summer

Project Characteristics -

Land Use -

Construction Phase - schedule adjusted based on anticipated project construction duration

Off-road Equipment - run used for hauling only

Off-road Equipment - run used for tree hauling only

Off-road Equipment - run used for tree hauling only

Off-road Equipment - run used for tree hauling only

Trips and VMT - Run is used to quantify 46 round trip (92 one-way) haul trips from tree off-hauling

Grading - Tree hauling would require 23 truck loads using a 26-ton truck. CalEEMod assumes a truck capacity of 16 CY. So, material export was adjusted to result in 92 trips (i.e., 736 cy/16 cy truck=92 one-way trips)

Architectural Coating - run used for tree hauling only

Vehicle Trips - run used for tree hauling only

Energy Use - run used for tree hauling only

Water And Wastewater - run used for tree hauling only

Solid Waste - run used for tree hauling only

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Residential_Exterior	100.00	0.00
tblArchitecturalCoating	EF_Residential_Interior	100.00	0.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	230.00	150.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	10.00	30.00
tblEnergyUse	LightingElect	1.75	0.00
tblEnergyUse	T24E	3.92	0.00
tblGrading	MaterialExported	0.00	736.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblSolidWaste	SolidWasteGenerationRate	0.47	0.00
tblTripsAndVMT	HaulingTripNumber	79.00	92.00
tblTripsAndVMT	VendorTripNumber	41.00	0.00
tblTripsAndVMT	WorkerTripNumber	104.00	0.00
tblTripsAndVMT	WorkerTripNumber	21.00	0.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	WD_TR	1.89	0.00
tblWater	OutdoorWaterUseRate	6,553,147.42	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	0.2299	0.8962	0.1409	2.5600e-003	0.0564	3.8300e-003	0.0603	0.0151	3.6700e-003	0.0188	0.0000	268.4673	268.4673	8.9600e-003	0.0000	268.6913
Maximum	**0.2299**	**0.8962**	**0.1409**	**2.5600e-003**	**0.0564**	**3.8300e-003**	**0.0603**	**0.0151**	**3.6700e-003**	**0.0188**	**0.0000**	**268.4673**	**268.4673**	**8.9600e-003**	**0.0000**	**268.6913**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	0.2299	0.8962	0.1409	2.5600e-003	0.0564	3.8300e-003	0.0603	0.0151	3.6700e-003	0.0188	0.0000	268.4673	268.4673	8.9600e-003	0.0000	268.6913
Maximum	**0.2299**	**0.8962**	**0.1409**	**2.5600e-003**	**0.0564**	**3.8300e-003**	**0.0603**	**0.0151**	**3.6700e-003**	**0.0188**	**0.0000**	**268.4673**	**268.4673**	**8.9600e-003**	**0.0000**	**268.6913**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0160	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0160**	**1.0000e-005**	**1.4100e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**3.0100e-003**	**3.0100e-003**	**1.0000e-005**	**0.0000**	**3.2100e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0160	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0160**	**1.0000e-005**	**1.4100e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**3.0100e-003**	**3.0100e-003**	**1.0000e-005**	**0.0000**	**3.2100e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/8/2019	4/18/2019	5	30	
2	Building Construction	Building Construction	4/19/2019	11/14/2019	5	150	
3	Paving	Paving	11/15/2019	11/28/2019	5	10	
4	Architectural Coating	Architectural Coating	11/29/2019	12/12/2019	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.19

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 496 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	0.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Construction	Cranes	0	7.00	231	0.29
Building Construction	Forklifts	0	8.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	0	7.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Paving	Pavers	0	8.00	130	0.42
Paving	Paving Equipment	0	8.00	132	0.36
Paving	Rollers	0	8.00	80	0.38
Architectural Coating	Air Compressors	0	0.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	92.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.7700e-003	0.0000	2.7700e-003	4.2000e-004	0.0000	4.2000e-004			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.7700e-003**	**0.0000**	**2.7700e-003**	**4.2000e-004**	**0.0000**	**4.2000e-004**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0272	0.8962	0.1409	2.5600e-003	0.0537	3.8300e-003	0.0575	0.0147	3.6700e-003	0.0184		268.4673	268.4673	8.9600e-003		268.6913
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0272**	**0.8962**	**0.1409**	**2.5600e-003**	**0.0537**	**3.8300e-003**	**0.0575**	**0.0147**	**3.6700e-003**	**0.0184**		**268.4673**	**268.4673**	**8.9600e-003**		**268.6913**

3.2 Site Preparation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.7700e-003	0.0000	2.7700e-003	4.2000e-004	0.0000	4.2000e-004			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.7700e-003**	**0.0000**	**2.7700e-003**	**4.2000e-004**	**0.0000**	**4.2000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0272	0.8962	0.1409	2.5600e-003	0.0537	3.8300e-003	0.0575	0.0147	3.6700e-003	0.0184		268.4673	268.4673	8.9600e-003		268.6913
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0272**	**0.8962**	**0.1409**	**2.5600e-003**	**0.0537**	**3.8300e-003**	**0.0575**	**0.0147**	**3.6700e-003**	**0.0184**		**268.4673**	**268.4673**	**8.9600e-003**		**268.6913**

3.3 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.3 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.4 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.4 Paving - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.2299					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.2299**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.5 Architectural Coating - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.2299					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.2299**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00		
Enclosed Parking Structure	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Enclosed Parking Structure	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333
Enclosed Parking Structure	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking Structure	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0160	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Unmitigated	0.0160	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	6.3000e-004					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0153					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Total	**0.0160**	**1.0000e-005**	**1.4100e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.0100e-003**	**3.0100e-003**	**1.0000e-005**		**3.2100e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	6.3000e-004					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0153					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.3000e-004	1.0000e-005	1.4100e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.0100e-003	3.0100e-003	1.0000e-005		3.2100e-003
Total	**0.0160**	**1.0000e-005**	**1.4100e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.0100e-003**	**3.0100e-003**	**1.0000e-005**		**3.2100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix H

Biological Resources Data

H1 Botanical Survey Report 2015–2017

H2 Animal Species Observed within the Study Area for the Squaw-Alpine Base to Base Gondola Project

H3 California Natural Diversity Database Results

H4 USDA Forest Service Sensitive Animal Species by Forest

H5 USFWS IPaC Resource List

H1

Botanical Survey Report 2015–2017

EcoSynthesis
SCIENTIFIC & REGULATORY SERVICES, INC.

Squaw Valley - Alpine Meadows

Interconnect Project

Botanical Survey Report 2015-2017

Prepared by:

EcoSynthesis Scientific & Regulatory Services, Inc.

Prepared for:

Ascent Environmental

Date:

December 18, 2017

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1 SUMMARY

1.1 Site and Survey Details

Site name: Squaw Valley - Alpine Meadows Interconnect Project

Location: Section 32, T. 16 N, R. 16 E; and Sections 5 and 8, T. 15 N, R. 16 E (USGS Tahoe City quadrangle). Site is partially within and between Squaw Valley and Alpine Meadows ski areas.

Prepared for: Ascent Environmental

Survey dates: August 25, October 2, 3, 11, and 18, 2015; September 17 and October 6, 12, and 13, 2016; July 6 and August 6, 8, 12, 15, 16, and 29, 2017.

Report date: November 28, 2017

Biologist: Adrian Juncosa, Ph.D.

1.2 Summary of Results

The study site includes several long linear polygons centered on possible gondola alignments, and several shorter curvilinear ones surrounding avalanche control facilities. The survey areas cross small patches of different kinds of Sierra Nevada coniferous forest, montane chaparral and other shrub/forb communities, extensive areas of Rock Outcrop and Talus, Ruderal vegetation of several kinds, Mountain Alder Thicket, part of a native quaking aspen grove, and very small areas of Freshwater Emergent Wetland and Riverine habitat (seasonal tributaries).

The lower portions of the northern and southern segments of the study site, and small portions of the Alternative 3 alignment, are within developed ski areas, and cross some unpaved roads and developed base areas that are variously revegetated (thus, an Urban land cover type). The remainder of the study area is undeveloped.

Several unnamed seasonal tributaries cross the site. Ponds occur both within the study area and short distances outside it.

Wetlands and other waters are mapped and described in a separate report by Hydro Restoration.

Habitat that is potentially suitable for several special-status species is present, but no special status species was observed on the site during surveys carried out during 2015-2017. Probable hybrid sagebrush plants were observed, with inferred parentage including one three-tip sagebrush, a Rare Plant Rank 2 species.

2 INTRODUCTION

2.1 Site Location and Setting

The mapped study site (Figure 1) consists of about 110-120 acres in the Squaw Creek and Bear Creek valleys, eastern Placer County. Distances are feet as seen in plan (map) view. In the northern and southern segments (see below), the actual straight-line distance of the gondola would be about 4.5 percent longer than the plan view. Areas of steep cliff that are not suitable for the installation of gondola towers were not surveyed. Portions of the mapped study area were not safely accessible on foot, but in those areas, tentative tower locations within otherwise unsurveyed areas were accessed using climbing ropes for fall protection, so that all areas of proposed construction footprint were surveyed.

The gondola alignment alternatives consist of the segments shown approximately in Figure 1. The northern segment runs from Cushing Pond in the Squaw Valley base area southwest approximately 5,500 (map) feet to the top of “Skunk Rock” at about 7,800 feet elevation. From that point, the central segment runs due south for about 4,000 feet. The southern segment then runs southeast for about 3,500 feet to arrive within the Alpine Meadows base area. Alternative 3 (for the central and southern segments) extends directly from Skunk Rock to the Alpine Meadows base area without a pivot point at the crest of the ski area. Alternative 4 follows an entirely independent alignment in the general vicinity of the existing KT-22 ski lift, and from a point on the ridge crest a short distance west of the upper KT-22 terminal directly to the Alpine Meadows base area.

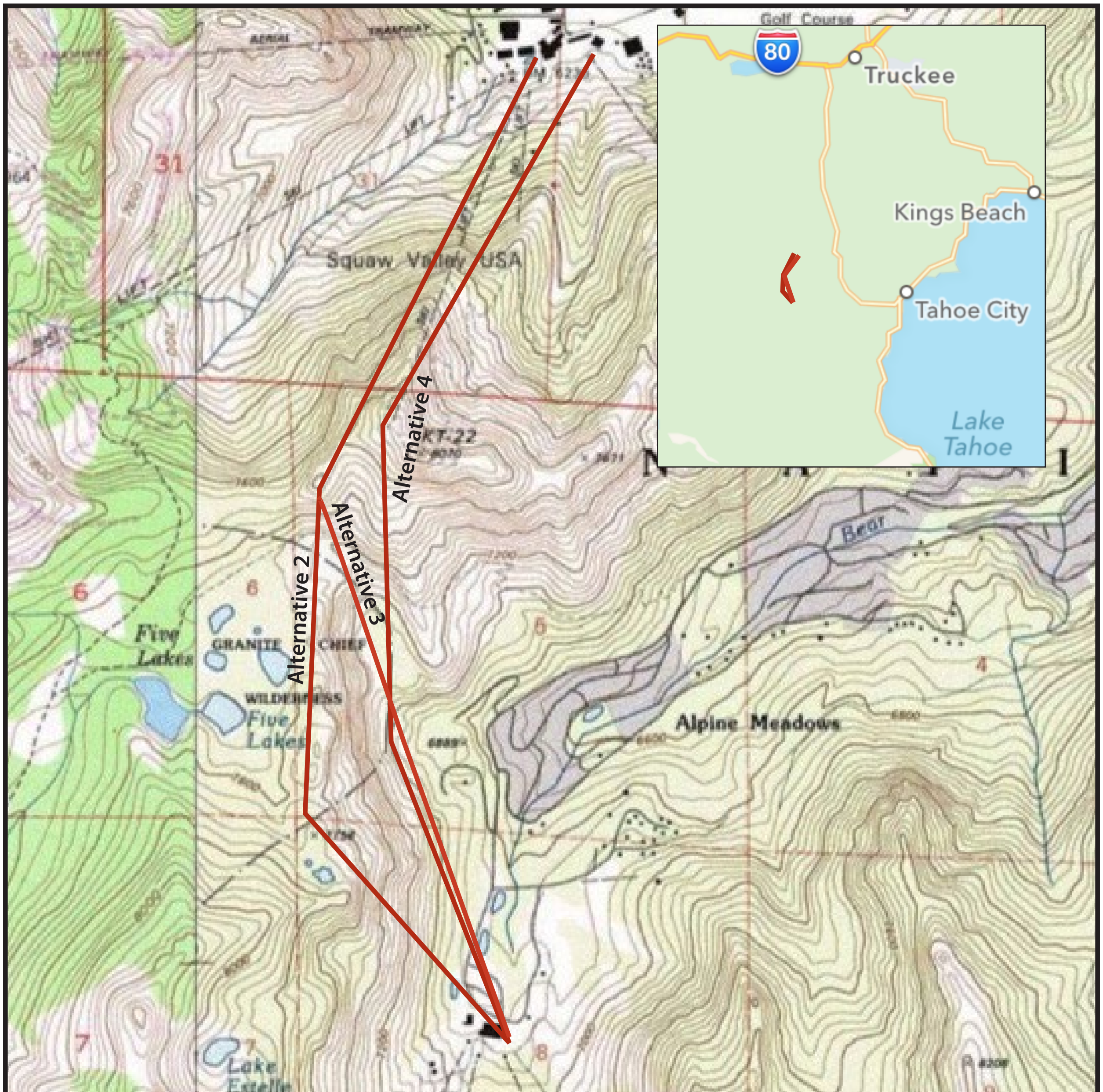
The botanical survey area (50 feet on each side of the Alternative 2 gondola alignment and 100 feet on each side of Alternatives 3 and 4; 30 to 50 feet around the Gasex facilities) is narrower in places than the wetland/tributary and wildlife study areas described in other reports. The botanical survey area totaled about 116 acres.

The elevation of the site varies from approximately 6,220 to 7,800 feet.

The regional setting of the study site is undeveloped and recreational development.

The study area lies in the Sierra Nevada ecoregion (Level III), Northern Sierra Upper Montane Forests (Level IV). However, even the Level IV regions are very broad biological categories encompassing an amount of species and ecological process diversity that is not useful for environmental review of individual small project sites. Further discussion of habitat mapping is provided under Methods, below.

The purpose of the present report was to provide a floristic botanical survey and general description of habitats and other land cover types that occur within the botanical study area. Thus, although this report necessarily includes some information about wetland habitat or other types of waters that lie within the study area boundaries, it is not intended to provide mapping of all such features at the level of detail that is needed for that category of impact assessment. Habitat boundaries do not always coincide with regulatory wetland boundaries. The reader is referred to other project reports for information on their respective subject matters.



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Alpine Meadows - Squaw Valley Base to Base Gondola Project

Botanical Surveys 2015-2017

Figure 1. Location Map

Scale: Approximately 1:24,000 (1"=2,000')

North

Study area (approximate)

Gasex survey areas not shown here (see Fig. 2)

3 METHODS

3.1 Field Survey

Botanical survey area polygons were provided by the project sponsor and uploaded onto a Trimble Geo XH 6000 GNSS ("GPS") capable field computer. The device thus served both as a means to stay within the study area in difficult terrain with few reference landmarks, and to record the survey transects, any plants of interest that were encountered, and other vegetation features of possible project or environmental review interest.

The study area was surveyed by means of transects meandering back and forth within each survey corridor so as to view all portions of the study area that 1) provide suitable habitat for special status plant species known from the region, and 2) might be subject to project impacts. Some areas of cliff terrain (solid rock faces with slope gradients exceeding about 170 percent) were excluded, since they are not suitable locations for tower construction. Potential tower sites on promontories or ledges surrounded by cliffs were surveyed using ropes for safety. Survey transects were created from points recorded every 30-50 feet (thus, not necessarily representing the entire meandering survey pathway) are shown in Figure 2 (included in Appendix C).

Plant species present were identified by sight or by reference to Baldwin et al. (2012) and other scientific sources, and were recorded on a proprietary checklist of the local flora. Dried fragments of some species were collected for subsequent microscopic identification. In 2016, reference populations of several special status species (*Boechera rigidissima* var. *demota*, *Erigeron miser*, and *Eriogonum umbellatum* var. *torreyanum*) were visited and photographed before and after the Interconnect field surveys.

The site was studied on the following dates: August 25, October 2, 3, 11, and 18, 2015; September 17 and October 6, 12, and 13, 2016; July 6 and August 6, 8, 12, 15, 16, and 29, 2017 (plus several site visits of short duration on other dates). The July 6, 2017, field survey was specifically directed at one species of concern (*Lewisia kelloggii*) which is evident and identifiable much earlier than other target species, but its above-ground parts fall completely apart or may be eaten by herbivores and therefore be impossible to find later in the season.

For administrative reasons, most of the 2015 and 2016 survey dates were later than the blooming time for many of the special-status plant species that have the potential to occur. Many California plants can be definitively identified (indeed some are *best* identified) by means of dry fruits or seeds which remain identifiable until they are knocked off by rain or covered by snow. Consequently, microscopic study of plant remains facilitated species-level identification of nearly all species encountered during those years. Plants that were identified only to genus during the 2015 and 2016 surveys were revisited during the blooming season in 2017 to finalize the species level identifications of the few plants in genera that include special-status species.

3.2 Descriptions and Mapping

Vegetation polygons were mapped by digitizing polygons on the basis of GNSS features and notes marked on field maps. More comprehensive study of wetlands and other waters has been conducted by Hydro Restoration and is documented in a separate report.

Vegetation types were discriminated to levels equivalent to the Group or, where possible, Alliance in the US National Vegetation Classification 2.01 (USNVC, 2016; referred to herein as USNVC) and/or *A Manual of California Vegetation, 2nd Edition* (Sawyer et al., 2009; referred to herein as MCV2). Deviations from this principle are described in Results. However, in environments such as steep mountain slopes, plants often occur in combinations that do not correspond precisely to the circumscriptions provided by Also, the very granular microsite variation leads to occurrence of very small occurrences of different alliances, at scales that were not mapped for the present project. For one example, extremely arid microsites occur in close juxtaposition to mesic or even wetland microsites in areas where bedrock occurs near the land surface.

Some land cover types that do not have a suitable name and description in either reference cited above are referred to by descriptive names applicable to the local region.

3.3 Investigator Qualifications

The site was studied and this report written by Adrian M. Juncosa, Ph.D. (Botany; Duke University). Since 1988, he has completed over 150 site studies, impact analyses, mitigation, and monitoring projects in central and northern California, with particular expertise with floristic botanical surveys in the foothills and montane Sierra Nevada, where he has been based since 1995.

4 RESULTS

Appendix A includes the list of about 340 vascular plants and 25 mosses that were observed. On a per-area basis, this is a relatively extensive plant list, but such is often the result for long narrow study sites with substantial elevation change within them. Vegetation and other types of land cover, such as areas of generally <10 percent vegetation cover and urban land cover such as roads and buildings, that are found within the study area are depicted in Figure 2 (Appendix C).

As noted in Methods, the mapping of land cover types depicts the predominant land cover type. Thus, Rock Outcrop polygons include patches of Montane Chaparral, and individual conifer trees occur in other land cover types than Coniferous Woodland.

Under each vegetation type heading, alliances described in MCV2 that are found within that community type are listed. The text descriptions below characterize the typical conditions within each land cover type.

4.1 Upland Habitats

4.1.1 SIERRA NEVADA CONIFEROUS WOODLAND

Abies magnifica – A. concolor Alliance

Pinus contorta ssp. *murrayana* Alliance

Pinus jeffreyi Alliance

(Pinus monticola Alliance possible)

The patches of coniferous woodland that lie within the study area are so small that, for many of them, it was not possible to definitively assign them to one or another forest alliance as described in MCV2. Overall, seven species of arborescent conifers were observed (see Appendix A; plus the prostrate shrubby *Juniperus communis* var. *saxatilis*), and dominance varies between as many of five of those from one to another small patch of forest along the alignment. Identifiable woodland types included Lodgepole Pine (*Pinus contorta* ssp. *murrayana*) near the Alpine Meadows base area; Jeffrey Pine (*Pinus jeffreyi*) scattered at mostly moderate elevations; and Red Fir – White Fir (*Abies magnifica* and *A. concolor*) in one or two very small patches at middle-upper elevations of the slopes. Coniferous trees were also encountered as scattered individuals within non-forest vegetation types, and, in one area within the Rock Outcrop land cover type,

The woodland understory was generally sparse to non-existent and, due to the small size of forest patches, no one or several herbs or shrubs could be identified as being consistently dominant or as being characteristic associates of the Coniferous Woodland.

4.1.2 MONTANE CHAPARRAL

For the purposes of the present report, Montane Chaparral is mostly limited to the non-deciduous, coriaceous-leaved community. Deciduous and soft-leaved shrub vegetation is described in other land cover types.

Quercus vacciniifolia Shrubland Alliance

Arctostaphylos patula Shrubland Alliance (*A. patula – A. nevadensis* Alliance in USNVC web site)

Montane Chaparral include areas that correspond to more than one vegetation alliance described in Sawyer et al. (2009), however, these often occur intermixed, so a single more inclusive cover type is appropriate for the present project. This community is found most continuously on south- and southeast-facing rocky slopes, especially in the southern segment of all of the gondola alignments.

Many of the mapped polygons of Montane Chaparral are nearly pure huckleberry oak; other areas are mostly greenleaf or rarely pinemat manzanita; some areas are a mixture of those species and/or mixed with snowbush (*Ceanothus cordulatus*) or rarely tobacco brush (*C. velutinus*). The distinguishing ecological characteristics of this community type as mapped in the present report are dense "hard-leaved" shrub canopy with leaves that are not deciduous. This vegetation occurs on steep rocky slopes. There is often no herbaceous understory at all, due to the dense shrub canopy which prevents sufficient light from reaching the ground surface for herbaceous or subshrubby plants to be sustained. Where there are gaps or thin shrub canopy, lower stratum plant species may occur, most often ones that are typical of Rock Outcrop areas (see below), such as species of wild buckwheat (*Eriogonum* spp.) or penstemon (*Penstemon* spp.).

4.1.3 BITTER CHERRY THICKETS

Prunus emarginata Provisional Alliance

This shrubland type is distinguished from Montane Chaparral by the deciduous habit of the majority of the dominant species within it. It is found extensively but not exclusively on the lower elevation slopes of the southern segments of Alternatives 3 and 4. MCV2 and direct field observation suggest that there is likely to be a somewhat more mesic soil moisture regime in bitter cherry thickets than chaparral areas, but they are still quite dry in summertime.

The most dominant species is bitter cherry; also codominant in many areas is Sierra coffeeberry (*Frangula rubra*). In some areas, there is a minor to codominant component of some non-deciduous species such as tobacco brush (*Ceanothus velutinus*). Wildlife values of the deciduous and non-deciduous shrubland types may differ somewhat.

This map unit term is also applied to the patchwork of mostly shrub- and subshrub-dominated woody vegetation found in the northern segment of the alignment, which varies widely in species composition (bitter cherry; oceanspray, *Holodiscus discolor* var. *microphyllus*; and snowberry, *Symphoricarpos rotundifolius*). These mixed species communities may also include a substantial component of subshrub or forb species.

4.1.4 MOUNTAIN SAGEBRUSH/FORB VEGETATION

Artemisia tridentata ssp. *vaseyana* Shrubland Alliance

These communities occur on slopes and ridges with all aspects and of all gradients from gentle to steeply sloping. Soil moisture regimes vary from relatively dry to much more mesic. Mountain sagebrush is the distinguishing shrub species, but many others occur within the alliance. Cover is highly variable from sparse to nearly 100 percent canopy including associated forbs and grasses. Overall species diversity tends to be much higher than in Montane Chaparral or Bitter Cherry Thickets.

Although the USNVC has formerly mentioned "Forb Meadow" in Macrogroup descriptions of montane vegetation, there is no alliance for the mixed subshrub/forb communities that occur commonly throughout the northern Sierra Nevada. Since those are ecologically more similar to the Mountain Sagebrush community at the present project site, and cannot always be mapped separately, they are included under this heading. Common species of the montane forb communities on the Interconnect study site include coyote mint (*Monardella odoratissima*), Brewer's angelica (*Angelica breweri*), woolly mule's-ears (*Wyethia mollis*), Brewer's aster (*Eucephalus breweri*), paint-brush (*Castilleja* spp.), beard-tongue (*Penstemon* spp.), sulfur buckwheat (*Eriogonum umbellatum* var. *nevadense* and var. *modocense*), lupines (*Lupinus* spp.), and others.

Plant communities that are transitional to riparian ecological conditions are described below under Mesic to Aquatic Habitats.

4.1.5 ROCK AND TALUS

This land cover type does not technically constitute vegetation: except for small patches, there is usually much less than 10 percent vegetative cover. Nearly all of the area within Rock and Talus is exposed bedrock, with areas of talus (broken rock from large boulders down to angular cobbles) and sparsely vegetated gravel and coarse sand. Within the study area, talus may occur in large exposures of one to many acres, or in small patches within otherwise extensive bedrock. For this reason they were mapped together for this report.

The lithology along the central and segment of Alternative 2 and portions of Alternatives 3 and 4 is mostly granitic, but it is volcanic rock throughout most of the northern and southern segments. "Skunk Rock" (a major pivot point where Alternatives 2 and 3 diverge) is so named for the light (granitic) and dark colored (volcanic) rock occurring next to one another. Rock and Talus occur on all aspects and slopes.

Notwithstanding the low vegetation cover, many plant species occur in Rock and Talus. In small depressions or flat areas within the rock, tiny pockets of finer grained soil have accumulated and support a great diversity if not much cover of vegetation. Commonly encountered species include frosted buckwheat (*Eriogonum incanum*), Lobb's buckwheat (*E. lobbii*), mountain pride (*Penstemon newberryi*), stonecrop (*Sedum obtusatum*), jewel weed (*Streptanthus tortuosus*), and various sedges and grasses. Rock outcrops and small accumulations of sandy soil within them provide potentially suitable habitat for a variety of special status plant species. Talus is typically fractured along pre-existing zones of weakness and are lying at diverse angles, there is usually nowhere for soil to accumulate, and no crevices in which species such as starved daisy (*Erigeron miser*) could grow. However, talus provides refuge for wildlife species that forage on herbaceous species supported by nearby soil patches.

4.2 Human Modified Habitats

The two land cover types in this category are characterized by substantial modification from the original natural conditions.

4.2.1 RUDERAL VEGETATION

"Ruderal" refers to vegetation growing in areas disturbed by human activities, usually grading but also applicable to other anthropogenic disturbances. Within the study area, this occurs primarily within the developed ski areas, both at the base facilities and on road embankments and ski runs. Ruderal vegetation occurs on all aspects and slope gradients from nearly level to steeply sloping. Soil textures and moisture regimes are also highly variable.

Ruderal vegetation is often used to refer only to weedy communities dominated by non-native species; however, for the present project, the wider (and correct) definition of the term is appropriate. Within the study area, Ruderal vegetation includes small areas of landscaping and lawn turf near the ski area base facilities; erosion control revegetation on ski slopes and other constructed features such as roads and their embankments; and substantially disturbed soil profiles that support weedy plants.

The ruderal erosion control vegetation within the two ski area base areas is generally dominated by grasses, especially wheatgrass (*Elymus hispidus=Thinopyrum intermedium*), squirreltail (*Elymus elymoides*), and hard fescue (*Festuca* sp.) but also including (and being locally dominated by) a variety of forbs and low shrubs (yarrow, *Achillea millefolium*; rabbitbrush, *Ericameria nauseosa*; and many others). As is typical of ruderal vegetation, dominance varies greatly by microsite. Weedy ruderal vegetation includes a wide variety of both native and non-native species.

4.2.2 URBAN LAND COVER

This land cover type includes primarily pavement (asphalt or gravel), buildings including ski lift towers, and some other structures such as pond weirs and outfalls. Most of the lift towers and some other constructed features have very small footprints and were not mapped separately, but some of the terminals with associated paved or otherwise unvegetated surface were mapped as Urban polygons.

4.3 Mesic to Aquatic Habitats

The focus of the present report is the overall vegetation and botany of the study area. A report being prepared separately by Hydro Restoration focuses upon mapping of wetlands and other waters. These features are therefore treated only briefly in the present study. However, it is appropriate to mention them in the context of a report on overall vegetation and habitats.

4.3.1 MESIC AND RIPARIAN SHRUBLAND

Acer glabrum Provisional Shrubland Alliance

Rubus (parviflorus) Shrubland Alliance

This land cover type includes vegetation that is intermediate between the upland shrubland types described above, and truly riparian woody vegetation that is consistently associated with presence of surface water or saturated soil for a portion of the year (see below under Mountain Alder Thicket). It occurs almost exclusively on moderate slopes (for this project study area) with shallow to deep, sometimes loamy soils. Aspect is generally north or east. The vegetation is characterized by having deciduous leaves that are much thinner and more susceptible to desiccation than those of the species that are characteristic of Montane Chaparral or Bitter Cherry Thickets.

Common plant species in Mesic and Riparian Shrubland vary spatially but include one or more of the following: mountain maple (*Acer glabrum*), Scouler's willow (*Salix scouleriana*), thimbleberry

(*Rubus parviflorus*), currants/gooseberries (*Ribes nevadensis, roezlii, viscosissimum*), elderberries (*Sambucus* spp.), snowberry (*Symphoricarpos mollis*), and serviceberry (*Amelanchier* spp.).

4.3.2 MOUNTAIN ALDER THICKET

Alnus incana Shrubland Alliance

This woody riparian vegetation type occurs in the lower elevation portion of the southern segment, on lower slopes adjoining a snowmaking pond at Alpine Meadows ski area, and in several other small exposures. Aspect is variable, and slopes vary from steep ones that are fed by groundwater emerging at a point-source or diffuse spring to near level ones. The water source is generally entirely, or supplemented by, groundwater, though for convenience the small areas of streamflow supported riparian vegetation are included in this land cover type. The distinguishing physical characteristic of Mountain Alder Thicket is the presence of saturated soil at or near the ground surface throughout most or all of the year.

The dominant species is mountain alder (*Alnus incana*), but scattered groups of willow species (*Salix* spp.) may also occur. A small patch of Eastwood's willow (*S. eastwoodiae*) near the pond where Alternatives 3 and 4 cross was mapped within adjacent alder thicket for simplicity.

There is little or no understory in most of the alder thickets, but some openings are vegetated by wetland or facultative herbaceous species. In the present study area, these herbaceous areas are dominated mostly by forbs (specifically fireweed, *Chamerion angustifolium* and corn lily, *Veratrum californicum*) but may also include species of *Juncus* and/or *Carex*.

4.3.3 ASPEN GROVE

Populus tremuloides Forest Alliance

A very small portion of the study area passes through an aspen grove in the lower part of the southern segment of the study area. Quaking aspen is a tree with rhizomes (underground stems) or near-surface roots with adventitious shoots, which thereby form small to large (100-acre) clones of separate-appearing trees. These groves persist for long periods of time; some, at least, are believed to date from the last glacial period, 10,000 years ago. Most aspen groves occur on upland slopes, but also occur in lower parts of riparian valleys. Aspen groves provide some ecological values that are similar to those of riparian forest and are a sensitive biological resource, even though aspen itself is a facultative-upland (mesic but not generally hydrophytic) plant species.

4.3.4 FRESHWATER EMERGENT WETLANDS

Herbaceous wetland vegetation occurs in extremely small patches in slight topographic depressions within tributary drainages within the study area. Dominant species include sedges (*Carex leporinella* and *heteroneura*), rushes (*Juncus chlorocephalus* or *bufonius*), grasses (*Agrostis exarata* and/or *humilis*), and forbs (e.g. *Oreostemma alpigenus*). In one seasonally ponded area, some woody species are also present (*Salix eastwoodiae*, *Vaccinium* sp.). A *Carex* wetland is present at the fringe of a perennial pond near the southern end of the central segment. Small areas of wetland vegetation occur near the Alpine Meadows base lodge, in patches too small to be effectively mapped for the present vegetation study.

4.3.5 RIVERINE

Several unnamed seasonal tributaries cross the site, in all three segments of the study area. They are recognizable primarily from exposures of rounded or subangular (alluvial) gravels, deposits of transported sand and from "water staining" (blackish growth of cyanobacteria, and/or deposition of orangish oxidized iron compounds) on bedrock and boulders, but also occasionally from the presence of hydrophytic plant species. Mapping and other details pertaining to wetlands and tributaries are provided in a separate report by Hydro Restoration. Vegetation of Riverine habitat within the study site includes areas of cover by mosses (and no vascular plants) growing on sand or bedrock, and areas of hydrophytic vascular plants.

4.4 Special Status Species

The study site lies in the Tahoe City quadrangle. The element list of species and natural communities that resulted from a CNDDB query for the nine quadrangles centered on Tahoe City is included in Appendix B, along with a species list and resource report from US Fish and Wildlife Service (USFWS).

Information on regulatory status (if any), habitat requirements, and potential occurrence within the site is provided in Table 1. CNDDB query results include species designated as "sensitive" by US Forest Service and Bureau of Land Management, as well as many species (particularly insects) that have no official regulatory status and do not necessarily meet the criteria provided by CEQA Guideline 15380 for determination of significant impacts on individual species. For example, plant species with Rare Plant Rating of 4 are those of limited geographic distribution (a watch list). Except on a case-by-case basis, impacts on these species do not usually merit a determination of "significant." However, this botanical survey report does not make any determinations about potential impacts, but rather is intended merely to provide background information and field survey results, so all species on either the CNDDB element list or USFWS resource report list, with or without any status, or with status designations that might not be expected to result in determination of a significant impact (except on a case-by-case basis), are included in Table 1.

At the suggestion of US Forest Service staff, one species (*Lewisia kelloggii*) that is not yet reported as occurring in the nine-quadrangle query area, but for which potentially suitable habitat occurs in small exposures on the ridge top between Squaw Valley and Bear Valley, was specifically searched for in those locations at the time when it is evident and identifiable (about 4-6 weeks earlier than most other target plant species.

The current, authoritative treatment in Flora of North America North of Mexico (volume 7) does not recognize *Boechera* (formerly *Arabis) rigidissima* var. *demota* as a separate taxon, but includes it in *A. rigidissima*, which is relatively common and widespread and considered to be a series of apomictic (non-outcrossing) hybrids. However, the discussion states that the two geographic occurrences (var. *rigidissima* in Trinity County and var. *demota* in the northern Sierra) represent different hybrid origins possibly from the same two parent species.

4.4.1 OVERVIEW OF DATA BASE AND AGENCY QUERY RESULTS

Many of the special-status species, both plants and wildlife, which resulted from the CNDDB and USFWS queries utilize wetland and aquatic habitats with slow-moving or stationary water, or (in the case of wetland species) are found in nearly level wetland habitats with long-seasonal saturation to or nearly to the ground surface. The floristic field survey was extended to such areas notwithstanding the likelihood that wetlands and aquatic sites would be avoided by project facilities to the extent that is feasible.

The soils of the site are primarily very gravelly or stony, including fine-textured loams only in very small microsites within Rock Outcrop areas. Lithology includes both granitic and volcanic rocks. Deeper soils are found only in a few small patches that support forest vegetation.

Some of the upland plant species in Table 1 are characteristically found in granitic rocks (e.g., starved daisy, *Erigeron miser*); others only in specific subtypes of volcanic soils (Torrey's sulfur buckwheat, *Eriogonum umbellatum* ssp. *torreyanum*); others in either.

Table 1. Special status plant species recorded by CNDDB in the nine USGS quadrangles centered on the Tahoe City quadrangle, and some US Forest Service sensitive species with known occurrences within the elevation range of the site though not represented by reported occurrences within the nine-quadrangle area. Plants are listed alphabetically by scientific name. Some species tracked by CNDDB have no regulatory status, or have status applicable only within certain lands, and do not necessarily meet the criteria of CEQA guideline 15380. Lichens and fungi are not included in this list; no suitable habitat for *Peltigera gowardii*. Fungi cannot be effectively targeted by floristic surveys.

Status definitions (Federal status/State status/California Native Plant Society [CNPS] list):

E or T, listed as endangered or threatened under state or federal Endangered Species Act;

C, candidate for listing as endangered or threatened;

SC, species of special concern (California DFW);

RPR (rare plant rank) 1B, considered rare, threatened or endangered by CNPS and normally regarded by DFW as meriting consideration under CEQA Guideline 15380; RPR 2, rare, threatened, or endangered in California but more common elsewhere; effects on RPR 3 (insufficient information) and 4 (watch list) species are not generally considered to be significant except on a case-by-case basis.

Species	**Status (US/Ca /RPR)**	**Microhabitat/Occurrence**	**Suitable Habitat Present?**	**Other Information**
PLANTS				
Galena Creek rock-cress *Arabis (Boechera) rigidissima* var. *demota*	-/-/1B	Moderately mesic lower-slope open coniferous woodland, near small-tributary floodplain.	Yes	Taxon is not considered valid by Flora North America, Vol. 7 (2010), but was considered for this study. See text.
Three-tip sagebrush *Artemisia tripartita* ssp. *tripartita*	-/-/2B	Exposed montane ridges on rocky volcanic substrate; one site in conifer forest just above edge of mesic meadow.	Yes	
Austin's astragalus *Astragalus austiniae*	-/-/1B	Exposed ridges above timberline (7,900 to 9,000 feet)	Marginal	Site is just below known lower elevational limit of the species.
Upswept moonwort *Botrychium ascendens*	-/-/2B	Meadows or willow-forb vegetation near springs or creeks.	Marginal	
Scalloped moonwort *Botrychium crenulatum*	-/-/2	Moist meadows.	Marginal	Tiny areas of suitable meadows within study area.

Common moonwort *Botrychium lunaria*	-/-/2	Moist meadows.	Marginal	Tiny areas of suitable meadows within study area.
Mingan moonwort *Botrychium minganense*	-/-/2	Meadows and open forest along streams.	No	
Western goblin *Botrychium montanum*	-/-/2	Shady, mesic conifer woodland along streams	No	Not within 9-quad area, but known from the region.
Bolander's bruchia *Bruchia bolanderi*	-/-/2	Wet soil, often fresh fine sand.	Yes	
Davy's sedge *Carex davyi*	-/-/1B	Mesic to wet meadows.	Yes	
Woolly-fruited sedge *Carex lasiocarpa*	-/-/2	Shores of lakes, ponds	Yes	
Mud sedge *Carex limosa*	-/-/2B	Perennial standing water in fens or edges of perennial ponds or lakes.	Yes	One very small spot of suitable pond-edge habitat within Alternatives 3 and 4.
Starved daisy *Erigeron miser*	-/-/1B	Granite outcrops.	No	
Donner Pass buckwheat *Eriogonum umbellatum* var. *torreyanum*	-/-/1B	Open areas on specific type of volcanic soils substrate.	Yes	
American manna grass *Glyceria grandis*	-/-/2	Long-saturated, nearly level wetlands.	No	Only Sierra occurrences are in the Truckee River.
Blandow's bog-moss *Helodium blandowii*	-/-/2B	Usually in bogs or fens, but also rarely in other wetland situations.	Marginal	
Plumas ivesia *Ivesia sericoleuca*	-/-/1B	Vernally moist flats and areas just outside meadow wetlands; volcanic lithology.	No	No records from steeply sloping terrain or granitic outcrops.
Santa Lucia dwarf rush *Juncus luciensis*	-/-/1B	Wetland species.	Yes	
Kellogg's lewisia *Lewisia kelloggii*		Sandy soils on level or gently sloping surfaces.	Yes	
Long-petaled lewisia *Lewisia longipetala*	-/-/1B	Rocky and gravelly areas with snowmelt seepage.	No	Site is below altitudinal range of species.
Three-ranked hump moss *Meesia triquetra*	-/-/4	Fens.	No	

Broad-nerved hump moss *Meesia uliginosa*	-/-/2	Very wet situations in lodgepole pine forests.	Yes	One very small area near Alpine Meadows but not where any gondola tower would be built.
Hiroshi's flapwort *Nardia hiroshii*	-/-/2	Soil at edge of wet meadow with willows. CNDDB lists meadows and seeps; damp soil on granitic bedrock.	Yes	Plant is a liverwort (closer to mosses than vascular plants). Only one North American record.
Stebbins's phacelia *Phacelia stebbinsii*	-/-/1B	Various habitats on west slope of Sierra Nevada.	Not in the project area.	Unverified listing in checklist at Sugar Pine Point park is likely a misidentification.
Whitebark pine *Pinus albicaulis*	-/-/-	High elevation montane habitat.	Marginal	Generally above elevation of site. Considered for RPR listing but rejected.
Nuttall's pondweed *Potamogeton epihydrus*	-/-/2	Grows exclusively in standing water such as ponds.	Yes	Usually only in natural perennial ponds.
Robbins's pondweed *Potamogeton robbinsii*	-/-/2	Grows exclusively in standing water such as ponds.	Yes	Usually only in natural perennial ponds.
Alder buckthorn *Rhamnus alnifolia*	-/-/2	Wet meadow edges, seeps, stream sides; obligate wetland species in California.	Yes	No species of *Rhamnus* was found anywhere within study area.
Tahoe yellow cress *Rorippa subumbellata*	C/E/1B	Known only from sandy lakeshore habitat (Lake Tahoe).	No	
Marsh skullcap *Scutellaria galericulata*	-/-/2	Wetland (wet meadow) species.	Yes	No wet meadows.
Munro's desert mallow *Sphaeralcea munroana*	-/-/2	Open areas in conifer forest.	Yes	Species was not found in suitable habitat.
Slender-leaved pondweed *Stuckenia filiformis* ssp. *alpina*	-/-/2	Ponds, near-stationary water.	Yes	Usually only in natural perennial ponds.
Howell's tauschia *Tauschia howellii*	-/-/1B	Exposed sandy or gravelly granitic soils; ridgetops and forest openings	(No)	No known occurrence south of Sierra County.
Felt-leaved violet *Viola tomentosa*	-/-/4	Dry, gravelly, open conifer forest on west slopes of Sierra Nevada.	Marginal	
NATURAL COMMUNITIES				
Fen	n.a.	Fen is defined as a wetland habitat supported by groundwater seepage.	No	Wetlands on site are supported primarily by incident precipitation and runoff.
Great Basin Cutthroat Trout/Paiute Sculpin Stream	n.a.	Perennial tributaries	No	No perennial streams within study area.

4.4.2 FIELD SURVEY FINDINGS

The list of species encountered during the field surveys is included in Appendix A. No special status plant species were observed within the study area.

Three-tip Sagebrush – Mountain Sagebrush Hybrids

Three-tip sagebrush (*Artemisia tripartita*) was not recognized as occurring in California by the second edition of the Jepson Manual (Baldwin et al., 2012; as is normal for large floristic references, the taxonomic treatment was completed much earlier than the publication date). However, a few specimens identified as that species are found in one or more California herbaria, and I have observed plants corresponding to the species in several locations in the Tahoe – Donner region of the northern Sierra Nevada. Dr. Leila Shultz, the author of the *Artemisia* treatments for both Jepson and the Flora of North America, examined a specimen from one of these locations and confirmed that it was three-tip sagebrush. Based upon that identification and observation of the species in the field in both Nevada and California, including locations where some of the aforementioned herbarium specimens were collected), I am confident of having a detailed and comprehensive knowledge of the taxonomic characters of the species.

In 2012, the California Native Plant Society recommended that a status of RPR 2 be assigned to based upon the herbarium records available at the time, and the relatively scanty additional field observation data from myself and others. Accumulating survey results and field observations suggest that the species may not be quite as rare as previously supposed, but information is incomplete in any case.

Many sagebrush plants in the Sierra region where three-tip sagebrush is found match mountain sagebrush perfectly with the exception of having more divided leaves than the characteristic mountain sagebrush strap-shaped leaves with three short lobes. There are several additional characters that distinguish three-tip from mountain sagebrush; not merely the divided leaves, though that is the easiest character to use in a dichotomous key.

Accordingly, I concluded (back in 2009) that these divided-leaved mountain sagebrush plants are hybrids between the two species. Multiple instances of hybrids between different species of *Artemisia* are known, most of which are not judged to merit recognition as discrete taxa. It is also well known in the botanical literature that fertile hybrids may occur where one or even both of the putative parent species are absent, which is the case here as well. Within the Interconnect study area, the hybrid sagebrush plants occur commonly on the slope that is crossed by the northern segment of Alternative 4 (where three-tip sagebrush is not found), and also extensively outside the study area, from Ward Valley northward to Castle Peak, and possibly further.

4.5 Invasive Weeds

Three species of invasive weeds were observed in the study area: diffuse knapweed (*Centaurea diffusa*), tall whitetop (*Lepidium latifolium*), and hoary cress (*Berteroa incana*). Additional occurrences of these species and of other invasive species are found outside the defined study area of the present survey project.

Diffuse knapweed was found in one location in the lower part of the northern segment of Alternative 2, within Squaw Valley Ski Area (no waypoint recorded).

Tall whitetop was found in two occurrences. One of these was only one or two plants in 2015 but is probably many more plants now, on the same Alternative 2 gondola alignment segment (point shown in Figure 2). The other is surrounding and within an abandoned building just west of the KT-22 top terminal, within the Alternative 4 alignment and surrounding survey area.

Hoary cress was found in moist vegetation adjacent to the Alpine Meadows base area (see points in Figure 2). When this survey began in 2015, there were only a few plants of the species there and extending uphill toward the area behind the maintenance buildings. In 2017, there were at least 20 plants, which were uprooted and removed from the site for sterilization of both the plants and seeds and disposal of the remains. However it should be considered certain that there is now a substantial seed bank in that area, perhaps spreading elsewhere, so long-term monitoring and control in the early spring would be advisable to reduce the chance that this species could spread widely in the northern Sierra Nevada.

5 REFERENCES

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Appendix A.

Plant Species Observed in Squaw-Alpine Interconnect Study Area

Appendix A. List of plant species observed within the project study areas during 2015, 2016, and 2017.

Species are listed first by divisions, then within groups alphabetically by family, genus, and species, except for mosses (alphabetically by genus). Moss species nomenclature follows FNAEC (2007 and 2014) and Malcolm et al. (2009); for mosses identified only to genus, names follow Norris and Shevock (2004). Vascular plant nomenclature generally follows Baldwin et al. (2012). The names and placements of families in the current Jepson Manual (Baldwin et al., 2012) are based upon major changes in angiosperm systematics in recent years. In many cases, notes are provided pertaining to former or more familiar classification or nomenclature. Species marked with an asterisk (*) are non-native.

Scientific Name	Notes
BRYOPHYTA (*s.l.*)	Mosses and liverworts listed together.
Amblystegium varium	
Brachytheciastrum collinum	
Brachythecium salebrosum	
Bryum calobryoides	
Bryum lanatum	
Bryum uliginosum	
Bryum weigelii	
Cephaloziella sp.	Only liverwort encountered.
Codriophorus (Racomitrium) aciculare	Within seasonal tributary.
Dicranoweisia crispula/contermina	Separate species according to Norris and Shevock (2004a); conspecific according to FNAEC Vol. 27 (2007).
Fontinalis antipyretica	
Grimmia hamulosa	
Grimmia montana	Possibly *G. alpestris* also.
Homalothecium nevadense	
Kiaeria starkei	
Leskea polycarpa	
Meiotrichum lyallii	
Mnium blyttii	
Philonotis caespitosa	
Pohlia sp.	Outside range of *P. robertsonii*.
Polytrichum juniperinum	
Polytrichum piliferum	
Pseudoleskea (Lescuraea) patens	
Scleropodium sp.	
Syntrichia ruralis	
Tortula hoppeana	
Trichostomum brachydontium/crispulum	

Scientific Name	Common Name	Notes
LYCOPHYTA	LYCOPHYTES	
Selaginellaceae	**Spike-moss Family**	
Selaginella watsonii	Watson's spike-moss	
FERNS	FERNS	
Dennstaedtiaceae	**Bracken Family**	
Pteridium aquilinum	bracken	
Pteridaceae	**Brake Family**	
Aspidotis densa	dense lace fern	
Cheilanthes gracillima	lace lip-fern	
Cryptogramma acrostichoides	rock-brake, parsley fern	
Pellaea breweri	cliff-brake	
Pellaea bridgesii	cliff-brake	
Woodsiaceae	**Cliff Fern Family**	
Athyrium filix-femina var. *cyclosorum*	lady fern	
Woodsia oregana	cliff fern	
GYMNOSPERMS	CONIFERS	
Cupressaceae	**Cypress Family**	
Juniperus communis var. *saxatilis*	mountain juniper	
Juniperus grandis	Sierra juniper	
Pinaceae	**Pine Family**	
Abies concolor	white fir	
Abies magnifica	red fir	
Pinus contorta ssp. *murrayana*	lodgepole pine	
Pinus jeffreyi	Jeffrey pine	
Pinus monticola	western white pine	
Tsuga mertensiana	mountain hemlock	
ANGIOSPERMS-DICOTYLEDONS	FLOWERING PLANTS	
Adoxaceae	**Muskroot Family**	
Sambucus nigra ssp. *caerulea*	elderberry	
Sambucus racemosa	elderberry	
Apiaceae (Umbelliferae)	**Carrot Family**	
Angelica breweri	Brewer's angelica	
Cymopterus terebinthinus		
Heracleum maximum	cow parsnip	
Ligusticum grayi	Gray's lovage	
Lomatium nevadense		
Osmorhiza chilensis	sweet cicely	

Perideridia lemmonii	Lemmon's yampah	
Perideridia parishii	Parish's yampah	
Apocynaceae	**Dogbane Family**	
Apocynum androsaemifolium	dogbane	
Asclepias cordifolia	purple milkweed	
Asteraceae (Compositae)	**Sunflower Family**	
Achillea millefolium	yarrow	
Ageratina occidentalis	snakeroot	
Anaphalis margaritacea	pearly everlasting	
Antennaria rosea	rosy pussy-toes	
Arnica lanceolata ssp. *prima*		
Arnica longifolia		
Artemisia douglasiana	mugwort	
Artemisia tridentata ssp. *vaseyana*	mountain sagebrush	
A. tridentata ssp. *vaseyana* X *A. tripartita*		See text for discussion.
Balsamorhiza sagittata	arrow-leafed balsamroot	
Brickelia grandiflora	brickellbush	
Brickelia greenei		
**Centaurea diffusa*	diffuse knapweed	Noxious weed; one patch
Chaenactis douglasii var. *douglasii*	dusty maidens	
Cichorium intybus	chicory	
Cirsium andersonii	Sierra thistle	
Crepis occidentalis		
Ericameria nauseosa ssp. *hololeuca*	rubber rabbitbrush	
Erigeron breweri var. *breweri*		
Erigeron coulteri		
Erigeron inornatus var. *inornatus*		
Erigeron tener		
Eriophyllum lanatum var. *integrifolium*	woolly sunflower	
Eucephalus (Aster) breweri	Brewer's aster	
Eurybia integrifolia		
Gnaphalium palustre	marsh cudweed	
Helianthella californica	California helianthella	
Hieracium albiflorum	white-flowered hawkweed	
Hieracium horridum	hawkweed	
Kyhosia (Madia) bolanderi	tarweed	
**Lactuca serriola*	prickly lettuce	
**Leucanthemum vulgare*	ox-eye daisy	
Madia glomerata	mountain tarweed	
**Matricaria discoidea*	pineapple weed	
Microseris nutans		
Oreostemma alpigenum var. *andersonii*	alpine-aster	
Pseudognaphalium thermale	cudweed	

Raillardella argentea	silky raillardella	
Senecio integerrimus	lambs-tongue groundsel	
Senecio triangularis	arrowleaf groundsel	
Solidago lepida var. *salebrosa*	goldenrod	
Symphyotrichum bracteolatum	Eaton's aster	
Symphyotrichum (Aster) campestre	aster	
Symphyotrichum spathulatum	western aster	
**Taraxacum officinale*	dandelion	
**Tragopogon dubius*	salsify, goat's-beard	
Wyethia mollis	mule's-ears	
Betulaceae	**Birch Family**	
Alnus incana ssp. *tenuifolia*	mountain alder	
Betula occidentalis	western river birch	Planted by Cushing Pond.
Boraginaceae	**Borage Family**	
Cryptantha affinis		
Cryptantha echinella		
Cryptantha torreyana var. *torreyana*		
Cynoglossum occidentalis		
Hackelia micrantha	stickseed	
Phacelia hastata ssp. *hastata*	silver-leaf scorpion-weed	
Phacelia humilis		
Phacelia ramosissima var. *eremophila*	scorpion-weed	
Plagiobothrys sp.	popcorn flower	
Brassicaceae (Cruciferae)	**Mustard Family**	
**Berteroa incana*	hoary cress	Alpine base near pond.
Boechera howellii	rock-cress	
Boechera lyallii	rock-cress	Glabrous individuals.
Boechera platysperma	rock-cress	
Boechera retrofracta	rock-cress	
Boechera (sparsiflora var. *sparsiflora)*	rock-cress	
Boechera suffrutescens	rock-cress	
Descurainia sp.	tansy mustard	
Erysimum capitatum	wall flower	
Erysimum perenne	wall flower	
**Lepidium campestre*	field peppergrass	
Lepidium densiflorum	peppergrass	
Lepidium virginicum	peppergrass	
**Lepidium latifolium*	tall whitetop	Very noxious weed
Phoenicaulis cheiranthoides	daggerpod	
Rorippa curvipes	yellow cress	
**Sisymbrium altissimum*	tumble mustard	
Streptanthus tortuosus (ssp. orbiculatus)	jewel weed	

Caprifoliaceae	**Honeysuckle Family**	
Lonicera conjugialis	honeysuckle	
Symphoricarpos mollis	snowberry	
Symphoricarpos rotundifolius	snowberry	
Caryophyllaceae	**Pink Family**	
Eremogone (Arenaria) kingii var. *glabrescens*		
Silene douglasii var. *douglasii*	catchfly	
**Spergularia rubra*	purple sand-spurry	
Chenopodiaceae	**Pigweed Family**	
**Chenopodium album*	pigweed	
Chenopodium atrovirens		
Chenopodium berlandieri	pitted goosefoot	
**Chenopodium foliosum*		
**Dysphania botrys*	Jerusalem oak	
Convolvulaceae		
Calystegia malacophylla ssp. *malacophylla*	morning-glory	
**Convolvulus arvensis*	field bindweed	
Cuscuta californica var. *californica*	dodder	
Cornaceae	**Dogwood Family**	
Cornus sericea	red-osier dogwood	
Crassulaceae	**Stonecrop Family**	
Sedum obtusatum ssp. *obtusatum*	stonecrop	
Ericaceae	**Heath Family**	
Arctostaphylos nevadensis	pinemat manzanita	
Arctostaphylos patula	greenleaf manzanita	
Chimaphila menziesii	prince's-pine	
Phyllodoce breweri	mountain heather	
Pterospora andromedea	pine-drops	
Pyrola asarifolia ssp. *asarifolia*	bog wintergreen	
Pyrola picta	white-veined wintergreen	
Sarcodes sanguinea	snowplant	
Vaccinium sp.	bilberry	
Euphorbiaceae	**Spurge Family**	
Chamaesyce serpyllifolia var. *serpyllifolia*		
Fabaceae	**Legume Family**	
Acmispon americanus var. *americanus*		Formerly *Lotus purshianus.*
**Astragalus canadensis*	Canadian milkvetch	
**Lathyrus latifolius*	sweet pea	
**Lotus corniculatus*	bird's-foot trefoil	
*Lupinus arbustus (*possibly *argenteus)*	lupine	

Lupinus lepidus	dwarf lupine	
Melilotus albus	sweet-clover	
Trifolium gracilentum	clover	
**Trifolium repens*	white clover	
Fagaceae	**Oak Family**	
Quercus vaccinifolia	huckleberry oak	
Gentianaceae	**Gentian Family**	
Gentiana calycosa	explorer's gentian	
Gentianopsis simplex	hiker's gentian	
Grossulariaceae	**Gooseberry Family**	
Ribes cereum	wax currant	
Ribes inerme	currant	
Ribes nevadense	mountain pink currant	
Ribes roezlii	Sierra gooseberry	
Ribes viscosissimum	sticky currant	
Hypericaceae	**St. Johns Wort Family**	
Hypericum anagalloides		
**Hypericum perforatum*	Klamath weed	
Lamiaceae (Labiatae)	**Mint Family**	
Agastache urticifolia	horse-mint	
Monardella odoratissima ssp. *pallida*	coyote-mint	
Stachys ajugoides var. *rigida*	hedge-nettle	
Linaceae	**Flax Family**	
Linum lewisii	Lewis' flax	
Malvaceae	**Mallow Family**	
Sidalcea glaucescens	checkerbloom	
Sidalcea oregana		
Montiaceae	**Miner's Lettuce Family**	
Calyptridium monospermum	pussy-paws	
Onagraceae	**Evening Primrose Family**	
Chamerion angustifolium	fireweed	
Circaea alpina ssp. *pacifica*		
Epilobium brachycarpum	willow herb	
Epilobium canum ssp. *latifolium*	California fuschia	
Epilobium ciliatum	willow herb	Offset leafy rosettes.
Epilobium hallianum/saximontanum	willow herb	Pink fleshy bulb-like shoots;
Epilobium obcordatum		
Epilobium pallidum		
Gayophytum diffusum ssp. *parviflorum*		
Taraxia tanacetifolia		

Orobanchaceae	**Broomrape Family**	
Castilleja applegatei	indian paintbrush	
Castilleja miniata	indian paintbrush	
Castilleja nana		
Castilleja pilosa		
Cordylanthus tenuis	bird’s-beak	
Orthocarpus cuspidatus ssp. *cryptanthus*		
Papaveraceae	**Poppy Family**	
**Eschscholtzia californi*a*	California poppy	From seed mix; native to California but not area.
Phrymaceae	**Lopseed Family**	
Mimulus breweri		
Mimulus guttatus	monkeyflower	Also one or two additional small annual species.
Mimulus lewisii		
Mimulus tilingii		
Plantaginaceae	**Plantain Family**	
Collinsia parviflora		
Keckiella lemmonii		
Penstemon azureus		
Penstemon deustus		
Penstemon gracilentus		
Penstemon heterodoxus var. *heterodoxus*		
Penstemon heterophyllus		
Penstemon newberryi		
Penstemon roezlii		
Penstemon rydbergii ssp. *oreocharis*		
Penstemon speciosus		
**Plantago lanceolat*a*	plantain	
**Plantago majo*r*	English plantain	
Polemoniaceae	**Phlox Family**	
Allophyllum gilioides		
Collomia linearis		
Collomia tinctoria		
Ipomopsis congesta ssp. *montana*		
Leptosiphon ciliatus		
Linanthus (Leptodactylon) pungens		
Microsteris gracilis		
Navarretia capillaris		
Navarretia intertexta		
Navarretia leptalea		
Phlox diffusa		

Polygonaceae	**Buckwheat Family**	
Aconogonon (Polygonum) davisiae		
Aconogonon (Polygonum) phytolaccifolium		
Eriogonum heracleoides		Probably from seed mix.
Eriogonum incanum	frosted wild buckwheat	
Eriogonum lobbii	Lobb's wild buckwheat	
Eriogonum nudum var. *nudum*	wild buckwheat	
Eriogonum umbellatum var. *modocense*	Modoc sulfur buckwheat	
Eriogonum umbellatum var. *nevadense*	sulfur buckwheat	
Eriogonum ursinum	bear buckwheat	
Eriogonum wrightii var. *subscaposum*	bastard-sage	
Oxyria digyna	mountain sorrel	
**Polygonum aviculare* ssp. *depressum*	knotweed	
Polygonum douglasii ssp. *douglasii*	Douglas's knotweed	
Polygonum douglasii ssp. *johnstonii*	knotweed	
Polygonum minimum		
Polygonum spergulariiforme		
**Rumex acetosella*	sheep sorrel	
**Rumex crispus*	curly dock	
Rumex salicifolius	willow dock	
Ranunculaceae	**Buttercup Family**	
Anemone drummondii var. *drummondii*		
Aquilegia formosa	western columbine	
Delphinium glaucum	tower delphinium	
Delphinium sp.	larkspur	
Thalictrum fendleri	meadow-rue	
Rhamnaceae	**Buckthorn Family**	
Ceanothus cordulatus	snow-bush	
Ceanothus prostratus	mahala mat, squaw carpet	
Ceanothus velutinus	tobacco-bush	
Frangula rubra ssp. *obtusissima*	Sierra coffee-berry	
Rosaceae	**Rose Family**	
Amelanchier alnifolia	serviceberry	
Amelanchier utahensis	serviceberry	
Drymocallis glandulosa ssp. *reflexa*	sticky cinquefoil	
Holodiscus discolor var. *microphyllus*	oceanspray	
Horkelia fusca ssp. *parviflora*	horkelia	
Potentilla drummondii	Drummond's cinquefoil	
Potentilla gracilis	slender cinquefoil	
Prunus emarginata	Sierra (bitter) cherry	
Prunus sp. (probably *virginiana*)	choke cherry	Planted at Cushing Pond.
Rosa woodsii	wild rose	

Rubus parviflorus	thimbleberry	
Sorbus californica	mountain ash	
Sorbus scopulina	mountain ash	
Spiraea densiflora	spiraea	
Rubiaceae	**Madder Family**	
Galium grayanum	Gray's bedstraw	
Galium triflorum	bedstraw	
Kelloggia galioides		
Salicaceae	**Willow Family**	
Populus balsamifera ssp. *trichocarpa*	black cottonwood	
Populus tremuloides	quaking aspen	
Salix eastwoodiae	Eastwood's willow	
Salix geyeriana	Geyer's willow	
Salix lasiandra var. *lasiandra*	Pacific willow	
Salix lasiolepis	arroyo willow	
Salix lemmonii	Lemmon's willow	
Salix scouleriana	Scouler's willow	
Sapindaceae	**Soapberry Family**	
Acer glabrum var. *glabrum*	mountain maple	Formerly Aceraceae.
Saxifragaceae	**Saxifrage Family**	
Heuchera micrantha	alumroot	
Pectiantia (Mitella) breweri		
Scrophulariaceae	**Figwort Family**	
Scrophularia californica	figwort	
**Verbascum thapsus*	woolly mullein	
Solanaceae	**Nightshade Family**	
Chamaesaracha nana		
Valerianaceae	**Valerian Family**	
Valeriana californica		
Verbenaceae	**Vervain Family**	
Verbena lasiostachys var. *scabrida*		Wrong geographic range, but nutlets unequivocally key to var. *scabrida* (clearly white-papillate faces).
Violaceae	**Violet Family**	
Viola macloskeyi		
Viola purpurea		

ANGIOSPERMS-MONOCOTYLEDONS	FLOWERING PLANTS	
Alliaceae	**Onion Family**	
Allium platycaule		
Cyperaceae	**Sedge Family**	
Carex athrostachya		
Carex brainerdii		
Carex fracta		
Carex heteroneura		
Carex hoodii		
Carex lenticularis var. *lipocarpa*		
Carex leporinella		
Carex multicostata		Including *C. pachycarpa*.
Carex nebrascensis		
Carex nervina		
Carex praegracilis		
Carex raynoldsii		
Carex rossii		
Carex subfusca		
Carex utriculata/vescicaria		Not flowering.
Carex whitneyi		
Eleocharis macrostachya	creeping spike-rush	
Scirpus congdonii		
Juncaceae	**Rush Family**	
Juncus balticus	Baltic rush	
Juncus bufonius	toad rush	
Juncus chlorocephalus	green-headed rush	
Juncus confusus		
Juncus effusus ssp. *pacificus*	soft rush	
Juncus ensifolius var. *brunnescens*	sword-leaved rush	
Juncus ensifolius var. *montanus*		
Juncus exiguus		
Juncus nevadensis		
Juncus orthopyllus		
Juncus parryi		
Luzula divaricata		
Liliaceae	**Lily Family**	
Calochortus leichtlinii	mariposa lily	
Lilium parvum	Sierra lily	
Melanthiaceae	**False-Hellebore Family**	
Toxicoscordion venenosum var. *venenosum*	death camas	
Veratrum californicum	corn lily; false hellebore	

Orchidaceae	**Orchid Family**	
Platanthera dilatata var. *leucostachys*	white flowered bog orchid	
Poaceae	**Grass Family**	
Agrostis exarata	spike bent grass	
**Agrostis gigantea*	redtop	
Agrostis humilis	bent grass	
Agrostis scabra	rough bent grass	
Agrostis stolonifera	creeping bent grass	
Agrostis variabilis	mountain bent grass	
Alopecurus pratensis	meadow foxtail	
Bromus carinatus	mountain brome	
**Bromus inermis*	smooth brome	
Calamagrostis canadensis	reed grass	
**Dactylis glomerata*	orchard grass	
Danthonia sp.	oat grass	
Deschampsia elongata	slender hair grass	
Elymus elymoides	squirrel-tail	
Elymus glaucus	blue wild-rye	
**Elymus hispidus (Thinopyrum intermedium)*	pubescent wheatgrass	Probably cv. 'Luna'
Elymus (Pseudoroegneria) spicatus	bluebunch wheatgrass	
Elymus trachycaulus	slender wheatgrass	
Festuca (Lolium) perennis	Italian wild-rye	In lawn at base area.
**Festuca* sp.	hard fescue	*F. trachyphylla* or *viridula.*
Glyceria elata	manna grass	
Hordeum brachyantherum	meadow barley	
Melica stricta	rock melic	
Muhlenbergia andina	foxtail muhly	
Muhlenbergia filiformis	pull-up muhly	
**Phleum pratense*	field timothy	
**Poa annua*	annual bluegrass	
Poa pratensis	Kentucky bluegrass	Native/introduced status is still being debated.
Poa secunda	one-sided bluegrass	
Stipa (Achnatherum) hymenoides	Indian rice-grass	
Stipa (Achnatherum) nelsonii	Nelson's needle-grass	
Stipa (Achnatherum) occidentalis	western needle grass	
Torreyochloa pallida	false manna grass	
Trisetum spicatum	spike false oat	
Potamogetonaceae	**Pondweed Family**	
Stuckenia pectinata	fennel-leaf pondweed	
Ruscaceae		
Maianthemum (Smilacina) racemosa	false Solomon's seal	

Themidaceae		
Triteleia ixioides ssp. *scabra*		
Typhaceae	**Cattail Family**	
Sparganium sp.		In pond, barely within survey area.

Appendix B.

Element List for Nine-Quadrangle CNDDB Query

for

Squaw-Alpine Interconnect Project Site

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Truckee (3912032) OR Tahoe City (3912022) OR Wentworth Springs (3912013) OR Kings Beach (3912021) OR Meeks Bay (3912011) OR Martis Peak (3912031) OR Homewood (3912012) OR Norden (3912033) OR Granite Chief (3912023))
 AND Taxonomic Group IS (Dune OR Scrub OR Herbaceous OR Marsh OR Riparian OR Woodland OR Forest OR Alpine OR Inland Waters OR Marine OR Estuarine OR Riverine OR Palustrine OR Ferns OR Gymnosperms OR Monocots OR Dicots OR Lichens OR Bryophytes)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Arabis rigidissima var. demota Galena Creek rockcress	PDBRA061R1	None	None	G3T3Q	S1	1B.2
Artemisia tripartita ssp. tripartita threetip sagebrush	PDAST0S1S2	None	None	G5T4T5	S2	2B.3
Astragalus austiniae Austin's astragalus	PDFAB0F120	None	None	G2G3	S2S3	1B.3
Botrychium ascendens upswept moonwort	PPOPH010S0	None	None	G3G4	S2	2B.3
Botrychium crenulatum scalloped moonwort	PPOPH010L0	None	None	G4	S3	2B.2
Botrychium lunaria common moonwort	PPOPH01080	None	None	G5	S2	2B.3
Botrychium minganense Mingan moonwort	PPOPH010R0	None	None	G4G5	S3	2B.2
Botrychium montanum western goblin	PPOPH010K0	None	None	G3	S2	2B.1
Bruchia bolanderi Bolander's bruchia	NBMUS13010	None	None	G3G4	S3	4.2
Carex davyi Davy's sedge	PMCYP033H0	None	None	G3	S3	1B.3
Carex lasiocarpa woolly-fruited sedge	PMCYP03720	None	None	G5	S2	2B.3
Carex limosa mud sedge	PMCYP037K0	None	None	G5	S3	2B.2
Erigeron miser starved daisy	PDAST3M2K0	None	None	G3?	S3?	1B.3
Eriogonum umbellatum var. torreyanum Donner Pass buckwheat	PDPGN086U9	None	None	G5T2	S2	1B.2
Fen Fen	CTT51200CA	None	None	G2	S1.2	
Glyceria grandis American manna grass	PMPOA2Y080	None	None	G5	S3	2B.3

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

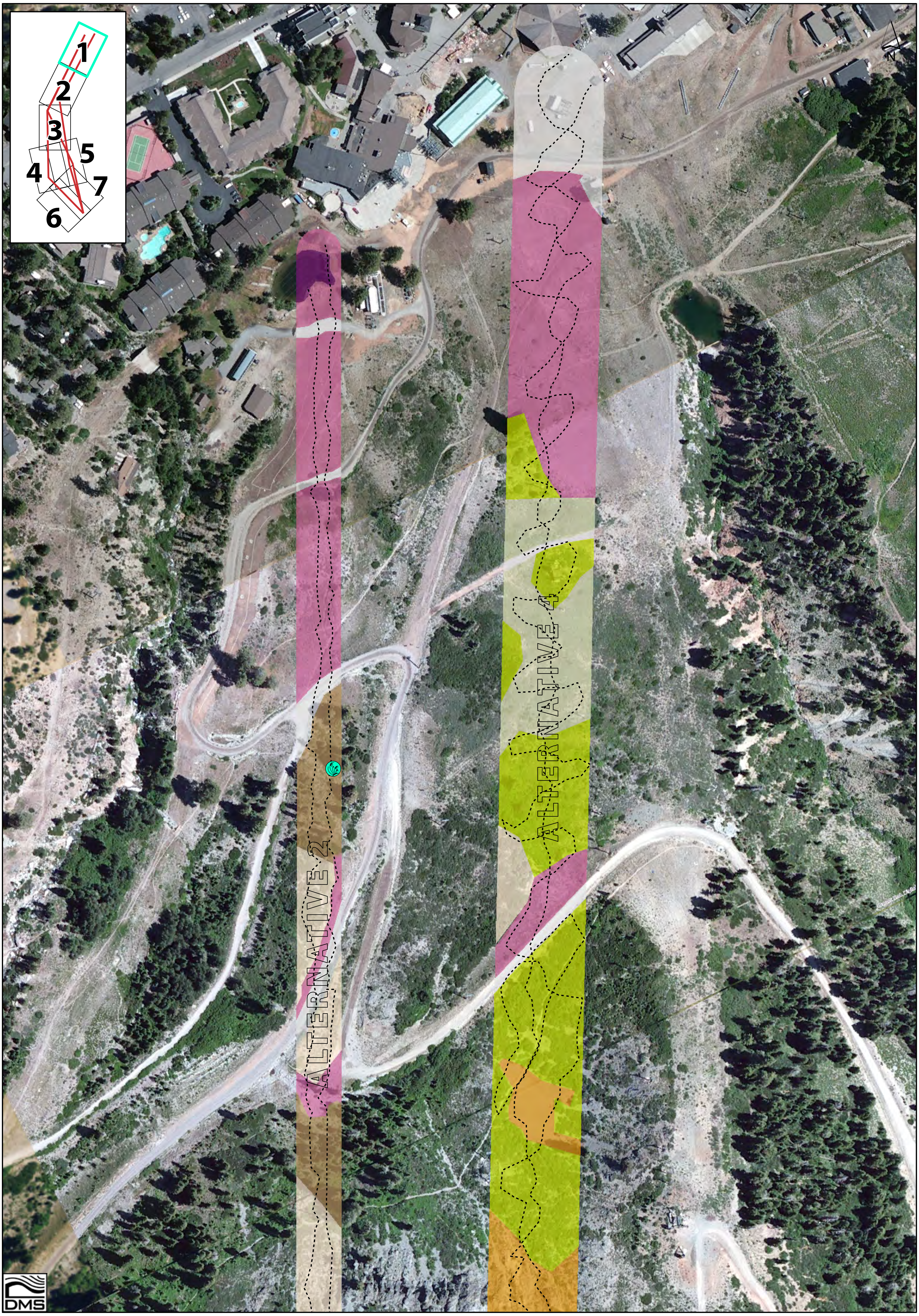
Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Great Basin Cutthroat Trout/Paiute Sculpin Stream Great Basin Cutthroat Trout/Paiute Sculpin Stream	CARC2320CA	None	None	GNR	SNR	
Ivesia sericoleuca Plumas ivesia	PDROS0X0K0	None	None	G2	S2	1B.2
Juncus luciensis Santa Lucia dwarf rush	PMJUN013J0	None	None	G3	S3	1B.2
Lewisia longipetala long-petaled lewisia	PDPOR040K0	None	None	G2	S2	1B.3
Nardia hiroshii Hiroshi's flapwort	NBHEP2A080	None	None	G5	S1	2B.3
Phacelia stebbinsii Stebbins' phacelia	PDHYD0C4D0	None	None	G3	S3	1B.2
Potamogeton epihydrus Nuttall's ribbon-leaved pondweed	PMPOT03080	None	None	G5	S2S3	2B.2
Potamogeton robbinsii Robbins' pondweed	PMPOT030Z0	None	None	G5	S3	2B.3
Rhamnus alnifolia alder buckthorn	PDRHA0C010	None	None	G5	S3	2B.2
Rorippa subumbellata Tahoe yellow cress	PDBRA270M0	None	Endangered	G1	S1	1B.1
Scutellaria galericulata marsh skullcap	PDLAM1U0J0	None	None	G5	S2	2B.2
Sphaeralcea munroana Munro's desert mallow	PDMAL140F0	None	None	G4	S1	2B.2
Stuckenia filiformis ssp. alpina slender-leaved pondweed	PMPOT03091	None	None	G5T5	S3	2B.2
Viola tomentosa felt-leaved violet	PDVIO04280	None	None	G3	S3	4.2

Record Count: 30

Appendix C.

Botanical Survey and Land Cover Map

Squaw-Alpine Interconnect Study Area



Squaw Alpine Interconnect Project
Figure 2. Botanical and Vegetation Study
Placer County, California

Page 1 of 7

0 100 200
Feet

Scale 1:2,400 (1 in = 200 ft)

Legend

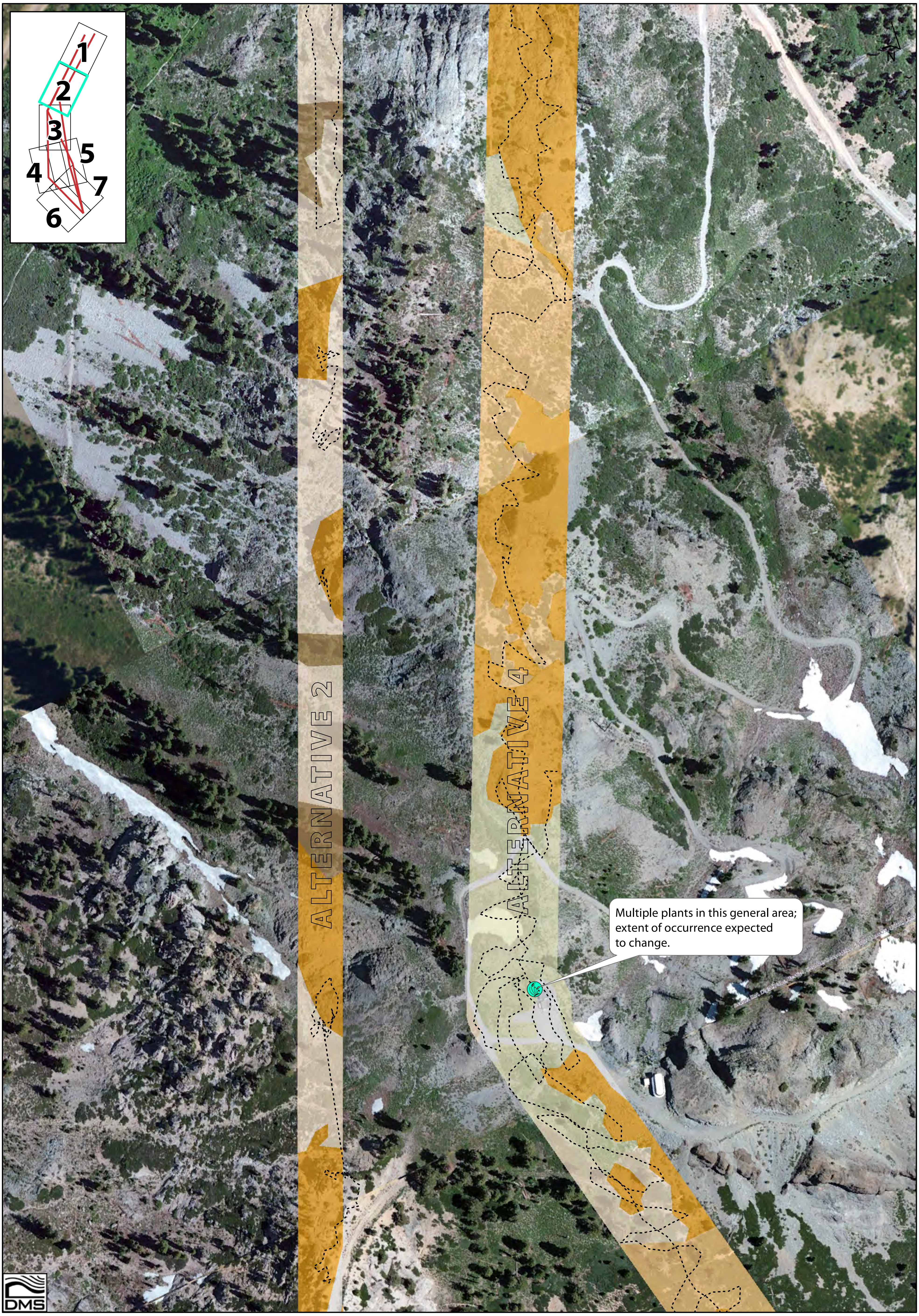
- Berteroa incana
- Lepidium latifolium
- Surveyed Tracks
- Coniferous Woodland
- Montane Chaparral
- Bitter Cherry Thicket
- Mountain Sagebrush - Forb
- Aspen
- Mesic and Riparian Shrubland
- Mountain Alder Thicket
- Freshwater Emergent Wetland
- Pond
- Tributary
- Rock and Talus
- Rock Outcrop
- Urban
- Ruderal

Notes

Rock and Talus includes both granitic and volcanic lithology. Mapping of wetlands and other waters is partial. Please refer to other baseline reports for additional information. Portions of some areas that were surveyed in the field are not represented by tracks shown on this figure.

Aerial Source: NAIP 2016, ESRI, Digital Globe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Map created by www.digitalmappingsolutions.com on 12/14/2017.



Squaw Alpine Interconnect Project
Figure 2. Botanical and Vegetation Study
Placer County, California

Page 2 of 7

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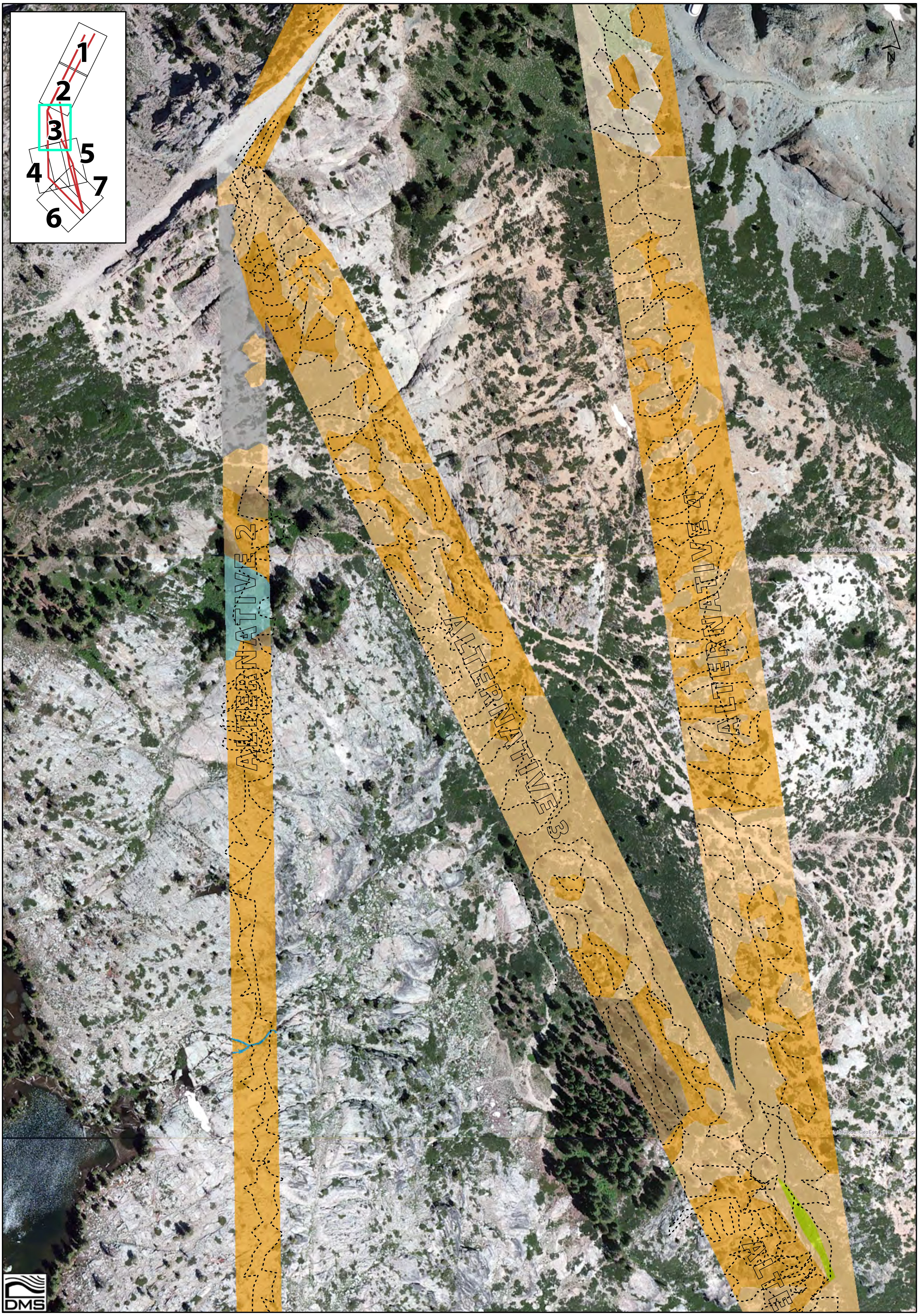

Squaw Alpine Interconnect Project
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Placer County, California

Page 3 of 7

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Placer County, California

Page 4 of 7

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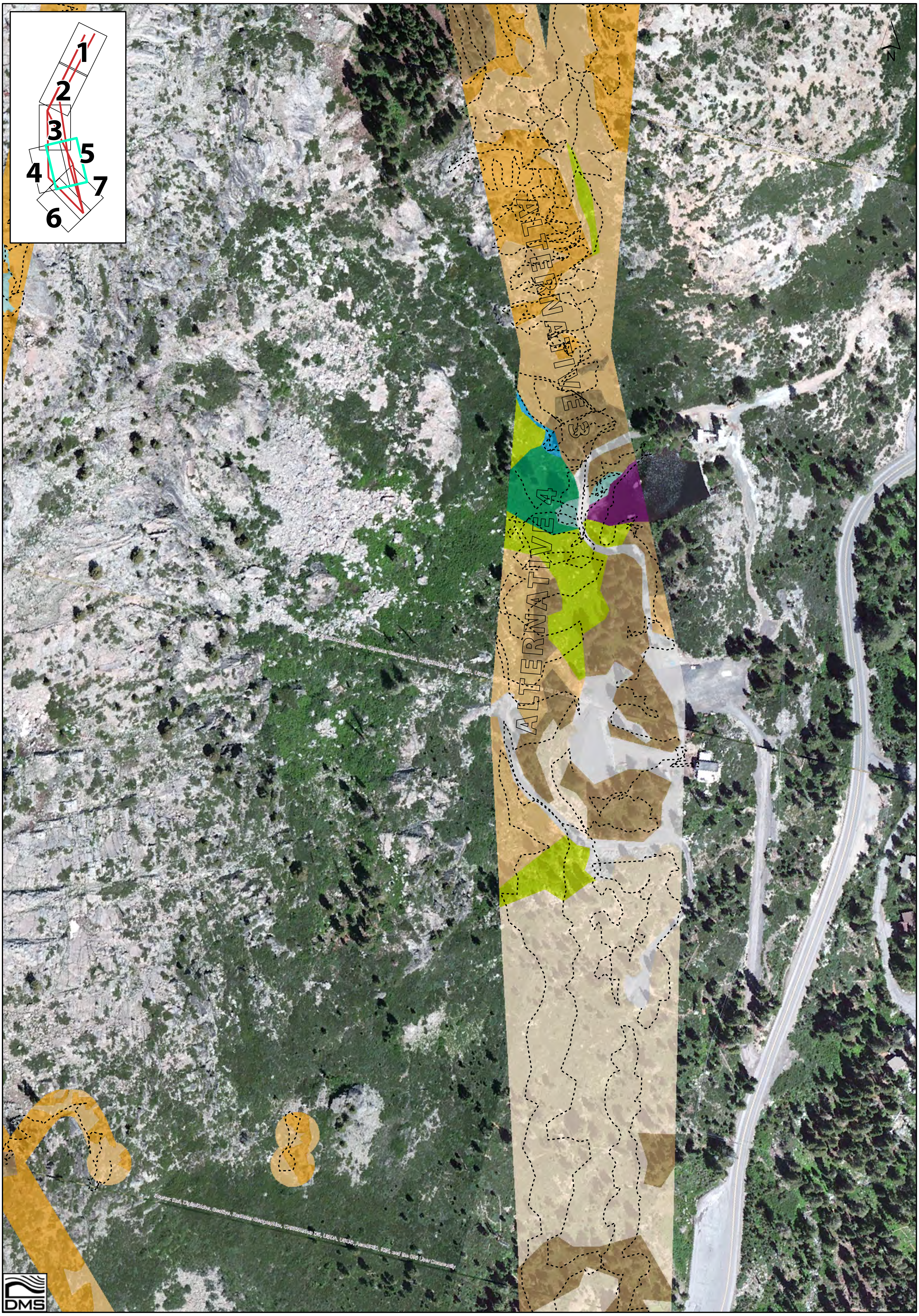

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Page 5 of 7

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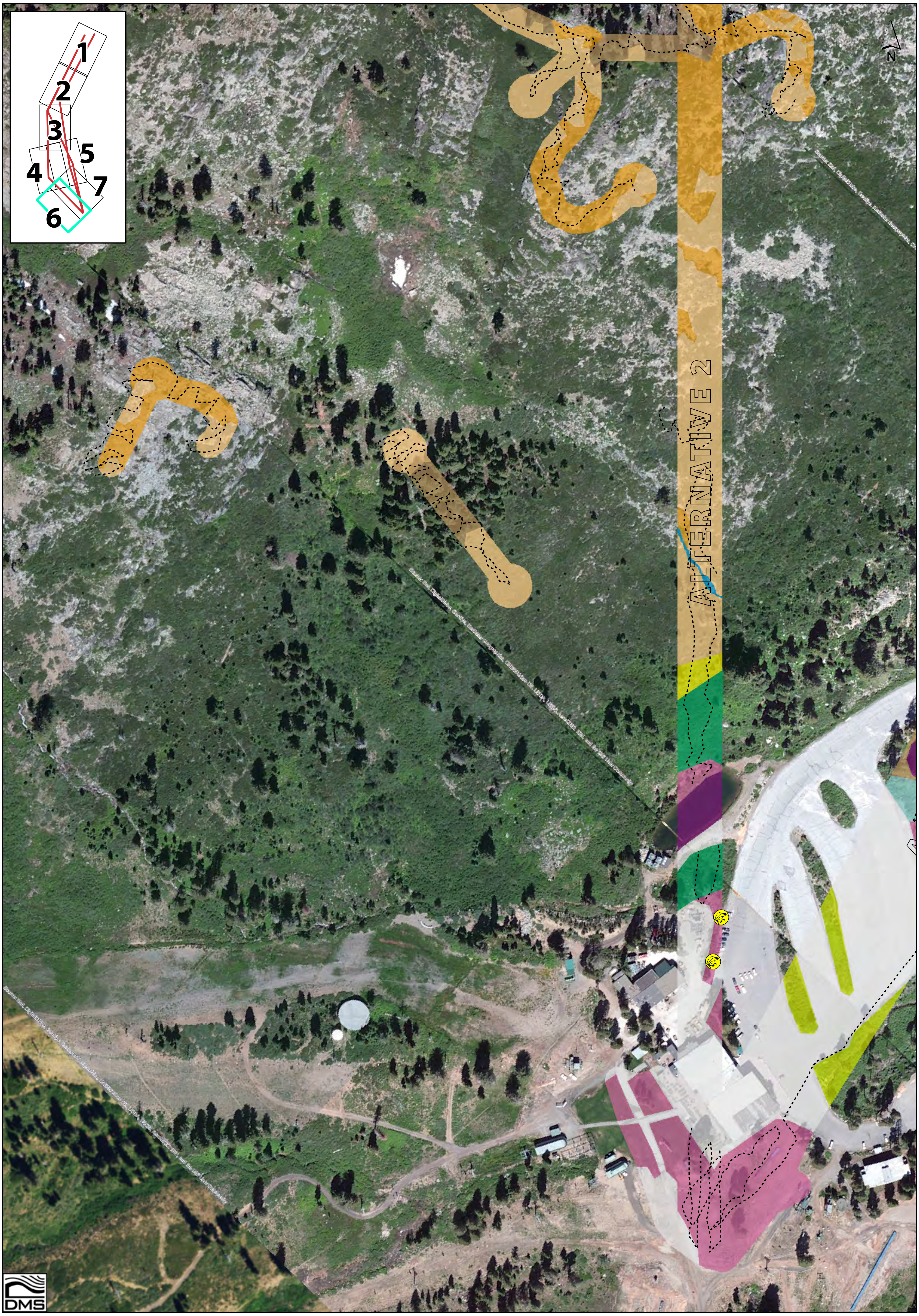

Squaw Alpine Interconnect Project
Figure 2. Botanical and Vegetation Study
Placer County, California

Page 6 of 7

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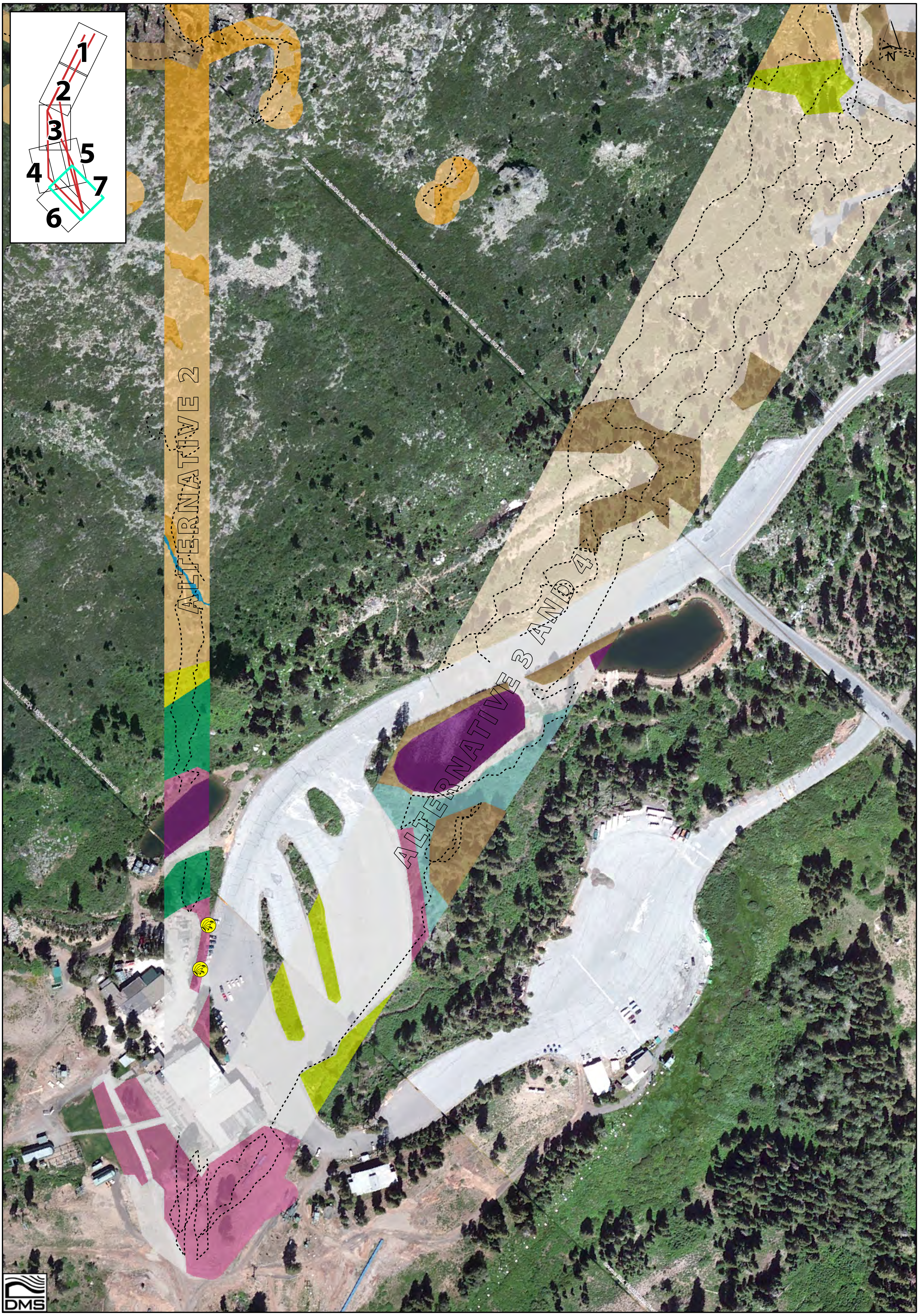

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Page 7 of 7

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Map created by www.digitalmappingsolutions.com on 12/14/2017.

H2

Animal Species Observed within the Study Area for the Squaw-Alpine Base to Base Gondola Project

Animal Species Observed within the Study Area for the Squaw-Alpine Base to Base Gondola Project

Common Name	Scientific Name
Birds	
American crow	*Corvus brachyrhynchos*
American dipper	*Cinclus mexicanus*
American goldfinch	*Spinus tristis*
American peregrine falcon	*Falco peregrinus anatum*
American robin	*Turdus migratorius*
Bald eagle	*Haliaeetus leucocephalus*
Band-tailed pigeon	*Patagioenas fasciata*
Barn swallow	*Hirundo rustica*
Brown-headed cowbird	*Molothrys ater*
Brown creeper	*Certhia americana*
Bushtit	*Psaltriparus minimus*
Calliope hummingbird	*Selasphorus calliope*
Cassin's finch	*Carpodacus cassinii*
Cassin's vireo	*Vireo cassinii*
Chipping sparrow	*Spizella passerina*
Clark's nutcracker	*Nucifraga columbiana*
Common goldeneye	*Bucephala clangula*
Common raven	*Corvus corax*
Cooper's hawk	*Accipiter cooperi*
Dark-eyed junco	*Junco hyemalis*
Evening grosbeak	*Coccothraustes vespertinus*
Fox sparrow	*Passerella iliaca*
Golden eagle	*Aquila chrysaetos*
Golden-crowned sparrow	*Zonotrichia atricapilla*
Golden-crowned kinglet	*Regulus satrapa*
Green-tailed towhee	*Pipilo chlorurus*
Hairy woodpecker	*Picoides villosus*
Hermit warbler	*Setophaga occidentalis*
House wren	*Troglodytes aedon*
House finch	*Carpodacus mexicanus*
Lewis's woodpecker	*Melanerpes lewis*
Mallard	*Anas platyrhynchos*
Mountain chickadee	*Poecile gambeli*
Northern flicker	*Colaptes auratus*
Northern saw-whet owl	*Aegolius acadicus*
Olive-sided flycatcher	*Contopus cooperi*
Pied-billed grebe	*Podilymbus podiceps*
Pygmy nuthatch	*Sitta pygmaea*
Red-breasted nuthatch	*Sitta canadensis*
Red-tailed hawk	*Buteo jamaicensis*
Rock wren	*Salpinctes obsoletus*
Rufous hummingbird	*Selasphorus rufus*
Sooty grouse	*Dendragapus fuliginosus*

Animal Species Observed within the Study Area for the Squaw-Alpine Base to Base Gondola Project

Common Name	Scientific Name
Steller's jay	*Cyanocitta stelleri*
Townsend's solitaire	*Myadestes townsendi*
Turkey vulture	*Cathartes aura*
Western tanager	*Piranga ludoviciana*
Western wood-pewee	*Contopus sordidulus*
White-headed woodpecker	*Picoides albolarvatus*
Williamson's sapsucker	*Sphyrapicus thyroideus*
Yellow-rumped warbler	*Setophaga coronata*
Yellow warbler	*Dendroica petechia*
Mammals	
Black bear	*Ursus americanus*
California ground squirrel	*Otospermophilus beecheyi*
Chipmunk	*Neotamias* sp.
Coyote	*Canis latrans*
Douglas' squirrel	*Tamias douglasii*
Golden-mantled ground squirrel	*Callospermophilis lateralis*
Mole	*Scapanus* sp.
Mule deer	*Odocoileus hemionus*
Raccoon	*Procyon lotor*
Yellow-bellied marmot	*Marmota flaviventris*
Yellow pine chipmunk	*Tamias amoenus*
Invertebrates	
Checkered white	*Pontia protodice*
Monarch butterfly	*Danaus plexippus*
Orange sulphur	*Colias eurytheme*
Water boatman	*Hesperocorixa vulgaris*
Water scavenger beetle	*Hydrophilidae* sp.
Water strider	*Gerris remigis*
Bumble bee	*Bombus* sp.
Honey bee	*Apis* sp.
Fish	
Rainbow trout	*Oncorhynchus mykiss*
Brown trout	*Salmo trutta*
Brook trout	*Salvelinus fontinalis*
Koi	*Cyprinus carpio*
Amphibians and Reptiles	
Common garter snake	*Thamnophis sirtalis*
Southern long-toed salamander	*Ambystoma macrodactylum*
Sierra garter snake	*Thamnophis couchii*
Sierra Nevada yellow-legged frog	*Rana sierrae*
Sierran treefrog=Pacific chorus frog	*Pseudacris sierra (Hyla regilla)*
Western terrestrial gartersnake	*Thamnophis elegans*
Western fence lizard	*Sceloporus occidentalis*

H3

California Natural Diversity Database Results

Selected Elements by Element Code

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: BIOS selection

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AAAAA01085	***Ambystoma macrodactylum sigillatum*** southern long-toed salamander	None	None	G5T4	S3	SSC
AAABH01340	***Rana sierrae*** Sierra Nevada yellow-legged frog	Endangered	Threatened	G1	S1	WL
ABNKC01010	***Pandion haliaetus*** osprey	None	None	G5	S4	WL
ABNKC10010	***Haliaeetus leucocephalus*** bald eagle	Delisted	Endangered	G5	S3	FP
ABNKC12040	***Accipiter cooperii*** Cooper's hawk	None	None	G5	S4	WL
ABNKC12060	***Accipiter gentilis*** northern goshawk	None	None	G5	S3	SSC
ABPAE33040	***Empidonax traillii*** willow flycatcher	None	Endangered	G5	S1S2	
ABPBX03010	***Setophaga petechia*** yellow warbler	None	None	G5	S3S4	SSC
AFCHA02081	***Oncorhynchus clarkii henshawi*** Lahontan cutthroat trout	Threatened	None	G4T3	S2	
AMACC01110	***Myotis volans*** long-legged myotis	None	None	G5	S3	
AMAEA0102H	***Ochotona princeps schisticeps*** gray-headed pika	None	None	G5T2T4	S2S4	
AMAEB03012	***Lepus americanus tahoensis*** Sierra Nevada snowshoe hare	None	None	G5T3T4Q	S2	SSC
AMAEB03041	***Lepus townsendii townsendii*** western white-tailed jackrabbit	None	None	G5T5	S3?	SSC
AMAFA01013	***Aplodontia rufa californica*** Sierra Nevada mountain beaver	None	None	G5T3T4	S2S3	SSC
AMAFJ01010	***Erethizon dorsatum*** North American porcupine	None	None	G5	S3	
AMAJF01014	***Martes caurina sierrae*** Sierra marten	None	None	G5T3	S3	
AMAJF01021	***Pekania pennanti*** fisher - West Coast DPS	None	Candidate Threatened	G5T2T3Q	S2S3	SSC
AMAJF03010	***Gulo gulo*** California wolverine	Proposed Threatened	Threatened	G4	S1	FP
ICMAL05970	***Stygobromus lacicolus*** Lake Tahoe amphipod	None	None	G1	S1	
ICMAL05A70	***Stygobromus tahoensis*** Lake Tahoe stygobromid	None	None	G1	S1	

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
IIPLE03200	***Capnia lacustra*** Lake Tahoe benthic stonefly	None	None	G1	S1	
IITRI11010	***Cryptochia excella*** Kings Canyon cryptochian caddisfly	None	None	G1G2	S1S2	
IITRI77010	***Desmona bethula*** amphibious caddisfly	None	None	G2G3	S2S3	
IMBIV27020	***Margaritifera falcata*** western pearlshell	None	None	G4G5	S1S2	
IMGASM6020	***Helisoma newberryi*** Great Basin rams-horn	None	None	G1	S1S2	
PDAST0S1S2	***Artemisia tripartita ssp. tripartita*** threetip sagebrush	None	None	G5T4T5	S2	2B.3
PDAST3M2K0	***Erigeron miser*** starved daisy	None	None	G3?	S3?	1B.3
PDBRA061R1	***Arabis rigidissima var. demota*** Galena Creek rockcress	None	None	G3T3Q	S1	1B.2
PDBRA270M0	***Rorippa subumbellata*** Tahoe yellow cress	None	Endangered	G1	S1	1B.1
PDFAB0F120	***Astragalus austiniae*** Austin's astragalus	None	None	G2G3	S2S3	1B.3
PDHYD0C4D0	***Phacelia stebbinsii*** Stebbins' phacelia	None	None	G3	S3	1B.2
PDMAL140F0	***Sphaeralcea munroana*** Munro's desert mallow	None	None	G4	S1	2B.2
PDPGN086U9	***Eriogonum umbellatum var. torreyanum*** Donner Pass buckwheat	None	None	G5T2	S2	1B.2
PDPOR040K0	***Lewisia longipetala*** long-petaled lewisia	None	None	G2	S2	1B.3
PDRHA0C010	***Rhamnus alnifolia*** alder buckthorn	None	None	G5	S3	2B.2
PDROS0X0K0	***Ivesia sericoleuca*** Plumas ivesia	None	None	G2	S2	1B.2
PDVIO04280	***Viola tomentosa*** felt-leaved violet	None	None	G3	S3	4.2
PMCYP033H0	***Carex davyi*** Davy's sedge	None	None	G3	S3	1B.3
PMPOA2Y080	***Glyceria grandis*** American manna grass	None	None	G5	S3	2B.3
PMPOT03080	***Potamogeton epihydrus*** Nuttall's ribbon-leaved pondweed	None	None	G5	S2S3	2B.2
PMPOT030Z0	***Potamogeton robbinsii*** Robbins' pondweed	None	None	G5	S3	2B.3

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
PPOPH010L0	***Botrychium crenulatum*** scalloped moonwort	None	None	G4	S3	2B.2
PPOPH010R0	***Botrychium minganense*** Mingan moonwort	None	None	G4G5	S3	2B.2
PPOPH010S0	***Botrychium ascendens*** upswept moonwort	None	None	G3G4	S2	2B.3

Record Count: 44

H4

USDA Forest Service

Sensitive Animal Species by Forest List

USDA Forest Service, Pacific Southwest Region

Sensitive Animal Species by Forest

6/30/2013; Updated 9/9/2013

Scientific Name	Common Name	Angeles	Cleveland	Eldorado	Inyo	Klamath	Lassen	Los Padres	Mendocino	Modoc	Plumas	San Bernardino	Sequoia	Shasta-Trinity	Sierra	Six Rivers	Stanislaus	Tahoe	Lake Tahoe Basin
BIRDS (12)																			
Accipiter gentilis	Northern goshawk	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Campylorhynchus brunneicapillus sandiegensis	San Diego cactus wren		X									X							
Centrocercus urophasianus	Greater sage-grouse				X					X									
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	X	X		X							X	X			X			
Coturnicops noveboracensis	Yellow rail						X							X					
Empidonax traillii	Willow flycatcher			X	X	X	X	X	X		X	X	X	X	X		X	X	X
Grus canadensis tabida	Greater sandhill crane					X	X			X	X							X	
Haliaeetus leucocephalus	Bald eagle	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pelicanus occidentalis	Brown pelican		X					X				X							
Strix nebulosa	Great gray owl			X	X	X	X			X	X		X		X		X	X	X
Strix occidentalis occidentalis	California spotted owl	X	X	X	X		X	X		X	X	X	X		X		X	X	X
Vireo vicinior	Gray vireo	X	X									X							
MAMMALS (13)																			
Antrozous pallidus	Pallid bat	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Brachylagus idahoensis	Pygmy rabbit				X					X									
Corynorhinus townsendii	Townsend's big-eared bat	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Glaucomys sabrinus californicus	San Bernardino flying squirrel											X							
Gulo gulo luscus	North American wolverine			X	X	X	X		X	X	X		X	X	X	X	X	X	X
Martes caurina	Pacific marten			X	X	X	X		X	X	X		X	X	X	X	X	X	X
Pekania pennanti	Fisher			X	X	X	X		X		X		X	X	X	X	X	X	
Myotis thysanodes	Fringed myotis	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ovis canadensis nelsoni	San Gabriel Mountains bighorn sheep	X										X							
Perognathus alticolus alticolus	White-eared pocket mouse											X							
Perognathus alticolus inexpectatus	Tehachapi pocket mouse	X						X											
Tamias speciosus callipeplus	Mount Pinos lodgepole chipmunk							X											
Vulpes vulpes necator	Sierra Nevada red fox				?		X										X		
AMPHIBIANS (21)																			
Anaxyrus canorus	Yosemite toad			X	X										X		X		
Anaxyrus exsul	Black toad				X														
Batrachoseps bramei	Fairview slender salamander												X						
Batrachoseps campi	Inyo Mountain salamander				X														
Batrachoseps gabrieli	San Gabriel Mountains slender salamander	X										X							
Batrachoseps incognitus	San Simeon slender salamander							X											
Batrachoseps minor	Lesser slender salamander							X											
Batrachoseps regius	Kings River slender salamander														X				
Batrachoseps relictus	Relictual slender salamander												X						
Batrachoseps simatus	Kern Canyon slender salamander												X						
Ensatina eschscholtzii croceater	Yellow-blotched salamander	X						X					X						
Ensatina eschscholtzii klauberi	Large-blotched salamander		X									X							
Hydromantes brunus	Limestone salamander														X		X		
Hydromantes shastae	Shasta salamander													X					
Plethodon stormi	Siskiyou Mountain salamander					X													

Scientific Name	Common Name	Angeles	Cleveland	Eldorado	Inyo	Klamath	Lassen	Los Padres	Mendocino	Modoc	Plumas	San Bernardino	Sequoia	Shasta-Trinity	Sierra	Six Rivers	Stanislaus	Tahoe	Lake Tahoe Basin
Rana aurora aurora	Northern red-legged frog													X		X			
Rana boylii	Foothill yellow-legged frog			X		X	X	X	X		X		X	X	X	X	X	X	
Rana cascadae	Cascade frog					X	X							X					
Rana muscosa	Mountain yellow-legged frog: Southern Sierra DPS				X								X						
Rana sierrae	Sierra Nevada yellow-legged frog			X	X		X				X				X		X	X	X
Rhyacotriton variegatus	Southern torrent salamander					X								X		X			
REPTILES (12)																			
Emys marmorata	Western pond turtle	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	
Anniella pulchra	California legless lizard	X	X					X				X	X						
Aspidoscelis hyperythra	Orange-throated whiptail		X									X							
Charina umbratica	Southern rubber boa											X							
Crotalus ruber ruber	Red diamond rattlesnake		X									X							
Diadophis punctatus modestus	San Bernardino ringneck snake	X						X				X							
Diadophis punctatus similus	San Diego ringneck snake		X									X							
Elgaria panamintina	Panamint alligator lizard				X														
Lampropeltis zonata parvirubra	San Bernardino Mountain kingsnake	X										X							
Lampropeltis zonata pulchra	San Diego Mountain kingsnake		X																
Lichanura orcutti	Coastal rosy boa or 3-lined boa	X	X									X							
Thamnophis hammondii	Two-striped garter snake	X	X					X				X							
INVERTEBRATES, TERRESTRIAL (24)																			
Bombus occidentalis	Western bumble bee			X		X	X			X	X			X		X		X	X
Danaus plexippus	Monarch butterfly							X											
Euphilotes baueri (battoides) vernalis	Vernal blue butterfly											X							
Euphilotes enoptes cryptorufes	Pratt's blue butterfly											X							
Euphilotes enoptes nr. *Dammersi*	Dammer's blue butterfly											X							
Euphydryas editha bingi	Bing's checkerspot butterfly									X									
Euphydryas editha ehrlichi	Ehrlich's checkerspot butterfly											X							
Euphydryas editha karinae	Karin's checkerspot butterfly								X										
Euphydryas editha monoensis	Mono Lake checkerspot butterfly				X														
Glaucopsyche piasus nr. *sagittegera*	Arrowhead blue butterfly											X							
Hermelyceana hermes	Hermes copper butterfly		X																
Incisalia mossii hidakupa	San Gabriel Mountains elfin											X							
Monadenia troglodytes troglodytes	Shasta sideband snail													X					
Monadenia troglodytes wintu	Wintu sideband snail													X					
Plebejus saepiolus aureolus	San Gabriel Mountains blue butterfly	X										X							
Plebulina emigdionis	San Emigdio blue butterfly	X			X							X							
Polites mardon	Mardon skipper															X			
Rothelix warnerfontis	Warner Spring shoulderband snail		X																
Speyeria egleis tehachapina	Tehachapi fritillary butterfly												X						
Speyeria nokomis apacheana	Apache silverspot butterfly				X														
Trilobopsis roperi	Shasta chaparral snail													X					
Trilobopsis tehamana	Tehama chaparral snail					X								X					
Vespericola pressleyi	Big Bar hesperian snail													X					
Vespericola shasta	Shasta hesperian snail						X							X					

Scientific Name	Common Name	Angeles	Cleveland	Eldorado	Inyo	Klamath	Lassen	Los Padres	Mendocino	Modoc	Plumas	San Bernardino	Sequoia	Shasta-Trinity	Sierra	Six Rivers	Stanislaus	Tahoe	Lake Tahoe Basin
INVERTEBRATES, AQUATIC - Mollusks (13)																			
Anodonta californiensis	California floater (freshwater mussel)						X			X				X		X		X	
Fluminicola seminalis	Nugget pebblesnail						X							X					
Helisoma newberryi newberryi	Great Basin rams-horn (snail)						X											X	X
Juga (Calibasis) acutifilosa	Topaz juga (snail)						X			X									
Juga chacei	Chace juga (snail)															X			
Juga nigrina	Black juga (snail)						X			X				X				X	
Juga (Calibasis) occata	Scalloped juga (snail)						X							X					
Lanx patelloides	Kneecap lanx (limpet)						X							X					
Pisidium (Cyclocalyx) ultramontanum	Montane peaclam						X							X					
Pristinicola hemphilli	Pristine springsnail															X			
Pyrgulopsis lasseni	Willow Creek pyrg (springsnail)									X									
Pyrgulopsis owensensis	Owen's Valley springsnail				X														
Pyrgulopsis wongi	Wong's springsnail				X														
FISHES (22)																			
Catostomus occidentalis lacusanserinus	Goose Lake sucker									X									
Entosphenus similis	Klamath River lamprey					X													
Entosphenus tridentatus	Pacific lamprey			X		X	X	X	X	X				X		X			
Gila bicolor pectinifer	Lahontan Lake tui chub																	X	X
Gila bicolor thallassina	Goose Lake tui chub									X									
Gila orcutti	Arroyo chub	X	X					X				X							
Lampetra hubbsi	Kern brook lamprey												X		X				
Lampetra richardsoni	Western brook lamprey					X			X							X			
Lampetra tridentata ssp.	Goose Lake lamprey									X									
Lavinia exilicauda chi	Clear Lake hitch								X										
Mylopharodon conocephalus	Hardhead			X			X		X	X	X		X	X	X		X	X	
Oncorhynchus clarkii	Coastal run cutthroat trout															X			
Oncorhynchus mykiss	Steelhead - Klamath Mountains Province ESU					X								X		X			
Oncorhynchus mykiss aguabonita	California golden trout				X								X						
Oncorhynchus mykiss aquilarum (pop 5)	Eagle Lake rainbow trout						X												
Oncorhynchus mykiss gilberti	Kern River rainbow trout												X						
Oncorhynchus mykiss pop 4	Warner Valley redband trout									X									
Oncorhynchus mykiss pop 6	Goose Lake redband trout						X			X									
Oncorhynchus mykiss pop 7	McCloud River redband trout													X					
Oncorhynchus tshawytscha	Upper Klamath-Trinity chinook ESU					X								X		X			
Oncorhynchus tshawytscha ssp.	SONCC Chinook salmon															X			
Rhinichthys osculus ssp 8	Santa Ana speckled dace	X	X									X							
R5 Total Sensitive Animals = 124	Total # Sensitive Animals per Forest	22	22	18	27	23	32	21	16	26	17	36	25	34	19	24	18	21	14
		ANG	CLE	ELD	INY	KNF	LAS	LP	MEN	MOD	PLU	SB	SEQ	S-T	SIE	6R	STAN	TAH	LTB

Note: Common names may not always meet official standards used by various scientific organizations, but have been edited for document consistency.
Only the first letter of the common name has been capitalized unless referring to a personal or geographic name.

H5

USFWS IPaC Resource List

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

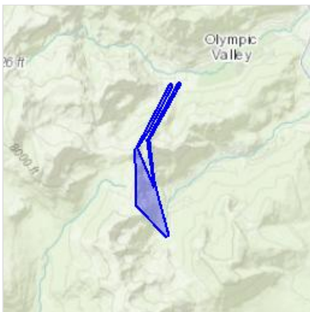
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Placer County, California



Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.

The following species are potentially affected by activities in this location:

Amphibians

NAME	STATUS
Sierra Nevada Yellow-legged Frog *Rana sierrae* There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/9529	Endangered

Fishes

NAME	STATUS
Lahontan Cutthroat Trout *Oncorhynchus clarkii henshawi* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3964	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Sierra Nevada Yellow-legged Frog *Rana sierrae* https://ecos.fws.gov/ecp/species/9529#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured. Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or are known to have particular vulnerabilities in your project location. To learn more about the levels of concern for birds on your list, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your specific project area. To see maps of where birders and the general public have sighted birds in and around your project area, visit E-bird tools such as the E-bird data mapping tool (search for the scientific name of a bird on your list to see specific locations where that bird has been reported to occur within your project area over a certain time-frame) and the E-bird Explore Data Tool (perform a query to see a list of all birds sighted in your county or region and within a certain time-frame). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list can be found below.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC), but is of concern in this area either because of the Eagle Act, or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Mar 20 to Sep 15
Black Swift Cypseloides niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8878	Breeds Jun 15 to Sep 10
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC), but is of concern in this area either because of the Eagle Act, or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Apr 1 to Aug 31
Lewis's Woodpecker Melanerpes lewis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9408	Breeds Apr 20 to Sep 30
Olive-sided Flycatcher Contopus cooperi This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Rufous Hummingbird selasphorus rufus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds elsewhere
Williamson's Sapsucker Sphyrapicus thyroideus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8832	Breeds May 1 to Jul 31
Willow Flycatcher Empidonax traillii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/3482	Breeds May 20 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in your project's counties during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the counties of your project area. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information.

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Such measures are particularly important when birds are most likely to occur in the project area. To see when birds are most likely to occur in your project area, view the Probability of Presence Summary. Special attention should be made to look for nests and avoid nest destruction during the breeding season. The best information about when birds are breeding can be found in Birds of North America (BNA) Online under the "Breeding Phenology" section of each species profile. Note that accessing this information may require a subscription. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) that might be affected by activities in your project location. These birds are of priority concern because it has been determined that without additional conservation actions, they are likely to become candidates for listing under the Endangered Species Act (ESA).

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets. The AKN list represents all birds reported to be occurring at some level throughout the year in the counties in which your project lies. That list is then narrowed to only the Birds of Conservation Concern for your project area.

Again, the Migratory Bird Resource list only includes species of particular priority concern, and is not representative of all birds that may occur in your project area. Although it is important to try to avoid and minimize impacts to all birds, special attention should be made to avoid and minimize impacts to birds of priority concern. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird entry on your migratory bird species list indicates a breeding season, it is probable the bird breeds in your project's counties at some point within the time-frame specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Avoidance and minimization measures should be implemented to reduce impacts to birds on your list, and all other birds that may occur in your project area. Nationwide Standard Conservation Measures can be applied for any project, regardless of project type or location.

If measures exist that are specific to your activity or to any of the species on your list that are confirmed to exist at your project area, these should also be considered for implementation in addition to the Nationwide Standard Conservation Measures. Implementation of avoidance and minimization measures is particularly important for BCC birds of rangewide concern.

If your project has the potential to disturb or kill eagles, you will need to obtain a permit to avoid violating the BGEPA should such impacts occur.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

Facilities

Wildlife refuges and fish hatcheries

REFUGE AND FISH HATCHERY INFORMATION IS NOT AVAILABLE AT THIS TIME

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND
PSSC

FRESHWATER POND
PUBHx

A full description for each wetland code can be found at the National Wetlands Inventory website: https://ecos.fws.gov/ipac/wetlands/decoder

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

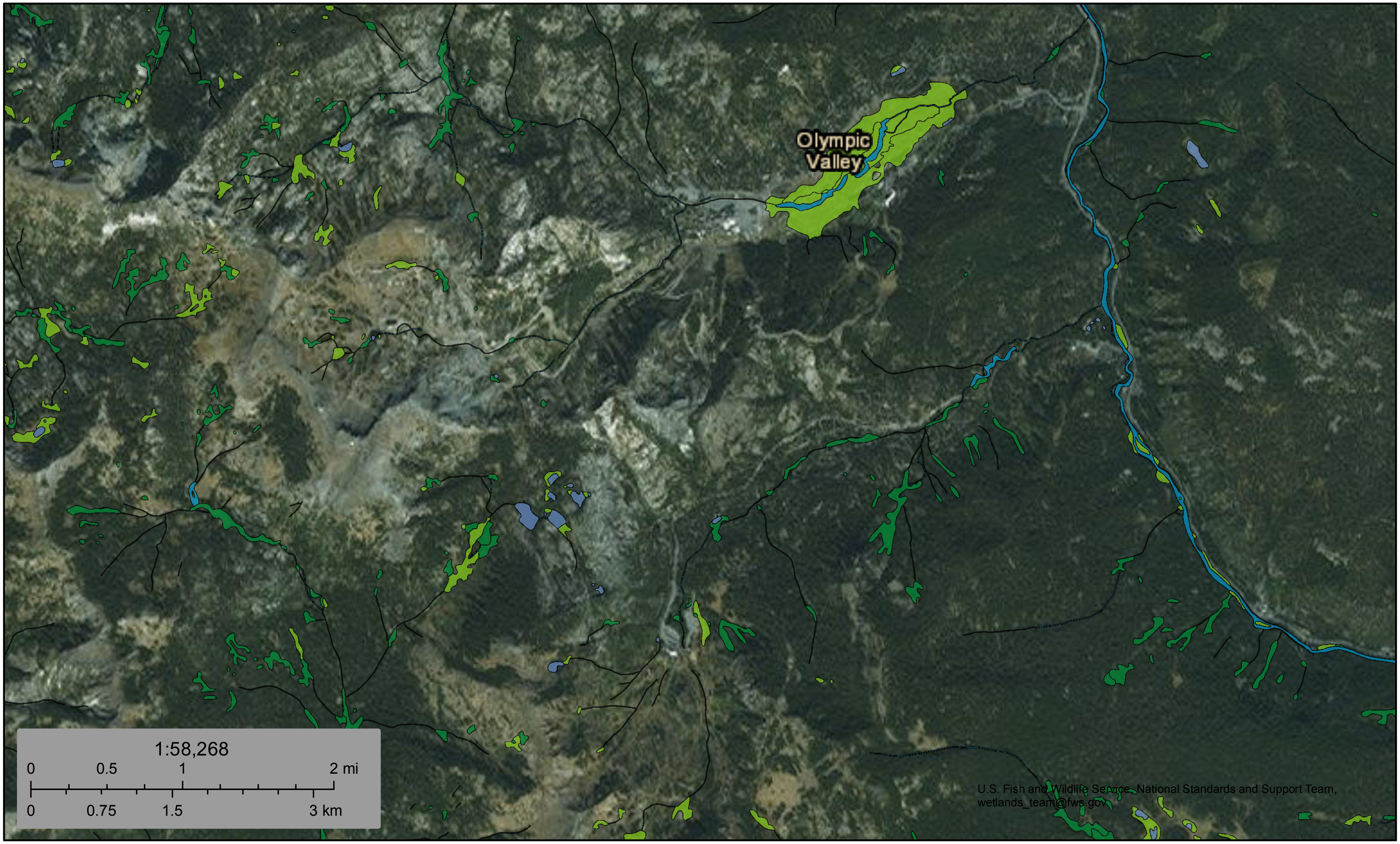
Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

U.S. Fish and Wildlife Service

National Wetlands Inventory

Squaw | Alpine Base-to-Base NWI January



January 5, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Appendix I

Mitigation Monitoring and Reporting Program

ACRONYMS AND ABBREVIATIONS

BMP	best management practice
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CUP	Conditional Use Permit
DRC	Placer County Development Review Committee
D/SRC	Placer County Design/Site Review Committee
EHS	Placer County Environmental Health Services
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
ESD	Placer County Engineering and Surveying Division
LRWQCB	Lahontan Regional Water Quality Control Board
MMRP	Mitigation Monitoring and Reporting Program
MS4	Municipal Separate Storm Sewer System
NAGPRA	Native American Graves Protection and Repatriation Act
NFS	National Forest System
NPDES	National Pollutant Discharge Elimination System
PRC	California Public Resources Code
PRC	Public Resources Code
RPM	Resource Protection Measure
SUP	Special Use Permit
SWPPP	storm water pollution prevention plan
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WBBZ	waterbody buffer zone
WEAP	Worker Environmental Awareness Program

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MITIGATION MONITORING AND REPORTING PROGRAM

The following Mitigation Monitoring and Reporting Program (MMRP) was prepared in compliance with the requirements of California Public Resources Code (PRC) Section 21081.6 and Section 15097 of the California Environmental Quality Act (CEQA) Guidelines. This MMRP identifies specific funding, timing, and monitoring requirements for implementation of all mitigation measures identified in the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) for the Squaw Valley |Alpine Meadows Base-to-Base Gondola Project. The project includes Resource Protection Measures (RPMs), which are included as part of the project to avoid, minimize, and compensate for environmental effects. The implementation of RPMs is considered in the environmental impact analysis in the EIS/EIR prepared for the project, and determinations of "less-than-significant" for various environmental effects are dependent on the implementation of RPMs. All RPMs provided in Appendix B of the EIS/EIR are adopted by Placer County as mitigation measures and are included in this MMRP. Because of the importance of the RPMs in avoiding, minimizing, and compensating for environmental effects resulting from the project, the RPMs are included in the MMRP in the same manner as mitigation measures.

STANDARD MITIGATION MONITORING PROGRAM

Placer County has adopted a standard mitigation monitoring program (Section 18.28.030 of the Placer County Environmental Review Ordinance) to implement PRC Section 21081.6. This program requires that mitigation measures recommended for discretionary projects, such as the Squaw Valley|Alpine Meadows Base-to-Base Gondola Project, be included in the conditions of approval monitored by the County through a variety of permit processes as listed below.

- Development Review Committee
- Improvements Plan Approval
- Improvements Construction Inspection
- Encroachment Permit
- Final Map Recordation
- Acceptance of Project as Complete
- Building Permit Approval

As stated above, for the Squaw Valley |Alpine Meadows Base-to-Base Gondola Project, RPMs are treated in the same manner as mitigation measures. Therefore, RPMs identified in this MMRP would also be included in the conditions of approval and permit processes as applicable. Many of the RPMs are based on language included in the Placer County standard conditions of approval; therefore, including the RPMs in the MMRP strengthens the nexus between this MMRP and County approvals and permits.

Responsibility for ensuring that required RPMs are implemented rests with the Forest Service and Placer County; in some cases, it is a joint responsibility, whereas in others it is agency-specific. Some RPMs also include participation by regulatory agencies, such as the U.S. Fish and Wildlife Service, the California Department of Fish and Wildlife, and the Placer County Air Pollution Control District. When the enforcement of an RPM is the responsibility of the Forest Service, the ultimate enforcement mechanism will be compliance with the terms and conditions of the Ski Area Term Permit and associated Construction and Operation Plans administered by the Forest Service Mountain Sports Administrator, the District Ranger, and the Forest Supervisor. When the enforcement of an RPM is the responsibility Placer County, the ultimate enforcement mechanism will be contained within this MMRP and conditions of approval within the conditional use permit.

MMRP and Required Approvals and Permits/Format of Table

The issuance of any of the listed permits or County actions must be preceded by verification by County staff that applicable conditions of approval/mitigation measures have been met. This verification shall serve as the required monitoring for those specific conditions of approval/mitigation measures that can be met at the time of permit issuance/County authorization, such as required content on improvement plans. Because some conditions of approval/mitigation measures cannot be implemented until after construction is initiated or the project has begun operation, such as implementation of post-construction site restoration, verification of this category of conditions of approval/mitigation measures would occur after some permits and authorizations have been provided. However, all of the mitigation measures and RPMs for the Squaw Valley |Alpine Meadows Base-to-Base Gondola Project included in the EIS/EIR would be monitored through the County's Standard Mitigation Monitoring Program. As indicated in the text of each mitigation measure/RPM and/or within this MMRP, compliance with each would be verified by the County at an appropriate time in the project implementation process. Table 1 identifies each mitigation measure/RPM that would be monitored through the County's Standard Mitigation Monitoring Program. The timing for beginning implementation of each mitigation measure/RPM is identified in the column titled "Timing of Initial Action" in Table 1 (below). The frequency and duration of monitoring, whether ongoing or a single event, is described in the last column of Table 1. Finally, in the column titled "Agency Responsible for Monitoring and Verifying Compliance" the agency or agencies, agency department(s), and/or individual agency personnel responsible for monitoring and verifying compliance with each RPM or mitigation measure is identified.

Table 1 is organized as follows: RPMs are listed first, followed by mitigation measures. RPMs are presented in the following categories:

- Review and Approval Process (REV),
- Multiple Resources (MUL),
- Recreation (REC),
- Scenic Resources (SCE),
- Public Safety/Hazards (HAZ),
- Utilities (UTL),
- Noise (NOI),
- Air Quality (AQ),
- Biological Resources (BIO),
- Soil and Erosion (SOILS),
- Hydrology and Water Quality (WQ),
- Tree Removal (TREE), and
- Cultural Resources (CUL).

The same numbering system for mitigation measures (4.10-1a, 4.10-1b, 4.10-2, etc.) and RPMs (SCE-1, BIO-3) used in the EIS/EIR is carried over from the EIS/EIR discussion into the table. If an issue addressed in the EIS/EIR does not result in mitigation or RPMs, it is not included in the table; however, an issue not addressed in detail in the EIS/EIR may nonetheless be addressed by the above RPM categories (e.g., Cultural resources are "scoped out" of the EIS/EIR because there is no evidence of cultural resources being present in the project area and there is no specific cultural resources section in the EIS/EIR. However, RPMs addressing cultural resources are provided conveying common best practices to address an unanticipated subsurface find is one encountered during construction.).

A statement shall be included on the Improvement Plans submitted to Placer County and all permits where Placer County has jurisdiction indicating that all RPMs and mitigation measures included in this MMRP and all conditions of project approval shall be adhered to.

Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
Review and Approval Process			
RPM REV-1 The applicant will prepare and submit Improvement Plans, specifications, and cost estimates (per the requirements of Section II of the Land Development Manual that are in effect at the time of submittal) to the Placer County Engineering and Surveying Division (ESD) for ESD review and approval. The same plans shall be submitted by the applicant to the Forest Service for their review and comment. All Placer County Improvement Plans (and Forest Service Construction and Operation Plans) shall show the entire alignment and project design of the gondola on private and public lands, and all physical improvements as required by the conditions for the project as well as pertinent topographical features both on and off site. All existing and proposed utilities and easements, on site and adjacent to the project, which may be affected by planned construction, shall be shown on the plans. The applicant shall pay plan check and inspection fees and Placer County Fire Department improvement plan review and inspection fees with the 1st Improvement Plan submittal. It is the applicant's responsibility to obtain all required agency signatures on the plans and to secure department approvals. If the Placer County Design/Site Review process and/or Development Review Committee (DRC) review is required as a condition of approval for the project, said review process shall be completed prior to submittal of Improvement Plans. Record drawings shall be prepared and signed by a California Registered Civil Engineer at the applicant's expense and shall be submitted to the ESD in both hard copy and electronic versions in a format to be approved by the ESD prior to acceptance by the County of site improvements. Any Building Permits associated with this project shall not be issued until, at a minimum, the Improvement Plans are approved by the ESD and confirmation from the Forest Service that the project on Forest Service lands conforms to all relevant Forest Service regulations, standards, Special Use Permit conditions and RPMs listed in this table. All contents of the approved Improvement Plans and Forest Service Construction and Operation Plans, including drawings, specifications, and notes, must be implemented by the applicant. All plans developed and/or financed for the proposed project will be reviewed by the Forest Service and Placer County to ensure they are consistent with the Biological Opinion. This includes but is not limited to: erosion and sediment control plans/SWPPP, construction and operation plans, improvement plans, design plans, construction emission/dust control plan, invasive/noxious weed infestation treatments, and revegetation plans.	Forest Service and Placer County ESD	Obtain ESD approval and Forest Service Authorization of Improvement Plans/Operating Plans prior to issuance of building permits	Obtain ESD approval and Forest Service authorization of Improvement Plans/Operating Plans prior to issuance of building permits. Then also monitor implementation of contents of the Improvement Plans after approval of the plans
RPM REV-2 Prior to Improvement Plan approval, the applicant shall prepare and submit an erosion and sediment control plan or a stormwater pollution prevention plan (SWPPP), including site-specific construction site best management practices (BMPs), for County and Forest Service review and approval, as required by the National Pollutant Discharge Elimination System (NPDES) Phase II Municipal Separate Storm Sewer System (MS4) Permit. The County and Forest Service shall review and approve any proposed revisions to the approved erosion and sediment control plan or SWPPP. The plan or SWPPP shall include the rationale used in selecting BMPs including supporting soil loss calculations, if necessary. The plan or SWPPP shall also include a list of applicable permits directly associated with the grading activity, including, but not limited to the State Water Board's Construction General Plan, State Water Board 401 Water Quality Certification, U.S. Army Corps of Engineers (USACE) 404 permit, and California Department of Fish and Wildlife (CDFW) 1600 Agreement. The applicant shall submit evidence to the County that all permits directly associated with the grading activity have been obtained prior to Improvement Plan Approval.	Forest Service and Placer County	Submit erosion and sediment control plan or SWPPP prior to Improvement Plan approval; submit evidence to the County that all permits directly associated with the grading activity have been obtained prior to Improvement Plan approval	Completion prior to Improvement Plan approval

[1]A statement shall be included on the Improvement Plans submitted to Placer County and all permits where Placer County has jurisdiction indicating that all RPMs and mitigation measures included in this MMRP and all conditions of project approval shall be adhered to.

Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM REV-3 Construction and Operation Plans and maps for activities on National Forest System (NFS) lands will be reviewed and approved by the Forest Service prior to the initiation of any part of project construction on NFS lands, including tree removal. The plans shall show the entire alignment and project design of the gondola on both private and public lands. Plan/map review will be used to ensure sensitive areas are adequately represented on the map or on the ground, including stream courses and their respective protection limits, waterbody buffer zones (WBBZs), and limits of operations within WBBZ in accordance with the Lahontan Regional Water Quality Control Board (LRWQCB) Board Order R6-T-2014-0030. GPS information is also included in the project record to identify and record locations of sensitive areas. These same maps shall be submitted by the applicant to Placer County for review and comment.	Forest Service	Forest Service review and approve Construction and Operation Plans prior to the initiation of any part of project construction on NFS lands, including tree removal	Completion prior to the initiation of any part of project construction on NFS lands, including tree removal
RPM REV-4 Placer County General Plan Policy C-2, in the Housing Element, requires that new development in the Sierra Nevada provide housing for a minimum of 50 percent of the full-time equivalent employees (FTEEs) generated by a development project. Because the gondola project would generate 10 new employment positions (two full-time, year-round employment positions and eight full-time, seasonal positions) or six FTEEs, housing would need to be provided for three employees. The applicant shall meet this obligation by providing on-site housing, dedicating land for needed units, and/or securing units elsewhere. If it can be demonstrated to the County that these mechanisms are infeasible, the applicant may pay an in-lieu fee. Prior to the approval of Improvement Plans the applicant shall provide Placer County verification of compliance with General Plan Policy C-2.	Placer County Planning Services Division	Prior to the approval of Improvement Plans	Completion prior to the approval of Improvement Plans
Multiple Resources			
RPM MUL-1 As project design and construction proceed, there is the potential that new locations may be added to the construction disturbance area (e.g., temporary access roads, temporary staging areas). If this occurs, Squaw Valley Ski Holdings will complete botanical, wildlife, wetland, and cultural resources surveys, and a Non-Native Plant Risk Assessment for any areas not previously surveyed. Survey methods will follow preconstruction survey requirements provided in other RPMs. Survey results will be reported to the Forest Service and Placer County and applicable RPMs, and therefore mitigation measures, will be applied based on the resources present. Coordination with, and authorization from other agencies (e.g., U.S. Fish and Wildlife Service [USFWS], USACE, CDFW, LRWQCB) will be undertaken as applicable. Use of any new location cannot begin until authorization is received from the Forest Service and Placer County and any other applicable regulatory agencies.	Forest Service and Placer County	Prior to the use of any new locations within the construction disturbance area	Completion prior to the use of any new locations within the construction disturbance area
RPM MUL-2 The Improvement Plan(s) and Construction and Operation Plans submitted to Placer County and the Forest Service for review and approval shall identify the stockpiling and/or vehicle staging areas with locations as far as practical from existing dwellings and protected resources in the area. Work areas shall be clearly marked with fencing, staking, flagging, or another appropriate material. All project personnel and equipment will be confined to delineated work areas. In the event that work must occur outside of the work area, approval from lead and other agencies with jurisdiction over the property will be obtained prior to the commencement of activities. Fencing/flagging of resource exclusion area (e.g., aquatic habitats, invasive weed infestations) are addressed in RPMs specific to these resources.	Forest Service and Placer County	Concurrent with the submittal of Improvement Plan(s)/Operating Plans	Verify inclusion of required content during review of Improvement Plan(s)/Operating Plans. Verify that required actions are implemented during construction.

[1]A statement shall be included on the Improvement Plans submitted to Placer County and all permits where Placer County has jurisdiction indicating that all RPMs and mitigation measures included in this MMRP and all conditions of project approval shall be adhered to.

Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM MUL-3 To the maximum extent possible, use existing roads to access the project site and construction area. Temporary access routes and overland travel routes must be approved by the Forest Service and Placer County before use. The Forest Service and Placer County will ensure that any new proposed access routes and overland travel are consistent with the Biological Opinion. *BMP 2.1*	Forest Service and Placer County	Use existing roads to access the project site and construction area during construction; Obtain approval from the Forest Service and Placer County for temporary access routes and overland travel routes before use	Approval prior to use of temporary access routes and overland travel routes. Ongoing monitoring during construction.
RPM MUL-4 For Alternative 2, the Alpine Meadows mid-station may be open to skier entry/exit through April 15th only, to minimize the potential for adverse effects on Sierra Nevada yellow-legged frog at Barstool Lake. For Alternatives 3 and 4, skier entry/exit at the Alpine Meadows mid-station will correspond directly with overall gondola operation. The only operation during the non-winter/ski season would be for short periods associated with maintenance and testing, including occasionally moving individual cabins, or small numbers of cabins, across the system. These operational conditions will be reflected in the Forest Service special use permit (SUP) and the Placer County Conditional Use Permit (CUP).	Forest Service and Placer County	Include condition in SUP and CUP; Ongoing compliance monitoring during project operation	Continuously during project operation
RPM MUL-5 At least one environmental monitor, as specified by Placer County, Forest Service or other permitting authority requirements, will be on-site during all construction activities where environmental resources could be adversely affected. The project applicant shall work with Placer County and the Forest Service to identify the specific construction activities that may not require environmental monitoring (e.g., electrical work inside base-terminals). Environmental monitors will be qualified to address the environmental resources being protected (e.g., biological, cultural) per the requirements of each applicable RPM and approved by the Forest Service and Placer County. Unless specified otherwise in other RPMs, monitors will be allowed to cover up to 0.75-mile of the project area at once to allow multiple crews to work in close proximity to each other at the same time. Environmental monitors will have the authority to stop work or direct work to help ensure the protection of resources and compliance with all permits.	Forest Service and Placer County	During construction	Continuously during project construction
RPM MUL-6 Squaw Valley Ski Holdings will design and, with approval by the Forest Service and Placer County, implement a Worker Environmental Awareness Program (WEAP) that will be provided to all construction personnel and supervisors. Prior to construction, all Squaw Valley Ski Holdings, contractor, and subcontractor project personnel will receive training from qualified resource specialists regarding the appropriate work practices necessary to effectively implement the RPMs and any mitigation measures, and to comply with the applicable environmental laws and regulations. Gondola maintenance and operations staff will also be provided relevant WEAP related training materials on an annual basis. The training will identify appropriate wildlife avoidance measures, impact minimization procedures, the importance of sensitive resources, and the purpose and methods for protecting such resources. The training will also include a discussion of BMPs to reduce the potential for erosion and sedimentation during construction and	Forest Service and Placer County	Prior to construction	Completion prior to and during construction

[1]A statement shall be included on the Improvement Plans submitted to Placer County and all permits where Placer County has jurisdiction indicating that all RPMs and mitigation measures included in this MMRP and all conditions of project approval shall be adhered to.

Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
measures for the safe transport, use, disposal, and cleanup of hazardous materials. For cultural resources, the training will identify, at a minimum: ◢ types of heritage and cultural resources that could be encountered in the project area; ◢ types of evidence that indicates heritage or cultural resources might be present (e.g., ceramic shards, trash scatters, lithic scatters); ◢ roles and responsibilities of the construction monitors; ◢ what to do if a worker encounters a possible resource; ◢ what to do if a worker encounters bones or possible bones; and penalties for removing or intentionally disturbing heritage and cultural resources.			
RPM MUL-7 Squaw Valley Ski Holdings has committed to completing all ground disturbing activities and construction of the gondola alignment in a single construction season. All site clean-up, soil stabilization, revegetation, winterization, and related activities will be completed by October 15. Although vertical construction may continue if weather and soil conditions permit as determined by the Forest Service, Placer County, and LRWQCB. Materials and equipment required to complete site clean-up and stabilization/winterization will not be permitted to be removed from the project site until Forest Service and Placer County have inspected the site and determined that the work is adequate.	Forest Service, Placer County, and Lahontan Regional Water Quality Control Board	Complete all ground disturbing activities and construction of the gondola alignment in a single construction season; Complete all site clean-up, soil stabilization, revegetation, winterization, and related activities by October 15	Completion concurrent with completion of construction
Recreation			
RPM REC-1 A public-liaison will be assigned by Squaw Valley Ski Holdings to provide the public with advance notification of construction activities at least 15 days prior to the start of construction activities. A project website will be developed for the public to ask questions about the construction process and schedule. Concerns related to dust, noise, odor, trail closures, and access restrictions associated with construction activities will be addressed within this program.	Forest Service and Placer County	Prior to initiation of construction	Completion concurrent with construction
RPM REC-2 Squaw Valley Ski Holdings will provide the Forest Service, as part of the Construction and Operation Plans, notice of all construction activities potentially affecting recreation areas and trail systems, including temporary trail closures, within the Forest Service trail system. Squaw Valley Ski Holdings will coordinate with Forest Service prior to preparation of the plan to avoid conflicts with known, scheduled, permitted events. Such avoidance will be reflected in the annual construction plan. Notification to Forest Service officials will be provided at least 60 days before construction begins in these areas.	Forest Service	Concurrent with submittal of the Construction and Operation Plans	Completion concurrent with construction

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Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM REC-3 Signs advising recreationists of construction activities and directing them to alternative trails will be posted at all trail access points or in locations as determined through coordination with the respective jurisdictional agencies. Signage describing the closures will be posted at trail access points one week prior to closures, will remain posted during the entire closure period, and will be removed upon completion of construction.	Forest Service	Post signage one week prior to trail closures	Signs to remain posted during the entire closure period; Remove signs upon completion of construction
RPM REC-4 Signage will be posted at both the Squaw Valley and Alpine Meadows base terminals and mid-stations stating that walking or hiking trail access directly from the gondola (i.e., by exiting at a mid-station) is strictly prohibited. The applicant will not permit foot traffic to exit at the Squaw Valley mid-station, or the Alpine Meadows mid-station under Alternative 2.	Forest Service and Placer County	Prior to project operation	Completion prior to project operation, and annual inspections during project operation or inspections in response to complaints
Scenic Resources			
RPM SCE-1 Prior to development of above ground structures, facilities, and features, design plans will be reviewed and approved by the Forest Service as part of the Design Review Process. Applicable structures must meet the Built Environment Image Guide (BEIG) guidelines (available at http://www.fs.fed.us/recreation/programs/beig/). It has been determined that the Forest Service BEIG guidelines are more stringent than County design standards, and in an effort to maintain a consistent aesthetic and level of design throughout the project, these standards will provide the basis for design related approvals by both the Forest Service and Placer County Design Site Review (also see RPM SCE-7)	Forest Service and Placer County Design Site Review	Prior to issuance of building permit	Completion prior to development of above ground structures, facilities, and features
RPM SCE-2 Choose structure design, scale, and color of materials, location, and orientation to meet the Forest Service visual quality objective of the Project Area and reduce potential visual contrast. It has been determined that the Forest Service BEIG guidelines are more stringent than County design standards, and as such, these standards will provide the basis for design related approvals by both the Forest Service and Placer County Design Site Review.	Forest Service and Placer County Design Site Review	Prior to approval of Placer County Design Site Review and approval of Construction and Operations Plans	Completion prior to issuance of Building Permits and approval of Construction and Operations Plans
RPM SCE-3 Stumps must be cut as low as possible to the ground to avoid safety hazards and lessen scenic impacts.	Forest Service and Placer County	During construction	Completion concurrent with construction
RPM SCE-4 All structures, facilities, and above ground features will meet color guidelines. Bright colors are inappropriate for the forest setting. The colors must be muted, subdued colors because they blend well with the natural color scheme. The FSH 617, “National Forest Landscape Management for Ski Areas, Volume 2, Chapter 7,” identifies recommended colors for ski areas. It has been determined that the Forest Service guidelines are more stringent than County design standards, and as such, these standards will provide the basis for design related approvals by both the Forest Service and Placer County Design Site Review.	Forest Service and Placer County Design Site Review	Prior to approval of Placer County Design Site Review and approval of Construction and Operations Plans	Completion prior to issuance of Building Permits and approval of Construction and Operations Plans; inspect/correct following construction

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM SCE-5 All structures, facilities, and above ground features will meet applicable reflectivity guidelines. This includes any reflective surfaces (metal, glass, plastics, or other materials with smooth surfaces), that do not blend with the natural environment. They must be covered, painted, stained, chemically treated, etched, sandblasted, corrugated, or otherwise treated to meet the solar reflectivity standards. The specific requirements for reflectivity are as follows: Structures with exteriors consisting of galvanized metal or other reflective surfaces will be treated or painted dark non-reflective colors that blend with the forest background to meet an average neutral value of 4.5 or less as measured on the Munsell neutral scale.	Forest Service and Placer County	Prior to approval of Placer County Design Site Review and approval of Construction and Operations Plans	Completion prior to issuance of Building Permits and approval of Construction and Operations Plans; inspect/correct following construction
RPM SCE-6 Trees will be retained, where possible, to provide species and size diversity, maintain forest cover, and screen facilities.	Forest Service and Placer County	During pre-construction tree marking	During pre-construction tree marking, during tree removal, during construction, completion concurrent with construction
RPM SCE-7 The project is subject to review by the Placer County Design/Site Review Committee (D/SRC) and approval by the Placer County DRC. In addition, the portion of the project in Olympic Valley is subject to review and recommendation by the Squaw Valley Design Review Committee. Such a review shall be conducted prior to the submittal of the Improvement Plans for the project and shall include, but not be limited to: architectural colors, materials, and textures of all structures; signs; exterior lighting; snow storage areas; storage area(s); fences and walls; tree impacts, tree removal, and tree replacement areas. It has been determined that the Forest Service BEIG guidelines are more stringent than County design standards, and as such, these standards will provide the basis for design related approvals. This process will be coordinated with, and be consistent with, the Forest Service Design Review process (also see RPM SCE-1).	Forest Service, Placer County D/SRC, Placer County DRC, and Squaw Valley Design Review Committee	Prior to approval of Placer County Design Site Review and approval of Construction and Operations Plans	Completion prior to issuance of Building Permits
RPM SCE-8 Prior to Improvement Plan approval, and as part of the Placer County Design Site Review process, a detailed lighting and photometric plan shall be submitted to the Placer County DRC for review and approval, which include the following: A) The site lighting plan shall demonstrate compliance with the Squaw Valley General Plan and Land Use Ordinance (SVGPLUO), the Alpine Meadows General Plan, and the Placer County Design Guidelines. The night lighting design shall be designed to minimize impacts to adjoining and nearby land uses. No lighting is permitted on top of structures. B) Building lighting shall be shielded and directed downward such that the bulb or ballast is not visible. Lighting fixture design shall complement the building colors and materials and shall be used to light entries, soffits, covered walkways and pedestrian areas such as plazas. Roof and wall pack lighting shall not be used. Lighting intensity shall be of a level that only highlights the adjacent building area and ground area and shall not impose glare on any pedestrian or vehicular traffic. C) Landscape lighting may be used to visually accentuate and highlight ornamental shrubs and trees adjacent to buildings,	Forest Service and Placer County DRC	Prior to approval of Improvement Plans and approval of Construction and Operations Plans	Completion prior to issuance of Building Permits and approval of Construction and Operations Plans; inspect/correct following construction

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
monument signs, and in open spaces. Lighting intensity shall be of a level that only highlights shrubs and trees and shall not impose glare on any pedestrian or vehicular traffic. It has been determined that the County's guidelines are more stringent than the Forest Service BEIG guidelines for lighting, and as such, the County standards will provide the basis for lighting related approvals. The photometric plan shall be submitted to the Forest Service for review and comment.			
Public Safety/Hazards			
RPM HAZ-1 Prior to construction, all Squaw Valley Ski Holdings, contractor, and subcontractor project personnel will receive training regarding the work practices necessary to effectively implement the RPMs to comply with the applicable environmental laws and regulations associated with hazardous materials.	Forest Service and Placer County	Prior to construction	Completion prior to construction
RPM HAZ-2 Prior to construction, Squaw Valley Ski Holdings will prepare a Fire Suppression and Prevention Plan that will discuss necessary fire equipment to be stored at the project staging areas, appropriate protective wear, preconstruction and construction fire prevention measures, fire-fighting methods, and notification procedures in the event of a fire. This plan will be submitted to the Forest Service, Placer County, North Tahoe Fire Protection District, and the Squaw Valley Fire Department for review and approval prior to the start of construction.	Forest Service, Placer County, North Tahoe Fire Protection District, and the Squaw Valley Fire Department	Prepare Fire Suppression and Prevention Plan prior to construction; Receive approval prior to the start of construction	Completion prior to the start of construction
RPM HAZ-3 RPM deleted based on removal of Gazex from the project description. See the first page of Chapter 1, "Introduction," Volume 1, for more information on the removal of Gazex from the project.	Not applicable	Not applicable	Not applicable
RPM HAZ-4 During project construction, maintenance, and repairs, smoking will only be allowed in designated cleared areas or enclosed vehicles to reduce the potential for wildfires.	Forest Service and Placer County	During construction	Continuously during project construction
RPM HAZ-5 Prior to Improvement Plan approval by Placer County, the applicant shall submit one of the following: A) A business plan and fee payment required fees to Placer County Environmental Health Services (EHS) Hazardous Materials Section, for review and approval. The actual fees paid will be those in effect at the time payment occurs. "Hazardous" materials, as defined in Health and Safety Code Division 20, Chapter 6.95, Articles 1 & 2, shall not be allowed on any premises in regulated quantities without notification to EHS. B) A Placer County Hazardous Materials Project/Business Activities Screening Form to an EHS Technician, for review and approval. "Hazardous" materials, as defined in California Health and Safety Code Division 20, Chapter 6.95, Articles 1 & 2, shall not be allowed on any premises in regulated quantities without notification to EHS. These documents shall also be provided to the Forest Service for review and comment.	Placer County EHS	Prior to Improvement Plan approval	Completion prior to Improvement Plan approval

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM HAZ-6 Include the following standard note on the Placer County Improvement Plans and Forest Service Construction and Operation Plans: If at any time during the course of constructing the proposed project, evidence of soil and/or groundwater contamination with hazardous material is encountered on National Forest System (NFS) lands or private lands, the applicant shall immediately stop the project and contact the Placer County EHS Hazardous Materials Section. The project shall remain stopped until there is resolution of the contamination problem to the satisfaction of EHS and to the LRWQCB, and to the Forest Service if the contamination is on NFS lands.	Forest Service and Placer County EHS	Prior to or concurrent with submittal of Placer County Improvement Plans and Forest Service Construction and Operation Plans	Completion prior to or concurrent with submittal of Placer County Improvement Plans and Forest Service Construction and Operation Plans
RPM HAZ-7 Any hazardous materials used or collected during the life of the project shall be disposed of in accordance with all applicable hazardous materials laws and regulations.	Forest Service and Placer County	During project operation	During project operations at a frequency to be specified in the Placer County Improvement Plans and Forest Service Construction and Operation Plans
RPM HAZ-8 Include the following standard note on the Placer County Improvement/Grading Plans: On private lands, and during construction, temporary storage and use of hazardous substances shall comply with Placer County Fire and EHS regulations and requirements, and spill prevention practices shall be used.	Placer County EHS	Prior to or concurrent with submittal of Placer County Improvement/ Grading Plans	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plans
RPM HAZ-9 The project is located within a "State Responsibility Area" and, as such, is subject to fire protection regulations established by the State Board of Forestry. Prior to Placer County Improvement Plan approval, compliance with these regulations shall be evidenced by submittal of a letter from the California Department of Forestry and Fire Protection or the local fire authority having jurisdiction to the Placer County ESD.	California Department of Forestry and Fire Protection and Placer County ESD	Prior to Placer County Improvement Plan approval	Completion prior to Placer County Improvement Plan approval and per the regulations included in the fire protection regulations
RPM HAZ-10 The Placer County Improvement Plans shall show that the applicant shall comply with any conditions imposed by the California Department of Forestry and Fire Protection or the serving fire districts.	California Department of Forestry and Fire Protection and Placer County	Prior to or concurrent with submittal of Placer County Improvement Plans	Completion prior to or concurrent with submittal of Placer County Improvement Plans and per the regulations included in the fire protection regulations

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM HAZ-11 The County shall require all new development projects to prepare and implement an emergency preparedness and evacuation plan (EPEP) consistent with Government Code Section 65302(g) (protection from unreasonable risks associated with the effects of seismic, geologic or flooding events or wildland fires, etc.) and in furtherance of the Placer Operational Area Eastside Emergency Access Evacuation Plan.	Placer County	Prior to or concurrent with submittal of Placer County Improvement Plans and Forest Service Construction and Operation Plans	Completion prior to construction and per the conditions specified in the Placer County Improvement Plans and Forest Service Construction and Operation Plans
Utilities			
RPM UTL-1 During the project design process, Squaw Valley Ski Holdings will coordinate with utility providers in the project area to identify the location of underground facilities in the vicinity of the selected alignment and staging areas. The final excavation and grading plans provided to Placer County and the Forest Service will avoid existing utilities where possible; and where it is not possible to avoid utilities, the applicant will coordinate with service providers to minimize disturbance. Prior to the start of construction, the applicant will verify utility locations through field surveys and use of the Underground Service Alert (USA) services. Any buried utility lines will be clearly marked in construction areas.	Forest Service and Placer County	Coordinate with utility providers during the project design process	Verify utility locations through field surveys and use of the Underground Service Alert (USA) services prior to the start of construction; Clearly mark any buried utility lines in construction areas
RPM UTL-2 The Placer County Improvement Plans shall be approved by the water supply entities for water service, supply, and maintenance. The water supply entities shall submit to the Placer County EHS and the ESD "will-serve" letters or a "letters of availability" from the water district indicating that the agency has the ability and system capacity to provide the project's domestic and fire protection water quantity needs. The applicant shall connect the project to this treated domestic water supply.	Placer County EHS and ESD	Prior to or concurrent with Placer County Improvement Plan approval	Completion prior to or concurrent with Placer County Improvement Plan approval
RPM UTL-3 Prior to Placer County Building Permit issuance, the domestic water supplying entity shall be in compliance with the requirements of Placer County Code, Section 16.08.040(e).	Placer County Building Services	Prior to Placer County Building Permit issuance	Completion prior to Placer County Building Permit issuance
Noise			
RPM NOI-1 Squaw Valley Ski Holdings will designate a Disturbance Coordinator, who will be responsible for responding to any local complaints about construction noise. The Disturbance Coordinator will determine the nature of the noise complaint and whether a residence or other noise-sensitive receptor is exposed to a noise level that exceeds one or more of the noise level standards established in the Placer County Noise Ordinance (Article 9.36.060 Sound limits) and presented in Table 4.9-9 of the Draft EIS/EIR. If the Disturbance Coordinator determines that a noise ordinance standard has been exceeded at a sensitive receptor then the Disturbance Coordinator will work with the construction contractor to identify and implement site-specific measures to reduce the level of noise exposure to less than the applicable County standard, to the extent feasible. The Disturbance Coordinator will conclude its investigation of each local complaint within two full business days of receiving	Forest Service and Placer County	Prior to the start of construction	Continuously during project construction

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
the complaint. If the investigation determines that feasible, effective noise exposure reduction measures shall be implemented, then the offending construction activity will not continue until the identified site-specific reduction measures are implemented. Site-specific measures to lessen noise exposure may include the following: ◢ Stage construction equipment as far from the affected receptors as possible. ◢ Use quieter equipment for construction activity near affected receptors (e.g., a front-end loader instead of an excavator). ◢ Limit the number of equipment that are used at the same time in proximity to the affected sensitive receptor. ◢ Where available and feasible, only use equipment with back-up alarms that is equipped with either audible self-adjusting backup alarms or alarms that only sound when an object is detected. Self-adjusting backup alarms shall automatically adjust to be no more than 10 dBA louder than the surrounding background levels. Set all non-self-adjusting backup alarms to the lowest setting required to be audible above the surrounding noise levels. ◢ Install temporary noise-reducing enclosures around stationary noise-generating equipment (e.g., concrete mixers, generators, compressors). ◢ Install temporary noise curtains as close as possible to the noise-generating activity such that the curtains obstruct the direct line of sight between the noise-generating construction activity and the nearby sensitive receptors. Temporary noise curtains shall consist of durable, flexible composite material featuring a noise barrier layer bounded to sound-absorptive material on one side. The noise barrier layer shall consist of rugged, impervious, material with a surface weight of at least one pound per square foot. ◢ Specify routes of trucks hauling materials and equipment to construction sites and hauling debris away from staging areas to avoid exposing sensitive receptors to haul truck noise. ◢ Change helicopter flight paths to avoid exposing sensitive receptors to helicopter noise.			
RPM NOI-2 All internal combustion-engine driven equipment will be properly maintained with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturer recommendations. Equipment engine shrouds will be closed during equipment operation.	Forest Service and Placer County	During construction	Continuously during project construction
RPM NOI-3 Helicopter flight patterns will be designed to avoid and minimize flights over residential areas, the National Forest system-Granite Chief Wilderness Area, and the Five Lakes Trail to the extent practical. For Alternatives 3 and 4, helicopter flights over the National Forest System - Granite Chief Wilderness will be prohibited. Prior to Place County issuance of building permits and Forest Service Operating Plan approval, the applicant shall submit maps to both agencies, for review and approval, indicating zones where helicopter flights would occur during construction.	Forest Service and Placer County	During project design	Completion prior to final project design; implement flight patterns continuously during construction when helicopters are operating

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM NOI-4 Include the following standard note on the Improvement Plans and Construction and Operation Plans: In the event of blasting, three copies of an approved plan and permit shall be submitted to the County not less than 10 days prior to the scheduled blasting. A blasting permit must be obtained from the Placer County Sheriff's Department for all blasting to be done in Placer County. Additionally, the County must be notified and give approval for all blasting done within County right-of-way. If utility infrastructure is in the vicinity where blasting is to occur, the appropriate utility companies must be notified to determine possible damage prevention measures. If blasting is required, the blasting schedule shall be approved by the County and any other utility companies with facilities in the area prior to the commencement of work. Blasting will only be conducted by State licensed contractors. Occupants of residential dwelling units located within 230 feet of any site where blasting would take place shall be notified (in person or via phone or written notice) at least one week before the blasting would occur to warn them of any potential annoyance. The 230-feet distance is based on the modelling performed for the project (see EIS/EIR Impact 4.9-2 and Appendix F). Only a few residences are located within 230 feet of where blasting could occur. Occupants shall be given a set window of time during the day when blasting will occur. They shall also be given a reminder approximately 1 hour before the time window for blasting begins. Notification shall indicate the approximate number of blasting events and the time frame in which they would occur (e.g., 1:00 PM–4:00 PM). This measure applies to both National Forest System and private lands.	Forest Service and Placer County	Prior to or concurrent with submittal of Improvement Plans and Construction and Operation Plans	Completion prior to or concurrent with submittal of Improvement Plans and Construction and Operation Plans
RPM NOI-5 Prior to Placer County Improvement Plan approval, the project owner or authorized managing entity shall insure that all construction vehicles or equipment, fixed or mobile, operated within close proximity of a residential dwelling shall be equipped with properly operating and maintained mufflers at all times during project construction as required by RPM NOI-2. It is the owner's/applicant's responsibility to obtain the services of a qualified acoustical professional to verify proper equipment mufflers if concerns relating to the issue arise. A note to this effect shall be added to the Placer County Improvement Plans where applicable.	Placer County	Prior to Placer County Improvement Plan approval	Completion prior to Placer County Improvement Plan approval; implement continuously during construction
RPM NOI-6 Construction noise emanating from any construction activities, including any blasting and helicopter flights, is prohibited on weekends and Federal Holidays, and shall only occur: A) Monday through Friday, 6:00 a.m. to 8:00 p.m. (during daylight savings) B) Monday through Friday, 7:00 a.m. to 8:00 p.m. (during standard time) In addition, temporary signs 4 feet x 4 feet shall be located throughout the project, as determined by the Placer County DRC, at key intersections depicting the above construction hour limitations. Said signs shall include a toll free public information phone number for the Disturbance Coordinator where surrounding residents can report violations and the Disturbance Coordinator will respond and resolve noise violations. The Disturbance Coordinator will respond to noise complaints in accordance with the requirements of RPM NOI-2. This condition shall be included on the Placer County Improvement Plans and shown in the	Forest Service and Placer County Planning Services	During construction	Continuously during project construction

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County's development notebook. Quiet activities, which do not involve heavy equipment or machinery, may occur at other times. Work occurring within an enclosed building, such as a building under construction with the roof and siding completed, may occur at other times as well. The Planning Director is authorized to waive the time frames based on special circumstances, such as adverse weather conditions. This same plan shall be submitted to the Forest Service for their review and incorporation into the Construction and Operation Plans.			
Air Quality			
RPM AQ-1 The applicant will submit a Construction Emission/Dust Control Plan to the Placer County Air Pollution Control District (PCAPCD) for approval prior to ground disturbance or vegetation removal associated with construction of the proposed project. The Dust Control Plan will summarize the RPMs related to emissions control during construction. *BMP 2.4, 2.5, 2.13*	Placer County Planning Services Division and PCAPCD	Prior to ground disturbance or vegetation removal associated with construction	Completion prior to ground disturbance or vegetation removal associated with construction
RPM AQ-2 Unpaved areas subject to vehicle access will be stabilized using water at least two times daily, or as needed to control fugitive dust. Water will be preferred except on roads where distance limits practical application of water. A locally approved chemical dust palliative, applied according to the manufacturer's recommendations, may be substituted for watering. On NFS lands, palliatives would be used in accordance with T Spec 806. Palliatives cannot be applied within a 25-foot buffer from any flowing water; this includes culverts or bridges that are currently flowing water. Dust stabilization and/or reduction measures will also be required where helicopters land, take-off, or where the helicopter is close enough to the ground (e.g., material delivery) to generate a dust plume. *BMP 2.4, 2.5, 2.13*	Forest Service and Placer County Planning Services Division	Prior to the start of construction	Continuously during project construction
RPM AQ-3 All inactive, disturbed portions of the project's right-of-way (ROW) will be covered, seeded, or watered, as needed to control fugitive dust, until suitable vegetative cover is established, as determined by the Placer County ESD and the Forest Service. BMP 2.4, 2.5, 2.13	Forest Service and Placer County Planning Services Division	Prior to the start of construction	Continuously during project construction until suitable vegetative cover is established
RPM AQ-4 If wind-driven or helicopter generated fugitive dust cannot be sufficiently stabilized using water, chemical dust suppressant, or other means such that the resulting dust plume crosses into a residential/lodging land use, the dust generating activities must cease until dust can be effectively controlled. BMP 2.4, 2.5, 2.13	Forest Service and Placer County Planning Services Division	Prior to the start of construction	Continuously during project construction

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Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM AQ-5 Exposed stockpiles (e.g., dirt, sand, etc.) will be covered and/or stabilized with water or a locally approved chemical dust stabilizer as needed to control fugitive dust emissions. When loading or unloading stockpiled material, material will be stabilized using water and/or drop heights will be minimized to control fugitive dust. BMP 2.4, 2.5, 2.13	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to the start of construction	Continuously during project construction
RPM AQ-6 Any visible trackout deposited on paved, public roadways will be cleaned up at the conclusion of each workday or at 24-hour intervals for continuous operation. If trackout extends for a cumulative distance greater than 50 feet, it will be cleaned up within 1 hour. Trackout will be cleaned with a wet sweeper or vacuum device.	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to the start of construction	Continuously during project construction
RPM AQ-7 Trucks transporting bulk materials off-site will be maintained such that no spillage can occur from holes or other openings in the cargo compartments. Loads will be completely covered or the bulk material will be wetted and loaded to maintain 6 inches of freeboard from the top of the container.	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to the start of construction	Continuously during project construction
RPM AQ-8 All off-road diesel engines with a rated output of greater than 100 horsepower will, at a minimum, meet the Tier II California Emissions Standards for Off-Road Compression Ignition Engines. If reasonably available, Tier III engines will be employed.	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to the start of construction	Continuously during project construction
RPM AQ-9 If the project's emissions of criteria pollutants exceed applicable thresholds, resulting in a significant impact, to mitigate the project's contribution to long-term emission of pollutants, the applicant shall implement one of the following: A) Participate in the Placer County Air Pollution Control District (PCAPCD) Offsite Mitigation Program by paying the equivalent amount of money, which is equal to the project's contribution of pollutants (ROG and NOx), which exceeds the cumulative threshold of 55 pounds per day. The actual amount to be paid shall be determined, per current California Air Resource Board guidelines, at the time of issuance of a Building Permit. Verification of participation in the Offside Mitigation Program shall be provided prior to approval of Improvement Plans for the project. or, B) Participate in an offsite mitigation program, coordinated through the PCAPCD, to offset the project's long-term emission of pollutants. Examples include participation in a "Biomass" program, retrofitting mobile sources (i.e. busses, heavy duty diesel equipment), or any other program that is deemed acceptable by the Director of the PCAPCD. Any proposed offsite mitigation shall be located within the same region as the project. This condition shall be satisfied prior to approval of Improvement Plans for the project.	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to approval of Improvement Plans	Completion prior to approval of Improvement Plans

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
<u>RPM AQ-10</u> A) Prior to Placer County approval of Grading or Improvement Plans, on project sites greater than one acre, the applicant shall submit a Construction Emission / Dust Control Plan to the Placer County Air Pollution Control District (PCAPCD). If PCAPCD does not respond within twenty (20) days of the plan being accepted as complete, the plan shall be considered approved. The applicant shall provide written evidence, provided by PCAPCD, to Placer County that the plan has been submitted to PCAPCD. It is the responsibility of the applicant to deliver the approved plan to Placer County. The applicant shall not break ground prior to receiving PCAPCD approval of the Construction Emission / Dust Control Plan and delivering that approval to Placer County. B) Include the following standard note on the Placer County Grading Plan or Improvement Plans: The prime contractor shall submit to the PCAPCD a comprehensive inventory (i.e. make, model, year, emission rating) of all the heavy-duty off-road equipment (50 horsepower of greater) that will be used in aggregate of 40 or more hours for the construction project. If any new equipment is added after submission of the inventory, the prime contractor shall contact PCAPCD prior to the new equipment being utilized. At least three business days prior to the use of subject heavy-duty off-road equipment, the project representative shall provide PCAPCD with the anticipated construction timeline including start date, name, and phone number of the property owner, project manager, and on-site foreman. C) Prior to approval of Placer County Grading or Improvement Plans, whichever occurs first, the applicant shall provide a written calculation to the PCAPCD, for approval by the District, demonstrating that the heavy-duty (> 50 horsepower) off-road vehicles to be used in the construction project, including owned, leased and subcontractor vehicles, will achieve a project wide fleet-average 20 percent NOx reduction and 45 percent particulate reduction as required by the California Air Resources Board (CARB). Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available. The following link shall be used to calculate compliance with this condition and shall be submitted to the PCAPCD as described above: http://www.airquality.org/ceqa/ (click on the current "Roadway Construction Emissions Model").	Placer County Planning Services Division and PCAPCD	Prior to approval of Grading or Improvement Plans, (whichever occurs first), on project sites greater than one acre	Completion prior to breaking ground
<u>RPM AQ-11</u> A) In order to control dust, operational watering trucks shall be on site during construction hours. In addition, dry, mechanical sweeping is prohibited. Watering of a construction site shall be carried out in compliance with all pertinent Placer County Air Pollution Control District (PCAPCD) rules (or as required by ordinance within each local jurisdiction). B) Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: The prime contractor shall be responsible for keeping adjacent public thoroughfares clean of silt, dirt, mud, and debris, and shall "wet broom" the streets (or use another method to control dust as approved by the individual jurisdiction) if silt, dirt, mud or debris is carried over to adjacent public thoroughfares. *(Based on PCAPCD Rule 228 / section 401.5)* C) Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: The contractor shall apply water or use other method to control dust impacts offsite. Construction vehicles leaving the site shall be cleaned to prevent dust, silt, mud, and dirt from being released or tracked off-site. *(Based on PCAPCD Rule 228 / section 401.1, 401.)*	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans; implement measures continuously during construction

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RPM AQ-12 Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: During construction, traffic speeds on all unpaved surfaces shall be limited to 15 miles per hour or less. *(Based on PCAPCD Rule 228 / section 401.5)*	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans; implement measures continuously during construction
RPM AQ-13 Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: The prime contractor shall suspend all grading operations when wind speeds (including instantaneous gusts) are excessive and dust is impacting adjacent properties. *(Based on PCAPCD Rule 228)*	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans; implement measures continuously during construction
RPM AQ-14 Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: In order to minimize wind driven dust during construction, the prime contractor shall apply methods such as surface stabilization, establishment of a vegetative cover, paving, (or use another method to control dust as approved by Placer County and the Forest Service). *(Based on PCAPCD Rule 228 / section 402)*	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans; implement measures continuously during construction
RPM AQ-15 Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: The contractor shall suspend all grading operations when fugitive dust exceeds Placer County Air Pollution Control District (PCAPCD) Rule 228 (Fugitive Dust) limitations. The prime contractor shall be responsible for having an individual who is California Air Resources Board (CARB)-certified to perform Visible Emissions Evaluations (VEE). This individual shall	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service

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Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
evaluate compliance with Rule 228 on a weekly basis. It is to be noted that fugitive dust is not to exceed 40% opacity and not go beyond the property boundary at any time. Lime or other drying agents utilized to dry out wet grading areas shall not exceed PCAPCD Rule 228 Fugitive Dust limitations. Operators of vehicles and equipment found to exceed opacity limits will be notified by PCAPCD and the equipment must be repaired within 72 hours. *(Based on PCAPCD Rule 228)*		Construction and Operation Plans	Construction and Operation Plans; implement measures continuously during construction on a weekly basis
RPM AQ-16 Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: Construction equipment exhaust emissions shall not exceed Placer County Air Pollution Control District (PCAPCD) Rule 202 Visible Emission limitations. Operators of vehicles and equipment found to exceed opacity limits are to be immediately notified by PCAPCD to cease operations and the equipment must be repaired within 72 hours. *(Based on PCAPCD Rule 202)*	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans; implement measures continuously during construction
RPM AQ-17 Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: During construction the contractor shall utilize existing power sources (e.g., power poles) or clean fuel (i.e. gasoline, biodiesel, natural gas) generators rather than temporary diesel power generators.	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans; implement measures continuously during construction
RPM AQ-18 Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: During construction, the contractor shall minimize idling time to a maximum of five (5) minutes for all diesel-powered equipment. Idling of construction-related equipment and construction-related vehicles shall be minimized within 1,000 feet of any sensitive receptor (i.e., house, hospital, or school).	Forest Service and Placer County Planning Services Division	Prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans; implement measures continuously during construction

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RPM AQ-19 Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: During construction, no open burning of removed vegetation shall be allowed. All removed vegetative material on private land, other than marketable lumber, shall be either chipped on site (if approved by the land owner) or taken to an appropriate recycling site, or if a site is not available, a licensed disposal site. *(Based on PCAPCD Rule 310)*	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans; implement measures continuously during construction
RPM AQ-20 Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: If required by the Placer County Engineering Division and/or the Department of Public Works and Facilities, the contractor shall hold a pre-construction meeting prior to any grading activities. The contractor shall invite the Placer County Air Pollution Control District (PCAPCD), Placer County staff, and Forest Service staff to the pre-construction meeting in order to discuss the construction emission/dust control plan with employees and/or contractors.	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans; implement measures upon initiation of construction
RPM AQ-21 Include the following standard note on the Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans: Processes that discharge two (2) pounds per day or more of air contaminants, as defined by Health and Safety Code Section 39013, to the atmosphere may require a permit from the Placer County Air Pollution Control District (PCAPCD). Permits may be required for both construction and operation. Developers/contractors shall contact the PCAPCD prior to construction and obtain any necessary permits prior to the issuance of a Building Permit. *(Based on the California Health & Safety Code section 39013:* http://www.leginfo.ca.gov/cgi-bin/displaycode?section=hsc&group=39001-40000&file=39010-39060)	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans	Completion prior to or concurrent with submittal of Placer County Improvement/Grading Plan and Forest Service Construction and Operation Plans
RPM AQ-22 Include the following standard note on all building plans approved in association with this project: Stationary sources or processes (i.e., certain types of engines, boilers, heaters, etc.) associated with this project shall be required to obtain an Authority to Construct (ATC) permit from the Placer County Air Pollution Control District (PCAPCD) prior to the construction of these sources. In general, the following types of sources shall be required to obtain a permit: 1). Any engine greater than 50 brake horsepower, 2). Any boiler that produces heat in excess of 1,000,000 Btu per hour, or 3) Any equipment or process which discharge 2 pounds per day or more of pollutants. Developers / contactors shall contact the PCAPDC prior to construction for additional information. *(Based on PCAPCD Rule 501 and the California Health & Safety Code, Section 39013).*	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with approval of building plans	Completion prior to or concurrent with approval of building plans

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RPM AQ-23 For those projects which include stationary emission sources (i.e. gasoline dispensing facility, auto painting, dry cleaning, large HVAC units, etc.), the applicant shall obtain an Authority to Construct (ATC) permit from the PCAPCD prior to the issuance of a Certificate of Occupancy from Placer County. NOTE: A third party detailed Health Risk Assessment may be required as a part of the permitting process.	Placer County Planning Services Division and PCAPCD	Prior to the issuance of a Certificate of Occupancy from Placer County	Completion prior to the issuance of a Certificate of Occupancy from Placer County
RPM AQ-24 Include the following standard note on all building plans approved in association with this project: To limit the quantity of volatile organic compounds in architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within the Placer County Air Pollution Control District (PCAPCD), all projects must comply with PCAPCD Rule 218. Please see the District's website for additional information: *(Based on PCAPCD Rule 218)*	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to or concurrent with approval of building plans	Completion prior to or concurrent with approval of building plans
RPM AQ-25 Prior to approval of Placer County Grading/Improvement Plans, the applicant shall provide a landscaping plan for review and approval by the Placer County Design/Site Review Committee. As required by the Placer County Air Pollution Control District (PCAPCD), landscaping shall include native drought-resistant species (plants, trees and bushes) in order to reduce the demand for irrigation and gas-powered landscape maintenance equipment. As a part of the project design, the applicant shall include irrigation systems which efficiently utilize water (*e.g.*, prohibit systems that apply water to non- vegetated surfaces and systems which create runoff). In addition, the applicant shall install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls, rain "shut off" valves, or other devices as reviewed and approved by the Placer County Design/Site Review Committee.	Placer County Planning Services Division and PCAPCD	Prior to approval of Placer County Grading/Improvement Plans	Completion prior to approval of Placer County Grading/Improvement Plans
RPM AQ-26 If the project exceeds the cumulative air quality thresholds as established by the Placer County Air Pollution Control District (PCAPCD) (a maximum of 55 pounds per day of ROG and/or NO_X), to mitigate the project's contribution to long-term emission of pollutants, the applicant shall either: A. **(preferred by PCAPCD):** Establish mitigation on-site by incorporating design features within the project. This may include, but not be limited to: "green" building features such solar panels, energy efficient heating and cooling, exceeding Title 24 standards, bike lanes, bus shelters, etc. NOTE: The specific amounts of "credits" received shall be established and coordinated through the PCAPCD. B. Establish mitigation off-site within the same region (i.e. east or west Placer County) by participating in an offsite mitigation program, coordinated through the PCAPCD. Examples include, but are not limited to, participation in a "Biomass" program that provides emissions benefits; retrofitting, repowering, or replacing heavy duty engines from mobile sources (i.e. busses, construction equipment, on road haulers); or other program that the project proponent may propose to reduce emissions. C. Participate in the PCAPCD Offsite Mitigation Program by paying the equivalent amount of money, which is equal to the projects contribution of pollutants (ROG and NO_X), which exceeds the cumulative threshold of 10 pounds per day. The actual amount to be paid shall be determined, and satisfied, per current California Air Resource Board (CARB) guideline.	Forest Service, Placer County Planning Services Division, and PCAPCD	Prior to approval of Placer County Improvement Plans	Completion prior to approval of Placer County Improvement Plans

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D. Any combination of a, b, or c, as determined feasible by the Director of the PCAPCD. NOTE: All mitigation measures (either a, b, c, or d) must be satisfied prior to approval of Placer County Improvement Plans. It is the applicant's responsibility to forward written proof of satisfaction of this condition to PCAPCD.			
Biological Resources			
RPM BIO-1 Qualified environmental monitors, approved by the Forest Service and Placer County, will be present with each crew during all vegetation-removal activities to help ensure that impacts to biological resources are minimized to the extent possible.	Forest Service and Placer County	During all vegetation-removal activities	Completion during all vegetation-removal activities
RPM BIO-2 Squaw Valley Ski Holdings will conduct a complete pre-construction floristic survey of construction activity areas (including all construction vehicle travel routes, but not paved public roadways), and lands within 50-feet of construction activity areas. The pre-construction floristic survey will include all rare plants, fungi, and non-native invasive plants, and be conducted during a time that coincides with the greatest number of blooming periods for target species. This survey will be conducted no more than one year prior to the start of construction. Surveys conducted previously in support of the EIS/EIR process may fulfill this requirement if they meet the timeframe limitations. Populations of rare plants or fungi and weed-infested areas within the survey area will be flagged or fenced no more than 30 days prior to the start of construction. Flagging and fencing will be refreshed and maintained throughout construction. Implementation of this measure will occur in coordination with the Forest Service and Placer County.	Forest Service and Placer County	Conduct survey no more than one year prior to the start of construction; Flag or fence populations of rare plants or fungi and weed-infested areas within the survey area no more than 30 days prior to the start of construction	Refresh and maintain flagging and fencing throughout construction
RPM BIO-3 Before construction activities begin, Squaw Valley Ski Holdings will treat invasive plant infestations in the construction activity area, and within 50-feet of the construction activity area. Any new invasive plant infestations discovered during construction will be documented, reported to the land owner, and treated where needed as determined by the Forest Service on NFS lands and by Placer County on private lands. As the Forest Service invasive plant infestation criteria are more stringent than Placer County's, the same criteria applied by the Forest Service will be applied to private lands. After construction is complete, the applicant will monitor all construction disturbance areas for new noxious weed invasions and expansion of existing weed populations and treat invasive plan infestations where needed as determined by the Forest Service on NFS lands and by Placer County on private lands. Post-construction monitoring for noxious weeds would be conducted annually for three years. Invasive plant treatments will be selected based on each species ecology and phenology and responses to treatments. For example, for perennial pepperweed (*Lepidium latifolium*), the only consistently effective treatment is use of herbicides. Whereas some other species may be effectively eradicated through mechanical removal or other means. Examples of potential removal methods include hand pulling, tarping, mowing, thermal treatment, and herbicide application. All treatment methods—including the use of herbicides—will be conducted in accordance with the law, regulations, and policies governing the land owner. On NFS lands, the Forest Service District Botanist or their designated appointee will be consulted prior to initiation of any invasive plant treatment. On private lands the landowner or designated appointee will be consulted. Land owners will be notified prior to the use of herbicides for invasive plant treatment. If there are any areas where pre-construction treatment is not feasible, Squaw Valley Ski Holdings will clearly flag or fence non-native invasive plant areas to delineate the area as a work exclusion zone. [Nonnative	Forest Service and Placer County	Treat invasive plant infestations before construction activities begin	Document any new invasive plant infestations discovered during construction; Monitor all construction disturbance areas for new noxious weed invasions and expansion of existing weed populations and treat invasive plan infestations where needed after construction is complete; Conduct post-construction monitoring for noxious weeds annually for three years

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Invasive Plant Management Resource Protection Measures for Project related Non-native Invasive Plant Control taken from "Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers" (Cal-IPC 2012).] If the use of herbicides is selected as the most appropriate control method for invasive plant infestations, the following restrictions will apply: ◢ Herbicides will only be applied by licensed applicators. ◢ Prior to herbicide application, the application area will be clearly identified by flagging or other means. The application area will be the minimum necessary to achieve the eradication of the invasive plant infestation as judged by the District Botanist or their designated appointee on NFS lands, and an environmental monitor approved by Placer County on private lands, and in coordination with the licensed applicator. ◢ A Forest Service employee and/or an environmental monitor approved by the Forest Service and Placer County will be present during all herbicide applications to ensure that herbicide remains within the designated application area. ◢ Spraying will not be used as an herbicide application method if wind speeds are sufficient to carry herbicide outside of the designated application area. ◢ Chlorsulfuron and Triclopyr will not be applied within 50 feet of perennial or seasonal waterbodies or wetlands. ◢ Only dipping, wiping, or spot applications of Aminopyralid or the aquatic formulation of Glyphosate will be used within a zone between 10 to 50 feet of perennial or seasonal waterbodies or wetlands, including adjacent to occupied Sierra Nevada yellow-legged frog (SNYLF) habitats (consistent with Sierra Nevada Forest Plan Amendment [SNFPA] Standard and Guideline #98). ◢ Herbicide application will not take place within six hours of predicted rainfall that has a high probability of producing measurable runoff. ◢ No herbicide will be applied within suitable Sierra Nevada yellow-legged frog habitat if there is a >30% chance of more than 0.1 inches of precipitation predicted within the next 48 hours. No herbicide will be applied outside suitable Sierra Nevada yellow-legged frog habitat if there is a >50% chance of more than 0.1 inches of precipitation predicted within the next 48 hours. 0.1 inch is based on following "measureable" precipitation prediction data provided by National Weather Service. ◢ Streams or other surface waters shall not be used for washing herbicide application equipment or personnel, unless required in an emergency situation. As required by law, water soap and towels will be available within ¼ mile of applicators and at mixing sites. ◢ Mixing of herbicides for application will take place more than 100 feet from perennial or seasonal waterbodies or wetlands.			
<u>RPM BIO-4</u> Equipment will arrive at the project area clean and weed-free. Equipment will be inspected by the on-site environmental monitor for mud or other signs that weed seeds or propagules could be present prior to use in the project area. If the equipment is not clean, the monitor will deny entry to the work areas. *BMP 2.8*	Forest Service and Placer County	During construction	Continuously during construction

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RPM BIO-5 Vehicles and equipment will be cleaned using high-pressure water or air at designated weed-cleaning stations after exiting a weed-infested area, as specified by the Noxious Weed Risk Assessment (NWRA). Cleaning stations will be designated by a botanist or noxious weed specialist and located away from aquatic resources. *BMP 2.8*	Forest Service and Placer County	During construction	Continuously during construction
RPM BIO-6 Any revegetation, erosion control, dust control, and similar plans prepared for the project that call for the use of mulch will identify that native materials such as conifer needles or locally produced chips from non-infested, nearby areas, would be preferred as mulch material. Manure is not an acceptable mulch material. Plans would be reviewed and approved by the Forest Service and Placer County as identified in applicable RPMs. *BMP 5.4*	Forest Service and Placer County	Prior to or concurrent with submittal of revegetation, erosion control, dust control, and similar plans. Information to be included in Improvement Plans and Operating Plans.	Completion prior to or concurrent with submittal of revegetation, erosion control, dust control, and similar plans
RPM BIO-7 Only certified weed-free construction materials, such as sand, gravel, straw, or fill, will be used throughout the project.	Forest Service and Placer County	During construction	Continuously during construction
RPM BIO-8 An available method of treatment for those noxious weeds which typically spread by seed and not roots is to dig, grub or hand pull, remove the top portion of the roots and dispose of the material in a special landfill which buries the bags of material, or dispose, or destroy in another manner acceptable to the Forest Service and Placer County. As an alternative to, or in addition to digging or hand pulling, layers of mulch, degradable geotextiles, or similar materials may be placed over infestation areas to minimize the spread of seeds and plant materials by equipment and vehicles during construction. These materials will be secured so they are not blown or washed away. Noxious weeds which do spread by root rhizomes may be treated by placing black plastic or some other non-breathable barrier, if the infestation is small enough. Problematic rhizomatous noxious weed infestations may require the use of appropriate herbicides.	Forest Service and Placer County	During construction	Continuously during construction
RPM BIO-9 Exclusion zones will be established around any identified special-status plants if they are found. In consultation with a qualified botanist, the Forest Service, and Placer County, Squaw Valley Ski Holdings will first attempt to avoid effects of project implementation on rare plants and protect their occurrences/populations in situ. In the event that a rare plant cannot be avoided by construction activities, CDFW and/or USFWS will be notified, as applicable, depending on the species regulatory status. Coordination with CDFW and/or USFWS will be undertaken, in collaboration with the Forest Service and Placer County, to establish appropriate mitigation measures. If sacrifice seed collection or transplantation are selected as appropriate mitigations, then the following measures would apply: a) Squaw Valley Ski Holdings will collect any mature seeds from the affected plants and store them at an appropriate native plant nursery or comparable facility; b) upon the completion of work, Squaw Valley Ski Holdings will redistribute the seeds within the original location of the population; c)	Forest Service and Placer County	During construction if special-status plants are found	Continuously during construction if special-status plants are found

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Squaw Valley Ski Holdings will establish performance standards for survivorship and will also monitor and document the success rate of the transplanted individuals for three consecutive growing seasons; d) if performance standards are not met, corrective measures will be implemented and monitoring and adaptive management continued until success criteria are met.			
RPM BIO-10 Any rare plants identified during floristic surveys (e.g., surveys conducted at new disturbance areas or if project construction begins more than a year after completion of the most recent survey) will be documented and photographed, and a Native Species Field Survey Form will be submitted to the CNDDB. The Forest Service or Placer County will notify CDFW, and/or Forest Service, as applicable depending on the species listing status.	Forest Service and Placer County	During floristic surveys	Completion concurrent with floristics surveys
RPM BIO-11 Construction or tree removal work within 50-feet of a sensitive plant occurrence will be monitored by a qualified environmental monitor to ensure protective measures are sufficient.	Forest Service and Placer County	During construction or tree removal work within 50-feet of a sensitive plant occurrence	Continuously during construction or tree removal work within 50-feet of a sensitive plant occurrence
RPM BIO-12 Nesting bird surveys will be conducted no more than 30 days prior to construction activities if work is scheduled to occur during the breeding season—March to September. Survey details (e.g., dates, survey area, specific methods) will be coordinated with a Forest Service biologist at least 30-days before surveys are initiated. Surveys will extend a minimum of 100-feet beyond the boundary of the construction area; however, surveys for nesting spotted owls will cover an area within 0.25 mile of the construction area and surveys for nesting goshawk will cover an area within 0.5 mile of the construction area. Exclusionary buffer zones (to be determined based on species-specific needs) will be created surrounding any active nests found during the surveys. Buffers will be established by a qualified biologist prior to the start of construction. If an area is given clearance to proceed with construction and nesting subsequently occurs, it will be assumed that the individuals are acclimated to the ongoing disturbance of construction and a buffer need not be established. However, if circumstances exist such that a qualified biologist determines that there is a high likelihood that future activities may result in the abandonment or failure of the nest, an appropriate exclusionary buffer will be established by Squaw Valley Ski Holdings in coordination with the CDFW and/or USFWS, as well as the Forest Service and Placer County.	Forest Service and Placer County	Conduct nesting bird surveys no more than 30 days prior to construction activities if work is scheduled to occur during the breeding season (March to September); Coordinate survey details (e.g., dates, survey area, specific methods) with a Forest Service biologist at least 30 days before surveys are initiated; Establish buffers prior to the start of construction	Completion of nesting bird surveys no more than 30 days prior to construction activities if work is scheduled to occur during the breeding season (March to September); Coordinate survey details (e.g., dates, survey area, specific methods) with a Forest Service biologist at least 30 days before surveys are initiated; Maintain buffers continuously during construction

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Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM BIO-13 No falling of trees will occur within 0.25 mile of active California spotted owl nests during the breeding season (March 1 to August 31) or within 0.50 mile of active northern goshawk nests during the breeding season (February 15 to September 15), unless surveys confirm that the birds are not nesting. All helicopter flight paths will be coordinated with a Forest Service biologist to limit disturbance to PACs (Protected Activity Centers). A qualified biologist will have the ability to amend the start and end dates of these breeding seasons with concurrence from appropriate agencies if it can be determined that breeding has not started or that fledglings have left the nest. If the location of a nest site within a PAC is unknown, either surveys are required to locate the nest stand and determine nesting status or, as an alternative to surveys, an activity buffer will be applied to the 0.25-mile area surrounding the PAC. The activity buffer may be waived for vegetation treatments of limited scope and duration, when a biological evaluation determines that such projects are unlikely to result in breeding disturbance considering their intensity, duration, timing, and specific location. Where a biological evaluation concludes that a nest site will be shielded from planned activities by topographic features that will minimize disturbance, the buffer distance may be modified in coordination with the Forest Service.	Forest Service and Placer County	During tree removal activities	Continuously during tree removal activities
RPM BIO-14 Preconstruction biological surveys will be conducted no more than 30 days prior to construction activities to identify biological resources, including burrows and den sites of sensitive mammal species, which could be impacted by construction activities. All burrows and den sites will be inspected for use by sensitive mammals, and buffers may be established based on occupation. If an area is given clearance to proceed with construction and burrowing or denning activities subsequently occur, it will be assumed that the individuals are acclimated to the ongoing disturbance of construction. If circumstances exist such that future activities may result in the abandonment of the burrow or den site, as determined by a qualified biologist, an appropriate exclusionary buffer will be established by Squaw Valley Ski Holdings, in coordination with CDFW, Forest Service, and, if necessary, the USFWS.	Forest Service and Placer County	Conduct preconstruction biological surveys no more than 30 days prior to construction activities	Completion of preconstruction biological surveys no later than 30 days prior to construction activities
RPM BIO-15 If, during tree removal, signs of active denning or large stick nests associated with sensitive avian or mammal species are observed in or near trees that are designated for removal or in down logs, work will cease in the immediate area and the occurrence and location will be reported to the wildlife biologist to determine the need for further review.	Forest Service and Placer County	During tree removal activities	Continuously during tree removal activities
RPM BIO-16 If a potentially active sensitive mammal burrow or den site is unavoidable, Squaw Valley Ski Holdings will employ den-dusting or scoping to determine the species and reproductive status of the animal. If the burrow or den is determined to be active and does not contain young, Squaw Valley Ski Holdings will excavate the burrow by hand, remove the den, or block the entrance to prevent re-entry until after the completion of work. If the animal is determined to be raising young, Squaw Valley Ski Holdings will establish a 200-foot exclusionary buffer surrounding the burrow or den until it is determined that the young have left the den. After it is determined that young have left the den, Squaw Valley Ski Holdings will commence hand excavation or removal of the den structure. Squaw Valley Ski Holdings will contact CDFW, Forest Service and/or USFWS prior to any den-dusting, scoping, burrow excavation, or den structure removal.	Forest Service and Placer County	Contact CDFW, Forest Service and/or USFWS during any ground-disturbing activities	Completion during any ground-disturbing activities

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
<u>RPM BIO-17</u> There are currently no known occurrences of wolverine or Sierra Nevada red fox in the project area. If there are any detections of a wolverine or Sierra Nevada red fox in the project area, they will be validated by a forest carnivore specialist. If a verified sighting occurs within 5-miles of the project site, conduct an analysis to determine if project construction will have the potential to adversely affect the species. If the analysis determines the potential to adversely affect the species, consider applying limited construction periods from January 1 to June 30 to avoid adverse impacts to potential breeding. Evaluate activities for a 2-year period for detections not associated with a den site. The Forest Service and Placer County will notify the USFWS of any new validated wolverine or Sierra Nevada red fox occurrences near the project area and, if needed, request Section 7 consultation.	Forest Service and Placer County	If a verified sighting of a wolverine or Sierra Nevada red fox occurs within 5 miles of the project site, conduct an analysis at any time the discovery is made if prior to the completion of construction to determine if project construction will have the potential to adversely affect the species; If the analysis determines the potential to adversely affect the species, consider applying limited construction periods from January 1 to June 30 to avoid adverse impacts to potential breeding	Evaluate activities for a 2-year period for detections not associated with a den site
<u>RPM BIO-18</u> Concurrent with the preconstruction surveys described in other RPMs, surveys will be conducted on both NFS lands and private lands for amphibians, including eggs, tadpoles, larvae, or juveniles, at aquatic habitat crossed by the project Any sightings of any federally listed species will be reported to the Forest Service, the USFWS, and the California Department of Fish and Wildlife's California Natural Diversity Database. On NFS lands and in habitat identified as suitable for Sierra Nevada yellow-legged frog (SNYLF), the field surveys will follow the Forest Service visual encounter survey protocol identified in the Biological Assessment prepared for the project. All monitors and environmental/biological survey personnel who will conduct monitoring or surveys for SNYLF will be "qualified project biologists", defined as Forest Service or USFWS approved biologists with professional experience in identifying suitable SNYLF habitat, all life stages of SNYLF, and in capturing and handling the species. If adults or juveniles of amphibians are discovered, a Forest Service or USFWS approved biologist will identify them to species. If the adults/juveniles are identified as a special-status species other than SNYLF, and there will be ground disturbance or construction vehicle travel in the occupied site, a biologist with appropriate permits/authorizations to handle the species will relocate the individuals to suitable habitat outside of the construction area. No movement of egg masses shall occur and the	Forest Service and Placer County	Concurrent with the preconstruction surveys described in other RPMs, conduct preconstruction surveys for amphibians, including eggs, tadpoles, larvae, or juveniles, at aquatic habitat crossed by the project	Continuously during construction at occupied sites; Coordinate with the CDFW, USFWS, and/or Forest Service prior to relocating any individuals

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Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
environmental monitor shall denote a 200-foot no-construction buffer around that water feature with flagging. If adult amphibians other than SNYLF are discovered in the construction area after the start of work, the environmental monitor will first allow the individuals to leave under their own volition. If the individual has not left the construction area after 4-hours, a biologist with appropriate permits/authorizations to handle the species may relocate the individuals from the project area to similar, suitable habitat. If SNYLF are encountered in the project area during project activities: Each SNYLF encounter will be treated on a case-by-case, but the general procedure is as follows: (1) Leave the non-injured SNYLF alone if it is not in danger, or (2) Move the animal to a nearby safe location if it is in danger. These two actions are further described as follows: a) If a SNYLF is encountered within a work area, all activities in the surrounding area that have the potential to result in the harassment, injury, or death of the individual will be temporarily stopped. Then, the situation shall be assessed by a qualified project biologist to select a course of action that will minimize adverse effects on the individual. b) Avoidance is the preferred option if an individual SNYLF is not moving or using refugia in the project area. The qualified project biological monitor shall visually inspect the animal and the area to evaluate the necessity of local on-site avoidance measures to protect the animal at that time and during future sampling (i.e. pin flag at burrow or site to avoid). c) If appropriate, SNYLF shall be allowed to move out of the hazardous situation on their own volition to a safe location. A SNYLF shall not be picked up and moved because it is not moving fast enough or it is an inconvenience for activities associated with rehabilitation or operation. This only applies to situations when individuals are encountered while they are moving during conditions that make upland travel feasible. It does not apply to individuals that are uncovered, exposed, or in areas where there is not sufficient adjacent habitat to support the species should the animal move outside the immediate area. d) SNYLF individuals shall be captured and moved manually only when it is necessary to prevent harassment, injury, or death or, in the case of adult and metamorphosed juvenile SNYLF, if they do not leave of their own volition after 4 hours. If suitable habitat is adjacent to the capture location, the preferred option is relocation to that site; the individual shall not be moved outside the radius it would have traveled on its own. e) Only a qualified project biologist may capture a SNYLF. Nets or bare hands may be used to capture the animals. Soaps, oils, creams, lotions, repellents, or solvents of any sort cannot be used on hands within 2 hours before or during periods when the biologist is capturing and relocating individuals. If the animal is held for any length of time in captivity, it shall be kept in a cool, dark, moist environment with proper airflow, such as a clean and disinfected bucket or plastic container with a damp sponge. Containers used for holding or transporting SNYLF shall not contain any standing water, objects, or chemicals that may injure or kill a SNYLF. f) To avoid transferring disease or pathogens between suitable habitats while translocating the SNYLF, qualified project			

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Table 1 Mitigation Monitoring and Reporting Program

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biologists shall disinfect equipment and clothing prior to moving following established disinfection protocols. g) The SNYLF should be observed for at least 5 minutes from the time of its release to ensure it is not vulnerable to predation or other environmental stochasticity. h) All encounters of individuals will be documented and reported immediately to a Forest Service aquatic biologist. Reporting will include GPS, photos of individual and habitat, condition of individual and techniques used to avoid impact. i) While the USFWS does not anticipate any deaths or injuries of SNYLF as a result of the proposed project, there is potential that a dead or injured SNYLF could be encountered during project activities. Any dead or injured SNYLF will be reported immediately to a Forest Service aquatic biologist. Any injured SNYLF determined by a USFS biologist or qualified project biologist to be in need of veterinary care shall only be cared for by a licensed veterinarian or other qualified person. Any dead SNYLF will be preserved as soon as possible by freezing. The Forest Service biologist should notify the Service within 24 hours of the discovery of any injured or dead SNYLF.			
RPM BIO-19 To reduce the potential of impacts to Sierra Nevada yellow-legged frog (SNYLF), actions will be consistent with requirements established by the USFWS in the Programmatic Biological Opinion on Nine Forest Programs on Nine National Forests in the Sierra Nevada for the SNYLF. 1. Within Riparian Conservation Areas (RCAs) and other aquatic habitat areas noted by the Forest Service aquatics biologist as suitable SNYLF habitat or breeding areas, there will be no ground disturbing activities without a qualified project biologist (approved by the Forest Service and Placer County) present. Potential SNYLF habitat, as identified by the Forest Service aquatics biologist, will be clearly identified on construction drawings and Placer County Improvement Plans prior to the start of construction and provided to maintenance personnel on an annual basis. 2. If SNYLF is encountered within a project site, stop all activities in the surrounding area that may have the potential to result in the harassment, injury, or death of the individual. The situation shall be assessed by a Forest Service Biologist or Forest Service approved biologist (e.g., qualified project biologist) in order to select a course of action that will minimize adverse effects to the individual. See suggested course of action for SNYLF encounters in RPM BIO-18. 3. Tightly woven fiber netting or similar material, plastic mono-filament netting or similar material shall not be used for erosion control or other purposes. Materials such as coconut fiber rolls or burlap rolls may be used.	Forest Service and Placer County	Identify potential SNYLF habitat on construction drawings and Placer County Improvement Plans prior to the start of construction	Continuously during construction within Riparian Conservation Areas (RCAs) and other aquatic habitat areas noted by the Forest Service aquatics biologist as SNYLF habitat or breeding areas
RPM BIO-20 Bat surveys will be conducted in the construction disturbance area the spring, no more than 30 days prior to the start of construction, in order to identify active bat roosting sites, such as snags, dense trees, and rock crevices. All potential roosting sites in the construction disturbance area will be surveyed by a qualified biologist in order to determine usage. All non-active roosting sites in the construction disturbance area will be trimmed or removed within 30 days of the surveys in order to prevent new roosts from being established. If it is determined that an active roosting site will be directly affected, Squaw Valley Ski Holdings will consult with CDFW, Forest Service, and/or USFWS to acquire appropriate authorizations to remove the roosting	Forest Service and Placer County	Conduct bat surveys in the spring, no more than 30 days prior to the start of construction	Trim or remove all non-active roosting sites in the construction disturbance area within 30 days of the surveys in order to prevent new roosts from being established;

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sites. All active non-maternity roosting sites will be fitted with passive exclusion devices, such as one-way doors, and all bats will be allowed to leave voluntarily. Once it is confirmed that all bats have left the roost, the roost may be removed if necessary, and crews will be allowed to continue work in the area. If a maternity roosting site is discovered, Squaw Valley Ski Holdings will consult with the CDFW, Forest Service, and/or USFWS to establish appropriate exclusionary buffers until all young are determined to be volant by a qualified biologist. Once it is determined that all young are volant, passive exclusion devices will be installed and all bats will be allowed to leave voluntarily. Once it is determined by a qualified biologist that all bats have left the roost, crews will be allowed to work within the buffer zone, and the roost removed if necessary.			Maintain exclusionary buffers and passive exclusion devices continuously during construction
<u>RPM BIO-21</u> If any Federally or State threatened, endangered, proposed, or candidate species, or Forest Service sensitive species, or CDFW species of special concern previously unknown in the project area is detected or found nesting or present within 0.25 mile of project activities, appropriate avoidance and minimization measures would be implemented based on coordination with the Forest Service aquatics biologist, botanist, and/or wildlife biologist, Placer County, and the regulatory agency(ies) with authority over the species (USFWS and/or CDFW). Avoidance and minimization measures would be sufficient to provide compliance with applicable species protection law(s) (ESA, California ESA, CEQA). Measures can include, but are not limited to, flagging and avoiding species habitat, implementing a species specific LOP, or designating a protected activity center.	Forest Service and Placer County	During construction	Continuously during construction
<u>RPM BIO-22</u> An environmental monitor will inspect all tower placement locations, temporary construction fencing, and areas of active construction on a daily basis for trapped wildlife. Wildlife found in active construction areas will be allowed to passively leave the site. If after 4-hours the wildlife has not left the site, or if for safety or other reasons a more rapid response is necessary, wildlife may be relocated by a qualified biologist with appropriate permits/authorizations to handle the species. The construction foreman will notify the environmental monitor immediately if any wildlife enters or becomes trapped in the work area.	Forest Service and Placer County	Prior to the start of construction	Inspect all tower placement locations and areas of active construction on a daily basis for trapped wildlife; Notify the environmental monitor immediately if any wildlife enters or becomes trapped in the work area
<u>RPM BIO-23</u> To facilitate revegetation in temporarily disturbed areas, topsoil, where present, will be salvaged in areas that will be graded or excavated. Topsoil will be segregated, stockpiled separately from subsoil, and covered. The topsoil will then be replaced to the approximate location of its removal after project construction has been completed to facilitate revegetation of temporarily disturbed areas. Topsoil may also be salvaged from where permanent facilities are planned or where operation and maintenance activities preclude the establishment of vegetation and used to assist in revegetation of adjacent areas.	Forest Service and Placer County	During construction	Continuously during construction; Replace topsoil to the approximate location of its removal after project construction has been completed
<u>RPM BIO-24</u> Squaw Valley Ski Holdings will minimize ground disturbance and vegetation and tree removal to only the areas necessary for construction, especially in riparian areas/RCAs.	Forest Service and Placer County	During construction	Continuously during construction

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RPM BIO-25 Any work conducted within 100 feet of waters of the United States, waters of the State, and wetlands, and within RCAs designated by the Forest Service, will have an environmental monitor present.	Forest Service and Placer County	During construction within 100 feet of waters of the United States, waters of the State, and wetlands, and within RCAs designated by the Forest Service	Continuously during construction within 100 feet of waters of the United States, waters of the State, and wetlands, and within RCAs designated by the Forest Service
RPM BIO-26 The project will be designed to avoid disturbance to, and vehicle travel in, identified aquatic habitats (with the exception of qualifying over snow travel consistent with applicable RPMs). If an aquatic habitat cannot be fully avoided, prior to disturbance of the habitat a qualified biologist will conduct a delineation of waters of the United States according to methods established in the USACE wetlands delineation manual (Environmental Laboratories 1987) and Western Mountains, Valleys, and Coast Region Supplement (Environmental Laboratories 2010). The delineation will map and quantify the acreage of all aquatic habitats in the area to be disturbed and will be submitted to USACE for verification and also submitted to LRWQCB for identification of waters of the State. The delineation may also be submitted to the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife to satisfy requirements of RPM BIO-35. Squaw Valley Ski Holdings, in coordination with USACE and LRWQCB, will determine, based on the verified wetland delineation and the project design plan, the acreage of impacts on Waters of the United States and Waters of the State that would result from project implementation. Impacts will be minimized to the extent practicable. Where feasible, work in wetlands or wet meadow habitats with saturated soil conditions will be scheduled when soils are dry (as defined in applicable RPMs). Disturbed wetland areas will be restored to preconstruction conditions and seeded with a native annual species to stabilize the soils and minimize the introduction of noxious weeds, as specified by the USACE and Lahontan RWQCB. In accordance with the USACE "no net loss" policy, all permanent wetland impacts will be mitigated at a minimum of a 1:1 ratio. This mitigation will come in the form of either contribution to a USACE-approved wetland mitigation bank or through the development and implementation of a Compensatory Mitigation and Monitoring Plan aimed at creating or restoring wetlands in the surrounding area. Permanent wetland impacts on National Forest System Lands will be mitigated through wetland creation and/or restoration. *BMP 2.1, 2.8*	Forest Service and Placer County	Conduct a delineation of waters of the United States prior to issuance of a construction/grading permit	Completion concurrent with submittal of a delineation of waters of the United States to USACE and Lahontan Regional Water Quality Control Board, and potentially U.S. Fish and Wildlife Service and California Department of Fish and Wildlife
RPM BIO-27 All trash and food will be removed from the work site at the end of each workday in order to deter wildlife from entering the site. Any outdoor trash receptacles will be bear proof containers.	Forest Service and Placer County	During construction	Continuously during construction; Remove all trash and food from the work site at the end of each workday

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM BIO-28 No pets or firearms will be allowed in the project area.	Forest Service and Placer County	During construction and operation	Continuously during construction and operation
RPM BIO-29 No harm, harassment, or collection of plant and wildlife species will be allowed. Feeding of wildlife will be prohibited.	Forest Service and Placer County	During construction and operation	Continuously during construction and operation
RPM BIO-30 As part of the Improvement Plan and Construction and Operation Plan submittals, Squaw Valley Ski Holdings will develop a Restoration Plan that will address pre-disturbance condition documentation, final clean-up, stabilization, and revegetation procedures for areas disturbed by the project. Squaw Valley Ski Holdings may develop a single plan for both the Forest Service and Placer County addressing restoration on NFS lands and private lands, or separate plans for each agency. Both agencies have review and approval authority for restoration planning and implementation in their respective jurisdictions. On Forest Service lands, Squaw Valley Ski Holdings will coordinate with the Tahoe National Forest to determine an appropriate seed mix or tree-planting plan. On private land, Squaw Valley Ski Holdings will develop a seed mix based on consultation with Placer County, the Lahontan Regional Water Quality Control Board (RWQCB), and the landowner. The plan will include approved seed mixes and soil amendments, application rates, and application methods. If broadcast seeding is determined to be the most feasible application method, seeding rates will be doubled and the seeding method rationale will be explained. The plan will also include long-term erosion and sediment control measures, slope stabilization, and monitoring procedures. *BMP 5.4*	Forest Service and Placer County	Develop a Restoration Plan as part of the Improvement Plan and Construction and Operation Plan submittals	Completion prior to or concurrent with Improvement Plan and Construction and Operation Plan submittals
RPM BIO-31 Reclaim disturbed areas promptly to prevent resource damage and invasion of noxious weeds. Restoration of disturbed sites will be overseen by a qualified biologist and will likely consist of a combination of the following: ◢ Pre-disturbance documentation of site conditions to guide restoration success criteria. ◢ Loosen soil compacted by construction activities, and/or loosen existing compaction, to promote restoration success. The need for, and depth of soil loosening would be determined by a Forest Service soil scientist or hydrologist on NFS lands, and by a qualified restoration ecologist or soil scientist on private lands. ◢ Apply appropriate erosion control BMPs (e.g., installation of straw bale check dams, mulch, log stabilization) in areas where evidence of sheet, rill, or gully erosion exists. ◢ Seed with a certified weed-free seed mix, approved by the applicable agencies and land owners, containing native and site-appropriate species. ◢ Apply 1 to 2 inches of locally obtained mulch such as pine needles, wood chips, or tub grindings. ◢ Monitor for new noxious weed invasions and expansion of existing weed populations following treatments and implement weed control measures where needed. Post-treatment monitoring for noxious weeds would be	Forest Service and Placer County	Identify these measures in the Restoration Plan to be reviewed and approved by the Forest Service and Placer County	Monitor for new noxious weed invasions and expansion of existing weed populations following treatments and implement weed control measures where needed; Conduct post-treatment monitoring for noxious weeds annually for up to three years, similar to the frequency and duration specified for USFS land in the USFS Noxious Weed Risk Assessment

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Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
conducted annually for up to three years, similar to the frequency and duration specified for USFS land in the USFS Noxious Weed Risk Assessment prepared for the project. ◢ Conduct post-treatment monitoring and reporting annually for the first three years, then every two years for up to 10 years, to evaluate success of restoration treatments. The details of the monitoring and reporting program, including identification and implementation of potential adaptive management actions based on monitoring results, will be developed jointly by Squaw Valley Ski Holdings and the land owner/manager. These items, as well as details of a monitoring and reporting program, including identification and implementation of potential adaptive management actions based on monitoring results, will be developed jointly by Squaw Valley Ski Holdings and the land owner/manager and Placer County. These measures will be reflected in the Restoration Plan(s) to be reviewed and approved by the Forest Service and Placer County. *BMP 5.4*			prepared for the project
<u>RPM BIO-32</u> Prior to Placer County Improvement Plan approval, a Revegetation Plan, prepared by a licensed landscape architect or similar professional, shall be submitted and approved by the DRC. This Revegetation Plan may consist of the Restoration Plan identified in other RPMs, if the Restoration Plan contains all the Revegetation Plan components required by Placer County. Prior to Improvement Plan submittal, a conceptual Revegetation Plan shall be submitted to the Placer County DRC. The revegetation shall be installed to the satisfaction of the County prior to the County's acceptance of the subdivision's improvements. All landscaping shall consist of native plant species with a water-conserving drip irrigation system to be installed by the developer. The applicant shall be responsible for the maintenance of said revegetation and irrigation. All areas that are disturbed shall be re-established with hydro seeding, broadcast seeding, and/or planting. A vegetation monitoring program report, prepared by a licensed landscaping architect, shall be submitted annually to the Planning Services Division for a 3-year period (note there is a longer 5-year monitoring period for replacement of native trees under RPM BIO-38 and wetland and riparian vegetation under RPM BIO-39). Said report shall define areas that have been disturbed/replanted with a description of the seeding and/or planting materials, and status of re-established vegetation, including survival rate. Any corrective actions required are the responsibility of the applicant. A letter of credit or cash deposit in the amount of 125 percent of the accepted proposal shall be deposited with the Placer County Planning Services Division to assure performance of the monitoring program. Evidence of this deposit shall be provided to the satisfaction of the DRC. Violation of any components of the approved Mitigation Monitoring and Reporting Program (MMRP) may result in enforcement activity per Placer County Environmental Review Ordinance Article 18.28.080 of the Placer County Code. An agreement between the applicant and the County shall be prepared which meets DRC approval that allows the County use of the deposit to assure performance of the MMRP in the event the applicant fails to perform.	Placer County	Submit conceptual Revegetation Plan prior to Improvement Plan submittal; Submit final Revegetation Plan prior to Placer County Improvement Plan approval; Install revegetation to the satisfaction of the County prior to the County's acceptance of the subdivision's improvements	Submit a vegetation monitoring program report annually to the Planning Services Division for a 3-year period (note there is a longer 5-year monitoring period for replacement of native trees under RPM BIO-38 and wetland and riparian vegetation under RPM BIO-39)

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Table 1 Mitigation Monitoring and Reporting Program

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<u>RPM BIO-33</u> Prior to Placer County Improvement Plan and Construction and Operation Plan approval, the applicant shall furnish to the Placer County DRC and the Forest Service, evidence that CDFW, USACE, and USFWS have been notified by certified letter regarding the existence of any wetlands, streams, and/or vernal pools on the project site. Prior to Improvement Plan approval, if permits are required, they shall be obtained and copies submitted to DRC and the Forest Service. Any clearing, grading, or excavation work shall not occur until the Improvement Plans have been approved.	Forest Service and Placer County DRC	Provide evidence prior to Placer County Improvement Plan and Construction and Operation Plan approval that CDFW, USACE, and USFWS have been notified by certified letter regarding the existence of any wetlands, streams, and/or vernal pools on the project site; If required, obtain permits prior to Improvement Plan approval	Completion prior to Placer County Improvement Plan and Construction and Operation Plan approval
<u>RPM BIO-34</u> The Placer County Improvement Plans shall include a note and show placement of Temporary Construction Fencing. The applicant shall install a four (4) foot tall, brightly colored (usually yellow or orange), synthetic mesh material fence (or an equivalent approved by the Placer County DRC) at the following locations prior to any construction equipment being moved on-site or any construction activities taking place: 1. Adjacent to any and all wetland preservation easements that are within 50 feet of any proposed construction activity; 2. At the limits of construction, outside the critical root zone of all trees six (6) inches dbh (diameter at breast height), or 10 inches dbh aggregate for multi-trunk trees, within 50 feet of any grading, road improvements, underground utilities, or other development activity, or as otherwise shown on the Improvement Plans; 3. Around any and all "special protection" areas as discussed in the project's environmental review documents. 4. Around all Open Space Lots within 50 feet of any development activity. No development of the site, including grading, shall be allowed until this condition is satisfied. Any encroachment within these areas, including critical root zones of trees to be saved, must first be approved by the DRC. Temporary fencing shall not be altered during construction without written approval of the DRC. No grading, clearing, storage of equipment or machinery, etc., may occur until a representative of the DRC has inspected and approved all temporary construction fencing. This includes both on-site and off-site improvements. Efforts should be made to save trees where feasible. This may include the use of retaining walls, planter islands, pavers, or other techniques commonly associated with tree preservation.	Placer County DRC	Include note and show placement of Temporary Construction Fencing concurrent with submittal of Placer County Improvement Plans	Maintain Temporary Construction Fencing continuously during construction

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Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM BIO-35 Prior to Placer County Improvement Plan approval, the wetlands report/delineation shall be field verified by USACE, USFWS, LRWQCB and CDFW as deemed necessary by these agencies. If significant discrepancies arise between the report and the field investigation of these agencies that cannot be resolved, the DRC may schedule a hearing before the Planning Commission to consider revocation or modification of the project's permit approvals if deemed necessary.	Placer County	Prior to Placer County Improvement Plan approval	Completion prior to Placer County Improvement Plan approval
RPM BIO-36 Prior to Placer County Improvement Plan approval or issuance of a Building Permit, where off-site mitigation has been determined to be acceptable for compensation of wetland/riparian impacts, and the area impacted is in excess of 1,000 square feet, the applicant or agent shall provide mitigation using one of the mechanisms below: A) Where mitigation banks are used, provide written evidence of payment that compensatory habitat has been established through the purchase of mitigation credits at a County-qualified wetland mitigation bank. Evidence of payment shall describe the amount and type of habitat purchased at the bank site. The amount of money required to purchase credits shall be equal to the amount necessary to replace wetland or riparian habitat acreage Evidence of payment shall describe the amount and type of habitat purchased at the bank site and resource values including compensation for temporal loss. Evidence of payment, which describes the amount and type of habitat purchased at the bank site, must be provided to the County prior to issuance of Improvement Plan. B) Construct wetland and/or riparian habitat in an off-site location acceptable to Placer County and any State or Federal resource agency (including the Forest Service) with jurisdiction over the habitat. A wetland/riparian mitigation plan shall be reviewed and approved by Placer County and any affected State or Federal resource agency prior to initiation of construction of any compensatory habitat. C) Provide a combination of mitigation bank credit purchase and off-site construction as outlined above.	Placer County	Prior to Placer County Improvement Plan approval or issuance of a Building Permit, where off-site mitigation has been determined to be acceptable for compensation of wetland/riparian impacts, and the area impacted is in excess of 1,000 square feet	
RPM BIO-37 The Placer County Improvement Plans shall include a note that includes the wording of this RPM and show placement of all protective fencing for those trees, and large snags identified for protection within the raptor report described below. Prior to any grading or tree removal activities, a focused survey for raptor nests shall be conducted by a qualified biologist during the raptor nesting season (March 1 - September 1). A report summarizing the survey shall be provided to Placer County and CDFW within 30 days of the completed survey. If an active raptor nest is identified, appropriate mitigation measures shall be developed and implemented in consultation with CDFW. If construction is proposed to take place between March 1st and September 1st, no construction activity or tree removal shall occur within 500 feet of an active nest (or greater distance, as determined by CDFW). Construction activities may only resume after a follow up survey has been conducted and a report prepared by a qualified raptor biologist indicating that the nest (or nests) are no longer active, and that no new nests have been identified. A follow-up survey shall be conducted 2 months following the initial survey, if the initial survey occurs between March 1st and July 1st. Additional follow up surveys may be required by the Placer County DRC, based on the recommendations in the raptor study and/or as recommended by CDFW. Temporary construction fencing and signage as described herein shall be installed at a minimum 500-	Placer County	Include note on Placer County Improvement Plans prior to or concurrent with submittal; Conduct focused survey for raptor nests during the raptor nesting season (March 1 - September 1) prior to any grading or tree removal activities; Provide report summarizing the survey to Placer County and	Conduct follow-up survey 2 months following the initial survey, if the initial survey occurs between March 1st and July 1st; Additional follow up surveys may be required; Maintain temporary construction fencing and signage continuously during construction

[1]A statement shall be included on the Improvement Plans submitted to Placer County and all permits where Placer County has jurisdiction indicating that all RPMs and mitigation measures included in this MMRP and all conditions of project approval shall be adhered to.

Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
foot radius around trees containing active nests. If all project construction occurs between September 1st and March 1st no raptor surveys will be required. Trees previously approved for removal by Placer County, which contain stick nests, may only be removed between September 1st and March 1st.		CDFW within 30 days of the completed survey	
RPM BIO-38 Prior to Placer County Improvement Plan submittal, a Mitigation Monitoring and Reporting Program (MMRP) for the replacement of native trees, prepared by an International Society of Arboriculture (ISA) certified arborist, Registered Forester, or Landscape Architect, shall be submitted to the Placer County Planning Services Division, for review and approval by the Placer County DRC. Said plan shall provide for a minimum of native trees based on replacement on an inch for inch basis to be planted by the project developer within Common Area Lots and any other areas determined appropriate by the DRC. The Plan shall include a site plan that indicates the trees' location, installation and irrigation requirements and other standards to ensure the successful planting and continued growth of these trees. ◢ Installation of all trees and irrigation systems must be completed prior to the County's acceptance of the improvements. ◢ An annual monitoring report for a minimum period of five (5) years from the date of installation, prepared by the above-cited professional, shall be submitted to the DRC for review and approval. Any corrective action shall be the responsibility of the applicant. ◢ Prior to the Improvement Plan approval, a Letter of Credit, Certificate of Deposit, or cash deposit in the amount of 100 percent of the accepted proposal shall be deposited with the Placer County Planning Services Division to assure on-going performance of the monitoring program. Evidence of this deposit shall be provided to the satisfaction of the DRC prior to the approval of Improvement Plans. For the purposes of administrative and program review by Placer County, an additional 25 percent of the estimated cost of the Monitoring Program shall be paid to the County, in cash, at the time that the 100 percent deposit is made. With the exception of the 25 percent administrative fee, 100 percent of the estimated costs of implementing the monitoring program shall be returned to the applicant once the applicant has demonstrated that all five (5) years of monitoring have been completed to the satisfaction of the DRC. Refunds will only be available at the end of the entire review period. ◢ It is the applicant's responsibility to ensure compliance with the MMRP. Violation of any components of the approved MMRP may result in enforcement activities per Placer County Environmental Review Ordinance, Article 18.28.080 (formerly Section 31.870). If a monitoring report is not submitted for any one year, or combination of years, as outlined in these conditions, the County has the option of utilizing these funds and hiring a consultant to implement the MMRP. Failure to submit annual monitoring reports could also result in forfeiture of a portion of, or all of, the deposit. An agreement between the applicant and County shall be prepared which meets DRC approval that allows the County use of this deposit to assure performance of the MMRP in the event the applicant reneges. This RPM addresses issues similar to RPM TREE-11 and Placer County will coordinate the implementation of these two RPMs.	Placer County Planning Services Division and Placer County DRC	Submit MMRP prior to Placer County Improvement Plan submittal; Install all trees and irrigation systems prior to the County's acceptance of the improvements; Provide a Letter of Credit, Certificate of Deposit, or cash deposit prior to the Improvement Plan approval	Submit an annual monitoring report for a minimum period of five (5) years from the date of installation to the DRC for review and approval; Comply with the MMRP continuously during project construction and operation

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
<u>RPM BIO-39</u> Prior to Placer County Improvement Plan approval, a Mitigation Monitoring and Reporting Program (MMRP) for the replacement of wetlands/riparian vegetation which resembles the density and species composition of the existing wetland area shall be prepared by a qualified wetlands biologist. Said MMRP shall be submitted to the Planning Services Division and shall comply with Article 18.28 of the Placer County Environmental Review Ordinance. Where stormwater detention/retention is proposed in conjunction with wetlands replacement or enhancement, the monitoring program shall consider sediment removal and restoration within disturbed areas. Project construction and project monitoring shall comply with the criteria defined in the EIR, MMRP, and the requirements of CDFW. ◢ An annual monitoring report for a minimum period of five (5) years from the date of installation, prepared by the above-cited professional, shall be submitted to the Placer County DRC for review and approval. Any corrective action shall be the responsibility of the applicant. ◢ Prior to the Improvement Plan approval, a Letter of Credit, Certificate of Deposit, or cash deposit in the amount of 100 percent of the accepted proposal shall be deposited with the Placer County Planning Services Division to assure on-going performance of the monitoring program. Evidence of this deposit shall be provided to the satisfaction of the DRC prior to the approval of Improvement Plans. For the purposes of administrative and program review by Placer County, an additional 25 percent of the estimated cost of the Monitoring Program shall be paid to the County, in cash, at the time that the 100 percent deposit is made. With the exception of the 25 percent administrative fee, 100 percent of the estimated costs of implementing the monitoring program shall be returned to the applicant once the applicant has demonstrated that all five (5) years of monitoring have been completed to the satisfaction of the DRC. Refunds will only be available at the end of the entire review period. ◢ It is the applicant's responsibility to ensure compliance with the MMRP. Violation of any components of the approved MMRP may result in enforcement activities per Placer County Environmental Review Ordinance, Section 18.28.080. If a monitoring report is not submitted for any one year, or combination of years, as outlined in these conditions, the County has the option of utilizing these funds and hiring a consultant to implement the MMRP. Failure to submit annual monitoring reports could also result in forfeiture of a portion of, or all of, the deposit. An agreement between the applicant and County shall be prepared which meets DRC approval that allows the County use of this deposit to assure performance of the MMRP in the event the applicant fails to perform.	Placer County Planning Services Division and Placer County DRC	Submit MMRP prior to Placer County Improvement Plan approval; Provide a Letter of Credit, Certificate of Deposit, or cash deposit prior to the Improvement Plan approval	Submit an annual monitoring report for a minimum period of five (5) years from the date of installation to the DRC for review and approval; Comply with the MMRP continuously during project construction and operation
<u>RPM BIO-40</u> Prior to Placer County Building Permit issuance, for projects which permanently alter or destroy riparian habitat or wetland habitat, where the impacted area is less than 1,000 square feet in area, the project proponent shall provide mitigation in the form of cash or other security, acceptable to the Placer County DRC. These funds shall be used for the purchase, enhancement, restoration, or re-creation of wetland/riparian habitat and resource values which will be modified, damaged, and/or destroyed by this project. The monies shall be held in a trust fund until such time that habitat credits are purchased at a County-qualified mitigation bank. The funds will be used solely for the above-described purpose. The amount of payment shall be that which was determined during the environmental review process as a fair share mitigation, based upon acres of wetland and/or riparian habitat lost on-site. The amount of money required to purchase credits shall be equal to the amount necessary to replace wetland or riparian habitat acreage and resource values, including compensation for temporal loss. The amount to be paid shall be the fee in effect at the time the Use Permit is exercised.	Placer County DRC	Prior to Placer County Building Permit issuance	Completion prior to Placer County Building Permit issuance

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
Soil and Erosion			
RPM SOILS-1 Temporary sediment control structures, such as silt fencing, straw mulch, waddles, straw bale check dams, and sediment traps will be installed, as appropriate, to contain sediment within construction work areas and staging areas. Where soils and slopes exhibit high erosion potential, additional sediment control structures, such as erosion control blankets, matting, and other fabrics may be installed. Erosion-control matting on steep fill slopes (i.e., land with a slope angle of 35% or greater) will be utilized to protect soils and enhance conditions for vegetation re-establishment. However, tightly woven fiber netting or similar material, plastic mono-filament netting or similar material, shall not be used for erosion control or other purposes. Materials such as coconut fiber rolls or burlap rolls are acceptable. Implementation and maintenance of these erosion control measures, and any others identified in the SWPPP, would be monitored by a qualified environmental monitor. *BMP 2.8, 2.9, 2.10, 2.13, 5.1, 5.2, 5.3, 5.4, 5.6*	Forest Service and Placer County	Implement and maintain erosion control measures during construction	Monitor the implementation and maintenance of erosion control measures continuously during construction
RPM SOILS-2 Design, implementation, and monitoring roles and responsibilities will be clearly defined and included in the construction management plan, submitted to the Forest Service and Placer County ESD by April 1 of the intended construction season. *BMP 2.8, 2.9, 2.10, 2.13, 5.1, 5.2, 5.3, 5.4, 5.6*	Forest Service and Placer County ESD	Submit construction management plan by April 1 of the intended construction season	Completion following submittal of construction management plan by April 1 of the intended construction season
RPM SOILS-3 Properly design, install, and maintain all BMPs for erosion and sediment control. Remove non-natural and non-biodegradable materials before leaving the site following construction. All BMPs on Forest Service lands are required to meet the Forest Service Region 5 regional policy and to be consistent with the provisions of the 1981 Management Agency Agreement between the State Water Resource Control Board and the Forest Service as the designated Water Quality Management Agency on National Forest System Lands. Site-specific BMPs and management requirements and careful implementation and monitoring of BMPs, consistent with the requirements of these RPMs, are primary means of minimizing erosion and water quality impacts in this project area. *BMP 2.8, 2.9, 2.10, 2.13, 5.1, 5.2, 5.3, 5.4, 5.6*	Forest Service and Placer County	Properly design and install BMPs for erosion and sediment control prior to construction	Maintain all BMPs for erosion and sediment control during construction; Remove non-natural and non-biodegradable materials before leaving the site following construction
RPM SOILS-4 Temporary erosion and sediment control BMPs intended to be retained for more than a year to ensure soil stabilization will be inspected and maintained at least once annually until stabilization success criteria have been achieved. Results of annual inspections and maintenance, including identification of any repairs or improvements that were completed, will be reported to the Forest Service and Placer County within 60-days of completion. *BMP 2.8, 2.9, 2.10, 2.13, 5.1, 5.2, 5.3, 5.4, 5.6*	Forest Service and Placer County	Inspect and maintain temporary erosion and sediment control BMPs (intended to be retained for more than a year to ensure soil stabilization)	Inspect and maintain temporary erosion and sediment control BMPs (intended to be retained for more than a year to ensure soil stabilization)

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
		at least once annually until stabilization success criteria have been achieved	at least once annually until stabilization success criteria have been achieved; Report results of annual inspections and maintenance, including identification of any repairs or improvements that were completed within 60 days of completion
<u>RPM SOILS-5</u> Soil-disturbing activities will be avoided during periods of heavy rain or excessively wet soils consistent with criteria developed by LRWQCB (https://www.waterboards.ca.gov/lahontan/water_issues/programs/waste_discharge_requirements/timber_harvest/docs/timber_waiver/atta_def14.pdf) *BMP 2.8, 2.9, 2.10, 2.13, 5.1, 5.2, 5.3, 5.4, 5.6*	Forest Service and Placer County	During construction	Continuously during construction
<u>RPM SOILS-6</u> Temporarily place construction spoils in upland areas in locations that will not migrate to wetland areas, provide protection measures from weed establishment, cover to prevent spoil displacement during precipitation events, and provide erosion control measures to prevent transport of loose materials. No long-term storage of spoil will be retained onsite. *BMP2.8, 2.9, 2.10, 2.13, 5.5*	Forest Service and Placer County	During construction	Continuously during construction
<u>RPM SOILS-7</u> Do not locate roads, trails, or other disturbed areas on slopes that show signs of instability, such as slope failure, mass movement, or slumps. *BMP 2.1, 2.2, 2.3, 2.4, 2.8, 2.9, 2.10, 2.13*	Forest Service and Placer County	During construction	Continuously during construction
<u>RPM SOILS-8</u> The Placer County Improvement Plan(s) and Forest Service Construction and Operation Plans shall identify the stockpiling and/or vehicle staging areas with locations as far as practical from existing dwellings and protected resources in the area. *BMP 2.10*	Forest Service and Placer County	Concurrent with submittal of Placer County Improvement Plan(s) and Forest Service Construction and Operation Plans	Completion concurrent with submittal of Placer County Improvement Plan(s) and Forest Service Construction and Operation Plans

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
<u>RPM SOILS-9</u> The Placer County Improvement Plans shall show all proposed grading, drainage improvements, vegetation and tree removal and all work shall conform to provisions of the County Grading Ordinance (Ref. Article 15.48, Placer County Code) and Stormwater Quality Ordinance (Ref. Article 8.28, Placer County Code) that are in effect at the time of submittal. No grading, clearing, or tree disturbance shall occur until the Improvement Plans are approved and all temporary construction fencing has been installed and inspected by a member of the Placer County DRC. All cut/fill slopes shall be at a maximum of 2:1 (horizontal: vertical) unless a soils report supports a steeper slope and the Placer County ESD concurs with said recommendation. The applicant shall revegetate all disturbed areas. Revegetation, undertaken from April 1 to October 1, shall include regular watering to ensure adequate growth. A winterization plan shall be provided with project Improvement Plans. It is the applicant's responsibility to ensure proper installation and maintenance of erosion control/winterization before, during, and after project construction. Soil stockpiling or borrow areas, shall have proper erosion control measures applied for the duration of the construction as specified in the Improvement Plans. Provide for erosion control where roadside drainage is off of the pavement, to the satisfaction of the ESD. The applicant shall submit to the ESD a letter of credit or cash deposit in the amount of 110 percent of an approved engineer's estimate for winterization and permanent erosion control work prior to Improvement Plan approval to guarantee protection against erosion and improper grading practices. One year after the County's acceptance of improvements as complete if there are no erosion or runoff issues to be corrected, unused portions of said deposit shall be refunded to the project applicant or authorized agent. If, at any time during construction, a field review by County personnel indicates a significant deviation from the proposed grading shown on the Improvement Plans, specifically with regard to slope heights, slope ratios, erosion control, winterization, tree disturbance, and/or pad elevations and configurations, the plans shall be reviewed by the DRC/ESD for a determination of substantial conformance to the project approvals prior to any further work proceeding. Failure of the DRC/ESD to make a determination of substantial conformance may serve as grounds for the revocation/modification of the project approval by the appropriate hearing body.	Placer County DRC and Placer County ESD	Identify all proposed grading, drainage improvements, vegetation, and tree removal on Placer County Improvement Plans; Provide winterization plan with project Improvement Plans; Submit a letter of credit or cash deposit for winterization and permanent erosion control work prior to Improvement Plan approval	Apply proper erosion control measures at soil stockpiling or borrow areas for the duration of construction; Refund unused portions of said deposit to the project applicant or authorized agent one year after the County's acceptance of improvements as complete if there are no erosion or runoff issues to be corrected; If, at any time during construction, a field review indicates a significant deviation from the proposed grading shown on the Improvement Plans, the plans shall be reviewed by the DRC/ESD prior to any further work proceeding
<u>RPM SOILS-10</u> Except in locations where work/disturbance has been authorized in wetlands or similar mesic habitats (e.g., see RPM BIO-26), soils will be dry to an appropriate depth for the equipment to be used consistent with the requirements of LRWQCB. Equipment with a higher ground pressure would require dryer soil than equipment that exerts a lower ground pressure. Overland movement of equipment may require dryer soils than movement on identified access roads. On NFS lands, soil suitability will be determined by a Forest Service soil scientist or hydrologist. On private lands soil suitability will be determined by a qualified environmental monitor. *BMP 2.1, 2.13*	Forest Service and Placer County	Prior to the start of construction	Continuously during construction
<u>RPM SOILS-11</u> To protect against accelerated erosion and hydrophobicity and to maintain long-term soil productivity, the following guidelines should be applied during the planning and implementation of tree removal and project construction on NFS lands:	Forest Service	During planning and implementation of tree removal and project	Continuously during tree removal and project construction on NFS

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
◢ Maintain downed wood retention adequate to contribute to organic matter while attaining desired conditions. ◢ All down logs greater than 15 inches diameter and 10 feet long will be retained. Crushing of logs with equipment will be avoided. Target down log levels would be approximately 5 of the largest logs available per acre. ◢ Downed logs in contact with soils within WBBZs (as defined by the Lahontan Regional Water Quality Control Board Conditional Waiver of Waste Discharge Requirements for Timber Harvest and Vegetation Management Activities) or downed large woody debris in the 100-year floodplain will not be removed. ◢ On soils with low to moderate erosion hazard ratings (0-25% slope), maintain 45% ground cover, 70% on soils in Tahoe Soil Group A. ◢ On soils with high erosion hazard ratings (25-50 % slope), maintain 55% ground cover, 80% on soils in Tahoe Soil Group A. ◢ On soils with very high hazard ratings (greater than 50% slopes), maintain 70% ground cover, 90% on soils in Tahoe Soil Group A. ◢ All areas disturbed from project implementation will be stabilized before the winter period or at conclusion of operations whichever is sooner. *BMP 2.13, 5.1, 5.2, 5.3, 5.4*		construction on NFS lands	lands; Stabilize all areas disturbed from project implementation before the winter period or at conclusion of operations, whichever is sooner
<u>RPM SOILS-12</u> Within Riparian Conservation Areas (RCAs) on NFS lands, mulching will occur over bare ground created by project activities within the RCA, with particular attention paid near the hydrologic feature. Upland areas of the RCA will meet the following General Ground Cover requirements: ◢ On soils with low to moderate erosion hazard ratings (0-25% slope), maintain 70% ground cover. ◢ On soils with very high erosion hazard ratings (greater than 25% slope), maintain 70 to 90% ground cover, depending on the soil type. ◢ In near stream zones for perennial streams and intermittent streams or seasonally wet areas with riparian and meadow features, approximately 75% ground cover will be required, more depending on soil type. Large patches of bare ground will be mulched. Within WBBZs (as defined by the Lahontan Regional Water Quality Control Board Conditional Waiver of Waste Discharge Requirements for Timber Harvest and Vegetation Management Activities), ground cover should meet an average of 2 inches in depth and a maximum of 4 inches with 85% ground cover. ◢ Mulch will be required on endline drag channels that exceed 4 inches depth on greater than 5% slopes in RCAs and 10% slopes on adjacent uplands where endlining is required. *BMP 2.13*	Forest Service	During construction	Continuously during construction

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
<u>RPM SOILS-13</u> Improvement Plan submittals shall include a final geotechnical engineering report produced by a California Registered Civil Engineer or Geotechnical Engineer for ESD review and approval. The report shall address and make recommendations on the following: A) Road, pavement, and parking area design B) Structural foundations, including retaining wall design (if applicable) C) Grading practices D) Erosion/winterization E) Special problems discovered on-site, (i.e., groundwater, expansive/unstable soils, etc.) F) Slope stability Once approved by the ESD, two copies of the final report shall be provided to the ESD and one copy to the Building Services Division for its use. It is the responsibility of the developer to provide for engineering inspection and certification that earthwork has been performed in conformity with recommendations contained in the report.	Placer County ESD	Concurrent with Improvement Plan submittals	Once approved by the ESD, provide two copies of the final report to the ESD and one copy to the Building Services Division; Provide for engineering inspection and certification that earthwork has been performed in conformity with recommendations contained in the report prior to initiating project operation
Hydrology and Water Quality			
<u>RPM WQ-1</u> Prior to initiating ground disturbing activities (including tree removal) or staging construction equipment, the project applicant will have a Spill Prevention Control and Countermeasure (SPPC) Plan approved by the Forest Service, complete a SWPPP, and receive appropriate authorization from LRWQCB. The SPPC and SWPPP will be implemented during project construction. The SPPC and/or SWPPP will address the following items related to the storage and use of fuels and other toxic materials: 1. Fuels and other toxic materials will be stored outside of Riparian Conservation Areas (RCAs), critical aquatic refuges, and aquatic habitats. 2. Identify appropriate sites for regular equipment refueling and servicing. These sites will also be identified in the Placer County Improvement Plans. The sites must be outside of Riparian Conservation Areas, critical aquatic refuges, and aquatic habitats. 3. Allow temporary refueling and servicing (e.g., a piece of equipment needs refueling or repair in the field, outside of the designated regular equipment refueling and servicing sites) only at locations either pre-designated for this purpose in the SPCC and/or SWPP, or that are approved by an environmental monitor. Temporary equipment refueling and services sites must be outside of RCAs, critical aquatic refuges, and aquatic habitats. 4. Emergency spill kits adequate to contain spills that could result from onsite equipment or from stored toxic materials will be available at all sites used for equipment refueling, servicing, or storage of toxic materials. Secondary containment will be installed at each of these sites to control accidental spills. 5. Provide training for all personnel handling fuels and chemicals in their proper use, handling, storage, and disposal; methods and practices to avoid spills; and the proper use of spill kits and methods for incident reporting in the event of a spill.	Forest Service, Placer County, and Lahontan Regional Water Quality Control Board	Prior to initiating ground disturbing activities (including tree removal) or staging construction equipment	Implement measures continuously during construction

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
6. As a condition of the LRWQCB Timber Waivers all equipment used must be monitored for leaks. Spills must be immediately contained and spilled materials and/or contaminated soils must be properly disposed. 7. Environmental monitors will regularly inspect refueling and servicing areas, and toxic material storage areas, to help ensure that proper measures are being implemented in accordance with the project's SPCC, SWPPP, RPMs, and mitigation measures. *BMP 2.11, 2.13, 7.4, 7.5*			
RPM WQ-2 All concrete washouts will be conducted either into excavations where the concrete was poured, within designated concrete washout areas, or will be captured using a washout-recycling system. Crews will not be allowed to dispose of concrete or concrete washout material directly onto the ground. *BMP 7.5*	Forest Service and Placer County	During construction	Continuously during construction
RPM WQ-3 Where feasible, all stormwater or groundwater within excavations will be discharged overland into well-vegetated areas to promote the settling of sediment. *BMP 2.13, 5.1, 5.2, 5.3*	Forest Service and Placer County	During construction	Continuously during construction
RPM WQ-4 No vehicle and equipment usage within stream channels and other aquatic resources will take place. Squaw Valley Ski Holdings will utilize alternative access routes, helicopters, and other means to access either side of the aquatic resource to avoid vehicles or equipment needing to enter or pass through the stream channel or aquatic resource. This does not apply to the movement of over snow-vehicles when at least 3-feet of snow is over the aquatic habitat. *BMP 2.1, 2.2, 2.3, 2.4, 2.8, 2.9, 2.10, 2.13, 7.3, 7.5*	Forest Service and Placer County	During construction	Continuously during construction
RPM WQ-5 Squaw Valley Ski Holdings will obtain permits from appropriate regulatory agencies prior to commencing work in Waters of the United States or Waters of the State, and in stream and riparian habitats, and implement all applicable permit conditions. Following construction, Squaw Valley Ski Holdings will restore any adversely affected riparian habitats, water bodies, and wetlands to pre-project conditions and compensate for any permanent wetland impacts in accordance with the USACE "no net loss" policy. *BMP 2.8, 2.9, 2.10, 2.13, 7.3, 7.5*	Forest Service and Placer County	Obtain permits from appropriate regulatory agencies prior to commencing work in Waters of the United States or Waters of the State, and in stream and riparian habitats	Restore any adversely affected riparian habitats, water bodies, and wetlands to pre-project conditions and compensate for any permanent wetland impacts following construction

[1]A statement shall be included on the Improvement Plans submitted to Placer County and all permits where Placer County has jurisdiction indicating that all RPMs and mitigation measures included in this MMRP and all conditions of project approval shall be adhered to.

Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
RPM WQ-6 For ground-disturbing activities near aquatic habitats, ensure that roads, road ditches, and other disturbed areas drain, to the maximum extent possible, to undisturbed soils rather than directly to aquatic habitats. Direct drainage from disturbed areas as necessary using natural topography, rolling dips, waterbars, etc. This may not apply, based on approval from the Forest Service and/or Placer County, to locations where ground disturbance is temporary and as part of restoration to pre-project conditions drainage flows would be restored to aquatic habitats. *BMP 2.1, 2.2, 2.3, 2.8, 2.9, 2.10, 2.13, 5.1, 5.3, 5.4*	Forest Service and Placer County	During ground-disturbing activities near aquatic habitats	Continuously during ground-disturbing activities near aquatic habitats
RPM WQ-7 All construction and operation water use will be sourced from existing domestic sources (i.e., existing plumbing systems, wells, fire hydrants). No water will be drawn directly from surface water sources. *BMP 2.7*	Forest Service and Placer County	During construction and operation	Continuously during construction and operation
RPM WQ-8 Slash and debris will not be placed in wetlands. *BMP 2.8, 2.9, 2.10, 2.13, 5.5*	Forest Service and Placer County	During construction	Continuously during construction
RPM WQ-9 The Placer County Improvement Plan submittal shall include a drainage report in conformance with the requirements of Section 5 of the Land Development Manual and the Placer County Storm Water Management Manual that are in effect at the time of submittal, to the Placer County ESD for review and approval. The report shall be prepared by a Registered Civil Engineer and shall, at a minimum, include: A written text addressing existing conditions, the effects of the improvements, all appropriate calculations, a watershed map, increases in downstream flows, proposed on- and off-site improvements and drainage easements to accommodate flows from this project. The report shall identify water quality protection features and methods to be used both during construction, as well as long-term post-construction water quality measures. The final Drainage Report shall be prepared in conformance with the requirements of Section 5 of the Land Development Manual and the Placer County Storm Water Management Manual that are in effect at the time of improvement plan submittal. The drainage report shall also be submitted to the Forest Service for review and comment. Portions of the drainage report addressing activities or facilities on NFS lands will be prepared in coordination with the Forest Service and the Forest Service will have approval authority for these portions of the report. The portion of the report addressing NFS lands will, at a minimum, be in conformance with the performance requirements of Section 5 of the Land Development Manual and the Placer County Storm Water Management Manual; however, the Forest Service may require more stringent standards.	Forest Service and Placer County Engineering and Surveying Division	Provide drainage report concurrent with Placer County Improvement Plan submittal	Completion concurrent with Placer County Improvement Plan submittal
RPM WQ-10 The Placer County Improvement Plan submittal and Drainage Report shall provide details showing that storm water run-off shall be reduced to pre-project conditions through the installation of retention/detention facilities. Retention/detention facilities shall be designed in accordance with the requirements of the Placer County Storm Water Management Manual that are in effect at the time of submittal, and to the satisfaction of the Placer County ESD and shall be shown on the Improvement Plans. The	Forest Service and Placer County ESD	Provide drainage report concurrent with Placer County Improvement Plan submittal; Include same drainage details in Forest	Completion concurrent with Placer County Improvement Plan submittal and Forest Service Construction and

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
Forest Service Construction and Operation Plans shall include the same details regarding storm water -run off and retention/detention facilities. Storm water run-off management techniques and any potential retention/detention facilities on NFS lands will be planned for and developed in coordination with the Forest Service and the Forest Service will have approval authority for these items. On NFS lands, storm water run-off shall be reduced to pre-project conditions, and if retention/detention facilities are needed, they shall, at a minimum, be designed in accordance with the requirements of the Placer County Storm Water Management Manual that are in effect at the time of submittal; however, the Forest Service may require more stringent standards. The ESD, on private lands, and the Forest Service, on NFS lands, may, after review of the project drainage report, delete requirements for retention/detention facilities, if it is determined that drainage conditions do not warrant installation of this type of facility. Maintenance of retention/detention facilities by the applicant shall be required. No retention/detention facility construction shall be permitted within any identified wetlands area, floodplain, or right-of-way, except as authorized by project approvals.		Service Construction and Operation Plans	Operation Plans submittal
<u>RPM WQ-11</u> Prior to Placer County Improvement Plan approval, the applicant shall obtain a State Regional Water Quality Control Board NPDES construction stormwater quality permit and shall provide to the Placer County ESD evidence of a state-issued Waste Discharge Identification (WDID) number or filing of a Notice of Intent and fees.	Forest Service and Placer County ESD	Prior to Placer County Improvement Plan approval	Completion prior to Placer County Improvement Plan approval
<u>RPM WQ-12</u> The Placer County Improvement Plans shall show that water quality treatment facilities/BMPs on private lands shall be designed according to the guidance of the California Stormwater Quality Association Stormwater Best Management Practice Handbooks for Construction, for New Development / Redevelopment, and for Industrial and Commercial (or other similar source as approved by the Placer County ESD. Storm drainage from on- and off-site impervious surfaces (including roads) shall be collected and routed through specially designed catch basins, vegetated swales, infiltration basins, water quality basins, filters, etc. for entrapment of sediment, debris and oils/greases or other identified pollutants, as approved by the ESD. BMPs shall be designed in accordance with the East Placer County Storm Water Quality Design Manual for sizing of Permanent Post-Construction Best Management Practices for Stormwater Quality Protection. No water quality facility construction shall be permitted within any identified wetlands area, floodplain, or right-of-way, except as authorized by project approvals. All BMPs shall be maintained as required to insure effectiveness. The applicant shall provide for the establishment of vegetation, where specified, by means of proper irrigation. Proof of on-going maintenance, such as contractual evidence, shall be provided to ESD upon request. Maintenance of these facilities shall be provided by the project owners/permittees and certification of completed maintenance reported annually to the County DPWF Stormwater Coordinator, unless, and until, a County Service Area is created and said facilities are accepted by the County for maintenance. Prior to Improvement Plan easements shall be created and offered for dedication to the County for maintenance and access to these facilities in anticipation of possible County maintenance.	Placer County ESD	Show water quality treatment facilities/BMPs on private lands on submitted Placer County Improvement Plans; Prior to Improvement Plan approval, easements shall be created and offered for dedication to the County for maintenance and access to these facilities in anticipation of possible County maintenance	Maintain BMPs continuously during construction; Provide proof of on-going maintenance to ESD upon request; Report completed maintenance annually to the County DPWF Stormwater Coordinator, unless, and until, a County Service Area is created and said facilities are accepted by the County for maintenance

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Table 1 Mitigation Monitoring and Reporting Program

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RPM WQ-13 The Placer County Improvement Plans shall show that materials with the potential to contaminate stormwater that are to be stored outdoors shall be placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the stormwater conveyance system, or protected by secondary containment structures such as berms, dikes, or curbs. The storage area shall be paved to contain leaks and spills and shall have a roof or awning to minimize collection of stormwater within the secondary containment area.	Placer County ESD	Concurrent with submittal of Placer County Improvement Plans	Completion concurrent with submittal of Placer County Improvement Plans
RPM WQ-14 The Placer County Improvement Plans shall show that vehicle/equipment wash areas, if needed, shall be designed to be self-contained and/or covered and equipped with a clarifier or other pretreatment facility. Direct connection of a vehicle/equipment wash area to the storm drain system is prohibited. The applicant/permittees shall properly connect to a sanitary sewer via an external grease or sand/oil interceptor and contact the Department of Facility Services or other applicable sewer agency to obtain an Industrial Waste Discharge Permit, if required. If so, said permit shall be provided to the Placer County ESD prior to Improvement Plan approval. If connection to sanitary sewer is not available, the method of discharge shall be subject to review and approval by Placer County.	Placer County ESD	Concurrent with submittal of Placer County Improvement Plans; Provide Industrial Waste Discharge Permit, if required, to the Placer County ESD prior to Improvement Plan approval	Completion concurrent with submittal and approval of Placer County Improvement Plans
RPM WQ-15 On both public and private lands, equipment will not cross seasonal streams except at designated crossings as reviewed and approved on the Improvement Plans and Construction and Operation Plans. Within Riparian Conservation Areas (RCAs) (i.e. on public lands) all bare ground resulting from equipment operations will be mulched to standards. Within WBBZs (as defined by the Lahontan Regional Water Quality Control Board Conditional Waiver of Waste Discharge Requirements for Timber Harvest and Vegetation Management Activities) all bare ground resulting from equipment operations will be mulched to 85%. *BMP 2.1, 2.2, 2.3, 2.8, 2.9, 2.10, 2.13, 7.3, 7.5*	Forest Service and Placer County	Concurrent with submittal of Improvement Plans and Construction and Operation Plans	Implement continuously during construction
RPM WQ-16 The USFS hydrologist or qualified specialist must approve locations of skid trails, travel routes and other areas of heavy equipment operations within RCAs on NFS lands. Construction and tree removal equipment will be excluded from meadows according to boundaries identified in the field with Forest Service and/or Placer County staff and consistent with applicable RPMs. The exclusion area will be flagged on the ground. *BMP 2.1, 2.13*	Forest Service and Placer County	Prior to approval of construction plans	Continuously during construction
RPM WQ-17 Roads used for project construction on NFS lands will be brought back to the pre-existing standards following implementation. This work includes: grading, clearing, ditch and culvert cleaning and repair of water conveyance features. The repair work must repair and restore the road to accommodate the planned traffic and be consistent with the existing traffic service level, water quality objectives, and Road Management Objectives If any temporary crossings of ephemeral drainages are needed, they will be designed to pass flow using drainage dips, waterbars or culverts when needed (if flowing). Removal of temporary roads on ephemeral drainages will include re-establishing	Forest Service	Restore roads used for project construction on NFS lands to the pre-existing standards following completion of construction; If any	Completion of road restoration following completion of construction; Remove temporary crossings or ephemeral drainages no

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
drainage passage, mulching, and pulling outside berms to restore overland flows. If any temporary crossings are needed, they will be removed no later than October 15th of the season of installation. *BMP 2.1, 2.2, 2.3, 2.7, 2.8, 2.9, 2.10, 2.13, 5.1, 5.2, 5.3, 5.4, 5.5*		temporary crossings of ephemeral drainages are needed, remove no later than October 15th of the season of installation	later than October 15th of the season of installation
<u>RPM WQ-18</u> Construction activities on all roads, including hauling of removed trees, will be restricted to the dry season when roads are stable. No winter construction activities will be permitted, although some operations may continue past October 15 to November 30 if conditions permit as determined by the Forest Service, Placer County, and LRWQCB. *BMP 2.1, 2.2, 2.3, 2.8, 2.9, 2.10, 2.13*	Forest Service and Placer County	During construction activities on all roads	Continuously during construction activities on all roads
<u>RPM WQ-19</u> All necessary post ground disturbance erosion control measures will be implemented as soon as possible after ground disturbance at any particular project feature (e.g., tower, mid-station, base station, staging area, temporary access way) ceases. *BMP 2.8, 2.9, 2.10, 2.13, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6*	Forest Service and Placer County	As soon as possible after ground disturbance at any particular project feature (e.g., tower, mid-station, base station, storage shelter, staging area, temporary access way) ceases	Completion as soon as possible after ground disturbance at any particular project feature (e.g., tower, mid-station, base station, staging area, temporary access way) ceases
<u>RPM WQ-20</u> Temporary road design and location, including skid trails for tree removal will follow the following principles: ◢ Temporary roads/skid trails will follow previously-used road beds where available and appropriately located. ◢ Use rolling dips and an out-sloped road template. ◢ Limit the amount of temporary road construction associated with tree removal by maximizing the skidding distance (i.e., for tree removal, favor the use of skid trails versus the construction of temporary roads). ◢ Minimize the length and width of the roads/skid trails. Avoid unstable areas where there is potential for mass soil erosion. ◢ If a temporary road requires crossing flowing water, incorporate a method of passing water under the running surface to minimize sediment transport if the road is used while water is flowing. Any stream crossings will not create barriers to aquatic species. ◢ Initiate decommissioning all temporary roads/skid trails immediately after use is complete. Complete decommissioning before the end of the construction season. Temporary roads/skid trails on NFS lands will be decommissioned according to Renewable Resources Planning Act (16 USC 1608): appropriately draining the road to establish a hydrologically neutral state, pulling berms (particularly including the mineral soil) and re-establishing the natural contour in necessary areas. Particular attention will be paid to roads/skid trails within RCAs or when	Forest Service and Placer County	Follow principles of temporary road design and location during project design and construction	Initiate decommissioning of all temporary roads/skid trails immediately after use is complete; Complete decommissioning before the end of the construction season

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Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
crossing drainages. ◢ Where needed, mulch will be applied to control erosion. Subsoil temporary roads where determined to be necessary after review by a soils scientist or hydrologist. ◢ Decommissioned temporary roads/skid trails in RCAs will be mulched to control erosion, but mulch will not be placed in the 100-year flood plain. ◢ Block or otherwise prevent long-term access over temporary roads/skid trails, where needed to deter unauthorized use, place logs and logging slash over the first 200 feet. *BMP 2.1, 2.2, 2.3, 2.8, 2.9, 2.10, 2.13*			
<u>RPM WQ-21</u> Per the State of California NPDES Phase II MS4 Permit, this project is a Regulated Project that creates and/or replaces 5,000 square feet or more of impervious surface. A final Storm Water Quality Plan (SWQP) shall be submitted, either within the final Drainage Report or as a separate document that identifies how this project will meet the Phase II MS4 permit obligations. Site design measures, source control measures, and Low Impact Development (LID) standards, as necessary, shall be incorporated into the design and shown on the Improvement Plans. In addition, per the Phase II MS4 permit, projects creating and/or replacing one acre or more of impervious surface (excepting projects that do not increase impervious surface area over the pre-project condition) are also required to demonstrate hydromodification management of stormwater such that post-project runoff is maintained to equal or below pre-project flow rates for the 2 year, 24-hour storm event, generally by way of infiltration, rooftop and impervious area disconnection, bioretention, and other LID measures that result in post-project flows that mimic pre-project conditions.	Forest Service and Placer County ESD	Submit final Storm Water Quality Plan either within the final Drainage Report or as a separate document that identifies how this project will meet the Phase II MS4 permit obligations; incorporate site design measures, source control measures, and Low Impact Development standards, as necessary, into the design and shown on the Improvement Plans	Completion concurrent with submittal of final Storm Water Quality Plan and Improvement Plans
Tree Removal			
<u>RPM TREE-1</u> Skidding of trees will not be permitted in waters of the United States or waters of the State, including wetlands. Within these waters tree removal may be conducted by hand, use of cable systems, helicopter yarding, or use of ground based equipment so the aquatic habitat can be fully protected from disturbance and sedimentation. *BMP 2.13*	Forest Service and Placer County	During skidding of trees	Continuously during skidding of trees
<u>RPM TREE-2</u> Keep skid trail grades as gentle as possible, avoid straight up and down the slope skidding over distances greater than 200 feet. Unless otherwise agreed to in writing, skid trail patterns shall be agreed to by the Forest Service and Placer County in advance of felling and main skid trails shall be flagged on the ground in advance of felling. Skid trails on slopes over 30%, and the erosion control procedure for these trails, must be approved by the Forest Service and Placer County in advance of felling. Needed main skid trails will be constructed in advance of skidding. Main skid trails will be spaced no less than 75 feet apart, except when	Forest Service and Placer County	Unless otherwise agreed to in writing, skid trail patterns shall be agreed to by the Forest Service and Placer County in advance of felling; Flag	Completion in advance of skidding and felling of trees

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Table 1 Mitigation Monitoring and Reporting Program

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converging. Additional skid trails may be agreed upon when soil conditions permit. Tree removal operations will be confined to designated main skid trails until soil conditions are dry (as defined in previous RPMs). Existing skid trails will be used whenever possible except when they do not satisfy other RPMs. *BMP 2.13*		main skid trails on the ground in advance of felling; Obtain approval for skid trails on slopes over 30%, and the erosion control procedure for these trails in advance of felling; Construct needed main skid trails in advance of skidding	
<u>RPM TREE-3</u> After completion of project construction, all skid trails over 30% slope will have natural slash mulching to control soil erosion. Skid trails will have waterbars spaced according to Forest Service standards based on soil erodibility and slope. Implement mulching of skid trails using slash, certified weed free rice, straw or wood chips, whichever is available, on soils with very high erodibility, and where the residual % ground cover does not meet Forest Service standards. This requirement may be modified after an on-site inspection by the soil scientist or hydrologist. If slash is used for mulch, the Forest Service fuels officer will be involved prior to and during implementation. *BMP 2.13*	Forest Service and Placer County	Install natural slash mulching on all skid trails over 30% slope after completion of project construction	Completion after tree removal and project construction
<u>RPM TREE-4</u> When decommissioning landings and skid trails, decompact the soil with a mechanism that lifts the soil rather than turning the soil over on landings and the first 100 feet from the landing's primary skid trails. Subsoiling other skid trails in highly compacted areas will be evaluated on a site by site basis by Forest Service and Placer County staff. The need for the tilling of skid trails would be reviewed by a soil scientist or hydrologist and would be restricted to areas on slopes less than 25%, where residual trees would not be excessively damaged (root tearing leaving areas open to disease) and on those trails that do not contain excessive rocks unless otherwise agreed with the hydrologist/soil scientist. *BMP 2.13*	Forest Service and Placer County	During decommissioning landings and skid trails	Completion during decommissioning landings and skid trails
<u>RPM TREE-5</u> Where vehicle access is not permitted, any trees identified for removal may be endlined out of this location as long as resource damage can be avoided. *BMP 2.13*	Forest Service and Placer County	During tree removal and construction	Continuously during tree removal and construction

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RPM TREE-6 Utilize existing locations suitable for landings wherever possible. Locate all new landings off of main public travel corridors outside of any aquatic habitats and designated buffer zones. Landing locations shall be carefully planned to minimize the number needed, and will consider site-specific factors such as topography, watershed and other resource protection concerns, and operational needs. Where using existing sites that need to be increased in size to function as landings, the landing site will be extended in size away from drainages. Landings on NFS lands not located in an existing disturbed area must be approved by the Forrest Service hydrologist or qualified specialist prior to use. *BMP 2.13*	Forest Service and Placer County	During project design	Landings on NFS lands not located in an existing disturbed area must be approved by the Forrest Service hydrologist or qualified specialist prior to use
RPM TREE-7 No new landings will be located within aquatic habitats, WBBZs (as defined by the Lahontan Regional Water Quality Control Board Conditional Waiver of Waste Discharge Requirements for Timber Harvest and Vegetation Management Activities), or the 100-year floodplain of drainageways. *BMP 2.13*	Forest Service and Placer County	During project design	Completion prior to final project design and implemented during tree removal
RPM TREE-8 Avoid the felling of large snags where possible (15 inches dbh or greater), and where they do not provide a public safety hazard, to maintain their value to wildlife. On National Forest System Lands, trees greater than 10" dbh will be removed by whole tree yarding, that is, the whole tree will be removed, including branches/slash. It is preferred that trees between 3" and 10" dbh also be removed by whole tree yarding, but this is not mandatory. Where slash remains after tree removal, it will be cut into 6' lengths and scattered to a depth of less than 18".	Forest Service and Placer County	During tree marking and removal activities	Continuously during tree marking and removal activities
RPM TREE-9 Restrict hauling of removed trees on Forest Service and public roads on weekends and holidays, and during special events that generate high levels of traffic on local roadways or State Route 89.	Forest Service and Placer County	During tree removal activities	Continuously during tree removal activities
RPM TREE-10 Prior to Placer County Improvement Plan approval, a Tree Permit shall be required for all trees six inches diameter at breast height (dbh) (County Tree Ordinance) or greater, or multi-trunked trees 10 inches (dbh) or greater, that are located within 50 feet of any development activity, including grading, clearing, or other site disturbance.	Placer County Planning Services	Prior to Placer County Improvement Plan approval	Completion prior to Placer County Improvement Plan approval
RPM TREE-11 Prior to Placer County Improvement Plan approval, trees identified for removal, and/or trees with disturbance to its critical root zone, shall be mitigated through replacement with comparable species on-site, in an area to be reviewed and approved by the Placer County DRC or through payment of in-lieu fees, as follows: (The County shall choose one or more of A, B, or C below) A) For each diameter inch of a tree removed, replacement shall be on an inch-for-inch basis. For example, if 100 diameter inches are proposed to be removed, the replacement trees would equal 100 diameter inches (aggregate). If replacement tree planting is proposed, the tree replacement/mitigation plan must be shown on Improvements Plans and	Placer County Planning Services	Prior to Placer County Improvement Plan approval	Completion prior to Placer County Improvement Plan approval or on schedule agreed to by DRC.

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Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
must be installed by the applicant and inspected and approved by the Placer County DRC. At its discretion, the DRC may establish an alternate deadline for installation of mitigation replacement trees if weather or other circumstances prevent the completion of this requirement. B) A revegetation plan, as recommended by an International Society of Arboriculture (ISA)-certified arborist or similarly qualified professional, to provide an appropriate level of mitigation to offset the loss of trees, and as approved by the DRC, shall be shown on the Improvements Plan. If replacement tree planting is proposed, the tree replacement/mitigation plan shall be shown on Improvements Plans and shall be installed by the applicant and inspected and approved by the DRC. At its discretion, the DRC may establish an alternate deadline for installation of mitigation replacement trees if weather or other circumstances prevent the completion of this requirement. C) In lieu of the tree planting mitigation for tree removal listed above, a tree replacement mitigation fee of $100 per diameter inch at breast height for each tree removed or impacted or the current market value, as established by an Arborist, Forester, or Registered Landscape Architect, of the replacement trees, including the cost of installation, shall be paid to the Placer County Tree Preservation Fund. The unauthorized disturbance to the critical root zone of a tree to be saved shall be cause for the Planning Commission to consider revocation of this permit/ approval. This RPM addresses issues similar to RPM BIO-38 and Placer County will coordinate the implementation of these two RPMs.			
<u>RPM TREE-12</u> All trees above 10" dbh to be removed from NFS lands must be marked and approved by the Forest Service prior to removal. The applicant will conduct initial marking to identify trees for removal and the marking will be verified by Forest Service personnel. Trees/logs removed from NFS lands will be segregated from trees/logs removed from private lands. Trees/logs removed from NFS lands will be transported, processed, and processed materials sold consistent with applicable laws and regulations.	Forest Service	During pre-removal tree marking	Continuously during tree removal activities
Cultural Resources			
<u>RPM CUL-1</u> Prior to construction, Squaw Valley Ski Holdings will prepare for Forest Service and Placer County approval an Unanticipated Discovery Plan that will present, in detail, procedures to be implemented during construction (e.g. work stoppage guidelines). At a minimum, if a potential heritage or cultural resources is discovered, construction will be halted within 50-feet of the site until a qualified archeologist can evaluate the find. The Placer County Planning Services Division and Department of Museums must also be contacted for review of the archaeological find(s). If the archeologist can determine at the time that the find would not be eligible for the National Register of Historic Places (NRHP) or California Register of Historic Resources (CRHR) and does not contain human remains, construction may proceed after the find is properly documented and/or collected. Otherwise, applicable elements of other RPMs will be implemented. The Unanticipated Discovery Plan will also discuss procedures for immediate work stoppage and treatment in the event of discovery of human remains during construction activities.	Forest Service and Placer County	Prepare an Unanticipated Discovery Plan prior to construction	Implement procedures in the Unanticipated Discovery Plan during construction

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Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
<u>RPM CUL-2</u> If human remains are discovered, all work within 50 feet of the discovery site will halt immediately. Squaw Valley Ski Holdings will notify the County Coroner, as stipulated in Section 7050.5 of the Health and Safety Code (HSC). The Coroner will determine whether the remains are Native American and, if so, will contact the NAHC by telephone within 24 hours. The commission will follow the stipulations in Section 5097.98 of the Public Resources Code (PRC), including notification of those persons it believes to be most likely descended from the deceased Native American. If the commission is unable to identify a descendant, the descendant is unable to make a recommendation, or the landowner rejects the recommendation, the Native American Heritage Commission (NAHC) will mediate any dispute between the parties. Where such mediation fails to provide measures acceptable to the landowner, the landowner shall reinter the human remains and associated funerary items with appropriate dignity on the property, in a location not subject to further subsurface disturbance. If human remains are discovered on federally managed lands, the provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) will apply. For NAGPRA-associated discoveries, it may be necessary to provide 24-hour, onsite security. Work may only proceed after authorization is granted by the County coroner, the Placer County Planning Services Division, and the Forest Service if the find is on NFS lands.	Forest Service and Placer County	During construction	Continuously during construction
<u>RPM CUL-3</u> The WEAP prepared for other resources will also address the identification and appropriate treatment of potential fossil finds. If fossils or other paleontological resources are encountered during construction, all work will be halted within a 30-foot radius of the find and a qualified paleontologist will be contacted to examine the find and evaluate its significance. If the find is deemed to have scientific value, the paleontologist and Squaw Valley Ski Holdings will formulate a plan to either avoid impacts or to continue construction without disturbing the integrity of the find (e.g., by carefully excavating the material containing the resources under the direction of the paleontologist followed by routine conservation, laboratory preparation, and curation). Any excavated finds shall be offered to a State-designated repository such as Museum of Paleontology, U.C. Berkeley, the California Academy of Sciences, or any other State-designated repository. Otherwise, the finds shall be offered to the Placer County Department of Museums for purposes of public education and interpretive displays. These actions, as well as final mitigation and disposition of the resources shall be subject to approval by the Department of Museums. If there are any fossil finds, the paleontologist shall submit a follow-up report to the Department of Museums and Planning Services Division which shall include the period of inspection, an analysis of the fossils found, and present repository of fossils.	Forest Service and Placer County	Prepare and present WEAP prior to construction	Implement WEAP during construction
<u>RPM CUL-4</u> The Placer County Improvement Plans shall include a note stating that if any archaeological artifacts, exotic rock (non-native), or unusual amounts of shell or bone are uncovered during any on-site construction activities, all work must stop immediately in the area and a qualified archaeologist retained to evaluate the deposit. The Placer County Planning Services Division and Department of Museums must also be contacted for review of the archaeological find(s). Following a review of any new find and consultation with appropriate experts, if necessary, the authority to proceed may be accompanied by the addition of development requirements that provide protection of the site and/or additional mitigation measures necessary to address the unique or sensitive nature of the site.	Placer County Planning Services Division and Department of Museums	Include note concurrent with submittal of Placer County Improvement Plans; During construction activities, stop work immediately in the area of the find and a qualified archaeologist will evaluate the deposit	Continuously during construction

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
4.7, "Transportation and Circulation"			
<u>Mitigation Measure 4.7-2 (Alt. 2): Conduct Traffic Management at Squaw Valley Road/Chamonix Place Intersection</u> Prior to October 15th annually, Squaw Valley Ski Holdings (SVSH) shall submit to Placer County Department of Public Works and Facilities a traffic management plan that shall include traffic management associated with Squaw Valley Road and intersecting roadways, including Chamonix Place and Squaw Creek Road. The traffic management plan shall include lessons learned from the previous season as well as modifications for the upcoming season and shall identify operational details and safety provisions to ensure both effective and safe management of traffic congestion. Upon approval of the traffic management plan, SVSH shall implement the traffic management plan with approval of an encroachment permit from Placer County Department of Public Works and Facilities. The traffic management plan may include, but not be limited to, employing traffic management personnel at intersections during the afternoon peak periods of peak weekend ski days. Traffic control personnel may manage traffic on Squaw Valley Road to assign right-of-way to vehicles on Chamonix Place and Squaw Creek Road. This type of traffic control is in effect at other intersections along Squaw Valley Road including at Wayne Road, which operates at an acceptable LOS.	Placer County Department of Public Works and Facilities	Submit traffic management plan prior to October 15th annually during project operation	Submit traffic management plan prior to October 15th annually during project operation; implement plan during project operation with approval of encroachment permit
<u>Mitigation Measure 4.7-4 (Alt. 2): Coordinate with Caltrans to Increase Maximum Amount of Green Time Provided for Northbound Left-Turn Movement at SR 89/Alpine Meadows Road Intersection</u> The project applicant shall coordinate with Caltrans to implement signal timing modifications that provide a greater amount of green time for this movement during peak winter AM periods. Caltrans staff (Brake, pers. comm., 2015) has indicated that they support the idea of modifying signal timing in response to changes in travel demand. Because there are so few competing movements at this intersection during the AM peak hour, it is possible to provide longer green times for this movement without adversely affecting queuing in the southbound right-turn and eastbound left- and right-turn movements.	Placer County Department of Public Works and Facilities	Applicant provides verification of coordination with Caltrans prior to Improvement Plan and Construction and Operation Plan approval	Completion dependent on Caltrans. Have answer from Caltrans on feasibility and timing of implementing signal timing modifications prior to initiation of project operation.
<u>Mitigation Measure 4.7-7 (Alt. 2): Advise Motorists of "Parked Out" Conditions before They Enter Squaw Valley Road or Alpine Meadows Road Using Traffic Control Personnel, Changeable Message Signs on SR 89, Online Mobile App, or Other Means</u> Prior to October 15th annually, SVSH shall submit to Placer County Department of Public Works and Facilities a traffic management plan that shall include an advanced messaging system to alert motorists of parking availability at the Squaw Valley and Alpine Meadows Ski Resorts. The traffic management plan shall include lessons learned from the previous season as well as modifications for the upcoming season. SVSH will be responsible to engage and coordinate affected agencies, including Caltrans, Placer County and the California Highway Patrol. Upon approval of the traffic management plan by all affected agencies, SVSH shall implement the traffic management plan with approval of any necessary encroachment permits from Caltrans and/or Placer County. Potential advanced messaging system(s) may include, but not be limited to, one or more of the following measures: ◢ California Highway Patrol or other traffic control personnel, accompanied by advisory signage or other means of disseminating information, present at the Squaw Valley Road and Alpine Meadows Road intersections on SR 89; ◢ portable or permanent changeable message signs placed in both directions of SR 89 (i.e., in the southbound direction north of Squaw Valley Road and in the northbound direction south of Alpine Meadows Rad) during peak	Placer County Department of Public Works and Facilities	Submit traffic management plan prior to October 15th annually during project operation	Submit traffic management plan prior to October 15th annually during project operation; implement plan during project operation with approval of encroachment permit

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
days (fed with "real-time" parking availability information); and ◢ other methods, such as smartphone mobile apps that provide "real-time" information related to existing parking availability at each resort and travel times to each resort (both inbound and outbound).			
<u>Mitigation Measure 4.7-8 (Alt. 2): Develop Construction Traffic Management Plan</u> Prior to the issuance of any grading or demolition permits, the project applicant shall prepare a Construction Traffic Management Plan to the satisfaction of the Forest Service, and Placer County Department of Public Works and the Engineering and Surveying Division. The plan shall include (but not be limited to) items such as: ◢ guidance on the number and size of trucks per day entering and leaving the project site; ◢ identification of arrival/departure times that would minimize traffic impacts; ◢ approved truck circulation patterns; ◢ locations of staging areas; ◢ locations of employee parking and methods to encourage carpooling and use of alternative transportation; ◢ methods for partial/complete street closures (e.g., timing, signage, location and duration restrictions); ◢ criteria for use of flaggers and other traffic controls; ◢ preservation of safe and convenient passage for bicyclists and pedestrians through/around construction areas; ◢ monitoring for roadbed damage and timing for completing repairs; ◢ limitations on construction activity during peak/holiday weekends and special events; ◢ preservation of emergency vehicle access; ◢ coordination with any other ongoing construction activities elsewhere within Olympic Valley, at Alpine Meadows, or at other locations along SR 89 to minimize potential additive construction traffic disruptions, avoid duplicative efforts (e.g., multiple occurrences if similar signage), and maximize effectiveness of traffic mitigation measures (e.g., joint employee alternative transportation programs); and ◢ a point of contact for Olympic Valley and Alpine Meadows residents and guests to obtain construction information, have questions answered, and convey complaints. The Construction Traffic Management Plan shall be developed such that the following minimum set of performance standards is achieved throughout project construction. It is anticipated that additional performance standards would be developed once details of project construction are better known. 1) Delivery trucks do not idle/stage on Squaw Valley Road, Alpine Meadows Road, or SR 89. 2) Squaw Valley Road and Alpine Meadows Road do not feature any construction-related lane closures on peak activity days. 3) All construction employees shall park in designated lots owned by Squaw Valley Ski Holdings. 4) Roadways, sidewalks, crosswalks, and bicycle facilities shall be maintained clear of debris (e.g., rocks) that could otherwise impede travel and impact public safety.	Forest Service, Placer County Department of Public Works and Facilities, and the Placer County ESD	Prepare Construction Traffic Management Plan prior to the issuance of any grading or demolition permits	Implement plan during project construction

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
<u>Mitigation Measure 4.7-9 (Alt. 2): Conduct Traffic Management along Squaw Valley Road</u> Prior to October 15th annually, SVSH shall submit to Placer County Department of Public Works and Facilities a traffic management plan that shall include traffic management on ski days on which traffic on Squaw Valley Road is projected to exceed 13,500 ADT. The traffic management plan shall include operation of the three-lane coning program during both the AM and PM peak periods. The traffic management plan shall include lessons learned from the previous season as well as modifications for the upcoming season. Upon approval of the traffic management plan, SVSH shall implement the traffic management plan with approval of an encroachment permit from Placer County. Although it is noted that these types of traffic management techniques were implemented during the 2016–2017 season, they have not always been used during peak conditions. This mitigation measure is therefore intended to reestablish the need for this traffic management during such conditions.	Placer County Department of Public Works and Facilities	Submit traffic management plan prior to issuance of Building Permit and October 15th annually during project operation	Submit traffic management plan prior to October 15th annually during project operation; implement plan during project operation with approval of encroachment permit
<u>Mitigation Measure 4.7-10 (Alt. 2): Conduct Traffic Management at Squaw Valley Road/Chamonix Place and Squaw Valley Road/Squaw Creek Road Intersections</u> Implement Mitigation Measure 4.7-2 (Alt. 2).	See Mitigation Measure 4.7-2 (Alt. 2), above	See Mitigation Measure 4.7-2 (Alt. 2), above	See Mitigation Measure 4.7-2 (Alt. 2), above
<u>Mitigation Measure 4.7-11 (Alt. 2): Pursue Strategies to Reduce Vehicle Trips Generated during the Sunday PM Peak Hour on Peak Ski Days</u> Prior to Improvement Plan approval, the applicant shall provide evidence to the Department of Public Works and Facilities of compliance with the Placer County Trip Reduction Ordinance, including a detailed accounting of Transportation Demand Management strategies currently provided for or planned by Squaw Valley. These strategies may include, but not be limited to, one or more of the following: ◢ operating a complementary and convenient shuttle between resorts and off-site park-and-ride lots (i.e., within Truckee or Tahoe City); ◢ implementing programs to better disperse the departures of skiers during peak afternoons, through entertainment options and other incentives; and ◢ joining/renewing membership in the Truckee North Tahoe Transportation Management Association.	Placer County Department of Public Works and Facilities	Provide evidence of compliance with the Placer County Trip Reduction Ordinance prior to Improvement Plan approval	Completion prior to Improvement Plan approval; implement Transportation Demand Management strategies during project operation
<u>Mitigation Measure 4.7-12 (Alt. 2): Pursue Strategies to Reduce Vehicle Trips Generated during the Sunday PM Peak Hour on Peak Ski Days</u> Implement Mitigation Measure 4.7-11 (Alt. 2).	See Mitigation Measure 4.7-11 (Alt. 2), above	See Mitigation Measure 4.7-11 (Alt. 2), above	See Mitigation Measure 4.7-11 (Alt. 2), above
<u>Mitigation Measure 4.7-13 (Alt. 2): Pursue Strategies to Reduce Vehicle Trips Generated during the Sunday PM Peak Hour on Peak Ski Days</u> Implement Mitigation Measure 4.7-11 (Alt. 2).	See Mitigation Measure 4.7-11 (Alt. 2), above	See Mitigation Measure 4.7-11 (Alt. 2), above	See Mitigation Measure 4.7-11 (Alt. 2), above
<u>Mitigation Measure 4.7-15 (Alt. 2): Advise Motorists of "Parked Out" Conditions before They Enter Squaw Valley Road or Alpine Meadows Road Using Traffic Control Personnel, Changeable Message Signs on SR 89, Mobile Online Apps, or Other Means</u> Implement Mitigation Measure 4.7-7 (Alt. 2).	See Mitigation Measure 4.7-7 (Alt. 2), above	See Mitigation Measure 4.7-7 (Alt. 2), above	See Mitigation Measure 4.7-7 (Alt. 2), above

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Table 1 Mitigation Monitoring and Reporting Program

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4.9, "Noise"			
Mitigation Measure 4.9-3 (Alt. 3): Reduce Noise Exposure to Existing Sensitive Receptors from Proposed Stationary Noise Sources The location of the proposed gondola components (e.g., stations, towers) under Alternative 3 shall be located, at a minimum, 200 feet from any existing sensitive land use.	Forest Service and Placer County Planning Services	During project design and to be shown on Improvement Plans	Completion concurrent with project design
4.14, "Wildlife and Aquatics"			
Mitigation Measure 4.14-1 (Alt. 2): Compensate for Impacts on Sierra Nevada Yellow-Legged Frog and Its Habitat through Consultation with Permitting Agencies Direct and indirect effects to SNYLF and to its utilized (occupied) and unutilized potential (unoccupied) habitat shall be addressed through formal consultation with USFWS, and impacts on the critical habitat shall be compensated for through a combination of habitat compensation and habitat restoration at a minimum of a 3:1 mitigation ratio for utilized critical habitat and at a minimum of a 1:1 mitigation ratio for unutilized critical habitat, or as required by the permitting agencies. Habitat compensation shall be accomplished through USFWS- and CDFW-approved land preservation (if a mitigation bank exists by the time consultation is completed) or mitigation fee payment for the purpose of habitat compensation for lands supporting SNYLF (if a fee program is established). Land preservation or mitigation fee payment for habitat compensation must be completed prior to habitat disturbance or as approved by USFWS and CDFW. Habitat restoration may be appropriate as habitat compensation provided that the restoration effort is demonstrated to be feasible and implemented under a habitat restoration plan, which shall include success criteria and monitoring specifications and shall be approved by the permitting agencies prior to project construction. All habitat compensation and restoration used as mitigation for the selected alternative on public lands shall be conducted in areas designated for resource protection and management. All habitat compensation and restoration used as mitigation for the selected alternative on private lands shall include long-term management and legal protection assurances.	Forest Service and Placer County Planning Services Division to verify consultation with USFWS and CDFW	Complete consultation prior to project construction; Complete land preservation or mitigation fee payment for habitat compensation prior to habitat disturbance or as approved by USFWS and CDFW	Continuously during project construction
Mitigation Measure 4.14-2 (Alt. 2): Compensate for Impacts on Sierra Nevada Yellow-Legged Frog Critical Habitat through Consultation with Permitting Agencies Implement Mitigation Measure 4.14-1 (Alt. 2).	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above
Mitigation Measure 4.14-6 (Alt. 2): Compensate for Impacts on Sierra Nevada Yellow-Legged Frog Nursery Sites through Consultation with Permitting Agencies Implement Mitigation Measure 4.14-1 (Alt. 2).	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above
Mitigation Measure 4.14-1 (Alt. 3): Compensate for Impacts on Sierra Nevada Yellow-Legged Frog Critical Habitat through Consultation with Permitting Agencies Implement Mitigation Measure 4.14-1 (Alt. 2).	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above
Mitigation Measure 4.14-2 (Alt. 3): Compensate for Impacts on Sierra Nevada Yellow-Legged Frog Critical Habitat through Consultation with Permitting Agencies Implement Mitigation Measure 4.14-1 (Alt. 2).	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above

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Table 1 Mitigation Monitoring and Reporting Program

Mitigation Measure/RPM	Agency Responsible for Monitoring and Verifying Compliance	Timing of Initial Action[1]	Frequency and Duration of Monitoring
<u>Mitigation Measure 4.14-6 (Alt. 3): Compensate for Impacts on Sierra Nevada Yellow-Legged Frog Dispersal Habitat Consultation with Permitting Agencies</u> Implement Mitigation Measure 4.14-1 (Alt. 2).	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above
<u>Mitigation Measure 4.14-1 (Alt. 4): Compensate for Impacts on Sierra Nevada Yellow-Legged Frog Critical Habitat through Consultation with Permitting Agencies</u> Implement Mitigation Measure 4.14-1 (Alt. 2).	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above
<u>Mitigation Measure 4.14-2 (Alt. 4): Compensate for Impacts on Sierra Nevada Yellow-Legged Frog Critical Habitat through Consultation with Permitting Agencies</u> Implement Mitigation Measure 4.14-1 (Alt. 2).	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above
<u>Mitigation Measure 4.14-6 (Alt. 4): Compensate for Impacts on Sierra Nevada Yellow-Legged Frog Dispersal Habitat through Consultation with Permitting Agencies</u> Implement Mitigation Measure 4.14-1 (Alt. 2).	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above	See Mitigation Measure 4.14-1 (Alt. 2), above
4.16, "Soils, Geology, and Seismicity"			
<u>Mitigation Measure 4.16-1 (Alt. 2): Develop and Implement a Rock Blasting Plan</u> To minimize the risk of mass wasting because of rock blasting during construction activities, a rock blasting plan shall be prepared by the contractor and submitted to the County at least 30 days prior to the blasting addressed in the plan. The blasting plan shall be site-specific, based on the locations of required blasting, and based on the results of a project-specific geotechnical investigation. The blasting plan shall include a description of the planned blasting methods, an inventory of receptors potentially affected by the planned blasting, calculations to determine the area affected by the planned blasting, and a description of measures that have been taken to minimize the risk of triggering mass wasting events by the blasting. The blasting plan shall meet criteria established in Chapter 3 (Control of Adverse Effects) in the Blasting Guidance Manual of the U.S. Department of Interior Office of Surface Mining Reclamation and Enforcement.	Forest Service and Placer County DRC	Prepare and submit rock blasting plan at least 30 days prior to the blasting addressed in the plan	Implement plan continuously during construction
<u>Mitigation Measure 4.16-2 (Alt. 2): Develop and Implement an Avalanche Hazard Mitigation Plan</u> Prior to issuance of permits, the project applicant shall provide the Forest Service and Placer County with a complete Avalanche Hazard Mitigation Plan for the project. The plan shall be subject to review and approval by the Forest Service and County, and permit approval will be conditioned based on ongoing implementation of the plan. The plan shall include, but shall not be limited to, the following elements: ◢ Prior to opening of the gondola, the project applicant shall develop avalanche notification protocols in consultation with the Squaw Valley Fire Department (SVFD), North Tahoe Fire Protection District (contracted through Alpine Springs County Water District), Squaw Valley, and Alpine Meadows operations. The protocols shall specify conditions that warrant consultation with these agencies regarding potential avalanche risks. ◢ If there is a substantial risk of avalanche, then the gondola and any public areas within the PAHA shall be closed to the public, and signs erected that explain that the closures are because of the avalanche risk. These areas shall be	Forest Service and Placer County Planning Services	Submit Avalanche Hazard Mitigation Plan prior to issuance of permits	Implement plan continuously during construction and operation

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Table 1 Mitigation Monitoring and Reporting Program

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secured from entry until the risk of avalanche has abated. ◢ On-site structures: The Building Services Division shall review building permit applications for structures within or near moderate PAHAs to confirm that they incorporate the structural specifications to address avalanche risk. ◢ Up-slope conditions: Policy procedures and necessary agreements and permissions shall be included to ensure that operations on the ski terrain of Squaw Valley and Alpine Meadows continue to implement avalanche mitigation programs and that slope development and management avoids the creation of new long continuous openings that could increase the potential for avalanche release and movement that could affect the gondola. No new large openings shall be created on slopes steeper than 30 degrees that could influence avalanche runouts leading to the gondola.			
Mitigation Measure 4.16-1 (Alt. 3): Develop and Implement a Rock Blasting Plan Implement Mitigation Measure 4.16-1 (Alt. 2).	See Mitigation Measure 4.16-1 (Alt. 2), above	See Mitigation Measure 4.16-1 (Alt. 2), above	See Mitigation Measure 4.16-1 (Alt. 2), above
Mitigation Measure 4.16-2 (Alt. 3): Develop and Implement an Avalanche Hazard Mitigation Plan Implement Mitigation Measure 4.16-2 (Alt. 2).	See Mitigation Measure 4.16-2 (Alt. 2), above	See Mitigation Measure 4.16-2 (Alt. 2), above	See Mitigation Measure 4.16-2 (Alt. 2), above
Mitigation Measure 4.16-1 (Alt. 4): Develop and Implement a Rock Blasting Plan Implement Mitigation Measure 4.16-1 (Alt. 2).	See Mitigation Measure 4.16-1 (Alt. 2), above	See Mitigation Measure 4.16-1 (Alt. 2), above	See Mitigation Measure 4.16-1 (Alt. 2), above
Mitigation Measure 4.16-2 (Alt. 4): Develop and Implement an Avalanche Hazard Mitigation Plan Implement Mitigation Measure 4.16-2 (Alt. 2).	See Mitigation Measure 4.16-2 (Alt. 2), above	See Mitigation Measure 4.16-2 (Alt. 2), above	See Mitigation Measure 4.16-2 (Alt. 2), above

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REFERENCES

Brake, Jim. Transportation engineer. California Department of Transportation, District 3, Marysville, CA. January 29, 2015—conversation with John Gard of Fehr & Peers regarding use of signal timing as mitigation at the SR 89/Squaw Valley Road intersection.

Cal-IPC. 2012. *Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers* (3rd ed.). Cal-IPC Publication 2012-03. California Invasive Plant Council, Berkeley, CA. Available: www.cal-ipc.org.