

Technical Memorandum

To: Shasta County
Attn: Resource Management
From: Kamesh Vedula, P.E., T.E.
Zach Stinger, E.I.T.
Re: Supplemental Traffic Impact Analysis
due to SB 1069 "Accessory Dwelling
Units"
Job No.: 45-6506-01
File No.: C987MEM006.DOCX
CC: Shasta Red LLC, c/o Steve Nelson, S2J2 Engineering

Introduction

This technical memorandum has been prepared to present the results of an updated traffic impact analysis performed by Omni-Means to address the potential impact of Senate Bill (SB) 1069 "Accessory Dwelling Units" for the proposed Tierra Robles development in Shasta County. The additional analysis presented in reference to the potential impact of SB 1069 "Accessory Dwelling Units" was performed by Omni-Means under the advice of S2J2 Engineering Inc., and as directed by Shasta County staff. Specifically, the expectation was passed onto Omni-Means to provide an analysis of the potential for 15 of the planned 166 of the single-family lots to have second dwelling units.

Will SB 1069 Impact Vehicular Trip Generation?

Following the discussion for the need for this additional analysis with S2J2 Engineering Inc., and research conducted by Omni-Means, no definitive published studies/reports are available to quantify the potential impact of SB 1069 (as related to vehicular traffic generation).

The analysis presented in this Memorandum is a highly conservative "worst-case" analysis since the ITE Trip Generation Manual equations used in estimating trip generation for Land Use Code 210 "Single-Family Detached Housing" is based off of numerous studies conducted across the US. Per the description of Land Use Code 210 provided within the ITE Manual, it is likely that the sites surveyed within the studies contain a wide variety of residential developments. Therefore, it is reasonable to assume a normal distribution of studies (both with and without "typical" ADU's) on existing single-family lots is captured within the equations and Coefficients of Determination (R²) that were used to generate the trips projected within the May 2015 TIAR (Omni-Means).

Land Uses Assumed for this Supplemental Analysis

As directed by County staff, the trip generation will include 15 accessory dwelling units (ADU) in addition to the 166 residential lots. The trip rate for the ADU's will be based on the apartment land use code, as presented in the ITE Trip Generation, 9th Edition.

Level of Service Methodology

Traffic operations will be quantified through the determination of “Level of Service” (LOS). Level of Service is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to an intersection, or roadway segment, representing progressively worsening traffic conditions. LOS "A" represents free-flow operating conditions and LOS "F" represents over-capacity conditions.

Levels of Service will be calculated for intersections controlled by traffic signals or stop signs using the methods documented in the Transportation Research Board Publication *Highway Capacity Manual, Fifth Edition, 2010* (HCM 2010).

Levels of Service will be calculated for intersections controlled by roundabouts using the methods documented in the Transportation Research Board Publication *Highway Capacity Manual, Sixth Edition* (HCM 6). The traffic signal and stop-controlled intersection analysis is conducted utilizing Synchro software (Version 9), which implements HCM 2010 methodologies. The roundabout analysis is conducted utilizing Sidra software (Version 7), which implements HCM 6 methodologies.

Technical Parameters and Analysis

This analysis also presents an update to all analysis scenarios, from the prior analysis conducted in May 2015, which was based on Synchro/Simtraffic Version 8 outputs. Both the previous study and the current update use the HCM 2010 methodology. The HCM 2010 methodology was implemented using Synchro/Simtraffic software. The current version of Synchro/Simtraffic used for this analysis is Synchro/Simtraffic version 9.1, while the previous version used was Synchro 8.

When an analysis is performed, the most current version of capacity software is used. The Synchro/Simtraffic software programs update the capacity equations on a regular basis in keeping with current industry standards. Through these updates, the capacities of some of the study intersections have changed. These updates resulted in and included:

- An average of approximately three percent reduction in capacity for signalized intersections.
- An average of approximately five percent reduction in capacity for two-way stop control (TWSC) intersections.
- Intersection 2 is a TWSC that had the incorrect leg delay selected in the previous analysis, which was corrected.
- Intersection 10 is a TWSC intersection that had very high delays in the previous analysis, with the delays significantly reduced in the current analysis.
- The capacity has not changed for All Way Stop Control (AWSC) intersections.
- Intersection 14 is an AWSC intersecting that changed due to the lane layout being corrected in the updated analysis.
- New intersection Level of Service analysis was done for all conditions analyzed in the 2015 TIAR.

The Existing Conditions roadway LOS is not reanalyzed as the roadway LOS thresholds are still valid.

An updated traffic signal “warrant” analysis is also conducted for the stop-controlled intersections that exceed the LOS thresholds.

The Synchro, Sidra, and Warrant analysis outputs are included in the appendix of this technical memorandum.



The numbers of the Tables and Figures presented in this technical memorandum correspond with the May 2015 TIAR. All Figures are included in the appendix of this memorandum. Included in this technical memorandum are updates to the following:

- Existing Conditions Intersection LOS (Table 8 REV)
- Proposed Trip Generation to reflect 166 single-family lots and 15 ADU's (Table 9 REV)
- Proposed Site Plan (Figure 4 REV)
- Existing Plus Project Intersection Traffic Volumes (Figure 7 REV)
- Year 2035 Plus Project Intersection Traffic Volumes (Figure 8 REV)
- Existing Plus Project Roadway LOS (Table 10 REV)
- Existing Plus Project Intersection LOS (Table 11 REV)
- Year 2035 No Project Intersection LOS (Table 13 REV)
- Year 2035 Plus Project Roadway LOS (Table 14 REV)
- Year 2035 Plus Project Intersection LOS (Table 15 REV)
- Existing Plus Project Significant Impacts (Table 16 REV)
- Existing Plus Project Mitigated Intersection LOS (Table 17 REV)
- Year 2035 Plus Project Significant Impacts (Table 18 REV)
- Year 2035 Plus Project Mitigated intersection LOS (Table 19 REV)
- Fair-Share Improvement Calculations

Existing Conditions

The *Existing* Conditions LOS was reanalyzed due to the analysis software being updated since the previous analysis.

Intersection Operations

Table 8 REV presents a summary of the intersection operations for the AM and PM peak hour scenarios of the *Existing* Conditions.

TABLE 8 REV
EXISTING CONDITIONS: INTERSECTION LEVEL OF SERVICE

#	Intersection	Control Type ^{1,2}	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met? ³	Delay	LOS	Warrant Met? ³
1	Deschutes Rd & SR 299	Signal	C	8.9	A	-	16.6	B	-
2	Deschutes Rd & Old Alturas Rd	TWSC	E	15.0	B	-	11.8	B	-
3	Old Alturas Rd & Seven Lakes Rd	TWSC	E	8.4	A	-	3.2	A	-
4	Shasta View Dr & Old Alturas Rd	RNDBT	C	5.1	A	-	4.9	A	-
5	Shasta View Dr & Tarmac Rd	Signal	C	15.9	B	-	13.6	B	-
6	Shasta View Dr & SR 44 WB Ramps	TWSC	C	22.4	C	-	21.6	C	-
7	SR 44 EB Ramps & Shasta View Dr	Signal	C	16.8	B	-	14.2	B	-
8	Old Oregon Trail & Old Alturas Rd	AWSC	E	15.5	C	-	11.6	B	-
9	Old Oregon Trail & Old 44 Dr	Signal	C	20.7	C	-	18.0	B	-
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	TWSC	C	28.7	D	No	68.6	F	No
11	Airport Rd & SR 44 EB Ramps	Signal	C	11.4	B	-	11.2	B	-
12	Old Alturas Rd & Boyle Rd	TWSC	E	9.9	A	-	9.8	A	-
13	Deschutes Rd & Boyle Rd	TWSC	E	27.7	D	-	12.3	B	-
14	Deschutes Rd & Old 44 Dr	AWSC	E	35.3	E	-	17.5	C	-
15	Deschutes Rd & Cedro Rd	AWSC	E	47.2	E	-	20.3	C	-
16	Deschutes Rd & SR 44 WB Ramps	TWSC	C	20.3	C	-	15.0	B	-
17	Deschutes Rd & SR 44 EB Ramps	AWSC	C	15.2	C	-	13.8	B	-
18			C	#N/A			#N/A		

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC, Signal, RNDBT

3. Warrant = Based on California MUTCD Warrant 3

As presented in Table 8 REV, all study intersections except for the following, are projected to operate at or above the threshold LOS for the *Existing Conditions*:

- Intersection 10 – Airport Road/Old Oregon Trail & State Route 44 Westbound Ramps

No significant changes occurred to the Existing Conditions LOS Table. The only notable change is that the delays for intersection 10 were reduced from the previous analysis.

Project Description

The term “project” as used in this analysis refers to the proposed development of 166 single-family lots and 15 accessory dwelling units (ADU) located on Boyle Road, near Rocky Road in Shasta County. The project’s site plan (dated August 15, 2017) is shown in **Figure 4 REV**, attached.

Trip Generation

Project site trip generation has been estimated utilizing trip generation rates and internal capture methods contained in the Institute of Transportation Engineers (ITE) Publication *Trip Generation Handbook (Ninth Edition)*. **Table 9 REV** presents a summary of the land use and quantities for the proposed land use for the project, along with corresponding ITE land use code from which trip generation characteristics were established.

**TABLE 9 REV
PROJECT TRIP GENERATION**

Land Use Category (ITE Code)	Unit ¹	Daily Trip Rate/Unit ²	AM Peak Hour Trip Rate/Unit			PM Peak Hour Trip Rate/Unit		
			Total	In %	Out %	Total	In %	Out %
Single Family Detached Housing (210)	D.U.	10.08	0.76	25%	75%	1.00	63%	37%
Apartment (220)	D.U.	6.65	0.51	20%	80%	0.62	65%	35%
Project Name	Quantity (Units)	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
			Total	In	Out	Total	In	Out
Housing	166	1,674	126	31	94	166	104	61
Apartments	15	100	8	2	6	9	6	4
replace with any reduction %	0%	0	0	0	0	0	0	0
Net New Project Trips		1,774	134	33	101	175	110	65

Notes:

1. DU = dwelling unit

2. Trip rates based on ITE Trip Generation Manual 9th edition fitted-curve equations or average rates

As presented in Table 9 REV, the 15 new ADU's added 8 AM and 9 PM peak trips. All together, the proposed project is projected to generate approximately 134 AM and 175 PM peak hour trips.

Project Trip Distribution and Assignment

The trip distribution that was determined previously was used for this analysis.

Project Site Access

Access to the proposed project will be via two proposed driveways, one on Boyle Road, the other on Old Alturas Road.

Existing Plus Project Traffic Operations

Existing Plus Project Conditions were simulated by superimposing traffic generated by the proposed project onto existing intersection and roadway traffic volumes. **Figure 7 REV** presents the revised Existing Plus Project Intersection Traffic Volumes, included in the appendix.

Roadway Operations

Table 10 REV presents a summary of the roadway operations for the weekday AM and PM peak hour scenarios for the *Existing Plus Project* Conditions.

**TABLE 10 REV
EXISTING PLUS PROJECT CONDITIONS: ROADWAY LEVEL OF SERVICE**

Roadway Segment	Capacity Configuration	Target LOS	Average Daily Traffic ADT	LOS
Old Alturas Rd, west of Deschutes Rd	Two-Lane Collector	E	1,348	A
Old Alturas Rd, north of boyle Rd	Two-Lane Collector	E	1,803	A
Old Alturas Rd, east of Shasta View Dr	Two-Lane Collector	C	6,532	B
Old Alturas Rd, between Old Oregon Trail & Boyle Rd	Two-Lane Arterial	E	5,297	A
Boyle Rd, west of Deschutes Rd	Two-Lane Collector	E	1,793	A
Shasta View Dr, north of Tarmac Rd	Three-Lane Arterial	C	12,023	B
Old Oregon Trail, north of Old 44 Dr	Two-Lane Collector	E	8,386	C
Deschutes Rd, north of Old 44 Dr	Two-Lane Collector	E	8,761	C

As presented in Table 10 REV, all study roadway segments, are projected to operate at or above the threshold LOS for the *Existing Plus Project* Conditions.

There are no significant changes in the roadway LOS.

Intersections Operations

Table 11 REV presents a summary of the intersection operations for the weekday AM and PM peak hour scenarios for the *Existing Plus Project* Conditions



TABLE 11 REV
EXISTING PLUS PROJECT CONDITIONS: INTERSECTION LEVEL OF SERVICE

#	Intersection	Control Type ^{1,2}	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met? ³	Delay	LOS	Warrant Met? ³
1	Deschutes Rd & SR 299	Signal	C	18.5	B	-	20.8	C	-
2	Deschutes Rd & Old Alturas Rd	TWSC	E	16.7	C	-	12.5	B	-
3	Old Alturas Rd & Seven Lakes Rd	TWSC	E	7.0	A	-	7.1	A	-
4	Shasta View Dr & Old Altruas Rd	RNDBT	C	5.3	A	-	5.0	A	-
5	Shasta View Dr & Tarmac Rd	Signal	C	15.9	B	-	15.1	B	-
6	Shasta View Dr & SR 44 WB Ramps	TWSC	C	22.6	C	-	24.1	C	-
7	SR 44 EB Ramps & Shasta View Dr	Signal	C	16.8	B	-	17.1	B	-
8	Old Oregon Trail & Old Alturas Rd	AWSC	E	18.8	C	-	17.1	C	-
9	Old Oregon Trail & Old 44 Dr	Signal	C	20.9	C	-	21.7	C	-
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	TWSC	C	29.7	D	No	88.1	F	Yes
11	Airport Rd & SR 44 EB Ramps	Signal	C	11.4	B	-	12.3	B	-
12	Old Alturas Rd & Boyle Rd	TWSC	E	10.5	B	-	10.1	B	-
13	Deschutes Rd & Boyle Rd	TWSC	E	31.3	D	-	15.4	C	-
14	Deschutes Rd & Old 44 Dr	AWSC	E	37.1	E	-	22.6	C	-
15	Deschutes Rd & Cedro Rd	AWSC	E	49.0	E	-	27.5	D	-
16	Deschutes Rd & SR 44 WB Ramps	TWSC	C	20.5	C	-	15.5	C	-
17	Deschutes Rd & SR 44 EB Ramps	AWSC	C	15.4	C	-	14.4	B	-
18	Boyle Road & Project Driveway A	TWSC	C	9.5	A	-	9.5	A	-

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC, Signal, RNDBT

3. Warrant = Based on California MUTCD Warrant 3

As presented in Table 11 REV, all study intersections except for the following, are projected to operate at or above the threshold LOS for the *Existing Plus Project* Conditions:

- Intersection 10 – Deschutes Road & Cedro Road

No significant changes to the *Existing Plus Project* intersection LOS. The delays for intersection 10 are reduced similar to the *Existing Conditions* intersection LOS.

Year 2035 No Project Traffic Operations

The Year 2035 No Project Conditions LOS was reanalyzed due to the analysis software being updated since the previous analysis.

Intersection Operations

Table 13 REV presents a summary of the *Cumulative No Project* study intersection LOS Conditions.

TABLE 13 REV
YEAR 2035 NO PROJECT CONDITIONS: INTERSECTION LEVEL OF SERVICE

#	Intersection	Control Type ^{1,2}	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met? ³	Delay	LOS	Warrant Met? ³
1	Deschutes Rd & SR 299	Signal	C	19.2	B	-	16.8	B	-
2	Deschutes Rd & Old Alturas Rd	TWSC	E	19.5	C	-	16.1	C	-
3	Old Alturas Rd & Seven Lakes Rd	TWSC	E	8.5	A	-	8.5	A	-
4	Shasta View Dr & Old Altruas Rd	RNDBT	C	8.3	A	-	26.4	C	-
5	Shasta View Dr & Tarmac Rd	Signal	C	20.8	C	-	8.7	A	-
6	Shasta View Dr & SR 44 WB Ramps	TWSC	C	24.6	C	-	28.5	D	Yes
7	SR 44 EB Ramps & Shasta View Dr	Signal	C	16.5	B	-	15.9	B	-
8	Old Oregon Trail & Old Alturas Rd	AWSC	E	180.2	F	Yes	137.2	F	Yes
9	Old Oregon Trail & Old 44 Dr	Signal	C	26.5	C	-	26.9	C	-
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	TWSC	C	104.0	F	Yes	OVR	F	Yes
11	Airport Rd & SR 44 EB Ramps	Signal	C	16.0	B	-	18.0	B	-
12	Old Alturas Rd & Boyle Rd	TWSC	E	11.7	B	-	10.6	B	-
13	Deschutes Rd & Boyle Rd	TWSC	E	64.2	F	No	17.7	C	-
14	Deschutes Rd & Old 44 Dr	AWSC	E	56.2	F	Yes	39.5	E	-
15	Deschutes Rd & Cedro Rd	AWSC	E	96.4	F	Yes	56.4	F	Yes
16	Deschutes Rd & SR 44 WB Ramps	TWSC	C	53.2	F	No	26.5	D	No
17	Deschutes Rd & SR 44 EB Ramps	AWSC	C	22.6	C	-	18.9	C	-
18	-	-	C	#N/A			#N/A		

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC, Signal, RNDBT

3. Warrant = Based on California MUTCD Warrant 3

OVR = Delay exceeds 300 seconds

As presented in Table 13 REV, all study intersections except for the following, are projected to operate at or above the threshold LOS for the Year 2035 No Project Conditions:

- Intersection 6 – Shasta View Drive & State Route 44 Westbound Ramps
- Intersection 8 – Old Oregon Trail & Old Alturas Road
- Intersection 10 – Airport Road/Old Oregon Trail & State Route 44 Westbound Ramps
- Intersection 13 – Deschutes Road & Boyle Road
- Intersection 14 – Deschutes Road & Old 44 Drive
- Intersection 15 – Deschutes Road & Cedro Road
- Intersection 16 – Deschutes Road & State Route 44 Westbound Ramps

There are several significant changes to the Year 2035 No Project intersection LOS table. Intersections 6 and 15 were operating above the threshold LOS in the previous analysis and intersection 16 was acceptable in the PM peak hour.

Year 2035 Plus Project Conditions

Year 2035 Plus Project AM and PM peak hour roadway and intersection traffic operations were quantified by superimposing traffic generated by the proposed project onto Year 2035 No Project Conditions. **Figure 9 REV** presents the revised Year 2035 Plus Project Intersection Traffic Volumes, included in the appendix.

Roadway Operations

Table 14 REV presents a summary of the roadway operations for the weekday AM and PM peak hour scenarios for the Year 2035 Plus Project Conditions.

TABLE 14 REV
YEAR 2035 PLUS PROJECT CONDITIONS: ROADWAY LEVEL OF SERVICE

Roadway Segment	Capacity Configuration	Target LOS	Year 2035 Plus Project AADT	LOS
Old Alturas Rd, west of Deschutes Rd	Two-Lane Collector	E	1,552	A
Old Alturas Rd, north of Boyle Rd	Two-Lane Collector	E	2,003	A
Old Alturas Rd, east of Shasta View Dr	Two-Lane Collector	C	8,940	C
Old Alturas Rd, between Old Oregon Trail & Boyle Rd	Two-Lane Arterial	E	5,700	A
Boyle Rd, west of Deschutes Rd	Two-Lane Collector	E	1,847	A
Shasta View Dr, north of Tarmac Rd	Three-Lane Arterial	C	12,131	B
Old Oregon Trail, north of Old 44 Dr	Two-Lane Collector	E	11,195	E
Deschutes Rd, north of Old 44 Dr	Two-Lane Collector	E	10,066	D

As presented in Table 14 REV, all study intersections are projected to operate at or above the threshold LOS for the *Year 2035 Plus Project Conditions*.

There are no significant changes in the roadway LOS.

Intersection Operations

Table 15 REV presents a summary of the intersection operations for the weekday AM and PM peak hour scenarios for the *Year 2035 Plus Project Conditions*.

TABLE 15 REV
YEAR 2035 PLUS PROJECT CONDITIONS: INTERSECTION LOS

#	Intersection	Control Type ^{1,2}	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met? ³	Delay	LOS	Warrant Met? ³
1	Deschutes Rd & SR 299	Signal	C	19.4	B	-	16.9	B	-
2	Deschutes Rd & Old Alturas Rd	TWSC	E	22.2	C	-	17.0	C	-
3	Old Alturas Rd & Seven Lakes Rd	TWSC	E	7.3	A	-	7.8	A	-
4	Shasta View Dr & Old Alturas Rd	RNDBT	C	8.8	A	-	9.4	A	-
5	Shasta View Dr & Tarmac Rd	Signal	C	20.8	C	-	17.1	B	-
6	Shasta View Dr & SR 44 WB Ramps	TWSC	C	24.7	C	-	28.8	D	Yes
7	SR 44 EB Ramps & Shasta View Dr	Signal	C	16.6	B	-	15.9	B	-
8	Old Oregon Trail & Old Alturas Rd	AWSC	E	218.8	F	Yes	171.8	F	Yes
9	Old Oregon Trail & Old 44 Dr	Signal	C	26.9	C	-	28.1	C	-
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	TWSC	C	111.6	F	Yes	OVR	F	Yes
11	Airport Rd & SR 44 EB Ramps	Signal	C	16.1	B	-	18.6	B	-
12	Old Alturas Rd & Boyle Rd	TWSC	E	12.7	B	-	11.1	B	-
13	Deschutes Rd & Boyle Rd	TWSC	E	76.3	F	No	18.4	C	-
14	Deschutes Rd & Old 44 Dr	AWSC	E	58.5	F	Yes	40.8	E	-
15	Deschutes Rd & Cedro Rd	AWSC	E	99.0	F	Yes	60.6	F	Yes
16	Deschutes Rd & SR 44 WB Ramps	TWSC	C	53.8	F	No	27.0	D	No
17	Deschutes Rd & SR 44 EB Ramps	AWSC	C	23.0	C	-	19.3	C	-
18	Boyle Road & Project Driveway A	TWSC	C	10.3	B	-	10.1	B	-

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC, Signal, RNDBT

3. Warrant = Based on California MUTCD Warrant 3

OVR = Delay exceeds 300 seconds

As presented in Table 15 REV, all study intersections except for the following, are projected to operate at or above the threshold LOS for the *Year 2035 Plus Project Conditions*:

- Intersection 6 – Shasta View Drive & State Route 44 Westbound Ramps
- Intersection 8 – Old Oregon Trail & Old Alturas Road
- Intersection 10 – Airport Road/Old Oregon Trail & State Route 44 Westbound Ramps
- Intersection 13 – Deschutes Road & Boyle Road
- Intersection 14 – Deschutes Road & Old 44 Drive
- Intersection 15 – Deschutes Road & Cedro Road
- Intersection 16 – Deschutes Road & State Route 44 Westbound Ramps

There are several significant changes to the *Year 2035 Plus Project* intersection LOS table. Intersections 6 and 15 were operating above the threshold LOS in the previous analysis and intersection 16 was acceptable in the PM peak hour.

Mitigations and Recommendations

This section presents recommended project-related mitigation measures at the study intersections. These measures were developed based on the findings from the analyses presented in prior sections of this report. The mitigations are provided for both *Existing Plus Project* and *Year 2035 Plus Project* Conditions separately, so it may be possible that the same mitigations at one location are applicable in both conditions.

Existing Plus Project Significant Impacts

Table 16 REV presents the intersections projected to operate at unacceptable levels of service and cause a significant impact under *Existing Plus Project* Conditions.

TABLE 16 REV EXISTING PLUS PROJECT SIGNIFICANT IMPACTS									
AM Peak Hour									
#	Intersection	Control Type ¹	Target LOS	Existing LOS ²	Existing Plus Project LOS ²	Existing Delay (D1)	Existing Plus Project Delay (D2)	D2-D1	Significant Impact?
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	TWSC	C	D	D	28.7	29.7	1	No
PM Peak Hour									
#	Intersection	Control Type ¹	Target LOS	Existing LOS ²	Existing Plus Project LOS ²	Existing Delay (D1)	Existing Plus Project Delay (D2)	D2-D1	Significant Impact?
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	TWSC	C	F	F	68.6	88.1	19.5	Yes

As presented in Table 16 REV, no significant changes to the *Existing Plus Project* significant impacts. Intersection 10 is still an impact in the PM peak hour.

Existing Plus Project Mitigations

The following improvements are proposed to provide acceptable operations at intersections and roadway segments where a project significant impact is identified for the *Existing Plus Project* Conditions.

Intersections

The following improvements are proposed to provide acceptable operations at the intersections where a project significant impact is identified for the *Existing Plus Project* Conditions.

Intersection 10 – Airport Road/Old Oregon Trail & State Route 44 Westbound Ramps

This un-signalized intersection is projected to operate at LOS F in the weekday PM peak hour. Although this intersection operates at an unacceptable LOS F in the "no project" condition, the proposed project creates a significant impact by causing the delay to increase by more than 5 seconds per vehicle. The following improvements are proposed to mitigate the project impact to less than significant:

- Construct a new traffic signal, *or*
- Construct a single/multi-lane roundabout

Significance after Mitigation

Project mitigation is to construct the proposed improvements stated within the previous section. After mitigation, project generated impacts will be considered less than significant. **Table 17 REV** presents the mitigated intersection LOS and delay assuming the stated improvements are implemented.

TABLE 17 REV
MITIGATED EXISTING PLUS PROJECT INTERSECTION LOS

#	Intersection	Control Type ^{1,2}	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	Signal	C	10.2	B	19.6	B
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	RNDBT	C	3.5	A	4.3	A

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC,

As presented in Table 17 REV, a signal or roundabout at intersection 10 would mitigate the impact on the intersection.

Year 2035 Plus Project Significant Impacts

Table 18 REV presents the intersections projected to operate at unacceptable levels of service and cause a significant impact under *Year 2035 Plus Project* Conditions.

TABLE 18 REV
YEAR 2035 PLUS PROJECT SIGNIFICANT IMPACTS

AM Peak Hour									
#	Intersection	Control Type ¹	Target LOS	Year 2035 LOS ²	Year 2035 Plus Project LOS ²	Year 2035 Delay (D1)	Year 2035 Plus Project Delay (D2)	D2-D1	Significant Impact?
6	Shasta View DR & SR 44 WB Ramps	TWSC	C	C	C	24.6	24.7	0.1	No
8	Old Oregon Trail & Old Alturas Rd	AWSC	E	F	F	180.2	218.8	38.6	Yes
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	TWSC	C	F	F	104	111.6	7.6	Yes
13	Deschutes Rd & Boyle Rd	TWSC	E	F	F	64.2	76.3	12.1	Yes
14	Deschutes Rd & Old 44 Dr	AWSC	E	F	F	56.2	58.5	2.3	No
15	Deschutes Rd & Cedro Rd	AWSC	E	F	F	96.4	99	2.6	No
16	Deschutes Rd & SR 44 WB Ramps	TWSC	C	F	F	53.2	53.8	0.6	No
PM Peak Hour									
#	Intersection	Control Type ¹	Target LOS	Year 2035 LOS ²	Year 2035 Plus Project LOS ²	Year 2035 Delay (D1)	Year 2035 Plus Project Delay (D2)	D2-D1	Significant Impact?
6	Shasta View DR & SR 44 WB Ramps	TWSC	C	D	D	28.5	28.8	0.3	No
8	Old Oregon Trail & Old Alturas Rd	AWSC	E	F	F	137.2	171.8	34.6	Yes
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	TWSC	C	F	F	OVR	OVR	>5 sec	Yes
13	Deschutes Rd & Boyle Rd	TWSC	E	C	C	17.7	18.4	0.7	No
14	Deschutes Rd & Old 44 Dr	AWSC	E	E	E	39.5	40.8	1.3	No
15	Deschutes Rd & Cedro Rd	AWSC	E	F	F	56.4	60.6	4.2	No
16	Deschutes Rd & SR 44 WB Ramps	TWSC	C	D	D	26.5	27	0.5	No

As presented in Table 18 REV, there is one significant change to the *Year 2035 Plus Project* significant impacts. Intersection 8 is a new impact that will need to be mitigated. Intersections 10 and 13 remain significant impacts.

Year 2035 Plus Project Mitigations

The following improvements are proposed to provide acceptable operations at intersections where a project significant impact is identified for the *Year 2035 Plus Project Conditions*.

Intersections

The following improvements are proposed to provide acceptable operations at the intersections where a project significant impact is identified for the *Year 2035 Plus Project Conditions*.

Intersection 8 – Old Oregon Trail & Old Alturas Road

This un-signalized intersection is projected to operate at LOS F in the weekday AM and PM peak hours. Although this intersection operates at an unacceptable LOS F in the "no project" condition, the proposed project creates a significant impact by causing the delay to increase by more than 5 seconds per vehicle. The following improvement is proposed to mitigate the project impact to less than significant:

- Construct a single/multi-lane roundabout

Intersection 10 – Airport Road/Old Oregon Trail & State Route 44 Westbound Ramps

This un-signalized intersection is projected to operate at LOS F in the weekday AM and PM peak hours. Although this intersection operates at an unacceptable LOS F in the "no project" condition, the proposed project creates a significant impact by causing the delay to increase by more than 5 seconds per vehicle. The following improvements are proposed to mitigate the project impact to less than significant:

- Provide the same improvements recommended under *Existing Plus Project Conditions*

Intersection 13 – Deschutes Road & Boyle Road

This un-signalized intersection is projected to operate at LOS F in the weekday AM peak hour. Although this intersection operates at an unacceptable LOS F in the "no project" condition, the proposed project creates a significant impact by causing the delay to increase by more than 5 seconds per vehicle. The following improvement is proposed to mitigate the project impact to less than significant:

- Construct an All-way Stop Control

Significance After Mitigation

Project mitigation is to construct the proposed improvements stated within the previous section. After mitigation, project generated impacts will be considered less than significant. **Table 19 REV** presents the mitigated intersection LOS and delay assuming the stated improvements are implemented.

TABLE 19 REV
MITIGATED YEAR 2035 PLUS PROJECT INTERSECTION LOS

#	Intersection	Control Type ^{1,2}	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
8	Old Oregon Trail & Old Alturas Rd	RNDBT	E	12.6	B	10.2	B
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	Signal	C	11.1	B	16.6	B
10	Airport Rd/Old Oregon Trail & SR 44 WB Ramps	RNDBT	C	4.3	A	5.7	A
13	Deschutes Rd & Boyle Rd	AWSC	E	18.6	C	10.6	B

Notes:

1. AWSC = All Way Stop Control; TWSC = Two Way Stop Control; RNDBT = Roundabout

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for AWSC,

As presented in Table 19 REV, a roundabout at intersection 8, a signal or roundabout at intersection 10, and an all-way stop control at intersection 13 would mitigate the impact on the intersection.

Fair Share Calculations

The theoretical fair-share of improvement cost percentages have been calculated based upon the proposed project's AM peak hour traffic impacts. Fair-share calculations have been identified for all intersections with significant project impacts. Below is a listing of each of the study intersection's warranting mitigation and the proposed project's equitable share of these improvements. The proposed project's equitable share is calculated using the method for calculating equitable mitigation measures outlined in the *Caltrans Guide for the Preparation of Traffic Impact Studies* (State of California, DOT, June 2001), which is shown below:

$$P = T / (T_B - T_E) \text{ where,}$$

- P = The equitable share for the project's traffic impact
- T = The vehicle trips generated by the project during the peak hour of adjacent State highway facility in vehicles per hour (vph).
- T_B = The forecasted traffic volume on an impacted State highway facility at the time of general plan build-out (e.g. 20-year model or the furthest future model date feasible), vph.
- T_E = The traffic volume existing on the impacted State highway facility plus other approved projects that will generate traffic that has yet to be constructed/opened, vph.

Note that the percent fair-share calculated using the above formula is reported to the nearest whole number.

Intersections

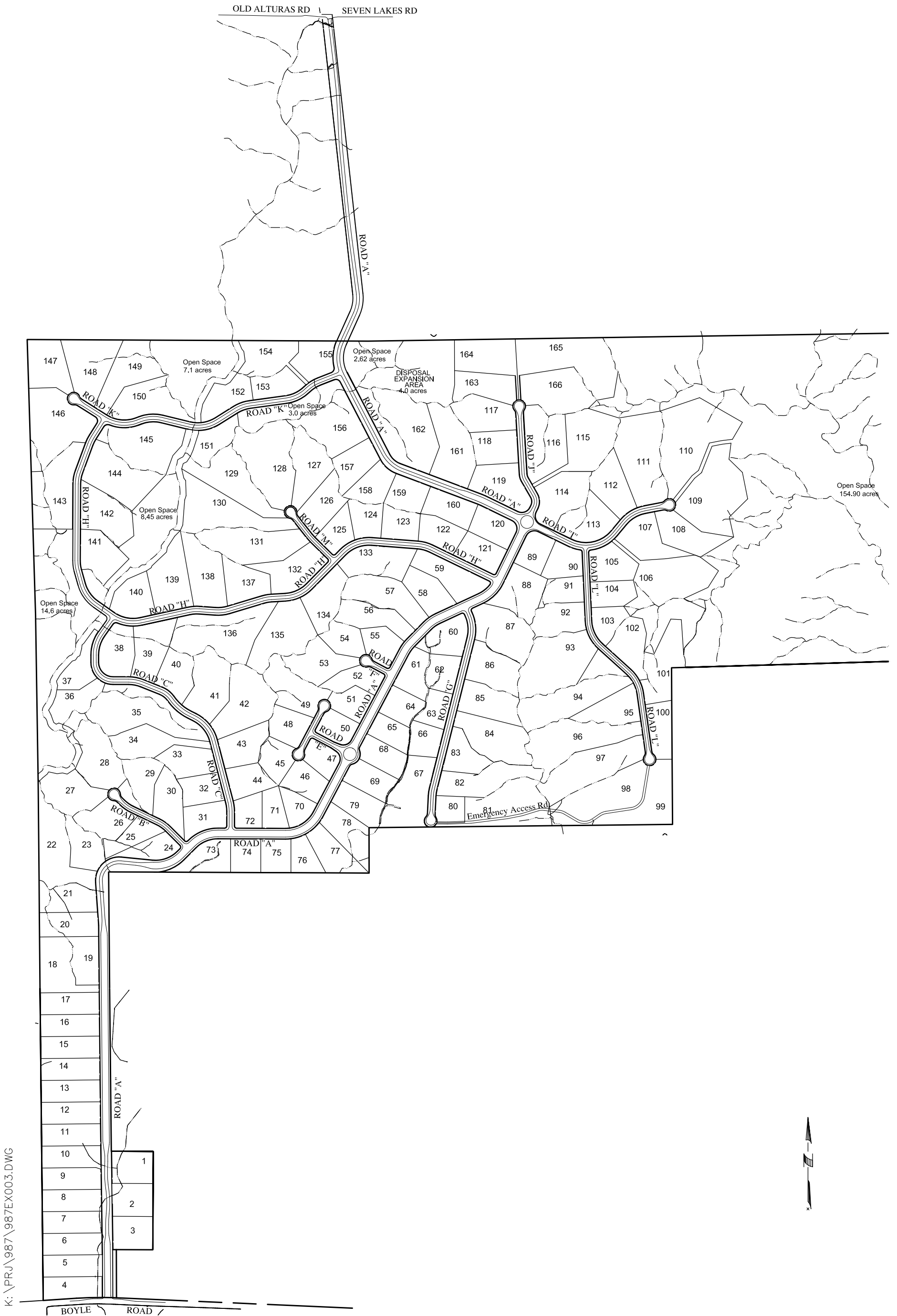
Table 20 presents a summary of the fair share cost calculations performed for intersections with significant impacts for the *Year 2035 Plus Project Conditions*.

TABLE 20
SUMMARY OF FAIR SHARE CALCULATIONS FOR INTERSECTIONS

#	Intersection Name	T	T _b	T _e	P
8	Old Oregon Trail & Old Alturas Rd	108	1818	956	13%
10	Airport Rd/Old Oregon Trail & SR WB Ramps	32	1902	1420	7%
13	Deschutes Rd & Boyle Rd	25	1105	752	11%

APPENDIX

FIGURES
SYNCHRO (HCM 2010) REPORTS
SIMTRAFFIC REPORT
SIDRA REPORTS
WARRANT SHEETS



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TIERRA ROBLES TIAR

PROPOSED SITE PLAN

Redding, CA

FIGURE 4 REV

8/17/17

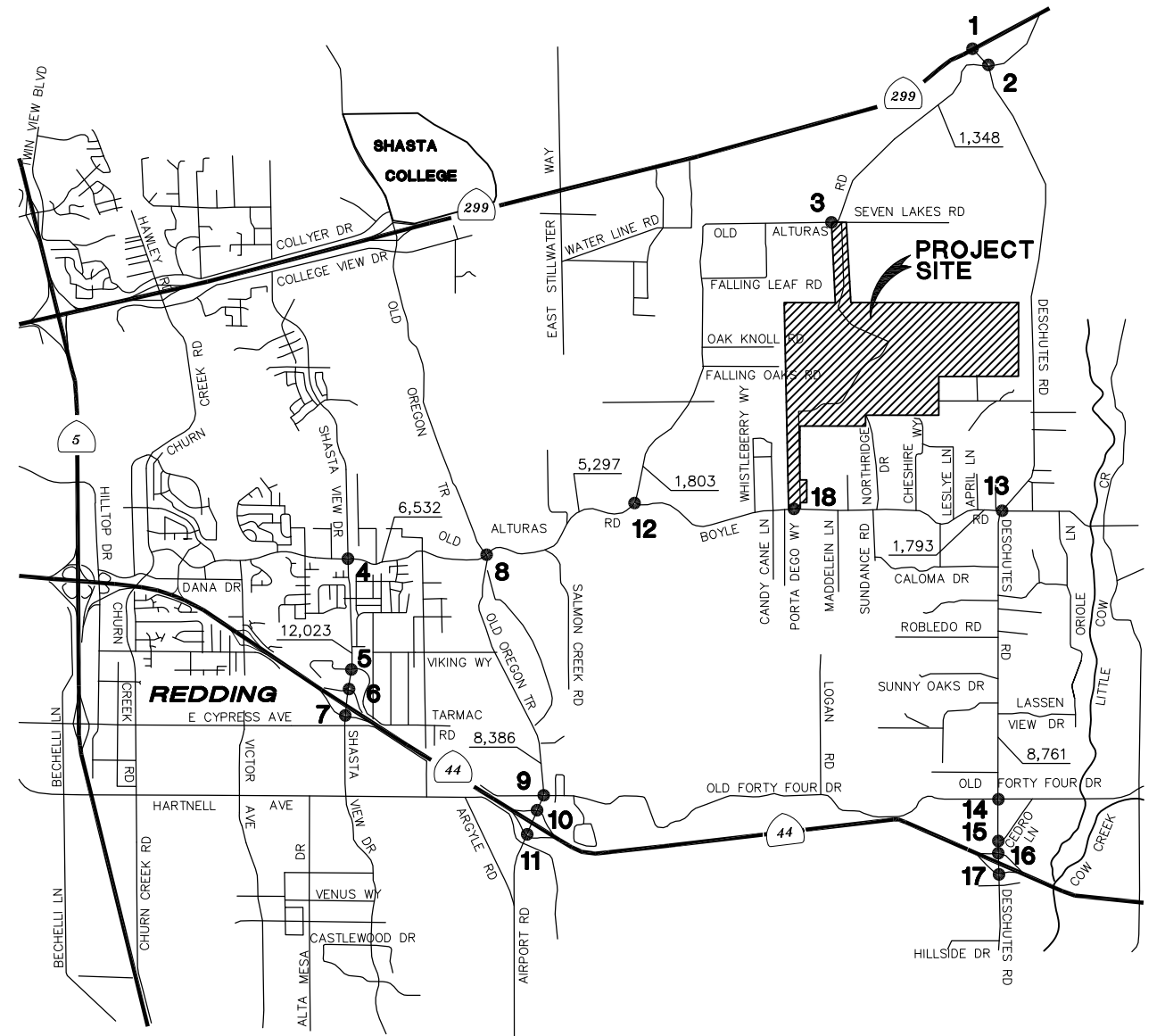
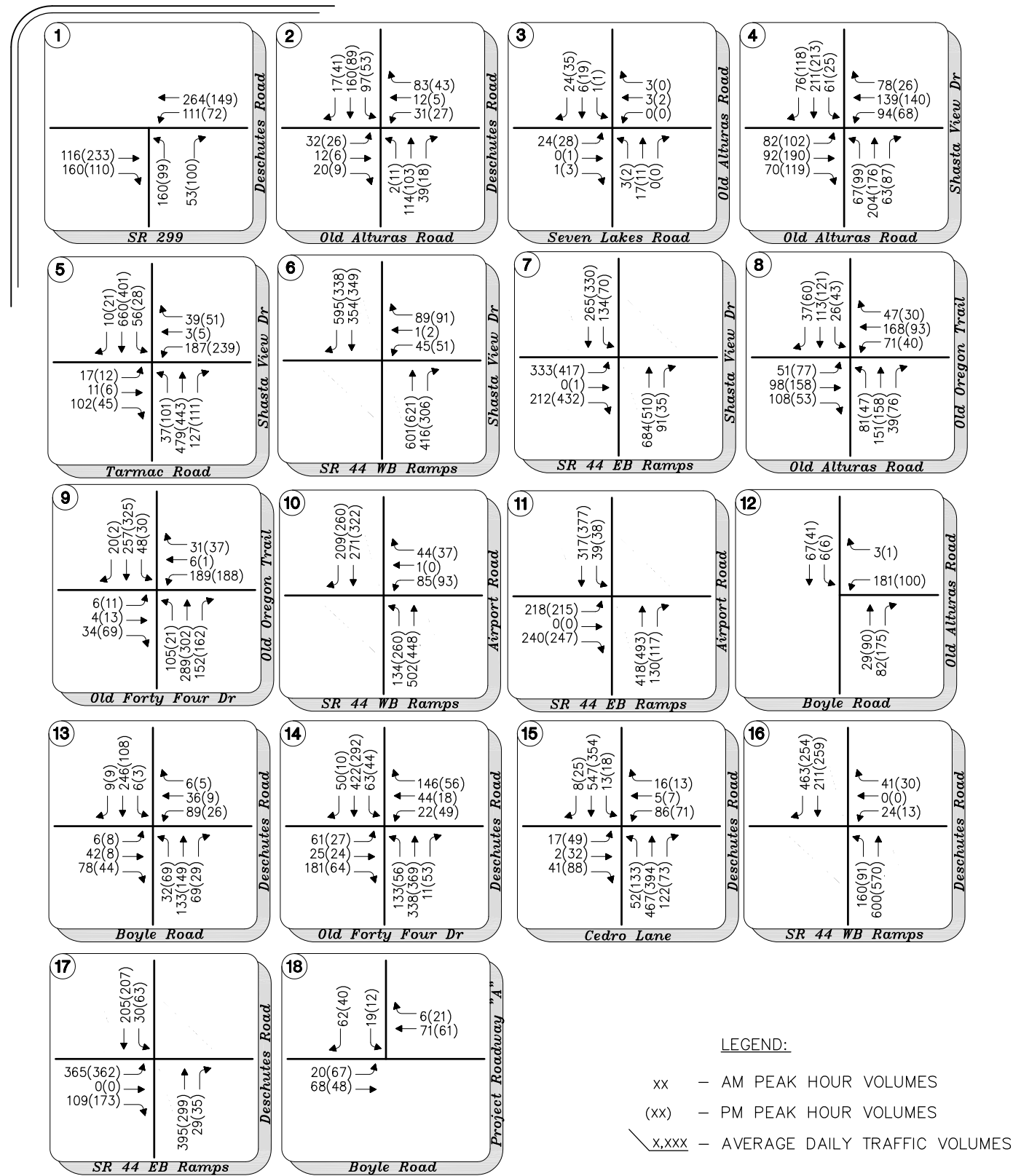
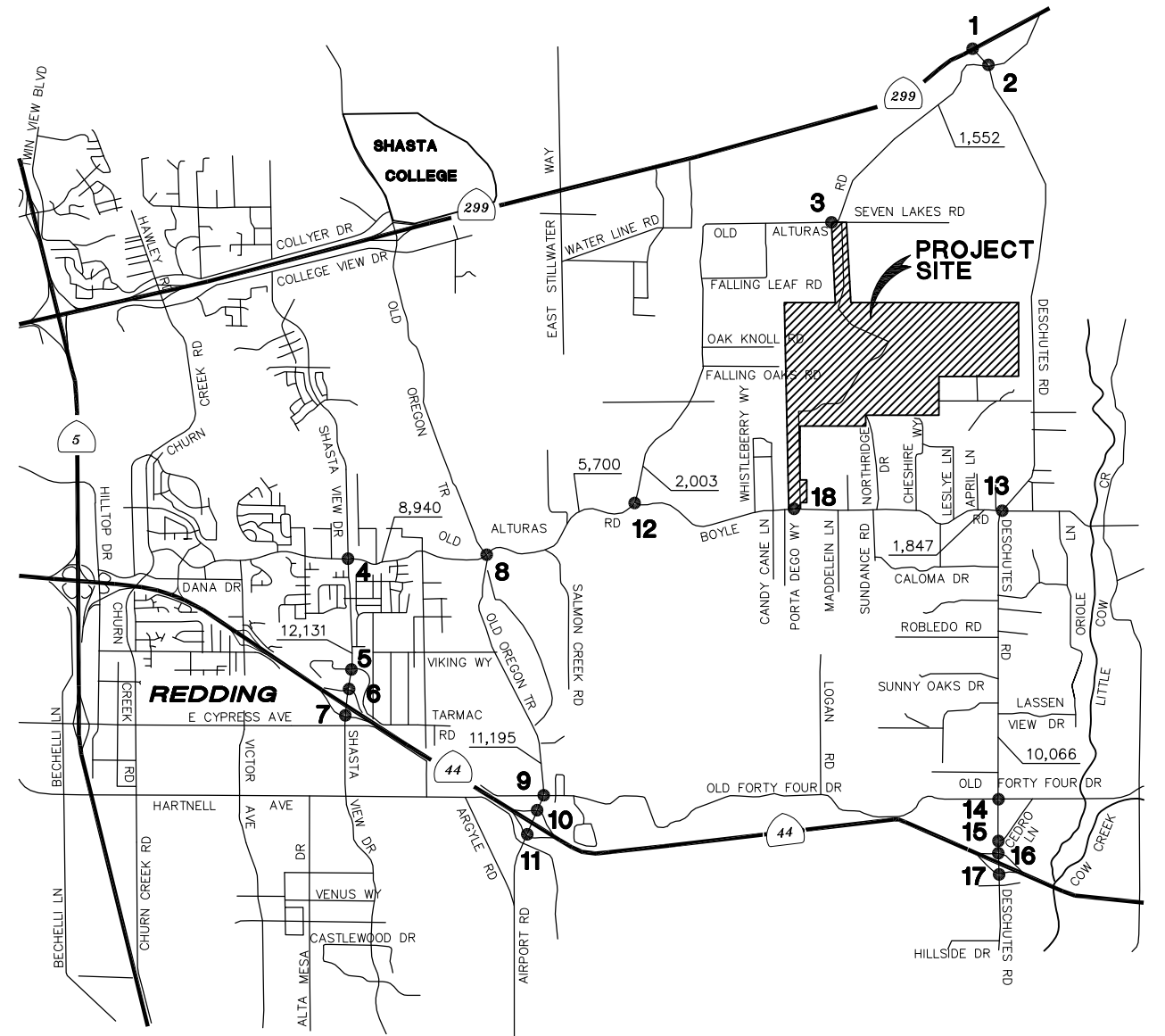
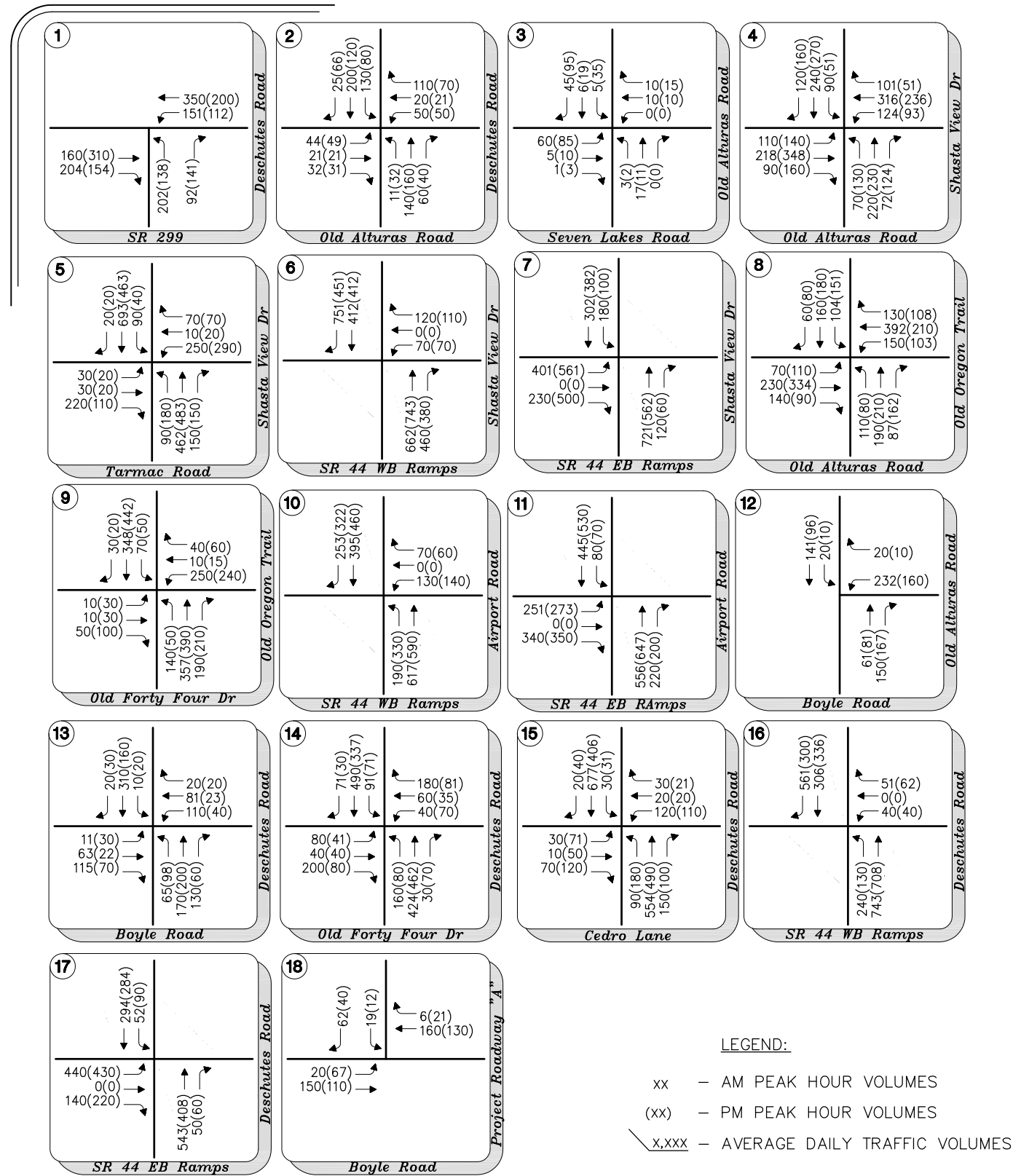


Figure 7 REV

Tierra Robles TIAR

Existing Plus Project Intersection Traffic Volumes



Tierra Robles TIAR

Figure 9 REV

Year 2035 Plus Project Intersection Traffic Volumes

HCM 2010 Signalized Intersection Summary

1: Deschutes Road & State Route 299

Existing Conditions

AM Peak

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (veh/h)	116	156	110	264	148	51		
Future Volume (veh/h)	116	156	110	264	148	51		
Number	2	12	1	6	3	18		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1810	1810	1629	1810	1629	1810		
Adj Flow Rate, veh/h	135	181	128	307	172	59		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86		
Percent Heavy Veh, %	5	5	5	5	5	5		
Cap, veh/h	447	380	239	985	262	260		
Arrive On Green	0.25	0.25	0.15	0.54	0.17	0.17		
Sat Flow, veh/h	1810	1538	1551	1810	1551	1538		
Grp Volume(v), veh/h	135	181	128	307	172	59		
Grp Sat Flow(s),veh/h/ln	1810	1538	1551	1810	1551	1538		
Q Serve(g_s), s	1.7	2.8	2.1	2.6	2.9	0.9		
Cycle Q Clear(g_c), s	1.7	2.8	2.1	2.6	2.9	0.9		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	447	380	239	985	262	260		
V/C Ratio(X)	0.30	0.48	0.54	0.31	0.66	0.23		
Avail Cap(c_a), veh/h	1556	1322	1167	3176	1278	1267		
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	8.5	9.0	10.9	3.5	10.8	10.0		
Incr Delay (d2), s/veh	0.4	0.9	1.9	0.2	2.8	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	0.9	1.3	1.0	1.3	1.4	0.4		
LnGrp Delay(d),s/veh	8.9	9.9	12.8	3.7	13.6	10.5		
LnGrp LOS	A	A	B	A	B	B		
Approach Vol, veh/h	316			435	231			
Approach Delay, s/veh	9.5			6.3	12.8			
Approach LOS	A			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	8.3	10.9				19.2		8.7
Change Period (Y+Rc), s	4.0	4.0				4.0		4.0
Max Green Setting (Gmax), s	21.0	24.0				49.0		23.0
Max Q Clear Time (g_c+I1), s	4.1	4.8				4.6		4.9
Green Ext Time (p_c), s	0.3	2.2				2.3		0.8
Intersection Summary								
HCM 2010 Ctrl Delay			8.9					
HCM 2010 LOS			A					

HCM 2010 TWSC
2: Deschutes Road & Old Alturas Rd

Existing Conditions
AM Peak

Intersection												
Int Delay, s/veh		5.4										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Traffic Vol, veh/h	18	11	18	31	12	83	1	114	39	97	160	12
Future Vol, veh/h	18	11	18	31	12	83	1	114	39	97	160	12
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	275
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	22	13	22	37	14	100	1	137	47	117	193	14
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	657	624	203	617	600	171	198	0	0	189	0	0
Stage 1	432	432	-	168	168	-	-	-	-	-	-	-
Stage 2	225	192	-	449	432	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	377	400	835	401	413	870	1369	-	-	1379	-	0
Stage 1	600	581	-	832	758	-	-	-	-	-	-	0
Stage 2	775	740	-	587	581	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	297	359	828	349	370	863	1363	-	-	1373	-	-
Mov Cap-2 Maneuver	297	359	-	349	370	-	-	-	-	-	-	-
Stage 1	597	524	-	828	754	-	-	-	-	-	-	-
Stage 2	669	736	-	502	524	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	15			13.4			0			3		
HCM LOS	C			B								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT					
Capacity (veh/h)	1363	-	-	416	579	1373	-					
HCM Lane V/C Ratio	0.001	-	-	0.136	0.262	0.085	-					
HCM Control Delay (s)	7.6	0	-	15	13.4	7.9	0					
HCM Lane LOS	A	A	-	C	B	A	A					
HCM 95th %tile O(veh)	0	-	-	0.5	1	0.3	-					

HCM 2010 TWSC
3: Old Alturas Rd & Seven Lakes Road

Existing Conditions
AM Peak

Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	0	3	3	1	24
Future Vol, veh/h	24	0	3	3	1	24
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	0	3	3	1	27
Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	32	0	93	10	5	-
Stage 1	-	-	59	-	-	-
Stage 2	-	-	34	-	-	-
Critical Hdwy	4.12	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	1580	-	797	1071	1616	-
Stage 1	-	-	846	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1580	-	0	1062	1609	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-
Approach	EB		WB		SB	
HCM Control Delay, s	7.3		8.4		0.3	
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBTWBLn1	SBL	SBR		
Capacity (veh/h)	1580	- 1062	1609	-		
HCM Lane V/C Ratio	0.017	- 0.006	0.001	-		
HCM Control Delay (s)	7.3	0 8.4	7.2	-		
HCM Lane LOS	A	A A	A	-		
HCM 95th %tile Q(veh)	0.1	- 0	0	-		

HCM 2010 Roundabout
4: Shasta View Dr & Old Alturas Rd

Existing Conditions
AM Peak

Intersection					
Intersection Delay, s/veh	10.1				
Intersection LOS	B				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	268	318	377	395	
Demand Flow Rate, veh/h	282	333	396	414	
Vehicles Circulating, veh/h	431	422	270	321	
Vehicles Exiting, veh/h	214	244	443	434	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	5	5	5	5	
Ped Cap Adj	0.999	0.999	0.999	0.999	
Approach Delay, s/veh	10.3	11.4	10.3	8.6	
Approach LOS	B	B	B	A	
Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LTR	LTR	LT	R
Assumed Moves	LTR	LTR	LTR	LT	R
RT Channelized					Yield
Lane Util	1.000	1.000	1.000	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	282	333	396	324	90
Cap Entry Lane, veh/h	734	741	863	820	912
Entry HV Adj Factor	0.951	0.954	0.953	0.954	0.952
Flow Entry, veh/h	268	318	377	309	86
Cap Entry, veh/h	698	706	821	781	868
V/C Ratio	0.384	0.450	0.459	0.396	0.099
Control Delay, s/veh	10.3	11.4	10.3	9.6	5.1
LOS	B	B	B	A	A
95th %tile Queue, veh	2	2	2	2	0

HCM 2010 Signalized Intersection Summary

5: Shasta View Dr & Tarmac Road

Existing Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↗		↖	↕	↗	↖	↕	
Traffic Volume (veh/h)	17	11	102	187	3	39	37	477	127	56	657	10
Future Volume (veh/h)	17	11	102	187	3	39	37	477	127	56	657	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1710	1827	1827	1644	1827	1900	1644	1827	1827	1644	1827	1900
Adj Flow Rate, veh/h	21	14	128	234	4	49	46	596	159	70	821	12
Adj No. of Lanes	0	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	123	82	179	399	16	191	60	1251	560	83	1313	19
Arrive On Green	0.12	0.12	0.12	0.13	0.13	0.13	0.04	0.36	0.36	0.05	0.37	0.37
Sat Flow, veh/h	1064	709	1553	3038	119	1452	1566	3471	1553	1566	3502	51
Grp Volume(v), veh/h	35	0	128	234	0	53	46	596	159	70	407	426
Grp Sat Flow(s),veh/h/ln	1774	0	1553	1519	0	1571	1566	1736	1553	1566	1736	1818
Q Serve(g_s), s	0.8	0.0	3.7	3.4	0.0	1.4	1.4	6.2	3.4	2.1	9.0	9.0
Cycle Q Clear(g_c), s	0.8	0.0	3.7	3.4	0.0	1.4	1.4	6.2	3.4	2.1	9.0	9.0
Prop In Lane	0.60		1.00	1.00		0.92	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	204	0	179	399	0	206	60	1251	560	83	651	682
V/C Ratio(X)	0.17	0.00	0.71	0.59	0.00	0.26	0.76	0.48	0.28	0.85	0.63	0.63
Avail Cap(c_a), veh/h	603	0	528	1033	0	534	200	1697	759	300	959	1005
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.8	0.0	20.1	19.2	0.0	18.4	22.4	11.6	10.7	22.1	12.0	12.0
Incr Delay (d2), s/veh	0.4	0.0	5.2	1.4	0.0	0.7	18.0	0.3	0.3	20.0	1.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	1.8	1.5	0.0	0.7	0.9	3.0	1.5	1.4	4.5	4.7
LnGrp Delay(d),s/veh	19.2	0.0	25.3	20.6	0.0	19.0	40.4	11.9	11.0	42.1	13.0	13.0
LnGrp LOS	B		C	C		B	D	B	B	D	B	B
Approach Vol, veh/h	163					287		801		903		
Approach Delay, s/veh	24.0					20.3		13.4		15.2		
Approach LOS	C					C		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	6.5	21.0	9.4		5.8	21.6	10.2					
Change Period (Y+Rc), s	4.0	4.0	4.0		4.0	4.0	4.0					
Max Green Setting (Gmax), s	23.0	23.0	16.0		6.0	26.0	16.0					
Max Q Clear Time (g_c+14), s	8.2	8.2	5.7		3.4	11.0	5.4					
Green Ext Time (p_c), s	0.1	6.6	0.4		0.0	6.6	0.9					
Intersection Summary												
HCM 2010 Ctrl Delay			15.9									
HCM 2010 LOS			B									

HCM 2010 TWSC
6: Shasta View Dr & SR 44 WB Ramps

Existing Conditions

AM Peak

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	0	0	0	45	1	89	0	599	416	0	352	594	
Future Vol, veh/h	0	0	0	45	1	89	0	599	416	0	352	594	
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	Free	
Storage Length	-	-	-	-	-	150	-	-	0	-	-	200	
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	0	0	0	54	1	107	0	722	501	0	424	716	
Major/Minor				Minor1			Major1			Major2			
Conflicting Flow All				939	1146	-	-	0	-	-	-	0	
Stage 1				722	722	-	-	-	-	-	-	-	
Stage 2				217	424	-	-	-	-	-	-	-	
Critical Hdwy				6.84	6.54	-	-	-	-	-	-	-	
Critical Hdwy Stg 1				5.84	5.54	-	-	-	-	-	-	-	
Critical Hdwy Stg 2				5.84	5.54	-	-	-	-	-	-	-	
Follow-up Hdwy				3.52	4.02	-	-	-	-	-	-	-	
Pot Cap-1 Maneuver				263	198	0	0	-	0	0	-	0	
Stage 1				442	429	0	0	-	0	0	-	0	
Stage 2				798	585	0	0	-	0	0	-	0	
Platoon blocked, %								-			-		
Mov Cap-1 Maneuver				262	0	-	-	-	-	-	-	-	
Mov Cap-2 Maneuver				262	0	-	-	-	-	-	-	-	
Stage 1				442	0	-	-	-	-	-	-	-	
Stage 2				795	0	-	-	-	-	-	-	-	
Approach				WB			NB			SB			
HCM Control Delay, s				22.4			0			0			
HCM LOS				C									
Minor Lane/Major Mvmt	NBTWBLn1WBLn2		SBT										
Capacity (veh/h)	-	262	-	-									
HCM Lane V/C Ratio	-	0.212	-	-									
HCM Control Delay (s)	-	22.4	0	-									
HCM Lane LOS	-	C	A	-									
HCM 95th %tile O(veh)	-	0.8	-	-									

HCM 2010 Signalized Intersection Summary

7: SR 44 EB Ramps & Shasta View Dr

Existing Conditions

AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	332	0	212	0	0	0	0	683	91	134	263	0
Future Volume (veh/h)	332	0	212	0	0	0	0	683	91	134	263	0
Number	5	2	12				3	8	18	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	1710	1845	1845				0	1845	1845	1660	1845	0
Adj Flow Rate, veh/h	420	0	268				0	865	0	170	333	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.79	0.79	0.79				0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	533	0	473				0	1202	538	214	1931	0
Arrive On Green	0.30	0.00	0.30				0.00	0.34	0.00	0.14	0.55	0.00
Sat Flow, veh/h	1757	0	1560				0	3597	1568	1581	3597	0
Grp Volume(v), veh/h	420	0	268				0	865	0	170	333	0
Grp Sat Flow(s),veh/h/ln	1757	0	1560				0	1752	1568	1581	1752	0
Q Serve(g_s), s	12.0	0.0	7.9				0.0	11.8	0.0	5.7	2.6	0.0
Cycle Q Clear(g_c), s	12.0	0.0	7.9				0.0	11.8	0.0	5.7	2.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	533	0	473				0	1202	538	214	1931	0
V/C Ratio(X)	0.79	0.00	0.57				0.00	0.72	0.00	0.80	0.17	0.00
Avail Cap(c_a), veh/h	864	0	767				0	1724	771	403	2873	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	1.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.5	0.0	16.1				0.0	15.7	0.0	23.0	6.1	0.0
Incr Delay (d2), s/veh	2.6	0.0	1.1				0.0	0.8	0.0	6.6	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	6.2	0.0	3.6				0.0	5.8	0.0	2.9	1.3	0.0
LnGrp Delay(d),s/veh	20.1	0.0	17.1				0.0	16.6	0.0	29.6	6.2	0.0
LnGrp LOS	C		B					B		C	A	
Approach Vol, veh/h		688						865			503	
Approach Delay, s/veh		19.0						16.6			14.1	
Approach LOS		B						B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		20.7		34.2			11.4	22.8				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		27.0		45.0			14.0	27.0				
Max Q Clear Time (g_c+l1), s		14.0		4.6			7.7	13.8				
Green Ext Time (p_c), s		2.6		6.9			0.3	5.0				
Intersection Summary												
HCM 2010 Ctrl Delay			16.8									
HCM 2010 LOS			B									

HCM 2010 AWSC
8: Old Oregeon Trail & Old Alturas Rd

Existing Conditions
AM Peak

Intersection

Intersection Delay, s/veh 15.5

Intersection LOS C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	51	88	108	0	51	136	37	0	81	151	32	0	22	113	37
Future Vol, veh/h	0	51	88	108	0	51	136	37	0	81	151	32	0	22	113	37
Peak Hour Factor	0.88	0.81	0.81	0.81	0.88	0.81	0.81	0.81	0.88	0.81	0.81	0.81	0.88	0.81	0.81	0.81
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	63	109	133	0	63	168	46	0	100	186	40	0	27	140	46
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	15.5	15.2	17.7	12.5
HCM LOS	C	C	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	31%	21%	23%	16%	0%
Vol Thru, %	57%	36%	61%	84%	0%
Vol Right, %	12%	44%	17%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	264	247	224	135	37
LT Vol	81	51	51	22	0
Through Vol	151	88	136	113	0
RT Vol	32	108	37	0	37
Lane Flow Rate	326	305	277	167	46
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.575	0.515	0.484	0.329	0.08
Departure Headway (Hd)	6.35	6.083	6.3	7.114	6.314
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	567	592	570	505	566
Service Time	4.4	4.135	4.352	4.871	4.07
HCM Lane V/C Ratio	0.575	0.515	0.486	0.331	0.081
HCM Control Delay	17.7	15.5	15.2	13.3	9.6
HCM Lane LOS	C	C	C	B	A
HCM 95th-tile Q	3.6	2.9	2.6	1.4	0.3

HCM 2010 Signalized Intersection Summary

9: Old Oregon Trail & Old Forty-Four Drive

Existing Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	4	34	189	6	31	105	282	152	48	239	20
Future Volume (veh/h)	6	4	34	189	6	31	105	282	152	48	239	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1598	1776	1900	1598	1776	1900	1598	1776	1900	1598	1776	1900
Adj Flow Rate, veh/h	7	5	41	228	7	37	127	340	183	58	288	24
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	11	10	82	280	58	308	157	417	225	68	526	44
Arrive On Green	0.01	0.06	0.06	0.18	0.24	0.24	0.10	0.38	0.38	0.04	0.33	0.33
Sat Flow, veh/h	1522	167	1368	1522	246	1300	1522	1087	585	1522	1617	135
Grp Volume(v), veh/h	7	0	46	228	0	44	127	0	523	58	0	312
Grp Sat Flow(s),veh/h/ln	1522	0	1534	1522	0	1546	1522	0	1672	1522	0	1752
Q Serve(g_s), s	0.2	0.0	1.4	7.0	0.0	1.1	4.0	0.0	13.7	1.8	0.0	7.1
Cycle Q Clear(g_c), s	0.2	0.0	1.4	7.0	0.0	1.1	4.0	0.0	13.7	1.8	0.0	7.1
Prop In Lane	1.00		0.89	1.00		0.84	1.00		0.35	1.00		0.08
Lane Grp Cap(c), veh/h	11	0	92	280	0	366	157	0	642	68	0	570
V/C Ratio(X)	0.62	0.00	0.50	0.81	0.00	0.12	0.81	0.00	0.81	0.85	0.00	0.55
Avail Cap(c_a), veh/h	125	0	503	468	0	855	312	0	993	125	0	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.2	0.0	22.2	19.1	0.0	14.6	21.4	0.0	13.5	23.2	0.0	13.5
Incr Delay (d2), s/veh	44.5	0.0	4.2	5.7	0.0	0.1	9.6	0.0	3.1	24.4	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.7	3.4	0.0	0.5	2.1	0.0	6.8	1.2	0.0	3.5
LnGrp Delay(d),s/veh	68.7	0.0	26.4	24.8	0.0	14.8	31.0	0.0	16.6	47.6	0.0	14.3
LnGrp LOS	E		C	C		B	C		B	D		B
Approach Vol, veh/h	53			272			650			370		
Approach Delay, s/veh	32.0			23.2			19.4			19.5		
Approach LOS	C			C			B			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.2	22.7	13.0	6.9	9.0	19.9	4.4	15.6				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	29.0	15.0	16.0	10.0	23.0	4.0	27.0				
Max Q Clear Time (g_c+I), s	13.8	15.7	9.0	3.4	6.0	9.1	2.2	3.1				
Green Ext Time (p_c), s	0.0	3.0	0.4	0.2	0.1	3.1	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay	20.7											
HCM 2010 LOS	C											

HCM 2010 TWSC
10: Airport Road/Old Oregon Trail & SR 44 WB Ramps

Existing Conditions

AM Peak

Intersection												
Int Delay, s/veh		4.1										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↕	↕	↑			↕	
Traffic Vol, veh/h	0	0	0	85	1	44	134	495	0	0	256	206
Future Vol, veh/h	0	0	0	85	1	44	134	495	0	0	256	206
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	0	99	1	51	156	576	0	0	298	240
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1309	1429	581	542	0	-	-	-	0
Stage 1				887	887	-	-	-	-	-	-	-
Stage 2				422	542	-	-	-	-	-	-	-
Critical Hdwy				6.44	6.54	6.24	4.14	-	-	-	-	-
Critical Hdwy Stg 1				5.44	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.44	5.54	-	-	-	-	-	-	-
Follow-up Hdwy				3.536	4.036	3.336	2.236	-	-	-	-	-
Pot Cap-1 Maneuver				174	133	510	1017	-	0	0	-	-
Stage 1				399	360	-	-	-	0	0	-	-
Stage 2				657	517	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				147	0	508	1013	-	-	-	-	-
Mov Cap-2 Maneuver				247	0	-	-	-	-	-	-	-
Stage 1				338	0	-	-	-	-	-	-	-
Stage 2				654	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				28.7			2			0		
HCM LOS				D								
Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR								
Capacity (veh/h)	1013	-	299	-	-							
HCM Lane V/C Ratio	0.154	-	0.506	-	-							
HCM Control Delay (s)	9.2	-	28.7	-	-							
HCM Lane LOS	A	-	D	-	-							
HCM 95th %tile O(veh)	0.5	-	2.7	-	-							

HCM 2010 Signalized Intersection Summary

11: Airport Road & SR 44 EB Ramps

Existing Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	217	0	240	0	0	0	0	412	130	39	302	0
Future Volume (veh/h)	217	0	240	0	0	0	0	412	130	39	302	0
Number	5	2	12				3	8	18	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	1710	1810	1810				0	1810	1810	1629	1810	0
Adj Flow Rate, veh/h	255	0	282				0	485	153	46	355	0
Adj No. of Lanes	0	1	1				0	1	1	1	1	0
Peak Hour Factor	0.85	0.85	0.85				0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	5	5	5				0	5	5	5	5	0
Cap, veh/h	460	0	411				0	698	594	62	956	0
Arrive On Green	0.27	0.00	0.27				0.00	0.39	0.39	0.04	0.53	0.00
Sat Flow, veh/h	1723	0	1538				0	1810	1538	1551	1810	0
Grp Volume(v), veh/h	255	0	282				0	485	153	46	355	0
Grp Sat Flow(s),veh/h/ln	1723	0	1538				0	1810	1538	1551	1810	0
Q Serve(g_s), s	5.0	0.0	6.4				0.0	8.8	2.7	1.1	4.5	0.0
Cycle Q Clear(g_c), s	5.0	0.0	6.4				0.0	8.8	2.7	1.1	4.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	460	0	411				0	698	594	62	956	0
V/C Ratio(X)	0.55	0.00	0.69				0.00	0.69	0.26	0.74	0.37	0.00
Avail Cap(c_a), veh/h	970	0	865				0	1805	1534	278	2314	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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.3	0.0	12.9				0.0	10.1	8.2	18.6	5.4	0.0
Incr Delay (d2), s/veh	1.0	0.0	2.0				0.0	1.3	0.2	15.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	2.9				0.0	4.6	1.1	0.8	2.2	0.0
LnGrp Delay(d),s/veh	13.4	0.0	14.9				0.0	11.3	8.4	34.0	5.6	0.0
LnGrp LOS	B		B					B	A	C	A	
Approach Vol, veh/h		537						638			401	
Approach Delay, s/veh		14.2						10.6			8.9	
Approach LOS		B						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		14.4		24.7			5.6	19.1				
Change Period (Y+Rc), s		4.0		4.0			4.0	4.0				
Max Green Setting (Gmax), s		22.0		50.0			7.0	39.0				
Max Q Clear Time (g_c+I1), s		8.4		6.5			3.1	10.8				
Green Ext Time (p_c), s		2.0		4.4			0.0	4.3				
Intersection Summary												
HCM 2010 Ctrl Delay			11.4									
HCM 2010 LOS			B									

Intersection						
Int Delay, s/veh	4.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	119	3	28	62	6	66
Future Vol, veh/h	119	3	28	62	6	66
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	155	185	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	129	3	30	67	7	72
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	125	40	0	0	35	0
Stage 1	35	-	-	-	-	-
Stage 2	90	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	870	1031	-	-	1576	-
Stage 1	987	-	-	-	-	-
Stage 2	934	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	859	1022	-	-	1569	-
Mov Cap-2 Maneuver	859	-	-	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.9	0		0.6		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 859 1022 1569	-	-		
HCM Lane V/C Ratio	-	- 0.151 0.003 0.004	-	-		
HCM Control Delay (s)	-	- 9.9 8.5 7.3	-	-		
HCM Lane LOS	-	- A A A	-	-		
HCM 95th %tile Q(veh)	-	- 0.5 0 0	-	-		

HCM 2010 TWSC
13: Deschutes Road & Boyle Road

Existing Conditions
AM Peak

Intersection												
Int Delay, s/veh	7.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	39	63	89	35	6	27	133	69	6	246	9
Future Vol, veh/h	5	39	63	89	35	6	27	133	69	6	246	9
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	50	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	51	82	116	45	8	35	173	90	8	319	12
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	620	594	335	660	600	183	336	0	0	178	0	0
Stage 1	346	346	-	248	248	-	-	-	-	-	-	-
Stage 2	274	248	-	412	352	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	400	418	707	376	415	859	1223	-	-	1398	-	-
Stage 1	670	635	-	756	701	-	-	-	-	-	-	-
Stage 2	732	701	-	617	632	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	349	400	701	290	397	852	1218	-	-	1392	-	-
Mov Cap-2 Maneuver	349	400	-	290	397	-	-	-	-	-	-	-
Stage 1	648	629	-	731	678	-	-	-	-	-	-	-
Stage 2	654	678	-	496	626	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.2			27.7			0.9			0.2		
HCM LOS	B			D								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1218	-	-	530	323	1392	-	-				
HCM Lane V/C Ratio	0.029	-	-	0.262	0.523	0.006	-	-				
HCM Control Delay (s)	8	-	-	14.2	27.7	7.6	-	-				
HCM Lane LOS	A	-	-	B	D	A	-	-				
HCM 95th %tile O(veh)	0.1	-	-	1	2.9	0	-	-				

HCM 2010 AWSC
14: Deschutes Road & Old Forty-Four Drive

Existing Conditions

AM Peak

Intersection												
Intersection Delay, s/veh	35.3											
Intersection LOS	E											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	61	25	181	0	22	44	146	0	133	334	11
Future Vol, veh/h	0	61	25	181	0	22	44	146	0	133	334	11
Peak Hour Factor	0.88	0.82	0.82	0.82	0.88	0.82	0.82	0.82	0.88	0.82	0.82	0.82
Heavy Vehicles, %	5	3	3	3	5	3	3	3	5	3	3	3
Mvmt Flow	0	74	30	221	0	27	54	178	0	162	407	13
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	2				2				2			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	2				2				2			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	2				2				2			
HCM Control Delay	21				21.4				53			
HCM LOS	C				C				F			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2				
Vol Left, %	100%	0%	100%	0%	100%	0%	23%	0%				
Vol Thru, %	0%	97%	0%	12%	0%	23%	77%	81%				
Vol Right, %	0%	3%	0%	88%	0%	77%	0%	19%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	133	345	61	206	22	190	268	255				
LT Vol	133	0	61	0	22	0	62	0				
Through Vol	0	334	0	25	0	44	206	206				
RT Vol	0	11	0	181	0	146	0	49				
Lane Flow Rate	162	421	74	251	27	232	327	311				
Geometry Grp	7	7	7	7	7	7	7	7				
Degree of Util (X)	0.401	0.976	0.2	0.593	0.073	0.564	0.773	0.713				
Departure Headway (Hd)	8.89	8.349	9.662	8.498	9.842	8.757	8.51	8.251				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	405	433	372	425	364	412	425	438				
Service Time	6.638	6.096	7.409	6.245	7.591	6.506	6.261	6.001				
HCM Lane V/C Ratio	0.4	0.972	0.199	0.591	0.074	0.563	0.769	0.71				
HCM Control Delay	17.5	66.7	14.8	22.9	13.4	22.3	34.9	29.1				
HCM Lane LOS	C	F	B	C	B	C	D	D				
HCM 95th-tile Q	1.9	11.9	0.7	3.7	0.2	3.4	6.6	5.5				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	62	412	49
Future Vol, veh/h	0	62	412	49
Peak Hour Factor	0.88	0.82	0.82	0.82
Heavy Vehicles, %	5	3	3	3
Mvmt Flow	0	76	502	60
Number of Lanes	0	0	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	32.1
HCM LOS	D

HCM 2010 AWSC
15: Deschutes Road & Cedro Road

Existing Conditions
AM Peak

Intersection

Intersection Delay, s/veh47.2

Intersection LOS E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	17	2	41	0	86	5	16	0	52	463	122	0	13	540	8
Future Vol, veh/h	0	17	2	41	0	86	5	16	0	52	463	122	0	13	540	8
Peak Hour Factor	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86
Heavy Vehicles, %	5	3	3	3	5	3	3	3	5	3	3	3	5	3	3	3
Mvmt Flow	0	20	2	48	0	100	6	19	0	60	538	142	0	15	628	9
Number of Lanes	0	0	1	1	0	0	1	0	0	1	1	1	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	2
HCM Control Delay	12.7	16.1	70.3	30.5
HCM LOS	B	C	F	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	89%	0%	80%	100%	0%	0%
Vol Thru, %	0%	100%	0%	11%	0%	5%	0%	100%	96%
Vol Right, %	0%	0%	100%	0%	100%	15%	0%	0%	4%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	52	463	122	19	41	107	13	360	188
LT Vol	52	0	0	17	0	86	13	0	0
Through Vol	0	463	0	2	0	5	0	360	180
RT Vol	0	0	122	0	41	16	0	0	8
Lane Flow Rate	60	538	142	22	48	124	15	419	219
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.131	1.087	0.258	0.059	0.112	0.313	0.032	0.842	0.438
Departure Headway (Hd)	7.779	7.27	6.557	9.857	8.677	9.265	8.028	7.518	7.488
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	463	501	550	366	416	391	449	486	483
Service Time	5.492	4.983	4.27	7.557	6.377	6.965	5.728	5.218	5.188
HCM Lane V/C Ratio	0.13	1.074	0.258	0.06	0.115	0.317	0.033	0.862	0.453
HCM Control Delay	11.7	92.4	11.5	13.2	12.5	16.1	11	38.8	15.9
HCM Lane LOS	B	F	B	B	B	C	B	E	C
HCM 95th-tile Q	0.4	17.1	1	0.2	0.4	1.3	0.1	8.4	2.2

HCM 2010 TWSC
16: Deschutes Road & SR 44 WB Ramps

Existing Conditions

AM Peak

Intersection												
Int Delay, s/veh		2.5										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	24	0	40	160	597	0	0	205	462
Future Vol, veh/h	0	0	0	24	0	40	160	597	0	0	205	462
Conflicting Peds, #/hr	0	0	0	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	175	-	-	200	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	0	27	0	45	182	678	0	0	233	525
Major/Minor				Minor1		Major1			Major2			
Conflicting Flow All				1280	1280	344	238	0	-	-	-	0
Stage 1				1042	1042	-	-	-	-	-	-	-
Stage 2				238	238	-	-	-	-	-	-	-
Critical Hdwy				6.66	6.56	6.96	4.16	-	-	-	-	-
Critical Hdwy Stg 1				5.86	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.46	5.56	-	-	-	-	-	-	-
Follow-up Hdwy				3.538	4.038	3.338	2.238	-	-	-	-	-
Pot Cap-1 Maneuver				168	163	648	1314	-	0	0	-	0
Stage 1				298	302	-	-	-	0	0	-	0
Stage 2				795	703	-	-	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				144	0	645	1309	-	-	-	-	-
Mov Cap-2 Maneuver				144	0	-	-	-	-	-	-	-
Stage 1				257	0	-	-	-	-	-	-	-
Stage 2				792	0	-	-	-	-	-	-	-
Approach				WB		NB			SB			
HCM Control Delay, s				20.3		1.7			0			
HCM LOS				C								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT							
Capacity (veh/h)	1309	-	144	645	-							
HCM Lane V/C Ratio	0.139	-	0.189	0.07	-							
HCM Control Delay (s)	8.2	-	35.8	11	-							
HCM Lane LOS	A	-	E	B	-							
HCM 95th %tile O(veh)	0.5	-	0.7	0.2	-							

HCM 2010 AWSC
17: Deschutes Road & SR 44 EB Ramps

Existing Conditions

AM Peak

Intersection												
Intersection Delay, s/veh	15.2											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	365	0	109	0	0	0	0	0	0	392	29
Future Vol, veh/h	0	365	0	109	0	0	0	0	0	0	392	29
Peak Hour Factor	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86
Heavy Vehicles, %	5	4	4	4	5	4	4	4	5	4	4	4
Mvmt Flow	0	424	0	127	0	0	0	0	0	0	456	34
Number of Lanes	0	1	1	1	0	0	0	0	0	0	2	1
Approach	EB											NB
Opposing Approach												SB
Opposing Lanes	0											2
Conflicting Approach Left	SB											EB
Conflicting Lanes Left	2											3
Conflicting Approach Right	NB											
Conflicting Lanes Right	3											0
HCM Control Delay	14.3											15.3
HCM LOS	B											C
Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	SBLn1	SBLn2				
Vol Left, %	0%	0%	0%	100%	100%	0%	100%	0%				
Vol Thru, %	100%	100%	0%	0%	0%	0%	0%	100%				
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	196	196	29	183	183	109	28	201				
LT Vol	0	0	0	183	183	0	28	0				
Through Vol	196	196	0	0	0	0	0	201				
RT Vol	0	0	29	0	0	109	0	0				
Lane Flow Rate	228	228	34	212	212	127	33	234				
Geometry Grp	8	8	8	7	7	7	8	8				
Degree of Util (X)	0.458	0.458	0.043	0.427	0.427	0.212	0.074	0.498				
Departure Headway (Hd)	7.236	7.236	4.625	7.243	7.243	6.032	8.176	7.665				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	501	501	762	494	494	589	440	472				
Service Time	4.936	4.936	2.424	5.042	5.042	3.83	5.89	5.379				
HCM Lane V/C Ratio	0.455	0.455	0.045	0.429	0.429	0.216	0.075	0.496				
HCM Control Delay	15.9	15.9	7.6	15.4	15.4	10.5	11.5	17.8				
HCM Lane LOS	C	C	A	C	C	B	B	C				
HCM 95th-tile Q	2.4	2.4	0.1	2.1	2.1	0.8	0.2	2.7				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	28	201	0
Future Vol, veh/h	0	28	201	0
Peak Hour Factor	0.88	0.86	0.86	0.86
Heavy Vehicles, %	5	4	4	4
Mvmt Flow	0	33	234	0
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	17
HCM LOS	C

HCM 2010 Signalized Intersection Summary

1: Deschutes Road & State Route 299

Existing Conditions

PM Peak

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (veh/h)	233	96	70	149	91	99		
Future Volume (veh/h)	233	96	70	149	91	99		
Number	2	12	1	6	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1845	1845	1660	1845	1660	1845		
Adj Flow Rate, veh/h	238	98	71	152	93	101		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	703	593	88	917	602	597		
Arrive On Green	0.38	0.38	0.06	0.50	0.38	0.38		
Sat Flow, veh/h	1845	1558	1581	1845	1581	1568		
Grp Volume(v), veh/h	238	98	71	152	93	101		
Grp Sat Flow(s),veh/h/ln	1845	1558	1581	1845	1581	1568		
Q Serve(g_s), s	6.0	2.7	2.9	3.0	2.5	2.8		
Cycle Q Clear(g_c), s	6.0	2.7	2.9	3.0	2.5	2.8		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	703	593	88	917	602	597		
V/C Ratio(X)	0.34	0.17	0.81	0.17	0.15	0.17		
Avail Cap(c_a), veh/h	703	593	361	1321	602	597		
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	14.4	13.4	30.7	9.0	13.4	13.4		
Incr Delay (d2), s/veh	1.3	0.6	15.9	0.1	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	3.3	1.3	1.6	1.5	1.2	1.3		
LnGrp Delay(d),s/veh	15.8	14.0	46.5	9.1	13.9	14.1		
LnGrp LOS	B	B	D	A	B	B		
Approach Vol, veh/h	336			223	194			
Approach Delay, s/veh	15.2			21.0	14.0			
Approach LOS	B			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	4		6			
Phs Duration (G+Y+Rc), s	7.6	29.0	29.0		36.6			
Change Period (Y+Rc), s	4.0	4.0	4.0		4.0			
Max Green Setting (Gmax), s	15.0	25.0	25.0		47.0			
Max Q Clear Time (g_c+I1), s	4.9	8.0	4.8		5.0			
Green Ext Time (p_c), s	0.1	1.6	0.7		1.7			
Intersection Summary								
HCM 2010 Ctrl Delay			16.6					
HCM 2010 LOS			B					

HCM 2010 TWSC
2: Deschutes Road & Old Alturas Rd

Existing Conditions
PM Peak

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	17	5	8	27	4	43	9	103	18	53	89	25
Future Vol, veh/h	17	5	8	27	4	43	9	103	18	53	89	25
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	275
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	6	9	31	5	50	10	120	21	62	103	29
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	415	399	113	395	388	140	108	0	0	146	0	0
Stage 1	232	232	-	156	156	-	-	-	-	-	-	-
Stage 2	183	167	-	239	232	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	548	539	940	565	547	908	1483	-	-	1436	-	0
Stage 1	771	713	-	846	769	-	-	-	-	-	-	0
Stage 2	819	760	-	764	713	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	489	506	932	528	514	900	1477	-	-	1430	-	-
Mov Cap-2 Maneuver	489	506	-	528	514	-	-	-	-	-	-	-
Stage 1	762	677	-	837	760	-	-	-	-	-	-	-
Stage 2	760	752	-	712	677	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	11.8			10.9			0.5			2.8		
HCM LOS	B			B								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT					
Capacity (veh/h)	1477	-	-	564	694	1430	-					
HCM Lane V/C Ratio	0.007	-	-	0.062	0.124	0.043	-					
HCM Control Delay (s)	7.5	0	-	11.8	10.9	7.6	0					
HCM Lane LOS	A	A	-	B	B	A	A					
HCM 95th %tile O(veh)	0	-	-	0.2	0.4	0.1	-					

HCM 2010 TWSC
3: Old Alturas Rd & Seven Lakes Road

Existing Conditions

PM Peak

Intersection						
Int Delay, s/veh	3.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	1	2	0	1	35
Future Vol, veh/h	28	1	2	0	1	35
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	1	2	0	1	38
Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	43	0	111	11	6	-
Stage 1	-	-	66	-	-	-
Stage 2	-	-	45	-	-	-
Critical Hdwy	4.12	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	1566	-	779	1070	1615	-
Stage 1	-	-	840	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1566	-	0	1061	1608	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-
Approach	EB		WB		SB	
HCM Control Delay, s	7.1				0.2	
HCM LOS			-			
Minor Lane/Major Mvmt	EBL	EBTWBLn1	SBL	SBR		
Capacity (veh/h)	1566	-	-	1608	-	
HCM Lane V/C Ratio	0.019	-	-	0.001	-	
HCM Control Delay (s)	7.3	0	-	7.2	-	
HCM Lane LOS	A	A	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

HCM 2010 Roundabout
4: Shasta View Dr & Old Alturas Rd

Existing Conditions
PM Peak

Intersection					
Intersection Delay, s/veh	9.7				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	408	228	380	379	
Demand Flow Rate, veh/h	416	233	388	388	
Vehicles Circulating, veh/h	329	409	313	312	
Vehicles Exiting, veh/h	242	292	432	330	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	5	5	5	5	
Ped Cap Adj	0.999	0.999	0.999	0.999	
Approach Delay, s/veh	11.7	8.6	10.7	7.2	
Approach LOS	B	A	B	A	
Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LTR	LTR	LT	R
Assumed Moves	LTR	LTR	LTR	LT	R
RT Channelized					Yield
Lane Util	1.000	1.000	1.000	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	416	233	388	259	129
Cap Entry Lane, veh/h	813	751	826	827	887
Entry HV Adj Factor	0.980	0.980	0.980	0.979	0.980
Flow Entry, veh/h	408	228	380	253	126
Cap Entry, veh/h	796	735	809	809	869
V/C Ratio	0.512	0.311	0.470	0.313	0.145
Control Delay, s/veh	11.7	8.6	10.7	8.0	5.6
LOS	B	A	B	A	A
95th %tile Queue, veh	3	1	3	1	1

HCM 2010 Signalized Intersection Summary

5: Shasta View Dr & Tarmac Road

Existing Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩	↩	↩		↩	↩	↩	↩	↩	↩
Traffic Volume (veh/h)	12	6	45	239	5	51	101	440	111	28	398	21
Future Volume (veh/h)	12	6	45	239	5	51	101	440	111	28	398	21
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1710	1863	1863	1676	1863	1900	1676	1863	1863	1676	1863	1900
Adj Flow Rate, veh/h	13	7	49	260	5	55	110	478	121	30	433	23
Adj No. of Lanes	0	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	64	35	87	483	21	229	137	1154	516	46	920	49
Arrive On Green	0.05	0.05	0.05	0.16	0.16	0.16	0.09	0.33	0.33	0.03	0.27	0.27
Sat Flow, veh/h	1173	631	1583	3097	134	1470	1597	3539	1583	1597	3419	181
Grp Volume(v), veh/h	20	0	49	260	0	60	110	478	121	30	224	232
Grp Sat Flow(s),veh/h/ln	1804	0	1583	1549	0	1603	1597	1770	1583	1597	1770	1831
Q Serve(g_s), s	0.4	0.0	1.1	2.8	0.0	1.2	2.5	3.9	2.1	0.7	3.9	3.9
Cycle Q Clear(g_c), s	0.4	0.0	1.1	2.8	0.0	1.2	2.5	3.9	2.1	0.7	3.9	3.9
Prop In Lane	0.65		1.00	1.00		0.92	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	99	0	87	483	0	250	137	1154	516	46	476	493
V/C Ratio(X)	0.20	0.00	0.56	0.54	0.00	0.24	0.80	0.41	0.23	0.65	0.47	0.47
Avail Cap(c_a), veh/h	783	0	687	1429	0	740	520	2401	1074	260	912	944
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	0.0	17.0	14.3	0.0	13.6	16.5	9.7	9.1	17.7	11.3	11.3
Incr Delay (d2), s/veh	1.0	0.0	5.6	0.9	0.0	0.5	10.4	0.2	0.2	14.7	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.6	1.3	0.0	0.6	1.5	1.9	0.9	0.5	2.0	2.0
LnGrp Delay(d),s/veh	17.6	0.0	22.6	15.3	0.0	14.1	27.0	9.9	9.3	32.4	12.0	12.0
LnGrp LOS	B		C	B		B	C	A	A	C	B	B
Approach Vol, veh/h	69			320			709			486		
Approach Delay, s/veh	21.1			15.0			12.5			13.2		
Approach LOS	C			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	5.1	16.0		6.0	7.2	13.9		9.7				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	25.0	25.0		16.0	12.0	19.0		17.0				
Max Q Clear Time (g_c+1/2), s	5.9	5.9		3.1	4.5	5.9		4.8				
Green Ext Time (p_c), s	0.0	4.6		0.1	0.2	4.0		1.1				
Intersection Summary												
HCM 2010 Ctrl Delay	13.6											
HCM 2010 LOS	B											

HCM 2010 TWSC
6: Shasta View Dr & SR 44 WB Ramps

Existing Conditions

PM Peak

Intersection												
Int Delay, s/veh		1.1										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗		↕	↗		↕	↗
Traffic Vol, veh/h	0	0	0	51	2	91	0	618	306	0	347	337
Future Vol, veh/h	0	0	0	51	2	91	0	618	306	0	347	337
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	Free
Storage Length	-	-	-	-	-	150	-	-	0	-	-	200
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	58	2	103	0	702	348	0	394	383
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				904	1096	-	-	0	-	-	-	0
Stage 1				702	702	-	-	-	-	-	-	-
Stage 2				202	394	-	-	-	-	-	-	-
Critical Hdwy				6.84	6.54	-	-	-	-	-	-	-
Critical Hdwy Stg 1				5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy				3.52	4.02	-	-	-	-	-	-	-
Pot Cap-1 Maneuver				277	212	0	0	-	0	0	-	0
Stage 1				453	439	0	0	-	0	0	-	0
Stage 2				812	604	0	0	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				276	0	-	-	-	-	-	-	-
Mov Cap-2 Maneuver				276	0	-	-	-	-	-	-	-
Stage 1				453	0	-	-	-	-	-	-	-
Stage 2				809	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				21.6			0			0		
HCM LOS				C								
Minor Lane/Major Mvmt		NBTWBLn1WBLn2		SBT								
Capacity (veh/h)		- 276		-								
HCM Lane V/C Ratio		- 0.218		-								
HCM Control Delay (s)		- 21.6		0								
HCM Lane LOS		- C		A								
HCM 95th %tile O(veh)		- 0.8		-								

HCM 2010 Signalized Intersection Summary

7: SR 44 EB Ramps & Shasta View Dr

Existing Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	416	1	432	0	0	0	0	508	35	70	328	0
Future Volume (veh/h)	416	1	432	0	0	0	0	508	35	70	328	0
Number	7	4	14				5	2	12	1	6	16
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	1710	1863	1863				0	1863	1863	1676	1863	0
Adj Flow Rate, veh/h	489	1	508				0	598	0	82	386	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.85	0.85	0.85				0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	743	2	664				0	951	426	100	1467	0
Arrive On Green	0.42	0.42	0.42				0.00	0.27	0.00	0.06	0.41	0.00
Sat Flow, veh/h	1771	4	1583				0	3632	1583	1597	3632	0
Grp Volume(v), veh/h	490	0	508				0	598	0	82	386	0
Grp Sat Flow(s),veh/h/ln	1774	0	1583				0	1770	1583	1597	1770	0
Q Serve(g_s), s	10.7	0.0	13.2				0.0	7.2	0.0	2.4	3.5	0.0
Cycle Q Clear(g_c), s	10.7	0.0	13.2				0.0	7.2	0.0	2.4	3.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	744	0	664				0	951	426	100	1467	0
V/C Ratio(X)	0.66	0.00	0.76				0.00	0.63	0.00	0.82	0.26	0.00
Avail Cap(c_a), veh/h	1362	0	1216				0	1542	690	331	2570	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	1.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	11.2	0.0	12.0				0.0	15.5	0.0	22.3	9.3	0.0
Incr Delay (d2), s/veh	1.0	0.0	1.9				0.0	0.7	0.0	14.9	0.1	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	5.4	0.0	6.0				0.0	3.6	0.0	1.5	1.7	0.0
LnGrp Delay(d),s/veh	12.2	0.0	13.8				0.0	16.2	0.0	37.2	9.4	0.0
LnGrp LOS	B		B					B		D	A	
Approach Vol, veh/h		998						598			468	
Approach Delay, s/veh		13.0						16.2			14.2	
Approach LOS		B						B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.0	17.0		24.2		24.0						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	10.0	21.0		37.0		35.0						
Max Q Clear Time (g_c+I1), s	4.4	9.2		15.2		5.5						
Green Ext Time (p_c), s	0.1	3.8		5.0		5.1						
Intersection Summary												
HCM 2010 Ctrl Delay			14.2									
HCM 2010 LOS			B									

Intersection

Intersection Delay, s/veh 11.6

Intersection LOS B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	77	124	53	0	27	73	22	0	47	158	54	0	32	121	60
Future Vol, veh/h	0	77	124	53	0	27	73	22	0	47	158	54	0	32	121	60
Peak Hour Factor	0.88	0.94	0.94	0.94	0.88	0.94	0.94	0.94	0.88	0.94	0.94	0.94	0.88	0.94	0.94	0.94
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	82	132	56	0	29	78	23	0	50	168	57	0	34	129	64
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	12.4	10.3	12.4	10.6
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	18%	30%	22%	21%	0%
Vol Thru, %	61%	49%	60%	79%	0%
Vol Right, %	21%	21%	18%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	259	254	122	153	60
LT Vol	47	77	27	32	0
Through Vol	158	124	73	121	0
RT Vol	54	53	22	0	60
Lane Flow Rate	276	270	130	163	64
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.419	0.412	0.207	0.279	0.095
Departure Headway (Hd)	5.472	5.486	5.745	6.174	5.357
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	656	654	622	581	667
Service Time	3.518	3.532	3.803	3.924	3.107
HCM Lane V/C Ratio	0.421	0.413	0.209	0.281	0.096
HCM Control Delay	12.4	12.4	10.3	11.3	8.7
HCM Lane LOS	B	B	B	B	A
HCM 95th-tile Q	2.1	2	0.8	1.1	0.3

HCM 2010 Signalized Intersection Summary

9: Old Oregon Trail & Old Forty-Four Drive

Existing Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	13	69	188	1	37	21	282	162	30	313	2
Future Volume (veh/h)	11	13	69	188	1	37	21	282	162	30	313	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1676	1863	1900	1676	1863	1900	1676	1863	1900	1676	1863	1900
Adj Flow Rate, veh/h	13	15	79	216	1	43	24	324	186	34	360	2
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	21	23	124	270	9	383	37	413	237	49	702	4
Arrive On Green	0.01	0.09	0.09	0.17	0.25	0.25	0.02	0.37	0.37	0.03	0.38	0.38
Sat Flow, veh/h	1597	259	1363	1597	36	1553	1597	1112	638	1597	1851	10
Grp Volume(v), veh/h	13	0	94	216	0	44	24	0	510	34	0	362
Grp Sat Flow(s),veh/h/ln	1597	0	1622	1597	0	1589	1597	0	1750	1597	0	1861
Q Serve(g_s), s	0.4	0.0	2.6	6.2	0.0	1.0	0.7	0.0	12.2	1.0	0.0	7.1
Cycle Q Clear(g_c), s	0.4	0.0	2.6	6.2	0.0	1.0	0.7	0.0	12.2	1.0	0.0	7.1
Prop In Lane	1.00		0.84	1.00		0.98	1.00		0.36	1.00		0.01
Lane Grp Cap(c), veh/h	21	0	147	270	0	392	37	0	650	49	0	706
V/C Ratio(X)	0.61	0.00	0.64	0.80	0.00	0.11	0.66	0.00	0.78	0.70	0.00	0.51
Avail Cap(c_a), veh/h	135	0	548	472	0	873	135	0	1109	135	0	1180
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.2	0.0	20.8	18.9	0.0	13.8	22.9	0.0	13.2	22.7	0.0	11.3
Incr Delay (d2), s/veh	25.4	0.0	4.6	5.4	0.0	0.1	18.3	0.0	2.1	16.5	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.4	3.1	0.0	0.5	0.5	0.0	6.2	0.7	0.0	3.7
LnGrp Delay(d),s/veh	48.6	0.0	25.3	24.3	0.0	13.9	41.2	0.0	15.3	39.3	0.0	11.9
LnGrp LOS	D		C	C		B	D		B	D		B
Approach Vol, veh/h	107			260			534			396		
Approach Delay, s/veh	28.2			22.5			16.5			14.3		
Approach LOS	C			C			B			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.4	21.6	12.0	8.3	5.1	21.9	4.6	15.7				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	30.0	14.0	16.0	4.0	30.0	4.0	26.0				
Max Q Clear Time (g_c+1.0), s	13.0	14.2	8.2	4.6	2.7	9.1	2.4	3.0				
Green Ext Time (p_c), s	0.0	3.4	0.4	0.3	0.0	3.6	0.0	0.5				
Intersection Summary												
HCM 2010 Ctrl Delay	18.0											
HCM 2010 LOS	B											

HCM 2010 TWSC
10: Airport Road/Old Oregon Trail & SR 44 WB Ramps

Existing Conditions

PM Peak

Intersection												
Int Delay, s/veh		8.5										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↕	↙	↗	↗			
Traffic Vol, veh/h	0	0	0	93	0	37	260	428	0	0	312	258
Future Vol, veh/h	0	0	0	93	0	37	260	428	0	0	312	258
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	106	0	42	295	486	0	0	355	293
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1583	1730	491	653	0	-	-	-	0
Stage 1				1077	1077	-	-	-	-	-	-	-
Stage 2				506	653	-	-	-	-	-	-	-
Critical Hdwy				6.45	6.55	6.25	4.15	-	-	-	-	-
Critical Hdwy Stg 1				5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy				3.545	4.045	3.345	2.245	-	-	-	-	-
Pot Cap-1 Maneuver				118	87	571	920	-	0	0	-	-
Stage 1				323	292	-	-	-	0	0	-	-
Stage 2				599	459	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				~ 80	0	569	916	-	-	-	-	-
Mov Cap-2 Maneuver				151	0	-	-	-	-	-	-	-
Stage 1				219	0	-	-	-	-	-	-	-
Stage 2				597	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				68.6			4.1			0		
HCM LOS				F								
Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR								
Capacity (veh/h)	916	- 191	-	-								
HCM Lane V/C Ratio	0.323	- 0.773	-	-								
HCM Control Delay (s)	10.8	- 68.6	-	-								
HCM Lane LOS	B	- F	-	-								
HCM 95th %tile Q(veh)	1.4	- 5.2	-	-								
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 2010 Signalized Intersection Summary

11: Airport Road & SR 44 EB Ramps

Existing Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	0	247	0	0	0	0	476	117	38	367	0
Future Volume (veh/h)	212	0	247	0	0	0	0	476	117	38	367	0
Number	7	4	14				5	2	12	1	6	16
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	1710	1827	1827				0	1827	1827	1644	1827	0
Adj Flow Rate, veh/h	236	0	274				0	529	130	42	408	0
Adj No. of Lanes	0	1	1				0	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90				0.90	0.90	0.90	0.90	0.90	1.00
Percent Heavy Veh, %	4	4	4				0	4	4	4	4	0
Cap, veh/h	443	0	396				0	747	635	58	997	0
Arrive On Green	0.25	0.00	0.25				0.00	0.41	0.41	0.04	0.55	0.00
Sat Flow, veh/h	1740	0	1553				0	1827	1553	1566	1827	0
Grp Volume(v), veh/h	236	0	274				0	529	130	42	408	0
Grp Sat Flow(s),veh/h/ln	1740	0	1553				0	1827	1553	1566	1827	0
Q Serve(g_s), s	4.7	0.0	6.4				0.0	9.7	2.2	1.1	5.2	0.0
Cycle Q Clear(g_c), s	4.7	0.0	6.4				0.0	9.7	2.2	1.1	5.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	443	0	396				0	747	635	58	997	0
V/C Ratio(X)	0.53	0.00	0.69				0.00	0.71	0.20	0.72	0.41	0.00
Avail Cap(c_a), veh/h	910	0	812				0	1866	1586	234	2321	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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.9	0.0	13.5				0.0	9.9	7.7	19.1	5.3	0.0
Incr Delay (d2), s/veh	1.0	0.0	2.2				0.0	1.3	0.2	15.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	3.0				0.0	5.1	0.9	0.7	2.7	0.0
LnGrp Delay(d),s/veh	13.9	0.0	15.7				0.0	11.1	7.8	34.4	5.6	0.0
LnGrp LOS	B		B					B	A	C	A	
Approach Vol, veh/h		510						659			450	
Approach Delay, s/veh		14.9						10.5			8.3	
Approach LOS		B						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.5	20.4		14.2		25.9						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	6.0	41.0		21.0		51.0						
Max Q Clear Time (g_c+I1), s	3.1	11.7		8.4		7.2						
Green Ext Time (p_c), s	0.0	4.7		1.9		4.9						
Intersection Summary												
HCM 2010 Ctrl Delay			11.2									
HCM 2010 LOS			B									

Intersection						
Int Delay, s/veh	2.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	1	89	108	6	40
Future Vol, veh/h	60	1	89	108	6	40
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	155	185	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	67	1	99	120	7	44
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	167	109	0	0	104	0
Stage 1	104	-	-	-	-	-
Stage 2	63	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	823	945	-	-	1488	-
Stage 1	920	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	812	937	-	-	1482	-
Mov Cap-2 Maneuver	812	-	-	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.8	0		1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 812 937 1482	-	-		
HCM Lane V/C Ratio	-	- 0.082 0.001 0.004	-	-		
HCM Control Delay (s)	-	- 9.8 8.8 7.4	-	-		
HCM Lane LOS	-	- A A A	-	-		
HCM 95th %tile Q(veh)	-	- 0.3 0 0	-	-		

HCM 2010 TWSC
13: Deschutes Road & Boyle Road

Existing Conditions
PM Peak

Intersection												
Int Delay, s/veh		3.1										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	6	34	26	6	5	51	149	29	3	108	9
Future Vol, veh/h	8	6	34	26	6	5	51	149	29	3	108	9
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	50	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	6	36	27	6	5	54	157	31	3	114	9
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	405	399	128	420	403	167	128	0	0	162	0	0
Stage 1	130	130	-	269	269	-	-	-	-	-	-	-
Stage 2	275	269	-	151	134	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	556	539	922	544	536	877	1458	-	-	1417	-	-
Stage 1	874	789	-	737	687	-	-	-	-	-	-	-
Stage 2	731	687	-	851	785	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	527	514	914	498	511	870	1452	-	-	1411	-	-
Mov Cap-2 Maneuver	527	514	-	498	511	-	-	-	-	-	-	-
Stage 1	838	784	-	707	659	-	-	-	-	-	-	-
Stage 2	690	659	-	806	780	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	10.2			12.3			1.7			0.2		
HCM LOS	B			B								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1452	-	-	749	531	1411	-	-				
HCM Lane V/C Ratio	0.037	-	-	0.067	0.073	0.002	-	-				
HCM Control Delay (s)	7.6	-	-	10.2	12.3	7.6	-	-				
HCM Lane LOS	A	-	-	B	B	A	-	-				
HCM 95th %tile O(veh)	0.1	-	-	0.2	0.2	0	-	-				

HCM 2010 AWSC
14: Deschutes Road & Old Forty-Four Drive

Existing Conditions

PM Peak

Intersection												
Intersection Delay, s/veh	17.5											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	26	24	64	0	49	18	55	0	56	357	53
Future Vol, veh/h	0	26	24	64	0	49	18	55	0	56	357	53
Peak Hour Factor	0.88	0.87	0.87	0.87	0.88	0.87	0.87	0.87	0.88	0.87	0.87	0.87
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	30	28	74	0	56	21	63	0	64	410	61
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	2				2				2			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	2				2				2			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	2				2				2			
HCM Control Delay	11.2				11.2				24.4			
HCM LOS	B				B				C			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2				
Vol Left, %	100%	0%	100%	0%	100%	0%	23%	0%				
Vol Thru, %	0%	87%	0%	27%	0%	25%	77%	93%				
Vol Right, %	0%	13%	0%	73%	0%	75%	0%	7%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	56	410	26	88	49	73	186	153				
LT Vol	56	0	26	0	49	0	43	0				
Through Vol	0	357	0	24	0	18	143	143				
RT Vol	0	53	0	64	0	55	0	10				
Lane Flow Rate	64	471	30	101	56	84	213	175				
Geometry Grp	7	7	7	7	7	7	7	7				
Degree of Util (X)	0.117	0.776	0.065	0.19	0.122	0.157	0.375	0.3				
Departure Headway (Hd)	6.529	5.931	7.808	6.775	7.78	6.729	6.331	6.167				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	548	608	456	526	458	529	565	580				
Service Time	4.286	3.688	5.596	4.561	5.566	4.514	4.098	3.933				
HCM Lane V/C Ratio	0.117	0.775	0.066	0.192	0.122	0.159	0.377	0.302				
HCM Control Delay	10.2	26.3	11.1	11.2	11.7	10.8	12.9	11.6				
HCM Lane LOS	B	D	B	B	B	B	B	B				
HCM 95th-tile Q	0.4	7.3	0.2	0.7	0.4	0.6	1.7	1.3				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	43	285	10
Future Vol, veh/h	0	43	285	10
Peak Hour Factor	0.88	0.87	0.87	0.87
Heavy Vehicles, %	5	2	2	2
Mvmt Flow	0	49	328	11
Number of Lanes	0	0	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	12.3
HCM LOS	B

HCM 2010 AWSC
15: Deschutes Road & Cedro Road

Existing Conditions
PM Peak

Intersection

Intersection Delay, s/veh20.3

Intersection LOS C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	48	32	88	0	71	7	12	0	133	384	73	0	17	348	25
Future Vol, veh/h	0	48	32	88	0	71	7	12	0	133	384	73	0	17	348	25
Peak Hour Factor	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	52	35	96	0	77	8	13	0	145	417	79	0	18	378	27
Number of Lanes	0	0	1	1	0	0	1	0	0	1	1	1	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	2
HCM Control Delay	12.8	14.2	26.1	16.1
HCM LOS	B	B	D	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	60%	0%	79%	100%	0%	0%
Vol Thru, %	0%	100%	0%	40%	0%	8%	0%	100%	82%
Vol Right, %	0%	0%	100%	0%	100%	13%	0%	0%	18%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	133	384	73	80	88	90	17	232	141
LT Vol	133	0	0	48	0	71	17	0	0
Through Vol	0	384	0	32	0	7	0	232	116
RT Vol	0	0	73	0	88	12	0	0	25
Lane Flow Rate	145	417	79	87	96	98	18	252	153
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.302	0.812	0.139	0.206	0.2	0.237	0.041	0.522	0.312
Departure Headway (Hd)	7.512	7.002	6.288	8.529	7.514	8.728	7.958	7.447	7.32
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	479	518	569	420	476	411	450	484	490
Service Time	5.262	4.752	4.038	6.293	5.278	6.497	5.713	5.202	5.075
HCM Lane V/C Ratio	0.303	0.805	0.139	0.207	0.202	0.238	0.04	0.521	0.312
HCM Control Delay	13.5	33.5	10.1	13.5	12.2	14.2	11.1	18.1	13.4
HCM Lane LOS	B	D	B	B	B	B	B	C	B
HCM 95th-tile Q	1.3	7.8	0.5	0.8	0.7	0.9	0.1	3	1.3

HCM 2010 TWSC
16: Deschutes Road & SR 44 WB Ramps

Existing Conditions

PM Peak

Intersection												
Int Delay, s/veh		1.4										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	13	0	28	91	562	0	0	253	254
Future Vol, veh/h	0	0	0	13	0	28	91	562	0	0	253	254
Conflicting Peds, #/hr	0	0	0	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	175	-	-	200	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	14	0	31	101	624	0	0	281	282
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1113	1113	317	286	0	-	-	-	0
Stage 1				827	827	-	-	-	-	-	-	-
Stage 2				286	286	-	-	-	-	-	-	-
Critical Hdwy				6.63	6.53	6.93	4.13	-	-	-	-	-
Critical Hdwy Stg 1				5.83	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.43	5.53	-	-	-	-	-	-	-
Follow-up Hdwy				3.519	4.019	3.319	2.219	-	-	-	-	-
Pot Cap-1 Maneuver				216	208	680	1275	-	0	0	-	0
Stage 1				391	385	-	-	-	0	0	-	0
Stage 2				762	674	-	-	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				198	0	677	1270	-	-	-	-	-
Mov Cap-2 Maneuver				198	0	-	-	-	-	-	-	-
Stage 1				360	0	-	-	-	-	-	-	-
Stage 2				759	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				15			1.1			0		
HCM LOS				C								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT							
Capacity (veh/h)	1270	-	198	677	-							
HCM Lane V/C Ratio	0.08	-	0.073	0.046	-							
HCM Control Delay (s)	8.1	-	24.6	10.6	-							
HCM Lane LOS	A	-	C	B	-							
HCM 95th %tile O(veh)	0.3	-	0.2	0.1	-							

HCM 2010 AWSC
17: Deschutes Road & SR 44 EB Ramps

Existing Conditions

PM Peak

Intersection												
Intersection Delay, s/veh	13.8											
Intersection LOS	B											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	362	0	173	0	0	0	0	0	0	291	35
Future Vol, veh/h	0	362	0	173	0	0	0	0	0	0	291	35
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	411	0	197	0	0	0	0	0	0	331	40
Number of Lanes	0	1	1	1	0	0	0	0	0	0	2	1
Approach	EB										NB	
Opposing Approach											SB	
Opposing Lanes	0										2	
Conflicting Approach Left	SB										EB	
Conflicting Lanes Left	2										3	
Conflicting Approach Right	NB											
Conflicting Lanes Right	3										0	
HCM Control Delay	13.4										13	
HCM LOS	B										B	
Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	SBLn1	SBLn2				
Vol Left, %	0%	0%	0%	100%	100%	0%	100%	0%				
Vol Thru, %	100%	100%	0%	0%	0%	0%	0%	100%				
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	146	146	35	181	181	173	63	203				
LT Vol	0	0	0	181	181	0	63	0				
Through Vol	146	146	0	0	0	0	0	203				
RT Vol	0	0	35	0	0	173	0	0				
Lane Flow Rate	165	165	40	206	206	197	72	231				
Geometry Grp	8	8	8	7	7	7	8	8				
Degree of Util (X)	0.332	0.332	0.052	0.401	0.401	0.317	0.156	0.469				
Departure Headway (Hd)	7.227	7.227	4.749	7.012	7.012	5.802	7.823	7.314				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	494	494	745	512	512	617	456	489				
Service Time	5.015	5.015	2.536	4.778	4.778	3.568	5.615	5.105				
HCM Lane V/C Ratio	0.334	0.334	0.054	0.402	0.402	0.319	0.158	0.472				
HCM Control Delay	13.6	13.6	7.8	14.4	14.4	11.3	12.1	16.5				
HCM Lane LOS	B	B	A	B	B	B	B	C				
HCM 95th-tile Q	1.4	1.4	0.2	1.9	1.9	1.4	0.5	2.5				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	63	203	0
Future Vol, veh/h	0	63	203	0
Peak Hour Factor	0.88	0.88	0.88	0.88
Heavy Vehicles, %	5	2	2	2
Mvmt Flow	0	72	231	0
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	15.5
HCM LOS	C

HCM 2010 Signalized Intersection Summary

1: Deschutes Road & State Route 299

Existing Plus Project Conditions

AM Peak

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (veh/h)	116	160	111	264	160	53		
Future Volume (veh/h)	116	160	111	264	160	53		
Number	2	12	1	6	7	14		
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	1810	1810	1629	1810	1629	1810		
Adj Flow Rate, veh/h	135	186	129	307	186	62		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86		
Percent Heavy Veh, %	5	5	5	5	5	5		
Cap, veh/h	313	266	481	981	527	522		
Arrive On Green	0.17	0.17	0.31	0.54	0.34	0.34		
Sat Flow, veh/h	1810	1538	1551	1810	1551	1538		
Grp Volume(v), veh/h	135	186	129	307	186	62		
Grp Sat Flow(s),veh/h/ln	1810	1538	1551	1810	1551	1538		
Q Serve(g_s), s	4.5	7.7	4.2	6.3	6.1	1.9		
Cycle Q Clear(g_c), s	4.5	7.7	4.2	6.3	6.1	1.9		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	313	266	481	981	527	522		
V/C Ratio(X)	0.43	0.70	0.27	0.31	0.35	0.12		
Avail Cap(c_a), veh/h	641	545	481	1310	527	522		
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	25.0	26.3	17.6	8.5	16.8	15.4		
Incr Delay (d2), s/veh	0.9	3.3	1.4	0.2	1.9	0.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.3	3.5	2.0	3.2	2.9	0.9		
LnGrp Delay(d),s/veh	26.0	29.7	18.9	8.7	18.6	15.8		
LnGrp LOS	C	C	B	A	B	B		
Approach Vol, veh/h	321			436	248			
Approach Delay, s/veh	28.1			11.7	17.9			
Approach LOS	C			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	25.0	15.7		27.0		40.7		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	21.0	24.0		23.0		49.0		
Max Q Clear Time (g_c+I1), s	6.2	9.7		8.1		8.3		
Green Ext Time (p_c), s	0.3	2.0		0.8		2.3		
Intersection Summary								
HCM 2010 Ctrl Delay			18.5					
HCM 2010 LOS			B					

HCM 2010 TWSC
2: Deschutes Road & Old Alturas Rd

Existing Plus Project Conditions

AM Peak

Intersection												
Int Delay, s/veh		5.9										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Traffic Vol, veh/h	32	12	20	31	12	83	2	114	39	97	160	17
Future Vol, veh/h	32	12	20	31	12	83	2	114	39	97	160	17
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	275
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	39	14	24	37	14	100	2	137	47	117	193	20
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	660	626	203	622	603	171	198	0	0	189	0	0
Stage 1	432	432	-	171	171	-	-	-	-	-	-	-
Stage 2	228	194	-	451	432	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	375	399	835	398	412	870	1369	-	-	1379	-	0
Stage 1	600	581	-	829	755	-	-	-	-	-	-	0
Stage 2	772	738	-	586	581	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	295	357	828	344	369	863	1363	-	-	1373	-	-
Mov Cap-2 Maneuver	295	357	-	344	369	-	-	-	-	-	-	-
Stage 1	596	524	-	824	750	-	-	-	-	-	-	-
Stage 2	665	733	-	499	524	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	16.7			13.5			0.1			3		
HCM LOS	C			B								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT						
Capacity (veh/h)	1363	-	-	385	576	1373						
HCM Lane V/C Ratio	0.002	-	-	0.2	0.264	0.085						
HCM Control Delay (s)	7.6	0	-	16.7	13.5	7.9						
HCM Lane LOS	A	A	-	C	B	A						
HCM 95th %tile Q(veh)	0	-	-	0.7	1.1	0.3						

Intersection

Intersection Delay, s/veh

7

Intersection LOS

A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	24	0	1	0	0	3	3	0	3	17	0
Future Vol, veh/h	0	24	0	1	0	0	3	3	0	3	17	0
Peak Hour Factor	0.88	0.89	0.89	0.88	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	27	0	1	0	0	3	3	0	3	19	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.4	6.8	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	96%	0%	3%
Vol Thru, %	85%	0%	50%	19%
Vol Right, %	0%	4%	50%	77%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	25	6	31
LT Vol	3	24	0	1
Through Vol	17	0	3	6
RT Vol	0	1	3	24
Lane Flow Rate	23	28	7	35
Geometry Grp	1	1	1	1
Degree of Util (X)	0.026	0.033	0.007	0.034
Departure Headway (Hd)	4.051	4.207	3.755	3.553
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	885	852	953	1007
Service Time	2.071	2.225	1.779	1.576
HCM Lane V/C Ratio	0.026	0.033	0.007	0.035
HCM Control Delay	7.2	7.4	6.8	6.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0	0.1

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	1	6	24
Future Vol, veh/h	0	1	6	24
Peak Hour Factor	0.88	0.89	0.88	0.89
Heavy Vehicles, %	5	2	2	2
Mvmt Flow	0	1	7	27
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	6.7
HCM LOS	A

Intersection					
Intersection Delay, s/veh10.7					
Intersection LOS B					
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	278	354	380	395	
Demand Flow Rate, veh/h	292	371	400	414	
Vehicles Circulating, veh/h	436	422	280	358	
Vehicles Exiting, veh/h	246	258	448	435	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	5	5	5	5	
Ped Cap Adj	0.999	0.999	0.999	0.999	
Approach Delay, s/veh	10.6	12.6	10.6	9.1	
Approach LOS	B	B	B	A	
Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LTR	LTR	LT	R
Assumed Moves	LTR	LTR	LTR	LT	R
RT Channelized					Yield
Lane Util	1.000	1.000	1.000	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	292	371	400	324	90
Cap Entry Lane, veh/h	731	741	854	790	884
Entry HV Adj Factor	0.951	0.954	0.951	0.954	0.952
Flow Entry, veh/h	278	354	380	309	86
Cap Entry, veh/h	695	707	812	753	841
V/C Ratio	0.400	0.501	0.469	0.410	0.102
Control Delay, s/veh	10.6	12.6	10.6	10.1	5.3
LOS	B	B	B	B	A
95th %tile Queue, veh	2	3	3	2	0

HCM 2010 Signalized Intersection Summary

5: Shasta View Dr & Tarmac Road

Existing Plus Project Conditions

AM Peak

	           											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	11	102	187	3	39	37	479	127	56	660	10
Future Volume (veh/h)	17	11	102	187	3	39	37	479	127	56	660	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1710	1827	1827	1644	1827	1900	1644	1827	1827	1644	1827	1900
Adj Flow Rate, veh/h	21	14	128	234	4	49	46	599	159	70	825	12
Adj No. of Lanes	0	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	123	82	179	399	16	191	60	1254	561	83	1316	19
Arrive On Green	0.12	0.12	0.12	0.13	0.13	0.13	0.04	0.36	0.36	0.05	0.38	0.38
Sat Flow, veh/h	1064	709	1553	3038	119	1452	1566	3471	1553	1566	3503	51
Grp Volume(v), veh/h	35	0	128	234	0	53	46	599	159	70	409	428
Grp Sat Flow(s),veh/h/ln	1774	0	1553	1519	0	1571	1566	1736	1553	1566	1736	1818
Q Serve(g_s), s	0.8	0.0	3.7	3.4	0.0	1.4	1.4	6.3	3.4	2.1	9.1	9.1
Cycle Q Clear(g_c), s	0.8	0.0	3.7	3.4	0.0	1.4	1.4	6.3	3.4	2.1	9.1	9.1
Prop In Lane	0.60		1.00	1.00		0.92	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	204	0	179	399	0	206	60	1254	561	83	652	683
V/C Ratio(X)	0.17	0.00	0.72	0.59	0.00	0.26	0.77	0.48	0.28	0.85	0.63	0.63
Avail Cap(c_a), veh/h	602	0	527	1031	0	533	199	1693	757	299	957	1002
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.8	0.0	20.1	19.3	0.0	18.4	22.5	11.6	10.7	22.1	12.0	12.0
Incr Delay (d2), s/veh	0.4	0.0	5.2	1.4	0.0	0.7	18.0	0.3	0.3	20.0	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	1.9	1.5	0.0	0.7	0.9	3.0	1.5	1.4	4.5	4.7
LnGrp Delay(d),s/veh	19.2	0.0	25.4	20.7	0.0	19.1	40.5	11.9	11.0	42.1	13.0	13.0
LnGrp LOS	B		C	C		B	D	B	B	D	B	B
Approach Vol, veh/h	163					287		804		907		
Approach Delay, s/veh	24.0					20.4		13.4		15.2		
Approach LOS	C					C		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	6.5	21.0	9.4		5.8	21.7	10.2					
Change Period (Y+Rc), s	4.0	4.0	4.0		4.0	4.0	4.0					
Max Green Setting (Gmax), s	23.0	23.0	16.0		6.0	26.0	16.0					
Max Q Clear Time (g_c+14), s	8.3	8.3	5.7		3.4	11.1	5.4					
Green Ext Time (p_c), s	0.1	6.6	0.4		0.0	6.7	0.9					
Intersection Summary												
HCM 2010 Ctrl Delay	15.9											
HCM 2010 LOS	B											

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	0	0	0	45	1	89	0	601	416	0	354	595
Future Vol, veh/h	0	0	0	45	1	89	0	601	416	0	354	595
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	Free
Storage Length	-	-	-	-	-	150	-	-	0	-	-	200
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	54	1	107	0	724	501	0	427	717
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				942	1151	-	-	0	-	-	-	0
Stage 1				724	724	-	-	-	-	-	-	-
Stage 2				218	427	-	-	-	-	-	-	-
Critical Hdwy				6.84	6.54	-	-	-	-	-	-	-
Critical Hdwy Stg 1				5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy				3.52	4.02	-	-	-	-	-	-	-
Pot Cap-1 Maneuver				261	197	0	0	-	0	0	-	0
Stage 1				441	429	0	0	-	0	0	-	0
Stage 2				797	584	0	0	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				260	0	-	-	-	-	-	-	-
Mov Cap-2 Maneuver				260	0	-	-	-	-	-	-	-
Stage 1				441	0	-	-	-	-	-	-	-
Stage 2				794	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				22.6			0			0		
HCM LOS				C								
Minor Lane/Major Mvmt				NBTWBLn1WBLn2			SBT					
Capacity (veh/h)				- 260			-			-		
HCM Lane V/C Ratio				- 0.213			-			-		
HCM Control Delay (s)				- 22.6			0			-		
HCM Lane LOS				- C			A			-		
HCM 95th %tile Q(veh)				- 0.8			-			-		

HCM 2010 Signalized Intersection Summary

7: SR 44 EB Ramps & Shasta View Dr

Existing Plus Project Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	333	0	212	0	0	0	0	684	91	134	265	0
Future Volume (veh/h)	333	0	212	0	0	0	0	684	91	134	265	0
Number	7	4	14				5	2	12	1	6	16
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	1710	1845	1845				0	1845	1845	1660	1845	0
Adj Flow Rate, veh/h	422	0	268				0	866	0	170	335	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.79	0.79	0.79				0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	535	0	475				0	1202	538	213	1929	0
Arrive On Green	0.30	0.00	0.30				0.00	0.34	0.00	0.13	0.55	0.00
Sat Flow, veh/h	1757	0	1560				0	3597	1568	1581	3597	0
Grp Volume(v), veh/h	422	0	268				0	866	0	170	335	0
Grp Sat Flow(s),veh/h/ln	1757	0	1560				0	1752	1568	1581	1752	0
Q Serve(g_s), s	12.1	0.0	7.9				0.0	11.9	0.0	5.7	2.6	0.0
Cycle Q Clear(g_c), s	12.1	0.0	7.9				0.0	11.9	0.0	5.7	2.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	535	0	475				0	1202	538	213	1929	0
V/C Ratio(X)	0.79	0.00	0.56				0.00	0.72	0.00	0.80	0.17	0.00
Avail Cap(c_a), veh/h	861	0	765				0	1718	769	402	2863	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.5	0.0	16.1				0.0	15.8	0.0	23.1	6.2	0.0
Incr Delay (d2), s/veh	2.7	0.0	1.1				0.0	0.9	0.0	6.6	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	6.3	0.0	3.6				0.0	5.8	0.0	2.9	1.3	0.0
LnGrp Delay(d),s/veh	20.2	0.0	17.2				0.0	16.6	0.0	29.7	6.2	0.0
LnGrp LOS	C		B					B		C	A	
Approach Vol, veh/h		690						866			505	
Approach Delay, s/veh		19.0						16.6			14.1	
Approach LOS		B						B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.4	22.9		20.8		34.3						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	14.0	27.0		27.0		45.0						
Max Q Clear Time (g_c+l1), s	7.7	13.9		14.1		4.6						
Green Ext Time (p_c), s	0.3	5.0		2.6		7.0						
Intersection Summary												
HCM 2010 Ctrl Delay			16.8									
HCM 2010 LOS			B									

Intersection

Intersection Delay, s/veh 18.8

Intersection LOS C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	51	98	108	0	71	168	47	0	81	151	39	0	26	113	37
Future Vol, veh/h	0	51	98	108	0	71	168	47	0	81	151	39	0	26	113	37
Peak Hour Factor	0.88	0.81	0.81	0.81	0.88	0.81	0.81	0.81	0.88	0.81	0.81	0.81	0.88	0.81	0.81	0.81
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	63	121	133	0	88	207	58	0	100	186	48	0	32	140	46
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	18	20.8	20.8	13.8
HCM LOS	C	C	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	30%	20%	25%	19%	0%
Vol Thru, %	56%	38%	59%	81%	0%
Vol Right, %	14%	42%	16%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	271	257	286	139	37
LT Vol	81	51	71	26	0
Through Vol	151	98	168	113	0
RT Vol	39	108	47	0	37
Lane Flow Rate	335	317	353	172	46
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.63	0.572	0.642	0.363	0.086
Departure Headway (Hd)	6.783	6.489	6.549	7.614	6.798
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	529	552	547	470	523
Service Time	4.868	4.575	4.634	5.409	4.593
HCM Lane V/C Ratio	0.633	0.574	0.645	0.366	0.088
HCM Control Delay	20.8	18	20.8	14.7	10.2
HCM Lane LOS	C	C	C	B	B
HCM 95th-tile Q	4.3	3.6	4.5	1.6	0.3

HCM 2010 Signalized Intersection Summary

9: Old Oregon Trail & Old Forty-Four Drive

Existing Plus Project Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	4	34	189	6	31	105	289	152	48	257	20
Future Volume (veh/h)	6	4	34	189	6	31	105	289	152	48	257	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1598	1776	1900	1598	1776	1900	1598	1776	1900	1598	1776	1900
Adj Flow Rate, veh/h	7	5	41	228	7	37	127	348	183	58	310	24
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	11	10	81	280	58	307	157	426	224	68	537	42
Arrive On Green	0.01	0.06	0.06	0.18	0.24	0.24	0.10	0.39	0.39	0.04	0.33	0.33
Sat Flow, veh/h	1522	167	1368	1522	246	1300	1522	1097	577	1522	1627	126
Grp Volume(v), veh/h	7	0	46	228	0	44	127	0	531	58	0	334
Grp Sat Flow(s),veh/h/ln	1522	0	1534	1522	0	1546	1522	0	1674	1522	0	1753
Q Serve(g_s), s	0.2	0.0	1.4	7.1	0.0	1.1	4.0	0.0	14.0	1.9	0.0	7.8
Cycle Q Clear(g_c), s	0.2	0.0	1.4	7.1	0.0	1.1	4.0	0.0	14.0	1.9	0.0	7.8
Prop In Lane	1.00		0.89	1.00		0.84	1.00		0.34	1.00		0.07
Lane Grp Cap(c), veh/h	11	0	91	280	0	365	157	0	650	68	0	578
V/C Ratio(X)	0.62	0.00	0.50	0.82	0.00	0.12	0.81	0.00	0.82	0.86	0.00	0.58
Avail Cap(c_a), veh/h	123	0	497	462	0	845	308	0	983	123	0	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.4	0.0	22.5	19.3	0.0	14.8	21.7	0.0	13.5	23.4	0.0	13.7
Incr Delay (d2), s/veh	44.6	0.0	4.2	5.7	0.0	0.1	9.6	0.0	3.3	24.9	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.7	3.4	0.0	0.5	2.1	0.0	6.9	1.2	0.0	3.9
LnGrp Delay(d),s/veh	69.1	0.0	26.7	25.1	0.0	15.0	31.3	0.0	16.9	48.3	0.0	14.6
LnGrp LOS	E		C	C		B	C		B	D		B
Approach Vol, veh/h	53				272				658		392	
Approach Delay, s/veh	32.3				23.5				19.6		19.6	
Approach LOS	C				C				B		B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.2	23.2	13.1	6.9	9.1	20.3	4.4	15.7				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	29.0	15.0	16.0	10.0	23.0	4.0	27.0				
Max Q Clear Time (g_c+1.0), s	13.5	16.0	9.1	3.4	6.0	9.8	2.2	3.1				
Green Ext Time (p_c), s	0.0	3.1	0.4	0.2	0.1	3.2	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			20.9									
HCM 2010 LOS			C									

HCM 2010 TWSC
10: Airport Road/Old Oregon Trail & SR 44 WB Ramps

Existing Plus Project Conditions

AM Peak

Intersection												
Int Delay, s/veh		4.1										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↕	↕	↑	↗			
Traffic Vol, veh/h	0	0	0	85	1	44	134	502	0	0	271	209
Future Vol, veh/h	0	0	0	85	1	44	134	502	0	0	271	209
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	0	99	1	51	156	584	0	0	315	243
Major/Minor				Minor1		Major1			Major2			
Conflicting Flow All				1337	1458	589	563	0	-	-	-	0
Stage 1				895	895	-	-	-	-	-	-	-
Stage 2				442	563	-	-	-	-	-	-	-
Critical Hdwy				6.44	6.54	6.24	4.14	-	-	-	-	-
Critical Hdwy Stg 1				5.44	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.44	5.54	-	-	-	-	-	-	-
Follow-up Hdwy				3.536	4.036	3.336	2.236	-	-	-	-	-
Pot Cap-1 Maneuver				167	128	504	999	-	0	0	-	-
Stage 1				396	356	-	-	-	0	0	-	-
Stage 2				644	506	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				140	0	502	995	-	-	-	-	-
Mov Cap-2 Maneuver				241	0	-	-	-	-	-	-	-
Stage 1				334	0	-	-	-	-	-	-	-
Stage 2				641	0	-	-	-	-	-	-	-
Approach				WB		NB			SB			
HCM Control Delay, s				29.7		2			0			
HCM LOS				D								
Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR								
Capacity (veh/h)	995	-	293	-	-							
HCM Lane V/C Ratio	0.157	-	0.516	-	-							
HCM Control Delay (s)	9.3	-	29.7	-	-							
HCM Lane LOS	A	-	D	-	-							
HCM 95th %tile O(veh)	0.6	-	2.8	-	-							

HCM 2010 Signalized Intersection Summary

11: Airport Road & SR 44 EB Ramps

Existing Plus Project Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	0	240	0	0	0	0	418	130	39	317	0
Future Volume (veh/h)	218	0	240	0	0	0	0	418	130	39	317	0
Number	7	4	14				5	2	12	1	6	16
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	1710	1810	1810				0	1810	1810	1629	1810	0
Adj Flow Rate, veh/h	256	0	282				0	492	153	46	373	0
Adj No. of Lanes	0	1	1				0	1	1	1	1	0
Peak Hour Factor	0.85	0.85	0.85				0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	5	5	5				0	5	5	5	5	0
Cap, veh/h	459	0	409				0	706	600	62	962	0
Arrive On Green	0.27	0.00	0.27				0.00	0.39	0.39	0.04	0.53	0.00
Sat Flow, veh/h	1723	0	1538				0	1810	1538	1551	1810	0
Grp Volume(v), veh/h	256	0	282				0	492	153	46	373	0
Grp Sat Flow(s),veh/h/ln	1723	0	1538				0	1810	1538	1551	1810	0
Q Serve(g_s), s	5.1	0.0	6.5				0.0	9.0	2.7	1.2	4.8	0.0
Cycle Q Clear(g_c), s	5.1	0.0	6.5				0.0	9.0	2.7	1.2	4.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	459	0	409				0	706	600	62	962	0
V/C Ratio(X)	0.56	0.00	0.69				0.00	0.70	0.25	0.74	0.39	0.00
Avail Cap(c_a), veh/h	959	0	856				0	1785	1517	275	2288	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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.5	0.0	13.0				0.0	10.1	8.2	18.8	5.5	0.0
Incr Delay (d2), s/veh	1.1	0.0	2.1				0.0	1.3	0.2	15.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	3.0				0.0	4.6	1.1	0.8	2.5	0.0
LnGrp Delay(d),s/veh	13.6	0.0	15.1				0.0	11.3	8.4	34.4	5.7	0.0
LnGrp LOS	B		B					B	A	C	A	
Approach Vol, veh/h		538						645			419	
Approach Delay, s/veh		14.4						10.6			8.9	
Approach LOS		B						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.6	19.4		14.5		25.0						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	7.0	39.0		22.0		50.0						
Max Q Clear Time (g_c+I1), s	3.2	11.0		8.5		6.8						
Green Ext Time (p_c), s	0.0	4.4		2.0		4.6						
Intersection Summary												
HCM 2010 Ctrl Delay			11.4									
HCM 2010 LOS			B									

Intersection						
Int Delay, s/veh	5.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	181	3	29	82	6	67
Future Vol, veh/h	181	3	29	82	6	67
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	155	185	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	197	3	32	89	7	73
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	128	42	0	0	37	0
Stage 1	37	-	-	-	-	-
Stage 2	91	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	866	1029	-	-	1574	-
Stage 1	985	-	-	-	-	-
Stage 2	933	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	855	1020	-	-	1567	-
Mov Cap-2 Maneuver	855	-	-	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.5	0		0.6		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 855 1020 1567	-	-		
HCM Lane V/C Ratio	-	- 0.23 0.003 0.004	-	-		
HCM Control Delay (s)	-	- 10.5 8.5 7.3	-	-		
HCM Lane LOS	-	- B A A	-	-		
HCM 95th %tile Q(veh)	-	- 0.9 0 0	-	-		

HCM 2010 TWSC
13: Deschutes Road & Boyle Road

Existing Plus Project Conditions
AM Peak

Intersection												
Int Delay, s/veh	8.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	42	78	89	36	6	32	133	69	6	246	9
Future Vol, veh/h	6	42	78	89	36	6	32	133	69	6	246	9
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	50	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	55	101	116	47	8	42	173	90	8	319	12
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	634	607	335	685	613	183	336	0	0	178	0	0
Stage 1	346	346	-	261	261	-	-	-	-	-	-	-
Stage 2	288	261	-	424	352	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	392	411	707	362	408	859	1223	-	-	1398	-	-
Stage 1	670	635	-	744	692	-	-	-	-	-	-	-
Stage 2	720	692	-	608	632	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	339	391	701	266	388	852	1218	-	-	1392	-	-
Mov Cap-2 Maneuver	339	391	-	266	388	-	-	-	-	-	-	-
Stage 1	644	629	-	715	665	-	-	-	-	-	-	-
Stage 2	638	665	-	470	626	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.7			31.3			1.1			0.2		
HCM LOS	B			D								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1218	-	-	533	302	1392	-	-				
HCM Lane V/C Ratio	0.034	-	-	0.307	0.563	0.006	-	-				
HCM Control Delay (s)	8.1	-	-	14.7	31.3	7.6	-	-				
HCM Lane LOS	A	-	-	B	D	A	-	-				
HCM 95th %tile O(veh)	0.1	-	-	1.3	3.2	0	-	-				

Intersection	
Intersection Delay, s/veh	37.1
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	61	25	181	0	22	44	146	0	133	338	11
Future Vol, veh/h	0	61	25	181	0	22	44	146	0	133	338	11
Peak Hour Factor	0.88	0.82	0.82	0.82	0.88	0.82	0.82	0.82	0.88	0.82	0.82	0.82
Heavy Vehicles, %	5	3	3	3	5	3	3	3	5	3	3	3
Mvmt Flow	0	74	30	221	0	27	54	178	0	162	412	13
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	2	2
HCM Control Delay	21.3	21.6	56
HCM LOS	C	C	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	23%	0%
Vol Thru, %	0%	97%	0%	12%	0%	23%	77%	81%
Vol Right, %	0%	3%	0%	88%	0%	77%	0%	19%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	133	349	61	206	22	190	274	261
LT Vol	133	0	61	0	22	0	63	0
Through Vol	0	338	0	25	0	44	211	211
RT Vol	0	11	0	181	0	146	0	50
Lane Flow Rate	162	426	74	251	27	232	334	318
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.402	0.992	0.201	0.597	0.074	0.567	0.793	0.733
Departure Headway (Hd)	8.933	8.391	9.717	8.552	9.898	8.812	8.544	8.286
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	404	434	370	422	362	410	424	436
Service Time	6.678	6.137	7.462	6.297	7.647	6.561	6.292	6.034
HCM Lane V/C Ratio	0.401	0.982	0.2	0.595	0.075	0.566	0.788	0.729
HCM Control Delay	17.6	70.7	14.9	23.2	13.4	22.5	37.1	30.7
HCM Lane LOS	C	F	B	C	B	C	E	D
HCM 95th-tile Q	1.9	12.4	0.7	3.8	0.2	3.4	7	5.9

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	63	422	50
Future Vol, veh/h	0	63	422	50
Peak Hour Factor	0.88	0.82	0.82	0.82
Heavy Vehicles, %	5	3	3	3
Mvmt Flow	0	77	515	61
Number of Lanes	0	0	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	34
HCM LOS	D

HCM 2010 AWSC
15: Deschutes Road & Cedro Road

Existing Plus Project Conditions

AM Peak

Intersection																
Intersection Delay, s/veh		49														
Intersection LOS		E														
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations			↶	↷			↶↷			↶	↶	↷		↶	↶↷	
Traffic Vol, veh/h	0	17	2	41	0	86	5	16	0	52	467	122	0	13	547	8
Future Vol, veh/h	0	17	2	41	0	86	5	16	0	52	467	122	0	13	547	8
Peak Hour Factor	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86
Heavy Vehicles, %	5	3	3	3	5	3	3	3	5	3	3	3	5	3	3	3
Mvmt Flow	0	20	2	48	0	100	6	19	0	60	543	142	0	15	636	9
Number of Lanes	0	0	1	1	0	0	1	0	0	1	1	1	0	1	2	0
Approach	EB				WB				NB				SB			
Opposing Approach	WB				EB				SB				NB			
Opposing Lanes	1				2				3				3			
Conflicting Approach Left	SB				NB				EB				WB			
Conflicting Lanes Left	3				3				2				1			
Conflicting Approach Right	NB				SB				WB				EB			
Conflicting Lanes Right	3				3				1				2			
HCM Control Delay	12.7				16.2				73.4				31.5			
HCM LOS	B				C				F				D			
Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3							
Vol Left, %	100%	0%	0%	89%	0%	80%	100%	0%	0%							
Vol Thru, %	0%	100%	0%	11%	0%	5%	0%	100%	96%							
Vol Right, %	0%	0%	100%	0%	100%	15%	0%	0%	4%							
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop							
Traffic Vol by Lane	52	467	122	19	41	107	13	365	190							
LT Vol	52	0	0	17	0	86	13	0	0							
Through Vol	0	467	0	2	0	5	0	365	182							
RT Vol	0	0	122	0	41	16	0	0	8							
Lane Flow Rate	60	543	142	22	48	124	15	424	221							
Geometry Grp	8	8	8	8	8	8	8	8	8							
Degree of Util (X)	0.131	1.099	0.259	0.059	0.112	0.314	0.033	0.853	0.443							
Departure Headway (Hd)	7.797	7.288	6.575	9.898	8.718	9.301	8.046	7.536	7.506							
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes							
Cap	462	500	549	364	414	389	448	483	482							
Service Time	5.512	5.003	4.29	7.598	6.418	7.001	5.746	5.236	5.206							
HCM Lane V/C Ratio	0.13	1.086	0.259	0.06	0.116	0.319	0.033	0.878	0.459							
HCM Control Delay	11.7	96.4	11.6	13.2	12.5	16.2	11	40.3	16							
HCM Lane LOS	B	F	B	B	B	C	B	E	C							
HCM 95th-tile Q	0.4	17.6	1	0.2	0.4	1.3	0.1	8.7	2.2							

HCM 2010 TWSC
16: Deschutes Road & SR 44 WB Ramps

Existing Plus Project Conditions

AM Peak

Intersection												
Int Delay, s/veh		2.5										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱		↰	↱↱			↱	↰
Traffic Vol, veh/h	0	0	0	24	0	41	160	600	0	0	211	463
Future Vol, veh/h	0	0	0	24	0	41	160	600	0	0	211	463
Conflicting Peds, #/hr	0	0	0	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	175	-	-	200	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	0	27	0	47	182	682	0	0	240	526
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1290	1290	346	245	0	-	-	-	0
Stage 1				1045	1045	-	-	-	-	-	-	-
Stage 2				245	245	-	-	-	-	-	-	-
Critical Hdwy				6.66	6.56	6.96	4.16	-	-	-	-	-
Critical Hdwy Stg 1				5.86	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.46	5.56	-	-	-	-	-	-	-
Follow-up Hdwy				3.538	4.038	3.338	2.238	-	-	-	-	-
Pot Cap-1 Maneuver				165	161	646	1307	-	0	0	-	0
Stage 1				297	301	-	-	-	0	0	-	0
Stage 2				790	698	-	-	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				141	0	643	1302	-	-	-	-	-
Mov Cap-2 Maneuver				141	0	-	-	-	-	-	-	-
Stage 1				255	0	-	-	-	-	-	-	-
Stage 2				787	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				20.5			1.7			0		
HCM LOS				C								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT							
Capacity (veh/h)	1302	-	141	643	-							
HCM Lane V/C Ratio	0.14	-	0.193	0.072	-							
HCM Control Delay (s)	8.2	-	36.6	11	-							
HCM Lane LOS	A	-	E	B	-							
HCM 95th %tile O(veh)	0.5	-	0.7	0.2	-							

HCM 2010 AWSC
17: Deschutes Road & SR 44 EB Ramps

Existing Plus Project Conditions

AM Peak

Intersection

Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	365	0	109	0	0	0	0	0	0	395	29
Future Vol, veh/h	0	365	0	109	0	0	0	0	0	0	395	29
Peak Hour Factor	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86
Heavy Vehicles, %	5	4	4	4	5	4	4	4	5	4	4	4
Mvmt Flow	0	424	0	127	0	0	0	0	0	0	459	34
Number of Lanes	0	1	1	1	0	0	0	0	0	0	2	1

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	3
Conflicting Approach Right	NB	
Conflicting Lanes Right	3	0
HCM Control Delay	14.4	15.5
HCM LOS	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	SBLn1	SBLn2
Vol Left, %	0%	0%	0%	100%	100%	0%	100%	0%
Vol Thru, %	100%	100%	0%	0%	0%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	198	198	29	183	183	109	30	205
LT Vol	0	0	0	183	183	0	30	0
Through Vol	198	198	0	0	0	0	0	205
RT Vol	0	0	29	0	0	109	0	0
Lane Flow Rate	230	230	34	212	212	127	35	238
Geometry Grp	8	8	8	7	7	7	8	8
Degree of Util (X)	0.463	0.463	0.045	0.429	0.429	0.213	0.079	0.509
Departure Headway (Hd)	7.265	7.265	4.752	7.274	7.274	6.063	8.196	7.685
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	498	498	758	492	492	587	439	472
Service Time	4.965	4.965	2.452	5.074	5.074	3.861	5.911	5.4
HCM Lane V/C Ratio	0.462	0.462	0.045	0.431	0.431	0.216	0.08	0.504
HCM Control Delay	16.1	16.1	7.7	15.5	15.5	10.5	11.6	18.1
HCM Lane LOS	C	C	A	C	C	B	B	C
HCM 95th-tile Q	2.4	2.4	0.1	2.1	2.1	0.8	0.3	2.8

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	30	205	0
Future Vol, veh/h	0	30	205	0
Peak Hour Factor	0.88	0.86	0.86	0.86
Heavy Vehicles, %	5	4	4	4
Mvmt Flow	0	35	238	0
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	17.3
HCM LOS	C

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	68	71	6	19	62
Future Vol, veh/h	20	68	71	6	19	62
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	23	77	81	7	22	70

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	93	0	217
Stage 1	-	-	89
Stage 2	-	-	128
Critical Hdwy	4.15	-	6.45
Critical Hdwy Stg 1	-	-	5.45
Critical Hdwy Stg 2	-	-	5.45
Follow-up Hdwy	2.245	-	3.545
Pot Cap-1 Maneuver	1483	-	765
Stage 1	-	-	927
Stage 2	-	-	890
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1477	-	747
Mov Cap-2 Maneuver	-	-	747
Stage 1	-	-	923
Stage 2	-	-	872

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1477	-	-	-	891
HCM Lane V/C Ratio	0.015	-	-	-	0.103
HCM Control Delay (s)	7.5	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

HCM 2010 Signalized Intersection Summary

1: Deschutes Road & State Route 299

Existing Plus Project Conditions

PM Peak

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (veh/h)	233	110	72	149	99	100		
Future Volume (veh/h)	233	110	72	149	99	100		
Number	2	12	1	6	7	14		
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	1810	1810	1629	1810	1629	1810		
Adj Flow Rate, veh/h	271	128	84	173	115	116		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86		
Percent Heavy Veh, %	5	5	5	5	5	5		
Cap, veh/h	352	299	468	1003	513	509		
Arrive On Green	0.19	0.19	0.30	0.55	0.33	0.33		
Sat Flow, veh/h	1810	1538	1551	1810	1551	1538		
Grp Volume(v), veh/h	271	128	84	173	115	116		
Grp Sat Flow(s),veh/h/ln	1810	1538	1551	1810	1551	1538		
Q Serve(g_s), s	9.9	5.1	2.8	3.3	3.7	3.8		
Cycle Q Clear(g_c), s	9.9	5.1	2.8	3.3	3.7	3.8		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	352	299	468	1003	513	509		
V/C Ratio(X)	0.77	0.43	0.18	0.17	0.22	0.23		
Avail Cap(c_a), veh/h	625	531	468	1275	513	509		
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	26.5	24.6	17.9	7.6	16.8	16.8		
Incr Delay (d2), s/veh	3.6	1.0	0.8	0.1	1.0	1.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.2	2.2	1.3	1.7	1.7	1.8		
LnGrp Delay(d),s/veh	30.1	25.6	18.7	7.7	17.8	17.9		
LnGrp LOS	C	C	B	A	B	B		
Approach Vol, veh/h	399			257	231			
Approach Delay, s/veh	28.6			11.3	17.9			
Approach LOS	C			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	25.0	17.5		27.0		42.5		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	21.0	24.0		23.0		49.0		
Max Q Clear Time (g_c+I1), s	4.8	11.9		5.8		5.3		
Green Ext Time (p_c), s	0.2	1.7		0.8		2.1		
Intersection Summary								
HCM 2010 Ctrl Delay			20.8					
HCM 2010 LOS			C					

HCM 2010 TWSC
2: Deschutes Road & Old Alturas Rd

Existing Plus Project Conditions

PM Peak

Intersection												
Int Delay, s/veh		4.7										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Traffic Vol, veh/h	26	6	9	27	5	43	11	103	18	53	89	41
Future Vol, veh/h	26	6	9	27	5	43	11	103	18	53	89	41
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	275
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	31	7	11	33	6	52	13	124	22	64	107	49
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	435	417	117	415	406	145	112	0	0	151	0	0
Stage 1	240	240	-	166	166	-	-	-	-	-	-	-
Stage 2	195	177	-	249	240	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	530	525	932	546	533	900	1471	-	-	1424	-	0
Stage 1	761	705	-	834	759	-	-	-	-	-	-	0
Stage 2	804	751	-	753	705	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	469	491	924	506	498	893	1465	-	-	1418	-	-
Mov Cap-2 Maneuver	469	491	-	506	498	-	-	-	-	-	-	-
Stage 1	750	668	-	822	748	-	-	-	-	-	-	-
Stage 2	741	740	-	698	668	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	12.5			11.2			0.6			2.9		
HCM LOS	B			B								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT					
Capacity (veh/h)	1465	-	-	530	672	1418	-					
HCM Lane V/C Ratio	0.009	-	-	0.093	0.134	0.045	-					
HCM Control Delay (s)	7.5	0	-	12.5	11.2	7.7	0					
HCM Lane LOS	A	A	-	B	B	A	A					
HCM 95th %tile O(veh)	0	-	-	0.3	0.5	0.1	-					

HCM 2010 AWSC
3: Project Driveway A & Old Alturas Rd & Seven Lake Road

Existing Plus Project Conditions

PM Peak

Intersection												
Intersection Delay, s/veh	7.1											
Intersection LOS	A											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	28	1	3	0	0	2	0	0	2	11	0
Future Vol, veh/h	0	28	1	3	0	0	2	0	0	2	11	0
Peak Hour Factor	0.88	0.89	0.89	0.88	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	31	1	3	0	0	2	0	0	2	13	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	1				1				1			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	1				1				1			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	1				1				1			
HCM Control Delay	7.4				7.1				7.2			
HCM LOS	A				A				A			
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	15%	88%	0%	2%								
Vol Thru, %	85%	3%	100%	35%								
Vol Right, %	0%	9%	0%	64%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	13	32	2	55								
LT Vol	2	28	0	1								
Through Vol	11	1	2	19								
RT Vol	0	3	0	35								
Lane Flow Rate	15	36	2	62								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.017	0.042	0.003	0.063								
Departure Headway (Hd)	4.078	4.187	4.094	3.633								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	877	855	872	985								
Service Time	2.107	2.212	2.127	1.658								
HCM Lane V/C Ratio	0.017	0.042	0.002	0.063								
HCM Control Delay	7.2	7.4	7.1	6.9								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	0.1	0.1	0	0.2								

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	1	19	35
Future Vol, veh/h	0	1	19	35
Peak Hour Factor	0.88	0.89	0.88	0.89
Heavy Vehicles, %	5	2	2	2
Mvmt Flow	0	1	22	39
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	6.9
HCM LOS	A

Intersection					
Intersection Delay, s/veh12.3					
Intersection LOS B					
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	467	266	412	404	
Demand Flow Rate, veh/h	491	280	433	424	
Vehicles Circulating, veh/h	364	451	378	367	
Vehicles Exiting, veh/h	286	360	477	363	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	5	5	5	5	
Ped Cap Adj	0.999	0.999	0.999	0.999	
Approach Delay, s/veh	15.7	10.5	13.7	8.3	
Approach LOS	C	B	B	A	
Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LTR	LTR	LT	R
Assumed Moves	LTR	LTR	LTR	LT	R
RT Channelized					Yield
Lane Util	1.000	1.000	1.000	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	491	280	433	283	141
Cap Entry Lane, veh/h	785	720	774	783	849
Entry HV Adj Factor	0.952	0.950	0.952	0.954	0.952
Flow Entry, veh/h	467	266	412	270	134
Cap Entry, veh/h	747	683	736	746	808
V/C Ratio	0.626	0.389	0.560	0.362	0.166
Control Delay, s/veh	15.7	10.5	13.7	9.3	6.2
LOS	C	B	B	A	A
95th %tile Queue, veh	4	2	4	2	1

HCM 2010 Signalized Intersection Summary

5: Shasta View Dr & Tarmac Road

Existing Plus Project Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↖	↗	↖	↖	
Traffic Volume (veh/h)	12	6	45	239	5	51	101	443	111	28	401	21
Future Volume (veh/h)	12	6	45	239	5	51	101	443	111	28	401	21
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1710	1827	1827	1644	1827	1900	1644	1827	1827	1644	1827	1900
Adj Flow Rate, veh/h	15	8	56	299	6	64	126	554	139	35	501	26
Adj No. of Lanes	0	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	66	35	89	502	22	238	153	1271	569	50	1008	52
Arrive On Green	0.06	0.06	0.06	0.17	0.17	0.17	0.10	0.37	0.37	0.03	0.30	0.30
Sat Flow, veh/h	1154	615	1553	3038	135	1438	1566	3471	1553	1566	3358	174
Grp Volume(v), veh/h	23	0	56	299	0	70	126	554	139	35	259	268
Grp Sat Flow(s),veh/h/ln	1769	0	1553	1519	0	1573	1566	1736	1553	1566	1736	1796
Q Serve(g_s), s	0.5	0.0	1.5	3.8	0.0	1.6	3.3	5.1	2.6	0.9	5.2	5.2
Cycle Q Clear(g_c), s	0.5	0.0	1.5	3.8	0.0	1.6	3.3	5.1	2.6	0.9	5.2	5.2
Prop In Lane	0.65		1.00	1.00		0.91	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	101	0	89	502	0	260	153	1271	569	50	521	539
V/C Ratio(X)	0.23	0.00	0.63	0.60	0.00	0.27	0.82	0.44	0.24	0.70	0.50	0.50
Avail Cap(c_a), veh/h	671	0	589	1153	0	597	223	1894	847	334	1070	1108
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	19.4	16.3	0.0	15.4	18.7	10.1	9.3	20.2	12.1	12.1
Incr Delay (d2), s/veh	1.1	0.0	7.1	1.1	0.0	0.6	14.6	0.2	0.2	16.3	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.8	1.7	0.0	0.7	2.1	2.4	1.2	0.6	2.5	2.6
LnGrp Delay(d),s/veh	20.1	0.0	26.6	17.4	0.0	15.9	33.2	10.3	9.5	36.5	12.9	12.9
LnGrp LOS	C		C	B		B	C	B	A	D	B	B
Approach Vol, veh/h	79					369		819		562		
Approach Delay, s/veh	24.7					17.1		13.7		14.3		
Approach LOS	C					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	5.3	19.4	6.4		8.1	16.7	11.0					
Change Period (Y+Rc), s	4.0	4.0	4.0		4.0	4.0	4.0					
Max Green Setting (Gmax), s	23.0	23.0	16.0		6.0	26.0	16.0					
Max Q Clear Time (g_c+12, s)	7.1	7.1	3.5		5.3	7.2	5.8					
Green Ext Time (p_c), s	0.0	5.1	0.2		0.0	5.5	1.2					
Intersection Summary												
HCM 2010 Ctrl Delay			15.1									
HCM 2010 LOS			B									

HCM 2010 TWSC
6: Shasta View Dr & SR 44 WB Ramps

Existing Plus Project Conditions

PM Peak

Intersection												
Int Delay, s/veh		1.2										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗		↕	↗		↕	↗
Traffic Vol, veh/h	0	0	0	51	2	91	0	621	306	0	349	338
Future Vol, veh/h	0	0	0	51	2	91	0	621	306	0	349	338
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	Free
Storage Length	-	-	-	-	-	150	-	-	0	-	-	200
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	61	2	110	0	748	369	0	420	407
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				963	1168	-	-	0	-	-	-	0
Stage 1				748	748	-	-	-	-	-	-	-
Stage 2				215	420	-	-	-	-	-	-	-
Critical Hdwy				6.84	6.54	-	-	-	-	-	-	-
Critical Hdwy Stg 1				5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy				3.52	4.02	-	-	-	-	-	-	-
Pot Cap-1 Maneuver				253	192	0	0	-	0	0	-	0
Stage 1				429	418	0	0	-	0	0	-	0
Stage 2				800	588	0	0	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				252	0	-	-	-	-	-	-	-
Mov Cap-2 Maneuver				252	0	-	-	-	-	-	-	-
Stage 1				429	0	-	-	-	-	-	-	-
Stage 2				797	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				24.1			0			0		
HCM LOS				C								
Minor Lane/Major Mvmt	NBTWBLn1WBLn2		SBT									
Capacity (veh/h)	-	252	-	-								
HCM Lane V/C Ratio	-	0.253	-	-								
HCM Control Delay (s)	-	24.1	0	-								
HCM Lane LOS	-	C	A	-								
HCM 95th %tile O(veh)	-	1	-	-								

HCM 2010 Signalized Intersection Summary

7: SR 44 EB Ramps & Shasta View Dr

Existing Plus Project Conditions

PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	417	1	432	0	0	0	0	510	35	70	330	0
Future Volume (veh/h)	417	1	432	0	0	0	0	510	35	70	330	0
Number	7	4	14				5	2	12	1	6	16
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	1710	1845	1845				0	1845	1845	1660	1845	0
Adj Flow Rate, veh/h	528	1	547				0	646	0	89	418	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.79	0.79	0.79				0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	730	1	651				0	1012	453	111	1520	0
Arrive On Green	0.42	0.42	0.42				0.00	0.29	0.00	0.07	0.43	0.00
Sat Flow, veh/h	1754	3	1562				0	3597	1568	1581	3597	0
Grp Volume(v), veh/h	529	0	547				0	646	0	89	418	0
Grp Sat Flow(s),veh/h/ln	1757	0	1562				0	1752	1568	1581	1752	0
Q Serve(g_s), s	13.4	0.0	16.8				0.0	8.6	0.0	3.0	4.1	0.0
Cycle Q Clear(g_c), s	13.4	0.0	16.8				0.0	8.6	0.0	3.0	4.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	732	0	651				0	1012	453	111	1520	0
V/C Ratio(X)	0.72	0.00	0.84				0.00	0.64	0.00	0.80	0.27	0.00
Avail Cap(c_a), veh/h	888	0	789				0	1771	792	414	2952	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	1.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.0	0.0	14.0				0.0	16.6	0.0	24.5	9.7	0.0
Incr Delay (d2), s/veh	2.3	0.0	6.9				0.0	0.7	0.0	12.5	0.1	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	6.9	0.0	8.4				0.0	4.2	0.0	1.7	2.0	0.0
LnGrp Delay(d),s/veh	15.3	0.0	20.9				0.0	17.2	0.0	36.9	9.8	0.0
LnGrp LOS	B		C					B		D	A	
Approach Vol, veh/h	1076						646			507		
Approach Delay, s/veh	18.2						17.2			14.6		
Approach LOS	B						B			B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.7	19.4		26.3		27.2						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	14.0	27.0		27.0		45.0						
Max Q Clear Time (g_c+I1), s	5.0	10.6		18.8		6.1						
Green Ext Time (p_c), s	0.2	4.8		3.5		5.8						
Intersection Summary												
HCM 2010 Ctrl Delay	17.1											
HCM 2010 LOS	B											

Intersection

Intersection Delay, s/veh17.1

Intersection LOS C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	77	158	53	0	40	93	30	0	47	158	76	0	43	121	60
Future Vol, veh/h	0	77	158	53	0	40	93	30	0	47	158	76	0	43	121	60
Peak Hour Factor	0.88	0.81	0.81	0.81	0.88	0.81	0.81	0.81	0.88	0.81	0.81	0.81	0.88	0.81	0.81	0.81
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	95	195	65	0	49	115	37	0	58	195	94	0	53	149	74
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	19.6	13.9	19.2	13.6
HCM LOS	C	B	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	17%	27%	25%	26%	0%
Vol Thru, %	56%	55%	57%	74%	0%
Vol Right, %	27%	18%	18%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	281	288	163	164	60
LT Vol	47	77	40	43	0
Through Vol	158	158	93	121	0
RT Vol	76	53	30	0	60
Lane Flow Rate	347	356	201	202	74
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.616	0.628	0.377	0.407	0.131
Departure Headway (Hd)	6.388	6.363	6.75	7.23	6.378
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	562	565	531	496	560
Service Time	4.45	4.423	4.824	4.997	4.145
HCM Lane V/C Ratio	0.617	0.63	0.379	0.407	0.132
HCM Control Delay	19.2	19.6	13.9	14.9	10.1
HCM Lane LOS	C	C	B	B	B
HCM 95th-tile Q	4.2	4.3	1.7	2	0.4

HCM 2010 Signalized Intersection Summary

9: Old Oregon Trail & Old Forty-Four Drive

Existing Plus Project Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	13	69	188	1	37	21	302	162	30	325	2
Future Volume (veh/h)	11	13	69	188	1	37	21	302	162	30	325	2
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1598	1776	1900	1598	1776	1900	1598	1776	1900	1598	1776	1900
Adj Flow Rate, veh/h	13	16	83	227	1	45	25	364	195	36	392	2
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	20	24	124	275	9	390	35	433	232	47	716	4
Arrive On Green	0.01	0.10	0.10	0.18	0.26	0.26	0.02	0.40	0.40	0.03	0.41	0.41
Sat Flow, veh/h	1522	250	1297	1522	33	1481	1522	1089	584	1522	1765	9
Grp Volume(v), veh/h	13	0	99	227	0	46	25	0	559	36	0	394
Grp Sat Flow(s),veh/h/ln	1522	0	1547	1522	0	1514	1522	0	1673	1522	0	1774
Q Serve(g_s), s	0.5	0.0	3.4	7.8	0.0	1.3	0.9	0.0	16.4	1.3	0.0	9.2
Cycle Q Clear(g_c), s	0.5	0.0	3.4	7.8	0.0	1.3	0.9	0.0	16.4	1.3	0.0	9.2
Prop In Lane	1.00		0.84	1.00		0.98	1.00		0.35	1.00		0.01
Lane Grp Cap(c), veh/h	20	0	147	275	0	398	35	0	665	47	0	719
V/C Ratio(X)	0.65	0.00	0.67	0.82	0.00	0.12	0.71	0.00	0.84	0.77	0.00	0.55
Avail Cap(c_a), veh/h	112	0	457	421	0	754	281	0	895	112	0	753
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.6	0.0	23.7	21.4	0.0	15.2	26.3	0.0	14.8	26.1	0.0	12.3
Incr Delay (d2), s/veh	30.4	0.0	5.2	7.8	0.0	0.1	22.9	0.0	5.4	22.3	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	1.6	3.9	0.0	0.5	0.6	0.0	8.5	0.8	0.0	4.6
LnGrp Delay(d),s/veh	57.1	0.0	28.9	29.1	0.0	15.3	49.2	0.0	20.2	48.4	0.0	13.1
LnGrp LOS	E		C	C		B	D		C	D		B
Approach Vol, veh/h	112				273				584		430	
Approach Delay, s/veh	32.2				26.8				21.4		16.0	
Approach LOS	C				C				C		B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.7	25.6	13.8	9.2	5.3	26.0	4.7	18.3				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	29.0	15.0	16.0	10.0	23.0	4.0	27.0				
Max Q Clear Time (g_c+1/3), s	13.3	18.4	9.8	5.4	2.9	11.2	2.5	3.3				
Green Ext Time (p_c), s	0.0	3.2	0.4	0.3	0.0	3.3	0.0	0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			21.7									
HCM 2010 LOS			C									

HCM 2010 TWSC
10: Airport Road/Old Oregon Trail & SR 44 WB Ramps

Existing Plus Project Conditions

PM Peak

Intersection												
Int Delay, s/veh	10.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↕	↕			↕	
Traffic Vol, veh/h	0	0	0	93	0	37	260	448	0	0	322	260
Future Vol, veh/h	0	0	0	93	0	37	260	448	0	0	322	260
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	0	108	0	43	302	521	0	0	374	302

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1657	1808	526	682	0	-	-	-	0
Stage 1	1126	1126	-	-	-	-	-	-	-
Stage 2	531	682	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	6.24	4.14	-	-	-	-	-
Critical Hdwy Stg 1	5.44	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	2.236	-	-	-	-	-
Pot Cap-1 Maneuver	~ 106	78	548	901	-	0	0	-	-
Stage 1	307	278	-	-	-	0	0	-	-
Stage 2	586	447	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	~ 70	0	546	897	-	-	-	-	-
Mov Cap-2 Maneuver	139	0	-	-	-	-	-	-	-
Stage 1	204	0	-	-	-	-	-	-	-
Stage 2	584	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	88.1	4.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	897	-	176	-
HCM Lane V/C Ratio	0.337	-	0.859	-
HCM Control Delay (s)	11	-	88.1	-
HCM Lane LOS	B	-	F	-
HCM 95th %tile Q(veh)	1.5	-	6.1	-

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

HCM 2010 Signalized Intersection Summary

11: Airport Road & SR 44 EB Ramps

Existing Plus Project Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	215	0	247	0	0	0	0	493	117	38	377	0
Future Volume (veh/h)	215	0	247	0	0	0	0	493	117	38	377	0
Number	7	4	14				5	2	12	1	6	16
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	1710	1810	1810				0	1810	1810	1629	1810	0
Adj Flow Rate, veh/h	253	0	291				0	580	138	45	444	0
Adj No. of Lanes	0	1	1				0	1	1	1	1	0
Peak Hour Factor	0.85	0.85	0.85				0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	5	5	5				0	5	5	5	5	0
Cap, veh/h	451	0	402				0	779	662	59	1011	0
Arrive On Green	0.26	0.00	0.26				0.00	0.43	0.43	0.04	0.56	0.00
Sat Flow, veh/h	1723	0	1538				0	1810	1538	1551	1810	0
Grp Volume(v), veh/h	253	0	291				0	580	138	45	444	0
Grp Sat Flow(s),veh/h/ln	1723	0	1538				0	1810	1538	1551	1810	0
Q Serve(g_s), s	5.7	0.0	7.7				0.0	12.0	2.5	1.3	6.4	0.0
Cycle Q Clear(g_c), s	5.7	0.0	7.7				0.0	12.0	2.5	1.3	6.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	451	0	402				0	779	662	59	1011	0
V/C Ratio(X)	0.56	0.00	0.72				0.00	0.74	0.21	0.76	0.44	0.00
Avail Cap(c_a), veh/h	852	0	760				0	1585	1348	244	2032	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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.2	0.0	15.0				0.0	10.6	7.9	21.2	5.7	0.0
Incr Delay (d2), s/veh	1.1	0.0	2.5				0.0	1.4	0.2	17.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	3.5				0.0	6.1	1.1	0.8	3.2	0.0
LnGrp Delay(d),s/veh	15.3	0.0	17.4				0.0	12.1	8.1	38.7	6.0	0.0
LnGrp LOS	B		B					B	A	D	A	
Approach Vol, veh/h		544						718			489	
Approach Delay, s/veh		16.5						11.3			9.1	
Approach LOS		B						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.7	23.2		15.6		28.9						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	7.0	39.0		22.0		50.0						
Max Q Clear Time (g_c+I1), s	3.3	14.0		9.7		8.4						
Green Ext Time (p_c), s	0.0	5.2		2.0		5.5						
Intersection Summary												
HCM 2010 Ctrl Delay			12.3									
HCM 2010 LOS			B									

Intersection						
Int Delay, s/veh	2.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	100	1	90	175	6	41
Future Vol, veh/h	100	1	90	175	6	41
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	155	185	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	109	1	98	190	7	45
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	166	108	0	0	103	0
Stage 1	103	-	-	-	-	-
Stage 2	63	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	824	946	-	-	1489	-
Stage 1	921	-	-	-	-	-
Stage 2	960	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	813	938	-	-	1483	-
Mov Cap-2 Maneuver	813	-	-	-	-	-
Stage 1	917	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.1	0		0.9		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 813 938 1483	-	-		
HCM Lane V/C Ratio	-	- 0.134 0.001 0.004	-	-		
HCM Control Delay (s)	-	- 10.1 8.8 7.4	-	-		
HCM Lane LOS	-	- B A A	-	-		
HCM 95th %tile Q(veh)	-	- 0.5 0 0	-	-		

HCM 2010 TWSC
13: Deschutes Road & Boyle Road

Existing Plus Project Conditions

PM Peak

Intersection												
Int Delay, s/veh		3.9										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	8	44	26	9	5	69	149	29	3	108	9
Future Vol, veh/h	8	8	44	26	9	5	69	149	29	3	108	9
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	50	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	10	57	34	12	6	90	194	38	4	140	12
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	546	537	156	571	543	204	157	0	0	199	0	0
Stage 1	159	159	-	378	378	-	-	-	-	-	-	-
Stage 2	387	378	-	193	165	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	448	450	890	432	447	837	1423	-	-	1373	-	-
Stage 1	843	766	-	644	615	-	-	-	-	-	-	-
Stage 2	637	615	-	809	762	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	410	417	883	373	414	830	1417	-	-	1367	-	-
Mov Cap-2 Maneuver	410	417	-	373	414	-	-	-	-	-	-	-
Stage 1	786	761	-	601	574	-	-	-	-	-	-	-
Stage 2	577	574	-	741	757	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	11			15.1			2.2			0.2		
HCM LOS	B			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1417	-	-	678	410	1367	-	-				
HCM Lane V/C Ratio	0.063	-	-	0.115	0.127	0.003	-	-				
HCM Control Delay (s)	7.7	-	-	11	15.1	7.6	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile O(veh)	0.2	-	-	0.4	0.4	0	-	-				

HCM 2010 AWSC
14: Deschutes Road & Old Forty-Four Drive

Existing Plus Project Conditions

PM Peak

Intersection												
Intersection Delay, s/veh	22.6											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	27	24	64	0	49	18	56	0	56	369	53
Future Vol, veh/h	0	27	24	64	0	49	18	56	0	56	369	53
Peak Hour Factor	0.88	0.82	0.82	0.82	0.88	0.82	0.82	0.82	0.88	0.82	0.82	0.82
Heavy Vehicles, %	5	3	3	3	5	3	3	3	5	3	3	3
Mvmt Flow	0	33	29	78	0	60	22	68	0	68	450	65
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	2				2				2			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	2				2				2			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	2				2				2			
HCM Control Delay	11.8				11.7				34.5			
HCM LOS	B				B				D			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2				
Vol Left, %	100%	0%	100%	0%	100%	0%	23%	0%				
Vol Thru, %	0%	87%	0%	27%	0%	24%	77%	94%				
Vol Right, %	0%	13%	0%	73%	0%	76%	0%	6%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	56	422	27	88	49	74	190	156				
LT Vol	56	0	27	0	49	0	44	0				
Through Vol	0	369	0	24	0	18	146	146				
RT Vol	0	53	0	64	0	56	0	10				
Lane Flow Rate	68	515	33	107	60	90	232	190				
Geometry Grp	7	7	7	7	7	7	7	7				
Degree of Util (X)	0.127	0.875	0.075	0.214	0.136	0.179	0.429	0.343				
Departure Headway (Hd)	6.823	6.226	8.217	7.179	8.186	7.128	6.66	6.496				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	529	587	438	501	440	505	545	557				
Service Time	4.523	3.926	5.938	4.9	5.905	4.847	4.36	4.196				
HCM Lane V/C Ratio	0.129	0.877	0.075	0.214	0.136	0.178	0.426	0.341				
HCM Control Delay	10.5	37.7	11.6	11.8	12.2	11.4	14.3	12.5				
HCM Lane LOS	B	E	B	B	B	B	B	B				
HCM 95th-tile Q	0.4	10	0.2	0.8	0.5	0.6	2.1	1.5				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	44	292	10
Future Vol, veh/h	0	44	292	10
Peak Hour Factor	0.88	0.82	0.82	0.82
Heavy Vehicles, %	5	3	3	3
Mvmt Flow	0	54	356	12
Number of Lanes	0	0	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	13.5
HCM LOS	B

HCM 2010 AWSC
15: Deschutes Road & Cedro Rd

Existing Plus Project Conditions

PM Peak

Intersection

Intersection Delay, s/veh27.5

Intersection LOS D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	49	32	88	0	71	7	13	0	133	394	73	0	18	354	25
Future Vol, veh/h	0	49	32	88	0	71	7	13	0	133	394	73	0	18	354	25
Peak Hour Factor	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86
Heavy Vehicles, %	5	3	3	3	5	3	3	3	5	3	3	3	5	3	3	3
Mvmt Flow	0	57	37	102	0	83	8	15	0	155	458	85	0	21	412	29
Number of Lanes	0	0	1	1	0	0	1	0	0	1	1	1	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	2
HCM Control Delay	13.8	15.4	39	18.7
HCM LOS	B	C	E	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	60%	0%	78%	100%	0%	0%
Vol Thru, %	0%	100%	0%	40%	0%	8%	0%	100%	83%
Vol Right, %	0%	0%	100%	0%	100%	14%	0%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	133	394	73	81	88	91	18	236	143
LT Vol	133	0	0	49	0	71	18	0	0
Through Vol	0	394	0	32	0	7	0	236	118
RT Vol	0	0	73	0	88	13	0	0	25
Lane Flow Rate	155	458	85	94	102	106	21	274	166
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.337	0.932	0.156	0.235	0.226	0.27	0.048	0.596	0.355
Departure Headway (Hd)	7.839	7.327	6.611	8.98	7.959	9.186	8.33	7.818	7.692
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	458	495	541	398	449	389	429	461	466
Service Time	5.604	5.092	4.376	6.762	5.741	6.974	6.102	5.59	5.464
HCM Lane V/C Ratio	0.338	0.925	0.157	0.236	0.227	0.272	0.049	0.594	0.356
HCM Control Delay	14.6	52.5	10.6	14.5	13.1	15.4	11.5	21.6	14.7
HCM Lane LOS	B	F	B	B	B	C	B	C	B
HCM 95th-tile Q	1.5	11.1	0.5	0.9	0.9	1.1	0.2	3.8	1.6

HCM 2010 TWSC
16: Deschutes Road & SR 44 WB Ramps

Existing Plus Project Conditions

PM Peak

Intersection												
Int Delay, s/veh		1.4										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	13	0	30	91	570	0	0	259	254
Future Vol, veh/h	0	0	0	13	0	30	91	570	0	0	259	254
Conflicting Peds, #/hr	0	0	0	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	175	-	-	200	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	0	15	0	34	103	648	0	0	294	289
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1154	1154	329	299	0	-	-	-	0
Stage 1				855	855	-	-	-	-	-	-	-
Stage 2				299	299	-	-	-	-	-	-	-
Critical Hdwy				6.66	6.56	6.96	4.16	-	-	-	-	-
Critical Hdwy Stg 1				5.86	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.46	5.56	-	-	-	-	-	-	-
Follow-up Hdwy				3.538	4.038	3.338	2.238	-	-	-	-	-
Pot Cap-1 Maneuver				201	194	662	1248	-	0	0	-	0
Stage 1				374	370	-	-	-	0	0	-	0
Stage 2				746	661	-	-	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				184	0	659	1243	-	-	-	-	-
Mov Cap-2 Maneuver				184	0	-	-	-	-	-	-	-
Stage 1				343	0	-	-	-	-	-	-	-
Stage 2				743	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				15.5			1.1			0		
HCM LOS				C								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT							
Capacity (veh/h)	1243	-	184	659	-							
HCM Lane V/C Ratio	0.083	-	0.08	0.052	-							
HCM Control Delay (s)	8.2	-	26.3	10.8	-							
HCM Lane LOS	A	-	D	B	-							
HCM 95th %tile O(veh)	0.3	-	0.3	0.2	-							

HCM 2010 AWSC
17: Deschutes Road & SR 44 EB Ramps

Existing Plus Project Conditions

PM Peak

Intersection	
Intersection Delay, s/veh	14.4
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	362	0	173	0	0	0	0	0	0	299	35
Future Vol, veh/h	0	362	0	173	0	0	0	0	0	0	299	35
Peak Hour Factor	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86	0.88	0.86	0.86	0.86
Heavy Vehicles, %	5	4	4	4	5	4	4	4	5	4	4	4
Mvmt Flow	0	421	0	201	0	0	0	0	0	0	348	41
Number of Lanes	0	1	1	1	0	0	0	0	0	0	2	1

Approach	EB	NB
Opposing Approach		SB
Opposing Lanes	0	2
Conflicting Approach Left	SB	EB
Conflicting Lanes Left	2	3
Conflicting Approach Right	NB	
Conflicting Lanes Right	3	0
HCM Control Delay	13.9	13.5
HCM LOS	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	SBLn1	SBLn2
Vol Left, %	0%	0%	0%	100%	100%	0%	100%	0%
Vol Thru, %	100%	100%	0%	0%	0%	0%	0%	99%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	1%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	150	150	35	181	181	173	63	209
LT Vol	0	0	0	181	181	0	63	0
Through Vol	150	150	0	0	0	0	0	207
RT Vol	0	0	35	0	0	173	0	2
Lane Flow Rate	174	174	41	210	210	201	73	243
Geometry Grp	8	8	8	7	7	7	8	8
Degree of Util (X)	0.356	0.356	0.055	0.418	0.418	0.332	0.164	0.504
Departure Headway (Hd)	7.375	7.375	4.861	7.151	7.151	5.941	8.079	7.462
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	485	485	727	501	501	601	447	479
Service Time	5.174	5.174	2.657	4.926	4.926	3.715	5.779	5.261
HCM Lane V/C Ratio	0.359	0.359	0.056	0.419	0.419	0.334	0.163	0.507
HCM Control Delay	14.2	14.2	7.9	15	15	11.7	12.4	17.7
HCM Lane LOS	B	B	A	B	B	B	B	C
HCM 95th-tile Q	1.6	1.6	0.2	2	2	1.4	0.6	2.8

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	63	207	2
Future Vol, veh/h	0	63	207	2
Peak Hour Factor	0.88	0.86	0.86	0.86
Heavy Vehicles, %	5	4	4	4
Mvmt Flow	0	73	241	2
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	16.5
HCM LOS	C

HCM 2010 TWSC
18: Boyle Road & Project Driveway A

Existing Plus Project Conditions
PM Peak

Intersection						
Int Delay, s/veh	4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	67	48	61	21	12	40
Future Vol, veh/h	67	48	61	21	12	40
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	76	55	69	24	14	45
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	98	0	-	0	298	91
Stage 1	-	-	-	-	86	-
Stage 2	-	-	-	-	212	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1476	-	-	-	687	958
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	816	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1470	-	-	-	645	950
Mov Cap-2 Maneuver	-	-	-	-	645	-
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	770	-
Approach	EB		WB		SB	
HCM Control Delay, s	4.4		0		9.5	
HCM LOS					A	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1470	-	-	-	857	
HCM Lane V/C Ratio	0.052	-	-	-	0.069	
HCM Control Delay (s)	7.6	0	-	-	9.5	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2	

HCM 2010 Signalized Intersection Summary

1: Deschutes Road & State Route 299

Year 2035 Conditions
AM Peak

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (veh/h)	160	200	150	350	190	90		
Future Volume (veh/h)	160	200	150	350	190	90		
Number	2	12	1	6	7	14		
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	1810	1810	1810	1810	1810	1810		
Adj Flow Rate, veh/h	174	217	163	380	207	98		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	5	5	5	5	5	5		
Cap, veh/h	351	298	512	991	585	522		
Arrive On Green	0.19	0.19	0.30	0.55	0.34	0.34		
Sat Flow, veh/h	1810	1538	1723	1810	1723	1538		
Grp Volume(v), veh/h	174	217	163	380	207	98		
Grp Sat Flow(s),veh/h/ln	1810	1538	1723	1810	1723	1538		
Q Serve(g_s), s	6.1	9.4	5.2	8.5	6.4	3.2		
Cycle Q Clear(g_c), s	6.1	9.4	5.2	8.5	6.4	3.2		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	351	298	512	991	585	522		
V/C Ratio(X)	0.50	0.73	0.32	0.38	0.35	0.19		
Avail Cap(c_a), veh/h	589	500	512	1228	585	522		
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	25.4	26.7	19.3	9.2	17.5	16.5		
Incr Delay (d2), s/veh	1.1	3.4	1.6	0.2	1.7	0.8		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.2	4.3	2.7	4.3	3.3	1.4		
LnGrp Delay(d),s/veh	26.5	30.1	20.9	9.4	19.2	17.3		
LnGrp LOS	C	C	C	A	B	B		
Approach Vol, veh/h	391			543	305			
Approach Delay, s/veh	28.5			12.9	18.6			
Approach LOS	C			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	25.0	17.7		28.0		42.7		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	21.0	23.0		24.0		48.0		
Max Q Clear Time (g_c+I1), s	7.2	11.4		8.4		10.5		
Green Ext Time (p_c), s	0.4	2.3		1.0		3.0		
Intersection Summary								
HCM 2010 Ctrl Delay			19.2					
HCM 2010 LOS			B					

HCM 2010 TWSC
2: Deschutes Road & Old Alturas Rd

Year 2035 Conditions
AM Peak

Intersection												
Int Delay, s/veh	7.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	20	30	50	20	110	10	140	60	130	200	20
Future Vol, veh/h	30	20	30	50	20	110	10	140	60	130	200	20
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	275
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	33	22	33	54	22	120	11	152	65	141	217	22
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	787	749	227	744	717	195	222	0	0	222	0	0
Stage 1	505	505	-	212	212	-	-	-	-	-	-	-
Stage 2	282	244	-	532	505	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	308	339	810	329	354	844	1341	-	-	1341	-	0
Stage 1	548	539	-	788	725	-	-	-	-	-	-	0
Stage 2	723	702	-	529	539	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	224	293	803	267	306	837	1335	-	-	1335	-	-
Mov Cap-2 Maneuver	224	293	-	267	306	-	-	-	-	-	-	-
Stage 1	541	472	-	778	715	-	-	-	-	-	-	-
Stage 2	593	693	-	424	472	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	19.5			18.1			0.4			3.2		
HCM LOS	C			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT						
Capacity (veh/h)	1335	-	-	334	469	1335						
HCM Lane V/C Ratio	0.008	-	-	0.26	0.417	0.106						
HCM Control Delay (s)	7.7	0	-	19.5	18.1	8						
HCM Lane LOS	A	A	-	C	C	A						
HCM 95th %tile Q(veh)	0	-	-	1	2	0.4						

HCM 2010 TWSC
3: Old Alturas Rd & Seven Lakes Road

Year 2035 Conditions
AM Peak

Intersection						
Int Delay, s/veh	4.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	60	5	10	10	5	45
Future Vol, veh/h	60	5	10	10	5	45
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	5	11	11	5	49
Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	54	0	206	15	10	-
Stage 1	-	-	141	-	-	-
Stage 2	-	-	65	-	-	-
Critical Hdwy	4.12	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	1551	-	691	1065	1610	-
Stage 1	-	-	780	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1551	-	0	1056	1603	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-
Approach	EB		WB		SB	
HCM Control Delay, s	6.9		8.5		0.7	
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBTWBLn1	SBL	SBR		
Capacity (veh/h)	1551	- 1056	1603	-		
HCM Lane V/C Ratio	0.042	- 0.021	0.003	-		
HCM Control Delay (s)	7.4	0 8.5	7.3	-		
HCM Lane LOS	A	A A	A	-		
HCM 95th %tile Q(veh)	0.1	- 0.1	0	-		

HCM 2010 Roundabout
4: Shasta View Dr & Old Alturas Rd

Year 2035 Conditions
AM Peak

Intersection					
Intersection Delay, s/veh	20.0				
Intersection LOS	C				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	446	554	391	489	
Demand Flow Rate, veh/h	468	581	411	513	
Vehicles Circulating, veh/h	513	457	468	547	
Vehicles Exiting, veh/h	411	422	513	491	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	5	5	5	5	
Ped Cap Adj	0.999	0.999	0.999	0.999	
Approach Delay, s/veh	20.7	28.1	15.4	13.8	
Approach LOS	C	D	C	B	
Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LTR	LTR	LT	R
Assumed Moves	LTR	LTR	LTR	LT	R
RT Channelized					Yield
Lane Util	1.000	1.000	1.000	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	468	581	411	377	136
Cap Entry Lane, veh/h	676	715	708	654	749
Entry HV Adj Factor	0.952	0.954	0.951	0.952	0.952
Flow Entry, veh/h	446	554	391	359	130
Cap Entry, veh/h	644	682	673	622	713
V/C Ratio	0.692	0.813	0.581	0.577	0.182
Control Delay, s/veh	20.7	28.1	15.4	16.3	7.1
LOS	C	D	C	C	A
95th %tile Queue, veh	6	8	4	4	1

HCM 2010 Signalized Intersection Summary

5: Shasta View Dr & Tarmac Road

Year 2035 Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	30	220	250	10	70	90	460	150	90	690	20
Future Volume (veh/h)	30	30	220	250	10	70	90	460	150	90	690	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1900	1827	1827	1827	1827	1900	1827	1827	1827	1827	1827	1900
Adj Flow Rate, veh/h	33	33	239	272	11	76	98	500	163	98	750	22
Adj No. of Lanes	0	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	172	172	299	445	26	182	126	1100	492	127	1093	32
Arrive On Green	0.19	0.19	0.19	0.13	0.13	0.13	0.07	0.32	0.32	0.07	0.32	0.32
Sat Flow, veh/h	891	891	1553	3375	200	1383	1740	3471	1553	1740	3444	101
Grp Volume(v), veh/h	66	0	239	272	0	87	98	500	163	98	378	394
Grp Sat Flow(s),veh/h/ln	1782	0	1553	1688	0	1583	1740	1736	1553	1740	1736	1809
Q Serve(g_s), s	1.7	0.0	8.2	4.3	0.0	2.8	3.1	6.4	4.5	3.1	10.6	10.6
Cycle Q Clear(g_c), s	1.7	0.0	8.2	4.3	0.0	2.8	3.1	6.4	4.5	3.1	10.6	10.6
Prop In Lane	0.50		1.00	1.00		0.87	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	343	0	299	445	0	209	126	1100	492	127	551	574
V/C Ratio(X)	0.19	0.00	0.80	0.61	0.00	0.42	0.78	0.45	0.33	0.77	0.69	0.69
Avail Cap(c_a), veh/h	510	0	444	966	0	453	249	1366	611	311	745	776
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.9	0.0	21.5	22.9	0.0	22.3	25.5	15.2	14.6	25.5	16.7	16.7
Incr Delay (d2), s/veh	0.3	0.0	6.2	1.4	0.0	1.3	10.0	0.3	0.4	9.6	1.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	4.0	2.0	0.0	1.3	1.8	3.1	2.0	1.8	5.3	5.5
LnGrp Delay(d),s/veh	19.2	0.0	27.7	24.3	0.0	23.6	35.5	15.5	15.0	35.1	18.3	18.2
LnGrp LOS	B		C	C		C	D	B	B	D	B	B
Approach Vol, veh/h	305					359		761		870		
Approach Delay, s/veh	25.9					24.1		18.0		20.1		
Approach LOS	C					C		B		C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	8.1	21.7	14.8		8.0	21.7	11.4					
Change Period (Y+Rc), s	4.0	4.0	4.0		4.0	4.0	4.0					
Max Green Setting (Gmax), s	10.0	22.0	16.0		8.0	24.0	16.0					
Max Q Clear Time (g_c+1.5s), s	15.5	8.4	10.2		5.1	12.6	6.3					
Green Ext Time (p_c), s	0.1	5.6	0.6		0.1	5.1	1.1					
Intersection Summary												
HCM 2010 Ctrl Delay			20.8									
HCM 2010 LOS			C									

HCM 2010 TWSC
6: Shasta View Dr & SR 44 WB Ramps

Year 2035 Conditions
AM Peak

Intersection												
Int Delay, s/veh		1.5										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↕		↕↕	↕		↕↕	↕
Traffic Vol, veh/h	0	0	0	70	0	120	0	660	460	0	410	750
Future Vol, veh/h	0	0	0	70	0	120	0	660	460	0	410	750
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	Free
Storage Length	-	-	-	-	-	150	-	-	0	-	-	200
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	76	0	130	0	717	500	0	446	815
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				945	1163	-	-	0	-	-	-	0
Stage 1				717	717	-	-	-	-	-	-	-
Stage 2				228	446	-	-	-	-	-	-	-
Critical Hdwy				6.84	6.54	-	-	-	-	-	-	-
Critical Hdwy Stg 1				5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy				3.52	4.02	-	-	-	-	-	-	-
Pot Cap-1 Maneuver				260	193	0	0	-	0	0	-	0
Stage 1				445	432	0	0	-	0	0	-	0
Stage 2				788	572	0	0	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				259	0	-	-	-	-	-	-	-
Mov Cap-2 Maneuver				259	0	-	-	-	-	-	-	-
Stage 1				445	0	-	-	-	-	-	-	-
Stage 2				785	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				24.6			0			0		
HCM LOS				C								
Minor Lane/Major Mvmt		NBTWBLn1WBLn2		SBT								
Capacity (veh/h)		- 259		-								
HCM Lane V/C Ratio		- 0.294		-								
HCM Control Delay (s)		- 24.6		0								
HCM Lane LOS		- C		A								
HCM 95th %tile Q(veh)		- 1.2		-								

HCM 2010 Signalized Intersection Summary

7: SR 44 EB Ramps & Shasta View Dr

Year 2035 Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	0	230	0	0	0	0	720	120	180	300	0
Future Volume (veh/h)	400	0	230	0	0	0	0	720	120	180	300	0
Number	7	4	14				5	2	12	1	6	16
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	1845	1845				0	1845	1845	1845	1845	0
Adj Flow Rate, veh/h	435	0	250				0	783	0	196	326	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	553	0	491				0	1112	498	252	1877	0
Arrive On Green	0.31	0.00	0.31				0.00	0.32	0.00	0.14	0.54	0.00
Sat Flow, veh/h	1757	0	1560				0	3597	1568	1757	3597	0
Grp Volume(v), veh/h	435	0	250				0	783	0	196	326	0
Grp Sat Flow(s),veh/h/ln	1757	0	1560				0	1752	1568	1757	1752	0
Q Serve(g_s), s	12.1	0.0	7.0				0.0	10.5	0.0	5.8	2.5	0.0
Cycle Q Clear(g_c), s	12.1	0.0	7.0				0.0	10.5	0.0	5.8	2.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	553	0	491				0	1112	498	252	1877	0
V/C Ratio(X)	0.79	0.00	0.51				0.00	0.70	0.00	0.78	0.17	0.00
Avail Cap(c_a), veh/h	952	0	846				0	1638	733	460	2818	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	1.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.7	0.0	14.9				0.0	16.0	0.0	22.1	6.4	0.0
Incr Delay (d2), s/veh	2.5	0.0	0.8				0.0	0.8	0.0	5.1	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	6.2	0.0	3.1				0.0	5.1	0.0	3.1	1.2	0.0
LnGrp Delay(d),s/veh	19.2	0.0	15.8				0.0	16.9	0.0	27.2	6.4	0.0
LnGrp LOS	B		B					B		C	A	
Approach Vol, veh/h		685						783			522	
Approach Delay, s/veh		18.0						16.9			14.2	
Approach LOS		B						B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.7	21.0		20.8		32.6						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	14.0	25.0		29.0		43.0						
Max Q Clear Time (g_c+I1), s	7.8	12.5		14.1		4.5						
Green Ext Time (p_c), s	0.4	4.5		2.8		6.2						
Intersection Summary												
HCM 2010 Ctrl Delay			16.5									
HCM 2010 LOS			B									

Intersection

Intersection Delay, s/veh 80.2

Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations			↕				↕				↕				↕	↕
Traffic Vol, veh/h	0	70	220	140	0	130	360	120	0	110	190	80	0	100	160	60
Future Vol, veh/h	0	70	220	140	0	130	360	120	0	110	190	80	0	100	160	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	76	239	152	0	141	391	130	0	120	207	87	0	109	174	65
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	134.8	335.3	100	41
HCM LOS	F	F	F	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	29%	16%	21%	38%	0%
Vol Thru, %	50%	51%	59%	62%	0%
Vol Right, %	21%	33%	20%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	380	430	610	260	60
LT Vol	110	70	130	100	0
Through Vol	190	220	360	160	0
RT Vol	80	140	120	0	60
Lane Flow Rate	413	467	663	283	65
Geometry Grp	5	2	2	7	7
Degree of Util (X)	1.05	1.163	1.666	0.779	0.164
Departure Headway (Hd)	11.419	10.957	9.802	12.044	11.099
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	322	337	378	302	325
Service Time	9.419	8.957	7.802	9.744	8.799
HCM Lane V/C Ratio	1.283	1.386	1.754	0.937	0.2
HCM Control Delay	100	134.8	335.3	46.8	16
HCM Lane LOS	F	F	F	E	C
HCM 95th-tile Q	12.2	15.8	36.8	6.1	0.6

HCM 2010 Signalized Intersection Summary

9: Old Oregon Trail & Old Forty-Four Drive

Year 2035 Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	50	250	10	40	140	350	190	70	330	30
Future Volume (veh/h)	10	10	50	250	10	40	140	350	190	70	330	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1776	1776	1900	1776	1776	1900	1776	1776	1900	1776	1776	1900
Adj Flow Rate, veh/h	11	11	54	272	11	43	152	380	207	76	359	33
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	19	18	90	324	79	311	192	441	240	94	561	52
Arrive On Green	0.01	0.07	0.07	0.19	0.25	0.25	0.11	0.41	0.41	0.06	0.35	0.35
Sat Flow, veh/h	1691	262	1287	1691	317	1240	1691	1082	589	1691	1602	147
Grp Volume(v), veh/h	11	0	65	272	0	54	152	0	587	76	0	392
Grp Sat Flow(s),veh/h/ln	1691	0	1549	1691	0	1557	1691	0	1672	1691	0	1750
Q Serve(g_s), s	0.4	0.0	2.4	9.0	0.0	1.6	5.1	0.0	18.7	2.6	0.0	10.9
Cycle Q Clear(g_c), s	0.4	0.0	2.4	9.0	0.0	1.6	5.1	0.0	18.7	2.6	0.0	10.9
Prop In Lane	1.00		0.83	1.00		0.80	1.00		0.35	1.00		0.08
Lane Grp Cap(c), veh/h	19	0	108	324	0	390	192	0	682	94	0	613
V/C Ratio(X)	0.58	0.00	0.60	0.84	0.00	0.14	0.79	0.00	0.86	0.81	0.00	0.64
Avail Cap(c_a), veh/h	116	0	425	406	0	695	290	0	861	116	0	721
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.7	0.0	26.3	22.7	0.0	16.9	25.2	0.0	15.7	27.2	0.0	15.9
Incr Delay (d2), s/veh	25.1	0.0	5.2	11.9	0.0	0.2	8.3	0.0	7.3	27.6	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.2	5.2	0.0	0.7	2.8	0.0	9.9	1.9	0.0	5.5
LnGrp Delay(d),s/veh	53.8	0.0	31.5	34.6	0.0	17.1	33.5	0.0	23.1	54.8	0.0	17.3
LnGrp LOS	D		C	C		B	C		C	D		B
Approach Vol, veh/h	76					326		739		468		
Approach Delay, s/veh	34.7					31.7		25.2		23.4		
Approach LOS	C					C		C		C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.2	27.8	15.2	8.1	10.6	24.4	4.7	18.6				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	30.0	14.0	16.0	10.0	24.0	4.0	26.0				
Max Q Clear Time (g_c+14.6)	4.0	20.7	11.0	4.4	7.1	12.9	2.4	3.6				
Green Ext Time (p_c), s	0.0	3.1	0.3	0.3	0.1	3.4	0.0	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			26.5									
HCM 2010 LOS			C									

HCM 2010 TWSC
10: Airport Road/Old Oregon Trail & SR 44 WB Ramps

Year 2035 Conditions
AM Peak

Intersection												
Int Delay, s/veh	13.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↕	↕			↕	
Traffic Vol, veh/h	0	0	0	130	0	70	190	610	0	0	380	250
Future Vol, veh/h	0	0	0	130	0	70	190	610	0	0	380	250
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	0	141	0	76	207	663	0	0	413	272

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1630	1766	668	690	0	-	-	-	0
Stage 1	1076	1076	-	-	-	-	-	-	-
Stage 2	554	690	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	6.24	4.14	-	-	-	-	-
Critical Hdwy Stg 1	5.44	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	2.236	-	-	-	-	-
Pot Cap-1 Maneuver	~ 111	83	455	895	-	0	0	-	-
Stage 1	324	293	-	-	-	0	0	-	-
Stage 2	572	443	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	~ 85	0	453	891	-	-	-	-	-
Mov Cap-2 Maneuver	172	0	-	-	-	-	-	-	-
Stage 1	249	0	-	-	-	-	-	-	-
Stage 2	570	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	104	2.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	891	-	220	-
HCM Lane V/C Ratio	0.232	-	0.988	-
HCM Control Delay (s)	10.3	-	104	-
HCM Lane LOS	B	-	F	-
HCM 95th %tile Q(veh)	0.9	-	8.9	-

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

HCM 2010 Signalized Intersection Summary

11: Airport Road & SR 44 EB Ramps

Year 2035 Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	250	0	340	0	0	0	0	550	220	80	430	0
Future Volume (veh/h)	250	0	340	0	0	0	0	550	220	80	430	0
Number	7	4	14				5	2	12	1	6	16
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	1810	1810				0	1810	1810	1810	1810	0
Adj Flow Rate, veh/h	272	0	370				0	598	239	87	467	0
Adj No. of Lanes	0	1	1				0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5				0	5	5	5	5	0
Cap, veh/h	503	0	449				0	769	653	111	1017	0
Arrive On Green	0.29	0.00	0.29				0.00	0.42	0.42	0.06	0.56	0.00
Sat Flow, veh/h	1723	0	1538				0	1810	1538	1723	1810	0
Grp Volume(v), veh/h	272	0	370				0	598	239	87	467	0
Grp Sat Flow(s),veh/h/ln	1723	0	1538				0	1810	1538	1723	1810	0
Q Serve(g_s), s	7.3	0.0	12.3				0.0	15.6	5.8	2.7	8.4	0.0
Cycle Q Clear(g_c), s	7.3	0.0	12.3				0.0	15.6	5.8	2.7	8.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	503	0	449				0	769	653	111	1017	0
V/C Ratio(X)	0.54	0.00	0.82				0.00	0.78	0.37	0.79	0.46	0.00
Avail Cap(c_a), veh/h	660	0	589				0	1253	1065	283	1682	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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.3	0.0	18.1				0.0	13.6	10.7	25.3	7.1	0.0
Incr Delay (d2), s/veh	0.9	0.0	7.2				0.0	1.7	0.3	11.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	6.0				0.0	8.0	2.5	1.6	4.2	0.0
LnGrp Delay(d),s/veh	17.2	0.0	25.3				0.0	15.3	11.1	36.8	7.4	0.0
LnGrp LOS	B		C					B	B	D	A	
Approach Vol, veh/h		642						837			554	
Approach Delay, s/veh		21.9						14.1			12.0	
Approach LOS		C						B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.5	27.3		20.0		34.8						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	9.0	38.0		21.0		51.0						
Max Q Clear Time (g_c+I1), s	4.7	17.6		14.3		10.4						
Green Ext Time (p_c), s	0.1	5.7		1.7		6.5						
Intersection Summary												
HCM 2010 Ctrl Delay			16.0									
HCM 2010 LOS			B									

Intersection						
Int Delay, s/veh	4.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	170	20	60	130	20	140
Future Vol, veh/h	170	20	60	130	20	140
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	155	185	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	185	22	65	141	22	152
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	271	75	0	0	70	0
Stage 1	70	-	-	-	-	-
Stage 2	201	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	718	986	-	-	1531	-
Stage 1	953	-	-	-	-	-
Stage 2	833	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	702	978	-	-	1525	-
Mov Cap-2 Maneuver	702	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	818	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.7	0		0.9		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 702 978 1525	-	-		
HCM Lane V/C Ratio	-	- 0.263 0.022 0.014	-	-		
HCM Control Delay (s)	-	- 12 8.8 7.4	-	-		
HCM Lane LOS	-	- B A A	-	-		
HCM 95th %tile Q(veh)	-	- 1.1 0.1 0	-	-		

HCM 2010 TWSC
13: Deschutes Road & Boyle Road

Year 2035 Conditions
AM Peak

Intersection												
Int Delay, s/veh	15.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↑	↘	↙	↘	
Traffic Vol, veh/h	10	60	100	110	80	20	60	170	130	10	310	20
Future Vol, veh/h	10	60	100	110	80	20	60	170	130	10	310	20
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	50	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	65	109	120	87	22	65	185	141	11	337	22
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	750	695	358	782	705	195	364	0	0	190	0	0
Stage 1	375	375	-	320	320	-	-	-	-	-	-	-
Stage 2	375	320	-	462	385	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	328	366	686	312	361	846	1195	-	-	1384	-	-
Stage 1	646	617	-	692	652	-	-	-	-	-	-	-
Stage 2	646	652	-	580	611	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	242	340	680	211	336	839	1190	-	-	1378	-	-
Mov Cap-2 Maneuver	242	340	-	211	336	-	-	-	-	-	-	-
Stage 1	608	610	-	651	614	-	-	-	-	-	-	-
Stage 2	509	614	-	430	604	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	17.7			64.2			1.4			0.2		
HCM LOS	C			F								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1190	-	-	466	268	1378	-	-				
HCM Lane V/C Ratio	0.055	-	-	0.397	0.852	0.008	-	-				
HCM Control Delay (s)	8.2	-	-	17.7	64.2	7.6	-	-				
HCM Lane LOS	A	-	-	C	F	A	-	-				
HCM 95th %tile O(veh)	0.2	-	-	1.9	7.1	0	-	-				

HCM 2010 AWSC
14: Deschutes Road & Old Forty-Four Drive

Year 2035 Conditions

AM Peak

Intersection												
Intersection Delay, s/veh	56.2											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	80	40	200	0	40	60	180	0	160	420	30
Future Vol, veh/h	0	80	40	200	0	40	60	180	0	160	420	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	3	3	3	5	3	3	3	5	3	3	3
Mvmt Flow	0	87	43	217	0	43	65	196	0	174	457	33
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	2				2				2			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	2				2				2			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	2				2				2			
HCM Control Delay	23.5				25.2				101.8			
HCM LOS	C				D				F			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2				
Vol Left, %	100%	0%	100%	0%	100%	0%	27%	0%				
Vol Thru, %	0%	93%	0%	17%	0%	25%	73%	77%				
Vol Right, %	0%	7%	0%	83%	0%	75%	0%	23%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	160	450	80	240	40	240	330	310				
LT Vol	160	0	80	0	40	0	90	0				
Through Vol	0	420	0	40	0	60	240	240				
RT Vol	0	30	0	200	0	180	0	70				
Lane Flow Rate	174	489	87	261	43	261	359	337				
Geometry Grp	7	7	7	7	7	7	7	7				
Degree of Util (X)	0.447	1.18	0.235	0.627	0.119	0.639	0.865	0.785				
Departure Headway (Hd)	9.256	8.688	10.248	9.111	10.353	9.276	9.1	8.792				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	390	421	352	399	348	391	402	414				
Service Time	7.02	6.452	7.948	6.811	8.053	6.976	6.8	6.492				
HCM Lane V/C Ratio	0.446	1.162	0.247	0.654	0.124	0.668	0.893	0.814				
HCM Control Delay	19.3	131.2	16.1	25.9	14.4	27	48.2	36.9				
HCM Lane LOS	C	F	C	D	B	D	E	E				
HCM 95th-tile Q	2.2	18.9	0.9	4.1	0.4	4.3	8.5	6.8				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	90	480	70
Future Vol, veh/h	0	90	480	70
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	3	3	3
Mvmt Flow	0	98	522	76
Number of Lanes	0	0	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	42.7
HCM LOS	E

HCM 2010 AWSC
15: Deschutes Road & Cedro Lane

Year 2035 Conditions

AM Peak

Intersection

Intersection Delay, s/veh96.4

Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	30	10	70	0	120	20	30	0	90	550	150	0	30	670	20
Future Vol, veh/h	0	30	10	70	0	120	20	30	0	90	550	150	0	30	670	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	3	3	3	5	3	3	3	5	3	3	3	5	3	3	3
Mvmt Flow	0	33	11	76	0	130	22	33	0	98	598	163	0	33	728	22
Number of Lanes	0	0	1	1	0	0	1	0	0	1	1	1	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	2
HCM Control Delay	15.5	23.7	145.2	72.4
HCM LOS	C	C	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	75%	0%	71%	100%	0%	0%
Vol Thru, %	0%	100%	0%	25%	0%	12%	0%	100%	92%
Vol Right, %	0%	0%	100%	0%	100%	18%	0%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	550	150	40	70	170	30	447	243
LT Vol	90	0	0	30	0	120	30	0	0
Through Vol	0	550	0	10	0	20	0	447	223
RT Vol	0	0	150	0	70	30	0	0	20
Lane Flow Rate	98	598	163	43	76	185	33	486	264
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.237	1.364	0.34	0.126	0.199	0.508	0.078	1.099	0.594
Departure Headway (Hd)	8.995	8.479	7.757	11.347	10.225	10.56	9.252	8.736	8.676
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	402	436	466	318	353	344	390	418	418
Service Time	6.695	6.179	5.457	9.047	7.925	8.26	6.952	6.436	6.376
HCM Lane V/C Ratio	0.244	1.372	0.35	0.135	0.215	0.538	0.085	1.163	0.632
HCM Control Delay	14.5	202.2	14.4	15.7	15.4	23.7	12.7	103.1	23.3
HCM Lane LOS	B	F	B	C	C	C	B	F	C
HCM 95th-tile Q	0.9	27.3	1.5	0.4	0.7	2.7	0.3	15.8	3.7

HCM 2010 TWSC
16: Deschutes Road & SR 44 WB Ramps

Year 2035 Conditions
AM Peak

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	40	0	50	240	740	0	0	300	560
Future Vol, veh/h	0	0	0	40	0	50	240	740	0	0	300	560
Conflicting Peds, #/hr	0	0	0	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	175	-	-	200	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	0	43	0	54	261	804	0	0	326	609
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1657	1657	407	331	0	-	-	-	0
Stage 1				1326	1326	-	-	-	-	-	-	-
Stage 2				331	331	-	-	-	-	-	-	-
Critical Hdwy				6.66	6.56	6.96	4.16	-	-	-	-	-
Critical Hdwy Stg 1				5.86	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.46	5.56	-	-	-	-	-	-	-
Follow-up Hdwy				3.538	4.038	3.338	2.238	-	-	-	-	-
Pot Cap-1 Maneuver				96	96	589	1214	-	0	0	-	0
Stage 1				210	221	-	-	-	0	0	-	0
Stage 2				722	640	-	-	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				75	0	587	1209	-	-	-	-	-
Mov Cap-2 Maneuver				75	0	-	-	-	-	-	-	-
Stage 1				165	0	-	-	-	-	-	-	-
Stage 2				719	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				53.2			2.2			0		
HCM LOS				F								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT							
Capacity (veh/h)	1209	-	75	587	-							
HCM Lane V/C Ratio	0.216	-	0.58	0.093	-							
HCM Control Delay (s)	8.8	-	104.9	11.8	-							
HCM Lane LOS	A	-	F	B	-							
HCM 95th %tile O(veh)	0.8	-	2.5	0.3	-							

HCM 2010 AWSC
17: Deschutes Road & SR 44 EB Ramps

Year 2035 Conditions

AM Peak

Intersection												
Intersection Delay, s/veh	22.6											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	440	0	140	0	0	0	0	0	0	540	50
Future Vol, veh/h	0	440	0	140	0	0	0	0	0	0	540	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	4	4	4	5	4	4	4	5	4	4	4
Mvmt Flow	0	478	0	152	0	0	0	0	0	0	587	54
Number of Lanes	0	1	1	1	0	0	0	0	0	0	2	1
Approach	EB										NB	
Opposing Approach											SB	
Opposing Lanes	0										2	
Conflicting Approach Left	SB										EB	
Conflicting Lanes Left	2										3	
Conflicting Approach Right	NB											
Conflicting Lanes Right	3										0	
HCM Control Delay	17.9										23.2	
HCM LOS	C										C	
Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	SBLn1	SBLn2				
Vol Left, %	0%	0%	0%	100%	100%	0%	100%	0%				
Vol Thru, %	100%	100%	0%	0%	0%	0%	0%	100%				
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	270	270	50	220	220	140	50	290				
LT Vol	0	0	0	220	220	0	50	0				
Through Vol	270	270	0	0	0	0	0	290				
RT Vol	0	0	50	0	0	140	0	0				
Lane Flow Rate	293	293	54	239	239	152	54	315				
Geometry Grp	8	8	8	7	7	7	8	8				
Degree of Util (X)	0.651	0.651	0.082	0.534	0.534	0.288	0.136	0.745				
Departure Headway (Hd)	7.991	7.991	5.462	8.043	8.043	6.82	9.019	8.506				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	452	452	654	450	450	527	397	426				
Service Time	5.741	5.741	3.21	5.782	5.782	4.559	6.778	6.264				
HCM Lane V/C Ratio	0.648	0.648	0.083	0.531	0.531	0.288	0.136	0.739				
HCM Control Delay	24.5	24.5	8.7	19.7	19.7	12.3	13.2	32.4				
HCM Lane LOS	C	C	A	C	C	B	B	D				
HCM 95th-tile Q	4.5	4.5	0.3	3.1	3.1	1.2	0.5	6				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	50	290	0
Future Vol, veh/h	0	50	290	0
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	4	4	4
Mvmt Flow	0	54	315	0
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	29.6
HCM LOS	D

HCM 2010 Signalized Intersection Summary

1: Deschutes Road & State Route 299

Year 2035 No Project Conditions

PM Peak

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (veh/h)	310	140	110	200	130	140		
Future Volume (veh/h)	310	140	110	200	130	140		
Number	2	12	1	6	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	316	143	112	204	133	143		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	859	726	146	1116	496	442		
Arrive On Green	0.47	0.47	0.08	0.60	0.28	0.28		
Sat Flow, veh/h	1845	1560	1757	1845	1757	1568		
Grp Volume(v), veh/h	316	143	112	204	133	143		
Grp Sat Flow(s),veh/h/ln	1845	1560	1757	1845	1757	1568		
Q Serve(g_s), s	7.8	3.8	4.4	3.5	4.2	5.1		
Cycle Q Clear(g_c), s	7.8	3.8	4.4	3.5	4.2	5.1		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	859	726	146	1116	496	442		
V/C Ratio(X)	0.37	0.20	0.77	0.18	0.27	0.32		
Avail Cap(c_a), veh/h	859	726	372	1353	496	442		
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	12.2	11.1	31.8	6.2	19.8	20.1		
Incr Delay (d2), s/veh	1.2	0.6	8.2	0.1	1.3	1.9		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.2	1.8	2.5	1.8	2.2	2.4		
LnGrp Delay(d),s/veh	13.4	11.7	40.1	6.3	21.1	22.0		
LnGrp LOS	B	B	D	A	C	C		
Approach Vol, veh/h	459			316	276			
Approach Delay, s/veh	12.9			18.3	21.6			
Approach LOS	B			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	9.9	37.0		24.0		46.9		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	15.0	33.0		20.0		52.0		
Max Q Clear Time (g_c+I1), s	6.4	9.8		7.1		5.5		
Green Ext Time (p_c), s	0.2	2.4		0.8		2.5		
Intersection Summary								
HCM 2010 Ctrl Delay			16.8					
HCM 2010 LOS			B					

HCM 2010 TWSC
2: Deschutes Road & Old Alturas Rd

Year 2035 No Project Conditions

PM Peak

Intersection													
Int Delay, s/veh		6.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations											 		
Traffic Vol, veh/h	40	20	30	50	20	70	30	160	40	80	120	50	
Future Vol, veh/h	40	20	30	50	20	70	30	160	40	80	120	50	
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	275	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	43	22	33	54	22	76	33	174	43	87	130	54	
Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	624	597	140	603	575	206	135	0	0	222	0	0	
Stage 1	309	309	-	266	266	-	-	-	-	-	-	-	
Stage 2	315	288	-	337	309	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	398	416	908	411	429	835	1449	-	-	1347	-	0	
Stage 1	701	660	-	739	689	-	-	-	-	-	-	0	
Stage 2	696	674	-	677	660	-	-	-	-	-	-	0	
Platoon blocked, %								-	-		-		
Mov Cap-1 Maneuver	318	374	900	349	385	828	1443	-	-	1341	-	-	
Mov Cap-2 Maneuver	318	374	-	349	385	-	-	-	-	-	-	-	
Stage 1	680	611	-	717	668	-	-	-	-	-	-	-	
Stage 2	593	654	-	583	611	-	-	-	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	16.1			15.3			1			3.1			
HCM LOS	C			C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT							
Capacity (veh/h)	1443	-	-	423	500	1341	-						
HCM Lane V/C Ratio	0.023	-	-	0.231	0.304	0.065	-						
HCM Control Delay (s)	7.6	0	-	16.1	15.3	7.9	0						
HCM Lane LOS	A	A	-	C	C	A	A						
HCM 95th %tile O(veh)	0.1	-	-	0.9	1.3	0.2	-						

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	85	10	10	15	35	95
Future Vol, veh/h	85	10	10	15	35	95
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	11	11	16	38	102
Major/Minor	Major1		Minor1		Major2	
Conflicting Flow All	107	0	381	21	16	-
Stage 1	-	-	199	-	-	-
Stage 2	-	-	182	-	-	-
Critical Hdwy	4.12	-	6.52	6.22	4.12	-
Critical Hdwy Stg 1	-	-	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	1484	-	552	1056	1602	-
Stage 1	-	-	736	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1484	-	0	1047	1595	-
Mov Cap-2 Maneuver	-	-	0	-	-	-
Stage 1	-	-	0	-	-	-
Stage 2	-	-	0	-	-	-
Approach	EB		WB		SB	
HCM Control Delay, s	6.8		8.5		2	
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBTWBLn1	SBL	SBR		
Capacity (veh/h)	1484	- 1047	1595	-		
HCM Lane V/C Ratio	0.062	- 0.026	0.024	-		
HCM Control Delay (s)	7.6	0 8.5	7.3	-		
HCM Lane LOS	A	A A	A	-		
HCM 95th %tile Q(veh)	0.2	- 0.1	0.1	-		

HCM 2010 Roundabout
4: Shasta View Dr & Old Alturas Rd

Year 2035 No Project Conditions

PM Peak

Intersection					
Intersection Delay, s/veh	26.4				
Intersection LOS	D				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	659	383	511	510	
Demand Flow Rate, veh/h	672	391	522	520	
Vehicles Circulating, veh/h	445	543	553	478	
Vehicles Exiting, veh/h	380	532	564	456	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	5	5	5	5	
Ped Cap Adj	0.999	0.999	0.999	0.999	
Approach Delay, s/veh	42.4	16.5	28.7	10.9	
Approach LOS	E	C	D	B	
Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LTR	LTR	LT	R
Assumed Moves	LTR	LTR	LTR	LT	R
RT Channelized					Yield
Lane Util	1.000	1.000	1.000	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	672	391	522	347	173
Cap Entry Lane, veh/h	724	657	650	701	773
Entry HV Adj Factor	0.981	0.980	0.979	0.981	0.980
Flow Entry, veh/h	659	383	511	340	170
Cap Entry, veh/h	710	643	636	687	757
V/C Ratio	0.929	0.596	0.804	0.496	0.225
Control Delay, s/veh	42.4	16.5	28.7	12.8	7.2
LOS	E	C	D	B	A
95th %tile Queue, veh	13	4	8	3	1

HCM 2010 Signalized Intersection Summary

5: Shasta View Dr & Tarmac Road

Year 2035 No Project Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖ ↗	↗	↖ ↗	↖ ↗		↖	↖ ↗	↗	↖	↖ ↗	
Traffic Volume (veh/h)	20	20	110	290	20	70	180	480	150	40	460	20
Future Volume (veh/h)	20	20	110	290	20	70	180	480	150	40	460	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1900	1863	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	22	22	120	315	22	76	196	522	163	43	500	22
Adj No. of Lanes	0	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	100	174	536	57	198	258	1269	568	65	862	38
Arrive On Green	0.11	0.11	0.11	0.16	0.16	0.16	0.15	0.36	0.36	0.04	0.25	0.25
Sat Flow, veh/h	909	909	1583	3442	368	1271	1774	3539	1583	1774	3454	152
Grp Volume(v), veh/h	44	0	120	315	0	98	196	522	163	43	256	266
Grp Sat Flow(s),veh/h/ln	1817	0	1583	1721	0	1639	1774	1770	1583	1774	1770	1836
Q Serve(g_s), s	1.0	0.0	3.4	4.0	0.0	2.5	5.0	5.2	3.5	1.1	6.0	6.0
Cycle Q Clear(g_c), s	1.0	0.0	3.4	4.0	0.0	2.5	5.0	5.2	3.5	1.1	6.0	6.0
Prop In Lane	0.50		1.00	1.00		0.78	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	200	0	174	536	0	255	258	1269	568	65	442	458
V/C Ratio(X)	0.22	0.00	0.69	0.59	0.00	0.38	0.76	0.41	0.29	0.66	0.58	0.58
Avail Cap(c_a), veh/h	617	0	537	1168	0	556	565	1952	873	226	638	662
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.1	0.0	20.2	18.5	0.0	17.9	19.3	11.4	10.8	22.4	15.5	15.5
Incr Delay (d2), s/veh	0.5	0.0	4.8	1.0	0.0	0.9	4.6	0.2	0.3	11.0	1.2	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	0.6	0.0	1.7	2.0	0.0	1.2	2.8	2.6	1.5	0.7	3.1	3.2
LnGrp Delay(d),s/veh	19.7	0.0	25.0	19.5	0.0	18.8	23.9	11.6	11.1	33.4	16.7	16.7
LnGrp LOS	B		C	B		B	C	B	B	C	B	B
Approach Vol, veh/h	164					413		881		565		
Approach Delay, s/veh	23.6					19.4		14.2		18.0		
Approach LOS	C					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	5.7	20.9	9.2		10.9	15.8	11.3					
Change Period (Y+Rc), s	4.0	4.0	4.0		4.0	4.0	4.0					
Max Green Setting (Gmax), s	6.0	26.0	16.0		15.0	17.0	16.0					
Max Q Clear Time (g_c+1.1s), s	13.5	7.2	5.4		7.0	8.0	6.0					
Green Ext Time (p_c), s	0.0	5.4	0.4		0.4	3.8	1.4					
Intersection Summary												
HCM 2010 Ctrl Delay			17.1									
HCM 2010 LOS			B									

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕	↗		↕	↗		↕	↗
Traffic Vol, veh/h	0	0	0	70	0	110	0	740	380	0	410	450
Future Vol, veh/h	0	0	0	70	0	110	0	740	380	0	410	450
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	Free
Storage Length	-	-	-	-	-	150	-	-	0	-	-	200
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	76	0	120	0	804	413	0	446	489
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1032	1250	-	-	0	-	-	-	0
Stage 1				804	804	-	-	-	-	-	-	-
Stage 2				228	446	-	-	-	-	-	-	-
Critical Hdwy				6.84	6.54	-	-	-	-	-	-	-
Critical Hdwy Stg 1				5.84	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.84	5.54	-	-	-	-	-	-	-
Follow-up Hdwy				3.52	4.02	-	-	-	-	-	-	-
Pot Cap-1 Maneuver				229	172	0	0	-	0	0	-	0
Stage 1				401	394	0	0	-	0	0	-	0
Stage 2				788	572	0	0	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				228	0	-	-	-	-	-	-	-
Mov Cap-2 Maneuver				228	0	-	-	-	-	-	-	-
Stage 1				401	0	-	-	-	-	-	-	-
Stage 2				785	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				28.5			0			0		
HCM LOS				D								
Minor Lane/Major Mvmt		NBTWBLn1WBLn2		SBT								
Capacity (veh/h)		-	228	-	-							
HCM Lane V/C Ratio		-	0.334	-	-							
HCM Control Delay (s)		-	28.5	0	-							
HCM Lane LOS		-	D	A	-							
HCM 95th %tile O(veh)		-	1.4	-	-							

HCM 2010 Signalized Intersection Summary

7: SR 44 EB Ramps & Shasta View Dr

Year 2035 No Project Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	560	0	500	0	0	0	0	560	60	100	380	0
Future Volume (veh/h)	560	0	500	0	0	0	0	560	60	100	380	0
Number	7	4	14				5	2	12	1	6	16
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	1863				0	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	609	0	543				0	609	0	109	413	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	785	0	700				0	899	402	142	1446	0
Arrive On Green	0.44	0.00	0.44				0.00	0.25	0.00	0.08	0.41	0.00
Sat Flow, veh/h	1774	0	1583				0	3632	1583	1774	3632	0
Grp Volume(v), veh/h	609	0	543				0	609	0	109	413	0
Grp Sat Flow(s),veh/h/ln	1774	0	1583				0	1770	1583	1774	1770	0
Q Serve(g_s), s	15.6	0.0	15.6				0.0	8.3	0.0	3.2	4.2	0.0
Cycle Q Clear(g_c), s	15.6	0.0	15.6				0.0	8.3	0.0	3.2	4.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	785	0	700				0	899	402	142	1446	0
V/C Ratio(X)	0.78	0.00	0.78				0.00	0.68	0.00	0.77	0.29	0.00
Avail Cap(c_a), veh/h	1324	0	1181				0	1254	561	298	2112	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.7	0.0	12.7				0.0	18.0	0.0	24.2	10.6	0.0
Incr Delay (d2), s/veh	1.7	0.0	1.9				0.0	0.9	0.0	8.5	0.1	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	8.0	0.0	7.2				0.0	4.2	0.0	1.9	2.0	0.0
LnGrp Delay(d),s/veh	14.4	0.0	14.6				0.0	18.9	0.0	32.7	10.7	0.0
LnGrp LOS	B		B					B		C	B	
Approach Vol, veh/h	1152							609			522	
Approach Delay, s/veh	14.5							18.9			15.3	
Approach LOS	B							B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4			6						
Phs Duration (G+Y+Rc), s	8.3	17.6	27.7			25.9						
Change Period (Y+Rc), s	4.0	4.0	4.0			4.0						
Max Green Setting (Gmax), s	9.0	19.0	40.0			32.0						
Max Q Clear Time (g_c+I1), s	5.2	10.3	17.6			6.2						
Green Ext Time (p_c), s	0.1	3.3	6.1			5.2						
Intersection Summary												
HCM 2010 Ctrl Delay			15.9									
HCM 2010 LOS			B									

Intersection

Intersection Delay, s/veh 137.2

Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	110	300	90	0	90	190	100	0	80	210	140	0	140	180	80
Future Vol, veh/h	0	110	300	90	0	90	190	100	0	80	210	140	0	140	180	80
Peak Hour Factor	0.88	0.94	0.94	0.94	0.88	0.94	0.94	0.94	0.88	0.94	0.94	0.94	0.88	0.94	0.94	0.94
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	117	319	96	0	96	202	106	0	85	223	149	0	149	191	85
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	219.6	99.2	145.7	61.2
HCM LOS	F	F	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	19%	22%	24%	44%	0%
Vol Thru, %	49%	60%	50%	56%	0%
Vol Right, %	33%	18%	26%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	430	500	380	320	80
LT Vol	80	110	90	140	0
Through Vol	210	300	190	180	0
RT Vol	140	90	100	0	80
Lane Flow Rate	457	532	404	340	85
Geometry Grp	5	2	2	7	7
Degree of Util (X)	1.195	1.389	1.05	0.941	0.213
Departure Headway (Hd)	10.831	10.312	11.237	11.627	10.657
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	339	356	327	313	339
Service Time	8.831	8.312	9.237	9.327	8.357
HCM Lane V/C Ratio	1.348	1.494	1.235	1.086	0.251
HCM Control Delay	145.7	219.6	99.2	72.5	16.2
HCM Lane LOS	F	F	F	F	C
HCM 95th-tile Q	16.9	24.4	12.3	9.4	0.8

HCM 2010 Signalized Intersection Summary
9: Old Oregon Trail & Old Forty-Four Drive

Year 2035 No Project Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	30	100	240	15	60	50	370	210	50	430	20
Future Volume (veh/h)	30	30	100	240	15	60	50	370	210	50	430	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	33	33	109	261	16	65	54	402	228	54	467	22
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	49	46	153	313	87	354	69	458	260	69	724	34
Arrive On Green	0.03	0.12	0.12	0.18	0.27	0.27	0.04	0.41	0.41	0.04	0.41	0.41
Sat Flow, veh/h	1774	381	1259	1774	322	1309	1774	1117	634	1774	1765	83
Grp Volume(v), veh/h	33	0	142	261	0	81	54	0	630	54	0	489
Grp Sat Flow(s),veh/h/ln	1774	0	1641	1774	0	1632	1774	0	1751	1774	0	1848
Q Serve(g_s), s	1.2	0.0	5.3	9.0	0.0	2.4	1.9	0.0	21.0	1.9	0.0	13.4
Cycle Q Clear(g_c), s	1.2	0.0	5.3	9.0	0.0	2.4	1.9	0.0	21.0	1.9	0.0	13.4
Prop In Lane	1.00		0.77	1.00		0.80	1.00		0.36	1.00		0.04
Lane Grp Cap(c), veh/h	49	0	200	313	0	441	69	0	718	69	0	758
V/C Ratio(X)	0.67	0.00	0.71	0.83	0.00	0.18	0.79	0.00	0.88	0.79	0.00	0.65
Avail Cap(c_a), veh/h	168	0	415	393	0	620	140	0	831	112	0	848
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	26.7	25.1	0.0	17.7	30.1	0.0	17.2	30.1	0.0	15.0
Incr Delay (d2), s/veh	14.5	0.0	4.6	11.9	0.0	0.2	17.5	0.0	9.5	17.5	0.0	1.4
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	0.8	0.0	2.6	5.4	0.0	1.1	1.3	0.0	11.9	1.3	0.0	7.1
LnGrp Delay(d),s/veh	44.9	0.0	31.3	37.0	0.0	17.9	47.6	0.0	26.7	47.6	0.0	16.4
LnGrp LOS	D		C	D		B	D		C	D		B
Approach Vol, veh/h	175					342		684		543		
Approach Delay, s/veh	33.9					32.5		28.3		19.5		
Approach LOS	C					C		C		B		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.4	29.9	15.1	11.7	6.4	29.9	5.8	21.1				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	30.0	14.0	16.0	5.0	29.0	6.0	24.0				
Max Q Clear Time (g_c+1.0), s	13.5	23.0	11.0	7.3	3.9	15.4	3.2	4.4				
Green Ext Time (p_c), s	0.0	3.0	0.3	0.5	0.0	4.3	0.0	0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			26.9									
HCM 2010 LOS			C									

HCM 2010 TWSC
10: Airport Road/Old Oregon Trail & SR 44 WB Ramps

Year 2035 No Project Conditions

PM Peak

Intersection												
Int Delay, s/veh	65.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↙	↑			↘	
Traffic Vol, veh/h	0	0	0	140	0	60	330	570	0	0	450	320
Future Vol, veh/h	0	0	0	140	0	60	330	570	0	0	450	320
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	152	0	65	359	620	0	0	489	348
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				2005	2179	625	842	0	-	-	-	0
Stage 1				1337	1337	-	-	-	-	-	-	-
Stage 2				668	842	-	-	-	-	-	-	-
Critical Hdwy				6.45	6.55	6.25	4.15	-	-	-	-	-
Critical Hdwy Stg 1				5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy				3.545	4.045	3.345	2.245	-	-	-	-	-
Pot Cap-1 Maneuver				~ 64	45	479	781	-	0	0	-	-
Stage 1				241	219	-	-	-	0	0	-	-
Stage 2				504	376	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				~ 34	0	477	778	-	-	-	-	-
Mov Cap-2 Maneuver				~ 78	0	-	-	-	-	-	-	-
Stage 1				~ 130	0	-	-	-	-	-	-	-
Stage 2				502	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				\$ 589.5			5			0		
HCM LOS				F								
Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR								
Capacity (veh/h)	778	- 104	-	-								
HCM Lane V/C Ratio	0.461	- 2.09	-	-								
HCM Control Delay (s)	13.5	\$ 589.5	-	-								
HCM Lane LOS	B	- F	-	-								
HCM 95th %tile Q(veh)	2.5	- 18.6	-	-								
Notes												
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon												

HCM 2010 Signalized Intersection Summary

11: Airport Road & SR 44 EB Ramps

Year 2035 No Project Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	0	350	0	0	0	0	630	200	70	520	0
Future Volume (veh/h)	270	0	350	0	0	0	0	630	200	70	520	0
Number	7	4	14				5	2	12	1	6	16
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	1827	1827				0	1827	1827	1827	1827	0
Adj Flow Rate, veh/h	293	0	380				0	685	217	76	565	0
Adj No. of Lanes	0	1	1				0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4				0	4	4	4	4	0
Cap, veh/h	496	0	442				0	844	718	97	1066	0
Arrive On Green	0.28	0.00	0.28				0.00	0.46	0.46	0.06	0.58	0.00
Sat Flow, veh/h	1740	0	1553				0	1827	1553	1740	1827	0
Grp Volume(v), veh/h	293	0	380				0	685	217	76	565	0
Grp Sat Flow(s),veh/h/ln	1740	0	1553				0	1827	1553	1740	1827	0
Q Serve(g_s), s	8.8	0.0	14.1				0.0	19.6	5.3	2.6	11.3	0.0
Cycle Q Clear(g_c), s	8.8	0.0	14.1				0.0	19.6	5.3	2.6	11.3	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	496	0	442				0	844	718	97	1066	0
V/C Ratio(X)	0.59	0.00	0.86				0.00	0.81	0.30	0.79	0.53	0.00
Avail Cap(c_a), veh/h	573	0	511				0	1203	1022	229	1563	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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.7	0.0	20.6				0.0	14.1	10.2	28.3	7.6	0.0
Incr Delay (d2), s/veh	1.2	0.0	12.4				0.0	2.9	0.2	13.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	7.5				0.0	10.4	2.3	1.6	5.8	0.0
LnGrp Delay(d),s/veh	19.9	0.0	33.0				0.0	16.9	10.5	41.4	8.0	0.0
LnGrp LOS	B		C					B	B	D	A	
Approach Vol, veh/h		673						902			641	
Approach Delay, s/veh		27.3						15.4			12.0	
Approach LOS		C						B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.4	32.1		21.3		39.5						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	8.0	40.0		20.0		52.0						
Max Q Clear Time (g_c+I1), s	4.6	21.6		16.1		13.3						
Green Ext Time (p_c), s	0.0	6.5		1.2		7.8						
Intersection Summary												
HCM 2010 Ctrl Delay			18.0									
HCM 2010 LOS			B									

Intersection						
Int Delay, s/veh	3.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	120	10	80	100	10	95
Future Vol, veh/h	120	10	80	100	10	95
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	155	185	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	130	11	87	109	11	103
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	222	97	0	0	92	0
Stage 1	92	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	766	959	-	-	1503	-
Stage 1	932	-	-	-	-	-
Stage 2	896	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	754	951	-	-	1497	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	928	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.6	0		0.7		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 754 951 1497	-	-		
HCM Lane V/C Ratio	-	- 0.173 0.011 0.007	-	-		
HCM Control Delay (s)	-	- 10.8 8.8 7.4	-	-		
HCM Lane LOS	-	- B A A	-	-		
HCM 95th %tile Q(veh)	-	- 0.6 0 0	-	-		

HCM 2010 TWSC
13: Deschutes Road & Boyle Road

Year 2035 No Project Conditions

PM Peak

Intersection												
Int Delay, s/veh		5.1										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	20	60	40	20	20	80	200	60	20	160	30
Future Vol, veh/h	30	20	60	40	20	20	80	200	60	20	160	30
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	21	63	42	21	21	84	211	63	21	168	32
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	668	678	194	689	663	252	205	0	0	279	0	0
Stage 1	231	231	-	416	416	-	-	-	-	-	-	-
Stage 2	437	447	-	273	247	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	372	374	847	360	382	787	1366	-	-	1284	-	-
Stage 1	772	713	-	614	592	-	-	-	-	-	-	-
Stage 2	598	573	-	733	702	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	322	342	840	296	350	780	1360	-	-	1279	-	-
Mov Cap-2 Maneuver	322	342	-	296	350	-	-	-	-	-	-	-
Stage 1	721	698	-	574	553	-	-	-	-	-	-	-
Stage 2	523	535	-	644	688	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.5			17.7			1.8			0.7		
HCM LOS	B			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1360	-	-	493	367	1279	-	-				
HCM Lane V/C Ratio	0.062	-	-	0.235	0.229	0.016	-	-				
HCM Control Delay (s)	7.8	-	-	14.5	17.7	7.9	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile O(veh)	0.2	-	-	0.9	0.9	0.1	-	-				

HCM 2010 AWSC
14: Deschutes Road & Old Forty-Four Drive

Year 2035 No Project Conditions

PM Peak

Intersection												
Intersection Delay, s/veh	39.5											
Intersection LOS	E											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	40	40	80	0	70	35	80	0	80	450	70
Future Vol, veh/h	0	40	40	80	0	70	35	80	0	80	450	70
Peak Hour Factor	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	43	43	87	0	76	38	87	0	87	489	76
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	2				2				2			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	2				2				2			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	2				2				2			
HCM Control Delay	13.3				13.3				71.4			
HCM LOS	B				B				F			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2				
Vol Left, %	100%	0%	100%	0%	100%	0%	30%	0%				
Vol Thru, %	0%	87%	0%	33%	0%	30%	70%	85%				
Vol Right, %	0%	13%	0%	67%	0%	70%	0%	15%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	80	520	40	120	70	115	235	195				
LT Vol	80	0	40	0	70	0	70	0				
Through Vol	0	450	0	40	0	35	165	165				
RT Vol	0	70	0	80	0	80	0	30				
Lane Flow Rate	87	565	43	130	76	125	255	212				
Geometry Grp	7	7	7	7	7	7	7	7				
Degree of Util (X)	0.177	1.058	0.105	0.277	0.181	0.262	0.509	0.406				
Departure Headway (Hd)	7.343	6.737	8.863	7.862	8.779	7.758	7.343	7.079				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	491	543	407	460	411	466	493	511				
Service Time	5.043	4.437	6.563	5.562	6.479	5.458	5.043	4.779				
HCM Lane V/C Ratio	0.177	1.041	0.106	0.283	0.185	0.268	0.517	0.415				
HCM Control Delay	11.6	80.6	12.6	13.5	13.4	13.2	17.4	14.5				
HCM Lane LOS	B	F	B	B	B	B	C	B				
HCM 95th-tile Q	0.6	16.6	0.3	1.1	0.7	1	2.8	1.9				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	70	330	30
Future Vol, veh/h	0	70	330	30
Peak Hour Factor	0.88	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2
Mvmt Flow	0	76	359	33
Number of Lanes	0	0	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	16.1
HCM LOS	C

HCM 2010 AWSC
15: Deschutes Road & Cedro Lane

Year 2035 No Project Conditions

PM Peak

Intersection

Intersection Delay, s/veh56.4

Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	70	50	120	0	110	20	20	0	180	480	100	0	30	400	40
Future Vol, veh/h	0	70	50	120	0	110	20	20	0	180	480	100	0	30	400	40
Peak Hour Factor	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	76	54	130	0	120	22	22	0	196	522	109	0	33	435	43
Number of Lanes	0	0	1	1	0	0	1	0	0	1	1	1	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	2
HCM Control Delay	17.3	21.5	94.9	25.2
HCM LOS	C	C	F	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	58%	0%	73%	100%	0%	0%
Vol Thru, %	0%	100%	0%	42%	0%	13%	0%	100%	77%
Vol Right, %	0%	0%	100%	0%	100%	13%	0%	0%	23%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	180	480	100	120	120	150	30	267	173
LT Vol	180	0	0	70	0	110	30	0	0
Through Vol	0	480	0	50	0	20	0	267	133
RT Vol	0	0	100	0	120	20	0	0	40
Lane Flow Rate	196	522	109	130	130	163	33	290	188
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.481	1.208	0.23	0.355	0.319	0.452	0.083	0.701	0.447
Departure Headway (Hd)	8.852	8.334	7.61	10.283	9.26	10.442	9.687	9.167	8.999
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	407	438	470	352	391	347	372	397	403
Service Time	6.632	6.114	5.388	7.983	6.96	8.142	7.387	6.867	6.699
HCM Lane V/C Ratio	0.482	1.192	0.232	0.369	0.332	0.47	0.089	0.73	0.467
HCM Control Delay	19.6	140.2	12.7	18.5	16.2	21.5	13.3	30.7	18.8
HCM Lane LOS	C	F	B	C	C	C	B	D	C
HCM 95th-tile Q	2.5	20.6	0.9	1.6	1.4	2.3	0.3	5.2	2.2

HCM 2010 TWSC
16: Deschutes Road & SR 44 WB Ramps

Year 2035 No Project Conditions

PM Peak

Intersection												
Int Delay, s/veh		3										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱		↰	↱↱			↱	↰
Traffic Vol, veh/h	0	0	0	40	0	60	130	700	0	0	330	300
Future Vol, veh/h	0	0	0	40	0	60	130	700	0	0	330	300
Conflicting Peds, #/hr	0	0	0	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	175	-	-	200	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	43	0	65	141	761	0	0	359	326
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1407	1407	385	364	0	-	-	-	0
Stage 1				1043	1043	-	-	-	-	-	-	-
Stage 2				364	364	-	-	-	-	-	-	-
Critical Hdwy				6.63	6.53	6.93	4.13	-	-	-	-	-
Critical Hdwy Stg 1				5.83	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.43	5.53	-	-	-	-	-	-	-
Follow-up Hdwy				3.519	4.019	3.319	2.219	-	-	-	-	-
Pot Cap-1 Maneuver				141	138	614	1193	-	0	0	-	0
Stage 1				301	305	-	-	-	0	0	-	0
Stage 2				702	623	-	-	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				124	0	611	1188	-	-	-	-	-
Mov Cap-2 Maneuver				124	0	-	-	-	-	-	-	-
Stage 1				265	0	-	-	-	-	-	-	-
Stage 2				699	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				26.5			1.3			0		
HCM LOS				D								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT							
Capacity (veh/h)	1188	-	124	611	-							
HCM Lane V/C Ratio	0.119	-	0.351	0.107	-							
HCM Control Delay (s)	8.4	-	48.9	11.6	-							
HCM Lane LOS	A	-	E	B	-							
HCM 95th %tile Q(veh)	0.4	-	1.4	0.4	-							

HCM 2010 AWSC
17: Deschutes Road & SR 44 EB Ramps

Year 2035 No Project Conditions

PM Peak

Intersection												
Intersection Delay, s/veh	18.9											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations											 	
Traffic Vol, veh/h	0	430	0	220	0	0	0	0	0	0	400	60
Future Vol, veh/h	0	430	0	220	0	0	0	0	0	0	400	60
Peak Hour Factor	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	467	0	239	0	0	0	0	0	0	435	65
Number of Lanes	0	1	1	1	0	0	0	0	0	0	2	1
Approach	EB											NB
Opposing Approach												SB
Opposing Lanes	0											2
Conflicting Approach Left	SB											EB
Conflicting Lanes Left	2											3
Conflicting Approach Right	NB											
Conflicting Lanes Right	3											0
HCM Control Delay	16.9											17.1
HCM LOS	C											C
Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	SBLn1	SBLn2				
Vol Left, %	0%	0%	0%	100%	100%	0%	100%	0%				
Vol Thru, %	100%	100%	0%	0%	0%	0%	0%	100%				
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	200	200	60	215	215	220	90	280				
LT Vol	0	0	0	215	215	0	90	0				
Through Vol	200	200	0	0	0	0	0	280				
RT Vol	0	0	60	0	0	220	0	0				
Lane Flow Rate	217	217	65	234	234	239	98	304				
Geometry Grp	8	8	8	7	7	7	8	8				
Degree of Util (X)	0.488	0.488	0.101	0.504	0.504	0.435	0.237	0.695				
Departure Headway (Hd)	8.088	8.088	5.593	7.77	7.77	6.551	8.73	8.217				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	446	446	639	465	465	550	412	441				
Service Time	5.838	5.838	3.342	5.508	5.508	4.289	6.481	5.968				
HCM Lane V/C Ratio	0.487	0.487	0.102	0.503	0.503	0.435	0.238	0.689				
HCM Control Delay	18.3	18.3	9	18.2	18.2	14.3	14.2	27.8				
HCM Lane LOS	C	C	A	C	C	B	B	D				
HCM 95th-tile Q	2.6	2.6	0.3	2.8	2.8	2.2	0.9	5.2				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	90	280	0
Future Vol, veh/h	0	90	280	0
Peak Hour Factor	0.88	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2
Mvmt Flow	0	98	304	0
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	24.5
HCM LOS	C

HCM 2010 Signalized Intersection Summary

1: Deschutes Road & State Route 299

Year 2035 Plus Project Conditions

AM Peak

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (veh/h)	160	204	151	350	202	92		
Future Volume (veh/h)	160	204	151	350	202	92		
Number	2	12	1	6	7	14		
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	1810	1810	1810	1810	1810	1810		
Adj Flow Rate, veh/h	174	222	164	380	220	100		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	5	5	5	5	5	5		
Cap, veh/h	356	303	510	993	583	520		
Arrive On Green	0.20	0.20	0.30	0.55	0.34	0.34		
Sat Flow, veh/h	1810	1538	1723	1810	1723	1538		
Grp Volume(v), veh/h	174	222	164	380	220	100		
Grp Sat Flow(s),veh/h/ln	1810	1538	1723	1810	1723	1538		
Q Serve(g_s), s	6.1	9.6	5.3	8.5	6.9	3.3		
Cycle Q Clear(g_c), s	6.1	9.6	5.3	8.5	6.9	3.3		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	356	303	510	993	583	520		
V/C Ratio(X)	0.49	0.73	0.32	0.38	0.38	0.19		
Avail Cap(c_a), veh/h	587	499	510	1224	583	520		
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	25.3	26.8	19.4	9.1	17.8	16.6		
Incr Delay (d2), s/veh	1.0	3.4	1.7	0.2	1.9	0.8		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.1	4.4	2.7	4.3	3.5	1.5		
LnGrp Delay(d),s/veh	26.4	30.2	21.1	9.4	19.7	17.4		
LnGrp LOS	C	C	C	A	B	B		
Approach Vol, veh/h	396			544	320			
Approach Delay, s/veh	28.5			12.9	19.0			
Approach LOS	C			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	25.0	18.0		28.0		43.0		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	21.0	23.0		24.0		48.0		
Max Q Clear Time (g_c+I1), s	7.3	11.6		8.9		10.5		
Green Ext Time (p_c), s	0.4	2.3		1.1		3.0		
Intersection Summary								
HCM 2010 Ctrl Delay			19.4					
HCM 2010 LOS			B					

HCM 2010 TWSC
2: Deschutes Road & Old Alturas Rd

Year 2035 Plus Project Conditions

AM Peak

Intersection												
Int Delay, s/veh		8										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕ ↗	
Traffic Vol, veh/h	44	21	32	50	20	110	11	140	60	130	200	25
Future Vol, veh/h	44	21	32	50	20	110	11	140	60	130	200	25
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	275
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	48	23	35	54	22	120	12	152	65	141	217	27
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	789	751	227	748	719	195	222	0	0	222	0	0
Stage 1	505	505	-	214	214	-	-	-	-	-	-	-
Stage 2	284	246	-	534	505	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	307	338	810	327	353	844	1341	-	-	1341	-	0
Stage 1	548	539	-	786	724	-	-	-	-	-	-	0
Stage 2	721	701	-	528	539	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	223	292	803	263	305	837	1335	-	-	1335	-	-
Mov Cap-2 Maneuver	223	292	-	263	305	-	-	-	-	-	-	-
Stage 1	540	472	-	775	714	-	-	-	-	-	-	-
Stage 2	591	691	-	421	472	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	22.2			18.2			0.4			3.2		
HCM LOS	C			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT					
Capacity (veh/h)	1335	-	-	314	465	1335	-					
HCM Lane V/C Ratio	0.009	-	-	0.336	0.421	0.106	-					
HCM Control Delay (s)	7.7	0	-	22.2	18.2	8	0					
HCM Lane LOS	A	A	-	C	C	A	A					
HCM 95th %tile O(veh)	0	-	-	1.4	2.1	0.4	-					

Intersection

Intersection Delay, s/veh 7.3

Intersection LOS A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	60	5	1	0	0	10	10	0	3	17	0
Future Vol, veh/h	0	60	5	1	0	0	10	10	0	3	17	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	65	5	1	0	0	11	11	0	3	18	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.7	7	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	91%	0%	9%
Vol Thru, %	85%	8%	50%	11%
Vol Right, %	0%	2%	50%	80%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	66	20	56
LT Vol	3	60	0	5
Through Vol	17	5	10	6
RT Vol	0	1	10	45
Lane Flow Rate	22	72	22	61
Geometry Grp	1	1	1	1
Degree of Util (X)	0.025	0.085	0.023	0.062
Departure Headway (Hd)	4.173	4.266	3.831	3.647
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	852	839	929	974
Service Time	2.229	2.297	1.877	1.701
HCM Lane V/C Ratio	0.026	0.086	0.024	0.063
HCM Control Delay	7.3	7.7	7	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.1	0.2

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	5	6	45
Future Vol, veh/h	0	5	6	45
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2
Mvmt Flow	0	5	7	49
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	6.9
HCM LOS	A

Intersection					
Intersection Delay, s/veh22.5					
Intersection LOS C					
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	455	588	393	489	
Demand Flow Rate, veh/h	478	618	413	513	
Vehicles Circulating, veh/h	519	457	478	582	
Vehicles Exiting, veh/h	440	434	519	492	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	5	5	5	5	
Ped Cap Adj	0.999	0.999	0.999	0.999	
Approach Delay, s/veh	21.8	33.8	15.8	14.8	
Approach LOS	C	D	C	B	
Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LTR	LTR	LT	R
Assumed Moves	LTR	LTR	LTR	LT	R
RT Channelized					Yield
Lane Util	1.000	1.000	1.000	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	478	618	413	377	136
Cap Entry Lane, veh/h	672	715	701	631	728
Entry HV Adj Factor	0.952	0.951	0.952	0.952	0.952
Flow Entry, veh/h	455	588	393	359	130
Cap Entry, veh/h	640	680	666	601	693
V/C Ratio	0.711	0.864	0.590	0.598	0.188
Control Delay, s/veh	21.8	33.8	15.8	17.5	7.3
LOS	C	D	C	C	A
95th %tile Queue, veh	6	10	4	4	1

HCM 2010 Signalized Intersection Summary

5: Shasta View Dr & Tarmac Road

Year 2035 Plus Project Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗		↖	↖	↗	↖	↖	
Traffic Volume (veh/h)	30	30	220	250	10	70	90	462	150	90	693	20
Future Volume (veh/h)	30	30	220	250	10	70	90	462	150	90	693	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1900	1827	1827	1827	1827	1900	1827	1827	1827	1827	1827	1900
Adj Flow Rate, veh/h	33	33	239	272	11	76	98	502	163	98	753	22
Adj No. of Lanes	0	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	171	172	299	445	26	182	126	1102	493	127	1095	32
Arrive On Green	0.19	0.19	0.19	0.13	0.13	0.13	0.07	0.32	0.32	0.07	0.32	0.32
Sat Flow, veh/h	891	891	1553	3375	200	1383	1740	3471	1553	1740	3444	101
Grp Volume(v), veh/h	66	0	239	272	0	87	98	502	163	98	379	396
Grp Sat Flow(s),veh/h/ln	1782	0	1553	1688	0	1583	1740	1736	1553	1740	1736	1809
Q Serve(g_s), s	1.7	0.0	8.2	4.3	0.0	2.8	3.1	6.5	4.5	3.1	10.7	10.7
Cycle Q Clear(g_c), s	1.7	0.0	8.2	4.3	0.0	2.8	3.1	6.5	4.5	3.1	10.7	10.7
Prop In Lane	0.50		1.00	1.00		0.87	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	343	0	299	445	0	208	126	1102	493	127	552	575
V/C Ratio(X)	0.19	0.00	0.80	0.61	0.00	0.42	0.78	0.46	0.33	0.77	0.69	0.69
Avail Cap(c_a), veh/h	509	0	444	964	0	452	249	1363	610	311	744	775
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	21.6	23.0	0.0	22.3	25.5	15.3	14.6	25.5	16.7	16.7
Incr Delay (d2), s/veh	0.3	0.0	6.2	1.4	0.0	1.3	10.0	0.3	0.4	9.6	1.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	4.1	2.0	0.0	1.3	1.8	3.1	2.0	1.8	5.3	5.5
LnGrp Delay(d),s/veh	19.2	0.0	27.8	24.3	0.0	23.7	35.5	15.5	15.0	35.2	18.3	18.3
LnGrp LOS	B		C	C		C	D	B	B	D	B	B
Approach Vol, veh/h	305				359		763				873	
Approach Delay, s/veh	26.0				24.2		18.0				20.2	
Approach LOS	C				C		B				C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	8.1	21.8	14.8		8.0	21.8	11.4					
Change Period (Y+Rc), s	4.0	4.0	4.0		4.0	4.0	4.0					
Max Green Setting (Gmax), s	10.0	22.0	16.0		8.0	24.0	16.0					
Max Q Clear Time (g_c+1.5), s	15.5	8.5	10.2		5.1	12.7	6.3					
Green Ext Time (p_c), s	0.1	5.7	0.6		0.1	5.1	1.1					
Intersection Summary												
HCM 2010 Ctrl Delay			20.8									
HCM 2010 LOS			C									

HCM 2010 TWSC
6: Shasta View Dr & SR 44 WB Ramps

Year 2035 Plus Project Conditions

AM Peak

Intersection													
Int Delay, s/veh		1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↕	↕		↕	↕		↕	↕	
Traffic Vol, veh/h	0	0	0	70	0	120	0	662	460	0	412	751	
Future Vol, veh/h	0	0	0	70	0	120	0	662	460	0	412	751	
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	Free	
Storage Length	-	-	-	-	-	150	-	-	0	-	-	200	
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	0	0	0	76	0	130	0	720	500	0	448	816	
Major/Minor				Minor1			Major1			Major2			
Conflicting Flow All				949	1168	-	-	0	-	-	-	0	
Stage 1				720	720	-	-	-	-	-	-	-	
Stage 2				229	448	-	-	-	-	-	-	-	
Critical Hdwy				6.84	6.54	-	-	-	-	-	-	-	
Critical Hdwy Stg 1				5.84	5.54	-	-	-	-	-	-	-	
Critical Hdwy Stg 2				5.84	5.54	-	-	-	-	-	-	-	
Follow-up Hdwy				3.52	4.02	-	-	-	-	-	-	-	
Pot Cap-1 Maneuver				259	192	0	0	-	0	0	-	0	
Stage 1				443	430	0	0	-	0	0	-	0	
Stage 2				787	571	0	0	-	0	0	-	0	
Platoon blocked, %								-			-		
Mov Cap-1 Maneuver				258	0	-	-	-	-	-	-	-	
Mov Cap-2 Maneuver				258	0	-	-	-	-	-	-	-	
Stage 1				443	0	-	-	-	-	-	-	-	
Stage 2				784	0	-	-	-	-	-	-	-	
Approach				WB			NB			SB			
HCM Control Delay, s				24.7			0			0			
HCM LOS				C									
Minor Lane/Major Mvmt	NBTWBLn1WBLn2		SBT										
Capacity (veh/h)	-	258	-	-									
HCM Lane V/C Ratio	-	0.295	-	-									
HCM Control Delay (s)	-	24.7	0	-									
HCM Lane LOS	-	C	A	-									
HCM 95th %tile O(veh)	-	1.2	-	-									

HCM 2010 Signalized Intersection Summary

7: SR 44 EB Ramps & Shasta View Dr

Year 2035 Plus Project Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	401	0	230	0	0	0	0	721	120	180	302	0
Future Volume (veh/h)	401	0	230	0	0	0	0	721	120	180	302	0
Number	7	4	14				5	2	12	1	6	16
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	1845	1845				0	1845	1845	1845	1845	0
Adj Flow Rate, veh/h	436	0	250				0	784	0	196	328	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3				0	3	3	3	3	0
Cap, veh/h	554	0	492				0	1113	498	252	1877	0
Arrive On Green	0.32	0.00	0.32				0.00	0.32	0.00	0.14	0.54	0.00
Sat Flow, veh/h	1757	0	1561				0	3597	1568	1757	3597	0
Grp Volume(v), veh/h	436	0	250				0	784	0	196	328	0
Grp Sat Flow(s),veh/h/ln	1757	0	1561				0	1752	1568	1757	1752	0
Q Serve(g_s), s	12.1	0.0	7.0				0.0	10.5	0.0	5.8	2.6	0.0
Cycle Q Clear(g_c), s	12.1	0.0	7.0				0.0	10.5	0.0	5.8	2.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	554	0	492				0	1113	498	252	1877	0
V/C Ratio(X)	0.79	0.00	0.51				0.00	0.70	0.00	0.78	0.17	0.00
Avail Cap(c_a), veh/h	950	0	844				0	1635	731	459	2812	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.7	0.0	15.0				0.0	16.1	0.0	22.1	6.4	0.0
Incr Delay (d2), s/veh	2.5	0.0	0.8				0.0	0.8	0.0	5.2	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	6.2	0.0	3.1				0.0	5.1	0.0	3.1	1.2	0.0
LnGrp Delay(d),s/veh	19.2	0.0	15.8				0.0	16.9	0.0	27.3	6.4	0.0
LnGrp LOS	B		B					B		C	A	
Approach Vol, veh/h		686						784			524	
Approach Delay, s/veh		18.0						16.9			14.2	
Approach LOS		B						B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.7	21.0		20.9		32.7						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	14.0	25.0		29.0		43.0						
Max Q Clear Time (g_c+I1), s	7.8	12.5		14.1		4.6						
Green Ext Time (p_c), s	0.4	4.5		2.8		6.2						
Intersection Summary												
HCM 2010 Ctrl Delay			16.6									
HCM 2010 LOS			B									

Intersection

Intersection Delay, s/veh 18.8

Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations			↔				↔				↔				↔	↗
Traffic Vol, veh/h	0	70	230	140	0	150	392	130	0	110	190	87	0	104	160	60
Future Vol, veh/h	0	70	230	140	0	150	392	130	0	110	190	87	0	104	160	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	76	250	152	0	163	426	141	0	120	207	95	0	113	174	65
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	148.4	413	108.7	43.1
HCM LOS	F	F	F	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	28%	16%	22%	39%	0%
Vol Thru, %	49%	52%	58%	61%	0%
Vol Right, %	22%	32%	19%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	387	440	672	264	60
LT Vol	110	70	150	104	0
Through Vol	190	230	392	160	0
RT Vol	87	140	130	0	60
Lane Flow Rate	421	478	730	287	65
Geometry Grp	5	2	2	7	7
Degree of Util (X)	1.072	1.195	1.843	0.784	0.162
Departure Headway (Hd)	11.935	11.495	9.96	12.551	11.599
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	307	320	373	290	311
Service Time	9.935	9.495	7.96	10.251	9.299
HCM Lane V/C Ratio	1.371	1.494	1.957	0.99	0.209
HCM Control Delay	108.7	148.4	413	49.1	16.5
HCM Lane LOS	F	F	F	E	C
HCM 95th-tile Q	12.5	16.3	43.8	6.1	0.6

HCM 2010 Signalized Intersection Summary
9: Old Oregon Trail & Old Forty-Four Drive

Year 2035 Plus Project Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	50	250	10	40	140	357	190	70	348	30
Future Volume (veh/h)	10	10	50	250	10	40	140	357	190	70	348	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1776	1776	1900	1776	1776	1900	1776	1776	1900	1776	1776	1900
Adj Flow Rate, veh/h	11	11	54	272	11	43	152	388	207	76	378	33
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	19	18	90	324	79	310	192	449	239	94	570	50
Arrive On Green	0.01	0.07	0.07	0.19	0.25	0.25	0.11	0.41	0.41	0.06	0.35	0.35
Sat Flow, veh/h	1691	262	1287	1691	317	1240	1691	1091	582	1691	1610	141
Grp Volume(v), veh/h	11	0	65	272	0	54	152	0	595	76	0	411
Grp Sat Flow(s),veh/h/ln	1691	0	1549	1691	0	1557	1691	0	1673	1691	0	1751
Q Serve(g_s), s	0.4	0.0	2.4	9.1	0.0	1.6	5.2	0.0	19.1	2.6	0.0	11.7
Cycle Q Clear(g_c), s	0.4	0.0	2.4	9.1	0.0	1.6	5.2	0.0	19.1	2.6	0.0	11.7
Prop In Lane	1.00		0.83	1.00		0.80	1.00		0.35	1.00		0.08
Lane Grp Cap(c), veh/h	19	0	108	324	0	389	192	0	688	94	0	619
V/C Ratio(X)	0.58	0.00	0.60	0.84	0.00	0.14	0.79	0.00	0.86	0.81	0.00	0.66
Avail Cap(c_a), veh/h	115	0	421	402	0	687	287	0	852	115	0	714
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.0	0.0	26.6	22.9	0.0	17.2	25.4	0.0	15.8	27.5	0.0	16.1
Incr Delay (d2), s/veh	25.2	0.0	5.3	12.3	0.0	0.2	8.6	0.0	7.8	28.1	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.2	5.3	0.0	0.7	2.9	0.0	10.3	1.9	0.0	5.9
LnGrp Delay(d),s/veh	54.2	0.0	31.9	35.2	0.0	17.3	34.1	0.0	23.6	55.6	0.0	18.0
LnGrp LOS	D		C	D		B	C		C	E		B
Approach Vol, veh/h	76					326		747		487		
Approach Delay, s/veh	35.1					32.3		25.8		23.8		
Approach LOS	D					C		C		C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.3	28.2	15.3	8.1	10.7	24.8	4.7	18.7				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	30.0	14.0	16.0	10.0	24.0	4.0	26.0				
Max Q Clear Time (g_c+14), s	4.0	21.1	11.1	4.4	7.2	13.7	2.4	3.6				
Green Ext Time (p_c), s	0.0	3.1	0.3	0.3	0.1	3.4	0.0	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			26.9									
HCM 2010 LOS			C									

HCM 2010 TWSC
10: Old Oregeon Trail & SR 44 WB Ramps

Year 2035 Plus Project Conditions

AM Peak

Intersection												
Int Delay, s/veh	14.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↕	↕			↕	
Traffic Vol, veh/h	0	0	0	130	0	70	190	617	0	0	395	253
Future Vol, veh/h	0	0	0	130	0	70	190	617	0	0	395	253
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	0	141	0	76	207	671	0	0	429	275

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1656	1793	676	709	0	-	-	-	0
Stage 1	1084	1084	-	-	-	-	-	-	-
Stage 2	572	709	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	6.24	4.14	-	-	-	-	-
Critical Hdwy Stg 1	5.44	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	2.236	-	-	-	-	-
Pot Cap-1 Maneuver	~ 107	80	450	881	-	0	0	-	-
Stage 1	322	291	-	-	-	0	0	-	-
Stage 2	561	434	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	~ 81	0	448	877	-	-	-	-	-
Mov Cap-2 Maneuver	168	0	-	-	-	-	-	-	-
Stage 1	246	0	-	-	-	-	-	-	-
Stage 2	559	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	111.6	2.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	877	-	215	-
HCM Lane V/C Ratio	0.235	-	1.011	-
HCM Control Delay (s)	10.4	-	111.6	-
HCM Lane LOS	B	-	F	-
HCM 95th %tile Q(veh)	0.9	-	9.2	-

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

HCM 2010 Signalized Intersection Summary

11: Old Oregon Trail & SR 44 EB Ramps

Year 2035 Plus Project Conditions

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	251	0	340	0	0	0	0	556	220	80	445	0
Future Volume (veh/h)	251	0	340	0	0	0	0	556	220	80	445	0
Number	7	4	14				5	2	12	1	6	16
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	1810	1810				0	1810	1810	1810	1810	0
Adj Flow Rate, veh/h	273	0	370				0	604	239	87	484	0
Adj No. of Lanes	0	1	1				0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5				0	5	5	5	5	0
Cap, veh/h	502	0	448				0	774	658	111	1021	0
Arrive On Green	0.29	0.00	0.29				0.00	0.43	0.43	0.06	0.56	0.00
Sat Flow, veh/h	1723	0	1538				0	1810	1538	1723	1810	0
Grp Volume(v), veh/h	273	0	370				0	604	239	87	484	0
Grp Sat Flow(s),veh/h/ln	1723	0	1538				0	1810	1538	1723	1810	0
Q Serve(g_s), s	7.4	0.0	12.4				0.0	15.9	5.8	2.8	8.8	0.0
Cycle Q Clear(g_c), s	7.4	0.0	12.4				0.0	15.9	5.8	2.8	8.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	502	0	448				0	774	658	111	1021	0
V/C Ratio(X)	0.54	0.00	0.83				0.00	0.78	0.36	0.78	0.47	0.00
Avail Cap(c_a), veh/h	653	0	583				0	1240	1054	280	1664	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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	16.5	0.0	18.3				0.0	13.6	10.7	25.6	7.2	0.0
Incr Delay (d2), s/veh	0.9	0.0	7.4				0.0	1.7	0.3	11.4	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	6.2				0.0	8.3	2.5	1.7	4.4	0.0
LnGrp Delay(d),s/veh	17.5	0.0	25.8				0.0	15.4	11.1	37.0	7.5	0.0
LnGrp LOS	B		C					B	B	D	A	
Approach Vol, veh/h		643						843			571	
Approach Delay, s/veh		22.3						14.1			12.0	
Approach LOS		C						B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.6	27.7		20.1		35.3						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	9.0	38.0		21.0		51.0						
Max Q Clear Time (g_c+I1), s	4.8	17.9		14.4		10.8						
Green Ext Time (p_c), s	0.1	5.8		1.7		6.6						
Intersection Summary												
HCM 2010 Ctrl Delay			16.1									
HCM 2010 LOS			B									

Intersection						
Int Delay, s/veh	5.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	232	20	61	150	20	141
Future Vol, veh/h	232	20	61	150	20	141
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	155	185	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	252	22	66	163	22	153
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	273	76	0	0	71	0
Stage 1	71	-	-	-	-	-
Stage 2	202	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	716	985	-	-	1529	-
Stage 1	952	-	-	-	-	-
Stage 2	832	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	700	977	-	-	1523	-
Mov Cap-2 Maneuver	700	-	-	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.7	0		0.9		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 700 977 1523	-	-		
HCM Lane V/C Ratio	-	- 0.36 0.022 0.014	-	-		
HCM Control Delay (s)	-	- 13 8.8 7.4	-	-		
HCM Lane LOS	-	- B A A	-	-		
HCM 95th %tile Q(veh)	-	- 1.6 0.1 0	-	-		

HCM 2010 TWSC
13: Deschutes Road & Boyle Road

Year 2035 Plus Project Conditions

AM Peak

Intersection												
Int Delay, s/veh	18.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	63	115	110	81	20	65	170	130	10	310	20
Future Vol, veh/h	11	63	115	110	81	20	65	170	130	10	310	20
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	50	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	68	125	120	88	22	71	185	141	11	337	22
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	761	706	358	802	716	195	364	0	0	190	0	0
Stage 1	375	375	-	331	331	-	-	-	-	-	-	-
Stage 2	386	331	-	471	385	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	322	361	686	302	356	846	1195	-	-	1384	-	-
Stage 1	646	617	-	682	645	-	-	-	-	-	-	-
Stage 2	637	645	-	573	611	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	235	334	680	196	329	839	1190	-	-	1378	-	-
Mov Cap-2 Maneuver	235	334	-	196	329	-	-	-	-	-	-	-
Stage 1	605	610	-	639	604	-	-	-	-	-	-	-
Stage 2	496	604	-	410	604	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	18.6			76.3			1.5			0.2		
HCM LOS	C			F								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1190	-	-	467	254	1378	-	-				
HCM Lane V/C Ratio	0.059	-	-	0.44	0.903	0.008	-	-				
HCM Control Delay (s)	8.2	-	-	18.6	76.3	7.6	-	-				
HCM Lane LOS	A	-	-	C	F	A	-	-				
HCM 95th %tile Q(veh)	0.2	-	-	2.2	7.9	0	-	-				

HCM 2010 AWSC
14: Deschutes Road & Old Forty-Four Drive

Year 2035 Plus Project Conditions

AM Peak

Intersection												
Intersection Delay, s/veh	58.5											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	80	40	200	0	40	60	180	0	160	424	30
Future Vol, veh/h	0	80	40	200	0	40	60	180	0	160	424	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	3	3	3	5	3	3	3	5	3	3	3
Mvmt Flow	0	87	43	217	0	43	65	196	0	174	461	33
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	2				2				2			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	2				2				2			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	2				2				2			
HCM Control Delay	23.6				25.4				106			
HCM LOS	C				D				F			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2				
Vol Left, %	100%	0%	100%	0%	100%	0%	27%	0%				
Vol Thru, %	0%	93%	0%	17%	0%	25%	73%	78%				
Vol Right, %	0%	7%	0%	83%	0%	75%	0%	22%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	160	454	80	240	40	240	336	316				
LT Vol	160	0	80	0	40	0	91	0				
Through Vol	0	424	0	40	0	60	245	245				
RT Vol	0	30	0	200	0	180	0	71				
Lane Flow Rate	174	493	87	261	43	261	365	343				
Geometry Grp	7	7	7	7	7	7	7	7				
Degree of Util (X)	0.448	1.194	0.236	0.629	0.119	0.641	0.882	0.801				
Departure Headway (Hd)	9.282	8.714	10.287	9.15	10.394	9.317	9.121	8.816				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	388	419	351	397	347	391	402	412				
Service Time	7.046	6.478	7.987	6.85	8.094	7.017	6.821	6.516				
HCM Lane V/C Ratio	0.448	1.177	0.248	0.657	0.124	0.668	0.908	0.833				
HCM Control Delay	19.4	136.5	16.1	26.1	14.5	27.2	51	38.7				
HCM Lane LOS	C	F	C	D	B	D	F	E				
HCM 95th-tile Q	2.2	19.4	0.9	4.1	0.4	4.3	8.9	7.1				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	91	490	71
Future Vol, veh/h	0	91	490	71
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	3	3	3
Mvmt Flow	0	99	533	77
Number of Lanes	0	0	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	45
HCM LOS	E

HCM 2010 AWSC
15: Deschutes Road & Cedro Lane

Year 2035 Plus Project Conditions

AM Peak

Intersection

Intersection Delay, s/veh 99

Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	30	10	70	0	120	20	30	0	90	554	150	0	30	677	20
Future Vol, veh/h	0	30	10	70	0	120	20	30	0	90	554	150	0	30	677	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	3	3	3	5	3	3	3	5	3	3	3	5	3	3	3
Mvmt Flow	0	33	11	76	0	130	22	33	0	98	602	163	0	33	736	22
Number of Lanes	0	0	1	1	0	0	1	0	0	1	1	1	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	2
HCM Control Delay	15.6	23.7	148.7	75
HCM LOS	C	C	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	75%	0%	71%	100%	0%	0%
Vol Thru, %	0%	100%	0%	25%	0%	12%	0%	100%	92%
Vol Right, %	0%	0%	100%	0%	100%	18%	0%	0%	8%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	554	150	40	70	170	30	451	246
LT Vol	90	0	0	30	0	120	30	0	0
Through Vol	0	554	0	10	0	20	0	451	226
RT Vol	0	0	150	0	70	30	0	0	20
Lane Flow Rate	98	602	163	43	76	185	33	491	267
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.237	1.375	0.341	0.127	0.199	0.508	0.078	1.111	0.6
Departure Headway (Hd)	9.014	8.498	7.776	11.385	10.263	10.598	9.268	8.751	8.692
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	401	434	465	317	352	342	389	417	419
Service Time	6.714	6.198	5.476	9.085	7.963	8.298	6.968	6.451	6.392
HCM Lane V/C Ratio	0.244	1.387	0.351	0.136	0.216	0.541	0.085	1.177	0.637
HCM Control Delay	14.5	206.8	14.4	15.7	15.5	23.7	12.8	107.1	23.6
HCM Lane LOS	B	F	B	C	C	C	B	F	C
HCM 95th-tile Q	0.9	27.7	1.5	0.4	0.7	2.7	0.3	16.3	3.8

HCM 2010 TWSC
16: Deschutes Road & SR 44 WB Ramps

Year 2035 Plus Project Conditions

AM Peak

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	40	0	51	240	743	0	0	306	561
Future Vol, veh/h	0	0	0	40	0	51	240	743	0	0	306	561
Conflicting Peds, #/hr	0	0	0	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	175	-	-	200	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	0	43	0	55	261	808	0	0	333	610
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1667	1667	409	338	0	-	-	-	0
Stage 1				1329	1329	-	-	-	-	-	-	-
Stage 2				338	338	-	-	-	-	-	-	-
Critical Hdwy				6.66	6.56	6.96	4.16	-	-	-	-	-
Critical Hdwy Stg 1				5.86	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.46	5.56	-	-	-	-	-	-	-
Follow-up Hdwy				3.538	4.038	3.338	2.238	-	-	-	-	-
Pot Cap-1 Maneuver				95	94	588	1207	-	0	0	-	0
Stage 1				210	220	-	-	-	0	0	-	0
Stage 2				716	636	-	-	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				74	0	586	1202	-	-	-	-	-
Mov Cap-2 Maneuver				74	0	-	-	-	-	-	-	-
Stage 1				164	0	-	-	-	-	-	-	-
Stage 2				713	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				53.8			2.2			0		
HCM LOS				F								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT							
Capacity (veh/h)	1202	-	74	586	-							
HCM Lane V/C Ratio	0.217	-	0.588	0.095	-							
HCM Control Delay (s)	8.8	-	107.4	11.8	-							
HCM Lane LOS	A	-	F	B	-							
HCM 95th %tile O(veh)	0.8	-	2.6	0.3	-							

HCM 2010 AWSC
17: Deschutes Road & SR 44 EB Ramps

Year 2035 Plus Project Conditions

AM Peak

Intersection												
Intersection Delay, s/veh	23											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	440	0	140	0	0	0	0	0	0	543	50
Future Vol, veh/h	0	440	0	140	0	0	0	0	0	0	543	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	4	4	4	5	4	4	4	5	4	4	4
Mvmt Flow	0	478	0	152	0	0	0	0	0	0	590	54
Number of Lanes	0	1	1	1	0	0	0	0	0	0	2	1
Approach	EB											NB
Opposing Approach												SB
Opposing Lanes	0											2
Conflicting Approach Left	SB											EB
Conflicting Lanes Left	2											3
Conflicting Approach Right	NB											
Conflicting Lanes Right	3											0
HCM Control Delay	18											23.5
HCM LOS	C											C
Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	SBLn1	SBLn2				
Vol Left, %	0%	0%	0%	100%	100%	0%	100%	0%				
Vol Thru, %	100%	100%	0%	0%	0%	0%	0%	100%				
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	272	272	50	220	220	140	52	294				
LT Vol	0	0	0	220	220	0	52	0				
Through Vol	272	272	0	0	0	0	0	294				
RT Vol	0	0	50	0	0	140	0	0				
Lane Flow Rate	295	295	54	239	239	152	57	320				
Geometry Grp	8	8	8	7	7	7	8	8				
Degree of Util (X)	0.657	0.657	0.083	0.536	0.536	0.289	0.142	0.757				
Departure Headway (Hd)	8.019	8.019	5.489	8.07	8.07	6.847	9.041	8.527				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	452	452	651	447	447	525	396	425				
Service Time	5.772	5.772	3.24	5.81	5.81	4.586	6.799	6.286				
HCM Lane V/C Ratio	0.653	0.653	0.083	0.535	0.535	0.29	0.144	0.753				
HCM Control Delay	24.9	24.9	8.7	19.8	19.8	12.4	13.3	33.5				
HCM Lane LOS	C	C	A	C	C	B	B	D				
HCM 95th-tile Q	4.6	4.6	0.3	3.1	3.1	1.2	0.5	6.3				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	52	294	0
Future Vol, veh/h	0	52	294	0
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	4	4	4
Mvmt Flow	0	57	320	0
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	30.5
HCM LOS	D

HCM 2010 TWSC
18: Boyle Road & Project Driveway A

Year 2035 Plus Project Conditions

AM Peak

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	150	160	6	19	62
Future Vol, veh/h	20	150	160	6	19	62
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	163	174	7	21	67
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	185	0	-	0	394	187
Stage 1	-	-	-	-	182	-
Stage 2	-	-	-	-	212	-
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	1390	-	-	-	611	855
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	823	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1384	-	-	-	596	848
Mov Cap-2 Maneuver	-	-	-	-	596	-
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	806	-
Approach	EB		WB		SB	
HCM Control Delay, s	0.9		0		10.3	
HCM LOS					B	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1384	-	-	-	771	
HCM Lane V/C Ratio	0.016	-	-	-	0.114	
HCM Control Delay (s)	7.6	0	-	-	10.3	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

HCM 2010 Signalized Intersection Summary

1: Deschutes Road & State Route 299

Year 2035 Plus Project Conditions

PM Peak

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Volume (veh/h)	310	154	112	200	138	141		
Future Volume (veh/h)	310	154	112	200	138	141		
Number	2	12	1	6	7	14		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1845		
Adj Flow Rate, veh/h	316	157	114	204	141	144		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98		
Percent Heavy Veh, %	3	3	3	3	3	3		
Cap, veh/h	858	725	148	1117	495	442		
Arrive On Green	0.46	0.46	0.08	0.61	0.28	0.28		
Sat Flow, veh/h	1845	1560	1757	1845	1757	1568		
Grp Volume(v), veh/h	316	157	114	204	141	144		
Grp Sat Flow(s),veh/h/ln	1845	1560	1757	1845	1757	1568		
Q Serve(g_s), s	7.9	4.3	4.5	3.5	4.4	5.2		
Cycle Q Clear(g_c), s	7.9	4.3	4.5	3.5	4.4	5.2		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	858	725	148	1117	495	442		
V/C Ratio(X)	0.37	0.22	0.77	0.18	0.28	0.33		
Avail Cap(c_a), veh/h	858	725	371	1351	495	442		
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	12.3	11.3	31.8	6.2	19.9	20.2		
Incr Delay (d2), s/veh	1.2	0.7	8.1	0.1	1.4	2.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.2	2.0	2.5	1.8	2.4	2.5		
LnGrp Delay(d),s/veh	13.5	12.0	40.0	6.3	21.3	22.1		
LnGrp LOS	B	B	D	A	C	C		
Approach Vol, veh/h	473			318	285			
Approach Delay, s/veh	13.0			18.4	21.7			
Approach LOS	B			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	10.0	37.0		24.0		47.0		
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		
Max Green Setting (Gmax), s	15.0	33.0		20.0		52.0		
Max Q Clear Time (g_c+I1), s	6.5	9.9		7.2		5.5		
Green Ext Time (p_c), s	0.2	2.4		0.9		2.5		
Intersection Summary								
HCM 2010 Ctrl Delay			16.9					
HCM 2010 LOS			B					

HCM 2010 TWSC
2: Deschutes Road & Old Alturas Rd

Year 2035 Plus Project Conditions

PM Peak

Intersection												
Int Delay, s/veh		7.1										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Traffic Vol, veh/h	49	21	31	50	21	70	32	160	40	80	120	66
Future Vol, veh/h	49	21	31	50	21	70	32	160	40	80	120	66
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	-	-	275
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	53	23	34	54	23	76	35	174	43	87	130	72
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	629	601	140	608	579	206	135	0	0	222	0	0
Stage 1	309	309	-	270	270	-	-	-	-	-	-	-
Stage 2	320	292	-	338	309	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	395	414	908	408	426	835	1449	-	-	1347	-	0
Stage 1	701	660	-	736	686	-	-	-	-	-	-	0
Stage 2	692	671	-	676	660	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	315	371	900	344	382	828	1443	-	-	1341	-	-
Mov Cap-2 Maneuver	315	371	-	344	382	-	-	-	-	-	-	-
Stage 1	679	611	-	712	664	-	-	-	-	-	-	-
Stage 2	587	649	-	580	611	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	17			15.5			1			3.1		
HCM LOS	C			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT					
Capacity (veh/h)	1443	-	-	410	495	1341	-					
HCM Lane V/C Ratio	0.024	-	-	0.268	0.31	0.065	-					
HCM Control Delay (s)	7.6	0	-	17	15.5	7.9	0					
HCM Lane LOS	A	A	-	C	C	A	A					
HCM 95th %tile O(veh)	0.1	-	-	1.1	1.3	0.2	-					

Intersection												
Intersection Delay, s/veh	7.8											
Intersection LOS	A											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	85	10	3	0	0	10	15	0	2	11	0
Future Vol, veh/h	0	85	10	3	0	0	10	15	0	2	11	0
Peak Hour Factor	0.88	0.93	0.93	0.93	0.88	0.93	0.93	0.93	0.88	0.93	0.93	0.93
Heavy Vehicles, %	5	2	2	2	5	5	2	2	5	2	2	2
Mvmt Flow	0	91	11	3	0	0	11	16	0	2	12	0
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	1				1				1			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	1				1				1			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	1				1				1			
HCM Control Delay	8.1				7.2				7.5			
HCM LOS	A				A				A			
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	15%	87%	0%	23%								
Vol Thru, %	85%	10%	40%	13%								
Vol Right, %	0%	3%	60%	64%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	13	98	25	149								
LT Vol	2	85	0	35								
Through Vol	11	10	10	19								
RT Vol	0	3	15	95								
Lane Flow Rate	14	105	27	160								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.017	0.129	0.03	0.171								
Departure Headway (Hd)	4.429	4.412	3.958	3.838								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	813	804	888	920								
Service Time	2.429	2.484	2.057	1.922								
HCM Lane V/C Ratio	0.017	0.131	0.03	0.174								
HCM Control Delay	7.5	8.1	7.2	7.7								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	0.1	0.4	0.1	0.6								

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	35	19	95
Future Vol, veh/h	0	35	19	95
Peak Hour Factor	0.88	0.93	0.93	0.93
Heavy Vehicles, %	5	2	5	2
Mvmt Flow	0	38	20	102
Number of Lanes	0	0	1	0

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

Intersection					
Intersection Delay, s/veh30.9					
Intersection LOS D					
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	689	404	515	511	
Demand Flow Rate, veh/h	702	412	526	521	
Vehicles Circulating, veh/h	449	543	584	498	
Vehicles Exiting, veh/h	397	567	567	457	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	5	5	5	5	
Ped Cap Adj	0.999	0.999	0.999	0.999	
Approach Delay, s/veh	51.7	17.7	32.7	11.3	
Approach LOS	F	C	D	B	
Lane	Left	Left	Left	Left	Bypass
Designated Moves	LTR	LTR	LTR	LT	R
Assumed Moves	LTR	LTR	LTR	LT	R
RT Channelized					Yield
Lane Util	1.000	1.000	1.000	1.000	
Critical Headway, s	5.193	5.193	5.193	5.193	
Entry Flow, veh/h	702	412	526	348	173
Cap Entry Lane, veh/h	721	657	630	687	760
Entry HV Adj Factor	0.981	0.981	0.979	0.981	0.980
Flow Entry, veh/h	689	404	515	341	170
Cap Entry, veh/h	707	643	617	673	744
V/C Ratio	0.974	0.628	0.835	0.507	0.228
Control Delay, s/veh	51.7	17.7	32.7	13.3	7.4
LOS	F	C	D	B	A
95th %tile Queue, veh	15	4	9	3	1

HCM 2010 Signalized Intersection Summary

5: Shasta View Dr & Tarmac Road

Year 2035 Plus Project Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	20	110	290	20	70	180	483	150	40	463	20
Future Volume (veh/h)	20	20	110	290	20	70	180	483	150	40	463	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1900	1863	1863	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	22	22	120	315	22	76	196	525	163	43	503	22
Adj No. of Lanes	0	1	1	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	100	174	535	57	198	258	1271	569	65	865	38
Arrive On Green	0.11	0.11	0.11	0.16	0.16	0.16	0.15	0.36	0.36	0.04	0.25	0.25
Sat Flow, veh/h	909	909	1583	3442	368	1271	1774	3539	1583	1774	3455	151
Grp Volume(v), veh/h	44	0	120	315	0	98	196	525	163	43	257	268
Grp Sat Flow(s),veh/h/ln	1817	0	1583	1721	0	1639	1774	1770	1583	1774	1770	1836
Q Serve(g_s), s	1.0	0.0	3.4	4.0	0.0	2.5	5.0	5.3	3.5	1.1	6.0	6.0
Cycle Q Clear(g_c), s	1.0	0.0	3.4	4.0	0.0	2.5	5.0	5.3	3.5	1.1	6.0	6.0
Prop In Lane	0.50		1.00	1.00		0.78	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	200	0	174	535	0	255	258	1271	569	65	443	459
V/C Ratio(X)	0.22	0.00	0.69	0.59	0.00	0.38	0.76	0.41	0.29	0.66	0.58	0.58
Avail Cap(c_a), veh/h	616	0	537	1166	0	555	564	1949	872	225	637	661
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	20.2	18.5	0.0	17.9	19.4	11.4	10.8	22.5	15.5	15.5
Incr Delay (d2), s/veh	0.6	0.0	4.8	1.0	0.0	0.9	4.6	0.2	0.3	11.0	1.2	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	0.6	0.0	1.7	2.0	0.0	1.2	2.8	2.6	1.5	0.7	3.1	3.2
LnGrp Delay(d),s/veh	19.7	0.0	25.1	19.6	0.0	18.9	23.9	11.6	11.1	33.5	16.7	16.7
LnGrp LOS	B		C	B		B	C	B	B	C	B	B
Approach Vol, veh/h	164					413		884		568		
Approach Delay, s/veh	23.6					19.4		14.2		18.0		
Approach LOS	C					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	5.7	21.0			9.2	10.9	15.8	11.3				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	6.0	26.0			16.0	15.0	17.0	16.0				
Max Q Clear Time (g_c+1.1s), s	13.5	7.3			5.4	7.0	8.0	6.0				
Green Ext Time (p_c), s	0.0	5.4			0.4	0.4	3.8	1.4				
Intersection Summary												
HCM 2010 Ctrl Delay			17.1									
HCM 2010 LOS			B									

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔	↔		↕	↕		↕	↕
Traffic Vol, veh/h	0	0	0	70	0	110	0	743	380	0	412	451
Future Vol, veh/h	0	0	0	70	0	110	0	743	380	0	412	451
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	Free
Storage Length	-	-	-	-	-	150	-	-	0	-	-	200
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	76	0	120	0	808	413	0	448	490
Major/Minor	Minor1			Major1			Major2					
Conflicting Flow All	1037	1256	-	-	0	-	-	-	-	-	-	0
Stage 1	808	808	-	-	-	-	-	-	-	-	-	-
Stage 2	229	448	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.84	6.54	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 1	5.84	5.54	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	-	-	-	-	-	-	-	-	-
Pot Cap-1 Maneuver	227	170	0	0	-	0	0	-	0	0	-	0
Stage 1	399	392	0	0	-	0	0	-	0	0	-	0
Stage 2	787	571	0	0	-	0	0	-	0	0	-	0
Platoon blocked, %							-					-
Mov Cap-1 Maneuver	226	0	-	-	-	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	226	0	-	-	-	-	-	-	-	-	-	-
Stage 1	399	0	-	-	-	-	-	-	-	-	-	-
Stage 2	784	0	-	-	-	-	-	-	-	-	-	-
Approach	WB			NB			SB					
HCM Control Delay, s	28.8			0			0					
HCM LOS	D											
Minor Lane/Major Mvmt	NBTWBLn1WBLn2		SBT									
Capacity (veh/h)	-	226	-	-								
HCM Lane V/C Ratio	-	0.337	-	-								
HCM Control Delay (s)	-	28.8	0	-								
HCM Lane LOS	-	D	A	-								
HCM 95th %tile Q(veh)	-	1.4	-	-								

HCM 2010 Signalized Intersection Summary
7: SR 44 EB Ramps & Shasta View Dr

Year 2035 Plus Project Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↪					↕	↪	↩	↕	
Traffic Volume (veh/h)	561	0	500	0	0	0	0	562	60	100	382	0
Future Volume (veh/h)	561	0	500	0	0	0	0	562	60	100	382	0
Number	7	4	14				5	2	12	1	6	16
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	1863				0	1863	1863	1863	1863	0
Adj Flow Rate, veh/h	610	0	543				0	611	0	109	415	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	785	0	701				0	900	403	142	1446	0
Arrive On Green	0.44	0.00	0.44				0.00	0.25	0.00	0.08	0.41	0.00
Sat Flow, veh/h	1774	0	1583				0	3632	1583	1774	3632	0
Grp Volume(v), veh/h	610	0	543				0	611	0	109	415	0
Grp Sat Flow(s),veh/h/ln	1774	0	1583				0	1770	1583	1774	1770	0
Q Serve(g_s), s	15.7	0.0	15.6				0.0	8.4	0.0	3.2	4.2	0.0
Cycle Q Clear(g_c), s	15.7	0.0	15.6				0.0	8.4	0.0	3.2	4.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	785	0	701				0	900	403	142	1446	0
V/C Ratio(X)	0.78	0.00	0.77				0.00	0.68	0.00	0.77	0.29	0.00
Avail Cap(c_a), veh/h	1320	0	1178				0	1251	560	297	2107	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	1.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.7	0.0	12.7				0.0	18.1	0.0	24.2	10.6	0.0
Incr Delay (d2), s/veh	1.7	0.0	1.9				0.0	0.9	0.0	8.5	0.1	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	8.0	0.0	7.2				0.0	4.2	0.0	1.9	2.0	0.0
LnGrp Delay(d),s/veh	14.4	0.0	14.6				0.0	19.0	0.0	32.7	10.8	0.0
LnGrp LOS	B		B					B		C	B	
Approach Vol, veh/h		1153						611			524	
Approach Delay, s/veh		14.5						19.0			15.3	
Approach LOS		B						B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.3	17.7		27.8		26.0						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	9.0	19.0		40.0		32.0						
Max Q Clear Time (g_c+I1), s	5.2	10.4		17.7		6.2						
Green Ext Time (p_c), s	0.1	3.3		6.1		5.2						
Intersection Summary												
HCM 2010 Ctrl Delay			15.9									
HCM 2010 LOS			B									

Intersection

Intersection Delay, s/veh 71.8

Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	110	334	90	0	103	210	108	0	80	210	162	0	151	180	80
Future Vol, veh/h	0	110	334	90	0	103	210	108	0	80	210	162	0	151	180	80
Peak Hour Factor	0.88	0.94	0.94	0.94	0.88	0.94	0.94	0.94	0.88	0.94	0.94	0.94	0.88	0.94	0.94	0.94
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	117	355	96	0	110	223	115	0	85	223	172	0	161	191	85
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay	268.5	143.9	176	70.3
HCM LOS	F	F	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	18%	21%	24%	46%	0%
Vol Thru, %	46%	63%	50%	54%	0%
Vol Right, %	36%	17%	26%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	452	534	421	331	80
LT Vol	80	110	103	151	0
Through Vol	210	334	210	180	0
RT Vol	162	90	108	0	80
Lane Flow Rate	481	568	448	352	85
Geometry Grp	5	2	2	7	7
Degree of Util (X)	1.268	1.501	1.178	0.974	0.213
Departure Headway (Hd)	11.547	10.975	11.901	12.367	11.385
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	317	335	309	296	317
Service Time	9.547	8.975	9.901	10.067	9.085
HCM Lane V/C Ratio	1.517	1.696	1.45	1.189	0.268
HCM Control Delay	176	268.5	143.9	83.1	17.1
HCM Lane LOS	F	F	F	F	C
HCM 95th-tile Q	18.5	27.3	15.4	9.8	0.8

HCM 2010 Signalized Intersection Summary

9: Old Oregon Trail & Old Forty-Four Drive

Year 2035 Plus Project Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	30	100	240	15	60	50	390	210	50	442	20
Future Volume (veh/h)	30	30	100	240	15	60	50	390	210	50	442	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
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	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	33	33	109	261	16	65	54	424	228	54	480	22
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	49	46	152	311	87	352	68	476	256	68	737	34
Arrive On Green	0.03	0.12	0.12	0.18	0.27	0.27	0.04	0.42	0.42	0.04	0.42	0.42
Sat Flow, veh/h	1774	381	1259	1774	322	1309	1774	1141	614	1774	1767	81
Grp Volume(v), veh/h	33	0	142	261	0	81	54	0	652	54	0	502
Grp Sat Flow(s),veh/h/ln	1774	0	1641	1774	0	1632	1774	0	1754	1774	0	1848
Q Serve(g_s), s	1.2	0.0	5.4	9.2	0.0	2.5	1.9	0.0	22.2	1.9	0.0	14.0
Cycle Q Clear(g_c), s	1.2	0.0	5.4	9.2	0.0	2.5	1.9	0.0	22.2	1.9	0.0	14.0
Prop In Lane	1.00		0.77	1.00		0.80	1.00		0.35	1.00		0.04
Lane Grp Cap(c), veh/h	49	0	198	311	0	439	68	0	732	68	0	771
V/C Ratio(X)	0.67	0.00	0.72	0.84	0.00	0.18	0.79	0.00	0.89	0.79	0.00	0.65
Avail Cap(c_a), veh/h	165	0	407	385	0	607	137	0	816	110	0	831
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.1	0.0	27.3	25.7	0.0	18.1	30.8	0.0	17.4	30.8	0.0	15.1
Incr Delay (d2), s/veh	14.8	0.0	4.8	12.6	0.0	0.2	18.2	0.0	11.2	18.2	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	2.7	5.6	0.0	1.1	1.3	0.0	13.0	1.3	0.0	7.5
LnGrp Delay(d),s/veh	45.8	0.0	32.0	38.3	0.0	18.3	48.9	0.0	28.7	48.9	0.0	16.7
LnGrp LOS	D		C	D		B	D		C	D		B
Approach Vol, veh/h	175				342				706		556	
Approach Delay, s/veh	34.6				33.6				30.2		19.8	
Approach LOS	C				C				C		B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	30.9	15.3	11.8	6.5	30.9	5.8	21.3				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	4.0	30.0	14.0	16.0	5.0	29.0	6.0	24.0				
Max Q Clear Time (g_c+13.5), s	4.0	24.2	11.2	7.4	3.9	16.0	3.2	4.5				
Green Ext Time (p_c), s	0.0	2.7	0.3	0.5	0.0	4.4	0.0	0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			28.1									
HCM 2010 LOS			C									

HCM 2010 TWSC
10: Airport Road/Old Oregon Trail & SR 44 WB Ramps

Year 2035 Plus Project Conditions

PM Peak

Intersection												
Int Delay, s/veh	120											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↙	↑			↘	
Traffic Vol, veh/h	0	0	0	140	0	60	330	590	0	0	460	322
Future Vol, veh/h	0	0	0	140	0	60	330	590	0	0	460	322
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	152	0	65	359	641	0	0	500	350
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				2039	2214	646	855	0	-	-	-	0
Stage 1				1359	1359	-	-	-	-	-	-	-
Stage 2				680	855	-	-	-	-	-	-	-
Critical Hdwy				7.15	6.55	6.25	4.15	-	-	-	-	-
Critical Hdwy Stg 1				6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2				6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy				3.545	4.045	3.345	2.245	-	-	-	-	-
Pot Cap-1 Maneuver				~ 41	43	466	772	-	0	0	-	-
Stage 1				181	214	-	-	-	0	0	-	-
Stage 2				436	371	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				~ 26	23	464	769	-	-	-	-	-
Mov Cap-2 Maneuver				~ 50	10	-	-	-	-	-	-	-
Stage 1				~ 97	114	-	-	-	-	-	-	-
Stage 2				434	371	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				\$ 1118.4			4.9			0		
HCM LOS				F								
Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR								
Capacity (veh/h)	769	- 68	-	-								
HCM Lane V/C Ratio	0.466	- 3.197	-	-								
HCM Control Delay (s)	13.7	\$ 1118.4	-	-								
HCM Lane LOS	B	- F	-	-								
HCM 95th %tile Q(veh)	2.5	- 22.3	-	-								
Notes												
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon												

HCM 2010 Signalized Intersection Summary

11: Airport Road & SR 44 EB Ramps

Year 2035 Plus Project Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	0	350	0	0	0	0	647	200	70	530	0
Future Volume (veh/h)	273	0	350	0	0	0	0	647	200	70	530	0
Number	7	4	14				5	2	12	1	6	16
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	1827	1827				0	1827	1827	1827	1827	0
Adj Flow Rate, veh/h	297	0	380				0	703	217	76	576	0
Adj No. of Lanes	0	1	1				0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4				0	4	4	4	4	0
Cap, veh/h	492	0	439				0	856	728	97	1075	0
Arrive On Green	0.28	0.00	0.28				0.00	0.47	0.47	0.06	0.59	0.00
Sat Flow, veh/h	1740	0	1553				0	1827	1553	1740	1827	0
Grp Volume(v), veh/h	297	0	380				0	703	217	76	576	0
Grp Sat Flow(s),veh/h/ln	1740	0	1553				0	1827	1553	1740	1827	0
Q Serve(g_s), s	9.2	0.0	14.5				0.0	20.7	5.4	2.7	11.8	0.0
Cycle Q Clear(g_c), s	9.2	0.0	14.5				0.0	20.7	5.4	2.7	11.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	492	0	439				0	856	728	97	1075	0
V/C Ratio(X)	0.60	0.00	0.87				0.00	0.82	0.30	0.79	0.54	0.00
Avail Cap(c_a), veh/h	559	0	499				0	1174	998	224	1527	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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	19.3	0.0	21.2				0.0	14.3	10.2	29.0	7.7	0.0
Incr Delay (d2), s/veh	1.5	0.0	13.5				0.0	3.4	0.2	13.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	7.8				0.0	11.2	2.3	1.6	5.9	0.0
LnGrp Delay(d),s/veh	20.8	0.0	34.7				0.0	17.7	10.4	42.0	8.1	0.0
LnGrp LOS	C		C					B	B	D	A	
Approach Vol, veh/h		677						920			652	
Approach Delay, s/veh		28.6						16.0			12.1	
Approach LOS		C						B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.5	33.2		21.6		40.6						
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0						
Max Green Setting (Gmax), s	8.0	40.0		20.0		52.0						
Max Q Clear Time (g_c+I1), s	4.7	22.7		16.5		13.8						
Green Ext Time (p_c), s	0.0	6.5		1.1		8.0						
Intersection Summary												
HCM 2010 Ctrl Delay			18.6									
HCM 2010 LOS			B									

Intersection						
Int Delay, s/veh	3.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	160	10	81	167	10	96
Future Vol, veh/h	160	10	81	167	10	96
Conflicting Peds, #/hr	5	5	0	5	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	155	185	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	174	11	88	182	11	104
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	224	98	0	0	93	0
Stage 1	93	-	-	-	-	-
Stage 2	131	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	764	958	-	-	1501	-
Stage 1	931	-	-	-	-	-
Stage 2	895	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	752	950	-	-	1495	-
Mov Cap-2 Maneuver	752	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.1	0		0.7		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	- 752 950 1495	-	-		
HCM Lane V/C Ratio	-	- 0.231 0.011 0.007	-	-		
HCM Control Delay (s)	-	- 11.2 8.8 7.4	-	-		
HCM Lane LOS	-	- B A A	-	-		
HCM 95th %tile Q(veh)	-	- 0.9 0 0	-	-		

HCM 2010 TWSC
13: Deschutes Road & Boyle Road

Year 2035 Plus Project Conditions

PM Peak

Intersection												
Int Delay, s/veh		5.5										
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	22	70	40	23	20	98	200	60	20	160	30
Future Vol, veh/h	30	22	70	40	23	20	98	200	60	20	160	30
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	50	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	23	74	42	24	21	103	211	63	21	168	32
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	675	653	194	702	669	221	205	0	0	216	0	0
Stage 1	231	231	-	422	422	-	-	-	-	-	-	-
Stage 2	444	422	-	280	247	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	368	387	847	353	379	819	1366	-	-	1354	-	-
Stage 1	772	713	-	609	588	-	-	-	-	-	-	-
Stage 2	593	588	-	727	702	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	313	349	840	282	342	812	1360	-	-	1348	-	-
Mov Cap-2 Maneuver	313	349	-	282	342	-	-	-	-	-	-	-
Stage 1	711	699	-	561	541	-	-	-	-	-	-	-
Stage 2	508	541	-	629	688	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.6			18.4			2.2			0.7		
HCM LOS	B			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1360	-	-	504	355	1348	-	-				
HCM Lane V/C Ratio	0.076	-	-	0.255	0.246	0.016	-	-				
HCM Control Delay (s)	7.9	-	-	14.6	18.4	7.7	-	-				
HCM Lane LOS	A	-	-	B	C	A	-	-				
HCM 95th %tile O(veh)	0.2	-	-	1	1	0	-	-				

HCM 2010 AWSC
14: Deschutes Road & Old Forty-Four Drive

Year 2035 Plus Project Conditions

PM Peak

Intersection												
Intersection Delay, s/veh	40.8											
Intersection LOS	E											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	41	40	80	0	70	35	81	0	80	462	70
Future Vol, veh/h	0	41	40	80	0	70	35	81	0	80	462	70
Peak Hour Factor	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	45	43	87	0	76	38	88	0	87	502	76
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	2				2				2			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	2				2				2			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	2				2				2			
HCM Control Delay	13.3				13.3				74			
HCM LOS	B				B				F			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2				
Vol Left, %	100%	0%	100%	0%	100%	0%	30%	0%				
Vol Thru, %	0%	87%	0%	33%	0%	30%	70%	85%				
Vol Right, %	0%	13%	0%	67%	0%	70%	0%	15%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	80	532	41	120	70	116	240	199				
LT Vol	80	0	41	0	70	0	71	0				
Through Vol	0	462	0	40	0	35	169	169				
RT Vol	0	70	0	80	0	81	0	30				
Lane Flow Rate	87	578	45	130	76	126	260	216				
Geometry Grp	7	7	7	7	7	7	7	7				
Degree of Util (X)	0.175	1.067	0.106	0.274	0.179	0.261	0.513	0.41				
Departure Headway (Hd)	7.248	6.644	8.879	7.878	8.795	7.772	7.339	7.079				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	491	544	406	459	410	465	495	511				
Service Time	5.041	4.437	6.579	5.578	6.495	5.472	5.039	4.779				
HCM Lane V/C Ratio	0.177	1.063	0.111	0.283	0.185	0.271	0.525	0.423				
HCM Control Delay	11.6	83.4	12.6	13.5	13.4	13.2	17.5	14.6				
HCM Lane LOS	B	F	B	B	B	B	C	B				
HCM 95th-tile Q	0.6	17	0.4	1.1	0.6	1	2.9	2				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	71	337	30
Future Vol, veh/h	0	71	337	30
Peak Hour Factor	0.88	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2
Mvmt Flow	0	77	366	33
Number of Lanes	0	0	2	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	16.2
HCM LOS	C

Intersection

Intersection Delay, s/veh60.6

Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	71	50	120	0	110	20	21	0	180	490	100	0	31	406	40
Future Vol, veh/h	0	71	50	120	0	110	20	21	0	180	490	100	0	31	406	40
Peak Hour Factor	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	77	54	130	0	120	22	23	0	196	533	109	0	34	441	43
Number of Lanes	0	0	1	1	0	0	1	0	0	1	1	1	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	2
HCM Control Delay	17.6	21.8	103.1	25.9
HCM LOS	C	C	F	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	59%	0%	73%	100%	0%	0%
Vol Thru, %	0%	100%	0%	41%	0%	13%	0%	100%	77%
Vol Right, %	0%	0%	100%	0%	100%	14%	0%	0%	23%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	180	490	100	121	120	151	31	271	175
LT Vol	180	0	0	71	0	110	31	0	0
Through Vol	0	490	0	50	0	20	0	271	135
RT Vol	0	0	100	0	120	21	0	0	40
Lane Flow Rate	196	533	109	132	130	164	34	294	191
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.483	1.239	0.231	0.359	0.32	0.457	0.086	0.713	0.454
Departure Headway (Hd)	8.895	8.377	7.653	10.368	9.343	10.515	9.746	9.225	9.059
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	403	431	467	350	387	345	370	394	400
Service Time	6.676	6.158	5.433	8.068	7.043	8.215	7.446	6.925	6.759
HCM Lane V/C Ratio	0.486	1.237	0.233	0.377	0.336	0.475	0.092	0.746	0.477
HCM Control Delay	19.8	152.2	12.7	18.8	16.4	21.8	13.4	31.8	19.1
HCM Lane LOS	C	F	B	C	C	C	B	D	C
HCM 95th-tile Q	2.6	21.8	0.9	1.6	1.4	2.3	0.3	5.4	2.3

HCM 2010 TWSC
16: Deschutes Road & SR 44 WB Ramps

Year 2035 Plus Project Conditions

PM Peak

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	40	0	62	130	708	0	0	336	300
Future Vol, veh/h	0	0	0	40	0	62	130	708	0	0	336	300
Conflicting Peds, #/hr	0	0	0	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	175	-	-	200	-	-	-	-	0
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	43	0	67	141	770	0	0	365	326
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1422	1422	390	370	0	-	-	-	0
Stage 1				1052	1052	-	-	-	-	-	-	-
Stage 2				370	370	-	-	-	-	-	-	-
Critical Hdwy				6.63	6.53	6.93	4.13	-	-	-	-	-
Critical Hdwy Stg 1				5.83	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.43	5.53	-	-	-	-	-	-	-
Follow-up Hdwy				3.519	4.019	3.319	2.219	-	-	-	-	-
Pot Cap-1 Maneuver				138	136	610	1187	-	0	0	-	0
Stage 1				298	302	-	-	-	0	0	-	0
Stage 2				698	619	-	-	-	0	0	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				121	0	607	1182	-	-	-	-	-
Mov Cap-2 Maneuver				121	0	-	-	-	-	-	-	-
Stage 1				262	0	-	-	-	-	-	-	-
Stage 2				695	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				27			1.3			0		
HCM LOS				D								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBT							
Capacity (veh/h)	1182	-	121	607	-							
HCM Lane V/C Ratio	0.12	-	0.359	0.111	-							
HCM Control Delay (s)	8.5	-	50.6	11.7	-							
HCM Lane LOS	A	-	F	B	-							
HCM 95th %tile Q(veh)	0.4	-	1.5	0.4	-							

HCM 2010 AWSC
17: Deschutes Road & SR 44 EB Ramps

Year 2035 Plus Project Conditions

PM Peak

Intersection												
Intersection Delay, s/veh	19.3											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	430	0	220	0	0	0	0	0	0	408	60
Future Vol, veh/h	0	430	0	220	0	0	0	0	0	0	408	60
Peak Hour Factor	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92	0.88	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	467	0	239	0	0	0	0	0	0	443	65
Number of Lanes	0	1	1	1	0	0	0	0	0	0	2	1
Approach	EB											NB
Opposing Approach												SB
Opposing Lanes	0											2
Conflicting Approach Left	SB											EB
Conflicting Lanes Left	2											3
Conflicting Approach Right	NB											
Conflicting Lanes Right	3											0
HCM Control Delay	17											17.5
HCM LOS	C											C
Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	SBLn1	SBLn2				
Vol Left, %	0%	0%	0%	100%	100%	0%	100%	0%				
Vol Thru, %	100%	100%	0%	0%	0%	0%	0%	99%				
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	1%				
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop				
Traffic Vol by Lane	204	204	60	215	215	220	90	286				
LT Vol	0	0	0	215	215	0	90	0				
Through Vol	204	204	0	0	0	0	0	284				
RT Vol	0	0	60	0	0	220	0	2				
Lane Flow Rate	222	222	65	234	234	239	98	311				
Geometry Grp	8	8	8	7	7	7	8	8				
Degree of Util (X)	0.5	0.5	0.102	0.507	0.507	0.438	0.238	0.713				
Departure Headway (Hd)	8.124	8.124	5.628	7.813	7.813	6.594	8.77	8.252				
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes				
Cap	443	443	635	463	463	545	410	438				
Service Time	5.876	5.876	3.379	5.553	5.553	4.333	6.524	6.006				
HCM Lane V/C Ratio	0.501	0.501	0.102	0.505	0.505	0.439	0.239	0.71				
HCM Control Delay	18.8	18.8	9	18.4	18.4	14.4	14.3	29.1				
HCM Lane LOS	C	C	A	C	C	B	B	D				
HCM 95th-tile Q	2.7	2.7	0.3	2.8	2.8	2.2	0.9	5.5				

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	90	284	2
Future Vol, veh/h	0	90	284	2
Peak Hour Factor	0.88	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2
Mvmt Flow	0	98	309	2
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	25.6
HCM LOS	D

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	67	110	130	21	12	40
Future Vol, veh/h	67	110	130	21	12	40
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	73	120	141	23	13	43
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	169	0	-	0	428	163
Stage 1	-	-	-	-	158	-
Stage 2	-	-	-	-	270	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1390	-	-	-	578	874
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	768	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1384	-	-	-	541	867
Mov Cap-2 Maneuver	-	-	-	-	541	-
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	722	-
Approach	EB		WB		SB	
HCM Control Delay, s	2.9		0		10.1	
HCM LOS					B	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1384	-	-	-	761	
HCM Lane V/C Ratio	0.053	-	-	-	0.074	
HCM Control Delay (s)	7.7	0	-	-	10.1	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2	

HCM 2010 Signalized Intersection Summary
10: Airport Road/Old Oregon Trail & SR 44 WB Ramps

Existing Plus Project Conditions Mitigation

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	85	1	44	134	502	0	0	271	209
Future Volume (veh/h)	0	0	0	85	1	44	134	502	0	0	271	209
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.98	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				1710	1827	1900	1644	1827	0	0	1827	1900
Adj Flow Rate, veh/h				99	1	51	156	584	0	0	315	243
Adj No. of Lanes				0	1	0	1	1	0	0	1	0
Peak Hour Factor				0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %				0	4	0	4	4	0	0	4	4
Cap, veh/h				138	1	71	199	1236	0	0	431	332
Arrive On Green				0.13	0.13	0.13	0.13	0.68	0.00	0.00	0.45	0.45
Sat Flow, veh/h				1089	11	561	1566	1827	0	0	955	737
Grp Volume(v), veh/h				151	0	0	156	584	0	0	0	558
Grp Sat Flow(s),veh/h/ln				1660	0	0	1566	1827	0	0	0	1692
Q Serve(g_s), s				3.6	0.0	0.0	3.9	6.2	0.0	0.0	0.0	11.0
Cycle Q Clear(g_c), s				3.6	0.0	0.0	3.9	6.2	0.0	0.0	0.0	11.0
Prop In Lane				0.66		0.34	1.00		0.00	0.00		0.44
Lane Grp Cap(c), veh/h				211	0	0	199	1236	0	0	0	763
V/C Ratio(X)				0.72	0.00	0.00	0.78	0.47	0.00	0.00	0.00	0.73
Avail Cap(c_a), veh/h				653	0	0	578	2515	0	0	0	1539
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	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				17.1	0.0	0.0	17.2	3.1	0.0	0.0	0.0	9.2
Incr Delay (d2), s/veh				4.5	0.0	0.0	6.6	0.3	0.0	0.0	0.0	1.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.9	0.0	0.0	2.1	3.0	0.0	0.0	0.0	5.3
LnGrp Delay(d),s/veh				21.5	0.0	0.0	23.8	3.4	0.0	0.0	0.0	10.5
LnGrp LOS				C			C	A				B
Approach Vol, veh/h					151			740			558	
Approach Delay, s/veh					21.5			7.7			10.5	
Approach LOS					C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.5			9.2	22.3		9.2				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		56.0			15.0	37.0		16.0				
Max Q Clear Time (g_c+I1), s		8.2			5.9	13.0		5.6				
Green Ext Time (p_c), s		5.8			0.3	5.3		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				10.2								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary

Existing Plus Project Conditions Mitigation

10: Airport Road/Old Oregon Trail & SR 44 WB Ramps

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	93	0	37	260	448	0	0	322	260
Future Volume (veh/h)	0	0	0	93	0	37	260	448	0	0	322	260
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.98	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				1710	1827	1900	1644	1827	0	0	1827	1900
Adj Flow Rate, veh/h				108	0	43	302	521	0	0	374	302
Adj No. of Lanes				0	1	0	1	1	0	0	1	0
Peak Hour Factor				0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %				0	4	0	4	4	0	0	4	4
Cap, veh/h				146	0	58	351	1367	0	0	428	346
Arrive On Green				0.12	0.00	0.12	0.22	0.75	0.00	0.00	0.46	0.46
Sat Flow, veh/h				1195	0	476	1566	1827	0	0	934	755
Grp Volume(v), veh/h				151	0	0	302	521	0	0	0	676
Grp Sat Flow(s),veh/h/ln				1671	0	0	1566	1827	0	0	0	1689
Q Serve(g_s), s				5.4	0.0	0.0	11.4	6.2	0.0	0.0	0.0	22.2
Cycle Q Clear(g_c), s				5.4	0.0	0.0	11.4	6.2	0.0	0.0	0.0	22.2
Prop In Lane				0.72		0.28	1.00		0.00	0.00		0.45
Lane Grp Cap(c), veh/h				203	0	0	351	1367	0	0	0	774
V/C Ratio(X)				0.74	0.00	0.00	0.86	0.38	0.00	0.00	0.00	0.87
Avail Cap(c_a), veh/h				435	0	0	459	1665	0	0	0	934
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	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				26.1	0.0	0.0	22.9	2.7	0.0	0.0	0.0	15.0
Incr Delay (d2), s/veh				5.3	0.0	0.0	12.2	0.2	0.0	0.0	0.0	7.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.8	0.0	0.0	6.1	3.1	0.0	0.0	0.0	11.8
LnGrp Delay(d),s/veh				31.3	0.0	0.0	35.1	2.9	0.0	0.0	0.0	23.0
LnGrp LOS				C			D	A				C
Approach Vol, veh/h					151			823			676	
Approach Delay, s/veh					31.3			14.7			23.0	
Approach LOS					C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		50.0			17.8	32.2		11.5				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		56.0			18.0	34.0		16.0				
Max Q Clear Time (g_c+I1), s		8.2			13.4	24.2		7.4				
Green Ext Time (p_c), s		6.3			0.5	4.0		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay				19.6								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary 10: Old Oregon Trail & SR 44 WB Ramps

Year 2035 Plus Project Conditions Mitigation

AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	130	0	70	190	617	0	0	395	253
Future Volume (veh/h)	0	0	0	130	0	70	190	617	0	0	395	253
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.99	1.00		1.00	1.00		0.99
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	1827	1900	1827	1827	0	0	1827	1827
Adj Flow Rate, veh/h				141	0	76	207	671	0	0	429	275
Adj No. of Lanes				0	1	0	1	1	0	0	1	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	4	0	4	4	0	0	4	4
Cap, veh/h				189	0	102	269	1167	0	0	714	603
Arrive On Green				0.18	0.00	0.18	0.15	0.64	0.00	0.00	0.39	0.39
Sat Flow, veh/h				1079	0	582	1740	1827	0	0	1827	1543
Grp Volume(v), veh/h				217	0	0	207	671	0	0	429	275
Grp Sat Flow(s),veh/h/ln				1660	0	0	1740	1827	0	0	1827	1543
Q Serve(g_s), s				5.3	0.0	0.0	4.9	9.0	0.0	0.0	8.0	5.7
Cycle Q Clear(g_c), s				5.3	0.0	0.0	4.9	9.0	0.0	0.0	8.0	5.7
Prop In Lane				0.65		0.35	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				291	0	0	269	1167	0	0	714	603
V/C Ratio(X)				0.75	0.00	0.00	0.77	0.58	0.00	0.00	0.60	0.46
Avail Cap(c_a), veh/h				618	0	0	526	2379	0	0	1657	1399
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	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				16.8	0.0	0.0	17.4	4.4	0.0	0.0	10.4	9.7
Incr Delay (d2), s/veh				3.8	0.0	0.0	4.6	0.5	0.0	0.0	0.8	0.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.7	0.0	0.0	2.7	4.6	0.0	0.0	4.1	2.5
LnGrp Delay(d),s/veh				20.6	0.0	0.0	22.0	4.9	0.0	0.0	11.2	10.2
LnGrp LOS				C			C	A			B	B
Approach Vol, veh/h					217			878			704	
Approach Delay, s/veh					20.6			8.9			10.9	
Approach LOS					C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.5			10.7	20.8		11.5				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		56.0			13.0	39.0		16.0				
Max Q Clear Time (g_c+I1), s		11.0			6.9	10.0		7.3				
Green Ext Time (p_c), s		7.1			0.4	6.8		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay				11.1								
HCM 2010 LOS				B								

Intersection												
Intersection Delay, s/veh	18.6											
Intersection LOS	C											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	11	63	115	0	110	81	20	0	65	170	130
Future Vol, veh/h	0	11	63	115	0	110	81	20	0	65	170	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	12	68	125	0	120	88	22	0	71	185	141
Number of Lanes	0	0	1	0	0	0	1	0	0	1	1	1
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	1				1				2			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	2				3				1			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	3				2				1			
HCM Control Delay	14.8				17.5				12.5			
HCM LOS	B				C				B			
Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	SBLn1	SBLn2					
Vol Left, %	100%	0%	0%	6%	52%	100%	0%					
Vol Thru, %	0%	100%	0%	33%	38%	0%	94%					
Vol Right, %	0%	0%	100%	61%	9%	0%	6%					
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop					
Traffic Vol by Lane	65	170	130	189	211	10	330					
LT Vol	65	0	0	11	110	10	0					
Through Vol	0	170	0	63	81	0	310					
RT Vol	0	0	130	115	20	0	20					
Lane Flow Rate	71	185	141	205	229	11	359					
Geometry Grp	7	7	7	7	7	8	8					
Degree of Util (X)	0.148	0.361	0.248	0.409	0.487	0.024	0.737					
Departure Headway (Hd)	7.548	7.035	6.316	7.166	7.647	7.957	7.399					
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Cap	474	510	567	501	470	449	488					
Service Time	5.313	4.799	4.08	4.932	5.413	5.722	5.163					
HCM Lane V/C Ratio	0.15	0.363	0.249	0.409	0.487	0.024	0.736					
HCM Control Delay	11.6	13.8	11.2	14.8	17.5	10.9	28.3					
HCM Lane LOS	B	B	B	B	C	B	D					
HCM 95th-tile Q	0.5	1.6	1	2	2.6	0.1	6.1					

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	10	310	20
Future Vol, veh/h	0	10	310	20
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	5	2	2	2
Mvmt Flow	0	11	337	22
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	27.8
HCM LOS	D

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	140	0	60	330	590	0	0	460	322
Future Volume (veh/h)	0	0	0	140	0	60	330	590	0	0	460	322
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		0.98	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	1810	1900	1810	1810	0	0	1810	1810
Adj Flow Rate, veh/h				152	0	65	359	641	0	0	500	350
Adj No. of Lanes				0	1	0	1	1	0	0	1	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				0	5	0	5	5	0	0	5	5
Cap, veh/h				193	0	82	419	1267	0	0	706	597
Arrive On Green				0.17	0.00	0.17	0.24	0.70	0.00	0.00	0.39	0.39
Sat Flow, veh/h				1159	0	496	1723	1810	0	0	1810	1528
Grp Volume(v), veh/h				217	0	0	359	641	0	0	500	350
Grp Sat Flow(s),veh/h/ln				1655	0	0	1723	1810	0	0	1810	1528
Q Serve(g_s), s				7.5	0.0	0.0	11.9	9.9	0.0	0.0	13.9	10.8
Cycle Q Clear(g_c), s				7.5	0.0	0.0	11.9	9.9	0.0	0.0	13.9	10.8
Prop In Lane				0.70		0.30	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				275	0	0	419	1267	0	0	706	597
V/C Ratio(X)				0.79	0.00	0.00	0.86	0.51	0.00	0.00	0.71	0.59
Avail Cap(c_a), veh/h				442	0	0	547	1993	0	0	1299	1097
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	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				24.0	0.0	0.0	21.7	4.2	0.0	0.0	15.4	14.4
Incr Delay (d2), s/veh				5.0	0.0	0.0	10.3	0.3	0.0	0.0	1.3	0.9
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.8	0.0	0.0	6.9	4.9	0.0	0.0	7.2	4.7
LnGrp Delay(d),s/veh				29.0	0.0	0.0	32.0	4.5	0.0	0.0	16.7	15.4
LnGrp LOS				C			C	A			B	B
Approach Vol, veh/h					217			1000			850	
Approach Delay, s/veh					29.0			14.4			16.1	
Approach LOS					C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		45.9			18.6	27.4		14.0				
Change Period (Y+Rc), s		4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s		66.0			19.0	43.0		16.0				
Max Q Clear Time (g_c+I1), s		11.9			13.9	15.9		9.5				
Green Ext Time (p_c), s		8.1			0.7	7.4		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				16.6								
HCM 2010 LOS				B								

HCM 2010 AWSC
13: Deschutes Road & Boyle Road

Year 2035 Plus Project Conditions Mitigation

PM Peak

Intersection												
Intersection Delay, s/veh	10.6											
Intersection LOS	B											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	30	22	70	0	40	23	20	0	98	200	60
Future Vol, veh/h	0	30	22	70	0	40	23	20	0	98	200	60
Peak Hour Factor	0.88	0.95	0.95	0.95	0.88	0.95	0.95	0.95	0.88	0.95	0.95	0.95
Heavy Vehicles, %	5	2	2	2	5	2	2	2	5	2	2	2
Mvmt Flow	0	32	23	74	0	42	24	21	0	103	211	63
Number of Lanes	0	0	1	0	0	0	1	0	0	1	1	1
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	1				1				2			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	2				3				1			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	3				2				1			
HCM Control Delay	10.3				10.3				10.2			
HCM LOS	B				B				B			
Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	SBLn1	SBLn2					
Vol Left, %	100%	0%	0%	25%	48%	100%	0%					
Vol Thru, %	0%	100%	0%	18%	28%	0%	84%					
Vol Right, %	0%	0%	100%	57%	24%	0%	16%					
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop					
Traffic Vol by Lane	98	200	60	122	83	20	190					
LT Vol	98	0	0	30	40	20	0					
Through Vol	0	200	0	22	23	0	160					
RT Vol	0	0	60	70	20	0	30					
Lane Flow Rate	103	211	63	128	87	21	200					
Geometry Grp	7	7	7	7	7	8	8					
Degree of Util (X)	0.173	0.323	0.085	0.212	0.155	0.039	0.334					
Departure Headway (Hd)	6.022	5.517	4.834	5.946	6.368	6.623	6.005					
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes					
Cap	597	653	746	604	564	541	600					
Service Time	3.747	3.241	2.534	3.681	4.103	4.355	3.737					
HCM Lane V/C Ratio	0.173	0.323	0.084	0.212	0.154	0.039	0.333					
HCM Control Delay	10	10.9	8	10.3	10.3	9.6	11.7					
HCM Lane LOS	A	B	A	B	B	A	B					
HCM 95th-tile Q	0.6	1.4	0.3	0.8	0.5	0.1	1.5					

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	20	160	30
Future Vol, veh/h	0	20	160	30
Peak Hour Factor	0.88	0.95	0.95	0.95
Heavy Vehicles, %	5	2	2	2
Mvmt Flow	0	21	168	32
Number of Lanes	0	1	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	3
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11.5
HCM LOS	B

Queuing and Blocking Report

Baseline

08/16/2017

Intersection: 1: Deschutes Road & State Route 299

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	R	L	T	L	R
Maximum Queue (ft)	92	102	112	110	85	60
Average Queue (ft)	32	39	46	35	49	19
95th Queue (ft)	70	80	86	87	86	41
Link Distance (ft)	11835			2257		224
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		135	105		70	
Storage Blk Time (%)			0	0	5	0
Queuing Penalty (veh)			1	0	2	0

Intersection: 2: Deschutes Road & Old Alturas Rd

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LT
Maximum Queue (ft)	69	106	13	77
Average Queue (ft)	28	40	0	13
95th Queue (ft)	56	77	4	43
Link Distance (ft)	4188	1245	7164	428
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Old Alturas Rd & Seven Lakes Road

Movement	WB	SB
Directions Served	TR	LR
Maximum Queue (ft)	26	2
Average Queue (ft)	1	0
95th Queue (ft)	9	0
Link Distance (ft)	1413	4188
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report

Baseline

08/16/2017

Intersection: 4: Shasta View Dr & Old Alturas Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	110	102	160	98	30
Average Queue (ft)	27	41	53	24	4
95th Queue (ft)	70	78	124	65	19
Link Distance (ft)	1979	2563	700	1683	1683
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Shasta View Dr & Tarmac Road

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	L	L	TR	L	T	T	R	L	T	TR
Maximum Queue (ft)	41	80	19	95	26	100	266	234	52	85	204	305
Average Queue (ft)	17	34	9	45	2	30	89	100	29	32	47	136
95th Queue (ft)	37	72	23	83	12	66	185	189	46	68	110	241
Link Distance (ft)	796	796			759		407	407			1197	1197
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			220	220		275			275	120		
Storage Blk Time (%)							0				0	
Queuing Penalty (veh)							0				0	

Intersection: 6: Shasta View Dr & SR 44 WB Ramps

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	T	T	T	T
Maximum Queue (ft)	33	2	61	27	67	28
Average Queue (ft)	11	0	3	2	3	2
95th Queue (ft)	28	0	21	13	24	14
Link Distance (ft)	419		469	469	407	407
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		150				
Storage Blk Time (%)						
Queuing Penalty (veh)						

Queuing and Blocking Report

Baseline

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Intersection: 7: SR 44 EB Ramps & Shasta View Dr

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	T	T	R	L	T	T
Maximum Queue (ft)	202	68	182	271	203	150	158	96
Average Queue (ft)	117	35	96	146	8	77	54	17
95th Queue (ft)	186	60	147	220	70	121	109	61
Link Distance (ft)	818	818	374	374		469	469	469
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)					85			
Storage Blk Time (%)				23				
Queuing Penalty (veh)				21				

Intersection: 8: Old Oregeon Trail & Old Alturas Rd

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LTR	LT	R
Maximum Queue (ft)	74	102	122	92	56
Average Queue (ft)	47	52	63	38	10
95th Queue (ft)	72	79	102	70	44
Link Distance (ft)	2563	2878	4476	2005	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				50	
Storage Blk Time (%)				1	1
Queuing Penalty (veh)				1	1

Intersection: 9: Old Oregeon Trail & Old Forty-Four Drive

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	L	TR
Maximum Queue (ft)	26	43	135	64	106	209	68	157
Average Queue (ft)	4	19	79	20	38	82	28	76
95th Queue (ft)	18	40	129	48	79	165	61	136
Link Distance (ft)		593		6519		243		210
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	135		135		120		120	
Storage Blk Time (%)			0		0	3		1
Queuing Penalty (veh)			0		0	3		0

Queuing and Blocking Report

Baseline

08/16/2017

Intersection: 10: Airport Road/Old Oregeon Trail & SR 44 WB Ramps

Movement	WB	NB	NB	SB
Directions Served	LTR	L	T	TR
Maximum Queue (ft)	98	71	30	53
Average Queue (ft)	48	34	2	8
95th Queue (ft)	86	67	12	33
Link Distance (ft)	356		571	243
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		150		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: Airport Road & SR 44 EB Ramps

Movement	EB	EB	NB	NB	SB	SB
Directions Served	LT	R	T	R	L	T
Maximum Queue (ft)	134	105	212	130	52	131
Average Queue (ft)	60	47	105	37	26	61
95th Queue (ft)	103	83	185	103	51	113
Link Distance (ft)	437	437	178			571
Upstream Blk Time (%)			2			
Queuing Penalty (veh)			0			
Storage Bay Dist (ft)				60	200	
Storage Blk Time (%)			13	1		
Queuing Penalty (veh)			17	3		

Intersection: 12: Old Alturas Rd & Boyle Road

Movement	WB	WB	SB	SB
Directions Served	L	R	L	T
Maximum Queue (ft)	74	31	15	17
Average Queue (ft)	42	2	0	1
95th Queue (ft)	63	14	5	6
Link Distance (ft)	6920			280
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		25	185	
Storage Blk Time (%)	10	0		
Queuing Penalty (veh)	0	0		

Queuing and Blocking Report

Baseline

08/16/2017

Intersection: 13: Deschutes Road & Boyle Road

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	R	TR
Maximum Queue (ft)	96	93	29	48	66
Average Queue (ft)	44	43	6	2	5
95th Queue (ft)	77	73	26	18	29
Link Distance (ft)	6920	2309			121
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			100	50	
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				0	0

Intersection: 14: Deschutes Road & Old Forty-Four Drive

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	L	TR	LT	TR
Maximum Queue (ft)	73	95	55	98	100	241	143	125
Average Queue (ft)	32	56	13	54	51	80	72	73
95th Queue (ft)	58	86	44	89	91	164	106	113
Link Distance (ft)		2060		381		651	83	83
Upstream Blk Time (%)							3	3
Queuing Penalty (veh)							5	6
Storage Bay Dist (ft)	105		125		75			
Storage Blk Time (%)		0			1	7		
Queuing Penalty (veh)		0			2	10		

Intersection: 15: Deschutes Road & Cedro Road

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	R	L	T	TR
Maximum Queue (ft)	30	78	70	38	112	32	25	99	119
Average Queue (ft)	14	24	35	17	51	13	12	40	62
95th Queue (ft)	38	57	56	28	88	29	31	72	97
Link Distance (ft)	149	149	1046		348			651	651
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				120		120	75		
Storage Blk Time (%)					0			0	
Queuing Penalty (veh)					0			0	

Queuing and Blocking Report

Baseline

08/16/2017

Intersection: 16: Deschutes Road & SR 44 WB Ramps

Movement	WB	WB	NB	NB	NB
Directions Served	L	TR	L	T	T
Maximum Queue (ft)	46	37	36	20	28
Average Queue (ft)	14	13	14	2	2
95th Queue (ft)	38	33	31	13	13
Link Distance (ft)		405		350	350
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	175		200		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 17: Deschutes Road & SR 44 EB Ramps

Movement	EB	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	LT	R	T	T	R	L	T
Maximum Queue (ft)	141	148	68	156	138	92	44	97
Average Queue (ft)	41	48	9	65	30	3	16	44
95th Queue (ft)	82	87	47	106	73	30	33	73
Link Distance (ft)		333		615	615		350	350
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	280		50			75		
Storage Blk Time (%)		4	0		0	0		
Queuing Penalty (veh)		12	0		0	0		

Network Summary

Network wide Queuing Penalty: 86

LANE SUMMARY



Site: 1 [Existing AM]

Existing AM
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Shashta View Dr													
Lane 1 ^d	377	5.0	997	0.378	100	4.6	LOS A	2.0	51.9	Full	1600	0.0	0.0
Approach	377	5.0		0.378		4.6	LOS A	2.0	51.9				
East: Old Alturas Road													
Lane 1 ^d	318	5.0	855	0.372	100	6.2	LOS A	1.8	47.1	Full	1600	0.0	0.0
Approach	318	5.0		0.372		6.2	LOS A	1.8	47.1				
North: Shashta View Dr													
Lane 1 ^d	309	5.0	1009	0.306	100	4.5	LOS A	1.4	36.1	Full	1600	0.0	0.0
Lane 2	86	5.0	1112	0.078	100	2.9	LOS A	0.3	7.7	Short	150	0.0	NA
Approach	395	5.0		0.306		4.1	LOS A	1.4	36.1				
West: Old Alturas Road													
Lane 1 ^d	268	5.0	846	0.317	100	6.3	LOS A	1.5	38.3	Full	1600	0.0	0.0
Approach	268	5.0		0.317		6.3	LOS A	1.5	38.3				
Intersection	1359	5.0		0.378		5.1	LOS A	2.0	51.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY



Site: 1 [Existing PM]

Existing PM
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Shashta View Dr													
Lane 1 ^d	381	2.0	984	0.387	100	5.3	LOS A	2.1	53.3	Full	1600	0.0	0.0
Approach	381	2.0		0.387		5.3	LOS A	2.1	53.3				
East: Old Alturas Road													
Lane 1 ^d	228	2.0	891	0.255	100	5.7	LOS A	1.2	30.0	Full	1600	0.0	0.0
Approach	228	2.0		0.255		5.7	LOS A	1.2	30.0				
North: Shashta View Dr													
Lane 1 ^d	252	2.0	1048	0.241	100	3.7	LOS A	1.1	27.1	Full	1600	0.0	0.0
Lane 2	126	2.0	1117	0.112	100	3.0	LOS A	0.5	11.5	Short	150	0.0	NA
Approach	378	2.0		0.241		3.5	LOS A	1.1	27.1				
West: Old Alturas Road													
Lane 1 ^d	407	2.0	969	0.421	100	5.4	LOS A	2.3	59.3	Full	1600	0.0	0.0
Approach	407	2.0		0.421		5.4	LOS A	2.3	59.3				
Intersection	1394	2.0		0.421		4.9	LOS A	2.3	59.3				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

Site: 1 [Existing AM PP]

Existing AM PP
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Shashta View Dr													
Lane 1 ^d	380	5.0	987	0.384	100	4.6	LOS A	2.0	52.8	Full	1600	0.0	0.0
Approach	380	5.0		0.384		4.6	LOS A	2.0	52.8				
East: Old Alturas Road													
Lane 1 ^d	353	5.0	855	0.413	100	6.2	LOS A	2.1	55.0	Full	1600	0.0	0.0
Approach	353	5.0		0.413		6.2	LOS A	2.1	55.0				
North: Shashta View Dr													
Lane 1 ^d	309	5.0	976	0.317	100	4.7	LOS A	1.4	37.1	Full	1600	0.0	0.0
Lane 2	86	5.0	1081	0.080	100	3.0	LOS A	0.3	7.9	Short	150	0.0	NA
Approach	395	5.0		0.317		4.3	LOS A	1.4	37.1				
West: Old Alturas Road													
Lane 1 ^d	277	5.0	842	0.329	100	6.2	LOS A	1.5	40.0	Full	1600	0.0	0.0
Approach	277	5.0		0.329		6.2	LOS A	1.5	40.0				
Intersection	1406	5.0		0.413		5.3	LOS A	2.1	55.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

Site: 1 [Existing PM PP]

Existing PM PP
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Shashta View Dr													
Lane 1 ^d	385	2.0	953	0.404	100	5.5	LOS A	2.2	55.6	Full	1600	0.0	0.0
Approach	385	2.0		0.404		5.5	LOS A	2.2	55.6				
East: Old Alturas Road													
Lane 1 ^d	249	2.0	891	0.279	100	5.7	LOS A	1.3	33.4	Full	1600	0.0	0.0
Approach	249	2.0		0.279		5.7	LOS A	1.3	33.4				
North: Shashta View Dr													
Lane 1 ^d	253	2.0	1028	0.246	100	3.8	LOS A	1.1	27.7	Full	1600	0.0	0.0
Lane 2	126	2.0	1099	0.114	100	3.1	LOS A	0.5	11.7	Short	150	0.0	NA
Approach	379	2.0		0.246		3.6	LOS A	1.1	27.7				
West: Old Alturas Road													
Lane 1 ^d	437	2.0	964	0.453	100	5.4	LOS A	2.6	66.0	Full	1600	0.0	0.0
Approach	437	2.0		0.453		5.4	LOS A	2.6	66.0				
Intersection	1450	2.0		0.453		5.0	LOS A	2.6	66.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY



Site: 1 [Year 2035 NP AM]

Existing AM
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Shashta View Dr													
Lane 1 ^d	409	5.0	798	0.513	100	7.1	LOS A	3.1	80.9	Full	1600	0.0	0.0
Approach	409	5.0		0.513		7.1	LOS A	3.1	80.9				
East: Old Alturas Road													
Lane 1 ^d	580	5.0	808	0.717	100	10.2	LOS B	6.5	169.6	Full	1600	0.0	0.0
Approach	580	5.0		0.717		10.2	LOS B	6.5	169.6				
North: Shashta View Dr													
Lane 1 ^d	375	5.0	803	0.467	100	7.0	LOS A	2.4	63.4	Full	1600	0.0	0.0
Lane 2	136	5.0	915	0.149	100	3.9	LOS A	0.6	15.0	Short	150	0.0	NA
Approach	511	5.0		0.467		6.2	LOS A	2.4	63.4				
West: Old Alturas Road													
Lane 1 ^d	466	5.0	760	0.613	100	9.3	LOS A	4.3	113.0	Full	1600	0.0	0.0
Approach	466	5.0		0.613		9.3	LOS A	4.3	113.0				
Intersection	1966	5.0		0.717		8.3	LOS A	6.5	169.6				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY



Site: 1 [Year 2035 NP PM]

Existing PM
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Shashta View Dr													
Lane 1 ^d	511	2.0	769	0.664	100	10.3	LOS B	5.4	136.1	Full	1600	0.0	0.0
Approach	511	2.0		0.664		10.3	LOS B	5.4	136.1				
East: Old Alturas Road													
Lane 1 ^d	383	2.0	778	0.492	100	7.8	LOS A	2.9	74.9	Full	1600	0.0	0.0
Approach	383	2.0		0.492		7.8	LOS A	2.9	74.9				
North: Shashta View Dr													
Lane 1 ^d	340	2.0	902	0.378	100	5.0	LOS A	1.8	45.2	Full	1600	0.0	0.0
Lane 2	170	2.0	985	0.173	100	3.7	LOS A	0.7	18.1	Short	150	0.0	NA
Approach	511	2.0		0.378		4.6	LOS A	1.8	45.2				
West: Old Alturas Road													
Lane 1 ^d	660	2.0	859	0.767	100	11.1	LOS B	8.5	216.0	Full	1600	0.0	0.0
Approach	660	2.0		0.767		11.1	LOS B	8.5	216.0				
Intersection	2064	2.0		0.767		8.7	LOS A	8.5	216.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 **Site: 1 [Year 2035 AM PP]**

Existing AM PP
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Shashta View Dr													
Lane 1 ^d	411	5.0	790	0.521	100	7.3	LOS A	3.2	83.0	Full	1600	0.0	0.0
Approach	411	5.0		0.521		7.3	LOS A	3.2	83.0				
East: Old Alturas Road													
Lane 1 ^d	615	5.0	808	0.761	100	11.3	LOS B	7.7	200.0	Full	1600	0.0	0.0
Approach	615	5.0		0.761		11.3	LOS B	7.7	200.0				
North: Shashta View Dr													
Lane 1 ^d	375	5.0	777	0.482	100	7.4	LOS A	2.6	66.4	Full	1600	0.0	0.0
Lane 2	136	5.0	889	0.153	100	4.0	LOS A	0.6	15.4	Short	150	0.0	NA
Approach	511	5.0		0.482		6.5	LOS A	2.6	66.4				
West: Old Alturas Road													
Lane 1 ^d	475	5.0	756	0.628	100	9.5	LOS A	4.6	118.7	Full	1600	0.0	0.0
Approach	475	5.0		0.628		9.5	LOS A	4.6	118.7				
Intersection	2013	5.0		0.761		8.8	LOS A	7.7	200.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 **Site: 1 [Year 2035 PM PP]**

Existing PM PP
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Shashta View Dr													
Lane 1 ^d	515	2.0	745	0.691	100	11.2	LOS B	5.8	146.5	Full	1600	0.0	0.0
Approach	515	2.0		0.691		11.2	LOS B	5.8	146.5				
East: Old Alturas Road													
Lane 1 ^d	404	2.0	778	0.520	100	8.0	LOS A	3.3	82.8	Full	1600	0.0	0.0
Approach	404	2.0		0.520		8.0	LOS A	3.3	82.8				
North: Shashta View Dr													
Lane 1 ^d	341	2.0	885	0.386	100	5.3	LOS A	1.8	46.8	Full	1600	0.0	0.0
Lane 2	170	2.0	970	0.175	100	3.7	LOS A	0.7	18.3	Short	150	0.0	NA
Approach	512	2.0		0.386		4.8	LOS A	1.8	46.8				
West: Old Alturas Road													
Lane 1 ^d	689	2.0	856	0.806	100	12.3	LOS B	9.9	251.8	Full	1600	0.0	0.0
Approach	689	2.0		0.806		12.3	LOS B	9.9	251.8				
Intersection	2120	2.0		0.806		9.4	LOS A	9.9	251.8				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 **Site: 10 [10 - EXPP AM]**

Existing AM PP
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Airport Road													
Lane 1 ^d	723	4.0	1327	0.545	100	2.6	LOS A	0.0	0.0	Full	650	0.0	0.0
Approach	723	4.0		0.545		2.6	LOS A	0.0	0.0				
East: SR 44 WB Off Ramp													
Lane 1 ^d	148	5.0	611	0.242	100	9.8	LOS A	1.0	25.0	Full	1600	0.0	0.0
Approach	148	5.0		0.242		9.8	LOS A	1.0	25.0				
North: Airport Road													
Lane 1 ^d	308	5.0	1066	0.289	100	2.6	LOS A	1.3	34.2	Full	350	0.0	0.0
Lane 2	238	5.0	1066	0.223	100	3.2	LOS A	1.0	24.8	Short	150	0.0	NA
Approach	545	5.0		0.289		2.9	LOS A	1.3	34.2				
Intersection	1416	4.5		0.545		3.5	LOS A	1.3	34.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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Project: K:\PRJ\987\T987\T987Sidra004\10 Mitigations.sip7

LANE SUMMARY

 Site: 10 [10 - EXPP PM]

Existing AM PP
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Airport Road													
Lane 1 ^d	805	5.0	1314	0.612	100	3.5	LOS A	0.0	0.0	Full	650	0.0	0.0
Approach	805	5.0		0.612		3.5	LOS A	0.0	0.0				
East: SR 44 WB Off Ramp													
Lane 1 ^d	149	5.0	555	0.268	100	10.9	LOS B	1.1	27.3	Full	1600	0.0	0.0
Approach	149	5.0		0.268		10.9	LOS B	1.1	27.3				
North: Airport Road													
Lane 1 ^d	366	5.0	921	0.397	100	3.6	LOS A	1.9	48.7	Full	350	0.0	0.0
Lane 2	295	5.0	921	0.321	100	4.1	LOS A	1.4	36.9	Short	150	0.0	NA
Approach	661	5.0		0.397		3.8	LOS A	1.9	48.7				
Intersection	1615	5.0		0.612		4.3	LOS A	1.9	48.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 **Site: 10 [8 - CPP AM]**

Existing AM PP
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Old Oregon Trail													
Lane 1 ^d	440	5.0	804	0.547	100	7.7	LOS A	3.5	92.0	Full	365	0.0	0.0
Approach	440	5.0		0.547		7.7	LOS A	3.5	92.0				
East: Old Alturas Road													
Lane 1 ^d	764	5.0	838	0.912	100	18.4	LOS B	15.8	411.9	Full	600	0.0	0.0
Approach	764	5.0		0.912		18.4	LOS B	15.8	411.9				
North: Old Oregon Trail													
Lane 1 ^d	368	5.0	594	0.619	100	12.1	LOS B	3.9	101.2	Full	1600	0.0	0.0
Approach	368	5.0		0.619		12.1	LOS B	3.9	101.2				
West: Old Alturas Road													
Lane 1 ^d	500	5.0	794	0.630	100	8.2	LOS A	4.7	122.6	Full	300	0.0	0.0
Approach	500	5.0		0.630		8.2	LOS A	4.7	122.6				
Intersection	2072	5.0		0.912		12.6	LOS B	15.8	411.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Roundabout LOS Method: Same as Signalised Intersections.
 Lane LOS values are based on average delay per lane.
 Intersection and Approach LOS values are based on average delay for all lanes.
 Roundabout Capacity Model: US HCM 6.
 SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
 Gap-Acceptance Capacity: Traditional M1.
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

LANE SUMMARY

 **Site: 10 [8 - CPP PM]**

Existing AM PP
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Old Oregon Trail													
Lane 1 ^d	514	2.0	670	0.767	100	14.0	LOS B	7.0	178.0	Full	365	0.0	0.0
Approach	514	2.0		0.767		14.0	LOS B	7.0	178.0				
East: Old Alturas Road													
Lane 1 ^d	478	2.0	843	0.567	100	7.6	LOS A	4.0	101.8	Full	600	0.0	0.0
Approach	478	2.0		0.567		7.6	LOS A	4.0	101.8				
North: Old Oregon Trail													
Lane 1 ^d	467	2.0	850	0.549	100	8.0	LOS A	3.8	95.6	Full	1600	0.0	0.0
Approach	467	2.0		0.549		8.0	LOS A	3.8	95.6				
West: Old Alturas Road													
Lane 1 ^d	607	2.0	810	0.749	100	11.0	LOS B	7.6	192.0	Full	300	0.0	0.0
Approach	607	2.0		0.749		11.0	LOS B	7.6	192.0				
Intersection	2066	2.0		0.767		10.2	LOS B	7.6	192.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 Site: 10 [10 - CPP AM]

Existing AM PP
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Airport Road													
Lane 1 ^d	877	4.0	1327	0.661	100	2.8	LOS A	0.0	0.0	Full	650	0.0	0.0
Approach	877	4.0		0.661		2.8	LOS A	0.0	0.0				
East: SR 44 WB Off Ramp													
Lane 1 ^d	218	5.0	518	0.422	100	12.7	LOS B	1.9	50.4	Full	1600	0.0	0.0
Approach	218	5.0		0.422		12.7	LOS B	1.9	50.4				
North: Airport Road													
Lane 1 ^d	429	5.0	971	0.442	100	3.4	LOS A	2.2	58.4	Full	350	0.0	0.0
Lane 2	275	5.0	971	0.283	100	3.8	LOS A	1.2	32.2	Short	150	0.0	NA
Approach	704	5.0		0.442		3.5	LOS A	2.2	58.4				
Intersection	1800	4.5		0.661		4.3	LOS A	2.2	58.4				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

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LANE SUMMARY

 **Site: 10 [10 - CPP PM]**

Existing AM PP
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Airport Road													
Lane 1 ^d	1000	4.0	1327	0.754	100	3.5	LOS A	0.0	0.0	Full	650	0.0	0.0
Approach	1000	4.0		0.754		3.5	LOS A	0.0	0.0				
East: SR 44 WB Off Ramp													
Lane 1 ^d	218	5.0	455	0.480	100	15.2	LOS B	2.3	58.6	Full	1600	0.0	0.0
Approach	218	5.0		0.480		15.2	LOS B	2.3	58.6				
North: Airport Road													
Lane 1 ^d	500	5.0	832	0.601	100	6.2	LOS A	4.0	103.9	Full	350	0.0	0.0
Lane 2	350	5.0	832	0.421	100	5.2	LOS A	2.0	53.3	Short	150	0.0	NA
Approach	850	5.0		0.601		5.8	LOS A	4.0	103.9				
Intersection	2068	4.5		0.754		5.7	LOS A	4.0	103.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: US HCM 6.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

^d Dominant lane on roundabout approach

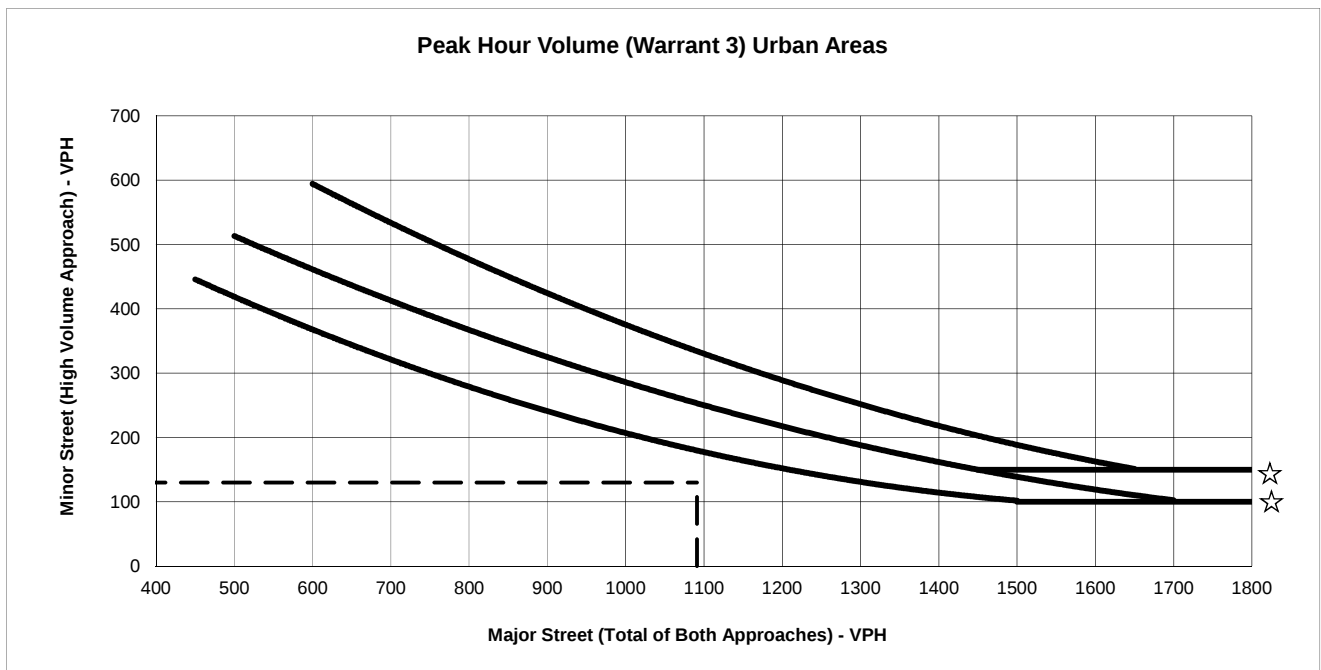
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Project: K:\PRJ\987\T987\T987Sidra004\10 Mitigations.sip7

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

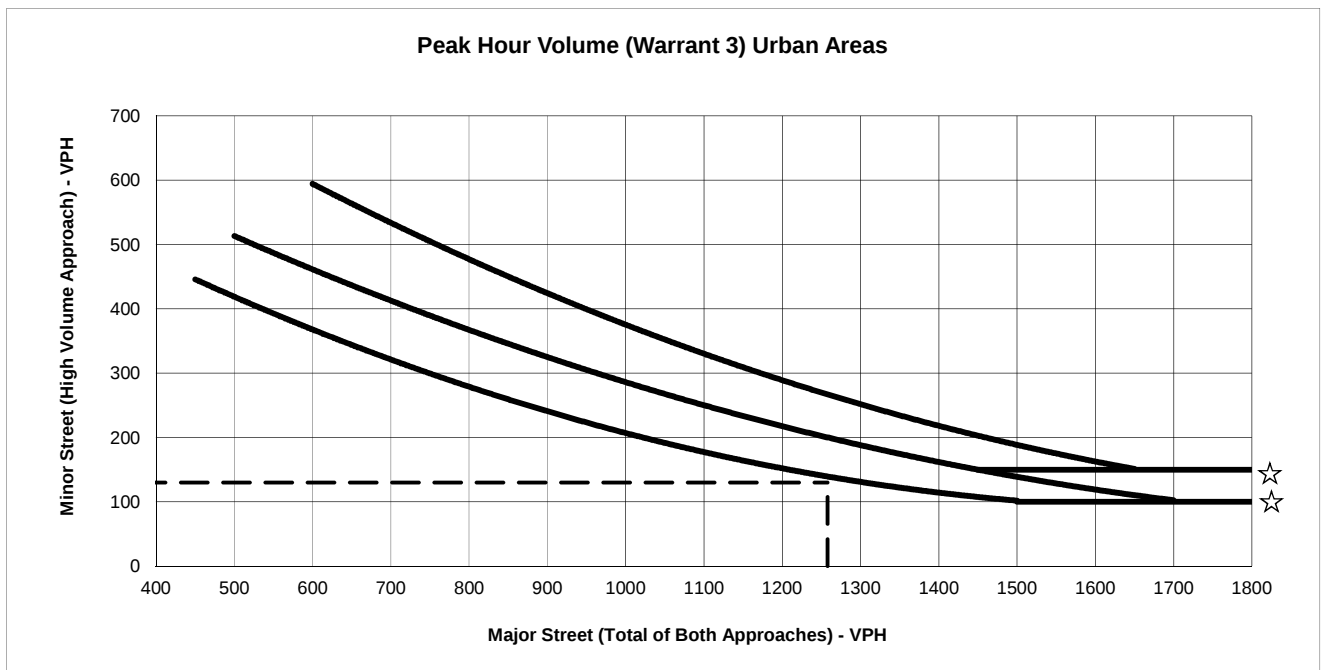
Number of Lanes

Major Approach Airport Rd
Minor Approach SR 44 SB Ramps

Major St. Volume: 1091
Minor St. Volume: 130
Warrant Met?: No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

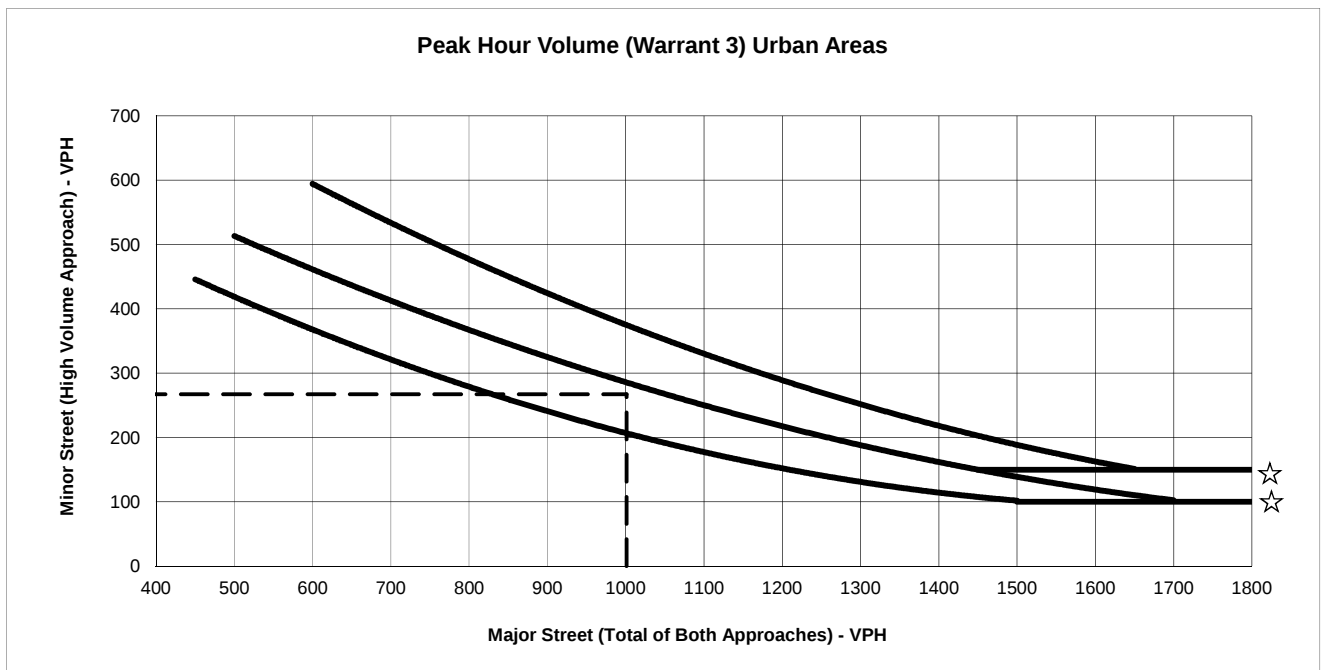
Number of Lanes

Major Approach Airport Rd
Minor Approach SR 44 SB Ramps

Major St. Volume: 1258
Minor St. Volume: 130
Warrant Met?: No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

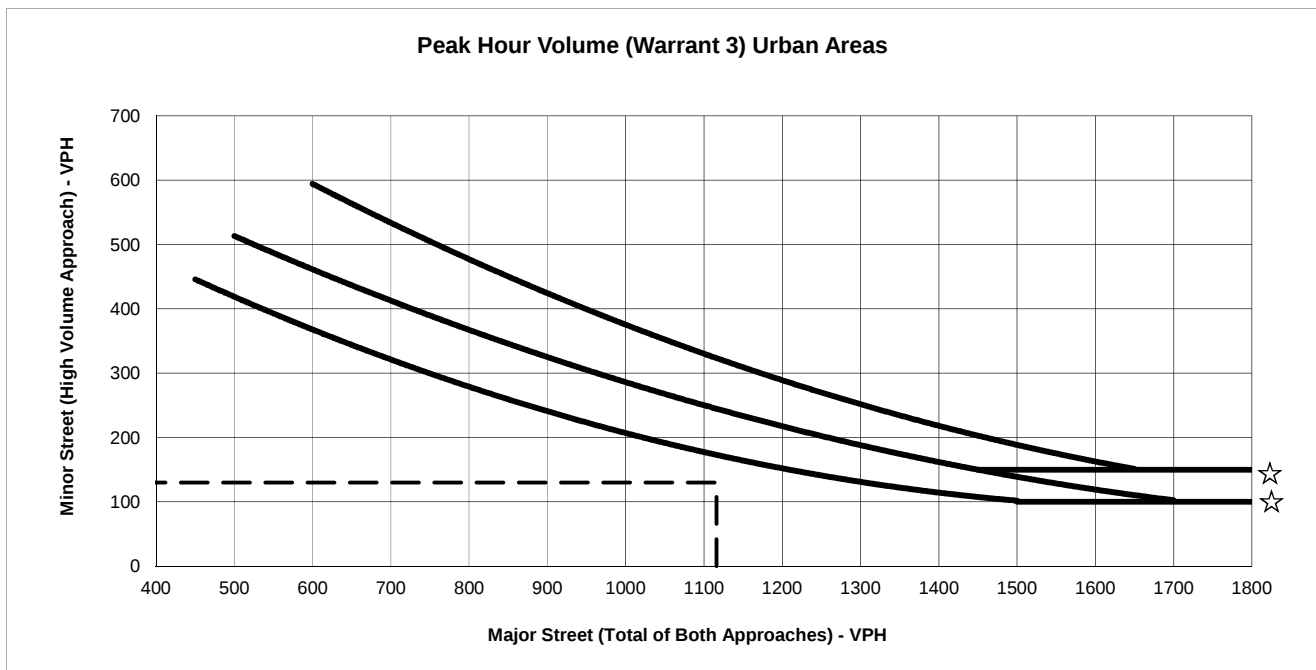
Number of Lanes

Major Approach Deschutes Rd
Minor Approach Old 44 Dr

Major St. Volume: 1001
Minor St. Volume: 267
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

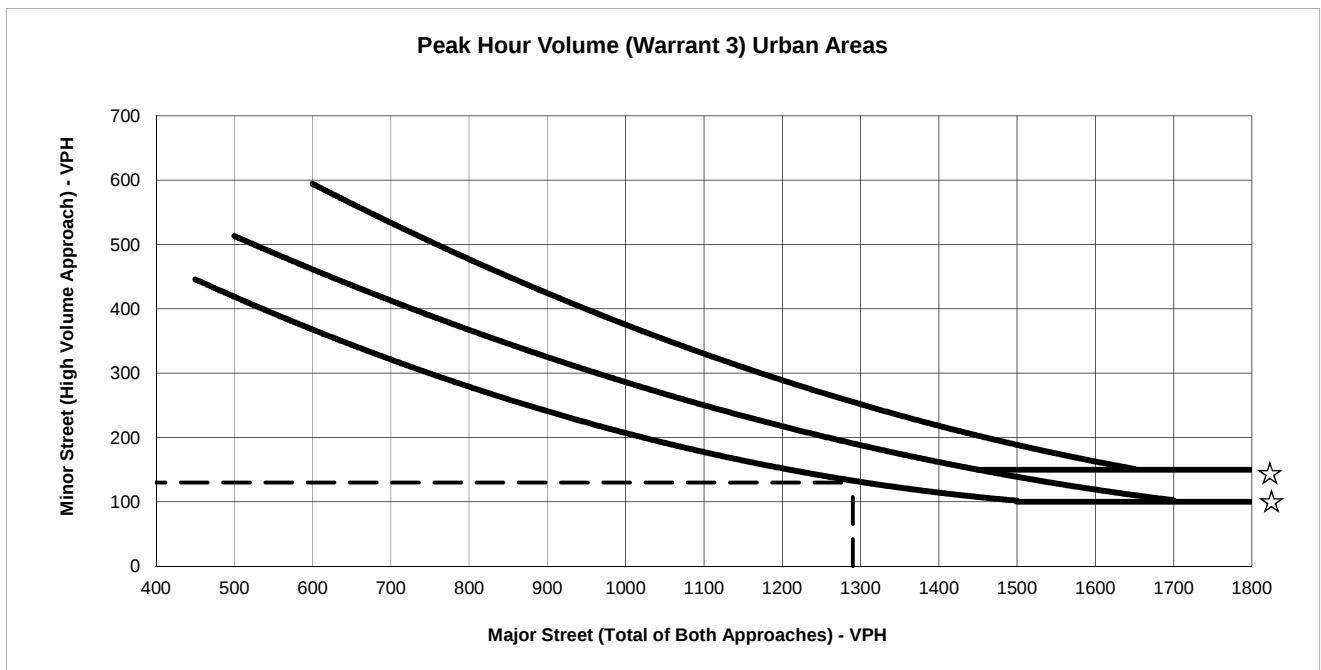
Number of Lanes

Major Approach Airport Rd
Minor Approach SR 44 SB Ramps

Major St. Volume: 1116
Minor St. Volume: 130
Warrant Met?: No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

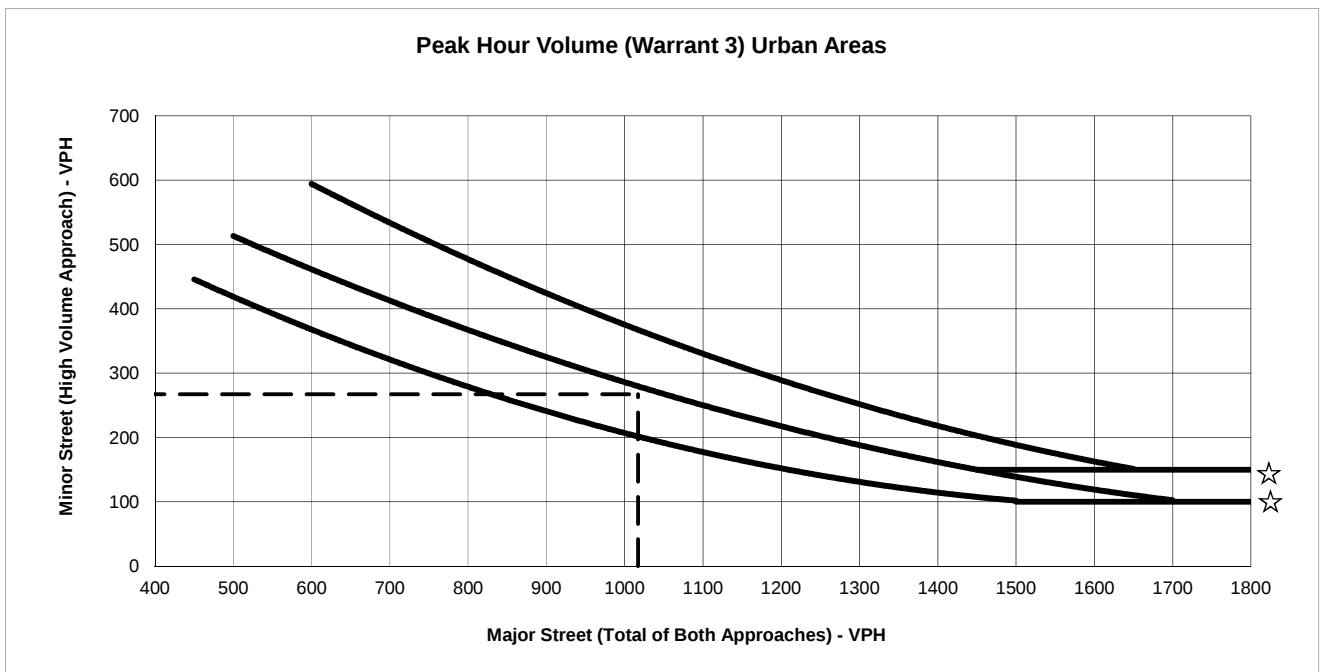
Number of Lanes

Major Approach Airport Rd
Minor Approach SR 44 SB Ramps

Major St. Volume: 1290
Minor St. Volume: 130
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

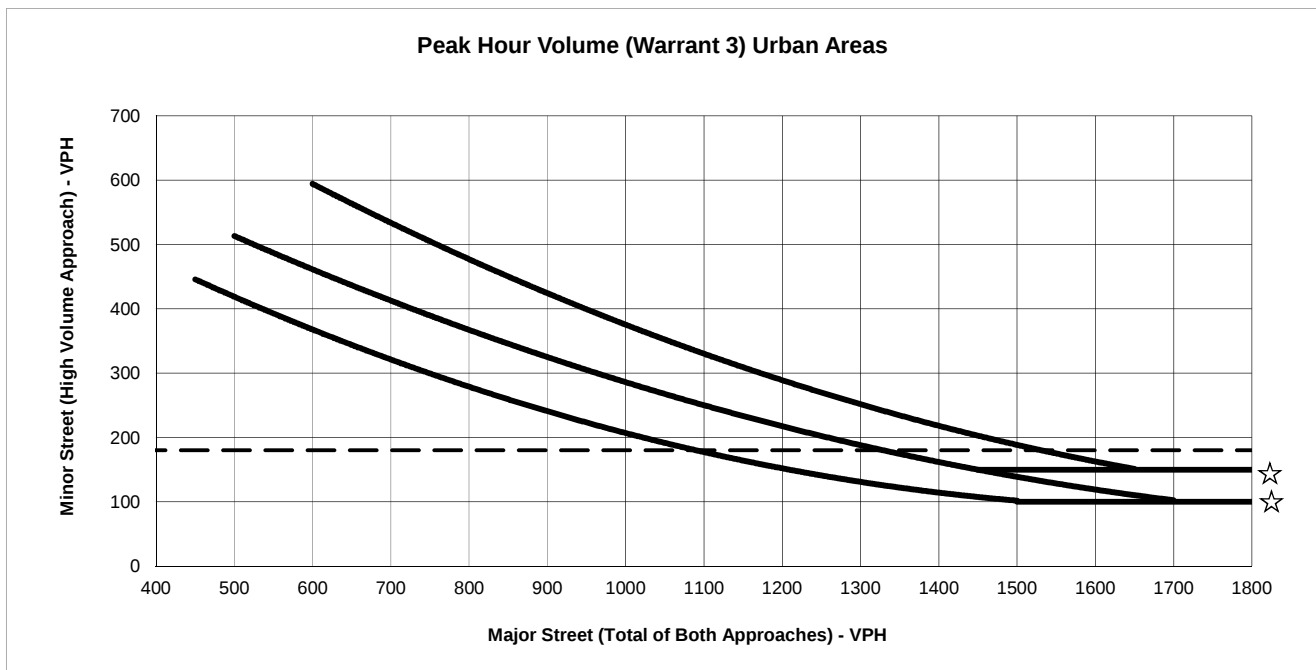
Number of Lanes

Major Approach Deschutes Rd
Minor Approach Old 44 Dr

Major St. Volume: 1017
Minor St. Volume: 267
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

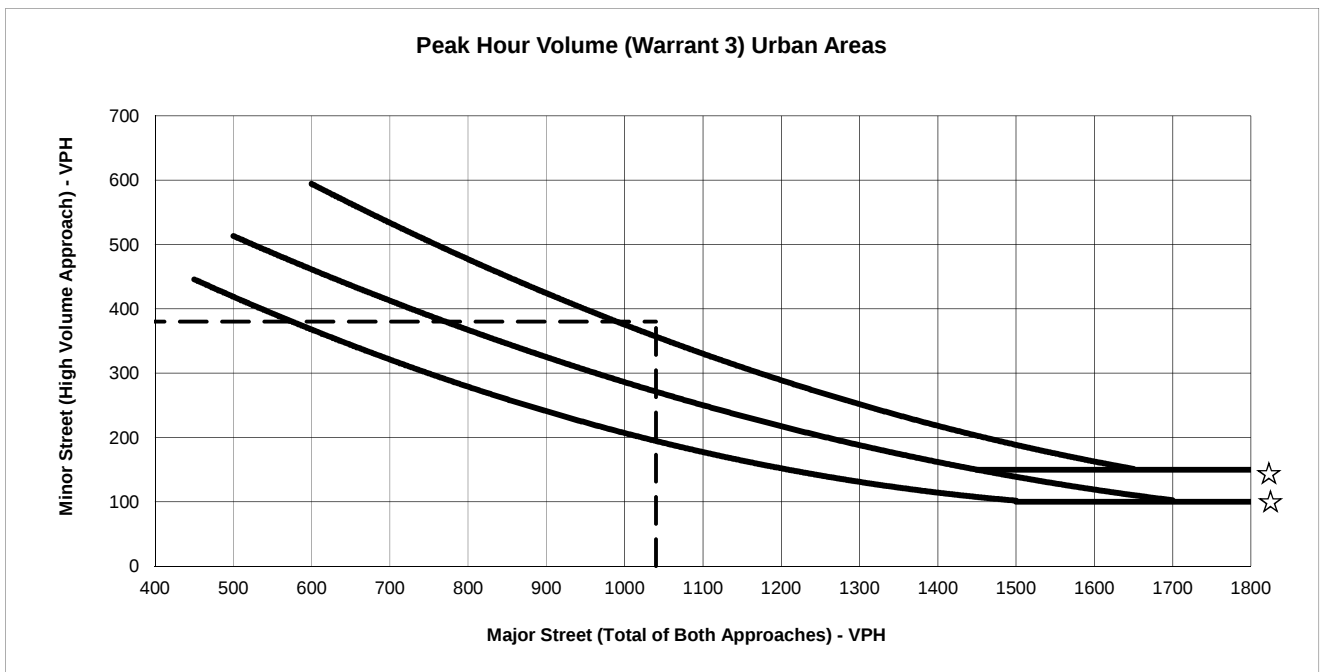
Number of Lanes

Major Approach Shasta View Dr
Minor Approach SR 44 WB Ramps

Major St. Volume: 1980
Minor St. Volume: 180
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



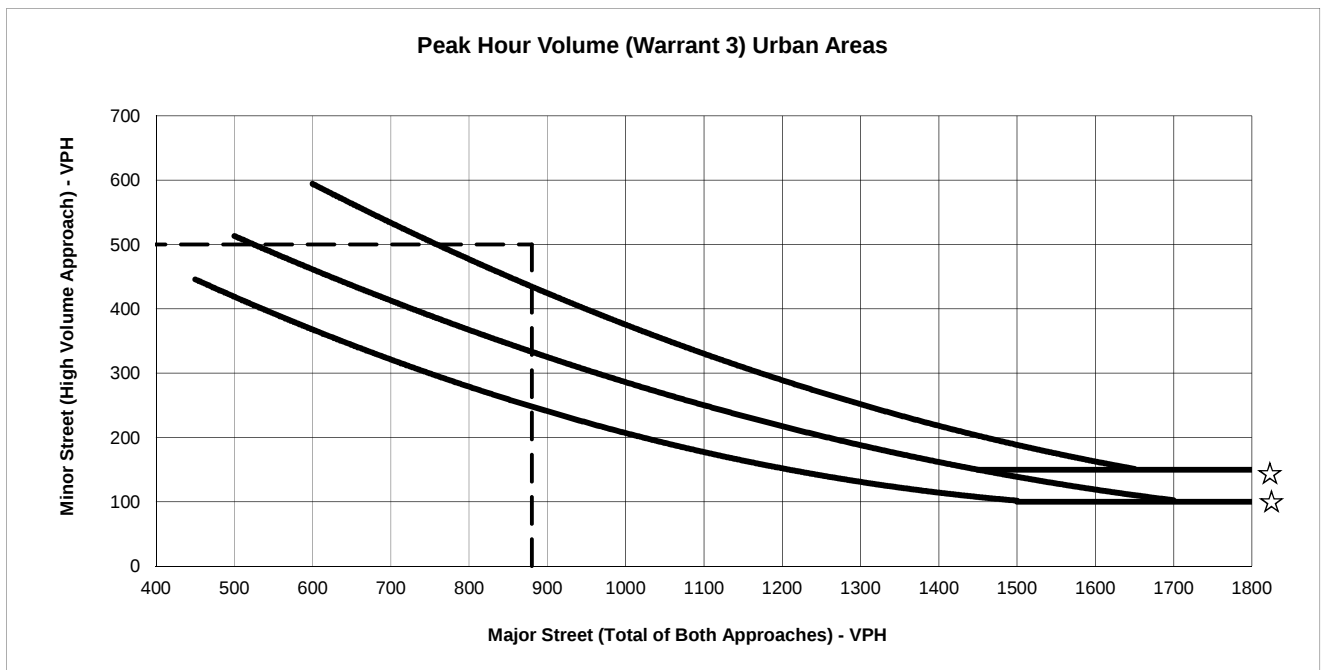
☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

Major Approach	Old Oregon Trail	Number of Lanes
Minor Approach	Old Altuas Rd	
Major St. Volume:	1040	
Minor St. Volume:	380	
Warrant Met?:	Yes	

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

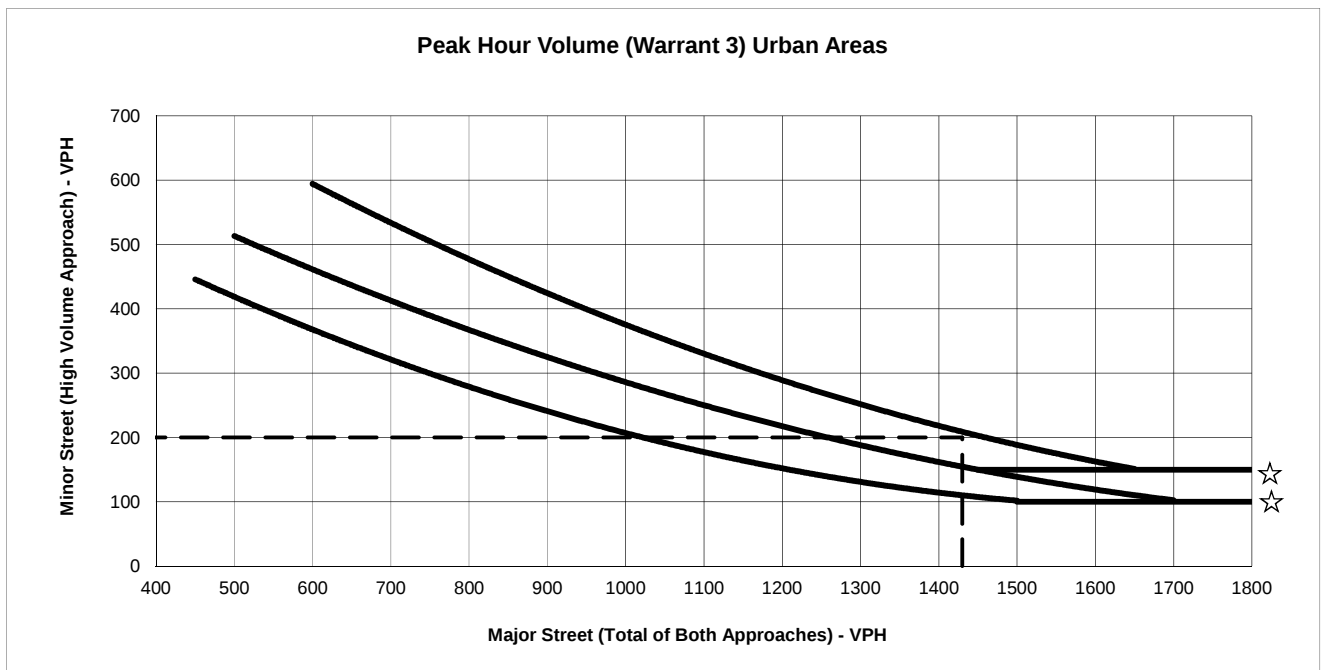
Major Approach Old Oregon Trail
Minor Approach Old Altuas Rd

Number of Lanes

Major St. Volume: 880
Minor St. Volume: 500
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

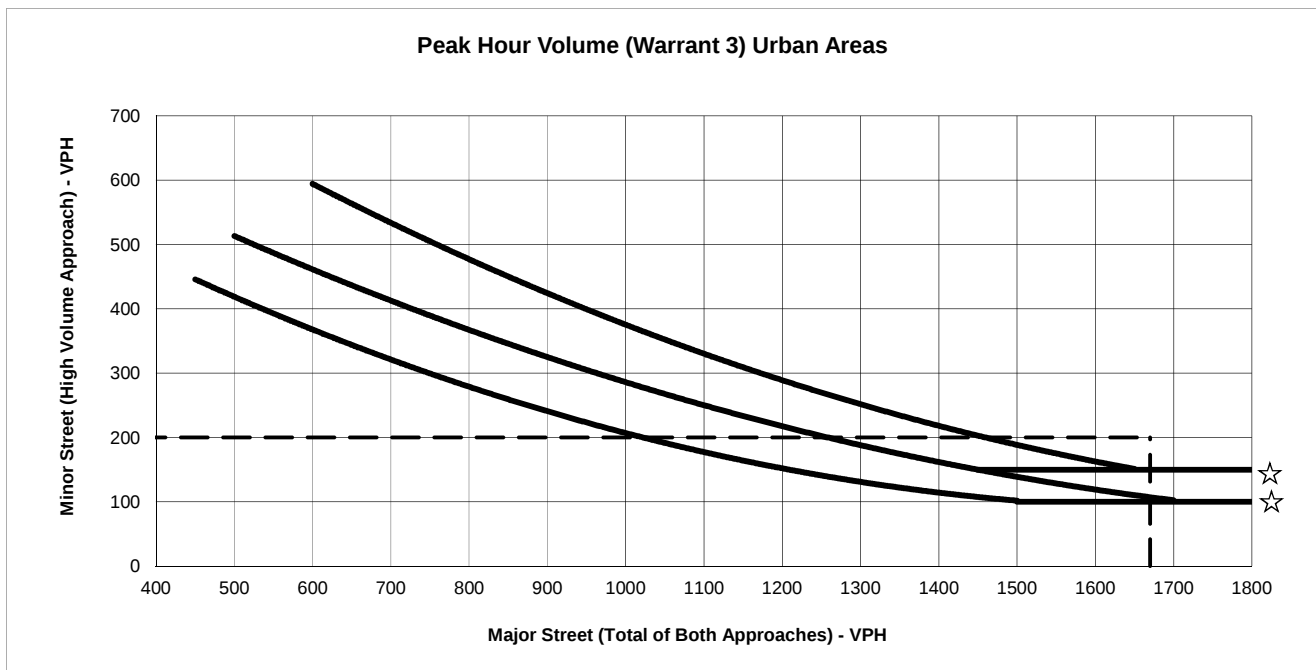
Number of Lanes

Major Approach Airport Rd
Minor Approach SR 44 SB Ramps

Major St. Volume: 1430
Minor St. Volume: 200
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

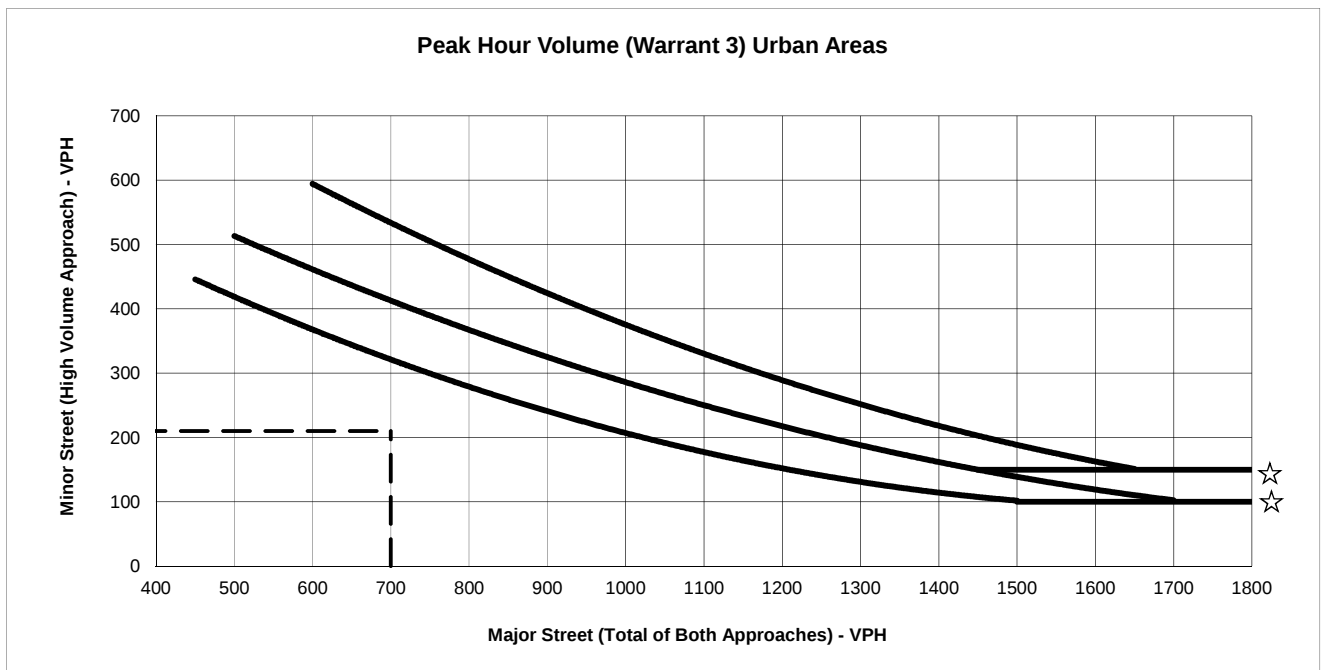
Number of Lanes

Major Approach Airport Rd
Minor Approach SR 44 SB Ramps

Major St. Volume: 1670
Minor St. Volume: 200
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



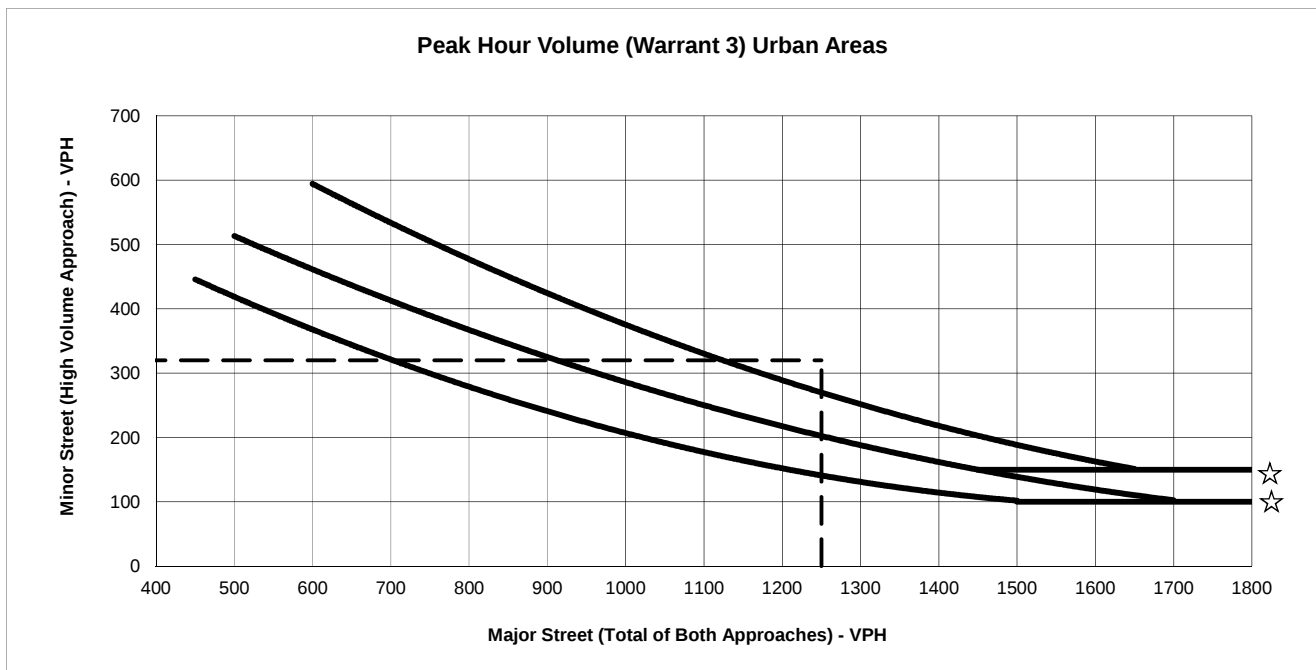
☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

Major Approach Deschutes Rd
 Minor Approach Boyle Rd
 Number of Lanes
 Major St. Volume: 700
 Minor St. Volume: 210
 Warrant Met?: No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

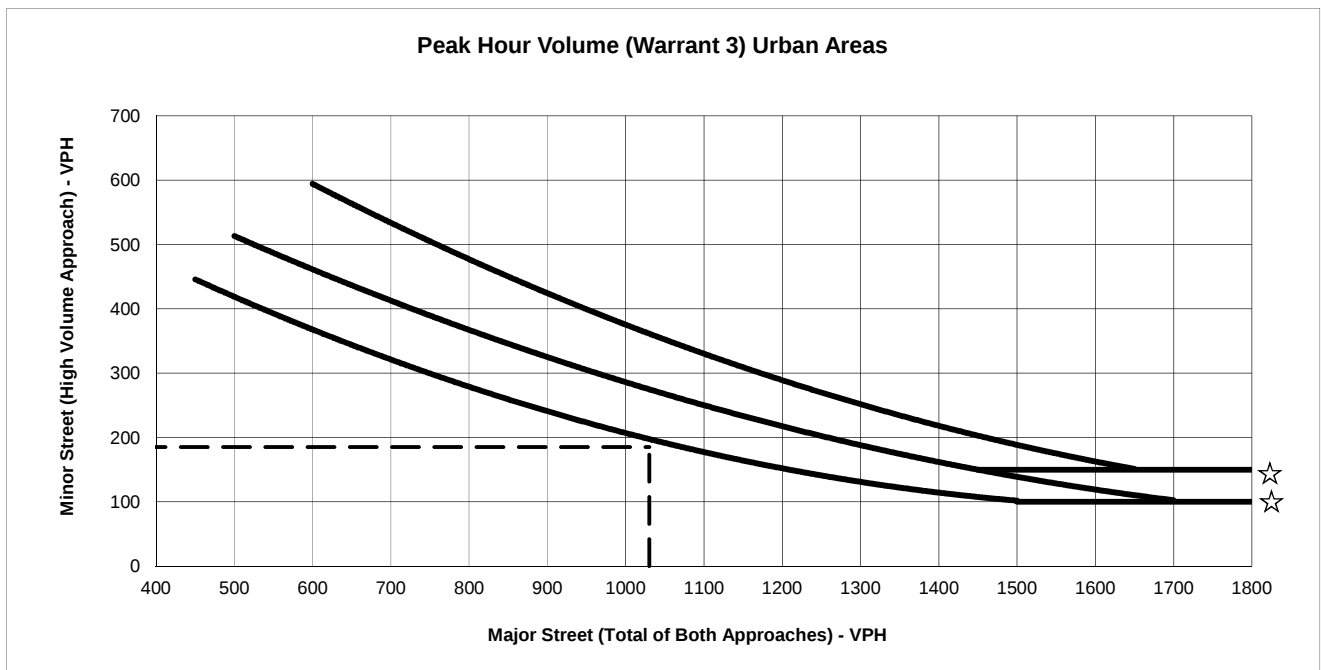
Number of Lanes

Major Approach Deschutes Rd
Minor Approach Old 44 Dr

Major St. Volume: 1250
Minor St. Volume: 320
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



NOTE:

150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

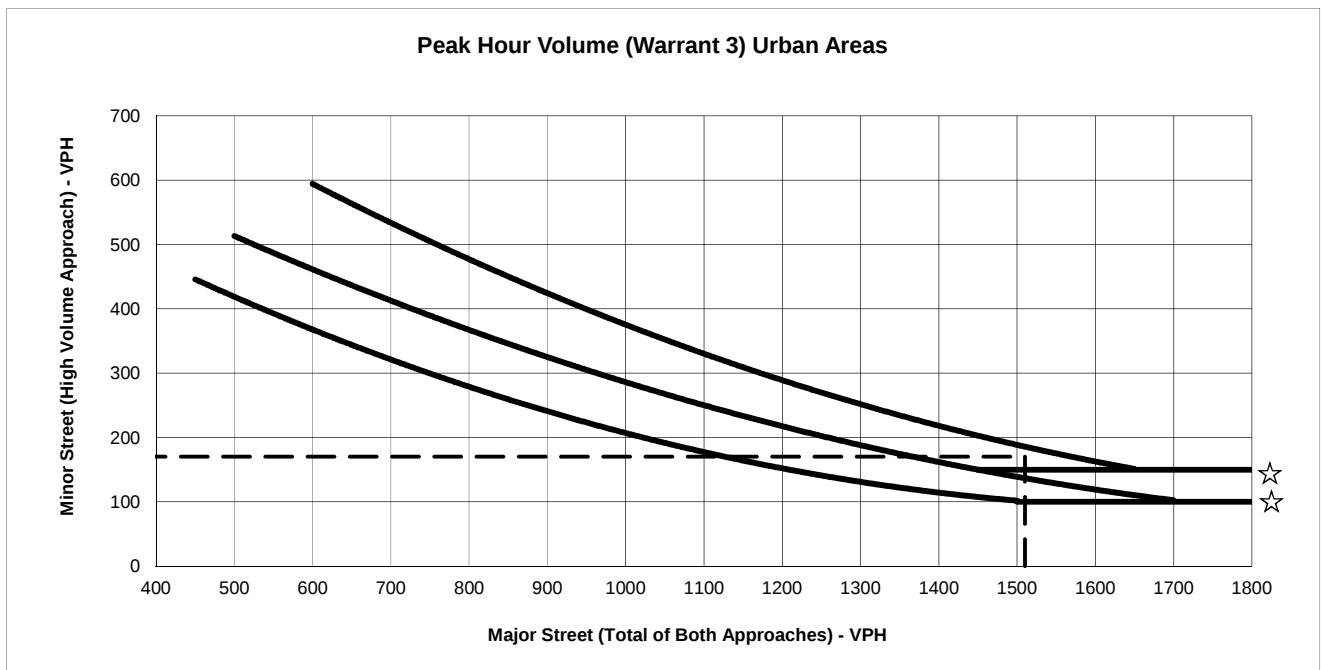
Number of Lanes

Major Approach Deschutes Rd
Minor Approach Old 44 Dr

Major St. Volume: 1030
Minor St. Volume: 185
Warrant Met?: No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



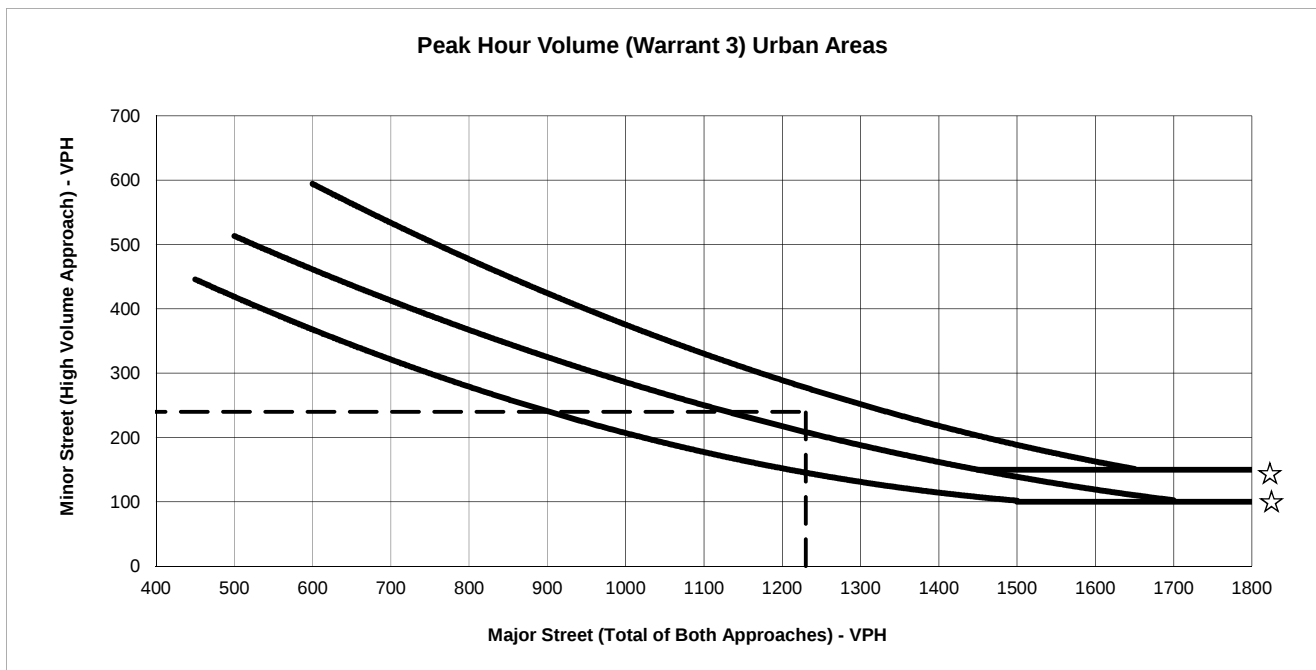
☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

Major Approach Deschutes Rd
 Minor Approach Cedro Rd
 Number of Lanes
 Major St. Volume: 1510
 Minor St. Volume: 170
 Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



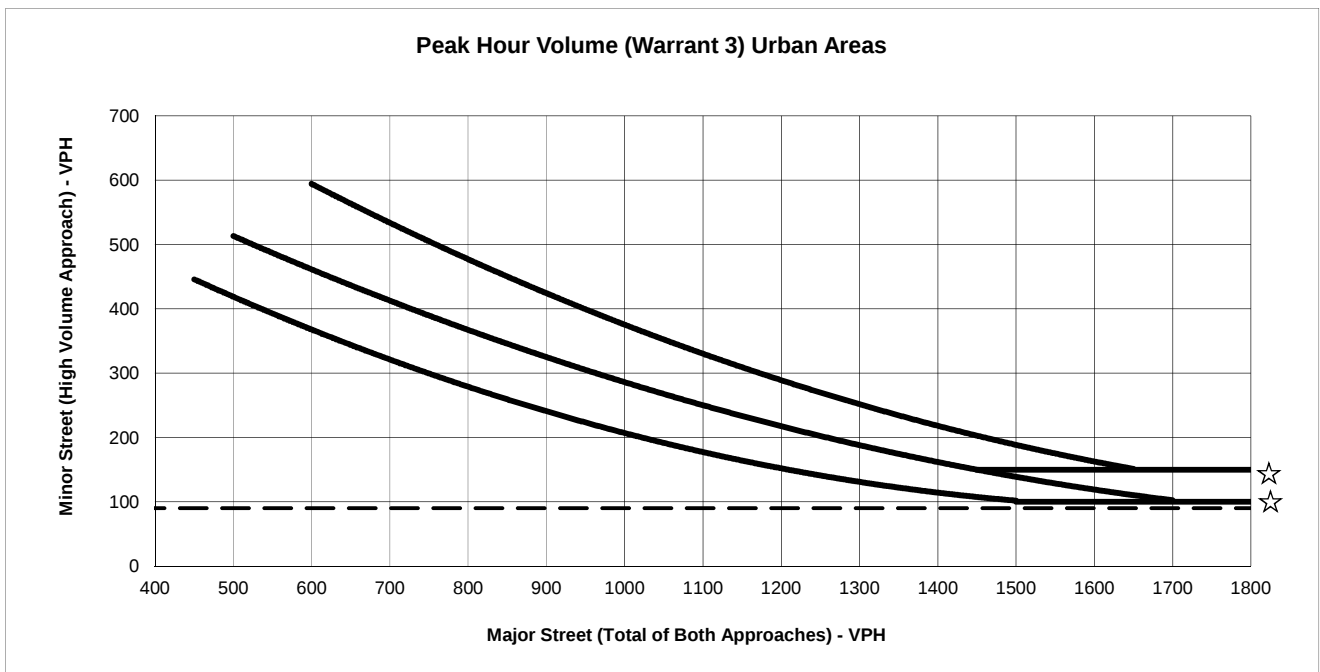
☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

Major Approach Deschutes Rd
 Minor Approach Cedro Rd
 Number of Lanes
 Major St. Volume: 1230
 Minor St. Volume: 240
 Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

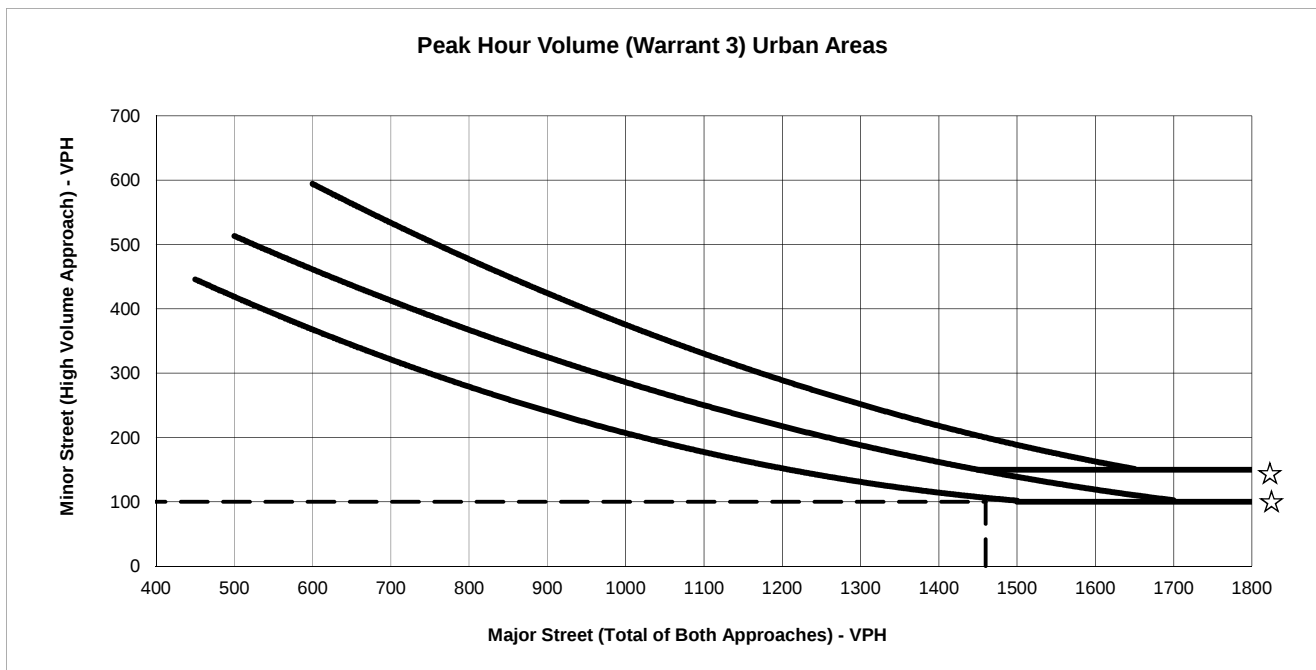
Number of Lanes

Major Approach Deschutes Rd
Minor Approach SR 44 WB Ramps

Major St. Volume: 1840
Minor St. Volume: 90
Warrant Met?: No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

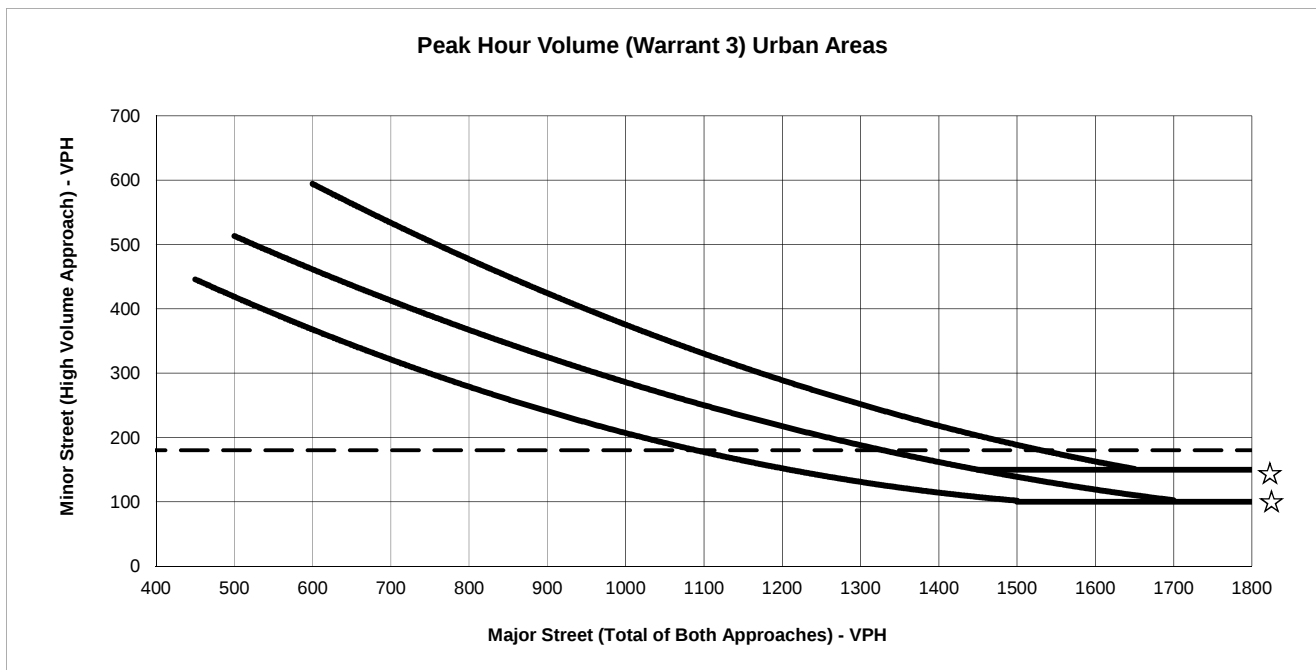
Number of Lanes

Major Approach Deschutes Rd
Minor Approach SR 44 WB Ramps

Major St. Volume: 1460
Minor St. Volume: 100
Warrant Met?: No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

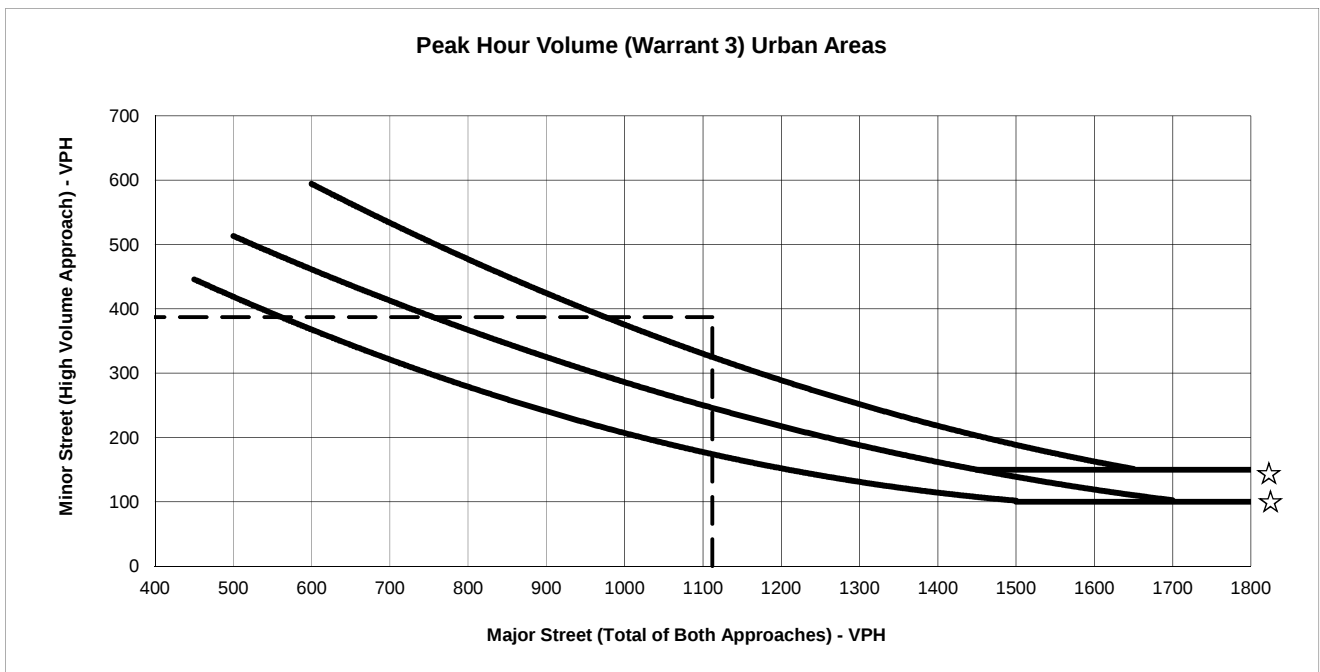
Number of Lanes

Major Approach Shasta View Dr
Minor Approach SR 44 WB Ramps

Major St. Volume: 1986
Minor St. Volume: 180
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

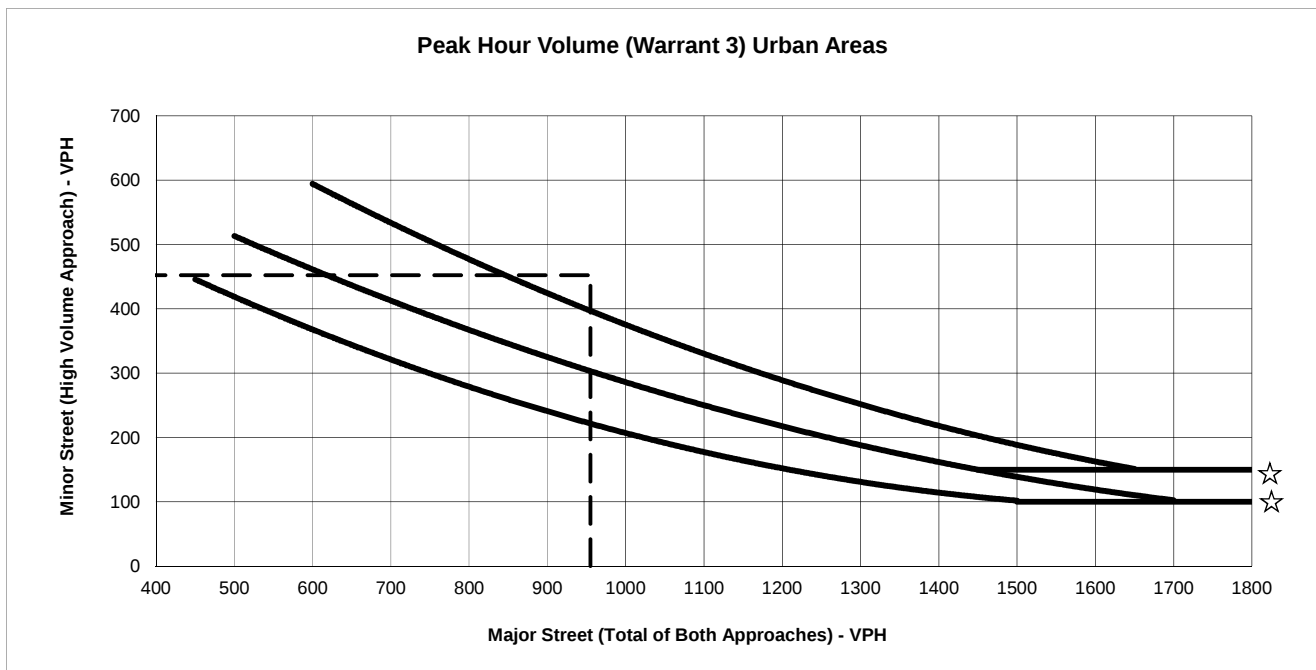
Major Approach Old Oregon Trail
Minor Approach Old Altuas Rd

Number of Lanes

Major St. Volume: 1112
Minor St. Volume: 387
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



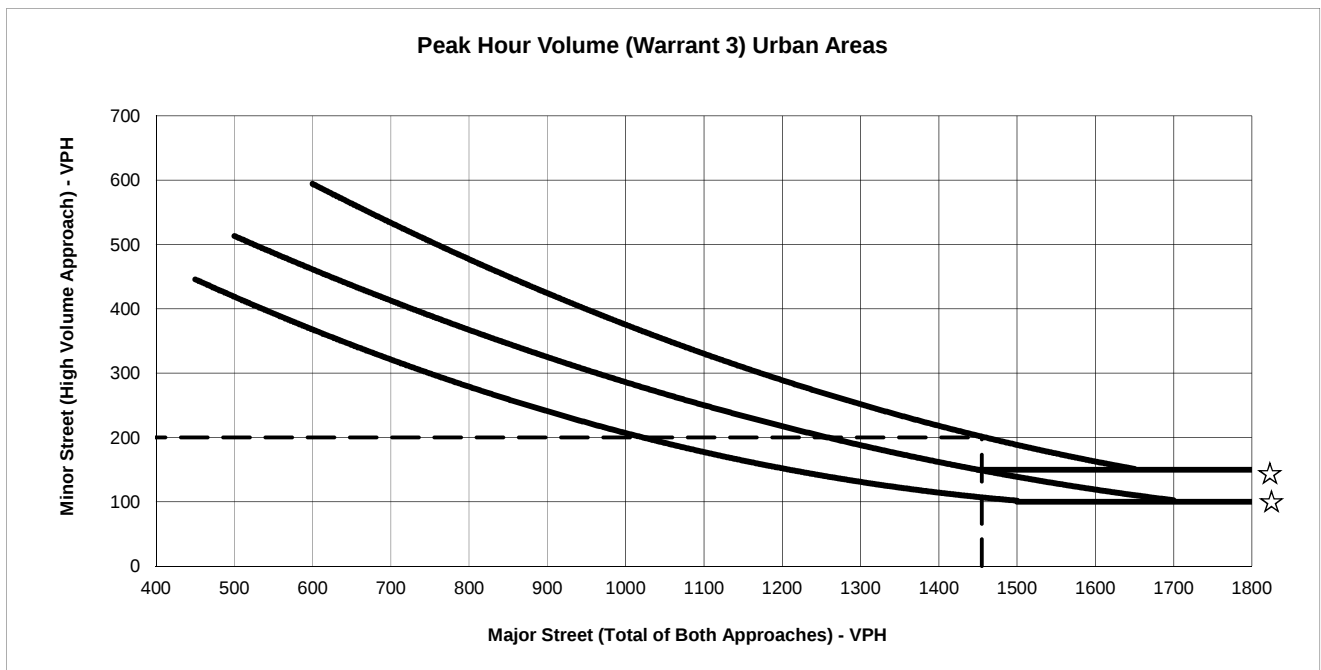
☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

Major Approach	Old Oregon Trail	Number of Lanes
Minor Approach	Old Altuas Rd	
Major St. Volume:	955	
Minor St. Volume:	452	
Warrant Met?:	Yes	

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

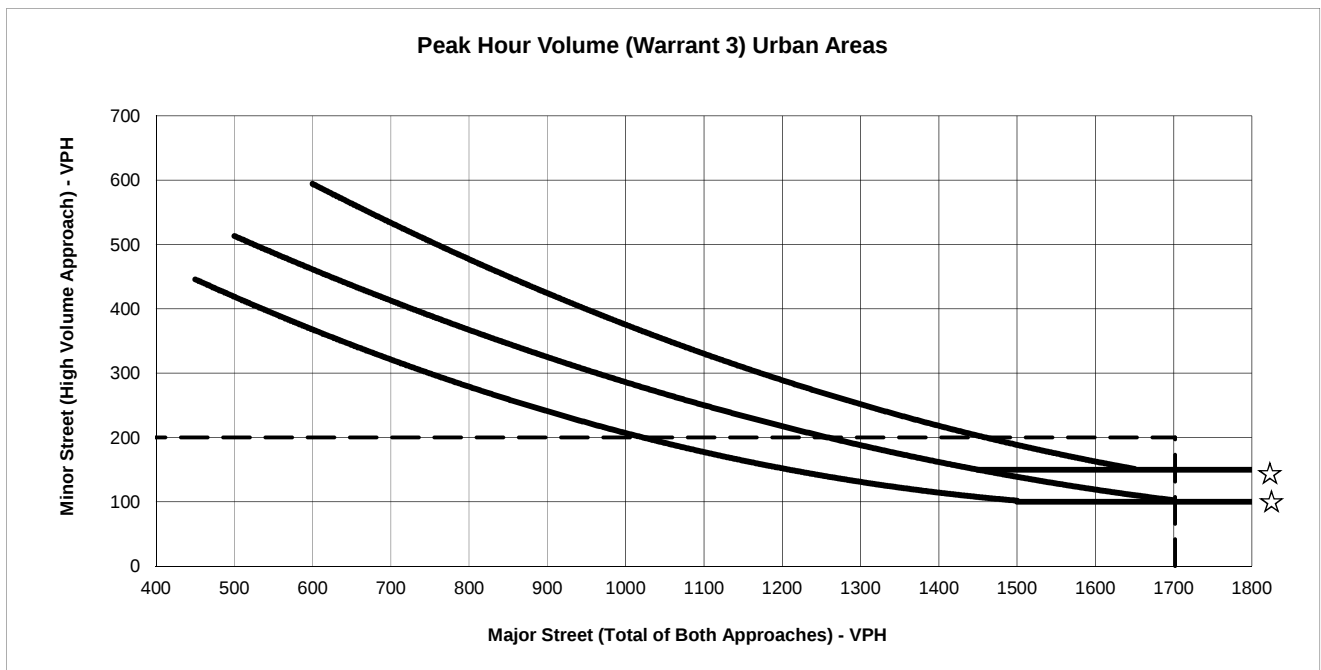
Number of Lanes

Major Approach Airport Rd
Minor Approach SR 44 SB Ramps

Major St. Volume: 1455
Minor St. Volume: 200
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



NOTE:

150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

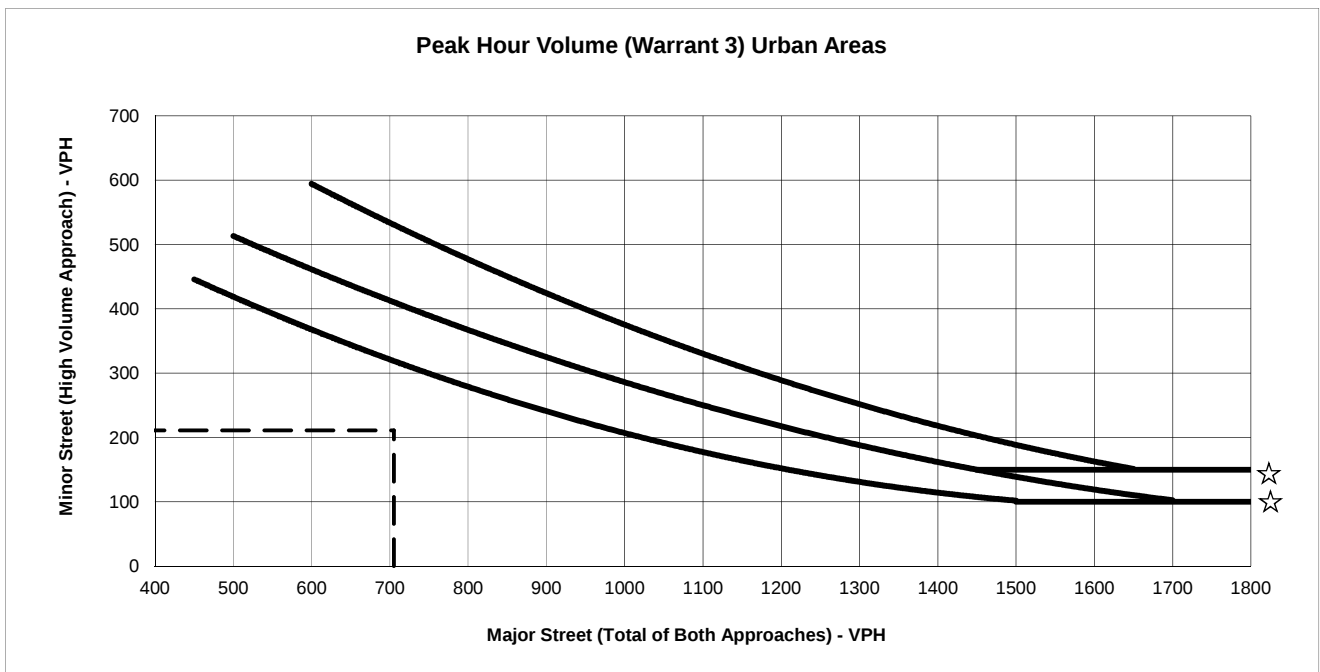
Number of Lanes

Major Approach Airport Rd
Minor Approach SR 44 SB Ramps

Major St. Volume: 1702
Minor St. Volume: 200
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

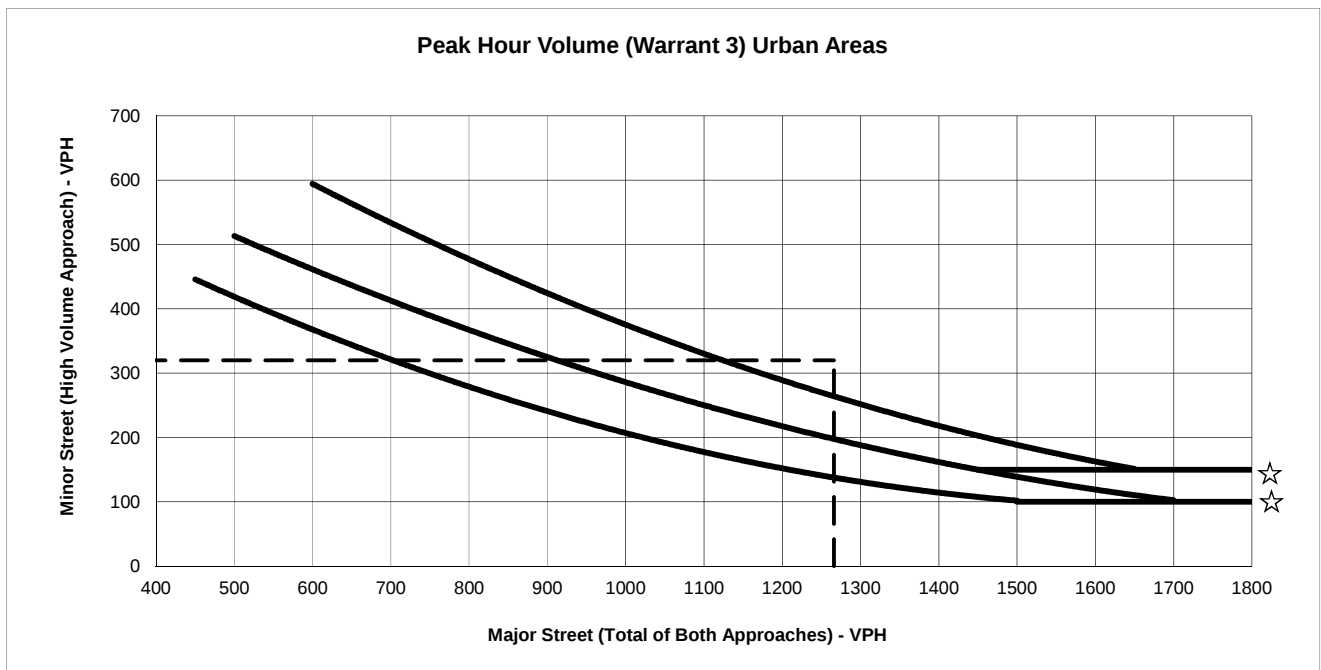
Number of Lanes

Major Approach Deschutes Rd
Minor Approach Boyle Rd

Major St. Volume: 705
Minor St. Volume: 211
Warrant Met?: No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

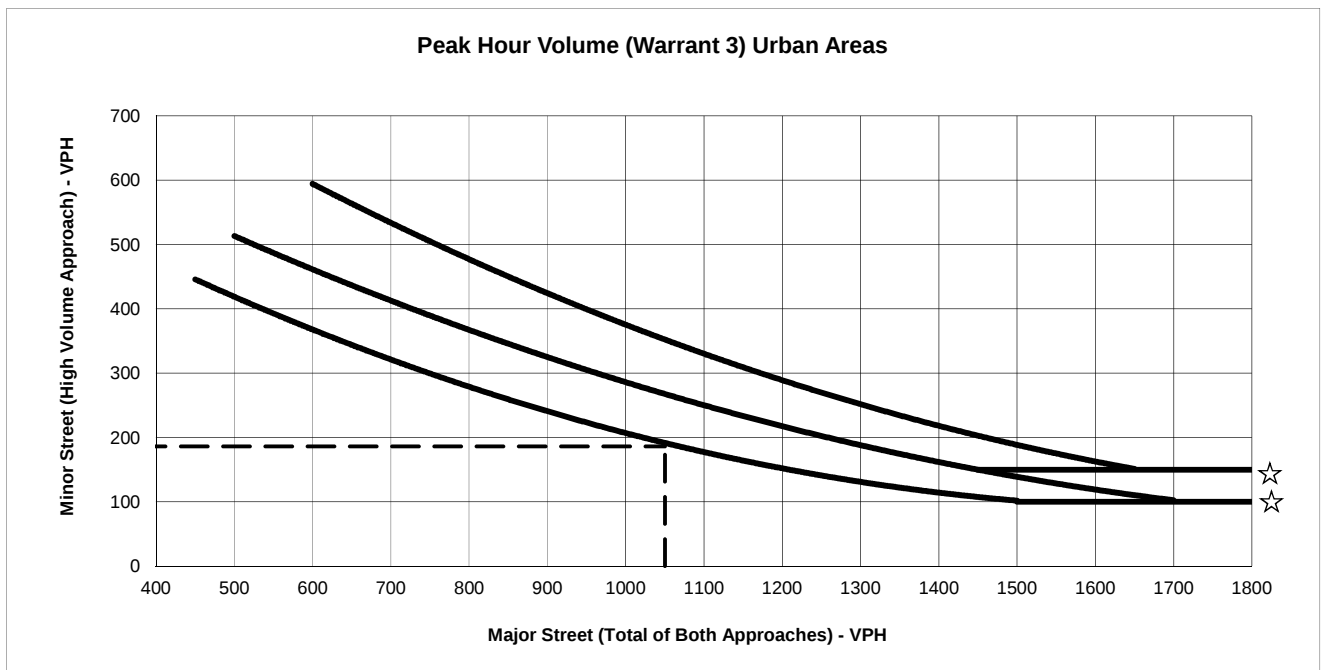
Number of Lanes

Major Approach Deschutes Rd
Minor Approach Old 44 Dr

Major St. Volume: 1266
Minor St. Volume: 320
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



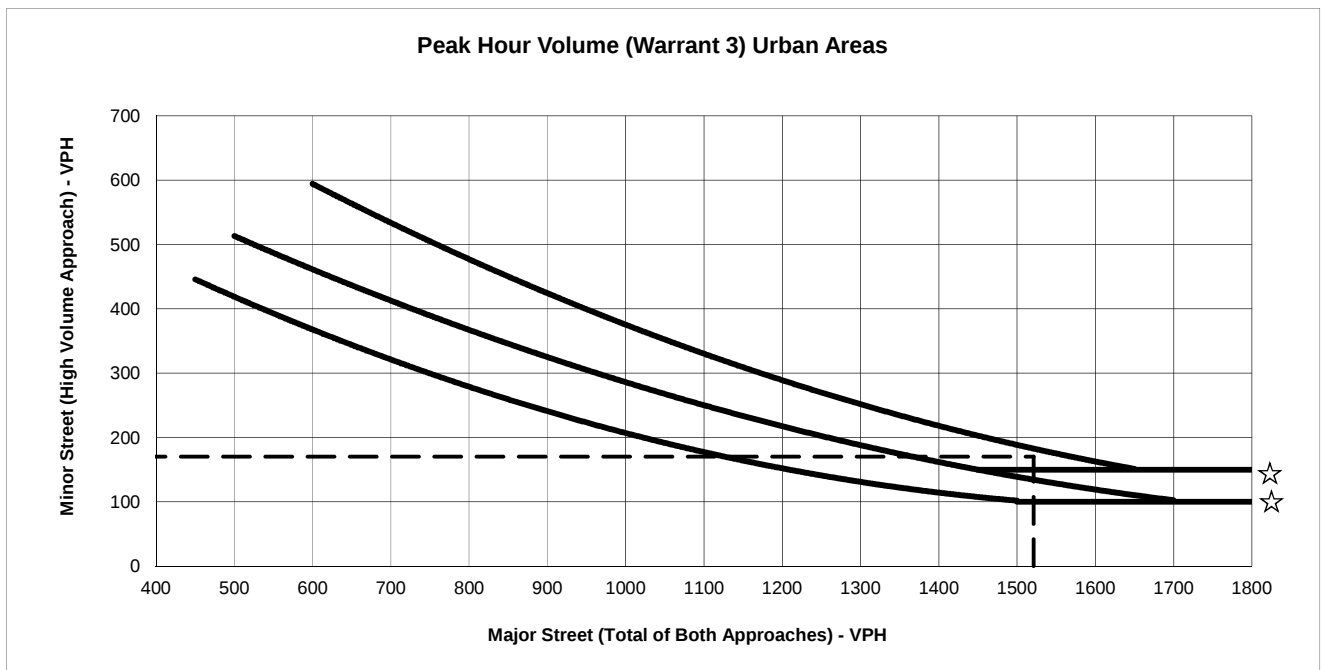
☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

Major Approach Deschutes Rd
 Minor Approach Old 44 Dr
 Number of Lanes
 Major St. Volume: 1050
 Minor St. Volume: 186
 Warrant Met?: No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

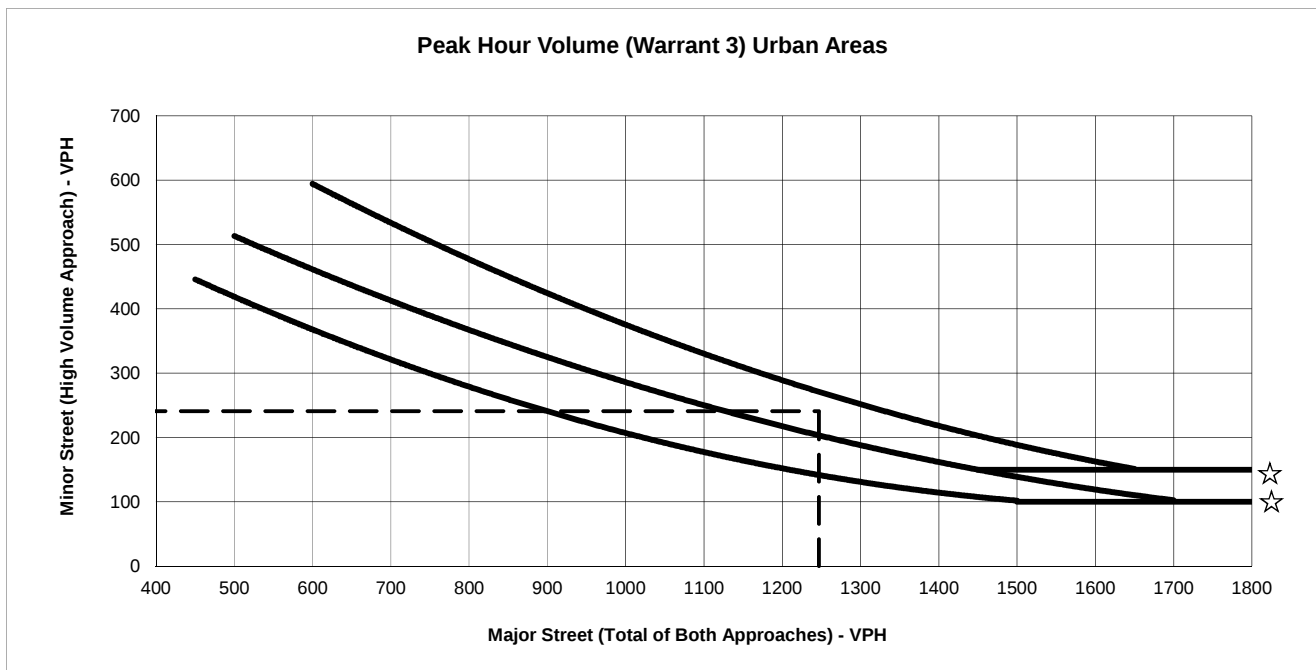
Number of Lanes

Major Approach Deschutes Rd
Minor Approach Cedro Rd

Major St. Volume: 1521
Minor St. Volume: 170
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

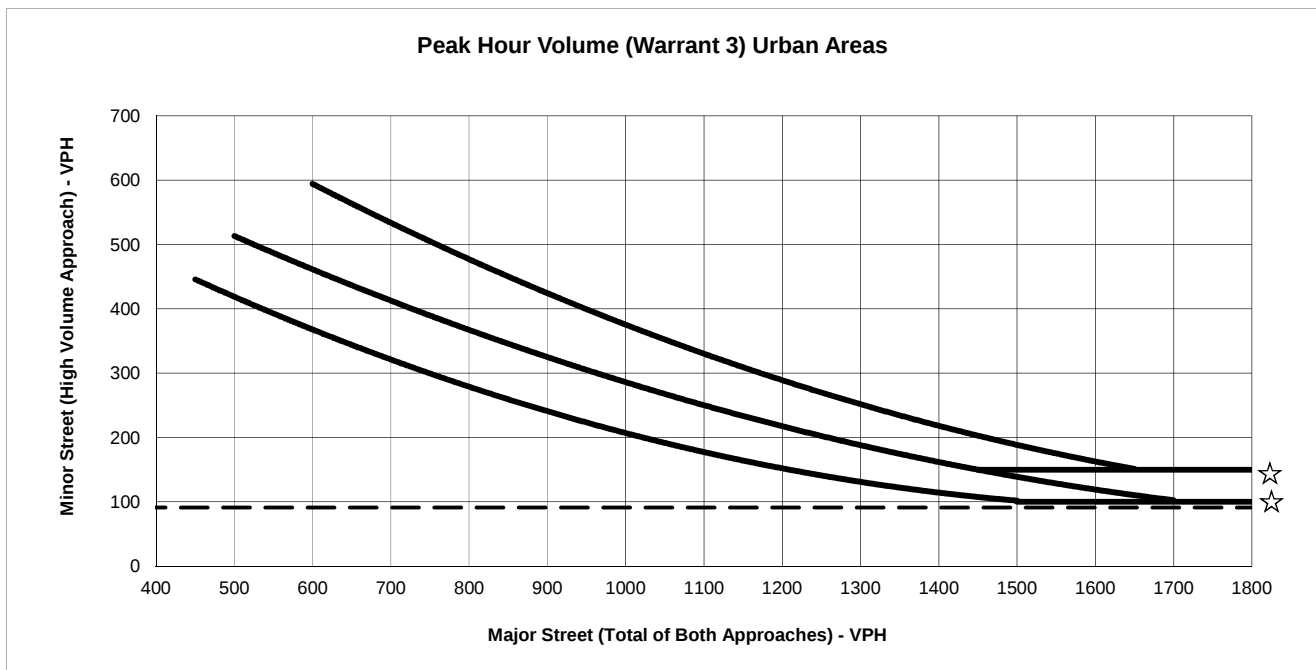
Number of Lanes

Major Approach Deschutes Rd
Minor Approach Cedro Rd

Major St. Volume: 1247
Minor St. Volume: 241
Warrant Met?: Yes

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

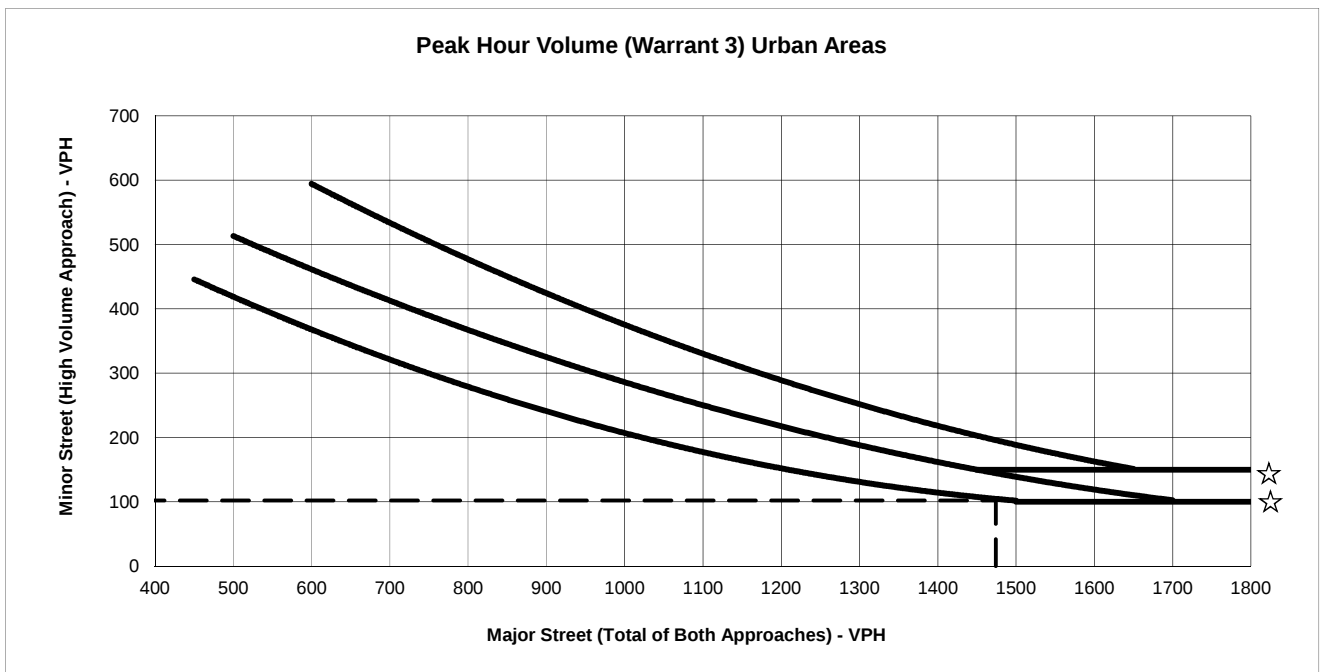
Number of Lanes

Major Approach Deschutes Rd
Minor Approach SR 44 WB Ramps

Major St. Volume: 1850
Minor St. Volume: 91
Warrant Met?: No

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

* Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)

Number of Lanes

Major Approach Deschutes Rd
Minor Approach SR 44 WB Ramps

Major St. Volume: 1474
Minor St. Volume: 102
Warrant Met?: No