SOUTHERN OREGON TRANSPORTATION ENGINEERING, LLC
319 Eastwood Drive - Medford, Or. 97504 – Phone (541) 941-4148 – Email: Kim.parducci@gmail.com

November 8, 2022

Matt Samitore, Public Works Director
City of Central Point
Public Works Department
140 S. 3rd Street
Central Point, OR 97502

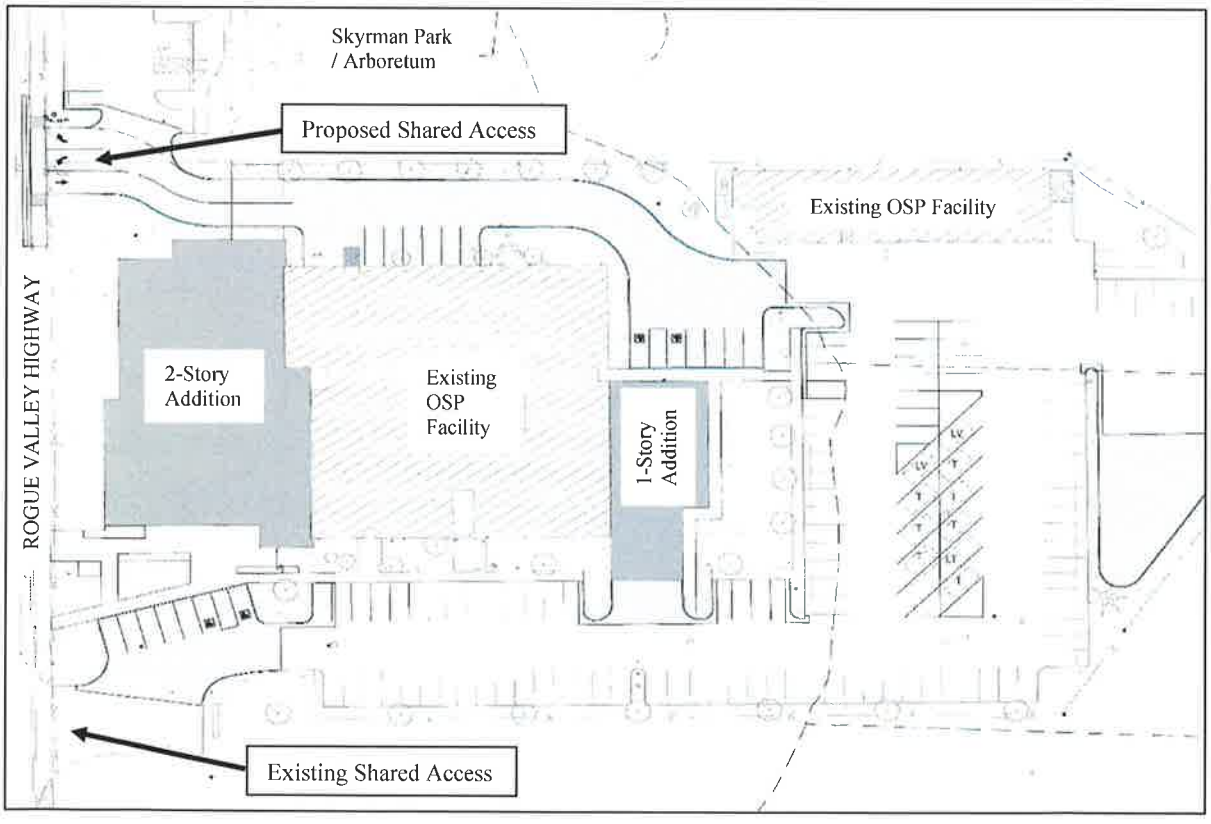
RE: Oregon State Police Building Expansion – Traffic Analysis

Dear Matt,

Southern Oregon Transportation Engineering, LLC prepared a traffic analysis for a proposed Oregon State Police (OSP) building expansion at 4500 Rogue Valley Highway (OR 99) in Central Point. The subject parcel is 3.57 acres located at 372W03BD, Tax Lot 900. The existing OSP building is approximately 25,450 square feet (SF) in size. The proposed new OSP building will be approximately 51,000 SF.

Background

Access to the site is currently provided on OR 99 through a shared access with the Teamsters to the south. North of the site is the Skyrman Park / Arboretum. Upon re-development, an additional shared access is proposed through the park site. See below.



Rogue Valley Highway (OR 99) at the existing OSP site is under City of Central Point jurisdiction. It carries a functional classification of Principal Arterial and is estimated in 2022 to carry approximately 6,800 average daily trips (ADT) with a carrying capacity of 10,000-40,000 ADT. A Principal Arterial for the City of Central Point is designed to link major activity centers, have the highest traffic volumes, serve the longest trips, and be integrated with local and regional arterials. They are commonly partially or fully access controlled. At the subject property, OR 99 is a five-lane fully improved facility with curb, gutter, sidewalk, and striped bike lanes.

Traffic Count Data

Manual traffic counts were gathered in June and September of 2022 at study area intersections. The a.m. and p.m. peak hours were shown to occur from 7:15-8:15 a.m. and 3:30-4:30 p.m. Count data was seasonally adjusted to represent design hour volumes, and one year of growth was added to develop design year 2023 no-build conditions. Growth was determined by historical data using counts from 2019 and 2022. Manual counts and volume development sheets are provided in the attachments.

Crash History

Crash data for the most recent 5-year period was gathered from ODOT's Crash Analysis Unit. Crash data was analyzed to identify crash patterns that could be attributable to geometric or operational deficiencies, or crash trends of a specific type that would indicate the need for further investigation along OR 99. Crash rates were also compared to the ODOT critical crash rate to determine whether additional analysis is necessary. Tables 1 and 2 provide a summary of results. Crash data is provided in the attachments. There were no reported collisions along OR 99 at the existing OSP shared driveway or the Skyrman Park / Arboretum access.

Table 1 - Study Area Intersection Crash Rates, 2016-2020

Intersection	2016	2017	2018	2019	2020	Total Crashes	AADT	Crash Rate	ODOT 90th %
Twin Creeks / OR 99	0	0	0	0	2	2	6,800	0.161	0.860

Table 2 - Crash History by Type, 2016-2020

Intersection	Collision Type					Severity		
	Rear-End	Turning	Angle	Other	Ped/ Bike	Non-Injury	Injury	Fatal
Twin Creeks / OR 99	1	1	0	0	0	1	1	0

There were two reported collisions at the intersection of Twin Creeks Crossing and OR 99 within the most recent five-year period. Of these collisions, one was a rear-end collision and one a turning collision. One resulted in minor injury while the other in property damage only. Both occurred in 2020 on Thursdays during daylight hours, but there are no other similarities. One occurred under dry conditions and the other under wet conditions. No pattern of crashes is identified. Neither of the crashes involved pedestrians or cyclists, nor resulted in severe injury or fatality. The intersection is not shown to have a crash rate higher than the ODOT critical crash rate. No further investigation is shown to be necessary.

Trip Generation

Trip generation calculations for the proposed OSP building expansion were prepared utilizing local data. The Institute of Transportation Engineers (ITE) *Trip Generation* 11th Edition did not have any land uses that provided a good match. When a good match is not provided, ITE recommends gathering local data. Local data was gathered in June of 2022 at the existing OSP site to develop a trip rate per 1000 SF during the a.m. and p.m. peak hours. The trip rate was then applied to the expanded building square footage to estimate additional trips or the net increase in trips to the transportation system. Results are provided in Table 3. Count data is provided in the attachments.

Table 3 – Development Trip Generations

Local Data	Unit	Size	AM Rate	AM Peak Hour			PM Rate	PM Peak Hour		
Existing Facility				Total	In	Out		Total	In	Out
OSP - Existing	1000 SF	25.45	0.75	19	16	3	0.86	22	8	14
Proposed Facility										
OSP - Proposed	1000 SF	51.00	0.75	38	32	6		44	16	28
Net Trip Increase				**+19**	**+16**	**+3**		**+22**	**+8**	**+14**

SF = square feet

Trip Distribution and Assignment

Trip distributions to/from the site were assumed to follow existing traffic splits taken from manual count data. This resulted in roughly 25% to/from the north and 75% to/from the south during the a.m. peak hour and 15% to/from the north and 85% to/from the south during the p.m. peak hour. Half of the net new trips were distributed through a proposed shared access to the north with the Skyrman Park / Arboretum that will be widened as part of development. The other half were distributed through the existing shared access with the Teamsters to the south. Trip distributions are provided on Figure 1 in the attachments.

Design Year 2023 No-Build and Build Intersection Operations

The study area consists of site driveways and the signalized intersection of Twin Creeks Crossing / OR 99. The City of Central Point performance standard for intersections on arterials is a level of service "D" or better. Design year 2023 no-build and build conditions were evaluated within the study area to determine what impact, if any, proposed development will have on the transportation system. A summary of results is provided in Table 4 during the a.m. and p.m. peak hours. Design year 2023 no-build and build traffic volumes are provided on Figures 2 and 3 in the attachments.

Table 4 – Design Year 2023 No-Build and Build Intersection Operations

Intersection	Jurisdiction	Performance Standard	Traffic Control	AM Peak Hour		PM Peak Hour	
				No-Build	Build	No-Build	Build
Twin Creeks / OR 99	City	LOS D	Signal	A	A	A	A
OSP-Teamsters / OR 99	City	None	TWSC	B, WBL	B, WBL	C, WBL	C, WBL
Arboretum / OR 99	City	None	TWSC	B, WBLR	B, WBL	B, WBLR	B, WBL

LOS = Level of Service, TWSC = two-way stop-controlled, WBL = westbound left, WBLR = westbound left/right
Note: Exceeded performance standards are shown in bold, italic

Results of the analysis show all intersections and site driveways operate acceptably (within City performance standards) under design year 2023 no-build and build conditions during both peak hours. No change in intersection operation is shown to occur as a result of proposed development trips. Synchro output sheets are provided in the attachments.

Design Year 2023 No-Build and Build Queuing and Blocking

Queue lengths are reported as the average, maximum, or 95th percentile queue length. The 95th percentile queue length is used for design purposes and is the queue length reported in this analysis. Five simulations were run and averaged in SimTraffic to determine 95th percentile queue lengths under design year 2023 no-build and build conditions. Queue lengths were rounded up to the nearest 25 feet (single vehicle length) and reported in Table 5 for applicable movements during the a.m. and p.m. peak hours.

Table 5 – Design Year 2023 No-Build and Build 95th Percentile Queue Lengths

Intersection Movement	Available Link Distance (Feet)	AM Peak Hour		PM Peak Hour	
		No-Build	Build	No-Build	Build
Twin Creeks / OR 99					
Eastbound Left	225	75	75	50	50
Eastbound Right	225	50	50	50	50
Northbound Left	500	75	75	75	75
Northbound Through	850	50	50	50	50
Southbound Through	525	75	75	75	75
Southbound Right	175	25	25	25	25
OSP-Teamsters / OR 99					
Southbound Left	225	25	25	25	25
Westbound Left	50	25	25	50	50
Westbound Right	50	25	25	25	25
Arboretum / OR 99					
Southbound Left	100	0	0	0	25
Westbound Left/Right	50	25	---	25	---
Westbound Left	50	---	25	---	25
Westbound Right	50	---	25	---	25

Note: Exceeded queue lengths are shown in bold, italic

Results of the queuing analysis show all intersection and driveway links continue to support 95th percentile queue lengths under design year 2023 no-build and build conditions during both peak hours. The southbound left turn movement on OR 99 at the proposed shared driveway with the Arboretum increases from zero to 25 feet during the p.m. peak hour, which is the equivalent of one vehicle. No other changes are shown to occur as a result of proposed development trips. Full queuing reports are provided in the attachments.

Sight Distance

Access to the site is proposed through an existing, shared driveway with the Teamsters to the south and a shared driveway with the Skyrman Arboretum to the north. The Skyrman Park / Arboretum access will be widened as a result of development and include a westbound left and right turn movement. OR 99 at both driveways is flat and straight with a posted speed of 45 miles per hour (mph).

The minimum stopping sight distance (SSD) recommended by American Association of State Highways and Transportation Officials (AASHTO) for a facility with a posted speed of 45 miles per hour is 360 feet. The desirable intersection sight distance (ISD) is 500 feet. The City of Central Point minimum sight distance and clear vision requirement for a 40 mph facility is 400 feet (Table 300-5 of the Public Works Standards and Specifications). Field measurements showed sight distance being > 1000 feet in both directions at the shared driveway with the Teamsters. At the shared driveway with the Skyrman Park/ Arboretum, sight distance is limited to the south by a gate and to the north by a park sign. When the driveway is widened to the south, an existing power pole will be relocated to the north and the gate will be removed entirely, but the park sign will continue to restrict sight distance to the north. It is our recommendation to work with the City of Central Point to relocate the park sign out of the sight triangle to provide adequate sight distance. Street views are provided below.

Looking south from Teamsters Driveway

Looking north from Teamsters Driveway

Looking south from Arboretum Driveway

Looking north from Arboretum Driveway

Access Spacing Standards

No new access is proposed on OR 99. The existing access to the Skyrman Park / Arboretum is proposed as a shared driveway with OSP as part of site re-development. This is proposed in lieu of using an access on the north property line of the OSP site, which would not meet access spacing standards. The City of Central Point access spacing standard on an arterial street is a minimum of 300 feet (Table 300-4 of the Public Works Standards and Specifications) and is approved at the discretion of the Public Works Director. The minimum access spacing standard is shown to be met between the two shared driveways.

Conclusions

The findings of the traffic analysis conclude that the proposed Oregon State Police (OSP) building expansion from 25,450 SF to approximately 51,000 SF can be approved without causing adverse impacts on the transportation system. The traffic analysis evaluated intersection and driveway operations, queuing, crash history, sight distance, and access spacing standards. One safety improvement was identified at the proposed, shared driveway with the Skyrman Park / Arboretum. The park sign on the north side of the driveway currently restricts sight distance to the north. It is our recommendation to work with Public Works to relocate the park sign out of the sight triangle to provide adequate sight distance when the driveway is widened. No other operational or safety concerns were identified as a result of proposed development.

This concludes our traffic analysis. Please feel free to contact me if you have any questions or need additional information.

Sincerely,

Kimberly Parducci PE, PTOE
Southern Oregon Transportation Engineering, LLC

Attachments: Site Plan
Figures
Count Data
Crash Data
Synchro/SimTraffic Output
Public Works Standards and Specifications

Cc: Client

ATTACHMENTS

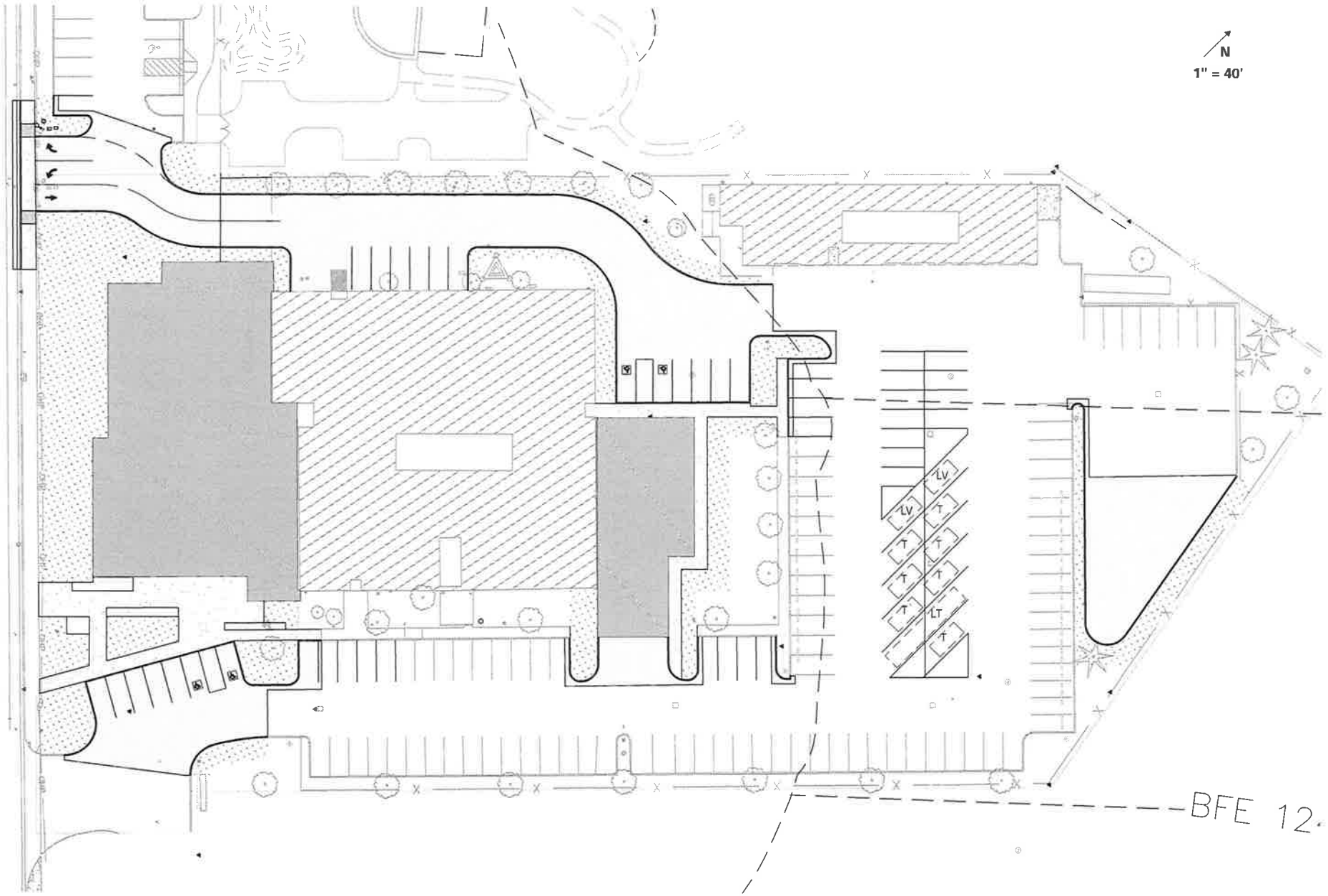
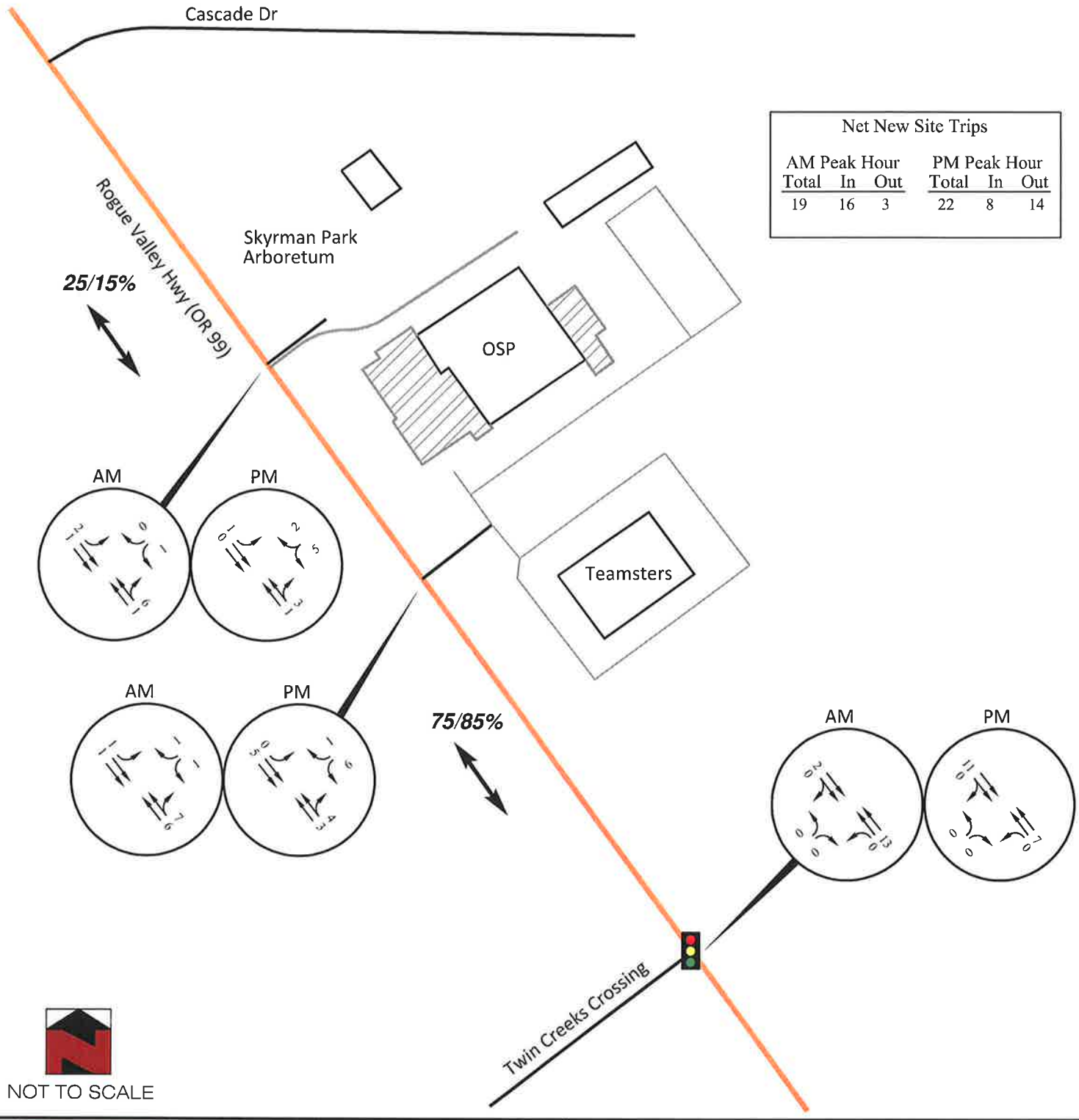

N
1" = 40'
LV
LV
LT
BFE 12

Figure 1: Development Trips Distributions, AM/PM Peak Hours



Net New Site Trips

AM Peak Hour			PM Peak Hour		
Total	In	Out	Total	In	Out
19	16	3	22	8	14

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Oregon State Police Building Expansion
Traffic Impact Analysis
Central Point, Oregon

Figure 2: Design Year 2023 No-Build Traffic Volumes, AM/PM Peak Hours

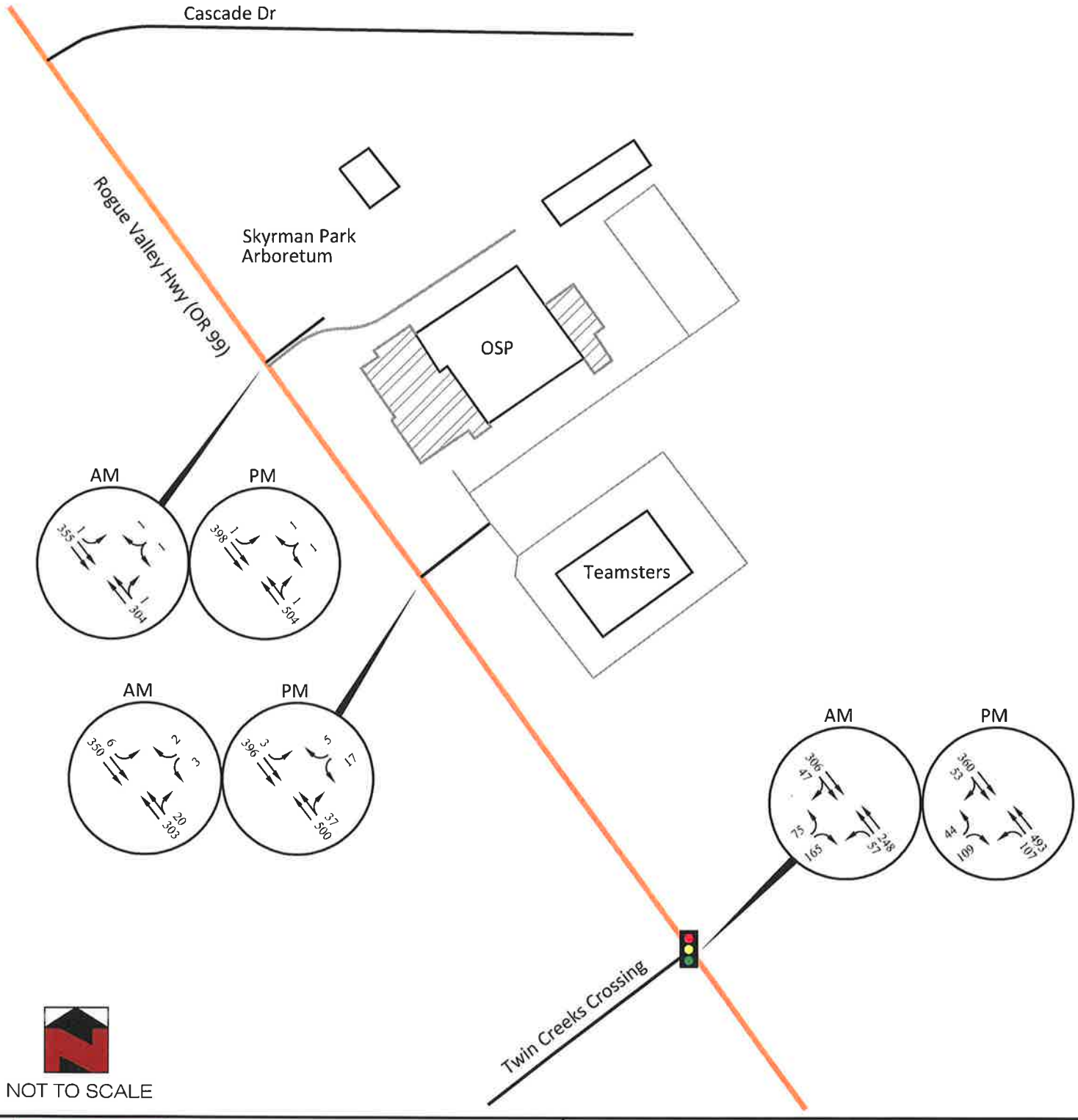

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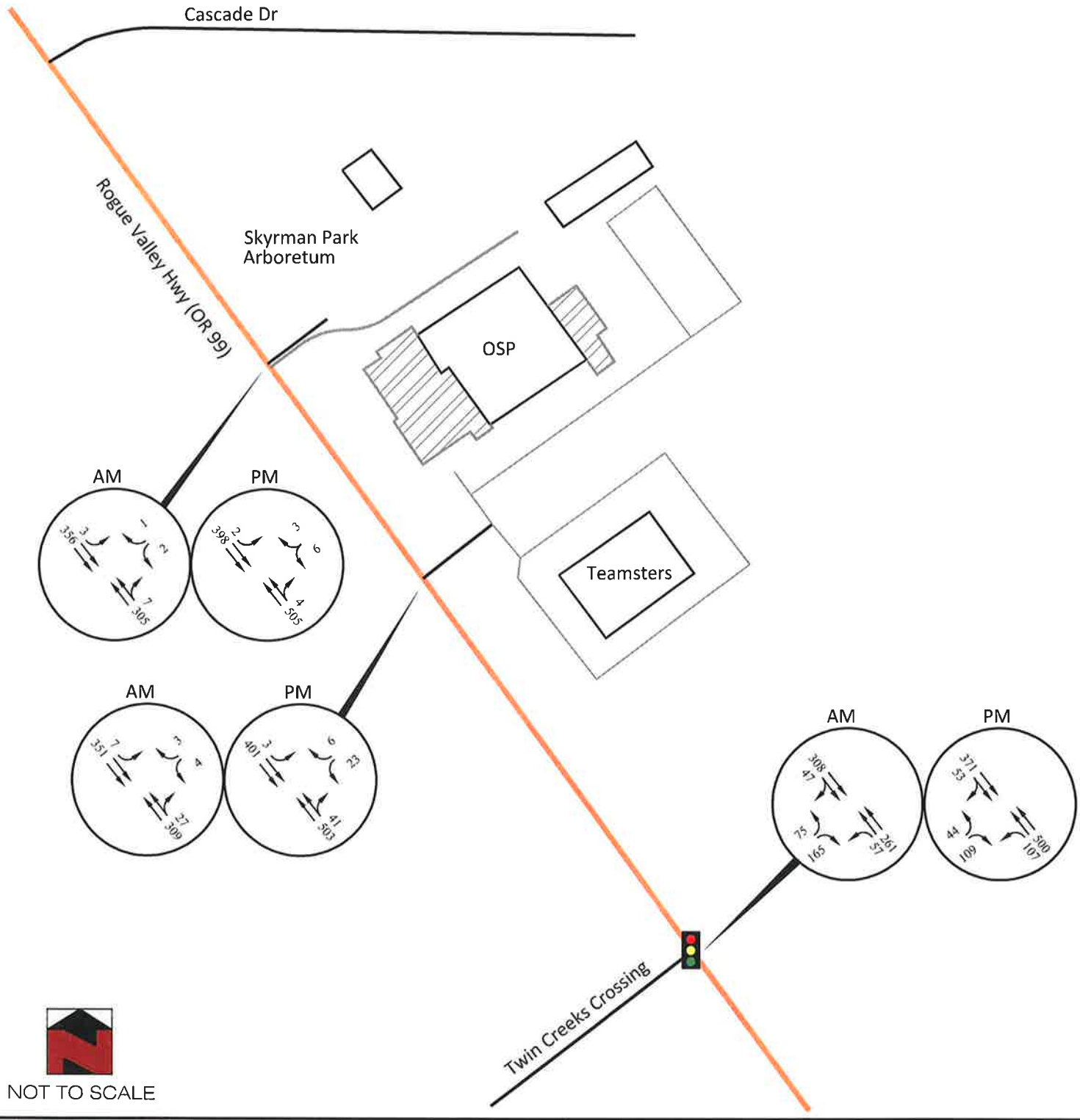
Figure 3: Design Year 2023 Build Traffic Volumes, AM/PM Peak Hours



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North-South: Main Street (OR99)
East-West: Twin Creeks Crossing
Weather: Clear, Warm
Vehicle: All Vehicles

File Name : TwinCreeks-OR99_AM-PM
Site Code : 00000002
Start Date : 9/13/2022
Page No : 1

Groups Printed- All

	Main St (OR99) From North					From East					Main St (OR99) From South					Twin Creeks From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	38	1	0	39	0	0	0	0	0	2	32	0	0	34	6	0	7	0	13	86
06:15 AM	0	29	1	0	30	0	0	0	0	0	4	34	0	0	38	6	0	8	0	14	82
06:30 AM	0	53	5	0	58	0	0	0	0	0	9	38	0	1	48	12	0	13	0	25	131
06:45 AM	0	50	2	0	52	0	0	0	0	0	13	49	0	0	62	9	0	19	0	28	142
Total	0	170	9	0	179	0	0	0	0	0	28	153	0	1	182	33	0	47	0	80	441
07:00 AM	0	45	7	0	52	0	0	0	0	0	3	49	0	1	53	17	0	21	0	38	143
07:15 AM	0	74	12	0	86	0	0	0	0	0	11	45	0	0	56	13	0	29	0	42	184
07:30 AM	0	76	18	0	94	0	0	0	0	0	10	72	0	1	83	20	0	56	0	76	253
07:45 AM	0	90	11	0	101	0	0	0	0	0	18	68	0	1	87	27	0	52	0	79	267
Total	0	285	48	0	333	0	0	0	0	0	42	234	0	3	279	77	0	158	0	235	847
08:00 AM	0	57	4	0	61	0	0	0	0	0	16	56	0	1	73	12	0	21	0	33	167
08:15 AM	0	58	7	0	65	0	0	0	0	0	12	69	0	0	81	10	0	16	0	26	172
08:30 AM	0	54	7	0	61	0	0	0	0	0	9	60	0	0	69	7	0	22	0	29	159
08:45 AM	0	54	8	0	62	0	0	0	0	0	12	61	0	0	73	6	0	15	0	21	156
Total	0	223	26	0	249	0	0	0	0	0	49	246	0	1	296	35	0	74	0	109	654
*** BREAK ***																					
03:00 PM	0	60	9	0	69	0	0	0	0	0	23	117	0	0	140	13	0	20	1	34	243
03:15 PM	0	81	15	0	96	0	0	0	0	0	20	88	0	1	109	14	0	13	0	27	232
03:30 PM	0	93	13	0	106	0	0	0	0	0	19	114	0	0	133	17	0	36	0	53	292
03:45 PM	0	97	10	0	107	0	0	0	0	0	33	118	0	9	160	9	0	18	0	27	294
Total	0	331	47	0	378	0	0	0	0	0	95	437	0	10	542	53	0	87	1	141	1061
04:00 PM	0	81	12	0	93	0	0	0	0	0	27	126	0	7	160	10	0	25	0	35	288
04:15 PM	0	79	16	0	95	0	0	0	0	0	23	121	0	0	144	6	0	25	0	31	270
04:30 PM	0	66	10	0	76	0	0	0	0	0	27	119	0	0	146	11	0	28	0	39	261
04:45 PM	0	74	22	0	96	0	0	0	0	0	26	110	0	0	136	16	0	18	0	34	266
Total	0	300	60	0	360	0	0	0	0	0	103	476	0	7	586	43	0	96	0	139	1085
05:00 PM	0	79	18	0	97	0	0	0	0	0	28	138	0	1	167	18	0	21	0	39	303
05:15 PM	0	59	18	0	77	0	0	0	0	0	39	119	0	2	160	20	0	17	0	37	274
05:30 PM	0	48	13	0	61	0	0	0	0	0	31	93	0	0	124	14	0	14	0	28	213
05:45 PM	0	42	12	0	54	0	0	0	0	0	26	84	0	1	111	12	0	16	0	28	193
Total	0	228	61	0	289	0	0	0	0	0	124	434	0	4	562	64	0	68	0	132	983
Grand Total	0	1537	251	0	1788	0	0	0	0	0	441	1980	0	26	2447	305	0	530	1	836	5071
Apprch %	0	86	14	0		0	0	0	0		18	80.9	0	1.1		36.5	0	63.4	0.1		
Total %	0	30.3	4.9	0	35.3	0	0	0	0	0	8.7	39	0	0.5	48.3	6	0	10.5	0	16.5	

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Weather: Clear, Warm
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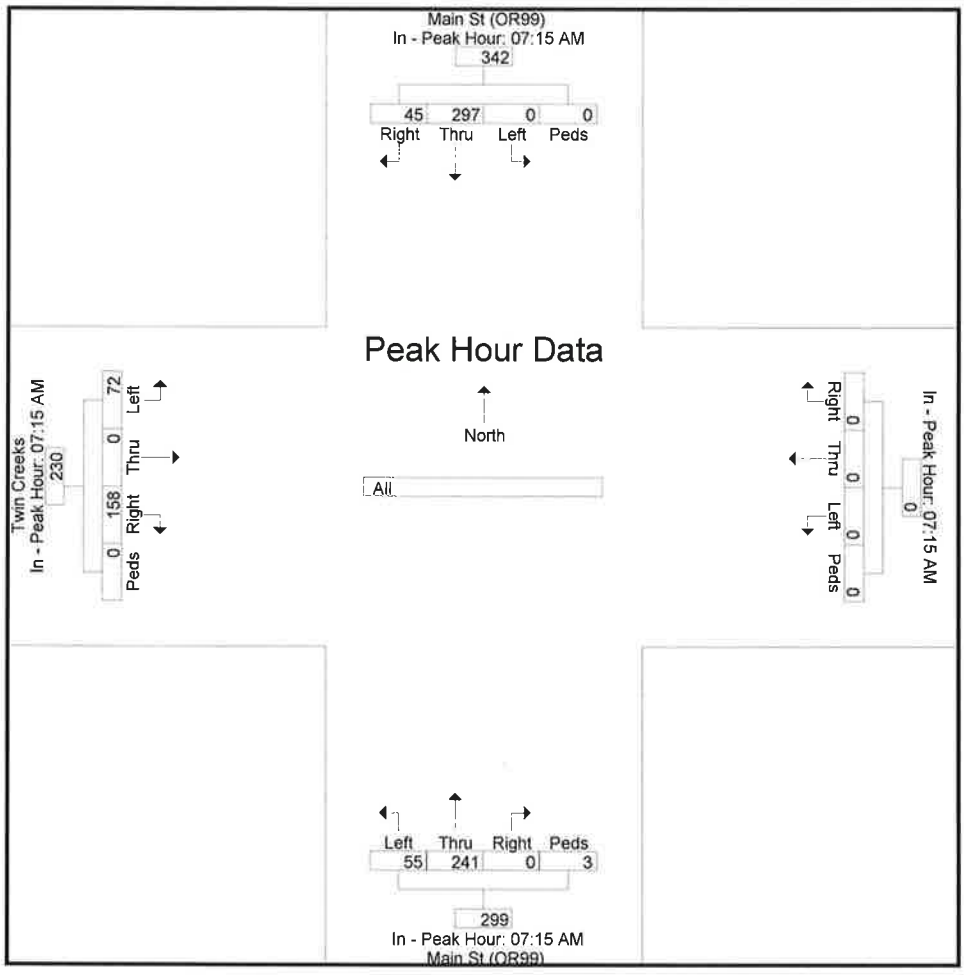
File Name : TwinCreeks-OR99_AM-PM
Site Code : 00000002
Start Date : 9/13/2022

	Main St (OR99) From North					From East					Main St (OR99) From South					Twin Creeks From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:15 AM					07:15 AM					07:15 AM					07:15 AM					
+0 mins.	0	74	12	0	86	0	0	0	0	0	11	45	0	0	56	13	0	29	0	42	
+15 mins.	0	76	18	0	94	0	0	0	0	0	10	72	0	1	83	20	0	56	0	76	
+30 mins.	0	90	11	0	101	0	0	0	0	0	18	68	0	1	87	27	0	52	0	79	
+45 mins.	0	57	4	0	61	0	0	0	0	0	16	56	0	1	73	12	0	21	0	33	
Total Volume	0	297	45	0	342	0	0	0	0	0	55	241	0	3	299	72	0	158	0	230	
% App. Total	0	86.8	13.2	0		0	0	0	0		18.4	80.6	0	1		31.3	0	68.7	0		
PHF	.000	.825	.625	.000	.847	.000	.000	.000	.000	.000	.764	.837	.000	.750	.859	.667	.000	.705	.000	.728	



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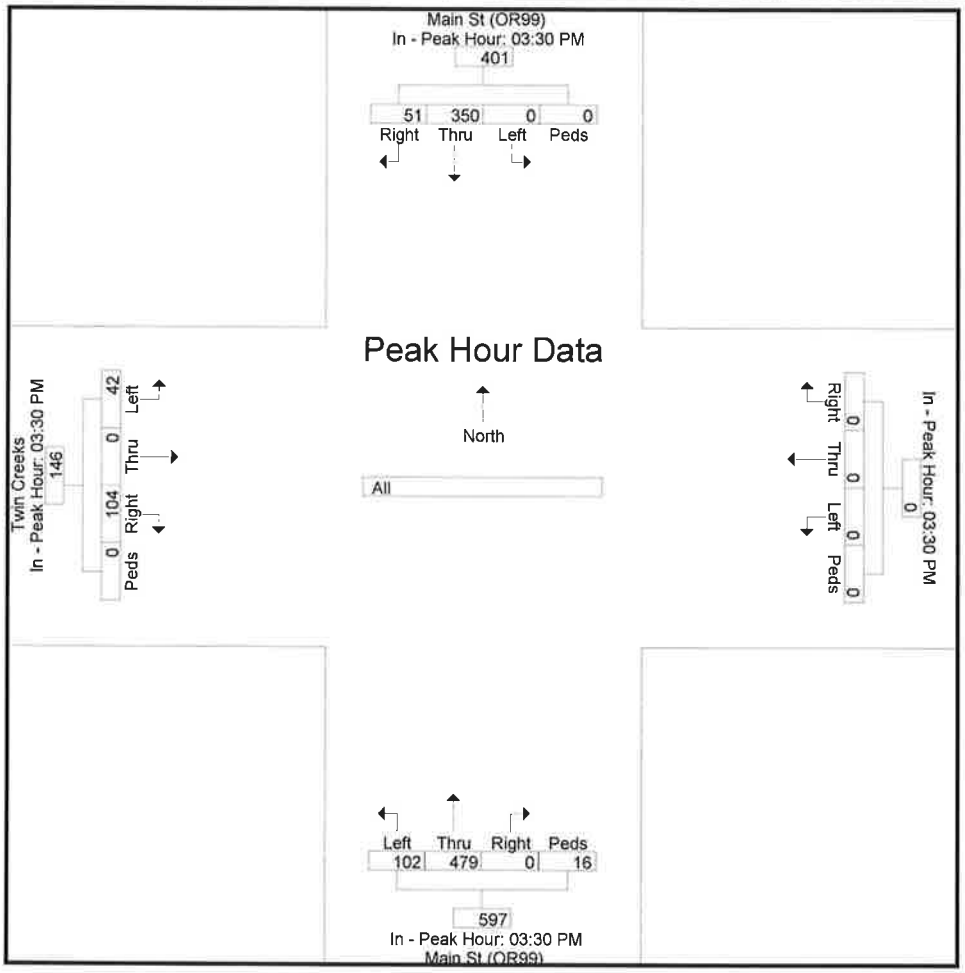
Peak Hour Analysis From 03:30 PM to 04:15 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	03:30 PM					03:30 PM					03:30 PM					03:30 PM					
+0 mins.	0	93	13	0	106	0	0	0	0	0	19	114	0	0	133	17	0	36	0	53	
+15 mins.	0	97	10	0	107	0	0	0	0	0	33	118	0	9	160	9	0	18	0	27	
+30 mins.	0	81	12	0	93	0	0	0	0	0	27	126	0	7	160	10	0	25	0	35	
+45 mins.	0	79	16	0	95	0	0	0	0	0	23	121	0	0	144	6	0	25	0	31	
Total Volume	0	350	51	0	401	0	0	0	0	0	102	479	0	16	597	42	0	104	0	146	
% App. Total	0	87.3	12.7	0		0	0	0	0		17.1	80.2	0	2.7		28.8	0	71.2	0		
PHF	.000	.902	.797	.000	.937	.000	.000	.000	.000	.000	.773	.950	.000	.444	.933	.618	.000	.722	.000	.689	



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File Name : OSP-OR99_PM
Site Code : 00000001
Start Date : 6/29/2022
Page No : 1

Groups Printed- All

	OR 99 From North					OSP /Teamsters From East					OR 99 From South					From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	39	0	0	39	1	0	2	0	3	0	21	2	0	23	0	0	0	0	0	65
06:15 AM	2	50	0	0	52	0	0	1	0	1	0	26	0	0	26	0	0	0	0	0	79
06:30 AM	0	47	0	0	47	0	0	0	0	0	0	52	3	0	55	0	0	0	0	0	102
06:45 AM	0	67	0	0	67	0	0	0	0	0	0	54	0	0	54	0	0	0	0	0	121
Total	2	203	0	0	205	1	0	3	0	4	0	153	5	0	158	0	0	0	0	0	367
07:00 AM	0	55	0	0	55	1	0	0	0	1	0	59	2	0	61	0	0	0	0	0	117
07:15 AM	0	62	0	0	62	0	0	1	0	1	0	47	5	1	53	0	0	0	0	0	116
07:30 AM	3	68	0	0	71	0	0	0	0	0	0	66	1	1	68	0	0	0	0	0	139
07:45 AM	3	97	0	0	100	1	0	0	0	1	0	75	12	0	87	0	0	0	0	0	188
Total	6	282	0	0	288	2	0	1	0	3	0	247	20	2	269	0	0	0	0	0	560
08:00 AM	0	70	0	0	70	2	0	1	0	3	0	54	2	4	60	0	0	0	0	0	133
08:15 AM	0	51	0	0	51	0	0	1	0	1	0	45	1	0	46	0	0	0	0	0	98
08:30 AM	0	71	0	0	71	3	0	0	0	3	0	45	2	9	56	0	0	0	0	0	130
08:45 AM	2	51	0	0	53	1	0	3	0	4	0	63	5	11	79	0	0	0	0	0	136
Total	2	243	0	0	245	6	0	5	0	11	0	207	10	24	241	0	0	0	0	0	497
*** BREAK ***																					
03:00 PM	0	62	0	0	62	4	0	0	0	4	0	100	1	0	101	0	0	0	0	0	167
03:15 PM	1	74	0	0	75	0	0	0	0	0	0	105	1	0	106	0	0	0	0	0	181
03:30 PM	1	71	0	0	72	2	0	3	0	5	0	118	2	2	122	0	0	0	0	0	199
03:45 PM	1	79	0	0	80	4	0	3	0	7	0	84	2	1	87	0	0	0	0	0	174
Total	3	286	0	0	289	10	0	6	0	16	0	407	6	3	416	0	0	0	0	0	721
04:00 PM	0	78	0	0	78	4	0	5	0	9	0	101	1	0	102	0	0	0	0	0	189
04:15 PM	0	87	0	0	87	3	0	2	0	5	0	113	0	0	113	0	0	0	0	0	205
04:30 PM	1	81	0	0	82	3	0	1	0	4	0	104	14	0	118	0	0	0	0	0	204
04:45 PM	2	74	0	0	76	6	0	0	0	6	0	118	19	0	137	0	0	0	0	0	219
Total	3	320	0	0	323	16	0	8	0	24	0	436	34	0	470	0	0	0	0	0	817
05:00 PM	0	71	0	0	71	5	0	2	0	7	0	132	4	0	136	0	0	0	0	0	214
05:15 PM	0	64	0	0	64	2	0	0	0	2	0	93	1	0	94	0	0	0	0	0	160
05:30 PM	0	72	0	0	72	1	0	0	0	1	0	101	2	0	103	0	0	0	0	0	176
05:45 PM	2	44	0	0	46	1	0	3	0	4	0	78	0	0	78	0	0	0	0	0	128
Total	2	251	0	0	253	9	0	5	0	14	0	404	7	0	411	0	0	0	0	0	678
Grand Total	18	1585	0	0	1603	44	0	28	0	72	0	1854	82	29	1965	0	0	0	0	0	3640
Apprch %	1.1	98.9	0	0		61.1	0	38.9	0		0	94.4	4.2	1.5		0	0	0	0		
Total %	0.5	43.5	0	0	44	1.2	0	0.8	0	2	0	50.9	2.3	0.8	54	0	0	0	0	0	

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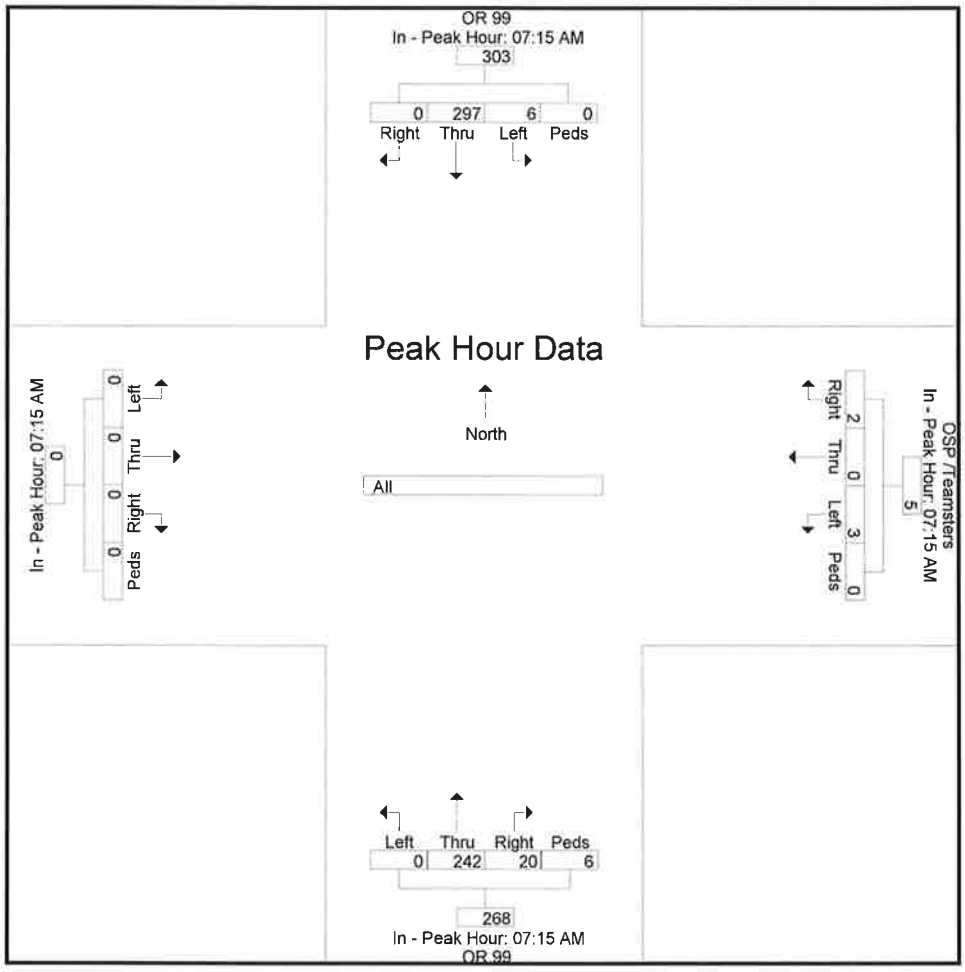
North-South: OR 99
East-West: OSP / Teamsters Driveway
Weather: Sunny, Warm
Vehicle: All Vehicles

File Name : OSP-OR99_PM
Site Code : 00000001
Start Date : 6/29/2022
Page No : 2

	OR 99 From North					OSP /Teamsters From East					OR 99 From South					From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:15 AM					07:15 AM					07:15 AM					07:15 AM					
+0 mins.	0	62	0	0	62	0	0	1	0	1	0	47	5	1	53	0	0	0	0	0	
+15 mins.	3	68	0	0	71	0	0	0	0	0	0	66	1	1	68	0	0	0	0	0	
+30 mins.	3	97	0	0	100	1	0	0	0	1	0	75	12	0	87	0	0	0	0	0	
+45 mins.	0	70	0	0	70	2	0	1	0	3	0	54	2	4	60	0	0	0	0	0	
Total Volume	6	297	0	0	303	3	0	2	0	5	0	242	20	6	268	0	0	0	0	0	
% App. Total	2	98	0	0		60	0	40	0		0	90.3	7.5	2.2		0	0	0	0		
PHF	.500	.765	.000	.000	.758	.375	.000	.500	.000	.417	.000	.807	.417	.375	.770	.000	.000	.000	.000	.000	



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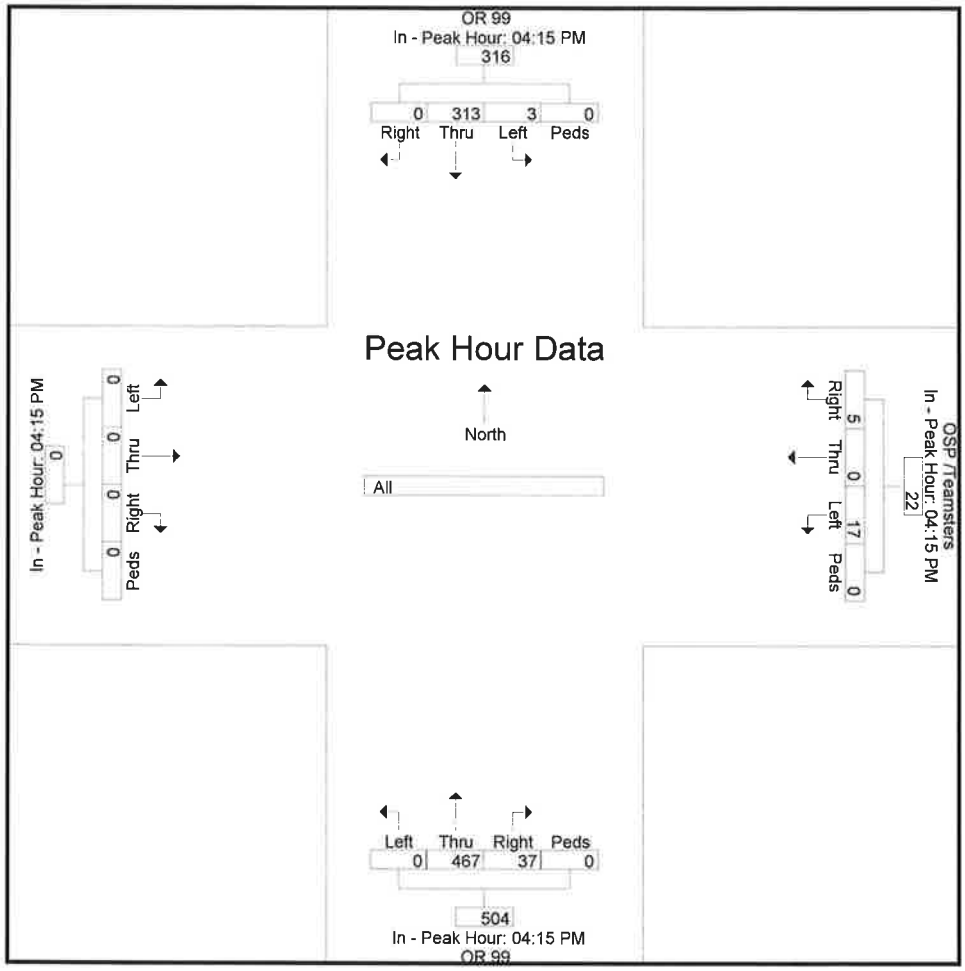
File Name : OSP-OR99_PM
Site Code : 00000001
Start Date : 6/29/2022
Page No : 3

	OR 99 From North					OSP /Teamsters From East					OR 99 From South					From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	04:15 PM					04:15 PM					04:15 PM					04:15 PM					
+0 mins.	0	87	0	0	87	3	0	2	0	5	0	113	0	0	113	0	0	0	0	0	
+15 mins.	1	81	0	0	82	3	0	1	0	4	0	104	14	0	118	0	0	0	0	0	
+30 mins.	2	74	0	0	76	6	0	0	0	6	0	118	19	0	137	0	0	0	0	0	
+45 mins.	0	71	0	0	71	5	0	2	0	7	0	132	4	0	136	0	0	0	0	0	
Total Volume	3	313	0	0	316	17	0	5	0	22	0	467	37	0	504	0	0	0	0	0	
% App. Total	0.9	99.1	0	0		77.3	0	22.7	0		0	92.7	7.3	0		0	0	0	0		
PHF	.375	.899	.000	.000	.908	.708	.000	.625	.000	.786	.000	.884	.487	.000	.920	.000	.000	.000	.000	.000	



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File Name : OSP-Driveway_PM
Site Code : 00000001
Start Date : 6/29/2022
Page No : 1

Groups Printed- All

	OSP From North					From East					Teamsters From South					to/from OR99 From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	4
06:15 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	3
06:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	3
*** BREAK ***																					
Total	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	4	0	3	0	7	10
07:00 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	3
07:15 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3	0	2	0	5	6
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4
07:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	8	0	7	0	15	16
Total	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	16	0	10	0	26	29
08:00 AM	0	0	1	0	1	0	0	0	0	0	2	0	0	0	2	1	0	1	0	2	5
08:15 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
08:30 AM	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	5
08:45 AM	0	0	3	0	3	0	0	0	0	0	1	0	0	0	1	2	0	5	0	7	11
Total	0	0	8	0	8	0	0	0	0	0	3	0	0	0	3	5	0	7	0	12	23
*** BREAK ***																					
03:00 PM	0	0	2	0	2	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	4
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	2
03:30 PM	0	0	2	0	2	0	0	0	0	0	3	0	0	0	3	2	0	1	0	3	8
03:45 PM	0	0	4	0	4	0	0	0	0	0	2	0	0	0	2	2	0	1	0	3	9
Total	0	0	8	0	8	0	0	0	0	0	7	0	0	0	7	5	0	3	0	8	23
04:00 PM	0	0	8	0	8	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	10
04:15 PM	0	0	2	0	2	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	5
04:30 PM	0	0	2	0	2	0	0	0	0	0	2	0	0	0	2	6	0	9	0	15	19
04:45 PM	0	0	3	0	3	0	0	0	0	0	3	0	0	0	3	2	0	19	0	21	27
Total	0	0	15	0	15	0	0	0	0	0	9	0	0	0	9	8	0	29	0	37	61
05:00 PM	0	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	11
05:15 PM	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	3
05:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	3
05:45 PM	0	0	2	0	2	0	0	0	0	0	2	0	0	0	2	0	0	2	0	2	6
Total	0	0	11	0	11	0	0	0	0	0	3	0	0	0	3	3	0	6	0	9	23
Grand Total	0	0	48	0	48	0	0	0	0	0	22	0	0	0	22	41	0	58	0	99	169
Apprch %	0	0	100	0		0	0	0	0		100	0	0	0		41.4	0	58.6	0		
Total %	0	0	28.4	0	28.4	0	0	0	0	0	13	0	0	0	13	24.3	0	34.3	0	58.6	

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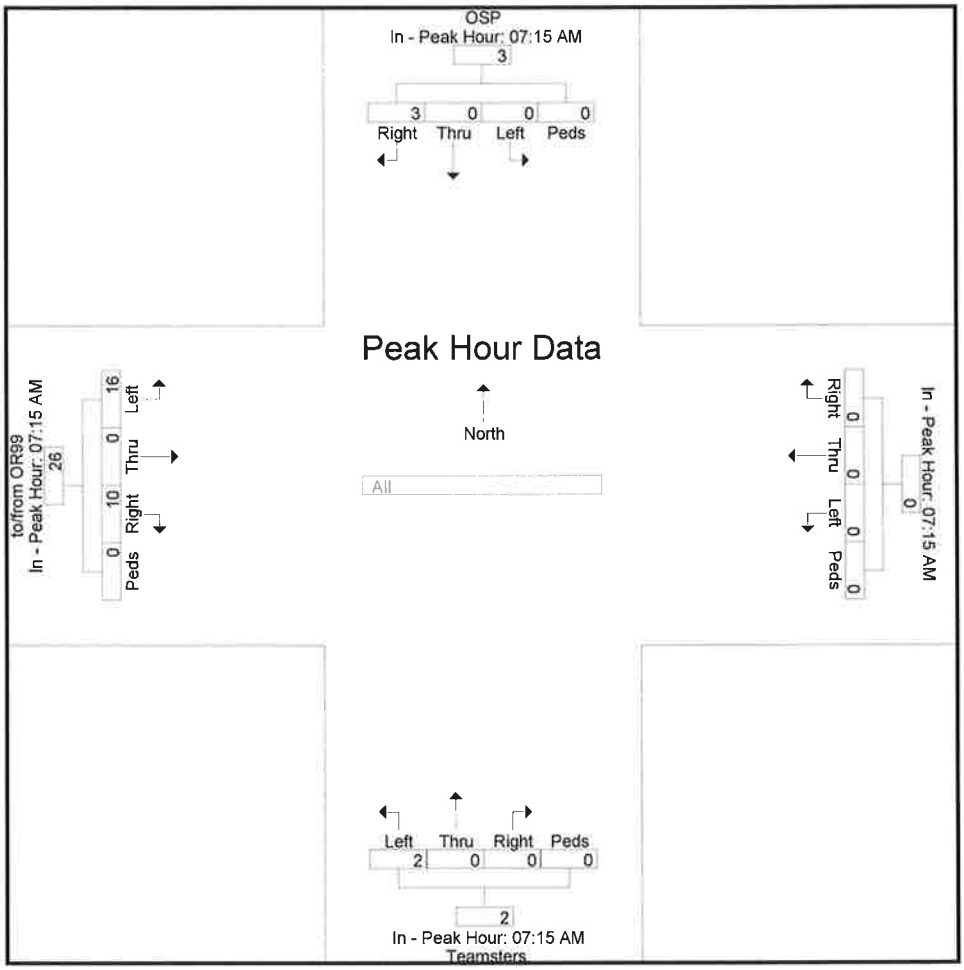
Vehicle: All Vehicles

File Name : OSP-Driveway_PM
Site Code : 00000001
Start Date : 6/29/2022
Page No : 2

	OSP From North					From East					Teamsters From South					to/from OR99 From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:15 AM					07:15 AM					07:15 AM					07:15 AM					
+0 mins.	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3	0	2	0	5	
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	
+30 mins.	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	8	0	7	0	15	
+45 mins.	0	0	1	0	1	0	0	0	0	0	2	0	0	0	2	1	0	1	0	2	
Total Volume	0	0	3	0	3	0	0	0	0	0	2	0	0	0	2	16	0	10	0	26	
% App. Total	0	0	100	0		0	0	0	0		100	0	0	0		61.5	0	38.5	0		
PHF	.000	.000	.750	.000	.750	.000	.000	.000	.000	.000	.250	.000	.000	.000	.250	.500	.000	.357	.000	.433	



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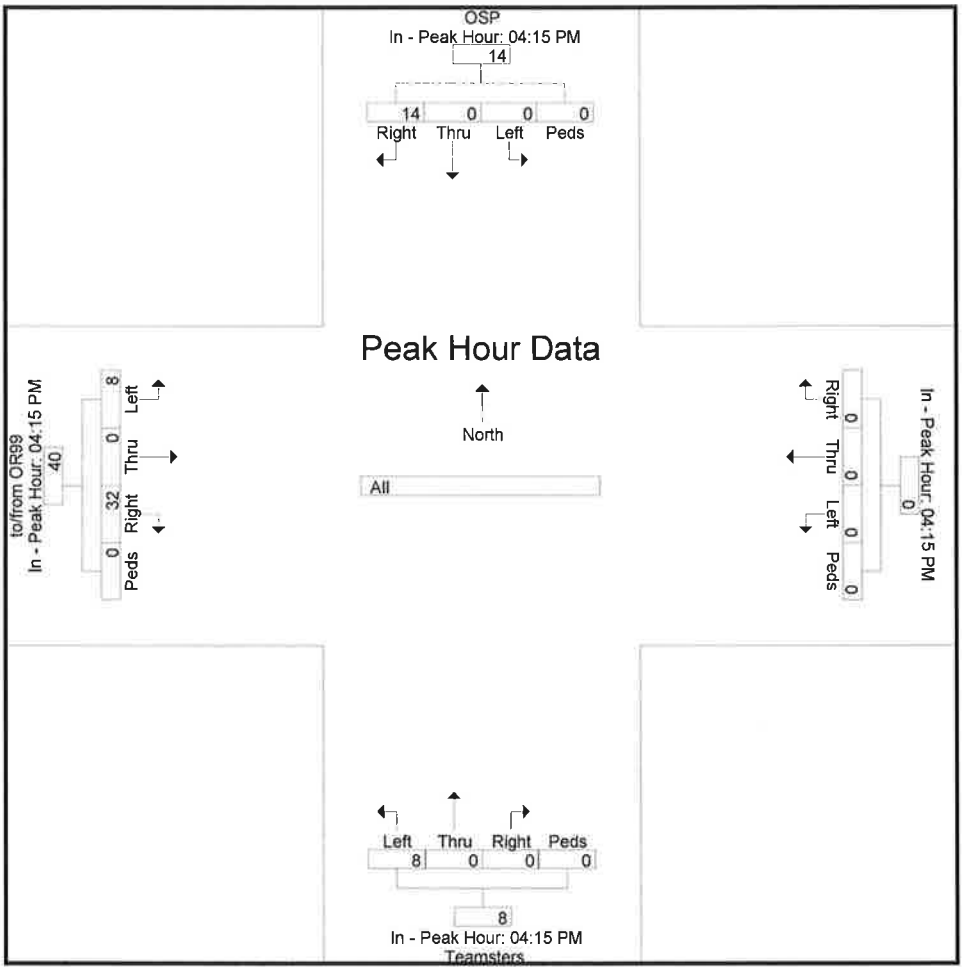
Site Code : 00000001
Start Date : 6/29/2022
Page No : 3

	OSP From North					From East					Teamsters From South					to/from OR99 From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	04:15 PM					04:15 PM					04:15 PM					04:15 PM					
+0 mins.	0	0	2	0	2	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	
+15 mins.	0	0	2	0	2	0	0	0	0	0	2	0	0	0	2	6	0	9	0	15	
+30 mins.	0	0	3	0	3	0	0	0	0	0	3	0	0	0	3	2	0	19	0	21	
+45 mins.	0	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	
Total Volume	0	0	14	0	14	0	0	0	0	0	8	0	0	0	8	8	0	32	0	40	
% App. Total	0	0	100	0		0	0	0	0		100	0	0	0		20	0	80	0		
PHF	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.667	.000	.000	.000	.667	.333	.000	.421	.000	.476	



OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CONTINUOUS SYSTEM CRASH LISTING
TWIN CRK CROSSING at FRONT ST, City of Central Point, Jackson County, 01/01/2018 to 12/31/2020
Total Crash Records = 2
*******CRASH DE-CODER V6.0.2 PRC REPORT PRINTABLE EQUIVALENT*******

DOCUMENT NBR / ID # / INVEST / RD DEPT / UNLOCT	SPEED	HAZMAT	ALCOHOL	DRUGS	WORKZONE	SCHOOLZONE	RAILROAD	DATE / DAY / TIME / LAT	COUNTY / CITY / URB AREA / LONG	RD # / FUNCTIONAL CLASS / COMPONENT / MILEAGE TYPE / MILEPOINT	CRAN # / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYP / MEDIAN / LEGS / # OF LANES	INT-REL / TRAF CONTL	OFF RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	VEHICLE #	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE PRIOR TO	PARTIC #	PARTIC TYPE	INJURY / SEVERITY	AGE	SEX	LICNS / RES	NON-MTRST / LOCATION	ERROR	ACTION (VEHICLE / PARTICIPANT)	EVENT (CRASH / VEHICLE / PARTICIPANT)	CAUSE (CRASH / VEHICLE / PARTICIPANT)
02982 1895225 CITY N False		Y	N	Y	N	N	N	05/11/2020 Thursday 1P 42.39105	Jackson Central Point MEDFORD UA -122.85540	Non-ODOT Roadway 14-Urb Oth Prin Art Not on st. sys. Not on st. sys.	TWIN CRK CROSSIN FRONT ST	INTER SE 06	3-LEG () 0 ()	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR INJ	3565673	NONE 0 PRVTE PSNGR CAR	STRGHT SE-NW	1	DRVR	NONE	21	M	OR-Y OR<25	051-Reckless Driving 026-Failed Avoid Stop Veh 047-Violation Basic Rule	000-No Action (038-Driver Distracted)		01-Too Fast For Cond 33-Reckless Driving 29-Fail avoid veh. Ahead	00-No Code	33-Reckless Driving 01-Too Fast For Cond 29-Fail avoid veh. Ahead
																		3565674	NONE 0 PRVTE PSNGR CAR	STOP SE-NW	1	DRVR	INJC	39	F	OR-Y OR<25	000-No Error	011-Stop In Trail-No Llsm (000-No Action)			00-No Code	00-No Code
02564 1911925 CITY N False		N	N	N	N	N	N	12/31/2020 Thursday 9A 42.39119	Jackson Central Point MEDFORD UA -122.85554	Non-ODOT Roadway 14-Urb Oth Prin Art Not on st. sys. Not on st. sys.	TWIN CRK CROSSIN FRONT ST	INTER CN 05	3-LEG () 0 ()	N TRF SIGNAL	N N N	CLD WET DAY	O-1 L-TURN TURN PDO	3594143	NONE 9-Unknown N/A PSNGR CAR	STRGHT NW-SE	1	DRVR	NONE	0	UNK	UNK UNK	000-No Error	000-No Action (000-No Action)		04-Disregard Traf. Signal 02-Failed Yield ROW	00-No Code	00-No Code
																		3594144	NONE 9-Unknown N/A PSNGR CAR	TURN-L SE-W	1	DRVR	NONE	0	UNK	UNK UNK	000-No Error	000-No Action (000-No Action)			00-No Code	00-No Code

Intersection crash rates also need to be compared to the published statewide 90th percentile intersection crash rates in Exhibit 4-1. Any rates close to or over the 90th percentile rates need to be flagged for further analysis. The intersection crash rate is calculated by the following formula:

$$Intersection\ Crash\ Rate\ per\ MEV = \frac{Annual\ Number\ of\ Crashes\ x\ 10^6}{(AADT)x\ (365\ days/year)}$$

The values shown in Exhibit 4-1 represent the 90th percentile crash rates from a study of 500 intersections in Oregon. The crash rates are grouped by rural/urban, signalized/unsignalized, and three-leg/four-leg intersections. Intersections with crash rates that exceed the 90th percentile values shown in the table should be flagged for further analysis. For more information on crash rates and using this table, see Section 4.3.4 Critical Crash Rate.

Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control

	Rural				Urban			
	3SG	**3ST**	**4SG**	**4ST**	**3SG**	**3ST**	**4SG**	**4ST**
No. of Intersections	7	115	20	60	55	77	106	60
Mean Crash Rate	**0.226**	**0.196**	**0.324**	**0.434**	**0.275**	**0.131**	**0.477**	**0.198**
Median Crash Rate	0.163	0.092	0.320	0.267	0.252	0.105	0.420	0.145
Standard Deviation	0.185	0.314	0.223	0.534	0.155	0.121	0.273	0.176
Coefficient of Variation	0.819	1.602	0.688	1.230	0.564	0.924	0.572	0.889
90th Percentile Rate	**0.464**	**0.475**	**0.579**	**1.080**	**0.509**	**0.293**	**0.860**	**0.408**

Source: Assessment of Statewide Intersection Safety Performance, FHWA-OR-RD-18, Portland State University and Oregon State University, June 2011, Table 4.1, p. 47.

Note: Traffic control types include
3SG (three-leg signalized),
3ST (three-leg minor stop-control),
4SG (four-leg signalized),
4ST (four-leg minor stop-control).

For intersections other than the configurations shown in Exhibit 4-1, there are usually too few locations with that intersection configuration to provide statewide statistics. There are some stop controlled intersection configurations that could be approximated as indicated in Exhibit 4-2 and Exhibit 4-3 below. Any other intersection configurations not in Exhibit 4-1, Exhibit 4-2, or Exhibit 4-3 should by default be flagged for further analysis, since the unusual configuration is likely to warrant a closer look at the crashes.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	75	165	57	248	306	47
Future Volume (vph)	75	165	57	248	306	47
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1599	1458	1630	3079	3137	1458
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1599	1458	1630	3079	3137	1458
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	91	201	70	302	373	57
RTOR Reduction (vph)	0	162	0	0	0	35
Lane Group Flow (vph)	91	39	70	302	373	22
Heavy Vehicles (%)	4%	2%	2%	8%	6%	2%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	8		1	6	2	
Permitted Phases		8				2
Actuated Green, G (s)	7.8	7.8	4.1	23.6	15.5	15.5
Effective Green, g (s)	7.8	7.8	4.1	23.6	15.5	15.5
Actuated g/C Ratio	0.19	0.19	0.10	0.58	0.38	0.38
Clearance Time (s)	4.0	4.0	4.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	2.5	2.5	5.2	5.2	5.2
Lane Grp Cap (vph)	308	281	165	1798	1203	559
v/s Ratio Prot	c0.06		c0.04	0.10	c0.12	
v/s Ratio Perm		0.03				0.01
v/c Ratio	0.30	0.14	0.42	0.17	0.31	0.04
Uniform Delay, d1	13.9	13.5	17.0	3.9	8.7	7.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2	1.3	0.1	0.3	0.1
Delay (s)	14.3	13.7	18.3	4.0	9.0	7.9
Level of Service	B	B	B	A	A	A
Approach Delay (s)	13.9			6.7	8.9	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	40.4	Sum of lost time (s)	13.0
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	2	303	20	6	350
Future Vol, veh/h	3	2	303	20	6	350
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None		None		None
Storage Length	0	0	-	-	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	13	0	0	13
Mvmt Flow	4	2	370	24	7	427

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	610	197	0	0	394	0
Stage 1	382	-	-	-	-	-
Stage 2	228	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	431	817	-	-	1176	-
Stage 1	665	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	428	817	-	-	1176	-
Mov Cap-2 Maneuver	428	-	-	-	-	-
Stage 1	665	-	-	-	-	-
Stage 2	789	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.9	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	428	817	1176	-
HCM Lane V/C Ratio	-	-	0.009	0.003	0.006	-
HCM Control Delay (s)	-	-	13.5	9.4	8.1	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	304	1	1	355
Future Vol, veh/h	1	1	304	1	1	355
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	13	0	0	13
Mvmt Flow	1	1	371	1	1	433

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	591	186	0	0	372	0
Stage 1	372	-	-	-	-	-
Stage 2	219	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	443	831	-	-	1198	-
Stage 1	673	-	-	-	-	-
Stage 2	802	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	443	831	-	-	1198	-
Mov Cap-2 Maneuver	632	-	-	-	-	-
Stage 1	673	-	-	-	-	-
Stage 2	801	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	649	1198	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	10.6	8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	44	109	107	493	360	53
Future Volume (vph)	44	109	107	493	360	53
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1662	1458	1662	3167	3197	1488
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1662	1458	1662	3167	3197	1488
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	45	112	110	508	371	55
RTOR Reduction (vph)	0	98	0	0	0	32
Lane Group Flow (vph)	45	14	110	508	371	23
Heavy Vehicles (%)	0%	2%	0%	5%	4%	0%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	8		1	6	2	
Permitted Phases		8				2
Actuated Green, G (s)	5.1	5.1	6.3	27.5	17.2	17.2
Effective Green, g (s)	5.1	5.1	6.3	27.5	17.2	17.2
Actuated g/C Ratio	0.12	0.12	0.15	0.66	0.41	0.41
Clearance Time (s)	4.0	4.0	4.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	2.5	2.5	5.2	5.2	5.2
Lane Grp Cap (vph)	203	178	251	2093	1321	615
v/s Ratio Prot	c0.03		c0.07	0.16	c0.12	
v/s Ratio Perm		0.01				0.02
v/c Ratio	0.22	0.08	0.44	0.24	0.28	0.04
Uniform Delay, d1	16.5	16.2	16.0	2.8	8.1	7.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.9	0.1	0.3	0.1
Delay (s)	16.9	16.3	16.9	3.0	8.4	7.3
Level of Service	B	B	B	A	A	A
Approach Delay (s)	16.5			5.5	8.2	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	41.6	Sum of lost time (s)	13.0
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.4

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑↑	↳		↰	↑↑	↰	↱
Traffic Vol, veh/h	500	37	3	396	17	5
Future Vol, veh/h	500	37	3	396	17	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized		None		None		None
Storage Length	-	-	225	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	6	0	0	9	0	0
Mvmt Flow	532	39	3	421	18	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	571	0	769	286
Stage 1	-	-	-	-	552	-
Stage 2	-	-	-	-	217	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1012	-	342	717
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	804	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1012	-	341	717
Mov Cap-2 Maneuver	-	-	-	-	341	-
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	802	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0.1	14.7
HCM LOS			B

Minor Lane/Major Mvmt	NBT	NBR	SBL	SBT	SWLn1	SWLn2
Capacity (veh/h)	-	-	1012	-	341	717
HCM Lane V/C Ratio	-	-	0.003	-	0.053	0.007
HCM Control Delay (s)	-	-	8.6	-	16.1	10.1
HCM Lane LOS	-	-	A	-	C	B
HCM 95th %tile Q(veh)	-	-	0	-	0.2	0

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	1	504	1	1	398
Future Vol, veh/h	1	1	504	1	1	398
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	6	0	0	9
Mvmt Flow	1	1	536	1	1	423

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	751	269	0	0	537	0
Stage 1	537	-	-	-	-	-
Stage 2	214	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	351	735	-	-	1041	-
Stage 1	556	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	351	735	-	-	1041	-
Mov Cap-2 Maneuver	449	-	-	-	-	-
Stage 1	556	-	-	-	-	-
Stage 2	806	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	557	1041	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	11.5	8.5	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	3	3	3	3	3	3
# of Recorded Intervals	2	2	2	2	2	2
Vehs Entered	990	925	954	955	989	963
Vehs Exited	998	933	960	975	1005	974
Starting Vehs	31	28	31	41	35	33
Ending Vehs	23	20	25	21	19	21
Travel Distance (mi)	1031	971	984	999	1030	1003
Travel Time (hr)	25.7	23.9	24.8	25.0	25.6	25.0
Total Delay (hr)	2.3	2.0	2.3	2.2	2.3	2.2
Total Stops	423	369	426	399	415	407
Fuel Used (gal)	31.9	30.0	30.6	30.9	32.3	31.2

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	312	283	288	303	281	292
Vehs Exited	307	282	294	310	285	296
Starting Vehs	31	28	31	41	35	33
Ending Vehs	36	29	25	34	31	29
Travel Distance (mi)	327	297	303	320	295	308
Travel Time (hr)	8.3	7.5	7.8	8.1	7.3	7.8
Total Delay (hr)	0.8	0.7	0.8	0.9	0.7	0.8
Total Stops	126	115	135	139	118	127
Fuel Used (gal)	10.1	9.3	9.5	10.0	9.4	9.7

Interval #2 Information Recording

Start Time	7:30
End Time	8:15
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	678	642	666	652	708	668
Vehs Exited	691	651	666	665	720	679
Starting Vehs	36	29	25	34	31	29
Ending Vehs	23	20	25	21	19	21
Travel Distance (mi)	704	675	680	679	735	694
Travel Time (hr)	17.5	16.5	17.0	16.8	18.3	17.2
Total Delay (hr)	1.5	1.3	1.5	1.3	1.6	1.4
Total Stops	297	254	291	260	297	280
Fuel Used (gal)	21.8	20.6	21.1	20.9	23.0	21.5

Intersection: 20: OR 99 & Twin Creeks

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	R
Maximum Queue (ft)	68	64	86	69	62	84	74	35
Average Queue (ft)	28	31	30	18	21	36	25	12
95th Queue (ft)	61	55	63	50	52	68	65	34
Link Distance (ft)	479	479		3312	3312	470	470	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			500					200
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 31: OR 99 & OSP south

Movement	WB	WB	SB
Directions Served	L	R	L
Maximum Queue (ft)	31	25	17
Average Queue (ft)	3	1	2
95th Queue (ft)	16	12	12
Link Distance (ft)	112	112	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			225
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 39: OR 99 & Aboretum

Movement	WB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	3
95th Queue (ft)	17
Link Distance (ft)	100
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:15	3:15	3:15	3:15	3:15	3:15
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	3	3	3	3	3	3
# of Recorded Intervals	2	2	2	2	2	2
Vehs Entered	1217	1163	1167	1187	1209	1190
Vehs Exited	1214	1174	1154	1175	1212	1186
Starting Vehs	28	44	37	32	32	34
Ending Vehs	31	33	50	44	29	38
Travel Distance (mi)	1346	1300	1272	1311	1340	1314
Travel Time (hr)	32.6	31.6	31.0	32.2	32.9	32.0
Total Delay (hr)	2.9	2.5	2.6	2.9	3.0	2.8
Total Stops	429	375	425	430	446	421
Fuel Used (gal)	40.8	38.9	38.6	39.8	39.8	39.6

Interval #0 Information Seeding

Start Time	3:15
End Time	3:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	3:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	298	322	270	333	302	304
Vehs Exited	290	329	274	339	305	308
Starting Vehs	28	44	37	32	32	34
Ending Vehs	36	37	33	26	29	33
Travel Distance (mi)	327	365	298	381	337	342
Travel Time (hr)	8.0	8.9	7.2	9.5	8.2	8.4
Total Delay (hr)	0.7	0.8	0.6	0.9	0.8	0.8
Total Stops	105	105	95	127	116	110
Fuel Used (gal)	9.9	11.0	8.9	11.5	10.1	10.3

Interval #2 Information Recording

Start Time	3:45
End Time	4:30
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	919	841	897	854	907	886
Vehs Exited	**924**	**845**	**880**	**836**	**907**	**879**
Starting Vehs	36	37	33	26	29	33
Ending Vehs	**31**	**33**	**50**	**44**	**29**	**38**
Travel Distance (mi)	1019	935	974	930	1003	972
Travel Time (hr)	**24.6**	**22.7**	**23.7**	**22.7**	**24.6**	**23.7**
Total Delay (hr)	2.2	1.7	2.0	2.0	2.2	2.0
Total Stops	**324**	**270**	**330**	**303**	**330**	**312**
Fuel Used (gal)	30.8	27.9	29.6	28.3	29.7	29.3

Intersection: 1: OR 99 & OSP south

Movement	SB	SW	SW
Directions Served	L	L	R
Maximum Queue (ft)	16	31	31
Average Queue (ft)	1	12	4
95th Queue (ft)	7	36	21
Link Distance (ft)		112	112
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	225		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: OR 99 & OSP/park north

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	24	5
Average Queue (ft)	1	0
95th Queue (ft)	11	4
Link Distance (ft)	100	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		100
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: OR 99 & Twin Creeks

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	R
Maximum Queue (ft)	57	56	86	60	71	74	87	44
Average Queue (ft)	18	24	44	19	25	35	27	13
95th Queue (ft)	42	46	78	50	61	66	67	37
Link Distance (ft)	479	479		3312	3312	470	470	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			500					200
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	75	165	57	261	308	47
Future Volume (vph)	75	165	57	261	308	47
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1599	1458	1630	3079	3137	1458
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1599	1458	1630	3079	3137	1458
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	91	201	70	318	376	57
RTOR Reduction (vph)	0	162	0	0	0	35
Lane Group Flow (vph)	91	39	70	318	376	22
Heavy Vehicles (%)	4%	2%	2%	8%	6%	2%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	8		1	6	2	
Permitted Phases		8				2
Actuated Green, G (s)	7.9	7.9	4.1	23.7	15.6	15.6
Effective Green, g (s)	7.9	7.9	4.1	23.7	15.6	15.6
Actuated g/C Ratio	0.19	0.19	0.10	0.58	0.38	0.38
Clearance Time (s)	4.0	4.0	4.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	2.5	2.5	5.2	5.2	5.2
Lane Grp Cap (vph)	311	283	164	1797	1205	560
v/s Ratio Prot	c0.06		c0.04	0.10	c0.12	
v/s Ratio Perm		0.03				0.02
v/c Ratio	0.29	0.14	0.43	0.18	0.31	0.04
Uniform Delay, d1	14.0	13.5	17.1	3.9	8.7	7.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2	1.3	0.1	0.3	0.1
Delay (s)	14.3	13.7	18.4	4.0	9.1	7.9
Level of Service	B	B	B	A	A	A
Approach Delay (s)	13.9			6.6	8.9	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	40.6	Sum of lost time (s)	13.0
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	3	309	27	7	351
Future Vol, veh/h	4	3	309	27	7	351
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	225	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	13	0	0	13
Mvmt Flow	5	4	377	33	9	428

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	626	205	0	0	410	0
Stage 1	394	-	-	-	-	-
Stage 2	232	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	421	808	-	-	1160	-
Stage 1	656	-	-	-	-	-
Stage 2	791	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	418	808	-	-	1160	-
Mov Cap-2 Maneuver	418	-	-	-	-	-
Stage 1	656	-	-	-	-	-
Stage 2	785	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.9	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	418	808	1160	-
HCM Lane V/C Ratio	-	-	0.012	0.005	0.007	-
HCM Control Delay (s)	-	-	13.7	9.5	8.1	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	1	305	7	3	356
Future Vol, veh/h	2	1	305	7	3	356
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	0	0	13	0	0	13
Mvmt Flow	2	1	372	9	4	434

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	602	191	0	0	381	0
Stage 1	377	-	-	-	-	-
Stage 2	225	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	436	825	-	-	1189	-
Stage 1	669	-	-	-	-	-
Stage 2	797	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	435	825	-	-	1189	-
Mov Cap-2 Maneuver	527	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	795	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	527	825	1189	-
HCM Lane V/C Ratio	-	-	0.005	0.001	0.003	-
HCM Control Delay (s)	-	-	11.9	9.4	8	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	44	109	107	500	371	53
Future Volume (vph)	44	109	107	500	371	53
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1662	1458	1662	3167	3197	1488
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1662	1458	1662	3167	3197	1488
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	45	112	110	515	382	55
RTOR Reduction (vph)	0	98	0	0	0	32
Lane Group Flow (vph)	45	14	110	515	382	23
Heavy Vehicles (%)	0%	2%	0%	5%	4%	0%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	8		1	6	2	
Permitted Phases		8				2
Actuated Green, G (s)	5.1	5.1	6.3	27.6	17.3	17.3
Effective Green, g (s)	5.1	5.1	6.3	27.6	17.3	17.3
Actuated g/C Ratio	0.12	0.12	0.15	0.66	0.41	0.41
Clearance Time (s)	4.0	4.0	4.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	2.5	2.5	5.2	5.2	5.2
Lane Grp Cap (vph)	203	178	251	2096	1326	617
v/s Ratio Prot	c0.03		c0.07	0.16	c0.12	
v/s Ratio Perm		0.01				0.02
v/c Ratio	0.22	0.08	0.44	0.25	0.29	0.04
Uniform Delay, d1	16.5	16.2	16.1	2.8	8.1	7.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.9	0.1	0.3	0.1
Delay (s)	16.9	16.3	17.0	3.0	8.4	7.3
Level of Service	B	B	B	A	A	A
Approach Delay (s)	16.5			5.4	8.2	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	41.7	Sum of lost time (s)	13.0
Intersection Capacity Utilization	33.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.5

Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	503	41	3	401	23	6
Future Vol, veh/h	503	41	3	401	23	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	225	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	6	0	0	9	0	0
Mvmt Flow	535	44	3	427	24	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	579	0	777	290
Stage 1	-	-	-	-	557	-
Stage 2	-	-	-	-	220	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1005	-	338	713
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	802	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1005	-	337	713
Mov Cap-2 Maneuver	-	-	-	-	337	-
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	800	-

Approach	NB	SB	SW
HCM Control Delay, s	0	0.1	15.2
HCM LOS			C

Minor Lane/Major Mvmt	NBT	NBR	SBL	SBR	SWLn1	SWLn2
Capacity (veh/h)	-	-	1005	-	337	713
HCM Lane V/C Ratio	-	-	0.003	-	0.073	0.009
HCM Control Delay (s)	-	-	8.6	-	16.5	10.1
HCM Lane LOS	-	-	A	-	C	B
HCM 95th %tile Q(veh)	-	-	0	-	0.2	0

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	3	505	4	2	398
Future Vol, veh/h	6	3	505	4	2	398
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	0	6	0	0	9
Mvmt Flow	6	3	537	4	2	423

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	755	271	0	0	541	0
Stage 1	539	-	-	-	-	-
Stage 2	216	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	349	733	-	-	1038	-
Stage 1	555	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	348	733	-	-	1038	-
Mov Cap-2 Maneuver	448	-	-	-	-	-
Stage 1	555	-	-	-	-	-
Stage 2	803	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	448	733	1038	-
HCM Lane V/C Ratio	-	-	0.014	0.004	0.002	-
HCM Control Delay (s)	-	-	13.2	9.9	8.5	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	3	3	3	3	3	3
# of Recorded Intervals	2	2	2	2	2	2
Vehs Entered	1007	1017	953	977	973	986
Vehs Exited	1022	1027	952	984	968	991
Starting Vehs	37	37	31	32	22	32
Ending Vehs	22	27	32	25	27	24
Travel Distance (mi)	1056	1024	975	992	1003	1010
Travel Time (hr)	26.5	25.8	24.5	24.9	25.2	25.4
Total Delay (hr)	2.3	2.4	2.2	2.3	2.3	2.3
Total Stops	420	445	409	406	415	419
Fuel Used (gal)	32.8	32.0	30.4	31.1	31.2	31.5

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	307	304	300	311	301	305
Vehs Exited	309	307	297	312	291	303
Starting Vehs	37	37	31	32	22	32
Ending Vehs	35	34	34	31	32	32
Travel Distance (mi)	316	309	312	314	309	312
Travel Time (hr)	8.1	7.9	7.8	8.0	7.8	7.9
Total Delay (hr)	0.9	0.8	0.7	0.8	0.8	0.8
Total Stops	143	136	127	137	128	134
Fuel Used (gal)	9.8	9.5	9.8	9.7	9.6	9.7

Interval #2 Information Recording

Start Time	7:30
End Time	8:15
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	700	713	653	666	672	680
Vehs Exited	713	720	655	672	677	688
Starting Vehs	35	34	34	31	32	32
Ending Vehs	22	27	32	25	27	24
Travel Distance (mi)	740	714	663	678	693	698
Travel Time (hr)	18.4	17.9	16.7	16.9	17.4	17.4
Total Delay (hr)	1.5	1.6	1.5	1.5	1.5	1.5
Total Stops	277	309	282	269	287	284
Fuel Used (gal)	23.0	22.5	20.6	21.3	21.6	21.8

Intersection: 20: OR 99 & Twin Creeks

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	R
Maximum Queue (ft)	76	69	70	55	63	87	85	36
Average Queue (ft)	28	31	29	18	21	38	25	13
95th Queue (ft)	57	55	61	45	55	67	66	35
Link Distance (ft)	479	479		3312	3312	470	470	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			500					200
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 31: OR 99 & OSP south

Movement	WB	WB	SB
Directions Served	L	R	L
Maximum Queue (ft)	31	36	18
Average Queue (ft)	4	5	2
95th Queue (ft)	20	25	12
Link Distance (ft)	112	112	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			225
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 39: OR 99 & Aboretum

Movement	WB	WB
Directions Served	L	R
Maximum Queue (ft)	24	24
Average Queue (ft)	2	1
95th Queue (ft)	13	10
Link Distance (ft)	99	99
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:15	3:15	3:15	3:15	3:15	3:15
End Time	4:30	4:30	4:30	4:30	4:30	4:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	3	3	3	3	3	3
# of Recorded Intervals	2	2	2	2	2	2
Vehs Entered	1209	1231	1228	1237	1269	1235
Vehs Exited	1202	1231	1212	1250	1269	1233
Starting Vehs	30	36	26	39	35	32
Ending Vehs	37	36	42	26	35	36
Travel Distance (mi)	1320	1361	1329	1353	1416	1356
Travel Time (hr)	32.3	33.1	32.5	33.2	34.4	33.1
Total Delay (hr)	2.7	2.9	2.9	2.9	3.0	2.9
Total Stops	445	449	441	446	433	441
Fuel Used (gal)	40.0	41.3	40.2	41.5	42.8	41.2

Interval #0 Information Seeding

Start Time	3:15
End Time	3:30
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.
No data recorded this interval.

Interval #1 Information Recording

Start Time	3:30
End Time	3:45
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	310	308	297	333	326	315
Vehs Exited	316	314	284	341	331	317
Starting Vehs	30	36	26	39	35	32
Ending Vehs	24	30	39	31	30	28
Travel Distance (mi)	337	346	322	366	370	348
Travel Time (hr)	8.2	8.5	7.7	9.0	9.2	8.5
Total Delay (hr)	0.7	0.7	0.6	0.8	0.9	0.7
Total Stops	113	97	98	125	121	112
Fuel Used (gal)	10.4	10.5	9.7	11.2	11.2	10.6

Interval #2 Information Recording

Start Time	3:45
End Time	4:30
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	899	923	931	904	943	920
Vehs Exited	886	917	928	909	938	916
Starting Vehs	24	30	39	31	30	28
Ending Vehs	37	36	42	26	35	36
Travel Distance (mi)	983	1015	1006	988	1046	1008
Travel Time (hr)	24.0	24.7	24.8	24.2	25.3	24.6
Total Delay (hr)	2.0	2.2	2.3	2.2	2.1	2.1
Total Stops	332	352	343	321	312	333
Fuel Used (gal)	29.6	30.8	30.5	30.3	31.7	30.6

Intersection: 1: OR 99 & OSP south

Movement	SB	SW	SW
Directions Served	L	L	R
Maximum Queue (ft)	22	46	31
Average Queue (ft)	2	18	7
95th Queue (ft)	12	44	29
Link Distance (ft)		112	112
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	225		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: OR 99 & OSP/park north

Movement	WB	WB	SB
Directions Served	L	R	L
Maximum Queue (ft)	30	31	5
Average Queue (ft)	6	4	0
95th Queue (ft)	26	20	4
Link Distance (ft)	100	100	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			100
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 20: OR 99 & Twin Creeks

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	R
Maximum Queue (ft)	48	55	91	64	86	70	72	44
Average Queue (ft)	20	24	43	18	23	35	26	13
95th Queue (ft)	43	45	78	50	63	65	65	37
Link Distance (ft)	479	479		3312	3312	470	470	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			500					200
Storage Blk Time (%)								
Queuing Penalty (veh)								

Network Summary

Network wide Queuing Penalty: 0

CITY OF CENTRAL POINT
PUBLIC WORKS DEPARTMENT

Standard Specifications
And
Uniform Standard Details
For
Public Works Construction

2014

320.00.00 – Design

320.10.01 – Design Standards

The purpose of these standards is to provide a consistent policy under which certain physical aspects of street and related design and plan preparation will be observed by the engineer.

The Engineer should be aware that certain alternate street standards for the Transit Oriented District and Transit Oriented Corridor might apply to the design and construction streets in these areas of the city. These alternate standards are fully described in the Central Point TOD Design Requirements and Guidelines. They are also briefly described in lesser detail in these Standards and Specifications.

This section contains design standards to ensure the safe and efficient operation of each facility type for all users and the best use of public space. The requirements in this section are established as minimum standards to follow and apply to both new construction and reconstruction, except as otherwise specified.

Designs shall consider the needs of people with disabilities and the aged, such as visually impaired pedestrians and mobility impaired pedestrians. Every effort should be made to locate street hardware away from pedestrian locations and provide a surface free of bumps and cracks, which create safety and mobility problems. Smooth access ramps shall be provided where required. All designs shall conform to the current American Disabilities Act (ADA) or as adopted by the Oregon Department of Transportation (ODOT), Oregon Bicycle and Pedestrian Plan.

The determination of the pavement width and total right-of-way shall be based on the operational needs for each street as determined by a technical analysis. The technical analysis shall use demand volumes that reflect the maximum number of pedestrians, bicyclists, parked vehicles and motorized vehicle traffic expected when the area using the street is fully developed. Technical analysis shall take into consideration, transportation elements of the Comprehensive Plan, TOD, neighborhood plans, approved tentative plans as well as existing commercial and residential developments. All street designs shall be coordinated with the design of other new or existing infrastructure.

These standards set forth the minimum requirements for materials and street design.
The Public Works Director shall have discretion to require a higher or different standard for materials or design when in his judgment it is in the best interest of the public's health, safety and welfare when considering all aspects and circumstances of the project.

The minimum geometric requirements for all street classifications are defined in Tables 300 – 1 through 300 – 7.

320.10.02 – Traffic Impact Analysis

The purpose of this section is to assist in the determination of which road authorities participate in land use decisions, and to implement Section 660-012-0045(2)(e) of the State Transportation

Planning Rule that requires the city to adopt a process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities.
This chapter establishes the standards for when a proposal must be reviewed for potential traffic impacts; when a traffic impact analysis must be submitted with a development application in order to determine whether conditions are needed to minimize impacts to and protect transportation facilities; what must be in a traffic impact analysis; and who is qualified to prepare the study.

A traffic impact analysis shall be prepared by a traffic engineer or civil engineer licensed to practice in the state of Oregon with special training and experience in traffic engineering. If the road authority is the Oregon Department of Transportation (ODOT), consult ODOT's regional development review planner and OAR 734-051-180. If the road is the authority of Jackson County, consult Jackson County's road design requirements.

The Public Works Director may, at his/her discretion, waive the study of certain intersections when it is concluded that the impacts are not substantial.

320.10.03 – Traffic Impact Analysis Applicability

(1) The level of detail and scope of a traffic impact analysis (TIA) will vary with the size, complexity, and location of the proposed application. Prior to any TIA, the applicant shall submit sufficient information to the City for the Public Works Department to issue a scoping letter. If stipulations to reduce traffic are requested by an applicant, it must first be shown by means of an analysis that an unconditional approval is not possible without some form of mitigation to maintain an adequate LOS. This will determine whether a stipulation is necessary.

(2) Extent of Study Area:
The study area shall be defined by the Public Works Department in the scoping letter and shall address at least the following areas:

a) All proposed site access points;
b) Any intersection where the proposed development can be expected to Contribute 25 or more trips during the analysis peak period. Impacts of less than 25 peak period trips are not substantial and will not be included in the study area. This volume may be adjusted, at the discretion of the Public Works Department, for safety or unusual situations; and
c) Any intersections directly adjacent to the subject property.

(3) When required: TIA shall be required when a land use application involves one or more of the following actions:

a) A change in zoning or a plan amendment designation that generates 300 average daily trips (ADT) more than the current zoning;
b) Any proposed development or land use action that a road authority, including the city, Jackson County or ODOT, states may have operational or safety concerns along its facilities;
c) An increase in site traffic volume generation by 250 average daily trips (ADT) or more, or 25 Peak Hour Trips (PHT);

d) An increase in peak hour volume of a particular movement to and from the State highway by 20 percent or more;
e) An increase in use of adjacent streets by vehicles exceeding twenty thousand pounds gross vehicle weight by 10 vehicles or more per day;
f) The location of the access driveway does not meet minimum sight distance requirements, as determined by the city engineer, or is located where vehicles entering or leaving the property are restricted, or such vehicles queue or hesitate on the state highway, creating a safety hazard at the discretion of the community development director; or
g) A change in internal traffic patterns that, at the discretion of the Public Works Director, may cause safety problems, such as back-up onto a street or greater potential for traffic accidents.

(4) Submittals:
Provide two copies of the TIA for Public Works Department to review.

(5) Elements of Analysis:
A TIA shall be prepared by a Traffic Engineer or Civil Engineer licensed to practice in the State of Oregon with special training and experience in traffic engineering. The TIA shall be a thorough review of the effects a proposed use will have on the transportation system. The study area shall include all streets and intersections in the analysis, as defined in subsection (2) above. Traffic generated from a proposed site will be distributed throughout the transportation system using existing count data or the current transportation model used by the City. Any alternate distribution method must be based on data acceptable to the Public Works Department. The following checklist outlines what a TIA shall contain. Incomplete reports shall be returned to the applicant for completion without review:

a) The scoping letter as provided by the Public Works Department;
b) The Final TIA shall be signed and stamped by a Professional Civil or Traffic Engineer registered in the State of Oregon;
c) An executive summary, discussing the development, the major findings of the analysis, and the mitigation measures proposed;
d) A vicinity map of the proposed site and study area;
e) Project characteristics such as zoning, potential trip generations (unless stipulated to less than potential), proposed access(s), and other pertinent factors;
f) Street characteristics within the study area including functional classification, number of travel lanes, lane width, shoulder treatment, bicycle path corridors, and traffic control at intersections;
g) Description of existing transportation conditions including transit accessibility, accident history, pedestrian facilities, bicycle facilities, traffic signals, and overall traffic operations and circulation;
h) Peak period turning movement counts of at least two-hour minimums at study area intersections, less than 2 years old. These counts shall be adjusted to the design year of the project and consider seasonal traffic adjustments when required by the scoping letter;
i) A "Figure" showing existing peak period (AM, noon, or PM, whichever is largest) turning movement volumes at study area intersections, as shown in Example 1. Approved applications obtained from the City that have not built out but will impact study

area intersections shall be included as pipeline traffic. An appropriate adjustment factor shall be applied to existing count data if counts were taken during the off-peak season;
j) Potential "Project" trip generation using the most current edition of the ITE Trip Generation, as required by the Public Works Department at the time of scoping. Variations of trip rates will require the approval of the Public Works Department. Such approval will require submission of adequate supporting data prior to first submittal of the TIA;
k) A "Figure" illustrating project turning movement volumes at study area intersections for peak periods, as shown in Example 2. Adjustments made for pass-by traffic volumes shall follow the methodology outlined in the latest edition of the ITE Trip Generation, and shall not exceed 25% unless approved by the Public Works Director;
l) A "Figure" illustrating the combined traffic of existing, background, and project turning movement volumes at study area intersections for peak periods, as shown in Example 3;
m) Level of Service (LOS) analysis at study area intersections under the following conditions:

(A) Existing plus pipeline traffic
(B) Existing plus pipeline traffic and project traffic.

A table shall be prepared which illustrates all LOS results. The table shall show LOS conditions with corresponding vehicle delays for signalized intersections and the critical movement at unsignalized intersections. If the proposed use is scheduled to be completed in phases, a LOS analysis shall be prepared for each phase;
n) A mitigation plan if impacts to the study area reduce level of service (LOS) below minimums. Mitigation measures may include stipulations and/or construction of necessary transportation improvements. Mitigation measures shall be required to the extent that the transportation facilities, under City jurisdiction, operate at an acceptable level of service (LOS) with the addition of project traffic; and
o) Intersections under jurisdiction of another agency, but still within the City limits, shall be evaluated by either the City's criteria or the other jurisdiction's criteria, or both, whichever is considered applicable by the Public Works Department.

If the TIA is not consistent with the scoping letter (including any amendments) then the TIA will be returned to the applicant without review.

(6) Analysis criteria:

a) All trip distributions into and out of the transportation system must reflect existing traffic count data for consistency or follow the current transportation model used by the City. If alternate splits are used to distribute traffic then justification must be provided and approved by the Public Works Department prior to first submittal of the TIA.
b) If progression analysis is being evaluated or queuing between intersections is a concern, the peak period used in the analysis must be the same for every intersection along the street and reflect that of the most critical intersection being evaluated. If a common peak period is not requested by the Public Works Department, then the actual peak period of every intersection shall be used.
c) Counts performed must be a minimum of two hours and include the peak period for analysis purposes. All documentation shall be included in the TIA.
d) All supporting count data, LOS analyses, pass-by deductions, growth rates, traffic

distributions, or other engineering assumptions must be clearly defined and attached to the TIA when submitted in report form to the City for review.
e) All LOS analyses shall follow operational procedures per the current Highway Capacity Manual. Ideal saturation flow rates greater than 1800 vehicles per hour per lane should not be used unless otherwise measured in the project vicinity. Queue lengths shall be calculated at the 95th percentile where feasible. Actual peak hour factors should be used for each movement or lane grouping in the analysis. Peak hour factors over 0.90 shall not be used unless justified by specific counts at that location.
f) Signal timing used in capacity or progression analysis shall follow City timing plans and account for pedestrian crossing times, unless otherwise noted in the scoping letter.
g) Arrival Type 3 (random arrivals) shall be used unless a coordinated plan is in place during the peak period.

320.10.04 – Maintenance of level of Service D

Whenever level of service is determined to be below level D for arterials or collectors, development is not permitted unless the developer makes the roadway or other improvements necessary to maintain level of service D respectively.

Table 300-4
Street Intersections and Access Separation

Street of Alignment	Major Arterial	Secondary Arterial	Collector	Local	New Driveway
Major Arterial	1000'(1)	1000'(1)	1000'	750'	See Note(2)
Secondary	1000'(1)	750'	500'	500'	See Note(2)
Collector	1000'	750'	500'	300'	Allowed
Local	750'	500'	300'	150'	Allowed

NOTES:

1. Major arterial streets, when aligned with other major arterial streets, shall be designed on a case-by-case basis and may require minimum spacing greater than 1000', but in no case shall spacing be less than 1000'.
2. Driveways are generally not allowed to access onto arterial streets unless no other reasonable access is available.
3. The Public Works Department, at the discretion of the Public Works Director, may allow a 300' distance between access driveways on major arterial streets.

Table 300-5

Minimum Sight Distance and Clear Vision Requirements

Sight Distance at Intersections (1)

20 MPH	30MPH	40MPH	50MPH	60MPH
200'	300'	400'	500'	600'

Notes:

1. Corner sight distance measured from a point of the minor road at least 10' from the edge of the major road pavement and measured from a height of eye of 3.5'on the minor road to a height of object of 4.25' as referenced on Standard Detail Sheet A-11, as distances d1 and d2.