

TRANSPORTATION ANALYSIS

CITY OF ROSEBURG URBAN GROWTH BOUNDARY SWAP

August 23, 2021

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Urban Growth Boundary Swap Analysis



Roseburg, Oregon
August 23, 2021

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EXECUTIVE SUMMARY

The City of Roseburg is in the process of preparing an Urban Growth Boundary (UGB) Exchange in which approximately 222.4 acres located on the west side of the city will be added to the UGB, and approximately 290.5 acres located in the northwest and northeast areas of the city will be removed from the UGB. The UGB Exchange is an amendment to the existing City of Roseburg Comprehensive Plan. As such, the UGB exchange needs to evaluate the traffic impacts consistent with the Statewide Planning Rule Goal 12, OAR 660-12-0060 Transportation Planning Rule (TPR) requirements.

The City of Roseburg TSP was completed in 2019 evaluating transportation conditions for a 20-year planning horizon, year 2040. The TSP considered traffic impacts from buildable lands currently in the UGB. The UGB Exchange will remove residential lands that contain difficult to unbuildable slopes with lands that provide improved building conditions for building infrastructure and dwelling units.

This report describes the traffic analysis and findings consistent with the Transportation Planning Rule (TPR) to evaluate the impacts of the lands added within the UGB. Additionally, this study includes a safety and operational evaluation of Troost Street between Felt Street and Katie Drive to determine the improvements necessary to facilitate the added traffic.

FINDINGS

The analysis is prepared for roadway and traffic conditions at the year 2040 with full build out of the approximately 222.4 acres added to the UGB. The following are improvements recommendations to facilitate the added vehicles on the system. These improvements are based intersection and roadway capability to meet City's and ODOT's intersection performance standards.

- **Garden Valley Blvd at Stewart Parkway**
The intersection at Garden Valley Blvd at Stewart Parkway is projected not meet the mobility standards for the year 2040 prior to and with the UGB expansion. The recommended improvements are to add eastbound and westbound dual left-turn lanes from Garden Valley Blvd to Stewart Parkway and dual southbound right-turn lanes from Stewart Parkway to Garden Valley Blvd consistent with the recommendations within the TSP.
- **Stewart Ave at Harvard Ave**
The intersection of Stewart Ave at Harvard Ave is projected to operate at LOS F for the year 2040 with full build out of the UGB expansion area. The standard for this intersection is to operate at LOS E or better. As this intersection does not meet the standard improvements will be necessary. The separate left turns at this intersection could be modified to protective-permissive phasing. With this minor change, the signal will operate at a LOS E, meeting the City's LOS standards.

- **Troost St at Calkins Ave**

The intersection of Troost St at Calkins Ave is projected to operate at the upper threshold of standard at the end of the planning horizon with the UGB swap. The UGB swap has the potential to add over 200 pm peak hour trips in the westbound left turn. Therefore, it is recommended that a separate westbound left turn lane be provided. The westbound left turn will result in the intersection operating significantly better than the standard. As the UGB expansion area gets developed, the City should monitor this intersection for possible signalization. The traffic volumes experienced at full-build out will meet the minimum threshold for warranting a traffic signal following the Federal Highway Administration Manual on Uniform Traffic Control Devices. The traffic signal will provide traffic flow and controlled pedestrian crossings as this intersection becomes more congested.

- **Garden Valley Blvd at Kline St**

The intersection of Garden Valley Blvd at Kline St is projected to operate at a LOS E and v/c 0.81 without the UGB swap and a LOS F and v/c 0.90 with the UGB swap. To improve the LOS at this intersection, the northbound and southbound left turn signal indications should be modified from protected phasing only to protective-permissive phasing.

- **Garden Valley Blvd at I-5 Exit 125 NB Ramp**

The intersection of Garden Valley Blvd at the I-5 Exit 125 NB ramps is projected to operate at a v/c 0.93 without the UGB swap and v/c 0.96 with the UGB swap. ODOT maintains a standard of 0.85 for ramp terminals. As per the Oregon Highway Plan, ODOT considers a change in v/c of 0.03 or less to not require mitigation. The UGB swap is shown to not have a significant effect on the intersection. Therefore, the UGB swap does not trigger mitigation for this intersection.

- **Garden Valley Blvd at I-5 Exit 125 SB Ramp**

The intersection of Garden Valley Blvd at the I-5 Exit 125 SB ramp is projected to operate at a v/c 1.01 without the UGB swap and v/c 1.04 with the UGB swap. ODOT maintains a standard of 0.85 for ramp terminals. As per the Oregon Highway Plan, ODOT considers a change in v/c of 0.03 or less to not require mitigation. The UGB swap does not trigger mitigation for this intersection.

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1.0 BACKGROUND

The City of Roseburg is in the process of an Urban Growth Boundary (UGB) Amendment. As part of the Amendment, an exchange of lands will occur that removes approximately 290.5 acres of land; 91.5 acres near Daysha Drive and Shantel Street and 199 acres near Parker Road and Barager Avenue; and will bring in approximately 222.4 acres located off Troost Street and Charter Oaks Drive.

The UGB Exchange is an amendment to the existing City of Roseburg Comprehensive Plan and Transportation System Plan (TSP). As such, the UGB exchange needs to evaluate the traffic impacts consistent with the Statewide Planning Rule Goal 12, OAR 660-12-0060 Transportation Planning Rule (TPR) requirements.

The evaluation considers transportation impacts from the lands to be added within the UGB. A majority of the parcels added within the UGB will be zoned Single Family Residential-R7.5 with approximately 23.5 acres to be zoned Public Reserve-PR. At the maximum build out, there is potential to add up to approximately 648 homes. This report describes the traffic analysis and findings consistent with the Transportation Planning Rule (TPR) to evaluate the impacts of the lands added within the UGB, consistent with the City of Roseburg Transportation System Plan (TSP), focusing primarily on intersection and roadway level of service. In addition to the TPR Analysis, Troost Street was evaluated for safety and operational concerns between Felt Street and Katie Drive.

1.1 SCOPE OF ANALYSIS

The traffic study is performed in accordance with the City of Roseburg, and Oregon Department of Transportation (ODOT) Traffic Impact Analysis standards and criteria. The results of the analysis are compared to the criteria under the TPR and Oregon Highway Plan (OHP) to demonstrate that the proposed UGB exchange is consistent with the TPR criteria. To be consistent with the TSP, the traffic impacts are evaluated for the weekday PM time period between 3:30 PM and 6:30 PM at the following locations:

- Garden Valley Blvd at NW Stewart Parkway
- NW Troost St at NW Calkins Ave
- NW Troost St at Garden Valley Blvd
- Garden Valley Blvd at NW Kline St
- Calkins Ave at Keasey St
- Stewart Parkway at Harvey Ave
- Stewart Parkway at Harvard Blvd
- Exit 124 at Harvard Ave
- Exit 125 at Garden Valley Blvd
- NW Troost St at Charter Oaks Dr
- NW Troost St at Loma Vista Dr
- NW Keasey St at NW Harvey Ave

The operational analysis is performed at the studied intersections during the weekday PM peak hour of the system for the TSP 20-year planning horizon (year 2040).

2.0 ANALYSIS STUDY AREA

2.1 UGB EXCHANGE AREA

As part of the UGB Amendment, an exchange of lands will occur that will remove 91.5 acres near Daysha Drive and Shantel Street, and 199 acres near Parker Road and Barager Avenue, and will bring in approximately 222.4 acres of land off Troost Avenue and Charter Oaks Drive.

Figure 1 provides an illustration of the location of the lands to be removed and added.

Lands removed from the UGB consist of about 199 acres of Low Density Residential- R10, 14.15 acres of Multiple-Family Residential- MR29, 8.9 acres of High Density Residential- MR40, 68.5 acres of R5, the lands to be added to the UGB, and 222.4 acres to be zoned Single-Family Residential.

2.2 STUDY AREA

The intersections within the study area are evaluated for impacts associated with the UGB Exchange. All of the study area intersections are within Roseburg's jurisdiction with the exception of the Interstate-5 ramp terminals on Garden Valley Blvd and Harvard Ave. Figure 2 provides the study intersection locations, geometry, and control. Table 1 provides the studied intersection jurisdiction and control.

TABLE 1: STUDY AREA INTERSECTION

Intersection	Jurisdiction	Intersection Control
Garden Valley Blvd @ NW Stewart Parkway	City	Signal
NW Troost St @ MW Calkins Ave	City	All-Way Stop
NW Troost St @ Garden Valley Blvd	City	Signal
Garden Valley Blvd @ NW Kline St	City	Signal
Calkins Ave @ Keasey St	City	Stop Sign
Stewart Parkway @ Harvey Ave	City	Signal
Stewart Parkway @ Harvard Blvd	City	Signal
Exit 124 @ Harvard Ave	ODOT	Signal
Exit 125 @ Garden Valley Blvd	ODOT	Signal
NW Troost St @ Charter Oaks Dr	City	Stop-Control
NW Troost St @ Loma Vista Dr	City	Stop-Control
NW Keasey St @ NW Harvey Ave	City	Stop-Control

2.3 STREET NETWORK

Major streets included within the study are Troost Ave, Garden Valley Blvd, Stewart Parkway and Calkins Ave. Table 2 illustrates the roadway characteristics within the study area (within existing UGB). Figure 3 provides an illustration of the adjacent street classification.

TABLE 2: ROADWAY CHARACTERISTICS WITHIN STUDY AREA

Characteristic	Troost St	Calkins Ave	Garden Valley	Stewart Parkway
Functional Classification	Major Collector	Minor Collector	Major Arterial	Major Arterial
Posted Speed	25/Basic Rule	25	20/30/35/55	35/45
Lanes per Direction	1	1	2	2
Center Left Turn Lane	No	No	Yes	no
Restrictions in the Median	No	No	No	No
Bikes Lanes Present	North of Katie	No	No	Yes
Sidewalks Present	North of Katie	Yes	Yes	North of YMCA
On-Street Parking	North of Katie	Yes	No	No



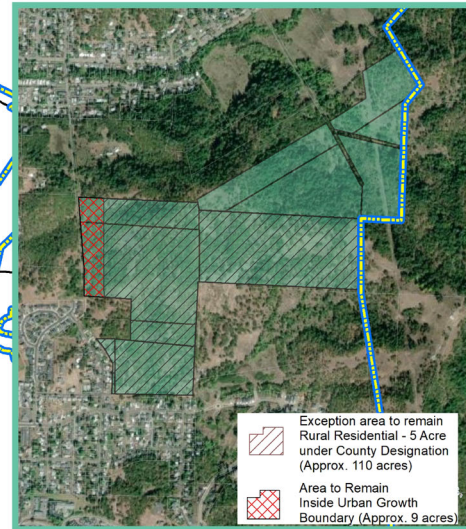
City of Roseburg
Urban Growth
Boundary Swap

Project Overview

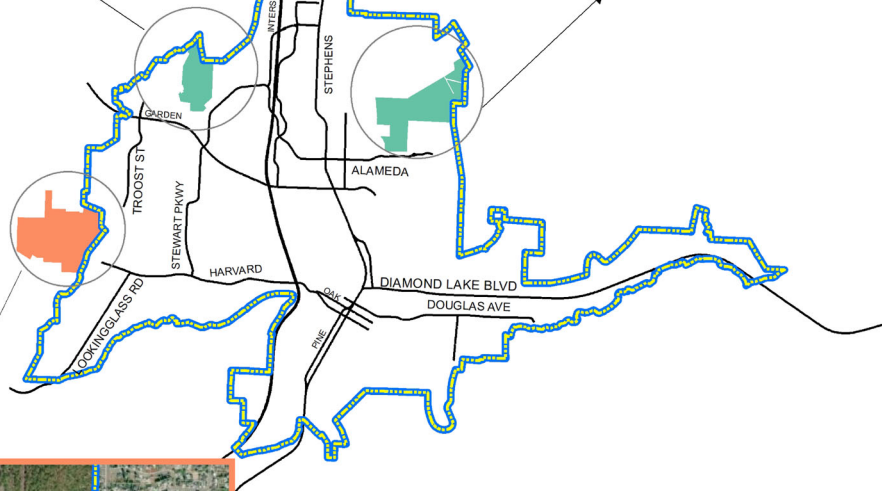
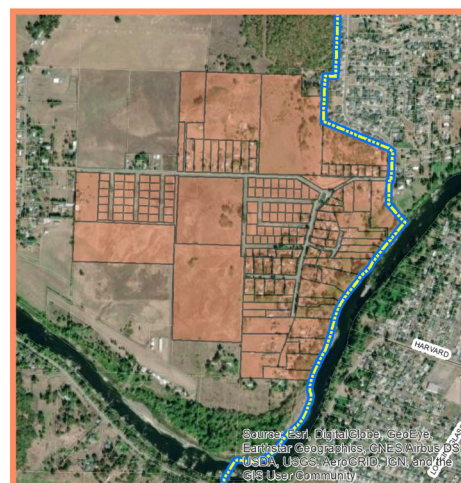
Withdrawn Area A



Withdrawn Area B



Expansion Area



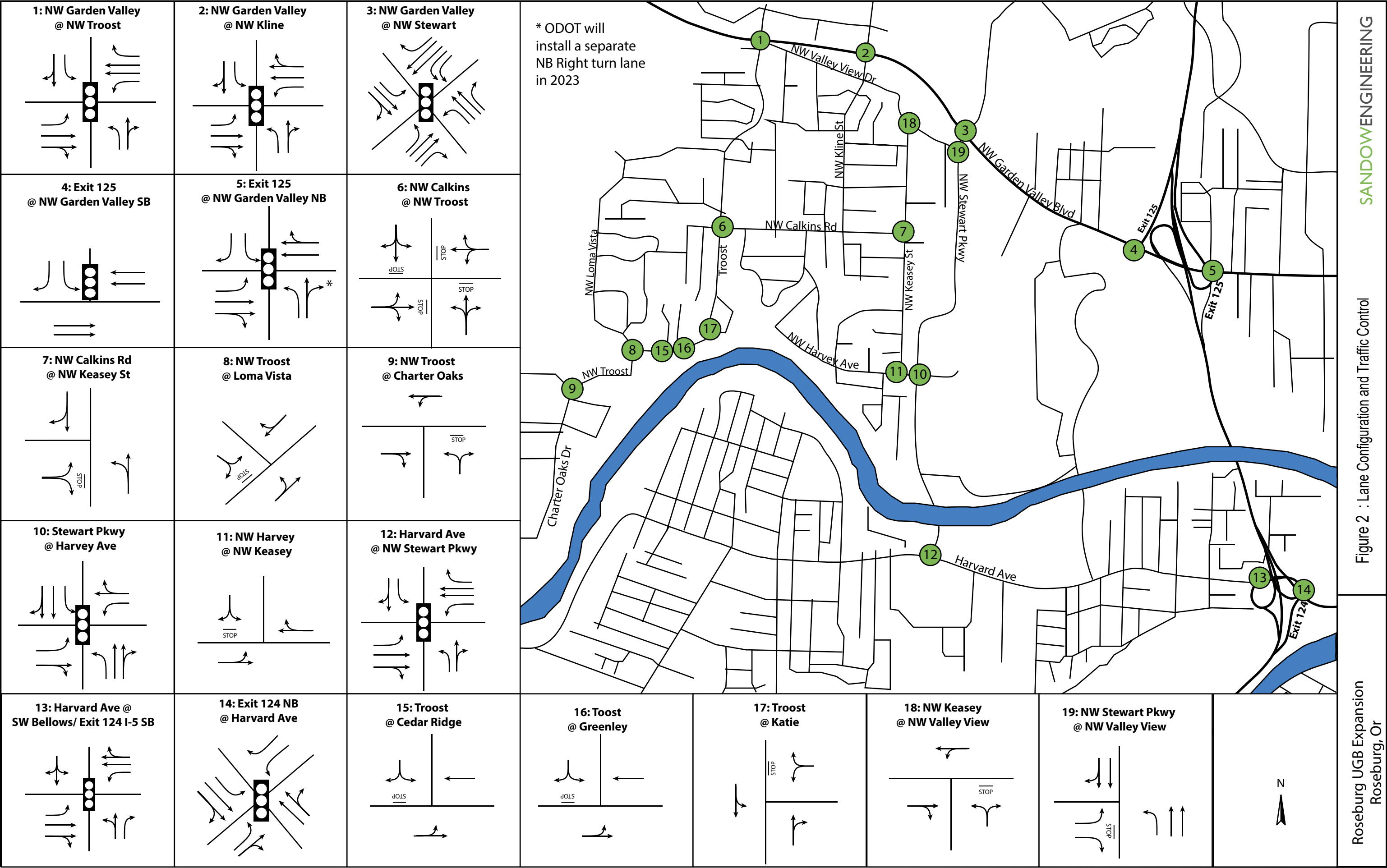
Urban Growth Boundary

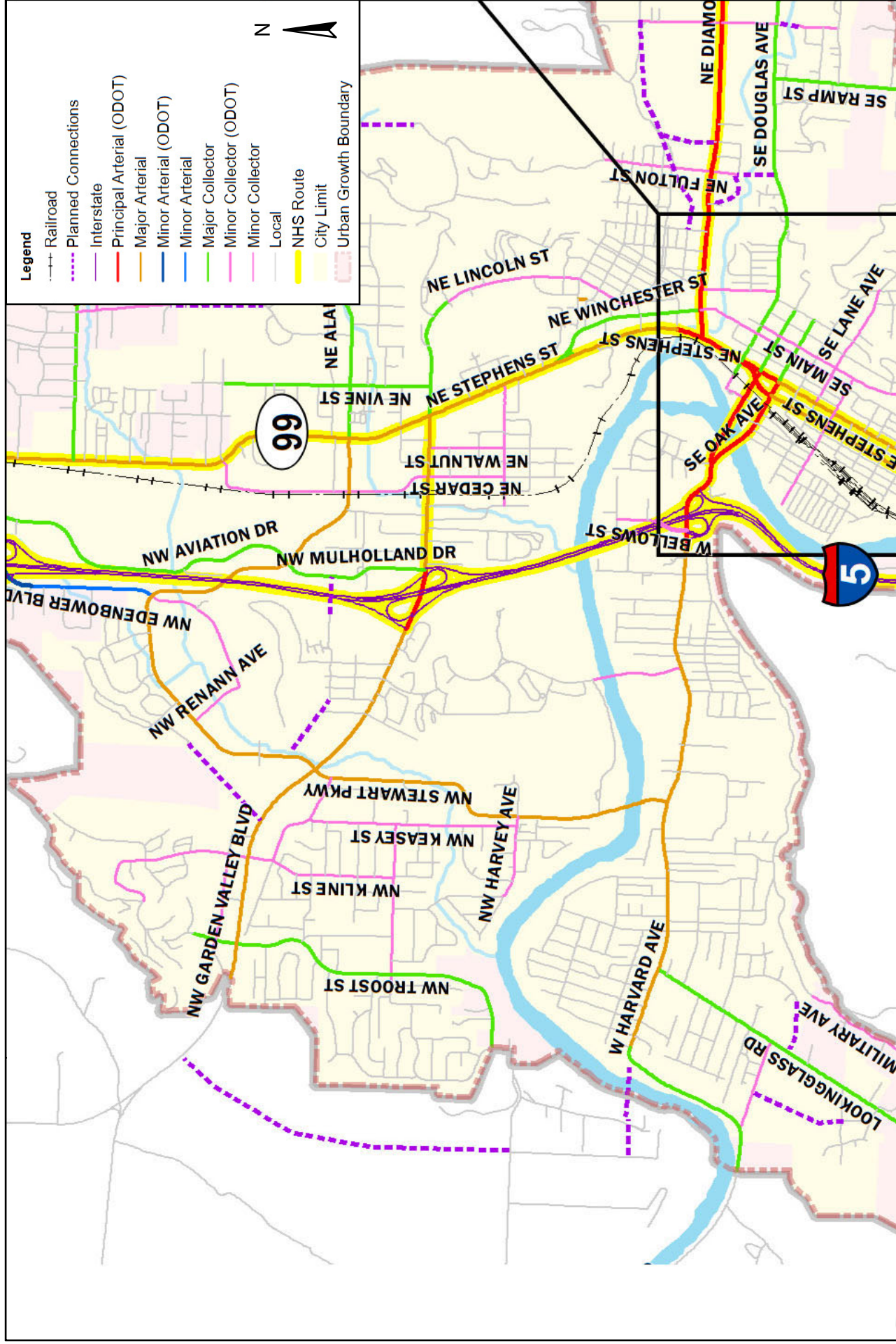


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Roseburg UGB Expansion

Figure 1: UGB Swap Areas





Roseburg UGB, Roseburg, Or

Figure 3: Street Classification

3.0 INTERSECTION VOLUMES

Intersection evaluation is performed for the design hour traffic volumes. The design hour volumes for this project have been identified to be the typical weekday peak hour occurring from 4:30 PM to 5:30 PM during the peak month of the year. The design hour traffic volumes are determined as follows.

3.1 BASE TRAFFIC VOLUMES

The base evaluation considers impacts at the 20-year planning horizon for the TSP, year 2040. The year 2040 30 HV (design hour) traffic volumes were derived within the 2019 TSP. The 2040 TSP volumes were used as the base volumes for this study.

The intersections of Troost at Charter Oaks, Troost and Loma Vista Dr, and Keasey St at Harvey St were not included in the TSP. Therefore, new traffic counts were collected for this study. The counts were collected in 2021. The counts are adjusted to account for any reductions due to the Covid-19 impacts. ODOT has been monitoring current traffic volumes and comparing them to 2019 volumes to determine impacts of Covid-19. The ODOT data illustrates up to a 14% reduction when compared to 2019 volumes for this area. Therefore, a factor of 1.14 was applied to the existing traffic counts to represent non-Covid 19 volumes. Appendix A contains the traffic volumes.

The 2021 counts are adjusted to year 2040 conditions using a growth rate consistent with the adjacent intersections within the TSP. The growth rates are 3.2% per year for the intersections on Troost Ave and 1.1% per year for the intersection of Keasey St at Harvey Ave.

The 2019 Transportation System Plan base year 2040 traffic volumes considers some growth from the areas to be removed from the UGB and the area to be included within the UGB.

Withdrawal Area A

Withdrawal Area A is located off Daysha Dr and Shantel St. The area is accessed via Kline St and Garden Valley Blvd. The area is within the Transportation Analysis Zone (TAZ), shown in Figure 4 below. The TAZ is shown to have a household growth of 326 homes within the 20-year planning horizon, see TSP Technical Memorandum #4, provided in Appendix B. The TAZ encompasses the area bounded by the UGB to the north, Withdrawal Area A to the east, Garden Valley Blvd to the south, and the UGB to the west. This TAZ encompasses an area with includes buildable residential lands beyond Withdrawal Area A.

Additional traffic volume data from the TSP Technical Memorandum #4, provided in Appendix B of this report, shows the growth in traffic volumes on Kline St just north of Garden Valley Blvd as 75 vehicles southbound and 55 vehicles northbound (130 vehicles). This is equivalent to approximately 93 single family homes and 37 trips from additional commercial/employment growth off Kline north of Garden Valley Blvd. There are approximately 25 single family vacant and buildable lots located within the TAZ and outside withdrawal area A. Additionally, there is approximately 19 acres of undeveloped land zoned for single family residential and approximately 2.73 acres of multi-family residential. It is reasonable to assume that these vacant residential lots could be developed by the year 2040.

Additionally, there is approximately 11 acres of undeveloped commercial land within the TAZ and outside the withdrawal area A. The 130-trip increase shown in the TSP would likely still occur and would be from reasonable growth outside the Withdrawal Area A but within the TAZ. Therefore, the 130 trips from Withdrawal Area A were not removed from the 2040 base volumes. This provides a conservative approach to the evaluation provided in this report.

Withdrawal Area B

Withdrawal Area B is located off Parker Rd and Barager Ave and will be primarily accessible via Alameda Ave and Newton Creek Road. Withdrawal Area B is located within two TAZs, see Figure 5. The northern TAZ is shown to have a household growth of 80 homes within the 20-year planning horizon. The southern TAZ has a household growth of 92 homes within the 20-year planning horizon. (TSP Technical Memorandum #4). Both TAZ areas encompass a buildable area substantially larger than Withdrawal Area B.

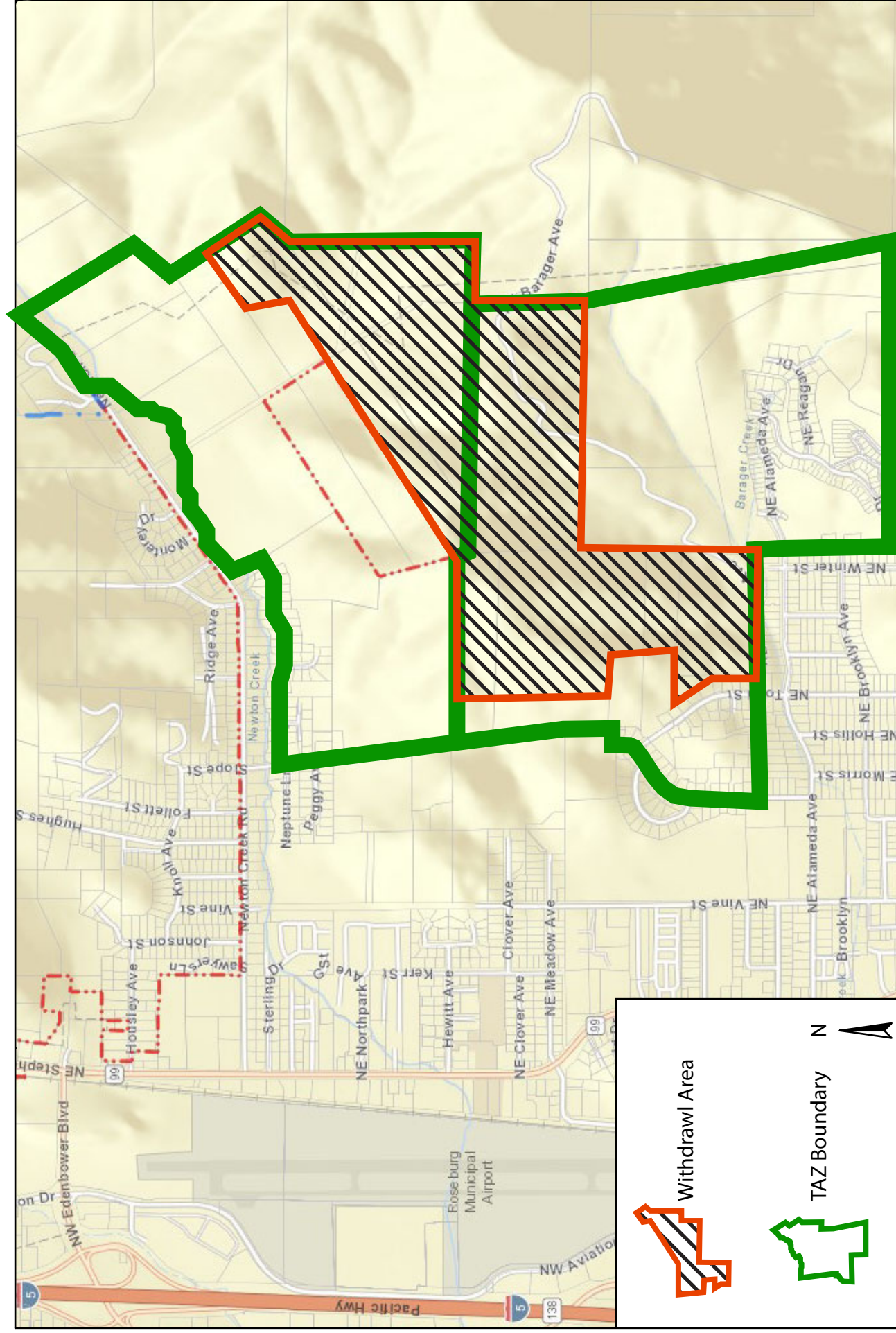
Additionally, traffic volume data from the Technical Memorandum #4, provided in Appendix B of this report, shows the growth in traffic volumes on Newton Creek Rd as 60 trips and shows no growth in traffic on Alameda Ave. There is more than 230 acres of buildable residential land within the TAZ and outside the withdrawal area A. The growth on the roadways, shown as 60 vehicle trips, equates to 60 homes. It is reasonable that this level of growth could occur outside Withdrawal Area B, but within the TAZ. The trips from Withdrawal Area B are not removed from the 2040 base traffic volumes. This provides a conservative approach to the evaluation provided in this report.

Expansion Area

The proposed expansion area is located along Troost St. The area is located within the TAZ area shown in Figure 6. The TAZ is shown to have a household growth of 140 homes within the 20-year planning horizon (TSP Technical Memorandum #4) and encompasses an area larger than the UGB Expansion Area.

Additional traffic volume data, included in Appendix B of this report, shows that the traffic volumes on Troost St have a growth rate of 85 trips just south of Calkins Ave. This is equivalent to 85 homes. At the time of the TSP development there were at least 40 vacant developable lots that could access Troost south of Calkins Ave, outside the expansion area, that could develop. Therefore, the trips from the TAZ were not modified to account for the expansion area.

The background vehicle trips for the year 2021 are shown in Figure 7 and the year 2040 are shown in Figure 8.



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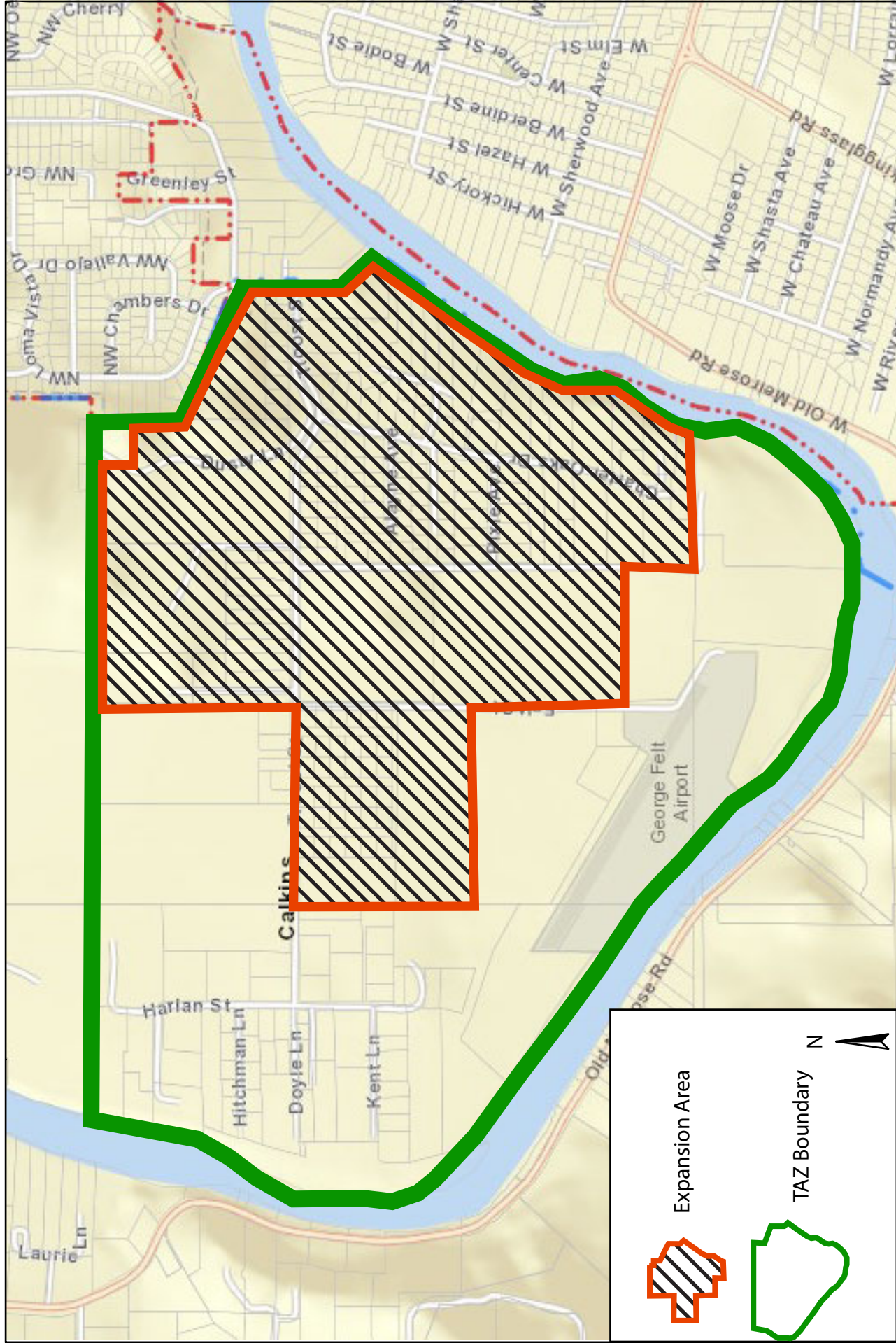


Figure 6: Expansion Area

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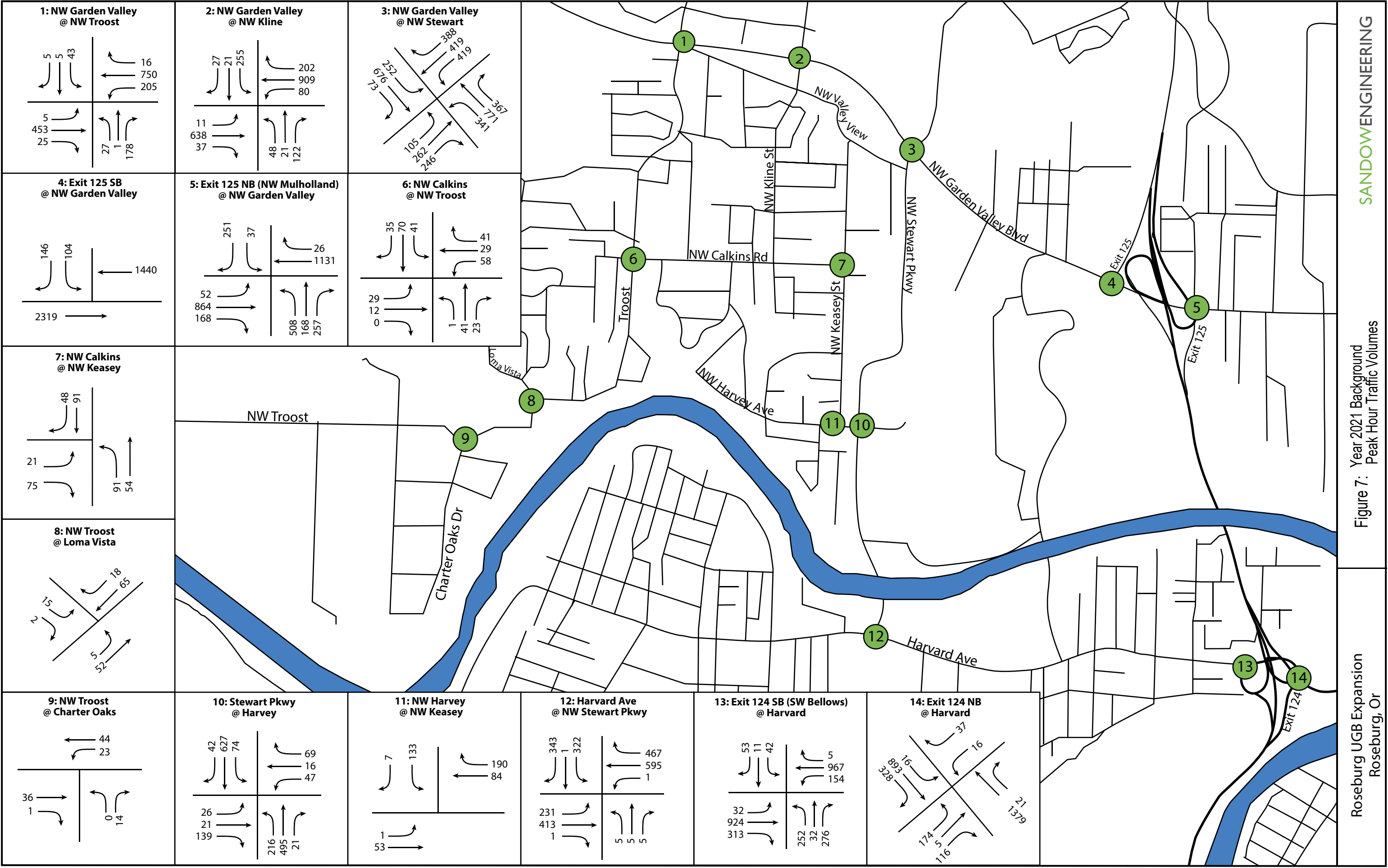
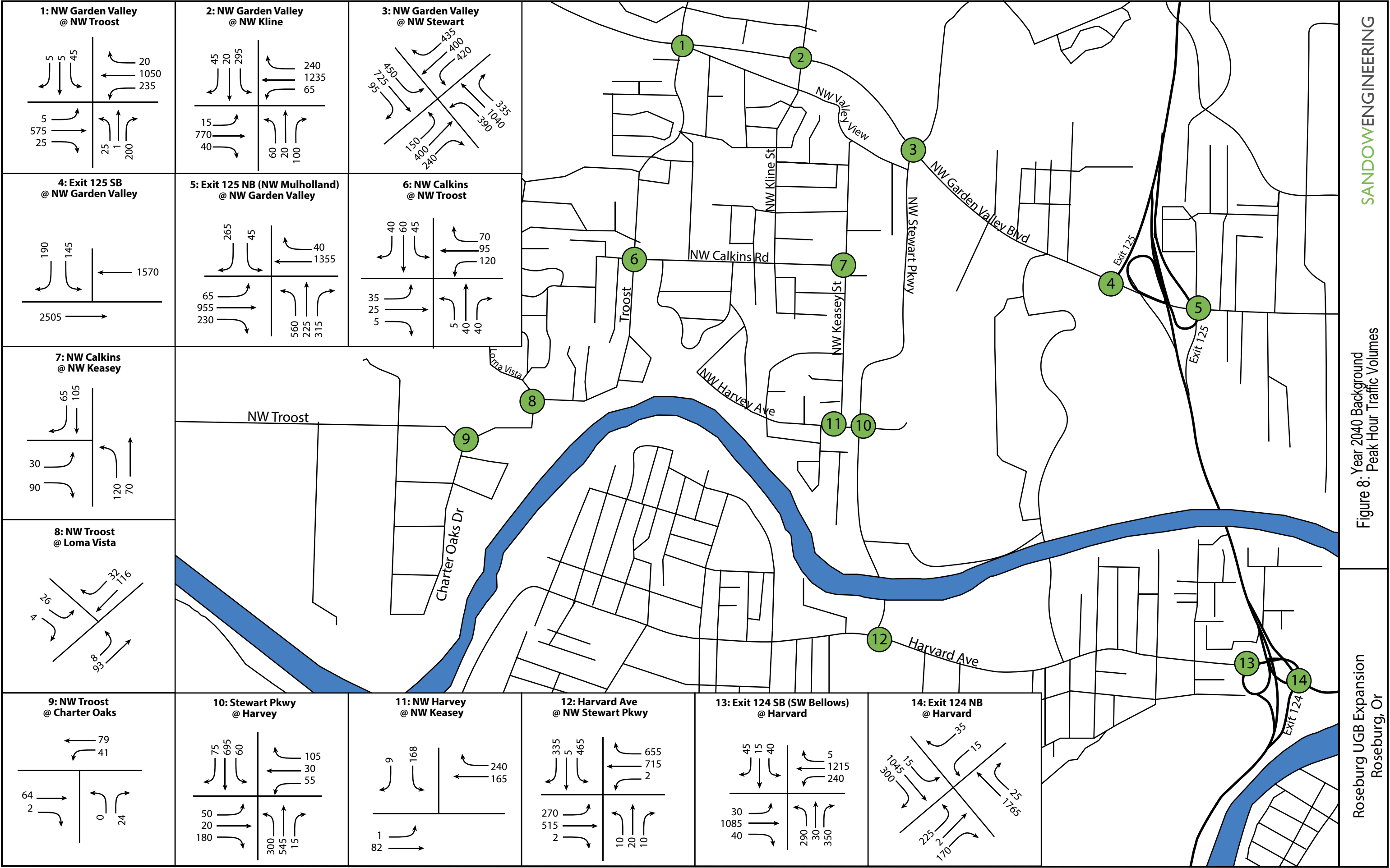


Figure 7: Year 2021 Background Peak Hour Traffic Volumes



3.2 TRIPS FROM UGB EXPANSION AREA

To comply with TPR standards the analysis needs to evaluate conditions for the reasonable worst-case development scenario under the new zoning for each of the tax lots to be added into the UGB. The City of Roseburg has determined that the maximum build out of the expansion area is estimated at approximately 648 dwelling units. This is determined by the following:

Step 1

- Total acres= 222.4 acres
- Currently developed= 17.6 acres
- Partially vacant= 87.2 acres
- Vacant= 117.6 acres
- PR zoning= 29.9 acres

Total acres with development capacity= 165.7 acres.

Step 2

- Developable acres= 165.7 acres
- Slopes less than 12%= 124.3 acres
- Slopes between 12% and 25%= 20 acres
- Slopes greater than 25%= 4.2 acres
- Flood way= 17.2 acres removed

Step 3

The properties will be zoned Single Family Residential R7.5. This means that each new lot created is a minimum of 7,500 sq ft.

- <12% slope= 124.3 acres / 7,500 sq ft= 721 D.U.
- 12%-25% slopes= 20 acres / 7,500 sq ft= 116 D.U. x 0.70= 81 D.U.
- >25% slopes = 4.2 acres / 7,500 sq ft= 24 D.U. x 0.40= 90 D.U.

Total = 811 D.U.

Subtract 20% for infrastructure

Total homes= 648

The vehicle trips to the expansion area are estimated using the ITE Trip Generation Manuals 10th Edition. The calculation uses the land use 210- Single Family Detached Housing. Table 3 contains the trip generation calculation for the PM Peak Hour.

TABLE 3: TRIP GENERATION BY AREA

ITE Land Use	Size (Dwelling Units)	Trip Generation					
		Rate (trips/ unit)	Trips	% In	% Out	Trips In	Trips Out
210 – Single-Family Detached Housing	648	Eqn ¹	611	63%	37%	385	226

Eqn¹ = $\ln(T) = 0.96\ln(x) + 0.20$

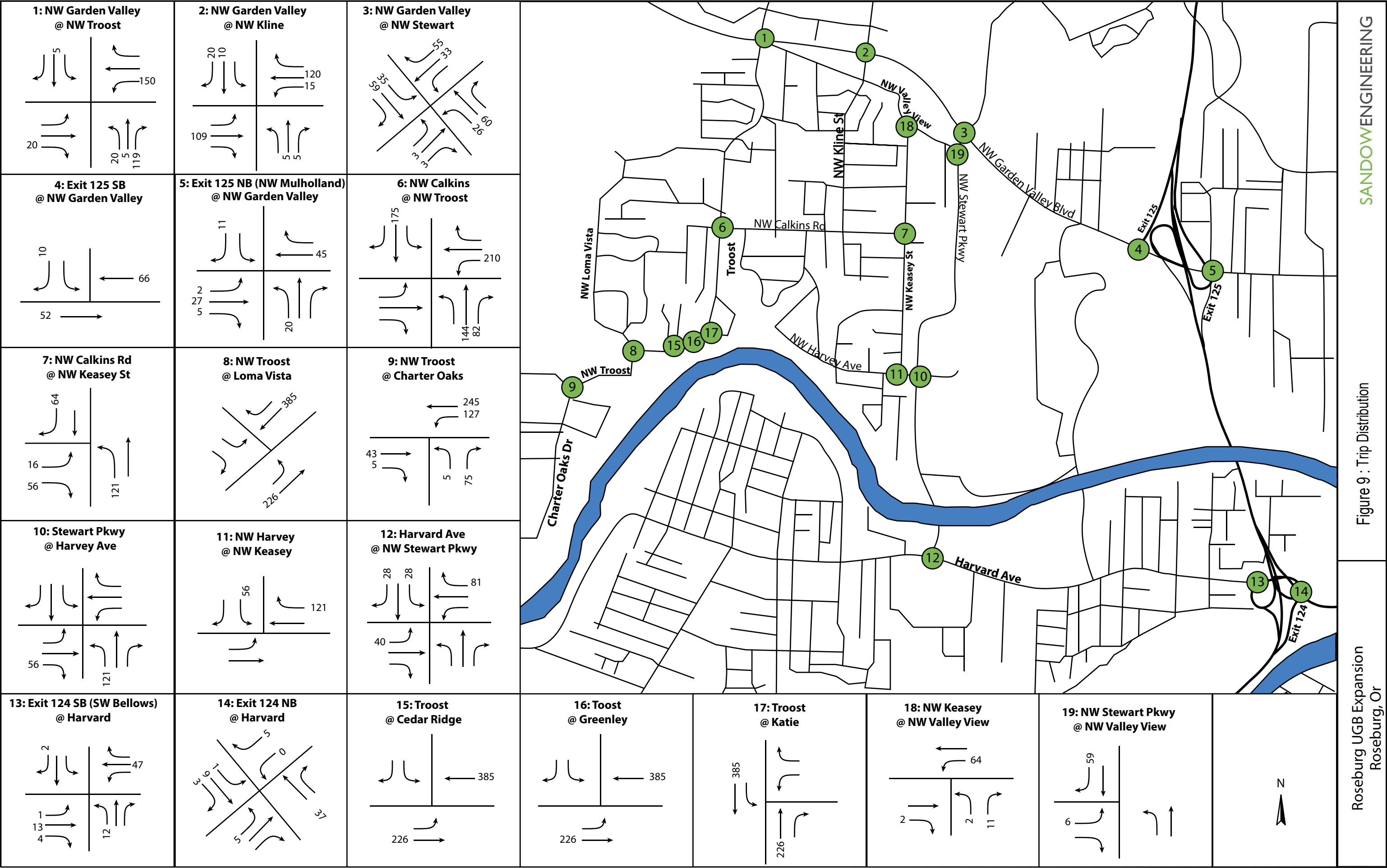
The traffic from the development was distributed to the roadway network following existing travel patterns adjusting for reasonable origins and destinations within the City. The distribution of trips from the expansion area uses Troost St to Calkins Ave and Garden Valley Blvd where the trips distribute to the system. The trips to the system assume the following distribution patterns:

- North to Garden Valley- 52%
- East to Stewart Parkway- 29%
- South to Harvard Ave- 29%
- I-5 via Garden Valley Blvd- 10%
- I-5 via Harvard Ave- 10%

Figure 9 illustrates the traffic added from the added parcels.

3.3 YEAR 2040 TOTAL TRAFFIC VOLUMES

The traffic from the UGB expansion area was added to the 2040 background traffic volumes resulting in the year 2040 total traffic volumes. These are the volumes used in the intersection analysis. Figure 10 illustrates the year 2040 total PM peak hour traffic volumes.



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Figure 9 : Trip Distribution

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Roseburg, Or

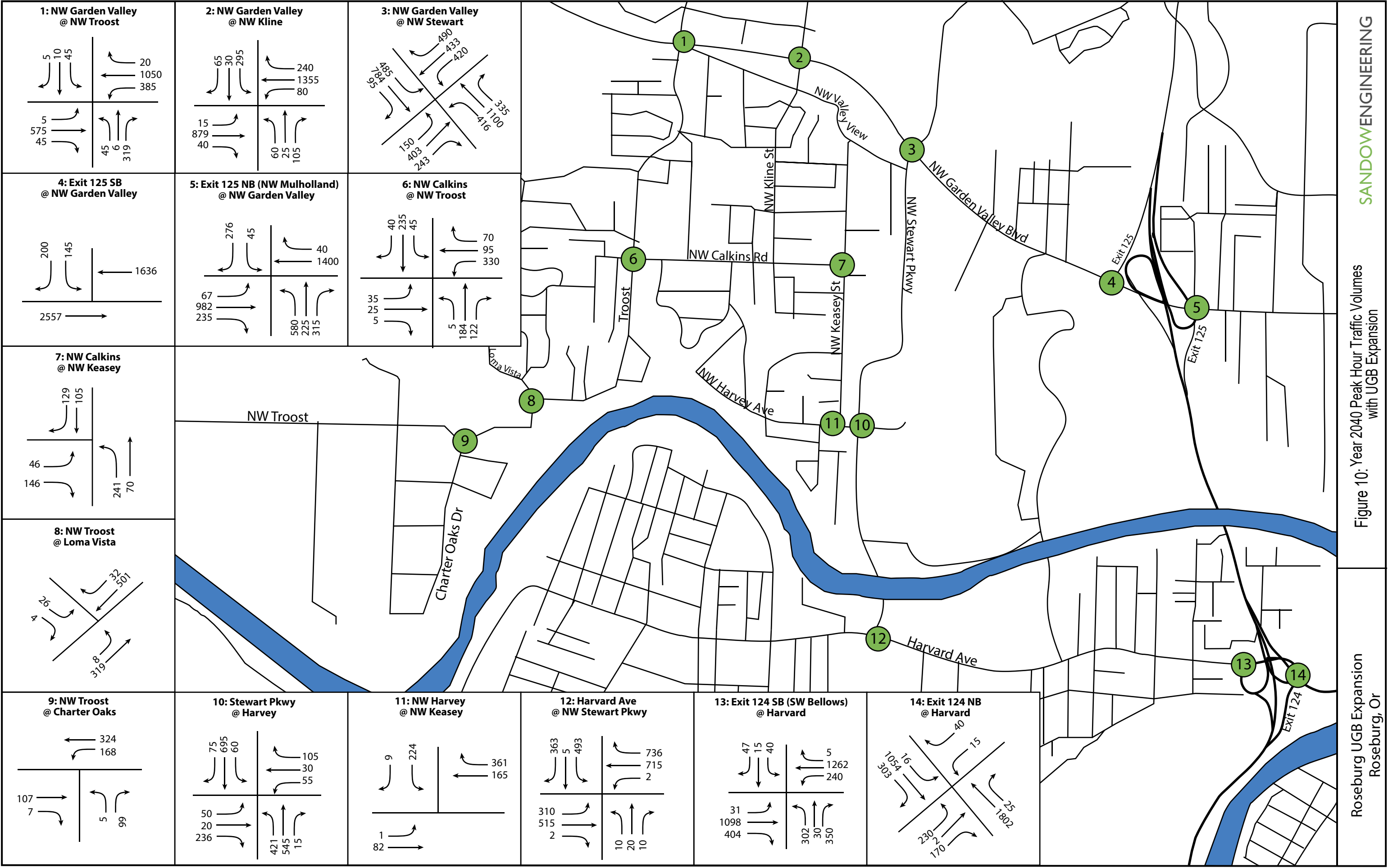


Figure 10: Year 2040 Peak Hour Traffic Volumes with UGB Expansion

4.0 INTERSECTIONS IMPACTED

As shown in Figure 9, there are several intersections that will have added trips, but the levels of trips added to critical movements is considered to not be significant enough to warrant a full intersection evaluation. These intersections are:

Keasey St at Valley View

As shown in Figure 9, this intersection is estimated to have 11 trips turning right from Keasey St to Valley View Dr and 64 trips from turning left from Valley View Dr to Keasey St. The right turns are considered to not impact the intersection operation. The 64 left trips are over a 60-minute time period, with an estimate of no more than 2 vehicles arriving to make the left-turn simultaneously. There is a two-way-left-turn lane to separate the left-turn from the through movements. The opposing traffic volumes for the left-turn are low enough that there are minimal delays for a left-turn vehicle. Therefore, the impacts to this intersection are minimal and don't warrant a full intersection LOS evaluation.

Stewart Pkwy at Valley View Dr

This intersection is estimated to add 6 additional left-turns from Valley View Dr to Stewart Pkwy and 59 trips turning right from Stewart Pkwy to Valley View. The right turns do not have a significant impact on the intersection. The 6 left turns will have a minimal impact as the added trips will be on trip every 10 minutes. The traffic volumes are considered insignificant, and the impacts are minimal. Additionally, the TSP has identified improvements to this intersection Tier 2 project R3. The project is the removal of the left turn from Valley View to Stewart Parkway. Therefore, this intersection doesn't warrant a full intersection evaluation.

Troost St at Cedar Ridge, Greenley St, and Katie Dr

At each of these intersections, a significant amount of through vehicles on Troost St will be added, but no additional trips are added to the turning movements. The turning movements at each of these intersections is less than 50 vehicles. All intersections will operate well within the level of service standards. Therefore, these intersections do not warrant further intersection LOS evaluation.

5.0 INTERSECTION EVALUATION

5.1 PERFORMANCE MEASURES

The two metrics to evaluate intersections are the performance-based level of service and the capacity-based volume-to-capacity.

The Highway Capacity Manual (HCM) defined level of service (LOS) is a concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or along a roadway segment. It was developed to quantify the quality of service of transportation facilities.

LOS is based on average delay, defined as the average total elapsed time from when a vehicle stops at the end of a queue until the vehicle departs from the stop line. Average delay is measured in seconds per vehicle per hour and is then translated into a grade or “level of service” for each intersection. LOS ranges from A to F, with A indicating the most desirable condition and F indicating the most unsatisfactory condition.

The LOS criteria, as defined by the Highway Capacity Manual, for intersections are provided in Table 4. For this study, the level of service intersection analysis was completed according to the Highway Capacity Manual (HCM) method implemented in SYNCHRO Version 10.

TABLE 4: HCM LEVEL OF SERVICE FOR INTERSECTIONS

Level of Service	Stopped Delay per Vehicle (Seconds per Vehicle)	
	Unsignalized Intersections	Signalized Intersections
A	≤ 10.0	≤ 10
B	> 10.0 and ≤ 15.0	> 10 and ≤ 20
C	> 15.0 and ≤ 25.0	> 20 and ≤ 35
D	> 25.0 and ≤ 35.0	> 35 and ≤ 55
E	> 35.0 and ≤ 50.0	> 55 and ≤ 80
F	> 50.0	> 80

The volume-to-capacity ratio describes the capability of an intersection to meet the volume demand based upon the maximum number of vehicles that could be served in an hour. The intersection v/c ratio for intersection uses the HCM 6 Critical v/c methodology, as required by Chapter 13 of the Analysis Procedures Manual.

The City of Roseburg has an adopted mobility targets of LOS E and v/c 0.95.

ODOT uses a volume to capacity ratio (v/c) as defined by the *1999 Oregon Highway Plan*. The Oregon Highway Plan defined v/c standard for the signalized highway ramp intersections is 0.85.

5.2 INTERSECTION ANALYSIS RESULTS – YEAR 2040

A performance and operational analysis were conducted for the studied intersections for the year 2040 traffic conditions with the full build out of the parcels being added within the UGB. The results of the analysis are illustrated in Table 5. The SYNCHRO outputs are provided in Appendix D.

TABLE 5: INTERSECTION PERFORMANCE: YEAR 2040 PM PEAK HOUR

Intersection	Mobility Standard	2040 Without UGB Swap	2040 With UGB Swap
Garden Valley Blvd at Stewart Pkwy	E 0.95	F 1.00	F 1.05
Harvard Ave at Stewart Pkwy	E 0.95	E 0.66	F 0.69
Stewart Pkwy at Harvey Ave	E 0.95	B 0.63	C 0.68
Troost St at Garden Valley Blvd	E 0.95	B 0.49	C 0.61
Troost St at Charter Oaks Dr	E 0.95	A 0.03	B 0.13
Troost St at Loma Vista Dr	E 0.95	B 0.04	C 0.34
Troost St at Calkins Ave	E 0.95	A 0.39	D 0.95
Garden Valley Blvd at Kline St	E 0.95	D 0.87	D 0.92
Keasey St at Calkins Ave	E 0.95	B 0.17	B 0.35
Keasey St at Harvey Ave	E 0.95	B 0.32	C 0.45
Garden Valley Blvd at I-5 Exit 125 NB Off Ramp	0.85	0.93	0.96
Garden Valley Blvd at I-5 Exit 125 SB Off Ramp	0.85	1.01	1.03
Harvard Ave at I-5 Exit 124 NB Off Ramp	0.85	0.72	0.74
Harvard Ave at I-5 Exit 124 SB Ramps	0.85	0.78	0.81

As shown in Table 5, the intersections of Garden Valley Blvd at Stewart Pkwy, Harvard Ave at Stewart Parkway, and Garden Valley Blvd at I-5 Exit 125 NB and SB off ramps do not meet the standards. Mitigation options for these intersections are provided in Section 6.0. The intersection of Troost St at Calkins Ave will operate just at the standard. A mitigation option is provided for this intersection to ensure safe operations of the intersection.

The intersection of Troost St at Calkins Ave is projected to operate at a LOS A and a v/c 0.39 under the year 2040 background conditions, and a LOS D and v/c 0.95 with full buildout of the UGB expansion area. This intersection is an all-way stop control. With full build out of the expansion area there could be approximately 483 vehicle trips added to this intersection. This substantial number of trips added to this all way stop-controlled intersection results in a substantial worsening in LOS and v/c ratio.

5.3 INTERSECTION QUEUING ANALYSIS RESULTS - YEAR 2040

A queuing analysis was performed following procedures within the Highway Capacity Manual and implemented within SimTraffic 8. SimTraffic, a micro simulation software, evaluates traffic operations as a network and provides queuing estimates. The Average and 95th Percentile queues for the year 2040 PM peak hour existing conditions are included in Table 7. The outputs are included in Appendix G.

TABLE 7: INTERSECTION QUEUING: YEAR 2040 PM PEAK HOUR

Intersection			Available Storage (Feet)	2040 No-Build (Feet)		2040 Build (Feet)	
				Average	95 th percentile	Average	95 th percentile
Garden Valley Rd at Stewart Pkwy	EB	L	TWLT	925	1250	975	1200
		T	1000+	1325	2350	1600	2500
		TR	1000+	1175	2275	1500	2525
	WB	L	TWLT	950	1325	1000	1250
		T	1000+	2450	3700	2550	3675
		R	115	150	200	125	200
	NB	L	215	150	225	200	250
		T	215	125	225	200	350
		R	200	100	175	100	175
	SB	L	470	700	1075	775	1125
		T	955	475	1100	600	1350
		R	120	150	175	150	200
Harvard Ave at Stewart Pkwy	EB	L	TWLT	150	150	150	150
		T	400	250	450	325	525
		TR	400	200	400	275	475
	WB	L	TWLT	25	25	25	25
		T	510	200	350	250	400
		R	160	175	250	200	225
	NB	L	50	25	25	25	25
		TR	580	25	75	25	50
	SB	L	160	125	125	125	125
		TR	1000+	575	1250	800	1425
Stewart Pkwy at Harvey Ave	EB	L	90	50	100	50	100
		TR	90	75	100	75	125
	WB	L	300	50	100	50	100
		TR	550	75	150	75	125
	NB	L	TWLT	125	200	175	225
		T	1000+	75	150	125	300
		TR	180	75	150	75	175
	SB	L	90	50	100	50	125
		T	1000+	250	425	325	575

		TR	1000+	150	375	250	525
NW Troost St at Garden Valley Rd	EB	L	TWLT	25	50	25	50
		T	1000+	250	375	275	400
		TR	1000+	225	375	275	400
	WB	L	1000+	125	175	125	175
		T	700	200	375	250	425
		R	145	25	75	25	100
	NB	L	115	25	50	50	100
		TR	445	75	125	125	200
	SB	L	80	25	75	50	100
		TR	300	25	25	25	50
Charter Oaks Dr at Troost St	WB	LT	1000+	25	25	25	75
	NB	LR	680	25	50	50	75
Loma Vista Dr at Troost St	NB	LT	1000+	25	25	25	25
	SB	LR	220	25	50	25	50
NW Troost St at Calkins Ave	EB	LTR	135	25	50	50	50
	WB	LTR	180	75	100	125	225
	NB	LTR	880	50	75	75	125
	SB	LTR	185	50	100	125	200
Kline St at Garden Valley Rd	EB	L	210	25	75	50	125
		T	715	250	600	500	1100
		TR	715	250	600	500	1100
	WB	L	TWLT	50	125	75	125
		T	1000+	150	350	225	425
		TR	1000+	175	375	225	450
	NB	L	TWLT	75	150	75	150
		TR	370	100	175	125	200
	SB	L	105	100	125	100	125
		TR	270	200	550	400	850
Keasey St at Calkins Ave	EB	LR	870	50	75	75	100
	NB	LT	160	25	50	50	100
	SB	TR	590	0	25	25	25
Harvey Ave at Keasey St	EB	LT	200	25	50	25	50
	WB	TR	100	0	25	25	25
	SB	LR	265	75	125	100	175
Exit 125 NB Ramps at Garden Valley Rd	EB	L	130	50	75	50	100
		T	1000+	125	200	150	225
	WB	T	1000+	725	1500	1100	1800
		TR	1000+	725	1475	1100	1775

	NB	L	800	1075	1775	825	1625
		TR	1000+	875	1775	625	1525
	SB	L	TWLT	50	75	50	75
		R	630	150	275	125	200
Garden Valley Rd at Hwy 125 SB Ramps	EB	T	290	1625	1875	825	1525
	WB	T	990	700	1350	600	1350
	SB	L	650	100	175	100	175
		R	1000+	100	175	150	325
Freeway Ave/ Willow St at i-5 NB Ramps	EB	L	100	125	200	125	200
		TR	1000+	75	100	50	100
	WB	L	100	25	50	25	50
		R	200	25	75	50	75
	NB	T	460	350	550	475	625
		TR	465	300	500	450	650
	SB	L	TWLT	25	50	25	50
		T	680	150	275	150	275
		R	680	50	50	50	50
Harvard Ave at Bellows / I-5 SB Ramp	EB	L	TWLT	50	125	50	125
		T	690	575	1025	425	650
		R	690	125	175	125	175
	WB	L	TWLT	125	150	125	150
		T	705	300	375	300	325
		R	310	25	50	25	75
	NB	L	970	125	150	125	150
		T	970	150	375	150	400
		R	155	125	200	125	200
	SB	L	525	25	75	25	75
		TR	525	50	75	50	75

EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, L = Left, T = Thru, R = Right

Garden Valley Road at Stewart Parkway: This intersection is anticipated to have lengthy queue for the eastbound, westbound, and southbound lanes. The UGB Exchange will increase the queue lengths for the eastbound and westbound movements. The TSP proposed improvement of dual eastbound and westbound left turn lanes will improve the queue lengths.

Stewart Parkway at Harvey Ave: The eastbound approach at this intersection is anticipated to have a queue length that extends to block Keasey St. The queue is anticipated to clear each cycle, resulting a limited impact to Keasey St.

Harvey Ave at Keasey St: The eastbound approach at the signalized intersection of Harvey Ave at Keasey St is anticipated to queue to block the intersection. The queue clears each cycle limiting the impact to Keasey St. Keasey St southbound approach will have an estimated queue length of 175 feet with the UGB exchange and 125 feet without the UGB exchange. While the

UGB exchange will add traffic to the southbound approach, the expansion will not have a significant impact over the background conditions.

6.0 INTERSECTION MITIGATION

As shown in Section 5.2, the following intersections do not meet the applicable intersection standards:

- Garden Valley Blvd at Stewart Pkwy
- Stewart Ave at Harvard Ave
- Troost St at Calkins Ave
- Garden Valley Blvd at I-5 Exit 125 NB Off Ramps
- Garden Valley Blvd at I-5 Exit 125 SB Off Ramps

Garden Valley Blvd at Stewart Parkway

The intersection at Garden Valley Blvd at Stewart Parkway is projected to operate at LOS F and v/c 1.07 without the UGB exchange and LOS F and v/c 1.14 with the UGB exchange.

Additionally, the TSP has identified this intersection as not meeting the standards for the year and has recommended improvements to this intersection, Tier 2 Project R2. The improvements are to add eastbound and westbound dual left-turn lanes from Garden Valley Blvd to Stewart Parkway and dual southbound right-turn lanes from Stewart Parkway to Garden Valley Blvd. These improvements result in an LOS E and v/c 0.91 with the UGB swap. The recommended improvements in the TSP will be sufficient for the added traffic from the UGB swap.

To mitigate just the impacts of the added traffic from the UGB swap, the second southbound right turn from Stewart Pkwy to Garden Valley Blvd should be installed. With the dual southbound right turn lanes, the intersection will operate at LOS F and v/c 1.07, mitigating the impacts of the UGB swap.

Stewart Ave at Harvard Ave

The intersection of Stewart Ave at Harvard Ave is projected to operate at LOS F for the year 2040 with full build out of the UGB expansion area. The standard for this intersection is to operate at LOS E or better. As this intersection does not meet the standard improvements will be necessary. The separate left turns at this intersection could be modified to protective-permissive phasing. With this minor change, the signal will operate at a LOS E, meeting the City's LOS standards.

Troost St at Calkins Ave

The intersection of Troost St at Calkins Ave is projected to operate at the upper threshold standard at the end of the planning horizon with the UGB swap. While this intersection meets the standards, the increase in traffic volumes at this stop-controlled intersection could cause safety concerns. Therefore, improvement options were evaluated. The intersection is currently an all way stop with one lane in each direction and is projected to operate at a LOS A and a v/c 0.69 without the USB swap. The additional vehicle trips from the swap results in a LOS D and a

v/c 0.95. The intersection standard is LOS E and v/c 0.95. The UGB swap has the potential to add over 200 pm peak hour trips in the westbound left turn. Therefore, it is recommended that a separate westbound left turn lane be provided. With the separate left-turn pocket the intersection will operate at a LOS C and v/c 0.73.

The east leg of the intersection has approximately 40 feet of pavement width. There are curb-side sidewalks, on-street parking, and no bike lanes on both the north and south sides of the roadway. Calkins Ave has approximately 40 feet of pavement (curb-to-curb). The east leg can be restriped to add in the left-turn pocket. The restriping would require removal of on street parking for the length of the storage space and the taper space. The TSP has identified improvement, Tier 2 Project BP18 that proposed the installation of sharrows on Calkins Ave between Grove Lane and Keasey St. The recommended westbound left turn pocket does not negatively impact the City's TSP project on Calkins Ave.

As an alternative mitigation option, the intersection was evaluated for a traffic signal. The Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD) provide guidance to the conditions when an intersection should be signalized. MUTCD Warrant 3, peak hour warrants a traffic signal based on the ratio of PM peak hour trips on the major road and minor roads. Troost St (major road) is projected to have a PM peak hour volume of 631 and the minor street approach (Calkins Ave) of 495. The PM peak hour traffic volumes meet the Warrant 3 peak hour threshold for warranting a signal. It is recommended that this intersection be monitored, and signalization be considered as the UGB expansion area gets built out.

Garden Valley Blvd at I-5 Exit 125 NB Ramp

The intersection of Garden Valley Blvd at the I-5 Exit 125 NB ramps is projected to operate at a v/c 0.93 without the UGB swap and v/c 0.96 with the UGB swap. ODOT maintains a standard of 0.85 for ramp terminals. The TSP has also identified this intersection as failing to meet the standards. The TSP does not specify any improvements for this intersection. As per the Oregon Highway Plan, ODOT considers a change in v/c of 0.03 or less to not require mitigation. While overall, the intersection does not meet the standards, and will require improvements to meet the standards, the UGB swap is shown to not have a significant effect on the intersection. Therefore, the UGB swap does not trigger mitigation for this intersection.

Garden Valley Blvd at I-5 Exit 125 SB Ramp

The intersection of Garden Valley Blvd at the I-5 Exit 125 SB ramp is projected to operate at a v/c 1.01 without the UGB swap and v/c 1.03 with the UGB swap. ODOT maintains a standard of 0.85 for ramp terminals. The TSP does not specify any improvements for this intersection. As per the Oregon Highway Plan, ODOT considers a change in v/c of 0.03 or less to not require mitigation. While overall, the intersection does not meet the standards, and will require improvements to meet the standards, the UGB swap is shown to not have a significant effect on the intersection. Therefore, the UGB swap does not trigger mitigation for this intersection.

7.0 TROOST STREET

Troost Street will serve as the main route to/from the UGB expansion area to the greater Roseburg Area. Troost St south and west of Katie Dr is one lane in each direction with a small shoulder. There are no sidewalks, bike lanes, planter strips, or street lighting along this section. North of Katie Dr, Troost St has sidewalks, bike lanes, on-street parking, and street lighting. Troost St has a posted speed of 25 miles from Garden Valley Blvd to the terminus at Harlan St. The following provides an evaluation and recommendation for Troost St improvements to facilitate the added traffic from the UGB expansion area.

7.1 STREET CLASSIFICATION

The exiting UGB boundary is located just to the east of the intersection of Loma Vista Dr. The section of Troost St within the UGB boundary is classified as a Major Collector. The potential 648 homes in this area are estimated to add 6,480 daily trips. The total Average Daily Trips (ADT) on Troost St is estimated at 8,300 for the section between Felt St and Loma Vista Dr, and 9,000 ADT for the section between Loma Vista Dr and Katie Dr. Given the estimated ADT, Troost St should be classified as a major collector.

7.2 ROADWAY SPEED

Troost St has a posted speed of 25 mph from Garden Valley Blvd. to the terminus at Harlan St. There is a speed advisory sign of 20 mph for the curve between Katie Dr and Greenly St and 15 mph for the curves at Loma Vista Dr and Agape Ct. The roadway speed is appropriate for the geometric conditions.

7.3 INTERSECTION SIGHT DISTANCE

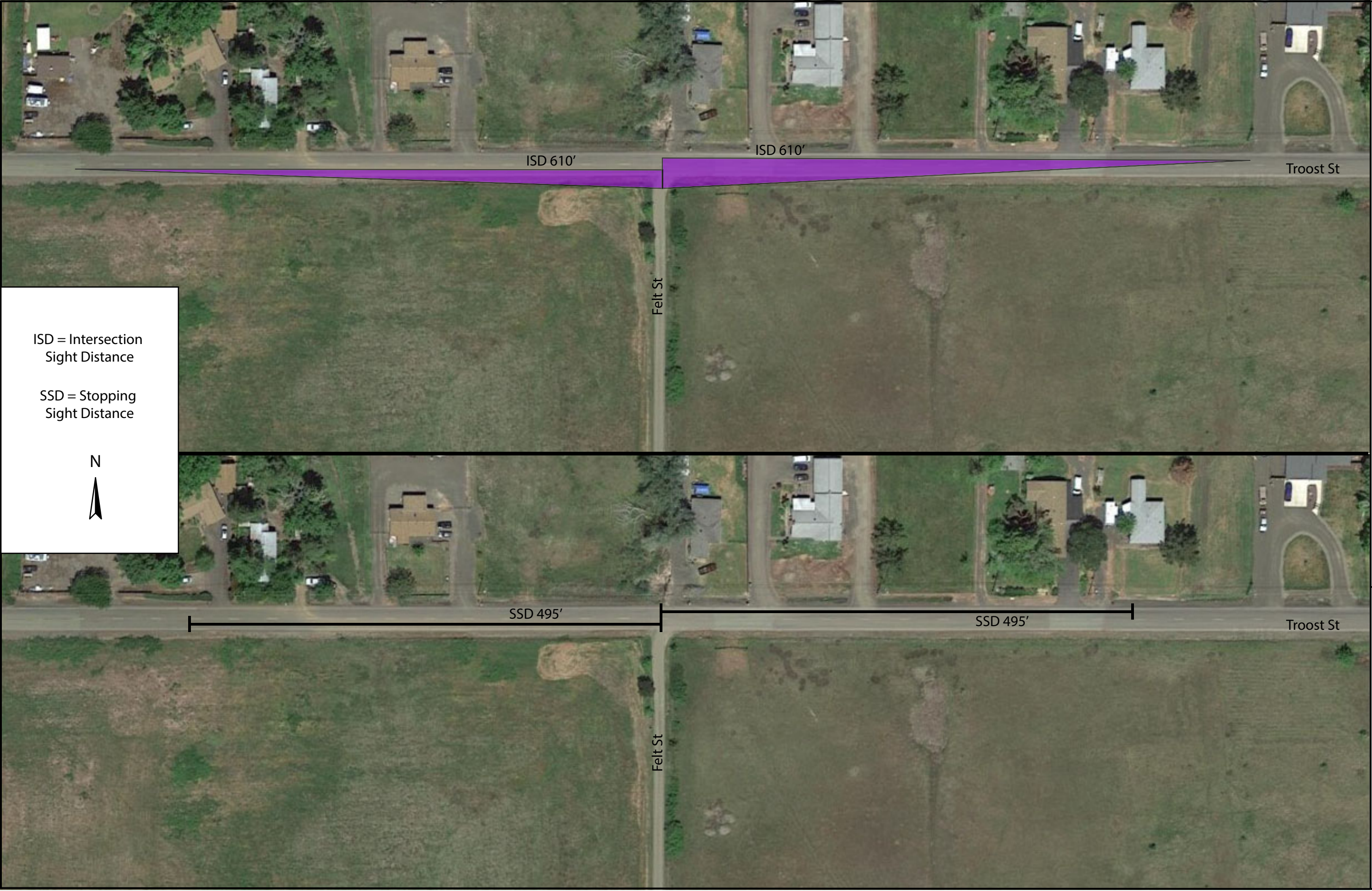
At this time, there are no specific new intersections or accesses proposed. The future street network will be developed as the parcels will be developed. At that time, all new intersections should be evaluated for sight distance to ensure standards are met. The existing intersections along Troost St between Felt St and Katie Dr were evaluated to determine if the line of sight is adequate.

The line of sight for drivers entering and exiting Troost St at the intersections was evaluated following the AASHTO Intersection Sight Distance (ISD) and Stopping Sight Distance (SSD) methodology. As per AASHTO the minimum standard is to meet the SSD distance and where practical, the ISD distance should be strived to be met. The SSD is the length of roadway a driver on Troost St needs to be able to see to perceive, react, and stop ahead of a driver entering or exiting an intersection. The ISD is the length of roadway a driver exiting the driveway would need to see in either direction to enter the roadway and begin accelerating to the posted speed. The posted speed is 25 mph along Troost St from 326 feet west of Charter Oaks to Garden Valley Blvd. From 326 feet west of Charter Oaks Drive to Harlan Street there is no posted speed. Therefore, Basic Rule/55 mph is assumed. As per the AASHTO Methodology, at 25 mph the ISD is 280 feet, and the SSD is 155 feet, at 55 mph the SSD is 495 feet and the ISD is 610 feet.

The ISD and SSD for the intersections along Troost St are provided in Figure 11 for Troost St at Felt St, Figure 12 for Troost St at Charter Oaks Dr, Figure 13 for Troost St at Loma Vista Dr, and Figure 14 for Troost St at Katie Dr.

Troost St at Charter Oaks Dr and Troost St at Loma Vista Dr have substantial roadway curvature. A concern is the addition of vehicle trips on Troost St approaching these intersections and needing to stop for a vehicle entering or exiting Troost St. At Loma Vista Dr, a westbound vehicle traveling towards Loma Vista can see a vehicle stopped at Loma Vista Dr from approximately 450 ahead. This is almost 3 times the minimum stopping sight distance at 25 mph and is a sufficient minimum stopping sight distance for a vehicle traveling 50 mph. An eastbound (northbound) traveling vehicle on Troost St towards Loma Vista Dr. can see a vehicle stopped at Loma Vista Dr. approximately 310 feet ahead. This is twice the stopping sight distance needed at 25 mph and is sufficient minimum stopping sight distance for a vehicle traveling 40 mph. There is adequate line of sight for safe turns into and out of Loma Vista Dr.

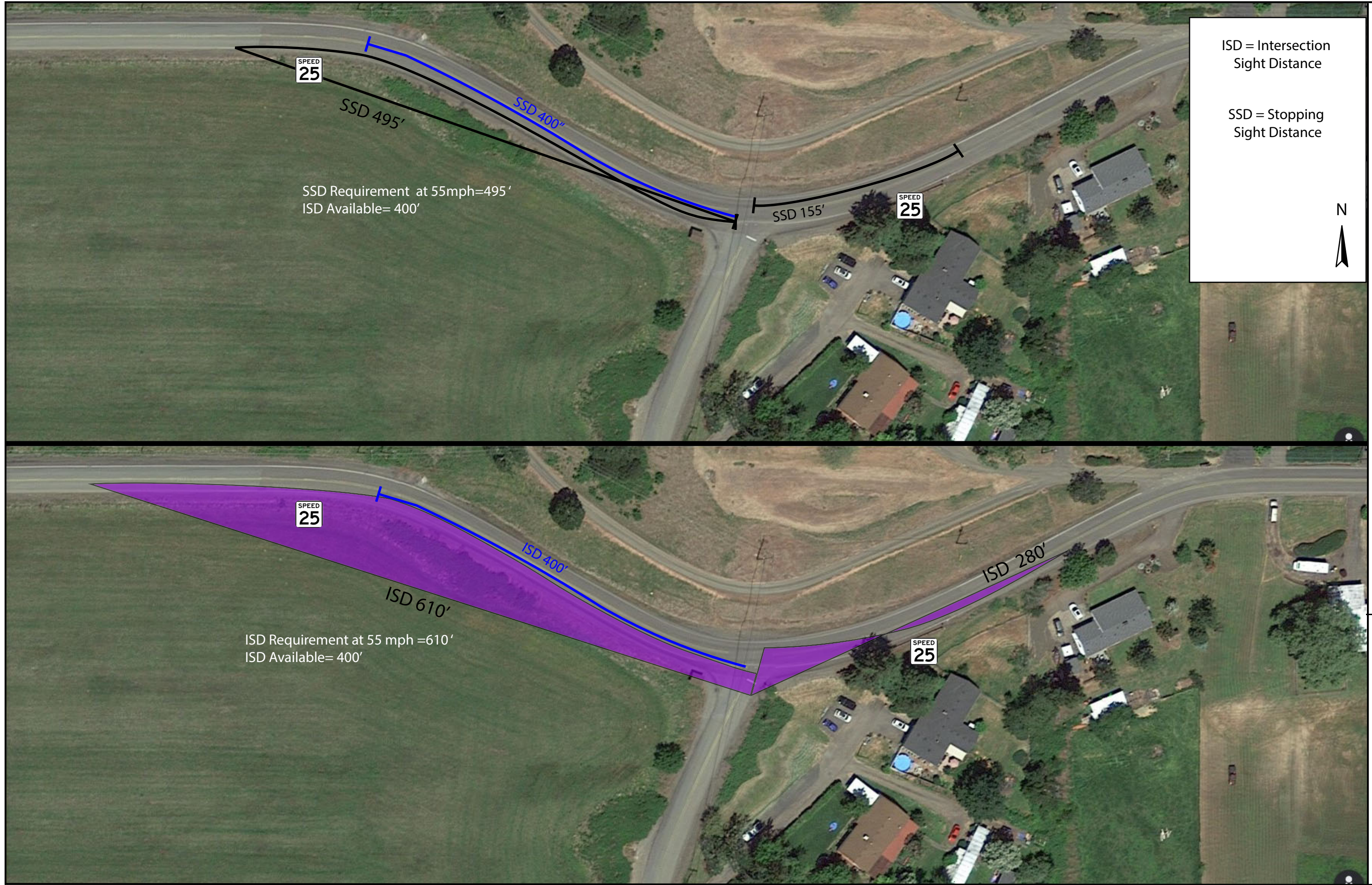
At Charter Oaks Drive, a westbound traveling vehicle on Troost St can see a vehicle stopped to turn into or out of Charter Oaks Dr at approximately 300 feet ahead of the intersection. This is almost twice the distance needed for speed of 25 mph and a sufficient minimum stopping sight distance for a vehicle traveling at 40 mph. The speed changes between basic rule/55 mph to 25mph approximately 425 feet west of Charter Oaks. The SSD at 25 mph is 155 feet and the ISD is 280 feet. The ISD and SSD are within the area posted as 25 mph and the sight distance needed for 25 mph. However, given the rural nature of Troost St, vehicles could approach Charter Oaks Drive from the west (eastbound) at up to 55 mph. Therefore, the SSD and ISD on Troost St to the west of Charter Oaks is evaluated at 55 mph. An eastbound traveling vehicle on Troost St towards Charter Oaks Dr. can see approximately 400 feet ahead of a stopped vehicle turning into or out of Charter Oaks Dr. This is 2.5 times the sight distance needed at the posted speed of 25 mph and is sufficient stopping sight distance for a vehicle traveling at 45 mph. There is adequate line of sight for vehicles turning into and out of Charter Oaks Dr at less than 45 mph. Therefore, it is recommended that the roadway speed west of the 25-mph sign be posted at 45 mph or less.



Roseburg UGB Expansion

Figure 11: Troost St at Felt St Stopping Sight and Intersection Sight Distance

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Roseburg UGB Expansion

Troost St at Charter Oaks Dr

Figure 12: Stopping Sight and Intersection Sight Distance

SANDOWENGINEERING

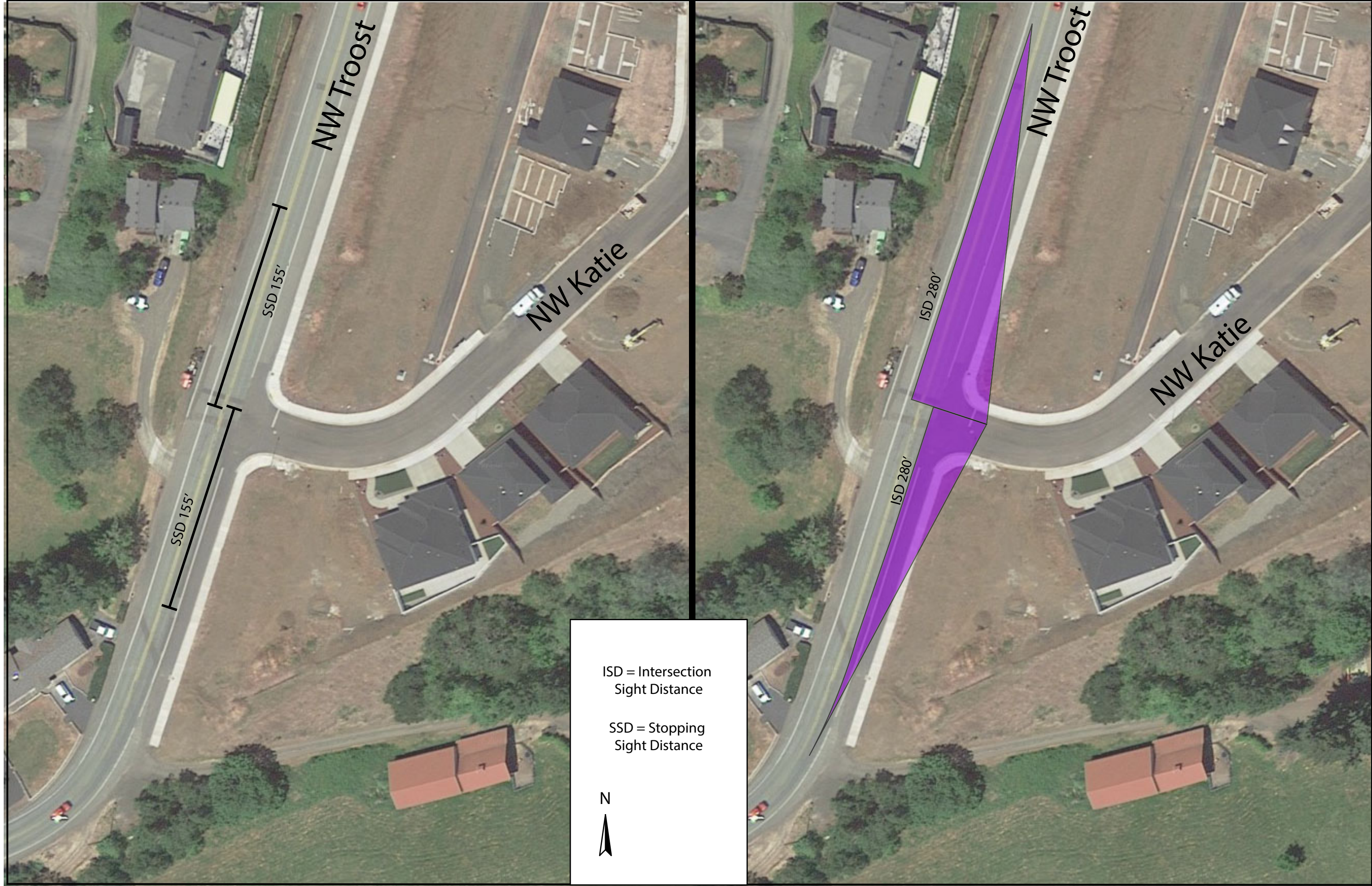


Roseburg UGB Expansion

Troost St at Loma Vista Dr

Figure 13: Stopping Sight and Intersection Sight Distance

SANDOWENGINEERING



Roseburg UGB Expansion

Troost St at Katie Dr

Figure 14: Stopping Sight Distance and Intersection Sight Distance

SANDOWENGINEERING

7.4 CRASH ANALYSIS

A crash investigation was performed for Troost St between Felt St and Katie Dr. The analysis investigates crashes that have been reported to the state for the most recent 6 years, 6/01/2014-6/30/2019, to determine a crash rate in crashes per million vehicles on the roadway and the types of crashes that occurred. Crash data was provided by ODOT. Within the past 5 years there were no reported crashes within that section of Troost St. One crash occurred at Troost at Harlan St. This crash occurred in December of 2014 and was the result of a single vehicle colliding with vegetation. There were 3 reported crashes at Troost St at Calkins Ave. The crashes occurred in 2017, 2016, and 2014 and were a result of turning movement errors. Figure 15 below illustrates the crash locations from ODOT GIS system. As shown in the figure, there are no crashes that have occurred within the recent 6 years on Troost St between Felt St and Katie Dr.

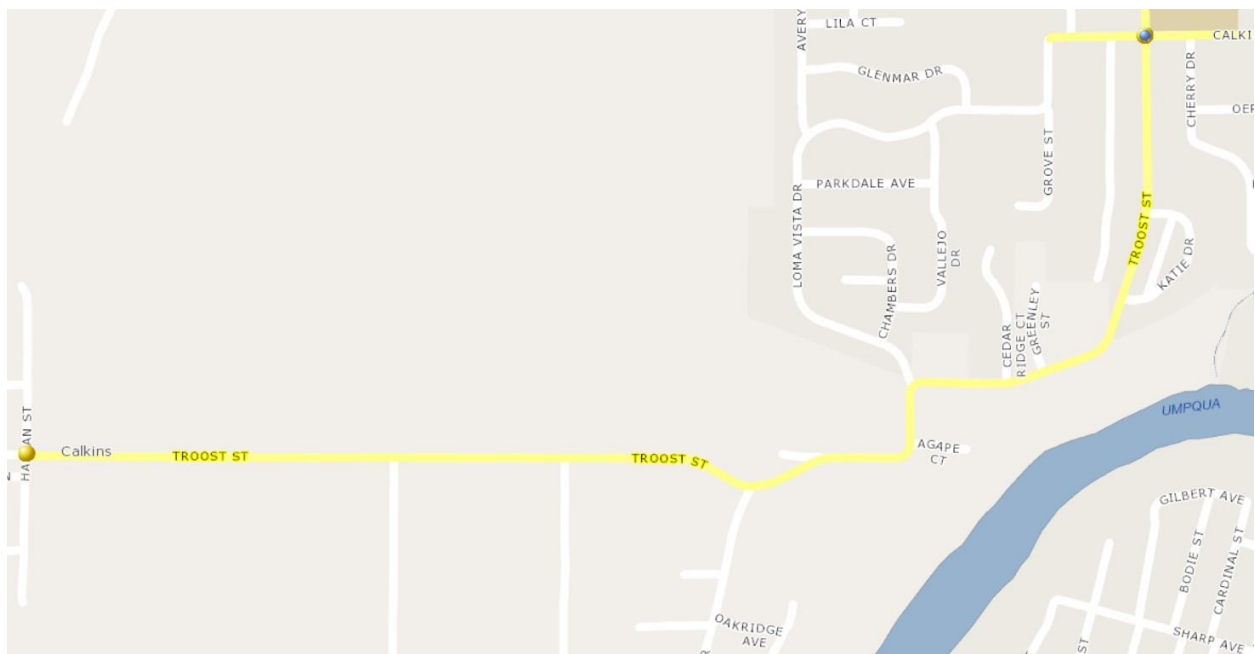


FIGURE 15- CRASH LOCATIONS

7.5 RIGHT AND LEFT TURN LANE WARRANTS

The increase in traffic volumes along Troost St will result in a reduction in the available gaps in traffic for making turns onto and from Troost St, potentially increasing delay and resulting in safety implications. Guidance as to when intersections should have right and left turn lanes installed is provided in the ODOT Analysis Procedures Manual. The criteria are traffic volume based where the turning movements are compared to the through volumes. The turning movement volumes at Felt St and Charter Oaks were estimated using the available buildable lands. The turning movements at Loma Vista Dr and Katie Dr were estimated using the existing traffic counts and estimated growth in the area. Table 8 includes the results of the evaluations. Appendix E include the worksheets.

TABLE 8: TURN LANE WARRANTS

Intersection	Right Turn	Left Turn
Troost St at Felt St	Not Met	Westbound Met
Troost St at Charter Oaks Dr	Not Met	Westbound met
Troost St at Loma Vista Dr	Not Met	Not Met
Troost St at Katie Dr	Not Met	Not Met

As illustrated in Table 8, a westbound left-turn lane should be installed at the intersection of Troost St and Felt St and Troost St and Charter Oaks Drive.

7.6 INTERSECTION RECOMMENDATION

Troost St at Felt St: Felt St at Troost St is currently stop controlled, with Felt St as the stopped movement. Troost St has a posted speed of 25 mph, and as shown in Section 7.3, the Troost Street approach meets the applicable stopping sight distance and intersection distance standards. Troost St has the potential to have a substantial amount of traffic entering and exiting from Felt St. The volume of left turns from Troost St to Felt Dr warrants a separate left turn pocket at this intersection. Figure 16 illustrates the recommended improvements at this intersection.

Troost St at Charter Oaks Dr: Troost St at Charter Oaks Dr is currently stop controlled with Charter Oaks at the stopped movement. Troost St has a posted speed of 25 mph, and as shown in Section 7.3, the Troost Street approach meets the applicable stopping sight distance and intersection distance standards. However, the speed of Troost St approximately 325 feet west of the intersection is basic rule/55 mph. It is recommended that the speed of Troost be reduced to a maximum of 45 mph at least 500 feet west of Charter Oaks Drive. However, as the area within the UGB Expansion area develops it is recommended that the speed of Troost west of Harlan St be posted at 25 mph.

Troost St has the potential to have a substantial amount of traffic entering and exiting from Charter Oaks Dr. The volume of left turns from Troost St to Charter Oaks Dr. warrants a separate left turn pocket at this intersection. However, the right of way and roadway curvature creates an awkward alignment. One recommendation for improvements is to modify the intersection to a roundabout with a 60 foot inside diameter. The roundabout will provide for safe and efficient movements through the intersection and negate the curvature of Troost St at this location. Figure 17 illustrates roundabout option for this intersection.

Another option for improvements is to realign the intersection to the west out of the curvature. This intersection could be located approximately 150 feet west of the curvature. Figure 18 provides the potential layout.

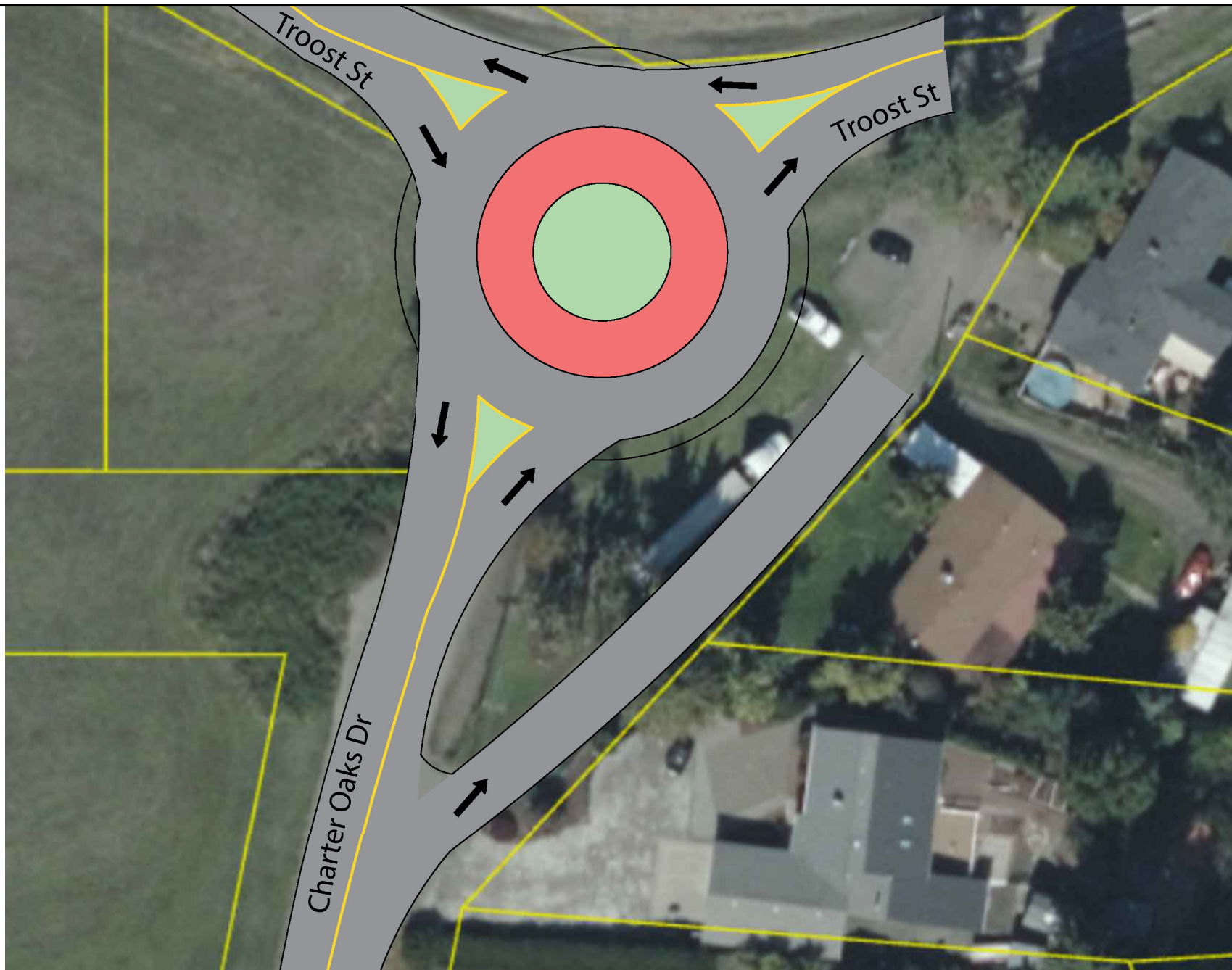
Troost Sr at Loma Vista Dr: Troost St at Charter Oaks Dr is currently stop controlled with Loma Vista Dr at the stopped movement. Troost St has a posted speed of 25 mph, and as shown in Section 7.3, the Troost Street approach meets the applicable stopping sight distance and intersection distance standards. The right of way, curvature of Troost, St and widened approach for Loma Vista Dr, results in an unconventional alignment at this intersection. This intersection could be preplaced with a roundabout. The roundabout would improve the safety and operation of the intersection and eliminate the widened and awkward Loma Vista Dr approach. Figure 19 illustrates the roundabout improvement option at this intersection.

Another option for improvements is realign this intersection to create a standard T-type intersection. The recommendation includes a free northbound right turn movement and westbound movements. All other movements will stop controlled. Figure 20 provides an illustration of this improvement option.



Roseburg UGB, Roseburg, OR

Figure 16: Troost St at Felt St Improvements



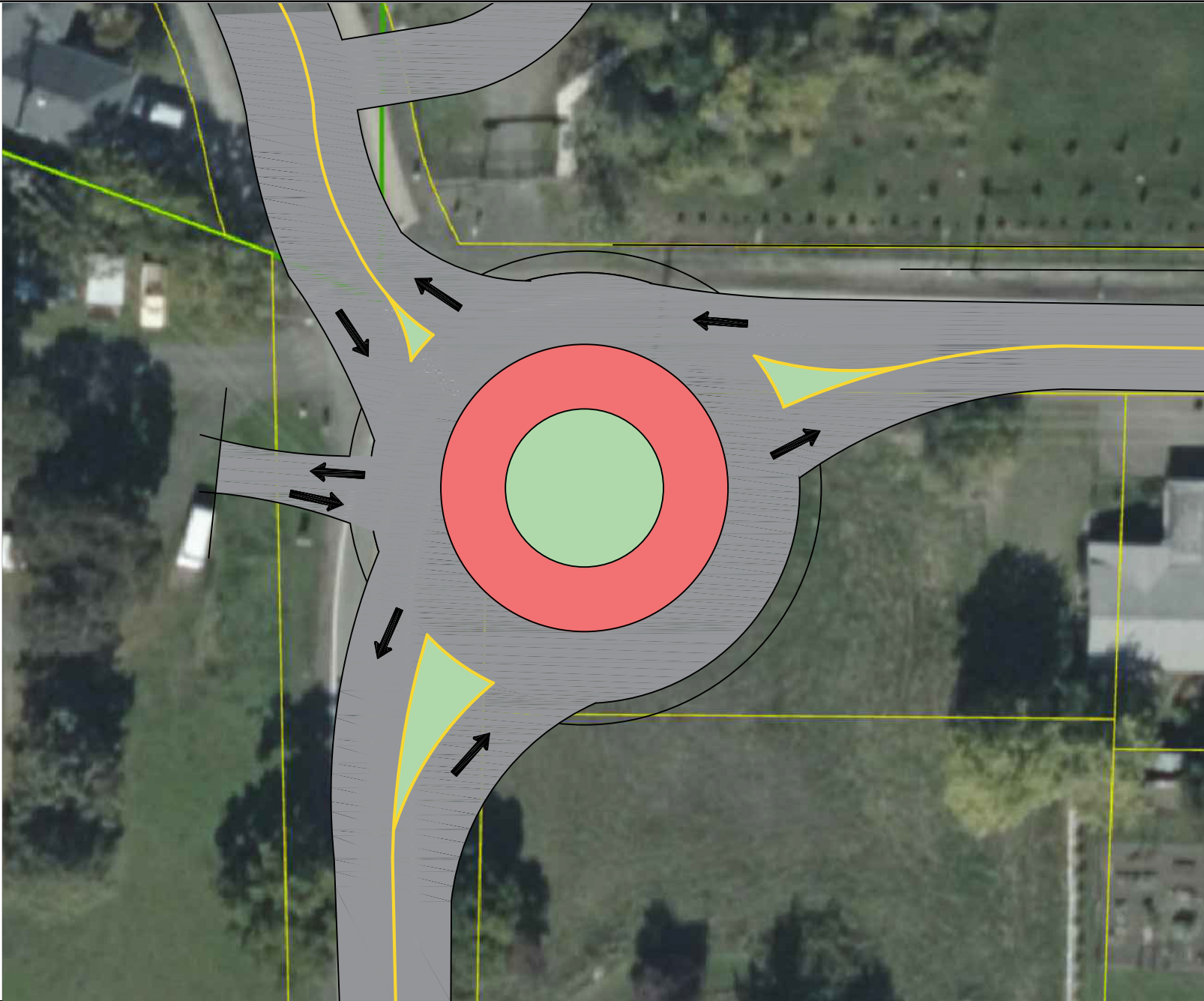
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Figure 17: Troost St at Charter Oaks Dr Improvements. (Option A)



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Figure 18: Troost St at Charter Oaks Dr Improvements. (Option B)



Roseburg UGB, Roseburg, OR

Figure 19: Troost St Loma Vista Dr Improvements (Option A)



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Figure 20 : Troost St at Loma Vista Dr Improvements. (Option B)

7.7 TROOST STREET CROSS-SECTION

It is recommended that Troost Street be classified as a Major Collector, consistent with the classification of Troost St currently within the UGB. The Transportation System Plan provides a recommendation for a typical cross section for a Major Collector. Figure 19 provided the TSP Major Collector Cross Section.

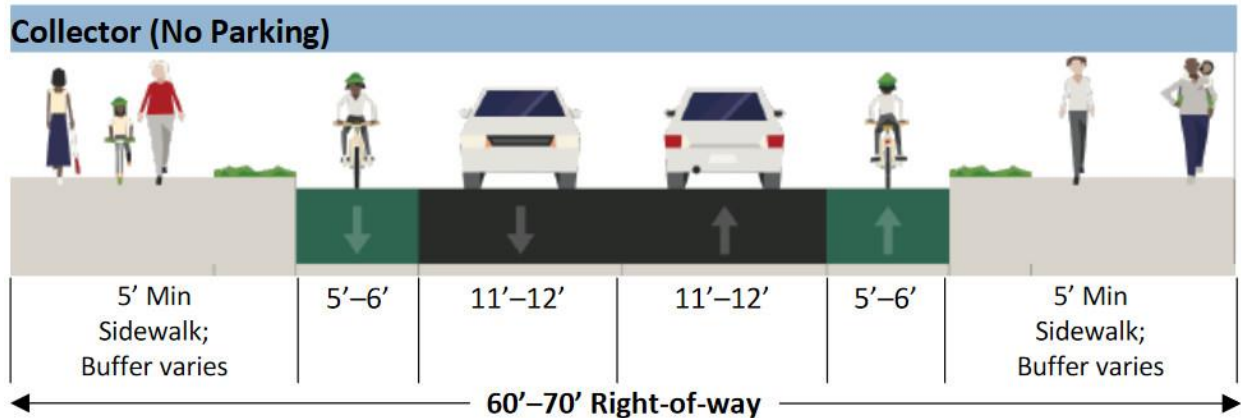


FIGURE 19– RECOMMENDED CROSS SECTION

On-Street Parking: On-Street parking is not recommended for Troost St.

Travel Lanes: One travel lane for each direction is recommended at a width of 11'-12' for this type of street. It is recommended that the lane width be minimized to help maintain the roadway speeds of 25 mph.

Bike Lanes: Six-foot bike lanes are recommended due to the higher volume of vehicles on Troost St

Sidewalks: 5-foot minimum sidewalks are recommended

Planter Strips: 5-foot minimum planter strips are recommended. Planter Strips help to reduce travel speeds and provide a buffer between pedestrians and vehicles making improving the comfort for walking.

Street Lighting: Street lighting is recommended on Troost St at the intersections with Felt St, Cloake St, Charter Oaks Dr, Loma Vista Dr, and Cedar Ridge Ct to provide adequate lighting for pedestrians crossing Troost St.

7.8 STREET ALIGNMENT AND CONNECTIVITY

The only current access to the UGB Expansion area is via Troost Street. The TSP has identified a future planned connection between Troost St and Garden Valley Blvd aligning with Cloake St and a future planned connection across South Umpqua River aligned with Harvard Ave. Both of these connections will provide necessary connectivity for this area.

There are limited options available for secondary access to this area. The lands to be added into the UGB do not provide additional route options. Therefore, the only route option within the UGB is the bridge and connection to Harvard Ave.

To create a second connection to the area, there will need to be connectivity outside of the UGB expansion area. There are a few options available. Figure 21 illustrates the options. The connections to Loma Vista will provide a secondary access that will be used as an alternate route but not a main route to the expansion area. The proposed connectivity in the TSP provides main route options to this area.

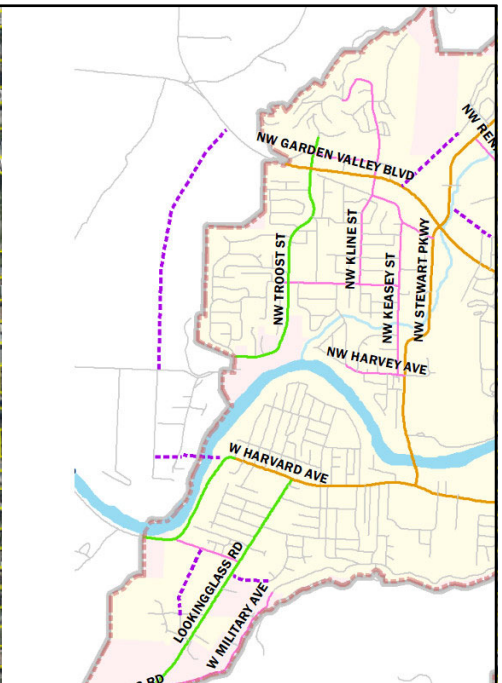


Figure 21: Recommended Alignment/ Connectivity

8.0 CONCLUSION

The analysis evaluates the adjacent roadway network and intersections with the added traffic from the proposed UGB swap area consistent with the requirements of TPR. The following findings are based on the information and analysis contained within this report.

FINDINGS

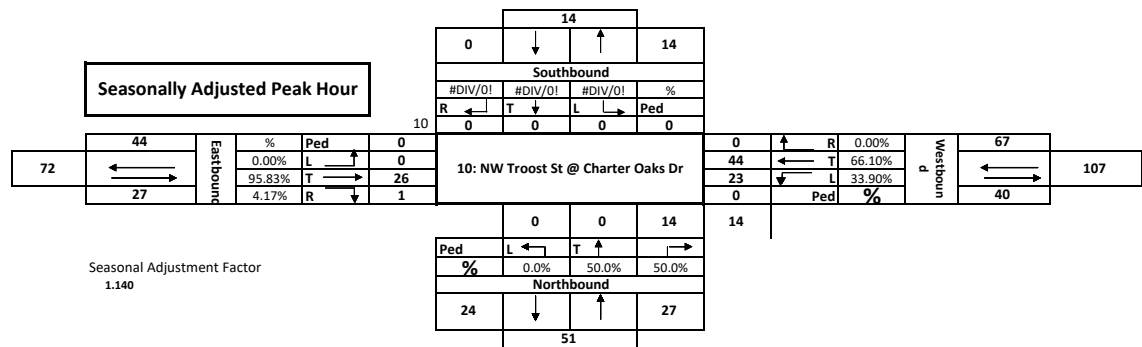
The analysis concludes the following findings:

- **Garden Valley Blvd at Stewart Parkway**
The intersection at Garden Valley Blvd at Stewart Parkway is projected not meet the mobility standards for the year 2040 prior to and with the UGB expansion. The recommended improvements are to add eastbound and westbound dual left-turn lanes from Garden Valley Blvd to Stewart Parkway and dual southbound right-turn lanes from Stewart Parkway to Garden Valley Blvd consistent with the recommendations within the TSP
- **Stewart Ave at Harvard Ave**
The intersection of Stewart Ave at Harvard Ave is projected to operate at LOS F for the year 2040 with full build out of the UGB expansion area. The standard for this intersection is to operate at LOS E or better. As this intersection does not meet the standard improvements will be necessary. The separate left turns at this intersection could be modified to protective-permissive phasing. With this minor change, the signal will operate at a LOS E, meeting the City's LOS standards.
- **Troost St at Calkins Ave**
The intersection of Troost St at Calkins Ave is projected to operate at the upper threshold of standard at the end of the planning horizon with the UGB swap. The UGB swap has the potential to add over 200 pm peak hour trips in the westbound left turn. Therefore, it is recommended that a separate westbound left turn lane be provided. The westbound left turn will result in the intersection operating significantly better than the standard.
- **Garden Valley Blvd at I-5 Exit 125 NB Ramp**
The intersection of Garden Valley Blvd at the I-5 Exit 125 NB ramps is projected to operate at a v/c 0.93 without the UGB swap and v/c 0.96 with the UGB swap. ODOT maintains a standard of 0.85 for ramp terminals. As per the Oregon Highway Plan, ODOT considers a change in v/c of 0.03 or less to not require mitigation. The UGB swap is shown to not have a significant effect on the intersection. Therefore, the UGB swap does not trigger mitigation for this intersection.
- **Garden Valley Blvd at I-5 Exit 125 SB Ramp**
The intersection of Garden Valley Blvd at the I-5 Exit 125 SB ramp is projected to operate at a v/c 1.01 without the UGB swap and v/c 1.04 with the UGB swap. ODOT maintains a standard of 0.85 for ramp terminals. As per the Oregon Highway Plan, ODOT

considers a change in v/c of 0.03 or less to not require mitigation. The UGB swap does not trigger mitigation for this intersection.

ROSEBURG UGB EXCHANGE

Intersection: 10: NW Troost St @ Charter Oaks Dr		City: Roseburg, OR																							
Counter: Sandow Engineering		Date: Saturday, January 0, 1900																							
Total of All Vehicles																									
Time Period	Southbound				Westbound				Northbound				Eastbound				15 Minute Volume	Hourly Volume	Pedestrians						
	Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total			SB	WB	NB	EB			
16:00 16:15	0	0	0	0	0	4	6	10	1	0	0	1	0	9	0	9	20	0	0	0	0				
16:15 16:30	0	0	0	0	0	10	1	11	2	0	0	2	1	10	0	11	24	0	0	0	0				
16:30 16:45	0	0	0	0	0	10	7	17	4	0	0	4	0	3	0	3	24	0	0	0	0				
16:45 17:00	0	0	0	0	0	6	8	14	1	0	0	1	0	8	0	8	23	91	0	0	0	0			
17:00 17:15	0	0	0	0	0	15	1	16	6	0	0	6	0	6	0	6	28	99	0	0	0	0			
17:15 17:30	0	0	0	0	0	8	4	12	1	0	0	1	1	6	0	7	20	95	0	0	0	0			
17:30 17:45	0	0	0	0	0	7	1	8	1	0	0	1	0	3	0	3	12	83	0	0	0	0			
17:45 18:00	0	0	0	0	0	7	6	13	0	0	0	0	0	5	0	5	18	78	0	0	0	0			
18:00 18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0			
18:15 18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0			
Count Period Total	0	0	0		0	67	34		16	0	0		2	50	0		169		0	0	0	0			
PM Peak Hour Count Summary																									
Peak Volumes	Southbound				Approach	Westbound			Approach	Northbound			Approach	Eastbound			Approach	95		Pedestrians					
	Right	Thru	Left	Right		Thru	Left	Right		Thru	Left	Right		Thru	Left	Right				Thru	Left	Right	WB	NB	EB
	0	0	0	0		39	20	59		12	0	0		12	1	23				0	24	0	0	0	0
	0.00	0.00	0.00	0.00		0.65	0.63	0.87		0.50	0.00	0.00		0.50	0.25	0.72				0.00	0.75	0.85			
PHF	0.00	0.00	0.00	0.00	0.00	0.65	0.63	0.87	0.50	0.00	0.00	0.50	0.25	0.72	0.00	0.75	0.85								
Trucks	0	0	0		0	2	0		1	0	0		0	0	0										
% Trucks	0%	0%	0%		0%	5%	0%		8%	0%	0%		0%	0%	0%										



Pedestrians and Cars

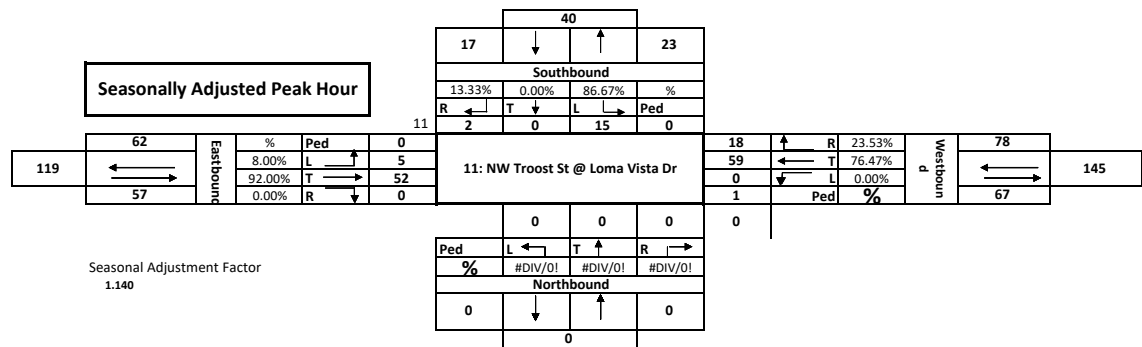
Trucks

Bikes

Pedestrians

[illegible]

Intersection: 11: NW Troost St @ Loma Vista Dr				City: Roseburg, OR																						
Counter: Sandow Engineering				Date: Saturday, January 0, 1900																						
Total of All Vehicles																										
Time Period		Southbound				Westbound				Northbound				Eastbound				15 Minute Volume	Hourly Volume	Pedestrians						
		Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total			SB	WB	NB	EB			
16:00	16:15	2	0	3	5	6	12	0	18	0	0	0	0	0	6	1	7	30	123 130 133 130 125	0	0	0	0			
16:15	16:30	0	0	2	2	5	17	0	22	0	0	0	0	0	8	1	9	33		0	0	0	0			
16:30	16:45	0	0	1	1	4	10	0	14	0	0	0	0	0	13	1	14	29		0	0	0	0			
16:45	17:00	2	0	2	4	4	9	0	13	0	0	0	0	0	12	2	14	31		0	1	0	0			
17:00	17:15	0	0	5	5	4	17	0	21	0	0	0	0	0	11	0	11	37		0	0	0	0			
17:15	17:30	0	0	5	5	4	16	0	20	0	0	0	0	0	10	1	11	36		0	0	0	0			
17:30	17:45	0	0	1	1	5	11	0	16	0	0	0	0	0	9	0	9	26		0	0	0	0			
17:45	18:00	0	0	2	2	5	10	0	15	0	0	0	0	0	9	0	9	26		1	0	0	0			
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0			
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Count Period Total		4	0	21		37	102	0		0	0	0		0	78	6		248		1	1	0	0			
PM Peak Hour Count Summary																										
Peak Volumes	Southbound				Approach	Westbound			Approach	Northbound			Approach	Eastbound			Approach			Pedestrians						
	Right	Thru	Left	Approach		Right	Thru	Left		Approach	Right	Thru		Left	Approach	Right				Thru	Left	Approach	SB	WB	NB	EB
	2	0	13	15		16	52	0		68	0	0		0	0	0				46	4	50	0	1	0	0
	PHF	0.25	0.00	0.65		0.75	1.00	0.76		0.00	0.81	0.00		0.00	0.00	0.00				0.00	0.88	0.50	0.89	0.90		
Trucks	0	0	0		1	3	0		0	0	0		0	0	0											
% Trucks	0%	0%	0%		6%	6%	0%		0%	0%	0%		0%	0%	0%											



Pedestrians and Cars

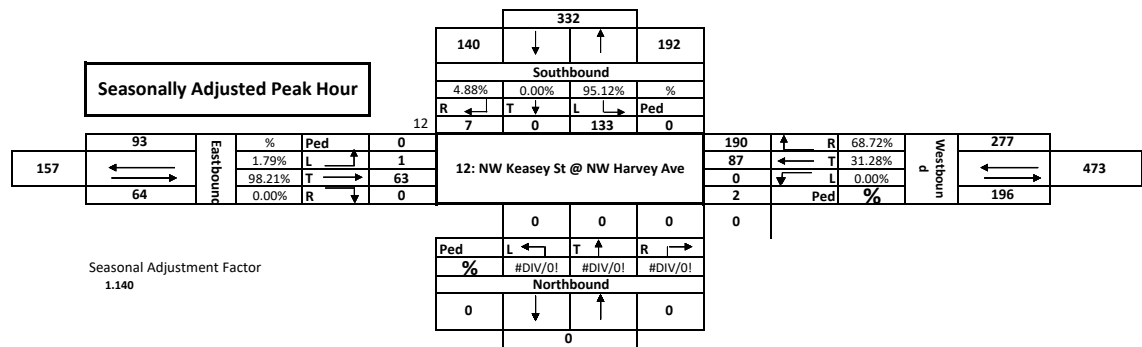
Trucks

Bikes

Pedestrians

Time Period	NE				NW				SW				SE			SB	WB	NB	EB
	Left	Right	Total		Left	Right	Total		Left	Right	Total		Left	Right	Total				
4:00 PM			0				0				0				0	0	0	0	
4:15 PM			0				0				0				0	0	0	0	
4:30 PM			0				0				0				0	0	0	0	
4:45 PM		1	1				0				0				0	1	0	0	
5:00 PM			0				0				0				0	0	0	0	
5:15 PM			0				0				0				0	0	0	0	
5:30 PM			0				0				0				0	0	0	0	
5:45 PM			0			1	1				0				1	0	0	0	
6:00 PM			0				0				0				0	0	0	0	
6:15 PM			0				0				0				0	0	0	0	
Total	0	1	1		0	1	1	0	0	0	0	0	0	0	1	1	0	0	
Peak Hour	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	

Intersection: 12: NW Keasey St @ NW Harvey Ave				City: Roseburg, OR																						
Counter: Sandow Engineering				Date: Saturday, January 0, 1900																						
Total of All Vehicles																										
Time Period		Southbound				Westbound				Northbound				Eastbound				15 Minute Volume	Hourly Volume	Pedestrians						
		Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total	Right	Thru	Left	Approach Total			SB	WB	NB	EB			
16:00	16:15	0	0	22	22	23	23	0	46	0	0	0	0	0	17	0	17	85	380 408 422 384 402	0	0	0	0			
16:15	16:30	2	0	30	32	31	16	0	47	0	0	0	0	0	17	0	17	96		0	0	0	0			
16:30	16:45	2	0	27	29	48	16	0	64	0	0	0	0	0	16	0	16	109		0	0	0	0			
16:45	17:00	0	0	31	31	33	15	0	48	0	0	0	0	0	11	0	11	90		0	0	0	0			
17:00	17:15	2	0	32	34	43	22	0	65	0	0	0	0	0	14	0	14	113		0	2	0	0			
17:15	17:30	2	0	27	29	43	23	0	66	0	0	0	0	0	14	1	15	110		0	0	0	0			
17:30	17:45	1	0	19	20	22	14	0	36	0	0	0	0	0	14	1	15	71		0	0	0	0			
17:45	18:00	1	0	27	28	38	18	0	56	0	0	0	0	0	21	3	24	108		0	0	0	0			
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0			
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Count Period Total		10	0	215		281	147	0		0	0	0		0	124	5		782		0	2	0	0			
PM Peak Hour Count Summary																										
Peak Volumes	Southbound				Approach	Westbound			Approach	Northbound				Approach	Eastbound			Approach			Pedestrians					
	Right	Thru	Left	Approach		Right	Thru	Left		Right	Thru	Left	Approach		Right	Thru	Left				Approach	SB	WB	NB	EB	
	6	0	117	123		167	76	0		243	0	0	0		0	0	55				1	56	0	2	0	0
	PHF	0.75	0.00	0.91		0.90	0.87	0.83		0.00	0.92	0.00	0.00		0.00	0.00	0.00				0.86	0.25	0.88	0.93		
Trucks	0	0	2		3	1	0		0	0	0		0	1	0											
% Trucks	0%	0%	2%		2%	1%	0%		0%	0%	0%		0%	2%	0%											



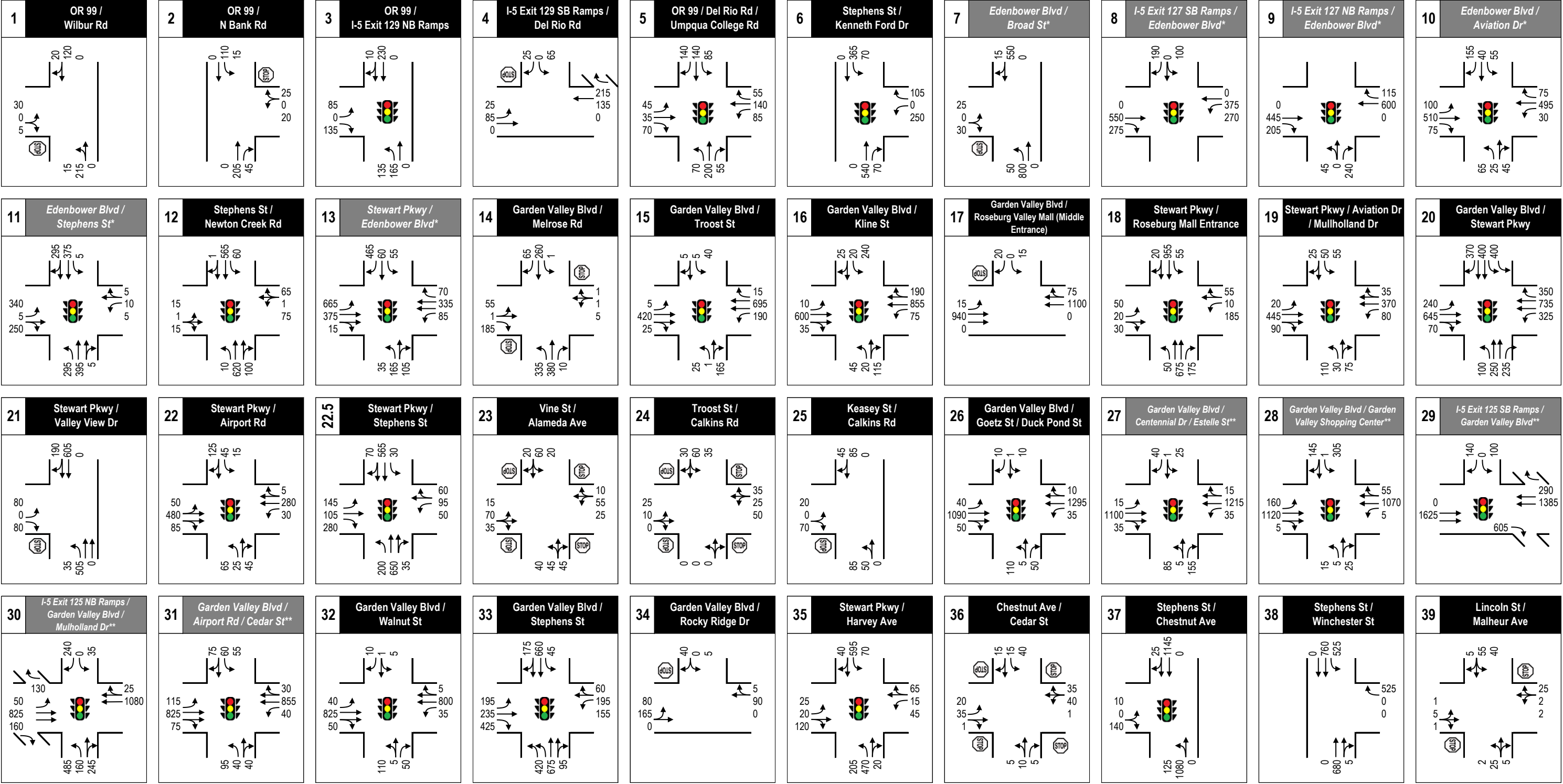
Pedestrians and Cars

Trucks

Bikes

Pedestrians

[illegible]



Legend

1 Intersection
*, **

Intersection volumes developed from previous study or plan

* IAMP 127 (December 2014)

** IAMPs 124/125 (October 2013)



Signalized intersection



STOP controlled intersection



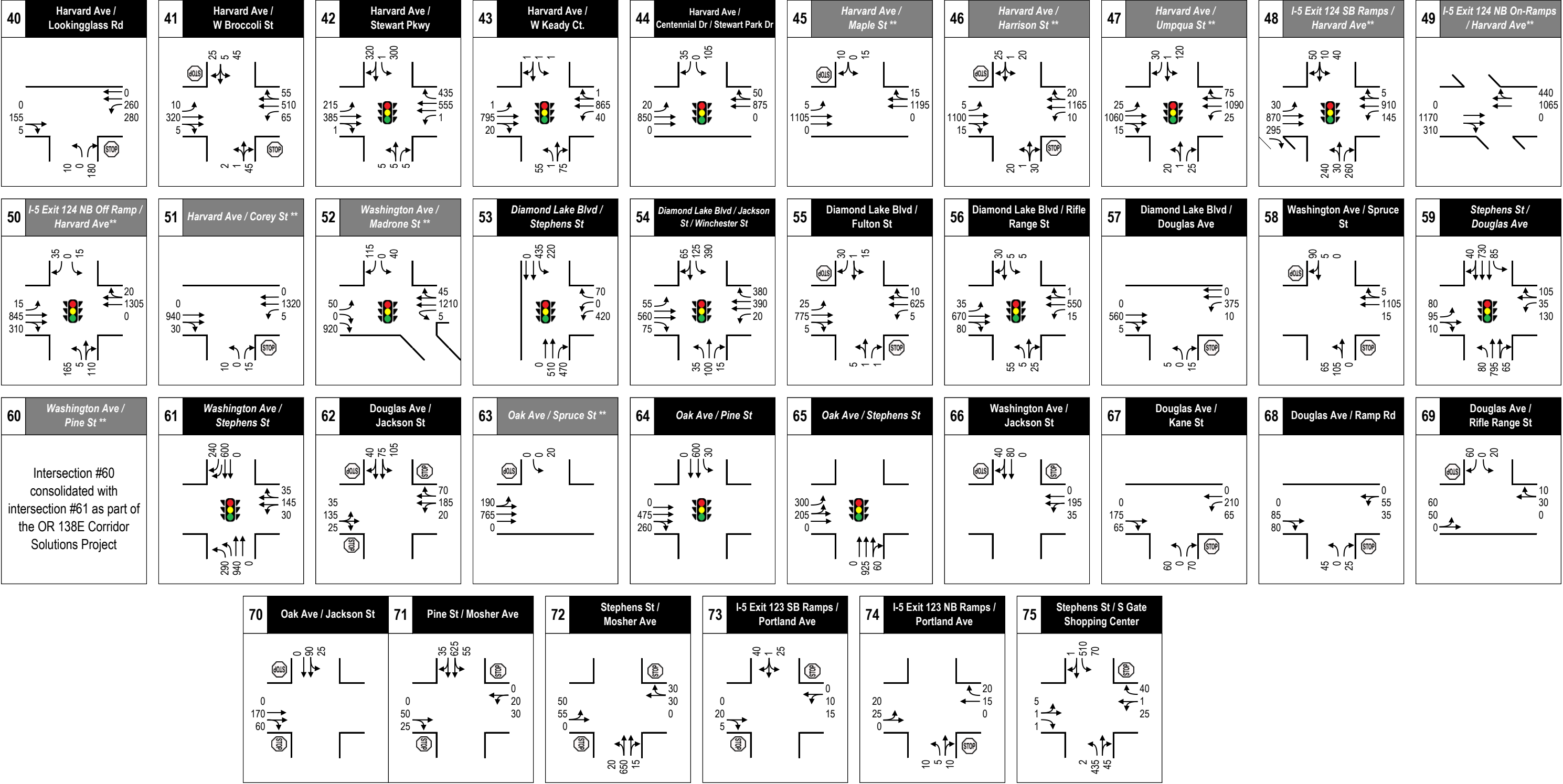
Lane configuration

Roseburg TSP

Figure 1a



Existing (2016) PM Peak Hour
Turning Movement Volumes



Legend

1 Intersection
*, **

Intersection volumes developed from previous study or plan
 * IAMP 127 (December 2014)
 ** IAMPs 124/125 (October 2013)



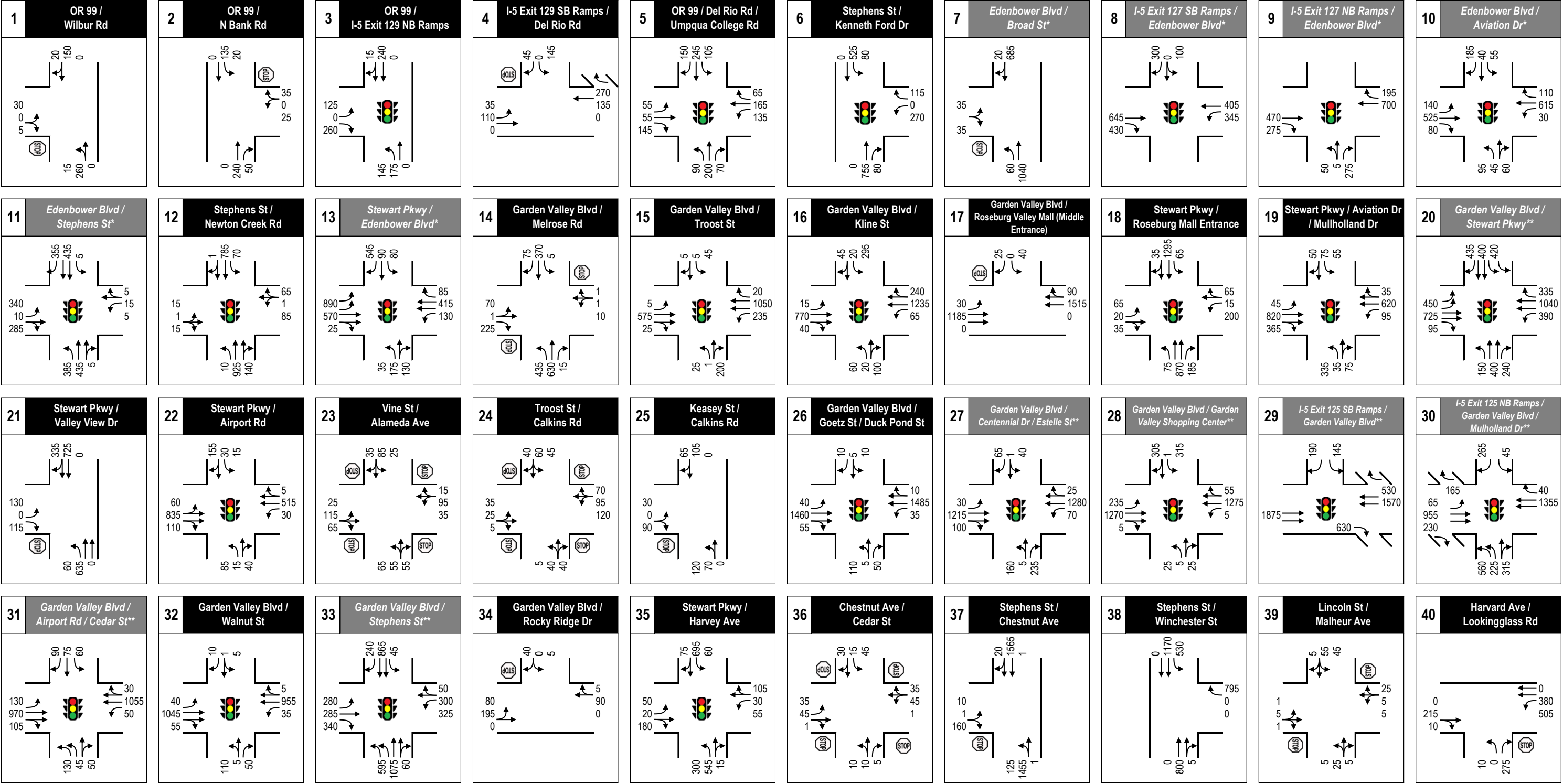
Signalized intersection
 STOP controlled intersection
 Lane configuration

Roseburg TSP

Figure 1b



**Existing (2016) PM Peak Hour
Turning Movement Volumes**



Legend

1 Intersection
*, **

Intersection volumes developed from previous study or plan

* IAMP 127 (December 2014)

** IAMPs 124/125 (October 2013)



Signalized intersection

STOP controlled intersection

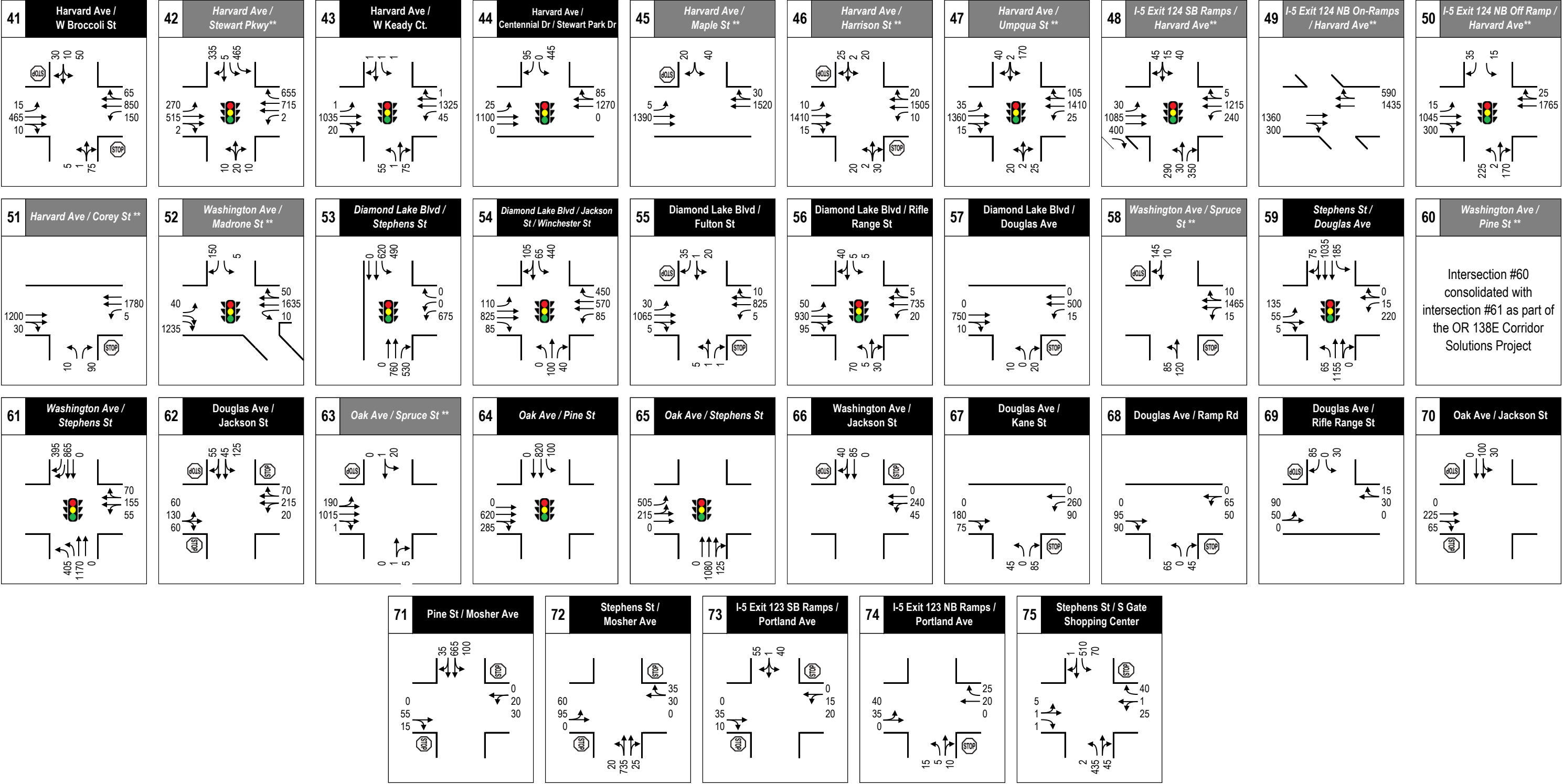
Lane configuration

Roseburg TSP

Figure 1a

Future (2040) Baseline
PM Peak Hour Turning
Movement Volumes





Legend

1 Intersection

Intersection volumes developed from previous study or plan

* IAMP 127 (December 2014)

** IAMPs 124/125 (October 2013)



Signalized intersection

STOP controlled intersection

Lane configuration

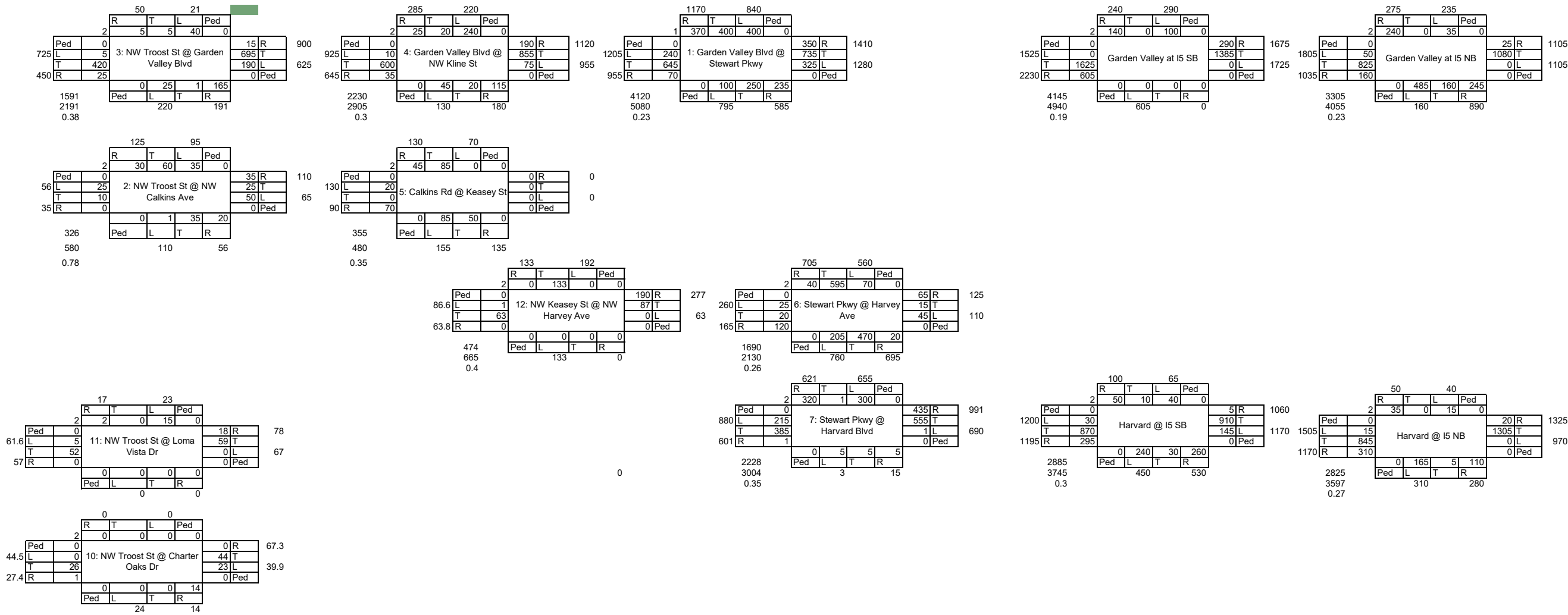
Roseburg TSP

Figure 1b

**Future (2040) Baseline
PM Peak Hour Turning
Movement Volumes**



Existing 2016 PM Volumes



Adjustment	
Base Year	2016
Target Year	2040
Years of Growth	24
Growth Rate Per Year	0.02
Growth Factor	1.48

2016
2040
24

				360		0.0126
			R	T	L	275
			2	45	20	295
1305	Ped	0				
1340	L	15	4: Garden Valley Blvd Kline St			
820	T	770				
825	R	40				
			0	60	20	
	Ped		L	T		
			125			

1305	Ped	0	4: Garden Valley Blvd @ NW Kline St				240	R
1340	L	15					1235	T
820	T	770					65	L
825	R	40					0	Ped
		0	60	20	100			
	Ped	L	T	R				
		125		180				

		R	T	Ped	
	1	435	400	420	0
Ped	0				335
1625	L	450			1040
	T	725			390
1270	R	95			0
		0	150	400	240
	Ped	L	T	R	
		885		790	

		R	T	L	Ped	
	2	190	0	145	0	
1760	Ped	0				530 R
	L	0				1570 T
	T	1875				0 L
2505	R	630				0 Ped
		0	0	0	0	
	Ped	L	T	R		
		630			0	

Garden Valley at 15 NB

	R	T	L	Ped			
	285	0	45	0			
2180	Ped	0			40	R	1395
	L	65			1355	T	
1250	T	955			0	L	1315
	R	230			0	Ped	
		0	560	225	315		
	Ped	L	T	R			
			230	1100			

		R	40	T	L	45	Ped		
			2				0		
140	Ped		0					70	R
	T		35					95	T
	L		25					120	L
65	R		5					0	Ped
				0	5	40	40		
		Ped			L	T	R		
				185			85		

[illegible]

		R	T	L	Ped	
		2	9	0	168	0
173.49	Ped	0				240 R
	L	1	12: NW Keasey St @ NW Harvey Ave			165 T
	T	82				0 L
83.236	R	0				0 Ped
			0	0	0	
	Ped	L	T	R		
			0		0	

			R	330	T	L	700	Ped	
		2		75	695	60		0	
405	Ped	0							105
405	L	50							30
250	T	20							55
250	R	180							0
			0	300	545	15			
	Ped	L	T	R					
				930		860			

	R	T	L	Ped						
	2	335	5	465	0					
Ped	0					655	R			1372
1060	L	270				715	T			
	T	515				2	L			990
787	R	2				0	Ped			
			0	10	20	10				
	Ped	L		T		R				
			9		40					

	R	T	L	Ped			
	2	4	0	26	0		
Ped	0	11: NW Trost St @ Loma Vista Dr				32	R
120 T	8					116	T
L	93					0	L
101 R	0					0	Ped
	0	0	0	0			
	Ped	L	T	R			
		0	0	0			

[illegible]

1.08												
54					23							
R		T		L		Ped						
2		5		5		43		0				
Ped		0								16 R		
781.961	L		5		3: NW Troost St @ Garden						750 T	
T		453		Valley Blvd						205 L		
485.355	R		27								0 Ped	
		0		27		1		178				
Ped		L		T		R						
237					206							

1.0631									
303					234				
R		T	L	Ped	R		T	L	Ped
2		27	21	255	0				
Ped		0			202		R		
971	L	11	4: Garden Valley Blvd @ NW			909	T		
674	T	638	Kline St			80	L		
686	R	37				0	Ped		
		0			21		122		
Ped		L	T	R					
138					191				

1.049									
1227					881				
R		T	L	Ped	R		T	L	Ped
1		388	419	419	0				
Ped		0			367		R		
1263	L	252	1: Garden Valley Blvd @			771	T		
1015	T	676	Stewart Pkwy			341	L		
1001	R	73				0	Ped		
		0			105		262		
Ped		L	T	R					
834					613				

				250			
				R	T		
				2	146		
				Ped	0		
1585.9	L			0	Garden Valley at I5 SB		
				T	1690		
2319	R			629			
				0			
				Ped	L		
				629			

1.04		1.05	
302	Ped	288	246
104	0	R	T
ey at I5 SB	0	2	251
0	0	0	3
0	0	Ped	0
R	0	L	52
0	0	T	864
0	0	R	168
0	0	0	508
0	0	Ped	L
0	0	168	T

1.16									
145					110				
R		T		L		Ped			
2		35		70		41		0	
Ped		0		2: NW Troost St @ NW Calkins Ave		41		R	
65.09 L		29				29		T	
T		12				58		L	
40.68 12 R		0				0		Ped	
		0		1		41		23	
Ped		L		T		R			
128					65				

1.0734									
140					75				
R		T		L		Ped			
2		48		91		0		0	
Ped		0						0 R	
128	L	21		5: Calkins Rd @ Keasey St				0 T	
76	T	0						0 L	
96.6	R	75						0 Ped	
		0		91		54		0	
Ped		L		T		R			
166					145				

1.05									
743					590				
R		T	L	Ped	R		T	L	Ped
2		42	627	74	0				
Ped		0			69		R		
274	L	26	6: Stewart Pkwy @ Harvey			16	T		
186	T	21	Ave			47	L		
186	R	139				0	Ped		
		0			216		495		
Ped		L	T	R					
813					733				

1.07									
666					703				
R		T	L	Ped	R		T	L	Ped
2		343	1	322	0				
Ped		0			467		R		
944	L	231	7: Stewart Pkwy @			595	T		
T		413	Harvard Blvd			1	L		
645	R	1				0	Ped		
		0			5		5		
Ped		L	T	R					
3					16				

1.062									
106					69				
R		T	L	Ped	R		T	L	Ped
2		53	11	42	0				
Ped		0			5		R		
1274.5	L	32	Harvard @ I5 SB			967	T		
T		924				154	L		
1269.2	R	313				0	Ped		
		0			255		32		
Ped		L	T	R					
478					563				

1.057									
53					42				
R		T	L	Ped	R		T	L	Ped
2		37	0	16	0				
Ped		0			21		R		
1126	L	16	Harvard @ I5 NB			1379	T		
1591	T	893				0	L		
1025	R	328				0	Ped		

ROSEBURG UGB EXCHANGE

Appendix C

Vehicular Volume Development and Simulation Worksheets

Road	From	To	Direction	Model Assignment					2010-2035 Model Comparison		2016-2040 Model Comparison		Post Processed Volumes Future 2040 No Build Year				Forecast Used	Method Used	Comments	Additional Comments
				Existing 30HV	Baseline Model	Future Ref Model	Interpolated Model	Forecasted Model	Total Growth	Annual Growth	Total Growth	Volume Difference	Volume Difference	Volume Growth	Absolute Difference	Average				
				2016	2010	2035	2016	2040												
Edenbower Blvd	S of Stewart	Stewart	NB	305	400	459	414	471	14.8%	0.6%	13.7%	57	362	347	4%	354	354	Average of Difference and Growth		
	Stewart	S of Stewart	SB	160	127	208	146	224	63.8%	2.6%	53.1%	78	238	245	3%	241	241	Average of Difference and Growth		
	Stewart	N of Stewart	NB	900	1245	1594	1329	1664	28.0%	1.1%	25.2%	335	1235	1127	9%	1181	1235	Difference Method		Absolute difference >10% -> Used difference only
	N of Stewart	Stewart	SB	580	638	801	677	834	25.5%	1.0%	23.1%	156	736	714	3%	725	736	Difference Method		Absolute difference >10% -> Used difference only
	S of Broad	Broad	NB	850	1150	1484	1230	1551	29.0%	1.2%	26.1%	321	1171	1072	9%	1121	1171	Difference Method		Absolute difference >10% -> Used difference only
	Broad	S of Broad	SB	590	617	780	656	813	26.4%	1.1%	23.8%	156	736	718	2%	727	736	Difference Method		Absolute difference >10% -> Used difference only
	Broad	N of Broad	NB	825	1112	1441	1191	1507	29.6%	1.2%	26.5%	316	1141	1044	9%	1092	1141	Difference Method		Absolute difference >10% -> Used difference only
	N of Broad	ON	SB	565	615	780	655	813	26.8%	1.1%	24.2%	158	723	702	3%	713	723	Difference Method		Absolute difference >10% -> Used difference only
	W of Exit 127 SB Ramps	Exit 127 SB Ramps	EB	825	1112	1441	1191	1507	29.6%	1.2%	26.5%	316	1141	1044	9%	1092	1141	Difference Method		Absolute difference >10% -> Used difference only
	Exit 127 SB Ramps	W of Exit 127 SB Ramps	WB	565	615	780	655	813	26.8%	1.1%	24.2%	158	723	702	3%	713	723	Difference Method		Absolute difference >10% -> Used difference only
	Exit 127 SB Ramps	E of Exit 127 SB Ramps	EB	650	1079	1213	1111	1240	12.4%	0.5%	11.8%	129	779	725	7%	752	779	Difference Method		Absolute difference >10% -> Used difference only
	E of Exit 127 SB Ramps	Exit 127 SB Ramps	WB	645	479	581	503	601	21.3%	0.9%	19.4%	98	743	770	4%	757	743	Difference Method		Absolute difference >10% -> Used difference only
	W of Exit 127 NB Ramps	Exit 127 NB Ramps	EB	650	1079	1213	1111	1240	12.4%	0.5%	11.6%	129	779	725	7%	752	779	Difference Method		Absolute difference >10% -> Used difference only
	Exit 127 NB Ramps	W of Exit 127 NB Ramps	WB	645	479	581	503	601	21.3%	0.9%	19.4%	98	743	770	4%	757	743	Difference Method		Absolute difference >10% -> Used difference only
	Exit 127 NB Ramps	E of Exit 127 NB Ramps	EB	685	801	875	819	890	9.2%	0.4%	8.7%	71	756	744	2%	750	756	Difference Method		Absolute difference >10% -> Used difference only
	E of Exit 127 NB Ramps	Exit 127 NB Ramps	WB	715	503	670	543	703	33.2%	1.3%	29.5%	160	875	926	6%	901	875	Difference Method		To be consistent with method used for opposing direction
	W of Aviation	Aviation	EB	685	801	875	819	890	9.2%	0.4%	8.7%	71	756	744	2%	750	756	Difference Method		Absolute difference >10% -> Used difference only
	Aviation	W of Aviation	WB	715	503	670	543	703	33.2%	1.3%	29.5%	160	875	926	6%	901	875	Difference Method		To be consistent with method used for opposing direction
	Aviation	E of Aviation	EB	610	776	820	787	829	5.7%	0.2%	5.4%	42	652	643	1%	647	652	Difference Method		Absolute difference >10% -> Used difference only
	E of Aviation	Aviation	WB	600	493	648	530	679	31.4%	1.3%	28.1%	149	749	768	3%	759	749	Difference Method		Absolute difference >10% -> Used difference only
	W of Stephens	Stephens	EB	595	776	820	787	829	5.7%	0.2%	5.4%	42	637	627	2%	632	637	Difference Method		Absolute difference >10% -> Used difference only
	Stephens	W of Stephens	WB	600	493	648	530	679	31.4%	1.3%	28.1%	149	749	768	3%	759	749	Difference Method		Absolute difference >10% -> Used difference only
	E of Stephens	E of Stephens	EB	15	1	3	1	3	200.0%	8.0%	129.7%	2	34	34	68%	26	17	Difference Method		Absolute difference >10% -> Used difference only
	E of Stephens	Stephens	WB	20	1	3	1	3	200.0%	8.0%	129.7%	2	22	46	71%	34	22	Difference Method		Absolute difference >10% -> Used difference only
Stewart Pkwy	N of Harvard	Harvard	SB	745	743	864	772	888	16.3%	0.7%	15.0%	116	861	857	0%	859	859	Average of Difference and Growth		
	Harvard	N of Harvard	NB	795	559	682	589	707	22.0%	0.9%	20.1%	118	913	955	4%	934	934	Average of Difference and Growth		
	S of Harvard	Harvard	NB	40	1	1	1	1	0.0%	0.0%	0.0%	0	40	40	0%	40	40	Average of Difference and Growth		
	Harvard	S of Harvard	SB	7	1	1	1	1	0.0%	0.0%	0.0%	0	7	7	0%	7	7	Average of Difference and Growth		
	S of Harvey	Harvey	NB	695	378	547	419	581	44.7%	1.8%	38.8%	162	857	964	12%	911	857	Difference Method		
	Harvey	S of Harvey	SB	760	481	660	524	696	37.2%	1.5%	32.8%	172	932	1009	8%	971	932	Difference Method		To be consistent with method used for opposing direction
	Harvey	N of Harvey	NB	560	552	699	587	728	26.6%	1.1%	24.0%	141	701	695	1%	698	698	Average of Difference and Growth		
	N of Harvey	Harvey	SB	705	657	797	691	825	21.3%	0.9%	19.5%	134	839	842	0%	841	841	Average of Difference and Growth		
	S of Valley View	Valley View	NB	540	657	699	667	707	6.4%	0.3%	6.0%	40	580	573	1%	576	576	Average of Difference and Growth		
	Valley View	S of Valley View	SB	685	552	797	611	846	44.4%	1.8%	38.5%	235	920	949	3%	934	934	Average of Difference and Growth		
	Valley View	Garden Valley	NB	585	672	878	721	919	30.7%	1.2%	27.4%	198	763	745	5%	764	764	Average of Difference and Growth		
	Garden Valley	Valley View	SB	735	884	1188	957	1249	34.4%	1.4%	30.5%	292	1087	1037	5%	1062	1062	Average of Difference and Growth		
	Garden Valley	Roseburg Mall	NB	900	619	836	671	879	35.1%	1.4%	31.0%	208	1108	1179	6%	1144	1144	Average of Difference and Growth		
	Roseburg Mall	Garden Valley	SB	1170	1005	1370	1093	1443	36.3%	1.5%	32.1%	350	1520	1545	2%	1533	1533	Average of Difference and Growth		
	Roseburg Mall	N of Roseburg Mall	NB	780	644	859	696	902	33.4%	1.3%	29.7%	206	986	1011	3%	999	999	Average of Difference and Growth		
	N of Roseburg Mall	Roseburg Mall	SB	1030	872	1252	963	1328	43.6%	1.7%	37.9%	365	1395	1420	2%	1407	1407	Average of Difference and Growth		
	W of Edenbower	Edenbower	EB	1055	1555	2055	1675	2155	32.2%	1.3%	28.7%	480	1535	1357	12%	1446	1535	Difference Method		Absolute difference >10% -> Used difference only
	Edenbower	W of Edenbower	WB	835	769	952	813	989	23.8%	1.0%	21.6%	176	1011	1015	0%	1013	1011	Difference Method		Absolute difference >10% -> Used difference only
	Edenbower	E of Edenbower	EB	535	862	1135	928	1190	31.7%	1.3%	28.3%	262	797	686	15%	742	797	Difference Method		Absolute difference >10% -> Used difference only
	E of Edenbower	Edenbower	WB	490	410	574	449	607	40.0%	1.6%	35.0%	157	647	662	2%	655	647	Difference Method		Absolute difference >10% -> Used difference only
	W of Aviation	Aviation	EB	555	624	1331	794	1472	113.3%	4.5%	85.5%	679	1234	1030	18%	1132	1234	Difference Method		Absolute difference >10% -> Used difference only
	Aviation	W of Aviation	WB	505	580	1102	705	1206	90.0%	3.6%	71.1%	501	1006	864	15%	935	1006	Difference Method		Absolute difference >10% -> Used difference only
	Aviation	E of Aviation	EB	575	523	907	615	984	73.4%	2.9%	59.9%	369	944	920	3%	932	932	Average of Difference and Growth		
	E of Aviation	Aviation	WB	485	309	572	372	625	85.1%	3.4%	67.8%	252	737	814	10%	776	737	Difference Method		
W of Airport	Airport	EB	615	570	984	669	1067	72.6%	2.9%	59.4%	397	1012	980	3%	996	996	Average of Difference and Growth			
Airport	W of Airport	WB	470	342	617	408	672	80.4%	3.2%	64.7%	264	734	774	5%	754	754	Average of Difference and Growth			
Airport	Stephens	EB	540	551	942	645	1020	71.0%	2.8%	58.2%	375	915	854	7%	885	885	Average of Difference and Growth			
Stephens	Airport	WB	315	334	589	395	640	76.3%	3.1%	61.8%	245	560	510	9%	535	535	Average of Difference and Growth			
Diamond Lake Blvd	Stephens	Jackson	EB	690	413	726	488	789	75.8%	3.0%	61.6%	300	990	1115	12%	1053	990	Difference Method		Absolute difference >10% -> Used difference only
	Jackson	Stephens	WB	490	424	517	446	536	21.9%	0.9%	20.0%	89	579	588	1%	584	579	Difference Method		To be consistent with method used for opposing direction
	Jackson	E of Jackson	EB	965	842	1198	927	1269	42.3%	1.7%	36.8%	342	1307	1321	1%	1314	1314	Average of Difference and Growth		TPAU STUDIED THIS INTERSECTION
	E of Jackson	Jackson	WB	790	729	989	791	1041	35.7%	1.4%	31.5%	250	1040	1039	0%	1039	1039	Average of Difference and Growth		TPAU STUDIED THIS INTERSECTION
	W of Fulton	Fulton	EB	805	741	1043	813	1103	40.8%	1.6%	35.6%	290	1095	1092	0%	1093	1093	Average of Difference and Growth		TPAU STUDIED THIS INTERSECTION
	Fulton	W of Fulton	WB	660	583	796	634	839	36.5%	1.5%	32.2%	204	864	873	1%	869	869	Average of Difference and Growth		
	Fulton	E of Fulton	EB	791	757	1070	832	1133	41.3%	1.7%	36.1%	300	1091	1077	1%	1084	1084	Average of Difference and Growth		
	E of Fulton	Fulton	WB	640	600	819	653	863	36.5%	1.5%	32.2%	210	850	846	0%	848	848	Average of Difference and Growth		
	W of Rifle Range	Rifle Range	EB	785	728	1035	802	1096	42.2%	1.7%	36.8%	295	1080	1074	1%	1077	1077	Average of Difference and Growth		
	Rifle Range	W of Rifle Range	WB	635	545	757	596	799	38.9%	1.6%	34.2%	204	839	852	2%	845	845	Average of Difference and Growth		
	Rifle Range	E of Rifle Range	EB	700	608	885	674	9												

			Model Assignment					2010-2035 Model Comparison		2016-2040 Model Comparison		Post Processed Volumes Future 2040 No Build Year				Forecast	Method Used	Comments	Additional Comments	
Road	From	To	Direction	Existing 30HV	Baseline Model	Future Ref Model	Interpolated Model	Forecasted Model	Total Growth	Annual Growth	Total Growth	Volume Difference	Volume Difference	Volume Growth	Average					
	Kane	Chadwick	EB	245	111	132	116	136	18.9%	0.8%	17.4%	20	265	288	8%	276	265	Difference Method	To be consistent with method used for opposing direction	
	Chadwick	Kane	WB	275	70	150	89	166	114.3%	4.6%	86.1%	77	352	512	37%	432	352	Difference Method	Absolute difference >10% -> Used difference only	
	W of Ramp	Ramp	EB	165	87	101	90	104	16.1%	0.6%	14.9%	13	178	190	6%	184	184	Average of Difference and Growth		
	Ramp	W of Ramp	WB	100	73	98	79	103	34.2%	1.4%	30.4%	24	124	130	5%	127	127	Average of Difference and Growth		
	Rifle Range	Rifle Range	EB	110	75	100	81	105	33.3%	1.3%	29.6%	24	134	143	6%	138	138	Average of Difference and Growth		
	Rifle Range	Ramp	WB	90	106	131	112	136	23.6%	0.9%	21.4%	24	114	109	4%	112	112	Average of Difference and Growth		
	Rifle Range	E of Rifle Range	EB	70	8	11	9	12	37.5%	1.5%	33.0%	3	73	93	24%	83	73	Difference Method	Absolute difference >10% -> Used difference only	
	E of Rifle Range	Rifle Range	WB	40	7	10	8	11	42.9%	1.7%	37.3%	3	43	55	25%	49	43	Difference Method	Absolute difference >10% -> Used difference only	
	S of Diamond Lake	S of Diamond Lake	SB	15	1	1	1	1	0.0%	0.0%	0.0%	0	15	15	0%	15	15	Average of Difference and Growth		
	S of Diamond Lake	Diamond Lake	NB	20	1	1	1	1	0.0%	0.0%	0.0%	0	20	20	0%	20	20	Average of Difference and Growth		
Fulton St	N of Diamond Lake	Diamond Lake	SB	46	16	27	19	29	68.8%	2.8%	56.7%	11	57	72	24%	64	57	Difference Method	Absolute difference >10% -> Used difference only	
	Diamond Lake	N of Diamond Lake	NB	36	17	23	18	24	35.3%	1.4%	31.2%	6	42	47	12%	45	42	Difference Method	Absolute difference >10% -> Used difference only	
	Diamond Lake	S of Diamond Lake	SB	11	14	17	15	18	20.9%	0.8%	19.1%	3	14	13	6%	13	14	Difference Method	To be consistent with method used for opposing direction	
	S of Diamond Lake	Diamond Lake	NB	7	23	27	24	27	14.3%	0.6%	13.3%	3	10	8	25%	9	10	Difference Method	Absolute difference >10% -> Used difference only	
Ramp Rd	Douglas	S of Douglas	SB	115	169	198	176	204	17.2%	0.7%	15.8%	28	143	133	7%	138	143	Difference Method	To be consistent with method used for opposing direction	
	S of Douglas	Douglas	NB	70	125	164	134	172	31.2%	1.2%	27.9%	37	107	90	18%	98	107	Difference Method	Absolute difference >10% -> Used difference only	
Rifle Range St	N of Diamond Lake	Diamond Lake	SB	40	38	54	42	57	42.1%	1.7%	36.7%	15	55	55	1%	55	55	Difference Method	To be consistent with method used for opposing direction	
	Diamond Lake	N of Diamond Lake	NB	41	56	76	61	80	35.7%	1.4%	31.6%	19	60	54	11%	57	60	Difference Method	Absolute difference >10% -> Used difference only	
	Diamond Lake	S of Diamond Lake	SB	100	99	121	104	125	22.2%	0.9%	20.3%	21	121	120	1%	121	121	Average of Difference and Growth		
	S of Diamond Lake	Diamond Lake	NB	85	67	89	72	93	32.8%	1.3%	29.2%	21	106	110	3%	108	108	Average of Difference and Growth		
	North of Douglas	Douglas	SB	80	99	121	104	125	22.2%	0.9%	20.3%	21	101	96	5%	99	99	Average of Difference and Growth		
Harvard Ave	Douglas	N of Douglas	NB	70	67	89	72	93	32.8%	1.3%	29.2%	21	91	90	1%	91	91	Average of Difference and Growth		
	W of Lookingglass	Lookingglass	EB	160	146	199	159	210	36.3%	1.5%	32.1%	51	211	211	0%	211	211	Average of Difference and Growth		
	Lookingglass	W of Lookingglass	WB	270	236	355	265	379	50.4%	2.0%	43.2%	114	384	387	1%	385	385	Average of Difference and Growth		
	Lookingglass	Broccoli	EB	335	242	383	276	411	58.3%	2.3%	49.1%	135	470	499	6%	485	485	Average of Difference and Growth		
	Broccoli	Lookingglass	WB	540	418	766	502	836	83.3%	3.3%	66.6%	334	874	900	3%	887	887	Average of Difference and Growth		
	Broccoli	E of Broccoli	EB	410	319	492	361	527	54.2%	2.2%	46.1%	166	576	599	4%	587	587	Average of Difference and Growth		
	E of Broccoli	Broccoli	WB	630	577	1025	685	1115	77.6%	3.1%	62.8%	430	1060	1026	3%	1043	1043	Average of Difference and Growth		
	W of Stewart	Stewart	EB	596	443	668	497	713	50.8%	2.0%	43.5%	216	812	855	5%	834	834	Average of Difference and Growth		
	Stewart	W of Stewart	WB	825	758	1310	890	1420	72.8%	2.9%	59.5%	530	1355	1316	3%	1335	1335	Average of Difference and Growth		
	Stewart	E of Stewart	EB	825	533	691	571	723	29.6%	1.2%	26.6%	152	977	1044	7%	1010	977	Difference Method		To be consistent with method used for opposing direction
	E of Stewart	Stewart	WB	1071	664	1150	781	1247	73.2%	2.9%	59.8%	467	1538	1711	11%	1624	1538	Difference Method		
	W of Keady	Keady	EB	816	622	842	675	886	35.4%	1.4%	31.3%	211	1027	1071	4%	1049	1049	Average of Difference and Growth		
	Keady	W of Keady	WB	921	662	1097	766	1184	65.7%	2.6%	54.5%	418	1339	1423	6%	1381	1381	Average of Difference and Growth		
	Keady	E of Keady	EB	871	622	842	675	886	35.4%	1.4%	31.3%	211	1082	1144	6%	1113	1113	Average of Difference and Growth		
	E of Keady	Keady	WB	908	662	1097	766	1184	65.7%	2.6%	54.5%	418	1324	1400	6%	1362	1362	Average of Difference and Growth		
	W of Centennial	Centennial	EB	870	622	842	675	886	35.4%	1.4%	31.3%	211	1081	1142	5%	1112	1112	Average of Difference and Growth		
	Centennial	W of Centennial	WB	910	682	1097	766	1184	65.7%	2.6%	54.5%	418	1328	1406	6%	1367	1367	Average of Difference and Growth		
	Centennial	E of Centennial	EB	955	803	1419	951	1542	76.7%	3.1%	62.2%	591	1546	1549	0%	1548	1548	Average of Difference and Growth		
	E of Centennial	Centennial	WB	925	765	1217	873	1307	59.1%	2.4%	49.7%	434	1359	1385	2%	1372	1372	Average of Difference and Growth		
	Lookingglass Rd	Harvard	S of Harvard	SB	285	193	426	249	473	120.7%	4.8%	89.9%	224	509	541	6%	525	509		Difference Method
S of Harvard		Harvard	NB	190	107	198	129	216	85.0%	3.4%	67.8%	87	277	319	14%	298	277	Difference Method	Absolute difference >10% -> Used difference only	
Broccoli St	N of Harvard	Harvard	SB	75	27	40	30	43	49.4%	2.0%	42.4%	13	88	107	20%	97	88	Difference Method	Absolute difference >10% -> Used difference only	Model loads all onto Agate -- moved a third to Broccoli
	Harvard	N of Harvard	NB	66	30	43	33	46	46.1%	1.8%	39.8%	13	79	92	15%	86	79	Difference Method	Absolute difference >10% -> Used difference only	
	Harvard	S of Harvard	SB	75	159	258	183	278	62.3%	2.5%	52.0%	95	170	114	39%	142	170	Difference Method	Absolute difference >10% -> Used difference only	
	S of Harvard	Harvard	NB	48	77	109	85	115	41.6%	1.7%	36.3%	31	79	65	18%	72	79	Difference Method	Absolute difference >10% -> Used difference only	
Keady Ct	Harvard	S of Harvard	SB	61	61	61	61	61	0.0%	0.0%	0.0%	0	61	61	0%	61	61	Average of Difference and Growth	Serves as middle school access - growth negligible (0 in model)	Serves as middle school access - growth negligible (0 in model)
	S of Harvard	Harvard	NB	131	131	131	131	131	0.0%	0.0%	0.0%	0	131	131	0%	131	131	Average of Difference and Growth		
Stewart Park Dr	N of Harvard	Harvard	SB	140	257	872	357	755	161.5%	6.5%	111.7%	398	538	296	58%	417	538	Difference Method	Absolute difference >10% -> Used difference only	
	Harvard	N of Harvard	NB	70	179	216	188	222	20.1%	0.8%	18.4%	35	105	83	23%	94	105	Difference Method	Absolute difference >10% -> Used difference only	
Garden Valley Blvd	N of Melrose	Melrose	SB	326	213	315	237	335	47.9%	1.9%	41.2%	98	424	460	8%	442	442	Average of Difference and Growth		
	Melrose	N of Melrose	NB	436	320	581	383	633	81.6%	3.3%	65.5%	251	687	722	5%	704	704	Average of Difference and Growth		
	Melrose	Trout	EB	450	393	541	429	571	37.7%	1.5%	33.2%	142	592	599	1%	596	596	Average of Difference and Growth		
	Trout	Melrose	WB	725	672	1051	763	1127	56.4%	2.3%	47.7%	364	1089	1071	2%	1080	1080	Average of Difference and Growth		
	Trout	E of Trout	EB	625	405	579	447	614	43.0%	1.7%	37.4%	167	792	859	8%	825	825	Average of Difference and Growth		
	E of Trout	Trout	WB	900	733	1146	832	1229	56.3%	2.3%	47.6%	396	1296	1329	2%	1313	1313	Average of Difference and Growth		
	W of Kline	Kline	EB	645	401	571	442	605	42.4%	1.7%	36.9%	163	808	883	9%	846	846	Average of Difference and Growth		
	Kline	W of Kline	WB	925	728	1133	825	1214	55.6%	2.2%	47.1%	389	1314	1361	4%	1337	1337	Average of Difference and Growth		
	Kline	E of Kline	EB	955	542	763	596	807	40.8%	1.6%	35.7%	212	1167	1296	10%	1231	1167	Difference Method		Absolute difference >10% -> Used difference only
	E of Kline	Kline	WB	1120	976	1421	1083	1510	45.6%	1.8%	39.5%	427	1547	1562	1%	1555	1547	Difference Method		Absolute difference >10% -> Used difference only
	W of Roseburg Mall	Roseburg Mall	EB	955	589	816	643	861	38.5%	1.5%	33.9%	218	1173	1278	9%	1226	1226	Average of Difference and Growth		
	Roseburg Mall	W of Roseburg Mall	WB	1120	1008	1455	1115	1544	44.3%	1.8%	38.5%	429	1549	1551	0%	1550	1550	Average of Difference and Growth		
	Roseburg Mall	Stewart	EB	955	816	1184	904	1258	45.1%	1.8%	39.1%	353	1308	1328	2%	1318	1318	Average of Difference and Growth		
	Stewart	Roseburg Mall	WB	1175	1075	1546	1189	1643	44.0%	1.8%	38.2%	454	1629	1624	0%	1626	1626	Average of Difference and Growth		
	Stewart	Goetz/Duck Pond	EB	1180	1106	1498	1058	1415	35.0%	1.4%	31.4%	377	1557	1551	0%	1554	1554	Average of Difference and Growth		
	Goetz/Duck Pond	Stewart	WB	1415	1192	1375	1236	1413	15.5%	0.6%	14.3%	177	692	1617	2%	1604	1604	Average of Difference and Growth		
	Goetz/Duck Pond	E of Goetz/Duck Pond	EB	1150	1106	1499	1200	1578	35.5%	1.4%	31.4%	377	1527	1511	1%	1519	1519	Average of Difference and Growth		
	E of Goetz/Duck Pond	Goetz/Duck Pond	WB	1340	1192	1376	1236	1413	15.4%	0.6%	14.3%	177	1517	1531	1%	1524	1524	Average of Difference and Growth		
	W of Walnut	Walnut	EB	915	807	1031	861	1076	27.8%	1.1%	25.0%	215	1130	1144	1%	1137	1137	Average of Difference and Growth		
	Walnut	W of Walnut	WB	920	696	843	731	872	21.1%	0.8%	19.3%	141	1061	1098	3%	1079	1079	Average of Difference and Growth		
Walnut	E of Walnut	EB	880	807	1031	861	1076	27.8%	1.1%	25.0%	215	1095	1100	0%	1097	1097	Average of Difference and Growth			
E of Walnut	Walnut	WB	840	696	843	731	872	21.1%	0.8%	19.3%	141	981	1002	2%	992	992	Average of Difference and Growth			
W of Rocky Ridge	Rocky Ridge	EB	245	4	36	12	42	800.0%	32.0%	263.0%	31	276	889	105%	583	276	Difference Method	Absolute difference >10% -> Used difference only		
Rocky Ridge	W of Rocky Ridge	WB	130	2	2	2	2	0.0%	0.0%	0.0%	0	130	130	0%	130	130	Difference Method	To be consistent with method used for opposing direction		
Rocky Ridge	E of Rocky Ridge	EB	170	4	36	12	42	800.0%	32.0%	263.0%	31	201	617	102%	409	201	Difference Method	Absolute difference >10% -> Used difference only		
E of Rocky Ridge	Rocky Ridge	WB	95	2	2.0	2	2	0.0%	0.0%	0.0%	0	95	95	0%	95	95	Difference Method	To be consistent with method used for opposing direction		
Calkins Ave	W of Trout	Trout	EB	35	50	77	56	82	54.0%	2.2%	45.9%	26	61	51	18%	56	61	Difference Method	Absolute difference >10% -> Used difference only	
	Trout	W of Trout	WB	56	105	190	125	207	81.0%	3.2%	65.1%	82	138	92	39%	115	138	Difference Method	Absolute difference >10% -> Used difference only	
	Trout	E of Trout	EB	65	81	131	93	141</												

Road	From	To	Direction	Model Assignment					2010-2035 Model Comparison		2016-2040 Model Comparison		Post Processed Volumes Future 2040 No Build Year				Forecast Used	Method Used	Comments	Additional Comments	
				Existing 30HV	Baseline Model	Future Ref Model	Interpolated Model	Forecasted Model	Total Growth	Annual Growth	Total Growth	Volume Difference	Volume Difference	Volume Growth	Absolute Difference	Average					
				2016	2010	2035	2016	2040													
Troost St	S of Calkins	Calkins	NB	135	36	65	43	71	80.6%	3.2%	64.8%	28	163	222	31%	193	163	Difference Method	Absolute difference >10% -> Used difference only		
	N of Garden Valley	Garden Valley	SB	50	3	7	4	8	133.3%	5.3%	97.0%	4	54	98	59%	76	54	Difference Method	Absolute difference >10% -> Used difference only		Model routes onto Newcastle instead of Troost
	Garden Valley	N of Garden Valley	NB	21	2	4	2	4	100.0%	4.0%	77.4%	2	23	37	48%	30	23	Difference Method	Absolute difference >10% -> Used difference only		Model routes onto Newcastle instead of Troost
	Garden Valley	S of Garden Valley	SB	220	114	156	124	164	36.8%	1.5%	32.5%	40	260	291	11%	276	260	Difference Method	To be consistent with method used for opposing direction		
	S of Garden Valley	Garden Valley	NB	191	64	98	72	105	53.1%	2.1%	45.2%	33	224	277	21%	251	224	Difference Method	Absolute difference >10% -> Used difference only		
	N of Calkins	Calkins	SB	125	34	47	37	50	38.2%	1.5%	33.6%	12	137	167	19%	152	137	Difference Method	Absolute difference >10% -> Used difference only		
Lincoln St	Calkins	N of Calkins	NB	95	52	99	63	108	90.4%	3.6%	71.3%	45	140	163	15%	151	140	Difference Method	Absolute difference >10% -> Used difference only		
	Calkins	S of Calkins	SB	110	36	102	52	115	183.3%	7.3%	122.2%	63	173	244	34%	209	173	Difference Method	Absolute difference >10% -> Used difference only		
	S of Calkins	Calkins	NB	56	27	53	33	58	96.3%	3.9%	75.1%	25	81	98	19%	90	81	Difference Method	Absolute difference >10% -> Used difference only		
	N of Malheur	Malheur	SB	100	62	62	62	62	0.0%	0.0%	0.0%	0	100	100	0%	100	100	Average of Difference and Growth			TAZ should not decrease
	Malheur	N of Malheur	NB	51	154	154	154	154	0.0%	0.0%	0.0%	0	51	51	0%	51	51	Average of Difference and Growth			TAZ should not decrease
	Malheur	S of Malheur	SB	58	1	1.5	1	2	50.0%	2.0%	42.9%	0	58	83	34%	71	58	Difference Method	Absolute difference >10% -> Used difference only		TAZ should not decrease
Malheur Ave	S of Malheur	Malheur	NB	32	1	1.5	1	2	50.0%	2.0%	42.9%	0	32	46	34%	39	32	Difference Method	Absolute difference >10% -> Used difference only		TAZ should not decrease
	W of Lincoln	Lincoln	EB	7	154	154	154	154	0.0%	0.0%	0.0%	0	7	7	0%	7	7	Average of Difference and Growth	Absolute difference >10% -> Used difference only		TAZ should not decrease
	Lincoln	W of Lincoln	WB	9	62	62	62	62	0.0%	0.0%	0.0%	0	9	9	0%	9	9	Average of Difference and Growth	Absolute difference >10% -> Used difference only		TAZ should not decrease
	Lincoln	E of Lincoln	EB	50	50	53	51	54	6.0%	0.2%	5.7%	3	53	53	0%	53	53	Average of Difference and Growth	Absolute difference >10% -> Used difference only		TAZ should not decrease
	E of Lincoln	Lincoln	WB	29	29	29	29	29	0.0%	0.0%	0.0%	0	29	29	0%	29	29	Average of Difference and Growth	To be consistent with method used for opposing direction		TAZ should not decrease
	N of Garden Valley	Garden Valley	SB	21	21	21	21	21	0.0%	0.0%	0.0%	0	21	21	0%	21	21	Average of Difference and Growth			Dead and street - assume negligible growth (model shows 0)
Duck Pond St/Goetz St	Garden Valley	N of Garden Valley	NB	55	55	55	55	55	0.0%	0.0%	0.0%	0	55	55	0%	55	55	Average of Difference and Growth			Dead and street - assume negligible growth (model shows 0)
	Garden Valley	S of Garden Valley	SB	86	86	86	86	86	0.0%	0.0%	0.0%	0	86	86	0%	86	86	Average of Difference and Growth			Fred Meyer Access - assume negligible growth (model shows 0)
	S of Garden Valley	Garden Valley	NB	165	165	165	165	165	0.0%	0.0%	0.0%	0	165	165	0%	165	165	Average of Difference and Growth			Fred Meyer Access - assume negligible growth (model shows 0)
	N of Garden Valley	Garden Valley	SB	285	154	220	170	233	42.9%	1.7%	37.3%	63	348	391	12%	370	370	Average of Difference and Growth			
	Garden Valley	N of Garden Valley	NB	241	306	371	292	353	26.6%	1.1%	24.0%	61	281	273	3%	277	277	Average of Difference and Growth			
	Garden Valley	S of Garden Valley	SB	130	92	86	91	85	-6.5%	-0.3%	-6.4%	-6	124	122	2%	123	123	Average of Difference and Growth			
Kline St	S of Garden Valley	Garden Valley	NB	180	72	74	72	74	2.8%	0.1%	2.6%	2	182	185	2%	183	183	Average of Difference and Growth			
	W of Garden Valley	Garden Valley	EB	241	210	260	222	270	23.8%	1.0%	21.6%	48	289	293	1%	291	291	Average of Difference and Growth			
	Garden Valley	W of Garden Valley	WB	401	382	499	410	522	30.6%	1.2%	27.4%	112	513	511	0%	512	512	Average of Difference and Growth			
	Garden Valley	E of Garden Valley	EB	12	7	12	8	13	71.4%	2.9%	58.5%	5	17	19	12%	18	18	Average of Difference and Growth			
	E of Garden Valley	Garden Valley	WB	7	8	6	8	6	-25.0%	-1.0%	-25.5%	-2	5	5	3%	5	5	Average of Difference and Growth			
	W of Stewart	Stewart	EB	100	76	99	82	104	30.3%	1.2%	27.1%	22	122	127	4%	125	122	Difference Method	To be consistent with method used for opposing direction		
Walmart	Stewart	W of Stewart	WB	80	35	81	46	90	131.4%	5.3%	95.9%	44	124	157	23%	140	124	Difference Method			
	Stewart	E of Stewart	EB	250	52	75	58	80	44.2%	1.8%	38.4%	22	272	346	24%	309	272	Difference Method			Existing Wal-Mart driveway - Assume minimal growth
	E of Stewart	Stewart	WB	250	169	200	176	206	18.3%	0.7%	16.9%	30	280	292	4%	286	280	Difference Method			Existing Wal-Mart driveway - Assume minimal growth
	N of Garden Valley	Garden Valley	SB	35	246	279	254	286	13.4%	0.5%	12.5%	32	67	39	52%	53	67	Difference Method			
	Garden Valley	N of Garden Valley	NB	90	102	102	102	102	0.0%	0.0%	0.0%	0	90	90	0%	90	90	Average of Difference and Growth			Existing Mall driveway - Assume minimal growth
	W of Stewart	Stewart	EB	160	134	221	155	238	64.9%	2.6%	53.9%	84	244	246	1%	245	245	Average of Difference and Growth			
Valley View Dr	Stewart	W of Stewart	WB	225	242	437	289	476	80.6%	3.2%	64.8%	187	412	371	11%	392	392	Average of Difference and Growth			
	N of Garden Valley	Garden Valley	SB	16	16	16	16	16	0.0%	0.0%	0.0%	0	16	16	0%	16	16	Average of Difference and Growth			No Link volume in model - driveway
	Garden Valley	N of Garden Valley	NB	50	16	16	16	16	0.0%	0.0%	0.0%	0	50	50	0%	50	50	Average of Difference and Growth			No Link volume in model - driveway
	Garden Valley	S of Garden Valley	SB	86	36	39	37	40	8.3%	0.3%	7.8%	3	89	93	4%	91	91	Average of Difference and Growth			Model routes all to Cedar instead of Walnut
	S of Garden Valley	Garden Valley	NB	165	61.5	61.5	62	62	0.0%	0.0%	0.0%	0	165	165	0%	165	165	Average of Difference and Growth			Model routes all to Cedar instead of Walnut
	N of Garden Valley	Garden Valley	SB	45	1	1	1	1	0.0%	0.0%	0.0%	0	45	45	0%	45	45	Average of Difference and Growth			TAZ should not decrease
Cedar St	Garden Valley	N of Garden Valley	NB	85	1	1	1	1	0.0%	0.0%	0.0%	0	85	85	0%	85	85	Average of Difference and Growth			TAZ should not decrease
	N of Chestnut	Chestnut	SB	70	53	75	58	79	41.5%	1.7%	36.2%	21	91	95	5%	93	93	Average of Difference and Growth			
	Chestnut	N of Chestnut	NB	65	55	66	58	68	20.0%	0.8%	18.3%	11	76	77	2%	76	76	Average of Difference and Growth			
	Chestnut	S of Chestnut	SB	17	16	14	16	14	-14.6%	-0.6%	-14.6%	-2	15	15	1%	15	15	Average of Difference and Growth			Model routes all to Post instead of Cedar
	S of Chestnut	Chestnut	NB	20	16	17	16	18	10.1%	0.4%	9.5%	2	22	22	2%	22	22	Average of Difference and Growth			Model routes all to Post instead of Cedar
	W of Stewart	Stewart	EB	165	136	224	157	242	64.7%	2.6%	53.8%	84	249	254	2%	252	252	Average of Difference and Growth			
Harvey Ave	Stewart	W of Stewart	WB	260	247	407	285	439	64.8%	2.6%	53.8%	154	414	400	3%	407	407	Average of Difference and Growth			
	Stewart	E of Stewart	EB	110	222	207	218	204	-6.8%	-0.3%	-6.6%	-14	96	103	7%	99	96	Difference Method	To be consistent with method used for opposing direction		
	E of Stewart	Stewart	WB	125	332	403	349	417	21.4%	0.9%	19.5%	68	193	149	26%	171	193	Difference Method	Absolute difference >10% -> Used difference only		
	Stewar	S of Stewar	WB	115	65	149	85	166	129.2%	5.2%	94.7%	81	196	224	13%	210	196	Difference Method	Absolute difference >10% -> Used difference only		
	Vine	E of Vine	EB	135	85	137	97	147	61.2%	2.4%	51.2%	50	185	204	10%	195	185	Average of Difference and Growth			
	E of Vine	Vine	WB	90	98	155	112	166	58.2%	2.3%	49.0%	55	145	134	8%	139	139	Average of Difference and Growth			
Vine St	N of Alameda	Alameda	SB	100	9	18	11	20	100.0%	4.0%	77.4%	9	109	177	48%	143	143	Average of Difference and Growth			
	Alameda	N of Alameda	NB	70	7	13	8	14	85.7%	3.4%	68.2%	6	76	118	43%	97	97	Average of Difference and Growth			
	Alameda	S of Alameda	SB	120	92	156	107	169	69.6%	2.8%	57.2%	61	181	189	4%	185	181	Difference Method	To be consistent with method used for opposing direction		
	S of Alameda	Alameda	NB	130	74	124	86	134	67.6%	2.7%	55.8%	48	178	203	13%	190	178	Difference Method	Absolute difference >10% -> Used difference only		
	N of Stewart	Stewart	SB	185	37	40	38	41	8.1%	0.3%	7.6%	3	188	199	6%	194	194	Average of Difference and Growth			
	Stewart	N of Stewart	NB	80	37	36	37	36	-2.7%	-0.1%	-2.6%	-1	79	78	1%	78	78	Average of Difference and Growth			
Airport Rd	Stewart	S of Stewart	SB	160	29	38	31	40	31.0%	1.2%	27.7%	9	169	204	19%	187	169	Difference Method	Absolute difference >10% -> Used difference only		
	S of Stewart	Stewart	NB	135	18	20	18	20	11.1%	0.4%	10.4%	2	137	149	8%	143	137	Difference Method	To be consistent with method used for opposing direction		
	W of Edenbower	Edenbower	EB	55	30	40	32	42	33.3%	1.3%	29.6%	10	65	71	10%	68	65	Difference Method	Absolute difference >10% -> Used difference only		
	W of Edenbower	W of Edenbower	WB	65	66	84	70	88	27.3%	1.1%	24.6%	17	82	81	2%	82	82	Difference Method	To be consistent with method used for opposing direction		
	N of Edenbower	Edenbower																			

Road	From	To	Direction	Model Assignment					2010-2035 Model Comparison	2016-2040 Model Comparison		Post Processed Volumes				Forecast Used	Method Used	Comments	Additional Comments	
				Existing 30HV	Baseline Model	Future Model	Interpolated Model	Forecasted Model		Total Growth	Annual Growth	Total Growth	Volume Difference	Volume Growth	Absolute Difference					Average
				2016	2010	2035	2016	2040												
Mulholland	Stewart	S of Stewart	SB	220	168	492	246	557	192.9%	7.7%	126.6%	311	531	498	6%	515	531	Difference Method	Absolute difference >10% -> Used difference only	
	S of Stewart	Stewart	NB	215	282	522	340	570	85.1%	3.4%	67.8%	230	445	361	21%	403	445	Difference Method	To be consistent with method used for opposing direction	
Stevens St (OR 99)	N of Wilbur	Wilbur	SB	140	133	166	141	173	24.8%	1.0%	22.5%	32	172	171	0%	172	172	Average of Difference and Growth		
	Wilbur	N of Wilbur	NB	245	153	191	162	199	24.8%	1.0%	22.5%	36	281	300	6%	291	291	Average of Difference and Growth		
	Wilbur	Bank	SB	125	132	165	140	172	25.0%	1.0%	22.6%	32	157	153	2%	155	155	Average of Difference and Growth		
	Bank	Wilbur	NB	230	151	190	160	198	25.8%	1.0%	23.3%	37	267	284	6%	276	276	Average of Difference and Growth		
	Bank	S of Bank	SB	130	93	117	99	122	25.8%	1.0%	23.3%	23	153	160	5%	157	157	Average of Difference and Growth		
	S of Bank	Bank	NB	250	117	143	123	148	22.2%	0.9%	20.3%	25	275	301	9%	288	288	Average of Difference and Growth		
	N of Exit 129 NB Ramps	Exit 129 NB Ramps	SB	335	335	335	335	335	0.0%	0.0%	0.0%	0	240	240	0%	240	240	Difference Method	Absolute difference >10% -> Used difference only	Interchange reconstructed between 2010 and 2040
	Exit 129 NB Ramps	N of Exit 129 NB Ramps	NB	250	218	218	218	218	0.0%	0.0%	0.0%	0	250	250	0%	250	250	Difference Method	To be consistent with method used for opposing direction	Interchange reconstructed between 2010 and 2040
	Exit 129 NB Ramps	Umpqua College Rd	SB	365	359	457	383	477	27.3%	1.1%	24.6%	94	459	455	1%	457	457	Average of Difference and Growth		Interchange reconstructed between 2010 and 2040
	Umpqua College Rd	Exit 129 NB Ramps	NB	300	152	152	152	152	0.0%	0.0%	0.0%	0	300	300	0%	300	300	Average of Difference and Growth		Interchange reconstructed between 2010 and 2040
	Umpqua College Rd	S of Umpqua College	SB	295	203	450	262	499	121.7%	4.9%	90.4%	237	532	562	5%	547	547	Average of Difference and Growth		Interchange reconstructed between 2010 and 2040
	S of Umpqua College Rd	Umpqua College Rd	NB	325	195	195	195	195	0.0%	0.0%	0.0%	0	325	325	0%	325	325	Difference Method	Absolute difference >10% -> Used difference only	Interchange reconstructed between 2010 and 2040
	N of Kenneth Ford Dr	Kenneth Ford Dr	SB	435	374	524	410	554	40.1%	1.6%	35.1%	144	579	588	2%	583	579	Difference Method	To be consistent with method used for opposing direction	
	Kenneth Ford Dr	N of Kenneth Ford Dr	NB	645	622	845	676	890	35.9%	1.4%	31.7%	214	859	849	1%	854	854	Average of Difference and Growth		
	Kenneth Ford Dr	S of Kenneth Ford Dr	SB	615	374	524	410	554	40.1%	1.6%	35.1%	144	759	831	9%	795	795	Average of Difference and Growth		
	S of Kenneth Ford Dr	Kenneth Ford Dr	NB	610	622	845	676	890	35.9%	1.4%	31.7%	214	824	803	3%	814	814	Average of Difference and Growth		
	N of Edenbower	Edenbower	SB	565	389	721	469	787	85.3%	3.4%	68.0%	319	884	948	7%	916	916	Average of Difference and Growth		
	Edenbower	N of Edenbower	NB	825	657	926	722	980	40.9%	1.6%	35.8%	258	1083	1120	3%	1102	1102	Average of Difference and Growth		
	Edenbower	S of Edenbower	SB	580	381	564	425	601	48.0%	1.9%	41.3%	176	756	820	8%	788	788	Average of Difference and Growth		
	S of Edenbower	Edenbower	NB	850	566	596	573	602	5.3%	0.2%	5.0%	29	879	893	2%	886	886	Average of Difference and Growth		
	N of Newton Creek Rd	Newton Creek Rd	SB	626	304	539	360	586	77.3%	3.1%	62.6%	226	852	1018	18%	935	852	Difference Method	Absolute difference >10% -> Used difference only	
	Newton Creek Rd	N of Newton Creek Rd	NB	700	541	856	617	919	58.2%	2.3%	49.0%	302	1002	1043	4%	1023	1002	Difference Method	To be consistent with method used for opposing direction	
	Newton Creek Rd	S of Newton Creek Rd	SB	655	335	575	393	623	71.6%	2.9%	58.7%	230	885	1039	16%	962	885	Difference Method	Absolute difference >10% -> Used difference only	
	S of Newton Creek Rd	Newton Creek Rd	NB	730	630	984	715	1055	56.2%	2.2%	47.5%	340	1070	1077	1%	1073	1070	Difference Method	To be consistent with method used for opposing direction	
	N of Stewart/Alameda																			
	Stewart/Alameda																			
	Stewart/Alameda																			
	S of Stewart/Alameda																			
	N of Chestnut	Chestnut	SB	1170	1295	1756	1406	1848	35.6%	1.4%	31.5%	443	1613	1538	5%	1575	1575	Average of Difference and Growth		
	Chestnut	N of Chestnut	NB	1090	1065	1467	1161	1547	37.7%	1.5%	33.2%	386	1476	1452	2%	1464	1464	Average of Difference and Growth		
	Chestnut	Winchester	SB	1285	1318	1799	1433	1895	36.5%	1.5%	32.2%	462	1747	1699	3%	1723	1723	Average of Difference and Growth		
	Winchester	Chestnut	NB	1205	1081	1481	1177	1561	37.0%	1.5%	32.6%	384	1589	1598	1%	1594	1594	Average of Difference and Growth		
	Winchester	S of Winchester	SB	760	852	1330	967	1426	56.1%	2.2%	47.5%	459	1219	1121	8%	1170	1170	Average of Difference and Growth		
	S of Winchester	Winchester	NB	885	886	1016	917	1042	14.7%	0.6%	13.8%	125	810	718	4%	794	794	Average of Difference and Growth		
	N of Diamond Lake Blvd	Diamond Lake Blvd	SB	655	356	847	474	945	137.9%	5.5%	99.5%	471	1126	1307	15%	1216	1126	Difference Method	Absolute difference >10% -> Used difference only	
	Diamond Lake Blvd	N of Diamond Lake Blvd	NB	580	385	551	425	584	43.1%	1.7%	37.5%	159	739	798	8%	768	739	Difference Method	To be consistent with method used for opposing direction	
	Diamond Lake Blvd	S of Diamond Lake Blvd	SB	855	763	1156	857	1235	51.5%	2.1%	44.0%	377	1232	1231	0%	1232	1232	Average of Difference and Growth		
	S of Diamond Lake Blvd	Diamond Lake Blvd	NB	980	781	1069	850	1127	36.9%	1.5%	32.5%	276	1256	1299	3%	1278	1278	Average of Difference and Growth		
	Mosher	N of Mosher	NB	730	619	718	643	738	16.0%	0.6%	14.8%	95	825	838	2%	831	831	Average of Difference and Growth		
	S of Mosher	Mosher	NB	685	611	704	633	723	15.2%	0.6%	14.1%	89	774	782	1%	778	778	Average of Difference and Growth		
	N of S Gate Shopping Ctr	S Gate Shopping Ctr	SB	581	431	431	431	431	0.0%	0.0%	0.0%	0	581	581	0%	581	581	Average of Difference and Growth	No explanation for decrease - no growth	
	S Gate Shopping Ctr	N of S Gate Shopping Ctr	NB	480	397	397	397	397	0.0%	0.0%	0.0%	0	480	480	0%	480	480	Average of Difference and Growth	No explanation for decrease - no growth	
	S Gate Shopping Ctr	S of S Gate Shopping Ctr	SB	536	431	431	431	431	0.0%	0.0%	0.0%	0	536	536	0%	536	536	Average of Difference and Growth	No explanation for decrease - no growth	
	S of S Gate Shopping Ctr	S Gate Shopping Ctr	NB	482	397	397	397	397	0.0%	0.0%	0.0%	0	482	482	0%	482	482	Average of Difference and Growth	No explanation for decrease - no growth	
	S Gate Shopping Ctr	W of Stephens	EB	7	1	1	1	1	0.0%	0.0%	0.0%	0	7	7	0%	7	7	Average of Difference and Growth	No Link volume in model - driveway	
	Stephens	W of Stephens	WB	4	1	1	1	1	0.0%	0.0%	0.0%	0	4	4	0%	4	4	Average of Difference and Growth	No Link volume in model - driveway	
	Stephens	E of Stephens	WB	116	1	1	1	1	0.0%	0.0%	0.0%	0	116	116	0%	116	116	Average of Difference and Growth	No Link volume in model - driveway	
	E of Stephens	Stephens	EB	66	1	1	1	1	0.0%	0.0%	0.0%	0	66	66	0%	66	66	Average of Difference and Growth	No Link volume in model - driveway	
	Pine St	Mosher	SB	715	757	839	777	855	10.8%	0.4%	10.1%	79	794	787	1%	791	791	Average of Difference and Growth		
	Mosher	S of Mosher	SB	680	463	488	469	493	5.4%	0.2%	5.1%	24	704	715	2%	709	709	Average of Difference and Growth		
	E of Stephens	Stephens	WB	60	15	18	16	19	20.0%	0.8%	18.3%	3	63	71	12%	67	63	Difference Method	Absolute difference >10% -> Used difference only	
	Stephens	E of Stephens	EB	70	295	345	307	355	16.9%	0.7%	15.6%	48	118	81	37%	99	118	Difference Method	To be consistent with method used for opposing direction	
	Stephens	Pine	WB	50	8	4	7	3	-50.0%	-2.0%	-54.5%	-4	46	23	68%	34	46	Difference Method	Absolute difference >10% -> Used difference only	
	Pine	Stephens	EB	105	296	345	308	355	16.6%	0.7%	15.3%	47	152	121	23%	137	152	Difference Method	To be consistent with method used for opposing direction	
	Pine	W of Pine	WB	55	35	35	35	35	0.0%	0.0%	0.0%	0	55	55	0%	55	55	Average of Difference and Growth		
	W of Pine	Pine	EB	75	29	25	28	24	-13.8%	-0.6%	-13.7%	-4	71	65	9%	68	68	Average of Difference and Growth		
	Stephens	W of Stephens	WB	35	1	1	1	1	0.0%	0.0%	0.0%	0	35	35	0%	35	35	Average of Difference and Growth		
	W of Stephens	Stephens	EB	35	2	2	2	2	0.0%	0.0%	0.0%	0	35	35	0%	35	35	Average of Difference and Growth		
	Stephens	E of Stephens	EB	530	466	469	467	470	0.6%	0.0%	0.6%	3	533	533	0%	533	533	Difference Method	Absolute difference >10% -> Used difference only	
	E of Stephens	Stephens	WB	525	196	466	261	520	137.8%	5.5%	99.4%	259	784	1047	29%	915	784	Difference Method	To be consistent with method used for opposing direction	
	N of Diamond Lake Blvd	Diamond Lake Blvd	SB	580	733	729	732	728	-0.5%	0.0%	-0.5%	-4	576	577	0%	577	577	Average of Difference and Growth		TPAU STUDIED THIS INTERSECTION
	Diamond Lake Blvd	S of Diamond Lake Blvd	NB	535	604	736	636	762	21.9%	0.9%	19.9%	127	662	642	3%	652	652	Average of Difference and Growth		TPAU STUDIED THIS INTERSECTION
	N of Stephens	E of Stephens	EB																	

Existing Year 2016
Project Forecast Year 2040
Model Base Year 2010
Model Forecast Year 2035

Sidestreets not included in the regional model
Greater than 10% difference between difference and growth methods
Numbers adjusted from model to work with spreadsheet (0 growth = 1)
Previous study intersection

Model Assignment																				
Road	From	To	Direction	Existing 30HV	Baseline Model	Future Ref Model	Interpolated Model	Forecasted Model	2010-2035 Model Comparison		2016-2040 Model Comparison		Post Processed Volumes Future 2040 No Build Year				Forecast Used	Method Used	Comments	Additional Comments
				2016	2010	2035	1	2040	Total Growth	Annual Growth	Total Growth	Volume Difference	Volume Difference	Volume Growth	Absolute Difference	Average				
	Stephens	W of Stephens	WB	12	1	1	1	1	0.0%	0.0%	0.0%	0	12	12	0%	12	Average of Difference and Growth	No Link volume in model - driveway		
	Stephens	E of Stephens	EB	161	89	128	98	136	43.8%	1.8%	38.1%	37	198	222	11%	210	Average of Difference and Growth			
	E of Stephens	Stephens	WB	141	32	35	33	36	9.4%	0.4%	8.8%	3	144	153	6%	149	Average of Difference and Growth			
																	Average of Difference and Growth			
Oak Ave	Rose St	Jackson St	EB	230	312	389	330	404	24.7%	1.0%	22.4%	74	304	281	8%	293	Average of Difference and Growth			
	Jackson St	Main St	EB	195	308	385	326	400	25.0%	1.0%	22.6%	74	269	239	12%	254	Average of Difference and Growth			

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	2016	2040	2040	2040	240
						Balanced Volumes PM Peak	NCHRP 255-Base Unbalanced Future Baseline	NCHRP 255-Base Rounded Future Baseline	NCHRP 255-Base Volume Balancing Adjustments	NCHRP 255-Base Balanced Future Baseline
1	10	OR 99 @ Wilbur Rd.	EB	EBL	1	30	30	30	0	30
	10			EBT	1	0	0	0	0	0
	10	Count Date: 6/15/2015		EBR	1	5	5	5	0	5
	10		WB	WBL	1	0	0	0	0	0
	10			WBT	1	0	0	0	0	0
	10			WBR	1	0	0	0	0	0
	10	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	1	15	14	15	0	15
	10	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	1	215	261	260	0	260
	10			NBR	1	0	0	0	0	0
	10		SB	SBL	1	0	0	0	0	0
	10	PHF:		SBT	1	120	150	150	0	150
	10	0.89		SBR	1	20	21	20	0	20
			TEV	TEV	1	405	481	480	0	480
2	20	OR 99 @ N. Bank Rd.	EB	EBL	2	0	0	0	0	0
	20			EBT	2	0	0	0	0	0
	20	Count Date: 6/15/2015		EBR	2	0	0	0	0	0
	20		WB	WBL	2	20	23	25	0	25
	20			WBT	2	0	0	0	0	0
	20			WBR	2	25	36	35	0	35
	20	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	2	0	0	0	0	0
	20	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	2	205	240	240	0	240
	20			NBR	2	45	50	50	0	50
	20		SB	SBL	2	15	22	20	0	20
	20	PHF:		SBT	2	110	134	135	0	135
	20	0.94		SBR	2	0	0	0	0	0
			TEV	TEV	2	420	504	505	0	505
3	30	I-5 Exit 129 @ NB On/Off Ramps/OR 99	EB	EBL	3	85	127	125	0	125
	30			EBT	3	0	0	0	0	0
	30	Count Date: 5/11/2015		EBR	3	135	259	260	0	260
	30		WB	WBL	3	0	0	0	0	0
	30			WBT	3	0	0	0	0	0
	30			WBR	3	0	0	0	0	0
	30	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	3	135	136	135	10	145
	30	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	3	165	123	125	50	175
	30			NBR	3	0	0	0	0	0
	30		SB	SBL	3	0	0	0	0	0
	30	PHF:		SBT	3	230	198	200	40	240
	30	0.96		SBR	3	10	9	10	5	15
			TEV	TEV	3	760	852	855	105	960
4	40	I-5 Exit 129 @ SB On/Off Ramps/Del Rio Rd.	EB	EBL	4	25	37	35	0	35
	40			EBT	4	85	111	110	0	110
	40	Count Date: 5/11/2015		EBR	4	0	0	0	0	0
	40		WB	WBL	4	0	0	0	0	0
	40			WBT	4	135	117	115	20	135
	40			WBR2	4	215	270	270	0	270
	40	PM Peak Hour: 4:00 PM-5:00 PM	NB	NBL	4	0	0	0	0	0
	40	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	4	0	0	0	0	0
	40			NBR	4	0	0	0	0	0
	40		SB	SBL	4	65	145	145	0	145
	40	PHF:		SBT	4	0	0	0	0	0
	40	0.85		SBR	4	25	43	45	0	45
			TEV	TEV	4	550	723	720	20	740
5	50	OR 99 @ Del Rio Rd. /Umpqua College Rd.	EB	EBL	5	45	55	55	0	55
	50			EBT	5	35	54	55	0	55
	50	Count Date: 6/3/2015		EBR	5	70	164	165	-20	145
	50		WB	WBL	5	85	137	135	0	135
	50			WBT	5	140	131	130	35	165
	50			WBR	5	55	46	45	20	65
	50	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	5	70	77	75	15	90
	50	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	5	200	199	200	0	200
	50			NBR	5	55	70	70	0	70
	50		SB	SBL	5	85	99	100	5	105
	50	PHF:		SBT	5	140	246	245	0	245
	50	0.91		SBR	5	140	142	140	10	150
			TEV	TEV	5	1120	1419	1415	65	1480
6	60	NE Stephens St. @ Kenneth Ford Dr.	EB	EBL	6	0	0	0	0	0
	60			EBT	6	0	0	0	0	0
	60	Count Date: 6/15/2015		EBR	6	0	0	0	0	0
	60		WB	WBL	6	250	271	270	0	270
	60			WBT	6	0	0	0	0	0
	60			WBR	6	105	99	100	15	115
	60	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	6	0	0	0	0	0
	60	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	6	540	755	755	0	755

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	2016	2040	2040	2040	240
						Balanced Volumes PM Peak	NCHRP 255-Base Unbalanced Future Baseline	NCHRP 255-Base Rounded Future Baseline	NCHRP 255-Base Volume Balancing Adjustments	NCHRP 255-Base Balanced Future Baseline
60				NBR	6	70	80	80	0	80
60				SBL	6	70	72	70	10	80
60	PHF:		SB	SBT	6	365	524	525	0	525
60	0.96			SBR	6	0	0	0	0	0
			TEV	TEV	6	1400	1801	1800	25	1825
7	70	NW Edenbower Blvd. @ NW Broad St.(Draft IAMP 1		EBL	7	25		35	35	35
	70			EBT	7	0		0	0	0
	70	Count Date: 6/11/2015		EBR	7	30		35	35	35
	70			WBL	7	0		0	0	0
	70	Signalized	WB	WBT	7	0		0	0	0
	70			WBR	7	0		0	0	0
	70	PM Peak Hour: 4:30 PM-5:30 PM		NBL	7	50		60	60	60
	70	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	7	800		1040	1040	1040
	70			NBR	7	0		0	0	0
	70			SBL	7	0		0	0	0
	70	PHF:	SB	SBT	7	550		685	685	685
	70	0.99		SBR	7	15		20	20	20
			TEV	TEV	7	1470	0	1875	1875	1875
8	80	I-5 Exit 127 @ SB On/Off Ramps/NW Edenbower Bl		EBL	8	0		0	0	0
	80			EBT	8	550		645	645	645
	80	Count Date: 6/11/2012		EBR	8	275		430	430	430
	80			WBL	8	270		345	345	345
	80		WB	WBT	8	375		405	405	405
	80			WBR	8	0		0	0	0
	80	PM Peak Hour: 4:30 PM-5:30 PM		NBL	8	0		0	0	0
	80	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	8	0		0	0	0
	80			NBR	8	0		0	0	0
	80			SBL	8	100		100	100	100
	80	PHF:	SB	SBT	8	0		0	0	0
	80	0.93		SBR	8	190		300	300	300
			TEV	TEV	8	1760	0	2225	2225	2225
9	90	I-5 Exit 127 @ NB On/Off Ramps/NW Edenbower Bl		EBL	9	0		0	0	0
	90			EBT	9	445		470	470	470
	90	Count Date: 6/11/2012		EBR	9	205		275	275	275
	90			WBL	9	0		0	0	0
	90		WB	WBT	9	600		700	700	700
	90			WBR	9	115		195	195	195
	90	PM Peak Hour: 4:30 PM-5:30 PM		NBL	9	45		50	50	50
	90	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	9	0		5	5	5
	90			NBR	9	240		275	275	275
	90			SBL	9	0		0	0	0
	90	PHF:	SB	SBT	9	0		0	0	0
	90	0.92		SBR	9	0		0	0	0
			TEV	TEV	9	1650	0	1970	1970	1970
10	100	NW Edenbower Blvd. @ NW Aviation Dr.(Draft IAMP		EBL	10	100		140	140	140
	100			EBT	10	510		525	525	525
	100	Count Date: 6/11/2012		EBR	10	75		80	80	80
	100			WBL	10	30		30	30	30
	100		WB	WBT	10	495		615	615	615
	100			WBR	10	75		110	110	110
	100	PM Peak Hour: 6:00 PM-7:00 PM		NBL	10	65		95	95	95
	100	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	10	25		45	45	45
	100			NBR	10	45		60	60	60
	100			SBL	10	55		55	55	55
	100	PHF:	SB	SBT	10	40		40	40	40
	100	0.93		SBR	10	155		185	185	185
			TEV	TEV	10	1670	0	1980	1980	1980
11	110	NW Edenbower Blvd @ NE Stephens St.(Draft IAMP		EBL	11	340		340	340	340
	110			EBT	11	5		10	10	10
	110	Count Date: 6/11/2015		EBR	11	250		285	285	285
	110			WBL	11	5		5	5	5
	110		WB	WBT	11	10		15	15	15
	110			WBR	11	5		5	5	5
	110	PM Peak Hour: 4:30 PM-5:30 PM		NBL	11	295		385	385	385
	110	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	11	395		435	435	435
	110			NBR	11	5		5	5	5
	110			SBL	11	5		5	5	5
	110	PHF:	SB	SBT	11	375		435	435	435
	110	0.94		SBR	11	295		355	355	355
			TEV	TEV	11	1985	0	2280	2280	2280
12	120	NE Stephens St. @ NE Newton Creek Rd.		EBL	12	15	14	15	0	15
	120		EB	EBT	12	1	1	0	1	1

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	2016	2040	2040	2040	240
						Balanced Volumes PM Peak	NCHRP 255-Base Unbalanced Future Baseline	NCHRP 255-Base Rounded Future Baseline	NCHRP 255-Base Volume Balancing Adjustments	NCHRP 255-Base Balanced Future Baseline
120	Count Date: 5/14/2015		WB	EBR	12	15	16	15	0	15
				WBL	12	75	84	85	0	85
				WBT	12	1	1	0	1	1
				WBR	12	65	65	65	0	65
			NB	NBL	12	10	10	10	0	10
				NBT	12	620	923	925	0	925
				NBR	12	100	139	140	0	140
			SB	SBL	12	60	70	70	0	70
				SBT	12	565	786	785	0	785
				SBR	12	1	1	0	1	1
			TEV	TEV	12	1528	2110	2110	3	2113
13	Count Date: 6/12/2012		EB	EBL	13	665		890	890	890
				EBT	13	375		570	570	570
				EBR	13	15		25	25	25
			WB	WBL	13	85		130	130	130
				WBT	13	335		415	415	415
				WBR	13	70		85	85	85
			NB	NBL	13	35		35	35	35
				NBT	13	165		175	175	175
				NBR	13	105		130	130	130
			SB	SBL	13	55		80	80	80
				SBT	13	60		90	90	90
				SBR	13	465		545	545	545
			TEV	TEV	13	2430	0	3170	3170	3170
14	Count Date: 5/18/2015		EB	EBL	14	55	69	70	0	70
				EBT	14	1	1	0	1	1
				EBR	14	185	223	225	0	225
			WB	WBL	14	5	4	5	5	10
				WBT	14	1	1	0	1	1
				WBR	14	1	1	0	1	1
			NB	NBL	14	335	437	435	0	435
				NBT	14	380	634	635	-5	630
				NBR	14	10	15	15	0	15
			SB	SBL	14	1	1	0	5	5
				SBT	14	260	369	370	0	370
				SBR	14	65	75	75	0	75
			TEV	TEV	14	1299	1830	1830	8	1838
15	Count Date: 5/18/2015		EB	EBL	15	5	4	5	0	5
				EBT	15	420	577	575	0	575
				EBR	15	25	21	20	5	25
			WB	WBL	15	190	235	235	0	235
				WBT	15	695	1,052	1050	0	1050
				WBR	15	15	18	20	0	20
			NB	NBL	15	25	23	25	0	25
				NBT	15	1	1	0	1	1
				NBR	15	165	202	200	0	200
			SB	SBL	15	40	46	45	0	45
				SBT	15	5	4	5	0	5
				SBR	15	5	4	5	0	5
			TEV	TEV	15	1591	2188	2185	6	2191
16	Count Date: 5/18/2015		EB	EBL	16	10	17	15	0	15
				EBT	16	600	772	770	0	770
				EBR	16	35	39	40	0	40
			WB	WBL	16	75	63	65	0	65
				WBT	16	855	1,233	1235	0	1235
				WBR	16	190	238	240	0	240
			NB	NBL	16	45	58	60	0	60
				NBT	16	20	22	20	0	20
				NBR	16	115	100	100	0	100
			SB	SBL	16	240	295	295	0	295
				SBT	16	20	21	20	0	20
				SBR	16	25	46	45	0	45
			TEV	TEV	16	2230	2905	2905	0	2905
17	Count Date: 5/19/2015		EB	EBL	17	15	8	10	20	30
				EBT	17	940	1,277	1275	-90	1185
				EBR	17	0	0	0	0	0
			WB	WBL	17	0	0	0	0	0
				WBT	17	1100	1,523	1525	-10	1515
				WBR	17	75	82	80	10	90
			NB	NBL	17	0	0	0	0	0
				NBT	17	0	0	0	0	0
				NBR	17	0	0	0	0	0
			SB	SBL	17	15	41	40	0	40
				SBT	17	0	0	0	0	0
				SBR	17	0	0	0	0	0

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	2016	2040	2040	2040	240
						Balanced Volumes PM Peak	NCHRP 255-Base Unbalanced Future Baseline	NCHRP 255-Base Rounded Future Baseline	NCHRP 255-Base Volume Balancing Adjustments	NCHRP 255-Base Balanced Future Baseline
170	PHF:		SB	SBT	17	0	0	0	0	0
170	0.92		SBR		17	20	27	25	0	25
			TEV	TEV	17	2165	2958	2955	-70	2885
18	180	NW Stewart Pkwy. @ Roseburg Mall Entrance/Walton	EB	EBL	18	50	64	65	0	65
	180			EBT	18	20	21	20	0	20
	180	Count Date: 5/19/2015		EBR	18	30	36	35	0	35
	180		WB	WBL	18	185	201	200	0	200
	180			WBT	18	10	14	15	0	15
	180			WBR	18	55	63	65	0	65
	180	PM Peak Hour: 4:45 PM-5:45 PM	NB	NBL	18	50	77	75	0	75
	180	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	18	675	872	870	0	870
	180			NBR	18	175	186	185	0	185
	180		SB	SBL	18	55	65	65	0	65
	180	PHF:		SBT	18	955	1,296	1295	0	1295
	180	0.93		SBR	18	20	34	35	0	35
			TEV	TEV	18	2280	2928	2925	0	2925
19	190	NW Stewart Pkwy. @ NW Aviation Dr. /NW Mullholland	EB	EBL	19	20	43	45	0	45
	190			EBT	19	445	820	820	0	820
	190	Count Date: 2/27/2013		EBR	19	90	363	365	0	365
	190		WB	WBL	19	80	96	95	0	95
	190			WBT	19	370	620	620	0	620
	190			WBR	19	35	22	20	15	35
	190	PM Peak Hour: 5:15 PM-6:15 PM	NB	NBL	19	110	336	335	0	335
	190	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	19	30	35	35	0	35
	190			NBR	19	75	75	75	0	75
	190		SB	SBL	19	55	37	35	20	55
	190	PHF:		SBT	19	50	73	75	0	75
	190	0.85		SBR	19	25	51	50	0	50
			TEV	TEV	19	1385	2568	2570	35	2605
20	200	NW Garden Valley Blvd. @ NW Stewart Pkwy.(Draft)	EB	EBL	20	300	450	450	450	450
	200			EBT	20	545	725	725	725	725
	200	Count Date: 9/27/2012		EBR	20	65	95	95	95	95
	200		WB	WBL	20	330	390	390	390	390
	200			WBT	20	830	1040	1040	1040	1040
	200			WBR	20	295	335	335	335	335
	200	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	20	105	150	150	150	150
	200	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	20	310	400	400	400	400
	200			NBR	20	195	240	240	240	240
	200		SB	SBL	20	440	420	420	420	420
	200	PHF:		SBT	20	365	400	400	400	400
	200	0.93		SBR	20	360	435	435	435	435
			TEV	TEV	20	4140	5080	5080	5080	5080
21	210	NW Stewart Pkwy. @ NW Valley View Dr.	EB	EBL	21	80	128	130	0	130
	210			EBT	21	0	0	0	0	0
	210	Count Date: 6/10/2015		EBR	21	80	116	115	0	115
	210		WB	WBL	21	0	0	0	0	0
	210			WBT	21	0	0	0	0	0
	210			WBR	21	0	0	0	0	0
	210	PM Peak Hour: 4:45 PM-5:45 PM	NB	NBL	21	35	59	60	0	60
	210	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	21	505	636	635	0	635
	210			NBR	21	0	0	0	0	0
	210		SB	SBL	21	0	0	0	0	0
	210	PHF:		SBT	21	605	725	725	0	725
	210	0.91		SBR	21	190	333	335	0	335
			TEV	TEV	21	1495	1996	2000	0	2000
22	220	NW Stewart Pkwy. @ NE Airport Rd.	EB	EBL	22	50	59	60	0	60
	220			EBT	22	480	833	835	0	835
	220	Count Date: 5/21/2015		EBR	22	85	112	110	0	110
	220		WB	WBL	22	30	28	30	0	30
	220			WBT	22	280	514	515	0	515
	220			WBR	22	5	4	5	0	5
	220	PM Peak Hour: 4:15 PM-5:15 PM	NB	NBL	22	65	85	85	0	85
	220	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	22	25	15	15	0	15
	220			NBR	22	45	39	40	0	40
	220		SB	SBL	22	15	13	15	0	15
	220	PHF:		SBT	22	45	29	30	0	30
	220	0.88		SBR	22	125	156	155	0	155
			TEV	TEV	22	1250	1886	1895	0	1895
22.5	225	NW Stewart Pkwy. @ NE Stephens St.	EB	EBL	22.5	225				360
	225			EBT	22.5	40				70
	225	Count Date:		EBR	22.5	275				460
	225			WBL	22.5	60				100

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	2016	2040	2040	2040	240
						Balanced Volumes PM Peak	NCHRP 255-Base Unbalanced Future Baseline	NCHRP 255-Base Rounded Future Baseline	NCHRP 255-Base Volume Balancing Adjustments	NCHRP 255-Base Balanced Future Baseline
	225	PM Peak Hour: 3:00 PM-4:00 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: #DIV/0!	WB	WBT	22.5	40				70
	225			WBR	22.5	15				25
	225		NB	NBL	22.5	260				400
	225			NBT	22.5	800				900
	225			NBR	22.5	40				70
	225		SB	SBL	22.5	40				65
	225			SBT	22.5	580				590
	225			SBR	22.5	15				75
			TEV	TEV	22.5	2390	0	0	0	3185
23	230	NE Vine St. @ NE Alameda Ave. Count Date: 6/8/2015 PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: 0.93	EB	EBL	23	15	27	25	0	25
	230			EBT	23	70	116	115	0	115
	230			EBR	23	35	65	65	0	65
	230		WB	WBL	23	25	33	35	0	35
	230			WBT	23	55	93	95	0	95
	230			WBR	23	10	13	15	0	15
	230		NB	NBL	23	40	67	65	0	65
	230			NBT	23	45	57	55	0	55
	230			NBR	23	45	53	55	0	55
	230		SB	SBL	23	20	25	25	0	25
	230			SBT	23	60	83	85	0	85
	230			SBR	23	20	35	35	0	35
			TEV	TEV	23	440	668	670	0	670
24	240	NW Troost St. @ NW Calkins Rd. Count Date: 5/19/2015 PM Peak Hour: 4:15 PM-5:15 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: 0.84	EB	EBL	24	25	34	35	0	35
	240			EBT	24	10	26	25	0	25
	240			EBR	24	0	0	0	5	5
	240		WB	WBL	24	50	122	120	0	120
	240			WBT	24	25	95	95	0	95
	240			WBR	24	35	68	70	0	70
	240		NB	NBL	24	1	2	0	5	5
	240			NBT	24	35	38	40	0	40
	240			NBR	24	20	41	40	0	40
	240		SB	SBL	24	35	46	45	0	45
	240			SBT	24	60	51	50	10	60
	240			SBR	24	30	40	40	0	40
			TEV	TEV	24	326	564	560	20	580
25	250	NW Keasey St. @ NW Calkins Rd. Count Date: 6/9/2015 PM Peak Hour: 5:15 PM-6:15 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: 0.93	EB	EBL	25	20	29	30	0	30
	250			EBT	25	0	0	0	0	0
	250			EBR	25	70	89	90	0	90
	250		WB	WBL	25	0	0	0	0	0
	250			WBT	25	0	0	0	0	0
	250			WBR	25	0	0	0	0	0
	250		NB	NBL	25	85	119	120	0	120
	250			NBT	25	50	69	70	0	70
	250			NBR	25	0	0	0	0	0
	250		SB	SBL	25	0	0	0	0	0
	250			SBT	25	85	104	105	0	105
	250			SBR	25	45	64	65	0	65
			TEV	TEV	25	355	474	480	0	480
26	260	NW Garden Valley Blvd. @ NW Goetz Street/Duck P Count Date: 4/25/2016 PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: 0.97	EB	EBL	26	40	42	40	0	40
	260			EBT	26	1090	1,459	1460	0	1460
	260			EBR	26	50	53	55	0	55
	260		WB	WBL	26	35	32	30	5	35
	260			WBT	26	1295	1,484	1485	0	1485
	260			WBR	26	10	9	10	0	10
	260		NB	NBL	26	110	111	110	0	110
	260			NBT	26	5	4	5	0	5
	260			NBR	26	50	50	50	0	50
	260		SB	SBL	26	10	10	10	0	10
	260			SBT	26	1	1	0	5	5
	260			SBR	26	10	10	10	0	10
			TEV	TEV	26	2706	3265	3265	10	3275
27	270	NW Garden Valley Blvd. @ Centennial Dr./NE Este Count Date: 10/8/2014 PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: 0.95	EB	EBL	27	15				30
	270			EBT	27	1100				1215
	270			EBR	27	35				100
	270		WB	WBL	27	35				70
	270			WBT	27	1215				1280
	270			WBR	27	15				25
	270		NB	NBL	27	85				160
	270			NBT	27	5				5
	270			NBR	27	155				235
	270		SB	SBL	27	25				40
	270			SBT	27	1				1
	270			SBR	27	40				65

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	2016	2040	2040	2040	240
						Balanced Volumes PM Peak	NCHRP 255-Base Unbalanced Future Baseline	NCHRP 255-Base Rounded Future Baseline	NCHRP 255-Base Volume Balancing Adjustments	NCHRP 255-Base Balanced Future Baseline
			TEV	TEV	27	2726	0	0	0	3226
28	280	NW Garden Valley Blvd. @ Garden Valley Shopping	EB	EBL	28	160				235
	280			EBT	28	1120				1270
	280			EBR	28	5				5
	280		WB	WBL	28	5				5
	280			WBT	28	1070				1275
	280			WBR	28	55				55
	280		NB	NBL	28	15				25
	280			NBT	28	5				5
	280			NBR	28	25				25
	280		SB	SBL	28	305				315
	280			SBT	28	1				1
	280			SBR	28	145				305
			TEV	TEV	28	2911	0	0	0	3521
29	290	I-5 Exit 125 @ SB On-Ramp/NW Garden Valley Blvd	EB	EBL	29	0		0	0	0
	290			EBT	29	1625		1875	1875	1875
	290			EBR	29	605		630	630	630
	290		WB	WBL	29	0		0	0	0
	290			WBT	29	1385		1570	1570	1570
	290			WBR	29	290		530	530	530
	290		NB	NBL	29	0		0	0	0
	290			NBT	29	0		0	0	0
	290			NBR	29	0		0	0	0
	290		SB	SBL	29	100		145	145	145
	290			SBT	29	0		0	0	0
	290			SBR	29	140		190	190	190
	290		TEV	TEV	29	4145	0	4940	4940	4940
30	300	I-5 Exit 125 @ NB Off-Ramp/NW Garden Valley Blvd	EB	EBL	30	50		65	65	65
	300			EBT	30	825		955	955	955
	300			EBR	30	160		230	230	230
	300		WB	WBL	30	130		165	165	165
	300			WBT	30	1080		1355	1355	1355
	300			WBR	30	25		40	40	40
	300		NB	NBL	30	485		560	560	560
	300			NBT	30	160		225	225	225
	300			NBR	30	245		315	315	315
	300		SB	SBL	30	35		45	45	45
	300			SBT	30	0		0	0	0
	300			SBR	30	240		265	265	265
	300		TEV	TEV	30	3435	0	4220	4220	4220
31	310	NE Garden Valley Blvd. @ NE Airport Rd./NE Cedar	EB	EBL	31	115		130	130	130
	310			EBT	31	825		970	970	970
	310			EBR	31	75		105	105	105
	310		WB	WBL	31	40		50	50	50
	310			WBT	31	855		1055	1055	1055
	310			WBR	31	30		30	30	30
	310		NB	NBL	31	95		130	130	130
	310			NBT	31	40		45	45	45
	310			NBR	31	40		50	50	50
	310		SB	SBL	31	55		60	60	60
	310			SBT	31	60		75	75	75
	310			SBR	31	75		90	90	90
	310		TEV	TEV	31	2305	0	2790	2790	2790
32	320	NE Garden Valley Blvd. @ NE Walnut Street	EB	EBL	32	40	41	40	0	40
	320			EBT	32	825	1,043	1045	0	1045
	320			EBR	32	50	55	55	0	55
	320		WB	WBL	32	35	35	35	0	35
	320			WBT	32	800	957	955	0	955
	320			WBR	32	5	5	5	0	5
	320		NB	NBL	32	110	112	110	0	110
	320			NBT	32	5	4	5	0	5
	320			NBR	32	50	49	50	0	50
	320		SB	SBL	32	5	5	5	0	5
	320			SBT	32	1	1	0	1	1
	320			SBR	32	10	10	10	0	10
	320		TEV	TEV	32	1936	2318	2315	1	2316
33	330	NE Garden Valley Blvd. @ NE Stephens St.(Draft)	EB	EBL	33	225		280	280	280
	330			EBT	33	210		285	285	285
	330			EBR	33	325		340	340	340
	330		WB	WBL	33	255		325	325	325
	330			WBT	33	220		300	300	300
	330			WBR	33	35		50	50	50

					2016	2040	2040	2040	240
					Balanced Volumes	NCHRP 255-Base	NCHRP 255-Base	NCHRP 255-Base	NCHRP 255-Base
N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	PM Peak	Unbalanced	Rounded	Volume Balancing
						Future Baseline	Future Baseline	Adjustments	Balanced
						Future Baseline	Future Baseline	Adjustments	Future Baseline
330	PM Peak Hour: 4:45 PM-5:45 PM			NBL	33	525		595	595
330	PM Peak Hour Used: 4:30 PM-5:30 PM		NB	NBT	33	875		1075	1075
330				NBR	33	45		60	60
330				SBL	33	30		45	45
330	PHF:		SB	SBT	33	705		865	865
330	0.84			SBR	33	180		240	240
			TEV	TEV	33	3630	0	4460	4460
34	NE Garden Valley Blvd. @ NE Rocky Ridge Dr.			EBL	34	80	80	80	80
340			EB	EBT	34	165	195	195	195
340	Count Date: 6/9/2015			EBR	34	0	0	0	0
340				WBL	34	0	0	0	0
340			WB	WBT	34	90	90	90	90
340				WBR	34	5	5	5	5
340	PM Peak Hour: 4:00 PM-5:00 PM			NBL	34	0	0	0	0
340	PM Peak Hour Used: 4:30 PM-5:30 PM		NB	NBT	34	0	0	0	0
340				NBR	34	0	0	0	0
340				SBL	34	5	5	5	5
340	PHF:		SB	SBT	34	0	0	0	0
340	0.72			SBR	34	40	40	40	40
			TEV	TEV	34	385	416	415	415
35	NW Stewart Pkwy. @ NW Harvey Ave.			EBL	35	25	49	50	50
350			EB	EBT	35	20	22	20	20
350	Count Date: 5/19/2015			EBR	35	120	179	180	180
350				WBL	35	45	56	55	55
350			WB	WBT	35	15	31	30	30
350				WBR	35	65	106	105	105
350	PM Peak Hour: 4:45 PM-5:45 PM			NBL	35	205	299	300	300
350	PM Peak Hour Used: 4:30 PM-5:30 PM		NB	NBT	35	470	543	545	545
350				NBR	35	20	13	15	15
350				SBL	35	70	61	60	60
350	PHF:		SB	SBT	35	595	697	695	695
350	0.88			SBR	35	40	77	75	75
			TEV	TEV	35	1690	2132	2130	2130
36	NE Chestnut Ave. @ NE Cedar St.			EBL	36	20	34	35	35
360			EB	EBT	36	35	43	45	45
360	Count Date: 6/9/2015			EBR	36	1	1	0	1
360				WBL	36	1	0	0	1
360			WB	WBT	36	40	46	45	45
360				WBR	36	35	31	30	35
360	PM Peak Hour: 4:15 PM-5:15 PM			NBL	36	5	7	5	10
360	PM Peak Hour Used: 4:30 PM-5:30 PM		NB	NBT	36	10	11	10	10
360				NBR	36	5	4	5	5
360				SBL	36	40	47	45	45
360	PHF:		SB	SBT	36	15	13	15	15
360	0.72			SBR	36	15	31	30	30
			TEV	TEV	36	222	268	265	277
37	NE Stephens St. @ NE Chestnut Ave.			EBL	37	10	10	10	10
370			EB	EBT	37	0	0	0	1
370	Count Date: 5/20/2015			EBR	37	140	160	160	0
370				WBL	37	0	0	0	1
370			WB	WBT	37	0	0	0	1
370				WBR	37	0	0	0	1
370	PM Peak Hour: 4:45 PM-5:45 PM			NBL	37	125	126	125	0
370	PM Peak Hour Used: 4:30 PM-5:30 PM		NB	NBT	37	1080	1,454	1455	0
370				NBR	37	0	0	0	1
370				SBL	37	0	0	0	1
370	PHF:		SB	SBT	37	1145	1,563	1565	0
370	0.90			SBR	37	25	22	20	0
			TEV	TEV	37	2525	3335	3335	3341
38	NE Stephens St. @ NE Winchester St.			EBL	38	0	0	0	0
380			EB	EBT	38	0	0	0	0
380	Count Date: 5/20/2015			EBR	38	0	0	0	0
380				WBL	38	0	0	0	0
380			WB	WBT	38	0	0	0	0
380				WBR	38	525	794	795	0
380	PM Peak Hour: 4:15 PM-5:15 PM			NBL	38	0	0	0	0
380	PM Peak Hour Used: 4:30 PM-5:30 PM		NB	NBT	38	680	800	800	0
380				NBR	38	5	3	5	0
380				SBL	38	525	529	530	0
380	PHF:		SB	SBT	38	760	1,170	1170	0
380	0.89			SBR	38	0	0	0	0
			TEV	TEV	38	2495	3296	3300	3300

					2016 Balanced Volumes PM Peak	2040 NCHRP 255-Base Unbalanced Future Baseline	2040 NCHRP 255-Base Rounded Future Baseline	2040 NCHRP 255-Base Volume Balancing Adjustments	240 NCHRP 255-Base Balanced Future Baseline
N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID				
39	390	NE Lincoln St. @ NE Malheur Ave.	EB	EBL	39	1	1	0	1
	390			EBT	39	5	5	5	0
	390	Count Date: 6/16/2015		EBR	39	1	1	0	1
	390		WB	WBL	39	2	2	0	5
	390			WBT	39	2	2	0	5
	390			WBR	39	25	25	25	0
	390	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	39	2	2	0	5
	390	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	39	25	25	25	0
	390			NBR	39	5	6	5	0
	390		SB	SBL	39	40	42	40	5
	390	PHF:		SBT	39	55	55	55	0
	390	0.72		SBR	39	5	5	5	0
			TEV	TEV	39	168	171	160	22
40	400	W. Harvard Ave. @ Lookingglass Rd.	EB	EBL	40	0	0	0	0
	400			EBT	40	155	211	210	5
	400	Count Date: 5/14/2015		EBR	40	5	5	5	5
	400		WB	WBL	40	280	504	505	0
	400			WBT	40	260	376	375	5
	400			WBR	40	0	0	0	0
	400	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	40	10	9	10	0
	400	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	40	0	0	0	0
	400			NBR	40	180	274	275	0
	400		SB	SBL	40	0	0	0	0
	400	PHF:		SBT	40	0	0	0	0
	400	0.93		SBR	40	0	0	0	0
			TEV	TEV	40	890	1379	1380	15
41	410	W. Harvard Ave. @ W. Broccoli St.	EB	EBL	41	10	13	15	0
	410			EBT	41	320	465	465	0
	410	Count Date: 6/5/2015		EBR	41	5	12	10	0
	410		WB	WBL	41	65	149	150	0
	410			WBT	41	510	851	850	0
	410			WBR	41	55	65	65	0
	410	PM Peak Hour: 5:00 PM-6:00 PM	NB	NBL	41	2	4	5	0
	410	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	41	1	1	0	1
	410			NBR	41	45	74	75	0
	410		SB	SBL	41	45	48	50	0
	410	PHF:		SBT	41	5	9	10	0
	410	0.92		SBR	41	25	32	30	0
			TEV	TEV	41	1088	1724	1725	1
42	420	W. Harvard Ave. @ NW Stewart Pkwy.(Draft IAMP 1	EB	EBL	42	220		270	270
	420			EBT	42	375		515	515
	420	Count Date: 10/2/2012		EBR	42	1		2	2
	420		WB	WBL	42	1		2	2
	420			WBT	42	515		715	715
	420			WBR	42	555		655	655
	420	PM Peak Hour: 4:45 PM-5:45 PM	NB	NBL	42	10		10	10
	420	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	42	20		20	20
	420			NBR	42	10		10	10
	420		SB	SBL	42	440		465	465
	420	PHF:		SBT	42	5		5	5
	420	0.93		SBR	42	300		335	335
			TEV	TEV	42	2452	0	3004	3004
43	430	W. Harvard Ave. @ W. Keady Ct.	EB	EBL	43	1	0	0	1
	430			EBT	43	795	1,037	1035	0
	430	Count Date: 6/10/2015		EBR	43	20	18	20	0
	430		WB	WBL	43	40	43	45	0
	430			WBT	43	865	1,325	1325	0
	430			WBR	43	1	0	0	1
	430	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	43	55	56	55	0
	430	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	43	1	0	0	1
	430			NBR	43	75	76	75	0
	430		SB	SBL	43	1	0	0	1
	430	PHF:		SBT	43	1	0	0	1
	430	0.87		SBR	43	1	0	0	1
			TEV	TEV	43	1856	2555	2555	6
44	440	W. Harvard Ave. @ Centennial Dr.	EB	EBL	44	20	20	20	5
	440			EBT	44	850	1,102	1100	0
	440	Count Date: 6/10/2015		EBR	44	0	0	0	0
	440		WB	WBL	44	0	0	0	0
	440			WBT	44	875	1,271	1270	0
	440			WBR	44	50	85	85	0
	440	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	44	0	0	0	0
	440	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	44	0	0	0	0

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	2016	2040	2040	2040	240
						Balanced Volumes PM Peak	NCHRP 255-Base Unbalanced Future Baseline	NCHRP 255-Base Rounded Future Baseline	NCHRP 255-Base Volume Balancing Adjustments	NCHRP 255-Base Balanced Future Baseline
440				NBR	44	0	0	0	0	0
440				SBL	44	105	446	445	0	445
440	PHF:		SB	SBT	44	0	0	0	0	0
440	0.88			SBR	44	35	96	95	0	95
			TEV	TEV	44	1935	3019	3015	5	3020
45	450	W. Harvard Ave. @ W. Maple St.(Draft IAMP 124)	EB	EBL	45	5		5	0	5
	450			EBT	45	1105		1390	0	1390
	450	Count Date: 10/10/2012		EBR	45	0		0	0	0
	450			WBL	45	0		0	0	0
	450		WB	WBT	45	1195		1520	0	1520
	450			WBR	45	15		30	0	30
	450	PM Peak Hour: 4:45 PM-5:45 PM		NBL	45	0		0	0	0
	450	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	45	0		0	0	0
	450			NBR	45	0		0	0	0
	450			SBL	45	15		40	0	40
	450	PHF:	SB	SBT	45	0		0	0	0
	450	0.86		SBR	45	10		20	0	20
			TEV	TEV	45	2345	0	3005	0	3005
46	460	W. Harvard Ave. @ W. Harrison St.(Draft IAMP 124)	EB	EBL	46	5		10	0	10
	460			EBT	46	1100		1410	0	1410
	460	Count Date: 10/3/2012		EBR	46	15		15	0	15
	460			WBL	46	10		10	0	10
	460		WB	WBT	46	1165		1505	0	1505
	460			WBR	46	20		20	0	20
	460	PM Peak Hour: 4:45 PM-5:45 PM		NBL	46	20		20	0	20
	460	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	46	1		2	0	2
	460			NBR	46	30		30	0	30
	460			SBL	46	20		20	0	20
	460	PHF:	SB	SBT	46	1		2	0	2
	460	0.83		SBR	46	25		25	0	25
			TEV	TEV	46	2412	0	3069	0	3069
47	470	W. Harvard Ave. @ W. Umpqua St.(Draft IAMP 124)	EB	EBL	47	25		35	0	35
	470			EBT	47	1060		1360	0	1360
	470	Count Date: 10/2/2012		EBR	47	15		15	0	15
	470			WBL	47	25		25	0	25
	470		WB	WBT	47	1090		1410	0	1410
	470			WBR	47	75		105	0	105
	470	PM Peak Hour: 4:15 PM-5:15 PM		NBL	47	20		20	0	20
	470	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	47	1		2	0	2
	470			NBR	47	25		25	0	25
	470			SBL	47	120		170	0	170
	470	PHF:	SB	SBT	47	1		2	0	2
	470	0.92		SBR	47	30		40	0	40
			TEV	TEV	47	2487	0	3209	0	3209
48	480	I-5 Exit 124 @ SB On/Off Ramps/W. Harvard Ave.(Draft IAMP 124)	EB	EBL	48	30		30	0	30
	480			EBT	48	870		1085	0	1085
	481	Count Date: 10/1/2012		EBR	48	295		400	0	400
	480			WBL	48	145		240	0	240
	480		WB	WBT	48	910		1215	0	1215
	480			WBR	48	5		5	0	5
	480	PM Peak Hour: 4:00 PM-5:00 PM		NBL	48	240		290	0	290
	480	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	48	30		30	0	30
	480			NBR	48	260		350	0	350
	480			SBL	48	40		40	0	40
	480	PHF:	SB	SBT	48	10		15	0	15
	480	0.95		SBR	48	50		45	0	45
			TEV	TEV	48	2885	0	3745	0	3745
49	490	I-5 Exit 124 @ NB On-Ramp/W. Harvard Ave.(Draft IAMP 124)	EB	EBL	49	0		15	-15	0
	490			EBT	49	1170		1045	315	1360
	490	Count Date:		EBR	49	0			0	0
	490			WBL	49	0		0	0	0
	490		WB	WBT	49	1065		1765	-330	1435
	490			WBR	49	440		590	0	590
	490	PM Peak Hour: 4:30 PM-5:30 PM		NBL	49	0			0	0
	490	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	49	0			0	0
	490			NBR	49	0			0	0
	490			SBL	49	0			0	0
	490	PHF:	SB	SBT	49	0			0	0
	490	#DIV/0!		SBR	49	0			0	0
			TEV	TEV	49	2675	0	3415	-30	3385
50	500	I-5 Exit 124 @ NB On/Off Ramps/W. Harvard Ave.(Draft IAMP 124)	EB	EBL	50	15		15	0	15
	500			EBT	50	845		1045	0	1045

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	2016	2040	2040	2040	240
						Balanced Volumes PM Peak	NCHRP 255-Base Unbalanced Future Baseline	NCHRP 255-Base Rounded Future Baseline	NCHRP 255-Base Volume Balancing Adjustments	NCHRP 255-Base Balanced Future Baseline
500	Count Date:		WB	EBR	50	310		300	-300	0
				WBL	50	0		0	0	0
				WBT	50	1305		1765	0	1765
			NB	WBR	50	20		25	0	25
				NBL	50	165		225	0	225
				NBT	50	5		2	0	2
			SB	NBR	50	110		170	0	170
				SBL	50	15		15	0	15
				SBT	50	0		0	0	0
			TEV	SBR	50	35		35	0	35
				TEV	50	2825	0	3597	-300	3297
51	W. Harvard Ave. @ W. Corey St.(Draft IAMP 124)		EB	EBL	51	0		0	0	0
				EBT	51	940		1200	0	1200
				EBR	51	30		30	0	30
			WB	WBL	51	5		5	0	5
				WBT	51	1320		1780	0	1780
				WBR	51	0		0	0	0
			NB	NBL	51	10		10	0	10
				NBT	51	0		0	0	0
				NBR	51	15		90	0	90
			SB	SBL	51	0		0	0	0
				SBT	51	0		0	0	0
			TEV	TEV	51	2320	0	3115	0	3115
52	SE Washington Ave. @ W. Madrone St.(Draft IAMP 124)		EB	EBL	52	50		40	0	40
				EBT	52	0		0	0	0
				EBR	52	920		1235	0	1235
			WB	WBL	52	5		10	0	10
				WBT	52	1210		1635	0	1635
				WBR	52	45		50	0	50
			NB	NBL	52	0		0	0	0
				NBT	52	0		0	0	0
				NBR	52	0		0	0	0
			SB	SBL	52	40		5	0	5
				SBT	52	0		0	0	0
			TEV	TEV	52	2385	0	3125	0	3125
53	NE Diamond Lake Blvd. @ SE Stephens St.(OR 138)		EB	EBL	53	0		0	0	0
				EBT	53	0		0	0	0
				EBR	53	0		0	0	0
			WB	WBL	53	420		675	0	675
				WBT	53	0		0	0	0
				WBR	53	70		0	0	0
			NB	NBL	53	0		0	0	0
				NBT	53	510		760	0	760
				NBR	53	470		530	0	530
			SB	SBL	53	220		490	0	490
				SBT	53	435		620	0	620
			TEV	TEV	53	2125	0	3075	0	3075
54	NE Diamond Lake Blvd. @ NE Jackson St./NE Windermere St.		EB	EBL	54	55	57	55	55	110
				EBT	54	560	858	860	-35	825
				EBR	54	75	78	80	5	85
			WB	WBL	54	20	27	25	60	85
				WBT	54	390	501	500	70	570
				WBR	54	380	504	505	-55	450
			NB	NBL	54	35	31	30	-30	0
				NBT	54	100	90	90	10	100
				NBR	54	15	20	20	20	40
			SB	SBL	54	390	436	435	5	440
				SBT	54	125	94	95	-30	65
			TEV	TEV	54	2210	2743	2745	130	2875
55	NE Diamond Lake Blvd. @ NE Fulton St.		EB	EBL	55	25	28	30	0	30
				EBT	55	775	1,063	1065	0	1065
				EBR	55	5	6	5	0	5
			WB	WBL	55	5	7	5	0	5
				WBT	55	625	826	825	0	825
				WBR	55	10	12	10	0	10
			NB	NBL	55	5	7	5	0	5
				NBT	55	1	1	0	1	1
				NBR	55	1	2	0	1	1
			SB	SBL	55	15	20	20	0	20
				SBT	55					

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	2016	2040	2040	2040	240
						Balanced Volumes PM Peak	NCHRP 255-Base Unbalanced Future Baseline	NCHRP 255-Base Rounded Future Baseline	NCHRP 255-Base Volume Balancing Adjustments	NCHRP 255-Base Balanced Future Baseline
550	PHF:	550 0.96	SB	SBT	55	1	1	0	1	1
550			SB	SBR	55	30	36	35	0	35
			TEV	TEV	55	1498	2008	2000	3	2003
56	NE Diamond Lake Blvd. @ NE Rifle Range St.	560 Count Date: 5/13/2015 560 PM Peak Hour: 4:00 PM-5:00 PM 560 PM Peak Hour Used: 4:30 PM-5:30 PM 560 PHF: 0.91	EB	EBL	56	35	52	50	0	50
560			EB	EBT	56	670	931	930	0	930
560			EB	EBR	56	80	96	95	0	95
560			WB	WBL	56	15	18	20	0	20
560			WB	WBT	56	550	734	735	0	735
560			WB	WBR	56	1	1	0	5	5
560			NB	NBL	56	55	69	70	0	70
560			NB	NBT	56	5	7	5	0	5
560			NB	NBR	56	25	32	30	0	30
560			SB	SBL	56	5	7	5	0	5
560			SB	SBT	56	5	6	5	0	5
560			SB	SBR	56	30	42	40	0	40
			TEV	TEV	56	1476	1997	1985	5	1990
57	NE Diamond Lake Blvd. @ NE Douglas Ave.	570 Count Date: 6/3/2015 570 PM Peak Hour: 4:45 PM-5:45 PM 570 PM Peak Hour Used: 4:30 PM-5:30 PM 570 PHF: 0.92	EB	EBL	57	0	0	0	0	0
570			EB	EBT	57	560	748	750	0	750
570			EB	EBR	57	5	5	5	5	10
570			WB	WBL	57	10	10	10	5	15
570			WB	WBT	57	375	499	500	0	500
570			WB	WBR	57	0	0	0	0	0
570			NB	NBL	57	5	5	5	5	10
570			NB	NBT	57	0	0	0	0	0
570			NB	NBR	57	15	15	15	5	20
570			SB	SBL	57	0	0	0	0	0
570			SB	SBT	57	0	0	0	0	0
570			SB	SBR	57	0	0	0	0	0
			TEV	TEV	57	970	1282	1285	20	1305
58	SE Washington Ave. @ SE Spruce St.(Draft IAMP 1	580 Count Date: 10/3/2012 580 PM Peak Hour: 4:45 PM-5:45 PM 580 PM Peak Hour Used: 4:30 PM-5:30 PM 580 PHF: 0.78	EB	EBL	58	0		0	0	0
580			EB	EBT	58	0		0	0	0
580			EB	EBR	58	0		0	0	0
580			WB	WBL	58	10		15	0	15
580			WB	WBT	58	1085		1465	0	1465
580			WB	WBR	58	10		10	0	10
580			NB	NBL	58	80		85	0	85
580			NB	NBT	58	120		120	0	120
580			NB	NBR	58	0		0	0	0
580			SB	SBL	58	0		0	0	0
580			SB	SBT	58	10		10	0	10
580			SB	SBR	58	95		145	0	145
			TEV	TEV	58	1410	0	1850	0	1850
59	SE Stephens St. @ SE Douglas Ave.(OR 138E Solu	590 Count Date: 1/19/2011 590 PM Peak Hour: 4:15 PM-5:15 PM 590 PM Peak Hour Used: 4:30 PM-5:30 PM 590 PHF: 0.87	EB	EBL	59	80		135	0	135
590			EB	EBT	59	95		55	0	55
590			EB	EBR	59	10		5	0	5
590			WB	WBL	59	130		220	0	220
590			WB	WBT	59	35		15	0	15
590			WB	WBR	59	105		0	0	0
590			NB	NBL	59	80		65	0	65
590			NB	NBT	59	795		1155	0	1155
590			NB	NBR	59	65		0	0	0
590			SB	SBL	59	85		185	0	185
590			SB	SBT	59	730		1035	0	1035
590			SB	SBR	59	40		75	0	75
			TEV	TEV	59	2250	0	2945	0	2945
60	SE Washington Ave. @ SE Pine St.(Draft IAMP 124	600 Count Date: 1/19/2011 600 PM Peak Hour: 4:15 PM-5:15 PM 600 PM Peak Hour Used: 4:30 PM-5:30 PM 600 PHF: 0.83	EB	EBL	60	0			0	0
600			EB	EBT	60	0			0	0
600			EB	EBR	60	0			0	0
600			WB	WBL	60	0			0	0
600			WB	WBT	60	0			0	0
600			WB	WBR	60	0			0	0
600			NB	NBL	60	0			0	0
600			NB	NBT	60	1230			1575	1575
600			NB	NBR	60	0			0	0
600			SB	SBL	60	0			0	0
600			SB	SBT	60	0			0	0
600			SB	SBR	60	630			920	920
			TEV	TEV	60	1860	0	0	2495	2495
61	SE Washington Ave. @ SE Stephens St.(Draft IAMP	610 Count Date:	EB	EBL	61	0		0	0	0
610			EB	EBT	61	0		0	0	0
610			EB	EBR	61	0		0	0	0
610			WB	WBL	61	30		55	0	55

						2040	2040	2040	240			
					2016	NCHRP 255-Base	NCHRP 255-Base	NCHRP 255-Base	NCHRP 255-Base			
					Balanced Volumes	Unbalanced	Rounded	Volume Balancing	Balanced			
N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	PM Peak	Future Baseline	Future Baseline	Adjustments	Future Baseline		
	610	PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: 0.81	WB	WBT	61	145		155	0	155		
	WBR			61	35		70	0	70			
	NB		NBL	61	290		405	0	405			
			NBT	61	940		1170	0	1170			
			NBR	61	0		0	0	0			
			SBL	61	0		0	0	0			
	SB		SBT	61	600		865	0	865			
			SBR	61	240		395	0	395			
	TEV		TEV	61	2280	0	3115	0	3115			
62	620	SE Douglas Ave. @ NE Jackson St. Count Date: 5/13/2015 PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: 0.86	EB	EBL	62	35	59	60	0	60		
	EBT			62	135	643	645	-515	130			
	EBR			62	25	56	55	5	60			
	WB		WBL	62	20	19	20	0	20			
			WBT	62	185	448	450	-235	215			
			WBR	62	70	50	50	20	70			
	NB		NBL	62	0	0	0	0	0			
			NBT	62	0	0	0	0	0			
			NBR	62	0	0	0	0	0			
	SB		SBL	62	105	120	120	5	125			
			SBT	62	75	40	40	5	45			
			SBR	62	40	56	55	0	55			
	TEV		TEV	62	690	1491	1495	-715	780			
	63		630	SE Oak Ave. @ SE Spruce St.(Draft IAMP 124) Count Date: 10/4/2012 PM Peak Hour: 4:15 PM-5:15 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: 0.94	EB	EBL	63	190		190	0	190
			EBT			63	765		1015	0	1015	
EBR		63	0				2	-1	1			
WB		WBL	63		0			0	0			
		WBT	63		0			0	0			
		WBR	63		0			0	0			
NB		NBL	63		0			0	0			
		NBT	63		0			1	1			
		NBR	63		0			5	5			
SB		SBL	63		20		20	0	20			
		SBT	63		0			1	1			
		SBR	63		0			0	0			
TEV		TEV	63		975	0	1227	6	1233			
64	640	SE Oak Ave. @ SE Pine St.(Draft IAMP 124) Count Date: PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: 0.87	EB	EBL	64	0		0	0	0		
	EBT			64	475		620	0	620			
	EBR			64	260		285	0	285			
	WB		WBL	64	0		0	0	0			
			WBT	64	0		0	0	0			
			WBR	64	0		0	0	0			
	NB		NBL	64	0		0	0	0			
			NBT	64	0		0	0	0			
			NBR	64	0		0	0	0			
	SB		SBL	64	30		100	0	100			
			SBT	64	600		820	0	820			
			SBR	64	0		0	0	0			
	TEV		TEV	64	1365	0	1825	0	1825			
65	650	SE Oak Ave. @ SE Stephens St.(Draft IAMP 124) Count Date: PM Peak Hour: 4:30 PM-5:30 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: 0.89	EB	EBL	65	300		505	0	505		
	EBT			65	205		215	0	215			
	EBR			65	0			0	0			
	WB		WBL	65	0		0	0	0			
			WBT	65	0		0	0	0			
			WBR	65	0		0	0	0			
	NB		NBL	65	0		0	0	0			
			NBT	65	925		1080	0	1080			
			NBR	65	60		125	0	125			
	SB		SBL	65	0		0	0	0			
			SBT	65	0		0	0	0			
			SBR	65	0		0	0	0			
	TEV		TEV	65	1490	0	1925	0	1925			
66	660	SE Washington Ave. @ SE Jackson St. Count Date: 6/9/2015 PM Peak Hour: 4:15 PM-5:15 PM PM Peak Hour Used: 4:30 PM-5:30 PM PHF: 0.70	EB	EBL	66	0	0	0	0	0		
	EBT			66	0	0	0	0	0			
	EBR			66	0	0	0	0	0			
	WB		WBL	66	35	48	50	-5	45			
			WBT	66	195	277	275	-35	240			
			WBR	66	0	0	0	0	0			
	NB		NBL	66	0	0	0	0	0			
			NBT	66	0	0	0	0	0			
			NBR	66	0	0	0	0	0			
	SB		SBL	66	0	0	0	0	0			
			SBT	66	80	76	75	10	85			
			SBR	66	40	39	40	0	40			

N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID	2016	2040	2040	2040	240
						Balanced Volumes PM Peak	NCHRP 255-Base Unbalanced Future Baseline	NCHRP 255-Base Rounded Future Baseline	NCHRP 255-Base Volume Balancing Adjustments	NCHRP 255-Base Balanced Future Baseline
			TEV	TEV	66	350	440	440	-30	410
67	670	SE Douglas Ave. @ SE Kane St.	EB	EBL	67	0	0	0	0	0
	670			EBT	67	175	180	180	0	180
	670	Count Date: 6/08/2015		EBR	67	65	74	75	0	75
	670		WB	WBL	67	65	127	125	-35	90
	670			WBT	67	210	225	225	35	260
	670			WBR	67	0	0	0	0	0
	670	PM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	67	60	45	45	0	45
	670	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	67	0	0	0	0	0
	670			NBR	67	70	85	85	0	85
	670		SB	SBL	67	0	0	0	0	0
	670	PHF:		SBT	67	0	0	0	0	0
	670	0.82		SBR	67	0	0	0	0	0
			TEV	TEV	67	645	736	735	0	735
68	680	SE Douglas Ave. @ SE Ramp Rd.	EB	EBL	68	0	0	0	0	0
	680			EBT	68	85	94	95	0	95
	680	Count Date: 6/2/2015		EBR	68	80	92	90	0	90
	680		WB	WBL	68	35	51	50	0	50
	680			WBT	68	55	62	60	5	65
	680			WBR	68	0	0	0	0	0
	680	PM Peak Hour: 5:00 PM-6:00 PM	NB	NBL	68	45	65	65	0	65
	680	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	68	0	0	0	0	0
	680			NBR	68	25	44	45	0	45
	680		SB	SBL	68	0	0	0	0	0
	680	PHF:		SBT	68	0	0	0	0	0
	680	0.83		SBR	68	0	0	0	0	0
			TEV	TEV	68	325	408	405	5	410
69	690	NE Douglas Ave. @ NE Rifle Range St.	EB	EBL	69	60	92	90	0	90
	690			EBT	69	50	42	40	10	50
	690	Count Date: 6/3/2015		EBR	69	0	0	0	0	0
	690		WB	WBL	69	0	0	0	0	0
	690			WBT	69	30	25	25	5	30
	690			WBR	69	10	16	15	0	15
	690	PM Peak Hour: 4:45 PM-5:45 PM	NB	NBL	69	0	0	0	0	0
	690	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	69	0	0	0	0	0
	690			NBR	69	0	0	0	0	0
	690		SB	SBL	69	20	31	30	0	30
	690	PHF:		SBT	69	0	0	0	0	0
	690	0.89		SBR	69	60	86	85	0	85
			TEV	TEV	69	230	293	285	15	300
70	700	SE Oak Ave. @ SE Jackson St.	EB	EBL	70	0	0	0	0	0
	700			EBT	70	170	224	225	0	225
	700	Count Date: 6/8/2015		EBR	70	60	67	65	0	65
	700		WB	WBL	70	0	0	0	0	0
	700			WBT	70	0	0	0	0	0
	700			WBR	70	0	0	0	0	0
	700	PM Peak Hour: 4:15 PM-5:15 PM	NB	NBL	70	0	0	0	0	0
	700	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	70	0	0	0	0	0
	700			NBR	70	0	0	0	0	0
	700		SB	SBL	70	25	30	30	0	30
	700	PHF:		SBT	70	90	93	95	5	100
	700	0.90		SBR	70	0	0	0	0	0
			TEV	TEV	70	345	414	415	5	420
71	710	SE Pine St. @ SE Mosher Ave.	EB	EBL	71	0	0	0	0	0
	710			EBT	71	50	53	55	0	55
	710	Count Date: 5/21/2015		EBR	71	25	16	15	0	15
	710		WB	WBL	71	30	28	30	0	30
	710			WBT	71	20	18	20	0	20
	710			WBR	71	0	0	0	0	0
	710	PM Peak Hour: 4:15 PM-5:15 PM	NB	NBL	71	0	0	0	0	0
	710	PM Peak Hour Used: 4:30 PM-5:30 PM		NBT	71	0	0	0	0	0
	710			NBR	71	0	0	0	0	0
	710		SB	SBL	71	55	99	100	0	100
	710	PHF:		SBT	71	625	665	665	0	665
	710	0.79		SBR	71	35	37	35	0	35
			TEV	TEV	71	840	916	920	0	920
72	720	SE Stephens St. @ SE Mosher Ave.	EB	EBL	72	50	59	60	0	60
	720			EBT	72	55	93	95	0	95
	720	Count Date: 5/20/2015		EBR	72	0	0	0	0	0
	720		WB	WBL	72	0	0	0	0	0
	720			WBT	72	30	28	30	0	30
	720			WBR	72	30	35	35	0	35

					2016 Balanced Volumes PM Peak	2040 NCHRP 255-Base Unbalanced Future Baseline	2040 NCHRP 255-Base Rounded Future Baseline	2040 NCHRP 255-Base Volume Balancing Adjustments	240 NCHRP 255-Base Balanced Future Baseline
N-S ID	Synchro ID	Intersection	Direction	Movement	Int ID				
720	PM Peak Hour: 4:15 PM-5:15 PM		NB	NBL	72	20	18	20	0
				NBT	72	650	737	735	0
				NBR	72	15	25	25	0
	PM Peak Hour Used: 4:30 PM-5:30 PM		SB	SBL	72	0	0	0	0
				SBT	72	0	0	0	0
				SBR	72	0	0	0	0
	PHF:								
	0.87								
					TEV	850	996	1000	0
73	I-5 Exit 123 @ SB On/Off Ramps/SW Portland Ave.		EB	EBL	73	0	0	0	0
				EBT	73	20	35	35	0
				EBR	73	5	10	10	0
	Count Date: 6/3/2015		WB	WBL	73	15	22	20	0
				WBT	73	10	11	10	5
				WBR	73	0	0	0	0
	PM Peak Hour: 5:00 PM-6:00 PM		NB	NBL	73	0	0	0	0
				NBT	73	0	0	0	0
				NBR	73	0	0	0	0
	PM Peak Hour Used: 4:30 PM-5:30 PM		SB	SBL	73	25	37	35	5
				SBT	73	1	2	0	1
				SBR	73	40	53	55	0
	PHF:								
	0.76								
					TEV	116	170	165	11
74	I-5 Exit 123 @ NB On/Off Ramps/SW Portland Ave.		EB	EBL	74	20	38	40	0
				EBT	74	25	37	35	0
				EBR	74	0	0	0	0
	Count Date: 6/4/2015		WB	WBL	74	0	0	0	0
				WBT	74	15	19	20	0
				WBR	74	20	23	25	0
	PM Peak Hour: 5:00 PM-6:00 PM		NB	NBL	74	10	13	15	0
				NBT	74	5	6	5	0
				NBR	74	10	9	10	0
	PM Peak Hour Used: 4:30 PM-5:30 PM		SB	SBL	74	0	0	0	0
				SBT	74	0	0	0	0
				SBR	74	0	0	0	0
	PHF:								
	0.95								
					TEV	105	145	150	0
75	SE Stephens St. @ S. Gate Shopping Center Entr		EB	EBL	75	5	5	5	0
				EBT	75	1	1	0	1
				EBR	75	1	1	0	1
	Count Date: 6/15/2015		WB	WBL	75	25	25	25	0
				WBT	75	1	1	0	1
				WBR	75	40	40	40	0
	PM Peak Hour: 4:30 PM-5:30 PM		NB	NBL	75	2	2	0	2
				NBT	75	435	435	435	0
				NBR	75	45	45	45	0
	PM Peak Hour Used: 4:30 PM-5:30 PM		SB	SBL	75	70	70	70	0
				SBT	75	510	510	510	0
				SBR	75	1	1	0	1
	PHF:								
	0.90								
					TEV	1136	1136	1130	6

ROSEBURG UGB EXCHANGE

Harvard Ave at Stewart Parkway

2021 Existing Conditions										C
Phase				Critical Pairs						
1 SBL	339	1667	0.203 Prot	1,2	0.210	0.247				
2 NBTR	10	1606	0.006	5,6	0.247					
EBL	243	1667	0.146 Perm	4 perm L	0.146	0.190		Cycle Length	120	
4 EBT	435	3350	0.130	4	0.130			Lost Time/phase	4	
5 NBL	5	1667	0.003 Prot	8 Perm L	0.001			# phases	3	
6 SBTR	362	1484	0.244	8	0.190	0.190		Total Lost Time	12	
WBL	1	968	0.001 Perm							
8 WBT	626	3299	0.190	Critical Pairs	0.437		Critical	v/c	0.49	

2040 Background										E
Phase				Critical Pairs						
1 SBL	489	1399	0.350 Prot	1,2	0.369	0.369	Cycle Length	120		
2 NBTR	32	1648	0.019	5,6	0.251					
EBL	284	1667	0.170 Perm	4 perm	0.170					
4 EBT	542	3345	0.162	4	0.162	0.228	# phases	3		
5 NBL	11	1040	0.011 Prot	8 Perm	0.001					
6 SBTR	358	1486	0.241	8	0.228					
WBL	2	1667	0.001 Perm			0.228	Critical	v/c	0.66	
8 WBT	753	3299	0.228							
				Critical Pairs	0.597					

2040 Build										F
Phase				Critical Pairs						
1	SBL	519	1399	0.371	Prot	1,2	0.390	0.390	Cycle Length	120
2	NBTR	32	1648	0.019		5,6	0.271			
	EBL	326	1667	0.196	Perm	4 perm	0.196			
4	EBT	542	3345	0.162		4	0.162	0.228	Lost Time/phase	4
5	NBL	11	1012	0.011	Prot	8 Perm	0.001			
6	SBTR	387	1486	0.260		8	0.228			
	WBL	2	1667	0.001	Perm			0.228	Critical	v/c
8	WBT	753	3299	0.228						
				Critical Pairs		0.619		0.69		

Garcen Valley at NB

2021 Existing Conditions										C
Phase										
2	NBL	529	1630	0.325	Perm	2	0.325	0.325	Cycle Length	120
2	NBTR	378	1560	0.242		6	0.179			4
4	EBT	900	3260	0.276		4	0.276	0.396	# phases	3
6	SBL	39	484	0.081	Perm	7,8	0.396			12
	SBR	261	1458	0.179					Total Lost Time	
7	EBL	54	1630	0.033	Prot	Critical Pairs		0.720	Critical	v/c
8	WBT	1178	3249	0.363						0.80

2040 Background										D
Phase										
2	NBL	583	1630	0.358	Perm	2	0.358	0.358	Cycle Length	120
	NBT	234	1716	0.136		6	0.189			4
	NBR	328	1458	0.225				0.476	# phases	3
4	EBT	995	3260	0.305		4	0.305			12
6	SBL	47	905	0.052	Perm	7,8	0.476		Total Lost Time	
	SBR	276	1458	0.189						
7	EBL	68	1630	0.042	Prot	Critical Pairs		0.834	Critical	v/c
8	WBT	1411	3246	0.435						0.93

2040 Build										D
Phase										
2	NBL	604	1630	0.371	Perm	2	0.371	0.371	Cycle Length	120
	NBT	234	1716	0.136		6	0.198			4
	NBR	328	1458	0.225				0.492	# phases	3
4	EBT	1023	3260	0.314		4	0.314			12
6	SBL	47	937	0.050	Perm	7,8	0.492		Total Lost Time	
	SBR	288	1458	0.198						
7	EBL	70	1630	0.043	Prot	Critical Pairs		0.863	Critical	v/c
8	WBT	1458	3246	0.449						0.96

2021 Existing Conditions										B
Phase										
1	SBL	48	1667	0.029	Prot	EBL PM, PT	0.018	NBL PM, PT	0.150	
		36	1667	0.022	Perm	EBL PT, WBL PM	0.017	NBL PT, SBL PM	0.128	
2	NBT	562	3249	0.173		EBL PT, WBT	0.068	NBL PT, SBT	0.334	Cycle Length
		33	1662	0.020	Prot	WBL PM, PT	0.032	SBL PM, PT	0.050	
3	WBL	20	1662	0.012	Perm	WBL PT, EBL PM	0.032	SBL PT, NBL PM	0.072	# phases
		24	200	0.120		WBL PT, EBT	0.140	SBL PT, NBT	0.202	
4	EBT	174	1630	0.107	Prot		0.140		0.334	Total Lost Time
		71	1630	0.044	Perm					
6	SBT	712	3137	0.227						
		9	1662	0.005	Prot					
7	EBL	21	1662	0.013	Perm					Critical
		18	286	0.063						
8 WBT						Critical Pairs	0.474			v/c
										0.55

2040 Background										B		
Phase												
1	SBL	36	1667	0.022	Prot	EBL PM, PT	0.032	NBL PM, PT	0.193			
		27	1667	0.016	Perm	EBL PT, WBL PM	0.033	NBL PT, SBL PM	0.159			
2	NBT	574	3304	0.174		EBL PT, WBT	0.109	NBL PT, SBT	0.386	Cycle Length	120	
3	WBL	30	1667	0.018	Prot	WBL PM, PT	0.035	SBL PM, PT	0.038	Lost Time/phase	4	
		28	1667	0.017	Perm	WBL PT, EBL PM	0.034	SBL PT, NBL PM	0.072	# phases	4	
4	EBT	21	151	0.139		WBL PT, EBT	0.157	SBL PT, NBT	0.195	Total Lost Time	16	
5	NBL	234	1641	0.143	Prot		0.157		0.386			
		82	1641	0.050	Perm							
6	SBT	732	3004	0.244								
7	EBL	27	1667	0.016	Prot					Critical	v/c	0.63
		26	1667	0.016	Perm							
8	WBT	32	344	0.093			Critical Pairs	0.543				

2040 Build										C		
Phase												
1	SBL	36	1667	0.022	Prot	EBL PM, PT	0.032	NBL PM, PT	0.270			
		27	1667	0.016	Perm	EBL PT, WBL PM	0.033	NBL PT, SBL PM	0.227			
2	NBT	574	3304	0.174		EBL PT, WBT	0.109	NBL PT, SBT	0.455	Cycle Length	120	
3	WBL	30	1667	0.018	Prot	WBL PM, PT	0.035	SBL PM, PT	0.038	Lost Time/phase	4	
		28	1667	0.017	Perm	WBL PT, EBL PM	0.034	SBL PT, NBL PM	0.081	# phases	4	
4	EBT	21	177	0.119		WBL PT, EBT	0.137	SBL PT, NBT	0.195	Total Lost Time	16	
		5	NBL	346	1641	0.211	Prot		0.137		0.455	
		97	1641	0.059	Perm							
6	SBT	732	3004	0.244								
7	EBL	27	1667	0.016	Prot					Critical	v/c	0.68
		27	1667	0.016	Perm							
8	WBT	32	344	0.093								
						Critical Pairs	0.591					

Troost at GV

2021 Existing Conditions										B
Phase										
2	NBL	28	1427	0.020	Perm	EBL PM, PT	0.003	NBL	0.020	
2	NBTR	186	1484	0.125		EBL PT, WBL PM	0.057	NBTR	0.125	Cycle Length
3	WBL	122	1667	0.073	Prot	EBL PT, WBT	0.002	SBL	0.037	Lost Time/phase
		92	1667	0.055	Perm	WBL PM, PT	0.128	SBTR	0.006	# phases
4	EBTR	472	2891	0.163		WBL PT, EBL PM	0.074			Total Lost Time
6	SBL	45	1217	0.037	Perm	WBL PT, EBT	0.236			
6	SBTR	10	1606	0.006			0.236		0.125	
7	EBL	3	1667	0.002	Prot					Critical
		2	1667	0.001	Perm					v/c
8	WBT	0	3273	0.000						0.40
							Critical Pairs	0.362		

2040 Background Phase										B
2	NBL	26	1427	0.018	Perm	EBL PM, PT	0.003	NBL	0.018	
2	NBTR	209	1484	0.141		EBL PT, WBL PM	0.057	NBTR	0.141	Cycle Length
3	WBL	154	1667	0.092	Prot	EBL PT, WBT	0.337	SBL	0.039	Lost Time/phase
		91	1667	0.055	Perm	WBL PM, PT	0.147	SBTR	0.006	
4	EBTR	599	2943	0.204		WBL PT, EBL PM	0.093			# phases
6	SBL	47	1191	0.039	Perm	WBL PT, EBT	0.296			Total Lost Time
6	SBTR	10	1606	0.006			0.337		0.141	
7	EBL	4	1667	0.002	Prot					Critical v/c
		1	1667	0.001	Perm					0.49
8	WBT	1094	3273	0.334			Critical Pairs 0.477			

2040 Build Phase										C
2	NBL	47	1421	0.033	Perm	EBL PM, PT	0.003	NBL	0.033	
2	NBTR	338	1487	0.227		EBL PT, WBL PM	0.084	NBTR	0.227	Cycle Length
3	WBL	265	1667	0.159	Prot	EBL PT, WBT	0.387	SBL	0.044	Lost Time/phase
		136	1667	0.082	Perm	WBL PM, PT	0.241	SBTR	0.009	
4	EBTR	599	2831	0.212		WBL PT, EBL PM	0.160			# phases
6	SBL	47	1059	0.044	Perm	WBL PT, EBT	0.371			Total Lost Time
6	SBTR	15	1651	0.009					0.227	
7	EBL	4	1667	0.002	Prot					Critical
		1	1667	0.001	Perm					<u>v/c</u>
8	WBT	1094	3273	0.334						<u>0.61</u>
						Critical Pairs	0.598			

Harvard at SB Ramps

2021 Existing Conditions										C				
Phase														
1 SBL	13	1641	0.008	Prot	EBL PT, WBT	0.354	NBL PM, PT	0.175	Cycle Length	120				
	34	1641	0.021	Perm							NBL PT, SBL PM	0.126		
2 NBT	36	1723	0.021		WBL PT, EBT	0.423	NBL PT, SBT	0.153	Lost Time/phase	4				
	NBR	310	1460	0.212							SBL PM, PT	0.029		
3 WBL	173	1641	0.105	Prot							SBL PT, NBL PM	0.078	# phases	4
4 EBT	1038	3273	0.317								SBL PT, NBT	0.029		
EBR	0	1460	0.000		0.423	0.175	Total Lost Time	16						
	5 NBL	172	1641	0.105					Prot					
	115	1641	0.070	Perm										
6 SBTR	72	1498	0.048											
7 EBL	36	1641	0.022	Prot										
8 WBT	1087	3273	0.332		Critical	v/c	0.69							
	WBR	0	1460	0.000										
Critical Pairs 0.597														

2040 Background										C
Phase										
1 SBL	12	1641	0.007	Prot	EBL PT, WBT	0.410	NBL PM, PT	0.175	Cycle Length	120
	35	1641	0.021	Perm			NBL PT, SBL PM	0.119		
2 NBT	32	1723	0.019				NBL PT, SBT	0.140		
NBR	368	1460	0.252				SBL PM, PT	0.029	Lost Time/phase	4
3 WBL	253	1641	0.154	Prot			SBL PT, NBL PM	0.084		
4 EBT	1142	3273	0.349		WBL PT, EBT	0.503	SBL PT, NBT	0.026		
EBR	0	1460	0.000				0.175			
5 NBL	161	1641	0.098	Prot					Total Lost Time	16
	126	1641	0.077	Perm						
6 SBTR	63	1519	0.041							
7 EBL	32	1641	0.020	Prot					Critical v/c	0.78
8 WBT	1279	3273	0.391							
WBR	0	1460	0.000		Critical Pairs 0.678					

2040 Build										C				
Phase														
1 SBL	11	1641	0.007	Prot	EBL PT, WBT	0.426	NBL PM, PT	0.194	Cycle Length	120				
	34	1641	0.021	Perm							NBL PT, SBL PM	0.135		
2 NBT	32	1723	0.019		WBL PT, EBT	0.507	NBL PT, SBT	0.157	Lost Time/phase	4				
	NBR	368	1460	0.252							SBL PM, PT	0.027		
3 WBL	253	1641	0.154	Prot							SBL PT, NBL PM	0.086	# phases	4
4 EBT	1156	3273	0.353								SBL PT, NBT	0.025		
EBR	0	1460	0.000		WBL PT, EBT	0.507	0.194	Total Lost Time	16					
5 NBL	188	1641	0.115	Prot										
	130	1641	0.079	Perm										
6 SBTR	65	1517	0.043											
7 EBL	33	1641	0.020	Prot										
8 WBT	1328	3273	0.406											
WBR	0	1460	0.000											
Critical Pairs 0.701										Critical v/c	0.81			

Garden Valley at Stewart Pkwy

2021 Existing Conditions										E
Phase										
1	SBL	432	3208	0.135						
2	NBT	270	3325	0.081	1,2,3,4	0.645			Cycle Length	120
3	WBL	325	1667	0.195	1,2,7,8	0.616			Lost Time/phase	4
4	EBT	697	2981	0.234	5,6,3,4	0.625			# phases	4
5	NBL	108	1628	0.066	5,6,7,8	0.596			Total Lost Time	16
6	SBT	432	3325	0.130						
7	EBL	260	1654	0.157	Critical Pairs	0.645	Critical		v/c	0.74
8	WBT	795	3273	0.243						

2040 Background										F
Phase										
1	SBL	433	3208	0.135						
2	NBT	412	3325	0.124	1,2,3,4	0.757			Cycle Length	120
3	WBL	402	1667	0.241	1,2,7,8	0.867			Lost Time/phase	4
4	EBT	747	2909	0.257	5,6,3,4	0.717			# phases	4
5	NBL	155	1628	0.095	5,6,7,8	0.827			Total Lost Time	16
6	SBT	412	3325	0.124						
7	EBL	464	1654	0.281	Critical Pairs	0.867	Critical		v/c	1.00
8	WBT	1072	3273	0.328						

2040 Build										F
Phase										
1	SBL	433	3208	0.135						
2	NBT	415	3325	0.125	1,2,3,4	0.792			Cycle Length	120
3	WBL	429	1667	0.257	1,2,7,8	0.909			Lost Time/phase	4
4	EBT	808	2939	0.275	5,6,3,4	0.762			# phases	4
5	NBL	155	1628	0.095	5,6,7,8	0.878			Total Lost Time	16
6	SBT	446	3325	0.134						
7	EBL	500	1654	0.302	Critical Pairs	0.909	Critical		v/c	1.05
8	WBT	1134	3273	0.346						

Garden Valley at Kline

2021 Existing Conditions										C
Phase										
1 SBL	271	1667	0.163							
2 NBTR	152	1517	0.100	1,2,3,4	0.533			Cycle Length		120
3 WBL	85	1667	0.051	1,2,7,8	0.632			Lost Time/phase		4
4 EBT	679	3096	0.219	5,6,3,4	0.333			# phases		4
5 NBL	51	1667	0.031	5,6,7,8	0.432			Total Lost Time		16
6 SBTR	51	1588	0.032							
7 EBL	12	1433	0.008	Critical Pairs	0.632		Critical	v/c		0.73
8 WBT	967	2683	0.360							

2040 Background										D
Phase										
1 SBL	311	1667	0.187							
2 NBT	21	254	0.083	1,2,3,4	0.570			Cycle Length		120
3 WBL	67	1667	0.040	1,2,7,8	0.751			Lost Time/phase		4
4 EBT	811	3116	0.260	5,6,3,4	0.382			# phases		4
5 NBL	63	1667	0.038	5,6,7,8	0.564			Total Lost Time		16
6 SBT	21	481	0.044							
7 EBL	16	1433	0.011	Critical Pairs	0.751		Critical	v/c		0.87
8 WBT	1300	2760	0.471							

2040 Build										D
Phase										
1 SBL	311	1667	0.187							
2 NBT	26	290	0.090	1,2,3,4	0.621			Cycle Length		120
3 WBL	84	1667	0.050	1,2,7,8	0.795			Lost Time/phase		4
4 EBT	925	3138	0.295	5,6,3,4	0.447			# phases		4
5 NBL	63	1667	0.038	5,6,7,8	0.621			Total Lost Time		16
6 SBT	32	499	0.064							
7 EBL	16	1433	0.011	Critical Pairs	0.795		Critical	v/c		0.92
8 WBT	1426	2807	0.508							

GV at SB Ramp

2021 Existing Conditions										C
Phase										
1 SBR	159	1458	0.109							
2				1,2,3,4	0.882			Cycle Length		120
3				1,2,7,8	0.589			Lost Time/phase		4
4 EBT	2521	3260	0.773	5,6,3,4	0.773			# phases		2
5				5,6,7,8	0.480			Total Lost Time		8
6										
7				Critical Pairs	0.882		Critical	v/c		0.95
8 WBT	1565	3260	0.480							

2040 Background										D
Phase										
1 SBR	200	1458	0.137							
2				1,2,3,4	0.946			Cycle Length		120
3				1,2,7,8	0.644			Lost Time/phase		4
4 EBT	2637	3260	0.809	5,6,3,4	0.809			# phases		2
5				5,6,7,8	0.507			Total Lost Time		8
6										
7				Critical Pairs	0.946		Critical	v/c		1.01
8 WBT	1653	3260	0.507							

2040 Build										D
Phase										
1 SBR	200	1458	0.137							
2				1,2,3,4	0.963			Cycle Length		120
3				1,2,7,8	0.665			Lost Time/phase		4
4 EBT	2692	3260	0.826	5,6,3,4	0.826			# phases		2
5				5,6,7,8	0.528			Total Lost Time		8
6										
7				Critical Pairs	0.963		Critical	v/c		1.03
8 WBT	1722	3260	0.528							

Harvard at NB Ramps

2021 Existing Conditions										B
Phase										
1 SBL	17	1630	0.010							
2 NBT	1452	3253	0.446	1,2,3,4	0.474			Cycle Length	120	
3				1,2,7,8	0.474			Lost Time/phase	4	
4 EBTR	25	1468	0.017	5,6,3,4	0.305			# phases	3	
5				5,6,7,8	0.305			Total Lost Time	12	
6 SBT	940	3260	0.288							
7				Critical Pairs	0.474		Critical	v/c	0.53	
8 WBL	17	996	0.017							

2040 Background										B
Phase										
1 SBL	16	1630	0.010							
2 NBT	1858	3253	0.571	1,2,3,4	0.651			Cycle Length	120	
3				1,2,7,8	0.599			Lost Time/phase	4	
4 EBTR	103	1461	0.070	5,6,3,4	0.408			# phases	3	
5				5,6,7,8	0.355			Total Lost Time	12	
6 SBT	1100	3260	0.337							
7				Critical Pairs	0.651		Critical	v/c	0.72	
8 WBL	16	897	0.018							

2040 Build										
Phase										
1 SBL	17	1630	0.010							
2 NBT	1897	3253	0.583	1,2,3,4	0.663			Cycle Length	120	
3				1,2,7,8	0.611			Lost Time/phase	4	
4 EBTR	102	1461	0.070	5,6,3,4	0.410			# phases	3	
5				5,6,7,8	0.358			Total Lost Time	12	
6 SBT	1109	3260	0.340							
7				Critical Pairs	0.663		Critical	v/c	0.74	
8 WBL	16	921	0.017							

HCM Signalized Intersection Capacity Analysis

9: Garden Valley Rd & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	252	676	73	341	771	367	105	262	246	419	419	388
Future Volume (vph)	252	676	73	341	771	367	105	262	246	419	419	388
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1646	3215		1662	3260	1473	1614	3325	1488	3193	3325	1473
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1646	3215		1662	3260	1473	1614	3325	1488	3193	3325	1473
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	260	697	75	352	795	378	108	270	254	432	432	400
RTOR Reduction (vph)	0	7	0	0	0	140	0	0	210	0	0	310
Lane Group Flow (vph)	260	765	0	352	795	238	108	270	44	432	432	90
Heavy Vehicles (%)	1%	2%	1%	0%	2%	1%	3%	0%	0%	1%	0%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	19.4	26.7		24.6	31.9	47.7	10.3	17.6	17.6	15.8	23.1	23.1
Effective Green, g (s)	19.4	26.7		24.6	31.9	47.7	10.3	17.6	17.6	15.8	23.1	23.1
Actuated g/C Ratio	0.19	0.26		0.24	0.31	0.46	0.10	0.17	0.17	0.15	0.22	0.22
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0		2.0	3.0	2.0	2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	310	835		398	1012	748	161	569	255	491	747	331
v/s Ratio Prot	0.16	c0.24		c0.21	0.24	0.05	0.07	0.08		c0.14	c0.13	
v/s Ratio Perm						0.11			0.03			0.06
v/c Ratio	0.84	0.92		0.88	0.79	0.32	0.67	0.47	0.17	0.88	0.58	0.27
Uniform Delay, d1	40.1	36.9		37.7	32.3	17.3	44.6	38.4	36.3	42.5	35.5	32.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.0	16.5		19.7	6.1	0.1	8.3	0.9	0.4	15.9	1.3	0.6
Delay (s)	57.1	53.4		57.4	38.4	17.4	52.9	39.2	36.8	58.4	36.8	33.5
Level of Service	E	D		E	D	B	D	D	D	E	D	C
Approach Delay (s)		54.3			37.6			40.6			43.1	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			43.5				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			102.7				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			79.6%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

9: Garden Valley Rd & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	676	73	341	771	367	105	262	246	419	419	388
Future Volume (veh/h)	252	676	73	341	771	367	105	262	246	419	419	388
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1723	1736	1750	1723	1736	1709	1750	1750	1736	1750	1736
Adj Flow Rate, veh/h	260	697	75	352	795	378	108	270	254	432	432	400
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	2	1	0	2	1	3	0	0	1	0	1
Cap, veh/h	285	702	75	361	915	616	131	830	370	446	1023	453
Arrive On Green	0.17	0.24	0.24	0.22	0.28	0.28	0.08	0.25	0.25	0.14	0.31	0.31
Sat Flow, veh/h	1654	2981	321	1667	3273	1471	1628	3325	1483	3208	3325	1471
Grp Volume(v), veh/h	260	382	390	352	795	378	108	270	254	432	432	400
Grp Sat Flow(s),veh/h/ln	1654	1637	1665	1667	1637	1471	1628	1663	1483	1604	1663	1471
Q Serve(g_s), s	17.4	26.3	26.4	23.7	26.1	22.7	7.4	7.5	17.5	15.1	11.7	29.2
Cycle Q Clear(g_c), s	17.4	26.3	26.4	23.7	26.1	22.7	7.4	7.5	17.5	15.1	11.7	29.2
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	285	385	392	361	915	616	131	830	370	446	1023	453
V/C Ratio(X)	0.91	0.99	0.99	0.97	0.87	0.61	0.82	0.33	0.69	0.97	0.42	0.88
Avail Cap(c_a), veh/h	294	385	392	361	915	616	180	1036	462	446	1130	500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.9	43.1	43.1	43.9	38.7	25.7	51.1	34.6	38.4	48.4	31.1	37.2
Incr Delay (d2), s/veh	29.4	44.1	44.0	40.2	11.0	4.5	14.1	0.3	3.9	34.4	0.4	16.5
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	9.4	15.1	15.4	13.6	11.6	8.5	3.5	3.0	6.7	8.1	4.7	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.3	87.2	87.2	84.1	49.7	30.2	65.3	34.9	42.3	82.9	31.5	53.7
LnGrp LOS	E	F	F	F	D	C	E	C	D	F	C	D
Approach Vol, veh/h		1032			1525			632			1264	
Approach Delay, s/veh		84.2			52.8			43.1			56.1	
Approach LOS		F			D			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.2	32.7	29.0	31.1	13.6	39.3	24.0	36.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	15.7	35.2	24.5	26.6	12.5	38.4	20.1	31.0				
Max Q Clear Time (g_c+I1), s	17.1	19.5	25.7	28.4	9.4	31.2	19.4	28.1				
Green Ext Time (p_c), s	0.0	3.6	0.0	0.0	0.1	3.6	0.1	2.3				
Intersection Summary												
HCM 6th Ctrl Delay				59.6								
HCM 6th LOS				E								

HCM Signalized Intersection Capacity Analysis

10: Harvard Ave & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	231	413	1	1	595	467	5	5	5	322	1	343
Future Volume (vph)	231	413	1	1	595	467	5	5	5	322	1	343
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.93		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3259		1662	3292	1473	1662	1619		1662	1488	
Flt Permitted	0.38	1.00		0.49	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	665	3259		852	3292	1473	1662	1619		1662	1488	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	243	435	1	1	626	492	5	5	5	339	1	361
RTOR Reduction (vph)	0	0	0	0	0	214	0	5	0	0	163	0
Lane Group Flow (vph)	243	436	0	1	626	278	5	5	0	339	199	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)	50.6	50.6		50.6	50.6	50.6	0.9	1.1		24.3	24.5	
Effective Green, g (s)	50.6	50.6		50.6	50.6	50.6	0.9	1.1		24.3	24.5	
Actuated g/C Ratio	0.57	0.57		0.57	0.57	0.57	0.01	0.01		0.27	0.27	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	375	1842		481	1861	832	16	19		451	407	
v/s Ratio Prot		0.13			0.19		0.00	0.00		c0.20	c0.13	
v/s Ratio Perm	c0.37			0.00		0.19						
v/c Ratio	0.65	0.24		0.00	0.34	0.33	0.31	0.27		0.75	0.49	
Uniform Delay, d1	13.3	9.8		8.5	10.4	10.4	44.0	43.8		29.8	27.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.4	0.3		0.0	0.5	1.1	4.0	2.7		6.2	0.3	
Delay (s)	21.7	10.1		8.5	10.9	11.5	48.0	46.5		36.0	27.6	
Level of Service	C	B		A	B	B	D	D		D	C	
Approach Delay (s)		14.2			11.2			47.0			31.7	
Approach LOS		B			B			D			C	
Intersection Summary												
HCM 2000 Control Delay			17.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			89.5				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			69.0%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

10: Harvard Ave & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	231	413	1	1	595	467	5	5	5	322	1	343
Future Volume (veh/h)	231	413	1	1	595	467	5	5	5	322	1	343
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1723	1750	1750	1736	1736	1750	1750	1750	1750	1750	1750
Adj Flow Rate, veh/h	243	435	1	1	626	492	5	5	5	339	1	361
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	0	1	1	0	0	0	0	0	0
Cap, veh/h	322	1912	4	572	1883	840	7	41	41	376	1	404
Arrive On Green	0.57	0.57	0.57	0.57	0.57	0.57	0.00	0.05	0.05	0.23	0.27	0.27
Sat Flow, veh/h	512	3350	8	968	3299	1471	1667	803	803	1667	4	1480
Grp Volume(v), veh/h	243	212	224	1	626	492	5	0	10	339	0	362
Grp Sat Flow(s),veh/h/ln	512	1637	1721	968	1650	1471	1667	0	1606	1667	0	1484
Q Serve(g_s), s	41.6	5.7	5.7	0.0	8.9	19.1	0.3	0.0	0.5	17.5	0.0	20.8
Cycle Q Clear(g_c), s	50.5	5.7	5.7	5.7	8.9	19.1	0.3	0.0	0.5	17.5	0.0	20.8
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	322	934	982	572	1883	840	7	0	82	376	0	405
V/C Ratio(X)	0.75	0.23	0.23	0.00	0.33	0.59	0.77	0.00	0.12	0.90	0.00	0.89
Avail Cap(c_a), veh/h	322	934	982	572	1883	840	94	0	577	456	0	855
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.6	9.4	9.4	10.8	10.1	12.2	44.0	0.0	40.1	33.3	0.0	30.9
Incr Delay (d2), s/veh	15.1	0.6	0.5	0.0	0.5	3.0	49.1	0.0	0.2	16.7	0.0	2.9
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	5.9	2.0	2.1	0.0	3.0	6.2	0.2	0.0	0.2	8.5	0.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	9.9	9.9	10.8	10.5	15.2	93.2	0.0	40.3	50.0	0.0	33.8
LnGrp LOS	D	A	A	B	B	B	F	A	D	D	A	C
Approach Vol, veh/h	679				1119				15			
Approach Delay, s/veh	20.2				12.6				58.0			
Approach LOS	C				B				E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.5	9.0		55.0	4.8	28.6		55.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	24.2	31.8		50.5	5.0	51.0		50.5				
Max Q Clear Time (g_c+I1), s	19.5	2.5		52.5	2.3	22.8		21.1				
Green Ext Time (p_c), s	0.5	0.0		0.0	0.0	1.4		10.2				
Intersection Summary												
HCM 6th Ctrl Delay	23.0											
HCM 6th LOS	C											

HCM Signalized Intersection Capacity Analysis

13: Stewart Pkwy & Harvey Ave

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	21	139	47	16	69	216	495	21	74	627	42
Future Volume (vph)	26	21	139	47	16	69	216	495	21	74	627	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.87		1.00	0.88		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1522		1662	1537		1630	3305		1662	3263	
Flt Permitted	0.69	1.00		0.40	1.00		0.29	1.00		0.43	1.00	
Satd. Flow (perm)	1216	1522		700	1537		506	3305		753	3263	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	30	24	158	53	18	78	245	562	24	84	712	48
RTOR Reduction (vph)	0	145	0	0	70	0	0	2	0	0	2	0
Lane Group Flow (vph)	30	37	0	53	26	0	245	585	0	84	759	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.4	8.3		14.8	10.0		71.2	62.1		61.8	57.2	
Effective Green, g (s)	11.4	8.3		14.8	10.0		71.2	62.1		61.8	57.2	
Actuated g/C Ratio	0.12	0.08		0.15	0.10		0.73	0.63		0.63	0.58	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	155	129		153	157		477	2098		518	1908	
v/s Ratio Prot	0.01	0.02		c0.02	0.02		c0.05	0.18		0.01	0.23	
v/s Ratio Perm	0.02			c0.04			c0.32			0.09		
v/c Ratio	0.19	0.29		0.35	0.17		0.51	0.28		0.16	0.40	
Uniform Delay, d1	38.9	42.0		36.6	40.1		5.4	7.9		7.0	11.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.5		0.5	0.2		0.4	0.3		0.1	0.6	
Delay (s)	39.1	42.4		37.1	40.3		5.8	8.2		7.0	11.6	
Level of Service	D	D		D	D		A	A		A	B	
Approach Delay (s)		42.0			39.1			7.5			11.1	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			14.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			97.8			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			62.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

13: Stewart Pkwy & Harvey Ave

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	21	139	47	16	69	216	495	21	74	627	42
Future Volume (veh/h)	26	21	139	47	16	69	216	495	21	74	627	42
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1723	1750	1750	1750	1736	1750
Adj Flow Rate, veh/h	30	24	158	53	18	78	245	562	24	84	712	48
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
Percent Heavy Veh, %	0	0	0	0	0	0	2	0	0	0	1	0
Cap, veh/h	240	29	188	163	46	197	510	1967	84	574	1758	118
Arrive On Green	0.02	0.14	0.14	0.04	0.16	0.16	0.08	0.61	0.61	0.04	0.56	0.56
Sat Flow, veh/h	1667	200	1314	1667	286	1240	1641	3249	139	1667	3137	211
Grp Volume(v), veh/h	30	0	182	53	0	96	245	287	299	84	374	386
Grp Sat Flow(s),veh/h/ln	1667	0	1513	1667	0	1527	1641	1663	1725	1667	1650	1698
Q Serve(g_s), s	1.6	0.0	11.8	2.7	0.0	5.7	6.0	8.3	8.4	2.2	13.0	13.1
Cycle Q Clear(g_c), s	1.6	0.0	11.8	2.7	0.0	5.7	6.0	8.3	8.4	2.2	13.0	13.1
Prop In Lane	1.00		0.87	1.00		0.81	1.00		0.08	1.00		0.12
Lane Grp Cap(c), veh/h	240	0	216	163	0	243	510	1006	1044	574	925	952
V/C Ratio(X)	0.12	0.00	0.84	0.32	0.00	0.40	0.48	0.29	0.29	0.15	0.40	0.41
Avail Cap(c_a), veh/h	298	0	412	210	0	430	773	1006	1044	624	925	952
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	36.1	0.0	42.2	35.9	0.0	38.1	8.5	9.5	9.5	8.7	12.6	12.6
Incr Delay (d2), s/veh	0.1	0.0	3.4	0.4	0.0	0.4	0.3	0.7	0.7	0.0	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	4.6	1.1	0.0	2.2	2.0	3.1	3.2	0.8	5.0	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	0.0	45.6	36.3	0.0	38.5	8.7	10.2	10.2	8.7	13.9	13.9
LnGrp LOS	D	A	D	D	A	D	A	B	B	A	B	B
Approach Vol, veh/h	212			149			831			844		
Approach Delay, s/veh	44.3			37.7			9.8			13.4		
Approach LOS	D			D			A			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.3	65.7	8.2	19.0	12.8	61.2	6.5	20.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.8	61.2	6.5	27.5	24.5	43.5	5.5	28.5				
Max Q Clear Time (g_c+l1), s	4.2	10.4	4.7	13.8	8.0	15.1	3.6	7.7				
Green Ext Time (p_c), s	0.0	6.4	0.0	0.6	0.3	7.9	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay	16.9											
HCM 6th LOS	B											

HCM Signalized Intersection Capacity Analysis

16: NW Troost St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	453	27	205	750	16	27	1	178	43	5	5
Future Volume (vph)	5	453	27	205	750	16	27	1	178	43	5	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.85		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	2962		1662	3260	1488	1662	1474		1662	1619	
Flt Permitted	0.36	1.00		0.43	1.00	1.00	0.75	1.00		0.50	1.00	
Satd. Flow (perm)	623	2962		753	3260	1488	1314	1474		875	1619	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	472	28	214	781	17	28	1	185	45	5	5
RTOR Reduction (vph)	0	2	0	0	0	5	0	167	0	0	5	0
Lane Group Flow (vph)	5	498	0	214	781	12	28	19	0	45	5	0
Heavy Vehicles (%)	0%	12%	0%	0%	2%	0%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	56.6	55.7		67.3	61.9	61.9	8.0	8.0		8.0	8.0	
Effective Green, g (s)	56.6	55.7		67.3	61.9	61.9	8.0	8.0		8.0	8.0	
Actuated g/C Ratio	0.67	0.66		0.80	0.73	0.73	0.09	0.09		0.09	0.09	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	429	1957		677	2393	1092	124	139		83	153	
v/s Ratio Prot	0.00	0.17		c0.03	c0.24			0.01			0.00	
v/s Ratio Perm	0.01			0.23		0.01	0.02			c0.05		
v/c Ratio	0.01	0.25		0.32	0.33	0.01	0.23	0.13		0.54	0.04	
Uniform Delay, d1	4.6	5.8		2.2	3.9	3.0	35.3	35.0		36.4	34.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.1	0.4	0.0	0.3	0.2		3.8	0.0	
Delay (s)	4.6	6.1		2.3	4.3	3.0	35.6	35.1		40.2	34.7	
Level of Service	A	A		A	A	A	D	D		D	C	
Approach Delay (s)		6.1			3.8			35.2			39.2	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			9.3			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			84.3			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			57.2%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary 16: NW Troost St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	453	27	205	750	16	27	1	178	43	5	5
Future Volume (veh/h)	5	453	27	205	750	16	27	1	178	43	5	5
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1586	1750	1750	1723	1750	1750	1750	1736	1750	1750	1750
Adj Flow Rate, veh/h	5	472	28	214	781	17	28	1	185	45	5	5
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	12	0	0	2	0	0	0	1	0	0	0
Cap, veh/h	478	1744	103	678	2198	996	324	1	262	151	142	142
Arrive On Green	0.00	0.60	0.60	0.07	0.67	0.67	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1667	2891	171	1667	3273	1483	1427	8	1476	1217	803	803
Grp Volume(v), veh/h	5	245	255	214	781	17	28	0	186	45	0	10
Grp Sat Flow(s),veh/h/ln	1667	1507	1555	1667	1637	1483	1427	0	1484	1217	0	1606
Q Serve(g_s), s	0.1	7.1	7.1	4.1	9.4	0.3	1.5	0.0	10.8	3.3	0.0	0.5
Cycle Q Clear(g_c), s	0.1	7.1	7.1	4.1	9.4	0.3	2.0	0.0	10.8	14.1	0.0	0.5
Prop In Lane	1.00		0.11	1.00		1.00	1.00		0.99	1.00		0.50
Lane Grp Cap(c), veh/h	478	909	938	678	2198	996	324	0	263	151	0	285
V/C Ratio(X)	0.01	0.27	0.27	0.32	0.36	0.02	0.09	0.00	0.71	0.30	0.00	0.04
Avail Cap(c_a), veh/h	572	909	938	1131	2198	996	687	0	640	460	0	692
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.1	8.6	8.6	5.4	6.5	5.0	32.0	0.0	35.4	42.1	0.0	31.2
Incr Delay (d2), s/veh	0.0	0.7	0.7	0.1	0.5	0.0	0.0	0.0	1.3	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.1	2.2	1.0	2.6	0.1	0.5	0.0	4.0	1.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.2	9.3	9.3	5.5	6.9	5.0	32.1	0.0	36.8	42.5	0.0	31.2
LnGrp LOS	A	A	A	A	A	A	C	A	D	D	A	C
Approach Vol, veh/h	505			1012			214			55		
Approach Delay, s/veh	9.3			6.6			36.1			40.4		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	20.7		11.1	59.7		20.7		4.9	66.0			
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5		4.5	4.5			
Max Green Setting (Gmax), s	39.5		31.5	35.5		39.5		5.5	61.5			
Max Q Clear Time (g_c+I1), s	12.8		6.1	9.1		16.1		2.1	11.4			
Green Ext Time (p_c), s	0.8		0.6	10.0		0.1		0.0	23.6			
Intersection Summary												
HCM 6th Ctrl Delay	12.0											
HCM 6th LOS	B											

Intersection

Int Delay, s/veh 2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	36	1	23	44	0	14
Future Vol, veh/h	36	1	23	44	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0
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	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	0	13
Mvmt Flow	38	1	24	46	0	15

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	39
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	4.1	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	2.2	-
Pot Cap-1 Maneuver	-	1584	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1584	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.5	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1002	-	-	1584	-
HCM Lane V/C Ratio	0.015	-	-	0.015	-
HCM Control Delay (s)	8.6	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	65	19	5	52	15	2
Future Vol, veh/h	65	19	5	52	15	2
Conflicting Peds, #/hr	0	0	0	0	0	0
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	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	20	5	56	16	2
Major/Minor		Major1		Minor2		
Conflicting Flow All		0	0	33	61	
Stage 1		-	-	0	0	
Stage 2		-	-	33	61	
Critical Hdwy		-	-	6.42	6.52	
Critical Hdwy Stg 1		-	-	-	-	
Critical Hdwy Stg 2		-	-	5.42	5.52	
Follow-up Hdwy		-	-	3.518	4.018	
Pot Cap-1 Maneuver		-	-	980	830	
Stage 1		-	-	-	-	
Stage 2		-	-	989	844	
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver		-	-	980	0	
Mov Cap-2 Maneuver		-	-	980	0	
Stage 1		-	-	-	0	
Stage 2		-	-	989	0	
Approach		NB		SB		
HCM Control Delay, s		0		8.7		
HCM LOS				A		
Minor Lane/Major Mvmt	NBT	NBR	SBLn1			
Capacity (veh/h)	-	-	980			
HCM Lane V/C Ratio	-	-	0.019			
HCM Control Delay (s)	-	-	8.7			
HCM Lane LOS	-	-	A			
HCM 95th %tile Q(veh)	-	-	0.1			

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	12	0	58	29	41	1	41	23	41	70	35
Future Vol, veh/h	29	12	0	58	29	41	1	41	23	41	70	35
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	0	0	0	5	3	0	0	5	3	2	0
Mvmt Flow	35	14	0	69	35	49	1	49	27	49	83	42
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	8.5	7.8	8.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	71%	45%	28%
Vol Thru, %	63%	29%	23%	48%
Vol Right, %	35%	0%	32%	24%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	65	41	128	146
LT Vol	1	29	58	41
Through Vol	41	12	29	70
RT Vol	23	0	41	35
Lane Flow Rate	77	49	152	174
Geometry Grp	1	1	1	1
Degree of Util (X)	0.094	0.065	0.187	0.213
Departure Headway (Hd)	4.354	4.787	4.426	4.417
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	823	748	811	813
Service Time	2.378	2.815	2.45	2.438
HCM Lane V/C Ratio	0.094	0.066	0.187	0.214
HCM Control Delay	7.8	8.1	8.5	8.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.7	0.8

HCM Signalized Intersection Capacity Analysis

29: Kline St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	638	37	80	909	202	48	21	122	255	21	27
Future Volume (vph)	11	638	37	80	909	202	48	21	122	255	21	27
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.87		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1409	3173		1662	3208		1662	1513		1662	1601	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1409	3173		1662	3208		1662	1513		1662	1601	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	12	679	39	85	967	215	51	22	130	271	22	29
RTOR Reduction (vph)	0	3	0	0	12	0	0	120	0	0	22	0
Lane Group Flow (vph)	12	715	0	85	1170	0	51	32	0	271	29	0
Heavy Vehicles (%)	18%	4%	3%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	0.9	41.8		6.0	46.9		3.8	7.1		19.6	22.9	
Effective Green, g (s)	0.9	41.8		6.0	46.9		3.8	7.1		19.6	22.9	
Actuated g/C Ratio	0.01	0.45		0.06	0.51		0.04	0.08		0.21	0.25	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	13	1433		107	1626		68	116		352	396	
v/s Ratio Prot	0.01	0.23		c0.05	c0.36		0.03	c0.02		c0.16	0.02	
v/s Ratio Perm												
v/c Ratio	0.92	0.50		0.79	0.72		0.75	0.28		0.77	0.07	
Uniform Delay, d1	45.8	17.9		42.6	17.7		43.9	40.3		34.3	26.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	205.3	1.2		30.3	2.8		33.1	0.5		8.8	0.0	
Delay (s)	251.0	19.2		73.0	20.5		77.0	40.7		43.2	26.7	
Level of Service	F	B		E	C		E	D		D	C	
Approach Delay (s)		23.0			24.0			49.9			40.5	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			27.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			92.5			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			77.3%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

29: Kline St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	11	638	37	80	909	202	48	21	122	255	21	27
Future Volume (veh/h)	11	638	37	80	909	202	48	21	122	255	21	27
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1504	1695	1709	1750	1736	1750	1750	1750	1736	1750	1750	1750
Adj Flow Rate, veh/h	12	679	39	85	967	215	51	22	130	271	22	29
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	18	4	3	0	1	0	0	0	1	0	0	0
Cap, veh/h	12	1315	75	108	1290	286	64	27	162	305	185	244
Arrive On Green	0.01	0.42	0.42	0.06	0.48	0.48	0.04	0.13	0.13	0.18	0.27	0.27
Sat Flow, veh/h	1433	3096	178	1667	2683	596	1667	219	1297	1667	685	903
Grp Volume(v), veh/h	12	353	365	85	594	588	51	0	152	271	0	51
Grp Sat Flow(s),veh/h/ln	1433	1611	1663	1667	1650	1629	1667	0	1517	1667	0	1588
Q Serve(g_s), s	0.7	14.4	14.4	4.5	26.0	26.1	2.7	0.0	8.7	14.1	0.0	2.2
Cycle Q Clear(g_c), s	0.7	14.4	14.4	4.5	26.0	26.1	2.7	0.0	8.7	14.1	0.0	2.2
Prop In Lane	1.00		0.11	1.00		0.37	1.00		0.86	1.00		0.57
Lane Grp Cap(c), veh/h	12	684	707	108	793	783	64	0	190	305	0	429
V/C Ratio(X)	0.97	0.52	0.52	0.79	0.75	0.75	0.80	0.00	0.80	0.89	0.00	0.12
Avail Cap(c_a), veh/h	81	684	707	182	793	783	178	0	579	384	0	803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.1	18.9	18.9	41.0	18.7	18.8	42.5	0.0	37.8	35.5	0.0	24.5
Incr Delay (d2), s/veh	64.4	2.8	2.7	4.7	6.4	6.5	8.5	0.0	3.0	16.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.5	5.7	1.9	10.4	10.4	1.3	0.0	3.4	7.0	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	108.5	21.6	21.5	45.7	25.1	25.3	50.9	0.0	40.8	51.8	0.0	24.5
LnGrp LOS	F	C	C	D	C	C	D	A	D	D	A	C
Approach Vol, veh/h	730		1267				203		322			
Approach Delay, s/veh	23.0		26.6				43.3		47.4			
Approach LOS	C		C				D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.8	15.6	10.3	42.3	7.9	28.5	5.3	47.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	20.5	34.0	9.7	37.8	9.5	45.0	5.0	42.5				
Max Q Clear Time (g_c+I1), s	16.1	10.7	6.5	16.4	4.7	4.2	2.7	28.1				
Green Ext Time (p_c), s	0.2	0.5	0.1	13.1	0.0	0.1	0.0	12.9				
Intersection Summary												
HCM 6th Ctrl Delay	29.6											
HCM 6th LOS	C											

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	75	91	54	91	48
Future Vol, veh/h	21	75	91	54	91	48
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	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	5	0	0	0	0	0
Mvmt Flow	23	81	98	58	98	52
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	378	124	150	0	-	0
Stage 1	124	-	-	-	-	-
Stage 2	254	-	-	-	-	-
Critical Hdwy	6.45	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	618	932	1444	-	-	-
Stage 1	894	-	-	-	-	-
Stage 2	781	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	575	932	1444	-	-	-
Mov Cap-2 Maneuver	575	-	-	-	-	-
Stage 1	831	-	-	-	-	-
Stage 2	781	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10	4.8		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1444	-	821	-	-	
HCM Lane V/C Ratio	0.068	-	0.126	-	-	
HCM Control Delay (s)	7.7	0	10	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.2	-	0.4	-	-	

HCM 6th TWSC
34: Harvey Ave & Keasey St

08/23/2021

Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	53	84	190	133	7
Future Vol, veh/h	1	53	84	190	133	7
Conflicting Peds, #/hr	0	0	0	0	0	0
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	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	61	97	218	153	8

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	315	0	0 269 206
Stage 1	-	-	- 206 -
Stage 2	-	-	- 63 -
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	1245	-	- 720 835
Stage 1	-	-	- 829 -
Stage 2	-	-	- 960 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1245	-	- 719 835
Mov Cap-2 Maneuver	-	-	- 719 -
Stage 1	-	-	- 828 -
Stage 2	-	-	- 960 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1245	-	-	-	724
HCM Lane V/C Ratio	0.001	-	-	-	0.222
HCM Control Delay (s)	7.9	0	-	-	11.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.8

HCM Signalized Intersection Capacity Analysis

35: Exit 125 & Garden Valley

08/23/2021

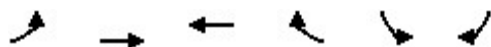
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	864	0	0	1131	26	508	168	257	37	0	251
Future Volume (vph)	52	864	0	0	1131	26	508	168	257	37	0	251
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5			4.5		4.5	4.5		4.5		4.5
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00		1.00		1.00
Frt	1.00	1.00			1.00		1.00	0.91		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1630	3260			3249		1630	1560		1630		1458
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.28		1.00
Satd. Flow (perm)	1630	3260			3249		1630	1560		484		1458
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	54	900	0	0	1178	27	529	175	268	39	0	261
RTOR Reduction (vph)	0	0	0	0	2	0	0	65	0	0	0	98
Lane Group Flow (vph)	54	900	0	0	1203	0	529	378	0	39	0	163
Turn Type	Prot	NA			NA		Perm	NA		Perm		Perm
Protected Phases	7	4			8			2				
Permitted Phases							2			6		6
Actuated Green, G (s)	4.0	46.4			37.9		30.7	30.7		30.7		30.7
Effective Green, g (s)	4.0	46.4			37.9		30.7	30.7		30.7		30.7
Actuated g/C Ratio	0.05	0.54			0.44		0.36	0.36		0.36		0.36
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5		4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0		2.0	2.0		2.0		2.0
Lane Grp Cap (vph)	75	1756			1430		581	556		172		519
v/s Ratio Prot	0.03	c0.28			c0.37			0.24				
v/s Ratio Perm							c0.32			0.08		0.11
v/c Ratio	0.72	0.51			0.84		0.91	0.68		0.23		0.31
Uniform Delay, d1	40.5	12.6			21.4		26.4	23.5		19.4		20.1
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	23.9	1.1			6.2		18.2	2.6		0.2		0.1
Delay (s)	64.4	13.7			27.6		44.6	26.1		19.6		20.2
Level of Service	E	B			C		D	C		B		C
Approach Delay (s)		16.6			27.6			36.2			20.1	
Approach LOS		B			C			D			C	
Intersection Summary												
HCM 2000 Control Delay	26.3				HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio	0.87											
Actuated Cycle Length (s)	86.1				Sum of lost time (s)				13.5			
Intersection Capacity Utilization	93.5%				ICU Level of Service				F			
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th Edition methodology does not support Non-NEMA phasing.

HCM Signalized Intersection Capacity Analysis

38: Garden Valley Rd & Hwy 125

08/23/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑	↑
Traffic Volume (vph)	0	2319	1440	0	104	146
Future Volume (vph)	0	2319	1440	0	104	146
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3260	3260		1630	1458
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3260	3260		1630	1458
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2521	1565	0	113	159
RTOR Reduction (vph)	0	0	0	0	0	21
Lane Group Flow (vph)	0	2521	1565	0	113	138
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			
Permitted Phases					6	6
Actuated Green, G (s)		53.4	53.4		11.1	11.1
Effective Green, g (s)		53.4	53.4		11.1	11.1
Actuated g/C Ratio		0.73	0.73		0.15	0.15
Clearance Time (s)		4.5	4.5		4.5	4.5
Vehicle Extension (s)		4.0	4.0		2.0	2.0
Lane Grp Cap (vph)		2368	2368		246	220
v/s Ratio Prot		c0.77	0.48			
v/s Ratio Perm					0.07	c0.09
v/c Ratio		1.06	0.66		0.46	0.63
Uniform Delay, d1		10.1	5.3		28.5	29.3
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		38.5	1.5		0.5	4.0
Delay (s)		48.6	6.8		29.0	33.2
Level of Service		D	A		C	C
Approach Delay (s)		48.6	6.8		31.4	
Approach LOS		D	A		C	
Intersection Summary						
HCM 2000 Control Delay			32.5		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.99			
Actuated Cycle Length (s)			73.5		Sum of lost time (s)	9.0
Intersection Capacity Utilization			83.4%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Edition methodology does not support Non-NEMA phasing.

HCM Signalized Intersection Capacity Analysis

40: Freeway Ave/Willow St

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	5	116	16	0	37	0	1379	21	16	893	328
Future Volume (vph)	174	5	116	16	0	37	0	1379	21	16	893	328
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5		4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00		1.00		0.95		1.00	0.95	1.00
Frt	1.00	0.86		1.00		0.85		1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1630	1468		1630		1458		3253		1630	3260	1458
Flt Permitted	0.95	1.00		0.58		1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)	1630	1468		996		1458		3253		1630	3260	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	183	5	122	17	0	39	0	1452	22	17	940	345
RTOR Reduction (vph)	0	102	0	0	0	33	0	0	0	0	0	22
Lane Group Flow (vph)	183	25	0	17	0	6	0	1474	0	17	940	323
Turn Type	Perm	NA		Perm		Perm		NA		Prot	NA	Perm
Protected Phases		4						2		1		6
Permitted Phases	4			8		8						6
Actuated Green, G (s)	18.3	18.3		18.3		18.3		77.1		2.6	84.2	84.2
Effective Green, g (s)	18.3	18.3		18.3		18.3		77.1		2.6	84.2	84.2
Actuated g/C Ratio	0.16	0.16		0.16		0.16		0.69		0.02	0.76	0.76
Clearance Time (s)	4.5	4.5		4.5		4.5		4.5		4.5	4.5	4.5
Vehicle Extension (s)	4.0	4.0		4.0		4.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	267	240		163		239		2249		38	2461	1101
v/s Ratio Prot		0.02						c0.45		0.01	c0.29	
v/s Ratio Perm	c0.11			0.02		0.00						0.22
v/c Ratio	0.69	0.10		0.10		0.03		0.66		0.45	0.38	0.29
Uniform Delay, d1	43.9	39.6		39.6		39.1		9.7		53.7	4.7	4.3
Progression Factor	1.00	1.00		1.00		1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	7.7	0.3		0.4		0.1		1.5		3.0	0.5	0.7
Delay (s)	51.6	39.9		40.0		39.2		11.2		56.8	5.1	5.0
Level of Service	D	D		D		D		B		E	A	A
Approach Delay (s)		46.8			39.4			11.2			5.8	
Approach LOS		D			D			B			A	
Intersection Summary												
HCM 2000 Control Delay			13.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			111.5				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			72.2%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support Non-NEMA phasing.

HCM Signalized Intersection Capacity Analysis

42: Harvard Ave & Bellows

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	924	313	154	967	5	255	32	276	42	11	53
Future Volume (vph)	32	924	313	154	967	5	255	32	276	42	11	53
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1630	3260	1458	1630	3260	1458	1630	1716	1458	1630	1501	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.40	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	1630	3260	1458	1630	3260	1458	686	1716	1458	1259	1501	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	36	1038	352	173	1087	6	287	36	310	47	12	60
RTOR Reduction (vph)	0	0	91	0	0	2	0	0	77	0	56	0
Lane Group Flow (vph)	36	1038	261	173	1087	4	287	36	233	47	16	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	3.9	46.3	46.3	13.8	56.2	56.2	21.4	14.0	27.8	8.7	5.8	
Effective Green, g (s)	3.9	46.3	46.3	13.8	56.2	56.2	21.4	14.0	27.8	8.7	5.8	
Actuated g/C Ratio	0.04	0.49	0.49	0.15	0.59	0.59	0.23	0.15	0.29	0.09	0.06	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	66	1588	710	236	1928	862	264	252	495	126	91	
v/s Ratio Prot	0.02	c0.32		c0.11	0.33		c0.13	0.02	0.07	0.01	0.01	
v/s Ratio Perm			0.18			0.00	c0.12		0.09	0.02		
v/c Ratio	0.55	0.65	0.37	0.73	0.56	0.00	1.09	0.14	0.47	0.37	0.17	
Uniform Delay, d1	44.7	18.3	15.2	38.8	11.9	7.9	35.2	35.3	27.6	40.4	42.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.9	2.1	1.5	9.7	1.2	0.0	80.6	0.1	0.3	1.9	0.3	
Delay (s)	49.5	20.4	16.7	48.5	13.1	8.0	115.8	35.4	27.8	42.2	42.7	
Level of Service	D	C	B	D	B	A	F	D	C	D	D	
Approach Delay (s)		20.2			17.9			68.2			42.5	
Approach LOS		C			B			E			D	
Intersection Summary												
HCM 2000 Control Delay	29.0			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.81											
Actuated Cycle Length (s)	95.0			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	70.2%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

42: Harvard Ave & Bellows

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	924	313	154	967	5	255	32	276	42	11	53
Future Volume (veh/h)	32	924	313	154	967	5	255	32	276	42	11	53
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1723	1723	1723	1723	1723	1723	1723	1723	1723	1723	1723	1723
Adj Flow Rate, veh/h	36	1038	0	173	1087	0	287	36	310	47	12	60
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	43	1469		204	1790		374	357	484	270	33	165
Arrive On Green	0.03	0.45	0.00	0.12	0.55	0.00	0.11	0.21	0.21	0.04	0.13	0.13
Sat Flow, veh/h	1641	3273	1460	1641	3273	1460	1641	1723	1460	1641	250	1248
Grp Volume(v), veh/h	36	1038	0	173	1087	0	287	36	310	47	0	72
Grp Sat Flow(s),veh/h/ln	1641	1637	1460	1641	1637	1460	1641	1723	1460	1641	0	1498
Q Serve(g_s), s	2.1	25.2	0.0	10.2	22.2	0.0	11.0	1.7	17.7	2.4	0.0	4.3
Cycle Q Clear(g_c), s	2.1	25.2	0.0	10.2	22.2	0.0	11.0	1.7	17.7	2.4	0.0	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.83
Lane Grp Cap(c), veh/h	43	1469		204	1790		374	357	484	270	0	198
V/C Ratio(X)	0.83	0.71		0.85	0.61		0.77	0.10	0.64	0.17	0.00	0.36
Avail Cap(c_a), veh/h	120	1469		292	1790		374	629	715	295	0	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.7	21.9	0.0	42.1	15.1	0.0	34.4	31.6	27.9	35.0	0.0	38.9
Incr Delay (d2), s/veh	13.8	2.9	0.0	10.5	1.5	0.0	9.3	0.0	0.5	0.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	9.8	0.0	4.7	8.1	0.0	2.6	0.7	6.1	1.0	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	24.8	0.0	52.7	16.7	0.0	43.7	31.6	28.4	35.3	0.0	39.4
LnGrp LOS	E	C		D	B		D	C	C	D	A	D
Approach Vol, veh/h	1074		A	1260		A	633				119	
Approach Delay, s/veh	26.0			21.6			35.5				37.8	
Approach LOS	C			C			D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	24.9	16.8	48.6	15.5	17.5	7.1	58.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	35.9	17.5	43.5	11.0	30.0	7.2	53.8				
Max Q Clear Time (g_c+I1), s	4.4	19.7	12.2	27.2	13.0	6.3	4.1	24.2				
Green Ext Time (p_c), s	0.0	0.6	0.2	8.8	0.0	0.2	0.0	13.0				
Intersection Summary												
HCM 6th Ctrl Delay	26.6											
HCM 6th LOS	C											

HCM Signalized Intersection Capacity Analysis

9: Garden Valley Rd & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	450	725	95	390	1040	335	150	400	240	420	400	435
Future Volume (vph)	450	725	95	390	1040	335	150	400	240	420	400	435
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1646	3207		1662	3260	1473	1614	3325	1488	3193	3325	1473
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1646	3207		1662	3260	1473	1614	3325	1488	3193	3325	1473
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	464	747	98	402	1072	345	155	412	247	433	412	448
RTOR Reduction (vph)	0	8	0	0	0	71	0	0	34	0	0	32
Lane Group Flow (vph)	464	837	0	402	1072	274	155	412	213	433	412	416
Heavy Vehicles (%)	1%	2%	1%	0%	2%	1%	3%	0%	0%	1%	0%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2	3	1	6	7
Permitted Phases						8			2			6
Actuated Green, G (s)	23.5	34.5		20.5	31.5	44.0	11.9	19.2	39.7	12.5	19.8	43.3
Effective Green, g (s)	24.0	35.0		21.0	32.0	45.0	12.4	19.7	40.7	13.0	20.3	44.3
Actuated g/C Ratio	0.23	0.33		0.20	0.31	0.43	0.12	0.19	0.39	0.12	0.19	0.42
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0		2.0	3.0	2.0	2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	377	1072		333	996	689	191	625	635	396	644	679
v/s Ratio Prot	c0.28	c0.26		0.24	c0.33	0.05	0.10	0.12	0.07	c0.14	0.12	c0.14
v/s Ratio Perm						0.14			0.08			0.14
v/c Ratio	1.23	0.78		1.21	1.08	0.40	0.81	0.66	0.34	1.09	0.64	0.61
Uniform Delay, d1	40.4	31.4		41.9	36.4	20.5	45.0	39.4	22.5	45.9	38.8	23.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	125.0	5.7		118.1	51.4	0.1	21.3	2.8	0.1	72.8	2.4	1.2
Delay (s)	165.4	37.1		160.0	87.7	20.7	66.3	42.2	22.6	118.6	41.2	24.7
Level of Service	F	D		F	F	C	E	D	C	F	D	C
Approach Delay (s)		82.5			91.0			40.8			61.4	
Approach LOS		F			F			D			E	
Intersection Summary												
HCM 2000 Control Delay			73.8				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			104.7				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			96.6%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

9: Garden Valley Rd & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	450	725	95	390	1040	335	150	400	240	420	400	435
Future Volume (veh/h)	450	725	95	390	1040	335	150	400	240	420	400	435
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1736	1723	1736	1750	1723	1736	1709	1750	1750	1736	1750	1736
Adj Flow Rate, veh/h	464	747	98	402	1072	345	155	412	247	433	412	448
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	2	1	0	2	1	3	0	0	1	0	1
Cap, veh/h	339	871	114	299	896	566	174	908	671	357	922	710
Arrive On Green	0.21	0.30	0.30	0.18	0.27	0.27	0.11	0.27	0.27	0.11	0.28	0.28
Sat Flow, veh/h	1654	2909	382	1667	3273	1471	1628	3325	1483	3208	3325	1471
Grp Volume(v), veh/h	464	420	425	402	1072	345	155	412	247	433	412	448
Grp Sat Flow(s),veh/h/ln	1654	1637	1654	1667	1637	1471	1628	1663	1483	1604	1663	1471
Q Serve(g_s), s	24.0	28.3	28.3	21.0	32.0	22.0	11.0	12.0	12.8	13.0	12.0	26.5
Cycle Q Clear(g_c), s	24.0	28.3	28.3	21.0	32.0	22.0	11.0	12.0	12.8	13.0	12.0	26.5
Prop In Lane	1.00		0.23	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	339	490	495	299	896	566	174	908	671	357	922	710
V/C Ratio(X)	1.37	0.86	0.86	1.34	1.20	0.61	0.89	0.45	0.37	1.21	0.45	0.63
Avail Cap(c_a), veh/h	339	490	495	299	896	566	174	995	710	357	1010	749
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.5	38.6	38.6	48.0	42.5	28.9	51.5	35.3	21.0	52.0	34.9	22.5
Incr Delay (d2), s/veh	182.9	17.4	17.3	175.0	99.3	4.8	38.0	0.5	0.5	119.3	0.5	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	26.9	13.5	13.6	23.1	25.0	8.3	6.3	4.9	4.4	11.1	4.8	9.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	229.3	56.0	55.9	223.0	141.8	33.7	89.5	35.8	21.5	171.3	35.3	24.4
LnGrp LOS	F	E	E	F	F	C	F	D	C	F	D	C
Approach Vol, veh/h	1309			1819			814			1293		
Approach Delay, s/veh	117.4			139.2			41.7			77.1		
Approach LOS	F			F			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.0	35.9	25.0	39.0	16.5	36.4	28.0	36.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	12.5	34.5	20.5	34.5	12.0	35.0	23.5	31.5				
Max Q Clear Time (g_c+l1), s	15.0	14.8	23.0	30.3	13.0	28.5	26.0	34.0				
Green Ext Time (p_c), s	0.0	5.2	0.0	2.9	0.0	3.4	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	103.3											
HCM 6th LOS	F											

HCM Signalized Intersection Capacity Analysis

10: Harvard Ave & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	515	2	2	715	655	10	20	10	465	5	335
Future Volume (vph)	270	515	2	2	715	655	10	20	10	465	5	335
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.95		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3258		1662	3292	1473	1662	1660		1662	1491	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.36	1.00		0.74	1.00	
Satd. Flow (perm)	1662	3258		1662	3292	1473	637	1660		1289	1491	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	542	2	2	753	689	11	21	11	489	5	353
RTOR Reduction (vph)	0	0	0	0	0	441	0	7	0	0	208	0
Lane Group Flow (vph)	284	544	0	2	753	248	11	25	0	489	150	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	15.5	49.5		1.0	35.0	35.0	34.6	34.6		34.6	34.6	
Effective Green, g (s)	16.0	50.0		1.5	35.5	35.5	35.1	35.1		35.1	35.1	
Actuated g/C Ratio	0.16	0.51		0.02	0.36	0.36	0.36	0.36		0.36	0.36	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	269	1652		25	1185	530	226	590		458	530	
v/s Ratio Prot	c0.17	0.17		0.00	c0.23			0.02			0.10	
v/s Ratio Perm						0.17	0.02			c0.38		
v/c Ratio	1.06	0.33		0.08	0.64	0.47	0.05	0.04		1.07	0.28	
Uniform Delay, d1	41.3	14.4		47.9	26.2	24.3	20.8	20.8		31.7	22.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	70.3	0.5		1.4	2.6	3.0	0.0	0.0		61.3	0.1	
Delay (s)	111.6	14.9		49.2	28.8	27.2	20.8	20.8		93.0	22.8	
Level of Service	F	B		D	C	C	C	C		F	C	
Approach Delay (s)		48.1			28.1			20.8			63.4	
Approach LOS		D			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			42.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			98.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			82.3%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

10: Harvard Ave & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	515	2	2	715	655	10	20	10	465	5	335
Future Volume (veh/h)	270	515	2	2	715	655	10	20	10	465	5	335
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1723	1750	1750	1736	1736	1750	1750	1750	1750	1750	1750
Adj Flow Rate, veh/h	284	542	2	2	753	689	11	21	11	489	5	353
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	0	1	1	0	0	0	0	0	0
Cap, veh/h	281	1660	6	13	1108	494	252	400	209	575	8	541
Arrive On Green	0.17	0.50	0.50	0.01	0.34	0.34	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1667	3345	12	1667	3299	1471	1040	1082	567	1399	21	1465
Grp Volume(v), veh/h	284	265	279	2	753	689	11	0	32	489	0	358
Grp Sat Flow(s),veh/h/ln	1667	1637	1720	1667	1650	1471	1040	0	1648	1399	0	1486
Q Serve(g_s), s	16.0	9.3	9.3	0.1	18.7	31.9	0.8	0.0	1.2	32.8	0.0	19.0
Cycle Q Clear(g_c), s	16.0	9.3	9.3	0.1	18.7	31.9	19.9	0.0	1.2	34.0	0.0	19.0
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.34	1.00		0.99
Lane Grp Cap(c), veh/h	281	812	854	13	1108	494	252	0	609	575	0	549
V/C Ratio(X)	1.01	0.33	0.33	0.15	0.68	1.39	0.04	0.00	0.05	0.85	0.00	0.65
Avail Cap(c_a), veh/h	281	812	854	96	1108	494	252	0	609	575	0	549
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.5	14.4	14.4	46.8	27.2	31.5	33.1	0.0	19.3	30.2	0.0	24.9
Incr Delay (d2), s/veh	56.7	1.1	1.0	5.1	3.4	189.6	0.0	0.0	0.0	11.0	0.0	2.2
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	10.8	3.5	3.6	0.1	7.5	36.7	0.2	0.0	0.4	12.2	0.0	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.2	15.5	15.4	51.9	30.5	221.1	33.1	0.0	19.3	41.2	0.0	27.1
LnGrp LOS	F	B	B	D	C	F	C	A	B	D	A	C
Approach Vol, veh/h	828			1444			43			847		
Approach Delay, s/veh	43.1			121.5			22.8			35.2		
Approach LOS	D			F			C			D		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	39.1			4.8			51.1			39.1		
Change Period (Y+Rc), s	4.5			4.5			4.5			4.5		
Max Green Setting (Gmax), s	34.6			5.0			41.9			34.6		
Max Q Clear Time (g_c+I1), s	21.9			2.1			11.3			36.0		
Green Ext Time (p_c), s	0.0			0.0			9.1			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	76.5											
HCM 6th LOS	E											

HCM Signalized Intersection Capacity Analysis

13: Stewart Pkwy & Harvey Ave

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	20	180	55	30	105	300	545	15	60	695	75
Future Volume (vph)	50	20	180	55	30	105	300	545	15	60	695	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.86		1.00	0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1514		1662	1546		1630	3311		1662	3247	
Flt Permitted	0.49	1.00		0.48	1.00		0.26	1.00		0.43	1.00	
Satd. Flow (perm)	864	1514		843	1546		447	3311		751	3247	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	21	189	58	32	111	316	574	16	63	732	79
RTOR Reduction (vph)	0	173	0	0	102	0	0	1	0	0	5	0
Lane Group Flow (vph)	53	37	0	58	41	0	316	589	0	63	806	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.2	7.6		13.6	7.8		70.6	61.9		56.4	52.2	
Effective Green, g (s)	14.2	8.1		14.6	8.3		71.1	62.4		57.4	52.7	
Actuated g/C Ratio	0.15	0.08		0.15	0.09		0.73	0.64		0.59	0.54	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	175	125		179	131		500	2119		486	1755	
v/s Ratio Prot	0.02	0.02		c0.02	0.03		c0.09	0.18		0.01	0.25	
v/s Ratio Perm	0.03			c0.03			c0.37			0.07		
v/c Ratio	0.30	0.29		0.32	0.32		0.63	0.28		0.13	0.46	
Uniform Delay, d1	36.8	42.0		36.6	41.9		6.6	7.7		8.6	13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.5		0.4	0.5		1.9	0.3		0.0	0.9	
Delay (s)	37.2	42.5		37.0	42.4		8.5	8.0		8.6	14.6	
Level of Service	D	D		D	D		A	A		A	B	
Approach Delay (s)		41.4			40.9			8.2			14.1	
Approach LOS		D			D			A			B	
Intersection Summary												
HCM 2000 Control Delay			17.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			97.5			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			71.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

13: Stewart Pkwy & Harvey Ave

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	20	180	55	30	105	300	545	15	60	695	75
Future Volume (veh/h)	50	20	180	55	30	105	300	545	15	60	695	75
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1723	1750	1750	1750	1736	1750
Adj Flow Rate, veh/h	53	21	189	58	32	111	316	574	16	63	732	79
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	2	0	0	0	1	0
Cap, veh/h	244	25	225	180	58	202	501	1978	55	561	1571	169
Arrive On Green	0.04	0.17	0.17	0.04	0.17	0.17	0.11	0.60	0.60	0.04	0.52	0.52
Sat Flow, veh/h	1667	151	1355	1667	344	1192	1641	3304	92	1667	3004	324
Grp Volume(v), veh/h	53	0	210	58	0	143	316	289	301	63	402	409
Grp Sat Flow(s),veh/h/ln	1667	0	1506	1667	0	1535	1641	1663	1733	1667	1650	1678
Q Serve(g_s), s	2.7	0.0	13.9	2.9	0.0	8.8	8.5	8.6	8.7	1.8	15.8	15.8
Cycle Q Clear(g_c), s	2.7	0.0	13.9	2.9	0.0	8.8	8.5	8.6	8.7	1.8	15.8	15.8
Prop In Lane	1.00		0.90	1.00		0.78	1.00		0.05	1.00		0.19
Lane Grp Cap(c), veh/h	244	0	250	180	0	260	501	995	1038	561	863	878
V/C Ratio(X)	0.22	0.00	0.84	0.32	0.00	0.55	0.63	0.29	0.29	0.11	0.47	0.47
Avail Cap(c_a), veh/h	323	0	399	253	0	407	767	995	1038	606	863	878
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	33.7	0.0	41.5	34.2	0.0	39.0	10.5	10.0	10.0	10.4	15.4	15.4
Incr Delay (d2), s/veh	0.2	0.0	4.6	0.4	0.0	0.7	0.5	0.7	0.7	0.0	1.8	1.8
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	1.1	0.0	5.5	1.2	0.0	3.4	2.9	3.3	3.4	0.7	6.2	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	0.0	46.0	34.6	0.0	39.7	11.0	10.7	10.7	10.4	17.2	17.2
LnGrp LOS	C	A	D	C	A	D	B	B	B	B	B	B
Approach Vol, veh/h	263			201			906			874		
Approach Delay, s/veh	43.6			38.2			10.8			16.7		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.7	65.4	8.5	21.0	15.4	57.6	8.2	21.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.9	60.9	8.5	26.7	27.5	39.3	8.5	26.7				
Max Q Clear Time (g_c+I1), s	3.8	10.7	4.9	15.9	10.5	17.8	4.7	10.8				
Green Ext Time (p_c), s	0.0	6.4	0.0	0.6	0.4	7.7	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay	19.4											
HCM 6th LOS	B											

HCM Signalized Intersection Capacity Analysis

16: NW Troost St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	575	25	235	1050	20	25	1	200	45	5	5
Future Volume (vph)	5	575	25	235	1050	20	25	1	200	45	5	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.85		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	2963		1662	3260	1488	1662	1474		1662	1619	
Flt Permitted	0.26	1.00		0.37	1.00	1.00	0.75	1.00		0.44	1.00	
Satd. Flow (perm)	457	2963		648	3260	1488	1314	1474		778	1619	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	599	26	245	1094	21	26	1	208	47	5	5
RTOR Reduction (vph)	0	1	0	0	0	5	0	186	0	0	4	0
Lane Group Flow (vph)	5	624	0	245	1094	16	26	23	0	47	6	0
Heavy Vehicles (%)	0%	12%	0%	0%	2%	0%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	57.1	56.2		68.3	62.9	62.9	8.5	8.5		8.5	8.5	
Effective Green, g (s)	58.1	56.7		68.8	63.4	63.4	9.0	9.0		9.0	9.0	
Actuated g/C Ratio	0.68	0.66		0.80	0.74	0.74	0.10	0.10		0.10	0.10	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	329	1958		615	2408	1099	137	154		81	169	
v/s Ratio Prot	0.00	0.21		c0.04	c0.34			0.02			0.00	
v/s Ratio Perm	0.01			0.28		0.01	0.02			c0.06		
v/c Ratio	0.02	0.32		0.40	0.45	0.01	0.19	0.15		0.58	0.03	
Uniform Delay, d1	4.5	6.3		2.3	4.4	3.0	35.1	34.9		36.6	34.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.4		0.2	0.6	0.0	0.2	0.2		6.6	0.0	
Delay (s)	4.5	6.7		2.5	5.0	3.0	35.3	35.1		43.2	34.5	
Level of Service	A	A		A	A	A	D	D		D	C	
Approach Delay (s)		6.7			4.5			35.1			41.7	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay		9.2			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		85.8			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		65.0%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

16: NW Troost St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	575	25	235	1050	20	25	1	200	45	5	5
Future Volume (veh/h)	5	575	25	235	1050	20	25	1	200	45	5	5
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1586	1750	1750	1723	1750	1750	1750	1736	1750	1750	1750
Adj Flow Rate, veh/h	5	599	26	245	1094	21	26	1	208	47	5	5
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	12	0	0	2	0	0	0	1	0	0	0
Cap, veh/h	347	1736	75	613	2181	988	351	1	292	155	159	159
Arrive On Green	0.01	0.59	0.59	0.09	0.67	0.67	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1667	2943	128	1667	3273	1483	1427	7	1477	1191	803	803
Grp Volume(v), veh/h	5	306	319	245	1094	21	26	0	209	47	0	10
Grp Sat Flow(s),veh/h/ln	1667	1507	1563	1667	1637	1483	1427	0	1484	1191	0	1606
Q Serve(g_s), s	0.1	9.9	9.9	4.9	15.8	0.5	1.4	0.0	12.4	3.6	0.0	0.5
Cycle Q Clear(g_c), s	0.1	9.9	9.9	4.9	15.8	0.5	1.9	0.0	12.4	16.1	0.0	0.5
Prop In Lane	1.00		0.08	1.00		1.00	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	347	889	922	613	2181	988	351	0	293	155	0	317
V/C Ratio(X)	0.01	0.34	0.35	0.40	0.50	0.02	0.07	0.00	0.71	0.30	0.00	0.03
Avail Cap(c_a), veh/h	438	889	922	1017	2181	988	658	0	612	411	0	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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.0	10.0	10.0	6.2	7.9	5.3	31.4	0.0	35.4	42.9	0.0	30.6
Incr Delay (d2), s/veh	0.0	1.1	1.0	0.2	0.8	0.0	0.0	0.0	1.2	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.0	3.1	1.3	4.5	0.1	0.5	0.0	4.6	1.1	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.0	11.0	11.0	6.3	8.7	5.4	31.4	0.0	36.6	43.3	0.0	30.6
LnGrp LOS	A	B	B	A	A	A	C	A	D	D	A	C
Approach Vol, veh/h	630			1360			235			57		
Approach Delay, s/veh	11.0			8.3			36.1			41.1		
Approach LOS	B			A			D			D		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	22.7		12.1	59.8		22.7		4.9	67.0			
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5		4.5	4.5			
Max Green Setting (Gmax), s	38.5		30.5	37.5		38.5		5.5	62.5			
Max Q Clear Time (g_c+l1), s	14.4		6.9	11.9		18.1		2.1	17.8			
Green Ext Time (p_c), s	0.9		0.6	12.3		0.1		0.0	31.7			
Intersection Summary												
HCM 6th Ctrl Delay	12.7											
HCM 6th LOS	B											

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	64	2	41	79	0	24
Future Vol, veh/h	64	2	41	79	0	24
Conflicting Peds, #/hr	0	0	0	0	0	0
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	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	0	13
Mvmt Flow	67	2	43	83	0	25
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	69	0	237	68
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	169	-
Critical Hdwy	-	-	4.1	-	6.4	6.33
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.417
Pot Cap-1 Maneuver	-	-	1545	-	756	965
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	866	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1545	-	734	965
Mov Cap-2 Maneuver	-	-	-	-	734	-
Stage 1	-	-	-	-	960	-
Stage 2	-	-	-	-	841	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.5		8.8	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	965	-	-	1545	-	
HCM Lane V/C Ratio	0.026	-	-	0.028	-	
HCM Control Delay (s)	8.8	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

Intersection

Int Delay, s/veh 1.3

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	8	93	116	32	26	4
Future Vol, veh/h	8	93	116	32	26	4
Conflicting Peds, #/hr	0	0	0	0	0	0
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	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	100	125	34	28	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	159	0	0 260 142
Stage 1	-	-	- 142 -
Stage 2	-	-	- 118 -
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	1420	-	- 729 906
Stage 1	-	-	- 885 -
Stage 2	-	-	- 907 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1420	-	- 724 906
Mov Cap-2 Maneuver	-	-	- 724 -
Stage 1	-	-	- 879 -
Stage 2	-	-	- 907 -

Approach	NB	SB	SE
HCM Control Delay, s	0.6	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SBT	SBR
Capacity (veh/h)	1420	-	744	-	-
HCM Lane V/C Ratio	0.006	-	0.043	-	-
HCM Control Delay (s)	7.6	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	25	5	120	95	70	5	40	40	45	60	40
Future Vol, veh/h	35	25	5	120	95	70	5	40	40	45	60	40
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, %	0	0	0	0	5	3	0	0	5	3	2	0
Mvmt Flow	38	27	5	130	103	76	5	43	43	49	65	43
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.5	10.4	8.4	9.2
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	54%	42%	31%
Vol Thru, %	47%	38%	33%	41%
Vol Right, %	47%	8%	25%	28%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	85	65	285	145
LT Vol	5	35	120	45
Through Vol	40	25	95	60
RT Vol	40	5	70	40
Lane Flow Rate	92	71	310	158
Geometry Grp	1	1	1	1
Degree of Util (X)	0.121	0.097	0.389	0.212
Departure Headway (Hd)	4.724	4.929	4.524	4.852
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	754	723	793	736
Service Time	2.782	2.987	2.569	2.904
HCM Lane V/C Ratio	0.122	0.098	0.391	0.215
HCM Control Delay	8.4	8.5	10.4	9.2
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0.4	0.3	1.9	0.8

HCM Signalized Intersection Capacity Analysis

29: Kline St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	770	40	65	1235	240	60	20	100	295	20	45
Future Volume (vph)	15	770	40	65	1235	240	60	20	100	295	20	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.88		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1409	3175		1662	3217		1662	1519		1662	1569	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1409	3175		1662	3217		1662	1519		1662	1569	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	811	42	68	1300	253	63	21	105	311	21	47
RTOR Reduction (vph)	0	3	0	0	12	0	0	99	0	0	38	0
Lane Group Flow (vph)	16	850	0	68	1541	0	63	27	0	311	30	0
Heavy Vehicles (%)	18%	4%	3%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	1.9	68.0		5.7	71.8		4.7	6.3		19.5	21.1	
Effective Green, g (s)	2.4	68.5		6.2	72.3		5.2	6.8		20.0	21.6	
Actuated g/C Ratio	0.02	0.58		0.05	0.62		0.04	0.06		0.17	0.18	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	28	1850		87	1979		73	87		282	288	
v/s Ratio Prot	0.01	0.27		c0.04	c0.48		0.04	c0.02		c0.19	0.02	
v/s Ratio Perm												
v/c Ratio	0.57	0.46		0.78	0.78		0.86	0.31		1.10	0.10	
Uniform Delay, d1	57.0	14.0		55.0	16.7		55.8	53.1		48.8	39.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.3	0.8		33.2	3.1		59.2	0.7		84.0	0.1	
Delay (s)	73.3	14.8		88.2	19.8		115.0	53.8		132.7	39.9	
Level of Service	E	B		F	B		F	D		F	D	
Approach Delay (s)		15.9			22.7			74.2			116.1	
Approach LOS		B			C			E			F	
Intersection Summary												
HCM 2000 Control Delay			35.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			117.5			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			83.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

29: Kline St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	770	40	65	1235	240	60	20	100	295	20	45
Future Volume (veh/h)	15	770	40	65	1235	240	60	20	100	295	20	45
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1504	1695	1709	1750	1736	1750	1750	1750	1736	1750	1750	1750
Adj Flow Rate, veh/h	16	811	42	68	1300	253	63	21	105	311	21	47
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	18	4	3	0	1	0	0	0	1	0	0	0
Cap, veh/h	22	1732	90	92	1643	316	86	22	109	281	97	218
Arrive On Green	0.02	0.56	0.56	0.06	0.60	0.60	0.05	0.09	0.09	0.17	0.20	0.20
Sat Flow, veh/h	1433	3116	161	1667	2760	531	1667	254	1268	1667	481	1076
Grp Volume(v), veh/h	16	419	434	68	771	782	63	0	126	311	0	68
Grp Sat Flow(s),veh/h/ln	1433	1611	1666	1667	1650	1641	1667	0	1522	1667	0	1556
Q Serve(g_s), s	1.3	18.6	18.6	4.8	42.2	43.8	4.4	0.0	9.8	20.0	0.0	4.3
Cycle Q Clear(g_c), s	1.3	18.6	18.6	4.8	42.2	43.8	4.4	0.0	9.8	20.0	0.0	4.3
Prop In Lane	1.00		0.10	1.00		0.32	1.00		0.83	1.00		0.69
Lane Grp Cap(c), veh/h	22	895	926	92	982	977	86	0	131	281	0	316
V/C Ratio(X)	0.71	0.47	0.47	0.74	0.79	0.80	0.73	0.00	0.96	1.11	0.00	0.22
Avail Cap(c_a), veh/h	66	895	926	109	982	977	93	0	131	281	0	316
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	58.2	15.8	15.8	55.3	18.3	18.6	55.5	0.0	54.1	49.4	0.0	39.5
Incr Delay (d2), s/veh	14.3	1.8	1.7	14.9	6.3	6.9	20.3	0.0	67.0	85.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	7.0	7.2	2.4	16.5	17.2	2.4	0.0	6.2	15.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.5	17.6	17.5	70.1	24.5	25.5	75.8	0.0	121.1	135.2	0.0	39.6
LnGrp LOS	E	B	B	E	C	C	E	A	F	F	A	D
Approach Vol, veh/h	869		1621			189			379			
Approach Delay, s/veh	18.6		26.9			106.0			118.1			
Approach LOS	B		C			F			F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.6	70.0	10.1	28.1	5.9	74.7	24.0	14.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.3	65.5	6.1	23.1	5.0	67.8	19.5	9.7				
Max Q Clear Time (g_c+I1), s	6.8	20.6	6.4	6.3	3.3	45.8	22.0	11.8				
Green Ext Time (p_c), s	0.0	17.6	0.0	0.1	0.0	19.5	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			40.7									
HCM 6th LOS			D									
Notes												

Intersection						
Int Delay, s/veh	4.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	90	120	70	105	65
Future Vol, veh/h	30	90	120	70	105	65
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	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	5	0	0	0	0	0
Mvmt Flow	32	97	129	75	113	70
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	481	148	183	0	-	0
Stage 1	148	-	-	-	-	-
Stage 2	333	-	-	-	-	-
Critical Hdwy	6.45	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	539	904	1404	-	-	-
Stage 1	872	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	487	904	1404	-	-	-
Mov Cap-2 Maneuver	487	-	-	-	-	-
Stage 1	788	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.8	4.9		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1404	-	745	-	-	
HCM Lane V/C Ratio	0.092	-	0.173	-	-	
HCM Control Delay (s)	7.8	0	10.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.6	-	-	

HCM 6th TWSC
34: Harvey Ave & Keasey St

08/23/2021

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	82	165	240	168	9
Future Vol, veh/h	1	82	165	240	168	9
Conflicting Peds, #/hr	0	0	0	0	0	0
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	1	89	179	261	183	10

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	440	0	0 401 310
Stage 1	-	-	- 310 -
Stage 2	-	-	- 91 -
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	1120	-	- 605 730
Stage 1	-	-	- 744 -
Stage 2	-	-	- 933 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1120	-	- 604 730
Mov Cap-2 Maneuver	-	-	- 604 -
Stage 1	-	-	- 743 -
Stage 2	-	-	- 933 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1120	-	-	-	609
HCM Lane V/C Ratio	0.001	-	-	-	0.316
HCM Control Delay (s)	8.2	0	-	-	13.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1.4

HCM Signalized Intersection Capacity Analysis

35: Exit 125 & Garden Valley

08/23/2021

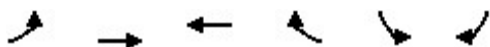
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	65	955	0	0	1355	40	560	225	315	45	0	265
Future Volume (vph)	65	955	0	0	1355	40	560	225	315	45	0	265
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1630	3260			3246		1630	1716	1458	1630		1458
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00	0.53		1.00
Satd. Flow (perm)	1630	3260			3246		1630	1716	1458	905		1458
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	68	995	0	0	1411	42	583	234	328	47	0	276
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	60	0	0	88
Lane Group Flow (vph)	68	995	0	0	1451	0	583	234	268	47	0	188
Turn Type	Prot	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	7	4			8			2				
Permitted Phases							2		2	6		6
Actuated Green, G (s)	4.1	49.1			40.5		32.5	32.5	32.5	32.5		32.5
Effective Green, g (s)	4.6	49.6			41.0		33.0	33.0	33.0	33.0		33.0
Actuated g/C Ratio	0.05	0.55			0.45		0.36	0.36	0.36	0.36		0.36
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5	4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0		2.0	2.0	2.0	2.0		2.0
Lane Grp Cap (vph)	82	1784			1468		593	625	531	329		531
v/s Ratio Prot	c0.04	0.31			c0.45			0.14				
v/s Ratio Perm							c0.36		0.18	0.05		0.13
v/c Ratio	0.83	0.56			0.99		0.98	0.37	0.50	0.14		0.35
Uniform Delay, d1	42.6	13.4			24.6		28.5	21.2	22.4	19.3		21.0
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	45.3	1.3			20.9		32.4	0.1	0.3	0.1		0.1
Delay (s)	87.9	14.6			45.4		60.9	21.3	22.7	19.4		21.2
Level of Service	F	B			D		E	C	C	B		C
Approach Delay (s)		19.3			45.4			41.9			20.9	
Approach LOS		B			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			35.5				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			90.6				Sum of lost time (s)			12.5		
Intersection Capacity Utilization			103.5%				ICU Level of Service			G		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support Non-NEMA phasing.

HCM Signalized Intersection Capacity Analysis

38: Garden Valley Rd & Hwy 125

08/23/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑	↑
Traffic Volume (vph)	0	2505	1570	0	145	190
Future Volume (vph)	0	2505	1570	0	145	190
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3260	3260		1630	1458
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3260	3260		1630	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2637	1653	0	153	200
RTOR Reduction (vph)	0	0	0	0	0	26
Lane Group Flow (vph)	0	2637	1653	0	153	174
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			
Permitted Phases					6	6
Actuated Green, G (s)		75.1	75.1		16.0	16.0
Effective Green, g (s)		75.6	75.6		16.5	16.5
Actuated g/C Ratio		0.76	0.76		0.16	0.16
Clearance Time (s)		4.5	4.5		4.5	4.5
Vehicle Extension (s)		4.0	4.0		2.0	2.0
Lane Grp Cap (vph)		2462	2462		268	240
v/s Ratio Prot		c0.81	0.51			
v/s Ratio Perm					0.09	c0.12
v/c Ratio		1.07	0.67		0.57	0.73
Uniform Delay, d1		12.2	6.1		38.5	39.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		40.7	1.5		1.8	8.9
Delay (s)		52.9	7.6		40.4	48.5
Level of Service		D	A		D	D
Approach Delay (s)		52.9	7.6		45.0	
Approach LOS		D	A		D	
Intersection Summary						
HCM 2000 Control Delay			36.2		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.01			
Actuated Cycle Length (s)			100.1		Sum of lost time (s)	8.5
Intersection Capacity Utilization			90.6%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Edition methodology does not support Non-NEMA phasing.

HCM Signalized Intersection Capacity Analysis

40: Freeway Ave/Willow St

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	2	170	15	0	35	0	1765	25	15	1045	300
Future Volume (vph)	225	2	170	15	0	35	0	1765	25	15	1045	300
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0		4.0		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00		1.00		0.95		1.00	0.95	1.00
Frt	1.00	0.85		1.00		0.85		1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1630	1461		1630		1458		3253		1630	3260	1458
Flt Permitted	0.95	1.00		0.52		1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)	1630	1461		897		1458		3253		1630	3260	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	237	2	179	16	0	37	0	1858	26	16	1100	316
RTOR Reduction (vph)	0	78	0	0	0	29	0	0	0	0	0	25
Lane Group Flow (vph)	237	103	0	16	0	8	0	1884	0	16	1100	291
Turn Type	Perm	NA		Perm		Perm		NA		Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)	18.1	18.1		18.1		18.1		52.6		1.3	58.4	58.4
Effective Green, g (s)	18.6	18.6		18.6		18.6		53.1		1.8	58.9	58.9
Actuated g/C Ratio	0.22	0.22		0.22		0.22		0.62		0.02	0.69	0.69
Clearance Time (s)	4.5	4.5		4.5		4.5		4.5		4.5	4.5	4.5
Vehicle Extension (s)	4.0	4.0		4.0		4.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	354	317		195		317		2020		34	2245	1004
v/s Ratio Prot		0.07						c0.58		0.01	c0.34	
v/s Ratio Perm	c0.15			0.02		0.01						0.20
v/c Ratio	0.67	0.32		0.08		0.03		0.93		0.47	0.49	0.29
Uniform Delay, d1	30.6	28.2		26.6		26.3		14.6		41.4	6.2	5.2
Progression Factor	1.00	1.00		1.00		1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	5.2	0.8		0.2		0.0		9.4		3.7	0.8	0.7
Delay (s)	35.8	29.0		26.9		26.4		24.0		45.1	7.0	5.9
Level of Service	D	C		C		C		C		D	A	A
Approach Delay (s)		32.9			26.5			24.0			7.2	
Approach LOS		C			C			C			A	
Intersection Summary												
HCM 2000 Control Delay		18.7			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		85.5			Sum of lost time (s)			12.5				
Intersection Capacity Utilization		85.7%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 6th Edition methodology does not support Non-NEMA phasing.

HCM Signalized Intersection Capacity Analysis

42: Harvard Ave & Bellows

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	30	1085	400	240	1215	5	290	30	350	40	15	45
Future Volume (vph)	30	1085	400	240	1215	5	290	30	350	40	15	45
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1630	3260	1458	1630	3260	1458	1630	1716	1458	1630	1524	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.44	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1630	3260	1458	1630	3260	1458	751	1716	1458	1263	1524	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	1142	421	253	1279	5	305	32	368	42	16	47
RTOR Reduction (vph)	0	0	86	0	0	2	0	0	73	0	44	0
Lane Group Flow (vph)	32	1142	335	253	1279	3	305	32	295	42	19	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	2.9	45.7	45.7	18.5	61.3	61.3	17.9	10.5	29.0	8.7	5.8	
Effective Green, g (s)	3.4	46.2	46.2	19.0	61.8	61.8	18.4	11.0	30.0	9.7	6.3	
Actuated g/C Ratio	0.04	0.48	0.48	0.20	0.65	0.65	0.19	0.12	0.31	0.10	0.07	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	57	1575	704	323	2107	942	219	197	518	141	100	
v/s Ratio Prot	0.02	c0.35		c0.16	0.39		c0.12	0.02	c0.11	0.01	0.01	
v/s Ratio Perm			0.23			0.00	c0.15		0.09	0.02		
v/c Ratio	0.56	0.73	0.48	0.78	0.61	0.00	1.39	0.16	0.57	0.30	0.19	
Uniform Delay, d1	45.4	19.6	16.6	36.3	9.8	6.0	37.6	38.1	27.4	39.6	42.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.3	2.9	2.3	10.9	1.3	0.0	202.2	0.1	0.9	1.2	0.3	
Delay (s)	52.7	22.6	18.9	47.2	11.1	6.0	239.8	38.3	28.4	40.8	42.6	
Level of Service	D	C	B	D	B	A	F	D	C	D	D	
Approach Delay (s)		22.2			17.1			120.3			41.9	
Approach LOS		C			B			F			D	
Intersection Summary												
HCM 2000 Control Delay			38.3			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			95.6			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			81.1%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

42: Harvard Ave & Bellows

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1085	400	240	1215	5	290	30	350	40	15	45
Future Volume (veh/h)	30	1085	400	240	1215	5	290	30	350	40	15	45
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723	1723	1723	1723	1723	1723	1723	1723	1723	1723
Adj Flow Rate, veh/h	32	1142	0	253	1279	0	305	32	368	42	16	47
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	46	1338		287	1818		401	396	591	319	74	218
Arrive On Green	0.03	0.41	0.00	0.17	0.56	0.00	0.08	0.23	0.23	0.04	0.19	0.19
Sat Flow, veh/h	1641	3273	1460	1641	3273	1460	1641	1723	1460	1641	386	1133
Grp Volume(v), veh/h	32	1142	0	253	1279	0	305	32	368	42	0	63
Grp Sat Flow(s),veh/h/ln	1641	1637	1460	1641	1637	1460	1641	1723	1460	1641	0	1519
Q Serve(g_s), s	2.1	34.1	0.0	16.2	30.7	0.0	8.1	1.6	21.6	2.2	0.0	3.8
Cycle Q Clear(g_c), s	2.1	34.1	0.0	16.2	30.7	0.0	8.1	1.6	21.6	2.2	0.0	3.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.75
Lane Grp Cap(c), veh/h	46	1338		287	1818		401	396	591	319	0	292
V/C Ratio(X)	0.70	0.85		0.88	0.70		0.76	0.08	0.62	0.13	0.00	0.22
Avail Cap(c_a), veh/h	84	1338		305	1818		401	551	722	342	0	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.8	28.9	0.0	43.3	17.4	0.0	37.3	32.5	25.5	32.7	0.0	36.6
Incr Delay (d2), s/veh	6.9	7.1	0.0	22.7	2.3	0.0	8.2	0.0	0.5	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	14.3	0.0	8.3	11.5	0.0	4.9	0.7	7.4	0.9	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.7	35.9	0.0	66.0	19.7	0.0	45.5	32.5	26.0	32.9	0.0	36.7
LnGrp LOS	E	D		E	B		D	C	C	C	A	D
Approach Vol, veh/h		1174	A		1532	A		705			105	
Approach Delay, s/veh		36.6			27.4			34.7			35.2	
Approach LOS		D			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	28.7	22.8	48.0	12.1	24.7	7.0	63.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	33.9	19.5	43.5	7.6	31.4	5.0	58.0				
Max Q Clear Time (g_c+I1), s	4.2	23.6	18.2	36.1	10.1	5.8	4.1	32.7				
Green Ext Time (p_c), s	0.0	0.6	0.1	5.2	0.0	0.2	0.0	14.4				

Intersection Summary

HCM 6th Ctrl Delay 32.2

HCM 6th LOS C

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM Signalized Intersection Capacity Analysis

9: Garden Valley Rd & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	485	784	95	416	1100	335	150	403	243	420	433	490
Future Volume (vph)	485	784	95	416	1100	335	150	403	243	420	433	490
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1646	3210		1662	3260	1473	1614	3325	1488	3193	3325	1473
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1646	3210		1662	3260	1473	1614	3325	1488	3193	3325	1473
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	500	808	98	429	1134	345	155	415	251	433	446	505
RTOR Reduction (vph)	0	7	0	0	0	70	0	0	34	0	0	31
Lane Group Flow (vph)	500	899	0	429	1134	275	155	415	217	433	446	474
Heavy Vehicles (%)	1%	2%	1%	0%	2%	1%	3%	0%	0%	1%	0%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases						8			2			6
Actuated Green, G (s)	24.5	35.5		20.5	31.5	43.0	9.5	19.3	39.8	11.5	21.3	45.8
Effective Green, g (s)	24.5	35.5		20.5	31.5	43.0	9.5	19.3	39.8	11.5	21.3	45.8
Actuated g/C Ratio	0.23	0.34		0.20	0.30	0.41	0.09	0.18	0.38	0.11	0.20	0.44
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0		2.0	3.0	2.0	2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	384	1087		325	979	667	146	612	628	350	675	706
v/s Ratio Prot	c0.30	c0.28		0.26	c0.35	0.05	0.10	0.12	0.07	c0.14	0.13	c0.16
v/s Ratio Perm						0.14			0.08			0.17
v/c Ratio	1.30	0.83		1.32	1.16	0.41	1.06	0.68	0.35	1.24	0.66	0.67
Uniform Delay, d1	40.1	31.8		42.1	36.6	21.9	47.6	39.9	23.2	46.6	38.4	23.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	153.8	7.2		164.1	82.8	0.2	91.9	3.3	0.1	128.9	2.7	2.0
Delay (s)	193.9	39.1		206.2	119.5	22.1	139.5	43.1	23.3	175.6	41.1	25.5
Level of Service	F	D		F	F	C	F	D	C	F	D	C
Approach Delay (s)		94.1			121.4			55.3			77.5	
Approach LOS		F			F			E			E	
Intersection Summary												
HCM 2000 Control Delay			93.6			HCM 2000 Level of Service				F		
HCM 2000 Volume to Capacity ratio			1.11									
Actuated Cycle Length (s)			104.8			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			102.3%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

9: Garden Valley Rd & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	485	784	95	416	1100	335	150	403	243	420	433	490
Future Volume (veh/h)	485	784	95	416	1100	335	150	403	243	420	433	490
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1723	1736	1750	1723	1736	1709	1750	1750	1736	1750	1736
Adj Flow Rate, veh/h	500	808	98	429	1134	345	155	415	251	433	446	505
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	2	1	0	2	1	3	0	0	1	0	1
Cap, veh/h	342	879	107	288	869	533	130	928	670	311	985	740
Arrive On Green	0.21	0.30	0.30	0.17	0.27	0.27	0.08	0.28	0.28	0.10	0.30	0.30
Sat Flow, veh/h	1654	2939	356	1667	3273	1471	1628	3325	1483	3208	3325	1471
Grp Volume(v), veh/h	500	450	456	429	1134	345	155	415	251	433	446	505
Grp Sat Flow(s),veh/h/ln	1654	1637	1659	1667	1637	1471	1628	1663	1483	1604	1663	1471
Q Serve(g_s), s	24.5	31.5	31.5	20.5	31.5	23.2	9.5	12.2	13.2	11.5	12.9	30.8
Cycle Q Clear(g_c), s	24.5	31.5	31.5	20.5	31.5	23.2	9.5	12.2	13.2	11.5	12.9	30.8
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	342	490	496	288	869	533	130	928	670	311	985	740
V/C Ratio(X)	1.46	0.92	0.92	1.49	1.30	0.65	1.19	0.45	0.37	1.39	0.45	0.68
Avail Cap(c_a), veh/h	342	490	496	288	869	533	130	967	688	311	1023	757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	40.2	40.2	49.1	43.6	31.5	54.6	35.2	21.4	53.6	33.9	22.3
Incr Delay (d2), s/veh	224.3	24.8	24.6	237.9	145.5	6.0	138.5	0.5	0.5	195.1	0.5	2.8
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	31.2	15.8	16.0	27.4	30.0	8.9	8.9	4.9	4.6	13.0	5.2	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	271.3	64.9	64.7	286.9	189.0	37.4	193.0	35.7	21.9	248.7	34.4	25.1
LnGrp LOS	F	E	E	F	F	D	F	D	C	F	C	C
Approach Vol, veh/h		1406			1908			821			1384	
Approach Delay, s/veh		138.3			183.6			61.2			98.0	
Approach LOS		F			F			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.0	37.6	25.0	40.0	14.0	39.6	29.0	36.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.5	34.5	20.5	35.5	9.5	36.5	24.5	31.5				
Max Q Clear Time (g_c+I1), s	13.5	15.2	22.5	33.5	11.5	32.8	26.5	33.5				
Green Ext Time (p_c), s	0.0	5.2	0.0	1.5	0.0	2.3	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			132.4									
HCM 6th LOS			F									

HCM Signalized Intersection Capacity Analysis

10: Harvard Ave & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	310	515	2	2	715	736	10	20	10	493	5	363
Future Volume (vph)	310	515	2	2	715	736	10	20	10	493	5	363
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.95		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3258		1662	3292	1473	1662	1660		1662	1491	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.34	1.00		0.74	1.00	
Satd. Flow (perm)	1662	3258		1662	3292	1473	604	1660		1289	1491	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	326	542	2	2	753	775	11	21	11	519	5	382
RTOR Reduction (vph)	0	0	0	0	0	493	0	7	0	0	239	0
Lane Group Flow (vph)	326	544	0	2	753	282	11	25	0	519	148	0
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2			6		
Actuated Green, G (s)	19.7	53.8		1.0	35.1	35.1	40.3	40.3		40.3	40.3	
Effective Green, g (s)	19.7	53.8		1.0	35.1	35.1	40.3	40.3		40.3	40.3	
Actuated g/C Ratio	0.18	0.50		0.01	0.32	0.32	0.37	0.37		0.37	0.37	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	301	1614		15	1063	476	224	616		478	553	
v/s Ratio Prot	c0.20	0.17		0.00	c0.23			0.02			0.10	
v/s Ratio Perm						0.19	0.02			c0.40		
v/c Ratio	1.08	0.34		0.13	0.71	0.59	0.05	0.04		1.09	0.27	
Uniform Delay, d1	44.4	16.6		53.4	32.3	30.8	21.9	21.8		34.1	23.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	75.8	0.6		4.0	4.0	5.3	0.0	0.0		66.3	0.1	
Delay (s)	120.3	17.2		57.4	36.2	36.1	21.9	21.8		100.5	23.9	
Level of Service	F	B		E	D	D	C	C		F	C	
Approach Delay (s)		55.8			36.2			21.8			67.8	
Approach LOS		E			D			C			E	
Intersection Summary												
HCM 2000 Control Delay			49.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			108.6			Sum of lost time (s)				13.5		
Intersection Capacity Utilization			87.7%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

10: Harvard Ave & Stewart Pkwy

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	310	515	2	2	715	736	10	20	10	493	5	363
Future Volume (veh/h)	310	515	2	2	715	736	10	20	10	493	5	363
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1723	1750	1750	1736	1736	1750	1750	1750	1750	1750	1750
Adj Flow Rate, veh/h	326	542	2	2	753	775	11	21	11	519	5	382
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	0	1	1	0	0	0	0	0	0
Cap, veh/h	313	1622	6	4	990	441	237	415	217	588	7	563
Arrive On Green	0.19	0.48	0.48	0.00	0.30	0.30	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	1667	3345	12	1667	3299	1471	1012	1082	567	1399	19	1467
Grp Volume(v), veh/h	326	265	279	2	753	775	11	0	32	519	0	387
Grp Sat Flow(s),veh/h/ln	1667	1637	1720	1667	1650	1471	1012	0	1648	1399	0	1486
Q Serve(g_s), s	19.7	10.5	10.5	0.1	21.7	31.5	1.0	0.0	1.3	38.9	0.0	22.8
Cycle Q Clear(g_c), s	19.7	10.5	10.5	0.1	21.7	31.5	23.7	0.0	1.3	40.2	0.0	22.8
Prop In Lane	1.00		0.01	1.00		1.00	1.00		0.34	1.00		0.99
Lane Grp Cap(c), veh/h	313	794	834	4	990	441	237	0	633	588	0	570
V/C Ratio(X)	1.04	0.33	0.33	0.44	0.76	1.76	0.05	0.00	0.05	0.88	0.00	0.68
Avail Cap(c_a), veh/h	313	794	834	79	990	441	237	0	633	588	0	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.7	16.6	16.6	52.3	33.3	36.7	36.8	0.0	20.3	33.0	0.0	27.0
Incr Delay (d2), s/veh	62.4	1.1	1.1	56.5	5.5	349.2	0.0	0.0	0.0	14.1	0.0	2.7
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	13.3	4.0	4.2	0.1	9.2	53.7	0.2	0.0	0.5	14.9	0.0	8.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	105.1	17.8	17.7	108.8	38.8	386.0	36.9	0.0	20.3	47.1	0.0	29.6
LnGrp LOS	F	B	B	F	D	F	D	A	C	D	A	C
Approach Vol, veh/h	870			1530			43			906		
Approach Delay, s/veh	50.5			214.8			24.6			39.6		
Approach LOS	D			F			C			D		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	44.8		4.8	55.4		44.8	24.2	36.0				
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	40.3		5.0	46.2		40.3	19.7	31.5				
Max Q Clear Time (g_c+l1), s	25.7		2.1	12.5		42.2	21.7	33.5				
Green Ext Time (p_c), s	0.0		0.0	9.4		0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay	122.3											
HCM 6th LOS	F											

HCM Signalized Intersection Capacity Analysis

13: Stewart Pkwy & Harvey Ave

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	20	236	55	30	105	421	545	15	60	695	75
Future Volume (vph)	50	20	236	55	30	105	421	545	15	60	695	75
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.86		1.00	0.88		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1508		1662	1546		1630	3311		1662	3247	
Flt Permitted	0.50	1.00		0.49	1.00		0.22	1.00		0.43	1.00	
Satd. Flow (perm)	875	1508		854	1546		376	3311		751	3247	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	21	248	58	32	111	443	574	16	63	732	79
RTOR Reduction (vph)	0	228	0	0	102	0	0	1	0	0	6	0
Lane Group Flow (vph)	53	41	0	58	41	0	443	589	0	63	805	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	13.1	8.0		13.5	8.2		71.9	63.1		47.2	42.9	
Effective Green, g (s)	13.1	8.0		13.5	8.2		71.9	63.1		47.2	42.9	
Actuated g/C Ratio	0.13	0.08		0.14	0.08		0.73	0.64		0.48	0.43	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	156	122		160	128		585	2116		398	1411	
v/s Ratio Prot	0.02	0.03		c0.02	0.03		c0.19	0.18		0.01	0.25	
v/s Ratio Perm	0.03			c0.03			c0.36			0.07		
v/c Ratio	0.34	0.34		0.36	0.32		0.76	0.28		0.16	0.57	
Uniform Delay, d1	38.4	42.8		38.2	42.6		13.0	7.8		14.0	21.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.6		0.5	0.5		5.0	0.3		0.1	1.7	
Delay (s)	38.9	43.4		38.7	43.2		18.0	8.1		14.0	22.7	
Level of Service	D	D		D	D		B	A		B	C	
Approach Delay (s)		42.7			41.9			12.4			22.0	
Approach LOS		D			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			22.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			98.7			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			84.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

13: Stewart Pkwy & Harvey Ave

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	20	236	55	30	105	421	545	15	60	695	75
Future Volume (veh/h)	50	20	236	55	30	105	421	545	15	60	695	75
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1750	1750	1750	1750	1750	1750	1723	1750	1750	1750	1736	1750
Adj Flow Rate, veh/h	53	21	248	58	32	111	443	574	16	63	732	79
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	2	0	0	0	1	0
Cap, veh/h	275	23	274	155	69	240	507	1870	52	486	1303	141
Arrive On Green	0.03	0.20	0.20	0.04	0.20	0.20	0.17	0.57	0.57	0.03	0.43	0.43
Sat Flow, veh/h	1667	117	1384	1667	344	1192	1641	3304	92	1667	3004	324
Grp Volume(v), veh/h	53	0	269	58	0	143	443	289	301	63	402	409
Grp Sat Flow(s),veh/h/ln	1667	0	1501	1667	0	1535	1641	1663	1733	1667	1650	1678
Q Serve(g_s), s	2.8	0.0	19.2	3.0	0.0	9.0	15.5	10.0	10.0	2.3	20.0	20.0
Cycle Q Clear(g_c), s	2.8	0.0	19.2	3.0	0.0	9.0	15.5	10.0	10.0	2.3	20.0	20.0
Prop In Lane	1.00		0.92	1.00		0.78	1.00		0.05	1.00		0.19
Lane Grp Cap(c), veh/h	275	0	298	155	0	309	507	941	981	486	716	728
V/C Ratio(X)	0.19	0.00	0.90	0.37	0.00	0.46	0.87	0.31	0.31	0.13	0.56	0.56
Avail Cap(c_a), veh/h	322	0	363	203	0	377	745	941	981	523	716	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	0.0	42.9	34.9	0.0	38.6	16.9	12.5	12.5	16.2	23.2	23.2
Incr Delay (d2), s/veh	0.1	0.0	20.3	0.6	0.0	0.4	5.7	0.8	0.8	0.0	3.2	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	8.8	1.3	0.0	3.5	6.2	3.9	4.1	0.9	8.4	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.8	0.0	63.2	35.5	0.0	39.0	22.7	13.3	13.3	16.2	26.4	26.4
LnGrp LOS	C	A	E	D	A	D	C	B	B	B	C	C
Approach Vol, veh/h	322		201				1033		874			
Approach Delay, s/veh	58.4		38.0				17.3		25.7			
Approach LOS	E		D				B		C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.2	66.6	8.7	26.3	22.7	52.1	8.3	26.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.1	62.1	7.3	26.5	34.1	34.1	6.9	26.9				
Max Q Clear Time (g_c+I1), s	4.3	12.0	5.0	21.2	17.5	22.0	4.8	11.0				
Green Ext Time (p_c), s	0.0	6.4	0.0	0.6	0.7	5.5	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay	27.5											
HCM 6th LOS	C											

HCM Signalized Intersection Capacity Analysis

16: NW Troost St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	5	575	45	385	1050	20	45	6	319	45	10	5
Future Volume (vph)	5	575	45	385	1050	20	45	6	319	45	10	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.85		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	2959		1662	3260	1488	1662	1478		1662	1662	
Flt Permitted	0.26	1.00		0.34	1.00	1.00	0.75	1.00		0.38	1.00	
Satd. Flow (perm)	457	2959		596	3260	1488	1308	1478		667	1662	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	5	599	47	401	1094	21	47	6	332	47	10	5
RTOR Reduction (vph)	0	3	0	0	0	6	0	292	0	0	4	0
Lane Group Flow (vph)	5	643	0	401	1094	15	47	46	0	47	11	0
Heavy Vehicles (%)	0%	12%	0%	0%	2%	0%	0%	0%	1%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	50.2	49.4		67.4	62.1	62.1	10.5	10.5		10.5	10.5	
Effective Green, g (s)	50.2	49.4		67.4	62.1	62.1	10.5	10.5		10.5	10.5	
Actuated g/C Ratio	0.58	0.57		0.78	0.71	0.71	0.12	0.12		0.12	0.12	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	275	1682		627	2329	1063	158	178		80	200	
v/s Ratio Prot	0.00	0.22		c0.10	0.34			0.03			0.01	
v/s Ratio Perm	0.01			c0.40		0.01	0.04			c0.07		
v/c Ratio	0.02	0.38		0.64	0.47	0.01	0.30	0.26		0.59	0.05	
Uniform Delay, d1	7.8	10.3		3.9	5.3	3.6	34.8	34.7		36.2	33.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.7		1.6	0.7	0.0	0.4	0.3		6.9	0.0	
Delay (s)	7.8	11.0		5.5	6.0	3.6	35.2	35.0		43.1	33.8	
Level of Service	A	B		A	A	A	D	C		D	C	
Approach Delay (s)		11.0			5.8			35.0			40.8	
Approach LOS		B			A			C			D	
Intersection Summary												
HCM 2000 Control Delay			12.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			86.9			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			82.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary 16: NW Troost St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	575	45	385	1050	20	45	6	319	45	10	5
Future Volume (veh/h)	5	575	45	385	1050	20	45	6	319	45	10	5
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1586	1750	1750	1723	1750	1750	1750	1736	1750	1750	1750
Adj Flow Rate, veh/h	5	599	47	401	1094	21	47	6	332	47	10	5
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	12	0	0	2	0	0	0	1	0	0	0
Cap, veh/h	273	1251	98	555	1931	875	453	7	404	137	304	152
Arrive On Green	0.00	0.44	0.44	0.15	0.59	0.59	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1667	2831	222	1667	3273	1483	1421	26	1461	1059	1101	550
Grp Volume(v), veh/h	5	318	328	401	1094	21	47	0	338	47	0	15
Grp Sat Flow(s),veh/h/ln	1667	1507	1546	1667	1637	1483	1421	0	1487	1059	0	1651
Q Serve(g_s), s	0.2	15.6	15.6	12.8	21.5	0.6	2.6	0.0	22.2	4.5	0.0	0.7
Cycle Q Clear(g_c), s	0.2	15.6	15.6	12.8	21.5	0.6	3.3	0.0	22.2	26.7	0.0	0.7
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.98	1.00		0.33
Lane Grp Cap(c), veh/h	273	666	683	555	1931	875	453	0	411	137	0	457
V/C Ratio(X)	0.02	0.48	0.48	0.72	0.57	0.02	0.10	0.00	0.82	0.34	0.00	0.03
Avail Cap(c_a), veh/h	354	666	683	805	1931	875	598	0	564	245	0	626
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.2	20.6	20.6	13.3	13.2	8.9	28.7	0.0	35.3	47.8	0.0	27.5
Incr Delay (d2), s/veh	0.0	2.5	2.4	0.7	1.2	0.1	0.0	0.0	5.0	0.6	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	5.5	5.7	4.1	7.1	0.2	0.9	0.0	8.6	1.2	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	23.0	23.0	14.0	14.4	8.9	28.8	0.0	40.3	48.4	0.0	27.5
LnGrp LOS	B	C	C	B	B	A	C	A	D	D	A	C
Approach Vol, veh/h		651			1516			385			62	
Approach Delay, s/veh		23.0			14.2			38.9			43.3	
Approach LOS		C			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		33.3	20.4	50.5		33.3	4.9	66.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		39.5	31.5	35.5		39.5	5.5	61.5				
Max Q Clear Time (g_c+I1), s		24.2	14.8	17.6		28.7	2.2	23.5				
Green Ext Time (p_c), s		1.4	1.1	10.0		0.1	0.0	28.1				
Intersection Summary												
HCM 6th Ctrl Delay			20.7									
HCM 6th LOS			C									

Intersection						
Int Delay, s/veh	3.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	107	7	166	324	5	99
Future Vol, veh/h	107	7	166	324	5	99
Conflicting Peds, #/hr	0	0	0	0	0	0
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	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	7	0	13
Mvmt Flow	113	7	175	341	5	104
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	120	0	808	117
Stage 1	-	-	-	-	117	-
Stage 2	-	-	-	-	691	-
Critical Hdwy	-	-	4.1	-	6.4	6.33
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.417
Pot Cap-1 Maneuver	-	-	1480	-	353	906
Stage 1	-	-	-	-	913	-
Stage 2	-	-	-	-	501	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1480	-	301	906
Mov Cap-2 Maneuver	-	-	-	-	301	-
Stage 1	-	-	-	-	913	-
Stage 2	-	-	-	-	428	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.6		10	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	826	-	-	1480	-	
HCM Lane V/C Ratio	0.133	-	-	0.118	-	
HCM Control Delay (s)	10	-	-	7.8	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.5	-	-	0.4	-	

Intersection						
Int Delay, s/veh	0.7					
Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	8	319	501	32	26	4
Future Vol, veh/h	8	319	501	32	26	4
Conflicting Peds, #/hr	0	0	0	0	0	0
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	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	343	539	34	28	4
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	573	0	-	0	917	556
Stage 1	-	-	-	-	556	-
Stage 2	-	-	-	-	361	-
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	1000	-	-	-	302	531
Stage 1	-	-	-	-	574	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1000	-	-	-	299	531
Mov Cap-2 Maneuver	-	-	-	-	299	-
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	705	-
Approach	NB	SB		SE		
HCM Control Delay, s	0.2	0		17.6		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	SELn1	SBT	SBR	
Capacity (veh/h)	1000	-	317	-	-	
HCM Lane V/C Ratio	0.009	-	0.102	-	-	
HCM Control Delay (s)	8.6	0	17.6	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

Intersection	
Intersection Delay, s/veh	33.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	35	25	5	330	95	70	5	184	122	45	235	40
Future Vol, veh/h	35	25	5	330	95	70	5	184	122	45	235	40
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, %	0	0	0	0	5	3	0	0	5	3	2	0
Mvmt Flow	38	27	5	359	103	76	5	200	133	49	255	43
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.3	52.3	19.9	22
HCM LOS	B	F	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	54%	67%	14%
Vol Thru, %	59%	38%	19%	73%
Vol Right, %	39%	8%	14%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	311	65	495	320
LT Vol	5	35	330	45
Through Vol	184	25	95	235
RT Vol	122	5	70	40
Lane Flow Rate	338	71	538	348
Geometry Grp	1	1	1	1
Degree of Util (X)	0.619	0.154	0.952	0.655
Departure Headway (Hd)	6.589	7.872	6.368	6.781
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	544	459	565	529
Service Time	4.682	5.872	4.441	4.872
HCM Lane V/C Ratio	0.621	0.155	0.952	0.658
HCM Control Delay	19.9	12.3	52.3	22
HCM Lane LOS	C	B	F	C
HCM 95th-tile Q	4.2	0.5	12.5	4.7

HCM Signalized Intersection Capacity Analysis

29: Kline St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	879	40	80	1355	240	60	25	105	295	30	65
Future Volume (vph)	15	879	40	80	1355	240	60	25	105	295	30	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.88		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1409	3178		1662	3222		1662	1525		1662	1572	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1409	3178		1662	3222		1662	1525		1662	1572	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	925	42	84	1426	253	63	26	111	311	32	68
RTOR Reduction (vph)	0	2	0	0	9	0	0	104	0	0	57	0
Lane Group Flow (vph)	16	965	0	84	1670	0	63	33	0	311	43	0
Heavy Vehicles (%)	18%	4%	3%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	1.9	48.1		6.9	53.1		5.3	6.2		14.6	15.5	
Effective Green, g (s)	1.9	48.1		6.9	53.1		5.3	6.2		14.6	15.5	
Actuated g/C Ratio	0.02	0.51		0.07	0.57		0.06	0.07		0.16	0.17	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	2.0		2.0	2.0		2.0	2.0		2.0	4.0	
Lane Grp Cap (vph)	28	1629		122	1823		93	100		258	259	
v/s Ratio Prot	0.01	0.30		c0.05	c0.52		0.04	c0.02		c0.19	0.03	
v/s Ratio Perm												
v/c Ratio	0.57	0.59		0.69	0.92		0.68	0.33		1.21	0.17	
Uniform Delay, d1	45.5	16.0		42.4	18.3		43.4	41.8		39.6	33.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	25.2	1.6		12.1	8.8		14.3	0.7		123.2	0.4	
Delay (s)	70.7	17.6		54.5	27.1		57.7	42.5		162.8	34.0	
Level of Service	E	B		D	C		E	D		F	C	
Approach Delay (s)		18.4			28.4			47.3			131.4	
Approach LOS		B			C			D			F	
Intersection Summary												
HCM 2000 Control Delay			39.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			93.8			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			94.3%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

29: Kline St & Garden Valley Rd

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	15	879	40	80	1355	240	60	25	105	295	30	65
Future Volume (veh/h)	15	879	40	80	1355	240	60	25	105	295	30	65
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1504	1695	1709	1750	1736	1750	1750	1750	1736	1750	1750	1750
Adj Flow Rate, veh/h	16	925	42	84	1426	253	63	26	111	311	32	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	18	4	3	0	1	0	0	0	1	0	0	0
Cap, veh/h	26	1502	68	106	1471	257	80	33	140	256	109	232
Arrive On Green	0.02	0.48	0.48	0.06	0.52	0.52	0.05	0.11	0.11	0.15	0.22	0.22
Sat Flow, veh/h	1433	3138	142	1667	2807	490	1667	290	1237	1667	499	1060
Grp Volume(v), veh/h	16	475	492	84	828	851	63	0	137	311	0	100
Grp Sat Flow(s),veh/h/ln	1433	1611	1670	1667	1650	1648	1667	0	1527	1667	0	1559
Q Serve(g_s), s	1.0	20.5	20.5	4.7	45.3	47.8	3.5	0.0	8.2	14.5	0.0	5.0
Cycle Q Clear(g_c), s	1.0	20.5	20.5	4.7	45.3	47.8	3.5	0.0	8.2	14.5	0.0	5.0
Prop In Lane	1.00		0.09	1.00		0.30	1.00		0.81	1.00		0.68
Lane Grp Cap(c), veh/h	26	771	799	106	864	864	80	0	173	256	0	342
V/C Ratio(X)	0.62	0.62	0.62	0.79	0.96	0.98	0.79	0.00	0.79	1.21	0.00	0.29
Avail Cap(c_a), veh/h	76	771	799	164	864	864	184	0	536	256	0	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.0	18.2	18.2	43.5	21.5	22.1	44.4	0.0	40.7	39.9	0.0	30.7
Incr Delay (d2), s/veh	21.3	3.7	3.5	6.2	22.0	27.2	6.5	0.0	3.1	126.3	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.9	8.1	2.1	20.9	23.0	1.6	0.0	3.2	14.9	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.2	21.8	21.7	49.7	43.5	49.2	50.9	0.0	43.8	166.2	0.0	31.4
LnGrp LOS	E	C	C	D	D	D	D	A	D	F	A	C
Approach Vol, veh/h	983			1763			200			411		
Approach Delay, s/veh	22.5			46.6			46.1			133.4		
Approach LOS	C			D			D			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.5	49.6	9.0	25.2	6.2	53.9	19.0	15.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	9.3	45.1	10.4	37.2	5.0	49.4	14.5	33.1				
Max Q Clear Time (g_c+I1), s	6.7	22.5	5.5	7.0	3.0	49.8	16.5	10.2				
Green Ext Time (p_c), s	0.0	13.8	0.0	0.5	0.0	0.0	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay	50.1											
HCM 6th LOS	D											

Intersection

Int Delay, s/veh 6.5

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations						
Traffic Vol, veh/h	46	146	241	70	105	129
Future Vol, veh/h	46	146	241	70	105	129
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	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	5	0	0	0	0	0
Mvmt Flow	49	157	259	75	113	139

Major/Minor Minor2 Major1 Major2

Conflicting Flow All	776	183	252	0	-	0
Stage 1	183	-	-	-	-	-
Stage 2	593	-	-	-	-	-
Critical Hdwy	6.45	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	362	865	1325	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	546	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	288	865	1325	-	-	-
Mov Cap-2 Maneuver	288	-	-	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	546	-	-	-	-	-

Approach EB NB SB

HCM Control Delay, s	14.5	6.5	0
HCM LOS	B		

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h)	1325	-	584	-	-
HCM Lane V/C Ratio	0.196	-	0.354	-	-
HCM Control Delay (s)	8.4	0	14.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.7	-	1.6	-	-

HCM 6th TWSC
34: Harvey Ave & Keasey St

08/23/2021

Intersection

Int Delay, s/veh 4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	82	165	361	224	9
Future Vol, veh/h	1	82	165	361	224	9
Conflicting Peds, #/hr	0	0	0	0	0	0
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	1	89	179	392	243	10

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	571	0	0 466 375
Stage 1	-	-	- 375 -
Stage 2	-	-	- 91 -
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	1002	-	- 555 671
Stage 1	-	-	- 695 -
Stage 2	-	-	- 933 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1002	-	- 554 671
Mov Cap-2 Maneuver	-	-	- 554 -
Stage 1	-	-	- 694 -
Stage 2	-	-	- 933 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1002	-	-	-	558
HCM Lane V/C Ratio	0.001	-	-	-	0.454
HCM Control Delay (s)	8.6	0	-	-	16.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	2.3

HCM Signalized Intersection Capacity Analysis

35: Exit 125 & Garden Valley

08/23/2021

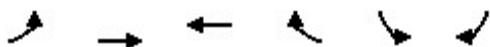
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	67	982	0	0	1400	40	580	225	315	45	0	276
Future Volume (vph)	67	982	0	0	1400	40	580	225	315	45	0	276
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5			4.5		4.5	4.5	4.5	4.5		4.5
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00	1.00	1.00		1.00
Frt	1.00	1.00			1.00		1.00	1.00	0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95		1.00
Satd. Flow (prot)	1630	3260			3246		1630	1716	1458	1630		1458
Flt Permitted	0.95	1.00			1.00		0.95	1.00	1.00	0.55		1.00
Satd. Flow (perm)	1630	3260			3246		1630	1716	1458	937		1458
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	70	1023	0	0	1458	42	604	234	328	47	0	288
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	45	0	0	88
Lane Group Flow (vph)	70	1023	0	0	1498	0	604	234	283	47	0	200
Turn Type	Prot	NA			NA		Perm	NA	Perm	Perm		Perm
Protected Phases	7	4			8			2				
Permitted Phases							2		2	6		6
Actuated Green, G (s)	4.0	46.1			37.6		34.3	34.3	34.3	34.3		34.3
Effective Green, g (s)	4.0	46.1			37.6		34.3	34.3	34.3	34.3		34.3
Actuated g/C Ratio	0.04	0.52			0.42		0.38	0.38	0.38	0.38		0.38
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5	4.5		4.5
Vehicle Extension (s)	2.0	4.0			4.0		2.0	2.0	2.0	2.0		2.0
Lane Grp Cap (vph)	72	1681			1365		625	658	559	359		559
v/s Ratio Prot	c0.04	0.31			c0.46			0.14				
v/s Ratio Perm							c0.37		0.19	0.05		0.14
v/c Ratio	0.97	0.61			1.10		0.97	0.36	0.51	0.13		0.36
Uniform Delay, d1	42.6	15.3			25.9		27.0	19.7	21.1	17.9		19.7
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	95.7	1.6			55.5		27.4	0.1	0.3	0.1		0.1
Delay (s)	138.3	16.9			81.4		54.3	19.8	21.3	17.9		19.8
Level of Service	F	B			F		D	B	C	B		B
Approach Delay (s)		24.7			81.4			38.1			19.6	
Approach LOS		C			F			D			B	
Intersection Summary												
HCM 2000 Control Delay			48.9				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			89.4				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			108.1%				ICU Level of Service			G		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support Non-NEMA phasing.

HCM Signalized Intersection Capacity Analysis

38: Garden Valley Rd & Hwy 125

08/23/2021



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑	↑
Traffic Volume (vph)	0	2557	1636	0	145	200
Future Volume (vph)	0	2557	1636	0	145	200
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5	4.5		4.5	4.5
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3260	3260		1630	1458
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3260	3260		1630	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2692	1722	0	153	211
RTOR Reduction (vph)	0	0	0	0	0	40
Lane Group Flow (vph)	0	2692	1722	0	153	171
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			
Permitted Phases					6	6
Actuated Green, G (s)		88.9	88.9		16.7	16.7
Effective Green, g (s)		88.9	88.9		16.7	16.7
Actuated g/C Ratio		0.78	0.78		0.15	0.15
Clearance Time (s)		4.5	4.5		4.5	4.5
Vehicle Extension (s)		4.0	4.0		2.0	2.0
Lane Grp Cap (vph)		2528	2528		237	212
v/s Ratio Prot		c0.83	0.53			
v/s Ratio Perm					0.09	c0.12
v/c Ratio		1.06	0.68		0.65	0.81
Uniform Delay, d1		12.8	6.1		46.2	47.4
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		38.1	1.5		4.5	18.6
Delay (s)		51.0	7.6		50.6	66.0
Level of Service		D	A		D	E
Approach Delay (s)		51.0	7.6		59.5	
Approach LOS		D	A		E	

Intersection Summary

HCM 2000 Control Delay	36.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support Non-NEMA phasing.

HCM Signalized Intersection Capacity Analysis

40: Freeway Ave/Willow St

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	2	170	15	0	40	0	1802	25	16	1054	303
Future Volume (vph)	230	2	170	15	0	40	0	1802	25	16	1054	303
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5		4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00		1.00		0.95		1.00	0.95	1.00
Frt	1.00	0.85		1.00		0.85		1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95		1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1630	1461		1630		1458		3253		1630	3260	1458
Flt Permitted	0.95	1.00		0.54		1.00		1.00		0.95	1.00	1.00
Satd. Flow (perm)	1630	1461		921		1458		3253		1630	3260	1458
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	242	2	179	16	0	42	0	1897	26	17	1109	319
RTOR Reduction (vph)	0	79	0	0	0	33	0	0	0	0	0	25
Lane Group Flow (vph)	242	102	0	16	0	9	0	1923	0	17	1109	294
Turn Type	Perm	NA		Perm		Perm		NA		Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)	18.3	18.3		18.3		18.3		51.4		2.5	58.4	58.4
Effective Green, g (s)	18.3	18.3		18.3		18.3		51.4		2.5	58.4	58.4
Actuated g/C Ratio	0.21	0.21		0.21		0.21		0.60		0.03	0.68	0.68
Clearance Time (s)	4.5	4.5		4.5		4.5		4.5		4.5	4.5	4.5
Vehicle Extension (s)	4.0	4.0		4.0		4.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	348	311		196		311		1951		47	2221	993
v/s Ratio Prot		0.07						c0.59		0.01	c0.34	
v/s Ratio Perm	c0.15			0.02		0.01						0.20
v/c Ratio	0.70	0.33		0.08		0.03		0.99		0.36	0.50	0.30
Uniform Delay, d1	31.1	28.5		27.0		26.7		16.8		40.8	6.6	5.4
Progression Factor	1.00	1.00		1.00		1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	6.4	0.8		0.2		0.1		17.2		1.7	0.8	0.8
Delay (s)	37.5	29.4		27.2		26.7		34.0		42.5	7.4	6.2
Level of Service	D	C		C		C		C		D	A	A
Approach Delay (s)		34.0			26.9			34.0			7.5	
Approach LOS		C			C			C			A	
Intersection Summary												
HCM 2000 Control Delay			24.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			85.7				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			88.4%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support Non-NEMA phasing.

HCM Signalized Intersection Capacity Analysis

42: Harvard Ave & Bellows

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	31	1098	404	240	1262	5	302	30	350	40	15	47
Future Volume (vph)	31	1098	404	240	1262	5	302	30	350	40	15	47
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1630	3260	1458	1630	3260	1458	1630	1716	1458	1630	1522	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.41	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1630	3260	1458	1630	3260	1458	696	1716	1458	1263	1522	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	1156	425	253	1328	5	318	32	368	42	16	49
RTOR Reduction (vph)	0	0	87	0	0	2	0	0	71	0	46	0
Lane Group Flow (vph)	33	1156	338	253	1328	3	318	32	297	42	19	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	2.9	45.6	45.6	18.9	61.6	61.6	18.9	11.5	30.4	8.8	5.9	
Effective Green, g (s)	2.9	45.6	45.6	18.9	61.6	61.6	18.9	11.5	30.4	8.8	5.9	
Actuated g/C Ratio	0.03	0.47	0.47	0.20	0.64	0.64	0.20	0.12	0.31	0.09	0.06	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	3.0	2.0	2.0	3.0	2.0	
Lane Grp Cap (vph)	48	1534	686	317	2072	926	217	203	525	125	92	
v/s Ratio Prot	0.02	c0.35		c0.16	0.41		c0.13	0.02	c0.11	0.01	0.01	
v/s Ratio Perm			0.23			0.00	c0.16		0.09	0.02		
v/c Ratio	0.69	0.75	0.49	0.80	0.64	0.00	1.47	0.16	0.57	0.34	0.21	
Uniform Delay, d1	46.6	21.0	17.7	37.2	10.9	6.4	37.8	38.3	27.7	41.1	43.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	27.8	3.5	2.5	12.3	1.5	0.0	232.9	0.1	0.8	1.6	0.4	
Delay (s)	74.4	24.5	20.2	49.4	12.4	6.5	270.7	38.5	28.6	42.7	43.7	
Level of Service	E	C	C	D	B	A	F	D	C	D	D	
Approach Delay (s)		24.4			18.3			136.3			43.3	
Approach LOS		C			B			F			D	
Intersection Summary												
HCM 2000 Control Delay			42.4				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			96.9				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			83.5%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

42: Harvard Ave & Bellows

08/23/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	1098	404	240	1262	5	302	30	350	40	15	47
Future Volume (veh/h)	31	1098	404	240	1262	5	302	30	350	40	15	47
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
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1723	1723	1723	1723	1723	1723	1723	1723	1723	1723	1723	1723
Adj Flow Rate, veh/h	33	1156	0	253	1328	0	318	32	368	42	16	49
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	40	1317		280	1796		390	392	581	300	68	208
Arrive On Green	0.02	0.40	0.00	0.17	0.55	0.00	0.08	0.23	0.23	0.03	0.18	0.18
Sat Flow, veh/h	1641	3273	1460	1641	3273	1460	1641	1723	1460	1641	373	1143
Grp Volume(v), veh/h	33	1156	0	253	1328	0	318	32	368	42	0	65
Grp Sat Flow(s),veh/h/ln	1641	1637	1460	1641	1637	1460	1641	1723	1460	1641	0	1517
Q Serve(g_s), s	2.2	35.3	0.0	16.3	33.3	0.0	8.5	1.6	21.9	2.2	0.0	4.0
Cycle Q Clear(g_c), s	2.2	35.3	0.0	16.3	33.3	0.0	8.5	1.6	21.9	2.2	0.0	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.75
Lane Grp Cap(c), veh/h	40	1317		280	1796		390	392	581	300	0	276
V/C Ratio(X)	0.83	0.88		0.90	0.74		0.82	0.08	0.63	0.14	0.00	0.24
Avail Cap(c_a), veh/h	76	1317		296	1796		390	540	707	323	0	428
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.5	29.8	0.0	44.0	18.5	0.0	38.8	32.9	26.2	34.2	0.0	37.8
Incr Delay (d2), s/veh	14.9	8.5	0.0	27.2	2.8	0.0	12.7	0.0	0.6	0.2	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	15.0	0.0	8.7	12.6	0.0	5.8	0.7	7.6	0.9	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.4	38.3	0.0	71.2	21.3	0.0	51.4	32.9	26.8	34.4	0.0	38.0
LnGrp LOS	E	D		E	C		D	C	C	C	A	D
Approach Vol, veh/h	1189		A	1581		A	718				107	
Approach Delay, s/veh	39.1			29.3			38.0				36.6	
Approach LOS	D			C			D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.1	29.1	22.9	48.0	13.0	24.1	7.1	63.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.1	33.9	19.5	43.5	8.5	30.5	5.0	58.0				
Max Q Clear Time (g_c+I1), s	4.2	23.9	18.3	37.3	10.5	6.0	4.2	35.3				
Green Ext Time (p_c), s	0.0	0.6	0.1	4.5	0.0	0.2	0.0	14.0				

Intersection Summary

HCM 6th Ctrl Delay	34.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

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Queuing and Blocking Report
2040 no-build

05/07/2021

Intersection: 9: Garden Valley Rd & Stewart Pkwy, Interval #1

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	L
Maximum Queue (ft)	1025	1920	1941	1025	2957	2966	140	203	250	225	195	931
Average Queue (ft)	923	1310	1173	949	2428	2442	128	137	124	118	87	657
95th Queue (ft)	1235	2350	2268	1318	3684	3682	188	212	221	186	159	1022
Link Distance (ft)		1947	1947		2937	2937			264	264		
Upstream Blk Time (%)		13	5		5	7			0	0		
Queuing Penalty (veh)		72	28		42	62			1	0		
Storage Bay Dist (ft)	1000			1000			115	185			190	1000
Storage Blk Time (%)	62	14		0	58	70	1	7	0	0	0	0
Queuing Penalty (veh)	223	64		0	224	234	4	14	1	1	1	0

Intersection: 9: Garden Valley Rd & Stewart Pkwy, Interval #1

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	970	1052	991	145
Average Queue (ft)	692	459	436	133
95th Queue (ft)	1069	1094	1000	168
Link Distance (ft)		1555	1555	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	1000			120
Storage Blk Time (%)	3	3	10	14
Queuing Penalty (veh)	6	14	43	28

Queuing and Blocking Report
2040 no-build

05/07/2021

Intersection: 9: Garden Valley Rd & Stewart Pkwy, Interval #2

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	L
Maximum Queue (ft)	1025	1920	1941	1025	2957	2966	140	203	250	225	195	931
Average Queue (ft)	923	1310	1173	949	2428	2442	128	137	124	118	87	657
95th Queue (ft)	1235	2350	2268	1318	3684	3682	188	212	221	186	159	1022
Link Distance (ft)		1947	1947		2937	2937			264	264		
Upstream Blk Time (%)		13	5		5	7			0	0		
Queuing Penalty (veh)		72	28		42	62			1	0		
Storage Bay Dist (ft)	1000			1000			115	185			190	1000
Storage Blk Time (%)	62	14		0	58	70	1	7	0	0	0	0
Queuing Penalty (veh)	223	64		0	224	234	4	14	1	1	1	0

Intersection: 9: Garden Valley Rd & Stewart Pkwy, Interval #2

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	970	1052	991	145
Average Queue (ft)	692	459	436	133
95th Queue (ft)	1069	1094	1000	168
Link Distance (ft)		1555	1555	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	1000			120
Storage Blk Time (%)	3	3	10	14
Queuing Penalty (veh)	6	14	43	28

Queuing and Blocking Report
2040 no-build

05/07/2021

Intersection: 9: Garden Valley Rd & Stewart Pkwy, All Intervals

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	L
Maximum Queue (ft)	1025	1920	1941	1025	2957	2966	140	203	250	225	195	931
Average Queue (ft)	923	1310	1173	949	2428	2442	128	137	124	118	87	657
95th Queue (ft)	1235	2350	2268	1318	3684	3682	188	212	221	186	159	1022
Link Distance (ft)		1947	1947		2937	2937			264	264		
Upstream Blk Time (%)		13	5		5	7			0	0		
Queuing Penalty (veh)		72	28		42	62			1	0		
Storage Bay Dist (ft)	1000			1000			115	185			190	1000
Storage Blk Time (%)	62	14		0	58	70	1	7	0	0	0	0
Queuing Penalty (veh)	223	64		0	224	234	4	14	1	1	1	0

Intersection: 9: Garden Valley Rd & Stewart Pkwy, All Intervals

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	970	1052	991	145
Average Queue (ft)	692	459	436	133
95th Queue (ft)	1069	1094	1000	168
Link Distance (ft)		1555	1555	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	1000			120
Storage Blk Time (%)	3	3	10	14
Queuing Penalty (veh)	6	14	43	28

Intersection: 10: Harvard Ave & Stewart Pkwy, Interval #1

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	B28
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR	T
Maximum Queue (ft)	135	471	447	23	304	409	190	26	65	115	1113	78
Average Queue (ft)	128	238	192	2	167	201	162	4	22	113	570	3
95th Queue (ft)	149	436	398	14	254	336	228	20	55	121	1230	56
Link Distance (ft)		1477	1477		1998	1998			140		2286	308
Upstream Blk Time (%)												0
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	110			100			165	60		90		
Storage Blk Time (%)	51	3			30	6	7		1	50	6	
Queuing Penalty (veh)	131	7			1	43	27		0	169	28	

Queuing and Blocking Report
2040 no-build

05/07/2021

Intersection: 10: Harvard Ave & Stewart Pkwy, Interval #2

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	B28
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR	T
Maximum Queue (ft)	135	471	447	23	304	409	190	26	65	115	1113	78
Average Queue (ft)	128	238	192	2	167	201	162	4	22	113	570	3
95th Queue (ft)	149	436	398	14	254	336	228	20	55	121	1230	56
Link Distance (ft)		1477	1477		1998	1998			140		2286	308
Upstream Blk Time (%)												0
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	110			100			165	60		90		
Storage Blk Time (%)	51	3			30	6	7		1	50	6	
Queuing Penalty (veh)	131	7			1	43	27		0	169	28	

Intersection: 10: Harvard Ave & Stewart Pkwy, All Intervals

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	B28
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR	T
Maximum Queue (ft)	135	471	447	23	304	409	190	26	65	115	1113	78
Average Queue (ft)	128	238	192	2	167	201	162	4	22	113	570	3
95th Queue (ft)	149	436	398	14	254	336	228	20	55	121	1230	56
Link Distance (ft)		1477	1477		1998	1998			140		2286	308
Upstream Blk Time (%)												0
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	110			100			165	60		90		
Storage Blk Time (%)	51	3			30	6	7		1	50	6	
Queuing Penalty (veh)	131	7			1	43	27		0	169	28	

Intersection: 13: Stewart Pkwy & Harvey Ave, Interval #1

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	86	100	117	153	196	190	173	104	451	420
Average Queue (ft)	39	59	44	68	116	58	71	38	235	149
95th Queue (ft)	76	98	90	130	190	136	137	99	409	357
Link Distance (ft)		91		376		308	308		1791	1791
Upstream Blk Time (%)	0	4								
Queuing Penalty (veh)	0	11								
Storage Bay Dist (ft)	65		130		175			80		
Storage Blk Time (%)	6	8	0	1	2	0		0	31	
Queuing Penalty (veh)	11	4	0	1	6	0		0	19	

Intersection: 13: Stewart Pkwy & Harvey Ave, Interval #2

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	86	100	117	153	196	190	173	104	451	420
Average Queue (ft)	39	59	44	68	116	58	71	38	235	149
95th Queue (ft)	76	98	90	130	190	136	137	99	409	357
Link Distance (ft)		91		376		308	308		1791	1791
Upstream Blk Time (%)	0	4								
Queuing Penalty (veh)	0	11								
Storage Bay Dist (ft)	65		130		175			80		
Storage Blk Time (%)	6	8	0	1	2	0		0	31	
Queuing Penalty (veh)	11	4	0	1	6	0		0	19	

Intersection: 13: Stewart Pkwy & Harvey Ave, All Intervals

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	86	100	117	153	196	190	173	104	451	420
Average Queue (ft)	39	59	44	68	116	58	71	38	235	149
95th Queue (ft)	76	98	90	130	190	136	137	99	409	357
Link Distance (ft)		91		376		308	308		1791	1791
Upstream Blk Time (%)	0	4								
Queuing Penalty (veh)	0	11								
Storage Bay Dist (ft)	65		130		175			80		
Storage Blk Time (%)	6	8	0	1	2	0		0	31	
Queuing Penalty (veh)	11	4	0	1	6	0		0	19	

Intersection: 16: NW Troost St & Garden Valley Rd, Interval #1

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	75	409	400	135	391	391	109	64	158	67	41
Average Queue (ft)	6	234	223	108	180	172	11	14	61	25	6
95th Queue (ft)	38	364	352	163	354	346	61	48	115	56	24
Link Distance (ft)		2075	2075		1481	1481			1001		610
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	120			110			140	95		80	
Storage Blk Time (%)		41		20	8	11	0		2	0	
Queuing Penalty (veh)		2		106	19	2	0		1	0	

Queuing and Blocking Report
2040 no-build

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Intersection: 16: NW Troost St & Garden Valley Rd, Interval #2

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	75	409	400	135	391	391	109	64	158	67	41
Average Queue (ft)	6	234	223	108	180	172	11	14	61	25	6
95th Queue (ft)	38	364	352	163	354	346	61	48	115	56	24
Link Distance (ft)		2075	2075		1481	1481			1001		610
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	120			110			140	95		80	
Storage Blk Time (%)		41		20	8	11	0		2	0	
Queuing Penalty (veh)		2		106	19	2	0		1	0	

Intersection: 16: NW Troost St & Garden Valley Rd, All Intervals

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	75	409	400	135	391	391	109	64	158	67	41
Average Queue (ft)	6	234	223	108	180	172	11	14	61	25	6
95th Queue (ft)	38	364	352	163	354	346	61	48	115	56	24
Link Distance (ft)		2075	2075		1481	1481			1001		610
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	120			110			140	95		80	
Storage Blk Time (%)		41		20	8	11	0		2	0	
Queuing Penalty (veh)		2		106	19	2	0		1	0	

Intersection: 19: Charter Oaks Dr & Troost St, Interval #1

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	35	67
Average Queue (ft)	2	16
95th Queue (ft)	14	45
Link Distance (ft)	613	728
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
2040 no-build

05/07/2021

Intersection: 19: Charter Oaks Dr & Troost St, Interval #2

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	35	67
Average Queue (ft)	2	16
95th Queue (ft)	14	45
Link Distance (ft)	613	728
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 19: Charter Oaks Dr & Troost St, All Intervals

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	35	67
Average Queue (ft)	2	16
95th Queue (ft)	14	45
Link Distance (ft)	613	728
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 22: Loma Vista Dr, Interval #1

Movement	NB	SE
Directions Served	LT	LR
Maximum Queue (ft)	22	55
Average Queue (ft)	1	18
95th Queue (ft)	13	44
Link Distance (ft)	564	633
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
2040 no-build

05/07/2021

Intersection: 22: Loma Vista Dr, Interval #2

Movement	NB	SE
Directions Served	LT	LR
Maximum Queue (ft)	22	55
Average Queue (ft)	1	18
95th Queue (ft)	13	44
Link Distance (ft)	564	633
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 22: Loma Vista Dr, All Intervals

Movement	NB	SE
Directions Served	LT	LR
Maximum Queue (ft)	22	55
Average Queue (ft)	1	18
95th Queue (ft)	13	44
Link Distance (ft)	564	633
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 26: NW Troost/Troost St & Calkins Rd, Interval #1

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	58	121	56	102
Average Queue (ft)	29	61	33	48
95th Queue (ft)	49	97	56	84
Link Distance (ft)	312	2632	1346	1924
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report
2040 no-build

05/07/2021

Intersection: 26: NW Troost/Troost St & Calkins Rd, Interval #2

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	58	121	56	102
Average Queue (ft)	29	61	33	48
95th Queue (ft)	49	97	56	84
Link Distance (ft)	312	2632	1346	1924
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 26: NW Troost/Troost St & Calkins Rd, All Intervals

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	58	121	56	102
Average Queue (ft)	29	61	33	48
95th Queue (ft)	49	97	56	84
Link Distance (ft)	312	2632	1346	1924
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 29: Kline St & Garden Valley Rd, Interval #1

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	129	665	642	124	478	489	157	201	104	627
Average Queue (ft)	19	248	244	49	151	176	75	92	94	185
95th Queue (ft)	70	592	580	106	336	354	138	171	121	528
Link Distance (ft)		1481	1481		1947	1947		1058		698
Upstream Blk Time (%)										8
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	105			100			275		80	
Storage Blk Time (%)	0	31		1	11			0	40	1
Queuing Penalty (veh)	0	5		4	7			0	26	3

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Intersection: 29: Kline St & Garden Valley Rd, Interval #2

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	129	665	642	124	478	489	157	201	104	627
Average Queue (ft)	19	248	244	49	151	176	75	92	94	185
95th Queue (ft)	70	592	580	106	336	354	138	171	121	528
Link Distance (ft)		1481	1481		1947	1947		1058		698
Upstream Blk Time (%)										8
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	105			100			275		80	
Storage Blk Time (%)	0	31		1	11			0	40	1
Queuing Penalty (veh)	0	5		4	7			0	26	3

Intersection: 29: Kline St & Garden Valley Rd, All Intervals

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	129	665	642	124	478	489	157	201	104	627
Average Queue (ft)	19	248	244	49	151	176	75	92	94	185
95th Queue (ft)	70	592	580	106	336	354	138	171	121	528
Link Distance (ft)		1481	1481		1947	1947		1058		698
Upstream Blk Time (%)										8
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	105			100			275		80	
Storage Blk Time (%)	0	31		1	11			0	40	1
Queuing Penalty (veh)	0	5		4	7			0	26	3

Intersection: 32: Keasey St & Calkins Rd, Interval #1

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	60	72	8
Average Queue (ft)	40	16	0
95th Queue (ft)	61	50	3
Link Distance (ft)	2632	2126	737
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Intersection: 32: Keasey St & Calkins Rd, Interval #2

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	60	72	8
Average Queue (ft)	40	16	0
95th Queue (ft)	61	50	3
Link Distance (ft)	2632	2126	737
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 32: Keasey St & Calkins Rd, All Intervals

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	60	72	8
Average Queue (ft)	40	16	0
95th Queue (ft)	61	50	3
Link Distance (ft)	2632	2126	737
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 34: Harvey Ave & Keasey St, Interval #1

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	45	10	129
Average Queue (ft)	5	0	57
95th Queue (ft)	27	7	102
Link Distance (ft)	738	91	2126
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 34: Harvey Ave & Keasey St, Interval #2

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	45	10	129
Average Queue (ft)	5	0	57
95th Queue (ft)	27	7	102
Link Distance (ft)	738	91	2126
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 34: Harvey Ave & Keasey St, All Intervals

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	45	10	129
Average Queue (ft)	5	0	57
95th Queue (ft)	27	7	102
Link Distance (ft)	738	91	2126
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 35: Exit 125 & Garden Valley , Interval #1

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	L	TR	L	R
Maximum Queue (ft)	88	175	192	1520	1516	1476	1492	72	294
Average Queue (ft)	33	89	106	715	707	1055	870	30	133
95th Queue (ft)	70	156	177	1488	1467	1759	1775	62	252
Link Distance (ft)	1072	1072	1072	1481	1481	1453	1453	543	543
Upstream Blk Time (%)				18	17	34	27		
Queuing Penalty (veh)				0	0	0	0		
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 35: Exit 125 & Garden Valley , Interval #2

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	L	TR	L	R
Maximum Queue (ft)	88	175	192	1520	1516	1476	1492	72	294
Average Queue (ft)	33	89	106	715	707	1055	870	30	133
95th Queue (ft)	70	156	177	1488	1467	1759	1775	62	252
Link Distance (ft)	1072	1072	1072	1481	1481	1453	1453	543	543
Upstream Blk Time (%)				18	17	34	27		
Queuing Penalty (veh)				0	0	0	0		
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 35: Exit 125 & Garden Valley , All Intervals

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	L	TR	L	R
Maximum Queue (ft)	88	175	192	1520	1516	1476	1492	72	294
Average Queue (ft)	33	89	106	715	707	1055	870	30	133
95th Queue (ft)	70	156	177	1488	1467	1759	1775	62	252
Link Distance (ft)	1072	1072	1072	1481	1481	1453	1453	543	543
Upstream Blk Time (%)				18	17	34	27		
Queuing Penalty (veh)				0	0	0	0		
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 38: Garden Valley Rd & Hwy 125, Interval #1

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	1724	1735	1101	1104	180	196
Average Queue (ft)	1575	1606	687	695	90	98
95th Queue (ft)	1856	1856	1358	1351	154	170
Link Distance (ft)	2937	2937	1072	1072	1104	1104
Upstream Blk Time (%)			7	7		
Queuing Penalty (veh)			73	78		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

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Intersection: 38: Garden Valley Rd & Hwy 125, Interval #2

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	1724	1735	1101	1104	180	196
Average Queue (ft)	1575	1606	687	695	90	98
95th Queue (ft)	1856	1856	1358	1351	154	170
Link Distance (ft)	2937	2937	1072	1072	1104	1104
Upstream Blk Time (%)			7	7		
Queuing Penalty (veh)			73	78		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 38: Garden Valley Rd & Hwy 125, All Intervals

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	1724	1735	1101	1104	180	196
Average Queue (ft)	1575	1606	687	695	90	98
95th Queue (ft)	1856	1856	1358	1351	154	170
Link Distance (ft)	2937	2937	1072	1072	1104	1104
Upstream Blk Time (%)			7	7		
Queuing Penalty (veh)			73	78		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 40: Freeway Ave/Willow St, Interval #1

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	R	T	TR	L	T	T	R
Maximum Queue (ft)	222	111	47	81	514	506	53	270	295	61
Average Queue (ft)	112	53	11	22	342	284	12	113	141	33
95th Queue (ft)	188	89	34	59	544	481	36	239	275	47
Link Distance (ft)	817	817	228	228	487	487		507	507	
Upstream Blk Time (%)					5	2				
Queuing Penalty (veh)					0	0				
Storage Bay Dist (ft)							400			10
Storage Blk Time (%)									24	3
Queuing Penalty (veh)									71	17

Intersection: 40: Freeway Ave/Willow St, Interval #2

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	R	T	TR	L	T	T	R
Maximum Queue (ft)	222	111	47	81	514	506	53	270	295	61
Average Queue (ft)	112	53	11	22	342	284	12	113	141	33
95th Queue (ft)	188	89	34	59	544	481	36	239	275	47
Link Distance (ft)	817	817	228	228	487	487		507	507	
Upstream Blk Time (%)					5	2				
Queuing Penalty (veh)					0	0				
Storage Bay Dist (ft)							400			10
Storage Blk Time (%)									24	3
Queuing Penalty (veh)									71	17

Intersection: 40: Freeway Ave/Willow St, All Intervals

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	R	T	TR	L	T	T	R
Maximum Queue (ft)	222	111	47	81	514	506	53	270	295	61
Average Queue (ft)	112	53	11	22	342	284	12	113	141	33
95th Queue (ft)	188	89	34	59	544	481	36	239	275	47
Link Distance (ft)	817	817	228	228	487	487		507	507	
Upstream Blk Time (%)					5	2				
Queuing Penalty (veh)					0	0				
Storage Bay Dist (ft)							400			10
Storage Blk Time (%)									24	3
Queuing Penalty (veh)									71	17

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Intersection: 42: Harvard Ave & Bellows, Interval #1

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B6	B6	NB	NB
Directions Served	L	T	T	R	L	T	T	R	T	T	L	T
Maximum Queue (ft)	129	872	938	125	120	324	317	96	500	502	124	417
Average Queue (ft)	38	502	567	115	114	281	278	3	243	245	111	143
95th Queue (ft)	107	916	1011	169	136	354	353	36	526	526	142	370
Link Distance (ft)		2828	2828			220	220		507	507		652
Upstream Blk Time (%)						36	27		0	0		
Queuing Penalty (veh)						370	277		3	3		
Storage Bay Dist (ft)	105			100	95			100			100	
Storage Blk Time (%)	0	52	50	1	46	22	32	0			23	0
Queuing Penalty (veh)	0	15	200	4	282	53	2	0			87	0

Intersection: 42: Harvard Ave & Bellows, Interval #1

Movement	NB	SB	SB
Directions Served	R	L	TR
Maximum Queue (ft)	160	68	93
Average Queue (ft)	111	21	33
95th Queue (ft)	200	53	74
Link Distance (ft)			281
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	135	100	
Storage Blk Time (%)	2	0	0
Queuing Penalty (veh)	8	0	0

Intersection: 42: Harvard Ave & Bellows, Interval #2

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B6	B6	NB	NB
Directions Served	L	T	T	R	L	T	T	R	T	T	L	T
Maximum Queue (ft)	129	872	938	125	120	324	317	96	500	502	124	417
Average Queue (ft)	38	502	567	115	114	281	278	3	243	245	111	143
95th Queue (ft)	107	916	1011	169	136	354	353	36	526	526	142	370
Link Distance (ft)		2828	2828			220	220		507	507		652
Upstream Blk Time (%)						36	27		0	0		
Queuing Penalty (veh)						370	277		3	3		
Storage Bay Dist (ft)	105			100	95			100			100	
Storage Blk Time (%)	0	52	50	1	46	22	32	0			23	0
Queuing Penalty (veh)	0	15	200	4	282	53	2	0			87	0

Intersection: 42: Harvard Ave & Bellows, Interval #2

Movement	NB	SB	SB
Directions Served	R	L	TR
Maximum Queue (ft)	160	68	93
Average Queue (ft)	111	21	33
95th Queue (ft)	200	53	74
Link Distance (ft)			281
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	135	100	
Storage Blk Time (%)	2	0	0
Queuing Penalty (veh)	8	0	0

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Intersection: 42: Harvard Ave & Bellows, All Intervals

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B6	B6	NB	NB
Directions Served	L	T	T	R	L	T	T	R	T	T	L	T
Maximum Queue (ft)	129	872	938	125	120	324	317	96	500	502	124	417
Average Queue (ft)	38	502	567	115	114	281	278	3	243	245	111	143
95th Queue (ft)	107	916	1011	169	136	354	353	36	526	526	142	370
Link Distance (ft)		2828	2828			220	220		507	507		652
Upstream Blk Time (%)						36	27		0	0		
Queuing Penalty (veh)						370	277		3	3		
Storage Bay Dist (ft)	105			100	95			100			100	
Storage Blk Time (%)	0	52	50	1	46	22	32	0			23	0
Queuing Penalty (veh)	0	15	200	4	282	53	2	0			87	0

Intersection: 42: Harvard Ave & Bellows, All Intervals

Movement	NB	SB	SB
Directions Served	R	L	TR
Maximum Queue (ft)	160	68	93
Average Queue (ft)	111	21	33
95th Queue (ft)	200	53	74
Link Distance (ft)			281
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	135	100	
Storage Blk Time (%)	2	0	0
Queuing Penalty (veh)	8	0	0

Network Summary

Network wide Queuing Penalty, Interval #1: 3242
Network wide Queuing Penalty, Interval #2: 3242
Network wide Queuing Penalty, All Intervals: 3242

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Intersection: 9: Garden Valley Rd & Stewart Pkwy, Interval #1

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	B51
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	T
Maximum Queue (ft)	1025	1972	2000	1025	2976	2980	140	210	318	263	201	73
Average Queue (ft)	974	1577	1483	979	2439	2443	121	181	192	133	84	10
95th Queue (ft)	1185	2494	2523	1234	3658	3656	194	246	343	229	168	57
Link Distance (ft)		1947	1947		2937	2937			264	264		1649
Upstream Blk Time (%)		28	13		8	9			16	0		
Queuing Penalty (veh)		174	81		71	84			57	0		
Storage Bay Dist (ft)	1000			1000			115	185			190	
Storage Blk Time (%)	75	19		18	58	70	1	45	2	0	0	
Queuing Penalty (veh)	291	92		100	242	235	6	90	3	1	1	

Intersection: 9: Garden Valley Rd & Stewart Pkwy, Interval #1

Movement	B51	SB	SB	SB	SB	SB
Directions Served	T	L	L	T	T	R
Maximum Queue (ft)	17	977	996	1370	1333	145
Average Queue (ft)	1	724	756	596	567	133
95th Queue (ft)	11	1070	1111	1345	1249	177
Link Distance (ft)	1649			1555	1555	
Upstream Blk Time (%)				2	1	
Queuing Penalty (veh)				0	0	
Storage Bay Dist (ft)		1000	1000			120
Storage Blk Time (%)		2	7	8	13	17
Queuing Penalty (veh)		3	15	33	62	37

Intersection: 9: Garden Valley Rd & Stewart Pkwy, Interval #2

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	B51
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	T
Maximum Queue (ft)	1025	1972	2000	1025	2976	2980	140	210	318	263	201	73
Average Queue (ft)	974	1577	1483	979	2439	2443	121	181	192	133	84	10
95th Queue (ft)	1185	2494	2523	1234	3658	3656	194	246	343	229	168	57
Link Distance (ft)		1947	1947		2937	2937			264	264		1649
Upstream Blk Time (%)		28	13		8	9			16	0		
Queuing Penalty (veh)		174	81		71	84			57	0		
Storage Bay Dist (ft)	1000			1000			115	185			190	
Storage Blk Time (%)	75	19		18	58	70	1	45	2	0	0	
Queuing Penalty (veh)	291	92		100	242	235	6	90	3	1	1	

Intersection: 9: Garden Valley Rd & Stewart Pkwy, Interval #2

Movement	B51	SB	SB	SB	SB	SB
Directions Served	T	L	L	T	T	R
Maximum Queue (ft)	17	977	996	1370	1333	145
Average Queue (ft)	1	724	756	596	567	133
95th Queue (ft)	11	1070	1111	1345	1249	177
Link Distance (ft)	1649			1555	1555	
Upstream Blk Time (%)				2	1	
Queuing Penalty (veh)				0	0	
Storage Bay Dist (ft)		1000	1000			120
Storage Blk Time (%)		2	7	8	13	17
Queuing Penalty (veh)		3	15	33	62	37

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Intersection: 9: Garden Valley Rd & Stewart Pkwy, All Intervals

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	B51
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	T
Maximum Queue (ft)	1025	1972	2000	1025	2976	2980	140	210	318	263	201	73
Average Queue (ft)	974	1577	1483	979	2439	2443	121	181	192	133	84	10
95th Queue (ft)	1185	2494	2523	1234	3658	3656	194	246	343	229	168	57
Link Distance (ft)		1947	1947		2937	2937			264	264		1649
Upstream Blk Time (%)		28	13		8	9			16	0		
Queuing Penalty (veh)		174	81		71	84			57	0		
Storage Bay Dist (ft)	1000			1000			115	185			190	
Storage Blk Time (%)	75	19		18	58	70	1	45	2	0	0	
Queuing Penalty (veh)	291	92		100	242	235	6	90	3	1	1	

Intersection: 9: Garden Valley Rd & Stewart Pkwy, All Intervals

Movement	B51	SB	SB	SB	SB	SB
Directions Served	T	L	L	T	T	R
Maximum Queue (ft)	17	977	996	1370	1333	145
Average Queue (ft)	1	724	756	596	567	133
95th Queue (ft)	11	1070	1111	1345	1249	177
Link Distance (ft)	1649			1555	1555	
Upstream Blk Time (%)				2	1	
Queuing Penalty (veh)				0	0	
Storage Bay Dist (ft)		1000	1000			120
Storage Blk Time (%)		2	7	8	13	17
Queuing Penalty (veh)		3	15	33	62	37

Intersection: 10: Harvard Ave & Stewart Pkwy, Interval #1

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	B28
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR	T
Maximum Queue (ft)	135	524	481	46	348	422	190	39	60	115	1370	270
Average Queue (ft)	132	309	262	3	190	249	179	6	18	114	787	12
95th Queue (ft)	148	518	465	23	284	397	222	25	47	117	1422	129
Link Distance (ft)		1477	1477		1991	1991			140		2197	394
Upstream Blk Time (%)											0	0
Queuing Penalty (veh)											4	1
Storage Bay Dist (ft)	110			100			165	60		90		
Storage Blk Time (%)	62	2			35	7	22	0	0	56	5	
Queuing Penalty (veh)	160	5			1	55	80	0	0	205	25	

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Intersection: 10: Harvard Ave & Stewart Pkwy, Interval #2

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	B28
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR	T
Maximum Queue (ft)	135	524	481	46	348	422	190	39	60	115	1370	270
Average Queue (ft)	132	309	262	3	190	249	179	6	18	114	787	12
95th Queue (ft)	148	518	465	23	284	397	222	25	47	117	1422	129
Link Distance (ft)		1477	1477		1991	1991			140		2197	394
Upstream Blk Time (%)											0	0
Queuing Penalty (veh)											4	1
Storage Bay Dist (ft)	110			100			165	60		90		
Storage Blk Time (%)	62	2			35	7	22	0	0	56	5	
Queuing Penalty (veh)	160	5			1	55	80	0	0	205	25	

Intersection: 10: Harvard Ave & Stewart Pkwy, All Intervals

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	B28
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR	T
Maximum Queue (ft)	135	524	481	46	348	422	190	39	60	115	1370	270
Average Queue (ft)	132	309	262	3	190	249	179	6	18	114	787	12
95th Queue (ft)	148	518	465	23	284	397	222	25	47	117	1422	129
Link Distance (ft)		1477	1477		1991	1991			140		2197	394
Upstream Blk Time (%)											0	0
Queuing Penalty (veh)											4	1
Storage Bay Dist (ft)	110			100			165	60		90		
Storage Blk Time (%)	62	2			35	7	22	0	0	56	5	
Queuing Penalty (veh)	160	5			1	55	80	0	0	205	25	

Intersection: 13: Stewart Pkwy & Harvey Ave, Interval #1

Movement	EB	EB	WB	WB	NB	NB	NB	B28	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	T	L	T	TR
Maximum Queue (ft)	85	107	114	151	200	367	250	7	105	537	500
Average Queue (ft)	40	73	50	63	160	113	75	0	42	304	239
95th Queue (ft)	80	110	95	115	226	298	155	5	106	565	518
Link Distance (ft)		91		377		394	394	2197		1791	1791
Upstream Blk Time (%)	1	11				0					
Queuing Penalty (veh)	0	33				1					
Storage Bay Dist (ft)	65		130		175				80		
Storage Blk Time (%)	6	17	0	1	13	0			0	46	
Queuing Penalty (veh)	15	8	0	0	34	1			1	28	

Intersection: 13: Stewart Pkwy & Harvey Ave, Interval #2

Movement	EB	EB	WB	WB	NB	NB	NB	B28	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	T	L	T	TR
Maximum Queue (ft)	85	107	114	151	200	367	250	7	105	537	500
Average Queue (ft)	40	73	50	63	160	113	75	0	42	304	239
95th Queue (ft)	80	110	95	115	226	298	155	5	106	565	518
Link Distance (ft)		91		377		394	394	2197		1791	1791
Upstream Blk Time (%)	1	11				0					
Queuing Penalty (veh)	0	33				1					
Storage Bay Dist (ft)	65		130		175				80		
Storage Blk Time (%)	6	17	0	1	13	0			0	46	
Queuing Penalty (veh)	15	8	0	0	34	1			1	28	

Intersection: 13: Stewart Pkwy & Harvey Ave, All Intervals

Movement	EB	EB	WB	WB	NB	NB	NB	B28	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	T	L	T	TR
Maximum Queue (ft)	85	107	114	151	200	367	250	7	105	537	500
Average Queue (ft)	40	73	50	63	160	113	75	0	42	304	239
95th Queue (ft)	80	110	95	115	226	298	155	5	106	565	518
Link Distance (ft)		91		377		394	394	2197		1791	1791
Upstream Blk Time (%)	1	11				0					
Queuing Penalty (veh)	0	33				1					
Storage Bay Dist (ft)	65		130		175				80		
Storage Blk Time (%)	6	17	0	1	13	0			0	46	
Queuing Penalty (veh)	15	8	0	0	34	1			1	28	

Intersection: 16: NW Troost St & Garden Valley Rd, Interval #1

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	98	451	429	135	429	414	165	111	204	64	33
Average Queue (ft)	9	264	253	125	230	192	17	32	103	26	8
95th Queue (ft)	51	398	395	157	412	371	91	86	181	59	27
Link Distance (ft)		2075	2075		1481	1481			1001		610
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	120			110			140	95		80	
Storage Blk Time (%)		47		33	6	12	0		9	0	
Queuing Penalty (veh)		2		174	22	2	0		4	0	

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Intersection: 16: NW Troost St & Garden Valley Rd, Interval #2

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	98	451	429	135	429	414	165	111	204	64	33
Average Queue (ft)	9	264	253	125	230	192	17	32	103	26	8
95th Queue (ft)	51	398	395	157	412	371	91	86	181	59	27
Link Distance (ft)		2075	2075		1481	1481			1001		610
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	120			110			140	95		80	
Storage Blk Time (%)		47		33	6	12	0		9	0	
Queuing Penalty (veh)		2		174	22	2	0		4	0	

Intersection: 16: NW Troost St & Garden Valley Rd, All Intervals

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	98	451	429	135	429	414	165	111	204	64	33
Average Queue (ft)	9	264	253	125	230	192	17	32	103	26	8
95th Queue (ft)	51	398	395	157	412	371	91	86	181	59	27
Link Distance (ft)		2075	2075		1481	1481			1001		610
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	120			110			140	95		80	
Storage Blk Time (%)		47		33	6	12	0		9	0	
Queuing Penalty (veh)		2		174	22	2	0		4	0	

Intersection: 19: Charter Oaks Dr & Troost St, Interval #1

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	109	73
Average Queue (ft)	25	35
95th Queue (ft)	76	62
Link Distance (ft)	613	728
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 19: Charter Oaks Dr & Troost St, Interval #2

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	109	73
Average Queue (ft)	25	35
95th Queue (ft)	76	62
Link Distance (ft)	613	728
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 19: Charter Oaks Dr & Troost St, All Intervals

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	109	73
Average Queue (ft)	25	35
95th Queue (ft)	76	62
Link Distance (ft)	613	728
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 22: Loma Vista Dr, Interval #1

Movement	NB	SB	SE
Directions Served	LT	TR	LR
Maximum Queue (ft)	47	10	52
Average Queue (ft)	4	0	19
95th Queue (ft)	25	7	46
Link Distance (ft)	564	448	633
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 22: Loma Vista Dr, Interval #2

Movement	NB	SB	SE
Directions Served	LT	TR	LR
Maximum Queue (ft)	47	10	52
Average Queue (ft)	4	0	19
95th Queue (ft)	25	7	46
Link Distance (ft)	564	448	633
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 22: Loma Vista Dr, All Intervals

Movement	NB	SB	SE
Directions Served	LT	TR	LR
Maximum Queue (ft)	47	10	52
Average Queue (ft)	4	0	19
95th Queue (ft)	25	7	46
Link Distance (ft)	564	448	633
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 26: NW Troost/Troost St & Calkins Rd, Interval #1

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	55	268	145	213
Average Queue (ft)	29	120	73	103
95th Queue (ft)	49	209	120	179
Link Distance (ft)	312	2632	1346	1924
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 26: NW Troost/Troost St & Calkins Rd, Interval #2

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	55	268	145	213
Average Queue (ft)	29	120	73	103
95th Queue (ft)	49	209	120	179
Link Distance (ft)	312	2632	1346	1924
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 26: NW Troost/Troost St & Calkins Rd, All Intervals

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	55	268	145	213
Average Queue (ft)	29	120	73	103
95th Queue (ft)	49	209	120	179
Link Distance (ft)	312	2632	1346	1924
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 29: Kline St & Garden Valley Rd, Interval #1

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	130	1180	1177	124	563	557	136	195	105	714
Average Queue (ft)	32	485	481	57	202	215	72	101	100	401
95th Queue (ft)	108	1092	1088	120	425	435	130	180	114	847
Link Distance (ft)		1481	1481		1947	1947		1058		698
Upstream Blk Time (%)		0	0							34
Queuing Penalty (veh)		1	0							0
Storage Bay Dist (ft)	105			100			275		80	
Storage Blk Time (%)	0	54		1	18			0	66	2
Queuing Penalty (veh)	2	8		7	14			0	62	5

Intersection: 29: Kline St & Garden Valley Rd, Interval #2

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	130	1180	1177	124	563	557	136	195	105	714
Average Queue (ft)	32	485	481	57	202	215	72	101	100	401
95th Queue (ft)	108	1092	1088	120	425	435	130	180	114	847
Link Distance (ft)		1481	1481		1947	1947		1058		698
Upstream Blk Time (%)		0	0							34
Queuing Penalty (veh)		1	0							0
Storage Bay Dist (ft)	105			100			275		80	
Storage Blk Time (%)	0	54		1	18			0	66	2
Queuing Penalty (veh)	2	8		7	14			0	62	5

Intersection: 29: Kline St & Garden Valley Rd, All Intervals

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	130	1180	1177	124	563	557	136	195	105	714
Average Queue (ft)	32	485	481	57	202	215	72	101	100	401
95th Queue (ft)	108	1092	1088	120	425	435	130	180	114	847
Link Distance (ft)		1481	1481		1947	1947		1058		698
Upstream Blk Time (%)		0	0							34
Queuing Penalty (veh)		1	0							0
Storage Bay Dist (ft)	105			100			275		80	
Storage Blk Time (%)	0	54		1	18			0	66	2
Queuing Penalty (veh)	2	8		7	14			0	62	5

Intersection: 32: Keasey St & Calkins Rd, Interval #1

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	119	107	17
Average Queue (ft)	55	44	1
95th Queue (ft)	90	92	10
Link Distance (ft)	2632	2126	737
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Intersection: 32: Keasey St & Calkins Rd, Interval #2

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	119	107	17
Average Queue (ft)	55	44	1
95th Queue (ft)	90	92	10
Link Distance (ft)	2632	2126	737
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 32: Keasey St & Calkins Rd, All Intervals

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	119	107	17
Average Queue (ft)	55	44	1
95th Queue (ft)	90	92	10
Link Distance (ft)	2632	2126	737
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 34: Harvey Ave & Keasey St, Interval #1

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	65	21	218
Average Queue (ft)	9	1	86
95th Queue (ft)	41	11	171
Link Distance (ft)	738	91	2126
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 34: Harvey Ave & Keasey St, Interval #2

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	65	21	218
Average Queue (ft)	9	1	86
95th Queue (ft)	41	11	171
Link Distance (ft)	738	91	2126
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 34: Harvey Ave & Keasey St, All Intervals

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	65	21	218
Average Queue (ft)	9	1	86
95th Queue (ft)	41	11	171
Link Distance (ft)	738	91	2126
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 35: Exit 125 & Garden Valley , Interval #1

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	L	TR	L	R
Maximum Queue (ft)	116	203	224	1535	1525	1483	1480	73	248
Average Queue (ft)	41	118	137	1096	1083	817	603	29	111
95th Queue (ft)	87	193	215	1777	1761	1611	1506	66	198
Link Distance (ft)	1072	1072	1072	1481	1481	1453	1453	543	543
Upstream Blk Time (%)				35	33	20	15		
Queuing Penalty (veh)				0	0	0	0		
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

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Intersection: 35: Exit 125 & Garden Valley , Interval #2

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	L	TR	L	R
Maximum Queue (ft)	116	203	224	1535	1525	1483	1480	73	248
Average Queue (ft)	41	118	137	1096	1083	817	603	29	111
95th Queue (ft)	87	193	215	1777	1761	1611	1506	66	198
Link Distance (ft)	1072	1072	1072	1481	1481	1453	1453	543	543
Upstream Blk Time (%)				35	33	20	15		
Queuing Penalty (veh)				0	0	0	0		
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 35: Exit 125 & Garden Valley , All Intervals

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	T	TR	L	TR	L	R
Maximum Queue (ft)	116	203	224	1535	1525	1483	1480	73	248
Average Queue (ft)	41	118	137	1096	1083	817	603	29	111
95th Queue (ft)	87	193	215	1777	1761	1611	1506	66	198
Link Distance (ft)	1072	1072	1072	1481	1481	1453	1453	543	543
Upstream Blk Time (%)				35	33	20	15		
Queuing Penalty (veh)				0	0	0	0		
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 38: Garden Valley Rd & Hwy 125, Interval #1

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	1464	1534	1101	1096	201	330
Average Queue (ft)	780	825	593	596	99	140
95th Queue (ft)	1475	1524	1343	1340	166	303
Link Distance (ft)	2937	2937	1072	1072	1104	1104
Upstream Blk Time (%)			6	6		
Queuing Penalty (veh)			64	66		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

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Intersection: 38: Garden Valley Rd & Hwy 125, Interval #2

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	1464	1534	1101	1096	201	330
Average Queue (ft)	780	825	593	596	99	140
95th Queue (ft)	1475	1524	1343	1340	166	303
Link Distance (ft)	2937	2937	1072	1072	1104	1104
Upstream Blk Time (%)			6	6		
Queuing Penalty (veh)			64	66		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 38: Garden Valley Rd & Hwy 125, All Intervals

Movement	EB	EB	WB	WB	SB	SB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	1464	1534	1101	1096	201	330
Average Queue (ft)	780	825	593	596	99	140
95th Queue (ft)	1475	1524	1343	1340	166	303
Link Distance (ft)	2937	2937	1072	1072	1104	1104
Upstream Blk Time (%)			6	6		
Queuing Penalty (veh)			64	66		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 40: Freeway Ave/Willow St, Interval #1

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB	SB	B6
Directions Served	L	TR	L	R	T	TR	L	T	T	R	T
Maximum Queue (ft)	221	111	38	68	530	528	43	280	297	60	11
Average Queue (ft)	116	50	8	26	462	435	12	107	132	33	0
95th Queue (ft)	187	88	28	60	612	626	34	242	271	47	8
Link Distance (ft)	817	817	228	228	487	487		507	507		220
Upstream Blk Time (%)					36	27					
Queuing Penalty (veh)					0	0					
Storage Bay Dist (ft)							400			10	
Storage Blk Time (%)									23	3	
Queuing Penalty (veh)									68	17	

Intersection: 40: Freeway Ave/Willow St, Interval #2

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB	SB	B6
Directions Served	L	TR	L	R	T	TR	L	T	T	R	T
Maximum Queue (ft)	221	111	38	68	530	528	43	280	297	60	11
Average Queue (ft)	116	50	8	26	462	435	12	107	132	33	0
95th Queue (ft)	187	88	28	60	612	626	34	242	271	47	8
Link Distance (ft)	817	817	228	228	487	487		507	507		220
Upstream Blk Time (%)					36	27					
Queuing Penalty (veh)					0	0					
Storage Bay Dist (ft)							400			10	
Storage Blk Time (%)									23	3	
Queuing Penalty (veh)									68	17	

Intersection: 40: Freeway Ave/Willow St, All Intervals

Movement	EB	EB	WB	WB	NB	NB	SB	SB	SB	SB	B6
Directions Served	L	TR	L	R	T	TR	L	T	T	R	T
Maximum Queue (ft)	221	111	38	68	530	528	43	280	297	60	11
Average Queue (ft)	116	50	8	26	462	435	12	107	132	33	0
95th Queue (ft)	187	88	28	60	612	626	34	242	271	47	8
Link Distance (ft)	817	817	228	228	487	487		507	507		220
Upstream Blk Time (%)					36	27					
Queuing Penalty (veh)					0	0					
Storage Bay Dist (ft)							400			10	
Storage Blk Time (%)									23	3	
Queuing Penalty (veh)									68	17	

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Intersection: 42: Harvard Ave & Bellows, Interval #1

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B6	B6	NB	NB
Directions Served	L	T	T	R	L	T	T	R	T	T	L	T
Maximum Queue (ft)	129	600	655	125	120	323	332	100	535	536	124	497
Average Queue (ft)	37	341	405	112	116	293	293	7	367	376	112	137
95th Queue (ft)	107	563	644	172	129	321	323	53	635	633	142	385
Link Distance (ft)		2828	2828			220	220		507	507		652
Upstream Blk Time (%)						43	33		2	2		0
Queuing Penalty (veh)						449	342		18	16		0
Storage Bay Dist (ft)	105			100	95			100			100	
Storage Blk Time (%)	0	46	45	1	51	24	33	0			25	0
Queuing Penalty (veh)	0	14	183	4	319	57	2	0			95	1

Intersection: 42: Harvard Ave & Bellows, Interval #1

Movement	NB	SB	SB
Directions Served	R	L	TR
Maximum Queue (ft)	160	68	103
Average Queue (ft)	105	23	30
95th Queue (ft)	196	57	69
Link Distance (ft)			281
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	135	100	
Storage Blk Time (%)	2		1
Queuing Penalty (veh)	7		0

Intersection: 42: Harvard Ave & Bellows, Interval #2

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B6	B6	NB	NB
Directions Served	L	T	T	R	L	T	T	R	T	T	L	T
Maximum Queue (ft)	129	600	655	125	120	323	332	100	535	536	124	497
Average Queue (ft)	37	341	405	112	116	293	293	7	367	376	112	137
95th Queue (ft)	107	563	644	172	129	321	323	53	635	633	142	385
Link Distance (ft)		2828	2828			220	220		507	507		652
Upstream Blk Time (%)						43	33		2	2		0
Queuing Penalty (veh)						449	342		18	16		0
Storage Bay Dist (ft)	105			100	95			100			100	
Storage Blk Time (%)	0	46	45	1	51	24	33	0			25	0
Queuing Penalty (veh)	0	14	183	4	319	57	2	0			95	1

Intersection: 42: Harvard Ave & Bellows, Interval #2

Movement	NB	SB	SB
Directions Served	R	L	TR
Maximum Queue (ft)	160	68	103
Average Queue (ft)	105	23	30
95th Queue (ft)	196	57	69
Link Distance (ft)			281
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	135	100	
Storage Blk Time (%)	2		1
Queuing Penalty (veh)	7		0

Intersection: 42: Harvard Ave & Bellows, All Intervals

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B6	B6	NB	NB
Directions Served	L	T	T	R	L	T	T	R	T	T	L	T
Maximum Queue (ft)	129	600	655	125	120	323	332	100	535	536	124	497
Average Queue (ft)	37	341	405	112	116	293	293	7	367	376	112	137
95th Queue (ft)	107	563	644	172	129	321	323	53	635	633	142	385
Link Distance (ft)		2828	2828			220	220		507	507		652
Upstream Blk Time (%)						43	33		2	2		0
Queuing Penalty (veh)						449	342		18	16		0
Storage Bay Dist (ft)	105			100	95			100			100	
Storage Blk Time (%)	0	46	45	1	51	24	33	0			25	0
Queuing Penalty (veh)	0	14	183	4	319	57	2	0			95	1

Intersection: 42: Harvard Ave & Bellows, All Intervals

Movement	NB	SB	SB
Directions Served	R	L	TR
Maximum Queue (ft)	160	68	103
Average Queue (ft)	105	23	30
95th Queue (ft)	196	57	69
Link Distance (ft)			281
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	135	100	
Storage Blk Time (%)	2		1
Queuing Penalty (veh)	7		0

Network Summary

Network wide Queuing Penalty, Interval #1: 4359
Network wide Queuing Penalty, Interval #2: 4359
Network wide Queuing Penalty, All Intervals: 4359

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