CAR WASH AND COFFEE KIOSK

TRAFFIC IMPACT ANALYSIS

Florence, Oregon

April 3, 2020

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Traffic Impact Analysis

Car Wash and Coffee Kiosk

Florence, Oregon
April 6, 2019

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project # 5775

EXECUTIVE SUMMARY

This report describes the Traffic Impact Analysis and findings prepared for the proposed development of Tax Lot 6600 and 6601 in Florence, Oregon. More specifically, the project site is located adjacent to Highway 101, on the east side, between 6th Street and Rhododendron Drive. The site is vacant and is contained within 0.57 acres. The development proposal is a 400 SF drive-through coffee stand and a single lane drive-through automated car wash. The development is proposed to be completed in the year 2020.

The development is proposing two-access connections. The southern access will be a direct connection to Rhododendron Drive at the east edge of the property. The northern access will be shared access with the adjacent property to the east and connect to the existing 6th St full movement access.

The impacts of the development are evaluated for the year of completion, year 2020, and a 5-year horizon, year 2025.

FINDINGS

The analysis concludes the following findings:

- All studied intersections will operate within the mobility standards with the completion of the development, the year 2020, and the year 2025. No off-site intersection improvements are necessary.
- The addition of development traffic will not substantially increase queueing conditions over the background conditions.
- All site driveways will operate safely and efficiently.
- The site as designed, is sufficient to hold the typical daily queue for the coffee shop usage.

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1.0 INTRODUCTION

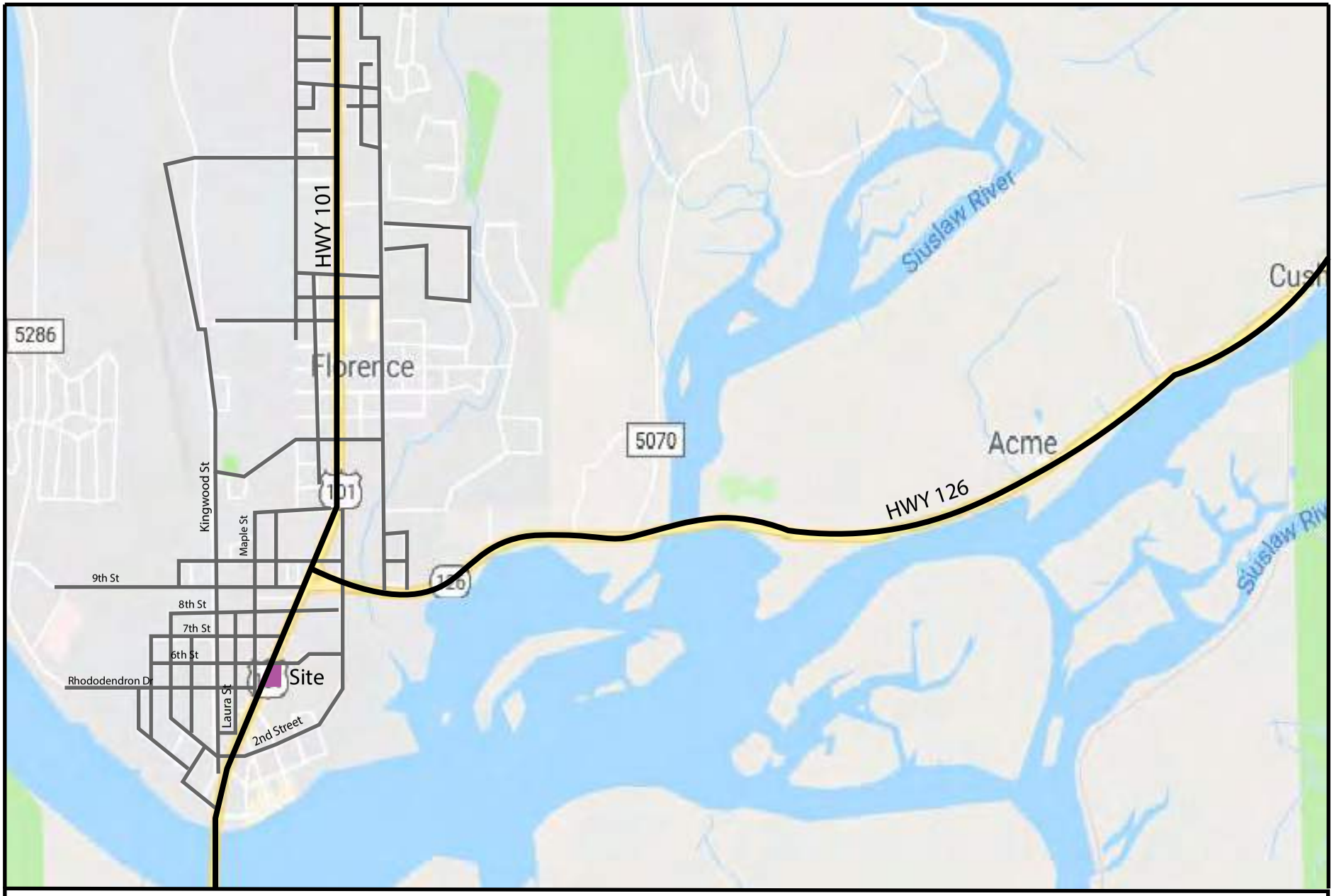
This report describes the Traffic Impact Analysis and findings prepared for the proposed Diamond Car Wash and Human Bean Coffee Drive-Through, located in Florence, Oregon. The project site is located to the East of Highway 101 between 6th Street and Rhododendron Drive on Tax Lots 6600 and 6601. Currently, the site is vacant and is contained within 0.57 acres. The development proposal is a 400 SF drive-through coffee stand and a single lane drive-through automated car wash. The development is proposed to be completed in 2020.

The development is proposing two-access connections. The southern access will be a direct connection to Rhododendron Drive at the east edge of the property. The northern access will be a shared access with the adjacent property to the east and connect to the existing 6th St full movement access.

The site plan is included in Appendix A. Figure 1 illustrates the site location.

The traffic study is performed in accordance with the City of Florence and ODOT criteria. The traffic impacts were evaluated for the weekday AM peak hour. The operational analysis is performed for the following conditions:

- Existing year 2019
- Year 2020 with and without the proposed development
- Year 2025 with and without the proposed development



Coffee Shop and Car Wash Florence, Oregon

Figure 1: Vicinity Map and Site Location

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2.0 PROPOSED SITE USAGE

The development proposal is a 400 square foot Drive-Thru coffee stand and a single lane automated car wash.

The site will have two full movement access points. One will be located off 6th Street and will be combined with the existing access connection shared with the adjacent property to the east. The other access is located off Rhododendron Drive and is closely located to the existing access to the adjacent site occupied by Old School Furniture to the east.

The coffee shop will be located at the south end of the site. It will have dual-sided drive-up windows and the space to accommodate 10 vehicles without impacting on-site circulation and approximately 16 vehicles before extending on to the adjacent roadway.

2.1 TRIP GENERATION

The trip generation for each use on-site is estimated using the information contained within the Institute of Transportation Engineers (ITE) Trip Generation Manual 10th Edition. The trip generation for each use on-site is described in the following.

Coffee Stand:
The trips generated by the coffee shop are estimated using ITE Land Use 938 – Coffee/Donut Shop with Drive-Through Window/No indoor seating.

The vehicle trips to the site are categorized as "primary trips" and "pass-by trips." Primary trips are vehicle trips with the study area for the specific purpose of visiting the site being studied. Pass-by trips are traffic already on the way from an origin to a primary trip destination that will make an intermediate stop at the site being studied without a route diversion. In this case, pass-by trips are those already on Highway 101 and stop at the Human Bean on the way. Pass-by trips are trips that are already on the roadway before the development occurs and therefore are not considered new trips on the system. Data contained within the ITE Trip Generation Handbook 3rd Edition estimates approximately 83% of trips to the drive-up coffee kiosks are pass-by trips. The site generated trips for the AM and PM peak hours are shown in Table 1.

Car Wash:
The trips generated by the car wash are estimated using ITE Land Use 948- Automated Car Wash, as this land use more closely describes the proposed use on site. This land use, however, does not contain AM Peak Hour trip generation information. Therefore, the ITE Land Use 979- Car Wash and Detail Center was used for the AM rate. Table 1 illustrates the trip generation estimate.

TABLE 1: TRIP GENERATION

ITE Land Use	Size	Trip Generation					
		Rate	Trips	% In	% Out	Trips In	Trips Out
AM Peak Hour							
938 – Coffee/Donut Shop with Drive-Through Window/No indoor seating	400 (KSF)	337.04*	135	50%	50%	67	67
Pass-by Trips		83%	112			56	56
Primary Trips			23			11	12
948- Automated Car Wash	1 (lane)	8.60*	9	50%	50%	4	5
Total New Trips						16	16
PM Peak Hour							
937 – Coffee/Donut Shop with Drive-Through Window/No indoor seating	400 (KSF)	83.33	33	50%	50%	16	17
Pass-by Trips		83%	28			14	14
Primary Trips			5			2	3
948- Automated Car Wash	1 (lane)	14.12*	14	50%	50%	7	7
Total New Trips						9	10

*trips/thousand square feet ** trips/lane

The proposed development is expected to generate 32 new trips during the AM peak hour and 19 new trips during the PM peak hour.

2.2 TRIP DISTRIBUTION

The development trips were distributed though the study area network using the existing observed travel patterns as a base, with modifications as per reasonable origins and destinations within the city. The existing traffic counts illustrate that during the Am Peak Hour within the study area, 40% of traffic is southbound on Hwy 101, 55% is northbound on Highway 101, and the remaining 5% is from the side streets. During the PM Peak Hour 46% of vehicles come from the north, 45% from the south, and 9% from the side streets. As the coffee shop is primarily pass-by the trip generation followed the existing traffic pattern.

The trip distribution for the PM peak hour is as follows:

- 46% to/from the north via Highway 101
- 45% to/from the south via Highway 101
- 9% to/from side streets

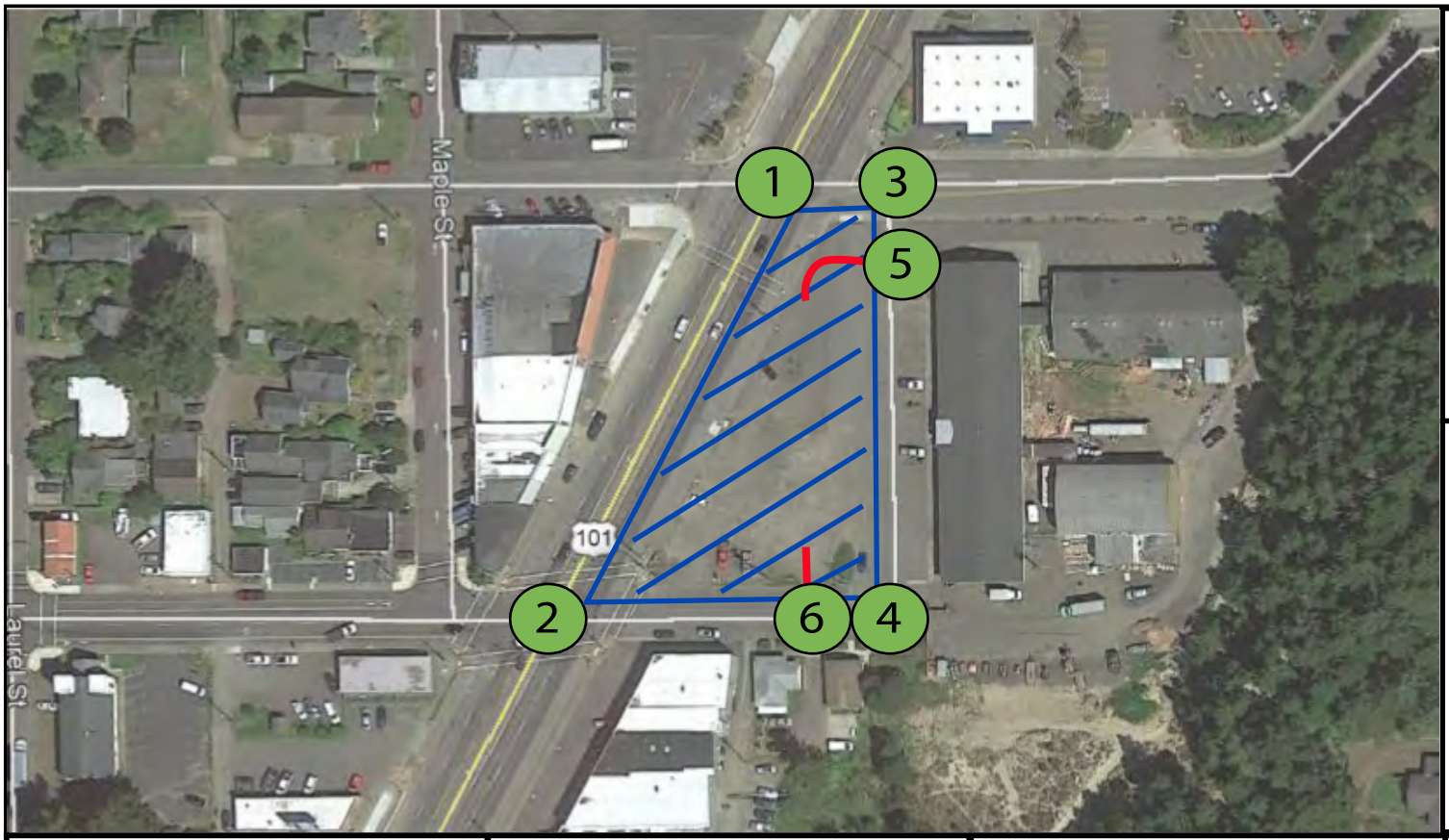
The trip distribution for the AM peak hour is as follows:

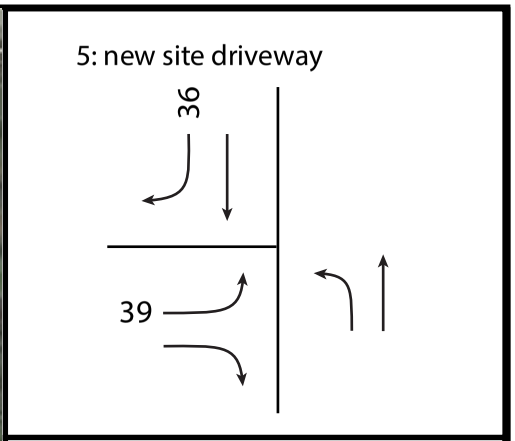
- 40% from the north via Hwy 101
- 55% from the south via Hwy 101
- 5% from the side streets

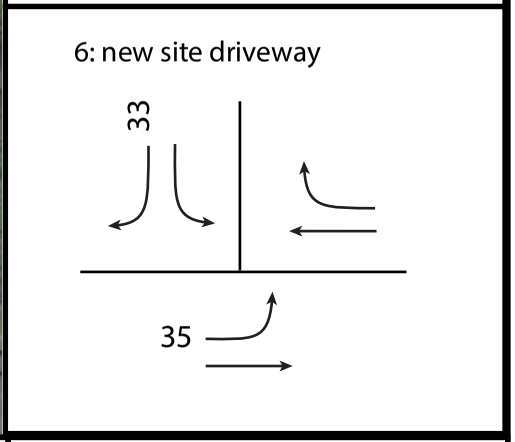
Figure 2 contains the trip distribution for the AM peak hour.

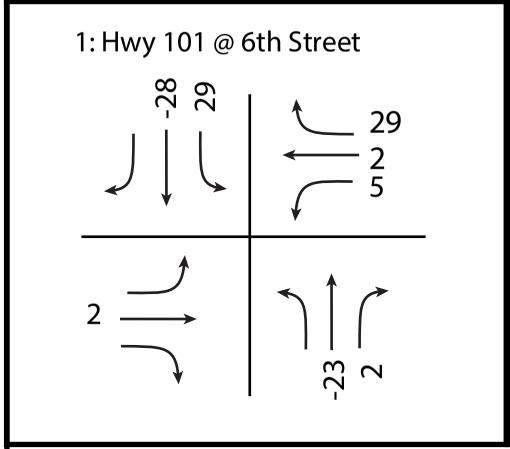
Figure 3 contains the trip distribution for the PM Peak Hour.

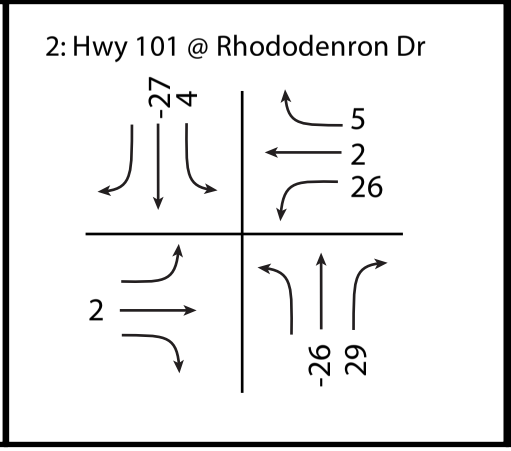
As demonstrated in Table 1, the site is anticipated to generate only 19 new trips in the PM peak hour. With the distribution to the north and south, there will not be more than 9 trips added to any intersection during the PM peak hour. As the AM generated substantially more trips than the PM peak hour, the evaluation was performed for only the AM peak hour.

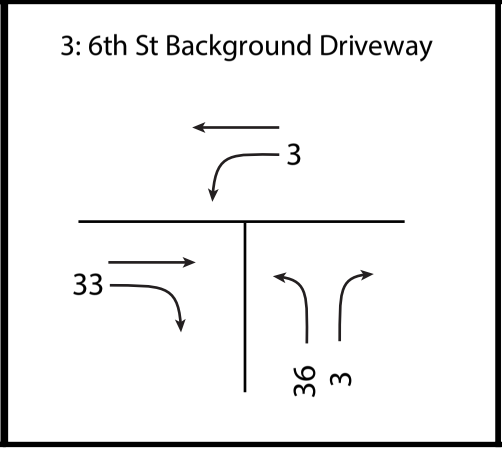












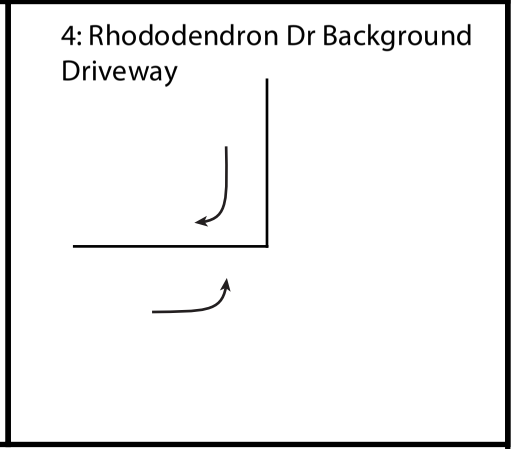


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Figure 2: 2019 Development AM Trip Distribution Volumes

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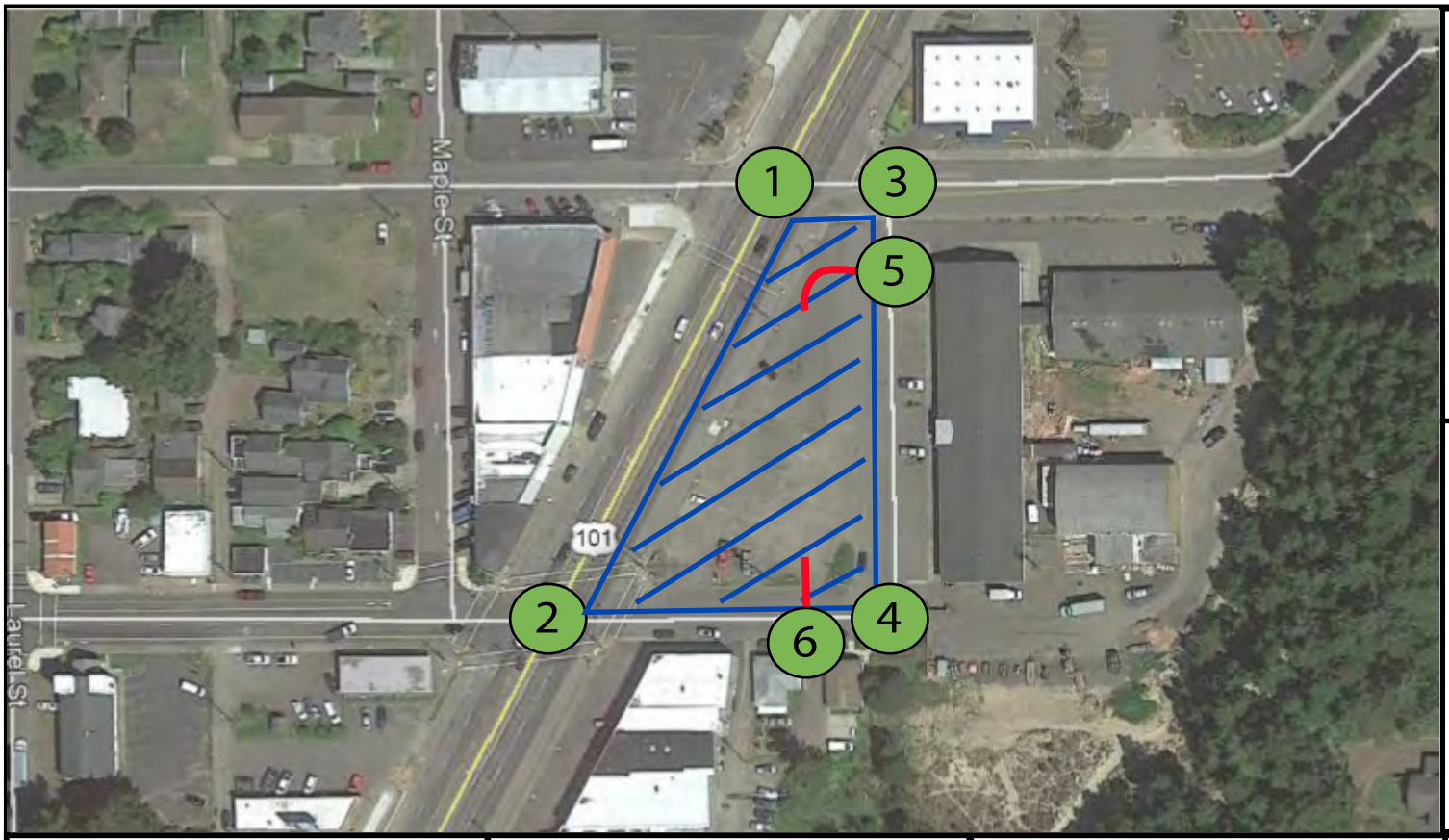
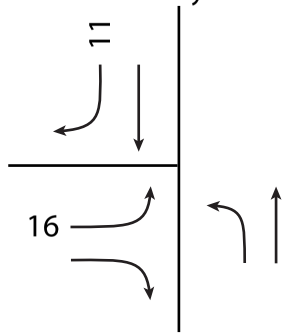
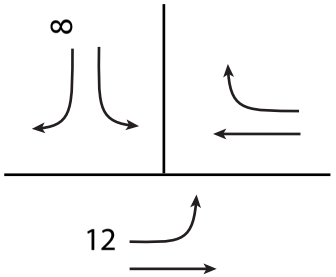


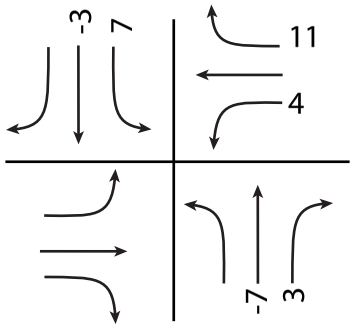
5: new site driveway



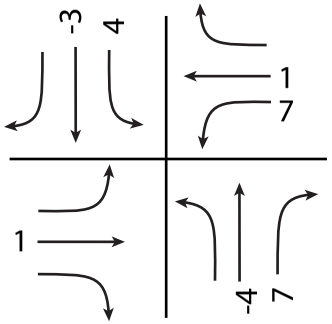
6: new site driveway



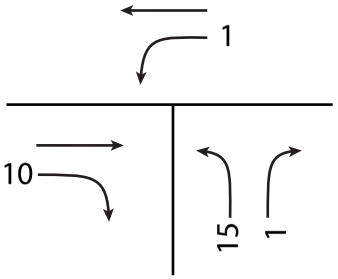
1: Hwy 101 @ 6th Street



2: Hwy 101 @ Rhododendron Dr



3: 6th St @



4: Existing Rhododendron Dr Diveway

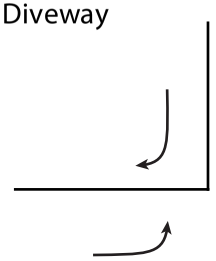


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Figure 3: 2019 Development PM Trip Distribution Volumes

3.0 EXISTING ROADWAY CONDITIONS

3.1 STUDY AREA

The study area consists of the flowing intersections:

- Highway 101 at Rhododendron Drive
- Highway 101 at 6th Street
- Rhododendron Drive @ Site Access
- 6th Street @ Site Access

Figure 4 contains the intersection geometry and control.

3.2 STREET NETWORK

The site abuts State Highway 101, which is an ODOT Highway. Rhododendron Drive and 6th Street are the City of Florence streets. Table 2 provides the study area roadway characteristics for these streets.

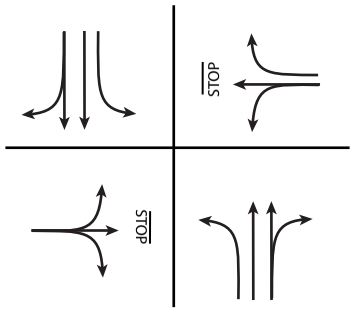
Highway Hwy 101 is a five-lane, two-way state highway with two northbound lanes, two southbound lanes, and a two-way left-turn lane (TWLTL) in front of the development. Highway 101 along the site frontage is currently being improved as part of the Revision Florence project. As part of this project, this roadway has recently been improved to include sidewalks, planter strips, bike lanes, on-street parking bays, and enhanced pedestrian crossings.

6th Street along the frontage has sidewalks on both sides. Rhododendron Drive along the site frontage is unimproved. However, the sidewalks will be installed along the north side as part of this development.

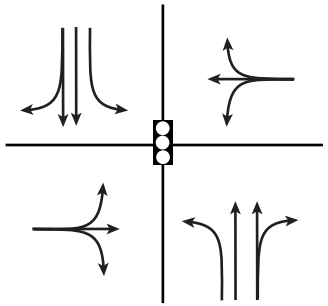
TABLE 2: ROADWAY CHARACTERISTICS WITHIN STUDY AREA

Roadway	Classification	Speed	Lanes per Direction	Sidewalk	Curb/Gutter	Bike Lanes
Highway 101	Statewide Highway Principal Arterial	35	1-2	Y	Y	Y
Rhododendron Drive	Collector	25	1	N	N	N
6th Street	Local	25	1	Y	Y	N

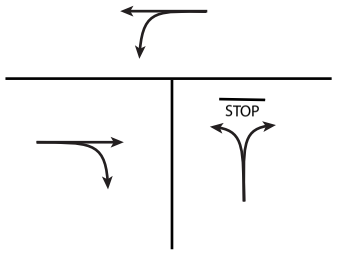
1: Hwy 101 @ 6th Street



2: Hwy 101 @ Rhododenron Dr



3: Existing 6th St driveway



4: Existing Rhododendron Dr Driveway

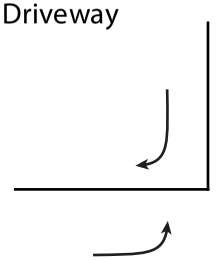


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Figure 4: Intersection Geometry and Control

3.3 INTERSECTION COUNTS

As part of the analysis, weekday AM peak hour turning movement counts were taken by Sandow Engineering for this project. The counts were taken on December 19, 2019, from 7:00 AM to 9:00 AM. The counts show the overall peak hour from 7:45 AM to 8:45 AM. Count data is provided in Appendix B.

The traffic counts were taken on a day when school is in session, and there were no holidays affecting typical commuter traffic. Additionally, the counts were taken when there were very little restrictions to free flow movements due to the Highway 101 construction.

3.4 SEASONAL ADJUSTMENT

Traffic counts are often taken during the time period in which traffic on the roadway is not at the levels seen during the peak season/month. To account for this, the traffic volumes are adjusted using traffic volume data collected by ODOT, and methodology approved by ODOT and described in the ODOT Analysis Procedures Manual. ODOT has collected daily traffic volumes along Highway 101 for many years. From this data, they have determined trends of traffic volumes for different months of the year. This data has been compiled into the Seasonal Adjustment Table (SAT). The SAT provides the ratio of traffic volumes of any given month to the peak season of the year. This ratio is known as the Seasonal Adjustment Factor.

ODOT has an Automatic Traffic Recorder (ATR) located about 3 miles north of the project site (ATR 20-026). The Seasonal Adjustment Table methodology for determining the seasonal adjustment factor was chosen over the ODOT ATR method. The ATR is located at MP 186.46. The project is located at MP 190.50. There is a significant difference in traffic flow between the project site and the ATR. Traffic from Heceta Beach Road at MP 187.2 to the south is relatively urban in nature. The ODOT ADT data shows that just south of Munsel Lake Road at MP 187.8 the AADT is 10,600, at the ATR the AADT is 7,000, and the AADT at the project site is approximately 12,800. The study area ADT is 82% higher than the AADT at the ATR. This means that the traffic variation between the low season and peak season is going to be higher than they would be south of Heceta Beach Road. Due to these factors, strictly applying the factor associated with the seasonal fluctuation from the ATR to the project site will inaccurately overestimate the traffic flow. The more appropriate method is to take into consideration the more urban non-seasonal traffic flow associated with the uses within and adjacent to the site as well as the seasonal fluctuation with tourist activities associate with Highway 101 coastal use.

The data within the SAT for Commuter trend and Coastal Destination route was calculated and averaged. The averaged value of 1.32 was applied to the existing traffic volumes to represent the peak month of July.

The existing seasonally adjusted and balanced traffic volumes are shown in Figure 5.

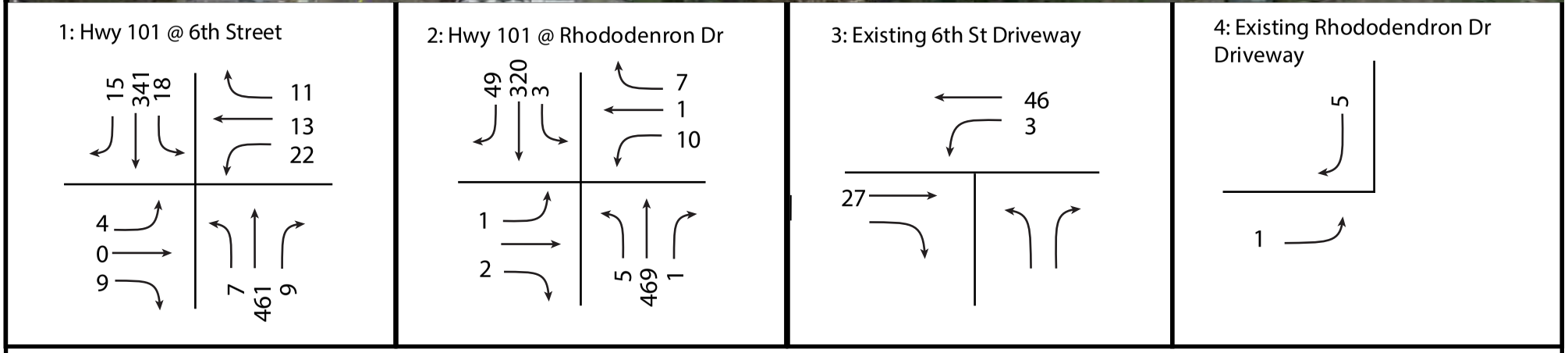

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Figure 5: Existing 2019 Peak Hour Background Traffic Volumes

3.5 CRASH ANALYSIS

A crash investigation was performed for the existing study area intersections of Highway 101 at 6th Street and Highway 101 at Rhododendron Drive. The analysis investigates crashes that have been reported to the state for the most recent 5 years, 2013-2017, to determine a crash rate in crashes per million vehicles entering the intersection and the types of crashes that occurred. Crash data beyond the year 2017 has not been compiled and published by ODOT. Therefore it is not available. The crash rate is compared to the statewide 90th percentile crash rate. If the calculated crash rate exceeds the 90th percentile crash rate or there is a high percentage of a certain crash type, the location should be investigated for further mitigation measures. The results of the crash analysis are provided in Table 3. The crash analysis data is in Appendix C.

TABLE 3: ROADWAY CRASH INFORMATION

Location on US 101	Number of Crashes	Types of Crashes						ADT	Crash Rate*	90th Percentile Crash rate
		Head	Rear	Angle	Turn	Other	Ped/ Bike			
Highway 101 @ 6th Street	1	0	0	1	0	0	0	10,060	.05	0.860
Highway 101 @ Rhododendron Drive	4	0	2	0	2	0	0	893	.25	0.408

*crashes per million entering vehicles

The crash rates at intersections are below the statewide crash rate and therefore, no further evaluation is necessary.

3.6 TRANSIT SERVICE

Rhody Express operated by Lane Transit District, provides transit service within the city. Busses run on a 60-minute route Monday through Friday, 10:00 a.m. to 6:00 p.m. Two routes North and South are provided. The south route runs along Highway 101 and 6th Street in front of the proposed development. The nearest bus stop is located on 6th St east of the site at the Events Center.

4.0 FUTURE STREET DESIGN

The City Florence Transportation System Plan has identified the following roadway projects for Highway 101 near the project site:

- PRJ-18: Provide bike lanes between Siuslaw Bridge and Highway 126. This project is part of the Revision Florence project (currently in progress).

5.0 FUTURE YEAR TRAFFIC VOLUMES

5.1 FUTURE YEAR BACKGROUND VOLUMES

The evaluation considers traffic levels at the completion of the project in the year 2020 and for the year 2025. To account for the traffic growth between the count year and future analysis years, an annual growth rate was applied.

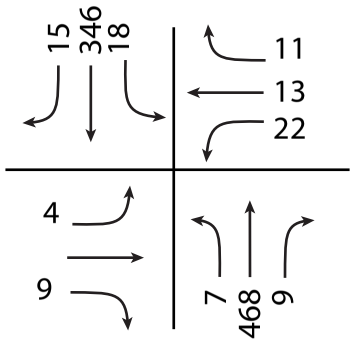
Initially, the ODOT historic trend table method was investigated. However, the growth shown was 0.04%. Instead, the City of Florence Transportation System Plan was used to identify growth patterns. The TSP estimates a growth rate of 1.5% per year on Highway 101 and 2.3% per year on the side streets. Traffic volumes were adjusted using a straight-line growth rate between volumes shown in the base year 2009 and the end of the planning horizon 2035.

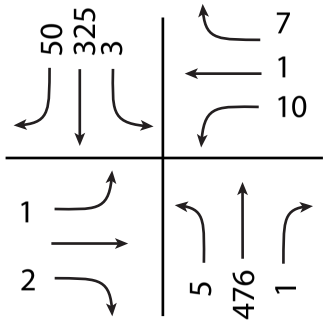
The existing seasonally-adjusted traffic volumes were adjusted according to the methodology described above. Figures 6 and 7 illustrate the AM peak hour year 2020 and 2025 traffic volumes, respectively. Appendix B contains the traffic volume calculations.

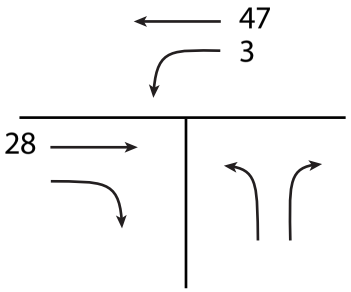
5.2 FUTURE YEAR BUILD-OUT VOLUMES

The development trips are added to the Year 2020 background traffic volumes to determine build-out volumes. Figure 8 illustrates the AM peak hour traffic volumes with the development in place.

The development trips are added to the Year 2025 background traffic volumes to determine build-out volumes. Figure 9 illustrates the AM peak hour traffic volumes with the development in place.







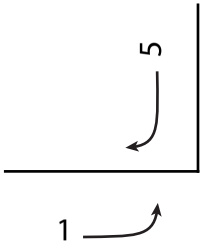


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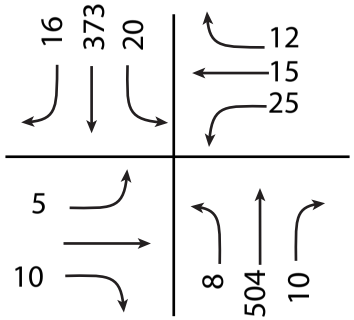
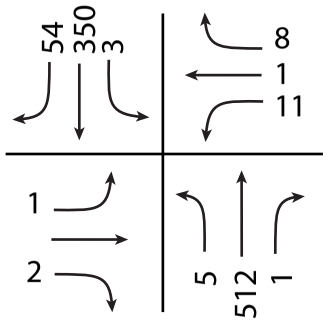
Figure 6: 2020 AM Peak Hour Background Traffic Volumes

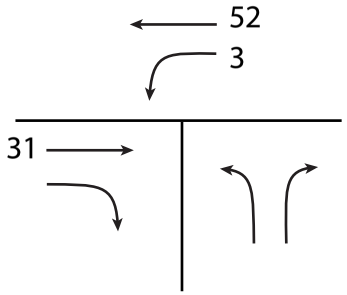
1: Hwy 101 @ 6th Street



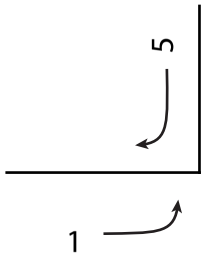
2: Hwy 101 @ Rhododenron Dr



3: 6th St Background Driveway

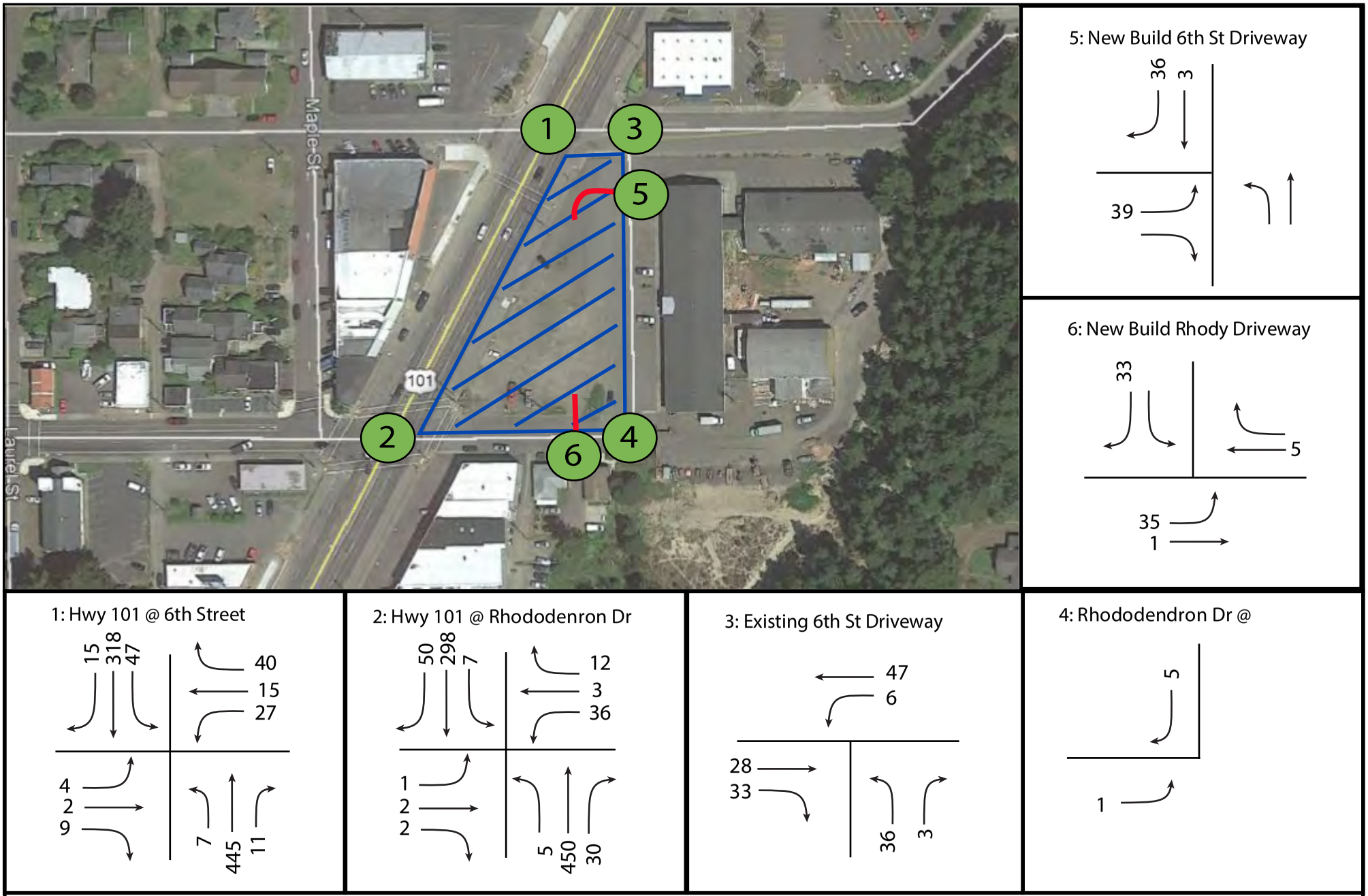


4: Rhododendron Dr Background Driveway



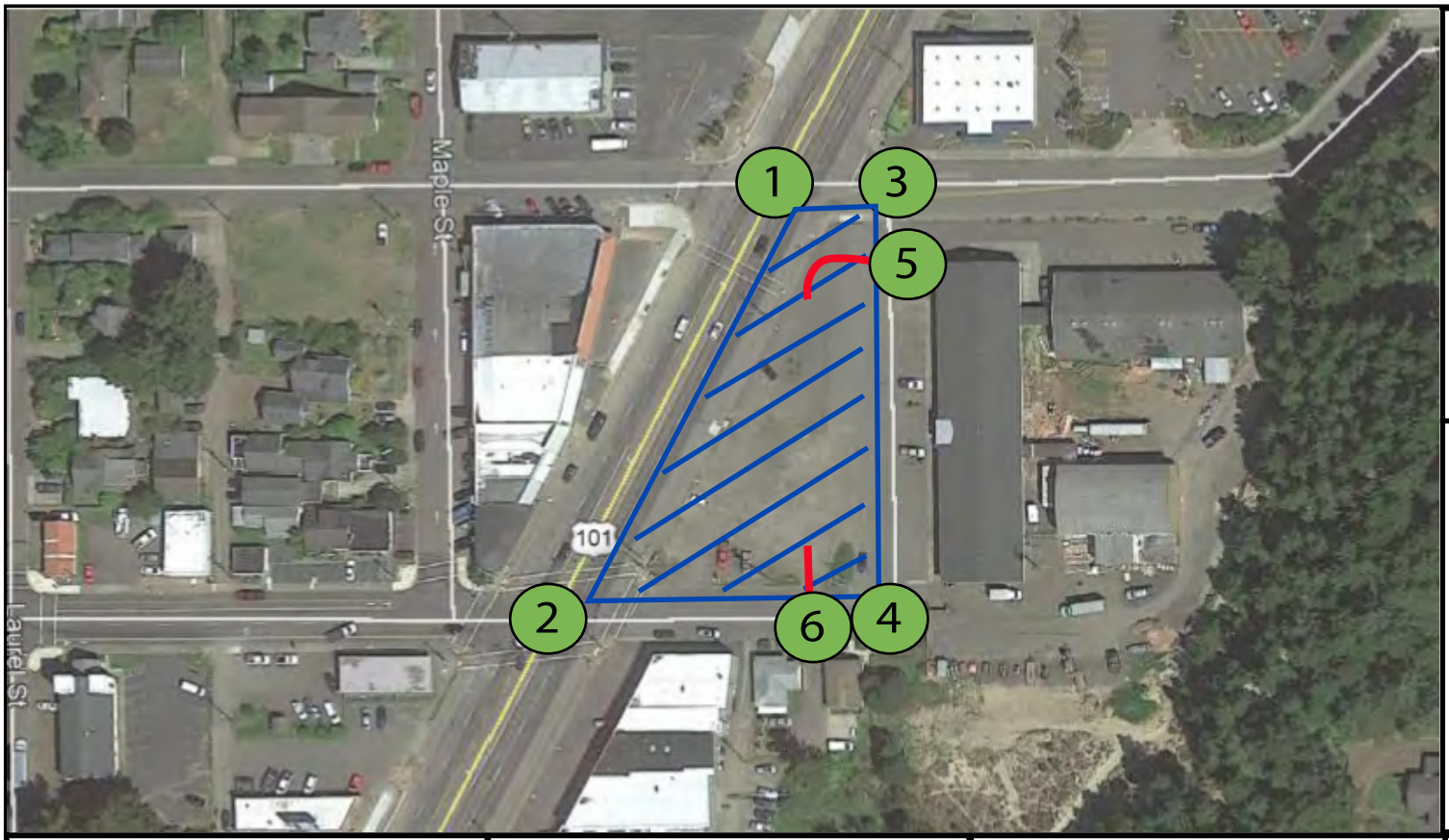
Florence Car Wash and Coffee Kiosk

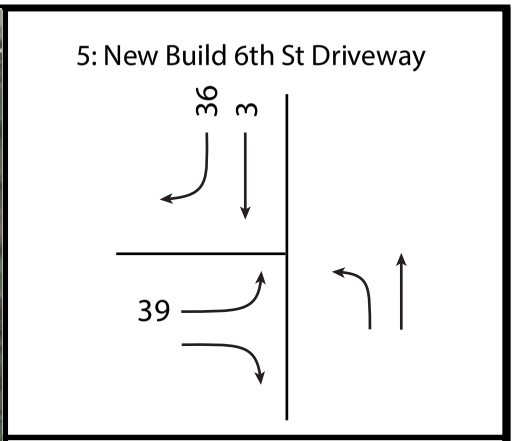
Figure 7: Year 2025 AM Peak Hour Background Traffic Volumes

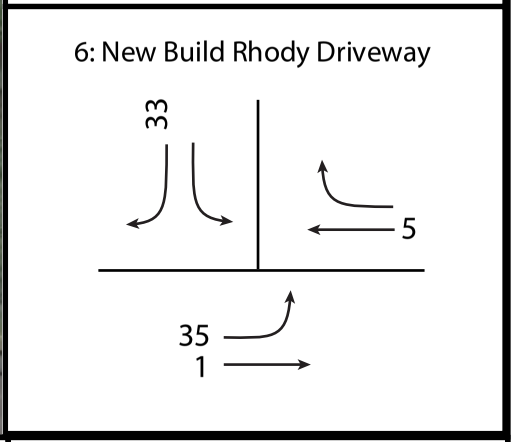


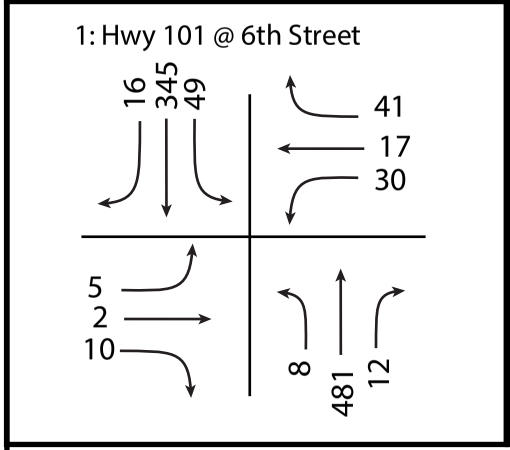
Florence Car Wash and Coffee Kiosk

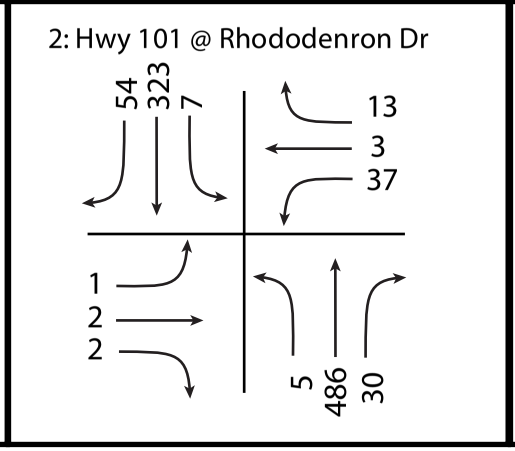
Figure 8: 2020 AM Peak Hour Traffic Volumes with Development

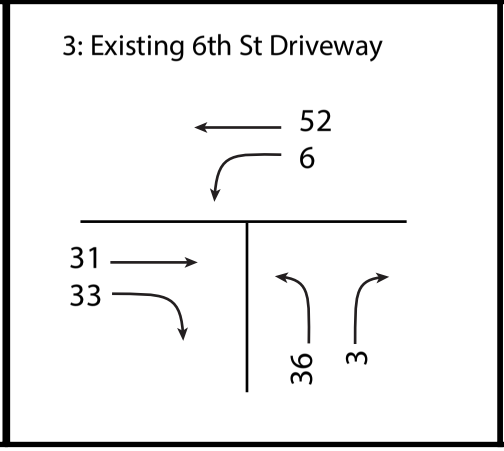


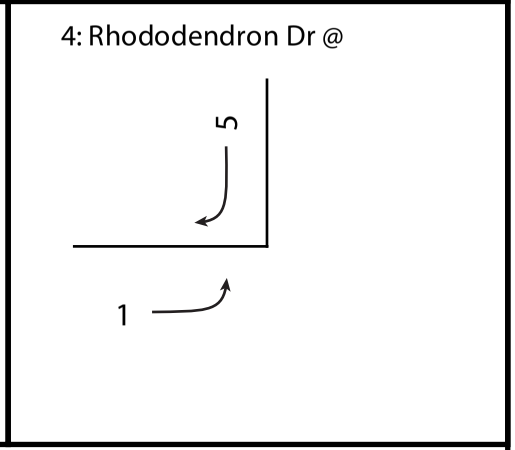












Florence Car Wash and Coffee Kiosk

Figure 9: 2025 AM Peak Hour Traffic Volumes with Development

6.0 INTERSECTION EVALUATION

6.1 PERFORMANCE MEASURES

The primary performance measure is the volume-to-capacity ratio (v/c). Volume-to-capacity ratio describes the capability of an intersection to meet volume demand based upon the maximum number of vehicles that could be served in an hour. V/C is the threshold for which ODOT evaluates the operation of intersections, as defined by the Oregon Highway Plan. V/C thresholds are defined based on roadway classification and speed. Highway 101 is designated as a Statewide Highway and Freight Route, with a speed of 30 mph within the study area. The v/c threshold for a facility of this type is 0.85 for the mainline and 0.95 for stopped approaches at unsignalized intersections and is 0.85 for signalized intersections.

The secondary measure of performance for intersections in this analysis is based on the Highway Capacity Manual (HCM) defined level of service (LOS). 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. The City of Florence has a standard of LOS D for signalized and all-way stop-controlled intersections and LOS E for two-way stop-controlled intersections.

6.2 INTERSECTION ANALYSIS RESULTS

A performance analysis was conducted for the study area intersections intersection for the following conditions:

- Existing Year 2019 AM Peak hour
- Year 2020 AM Peak hour with and without the proposed development
- year 2025 AM Peak hour with and without the proposed development

The results of the AM peak analysis are shown in Table 4. The SYNCHRO outputs are provided in Appendix D.

TABLE 4: INTERSECTION PERFORMANCE: AM PEAK HOUR

Intersection	Mobility Standard V/C/LOS*	2019 Existing	2020 Background	2020 Build	2025 Background	2025 Build
101 @ Rhododendron Drive	**0.85/D***	0.23/A	0.23/A	0.26/C	0.25/A	0.28/C
101 @ 6th Street						
SB Left	**0.95/E***	0.02/A	0.02/A	0.06/A	0.03/A	0.06/A
WB Left	**0.85/E***	0.2/D	0.2/D	0.26/D	0.27/D	0.33/D
WB Right	**0.85/E***	0.02/B	0.02/B	0.07/B	0.02/B	0.08/B
EB LTR	**0.85/E***	0.05/B	0.05/B	0.08/B	0.07/B	0.10/C
NBL	**0.95/E***	0.01/A	0.01/A	0.01/A	0.01/A	0.01/A
6th @ Driveway						
NB Left	**E***	A	A	A	A	A
EB Left	**E***	A	A	A	A	A
EB Right	**E***	A	A	A	A	A
5th @ Driveway						
NB Left-Right	**E***	A	A	A	A	A
EB Through-Right	**E***	A	A	A	A	A
WB Through-Left	**E***	A	A	A	A	A

*LOS City Standard

As illustrated in Table 4, all studied intersections operate better than the mobility standard under both existing and build conditions. There are no off-site improvements needed to offset the impact of development trips.

7.0 QUEUE ANALYSIS

A queuing analysis was conducted for the studied intersections for the Years 2020 and 2025. The analysis was performed using SimTraffic, a microsimulation software tool that uses the HCM defined criteria to estimate the queuing of vehicles within the study area. The average and 95th percentile queuing results are illustrated in Table 5. All results are rounded to 25 feet to better represent the total number of vehicles in the queue, as one vehicle typically occupies 25 feet of space. The 25 feet assumes the length of vehicle and space usually allotted between vehicles while queued at intersections. The SimTraffic outputs are provided in Appendix E.

TABLE 5: INTERSECTION QUEUING: AM PEAK HOUR

Movement	Available Storage	2020 Background		2020 Build		2025 Background		2025 Build	
		Avg	95th Percentile	Avg	95th Percentile	Avg	95th Percentile	Avg	95th Percentile
Highway 101 at 6th Street									
SB L	370	25	25	25	25	25	25	25	50
SB TR	370	n/a	n/a	0	0	0	0	0	25
WB LT	1000	25	50	25	50	25	50	25	75
WB R	1000	25	50	25	50	25	50	25	50
EB LTR	180	25	50	25	50	25	50	25	50
NB L	250	25	25	0	25	25	25	0	25
NB T	250	0	0	0	25	0	0	0	25
Highway 101 at Rhododendron Drive									
SB L	250	25	25	25	25	25	25	25	25
SB T	260	75	150	50	100	100	150	75	125
SB TR	280	50	100	50	100	75	175	50	100
NB L	230	25	25	25	25	25	25	25	25
NB T	245	150	200	125	225	150	225	150	225
NB TR	260	75	175	75	175	75	175	100	175
EB LTR	302	25	25	25	25	25	25	25	25
WB LTR	195	25	50	25	50	25	50	25	50
6th Street @ Driveway									
WB LT	980	25	25	0	0	0	25	25	25
NB LR	260	0	0	25	50	0	0	25	50
EB TR	25	0	0	0	0	0	0	25	25
Rhododendron Drive @ Driveway									
SB LR	260	n/a	n/a	25	50	n/a	n/a	25	50

As demonstrated in Table 5, the development will not create significant queuing concerns during the weekday AM peak hour.

Additionally, the queueing for the southbound through movement is shown to be shorter in the build condition. This is due to pass-by trips. As detailed previously, the site will have a significant number of pas-by trips, pass-by trips are those that would be in the southbound through movement, instead of going through the vehicles divert from the through movement and move to the left-turn movement. Therefore, there would be less through trips and subsequently, a shorter queue length.

8.0 DRIVEWAY QUEUING

A queuing analysis was performed to estimate the average and 95th percentile queues that will occur in the drive-through lane during the AM and PM peak hours.

Field measurements were performed by Sandow Engineering in the Eugene area at local area drive-through coffee establishments to verify assumptions in drive-thru usage and service rates. The data collection was performed for the AM peak hour as it has the highest trip generation and drive-thru use. The data collection included counting the total number of vehicles through the drive-thru and service time of each vehicle at the pick-up window during the peak hour. The data collection indicates the average service time during the AM peak hour is approximately 38 seconds per vehicle, the average queue is 7 vehicles, the 95th percentile queue was 11 vehicles, and the peak hour of trips to the site was from 7:30 – 8:30 AM with the highest drive-thru usage occurring between 8:00 AM and 8:15 AM. Appendix F contains the study data.

A variety of queuing models were researched, and it was determined that an M/D/1 queuing model provides results that most closely match field observations. The M/D/1 model assumes that the arrival rate of customers follows a Poisson distribution and that the service rate is constant. It should be noted that the service rate does vary with each customer; however, assuming a constant service rate provides results that matched field observations. The M/D/1 model was used to estimate average and 95th percentile queues during the AM and PM peak hours. Table 6 illustrates the results of the drive-thru queuing analysis and the following sections describe the results. Appendix F contains the analysis.

TABLE 6: DRIVE-THRU QUEUING ANALYSIS

	AM PEAK HOUR	PM PEAK HOUR
Average Queue (vehicles)	7	1
95% Queue (vehicles)	11	2
Max Queue (vehicles)	13	4
Average time in Queue (minutes)	4.9 minutes	1.0 minutes
% of hour at 95% queue	15.53% (9.32 minutes)	4.19 % (2.52 minutes)
% of hour at max queue	4.61% (2.77 minutes)	<1% (<1 minute)

The anticipated queuing during the AM peak hour is an average of 7 vehicles and 95th percentile of 11 vehicles. In a drive-thru queuing lane, the average vehicle takes up about 20 feet of space while queued in a drive-thru. This length is the average length of a car and the space between cars. In a drive-thru, the space between cars is generally shorter than the space between cars queued at intersections. Therefore, the length in the drive-thru needs to accommodate the average queue of 140 feet. The 95th percentile queue of 220 feet can be safely accommodated on-site without causing backups onto the adjacent roadways. A majority of the time the drive-thru is expected to have 7 vehicles in the queue with the 95% queue occurring no more than 15% of the time.

The design of the proposed Human Bean includes approximately 160 feet of designated drive-thru lane with an additional 150 feet of internal space available for storage before the driveways are obstructed. There is sufficient room on-site to allow for storage needed to accommodate the 95% queue.

9.0 IMPROVEMENT PROPORTIONALITY

Rhododendron Drive:

Rhododendron Drive is classified as a local street within the City's Transportation System Plan. Local streets carry about 1,000 ADT. The street is one lane in each direction with on-street parking on both sides. During the traffic count, it was observed that most of the available parking was occupied and was occupied by users of the business/housing on the south side. The proposed development is not anticipated to use any of the on-street parking along Rhododendron Drive. The existing traffic on this section is 35 peak hour trips and 350 daily trips.

The proposed development is anticipated to add 67 peak hour trips and 400 daily trips between the site access point and Highway 101, which is within the typical daily usage of a local street. Therefore, reconstruction of Rhododendron to offset the impact of the added development traffic is not needed. Additionally, the development will not use the available on-street parking. This is due to the drive-through usage and on-site available parking for employees. Therefore, the overall impacts of the development to Rhododendron Drive are minimal. Any street improvements should align with the impacts of the development. This should follow a proportionality assessment of the actual impacts of

the development. The recommended proportionality is the total added traffic to total traffic that a local street could handle. This is 400 development ADT/1000 total ADT or 40% of reconstruction costs.

6th Street:

The City has requested that the applicant provide a proportional share of the costs of the reconstruction of the shared access to 6th Street when the property to the east redevelops (Tax Lot #6501). It is anticipated that the redevelopment of Tax Lot #6501 will trigger the relocation of the shared access to 6th Street to provide greater spacing between the shared access and Hwy 101. There is no current development plan for this property. Therefore, it is difficult to assess what the impacts are and what the feasible proportion share of traffic would be. As an example, if the site was to redevelop as a large commercial development with a high trip attractor (like a popular restaurant), then the proportion of impact from this development would be small. Contrary, if the adjacent development was a lower trip generator, then the proportion of impact from this development would be larger.

Additionally, the actual design and location will be based on the type and layout of the development on that property. This condition should be modified to require an easement to be provided between sites to allow the shared access in the future with an agreement of proportional costs to be decided up when the application is filed.

10.0 CONCLUSION

This report describes the Traffic Impact Analysis and findings prepared for the proposed Diamond Car Wash and Human Bean Coffee Drive-Through, located in Florence, Oregon. The project site is located to the East of Highway 101 between 6th Street and Rhododendron Drive on Tax Lots 6600 and 6601. Currently, the site is vacant and is contained within 0.57 acres. The development proposal is a 400 SF drive-through coffee stand and a single lane drive-through automated car wash. The development is proposed to be completed in 2020.

The analysis evaluates the operation of the site entrance and adjacent intersections. The following findings and recommendations are based on the information and analysis contained within this report.

10.1 FINDINGS

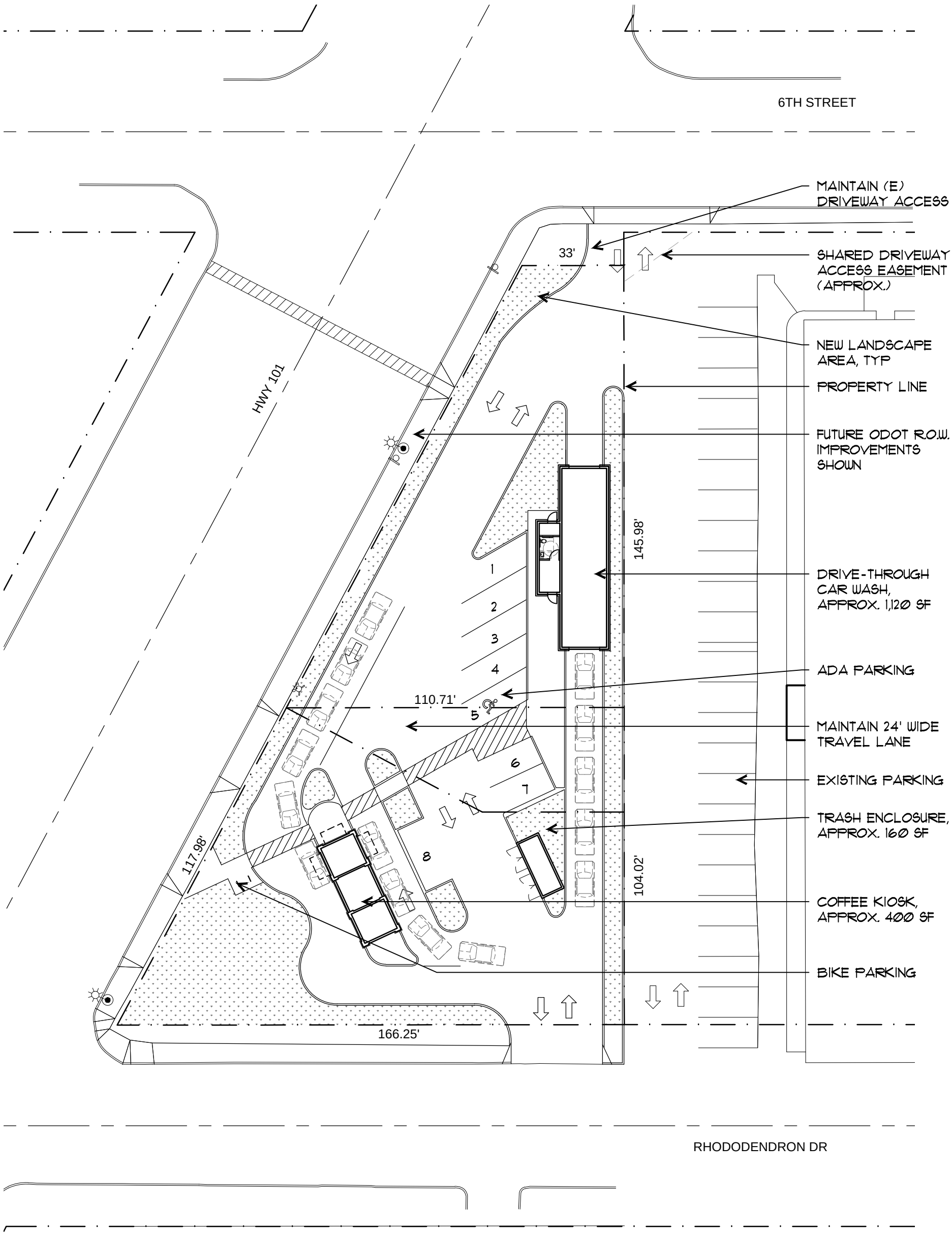
The analysis concludes the following findings:

- All studied intersections will operate within the mobility standards with the completion of the development, year 2020, and the year 2025. No off-site intersection improvements are necessary.
- The addition of development traffic will not substantially increase queueing conditions over the background conditions.
- All site driveways are projected to operate safely and efficiently.
- The site as designed is sufficient to hold the typical daily queue for the coffee shop usage.

Florence Car Wash and Coffee Kiosk

APPENDIX A: SITE PLAN

SANDOW ENGINEERING



1 SITE PLAN

1/32" = 1'-0"

NORTH

©21 MARCH 19

GMA ARCHITECTS

860 WEST PARK, SUITE 300
EUGENE, OREGON 97401 (541) 344-9157

FLORENCE, OR CARWASH

PROJECT NUMBER: 18036
586 HWY 101, FLORENCE, OR, 97439

SHEET

A-1

APPENDIX B: TRAFFIC COUNT DATA

Florence Car Wash and Coffee Kiosk

SANDOW ENGINEERING

Intersection: 1: Hwy 101 @ 6th Street **City:** Florence, OR

Counter: Sandow Engineering **Date:** Thursday, December 19, 2019

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
7:00	7:15	1	35	1	37	0	0	0	0	0	44	1	45	0	0	0	0	82		0	0	0	0
7:15	7:30	1	30	1	32	1	1	0	2	0	56	0	56	0	0	2	2	92		0	0	0	0
7:30	7:45	1	44	0	45	2	1	0	3	4	74	1	79	0	1	0	1	128		0	0	0	0
7:45	8:00	2	81	4	87	2	2	4	8	3	121	2	126	5	0	0	5	226	528	0	0	0	0
8:00	8:15	2	66	6	74	2	1	7	10	0	111	1	112	0	0	1	1	197	643	0	0	0	0
8:15	8:30	4	70	3	77	2	5	4	11	0	60	0	60	0	0	0	0	148	699	0	0	0	0
8:30	8:45	3	85	1	89	2	2	2	6	4	86	2	92	2	0	2	4	191	762	0	0	0	0
8:45	9:00	4	94	2	100	4	2	5	11	7	92	7	106	1	1	1	3	220	756	0	0	0	0
9:00	9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
9:15	9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
9:30	9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
9:45	10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
Count Period Total		**18**	**505**	**18**		**15**	**14**	**22**		**18**	**644**	**14**		**8**	**2**	**6**		**1284**		**0**	**0**	**0**	**0**

AM Peak Hour Count Summary

	Southbound				Westbound				Northbound				Eastbound						Pedestrians			
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach			SB	WB	NB	EB
Peak Volumes	**11**	**302**	**14**	**327**	**8**	**10**	**17**	**35**	**7**	**378**	**5**	**390**	**7**	**0**	**3**	**10**	**762**		**0**	**0**	**0**	**0**
PHF	0.69	0.89	0.58	0.92	1.00	0.50	0.61	0.80	0.44	0.78	0.63	0.77	0.35	0.00	0.38	0.50	0.84					
Trucks	1	9	2		0	2	1		0	4	0		1	0	0							
% Trucks	9%	3%	14%		0%	20%	6%		0%	1%	0%		14%	0%	0%							

Seasonally Adjusted Peak Hour

1: Hwy 101 @ 6th Street

Southbound

	43%	946	51%
432	↓	↑	514
3.47%	92.36%	4.17%	%
R	T	L	PED
15	399	18	0

1

Eastbound

3%	35	%	Ped	0
48	←→	30.77%	L	4
		0.00%	T	0
1%	13	69.23%	R	9

Westbound

11	R	23.91%	46	5%
13	T	28.26%	←→	73
22	L	47.83%		
0	Ped	%	27	3%

Northbound

0	7	499	9
Ped	L	T	R
%	1.4%	96.9%	1.7%
430	↓	↑	515
43%	945		51%

Seasonal Adjustment Factor

1.320

1006

1: Hwy 101 @ 6th Street

Pedestrians and Cars

Time Period	Southbound					Westbound					Northbound					Eastbound					15 Minute Volume	Hourly Volume
	Peds	Right	Thru	Left		Peds	Right	Thru	Left		Peds	Right	Thru	Left		Peds	Right	Thru	Left			
7:00 AM		1	26	1									44	1							73	
7:15 AM		1	28					1					55						1		86	
7:30 AM			40				2	1				3	73	1				1			121	
7:45 AM		1	78	4			2	2	4			3	119	2			4				219	499
8:00 AM		2	65	5			2	1	7				109	1					1		193	619
8:15 AM		4	65	3			2	3	3				60								140	673
8:30 AM		3	85				2	2	2			4	86	2			2		2		190	742
8:45 AM		4	91	2			4	2	5			6	89	7			1	1	1		213	736
9:00 AM							0		0			0									0	543
9:15 AM																					0	403
9:30 AM																					0	213
9:45 AM																					0	0
Total	0	16	478	15	0	0	14	12	21	0	0	16	635	14	0	0	7	2	5			
Peak Hour	**0**	**10**	**293**	**12**	**0**	**0**	**8**	**8**	**16**	**0**	**0**	**7**	**374**	**5**	**0**	**0**	**6**	**0**	**3**		**742**	

Trucks

Time Period	Southbound				Westbound				Northbound				Eastbound				15 Minute Volume	Hourly Volume
	Right	Thru	Left		Right	Thru	Left		Right	Thru	Left		Right	Thru	Left			
7:00 AM		9															9	
7:15 AM		2	1		1					1					1		6	
7:30 AM	1	4							1	1							7	
7:45 AM	1	3								2			1				7	29
8:00 AM		1	1							2							4	24
8:15 AM		5				2	1										8	26
8:30 AM			1														1	20
8:45 AM		3							1	3							7	20
9:00 AM																	0	16
9:15 AM																	0	8
9:30 AM																	0	7
9:45 AM																	0	0
Total	2	27	3	0	1	2	1	0	2	9	0		1	0	1			
Peak Hour	**1**	**9**	**2**	**0**	**0**	**2**	**1**	**0**	**0**	**4**	**0**	**0**	**1**	**0**	**0**	**0**	**20**	

Bikes

Time Period	Southbound				Westbound				Northbound				Eastbound			SB	WB	NB	EB
	Right	Thru	Left		Right	Thru	Left		Right	Thru	Left		Right	Thru	Left				
7:00 AM														0		0	0	0	0
7:15 AM																0	0	0	0
7:30 AM																0	0	0	0
7:45 AM																0	0	0	0
8:00 AM																0	0	0	0
8:15 AM																0	0	0	0
8:30 AM																0	0	0	0
8:45 AM																0	0	0	0
9:00 AM																0	0	0	0
9:15 AM																0	0	0	0
9:30 AM																0	0	0	0
9:45 AM																0	0	0	0
Total	0	0	0		0	0	0		0	0	0		0	0	0				
Peak Hour	**0**	**0**	**0**		**0**	**0**	**0**		**0**	**0**	**0**		**0**	**0**	**0**				

Pedestrians

Time Period	NE				NW				SW				SE			SB	WB	NB	EB
	Left	Right	Total		Left	Right	Total		Left	Right	Total		Left	Right	Total				
7:00 AM																0	0	0	0
7:15 AM																0	0	0	0
7:30 AM																0	0	0	0
7:45 AM																0	0	0	0
8:00 AM																0	0	0	0
8:15 AM																0	0	0	0
8:30 AM																0	0	0	0
8:45 AM																0	0	0	0
9:00 AM																0	0	0	0
9:15 AM																0	0	0	0
9:30 AM																0	0	0	0
9:45 AM																0	0	0	0
Total	0	0	0		0	0	0		0	0	0		0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**		**0**	**0**	**0**		**0**	**0**	**0**		**0**	**0**	**0**				

Intersection: 2: Hwy 101 @ Rhododrendron Drive **City:** Florence, OR

Counter: Sandow Engineering **Date:** Thursday, December 19, 2019

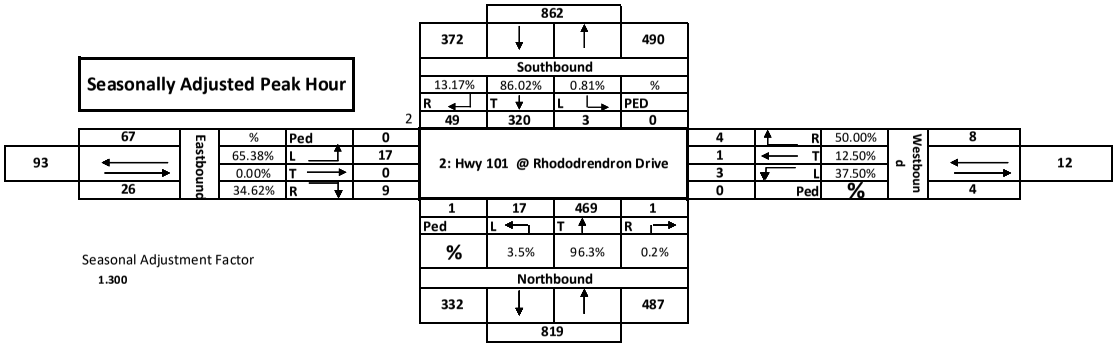
Total of All Vehicles

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
7:00	7:15	5	26	0	31	1	0	0	1	0	43	1	44	0	0	2	2	78		0	0	0	0
7:15	7:30	3	32	0	35	0	0	0	0	2	52	3	57	1	0	3	4	96		0	0	0	0
7:30	7:45	6	36	0	42	0	0	0	0	0	69	3	72	2	0	4	6	120		0	0	1	0
7:45	8:00	14	57	0	71	2	0	1	3	0	112	7	119	3	0	5	8	201	495	0	0	0	0
8:00	8:15	12	54	1	67	0	1	0	1	0	103	2	105	1	0	3	4	177	594	0	0	0	0
8:15	8:30	4	73	0	77	0	0	1	1	0	65	3	68	1	0	2	3	149	647	0	0	1	0
8:30	8:45	8	62	1	71	1	0	0	1	1	81	1	83	2	0	3	5	160	687	0	0	0	0
8:45	9:00	5	80	0	85	2	1	0	3	0	81	4	85	3	0	7	10	183	669	0	0	0	0
9:00	9:15	9	1	0	10	0	0	0	0	0	0	0	0	0	0	0	0	10		0	0	0	0
9:15	9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
9:30	9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
9:45	10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0
Count Period Total		**66**	**421**	**2**		**6**	**2**	**2**		**3**	**606**	**24**		**13**	**0**	**29**		**1174**		**0**	**0**	**2**	**0**

AM Peak Hour Count Summary

	Southbound				Westbound				Northbound				Eastbound						Pedestrians			
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach			SB	WB	NB	EB
Peak Volumes	**38**	**246**	**2**	**286**	**3**	**1**	**2**	**6**	**1**	**361**	**13**	**375**	**7**	**0**	**13**	**20**	**687**		**0**	**0**	**1**	**0**
PHF	0.68	0.84	0.50	0.93	0.38	0.25	0.50	0.50	0.25	0.81	0.46	0.79	0.58	0.00	0.65	0.63	0.85					
Trucks	1	8	0		0	0	0		0	6	1		1	0	1							
% Trucks	3%	3%	0%		0%	0%	0%		0%	2%	8%		14%	0%	8%							

Seasonally Adjusted Peak Hour



Seasonal Adjustment Factor

1.300

2: Hwy 101 @ Rhododrendron Drive

Pedestrians and Cars

Time Period	Southbound					Westbound					Northbound					Eastbound					15 Minute Volume	Hourly Volume
	Peds	Right	Thru	Left		Peds	Right	Thru	Left		Peds	Right	Thru	Left		Peds	Right	Thru	Left			
7:00 AM		5	19				1						43	1			0		2		71	
7:15 AM		2	32									2	52	3			1		3		95	
7:30 AM		6	33										67	3			2		4		115	
7:45 AM		14	55				2		1				110	7			2		5		196	477
8:00 AM		12	53	1				1					102	2			1		3		175	581
8:15 AM		3	69						1				63	2			1		2		141	627
8:30 AM		8	61	1			1					1	80	1			2		2		157	669
8:45 AM		5	78				1	1					76	4			3		7		175	648
9:00 AM		9	1																		10	483
9:15 AM																					0	342
9:30 AM																					0	185
9:45 AM																					0	10
Total	0	64	401	2		0	5	2	2		0	3	593	23		0	12	0	28			
Peak Hour	**0**	**37**	**238**	**2**		**0**	**3**	**1**	**2**		**0**	**1**	**355**	**12**		**0**	**6**	**0**	**12**		**669**	**2354**

Trucks

Time Period	Southbound				Westbound				Northbound				Eastbound				15 Minute Volume	Hourly Volume
	Right	Thru	Left		Right	Thru	Left		Right	Thru	Left		Right	Thru	Left			
7:00 AM		7															7	
7:15 AM	1																1	
7:30 AM		3								2							5	
7:45 AM		2								2			1				5	18
8:00 AM		1								1							2	13
8:15 AM	1	4								2	1						8	20
8:30 AM		1								1					1		3	18
8:45 AM		2			1					5							8	21
9:00 AM																	0	19
9:15 AM																	0	11
9:30 AM																	0	8
9:45 AM																	0	0
Total	2	20	0		1	0	0		0	13	1		1	0	1			
Peak Hour	**1**	**8**	**0**		**0**	**0**	**0**		**0**	**6**	**1**		**1**	**0**	**1**		**18**	

Bikes

Time Period	Southbound				Westbound				Northbound				Eastbound			SB	WB	NB	EB
	Right	Thru	Left		Right	Thru	Left		Right	Thru	Left		Right	Thru	Left				
7:00 AM						0								0		0	0	0	0
7:15 AM																0	0	0	0
7:30 AM																0	0	0	0
7:45 AM																0	0	0	0
8:00 AM																0	0	0	0
8:15 AM																0	0	0	0
8:30 AM																0	0	0	0
8:45 AM																0	0	0	0
9:00 AM																0	0	0	0
9:15 AM																0	0	0	0
9:30 AM																0	0	0	0
9:45 AM																0	0	0	0
Total	0	0	0		0	0	0		0	0	0		0	0	0				
Peak Hour	**0**	**0**	**0**		**0**	**0**	**0**		**0**	**0**	**0**		**0**	**0**	**0**				

SEASONAL TREND TABLE (Updated: 6/26/19)																										Seasonal
TREND	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec	Trend
INTERSTAT	1.0419	1.0728	1.0640	1.0552	1.0259	0.9966	0.9896	0.9825	0.9768	0.9711	0.9558	0.9404	0.9561	0.9718	0.9804	0.9890	0.9860	0.9830	0.9864	0.9897	1.0055	1.0213	1.0436	1.0659	0.9404
INTERSTAT	1.2583	1.3379	1.2962	1.2545	1.1572	1.0600	1.0383	1.0166	0.9863	0.9561	0.9075	0.8588	0.8422	0.8256	0.8325	0.8394	0.8806	0.9218	0.9559	0.9900	1.0158	1.0416	1.1192	1.1969	0.8256
COMMUTE	1.0577	1.1050	1.0844	1.0638	1.0406	1.0173	0.9975	0.9777	0.9711	0.9645	0.9542	0.9438	0.9544	0.9649	0.9592	0.9535	0.9637	0.9738	0.9737	0.9737	0.9976	1.0215	1.0520	1.0825	0.9438
COASTAL D	1.2069	1.2238	1.1889	1.1540	1.1006	1.0472	1.0504	1.0536	1.0125	0.9714	0.9394	0.9074	0.8574	0.8074	0.8100	0.8126	0.8635	0.9145	0.9648	1.0152	1.0683	1.1214	1.1636	1.2058	0.8074
COASTAL D	1.3738	1.4039	1.3653	1.3267	1.2268	1.1268	1.1203	1.1138	1.0308	0.9478	0.9031	0.8584	0.7781	0.6978	0.7080	0.7182	0.7932	0.8682	0.9574	1.0466	1.1248	1.2030	1.2836	1.3642	0.6978
AGRICULTU	1.4390	1.5042	1.4606	1.4171	1.3208	1.2246	1.1445	1.0643	0.9843	0.9043	0.8736	0.8429	0.8259	0.8089	0.8114	0.8140	0.7847	0.7554	0.8267	0.8980	0.9879	1.0778	1.2559	1.4339	0.7884
RECREATIO	1.6714	1.6739	1.6571	1.6403	1.4889	1.3375	1.2642	1.1909	1.0325	0.8742	0.8177	0.7611	0.7119	0.6626	0.6933	0.7239	0.7598	0.7957	0.8898	0.9838	1.1028	1.2218	1.3720	1.5221	0.6626
RECREATIO	1.0752	0.9963	1.0200	1.0437	1.0500	1.0563	1.1766	1.2970	1.1496	1.0021	0.9514	0.9006	0.8005	0.7005	0.7590	0.8176	0.9133	1.0091	1.1812	1.3532	1.4605	1.5677	1.2312	0.8948	0.7005
RECREATIO	0.8178	0.6528	0.7315	0.8102	0.8326	0.8549	1.0558	1.2566	1.1918	1.1270	1.1295	1.1321	1.0004	0.8687	0.9344	1.0001	1.0823	1.1646	1.2984	1.4323	1.7685	2.1047	1.4326	0.7605	0.6528
SUMMER	1.2007	1.2609	1.2367	1.2125	1.1528	1.0932	1.0592	1.0252	0.9810	0.9368	0.9061	0.8753	0.8535	0.8317	0.8437	0.8557	0.8872	0.9188	0.9502	0.9816	1.0276	1.0737	1.1341	1.1945	0.8317
SUMMER <	1.2437	1.3130	1.2858	1.2586	1.1886	1.1186	1.0667	1.0147	0.9592	0.9036	0.8816	0.8595	0.8489	0.8382	0.8564	0.8746	0.8721	0.8696	0.9094	0.9491	1.0234	1.0977	1.1930	1.2883	0.8382

***Seasonal Trend Table factors are based on previous year ATR data. The table is updated yearly.**
***Grey shading indicates months were seasonal factor is greater than or less than 30%**

	Commuter	Coastal	
Count	1.0825	1.2058	
	0.9438	0.8074	
	1.146959	1.493436	1.320197

Existing 2019 AM Volumes

			432		514				
			R	T	L	PED			
		1	15	399	18	0			
	Ped	0					11	R	46
35	L	4		1: Hwy 101 @ 6th Street			13	T	
	T	0					22	L	27
13	R	9					0	Ped	
			0	7	499	9			
			Ped	L	T	R			
				430		515			

			372		477				
			R	T	L	PED			
		2	49	320	3	0			
	Ped	0					7	R	18
55	L	1		2: Hwy 101 @ Rhododrendron Drive			1	T	
	T	0					10	L	4
3	R	2					0	Ped	
			1	5	469	1			
			Ped	L	T	R			
				332		475			

Existing 2019 AM Volumes Balanced

			374		476				
			R	T	L	PED			
		1	15	341	18	0			
	Ped	0					11	R	46
35	L	4		1: Hwy 101 @ 6th Street			13	T	
	T	0					22	L	27
13	R	9					0	Ped	
			0	7	461	9			
			Ped	L	T	R			
				372		477			

			372		477				
			R	T	L	PED			
		2	49	320	3	0			
	Ped	0					7	R	18
55	L	1		2: Hwy 101 @ Rhododrendron Drive			1	T	
	T	0					10	L	4
3	R	2					0	Ped	
			1	5	469	1			
			Ped	L	T	R			
				332		475			

EDIT Highlighted

2020 AM Volumes Background

Base Year	2019	2019
Target Year	2020	2020
Years of Growth	1	1
Growth Rate Per Year	0.02	0.02
Growth Factor	1.02	1.02

			380		483				
			R	T	L	PED			
		1	15	346	18	0			
	Ped	0					11	R	47
35.6	L	4		1: Hwy 101 @ 6th Street			13	T	
	T	0					22	L	27
13.3	R	9					0	Ped	
			0	7	468	9			
			Ped	L	T	R			
				378		484			

			378		484				
			R	T	L	PED			
		2	50	325	3	0			
	Ped	0					7	R	18.3356
56	L	1		2: Hwy 101 @ Rhododrendron Drive			1	T	
	T	0					10	L	4.0616
3	R	2					0	Ped	
			1	5	476	1			
			Ped	L	T	R			
				337		482			

			0		0				
			R	T	L	PED			
		Int #	0	0	0				
	Ped						0	R	50.1123
47	L	0		3:6th St Background Driveway			47	T	
	T	28					3	L	27.6129
27.6	R	0					0	Ped	
				0	0	0			
			Ped	L	T	R			
				3		0			

			5		1				
			R	T	L	PED			
		Int #	5	0	0				
	Ped						0	R	0
5.08	L	1		4:Rhododendron Dr Background Driveway			0	T	
	T	0					0	L	0
1.02	R	0					0	Ped	
				0	0	0			
			Ped	L	T	R			
				0		0			

EDIT Highlighted

2025 AM Volumes Background

Base Year	2019	2019
Target Year	2025	2025
Years of Growth	6	6
Growth Rate Per Yea	0.02	0.02
Growth Factor	1.09	1.14

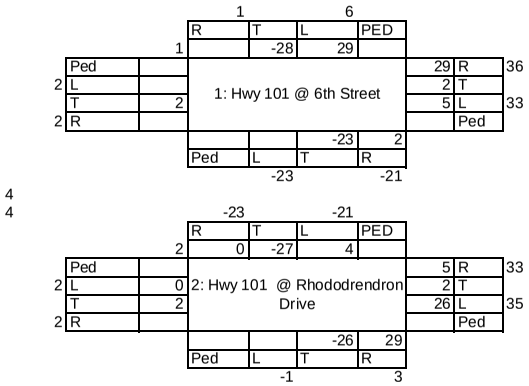
			409		521				
			R	T	L	PED			
		1	16	373	20	0			
	Ped	0					12	R	52
38.8	L	5		1: Hwy 101 @ 6th Street			15	T	
	T	0					25	L	29
14.8	R	10					0	Ped	
			0	8	504	10			
			Ped	L	T	R			
				408		521			

			406		521				
			R	T	L	PED			
		2	54	350	3	0			
	Ped	0					8	R	20.45
60	L	1		2: Hwy 101 @ Rhododrendron Drive			1	T	
	T	0					11	L	4.37
3	R	2					0	Ped	
			1	5	512	1			
			Ped	L	T	R			
				363		519			

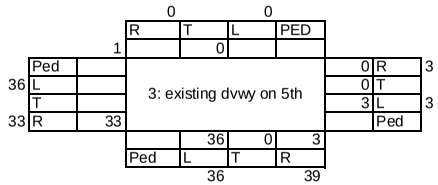
			0		0				
			R	T	L	PED			
		Int #	0	0	0				
	Ped						0	R	55.67
52.3	L	0		3:6th St Background Driveway			52	T	
	T	31					3	L	30.68
30.7	R	0					0	Ped	
			0	0	0				
			Ped	L	T	R			
				3		0			

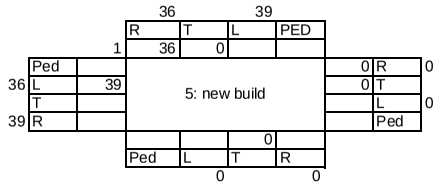
			5		1				
			R	T	L	PED			
		Int #	5	0	0				
	Ped						0	R	0
5.46	L	1		4:Rhododendron Dr Background Driveway			0	T	
	T	0					0	L	0
1.14	R	0					0	Ped	
			0	0	0				
			Ped	L	T	R			
				0		0			

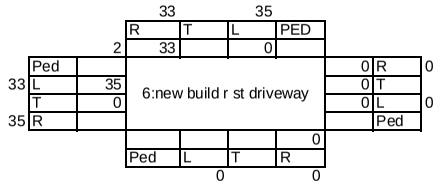
AM **Trip Distribution**



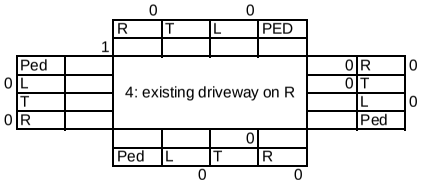
AM **Trip Distribution**



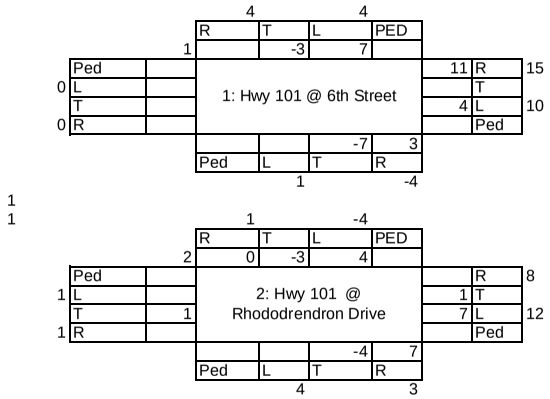




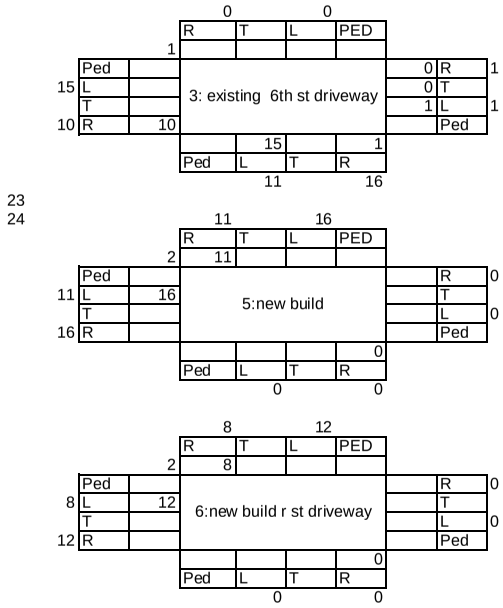
		IN	Out
		71	72
North	0.46	33	33
Souith	0.45	32	32
Side	0.1	7	7



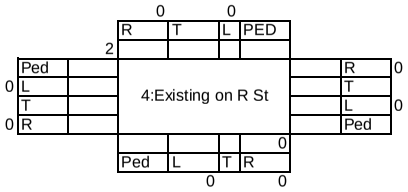
PM **Trip Distribution**



PM **Trip Distribution**



	IN	Out	
		23	24
North	0.46	11	11
South	0.45	10	11
Side	0.1	2	2



2020 Build Volumes AM

			381		489					
			R	T	L	PED				
		1	15	318	47	0				
	Ped	0					40	R	83	
38	L	4		1: Hwy 101 @ 6th Street			15	T		
	T	2					27	L	60	
15	R	9					0	Ped		
			0	7	445	11				
			Ped	L	T	R				
				355		463				

			0		0					
			R	T	L	PED				
		1	0	0	0	0				
	Ped	0					0	R	53.1	
83	L	0		3: 6th St Driveway			47	T		
	T	28					6	L	30.6	
61	R	33					0	Ped		
			0	36	0	3				
			Ped	L	T	R				
				39		39				

			39		39					
			R	T	L	PED				
		1	36	3	0	0				
	Ped	0					0	R	0	
36	L	39		5: New Driveway				T		
	T	0					0	L	0	
39	R	0						Ped		
			0	0	0	0				
			Ped	L	T	R				
				3		0				

			355		463					
			R	T	L	PED				
		2	50	298	7	0				
	Ped	0					12	R	51	
58	L	1		2: Hwy 101 @			3	T		
	T	2		Rhododrendron Drive			36	L	39	
5	R	2					0	Ped		
			1	5	450	30				
			Ped	L	T	R				
				336		485				

			33		35					
			R	T	L	PED				
		2	33	0	0	0				
	Ped	0					0	R	5	
38	L	35		6: Rhododendron Drive			5	T		
	T	1		New Build Driveway			0	L	1	
39	R	0					0	Ped		
			0	0	0	0				
			Ped	L	T	R				
				0		0				

			5		1					
			R	T	L	PED				
	Int #		5	0	0	0				
	Ped	0					0	R	0	
5	L	1		4:Rhododendron Dr			0	T		
	T	0		Background Driveway			0	L	0	
1	R	0						Ped		
			0	0	0	0				
			Ped	L	T	R				
				0		0				

2025 Build Volumes 0

			410		527					
			R	T	L	PED				
		1	16	345	49	0				
	Ped	0					41	R	88	
41	L	5		1: Hwy 101 @ 6th Street			17	T		
	T	2					30	L	62	
17	R	10					0	Ped		
			0	8	481	12				
			Ped	L	T	R				
				385		500				

			0		0					
			R	T	L	PED				
		1	0	0	0	0				
	Ped	0					0	R	59	
88	L	0		3: 6th St Driveway			52	T		
	T	31					6	L	34	
64	R	33					0	Ped		
			0	36	0	3				
			Ped	L	T	R				
				39		39				

			39		39					
			R	T	L	PED				
		1	36	3	0	0				
	Ped	0					0	R	0	
36	L	39		5: New Driveway			0	T		
	T	0					0	L	0	
39	R	0					0	Ped		
			0	0	0	0				
			Ped	L	T	R				
				3		0				

			383		500					
			R	T	L	PED				
		2	54	323	7	0				
	Ped	0					13	R	53	
62	L	1		2: Hwy 101 @			3	T		
	T	2		Rhododrendron Drive			37	L	39	
5	R	2					0	Ped		
			1	5	486	30				
			Ped	L	T	R				
				362		522				

			33		35					
			R	T	L	PED				
		2	33	0	0	0				
	Ped	0					0	R	5	
38	L	35		6: Rhododendron Drive			5	T		
	T	1		New Build Driveway			0	L	1	
36	R	0					0	Ped		
			0	0	0	0				
			Ped	L	T	R				
				0		0				

			5		1					
			R	T	L	PED				
	Int #		5	0	0	0				
	Ped						0	R	0	
5	L	1		4:Rhododendron Dr			0	T		
	T	0		Background Driveway			0	L	0	
1	R	0						Ped		
			0	0	0	0				
			Ped	L	T	R				
				0		0				

APPENDIX C: CRASH DATA

Florence Car Wash and Coffee Kiosk

CRASH DATA SUMMARY

HWY 101 @ 6TH

YEAR	PDO	INJURY	FATAL		HEAD	REAR	SIDE	TURN	ANGLE	OTHER	PED	BIKE	TOTAL	CHECK
2013													0	OK
2014													0	OK
2015													0	OK
2016													0	OK
2017		1							1				1	OK
TOTALS:	0	1	0		0	0	0	0	1	0	0	0	1	

P.M. PEAK HOUR	Number of Years, n	ADT	AVG. ANNUAL MILES (MILLIONS)	AVG. YEARLY CRASHES	CRASH RATE/ MILLION MILES
1,006	5	10,060	3,671,900	200,000	0.05

Angle	W-E&S-N				

HWY 101 @ RHODODENDRON

YEAR	PDO	INJURY	FATAL		HEAD	REAR	SIDE	TURN	ANGLE	OTHER	PED	BIKE	TOTAL	CHECK
2013	1					1							1	OK
2014	1							1					1	OK
2015													0	OK
2016													0	OK
2017	2					1		1					2	OK
TOTALS:	4	0	0		0	2	0	2	0	0	0	0	4	

P.M. PEAK HOUR	Number of Years, n	ADT	AVG. ANNUAL MILES (MILLIONS)	AVG. YEARLY CRASHES	CRASH RATE/ MILLION MILES
893	5	8,930	3,259,450	800,000	0.25
TURN	E-NE&SW-NE	NE-SW&W-NE			
REAR	NE-SW&NE-SW	SW-NE,SW-NE,&SW-NE			

APPENDIX D: SYNCHRO OUTPUT

Florence Car Wash and Coffee Kiosk

SANDOW ENGINEERING

HCM Signalized Intersection Capacity Analysis
6: Hwy 101 & Rhododendron Dr

04/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	2	10	1	7	5	469	1	3	320	49
Future Volume (vph)	1	0	2	10	1	7	5	469	1	3	320	49
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.91			0.95		1.00	1.00		1.00	0.98	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1536			1582		1630	3259		1630	3194	
Flt Permitted		1.00			1.00		0.50	1.00		0.45	1.00	
Satd. Flow (perm)		1561			1627		857	3259		764	3194	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	1	0	2	12	1	8	6	552	1	4	376	58
RTOR Reduction (vph)	0	3	0	0	8	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	0	0	13	0	6	553	0	4	429	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		1.3			1.3		46.5	45.5		46.5	45.5	
Effective Green, g (s)		1.3			1.3		46.5	45.5		46.5	45.5	
Actuated g/C Ratio		0.02			0.02		0.76	0.74		0.76	0.74	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		33			34		662	2418		593	2370	
v/s Ratio Prot							c0.00	c0.17		0.00	0.13	
v/s Ratio Perm		0.00			c0.01		0.01			0.01		
v/c Ratio		0.00			0.39		0.01	0.23		0.01	0.18	
Uniform Delay, d1		29.4			29.6		1.8	2.5		1.8	2.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			7.2		0.0	0.2		0.0	0.2	
Delay (s)		29.4			36.8		1.8	2.7		1.8	2.5	
Level of Service		C			D		A	A		A	A	
Approach Delay (s)		29.4			36.8			2.7			2.5	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	25.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	9	22	13	11	7	468	9	18	346	15
Future Vol, veh/h	4	0	9	22	13	11	7	468	9	18	346	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	85	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	80	80	80	77	77	77	92	92	92
Heavy Vehicles, %	0	0	14	6	20	0	0	1	0	14	3	9
Mvmt Flow	8	0	18	28	16	14	9	608	12	20	376	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	754	1062	196	860	1064	310	392	0	0	620	0	0
Stage 1	424	424	-	632	632	-	-	-	-	-	-	-
Stage 2	330	638	-	228	432	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.18	7.62	6.9	6.9	4.1	-	-	4.38	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.62	5.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.62	5.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.44	3.56	4.2	3.3	2.2	-	-	2.34	-	-
Pot Cap-1 Maneuver	302	225	776	243	195	692	1178	-	-	879	-	-
Stage 1	584	590	-	425	430	-	-	-	-	-	-	-
Stage 2	663	474	-	743	538	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	270	218	776	232	189	692	1178	-	-	879	-	-
Mov Cap-2 Maneuver	270	218	-	232	189	-	-	-	-	-	-	-
Stage 1	579	576	-	422	427	-	-	-	-	-	-	-
Stage 2	620	470	-	709	526	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.7	22.3	0.1	0.4
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1178	-	-	492	214	692	879	-	-
HCM Lane V/C Ratio	0.008	-	-	0.053	0.204	0.02	0.022	-	-
HCM Control Delay (s)	8.1	-	-	12.7	26.1	10.3	9.2	-	-
HCM Lane LOS	A	-	-	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.7	0.1	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	2	10	1	7	5	476	1	3	325	50
Future Volume (vph)	1	0	2	10	1	7	5	476	1	3	325	50
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.91			0.95		1.00	1.00		1.00	0.98	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1536			1582		1630	3259		1630	3194	
Flt Permitted		1.00			1.00		0.50	1.00		0.44	1.00	
Satd. Flow (perm)		1561			1627		851	3259		758	3194	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	1	0	2	12	1	8	6	560	1	4	382	59
RTOR Reduction (vph)	0	3	0	0	8	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	0	0	13	0	6	561	0	4	436	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		1.3			1.3		46.5	45.5		46.5	45.5	
Effective Green, g (s)		1.3			1.3		46.5	45.5		46.5	45.5	
Actuated g/C Ratio		0.02			0.02		0.76	0.74		0.76	0.74	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		33			34		658	2418		589	2370	
v/s Ratio Prot							c0.00	c0.17		0.00	0.14	
v/s Ratio Perm		0.00			c0.01		0.01			0.01		
v/c Ratio		0.00			0.39		0.01	0.23		0.01	0.18	
Uniform Delay, d1		29.4			29.6		1.8	2.5		1.8	2.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			7.2		0.0	0.2		0.0	0.2	
Delay (s)		29.4			36.8		1.8	2.7		1.8	2.5	
Level of Service		C			D		A	A		A	A	
Approach Delay (s)		29.4			36.8			2.7			2.5	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	61.3	Sum of lost time (s)	13.5
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	28	0	3	47	0	0
Future Vol, veh/h	28	0	3	47	0	0
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	30	0	3	51	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	30	0	87	30
Stage 1	-	-	-	-	30	-
Stage 2	-	-	-	-	57	-
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	-	-	1583	-	914	1044
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	966	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1583	-	912	1044
Mov Cap-2 Maneuver	-	-	-	-	912	-
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	964	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1583	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	2	9	27	15	40	7	445	11	47	318	15
Future Vol, veh/h	4	2	9	27	15	40	7	445	11	47	318	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	85	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	80	80	80	77	77	77	92	92	92
Heavy Vehicles, %	0	0	14	6	20	0	0	1	0	14	3	9
Mvmt Flow	8	4	18	34	19	50	9	578	14	51	346	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	773	1066	181	880	1067	296	362	0	0	592	0	0
Stage 1	456	456	-	603	603	-	-	-	-	-	-	-
Stage 2	317	610	-	277	464	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.18	7.62	6.9	6.9	4.1	-	-	4.38	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.62	5.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.62	5.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.44	3.56	4.2	3.3	2.2	-	-	2.34	-	-
Pot Cap-1 Maneuver	292	224	794	235	194	706	1208	-	-	902	-	-
Stage 1	559	572	-	443	444	-	-	-	-	-	-	-
Stage 2	674	488	-	695	519	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	238	210	794	215	182	706	1208	-	-	902	-	-
Mov Cap-2 Maneuver	238	210	-	215	182	-	-	-	-	-	-	-
Stage 1	555	539	-	440	441	-	-	-	-	-	-	-
Stage 2	595	485	-	636	489	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	20	0.1	1.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1208	-	-	398	202	706	902	-	-
HCM Lane V/C Ratio	0.008	-	-	0.075	0.26	0.071	0.057	-	-
HCM Control Delay (s)	8	-	-	14.8	29	10.5	9.2	-	-
HCM Lane LOS	A	-	-	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	28	33	6	47	36	3
Future Vol, veh/h	28	33	6	47	36	3
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	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	41	8	59	45	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	76	0	131	56
Stage 1	-	-	-	-	56	-
Stage 2	-	-	-	-	75	-
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	-	-	1523	-	863	1011
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	948	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1523	-	859	1011
Mov Cap-2 Maneuver	-	-	-	-	859	-
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	943	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	869	-	-	1523	-
HCM Lane V/C Ratio	0.056	-	-	0.005	-
HCM Control Delay (s)	9.4	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	39	0	0	0	3	36
Future Vol, veh/h	39	0	0	0	3	36
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	0	0	0	4	42

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	25	25	46	0	-	0
Stage 1	25	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	991	1051	1562	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	991	1051	1562	-	-	-
Mov Cap-2 Maneuver	991	-	-	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1562	-	991	-	-
HCM Lane V/C Ratio	-	-	0.046	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2	2	36	3	12	5	450	30	7	298	50
Future Volume (vph)	1	2	2	36	3	12	5	450	30	7	298	50
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.97		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1529			1638		1630	3060		1662	3158	
Flt Permitted		0.98			0.85		0.46	1.00		0.35	1.00	
Satd. Flow (perm)		1518			1441		794	3060		617	3158	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	1	2	2	42	4	14	6	529	35	8	351	59
RTOR Reduction (vph)	0	1	0	0	8	0	0	6	0	0	15	0
Lane Group Flow (vph)	0	4	0	0	52	0	6	558	0	8	395	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	8%	0%	14%	0%	0%	0%	2%	8%	0%	0%	3%	3%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		37.5			37.5		39.0	33.5		39.0	33.5	
Effective Green, g (s)		37.5			37.5		39.0	33.5		39.0	33.5	
Actuated g/C Ratio		0.42			0.42		0.43	0.37		0.43	0.37	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Grp Cap (vph)		632			600		395	1139		331	1175	
v/s Ratio Prot							0.00	c0.18		c0.00	0.13	
v/s Ratio Perm		0.00			c0.04		0.01			0.01		
v/c Ratio		0.01			0.09		0.02	0.49		0.02	0.34	
Uniform Delay, d1		15.4			15.9		14.6	21.7		14.8	20.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.3		0.1	1.5		0.1	0.8	
Delay (s)		15.4			16.2		14.6	23.2		14.9	21.0	
Level of Service		B			B		B	C		B	C	
Approach Delay (s)		15.4			16.2			23.1			20.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	1	0	0	0	33
Future Vol, veh/h	35	1	0	0	0	33
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	1	0	0	0	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1	0	-	0	84	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	83	-
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	1622	-	-	-	918	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	895	1084
Mov Cap-2 Maneuver	-	-	-	-	895	-
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	940	-

Approach	EB	WB	SB
HCM Control Delay, s	7.1	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	1084
HCM Lane V/C Ratio	0.025	-	-	-	0.036
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	10	25	15	12	8	504	10	20	373	16
Future Vol, veh/h	5	0	10	25	15	12	8	504	10	20	373	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	85	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	80	80	80	77	77	77	92	92	92
Heavy Vehicles, %	0	0	14	6	20	0	0	1	0	14	3	9
Mvmt Flow	10	0	20	31	19	15	10	655	13	22	405	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	815	1146	211	929	1148	334	422	0	0	668	0	0
Stage 1	458	458	-	682	682	-	-	-	-	-	-	-
Stage 2	357	688	-	247	466	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.18	7.62	6.9	6.9	4.1	-	-	4.38	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.62	5.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.62	5.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.44	3.56	4.2	3.3	2.2	-	-	2.34	-	-
Pot Cap-1 Maneuver	273	201	759	216	172	668	1148	-	-	841	-	-
Stage 1	557	570	-	397	406	-	-	-	-	-	-	-
Stage 2	639	450	-	724	518	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	238	194	759	205	166	668	1148	-	-	841	-	-
Mov Cap-2 Maneuver	238	194	-	205	166	-	-	-	-	-	-	-
Stage 1	552	555	-	393	402	-	-	-	-	-	-	-
Stage 2	590	446	-	686	505	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	26.2	0.1	0.5
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1148	-	-	439	188	668	841	-	-
HCM Lane V/C Ratio	0.009	-	-	0.068	0.266	0.022	0.026	-	-
HCM Control Delay (s)	8.2	-	-	13.8	30.9	10.5	9.4	-	-
HCM Lane LOS	A	-	-	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1	0.1	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	2	11	1	8	5	512	1	3	350	54
Future Volume (vph)	1	0	2	11	1	8	5	512	1	3	350	54
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.91			0.95		1.00	1.00		1.00	0.98	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1536			1580		1630	3259		1630	3194	
Flt Permitted		1.00			1.00		0.48	1.00		0.42	1.00	
Satd. Flow (perm)		1561			1625		823	3259		727	3194	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	1	0	2	13	1	9	6	602	1	4	412	64
RTOR Reduction (vph)	0	3	0	0	9	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	0	0	0	14	0	6	603	0	4	470	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		1.4			1.4		47.3	46.3		47.3	46.3	
Effective Green, g (s)		1.4			1.4		47.3	46.3		47.3	46.3	
Actuated g/C Ratio		0.02			0.02		0.76	0.74		0.76	0.74	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		35			36		638	2425		567	2377	
v/s Ratio Prot							c0.00	c0.19		0.00	0.15	
v/s Ratio Perm		0.00			c0.01		0.01			0.01		
v/c Ratio		0.00			0.39		0.01	0.25		0.01	0.20	
Uniform Delay, d1		29.7			30.0		1.8	2.5		1.8	2.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			7.0		0.0	0.2		0.0	0.2	
Delay (s)		29.7			37.0		1.8	2.7		1.8	2.6	
Level of Service		C			D		A	A		A	A	
Approach Delay (s)		29.7			37.0			2.7			2.6	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	62.2	Sum of lost time (s)	13.5
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	28	0	3	47	0	0
Future Vol, veh/h	28	0	3	47	0	0
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	30	0	3	51	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	30	0	87	30
Stage 1	-	-	-	-	30	-
Stage 2	-	-	-	-	57	-
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	-	-	1583	-	914	1044
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	966	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1583	-	912	1044
Mov Cap-2 Maneuver	-	-	-	-	912	-
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	964	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1583	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	2	10	30	17	41	8	481	12	49	345	16
Future Vol, veh/h	5	2	10	30	17	41	8	481	12	49	345	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	85	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	50	50	80	80	80	77	77	77	92	92	92
Heavy Vehicles, %	0	0	14	6	20	0	0	1	0	14	3	9
Mvmt Flow	10	4	20	38	21	51	10	625	16	53	375	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	833	1151	196	949	1151	321	392	0	0	641	0	0
Stage 1	490	490	-	653	653	-	-	-	-	-	-	-
Stage 2	343	661	-	296	498	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.18	7.62	6.9	6.9	4.1	-	-	4.38	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.62	5.9	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.62	5.9	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.44	3.56	4.2	3.3	2.2	-	-	2.34	-	-
Pot Cap-1 Maneuver	265	200	776	209	172	681	1178	-	-	862	-	-
Stage 1	534	552	-	413	420	-	-	-	-	-	-	-
Stage 2	651	463	-	677	500	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	209	186	776	190	160	681	1178	-	-	862	-	-
Mov Cap-2 Maneuver	209	186	-	190	160	-	-	-	-	-	-	-
Stage 1	530	518	-	410	417	-	-	-	-	-	-	-
Stage 2	566	459	-	614	470	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.1	23.6	0.1	1.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1178	-	-	357	178	681	862	-	-
HCM Lane V/C Ratio	0.009	-	-	0.095	0.33	0.075	0.062	-	-
HCM Control Delay (s)	8.1	-	-	16.1	34.9	10.7	9.5	-	-
HCM Lane LOS	A	-	-	C	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	1.4	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	31	33	6	52	36	3
Future Vol, veh/h	31	33	6	52	36	3
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	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	41	8	65	45	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	80	0	141	60
Stage 1	-	-	-	-	60	-
Stage 2	-	-	-	-	81	-
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	-	-	1518	-	852	1005
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	942	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1518	-	848	1005
Mov Cap-2 Maneuver	-	-	-	-	848	-
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	937	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	858	-	-	1518	-
HCM Lane V/C Ratio	0.057	-	-	0.005	-
HCM Control Delay (s)	9.4	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	39	0	0	0	3	36
Future Vol, veh/h	39	0	0	0	3	36
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	0	0	0	4	42

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	25	25	46	0	-	0
Stage 1	25	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	991	1051	1562	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	991	1051	1562	-	-	-
Mov Cap-2 Maneuver	991	-	-	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1562	-	991	-	-
HCM Lane V/C Ratio	-	-	0.046	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2	2	37	3	13	5	486	30	7	323	54
Future Volume (vph)	1	2	2	37	3	13	5	486	30	7	323	54
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.97		1.00	0.99		1.00	0.98	
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1529			1637		1630	3061		1662	3158	
Flt Permitted		0.98			0.85		0.44	1.00		0.33	1.00	
Satd. Flow (perm)		1518			1437		749	3061		569	3158	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	1	2	2	44	4	15	6	572	35	8	380	64
RTOR Reduction (vph)	0	1	0	0	9	0	0	5	0	0	15	0
Lane Group Flow (vph)	0	4	0	0	54	0	6	602	0	8	429	0
Confl. Peds. (#/hr)									1	1		
Heavy Vehicles (%)	8%	0%	14%	0%	0%	0%	2%	8%	0%	0%	3%	3%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		37.5			37.5		39.0	33.5		39.0	33.5	
Effective Green, g (s)		37.5			37.5		39.0	33.5		39.0	33.5	
Actuated g/C Ratio		0.42			0.42		0.43	0.37		0.43	0.37	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Grp Cap (vph)		632			598		378	1139		313	1175	
v/s Ratio Prot							0.00	c0.20		c0.00	0.14	
v/s Ratio Perm		0.00			c0.04		0.01			0.01		
v/c Ratio		0.01			0.09		0.02	0.53		0.03	0.37	
Uniform Delay, d1		15.4			15.9		14.6	22.1		14.9	20.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.3		0.1	1.8		0.2	0.9	
Delay (s)		15.4			16.2		14.7	23.8		15.0	21.4	
Level of Service		B			B		B	C		B	C	
Approach Delay (s)		15.4			16.2			23.7			21.3	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	1	0	0	0	33
Future Vol, veh/h	35	1	0	0	0	33
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	1	0	0	0	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1	0	-	0	84	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	83	-
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	1622	-	-	-	918	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	895	1084
Mov Cap-2 Maneuver	-	-	-	-	895	-
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	940	-

Approach	EB	WB	SB
HCM Control Delay, s	7.1	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	1084
HCM Lane V/C Ratio	0.025	-	-	-	0.036
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

APPENDIX E: QUEUING OUTPUT

Florence Car Wash and Coffee Kiosk

SANDOW ENGINEERING

Intersection: 3: Hwy 101 & 6th St, Interval #1

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	L	L
Maximum Queue (ft)	37	52	27	15	19
Average Queue (ft)	19	22	14	3	6
95th Queue (ft)	44	50	36	15	23
Link Distance (ft)	531	98	98		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				85	150
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Hwy 101 & 6th St, Interval #2

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	LT	R	L	T	L
Maximum Queue (ft)	41	51	29	10	7	22
Average Queue (ft)	8	16	9	1	0	2
95th Queue (ft)	31	39	29	7	6	12
Link Distance (ft)	531	98	98		260	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				85		150
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Hwy 101 & 6th St, All Intervals

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	LT	R	L	T	L
Maximum Queue (ft)	46	57	29	18	7	28
Average Queue (ft)	11	18	10	2	0	3
95th Queue (ft)	35	42	31	9	5	15
Link Distance (ft)	531	98	98		260	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				85		150
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Hwy 101 & Rhododendron Dr, Interval #1

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	9	30	11	208	161	8	120	81
Average Queue (ft)	1	12	3	144	85	2	79	46
95th Queue (ft)	10	35	11	213	171	9	125	91
Link Distance (ft)	338	283		470	470		260	260
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160			150		
Storage Blk Time (%)				4			0	
Queuing Penalty (veh)				0			0	

Intersection: 6: Hwy 101 & Rhododendron Dr, Interval #2

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	16	32	16	226	184	12	153	114
Average Queue (ft)	1	7	2	122	54	1	79	47
95th Queue (ft)	9	28	10	190	142	8	133	102
Link Distance (ft)	338	283		470	470		260	260
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160			150		
Storage Blk Time (%)				2			0	
Queuing Penalty (veh)				0			0	

Intersection: 6: Hwy 101 & Rhododendron Dr, All Intervals

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	16	36	16	228	184	12	153	114
Average Queue (ft)	1	8	2	127	62	1	79	46
95th Queue (ft)	9	30	10	198	152	8	132	100
Link Distance (ft)	338	283		470	470		260	260
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160			150		
Storage Blk Time (%)				3			0	
Queuing Penalty (veh)				0			0	

Intersection: 9: 6th St, Interval #1

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9: 6th St, Interval #2

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9: 6th St, All Intervals

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty, Interval #1: 0
Network wide Queuing Penalty, Interval #2: 0
Network wide Queuing Penalty, All Intervals: 0

Intersection: 3: Hwy 101 & 6th St, Interval #1

Movement	EB	WB	WB	SB
Directions Served	LTR	LT	R	L
Maximum Queue (ft)	55	41	30	15
Average Queue (ft)	29	21	13	4
95th Queue (ft)	61	44	35	16
Link Distance (ft)	531	98	98	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				150
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Hwy 101 & 6th St, Interval #2

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	L	L
Maximum Queue (ft)	37	54	30	13	12
Average Queue (ft)	11	15	7	1	2
95th Queue (ft)	34	38	26	6	9
Link Distance (ft)	531	98	98		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				85	150
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Hwy 101 & 6th St, All Intervals

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	L	L
Maximum Queue (ft)	58	55	30	13	17
Average Queue (ft)	16	16	8	1	2
95th Queue (ft)	44	40	29	5	11
Link Distance (ft)	531	98	98		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				85	150
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Hwy 101 & Rhododendron Dr, Interval #1

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	4	36	4	217	174	8	152	114
Average Queue (ft)	1	10	1	147	95	1	83	57
95th Queue (ft)	7	37	5	228	197	8	151	118
Link Distance (ft)	338	283		470	470		260	260
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160			150		
Storage Blk Time (%)				5			1	
Queuing Penalty (veh)				0			0	

Intersection: 6: Hwy 101 & Rhododendron Dr, Interval #2

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	24	33	19	196	176	17	141	101
Average Queue (ft)	2	7	2	123	64	1	72	40
95th Queue (ft)	11	26	10	188	160	9	125	90
Link Distance (ft)	338	283		470	470		260	260
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160			150		
Storage Blk Time (%)				2			0	
Queuing Penalty (veh)				0			0	

Intersection: 6: Hwy 101 & Rhododendron Dr, All Intervals

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	24	38	19	220	197	17	163	118
Average Queue (ft)	1	8	1	129	71	1	75	44
95th Queue (ft)	10	29	9	200	171	9	132	99
Link Distance (ft)	338	283		470	470		260	260
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160			150		
Storage Blk Time (%)				3			0	
Queuing Penalty (veh)				0			0	

Intersection: 9: 6th St, Interval #1

Movement	WB
Directions Served	LT
Maximum Queue (ft)	6
Average Queue (ft)	1
95th Queue (ft)	9
Link Distance (ft)	289
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: 6th St, Interval #2

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 9: 6th St, All Intervals

Movement	WB
Directions Served	LT
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	4
Link Distance (ft)	289
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty, Interval #1: 0
Network wide Queuing Penalty, Interval #2: 0
Network wide Queuing Penalty, All Intervals: 0

Intersection: 1: Hwy 101 & 6th St, Interval #1

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	L	L
Maximum Queue (ft)	56	44	34	3	22
Average Queue (ft)	28	23	26	1	5
95th Queue (ft)	59	49	39	3	22
Link Distance (ft)	518	245	245		
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				85	150
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 1: Hwy 101 & 6th St, Interval #2

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	LT	R	L	T	L
Maximum Queue (ft)	36	45	30	4	3	14
Average Queue (ft)	7	17	19	0	0	3
95th Queue (ft)	28	39	39	2	3	11
Link Distance (ft)	518	245	245		247	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				85		150
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 1: Hwy 101 & 6th St, All Intervals

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	LT	R	L	T	L
Maximum Queue (ft)	56	49	35	5	3	26
Average Queue (ft)	12	18	21	0	0	3
95th Queue (ft)	40	42	40	3	2	14
Link Distance (ft)	518	245	245		247	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				85		150
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: 6th St, Interval #1

Movement	NB
Directions Served	LR
Maximum Queue (ft)	23
Average Queue (ft)	15
95th Queue (ft)	27
Link Distance (ft)	46
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: 6th St, Interval #2

Movement	NB
Directions Served	LR
Maximum Queue (ft)	25
Average Queue (ft)	13
95th Queue (ft)	27
Link Distance (ft)	46
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: 6th St, All Intervals

Movement	NB
Directions Served	LR
Maximum Queue (ft)	29
Average Queue (ft)	13
95th Queue (ft)	27
Link Distance (ft)	46
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: , Interval #1

Movement	EB
Directions Served	LR
Maximum Queue (ft)	35
Average Queue (ft)	24
95th Queue (ft)	42
Link Distance (ft)	120
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: , Interval #2

Movement	EB
Directions Served	LR
Maximum Queue (ft)	47
Average Queue (ft)	22
95th Queue (ft)	44
Link Distance (ft)	120
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: , All Intervals

Movement	EB
Directions Served	LR
Maximum Queue (ft)	47
Average Queue (ft)	22
95th Queue (ft)	44
Link Distance (ft)	120
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Hwy 101 & Rhododendron Dr, Interval #1

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	20	50	7	241	196	10	87	82
Average Queue (ft)	7	26	2	154	103	2	50	39
95th Queue (ft)	28	55	8	238	203	10	89	86
Link Distance (ft)	332	157		652	652	247	247	247
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160					
Storage Blk Time (%)				7				
Queuing Penalty (veh)				0				

Intersection: 6: Hwy 101 & Rhododendron Dr, Interval #2

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	28	45	10	202	168	12	109	102
Average Queue (ft)	3	14	1	105	57	1	49	34
95th Queue (ft)	17	38	7	179	144	7	90	83
Link Distance (ft)	332	157		652	652	247	247	247
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160					
Storage Blk Time (%)				1				
Queuing Penalty (veh)				0				

Intersection: 6: Hwy 101 & Rhododendron Dr, All Intervals

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	33	55	13	241	204	15	109	104
Average Queue (ft)	4	17	1	117	68	1	49	35
95th Queue (ft)	20	44	7	201	164	8	90	84
Link Distance (ft)	332	157		652	652	247	247	247
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160					
Storage Blk Time (%)				3				
Queuing Penalty (veh)				0				

Intersection: 13: Rhododendron Dr, Interval #1

Movement	SB
Directions Served	LR
Maximum Queue (ft)	37
Average Queue (ft)	22
95th Queue (ft)	45
Link Distance (ft)	130
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 13: Rhododendron Dr, Interval #2

Movement	SB
Directions Served	LR
Maximum Queue (ft)	44
Average Queue (ft)	18
95th Queue (ft)	42
Link Distance (ft)	130
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 13: Rhododendron Dr, All Intervals

Movement	SB
Directions Served	LR
Maximum Queue (ft)	49
Average Queue (ft)	19
95th Queue (ft)	43
Link Distance (ft)	130
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty, Interval #1: 0
Network wide Queuing Penalty, Interval #2: 0
Network wide Queuing Penalty, All Intervals: 0

Intersection: 3: Hwy 101 & 6th St, Interval #1

Movement	EB	WB	WB	NB	SB
Directions Served	LTR	LT	R	L	L
Maximum Queue (ft)	53	54	29	9	15
Average Queue (ft)	22	29	13	1	4
95th Queue (ft)	57	61	35	6	14
Link Distance (ft)	531	98	98		
Upstream Blk Time (%)		0			
Queuing Penalty (veh)		0			
Storage Bay Dist (ft)				85	150
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Hwy 101 & 6th St, Interval #2

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	L	L	T
Maximum Queue (ft)	33	51	34	16	27	0
Average Queue (ft)	8	17	9	2	3	0
95th Queue (ft)	28	40	30	9	15	0
Link Distance (ft)	531	98	98			318
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				85	150	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: Hwy 101 & 6th St, All Intervals

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	L	L	T
Maximum Queue (ft)	55	57	34	16	30	0
Average Queue (ft)	11	20	10	1	3	0
95th Queue (ft)	38	47	32	9	15	0
Link Distance (ft)	531	98	98			318
Upstream Blk Time (%)		0				
Queuing Penalty (veh)		0				
Storage Bay Dist (ft)				85	150	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Hwy 101 & Rhododendron Dr, Interval #1

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	5	26	7	208	174	2	136	114
Average Queue (ft)	1	10	1	144	91	0	84	61
95th Queue (ft)	11	33	7	221	190	4	132	125
Link Distance (ft)	338	283		470	470		260	260
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160			150		
Storage Blk Time (%)				5			0	
Queuing Penalty (veh)				0			0	

Intersection: 6: Hwy 101 & Rhododendron Dr, Interval #2

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	20	40	21	218	170	12	137	110
Average Queue (ft)	1	10	2	135	68	1	77	45
95th Queue (ft)	10	33	13	201	162	7	125	101
Link Distance (ft)	338	283		470	470		260	260
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160			150		
Storage Blk Time (%)				3			0	
Queuing Penalty (veh)				0			0	

Intersection: 6: Hwy 101 & Rhododendron Dr, All Intervals

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	20	42	21	241	181	12	149	124
Average Queue (ft)	1	10	2	137	74	1	79	49
95th Queue (ft)	10	33	11	207	170	6	127	108
Link Distance (ft)	338	283		470	470		260	260
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160			150		
Storage Blk Time (%)				4			0	
Queuing Penalty (veh)				0			0	

Intersection: 9: 6th St, Interval #1

Movement	
Directions Served	
Maximum Queue (ft)	
Average Queue (ft)	
95th Queue (ft)	
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: 6th St, Interval #2

Movement	WB
Directions Served	LT
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	5
Link Distance (ft)	289
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: 6th St, All Intervals

Movement	WB
Directions Served	LT
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	4
Link Distance (ft)	289
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty, Interval #1: 0
Network wide Queuing Penalty, Interval #2: 0
Network wide Queuing Penalty, All Intervals: 0

Intersection: 1: Hwy 101 & 6th St, Interval #1

Movement	EB	WB	WB	NB	NB	SB
Directions Served	LTR	LT	R	L	T	L
Maximum Queue (ft)	52	60	38	1	2	21
Average Queue (ft)	29	27	25	0	0	6
95th Queue (ft)	56	62	42	2	3	25
Link Distance (ft)	518	245	245		247	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				85		150
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 1: Hwy 101 & 6th St, Interval #2

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	LT	R	L	L	TR
Maximum Queue (ft)	40	61	38	4	53	4
Average Queue (ft)	12	21	21	0	7	0
95th Queue (ft)	35	50	42	3	30	4
Link Distance (ft)	518	245	245			318
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				85	150	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 1: Hwy 101 & 6th St, All Intervals

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	L	TR
Maximum Queue (ft)	56	67	42	5	2	53	4
Average Queue (ft)	16	22	22	0	0	7	0
95th Queue (ft)	43	53	43	3	1	29	3
Link Distance (ft)	518	245	245		247		318
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)				85		150	
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: 6th St, Interval #1

Movement	NB
Directions Served	LR
Maximum Queue (ft)	28
Average Queue (ft)	16
95th Queue (ft)	31
Link Distance (ft)	46
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: 6th St, Interval #2

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	10	6	35
Average Queue (ft)	0	0	14
95th Queue (ft)	8	5	29
Link Distance (ft)	245	295	46
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: 6th St, All Intervals

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	10	6	36
Average Queue (ft)	0	0	15
95th Queue (ft)	7	4	30
Link Distance (ft)	245	295	46
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: , Interval #1

Movement	EB
Directions Served	LR
Maximum Queue (ft)	36
Average Queue (ft)	22
95th Queue (ft)	43
Link Distance (ft)	120
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: , Interval #2

Movement	EB
Directions Served	LR
Maximum Queue (ft)	53
Average Queue (ft)	24
95th Queue (ft)	47
Link Distance (ft)	120
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: , All Intervals

Movement	EB
Directions Served	LR
Maximum Queue (ft)	53
Average Queue (ft)	24
95th Queue (ft)	46
Link Distance (ft)	120
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Hwy 101 & Rhododendron Dr, Interval #1

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	34	61	4	212	161	12	92	108
Average Queue (ft)	11	35	1	149	107	2	55	52
95th Queue (ft)	35	66	5	223	190	13	94	103
Link Distance (ft)	332	157		652	652	247	247	247
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160					
Storage Blk Time (%)				6				
Queuing Penalty (veh)				0				

Intersection: 6: Hwy 101 & Rhododendron Dr, Interval #2

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	28	42	8	223	187	17	118	116
Average Queue (ft)	4	12	1	123	70	2	54	39
95th Queue (ft)	18	38	5	204	164	10	108	92
Link Distance (ft)	332	157		652	652	247	247	247
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160					
Storage Blk Time (%)				2				
Queuing Penalty (veh)				0				

Intersection: 6: Hwy 101 & Rhododendron Dr, All Intervals

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	36	61	9	239	193	24	123	122
Average Queue (ft)	5	18	1	130	79	2	54	42
95th Queue (ft)	24	49	5	210	174	11	105	96
Link Distance (ft)	332	157		652	652	247	247	247
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			160					
Storage Blk Time (%)				3				
Queuing Penalty (veh)				0				

Intersection: 13: Rhododendron Dr, Interval #1

Movement	SB
Directions Served	LR
Maximum Queue (ft)	43
Average Queue (ft)	24
95th Queue (ft)	46
Link Distance (ft)	130
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 13: Rhododendron Dr, Interval #2

Movement	SB
Directions Served	LR
Maximum Queue (ft)	51
Average Queue (ft)	18
95th Queue (ft)	44
Link Distance (ft)	130
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 13: Rhododendron Dr, All Intervals

Movement	SB
Directions Served	LR
Maximum Queue (ft)	52
Average Queue (ft)	19
95th Queue (ft)	45
Link Distance (ft)	130
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty, Interval #1: 0
Network wide Queuing Penalty, Interval #2: 0
Network wide Queuing Penalty, All Intervals: 0

APPENDIX F: DRIVE THROUGH QUEUING ANALYSIS

Florence Car Wash and Coffee Kiosk

SANDOW ENGINEERING

AM Queuing Analysis Human Bean Florence Oregon

	Inputs	
T	Analysis Period (h)	1
v	Arrival Volume (VPH)	62
c	Hourly Throughput (VPH)	86
n	Number of Toll Service Lanes	1

Traffic Volume		
Entering	89	
% Drive through	70%	
Total In	62	
Time per vehcle	42	seconds
# of vehicles /Hour	86	

Traffic Intensity *p* 0.73

M/D/1 Constant Service Time

Average Q	1	
Time in system	0.9	minutes

Percent Time full

Arrival	62	veh/hour
Departure	86	veh/hour
Storage Length	135	feet
Length of vehicle	16.5	feet
# vehicles stored	8.2	vehicles

% Time Full			
p	0.73		
% time at full	2.12%	1.27	Minutes
95th %	11		
% time at 95%	0.84%	0.50	Minutes
Max	13		
% time at Max	0.44%	0.26	Minutes
Average	6		
% time at Average	4.51%	2.71	Minutes

Vewhicles	Time at Vehicle					
6	4.51%	2.71	Minutes			
7	3.17%	1.90	Minutes			
8	2.26%	1.35	Minutes			
9	1.61%	0.97	Minutes			
10	1.16%	0.70	Minutes			
11	0.84%	0.50	Minutes			
12	0.60%	0.36	Minutes	% time full		
13	0.44%	0.26	Minutes	8%	4.81	minutes

PM Peak Hour Queuing — Human Bean Florence Oregon

	Inputs	
T	Analysis Period (h)	1
v	Arrival Volume (VPH)	62
c	Hourly Throughput (VPH)	86
n	Number of Toll Service Lanes	1

Traffic Volume

Entering	89	
% Drive through	70%	
Total In	62	
Time per vehcle	42	seconds
# of vehicles /Hour	86	

Traffic Intensity	*p*	0.73	
Average Q	Q	3	
Probability of Q	P(Q)	0.116879	0.8831206
Average Q Time		2.562538	Minutes/vehicle

95Th Percentile Queue

# Vehicles		
0	0.273167	0.273
1	0.198547	0.472
2	0.14431	0.616
3	0.10489	0.721
4	0.076237	0.797
5	0.055412	0.853
6	0.040275	0.893
7	0.029273	0.922
8	0.021277	0.943

M/D/1 Constant Service Time

Average Q	1	
Time in system	0.9	minutes

M/G/1

ρ	0.73	
λ	89	
σ	20.3	0.0056389
Θ	1	
Time	1.0	minutes

Percent Time full

Arrival	62	veh/hour
Departure	86	veh/hour
Storage Length	135	feet
Length of vehicle	16	feet
# vehicles stored	8.4	vehicles

% Time Full

p	0.73		
% of time full	1.95%	1.17	Minutes
95th %	3		
% time at 95%	14.55%	8.73	Minutes
Max	7		
% time at Max	3.17%	1.90	Minutes
Average	1		
% time at Average	42.09%	25.25	Minutes

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