

TRAFFIC IMPACT STUDY

FOR

MEADOW CREEK APARTMENTS (Phase 2)

PREPARED BY

INNOVATIVE TRAFFIC CONSULTING

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INTRODUCTION

Project Description.

Meadow Creek apartments (Phase 2) development is proposing to develop 74 mid-rise apartments (ITE LUC 221) on 5.49 acres located at 1306 North Springbrook Road, Newberg, Oregon. The development will consist of 74 (2 bedroom) units. Three of the buildings will be 3 stories tall plus a daylight basement. One building will be 3 stories tall with no daylight basement. The site is currently vacant. The development will access the roadway network through the south approach of Coffey lane at the intersection of Aquarius Blvd. and Coffey Lane.

The site is located at the southeast quadrant of the intersection of N Springbrook Road and Aquarius Road. Figure 1 illustrates the vicinity map of the site while figure 2 illustrates the site plan for the development.

EXECUTIVE SUMMARY

The traffic study has evaluated the impact of the proposed 74-unit apartment complex on the roadway network surrounding the development. The proposed development is anticipated to be built out by 2021. The development is estimated to generate 403 trips on an average day. The development is also estimated to generate 27 trips during the AM peak and 33 trips during the PM peak hour of adjacent street traffic.

Traffic analysis indicates that the intersection of Springbrook Road and Haworth Avenue is already failing the City of Newberg mobility standard under 2021 conditions without the proposed development. The intersection of Springwood Road and Haworth Avenue currently meet traffic signal warrant with or without the approved developments and/or the proposed development. Appendix B of this report contains the traffic signal warrant analysis for the intersection of Springbrook Road and Haworth Avenue under existing conditions. The remaining study intersections of Crestview Drive, Vittoria Way and Aquarius Blvd at N Springbrook Road and Coffey Lane at Aquarius Blvd. will operate satisfactorily at the buildout of the proposed development.

SCOPE AND ANALYSIS METHODOLOGY

This analysis determines the traffic impact of the proposed development on the surrounding roadway network and was prepared in accordance with the City of Newberg's requirements for traffic impact analysis. The study intersections and the scope of this traffic study is based on communication and direction of City staff.

Study intersections

This report includes operational analysis and traffic safety review for the following intersections.

1. N Springbrook Rd/E Crestview Dr
2. N Springbrook Rd/Vittoria Way
3. N Springbrook Rd/Aquarius Blvd
4. N Springbrook Rd/Haworth Ave
5. N Springbrook Rd/Portland Rd (OR99W)
6. Aquarius Blvd/Coffey Ln

The study has analyzed and documented the following scenarios

- Year 2019 existing conditions analysis, including Highway Capacity Manual (HCM), volume-to-capacity ratio, control delay, and 95th-percentile queuing analysis during the weekday AM and PM peak hours;
- A review of reported crash data from ODOT at the study intersections for the most recent five-year period available;
- Build-out Year 2021 background conditions (includes in-process traffic and regional growth but without the development trips), including HCM v/c ratio, control delay, and 95th percentile queuing analysis at the weekday AM and PM peak hours;
- Build-out Year 2021 total conditions analysis, including HCM v/c ratio, control delay, and 95th-percentile queuing analysis during the weekday AM and PM peak hours.
- Left turn lane warrant analysis and intersection sight distance at the development's access at Coffey Lane.

Analysis Methodology and Applicable Standards

All Level of Service analyses described in this report were performed in accordance with the procedures stated in the HCM. Because the intersections of E Crestview Drive, Vittoria Way, Aquarius Blvd at N Springbrook Road, and Coffey Lane at Aquarius Blvd. are currently operating and level-of-service B or better and are projected to continue operating at the same level-of-service at the buildout of the site, Sim-traffic analysis was not performed for these intersections. Also, the projected impact of the proposed development at the State intersection of Springbrook Road and OR-99W is approximately half percent of the current total entering vehicle. As such queuing analysis was also not performed for this intersection. Additionally, significant analysis and improvements have been and are being made along with the bypass project*. The operations and queuing analyses presented in this report were completed using Synchro 10 and Sim-Traffic 10 software.

*Source: Meadow Creek Apartment (Phase 1) traffic study.

The study intersections of N Springbrook Road-(OR99W) is subject to ODOT v/c ratio mobility targets, defined by the 1999 Oregon Highway Plan, Policy 1F. The study intersections along OR 99W are within the Newberg urban growth boundary, on a Statewide Highway, on a freight route, outside a Metropolitan Planning Organization, outside a Special Transportation Area, and not on a freeway. Thus, the mobility target (v/c ratio) for N Springbrook Rd/Portland Rd (OR99W) based on a posted speed of 35 MPH is 0.85.

EXISTING CONDITIONS

The proposed development is situated at the southeast quadrant of N. Springbrook Road and Aquarius Blvd. The site is currently vacant. N. Springbrook Road in the vicinity of the property is three lane (with center turn lane) 36 feet wide road with a classification of Minor Arterial. The frontage is fully improved with curb gutter and sidewalk. Aquarius Blvd. is a 34 feet collector street with a posted speed of 25 MPH. Aquarius Blvd is fully improved residential street with curb gutter and sidewalk. Parking is allowed on both sides of the street. The development will take its access to Aquarius Blvd. via the existing short dead-end stub of Coffey Lane. The north approach of Coffey Lane is a 34 feet wide local access residential street with parking allowed on both sides. The land use in the immediate adjoining vicinity and to the north is residential, while a few hundred feet to the south of the site is community commercial. Except for the subject development, the remaining area is mostly built out.

Transportation facilities

Existing lane configurations and traffic control devices at the study intersections are displayed in Figure 3. Table 1 summarizes the existing transportation facilities and roadways in the study area.

Table 1: Existing transportation facilities and roadways in the study area

Roadway	Functional Classification ¹	Number of Lanes	Posted Speed	Sidewalks	Bicycle Lanes	On-Street Parking
OR 99W	Major Arterial	5	35 mph	Both sides	Yes	No
Springbrook Road	Minor Arterial	3	35 mph**	Both Sides	South of Haworth Avenue	No
Crestview Drive	Major Collector	2	25 mph	Intermittent	No	No
Vittoria Way	Minor Collector	2	25 mph	Both Sides	No	Yes
Aquarius Blvd.	Local Access	2	25 mph	Both Sides	No	Yes
Coffey Lane	Local Access	2	25 mph	Both Sides	No	Yes
Haworth Avenue	Major Collector	2	25 mph	Both Sides	No	Yes

¹City of Newberg Transportation System Plan

**South of Aquarius to OR 99 WW, Springbrook Road is 25 MPH.

Pedestrian and Bicycle Facilities

The roadway corridors in the immediate vicinity of the proposed development are fully improved with sidewalks. The improvements provide complete walking route to commercial and retail centers to the south. In accordance with the roadway functional classification there are no dedicated bike

lanes in the immediate vicinity of the development except on N. Springbrook Road south of Haworth Avenue.

Transit Facilities.

N. Springbrook Road is currently not served by transit facility. However, transit service for route #7 and #44 is available along OR 99W approximately 0.4 miles from the proposed development.

TRAFFIC VOLUME AND PEAK HOUR OPERATIONS

Turning data including turning movement counts and corridor volumes were collected in October 2019. All counts used in the analysis were conducted on a typical midweek day AM and PM peak. Appendix "A" contains traffic count worksheet used in this analysis. Synchro software (HCM) was utilized to evaluate the intersection volume to capacity ratios, delays and intersection level-of-service. With permission from the City, the 2017 traffic data for the intersection of Springbrook Road and Crestview Drive was inflated by a conservative six percent to project 2019 traffic data.

Queuing

The *SimTraffic* queuing analysis (provided in later section of this report)

Level of Service Analysis

Tables 2 a and b displays the existing levels of service at each of the study intersections during weekday AM and PM peak hours. The City has adopted a Level-of-service D and v/c ratio of 0.90 as its mobility standard in the City. As shown in the table below, each of the study intersections currently meets the ODOT and City mobility standards with the following exception.

The intersection of Springbrook Road and Haworth Avenue currently operates at a level-of-service E and volume to capacity ratio of 1 which exceeds the City mobility standard of Level-of-service D and v/c ratio of 0.90. the intersection also currently meets the traffic signal warrant volumes.

TABLE 2 a

	Intersection name	Control Type	Worst Mvmt	V/C	Delay (Sec/Veh.)	LOS
1	Springbrook at OR 99	Signal	EBL	0.75	42.6	D
2	Springbrook at Haworth	All-way stop	SBT	1.0	36.8	E
3	Springbrook at Aquarius	TWSC	EB		12.0	B
4	Springbrook at Vittoria	TWSC	WB		12.4	B
5	Springbrook at Crestview	Roundabout	EB		7.4	A
6	Aquarius at Coffey Lane	TWSC	SB		8.4	A

AM Peak Hour- Existing conditions

Table 2 b

	Intersection name	Control Type	Worst Mvmt	V/C	Delay (Sec/Veh.)	LOS
1	Springbrook at OR 99	Signal	EBL	0.78	49.1	D
2	Springbrook at Haworth	All-way stop	SBT	0.98	44.5	E
3	Springbrook at Aquarius	TWSC	EB		13.8	B
4	Springbrook at Vittoria	TWSC	WB		12.3	B
5	Springbrook at Crestview	Roundabout	NB		6.6	A
6	Aquarius at Coffey Lane	TWSC	SB		9.1	A

PM Peak Hour- Existing conditions

TRAFFIC SAFETY

ODOT reported crash data was reviewed for the most recent five-year period, from January 1, 2014 to December 31, 2018. Table 3 summarizes the reported crash data at the study intersections. The raw crash data for the intersection crash history is included in appendix "C".

Table 3: ODOT-Reported Crash Data (January 1, 2014 to December 31, 2018)

Intersection	Crash Severity			Crash Type						Crash Rate ²
	Fatal	Injury	PDO ¹	Rear End	Turning	Sideswipe	Angle	Other	Total	
OR 9W/ Springbrook Rd.	0	25	21	26	6	0	2	18	46	.77
Springbrook Rd/Haworth Ave.	0	10	10	0	11	0	8	2	20	1.0
Springbrook Rd / Aquarius Blvd.	0	0	0	0	0	0	0	0	0	0
Springbrook Rd / Vittoria Way	0	0	0	0	0	0	0	0	0	0
Springbrook Rd / Crestview Drive	1	0	1	1	0	0	0	1	2	.10
Aquarius Blvd./ Coffey Lane	0	0	0	0	0	0	0	0	0	0

TRAFFIC IMPACT ANALYSIS

The traffic impact analysis has evaluated the traffic operational conditions at the buildout of the proposed site in 2021. The traffic impact to the surrounding roadway network at the completion of the proposed development was assessed as follows:

- The Crestview crossing, Oregon Clinic and Meadow Creek Apartments (Phase 1) development were identified as the in-process development by the City of Newberg and added to the

background traffic volume. Of those Oregon Clinic trips did not have any impact on the intersections being evaluated by this development. The site generated trip details of the above

stated developments, impacting the study intersections, are included in the appendix D of this report.

- Consistent with the assumption of Meadow Creek Apartments (Phase 1), Year 2021 background traffic volumes at the study intersections were developed by applying a one-percent annual growth rate to the existing mainline volumes along Springbrook Road and OR 99W. In process trips were then added the background traffic volume to obtain traffic volumes without the site traffic.
- Site trip distribution is consistent with the assumption of Meadow Creek Apartments (Phase 1). The trip distribution at the intersection of Springwood Road and OR-99W was based upon the existing turning movement volume distribution at the intersection.
- Year 2021 total traffic volumes at the study intersections were developed by adding the site-generated trips to the 2021 background traffic volumes.

YEAR 2021 BACKGROUND TRAFFIC CONDITIONS

The year 2021 background traffic analysis evaluates the traffic operations condition at the study intersections with general traffic growth and trips from approved developments superimposed on the existing volumes. This will identify the operational condition of the study intersections at the buildout year of the proposed site but without the site trips.

Approved Developments

The City of Newberg identified Crestview Crossing development, Oregon Clinic and Meadow Creek Apartments (Phase 1) within the influence area of the site. The development of in-process trips from the approved developments are summarized in a spread sheet in appendix "D". The in-process trips contain trips from Meadow Creek apartment phase 1 and the Crestview development.

Background Growth

To account for general area growth, a one-percent annual growth rate was applied to the existing mainline volumes along OR 99W and intersections along Springbrook Road corridor.

Figure 6 displays the 2021 general growth and net background traffic volumes at the study intersections during the weekday AM and PM peak hours, which include general area growth and in-process trips identified previously.

Level of Service Analysis

Tables 4 a and b also shows the corresponding level of service analysis for background conditions. Each of the study intersections is expected to continue meeting ODOT and City mobility standards, with the following exception:

The weekday AM and PM peak hour level-of-service at the intersection of Springbrook Road and Haworth Avenue are forecast to be E and E respectively. It also operates at v/c of 1.05 and 0.98 during the AM and PM peak hours. The level-of-service and v/c for background condition both exceed the City of Newberg mobility standard of level-of-service D and v/c of 0.90.

The delay and level-of-service for two-way stop control intersections, in the table below, was based on the worst movement (typically the stop-controlled approach). The worksheets for the operational analysis for background conditions is included in appendix "B"

TABLE 4 a

	Intersection name	Control Type	Worst Mvmt	V/C	Delay (Sec/Veh.)	LOS
1	Springbrook at OR 99	Signal	SBL	0.79	43.2	D
2	Springbrook at Haworth	All-way stop	SBT	1.05	43.6	E
3	Springbrook at Aquarius	TWSC	EB		14.8	B
4	Springbrook at Vittoria	TWSC	WB		12.6	B
5	Springbrook at Crestview	Roundabout	SB		8.1	A

AM Peak Hour- Background conditions

Table 4 b

	Intersection name	Control Type	Worst Mvmt	V/C	Delay (Sec/Veh.)	LOS
1	Springbrook at OR 99	Signal	EBL	0.85	52.3	D
2	Springbrook at Haworth	All-way stop	SBT	1.02	50.8	F
3	Springbrook at Aquarius	TWSC	EB		14.0	B
4	Springbrook at Vittoria	TWSC	WB		12.5	B
5	Springbrook at Crestview	Roundabout	NB		6.6	A

PM Peak Hour- Background conditions

PROPOSED DEVELOPMENT PLAN

Per the site plan displayed in Figure 2, the Meadowcreek development includes 74 apartment units. Full-build out and occupancy of this phase of the development included in this report is expected to occur in 2021.

Trip Generation

The projected weekday daily, AM, and PM peak-hour vehicle trip ends for the proposed development were based on the Institute of Transportation Engineer's *Trip Generation Manual*, 10th Edition. Table 5 summarizes the anticipated number of trips that will be generated by the proposed Meadowcreek development.

Table 5: Proposed Trip Generation

Land Use	ITE Code	Size		Weekday Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
					Total	In	Out	Total	In	Out
Mid Rise Apartments	221	74	units	403	27	7	20	33	20	13

As shown in Table 5, the proposed development is expected to generate approximately 403 weekday daily trips, of which 27 (7 in, 20 out) will occur during the AM peak hour and 33 (20 in, 13 out) will occur during the PM peak hour.

Site Trip Distribution/Trip Assignment

Consistent with the assumption of Meadow Creek Apartments- Phase 1, this study will assume that 20% of the traffic from the apartments will travel north on Springbrook Rd, 5% will travel east on Aquarius Blvd, 55% will travel on south on Springbrook Rd and 20% will travel west on Haworth Ave. existing trip distributions at the study intersections.

The estimated site-generated trips to the remaining intersections in the network were assigned to the network based on trip distribution at the respective study intersections. Figure 6 illustrates the trip distribution and the site-generated trips that are expected to use the roadway system during the weekday AM and PM peak hours.

YEAR 2021 TOTAL TRAFFIC CONDITIONS

The year 2021 total traffic condition analysis evaluates the traffic operations condition at the study intersections with site trips superimposed on 2021 background traffic. This will identify the operational condition of the study intersections at the buildout year of the proposed site with the site trips.

Level of Service Analysis

The weekday AM and PM peak hour turning-movement volumes for total traffic conditions shown in Figure 7 were used to conduct an operational analysis at each study intersection to determine the year 2021 total traffic levels of service. The results of the total traffic analysis shown in Tables 6 a and b indicate that all the study intersections and site access points are forecast to meet ODOT and City mobility standards under 2021 total traffic conditions during the weekday AM and PM peak hours, with the following exceptions

- At built-out of the proposed site, the Springbrook Rd/OR 99W intersection is forecast to operate with a v/c ratio of 0.86 during the weekday PM peak hour, which exceeds the ODOT

mobility standard of 0.85. The intersection v/c ratio under background traffic conditions is 0.85. The v/c ratio at built-out exceeds the ODOT mobility standard of 0.85, but per ODOT policy, the v/c ratios do not reflect a significant impact because they are not more than 0.03 above the respective v/c ratios under 2021 background conditions. The weekday AM and PM peak hour level of service of this intersection meets the City standard of LOS D.

- At build-out of the proposed site, the weekday AM and PM peak hour v/c ratios at the Springbrook Road and Haworth Road are forecast to be 1.08 and 1.05, respectively. This exceeds the City of Newberg mobility standard of 0.90.

The worksheets for the operational analysis for total conditions is included in appendix “B”

TABLE 6 a

	Intersection name	Control Type	Worst Mvmt	V/C	Delay (Sec/Veh.)	LOS
1	Springbrook at OR 99	Signal	SBL	0.79	43.4	D
2	Springbrook at Haworth	All-way stop	SBT	1.08	47.5	E
3	Springbrook at Aquarius	TWSC	EB		12.8	B
4	Springbrook at Vittoria	TWSC	WB		12.6	B
5	Springbrook at Crestview	Roundabout	SB		8.2	A
6	Aquarius at Coffey Lane	TWSC	NB		8.8	A

AM Peak Hour- Built out conditions

Table 6 b

	Intersection name	Control Type	Worst Mvmt	V/C	Delay (Sec/Veh.)	LOS
1	Springbrook at OR 99	Signal	EBL	0.86	53.3	D
2	Springbrook at Haworth	All-way stop	SBT	1.05	53.8	F
3	Springbrook at Aquarius	TWSC	EB		14.9	B
4	Springbrook at Vittoria	TWSC	WB		12.5	B
5	Springbrook at Crestview	Roundabout	NB		7.3	A
6	Aquarius at Coffey Lane	TWSC	NB		9.3	A

PM Peak Hour- Built out conditions

95TH-PERCENTILE QUEUING ANALYSIS

95th percentile queues at the intersection of Springbrook Road and Haworth Avenue were reviewed to assess whether adequate storage would be provided at turn lanes. Sim-Traffic was used to estimate the 95th percentile queues (reflecting an average of ten simulation runs), Synchro was used to estimate 95th percentile queues elsewhere. Tables 7 and 8 lists the estimated 95th-percentile

queue for each movement at the study intersections under existing, 2021 background, and 2021 total traffic conditions. Reported queues are rounded up to the nearest vehicle length (approximately 25 feet).

The intersection of Springbrook Road and Hayworth Avenue experience long queues, specifically in the southbound direction.

Table 7

Intersection	95 th Percentile Queue Length (Feet)						
	Eastbound		Westbound	Northbound		Southbound	
	Lt-T	R	LTR	Lt	TR	Lt	TR
Existing Condition	50	75	50	50	75	50	175
Background Condition	50	75	50	50	75	50	175
Total Condition	50	75	50	50	100	50	175

Queue length for AM Peak

Table 8

Intersection	95 th Percentile Queue Length (Feet)						
	Eastbound		Westbound	Northbound		Southbound	
	Lt-T	R	LTR	Lt	TR	Lt	TR
Existing Condition	100	100	175	125	250	175	500
Background Condition	100	100	175	125	325	200	625
Total Condition	100	100	150	125	300	220	600

Queue length for PM Peak

ACCESS SIGHT DISTANCE AND TURN LANE EVALUATION.

The posted speed limit along residential street of Aquarius Blvd. is 25 MPH. Coffey Lane is stop controlled at Aquarius Blvd. The required sight distance looking east and west along Aquarius Blvd with driver’s eyes positioned 15 feet back of the Aquarius Blvd.’s travel lane is required to be 240 feet and 280 feet respectively. The driver eye was at 3.5 feet above the pavement and the object height was 3.5 feet above the pavement. Field measurement of the sight distance at the site access (south access of Coffey lane at Aquarius Blvd.) indicate that

- a) The sight distance looking east from 15 feet back of the Aquarius Road has a filtered sight distance exceeding 350 feet. The filtered sight distance is due to landscaping installed in the planter strip between the sidewalk and the face of the curb.
- b) The sight distance looking west from 15 feet back of the Aquarius Road has a filtered sight distance exceeding 350 feet. The filtered sight distance is due to landscaping installed in the planter strip between the sidewalk and the face of the curb.
- c) The intersection of Aquarius Blvd. at Coffey lane does not warrant a left turn lane at the build out of the proposed development.

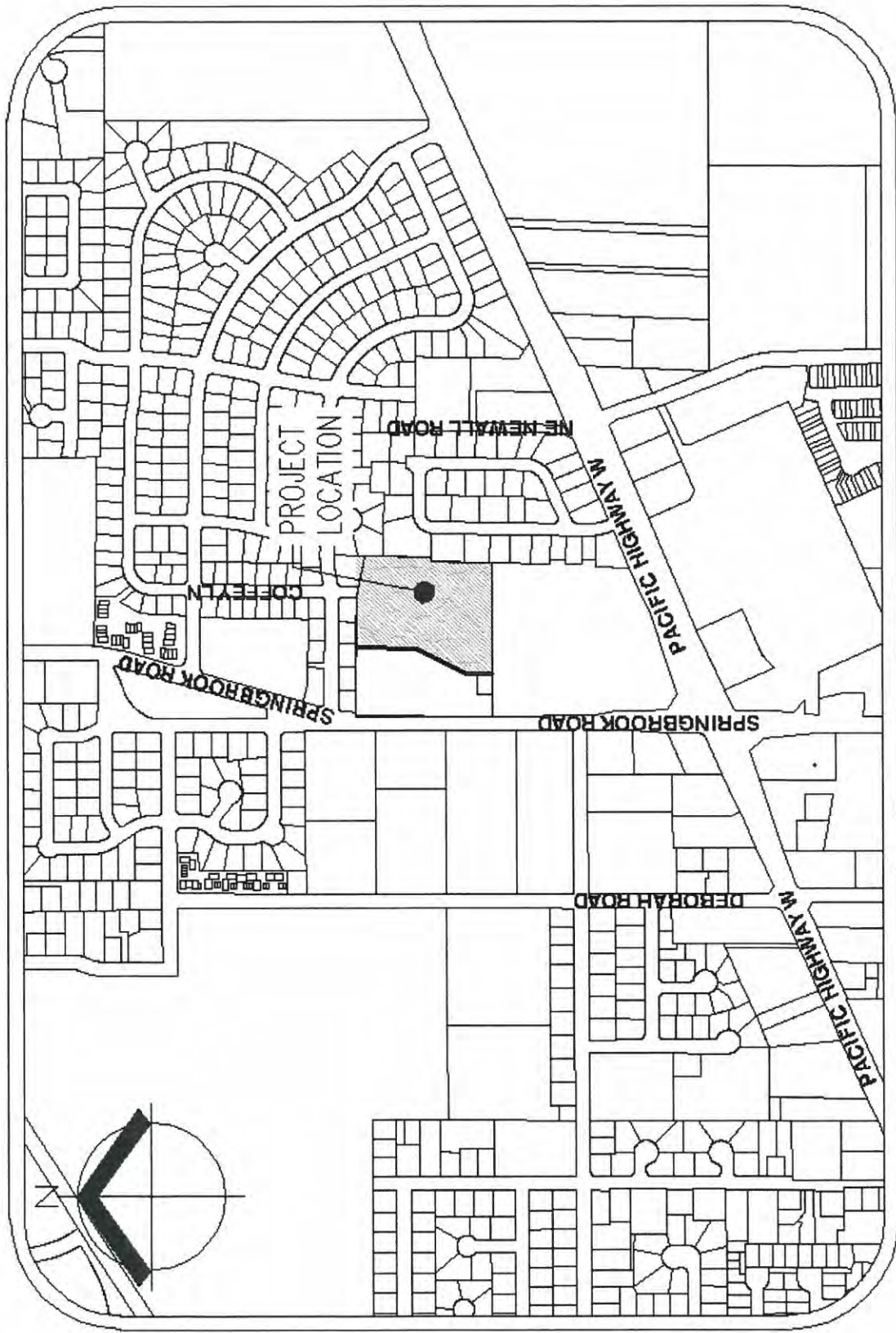
The sight distance photographs and the left turn lane warrant evaluation is included in Appendix E of this report.

CONCLUSIONS AND RECOMMENDATIONS

- The results of the traffic impact analysis indicate that the proposed Meadow Creek Apartment development will have negligible traffic impact at buildout. The findings of this analysis and our recommendations are discussed below.
- Under background condition, the Springbrook Road/OR 99W intersection is forecast to experiences a volume-to-capacity ratio (v/c) of 0.85 during the weekday PM peak hour. At build-out of the proposed development, the intersection is forecast to operate at level-of-service D and v/c of 0.86 during the weekday PM peak hour, which exceeds the which exceeds the ODOT mobility standard of 0.85. Per ODOT policy guidance, when an intersection exceeds mobility target, but the v/c ratio increases by less than 0.03 as a result of development, the impacts are not considered significant.
- The all-way stop control Springbrook Road and Haworth Avenue currently experience a v/c of 1 which exceeds the City standard of v/c of 0.90. The intersection currently meets traffic signal warrants and currently experiences long queues, specifically for the southbound through movement. The proposed development will impact the intersection by less than two percent of the existing trips. The intersection will continue to have same traffic operational parameters at build-out of the proposed site with or without the proposed development. The city should continue to monitor the intersection and begin planning improvements to the intersection.
- All other intersections meet the City's mobility target during the weekday AM and PM hours.
- A review of crash data did not indicate any crash pattern that require mitigation, associated with this project, for the study intersections. One fatal crash was reported at the

Springbrook Road/Crestview Drive roundabout—this crash occurred when a southbound motorcyclist struck a curb and was thrown from the vehicle.

- The City should work with the residents along Aquarius Avenue to maintain/trim landscaping in the public right-of-way planter strip to allow for unobstructed line of sight from the south approach of Coffey Lane.

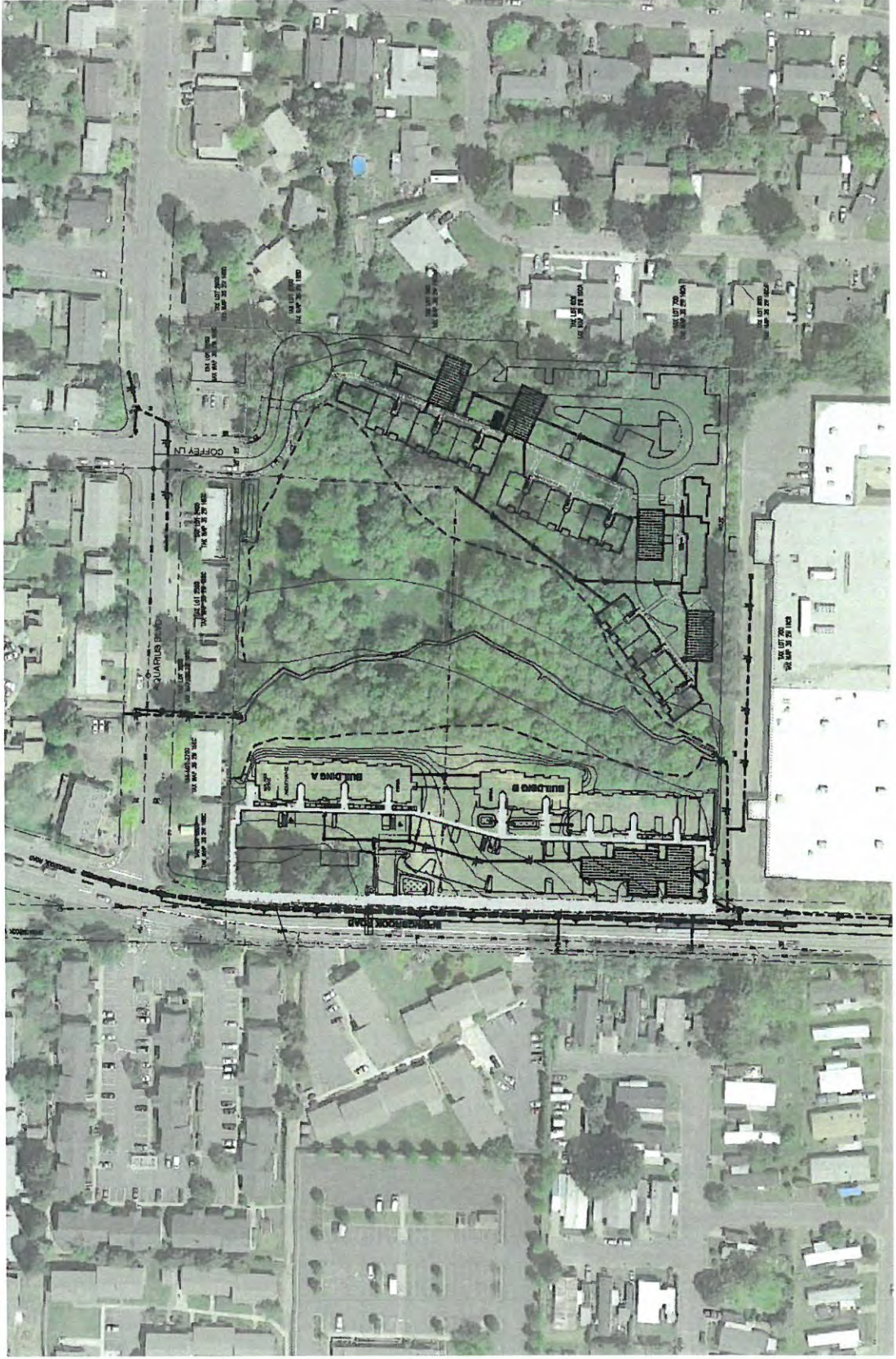


VICINITY MAP

Figure 1

SITE PLAN -Meadow Creek Apartments

Figure 2



EXISTING TRAFFIC CONTROL AND LANE CONFIGURATION FOR THE STUDY INTERSECTIONS

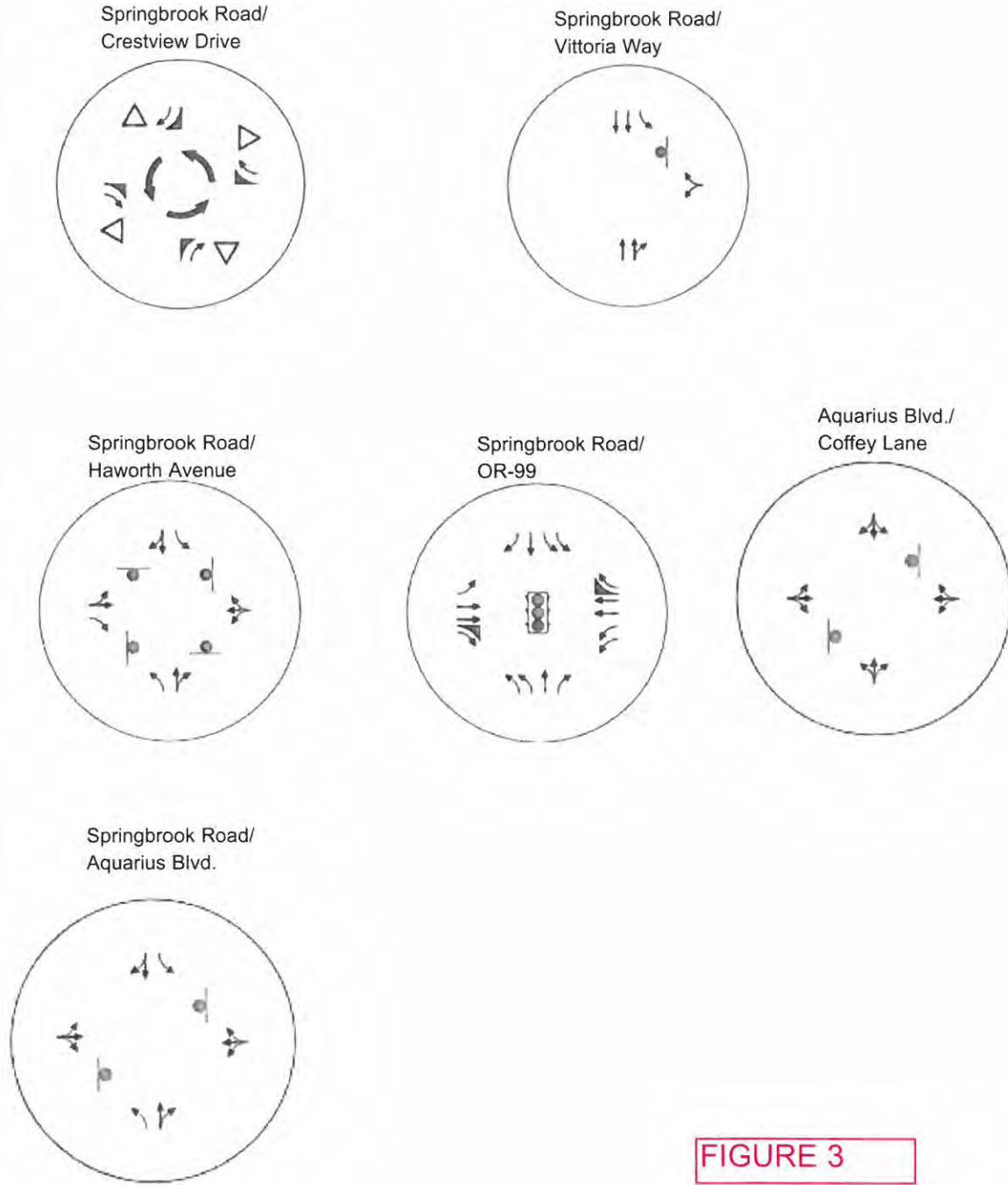




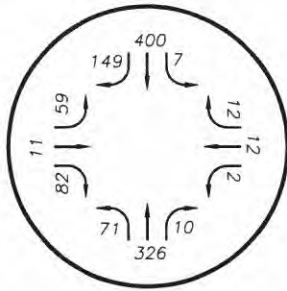


FIGURE 3

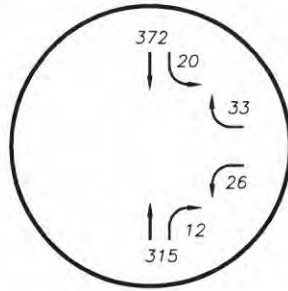
-  - STOP SIGN
-  - TRAFFIC SIGNAL
-  - ROUNDABOUT
-  - YIELD

AM PEAK HOUR VOLUME

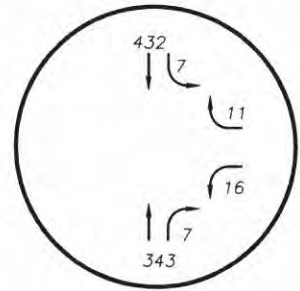
Springbrook at Crestview



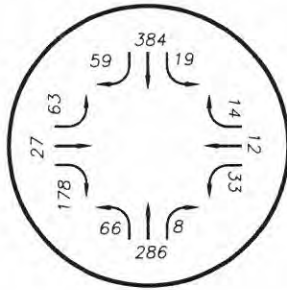
Springbrook at Vittoria



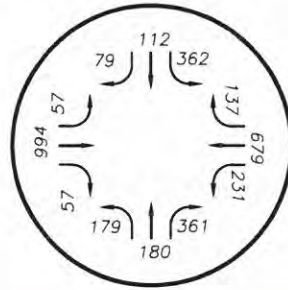
Springbrook at Aquarius



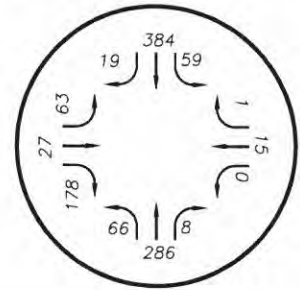
Springbrook at Haworth



Springbrook at OR-99

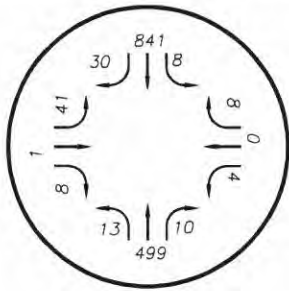


Aquarius at Coffey lane

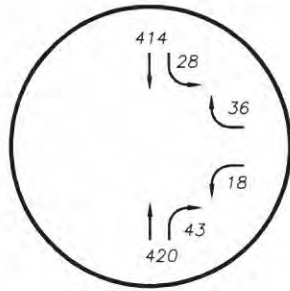


PM PEAK HOUR VOLUME

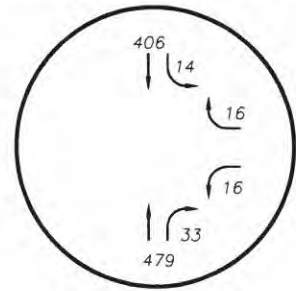
Springbrook at Crestview



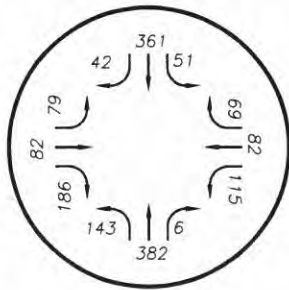
Springbrook at Vittoria



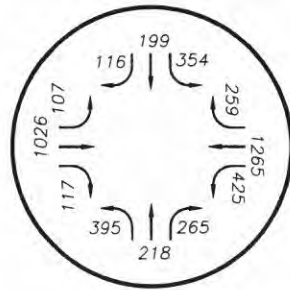
Springbrook at Aquarius



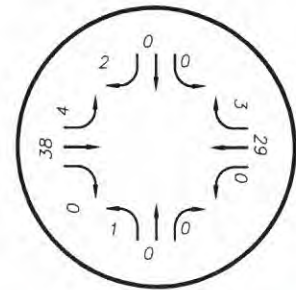
Springbrook at Haworth



Springbrook at OR-99



Aquarius at Coffey lane



EXISTING TURNING MOVEMENT VOLUME

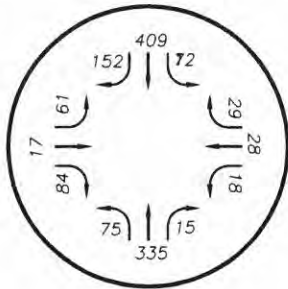
ADJUSTED FOR SEASONAL FACTOR AND 30TH HIGHEST HOURLY VOLUME

FIGURE 4

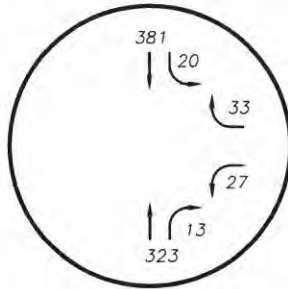


AM PEAK HOUR VOLUME

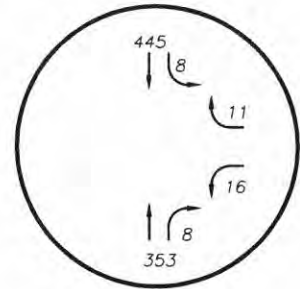
Springbrook at Crestview



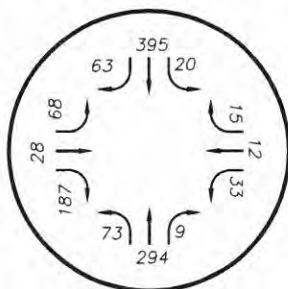
Springbrook at Vittoria



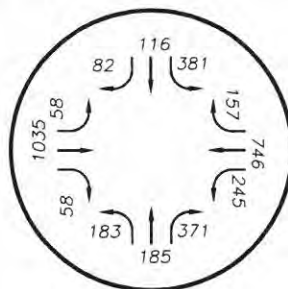
Springbrook at Aquarius



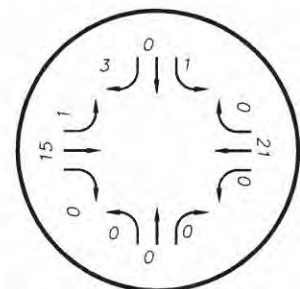
Springbrook at Haworth



Springbrook at OR-99

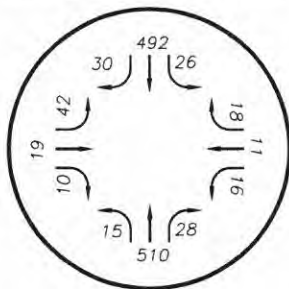


Aquarius at Coffey lane

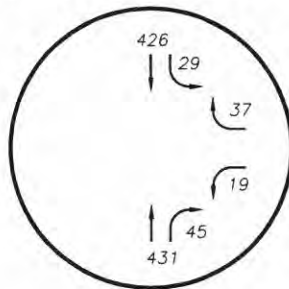


PM PEAK HOUR VOLUME

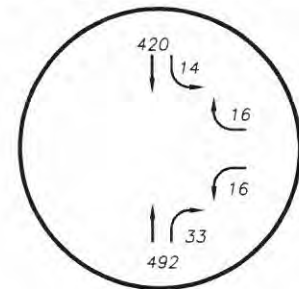
Springbrook at Crestview



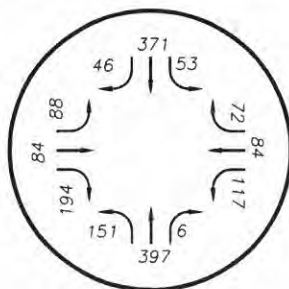
Springbrook at Vittoria



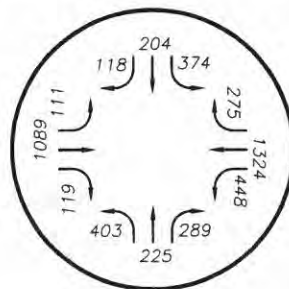
Springbrook at Aquarius



Springbrook at Haworth



Springbrook at OR-99



Aquarius at Coffey lane

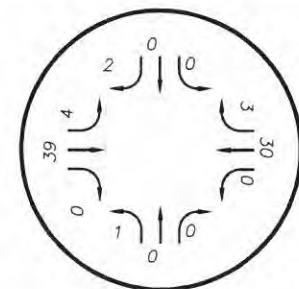


FIGURE 5



Trip Generation

Land Use	ITE Code	Size	Weekday Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Mid Rise Apartments	221	74 units	403	27	7	20	33	20	13

Site Trip Distribution/Trip Assignment

Consistent with the assumption of Meadow Creek Apartments- Phase 1, this study assumes that 20% of the traffic from the apartments will travel north on Springbrook Rd, 5% will travel east on Aquarius Blvd, 55% will travel on south on Springbrook Rd and 20% will travel west on Haworth Ave. existing trip distributions at the study intersections.

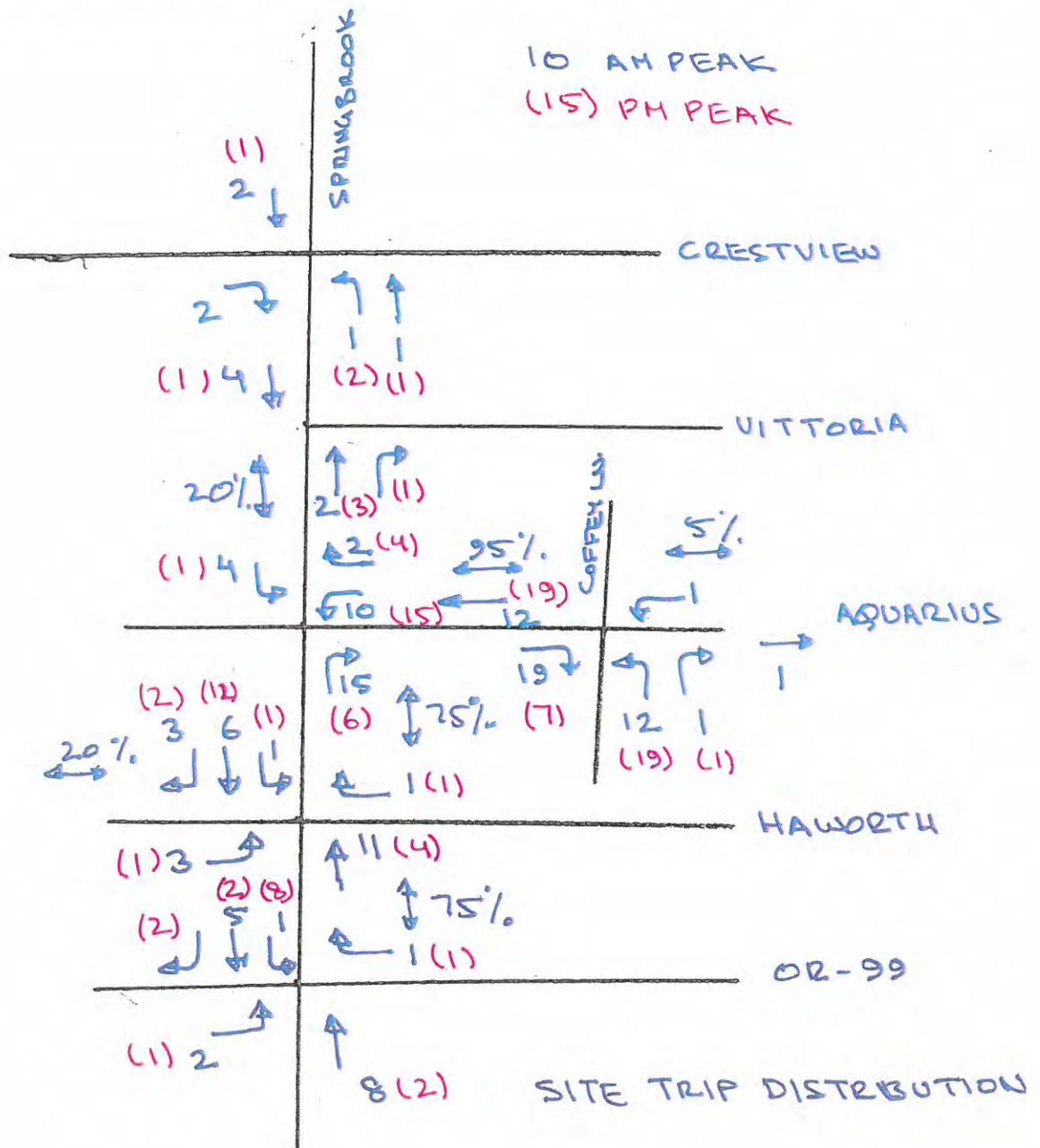
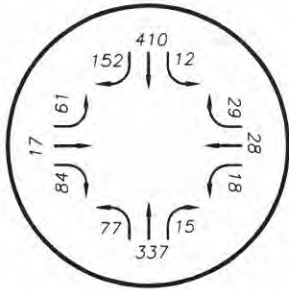


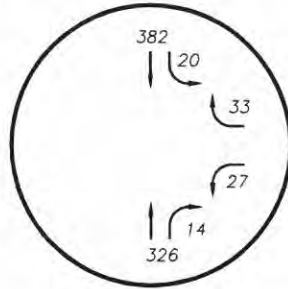
FIGURE 6

AM PEAK HOUR VOLUME

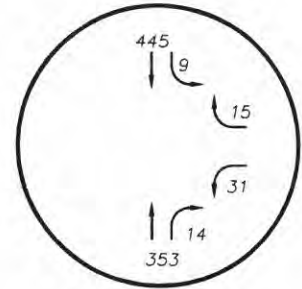
Springbrook at Crestview



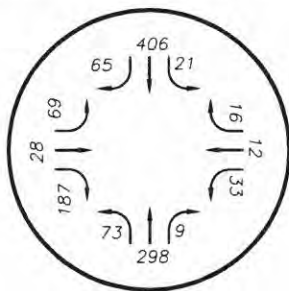
Springbrook at Vittoria



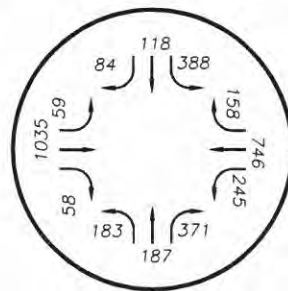
Springbrook at Aquarius



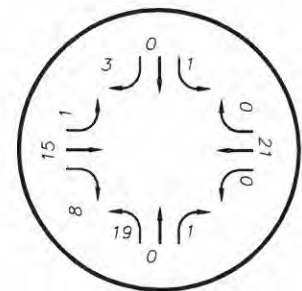
Springbrook at Haworth



Springbrook at OR-99

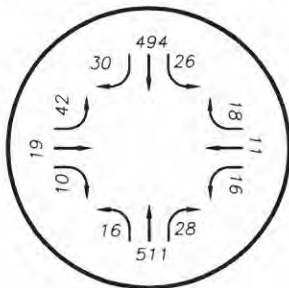


Aquarius at Coffey lane

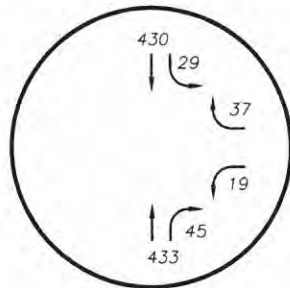


PM PEAK HOUR VOLUME

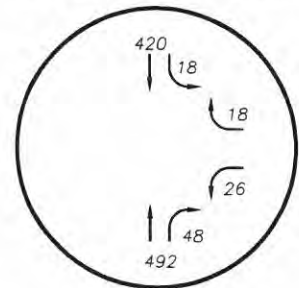
Springbrook at Crestview



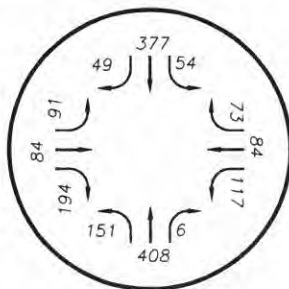
Springbrook at Vittoria



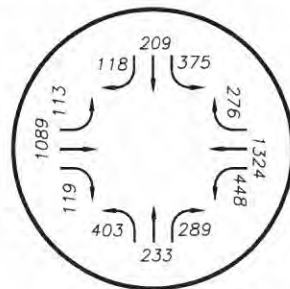
Springbrook at Aquarius



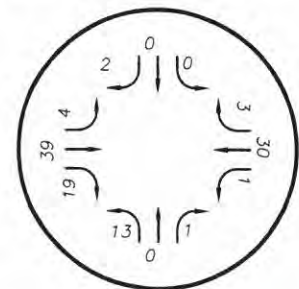
Springbrook at Haworth



Springbrook at OR-99



Aquarius at Coffey lane



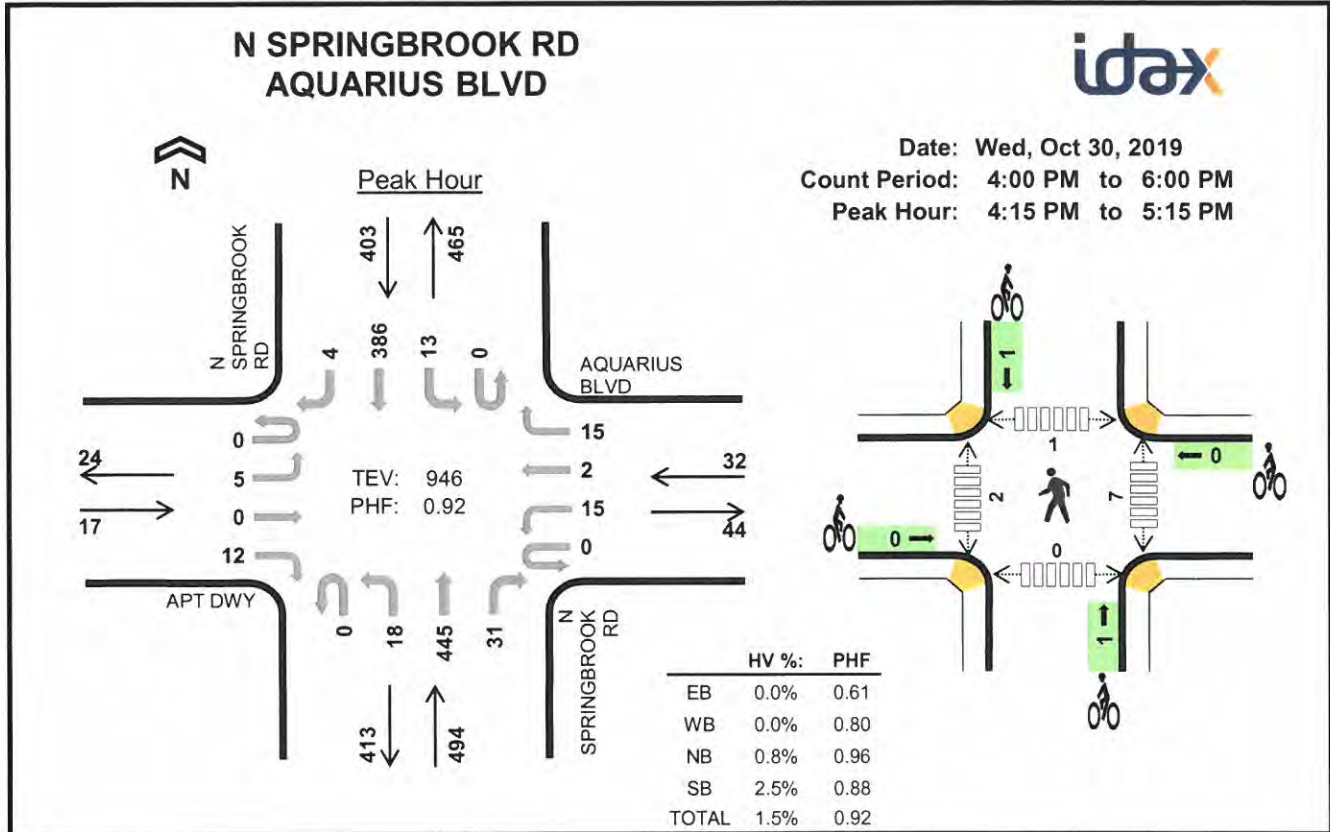
2021 BUILT-OUT TRAFFIC VOLUMES

FIGURE 7



Appendix A

Turning movement volumes

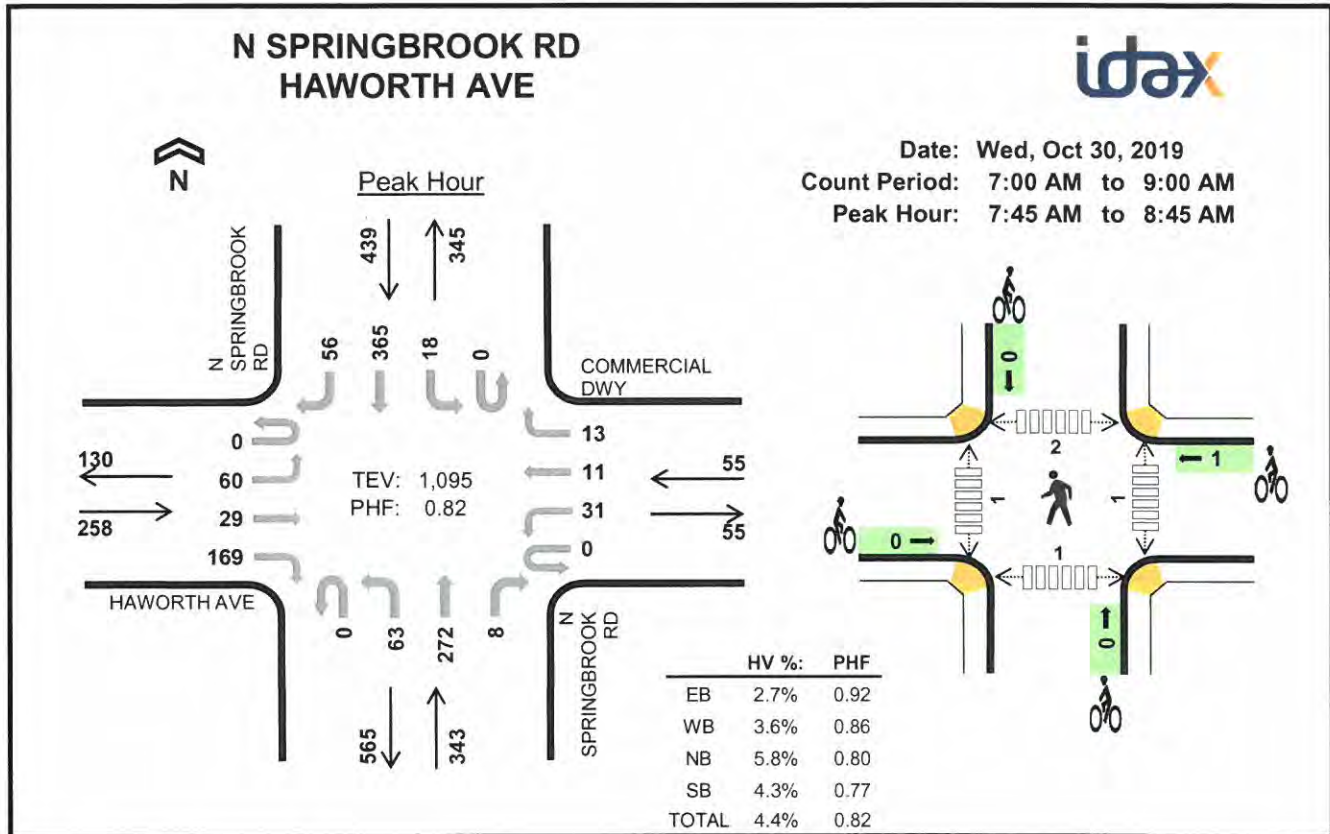


Two-Hour Count Summaries

Interval Start	APT DWY				AQUARIUS BLVD				N SPRINGBROOK RD				N SPRINGBROOK RD				15-min Total	Rolling One Hour	
	Eastbound		Westbound		Westbound		Northbound		Southbound		Southbound		Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			UT
4:00 PM	0	0	0	1	0	4	0	4	0	0	107	7	0	2	107	1	233	0	
4:15 PM	0	1	0	3	0	5	0	2	0	3	101	13	0	7	92	3	230	0	
4:30 PM	0	3	0	4	0	5	1	4	0	5	115	7	0	3	110	1	258	0	
4:45 PM	0	1	0	3	0	2	0	3	0	4	114	3	0	1	88	0	219	940	
5:00 PM	0	0	0	2	0	3	1	6	0	6	115	8	0	2	96	0	239	946	
5:15 PM	0	0	0	1	0	5	0	1	0	5	114	6	0	0	97	0	229	945	
5:30 PM	0	0	0	2	0	3	1	3	1	2	108	3	0	5	93	0	221	908	
5:45 PM	0	0	0	0	0	5	1	3	0	2	118	5	0	3	96	1	234	923	
Count Total	0	5	0	16	0	32	4	26	1	27	892	52	0	23	779	6	1,863	0	
Peak Hour	0	5	0	12	0	15	2	15	0	18	445	31	0	13	386	4	946	0	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	0	3	5	9	0	0	0	0	0	1	0	0	0	1
4:15 PM	0	0	2	3	5	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	3	3	0	0	0	0	0	3	1	1	0	5
4:45 PM	0	0	0	2	2	0	0	0	1	1	2	0	0	0	2
5:00 PM	0	0	2	2	4	0	0	1	0	1	2	1	0	0	3
5:15 PM	0	0	2	0	2	0	0	1	0	1	0	2	0	0	2
5:30 PM	0	0	1	1	2	0	2	0	0	2	0	2	0	0	2
5:45 PM	0	0	3	1	4	0	0	0	0	0	0	0	3	0	3
Count Total	1	0	13	17	31	0	2	2	1	5	8	6	4	0	18
Peak Hour	0	0	4	10	14	0	0	1	1	2	7	2	1	0	10

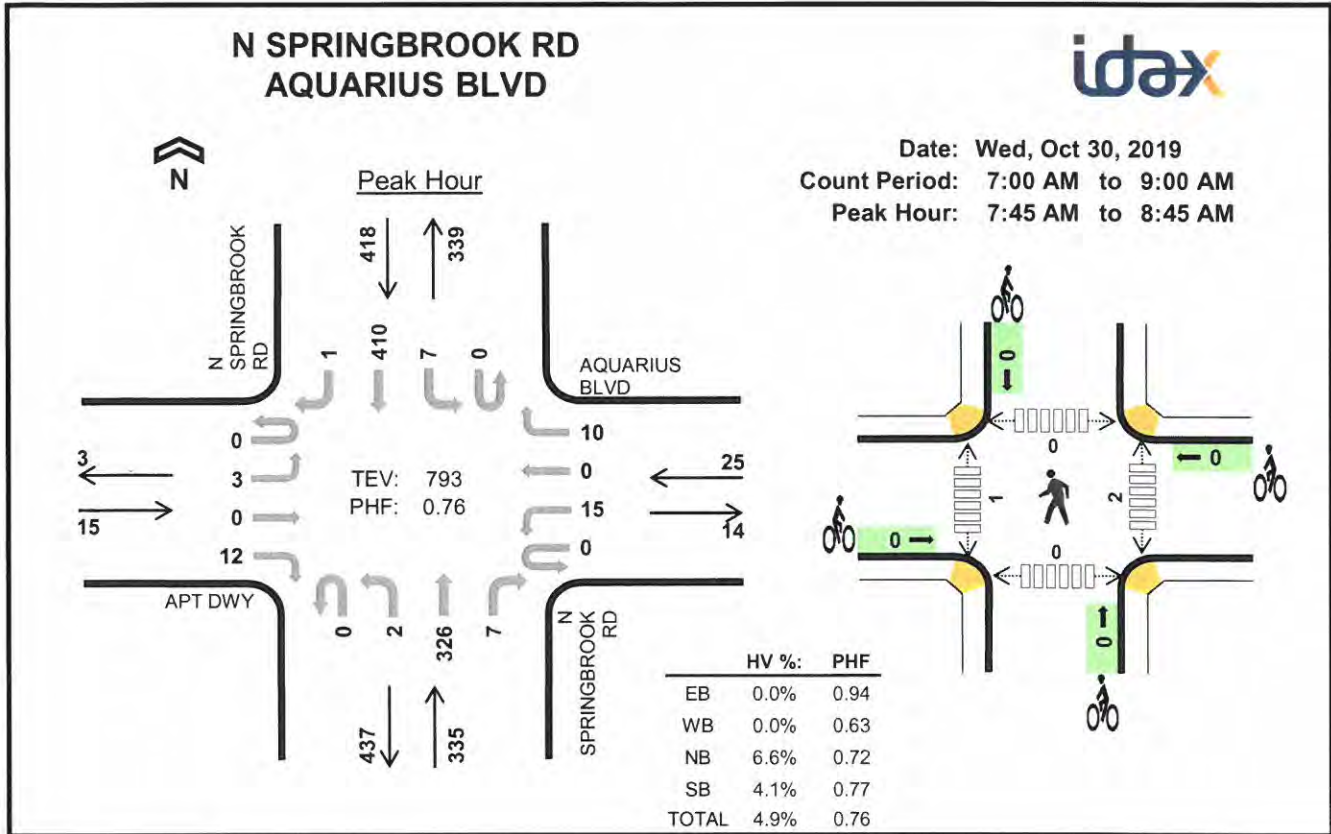


Two-Hour Count Summaries

Interval Start	HAWORTH AVE				COMMERCIAL DWY				N SPRINGBROOK RD				N SPRINGBROOK RD				15-min Total	Rolling One Hour
	Eastbound		Westbound		Westbound		Northbound		Southbound		Southbound		Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	8	5	35	0	5	4	3	0	9	61	2	0	3	84	16	235	0
7:15 AM	0	6	5	31	0	4	2	3	0	17	68	2	0	4	64	13	219	0
7:30 AM	0	8	6	50	0	6	2	2	0	20	41	1	0	2	59	13	210	0
7:45 AM	0	16	8	40	0	5	2	2	0	10	62	2	0	3	88	7	245	909
8:00 AM	0	13	4	39	0	8	5	3	0	16	73	1	0	4	84	10	260	934
8:15 AM	0	17	11	40	0	8	3	5	0	13	91	3	0	8	109	25	333	1,048
8:30 AM	0	14	6	50	0	10	1	3	0	24	46	2	0	3	84	14	257	1,095
8:45 AM	0	9	9	30	0	9	4	5	0	19	41	4	0	8	55	12	205	1,055
Count Total	0	91	54	315	0	55	23	26	0	128	483	17	0	35	627	110	1,964	0
Peak Hour	0	60	29	169	0	31	11	13	0	63	272	8	0	18	365	56	1,095	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	0	1	3	6	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0
7:30 AM	3	1	5	3	12	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	3	4	7	0	0	0	0	0	0	0	0	1	1
8:00 AM	2	1	4	4	11	0	1	0	0	1	1	1	2	0	4
8:15 AM	4	0	9	6	19	0	0	0	0	0	0	0	0	0	0
8:30 AM	1	1	4	5	11	0	0	0	0	0	0	0	0	0	0
8:45 AM	1	1	5	7	14	0	0	0	0	0	0	0	0	0	0
Count Total	13	4	32	34	83	0	1	0	0	1	1	1	2	1	5
Peak Hour	7	2	20	19	48	0	1	0	0	1	1	1	2	1	5

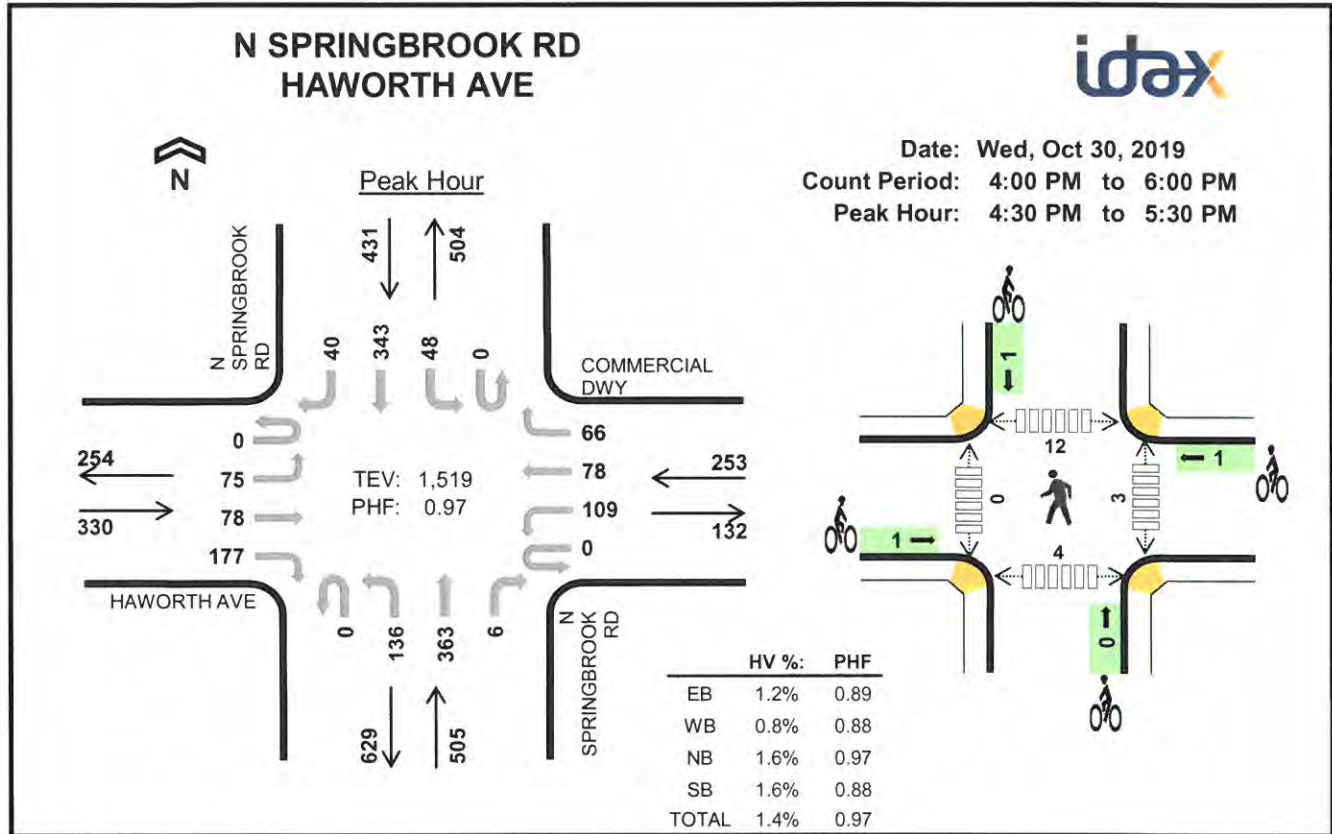


Two-Hour Count Summaries

Interval Start	APT DWY				AQUARIUS BLVD				N SPRINGBROOK RD				N SPRINGBROOK RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	0	4	0	4	0	3	0	2	78	2	0	3	95	0	192	0
7:15 AM	0	0	0	4	0	6	0	3	0	0	72	0	0	4	73	0	162	0
7:30 AM	0	2	0	3	0	0	0	0	0	0	54	0	0	2	71	0	132	0
7:45 AM	0	2	0	2	0	7	0	1	0	0	69	3	0	4	88	0	176	662
8:00 AM	0	0	0	4	0	4	0	6	0	1	87	1	0	0	92	1	196	666
8:15 AM	0	1	0	3	0	3	0	1	0	0	113	3	0	2	134	0	260	764
8:30 AM	0	0	0	3	0	1	0	2	0	1	57	0	0	1	96	0	161	793
8:45 AM	0	0	0	2	0	2	0	0	0	1	54	1	0	1	71	0	132	749
Count Total	0	6	0	25	0	27	0	16	0	5	584	10	0	17	720	1	1,411	0
Peak Hour	0	3	0	12	0	15	0	10	0	2	326	7	0	7	410	1	793	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	2	3	5	0	0	0	0	0	0	1	0	0	1
7:15 AM	0	1	2	1	4	0	0	0	0	0	0	2	0	0	2
7:30 AM	0	0	6	3	9	0	0	0	0	0	1	0	0	0	1
7:45 AM	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	6	3	9	0	0	0	0	0	2	0	0	0	2
8:15 AM	0	0	12	6	18	0	0	0	0	0	0	1	0	0	1
8:30 AM	0	0	1	5	6	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	4	6	10	0	0	0	0	0	0	1	0	0	1
Count Total	0	1	36	30	67	0	0	0	0	0	3	5	0	0	8
Peak Hour	0	0	22	17	39	0	0	0	0	0	2	1	0	0	3

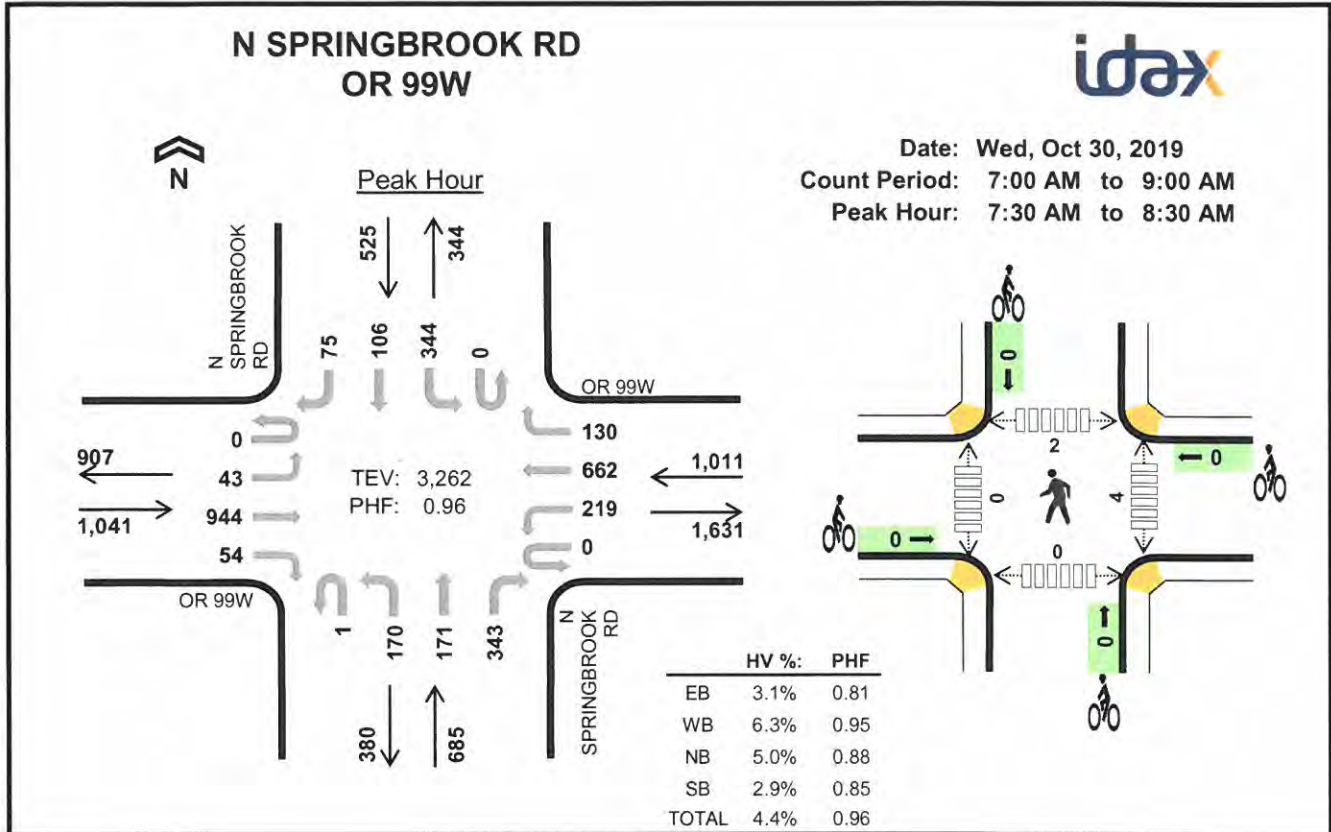


Two-Hour Count Summaries

Interval Start	HAWORTH AVE				COMMERCIAL DWY				N SPRINGBROOK RD				N SPRINGBROOK RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	22	16	42	0	21	21	12	0	30	78	3	0	15	76	13	349	0
4:15 PM	0	18	20	47	0	27	20	20	0	28	83	2	0	18	74	9	366	0
4:30 PM	0	17	15	34	0	32	22	18	0	42	87	1	0	16	95	12	391	0
4:45 PM	0	15	21	57	0	22	20	18	0	29	90	2	0	8	72	6	360	1,466
5:00 PM	0	23	18	43	0	26	12	18	0	29	98	1	0	10	98	11	387	1,504
5:15 PM	0	20	24	43	0	29	24	12	0	36	88	2	0	14	78	11	381	1,519
5:30 PM	0	14	20	38	0	24	18	11	0	39	91	3	0	15	71	11	355	1,483
5:45 PM	0	18	16	38	0	38	23	23	0	40	84	2	0	15	72	9	378	1,501
Count Total	0	147	150	342	0	219	160	132	0	273	699	16	0	111	636	82	2,967	0
Peak Hour	0	75	78	177	0	109	78	66	0	136	363	6	0	48	343	40	1,519	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	1	4	3	9	0	0	0	0	0	0	2	1	1	4
4:15 PM	1	1	2	5	9	0	0	0	0	0	0	4	3	1	8
4:30 PM	3	1	1	2	7	0	0	0	0	0	2	0	2	3	7
4:45 PM	1	0	2	2	5	0	0	0	1	1	1	0	0	1	2
5:00 PM	0	1	3	2	6	1	1	0	0	2	0	0	3	0	3
5:15 PM	0	0	2	1	3	0	0	0	0	0	0	0	7	0	7
5:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	2	0	2
5:45 PM	0	0	2	1	3	1	0	0	0	1	1	0	2	0	3
Count Total	6	4	16	17	43	2	1	0	1	4	4	6	20	6	36
Peak Hour	4	2	8	7	21	1	1	0	1	3	3	0	12	4	19



Two-Hour Count Summaries

Interval Start	OR 99W Eastbound				OR 99W Westbound				N SPRINGBROOK RD Northbound				N SPRINGBROOK RD Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
	7:00 AM	0	9	289	4	0	50	130	41	0	15	30	80	0	103	15		
7:15 AM	0	8	294	10	0	66	127	43	0	34	38	104	0	58	19	12	813	0
7:30 AM	0	9	299	13	0	54	163	28	1	37	28	96	0	87	25	10	850	0
7:45 AM	0	10	200	21	0	66	176	21	0	47	44	80	0	76	25	22	788	3,230
8:00 AM	0	8	204	12	0	48	178	41	0	36	39	83	0	86	22	18	775	3,226
8:15 AM	0	16	241	8	0	51	145	40	0	50	60	84	0	95	34	25	849	3,262
8:30 AM	0	13	224	15	0	60	166	34	1	35	27	78	0	83	43	23	802	3,214
8:45 AM	0	20	202	7	0	48	185	24	0	59	32	61	0	65	21	20	744	3,170
Count Total	0	93	1,953	90	0	443	1,270	272	2	313	298	666	0	653	204	143	6,400	0
Peak Hour	0	43	944	54	0	219	662	130	1	170	171	343	0	344	106	75	3,262	0

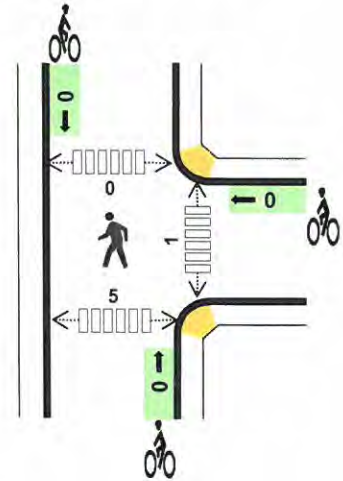
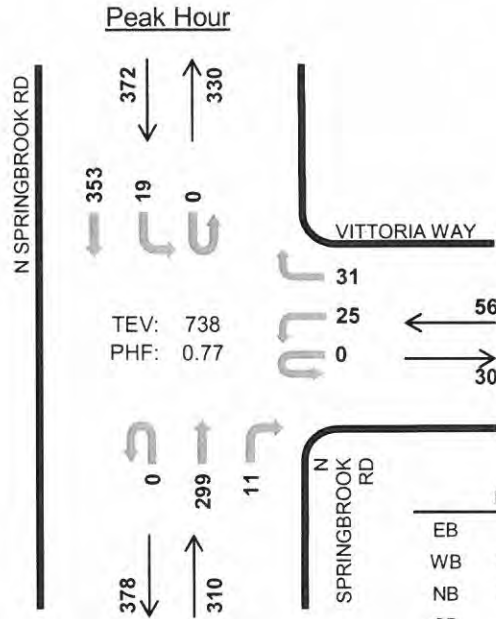
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	10	13	5	3	31	0	0	0	0	0	0	0	0	0	0
7:15 AM	6	10	4	3	23	0	0	0	0	0	0	0	0	0	0
7:30 AM	6	14	7	2	29	0	0	0	0	0	0	0	0	0	0
7:45 AM	10	17	4	3	34	0	0	0	0	0	0	0	0	0	0
8:00 AM	4	15	5	3	27	0	0	0	0	0	3	0	2	0	5
8:15 AM	12	18	18	7	55	0	0	0	0	0	1	0	0	0	1
8:30 AM	7	20	13	7	47	0	0	0	0	0	0	0	0	0	0
8:45 AM	6	24	8	6	44	0	0	0	0	0	3	0	1	0	4
Count Total	61	131	64	34	290	0	0	0	0	0	7	0	3	0	10
Peak Hour	32	64	34	15	145	0	0	0	0	0	4	0	2	0	6

N SPRINGBROOK RD VITTORIA WAY



Date: Wed, Oct 30, 2019
 Count Period: 7:00 AM to 9:00 AM
 Peak Hour: 7:45 AM to 8:45 AM



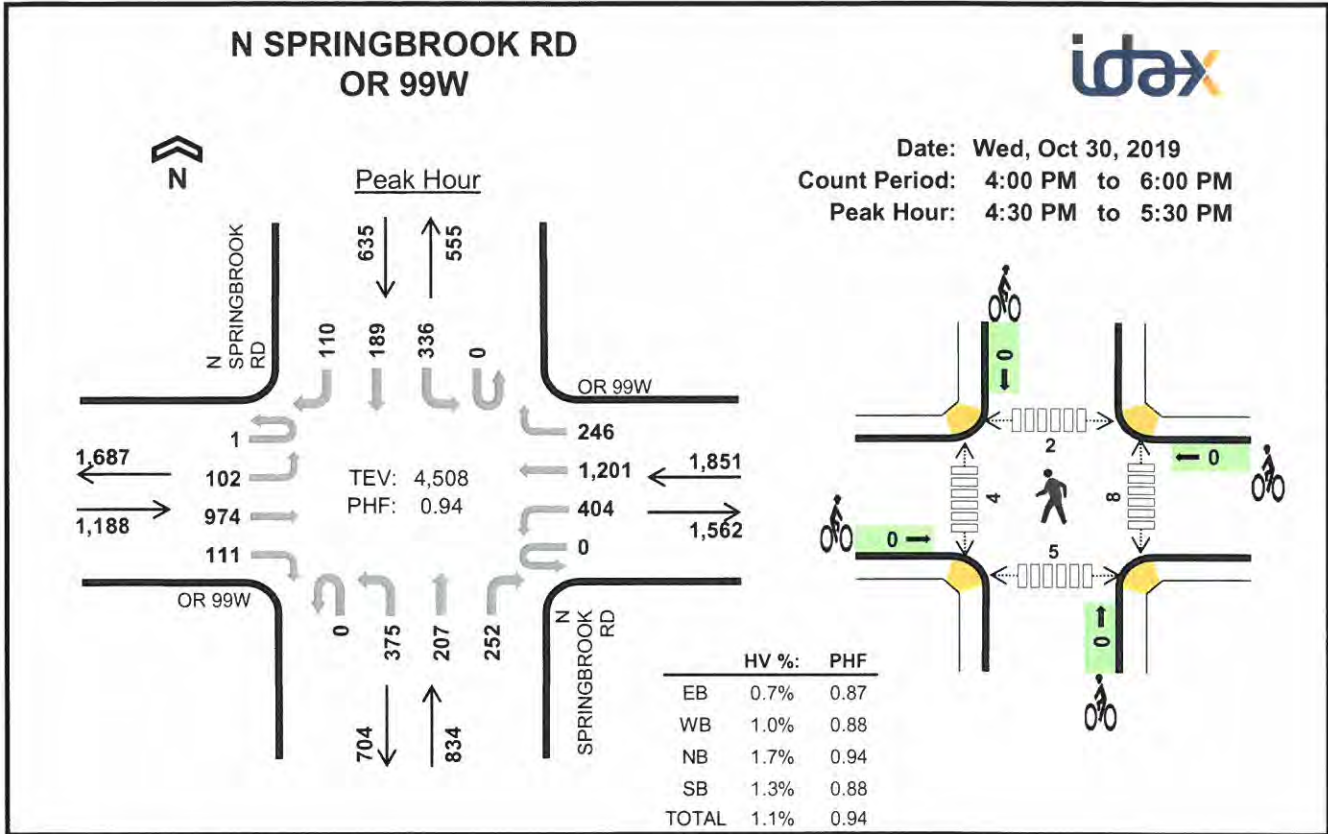
	HV %:	PHF
EB	-	-
WB	0.0%	0.67
NB	7.1%	0.81
SB	4.3%	0.72
TOTAL	5.1%	0.77

Two-Hour Count Summaries

Interval Start	0				VITTORIA WAY				N SPRINGBROOK RD				N SPRINGBROOK RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	8	0	2	0	0	71	3	0	3	86	0	173	0
7:15 AM	0	0	0	0	0	7	0	6	0	0	69	1	0	1	57	0	141	0
7:30 AM	0	0	0	0	0	5	0	3	0	0	51	2	0	3	61	0	125	0
7:45 AM	0	0	0	0	0	11	0	10	0	0	72	0	0	2	74	0	169	608
8:00 AM	0	0	0	0	0	3	0	6	0	0	86	3	0	4	81	0	183	618
8:15 AM	0	0	0	0	0	8	0	8	0	0	91	5	0	11	118	0	241	718
8:30 AM	0	0	0	0	0	3	0	7	0	0	50	3	0	2	80	0	145	738
8:45 AM	0	0	0	0	0	6	0	1	0	0	53	0	0	2	64	0	126	695
Count Total	0	0	0	0	0	51	0	43	0	0	543	17	0	28	621	0	1,303	0
Peak Hour	0	0	0	0	0	25	0	31	0	0	299	11	0	19	353	0	738	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	1	3	4	0	0	0	0	0	1	0	0	0	1
7:15 AM	0	1	1	1	3	0	0	0	0	0	0	1	0	3	4
7:30 AM	0	0	6	3	9	0	0	0	0	0	1	0	0	2	3
7:45 AM	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	6	3	9	0	0	0	0	0	1	2	0	5	8
8:15 AM	0	0	11	5	16	0	0	0	0	0	0	3	0	0	3
8:30 AM	0	0	2	5	7	0	0	0	0	0	0	1	0	0	1
8:45 AM	0	1	4	5	10	0	0	0	0	0	0	4	0	0	4
Count Total	0	2	34	28	64	0	0	0	0	0	3	11	0	10	24
Peak Hr	0	0	22	16	38	0	0	0	0	0	1	6	0	5	12

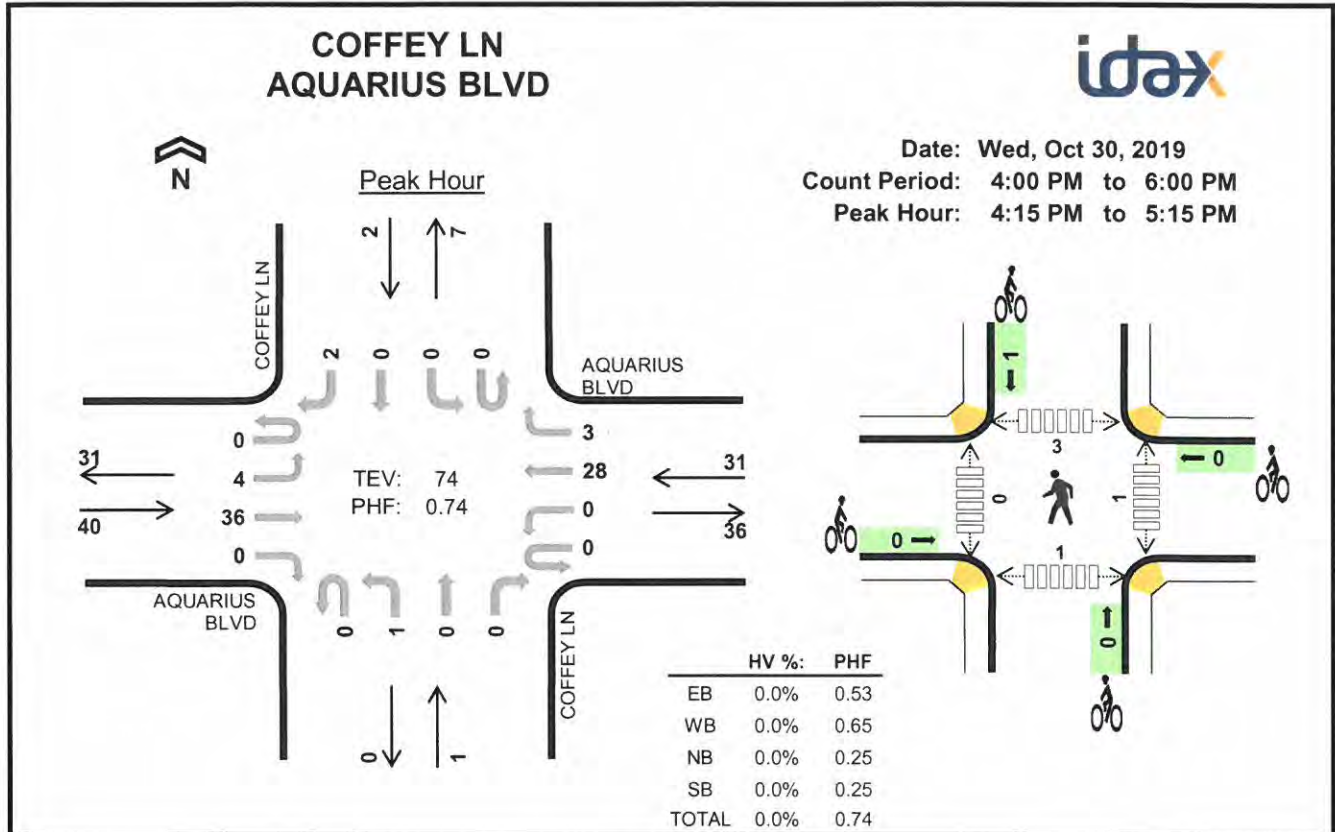


Two-Hour Count Summaries

Interval Start	OR 99W Eastbound				OR 99W Westbound				N SPRINGBROOK RD Northbound				N SPRINGBROOK RD Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
	4:00 PM	1	39	209	18	0	115	318	53	0	70	46	59	0	59	44		
4:15 PM	1	33	208	37	0	111	316	49	0	66	60	61	0	83	50	25	1,100	0
4:30 PM	0	31	226	26	0	116	341	67	0	106	53	62	0	86	49	32	1,195	0
4:45 PM	0	21	231	32	0	98	296	58	0	94	42	74	0	71	40	25	1,082	4,427
5:00 PM	0	21	230	27	0	106	271	57	0	95	59	59	0	97	59	24	1,105	4,482
5:15 PM	1	29	287	26	0	84	293	64	0	80	53	57	0	82	41	29	1,126	4,508
5:30 PM	1	27	203	29	0	81	295	73	0	112	56	77	0	76	35	24	1,089	4,402
5:45 PM	0	33	201	26	0	79	337	66	2	69	47	54	0	82	35	21	1,052	4,372
Count Total	4	234	1,795	221	0	790	2,467	487	2	692	416	503	0	636	353	199	8,799	0
Peak Hour	1	102	974	111	0	404	1,201	246	0	375	207	252	0	336	189	110	4,508	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	5	7	5	4	21	0	0	0	0	0	0	2	3	2	7
4:15 PM	2	14	5	4	25	0	0	0	0	0	2	6	1	3	12
4:30 PM	3	6	2	4	15	0	0	0	0	0	5	1	2	1	9
4:45 PM	1	6	5	1	13	0	0	0	0	0	1	1	0	2	4
5:00 PM	3	2	5	2	12	0	0	0	0	0	1	2	0	0	3
5:15 PM	1	5	2	1	9	0	0	0	0	0	1	0	0	2	3
5:30 PM	3	4	3	0	10	0	0	0	0	0	1	0	2	1	4
5:45 PM	5	4	5	0	14	0	0	0	0	0	0	1	0	0	1
Count Total	23	48	32	16	119	0	0	0	0	0	11	13	8	11	43
Peak Hour	8	19	14	8	49	0	0	0	0	0	8	4	2	5	19

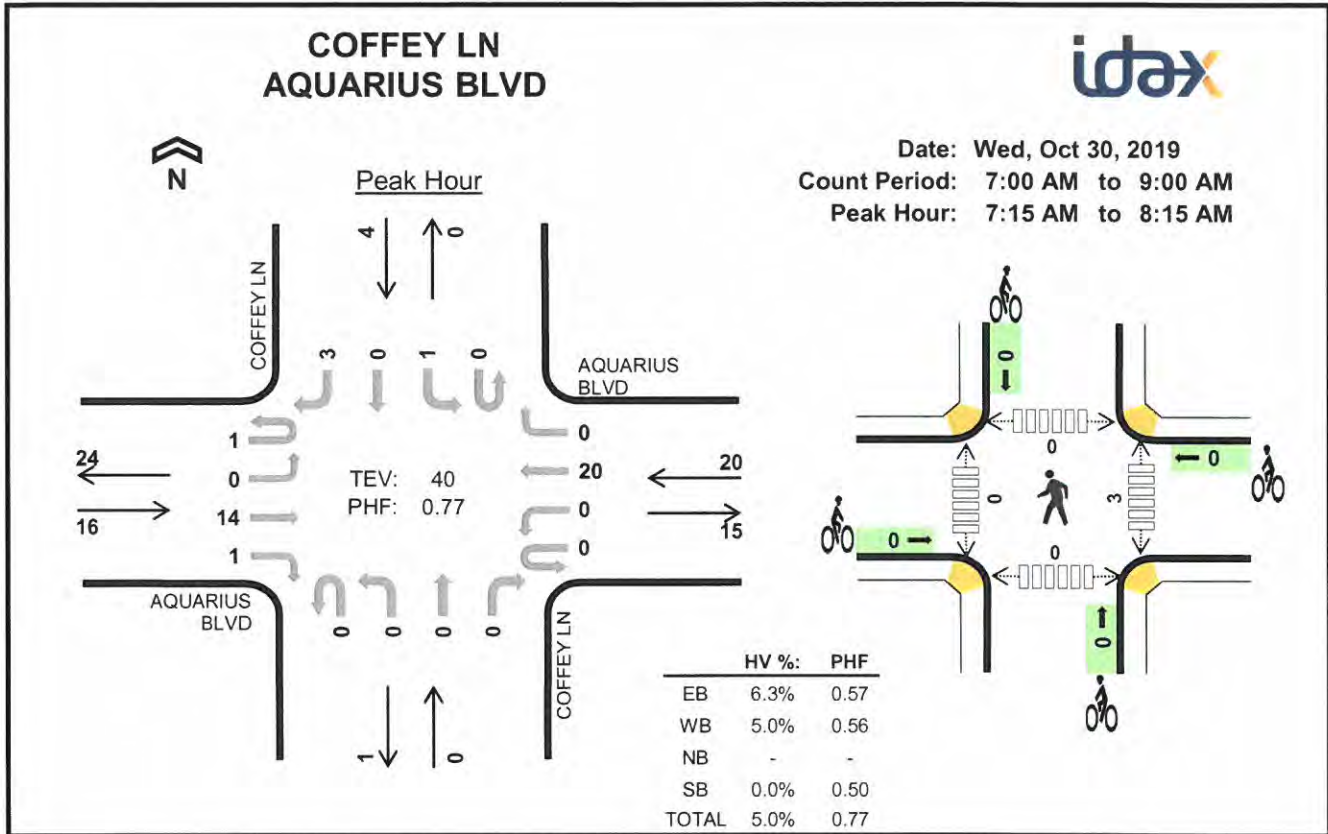


Two-Hour Count Summaries

Interval Start	AQUARIUS BLVD				AQUARIUS BLVD				COFFEY LN				COFFEY LN				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	1	1	5	0	0	0	7	0	0	0	0	0	0	0	0	0	14	0
4:15 PM	0	1	18	0	0	0	4	0	0	0	0	0	0	0	0	2	25	0
4:30 PM	0	1	6	0	0	0	11	1	0	0	0	0	0	0	0	0	19	0
4:45 PM	0	1	4	0	0	0	5	1	0	0	0	0	0	0	0	0	11	69
5:00 PM	0	1	8	0	0	0	8	1	0	1	0	0	0	0	0	0	19	74
5:15 PM	0	0	5	0	0	0	6	1	0	0	0	0	0	0	0	0	12	61
5:30 PM	0	0	8	0	0	0	7	2	0	0	0	0	0	1	0	0	18	60
5:45 PM	0	0	7	0	0	0	8	1	0	0	0	0	0	0	0	1	17	66
Count Total	1	5	61	0	0	0	56	7	0	1	0	0	0	1	0	3	135	0
Peak Hour	0	4	36	0	0	0	28	3	0	1	0	0	0	0	0	2	74	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	3	1	5
4:45 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	2	0	1	3	1	0	3	1	5
Peak Hour	0	0	0	0	0	0	0	0	1	1	1	0	3	1	5



Two-Hour Count Summaries

Interval Start	AQUARIUS BLVD				AQUARIUS BLVD				COFFEY LN				COFFEY LN				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	2	0	0	0	5	0	0	0	0	0	0	0	0	1	9	0
7:15 AM	0	0	4	0	0	0	6	0	0	0	0	0	0	0	0	1	11	0
7:30 AM	0	0	3	0	0	0	1	0	0	0	0	0	0	1	0	0	5	0
7:45 AM	1	0	5	1	0	0	4	0	0	0	0	0	0	0	0	2	13	38
8:00 AM	0	0	2	0	0	0	9	0	0	0	0	0	0	0	0	0	11	40
8:15 AM	0	0	4	0	0	0	3	0	0	0	0	0	0	1	0	0	8	37
8:30 AM	0	0	1	0	0	0	2	0	0	1	0	0	0	0	0	0	4	36
8:45 AM	0	0	3	0	0	0	1	0	0	0	0	1	0	0	0	1	6	29
Count Total	1	1	24	1	0	0	31	0	0	1	0	1	0	2	0	5	67	0
Peak Hour	1	0	14	1	0	0	20	0	0	0	0	0	0	1	0	3	40	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

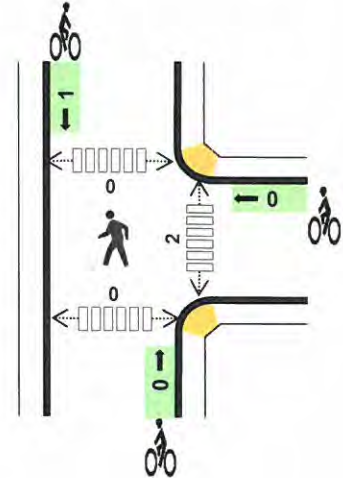
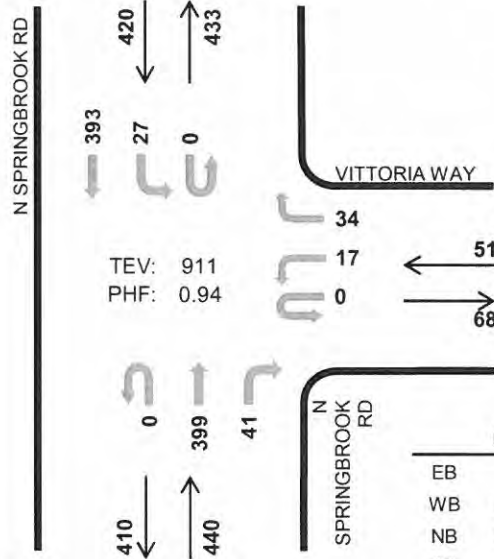
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
7:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
8:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2	0	4
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	1	1	0	0	2	0	1	0	0	1	6	0	2	0	8
Peak Hour	1	1	0	0	2	0	0	0	0	0	3	0	0	0	3

N SPRINGBROOK RD VITTORIA WAY



Peak Hour

Date: Wed, Oct 30, 2019
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM



	HV %:	PHF
EB	-	-
WB	0.0%	0.75
NB	0.9%	0.92
SB	2.6%	0.85
TOTAL	1.6%	0.94

Two-Hour Count Summaries

Interval Start	0				VITTORIA WAY				N SPRINGBROOK RD				N SPRINGBROOK RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	2	0	7	0	0	94	12	0	13	110	0	238	0
4:15 PM	0	0	0	0	0	4	0	9	0	0	90	10	0	5	94	0	212	0
4:30 PM	0	0	0	0	0	5	0	7	0	0	113	6	0	5	106	0	242	0
4:45 PM	0	0	0	0	0	6	0	11	0	0	102	13	0	4	83	0	219	911
5:00 PM	0	0	0	0	0	4	0	18	0	0	106	8	0	4	84	0	224	897
5:15 PM	0	0	0	0	0	5	0	10	0	0	98	15	0	5	91	0	224	909
5:30 PM	0	0	0	0	0	13	0	11	0	0	99	3	0	4	84	0	214	881
5:45 PM	0	0	0	0	0	6	0	9	0	0	108	9	0	4	83	0	219	881
Count Total	0	0	0	0	0	45	0	82	0	0	810	76	0	44	735	0	1,792	0
Peak Hour	0	0	0	0	0	17	0	34	0	0	399	41	0	27	393	0	911	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

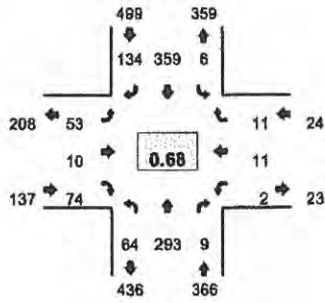
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	3	4	7	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	1	4	5	0	0	0	0	0	0	4	0	0	4
4:30 PM	0	0	0	1	1	0	0	0	0	0	1	1	0	0	2
4:45 PM	0	0	0	2	2	0	0	0	1	1	1	3	0	0	4
5:00 PM	0	0	2	2	4	0	0	1	0	1	0	0	0	0	0
5:15 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	1	1	2	0	0	0	0	0	0	1	0	0	1
5:45 PM	0	0	3	1	4	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	12	15	27	0	0	1	1	2	2	9	0	0	11
Peak Hr	0	0	4	11	15	0	0	0	1	1	2	8	0	0	10

Type of peak hour being reported: Intersection Peak

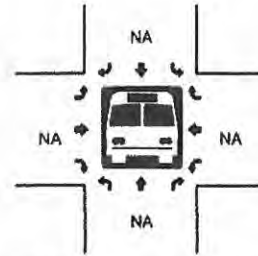
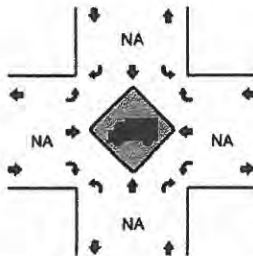
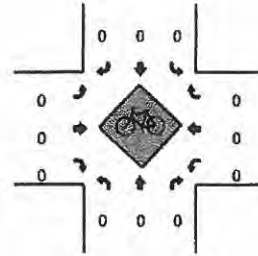
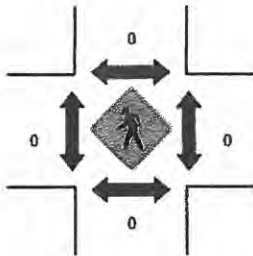
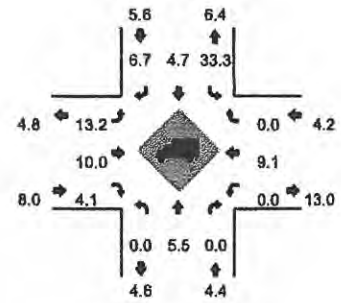
Method for determining peak hour: Total Entering Volume

LOCATION: N Springbrook Rd – Crestview Dr
 CITY/STATE: Newberg, OR

QC JOB #: 14556411
 DATE: Thu, Nov 16 2017



Peak-Hour: 7:10 AM -- 8:10 AM
 Peak 15-Min: 7:15 AM -- 7:30 AM



5-Min Count Period Beginning At	N Springbrook Rd (Northbound)				N Springbrook Rd (Southbound)				Crestview Dr (Eastbound)				Crestview Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	12	0	0	1	28	4	0	1	0	0	0	1	0	0	0	47	
7:05 AM	3	12	0	0	3	28	17	0	2	0	0	0	0	0	1	0	66	
7:10 AM	5	16	0	0	0	26	17	0	3	1	2	0	1	1	0	0	72	
7:15 AM	14	28	0	0	1	37	22	0	2	1	8	0	5	4	1	0	113	
7:20 AM	16	25	1	0	0	36	24	0	16	6	17	0	0	1	0	0	140	
7:25 AM	11	27	1	0	0	29	26	1	7	1	16	0	0	3	1	0	122	
7:30 AM	7	38	2	0	0	26	16	0	10	2	13	0	0	1	0	0	113	
7:35 AM	2	28	2	0	1	37	5	0	4	1	7	0	0	0	0	0	87	
7:40 AM	3	19	1	0	0	30	3	1	3	0	2	0	0	0	1	0	63	
7:45 AM	1	27	0	1	1	31	1	0	2	0	0	0	0	0	0	0	64	
7:50 AM	0	20	1	0	0	27	3	0	2	0	1	0	0	0	2	0	56	
7:55 AM	1	19	1	0	0	32	8	0	0	0	2	0	0	0	1	0	64	
8:00 AM	2	21	0	0	0	20	5	0	1	0	2	0	1	0	1	0	53	
8:05 AM	1	27	0	0	1	34	4	0	3	0	4	0	0	1	4	0	79	
8:10 AM	0	20	0	0	0	30	3	0	1	0	2	0	1	0	1	0	58	
8:15 AM	0	17	0	0	0	24	2	0	6	0	6	0	1	0	0	0	56	
8:20 AM	0	21	2	0	1	39	1	0	3	1	0	0	0	1	0	0	69	
8:25 AM	4	17	1	0	0	30	1	0	1	1	2	0	0	1	0	0	58	
8:30 AM	2	25	0	0	0	29	2	0	0	0	0	0	0	0	0	0	58	
8:35 AM	0	14	0	0	0	23	0	0	4	0	2	0	1	0	0	0	44	
8:40 AM	0	12	0	0	0	20	0	0	0	0	0	0	2	0	1	0	35	
8:45 AM	0	16	0	0	1	22	2	0	0	0	1	0	0	0	0	0	42	
8:50 AM	1	12	0	0	0	36	2	1	0	0	0	0	1	0	0	0	53	
8:55 AM	0	16	0	0	0	21	1	0	0	0	1	0	0	0	0	0	39	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	164	320	8	0	4	384	288	4	100	24	164	0	0	32	8	0	1500	
Heavy Trucks	0	8	0	0	0	20	24	0	16	0	8	0	0	0	0	0	76	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

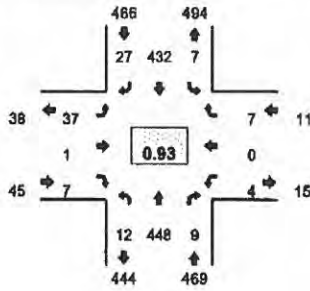
Comments:

Type of peak hour being reported: Intersection Peak

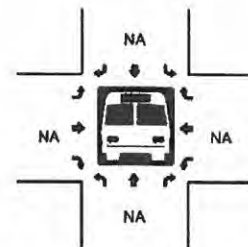
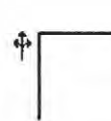
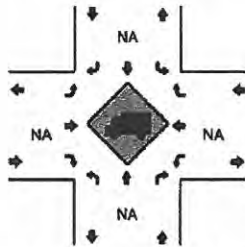
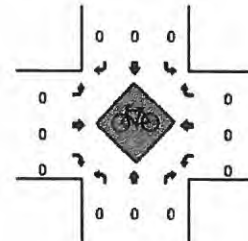
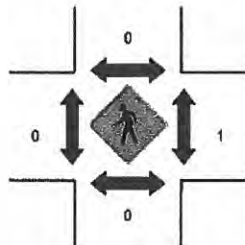
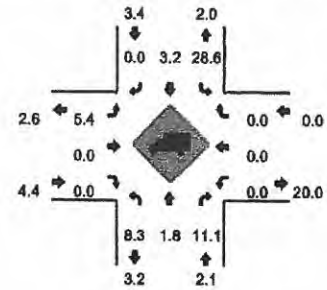
Method for determining peak hour: Total Entering Volume

LOCATION: N Springbrook Rd – Crestview Dr
CITY/STATE: Newberg, OR

QC JOB #: 14556412
DATE: Thu, Nov 16 2017



Peak-Hour: 4:05 PM – 5:05 PM
Peak 15-Min: 4:05 PM -- 4:20 PM

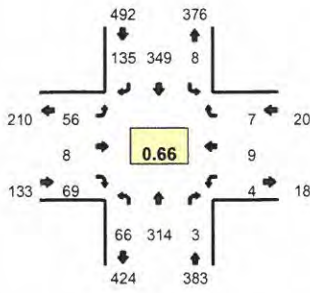


5-Min Count Period	N Springbrook Rd (Northbound)				N Springbrook Rd (Southbound)				Crestview Dr (Eastbound)				Crestview Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	32	0	0	0	36	2	0	5	1	1	0	1	0	1	0	80	
4:05 PM	1	28	2	1	0	58	0	0	9	1	0	0	0	0	0	0	85	
4:10 PM	0	33	2	0	1	40	5	0	4	0	0	0	1	0	0	0	80	
4:15 PM	1	39	1	0	1	34	1	0	3	0	1	0	0	0	0	0	84	
4:20 PM	1	37	0	0	0	37	2	0	2	0	1	0	2	0	0	0	82	
4:25 PM	3	32	0	0	0	27	1	0	2	0	1	0	0	0	0	0	66	
4:30 PM	0	38	0	0	0	40	2	1	1	0	1	0	0	0	0	0	83	
4:35 PM	0	39	0	0	2	45	4	0	1	0	0	0	1	0	2	0	84	
4:40 PM	0	37	1	0	0	36	4	0	6	0	0	0	0	0	1	0	84	
4:45 PM	1	30	2	0	0	43	1	0	2	0	1	0	0	0	1	0	81	
4:50 PM	1	45	0	0	1	19	1	0	1	0	0	0	0	0	2	0	70	
4:55 PM	2	48	1	0	0	28	3	0	1	0	0	0	0	0	0	0	83	989
5:00 PM	1	41	0	0	0	27	3	1	6	0	2	0	0	0	1	0	82	991
5:05 PM	0	34	2	0	1	32	0	0	3	0	1	0	0	0	1	0	74	969
5:10 PM	0	34	1	0	1	35	2	1	0	0	2	0	0	0	1	0	77	957
5:15 PM	0	37	0	0	1	39	3	1	3	0	1	0	0	0	1	0	86	962
5:20 PM	2	42	2	0	3	22	0	0	0	0	0	0	1	0	0	0	72	952
5:25 PM	1	34	1	0	0	33	0	2	1	0	1	0	0	0	1	0	74	960
5:30 PM	1	39	1	0	1	29	3	2	2	0	1	0	0	0	3	0	82	959
5:35 PM	4	39	1	0	1	24	2	0	10	1	1	0	1	0	0	0	84	949
5:40 PM	0	39	0	0	0	37	0	0	6	0	1	0	1	0	1	0	85	950
5:45 PM	0	39	1	0	0	31	0	0	3	0	0	0	0	2	1	0	77	946
5:50 PM	1	33	1	0	1	27	4	0	2	0	1	0	2	0	0	0	72	948
5:55 PM	0	34	2	0	1	27	4	1	2	0	0	0	0	0	1	0	72	937
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	8	404	20	4	8	520	24	0	64	4	4	0	4	0	0	0	1064	
Heavy Trucks	0	16	4		4	28	0		8	0	0		0	0	0		60	
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

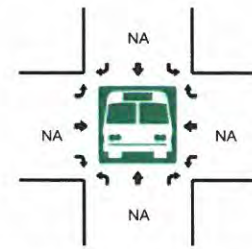
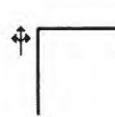
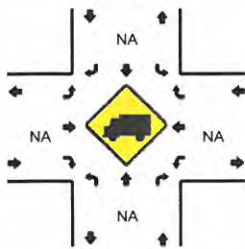
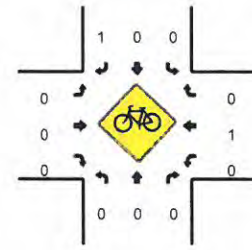
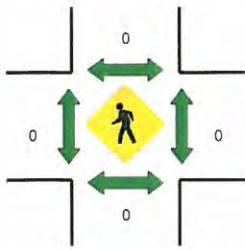
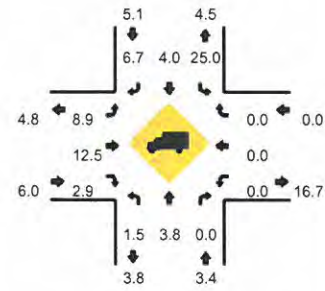
Comments:

LOCATION: Springbrook Rd -- Crestview Dr
CITY/STATE: Newberg, OR

QC JOB #: 14505611
DATE: Thu, Sep 14 2017



Peak-Hour: 7:05 AM -- 8:05 AM
Peak 15-Min: 7:20 AM -- 7:35 AM

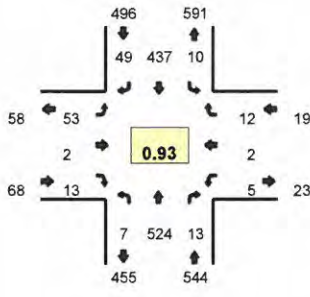


5-Min Count Period Beginning At	Springbrook Rd (Northbound)				Springbrook Rd (Southbound)				Crestview Dr (Eastbound)				Crestview Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:35 AM	0	9	0	0	0	19	2	0	0	0	1	0	0	0	0	0	31	
6:40 AM	1	10	0	0	0	22	5	0	1	0	3	0	0	0	1	0	43	
6:45 AM	0	20	0	0	0	35	5	0	0	0	1	0	0	0	0	0	61	
6:50 AM	0	10	0	0	1	30	12	0	1	0	0	0	0	2	1	0	57	
6:55 AM	0	23	0	0	1	22	9	0	1	1	0	0	1	1	0	0	59	485
7:00 AM	1	13	0	0	1	27	4	0	2	0	0	0	1	1	2	0	52	511
7:05 AM	6	21	1	1	1	23	11	1	3	0	0	0	1	0	0	0	69	558
7:10 AM	5	15	0	0	0	37	14	0	1	0	3	0	0	1	1	0	77	596
7:15 AM	14	16	0	0	1	26	23	0	9	2	6	1	0	0	0	0	98	660
7:20 AM	15	37	1	0	1	26	28	0	7	2	14	0	0	2	0	0	133	758
7:25 AM	10	30	0	0	0	29	26	0	7	3	21	0	0	5	1	0	132	851
7:30 AM	5	39	0	0	0	31	15	0	14	0	19	1	0	0	0	0	124	936
7:35 AM	1	25	1	1	1	30	8	0	8	1	2	0	0	0	1	0	79	984
7:40 AM	1	24	0	0	1	39	1	0	1	0	0	0	0	0	0	0	67	1008
7:45 AM	0	25	0	0	0	28	0	0	1	0	0	0	0	0	1	0	55	1002
7:50 AM	2	23	0	0	0	28	3	0	1	0	2	0	2	1	2	0	64	1009
7:55 AM	5	30	0	0	0	23	5	0	2	0	2	0	0	0	0	0	67	1017
8:00 AM	0	29	0	0	2	29	1	0	0	0	0	0	1	0	1	0	63	1028
8:05 AM	1	24	0	0	0	35	0	0	2	0	1	0	0	0	3	0	66	1025
8:10 AM	0	38	1	0	0	25	4	0	0	0	0	0	2	1	4	0	75	1023
8:15 AM	1	18	0	2	0	28	2	0	0	0	2	0	0	0	1	0	54	979
8:20 AM	2	17	0	0	0	39	1	0	1	0	0	0	2	0	1	0	63	909
8:25 AM	0	8	1	0	0	28	3	0	3	0	1	0	0	0	0	0	44	821
8:30 AM	0	25	0	0	0	22	0	0	2	0	0	0	0	0	0	0	49	746
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	120	424	4	0	4	344	276	0	112	20	216	4	0	28	4	0	1556	
Heavy Trucks	0	12	0	0	0	16	16	0	4	4	8	0	0	0	0	0	60	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

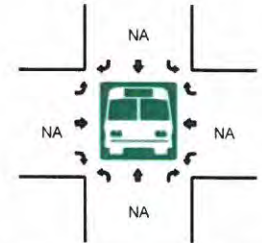
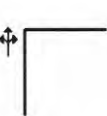
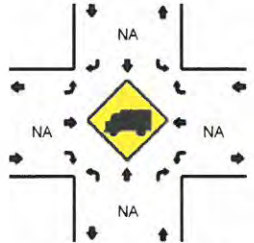
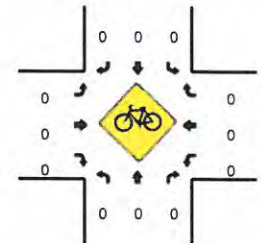
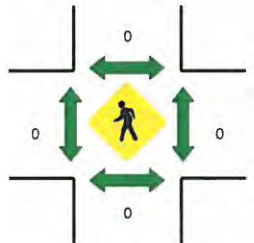
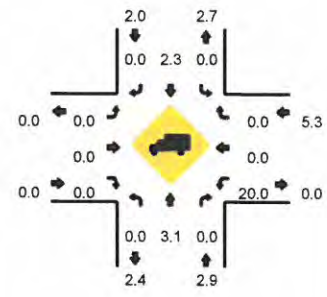
Comments:

LOCATION: Springbrook Rd – Crestview Dr
CITY/STATE: Newberg, OR

QC JOB #: 14505612
DATE: Thu, Sep 14 2017



Peak-Hour: 4:40 PM -- 5:40 PM
Peak 15-Min: 4:40 PM -- 4:55 PM



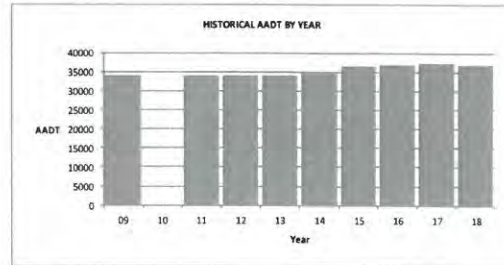
5-Min Count Period Beginning At	Springbrook Rd (Northbound)				Springbrook Rd (Southbound)				Crestview Dr (Eastbound)				Crestview Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	27	0	0	0	40	0	1	4	1	0	0	0	0	0	0	73	913
4:05 PM	1	31	0	0	1	55	3	0	2	0	0	0	1	0	1	0	95	925
4:10 PM	0	34	1	0	1	41	2	0	2	0	1	0	0	0	1	0	83	933
4:15 PM	2	26	2	0	1	35	2	0	0	0	0	0	1	0	1	0	70	923
4:20 PM	1	47	0	0	0	27	3	0	2	0	2	0	0	0	1	0	83	930
4:25 PM	1	36	1	0	0	32	6	0	1	0	0	0	0	0	0	0	77	939
4:30 PM	1	39	0	0	0	32	1	0	2	0	2	0	2	0	2	0	81	942
4:35 PM	1	31	3	0	0	38	4	0	3	0	0	0	2	0	0	0	82	922
4:40 PM	0	39	1	0	0	56	2	1	0	0	0	0	1	0	2	0	102	953
4:45 PM	2	47	1	0	2	40	4	0	2	0	0	0	0	0	2	0	100	986
4:50 PM	0	46	0	0	1	44	8	0	0	0	2	0	0	0	0	0	101	1017
4:55 PM	1	46	3	0	0	30	12	0	6	0	1	0	0	0	1	0	100	1047
5:00 PM	0	44	1	0	0	25	3	0	15	0	3	0	2	0	1	0	94	1068
5:05 PM	2	46	0	0	0	30	6	0	8	0	3	0	1	0	1	0	97	1070
5:10 PM	1	44	2	0	0	37	1	0	8	0	1	0	0	0	1	0	95	1082
5:15 PM	1	46	1	0	0	30	1	0	4	0	0	0	0	2	0	0	85	1097
5:20 PM	0	43	0	0	1	47	4	0	3	0	0	0	0	0	2	0	100	1114
5:25 PM	0	45	1	0	2	29	2	0	1	0	1	0	0	0	0	0	81	1118
5:30 PM	0	31	2	0	0	40	3	1	3	2	2	0	0	0	2	0	86	1123
5:35 PM	0	47	1	0	2	29	3	0	3	0	0	0	1	0	0	0	86	1127
5:40 PM	1	41	0	0	0	33	0	0	1	1	0	0	1	0	0	0	78	1103
5:45 PM	1	29	1	0	1	41	1	0	7	0	0	0	1	0	2	0	84	1087
5:50 PM	3	34	0	0	1	34	2	0	4	0	0	0	2	1	0	0	81	1067
5:55 PM	1	27	0	0	0	37	0	0	0	0	0	0	0	0	0	0	65	1032
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	8	528	8	0	12	560	56	4	8	0	8	0	4	0	16	0	1212	
Heavy Trucks	0	12	0	0	0	8	0	0	0	0	0	0	0	0	0	0	20	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

Location:	OR99W; MP 21.81; PACIFIC HWYWAY WEST NO. 91; 0.01 mile west of Brutscher Street	Site Name:	Newberg (36-004)
		Installed:	July, 1952

HISTORICAL TRAFFIC DATA

Year	AADT	Percent of AADT				
		Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2009	34060	***	***	***	***	***
2010	***	***	***	***	***	***
2011	34083	120	9.6	9.0	8.9	8.8
2012	33969	122	9.0	8.8	8.7	8.7
2013	34174	113	10.9	8.6	8.4	8.3
2014	34791	122	9.6	8.8	8.7	8.6
2015	36559	***	***	***	***	***
2016	37027	119	9.3	8.3	8.3	8.2
2017	37244	120	10.2	8.6	8.3	8.3
2018	37095	120	9.1	8.7	8.6	8.5



2018 TRAFFIC DATA

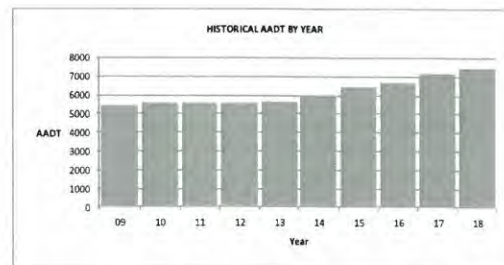
	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	35790	96	34510	93
February	36291	98	35293	95
March	37978	102	36876	99
April	38627	104	37620	101
May	38138	103	37758	102
June	39663	107	38924	105
July	39537	107	38886	105
August	39941	108	38997	105
September	38655	104	37926	102
October	38204	103	37227	100
November	37451	101	36247	98
December	35928	97	34874	94

For Vehicle Classification data near your project, please go to the following web page:
https://www.oregon.gov/ODOT/Data/Documents/TVT_2018.xlsx

Location:	OR99W; MP 47.45; PACIFIC HIGHWAY WEST NO. 91; 0.07 mile north of Yamhill-Polk County Line	Site Name:	Amity (36-005)
		Installed:	September, 1956

HISTORICAL TRAFFIC DATA

Year	AADT	Percent of AADT				
		Max Day	Max Hour	10TH Hour	20TH Hour	30TH Hour
2009	5453	132	15.0	11.5	11.0	10.7
2010	5594	135	14.7	11.8	11.2	11.0
2011	5553	135	14.5	11.8	11.3	11.1
2012	5556	133	14.6	11.8	11.6	11.4
2013	5644	143	14.5	12.1	11.5	11.2
2014	5970	134	14.0	11.8	11.7	11.5
2015	6431	136	12.5	11.5	11.2	11.0
2016	6632	134	13.2	11.7	11.4	11.2
2017	7159	156	12.5	11.7	11.6	11.3
2018	7464	129	12.8	11.5	11.2	11.1



2018 TRAFFIC DATA











	Average Weekday Traffic	Percent of AADT	Average Daily Traffic	Percent of AADT
January	6998	94	6649	89
February	7485	100	7069	95
March	7627	102	7194	96
April	7895	106	7509	101
May	8037	108	7874	105
June	8127	109	7943	106
July	7969	107	7708	103
August	8177	110	7896	106
September	8091	108	7862	105
October	8144	109	7828	105
November	7796	104	7402	99
December	7044	94	6632	89

For Vehicle Classification data near your project, please go to the following web page:
https://www.oregon.gov/ODOT/Data/Documents/TVT_2018.xlsx

Intersection						
Intersection Delay, s/veh	7.3					
Intersection LOS	A					
Approach	EB	WB	NB		SB	
Entry Lanes	1	1	1		1	
Conflicting Circle Lanes	1	1	1		1	
Adj Approach Flow, veh/h	78	48	596		591	
Demand Flow Rate, veh/h	79	48	608		604	
Vehicles Circulating, veh/h	588	623	95		46	
Vehicles Exiting, veh/h	29	80	572		606	
Ped Vol Crossing Leg, #/h	0	0	50		0	
Ped Cap Adj	1.000	1.000	0.993		1.000	
Approach Delay, s/veh	5.9	5.3	8.2		6.7	
Approach LOS	A	A	A		A	
Lane	Left	Left	Bypass	Left	Left	Bypass
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized			Yield			Free
Lane Util	1.000	1.000		1.000	1.000	
Follow-Up Headway, s	2.609	2.609		2.609	2.609	
Critical Headway, s	4.976	4.976	19	4.976	4.976	33
Entry Flow, veh/h	79	29	744	608	571	1938
Cap Entry Lane, veh/h	758	731	0.980	1252	1317	0.980
Entry HV Adj Factor	0.982	0.992	19	0.980	0.980	32
Flow Entry, veh/h	78	29	729	596	559	1900
Cap Entry, veh/h	744	725	0.026	1219	1290	0.017
V/C Ratio	0.104	0.040	5.2	0.489	0.434	0.0
Control Delay, s/veh	5.9	5.4	A	8.2	7.1	A
LOS	A	A	0	A	A	0
95th %tile Queue, veh	0	0		3	2	




















Springwood at Vittoria
2021 Total Conditions

PM Peak
Count date 10-30-19

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	19	37	433	45	29	430
Future Volume (Veh/h)	19	37	433	45	29	430
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	20	39	461	48	31	457
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh			2			2
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1004	485			509	
vC1, stage 1 conf vol	485					
vC2, stage 2 conf vol	519					
vCu, unblocked vol	1004	485			509	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	93			97	
cM capacity (veh/h)	474	582			1056	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	59	509	31	457		
Volume Left	20	0	31	0		
Volume Right	39	48	0	0		
cSH	540	1700	1056	1700		
Volume to Capacity	0.11	0.30	0.03	0.27		
Queue Length 95th (ft)	9	0	2	0		
Control Delay (s)	12.5	0.0	8.5	0.0		
Lane LOS	B		A			
Approach Delay (s)	12.5	0.0	0.5			
Approach LOS	B					
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			35.5%	ICU Level of Service	A	
Analysis Period (min)			15			

Springbrook at Aquarius
2021 Total Conditions

PM Peak
Count date 10-30-19

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	13	0	5	26	2	18	19	492	48	18	420	4	
Future Volume (Veh/h)	13	0	5	26	2	18	19	492	48	18	420	4	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	14	0	5	28	2	20	21	535	52	20	457	4	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type							TWLTL						
Median storage veh							2						
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	1097	1128	459	1105	1104	561	461					587	
vC1, stage 1 conf vol	499	499			603	603							
vC2, stage 2 conf vol	598	629			502	501							
vCu, unblocked vol	1097	1128	459	1105	1104	561	461					587	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1					4.1	
tC, 2 stage (s)	6.1	5.5			6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2					2.2	
p0 queue free %	96	100	99	93	99	96	98					98	
cM capacity (veh/h)	370	377	602	381	387	527	1100					988	
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2						
Volume Total	19	19	31	21	587	20	461						
Volume Left	14	19	9	21	0	20	0						
Volume Right	5	0	20	0	52	0	4						
cSH	412	381	463	1100	1700	988	1700						
Volume to Capacity	0.05	0.05	0.07	0.02	0.35	0.02	0.27						
Queue Length 95th (ft)	4	4	5	1	0	2	0						
Control Delay (s)	14.2	14.9	13.3	8.3	0.0	8.7	0.0						
Lane LOS	B	B	B	A		A							
Approach Delay (s)	14.2	13.9			0.3			0.4					
Approach LOS	B	B											
Intersection Summary													
Average Delay			1.1										
Intersection Capacity Utilization			43.2%		ICU Level of Service		A						
Analysis Period (min)			15										

Springbrook at Haworth
Total Conditions

PM Peak
Count date 10-30-19

Intersection	
Intersection Delay, s/veh	53.8
Intersection LOS	F

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕		↕	↕		↕	↕	
Traffic Vol, veh/h	88	84	197	117	84	73	151	408	6	54	377	49
Future Vol, veh/h	88	84	197	117	84	73	151	408	6	54	377	49
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	91	87	203	121	87	75	156	421	6	56	389	51
Number of Lanes	0	1	1	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	20	35.4	62.3	80.2
HCM LOS	C	E	F	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	51%	0%	43%	100%	0%
Vol Thru, %	0%	99%	49%	0%	31%	0%	88%
Vol Right, %	0%	1%	0%	100%	27%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	151	414	172	197	274	54	426
LT Vol	151	0	88	0	117	54	0
Through Vol	0	408	84	0	84	0	377
RT Vol	0	6	0	197	73	0	49
Lane Flow Rate	156	427	177	203	282	56	439
Geometry Grp	7	7	7	7	6	7	7
Degree of Util (X)	0.392	1.014	0.465	0.479	0.734	0.142	1.051
Departure Headway (Hd)	9.408	8.874	9.812	8.811	9.759	9.418	8.811
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	385	414	369	412	373	383	417
Service Time	7.108	6.574	7.512	6.511	7.759	7.118	6.511
HCM Lane V/C Ratio	0.405	1.031	0.48	0.493	0.756	0.146	1.053
HCM Control Delay	18	78.4	20.8	19.3	35.4	13.7	88.6
HCM Lane LOS	C	F	C	C	E	B	F
HCM 95th-tile Q	1.8	12.8	2.4	2.5	5.7	0.5	14.1

Springbrook- OR 99
Total Conditions

PM Peak
Count date 10-30-19

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	113	1089	119	448	1324	276	403	233	289	375	209	118	
Future Volume (vph)	113	1089	119	448	1324	276	403	233	289	375	209	118	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Grade (%)		0%			0%			3%			0%		
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	1.00	1.00	
Fr _t	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Fl _t Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1787	3574	1599	3467	3574	1599	3382	1835	1560	3467	1881	1599	
Fl _t Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1787	3574	1599	3467	3574	1599	3382	1835	1560	3467	1881	1599	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	
Adj. Flow (vph)	120	1159	127	477	1409	294	429	248	307	399	222	126	
RTOR Reduction (vph)	0	0	74	0	0	113	0	0	191	0	0	101	
Lane Group Flow (vph)	120	1159	53	477	1409	181	429	248	116	399	222	25	
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases	7	4		3	8		5	2		1	6		
Permitted Phases			4			8			2			6	
Actuated Green, G (s)	12.6	50.9	50.9	22.4	60.7	60.7	20.7	29.3	29.3	19.4	28.0	28.0	
Effective Green, g (s)	12.6	50.9	50.9	22.4	60.7	60.7	20.7	29.3	29.3	19.4	28.0	28.0	
Actuated g/C Ratio	0.09	0.36	0.36	0.16	0.43	0.43	0.15	0.21	0.21	0.14	0.20	0.20	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	160	1299	581	554	1549	693	500	384	326	480	376	319	
v/s Ratio Prot	0.07	0.32		c0.14	c0.39		c0.13	c0.14		0.12	0.12		
v/s Ratio Perm			0.03			0.11			0.07			0.02	
v/c Ratio	0.75	0.89	0.09	0.86	0.91	0.26	0.86	0.65	0.35	0.83	0.59	0.08	
Uniform Delay, d1	62.2	42.0	29.3	57.3	37.1	25.3	58.2	50.6	47.3	58.7	50.8	45.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.8	8.1	0.1	12.9	8.2	0.2	13.6	8.1	3.0	11.7	6.7	0.5	
Delay (s)	79.9	50.1	29.4	70.2	45.3	25.5	71.8	58.7	50.3	70.4	57.5	46.0	
Level of Service	E	D	C	E	D	C	E	E	D	E	E	D	
Approach Delay (s)		50.7			48.1			61.8			62.4		
Approach LOS		D			D			E			E		
Intersection Summary													
HCM 2000 Control Delay			53.3		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.86										
Actuated Cycle Length (s)			140.0		Sum of lost time (s)					18.0			
Intersection Capacity Utilization			80.8%		ICU Level of Service					D			
Analysis Period (min)			15										

c Critical Lane Group

Aquarius at Coffey Lane
Built-out Conditions

PM Peak
Count date 10-30-19

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	39	23	1	30	3	13	0	1	0	0	2
Future Volume (Veh/h)	0	39	23	1	30	3	13	0	1	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	0	53	31	1	41	4	18	0	1	0	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	45			84			116	116	68	114	129	43
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	45			84			116	116	68	114	129	43
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1563			1513			857	774	995	861	761	1027
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	84	46	19	3								
Volume Left	0	1	18	0								
Volume Right	31	4	1	3								
cSH	1563	1513	863	1027								
Volume to Capacity	0.00	0.00	0.02	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.0	0.2	9.3	8.5								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	0.2	9.3	8.5								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			17.6%	ICU Level of Service		A						
Analysis Period (min)			15									

Intersection: 3:

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	65	80	54	46	87	70	186
Average Queue (ft)	33	50	31	24	48	16	95
95th Queue (ft)	59	77	54	45	81	61	167
Link Distance (ft)	613		1173		543		587
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	200		80		150		
Storage Blk Time (%)			0		1	3	
Queuing Penalty (veh)			0		0	1	

Network Summary

Network wide Queuing Penalty: 1

Intersection: 3:

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	58	88	59	52	97	48	167
Average Queue (ft)	35	51	31	28	54	13	97
95th Queue (ft)	55	82	58	49	91	47	160
Link Distance (ft)	613		1173		543		587
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		200		80		150	
Storage Blk Time (%)					1		2
Queuing Penalty (veh)					1		0

Network Summary

Network wide Queuing Penalty: 1

Intersection: 3:

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	53	66	47	50	81	30	152
Average Queue (ft)	38	47	30	30	56	14	105
95th Queue (ft)	59	72	57	58	97	41	184
Link Distance (ft)	613		1173		543		587
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		200		80		150	
Storage Blk Time (%)					2		4
Queuing Penalty (veh)					1		1

Network Summary

Network wide Queuing Penalty: 2

Intersection: 3:

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	112	133	192	105	351	175	494
Average Queue (ft)	58	60	92	72	143	91	287
95th Queue (ft)	94	103	159	127	292	216	588
Link Distance (ft)	613		1173		543		587
Upstream Blk Time (%)					0		14
Queuing Penalty (veh)					0		0
Storage Bay Dist (ft)		200		80		150	
Storage Blk Time (%)				2	32	0	53
Queuing Penalty (veh)				7	48	0	28

Network Summary

Network wide Queuing Penalty: 84

Intersection: 3:

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	97	117	190	104	309	174	452
Average Queue (ft)	54	56	92	70	130	66	225
95th Queue (ft)	89	93	167	123	258	177	509
Link Distance (ft)	613		1173		543		587
Upstream Blk Time (%)							9
Queuing Penalty (veh)							0
Storage Bay Dist (ft)		200		80		150	
Storage Blk Time (%)				1	27	0	33
Queuing Penalty (veh)				4	40	0	18

Network Summary

Network wide Queuing Penalty: 61

Intersection: 3:

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	LT	R	LTR	L	TR	L	TR
Maximum Queue (ft)	120	138	225	105	371	175	533
Average Queue (ft)	58	62	93	70	144	87	291
95th Queue (ft)	96	104	172	125	319	211	619
Link Distance (ft)	613		1173		543		587
Upstream Blk Time (%)					1		14
Queuing Penalty (veh)					0		0
Storage Bay Dist (ft)		200		80		150	
Storage Blk Time (%)	0			1	32	0	50
Queuing Penalty (veh)	0			4	48	0	27

Network Summary

Network wide Queuing Penalty: 78

SPRINGBROOK & HAWORTH APPROACH COUNTS**WEDNESDAY, OCTOBER 30TH, 2019**

N SPRINGBROOK & HAWORTH AVE				
TIME	NB	EB	SB	WB
0:00	23	9	8	6
1:00	7	9	25	2
2:00	4	4	11	1
3:00	9	10	21	0
4:00	60	31	60	5
5:00	95	79	143	14
6:00	154	165	342	41
7:00	295	218	356	40
8:00	333	242	416	64
9:00	265	251	332	105
10:00	230	211	303	127
11:00	299	278	356	165
12:00	332	288	327	181
13:00	282	265	285	211
14:00	448	302	331	227
15:00	403	313	423	239
16:00	475	324	414	253
17:00	513	315	415	258
18:00	459	262	333	239
19:00	305	173	213	145
20:00	196	92	137	94
21:00	145	70	80	49
22:00	96	34	47	20
23:00	40	20	25	16
TOTAL	5468	3965	5403	2502

SPRINGBROOK & HAWORTH APPROACH COUNTS**WEDNESDAY, OCTOBER 30TH, 2019**

N SPRINGBROOK & HAWORTH AVE					
TIME	NB	SB	TOTAL	EB	WB
17:00	513	415	928	315	258
16:00	475	414	889	324	253
15:00	403	423	826	313	239
18:00	459	333	792	262	239
14:00	448	331	779	302	227
8:00	333	416	749	242	64
12:00	332	327	659	288	181
11:00	299	356	655	278	165
7:00	295	356	651	218	40
9:00	265	332	597	251	105
13:00	282	285	567	265	211
10:00	230	303	533	211	127
19:00	305	213	518	173	145
6:00	154	342	496	165	41
20:00	196	137	333	92	94
5:00	95	143	238	79	14
21:00	145	80	225	70	49
22:00	96	47	143	34	20
4:00	60	60	120	31	5
23:00	40	25	65	20	16
1:00	7	25	32	9	2
0:00	23	8	31	9	6
3:00	9	21	30	10	0
2:00	4	11	15	4	1
TOTAL	5468	5403	10871	3965	2502

Traffic Signal warrants for NE Springbrook Road and Haworth Avenue

The eight highest hours from an entire day¹ are summarized in the table for both directions of travel on Springbrook Road and Haworth Avenue.

Table for Highest Eight Hours of Traffic Volumes

TIME	N SPRINGBROOK & HAWORTH AVE					Eight hour warrant	Four hour warrant
	NB	SB	Total	EB	WB		
17:00	513	415	928	315	258	Met	Met
16:00	475	414	889	324	253	Met	Met
15:00	403	423	826	313	239	Met	Met
18:00	459	333	792	262	239	Met	Met
14:00	448	331	779	302	227	Met	
8:00	333	416	749	242	64	Met	
12:00	332	327	659	288	181	Met	
11:00	299	356	655	278	165	Met	

Traffic signal warrants per the MUTCD² were examined, and the intersection met the criteria based on existing traffic volume, as summarized in table above.

Traffic Signal Warrants

Warrant	Met criteria?	Rationale
Warrant 1, Eight-Hour Vehicular Volume	Yes	<ul style="list-style-type: none"> Met criteria for any hours of the day, 8 hours needed Condition A: the threshold was 600 vehicles per hour on major street (total of both approaches) and 200 vehicles per hour on the higher volume minor street approach (one direction only) Condition B: the threshold was 900 vehicles per hour on major street (total of both approaches) and 100 vehicles per hour on the higher volume minor street approach (one direction only)
Warrant 2, Four-Hour Vehicular Volume	Yes	<ul style="list-style-type: none"> Met the criteria for any hours of the day, 4 hours needed The thresholds vary based on volume
Warrant 3, Peak Hour	N/A	<ul style="list-style-type: none"> This does not fit the situation described, there is not an office complex, manufacturing plant, industrial complex, etc.
Warrant 4, Pedestrian Volume	N/A	<ul style="list-style-type: none"> This does not fit the situation described, there is very little pedestrian activity during the peak hours (per the traffic count data)
Warrant 5, School Crossing	N/A	<ul style="list-style-type: none"> This does not fit the situation described, there is no school nearby
Warrant 6,	N/A	<ul style="list-style-type: none"> This does not fit the situation described. A traffic signal at this

¹ Data collected on October 30, 2019 by IDAX

² Federal Highway Administration Manual on Uniform Control Devices, 2009 Edition

Coordinated Signal System		intersection is not needed for platooning of vehicles.
Warrant 7, Crash Experience	No	<ul style="list-style-type: none"> Does not meet the criteria of five reported crashes in a 12-month period over a five-year period
Warrant 8, Roadway Network	N/A	<ul style="list-style-type: none"> This does not fit the situation described, this intersection is not needed to concentrate traffic flow on a roadway network
Warrant 9, Intersection Near a Grade Crossing	N/A	<ul style="list-style-type: none"> This does not fit the situation described, this intersection is not near a grade crossing

Appendix C

Crash data

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION RELATED	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2013														
FIXED / OTHER OBJECT	1	0	0	1	1	0	0	1	0	1	0	1	0	1
REAR-END	0	0	1	1	0	0	0	1	0	0	1	1	0	0
YEAR 2013 TOTAL	1	0	1	2	1	0	0	2	0	1	1	2	0	1
FINAL TOTAL	1	0	1	2	1	0	0	2	0	1	1	2	0	1

11/13/2019 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SPRINGBROOK RD at HAWORTH AVE, City of Newberg, Yamhill County, 01/01/2013 to 12/31/2018

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2018													
ANGLE	0	2	0	2	0	3	0	2	0	1	1	2	0
TURNING MOVEMENTS	0	1	0	1	0	5	0	1	0	0	1	1	0
YEAR 2018 TOTAL	0	3	0	3	0	8	0	2	1	1	2	3	0
YEAR: 2017													
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0
TURNING MOVEMENTS	0	3	1	4	0	4	0	3	1	3	1	4	0
YEAR 2017 TOTAL	0	3	2	5	0	4	0	4	1	4	1	5	0
YEAR: 2016													
ANGLE	0	1	1	2	0	1	0	1	1	1	1	2	0
BACKING	0	0	1	1	0	0	0	1	0	1	0	1	0
TURNING MOVEMENTS	0	2	2	4	0	2	0	3	1	1	3	4	1
YEAR 2016 TOTAL	0	3	4	7	0	3	0	5	2	3	4	7	1
YEAR: 2014													
ANGLE	0	1	1	2	0	1	0	1	1	1	1	2	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0
YEAR 2014 TOTAL	0	1	2	3	0	1	0	2	1	2	1	3	0
YEAR: 2013													
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0
YEAR 2013 TOTAL	0	0	2	2	0	0	0	2	0	2	0	2	0
FINAL TOTAL	0	10	10	20	0	16	0	15	5	12	8	20	1

11/13/2019 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SPRINGBROOK RD at PACIFIC HY 99W, City of Newberg, Yamhill County, 01/01/2013 to 12/31/2018

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION RELATED	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2018														
ANGLE	0	1	0	1	0	6	0	1	0	0	1	1	0	0
REAR-END	0	3	0	3	0	3	0	2	1	2	1	3	0	0
YEAR 2018 TOTAL	0	4	0	4	0	9	0	3	1	2	2	4	0	0
YEAR: 2017														
REAR-END	0	1	3	4	0	2	0	3	1	3	1	4	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	0	1	0	1	1	0	0
YEAR 2017 TOTAL	0	2	3	5	0	3	0	3	2	3	2	5	0	0
YEAR: 2016														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	0	3	3	0	0	0	2	1	2	1	3	0	0
YEAR 2016 TOTAL	0	0	4	4	0	0	0	3	1	3	1	4	0	0
YEAR: 2015														
BACKING	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	2	2	4	0	2	0	4	0	4	0	4	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	2	0	0	2	2	0	0
YEAR 2015 TOTAL	0	2	5	7	0	2	0	7	0	5	2	7	0	0
YEAR: 2014														
REAR-END	0	5	6	11	0	7	0	9	2	9	2	11	0	0
SIDESWIPE - OVERTAKING	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	0	1	1	0	1	0	0
YEAR 2014 TOTAL	0	7	6	13	0	9	0	10	3	11	2	13	0	0
YEAR: 2013														
REAR-END	0	9	3	12	0	13	0	9	2	11	1	12	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	0	1	1	0	0
YEAR 2013 TOTAL	0	10	3	13	0	15	0	10	2	11	2	13	0	0
FINAL TOTAL	0	25	21	46	0	38	0	36	9	35	11	46	0	0

Appendix D

Traffic volume for study intersections
Existing, background and buildout condition.

TRIP ESTIMATES FOR EXISTING, BACKGROUND AND BUILT-OUT CONDITIONS

AM Peak												
Springbrook at Crestview												
	Northbound			Westbound			Southbound			Eastbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing volumes	71	326	10	2	12	12	7	400	149	59	11	82
General growth	1	7	0	0	0	0	0	8	3	1	0	2
Inprocess Crestview	0	0	5	16	16	17	5	0		0	6	0
Inprocess Meadowcreek Ph-1	2	2	0	0	0	0	0	1	0	1	0	0
Background Conditions	75	335	15	18	28	29	12	409	152	61	17	84
Site trips	2	2	0	0	0	0	0	1	0	0	0	0
Total conditions	77	337	15	18	28	29	12	410	152	61	17	84
Springbrook at Vittoria Way												
	Northbound			Westbound			Southbound			Eastbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing volumes	0	315	12	26	0	33	20	372	0	0	0	0
General growth	0	6	0	1	0	1	0	7	0	0	0	0
Inprocess Crestview												
Inprocess Meadowcreek Ph-1	0	2	1	0	0	0	0	2	0	0	0	0
Background Conditions	0	323	13	27	0	33	20	381	0	0	0	0
Site trips	0	3	1	0	0	0	0	1	0	0	0	0
Total conditions	0	326	14	27	0	33	20	382	0	0	0	0
Springbrook at Aquarius Blvd												
	Northbound			Westbound			Southbound			Eastbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing volumes	2	343	7	16	0	11	7	432	1	3	0	13
General growth	0	7	0	0	0	0	0	9	0	0	0	0
Inprocess Crestview												
Inprocess Meadowcreek Ph-1	0	3	0	0	0	0	0	5	0	0	0	0
Background Conditions	2	353	8	16	0	11	8	445	1	3	0	13
Site trips	0	0	6	15	0	4	1	0	0	0	0	0
Total conditions	2	353	14	31	0	15	9	445	1	3	0	13
Springbrook at Haworth												
	Northbound			Westbound			Southbound			Eastbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing volumes	66	286	8	33	12	14	19	384	59	63	27	178
General growth	1	6	0	1	0	0	0	8	1	1	1	4
Inprocess Crestview	5	0	0	0	0	0	0	0	0	0	0	5
Inprocess Meadowcreek Ph-1	0	2	0	0	0	1	1	3	3	4	0	0
Background Conditions	73	294	9	33	12	15	20	395	63	68	28	187
Site trips	0	4	0	0	0	1	1	11	2	1	0	0
Total conditions	73	298	9	33	12	16	21	406	65	69	28	187

TRIP ESTIMATES FOR EXISTING, BACKGROUND AND BUILT-OUT CONDITIONS

Springbrook at OR-99												
	Northbound			Westbound			Southbound			Eastbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing volumes	179	180	361	231	697	137	362	112	79	57	994	57
General growth	4	4	7	5	14	3	7	2	2	1	20	1
Inprocess Crestview	0	0	3	8	32	16	5	0	0	0	11	0
Inprocess Meadowcreek Ph-1	0	1	0	1	0	0	4	2	1	0	0	0
Surgical Center	0	0	3	1	3	1	3	0	0	0	10	0
Background Conditions	183	185	371	245	746	157	381	116	82	58	1035	58
Site trips	0	2	0	0	0	1	7	2	2	1	0	0
Total conditions	183	187	371	245	746	158	388	118	84	59	1035	58

Aquarius Blvd at Coffey Lane												
	Northbound			Westbound			Southbound			Eastbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing volumes	0	0	0	0	21	0	1	0	3	1	15	0
General growth	0	0	0	0	0	0	0	0	0	0	0	0
Inprocess Crestview												
Inprocess Meadowcreek Ph-1												
Background Conditions	0	0	0	0	21	0	1	0	3	1	15	0
Site trips	19	0	1	0	0	0	0	0	0	0	0	7
Total conditions	19	0	1	0	21	0	1	0	3	1	15	7

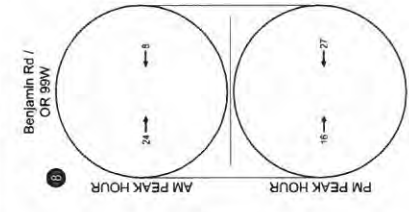
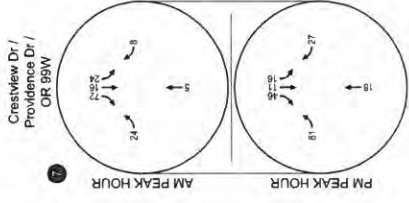
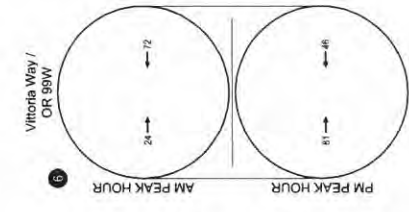
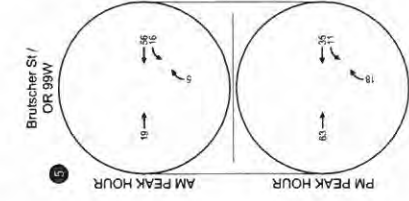
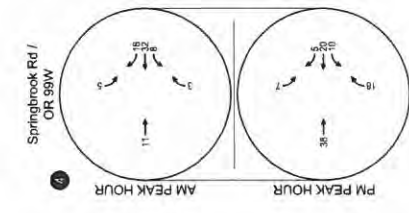
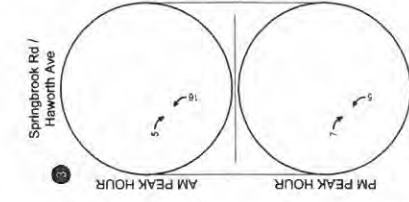
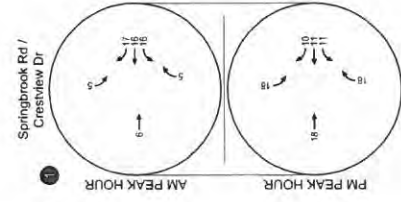
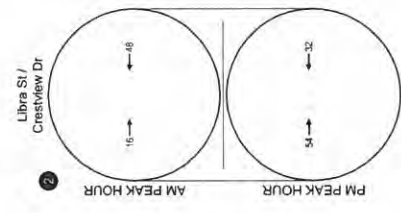
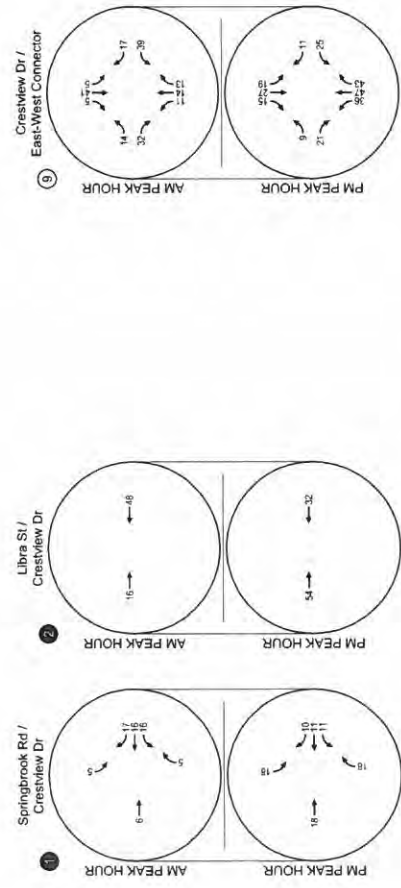
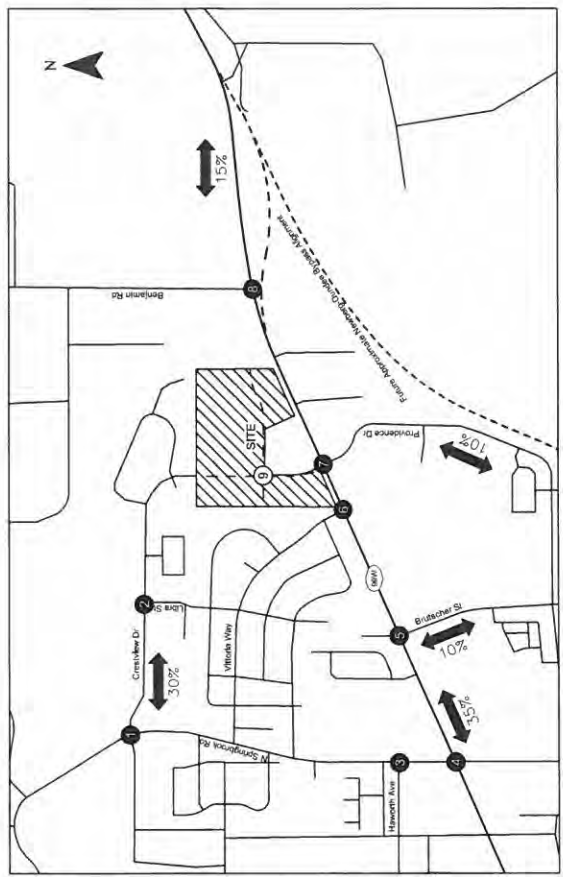
PM Peak

Springbrook at Crestview												
	Northbound			Westbound			Southbound					
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
Existing volumes	13	499	10	4	0	8	8	481	30			
General growth	0	10	0	0	0	0	0	10	0			
Inprocess Crestview	0	0	18	11	11	10	18	0	0			
Inprocess Meadowcreek Ph-1	1	1	0	0	0	0	0	2	0			
Background Conditions	15	510	28	16	11	18	26	492	30			
Site trips	1	1	0	0	0	0	0	2	0			
Total conditions	16	511	28	16	11	18	26	494	30			

Springbrook at Vittoria Way												
	Northbound			Westbound			Southbound					
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
Existing volumes	0	420	43	18	0	36	28	414	0			
General growth	0	8	1	0	0	1	1	8	0			
Inprocess Crestview												
Inprocess Meadowcreek Ph-1	0	2	1	1	0	0	0	4	0			
Background Conditions	0	431	45	19	0	37	29	426	0			
Site trips	0	2	0	0	0	0	0	4	0			
Total conditions	0	433	45	19	0	37	29	430	0			

TRIP ESTIMATES FOR EXISTING, BACKGROUND AND BUILT-OUT CONDITIONS

Springbrook at Aquarius Blvd												
	Northbound			Westbound			Southbound			Eastbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing volumes	19	479	33	16	2	16	14	406	4	13	0	5
General growth	0	10	1	0	0	0	0	8	0	0	0	0
Inprocess Crestview												
Inprocess Meadowcreek Ph-1	0	3	0	0	0	0	0	5	0	0	0	0
Background Conditions	19	492	33	16	2	16	14	420	4	13	0	5
Site trips	0	0	15	10	0	2	4	0	0	0	0	0
Total conditions	19	492	48	26	2	18	18	420	4	13	0	5
Springbrook at Haworth												
	Northbound			Westbound			Southbound			Eastbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing volumes	143	382	6	115	82	69	51	361	42	79	82	186
General growth	3	8	0	2	2	1	1	7	1	2	2	4
Inprocess Crestview	5	0	0	0	0	0	0	0	0	0	0	7
Inprocess Meadowcreek Ph-1	0	7	0	0	0	1	1	3	3	4	0	0
Background Conditions	151	397	6	117	84	72	53	371	46	85	84	197
Site trips	0	11	0	0	0	1	1	6	3	3	0	0
Total conditions	151	408	6	117	84	73	54	377	49	88	84	197
Springbrook at OR-99												
	Northbound			Westbound			Southbound			Eastbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing volumes	395	218	265	425	1265	259	354	199	116	107	1026	117
General growth	8	4	5	9	25	5	7	4	2	2	21	2
Inprocess Crestview	0	0	18	10	20	5	7	0	0	0	38	0
Inprocess Meadowcreek Ph-1	0	3	0	0	0	3	2	1	0	1	0	0
Surgical Center	0	0	1	4	14	3	4	0	0	0	5	0
Background Conditions	403	225	289	448	1324	275	374	204	118	111	1089	119
Site trips	0	8	0	0	0	1	1	5	0	2	0	0
Total conditions	403	233	289	448	1324	276	375	209	118	113	1089	119
Aquarius Blvd at Coffey Lane												
	Northbound			Westbound			Southbound			Eastbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing volumes	1	0	0	0	29	3	0	0	2	4	38	0
General growth	0	0	0	0	1	0	0	0	0	0	1	0
Inprocess Crestview												
Inprocess Meadowcreek Ph-1												
Background Conditions	1	0	0	0	30	3	0	0	2	4	39	0
Site trips	12	0	1	1	0	0	0	0	0	0	0	19
Total conditions	13	0	1	1	30	3	0	0	2	4	39	19

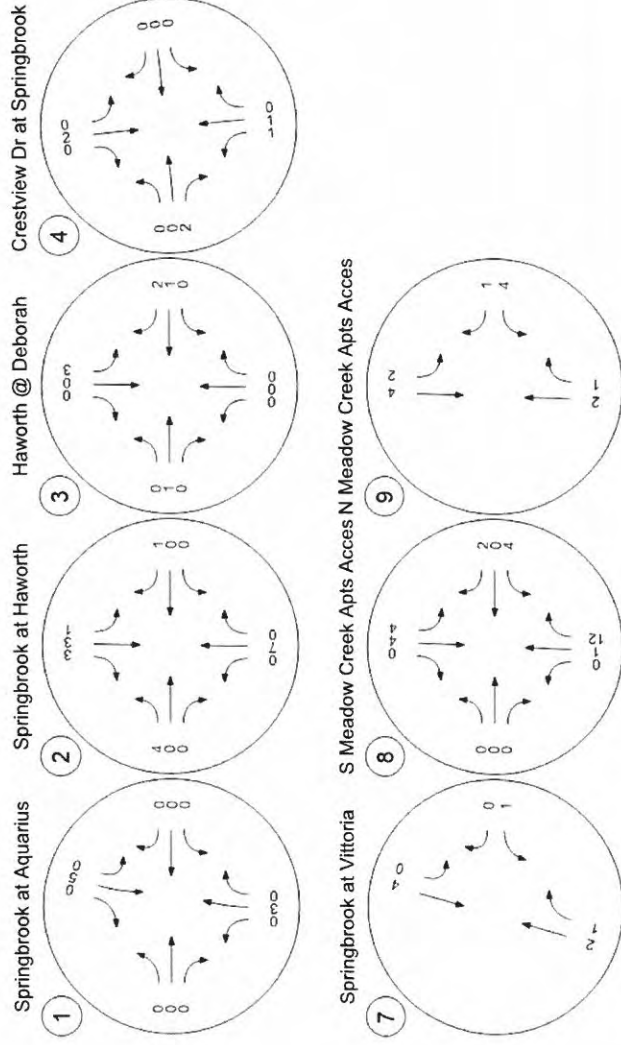


	TOTAL	IN	OUT
AM	213	53	160
PM	285	180	105

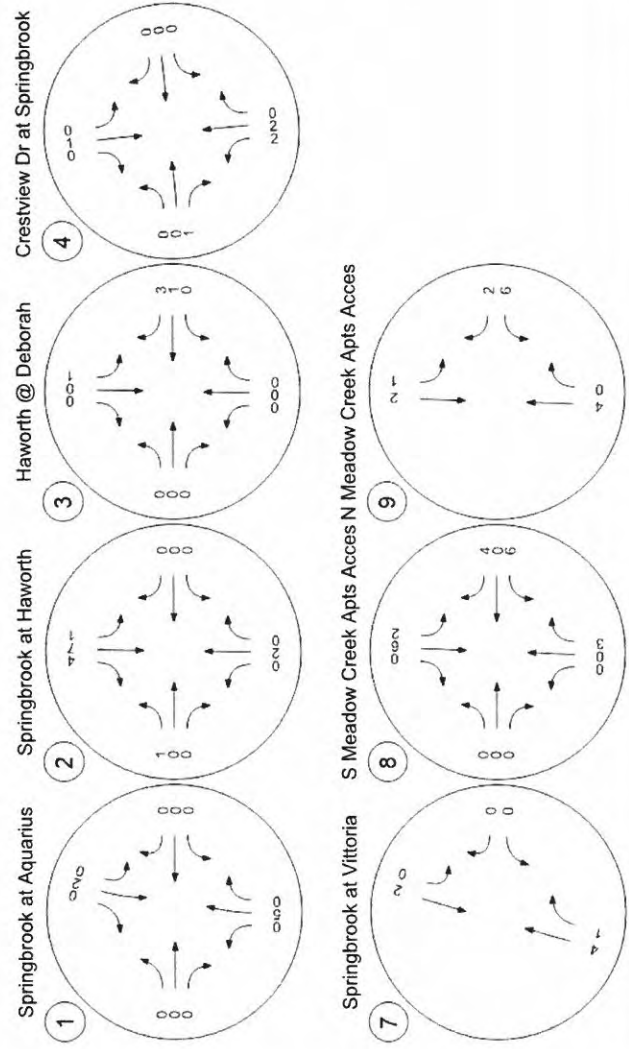
Site-Generated Trips
Weekday AM and PM Peak Hours
Newberg, Oregon

Figure 9

Report Figure 2d: Traffic Volume - Net New Site Trips



Report Figure 2d: Traffic Volume - Net New Site Trips



Traffic Impact Analysis

Newberg Ambulatory Surgical Center

Newberg, Oregon



Introduction:

The Oregon Clinic intends to develop a 17,510 sq. ft. Ambulatory Surgery Center on 3 acres of tax lot 2001 of tax map 3S2W16 in Newberg, Oregon. The site is west of Providence Drive and south of the Providence Hospital in Newberg. The facility will be developed with access to Providence Dr.

The Newberg Ambulatory Surgical Center will use the Newberg transportation system and add traffic to the roadways. This analysis will consider the traffic impacts at the intersection of 1) Providence Dr at Hwy 99W, 2) Hayes St at Werth Blvd. 3) Hayes St at Brutscher St and 4) Site Access at Providence Dr. Brutscher St at Fernwood Rd was closed while this study was conducted, diverting traffic to other intersections. Crash data was provided by the ODOT Crash Data Unit for the most recent 5 years.



Figure 1 - Vicinity Map

Summary of Findings:

The Newberg Ambulatory Surgical Center will generate an estimated 633 trips each day. 42 of those trips will be in the AM Peak hour and 62 trips will be in the PM Peak hour. The performance metrics at the studied intersections are shown in the following table upon opening in 2017.

	AM Peak hour		PM Peak hour	
	LOS	v/c	LOS	v/c
Hwy 99W at Providence Dr	A	0.661	B	0.721
Hayes at Werth	A		A	
Hayes at Brutscher	A		A	
Site Access at Providence Dr	A	0.012	B	0.067

Crash data from ODOT Crash Data Unit identifies 9 crashes at the studied intersections in the last 5 years. None were fatal crashes, 4 were injury crashes and 5 were property damage only crashes.

History and Existing Conditions:

The site has been vacant in the recent past and was is adjacent to the Providence Medical Center. The site is zoned Residential/Specific Plan (R R/SP). Traffic from the planned ambulatory surgery center will travel north or south on Providence Dr to access the transportation system. The intersection of Providence

Appendix E

Sight distance evaluation and turn lane warrants for site access.

LEFT TURN LANE WARRANT FOR SITE ACCESS

(South approach of Coffey Lane at Aquarius Blvd.)

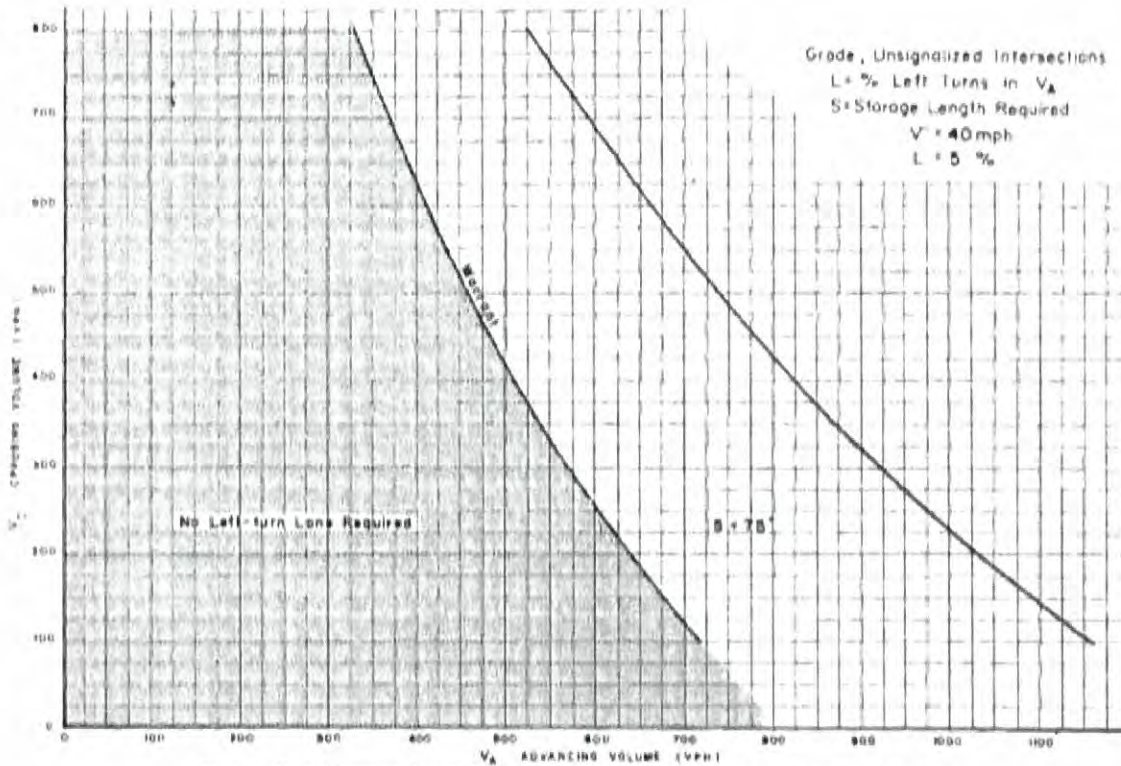


Figure 2. Warrant for left-turn storage lanes on two-lane highways.

STORAGE REQUIREMENT FOR CRITICAL LEFT TURN MOVEMENT AT UNSIGNALIZED INTERSECTIONS ON 2- LANE ROAD

Intersection	Mov't	Analysis Period	Speed V MPH	Left turns in advancing volume (vph)	Advancing Volume VA (vph)	Opposing Volume VO (vph)	% Left turns in advancing volume (L)	Storage Req'd. (Ft.)
Aquarius Blvd /Coffey Lane	WB Lt.	AM Peak	<40	1	34	62	3%	None
Aquarius Blvd /Coffey Lane	WB Lt	PM Peak	<40	0	21	23	0	None

Source: Highway Research Record # 211, Harmelink, M.D.

Site access- Coffey lane at Aquarius Blvd.- Looking left
Over 350 feet of filtered sight distance
Sight distance partially obstructed by landscaping in the planter strip



Site access- Coffey lane at Aquarius Blvd – Looking right
Over 350 feet of filtered sight distance
Sight distance partially obstructed by landscaping in the planter strip

