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MEMORANDUM

Date:	December 22, 2021	Project #: 27223
To:	Kevin Hottmann, PE, City of Salem	
Cc:	Casey McKeon, Heslin Holdings Charles Moseley, Barghausen Consulting Engineers	
From:	Kristine Connolly, PE, & Keisuke Harry, PE	
Project:	Salem Fred Meyer Fuel Addition	
Subject:	Traffic Impact Analysis	

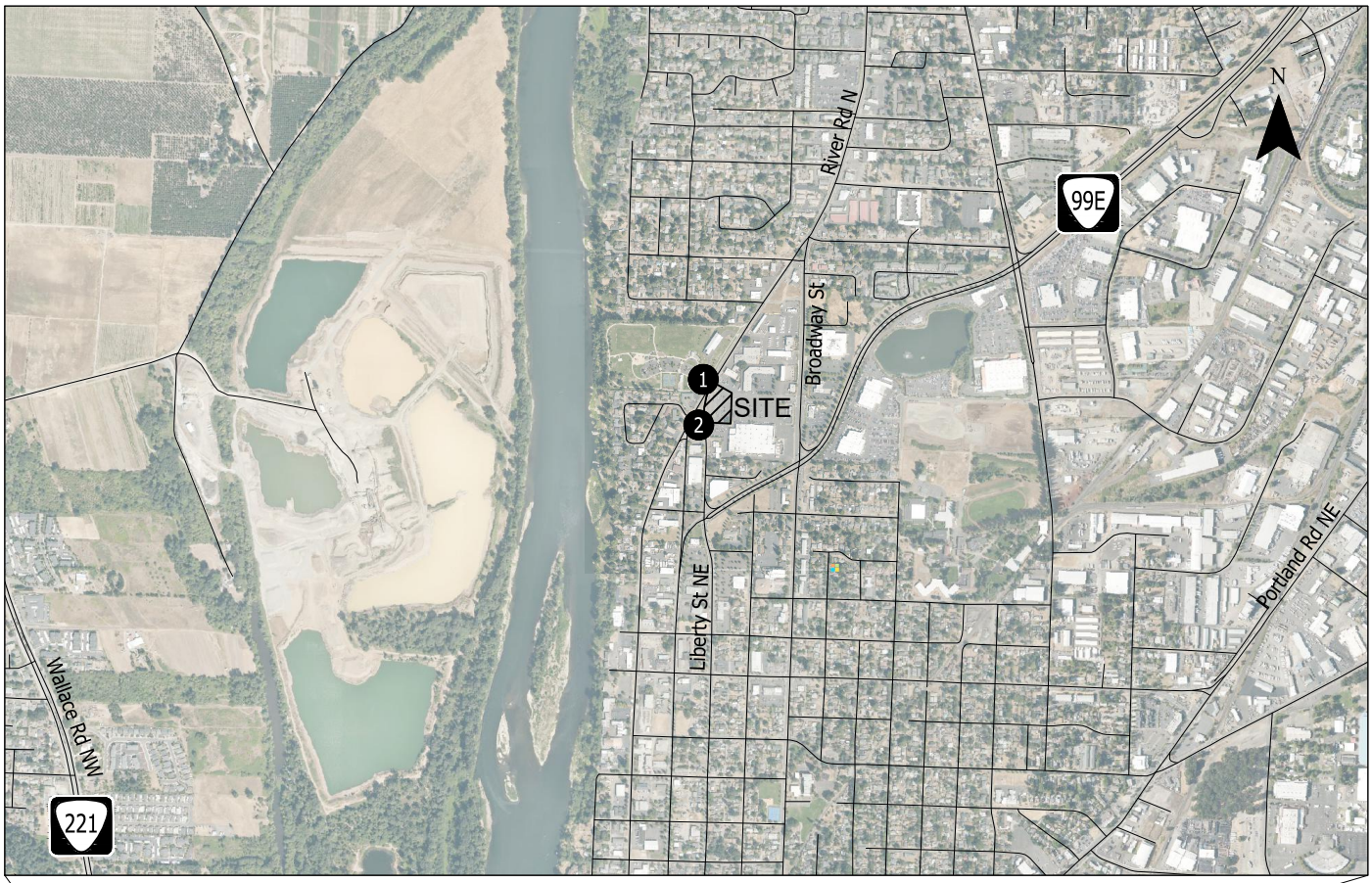
This memorandum documents the traffic impact analysis (TIA) prepared for the proposed Fred Meyer fuel station addition to the northwest corner of the existing North Salem Fred Meyer parking lot located at 2980 River Road N. Based on the analysis provided and documented herein, the proposed project can be constructed while complying with City of Salem requirements assuming provision of mitigation measures identified in this report. Key recommendations from this study include:

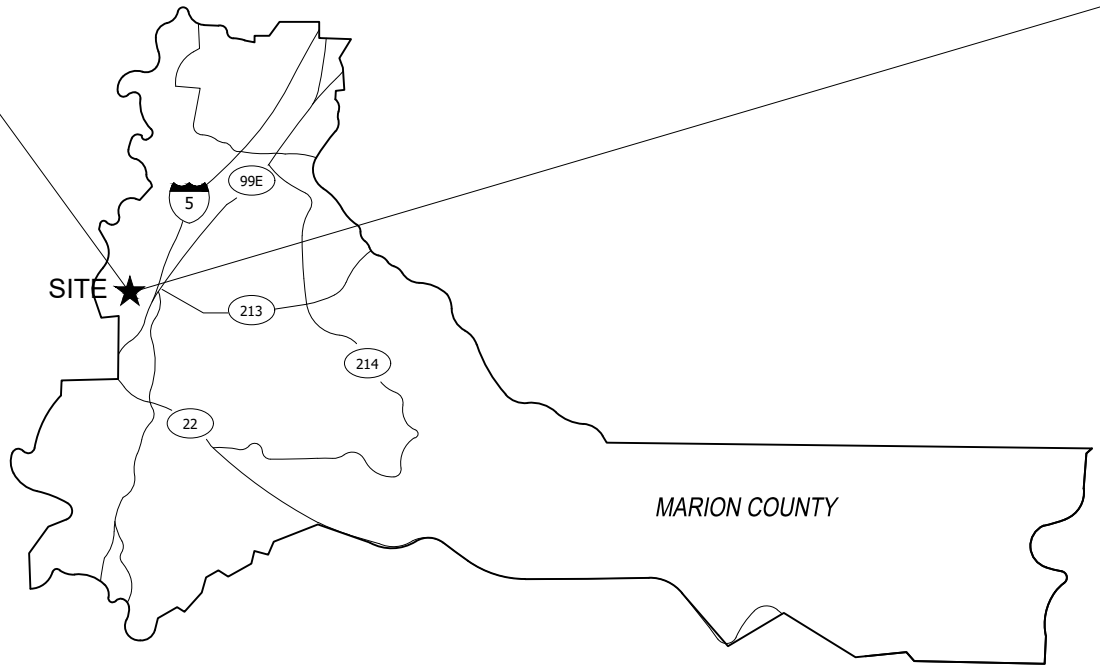
- Subject to City of Salem approval, the Applicant shall restripe the existing shared northbound left/through/right-turn and merge lane on Liberty Street NE at Riviera Drive NE to provide an exclusive northbound right-turn lane in conjunction with site development. The changes shall be implemented in accordance with the *Manual on Uniform Traffic Control Devices* and City of Salem design standards.
- Above-ground utilities, monuments, fencing, and vegetation should be appropriately located and maintained at the existing site access locations and along the River Road N site frontage to preserve adequate intersection sight lines per City of Salem standards.

The methodology of our analysis, pertinent findings, and further details regarding study recommendations are documented herein.

INTRODUCTION

The Applicant, Heslin Holdings, proposes to construct a Fred Meyer fuel station on the northwest corner of the parking lot for the existing Fred Meyer. The fuel station will be accessible by two existing unsignalized driveways on Liberty Street NE and River Road N, as well as the existing traffic signal on Broadway Street. The site location and overall vicinity are shown in Figure 1. A Conceptual site plan is shown in Figure 2.





- Study Intersections

Site Vicinity Map
Salem, Oregon

Figure
1

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Proposed Site Plan
Salem, Oregon

Figure
2

SITE PLAN PROVIDED BY BARGHAUSEN CONSULTING ENGINEERS, INC. ON 11/16/2021

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SCOPE OF THE REPORT

This report identifies the transportation-related impacts associated with the proposed fuel station and was prepared in accordance with City of Salem Revised Code Section 803.015. The study intersections and scope were selected in consultation with City staff and include:

1. River Road N/Fred Meyer Access
2. Liberty Street NE/Riviera Drive NE

This report evaluates the following transportation issues:

- Year 2021 existing traffic conditions within the study area during the weekday AM and PM peak hours
- Forecast year 2023 background traffic conditions (without the proposed development) during the weekday AM and PM peak hours
- Trip generation and distribution estimates for the proposed fuel station
- Year 2023 total traffic conditions (with the proposed development) during the weekday AM and PM peak hours
- Recommended improvements/intersection considerations

Analysis Methodology

All level-of-service (LOS) and queueing analyses described in this report were performed in accordance with the procedures stated in the *Highway Capacity Manual, 6th Edition* (Reference 1) using Synchro 11 software. Peak 15-minute flow rates were used in the evaluation of all intersection LOS to provide analyses based on a reasonable worst-case scenario. For this reason, the analyses reflect conditions that are only likely to occur for 15 minutes out of each average peak hour.

Intersection Operating Standards

City of Salem Operating Standards

The City of Salem's LOS standards are defined in the *City of Salem Transportation System Plan* (Reference 2) Street System Element, page 3-3, Policy 2.5-2c as follows:

> The City shall allow its existing streets and intersections to function at LOS E (where traffic volumes generally are approaching or at 100 percent of the street's effective capacity) during the morning and evening peak travel hours. However, traffic impacts created by new development, as identified in a traffic impact analysis, must be mitigated to maintain peak hour LOS D or better.

EXISTING CONDITIONS

This section summarizes the existing characteristics of the transportation system and adjacent land uses in the vicinity of the proposed fuel station, including an inventory of the existing multi-modal transportation facilities, an evaluation of existing intersection operations for motor vehicles at the study intersections, and a summary of recent crash history.

Site Conditions and Adjacent Land Uses

The proposed fuel station will be located adjacent to an existing Fred Meyer and share accesses with a tire store, fast-food restaurant, bank, and other retail stores. Access to the River Road City Park northwest of the site aligns with the River Road N/Fred Meyer Access intersection. The majority of nearby land uses are commercial and residential.

Transportation Facilities

Table 1 summarizes the attributes of the roadways within the study area. Figure 3 illustrates the existing lane configurations and traffic control at the study intersections.

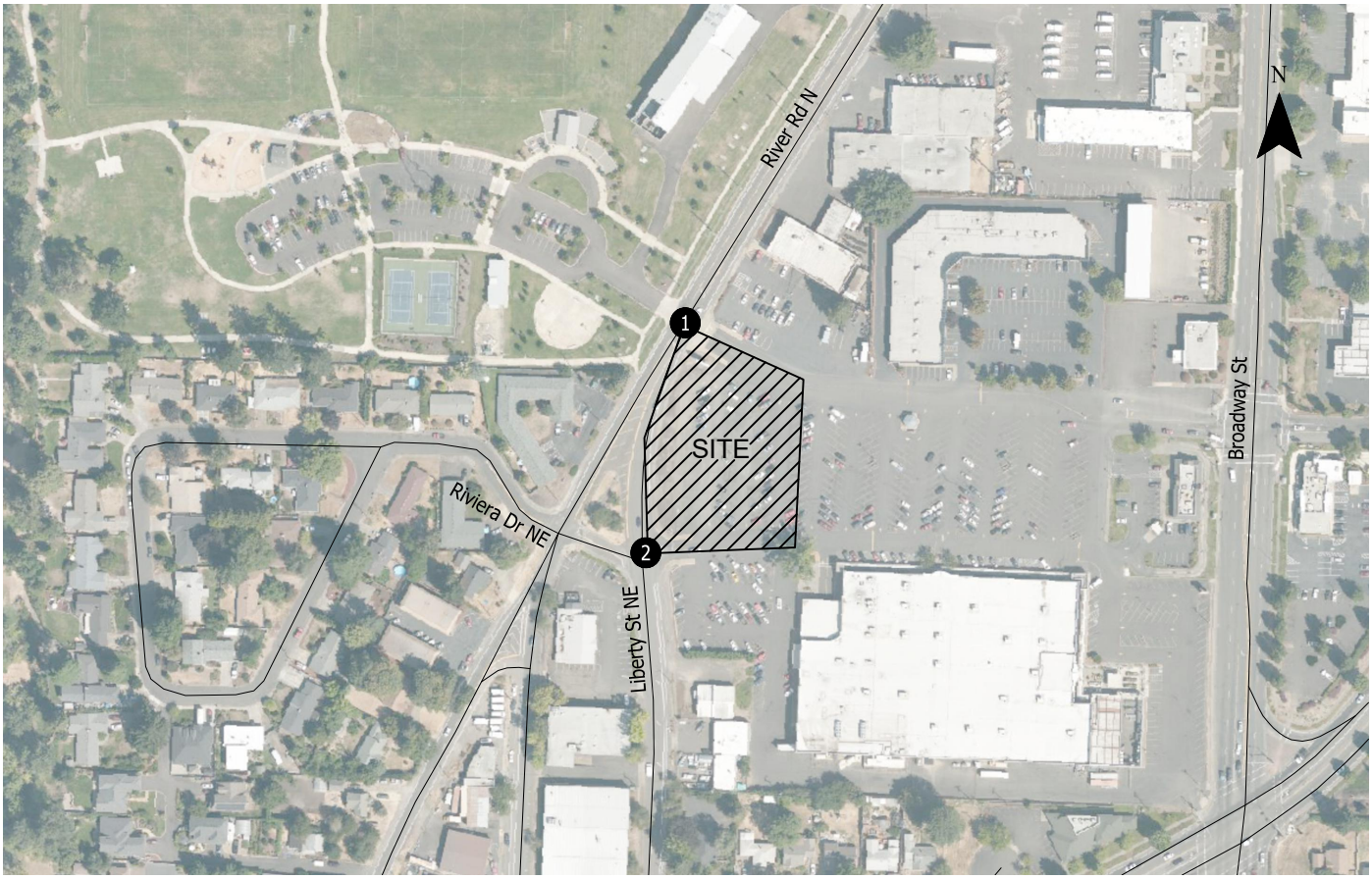
Table 1: Street Characteristics in Site Vicinity

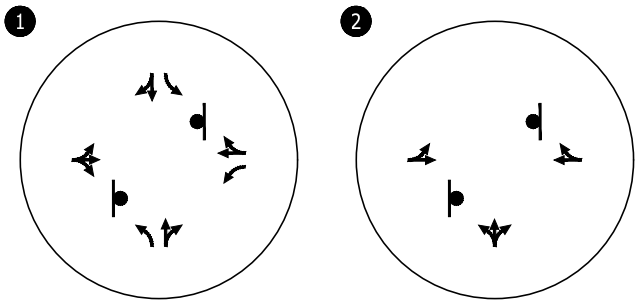
Street	Classification[1]	Motor Vehicle Travel Lanes	Posted Speed (mph)	Sidewalks	Striped Bicycle Lanes	On-Street Parking
River Road N	Arterial	2/3	35	Yes	Yes	No
Liberty Street NE	Arterial	1/2	35	Yes	Yes	Yes[2]

[1]Per the *City of Salem Transportation System Plan* (Reference 2).
[2] Parking present along the east side of Liberty Street NE south of Riviera Drive NE.

Transit Facilities

Regional transit access is provided to the site via Cherriots bus route 19 with stops adjacent to the site on Broadway Street (Reference 3). Route 19 provides access between the Downtown Transit Center and the Keizer Transit Center between 6:00 AM and 9:00 PM on weekdays with approximately 15-minute headways, between 6:30 AM and 9:00 PM on Saturdays with approximately 30-minute headways, and between 7:30 AM and 8:00 PM on Sundays with approximately 30-minute headways.





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Existing Lane Configurations
& Traffic Control Devices
Salem, Oregon

Figure
3

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Existing Conditions Operational Analysis

Turning movement count data was collected on a mid-week day in December 2021 at the two study intersections while local schools were in session during the morning (7:00 AM to 9:00 AM) and evening (4:00 PM to 6:00 PM) peak periods. *Appendix A contains the traffic counts.*

Figure 4 summarizes the operational analysis for the study intersections under existing weekday AM and PM peak hour traffic conditions. As shown in Figure 4, the study intersections currently operate acceptably per City of Salem standards. *Appendix B includes the operations analysis worksheets for the Existing Conditions analysis.*

Safety Analysis

The crash history of each study intersection was reviewed to identify potential intersection safety issues. Crash data for the study intersections was obtained from the Oregon Department of Transportation (ODOT) for the five-year period from January 1, 2015 through December 31, 2019. Note that the requested crash history also includes crashes reported along Liberty Street NE between Bliler Ave NE and River Road N.

Table 2 summarizes the crashes reported at the study intersections. Crash rates were calculated for each study intersection following the analysis methodology presented in Exhibit 4-1 of the *ODOT Analysis Procedures Manual* (APM), Version 2 (Reference 4). The APM provides 90th percentile intersection crash rates at a variety of intersection configurations in Oregon based on the number of approaches and traffic control types. Table 2 also shows the comparison of the five-year crash history with the 90th percentile intersection crash rates from the APM. Crash rates are reported per million entering vehicles. *Appendix C contains the ODOT crash data.*

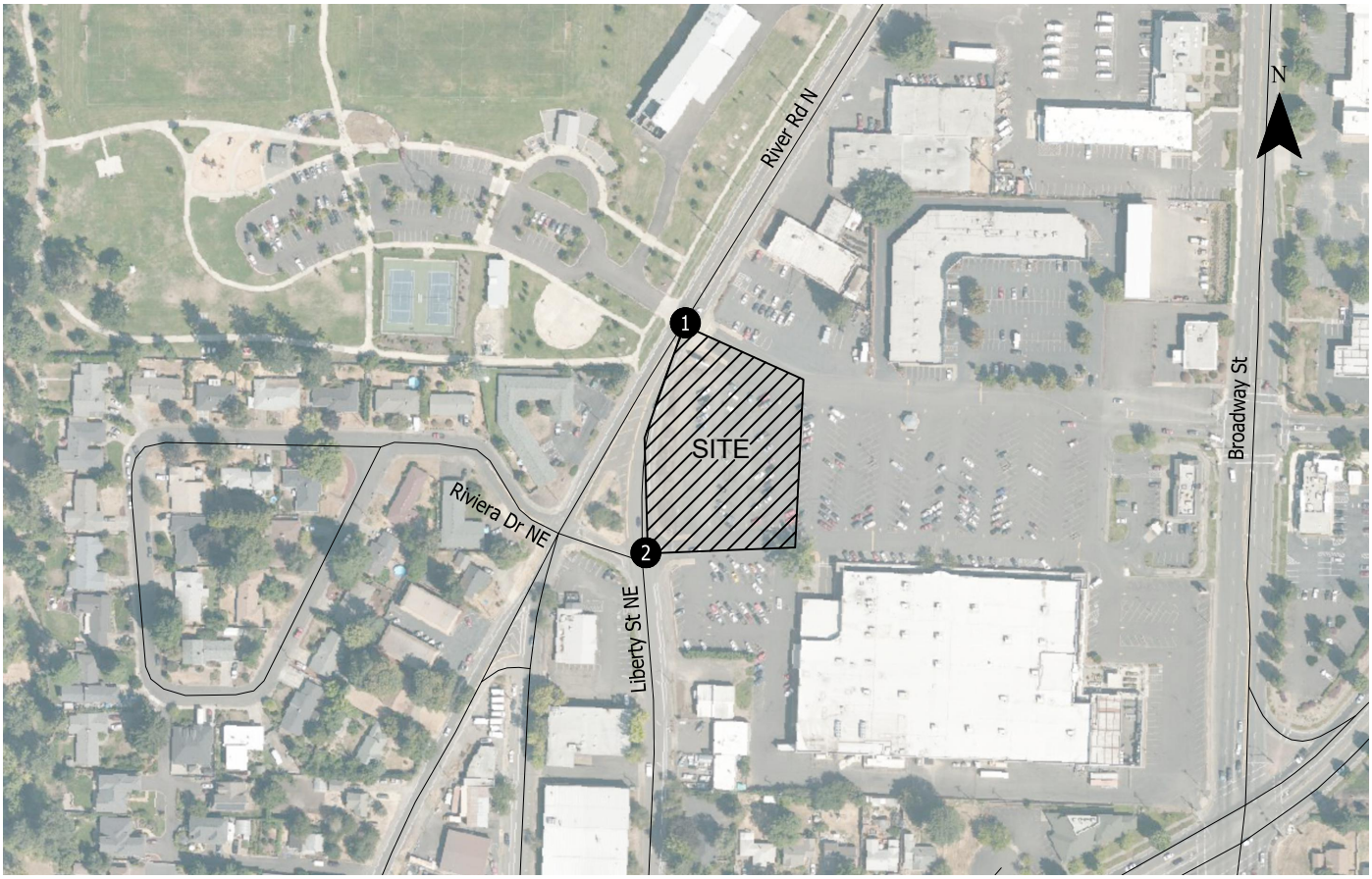
Table 2. Intersection Crash History (January 1, 2015 through December 31, 2019)

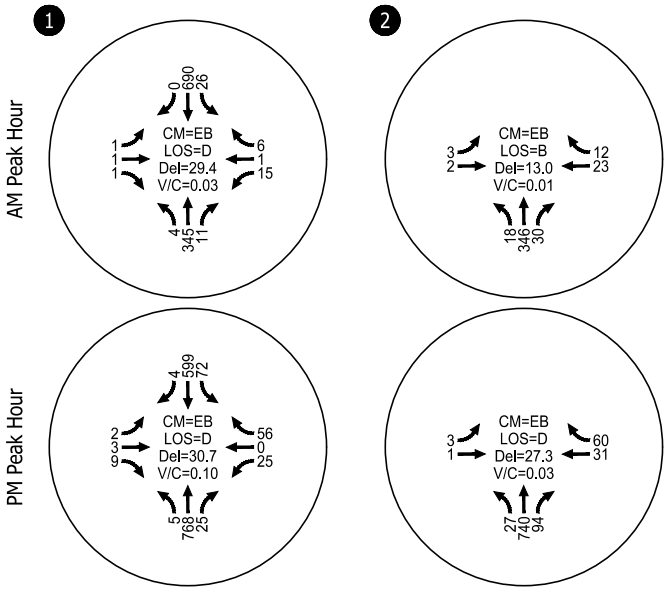
Location	Collision Type					Severity		Total Crashes	Observed Crash Rate[2]	Statewide 90th-percentile Crash Rate	Observed Crash Rate > Statewide 90th-percentile?
	Rear End	Turn-ing	Side-swipe	Angle	Head-on	PDO[1]	Injury				
River Road N/Fred Meyer Access	3	6	0	2	0	4	7	11	0.38	0.408	No
Liberty Street NE/ Riviera Drive NE	1	1	5	0	1	4	4	8	0.46	0.293	**Yes**

[1]PDO – Property damage only

[2]Crash rate per million entering vehicles

As shown in Table 2, the Liberty Street NE/Riviera Drive NE intersection exceeds statewide 90th percentile crash rates. This unsignalized intersection experienced a relatively large proportion of northbound sideswipe crashes (approximately 63%) amongst the reported collision types. The northbound sideswipe history suggests that the existing merge lane approaching the intersection may contribute to the relatively high observed crash rate. Recommended mitigation will be discussed later in this report.





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LOS = CRITICAL MOVEMENT LEVEL OF SERVICE
Del = CRITICAL MOVEMENT CONTROL DELAY
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Existing Traffic Conditions
Weekday AM & PM Peak Hours
Salem, Oregon

Figure
4

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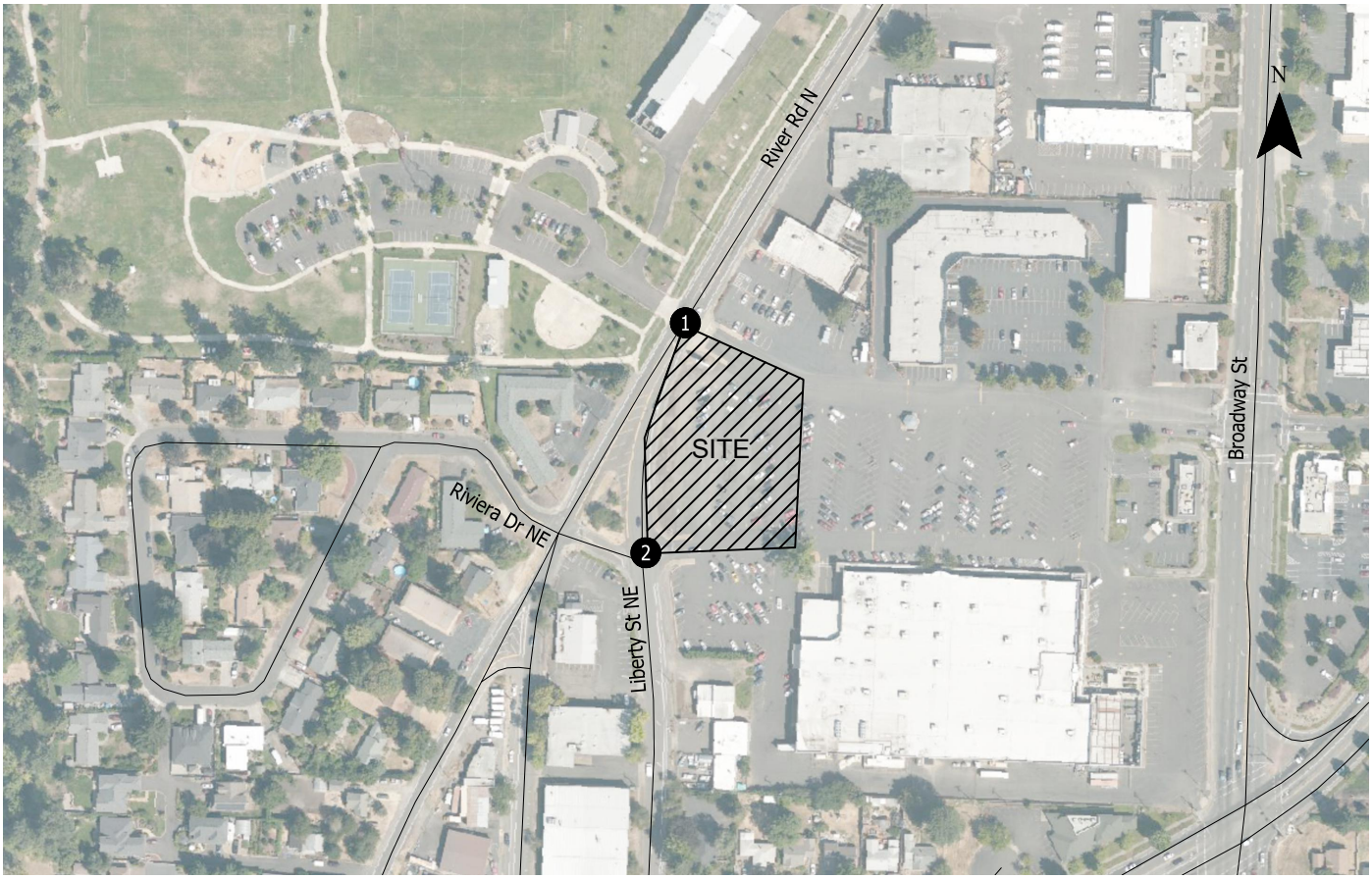
TRAFFIC IMPACT ANALYSIS

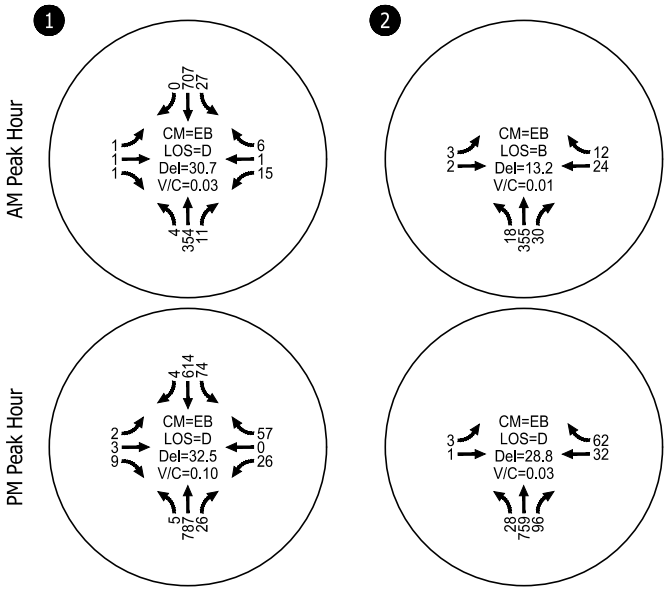
The traffic impact analysis identifies how the two study intersections will operate in the horizon year 2023 when the proposed fuel station is expected to be built. This section of the report includes analysis of 2023 background traffic volumes and operations, an estimate of site-generated trips, and analysis of 2023 total traffic volumes and operations with the proposed fuel station.

2023 Background Operational Analysis

Background traffic volumes include changes in volumes due to general regional growth. No planned transportation improvements or in-process developments are expected to impact traffic operations in the study area in the build-out year. The year 2023 analyses include a background annual growth rate of 1.25 percent at each study intersection. This growth rate was determined based on employment and population growth information in the *Salem Area Comprehensive Policies Plan* (Reference 5).

Figure 5 summarizes the operational analysis for the study intersections under weekday AM and PM peak hour background traffic conditions. As shown in Figure 5, the study intersections are projected to continue to operate acceptably per City of Salem standards. *Appendix D includes the operations analysis worksheets for the 2023 Background Traffic Conditions analysis.*





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Year 2023 Background Traffic Conditions
Weekday AM & PM Peak Hours
Salem, Oregon

Figure
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Trip Generation Estimate

Table 3 provides a trip generation estimate for the fuel station based on information provided in the *Trip Generation Manual, 11th Edition* (Reference 6), published by the Institute of Transportation Engineers (ITE). To determine the future impact to the two study intersections, internal, pass-by, and primary trips were considered as described below.

- Internal trips include existing trips for customers already visiting existing site uses that will also visit the proposed fuel station when constructed. Internal trips will remain within the shopping center and do not represent new trips on the surrounding roadway network. For the purposes of this study, the existing Jack in the Box and Fred Meyer store were considered when determining internal trips. Trips associated with these uses were not added to the roadway network. Trip internalization rates between uses were developed based on guidance in *Trip Generation Handbook, 2nd Edition* (Reference 7) for daily trips, and *NCHRP Report 684* (Reference 8) for peak hour trips. Although Fred Meyer customer trip type surveys report 35 – 52% of trips between Fred Meyer fuel stations and adjacent Fred Meyer stores are internal, an internal trip rate of 20% was conservatively assumed between these two uses.
- Pass-by trips include existing trips that are on roadways adjacent to the site that allow the motorist to turn into the fuel station, and then continue to their ultimate destination when their activity is concluded. Pass-by trips are assumed as a percentage of external trips (after deducting internal trips). Pass-by rates were developed based on guidance in the *Trip Generation Manual*.
- Primary trips include an entirely new trip on the roadway system for the express purpose of driving to and from the fuel station, after deducting pass-by and internal trips.

Note that the supermarket and fast-food uses shown in Table 3 are provided solely for the purposes of estimating potential internal trips at the fuel station. No new supermarket or fast food uses are proposed and only the fuel station trips will be new to the road network

Table 3. Trip Generation Estimate

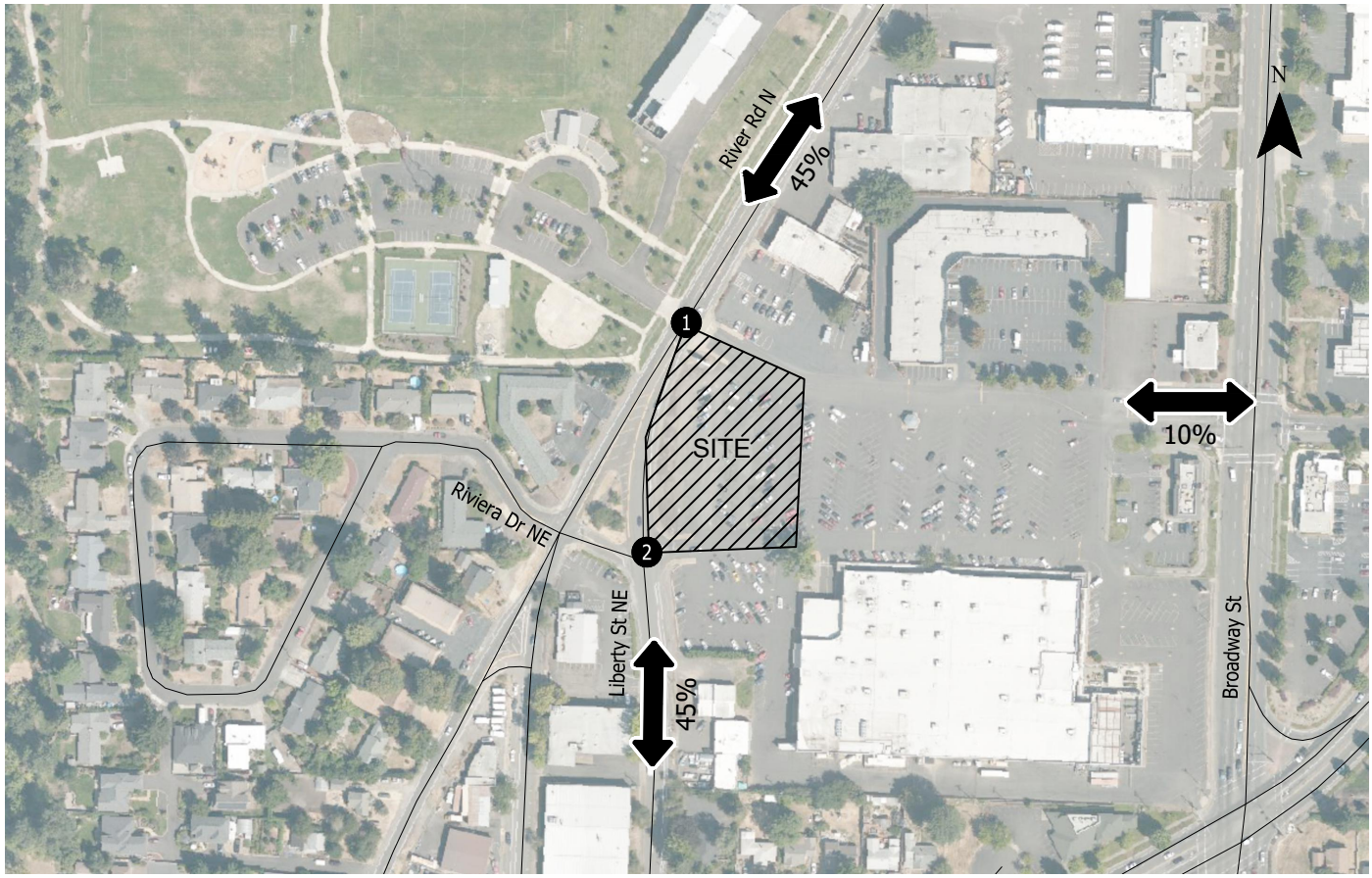
Land use	ITE Code	Size	Weekday Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
Supermarket	850	123,000 SF	11,542	208	144	352	457	457	914
Internal (7%/18%/10%)			*805*	*24*	*38*	*62*	*42*	*47*	*89*
Pass-By (24%[1]/24%[1]/24%)			*2,576*	*35*	*35*	*70*	*99*	*99*	*198*
Primary			*8,161*	*149*	*71*	*220*	*316*	*311*	*627*
Fast-Food Restaurant with Drive-Through Window	934	3,300 SF	1,543	75	72	147	57	52	109
Internal (20%/28%/17%)			*309*	*31*	*10*	*41*	*28*	*22*	*50*
Pass-By (52%[2]/50%/55%)			*642*	*26*	*26*	*52*	*16*	*16*	*32*
Primary			*592*	*18*	*36*	*54*	*13*	*14*	*27*
Gasoline/Service Station	**944**	**18 Vehicle Fueling Positions**	**3,096**	**93**	**92**	**185**	**125**	**125**	**250**
Internal (20%/29%/24%)			***620***	***23***	***30***	***53***	***30***	***31***	***61***
Pass-By (60%[2]/63%/57%)			***1,486***	***41***	***41***	***82***	***54***	***54***	***108***
Primary			***990***	***29***	***21***	***50***	***41***	***40***	***81***

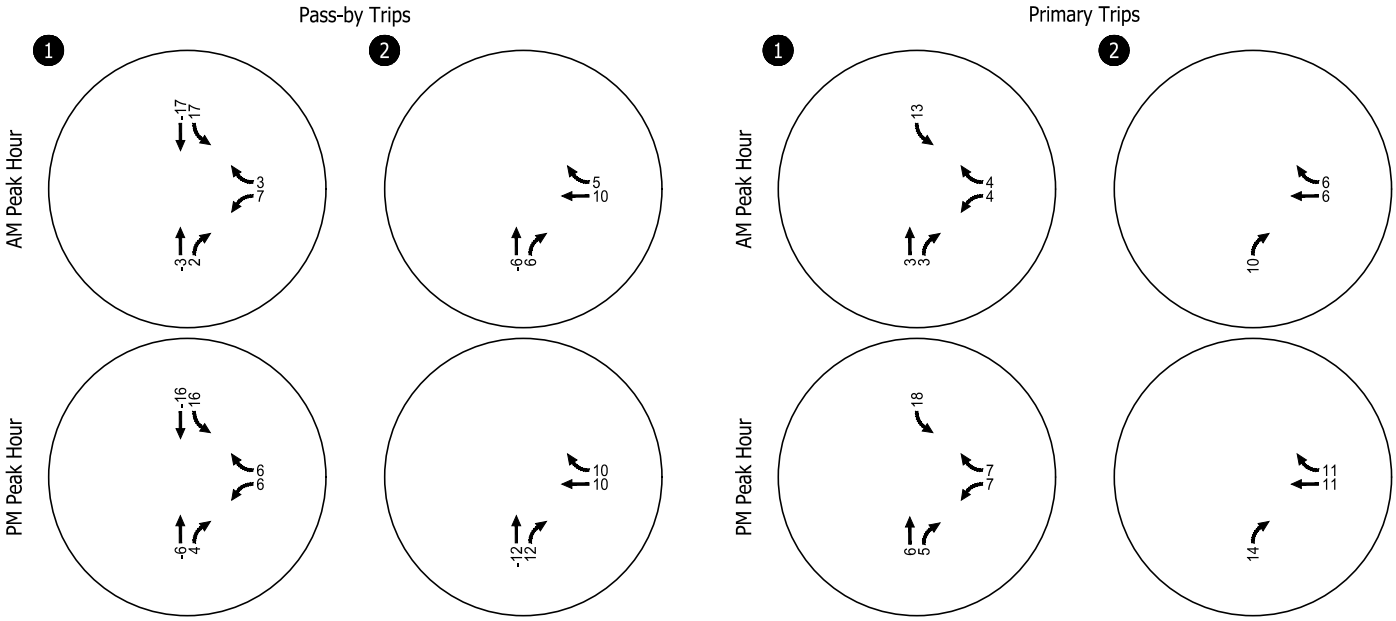
Percentages are as shown (Daily%/AM%/PM%)
[1]Daily and AM pass-by rates are not available; assumed to be the same as PM
[2]Daily pass-by rate not available; assumed as the average of AM and PM pass-by rates

Trip Distribution and Assignment

Figure 6 illustrates the estimated trip distribution pattern and trip assignment of pass-by and primary trips for the proposed fuel station during the AM and PM peak hours. A portion of pass-by and primary trips were assumed to enter and exit the site via Broadway Street, and therefore are not included at the study intersections in Figure 6:

- 40% of all pass-by trips are assumed to enter and exit via Broadway Street.
- 10% of all primary trips are assumed to enter and exit via Broadway Street.





Site Trip Distribution & Assignment
Weekday AM & PM Peak Hours
Salem, Oregon

Figure
6

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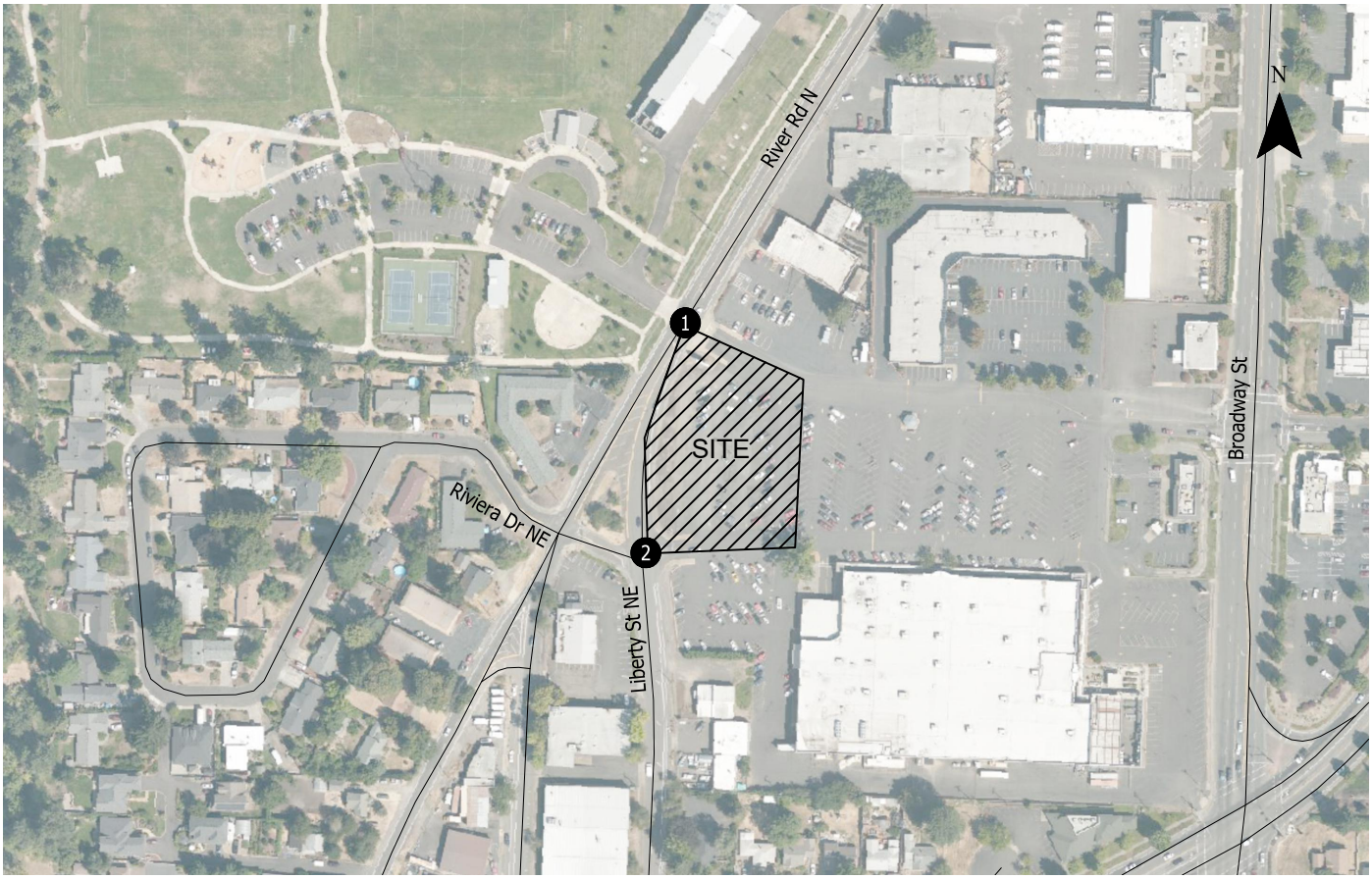
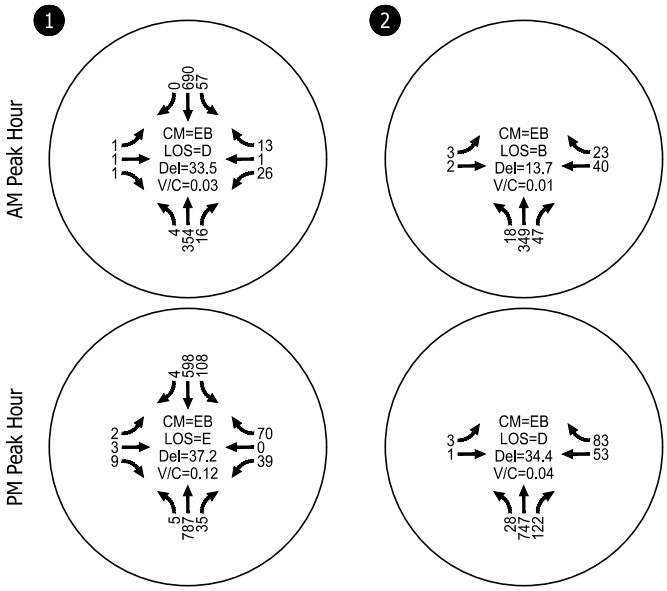
2023 Total Operational Analysis

The year 2023 background traffic volumes for the weekday AM and PM peak hours (shown in Figure 5) were added to the site-generated traffic (shown in Figure 6) to arrive at the year 2023 total traffic volumes. Figure 7 summarizes the operational analysis for the study intersections under weekday AM and PM peak hour total traffic conditions. As shown in Figure 7, the River Road City Park (eastbound) approach to the River Road N/Fred Meyer Access intersection is projected to operate at LOS E during the PM peak hour under total traffic conditions. Vehicles on the eastbound approach are projected to experience an increase of less than 5 seconds of delay from background conditions, and only 2.2 seconds of delay beyond the threshold for LOS D. The eastbound approach is forecast to operate well under capacity, traffic volumes are not sufficient to warrant signalization (14 vehicles on the approach over the course of the hour) and the major street turning and through movements operate at LOS B or better.

Given the above considerations, no capacity-based mitigation is recommended in conjunction with the proposed site development.

The potential for restriping the northbound Liberty Street NE/Riviera Drive NE intersection approach in conjunction with site development was evaluated separately and is discussed later in this report. *Appendix E includes the operations analysis worksheets for the 2023 Total Traffic Conditions analysis.*





Year 2023 Total Traffic Conditions
Weekday AM & PM Peak Hours
Salem, Oregon

Figure
7

CM = CRITICAL MOVEMENT
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Del = CRITICAL MOVEMENT CONTROL DELAY
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Sight Distance

The proposed site plan was reviewed to assess whether adequate sight distance is provided at the two study intersections for vehicles exiting the site. For the analysis, measurements of intersection sight distance (ISD) were obtained in the field to confirm compliance with the *2018 AASHTO Policy on Geometric Design of Highways and Streets* (Reference 9).

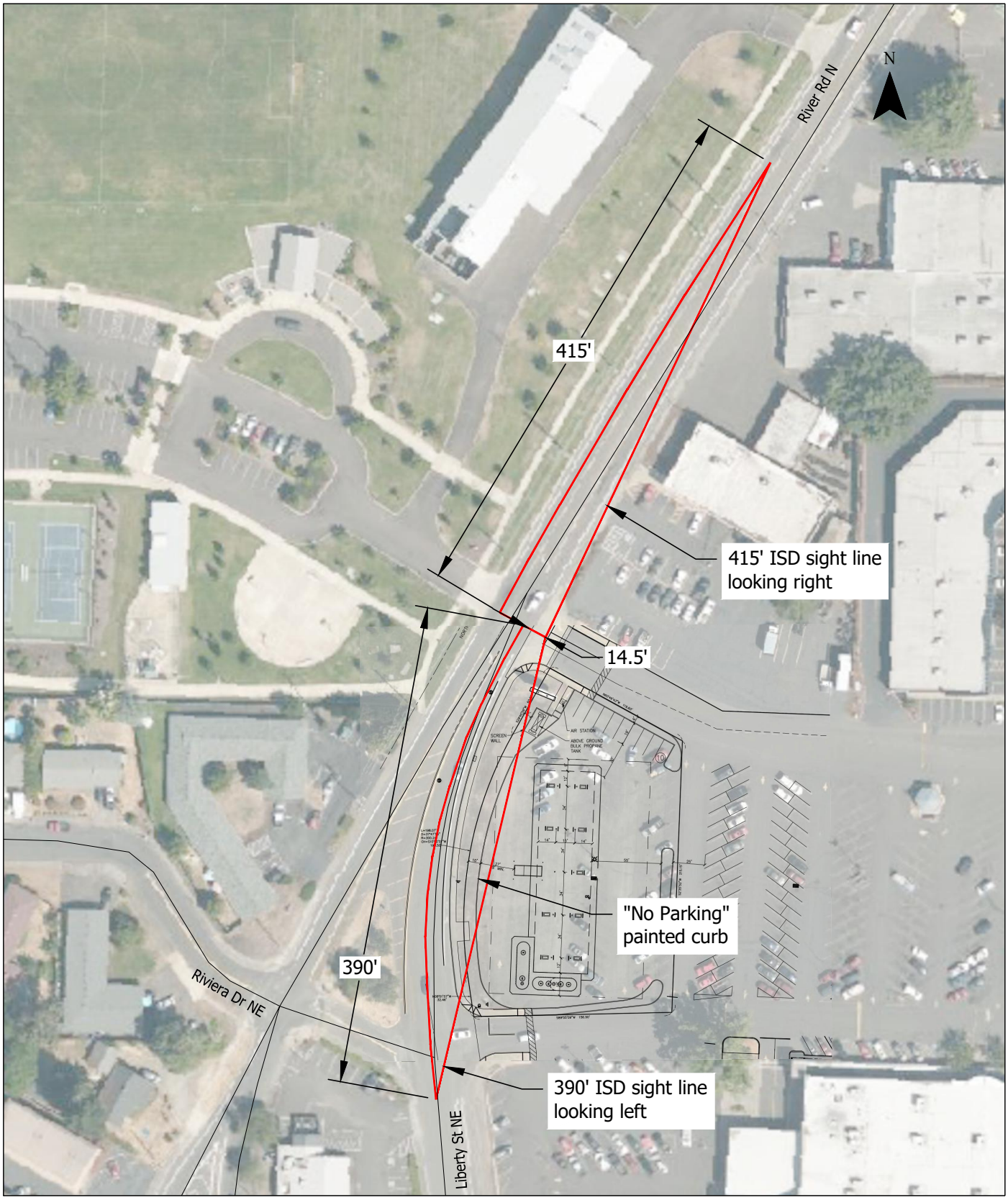
Intersection sight distance (ISD) measurements were measured in the field from the location of the two intersections (based on the site plan provided in Figure 2) and from a viewpoint 14.5 feet behind the edge of the traveled way and from a height of 3.5 feet above the ground, looking toward an object that is 3.5 feet above the ground along the travel way. Based on field observations, ISD was found to be adequate for both intersections as documented in Table 4.

Table 4: Intersection Sight Distances

Intersection	Controlling Movement	Roadway Design Speed	AASHTO Recommended Sight Distance (ISD)	Satisfies AASHTO Requirements?
1.River Road N/Fred Meyer Access	Left turn from stop	35	390[1]/415[2]	Yes
2.Liberty Street NE/Riviera Drive NE	Right turn from stop	35	335	Yes

ISD: Intersection Sight Distance
[1]Standard ISD looking left
[2]Adjusted ISD looking right to account for extra time to cross the left turn median

Figures 8 and 9 show the required ISD sight triangles at the two study intersections. The interior fuel station curb line along Liberty Street NE should be painted as a no-parking area. In addition, on-site landscaping, as well as any above ground utilities and signage, should be located and maintained at the site driveways and along the Liberty Street NE and River Road N frontage to provide adequate ISD, per AASHTO (Reference 9) requirements.



Intersection Sight Distance (ISD)
River Rd N/Fred Meyer Access
Salem, Oregon

Figure
8

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Intersection Sight Distance (ISD)
Liberty St NE/Riviera Dr NE
Salem, Oregon

Figure
9

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Turn Lane Considerations

Right turn lane criteria were evaluated at the Liberty Street NE/Riviera Drive NE study intersection to help inform consideration of restriping the northbound approach to address the historic sideswipe crash pattern noted earlier in this report as well as site access operations. The right-turn lane assessment was analyzed per the guidance in the APM and it was found that the ODOT criteria for providing a separate right-turn lane warrant is satisfied during the PM peak hour. *Appendix F includes the right turn lane criteria worksheet.*

Considering the safety and operational analysis of the intersection and the presence of a bicycle lane, restriping the northbound approach to provide a shared through left-turn lane and a separate right-turn lane installation is recommended at the Liberty Street NE/Riviera Drive NE intersection. Subject to City of Salem approval, we recommend the Applicant restripe and resign the existing shared northbound left/through/right-turn and merge lane on Liberty Street NE at Riviera Drive NE to provide an exclusive northbound right-turn lane. The changes should be implemented in accordance with the Manual on Uniform Traffic Control Devices and City of Salem design standards. *Appendix G includes the operations analysis worksheets for the intersection with the addition of a northbound right-turn lane.*

Queuing Needs Assessment

Table 5 provides 95th percentile queue lengths at the study intersections for westbound traffic leaving the site. Queue storage length was measured from the proposed site plan. Synchro 11 software reports queues based on number of vehicles for HCM 6th Edition. In the table below each vehicle is assumed to occupy 25 feet. Queue lengths are rounded up to the nearest 25 feet in cases where Synchro reports partial vehicles.

Table 5. Summary of 95th-Percentile Queues (AM/PM Peak Hours)

Intersection	Movement	Queue Storage (feet)	95th-percentile Queue (feet)			Queue Storage Adequate?
			Existing	2023 Background	2023 Total	
			AM	AM	AM	
River Road N/Fred Meyer Access	WB TH/RT	50	25/25	25/25	25/25	Yes
	WB LT	120	25/25	25/25	25/25	Yes
Liberty Street NE/Riviera Drive NE	WB TH/RT	130	25/50	25/50	25/75	Yes

As shown in Table 5, the proposed site plan has adequate storage for the anticipated 95th percentile queues.

FINDINGS

- Historical crash data for the study intersections indicate that the Liberty Street NE/Riviera Drive NE intersection exceeds statewide 90th percentile crash rates and that the majority of reported crashes involved northbound sideswipe movements (approximately 63%).
- The proposed fuel station addition is expected to generate 990 net new weekday daily trips, with 29 of these trips occurring during the AM peak hour and 41 during the PM peak hour. Actual net new trip generation realized may be lower based on trip internalization rates previously measured between other Fred Meyer Fuel and Fred Meyer store sites.
- Today and in the year 2023, the study intersections are forecast to continue to meet applicable operational standards prior to site development.
- With site development, the River Road City Park (eastbound) approach to the River Road N/Fred Meyer Access intersection is projected to operate at LOS E during the PM peak hour under total traffic conditions.
    - The future with-site condition represents an increase of less than 5 seconds of delay from background conditions, and only 2.2 seconds of delay beyond the threshold for LOS D.
    - The eastbound approach is forecast to operate well under capacity, traffic volumes are not sufficient to warrant signalization (14 vehicles on the approach over the course of the hour) and the major street turning and through movements operate at LOS B or better.
    - No capacity-based mitigation is recommended at the intersection in conjunction with the proposed site development.
- Projected traffic volumes with the proposed site development satisfy ODOT volume-based right-turn lane criteria for providing a separate northbound right-turn lane at the Liberty Street NE/Riviera Drive NE intersection. It appears that restriping the existing northbound merge from two lanes into a shared left/through lane and a separate right-turn lane would benefit intersection operations and safety.

RECOMMENDATIONS

- Subject to City of Salem approval, the Applicant shall restripe the existing shared northbound left/through/right-turn and merge lane on Liberty Street NE at Riviera Drive NE to provide an exclusive northbound right-turn lane in conjunction with site development. The changes shall be implemented in accordance with the *Manual on Uniform Traffic Control Devices* and City of Salem design standards.
- Above-ground utilities, monuments, fencing, and vegetation should be appropriately located and maintained at the existing site access locations and along the River Road N site frontage to preserve adequate intersection sight lines per City of Salem standards.

Please let us know if you have any questions regarding our analyses.

REFERENCES

1. Transportation Research Board. *Highway Capacity Manual, 6th Edition*. 2016.

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9. AASHTO, 2018. *A Policy on Geometric Design of Highways and Streets, 7th Edition*. 2018.

APPENDICES:

Appendix A: Traffic Count Data

Appendix B: 2021 Existing Traffic Operations Worksheets

Appendix C: ODOT Crash Data

Appendix D: 2023 Background Traffic Operations Worksheets

Appendix E: 2023 Total Traffic Operations Worksheets

Appendix F: Right Turn Lane Criteria Worksheets

Appendix G: 2023 Total Traffic Operations Worksheets with Right-turn Lane

Appendix A Traffic Count Data

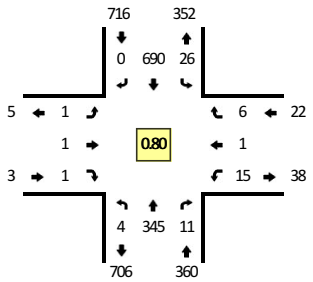
Type of peak hour being reported: Intersection Peak

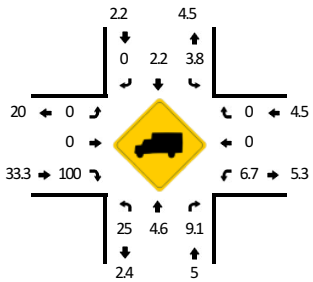
Method for determining peak hour: Total Entering Volume

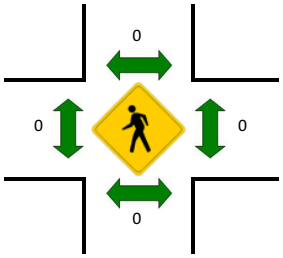
LOCATION: River Rd -- Park Dwy/N Fred Meyer Access
CITY/STATE: Salem, OR

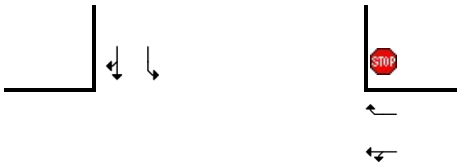
QC JOB #: 15638101
DATE: Wed, Dec 1 2021

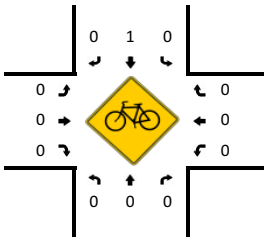
Peak-Hour: 7:20 AM -- 8:20 AM
Peak 15-Min: 7:40 AM -- 7:55 AM

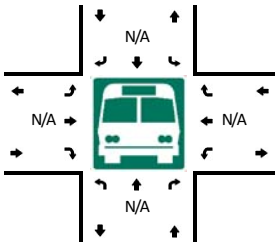


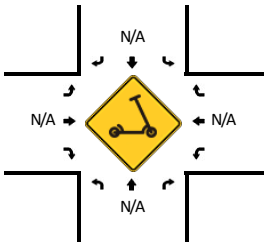












5-Min Count Period Beginning At	River Rd (Northbound)				River Rd (Southbound)				Park Dwy/N Fred Meyer Access (Eastbound)				Park Dwy/N Fred Meyer Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	18	0	0	5	27	0	0	0	0	0	0	0	0	0	0	50	
7:05 AM	1	20	2	0	1	43	0	0	0	0	0	0	0	0	1	0	68	
7:10 AM	1	25	0	0	1	47	0	0	0	0	0	0	2	0	1	0	77	
7:15 AM	0	1	1	0	5	51	0	0	0	0	0	0	0	1	1	0	60	
7:20 AM	0	29	0	0	4	51	0	0	0	0	0	0	1	0	0	0	85	
7:25 AM	0	48	1	0	0	33	0	0	0	0	0	0	0	0	1	0	83	
7:30 AM	1	17	0	0	1	60	0	0	0	0	0	0	0	0	0	0	79	
7:35 AM	0	28	1	0	2	53	0	0	0	0	0	0	1	0	2	0	87	
7:40 AM	0	24	1	0	6	92	0	0	0	0	0	0	0	0	0	0	123	
7:45 AM	2	28	0	0	2	76	0	0	0	0	0	0	5	0	0	0	113	
7:50 AM	0	28	2	0	2	71	0	0	0	1	0	0	1	0	1	0	106	
7:55 AM	0	37	2	0	2	60	0	0	1	0	0	0	2	0	2	0	106	1037
8:00 AM	1	25	2	0	0	44	0	0	0	0	0	0	1	1	0	0	74	1061
8:05 AM	0	30	0	0	3	40	0	0	0	0	0	0	1	0	0	0	74	1067
8:10 AM	0	22	0	0	2	61	0	0	0	0	1	0	2	0	0	0	88	1078
8:15 AM	0	29	2	0	2	49	0	0	0	0	0	0	1	0	0	0	83	1101
8:20 AM	0	30	0	0	4	34	0	0	0	0	0	0	0	0	0	0	68	1084
8:25 AM	0	23	1	0	1	33	1	0	0	0	0	0	0	0	0	0	59	1060
8:30 AM	0	33	2	0	8	55	0	0	0	0	0	0	3	0	1	0	102	1083
8:35 AM	1	28	1	0	4	57	1	0	0	0	0	0	1	0	0	0	93	1089
8:40 AM	0	18	0	0	2	44	0	0	0	2	0	0	2	0	1	0	69	1035
8:45 AM	0	38	0	0	8	52	0	0	0	0	0	0	0	0	1	0	99	1021
8:50 AM	0	36	2	0	5	60	0	0	0	0	0	0	3	1	1	0	108	1023
8:55 AM	0	35	2	0	10	49	1	0	0	0	0	0	0	0	0	0	97	1014

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	320	12	0	40	956	0	0	0	4	0	0	24	0	4	0	1368
Heavy Trucks	0	16	0		0	12	0		0	0	0		0	0	0		28
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 12/7/2021 1:13 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: River Rd -- Park Dwy/N Fred Meyer Access
CITY/STATE: Salem, OR

QC JOB #: 15638102
DATE: Wed, Dec 1 2021

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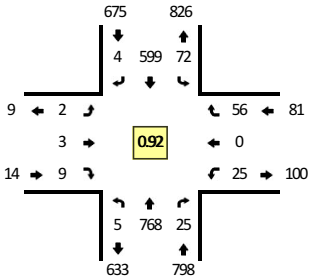
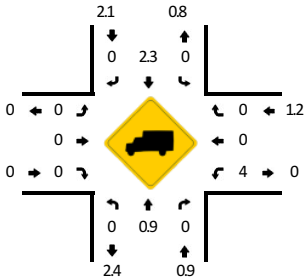
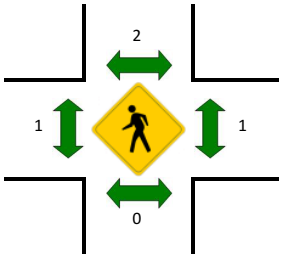
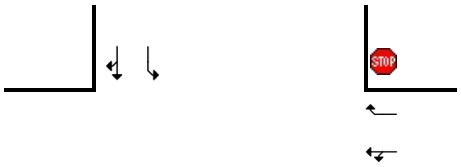
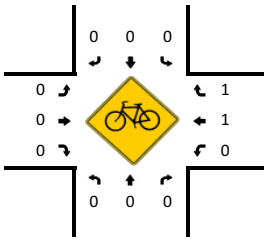
Peak 15-Min: 5:05 PM -- 5:20 PM

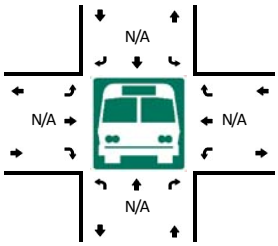


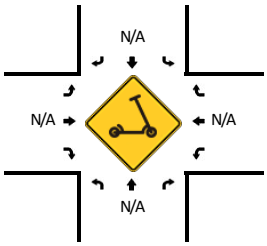












5-Min Count Period Beginning At	River Rd (Northbound)				River Rd (Southbound)				Park Dwy/N Fred Meyer Access (Eastbound)				Park Dwy/N Fred Meyer Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	55	6	0	6	43	1	0	0	0	1	0	3	0	7	0	122	
4:05 PM	0	51	5	0	6	56	1	0	0	1	1	0	1	2	2	0	126	
4:10 PM	0	78	2	0	5	55	0	0	1	0	0	0	1	1	4	0	147	
4:15 PM	0	66	0	0	7	46	0	0	0	0	1	0	3	0	4	0	127	
4:20 PM	0	56	0	0	7	49	0	0	0	1	6	0	4	0	4	0	127	
4:25 PM	2	58	0	0	6	38	0	0	0	0	1	0	1	0	2	0	108	
4:30 PM	3	50	3	0	6	49	1	0	0	0	1	0	1	0	7	0	121	
4:35 PM	0	59	2	0	8	58	0	0	1	0	1	0	2	0	9	0	140	
4:40 PM	0	62	3	0	3	39	0	0	1	0	0	0	1	0	5	0	114	
4:45 PM	0	43	2	0	4	55	0	0	0	1	1	0	2	0	3	0	111	
4:50 PM	0	71	4	0	7	47	1	0	0	1	0	0	2	0	2	0	135	
4:55 PM	0	61	2	0	8	40	1	0	0	0	0	0	3	0	5	0	120	1498
5:00 PM	1	66	3	0	6	44	0	0	0	0	1	0	2	0	4	0	127	1503
5:05 PM	0	59	1	0	11	75	0	0	0	0	1	0	3	0	4	0	154	1531
5:10 PM	0	70	1	0	5	46	1	0	0	0	3	0	0	0	4	0	130	1514
5:15 PM	1	75	1	0	4	51	0	0	0	0	1	0	5	0	4	0	142	1529
5:20 PM	0	69	2	0	8	49	0	0	0	1	0	0	1	0	4	0	134	1536
5:25 PM	0	83	1	0	2	46	0	0	0	0	0	0	3	0	5	0	140	1568
5:30 PM	0	44	0	0	3	49	0	0	0	0	1	0	4	1	8	0	110	1557
5:35 PM	2	56	1	0	3	48	0	0	0	0	0	0	1	0	5	0	116	1533
5:40 PM	1	51	1	0	9	51	0	0	0	0	0	0	1	0	8	0	122	1541
5:45 PM	0	40	2	0	7	41	0	0	0	0	0	0	2	0	8	0	100	1530
5:50 PM	0	46	1	0	1	44	0	0	1	0	0	0	2	0	3	0	98	1493
5:55 PM	0	50	1	0	6	33	0	0	0	0	0	0	1	2	4	0	97	1470

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	4	816	12	0	80	688	4	0	0	0	20	0	32	0	48	0	1704
Heavy Trucks	0	8	0		0	4	0		0	0	0		0	0	0		12
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	4		4
Scooters																	

Comments:

Report generated on 12/7/2021 1:13 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

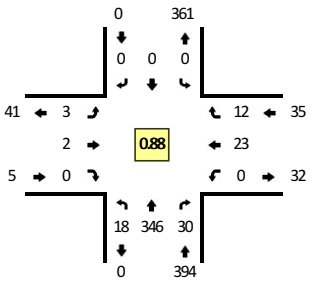
Type of peak hour being reported: Intersection Peak

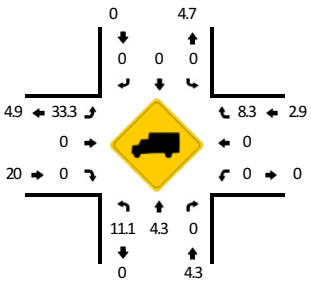
Method for determining peak hour: Total Entering Volume

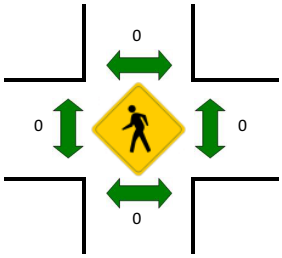
LOCATION: Liberty St NE -- Riviera Dr/NE Fred Meyer Access
CITY/STATE: Salem, OR

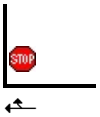
QC JOB #: 15638103
DATE: Wed, Dec 1 2021

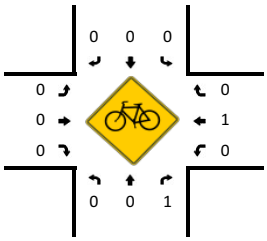
Peak-Hour: 7:25 AM -- 8:25 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

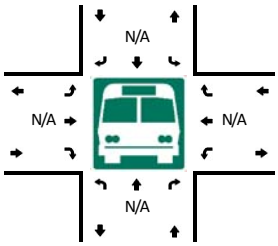


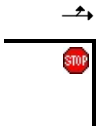


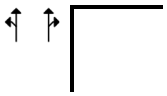


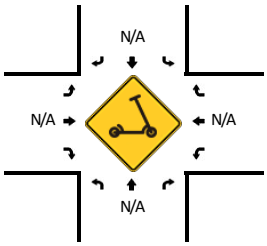












5-Min Count Period Beginning At	Liberty St NE (Northbound)				Liberty St NE (Southbound)				Riviera Dr/NE Fred Meyer Access (Eastbound)				Riviera Dr/NE Fred Meyer Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	18	2	0	0	0	0	0	0	0	0	0	0	1	0	0	21	
7:05 AM	2	23	5	0	0	0	0	0	0	0	0	0	0	2	0	0	32	
7:10 AM	0	25	0	0	0	0	0	0	0	1	0	0	0	0	0	0	26	
7:15 AM	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
7:20 AM	0	31	1	0	0	0	0	0	0	0	0	0	0	1	1	0	34	
7:25 AM	3	45	3	0	0	0	0	0	0	0	0	0	0	0	0	0	51	
7:30 AM	2	17	1	0	0	0	0	0	0	0	0	0	0	2	1	0	23	
7:35 AM	2	28	4	0	0	0	0	0	0	0	0	0	0	2	1	0	37	
7:40 AM	1	26	1	0	0	0	0	0	0	0	0	0	0	4	0	0	32	
7:45 AM	1	29	3	0	0	0	0	0	0	1	0	0	0	3	2	0	39	
7:50 AM	2	27	3	0	0	0	0	0	2	1	0	0	0	5	1	0	41	
7:55 AM	1	40	3	0	0	0	0	0	0	0	0	0	0	0	0	0	44	385
8:00 AM	0	25	1	0	0	0	0	0	0	0	0	0	0	0	3	0	29	393
8:05 AM	2	28	4	0	0	0	0	0	0	0	0	0	0	2	1	0	37	398
8:10 AM	1	23	2	0	0	0	0	0	0	0	0	0	0	1	1	0	28	400
8:15 AM	1	29	3	0	0	0	0	0	0	0	0	0	0	3	0	0	36	431
8:20 AM	2	29	2	0	0	0	0	0	1	0	0	0	0	1	2	0	37	434
8:25 AM	0	21	5	0	0	0	0	0	0	0	0	0	0	1	3	0	30	413
8:30 AM	2	33	3	0	0	0	0	0	1	0	0	0	0	1	0	0	40	430
8:35 AM	0	26	3	0	0	0	0	0	1	0	0	0	0	1	2	0	33	426
8:40 AM	0	17	2	0	0	0	0	0	0	1	0	0	0	2	1	0	23	417
8:45 AM	1	35	4	0	0	0	0	0	0	0	0	0	0	5	2	0	47	425
8:50 AM	0	35	3	0	0	0	0	0	0	0	0	0	0	1	3	0	42	426
8:55 AM	1	35	5	0	0	0	0	0	1	0	0	0	0	1	0	0	43	425

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	16	384	36	0	0	0	0	0	8	8	0	0	0	32	12	0	496
Heavy Trucks	4	20	0		0	0	0		4	0	0		0	0	0		28
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 12/7/2021 1:13 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

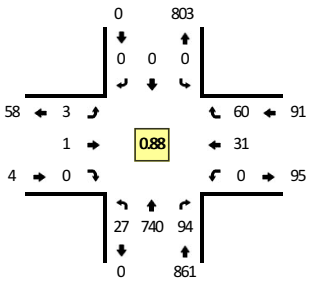
Type of peak hour being reported: Intersection Peak

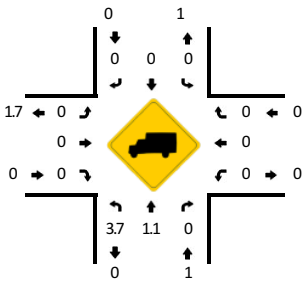
Method for determining peak hour: Total Entering Volume

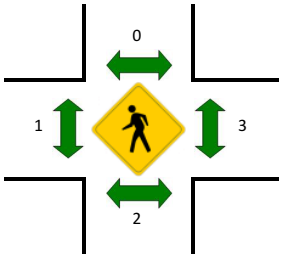
LOCATION: Liberty St NE -- Riviera Dr/NE Fred Meyer Access
CITY/STATE: Salem, OR

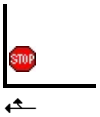
QC JOB #: 15638104
DATE: Wed, Dec 1 2021

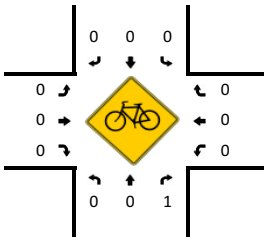
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

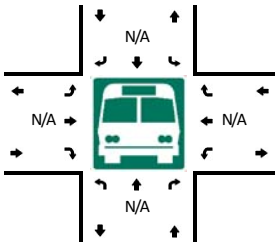


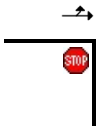


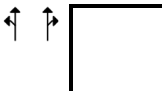


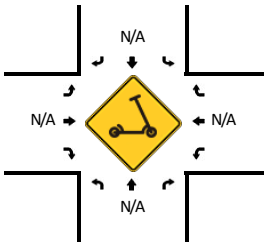












5-Min Count Period Beginning At	Liberty St NE (Northbound)				Liberty St NE (Southbound)				Riviera Dr/NE Fred Meyer Access (Eastbound)				Riviera Dr/NE Fred Meyer Access (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	54	7	0	0	0	0	0	0	1	0	0	0	1	6	0	71	
4:05 PM	3	50	7	0	0	0	0	0	2	1	0	0	0	2	6	0	71	
4:10 PM	3	77	4	0	0	0	0	0	0	2	0	0	0	2	4	0	92	
4:15 PM	5	62	4	0	0	0	0	0	1	0	0	0	0	3	2	0	77	
4:20 PM	1	49	5	0	0	0	0	0	1	1	0	0	0	5	5	0	67	
4:25 PM	1	54	6	0	0	0	0	0	1	0	0	0	0	5	3	0	70	
4:30 PM	0	56	4	0	0	0	0	0	0	0	0	0	0	2	4	0	66	
4:35 PM	2	55	5	0	0	0	0	0	0	0	0	0	0	4	5	0	71	
4:40 PM	3	56	9	0	0	0	0	0	0	0	0	0	0	0	6	0	74	
4:45 PM	2	44	9	0	0	0	0	0	0	0	0	0	0	2	3	0	60	
4:50 PM	1	69	13	0	0	0	0	0	0	0	0	0	0	3	5	0	91	
4:55 PM	1	52	5	0	0	0	0	0	0	0	0	0	0	3	10	0	71	881
5:00 PM	3	65	5	0	0	0	0	0	0	0	0	0	0	5	8	0	86	896
5:05 PM	3	60	9	0	0	0	0	0	1	0	0	0	0	3	1	0	77	902
5:10 PM	2	65	13	0	0	0	0	0	0	1	0	0	0	2	5	0	88	898
5:15 PM	1	68	7	0	0	0	0	0	1	0	0	0	0	2	4	0	83	904
5:20 PM	6	73	6	0	0	0	0	0	0	0	0	0	0	4	3	0	92	929
5:25 PM	3	77	9	0	0	0	0	0	1	0	0	0	0	1	6	0	97	956
5:30 PM	0	34	3	0	0	0	0	0	1	0	0	0	0	4	6	0	48	938
5:35 PM	2	60	6	0	0	0	0	0	0	1	0	0	0	3	3	0	75	942
5:40 PM	1	42	7	0	0	0	0	0	1	0	0	0	0	2	6	0	59	927
5:45 PM	2	37	3	0	0	0	0	0	2	0	0	0	0	1	3	0	48	915
5:50 PM	2	43	5	0	0	0	0	0	0	1	0	0	0	3	6	0	60	884
5:55 PM	2	46	7	0	0	0	0	0	0	0	0	0	0	3	3	0	61	874

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	40	872	88	0	0	0	0	0	8	0	0	0	0	28	52	0	1088
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	0		4
Buses																	
Pedestrians		4				0				0				8			12
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 12/7/2021 1:13 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix B 2021 Existing Traffic Operations Worksheets

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	1	15	1	6	4	345	11	26	690	0
Future Vol, veh/h	1	1	1	15	1	6	4	345	11	26	690	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	100	7	0	0	25	5	9	4	2	0
Mvmt Flow	1	1	1	19	1	8	5	431	14	33	863	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1382	1384	863	1378	1377	438	863	0	0	445	0	0
Stage 1	929	929	-	448	448	-	-	-	-	-	-	-
Stage 2	453	455	-	930	929	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	7.2	7.17	6.5	6.2	4.35	-	-	4.14	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	4.2	3.563	4	3.3	2.425	-	-	2.236	-	-
Pot Cap-1 Maneuver	122	145	242	119	146	623	690	-	-	1105	-	-
Stage 1	324	349	-	580	576	-	-	-	-	-	-	-
Stage 2	590	572	-	314	349	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	117	140	242	114	141	623	690	-	-	1105	-	-
Mov Cap-2 Maneuver	117	140	-	224	250	-	-	-	-	-	-	-
Stage 1	322	339	-	576	572	-	-	-	-	-	-	-
Stage 2	577	568	-	302	339	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.4	19.2	0.1	0.3
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	690	-	-	151	224	514	1105	-	-
HCM Lane V/C Ratio	0.007	-	-	0.025	0.084	0.017	0.029	-	-
HCM Control Delay (s)	10.3	-	-	29.4	22.5	12.1	8.4	-	-
HCM Lane LOS	B	-	-	D	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	2	0	0	23	12	18	346	30	0	0	0
Future Vol, veh/h	3	2	0	0	23	12	18	346	30	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	33	0	0	0	0	8	11	4	0	0	0	0
Mvmt Flow	3	2	0	0	26	14	20	393	34	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	470	467	-	-	450	410	0	0	0
Stage 1	0	0	-	-	450	-	-	-	-
Stage 2	470	467	-	-	0	-	-	-	-
Critical Hdwy	7.43	6.5	-	-	6.5	6.28	4.21	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.43	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.797	4	-	-	4	3.372	2.299	-	-
Pot Cap-1 Maneuver	456	496	0	0	508	629	-	-	-
Stage 1	-	-	0	0	575	-	-	-	-
Stage 2	519	565	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	429	496	-	-	508	629	-	-	-
Mov Cap-2 Maneuver	429	496	-	-	508	-	-	-	-
Stage 1	-	-	-	-	575	-	-	-	-
Stage 2	485	565	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	13	12.1	
HCM LOS	B	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	454	544
HCM Lane V/C Ratio	-	-	-	0.013	0.073
HCM Control Delay (s)	-	-	-	13	12.1
HCM Lane LOS	-	-	-	B	B
HCM 95th %tile Q(veh)	-	-	-	0	0.2

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	3	9	25	0	56	5	768	25	72	599	4
Future Vol, veh/h	2	3	9	25	0	56	5	768	25	72	599	4
Conflicting Peds, #/hr	2	0	0	0	0	2	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	4	0	0	0	1	0	0	2	0
Mvmt Flow	2	3	10	27	0	61	5	835	27	78	651	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1701	1683	654	1676	1672	852	656	0	0	863	0	0
Stage 1	810	810	-	860	860	-	-	-	-	-	-	-
Stage 2	891	873	-	816	812	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.14	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.536	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	73	95	470	75	97	362	941	-	-	788	-	-
Stage 1	377	396	-	348	376	-	-	-	-	-	-	-
Stage 2	340	370	-	368	395	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	56	85	469	66	87	361	940	-	-	787	-	-
Mov Cap-2 Maneuver	56	85	-	181	205	-	-	-	-	-	-	-
Stage 1	375	356	-	346	374	-	-	-	-	-	-	-
Stage 2	281	368	-	322	356	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.7	20.5	0.1	1.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	940	-	-	155	181	361	787	-	-
HCM Lane V/C Ratio	0.006	-	-	0.098	0.15	0.169	0.099	-	-
HCM Control Delay (s)	8.9	-	-	30.7	28.4	17	10.1	-	-
HCM Lane LOS	A	-	-	D	D	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.5	0.6	0.3	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	0	0	31	60	27	740	94	0	0	0
Future Vol, veh/h	3	1	0	0	31	60	27	740	94	0	0	0
Conflicting Peds, #/hr	0	0	2	2	0	0	1	0	3	3	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	4	1	0	0	0	0
Mvmt Flow	3	1	0	0	35	68	31	841	107	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	1009	1014	-	-	961	898	1	0	0
Stage 1	1	1	-	-	960	-	-	-	-
Stage 2	1008	1013	-	-	1	-	-	-	-
Critical Hdwy	7.1	6.5	-	-	6.5	6.2	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	-	-	4	3.3	2.236	-	-
Pot Cap-1 Maneuver	221	240	0	0	258	341	1609	-	-
Stage 1	-	-	0	0	338	-	-	-	-
Stage 2	292	319	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	152	229	-	-	246	340	1607	-	-
Mov Cap-2 Maneuver	152	229	-	-	246	-	-	-	-
Stage 1	-	-	-	-	323	-	-	-	-
Stage 2	199	305	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	27.3	23.1	0.2
HCM LOS	D	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	1607	-	-	166	301
HCM Lane V/C Ratio	0.019	-	-	0.027	0.344
HCM Control Delay (s)	7.3	0	-	27.3	23.1
HCM Lane LOS	A	A	-	D	C
HCM 95th %tile Q(veh)	0.1	-	-	0.1	1.5

Appendix C ODOT Crash Data

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF SALEM, MARION COUNTY

Crashes on Liberty St NE & River Rd N in Salem, OR.
Includes crashes on Liberty St NE North of Bliler Ave NE and on River Rd within 200 ft North of Liberty St NE & River Rd N Intersection.
January 1, 2015 through December 31, 2019

SER# / INVEST / UNLOC?	SPED	ALC	DRUG/MJ	SCHL	WORK	DATE / DAY/TIME / *LAT/LONG*	FC / DISTNC	CITY STREET / FIRST STREET / SECOND STREET / INTERSECTION SEQ #	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC / TYPE	INJ SVRTY	AGE	SEX	LICNS / RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
03680	N	N	N		Y	08/18/2016	14	LIBERTY ST NE	STRGHT		N		N CLR	S-STRGHT	01	NONE 0	STRGHT											13
NONE			N			Thu 1P	156	BLILER AVE NE	N	(NONE)	ACCEL LANE		N DRY	SS-O		PRVTE	S N									000		00
No	*44*	*58*	*4.20*			*-123 1 54.55*		1	07	(02)			N DAY	INJ		PSNGR CAR		01	DRVR	NONE	60	F	OR-Y OR<25		045	000		13
															02	NONE 0	STRGHT											
																PRVTE	S N									000		00
																PSNGR CAR		01	DRVR	INJC	53	F	OR-Y OR<25		000	000		00
03099	N	N	N			08/15/2019	14	LIBERTY ST NE	INTER	3-LEG	N		N CLR	ANGL-OTH	01	NONE 0	STRGHT											02
NONE			N			Thu 2P	0	N RIVER RD	CN		STOP SIGN		N DRY	TURN		PRVTE	NE SW									000		00
No	*44*	*58*	*10.74*			*-123 1 54.16*		1	01	0			N DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y OR<25		000	000		00
															02	NONE 0	TURN-L											
																PRVTE	S SW									018		00
																PSNGR CAR		01	DRVR	NONE	68	F	OR-Y OR<25		028	000		02
																		02	PSNG	INJC	07	M			000	000		00
00155	N	N	N	N	N	01/12/2016	14	LIBERTY ST NE	INTER	3-LEG	N		N RAIN	ANGL-OTH	01	NONE 0	TURN-L											02
CITY			N			Tue 5P	0	N RIVER RD	CN		STOP SIGN		N WET	TURN		PRVTE	NE S									018		00
No	*44*	*58*	*10.72*			*-123 1 54.17*		1	02	0			Y DUSK	INJ		PSNGR CAR		01	DRVR	INJC	79	M	OTH-Y N-RES		028	000		02
																		02	PSNG	INJC	66	F			000	000		00
															02	NONE 0	STRGHT											
																PRVTE	S N									000		00
																PSNGR CAR		01	DRVR	NONE	47	M	OTH-Y OR<25		000	000		00
04695	N	N	N			10/24/2016	14	LIBERTY ST NE	INTER	3-LEG	N		N CLD	ANGL-OTH	01	NONE 9	TURN-L											02
NONE			N			Mon 3P	0	N RIVER RD	CN		STOP SIGN		N WET	TURN		N/A	SE SW									018		00
No	*44*	*58*	*10.72*			*-123 1 54.17*		1	02	0			Y DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK UNK		000	000		00
															02	NONE 9	STRGHT											
																N/A	SW NE									000		00
																PSNGR CAR		01	DRVR	NONE	00	U	UNK UNK		000	000		00
02046	N	N	N	N	N	06/01/2019	14	LIBERTY ST NE	INTER	3-LEG	N		N CLR	ANGL-OTH	01	NONE 0	STRGHT											02
CITY			N			Sat 11A	0	N RIVER RD	CN		STOP SIGN		N DRY	TURN		PRVTE	S N									000		00
No	*44*	*58*	*10.73*			*-123 1 54.17*		1	02	0			Y DAY	INJ		PSNGR CAR		01	DRVR	INJC	73	F	OR-Y OR<25		000	000		00
															02	NONE 0	TURN-L											
																PRVTE	NE S									018		00
																PSNGR CAR		01	DRVR	INJC	66	F	OR-Y OR<25		028	000		02

CITY OF SALEM, MARION COUNTY

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02182	N N N N N	06/13/2015	14	LIBERTY ST NE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										001	02
CITY	N	Sat 2P	0	N RIVER RD	CN		STOP SIGN	N	DRY	ANGL		PRVTE	SW NE									000		00
No	*44 58 10.72*	*-123 1 54.17*		1	03	0		Y	DAY	INJ		MTRCYCLE		01	DRVR	INJB	40	M	OR-Y		000	000	001	00
																			OR<25					
											02	NONE 0	STRGHT											
												PRVTE	N S									018		00
												PSNGR CAR		01	DRVR	NONE	35	F	OR-Y		028	000		02
																			OR<25					
05470	N N N N N	12/10/2016	14	LIBERTY ST NE	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-R											02
CITY	N	Sat 4P	0	N RIVER RD	CN		STOP SIGN	N	WET	TURN		PRVTE	S NE									000		00
No	*44 58 10.72*	*-123 1 54.17*		1	04	0		Y	DUSK	INJ		PSNGR CAR		01	DRVR	INJB	18	F	OR-Y		000	000		00
																			OR<25					
											02	NONE 0	TURN-L											
												PRVTE	NE E									019		00
												PSNGR CAR		01	DRVR	NONE	59	M	OR-Y		028	000		02
																			OR<25					
														02	PSNG	INJC	64	F			000	000		00
02858	N N N N N	07/18/2017	14	LIBERTY ST NE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 9	TURN-L											02
CITY	N	Tue 2P	0	N RIVER RD	CN		STOP SIGN	N	DRY	TURN		N/A	SW N									018		00
No	*44 58 10.72*	*-123 1 54.17*		1	04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
																			UNK					
											02	NONE 9	STRGHT											
												N/A	S N									000		00
												PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
																			UNK					
02888	N N N	07/30/2019	14	LIBERTY ST NE	INTER	3-LEG	N	N	UNK	ANGL-OTH	01	NONE 0	STRGHT											02
NONE	N	Tue 5P	0	N RIVER RD	CN		STOP SIGN	N	UNK	ANGL		PRVTE	SW NE									000		00
No	*44 58 10.74*	*-123 1 54.19*		1	04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	40	M	OR-Y		000	000		00
																			OR<25					
											02	NONE 0	UNK											
												PRVTE	UN UN									000		00
												PSNGR CAR		01	DRVR	NONE	00	M	UNK		028	000		02
																			UNK					
03489	N N N	08/25/2017	14	LIBERTY ST NE	STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											29
NONE	N	Fri 9A	67	RIVIERA DR NE	N	(NONE)	ONE-WAY	N	DRY	REAR		PRVTE	S N									000		00
No	*44 58 8.16*	*-123 1 55.02*		1	07			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	17	F	OR-Y		042	000		29
						(02)													OR<25					
											02	NONE 0	STRGHT											
												PRVTE	S N									006		00
												PSNGR CAR		01	DRVR	NONE	00	F	UNK		000	000		00
																			UNK					

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00663	N	N	N			02/15/2016	14	LIBERTY ST NE	STRGHT		N		N	CLR	01	NONE 9	STRGHT											13
NONE			N			Mon UNK	41	RIVIERA DR NE	S	(NONE)	ACCEL LANE		N	DRY		N/A	S N									000		00
No	*44*	*58*	*6.68*	*-123*	*1 54.78*			1	06				N	DAY		PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
										(02)													UNK					
															02	NONE 9	STRGHT											
																N/A	S N									000		00
																PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
																							UNK					
03281	N	N	N			08/14/2017	14	LIBERTY ST NE	CURVE		N		N	CLR	01	NONE 0	STRGHT											13
NONE			N			Mon 1P	56	RIVIERA DR NE	S	(NONE)	ONE-WAY		N	DRY		PRVTE	S N									000		00
No	*44*	*58*	*6.60*	*-123*	*1 54.76*			1	07				N	DAY		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		045	000		13
										(02)													OR<25					
															02	NONE 0	STRGHT											
																PRVTE	S N									000		00
																PSNGR CAR		01	DRVR	INJC	33	F	OR-Y		000	000		00
																							OR<25					
																		02	PSNG	INJC	03	F			000	000		00
																		03	PSNG	INJC	01	M			000	000		00
04075	N	Y	N	N	N	10/17/2019	14	LIBERTY ST NE	STRGHT		N		N	RAIN	01	NONE 9	STRGHT											15
CITY			N			Thu 10P	211	RIVIERA DR NE	S	(NONE)	ONE-WAY		N	WET		N/A	N S									000		00
No	*44*	*58*	*5.02*	*-123*	*1 54.56*			1	07				N	DLIT		PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
										(00)													UNK					
															02	NONE 9	STRGHT											
																N/A	S N									000		00
																PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
																							UNK					
05095	N	N	N			12/17/2019	14	LIBERTY ST NE	STRGHT		N		N	CLR	01	NONE 9	STRGHT											13
CITY			N			Tue 5P	165	RIVIERA DR NE	S	(NONE)	ONE-WAY		N	DRY		N/A	S N									000		00
No	*44*	*58*	*5.45*	*-123*	*1 54.61*			1	08				N	DUSK		PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
										(02)													UNK					
															02	NONE 9	STRGHT											
																N/A	S N									000		00
																PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
																							UNK					
04162	N	N	N			10/23/2019	14	LIBERTY ST NE	STRGHT		N		N	CLR	01	NONE 9	STRGHT											13
NONE			N			Wed 4P	190	RIVIERA DR NE	S	(NONE)	ONE-WAY		N	DRY		N/A	S N									000		00
No	*44*	*58*	*5.20*	*-123*	*1 54.61*			1	08				N	DAY		PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
										(02)													UNK					
															02	NONE 9	STRGHT											
																N/A	S N									000		00
																PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
																							UNK					

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04248	N	N	N			11/03/2015	14	LIBERTY ST NE	INTER	3-LEG	N		N	RAIN	O-1 L-TURN	01	NONE 0	TURN-L										02
NONE			N			Tue 5P	0	RIVIERA DR NE	CN		STOP SIGN		N	WET	TURN		PRVTE	W N								000		00
No	*44*	*58*	*7.22*	*-123*	*1 54.87*		1		02	0			Y	DARK	INJ		PSNGR CAR		01	DRVR	INJC	47	F	OR-Y	004,028	000		02
																								OR<25				
																02	NONE 0	STRGHT										
																	PRVTE	E W								000		00
																	PSNGR CAR		01	DRVR	NONE	36	F	OR-Y	000	000		00
																								OR<25				
																			02	PSNG	NO<5	01	M		000	000		00
05159	N	N	N			11/21/2016	14	N RIVER RD	STRGHT		N		N	RAIN	O-1STOP	01	NONE 9	BACK										10
NONE			N			Mon 10A	35	LIBERTY ST NE	NE	(NONE)	UNKNOWN		N	WET	BACK		N/A	NE SW								000		00
No	*44*	*58*	*11.23*	*-123*	*1 53.79*		1		05				N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK	000	000		00
										(02)														UNK				
																02	NONE 9	STOP										
																	N/A	SW NE								011		00
																	PSNGR CAR		01	DRVR	NONE	00	U	UNK	000	000		00
																								UNK				
00193	N	N	N			01/13/2016	14	N RIVER RD	STRGHT		N		N	RAIN	S-1STOP	01	NONE 9	STRGHT										29
NONE			N			Wed 12P	136	LIBERTY ST NE	NE	(NONE)	UNKNOWN		N	WET	REAR		N/A	SW NE								000		00
No	*44*	*58*	*12.07*	*-123*	*1 53.16*		1		07				N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK	000	000		00
										(02)														UNK				
																02	NONE 9	STOP										
																	N/A	SW NE								011		00
																	PSNGR CAR		01	DRVR	NONE	00	U	UNK	000	000		00
																								UNK				
04452	N	N	N			11/19/2018	14	N RIVER RD	STRGHT		N		N	CLR	S-STRGHT	01	NONE 9	STRGHT										29
NONE			N			Mon 1P	79	LIBERTY ST NE	NE	(NONE)	UNKNOWN		N	DRY	REAR		N/A	NE SW								000		00
No	*44*	*58*	*11.46*	*-123*	*1 53.65*		1		08				N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK	000	000		00
										(02)														UNK				
																02	NONE 9	STRGHT										
																	N/A	NE SW								000		00
																	PSNGR CAR		01	DRVR	NONE	00	U	UNK	000	000		00
																								UNK				
01921	N	N	N			04/29/2016	14	N RIVER RD	STRGHT		N		N	RAIN	S-1STOP	01	NONE 0	STRGHT									013	29
NONE			N			Fri 4P	100	LIBERTY ST NE	NE	(NONE)	UNKNOWN		N	WET	REAR		PRVTE	NE SW								000		00
No	*44*	*58*	*11.80*	*-123*	*1 53.36*		1		08				N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y	026	000		29
										(02)														OR<25				
																02	NONE 0	STOP										
																	PRVTE	NE SW								011	013	00
																	PSNGR CAR		01	DRVR	NONE	27	M	OR-Y	000	022		00
																								OR<25				

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															03	NONE 0	STOP											
																PRVTE	NE SW									011		00
																PSNGR CAR		01	DRVR	INJC	30	M	OR-Y		000	000		00
																							OR<25					

Appendix D 2023 Background Traffic Operations Worksheets

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	1	15	1	6	4	354	11	27	707	0
Future Vol, veh/h	1	1	1	15	1	6	4	354	11	27	707	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	100	7	0	0	25	5	9	4	2	0
Mvmt Flow	1	1	1	19	1	8	5	443	14	34	884	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1417	1419	884	1413	1412	450	884	0	0	457	0	0
Stage 1	952	952	-	460	460	-	-	-	-	-	-	-
Stage 2	465	467	-	953	952	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	7.2	7.17	6.5	6.2	4.35	-	-	4.14	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	4.2	3.563	4	3.3	2.425	-	-	2.236	-	-
Pot Cap-1 Maneuver	116	138	234	112	139	613	677	-	-	1093	-	-
Stage 1	314	341	-	572	569	-	-	-	-	-	-	-
Stage 2	581	565	-	305	341	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	111	133	234	107	134	613	677	-	-	1093	-	-
Mov Cap-2 Maneuver	111	133	-	216	243	-	-	-	-	-	-	-
Stage 1	312	330	-	568	565	-	-	-	-	-	-	-
Stage 2	568	561	-	293	330	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.7	19.7	0.1	0.3
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	677	-	-	144	216	503	1093	-	-
HCM Lane V/C Ratio	0.007	-	-	0.026	0.087	0.017	0.031	-	-
HCM Control Delay (s)	10.4	-	-	30.7	23.2	12.3	8.4	-	-
HCM Lane LOS	B	-	-	D	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	2	0	0	24	12	18	355	31	0	0	0
Future Vol, veh/h	3	2	0	0	24	12	18	355	31	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	33	0	0	0	0	8	11	4	0	0	0	0
Mvmt Flow	3	2	0	0	27	14	20	403	35	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	481	478	-	-	461	421	0	0	0
Stage 1	0	0	-	-	461	-	-	-	-
Stage 2	481	478	-	-	0	-	-	-	-
Critical Hdwy	7.43	6.5	-	-	6.5	6.28	4.21	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.43	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.797	4	-	-	4	3.372	2.299	-	-
Pot Cap-1 Maneuver	448	489	0	0	500	620	-	-	-
Stage 1	-	-	0	0	569	-	-	-	-
Stage 2	512	559	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	420	489	-	-	500	620	-	-	-
Mov Cap-2 Maneuver	420	489	-	-	500	-	-	-	-
Stage 1	-	-	-	-	569	-	-	-	-
Stage 2	477	559	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	13.2	12.3	
HCM LOS	B	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	445	534
HCM Lane V/C Ratio	-	-	-	0.013	0.077
HCM Control Delay (s)	-	-	-	13.2	12.3
HCM Lane LOS	-	-	-	B	B
HCM 95th %tile Q(veh)	-	-	-	0	0.2

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	3	9	26	0	57	5	787	26	74	614	4
Future Vol, veh/h	2	3	9	26	0	57	5	787	26	74	614	4
Conflicting Peds, #/hr	2	0	0	0	0	2	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	4	0	0	0	1	0	0	2	0
Mvmt Flow	2	3	10	28	0	62	5	855	28	80	667	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1742	1724	670	1716	1712	872	672	0	0	884	0	0
Stage 1	830	830	-	880	880	-	-	-	-	-	-	-
Stage 2	912	894	-	836	832	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.14	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.536	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	69	90	460	70	91	353	928	-	-	774	-	-
Stage 1	367	388	-	339	368	-	-	-	-	-	-	-
Stage 2	331	362	-	359	387	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	52	80	459	61	81	352	927	-	-	773	-	-
Mov Cap-2 Maneuver	52	80	-	174	198	-	-	-	-	-	-	-
Stage 1	365	348	-	337	366	-	-	-	-	-	-	-
Stage 2	271	360	-	312	347	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.5	21.3	0.1	1.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	927	-	-	146	174	352	773	-	-
HCM Lane V/C Ratio	0.006	-	-	0.104	0.162	0.176	0.104	-	-
HCM Control Delay (s)	8.9	-	-	32.5	29.7	17.4	10.2	-	-
HCM Lane LOS	A	-	-	D	D	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.6	0.6	0.3	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	0	0	32	62	28	759	96	0	0	0
Future Vol, veh/h	3	1	0	0	32	62	28	759	96	0	0	0
Conflicting Peds, #/hr	0	0	2	2	0	0	1	0	3	3	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	4	1	0	0	0	0
Mvmt Flow	3	1	0	0	36	70	32	863	109	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	1036	1040	-	-	986	921	1	0	0
Stage 1	1	1	-	-	985	-	-	-	-
Stage 2	1035	1039	-	-	1	-	-	-	-
Critical Hdwy	7.1	6.5	-	-	6.5	6.2	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	-	-	4	3.3	2.236	-	-
Pot Cap-1 Maneuver	212	232	0	0	250	331	1609	-	-
Stage 1	-	-	0	0	329	-	-	-	-
Stage 2	282	310	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	142	221	-	-	238	330	1607	-	-
Mov Cap-2 Maneuver	142	221	-	-	238	-	-	-	-
Stage 1	-	-	-	-	314	-	-	-	-
Stage 2	187	295	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	28.8	24.3	0.2
HCM LOS	D	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	1607	-	-	156	292
HCM Lane V/C Ratio	0.02	-	-	0.029	0.366
HCM Control Delay (s)	7.3	0	-	28.8	24.3
HCM Lane LOS	A	A	-	D	C
HCM 95th %tile Q(veh)	0.1	-	-	0.1	1.6

Appendix E 2023 Total Traffic Operations Worksheets

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	1	26	1	13	4	354	16	57	690	0
Future Vol, veh/h	1	1	1	26	1	13	4	354	16	57	690	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	100	7	0	0	25	5	9	4	2	0
Mvmt Flow	1	1	1	33	1	16	5	443	20	71	863	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1477	1478	863	1469	1468	453	863	0	0	463	0	0
Stage 1	1005	1005	-	463	463	-	-	-	-	-	-	-
Stage 2	472	473	-	1006	1005	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	7.2	7.17	6.5	6.2	4.35	-	-	4.14	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	4.2	3.563	4	3.3	2.425	-	-	2.236	-	-
Pot Cap-1 Maneuver	105	127	242	103	129	611	690	-	-	1088	-	-
Stage 1	294	322	-	570	568	-	-	-	-	-	-	-
Stage 2	576	562	-	285	322	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	96	118	242	96	120	611	690	-	-	1088	-	-
Mov Cap-2 Maneuver	96	118	-	198	225	-	-	-	-	-	-	-
Stage 1	292	301	-	566	564	-	-	-	-	-	-	-
Stage 2	555	558	-	264	301	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	33.5	21.5	0.1	0.7
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	690	-	-	130	198	544	1088	-	-
HCM Lane V/C Ratio	0.007	-	-	0.029	0.164	0.032	0.065	-	-
HCM Control Delay (s)	10.3	-	-	33.5	26.7	11.8	8.5	-	-
HCM Lane LOS	B	-	-	D	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.6	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	2	0	0	40	23	18	349	47	0	0	0
Future Vol, veh/h	3	2	0	0	40	23	18	349	47	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	33	0	0	0	0	8	11	4	0	0	0	0
Mvmt Flow	3	2	0	0	45	26	20	397	53	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	499	490	-	-	464	424	0	0	0
Stage 1	0	0	-	-	464	-	-	-	-
Stage 2	499	490	-	-	0	-	-	-	-
Critical Hdwy	7.43	6.5	-	-	6.5	6.28	4.21	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.43	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.797	4	-	-	4	3.372	2.299	-	-
Pot Cap-1 Maneuver	435	482	0	0	498	617	-	-	-
Stage 1	-	-	0	0	567	-	-	-	-
Stage 2	500	552	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	388	482	-	-	498	617	-	-	-
Mov Cap-2 Maneuver	388	482	-	-	498	-	-	-	-
Stage 1	-	-	-	-	567	-	-	-	-
Stage 2	440	552	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	13.7	12.7	
HCM LOS	B	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	421	536
HCM Lane V/C Ratio	-	-	-	0.013	0.134
HCM Control Delay (s)	-	-	-	13.7	12.7
HCM Lane LOS	-	-	-	B	B
HCM 95th %tile Q(veh)	-	-	-	0	0.5

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	3	9	39	0	70	5	787	35	108	598	4
Future Vol, veh/h	2	3	9	39	0	70	5	787	35	108	598	4
Conflicting Peds, #/hr	2	0	0	0	0	2	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	4	0	0	0	1	0	0	2	0
Mvmt Flow	2	3	10	42	0	76	5	855	38	117	650	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1811	1791	653	1778	1774	877	655	0	0	894	0	0
Stage 1	887	887	-	885	885	-	-	-	-	-	-	-
Stage 2	924	904	-	893	889	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.14	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.536	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	61	82	471	63	84	351	942	-	-	767	-	-
Stage 1	341	365	-	337	366	-	-	-	-	-	-	-
Stage 2	326	358	-	333	364	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	42	69	470	52	71	350	941	-	-	766	-	-
Mov Cap-2 Maneuver	42	69	-	159	183	-	-	-	-	-	-	-
Stage 1	339	309	-	335	364	-	-	-	-	-	-	-
Stage 2	253	356	-	273	308	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.2	24.4	0.1	1.6
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	941	-	-	127	159	350	766	-	-
HCM Lane V/C Ratio	0.006	-	-	0.12	0.267	0.217	0.153	-	-
HCM Control Delay (s)	8.8	-	-	37.2	35.7	18.1	10.5	-	-
HCM Lane LOS	A	-	-	E	E	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	1	0.8	0.5	-	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	0	0	53	83	28	747	122	0	0	0
Future Vol, veh/h	3	1	0	0	53	83	28	747	122	0	0	0
Conflicting Peds, #/hr	0	0	2	2	0	0	1	0	3	3	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	4	1	0	0	0	0
Mvmt Flow	3	1	0	0	60	94	32	849	139	0	0	0

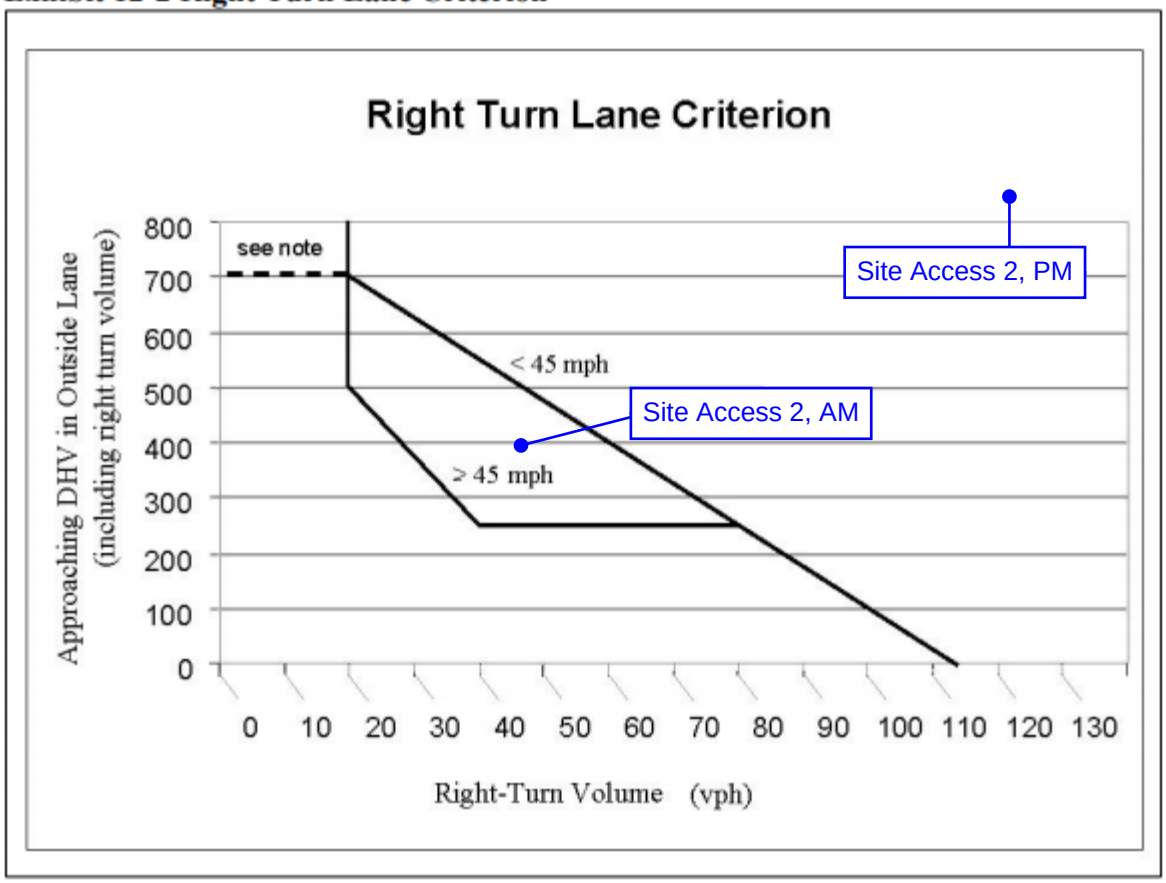
Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	1061	1056	-	-	987	922	1	0	0
Stage 1	1	1	-	-	986	-	-	-	-
Stage 2	1060	1055	-	-	1	-	-	-	-
Critical Hdwy	7.1	6.5	-	-	6.5	6.2	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	-	-	4	3.3	2.236	-	-
Pot Cap-1 Maneuver	203	227	0	0	249	330	1609	-	-
Stage 1	-	-	0	0	328	-	-	-	-
Stage 2	273	305	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	112	216	-	-	237	329	1607	-	-
Mov Cap-2 Maneuver	112	216	-	-	237	-	-	-	-
Stage 1	-	-	-	-	312	-	-	-	-
Stage 2	150	290	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	34.4	31.5	0.2
HCM LOS	D	D	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	1607	-	-	127	286
HCM Lane V/C Ratio	0.02	-	-	0.036	0.54
HCM Control Delay (s)	7.3	0	-	34.4	31.5
HCM Lane LOS	A	A	-	D	D
HCM 95th %tile Q(veh)	0.1	-	-	0.1	3

Appendix F Right-turn Lane Criteria Worksheets

Exhibit 12-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

Appendix G 2023 Total Traffic Operation Worksheets with Right-turn Lane

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	1	1	26	1	13	4	354	16	57	690	0
Future Vol, veh/h	1	1	1	26	1	13	4	354	16	57	690	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	100	7	0	0	25	5	9	4	2	0
Mvmt Flow	1	1	1	33	1	16	5	443	20	71	863	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1477	1478	863	1469	1468	453	863	0	0	463	0	0
Stage 1	1005	1005	-	463	463	-	-	-	-	-	-	-
Stage 2	472	473	-	1006	1005	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	7.2	7.17	6.5	6.2	4.35	-	-	4.14	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.17	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	4.2	3.563	4	3.3	2.425	-	-	2.236	-	-
Pot Cap-1 Maneuver	105	127	242	103	129	611	690	-	-	1088	-	-
Stage 1	294	322	-	570	568	-	-	-	-	-	-	-
Stage 2	576	562	-	285	322	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	96	118	242	96	120	611	690	-	-	1088	-	-
Mov Cap-2 Maneuver	96	118	-	198	225	-	-	-	-	-	-	-
Stage 1	292	301	-	566	564	-	-	-	-	-	-	-
Stage 2	555	558	-	264	301	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	33.5	21.5	0.1	0.7
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	690	-	-	130	198	544	1088	-	-
HCM Lane V/C Ratio	0.007	-	-	0.029	0.164	0.032	0.065	-	-
HCM Control Delay (s)	10.3	-	-	33.5	26.7	11.8	8.5	-	-
HCM Lane LOS	B	-	-	D	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.6	0.1	0.2	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	2	0	0	40	23	18	349	47	0	0	0
Future Vol, veh/h	3	2	0	0	40	23	18	349	47	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	33	0	0	0	0	8	11	4	0	0	0	0
Mvmt Flow	3	2	0	0	45	26	20	397	53	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	499	490	-	-	437	397	0	0	0
Stage 1	0	0	-	-	437	-	-	-	-
Stage 2	499	490	-	-	0	-	-	-	-
Critical Hdwy	7.43	6.5	-	-	6.5	6.28	4.21	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.43	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.797	4	-	-	4	3.372	2.299	-	-
Pot Cap-1 Maneuver	435	482	0	0	516	640	-	-	-
Stage 1	-	-	0	0	583	-	-	-	-
Stage 2	500	552	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	389	482	-	-	516	640	-	-	-
Mov Cap-2 Maneuver	389	482	-	-	516	-	-	-	-
Stage 1	-	-	-	-	583	-	-	-	-
Stage 2	442	552	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	13.6	12.4	
HCM LOS	B	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	422	555
HCM Lane V/C Ratio	-	-	-	0.013	0.129
HCM Control Delay (s)	-	-	-	13.6	12.4
HCM Lane LOS	-	-	-	B	B
HCM 95th %tile Q(veh)	-	-	-	0	0.4

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	3	9	39	0	70	5	787	35	108	598	4
Future Vol, veh/h	2	3	9	39	0	70	5	787	35	108	598	4
Conflicting Peds, #/hr	2	0	0	0	0	2	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	4	0	0	0	1	0	0	2	0
Mvmt Flow	2	3	10	42	0	76	5	855	38	117	650	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1811	1791	653	1778	1774	877	655	0	0	894	0	0
Stage 1	887	887	-	885	885	-	-	-	-	-	-	-
Stage 2	924	904	-	893	889	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.14	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.14	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.536	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	61	82	471	63	84	351	942	-	-	767	-	-
Stage 1	341	365	-	337	366	-	-	-	-	-	-	-
Stage 2	326	358	-	333	364	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	42	69	470	52	71	350	941	-	-	766	-	-
Mov Cap-2 Maneuver	42	69	-	159	183	-	-	-	-	-	-	-
Stage 1	339	309	-	335	364	-	-	-	-	-	-	-
Stage 2	253	356	-	273	308	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.2	24.4	0.1	1.6
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	941	-	-	127	159	350	766	-	-
HCM Lane V/C Ratio	0.006	-	-	0.12	0.267	0.217	0.153	-	-
HCM Control Delay (s)	8.8	-	-	37.2	35.7	18.1	10.5	-	-
HCM Lane LOS	A	-	-	E	E	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	1	0.8	0.5	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	0	0	53	83	28	747	122	0	0	0
Future Vol, veh/h	3	1	0	0	53	83	28	747	122	0	0	0
Conflicting Peds, #/hr	0	0	2	2	0	0	1	0	3	3	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	4	1	0	0	0	0
Mvmt Flow	3	1	0	0	60	94	32	849	139	0	0	0

Major/Minor	Minor2		Minor1			Major1			
Conflicting Flow All	1061	1056	-	-	917	852	1	0	0
Stage 1	1	1	-	-	916	-	-	-	-
Stage 2	1060	1055	-	-	1	-	-	-	-
Critical Hdwy	7.1	6.5	-	-	6.5	6.2	4.14	-	-
Critical Hdwy Stg 1	-	-	-	-	5.5	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	-	-	4	3.3	2.236	-	-
Pot Cap-1 Maneuver	203	227	0	0	274	362	1609	-	-
Stage 1	-	-	0	0	354	-	-	-	-
Stage 2	273	305	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	119	216	-	-	260	361	1607	-	-
Mov Cap-2 Maneuver	119	216	-	-	260	-	-	-	-
Stage 1	-	-	-	-	337	-	-	-	-
Stage 2	158	290	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	32.8	27.1	0.2
HCM LOS	D	D	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	1607	-	-	134	314
HCM Lane V/C Ratio	0.02	-	-	0.034	0.492
HCM Control Delay (s)	7.3	0	-	32.8	27.1
HCM Lane LOS	A	A	-	D	D
HCM 95th %tile Q(veh)	0.1	-	-	0.1	2.6