

Aurora Oaks

Thurston County, WA

Traffic Impact Analysis

May 16, 2023

Prepared for:

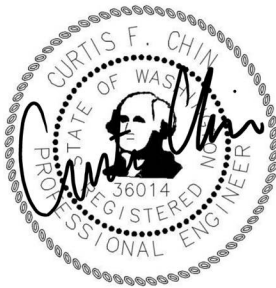
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Table of Contents

EXECUTIVE SUMMARY	1
INTRODUCTION	3
Traffic Scoping Report	3
Project Approach.....	3
Primary Data and Information Sources	3
TRAFFIC IMPACT ANALYSIS.....	2
1. Prospectus	2
2. Existing Conditions	4
3. Development Traffic	7
4. Project Trip Generation.....	7
5. Project Trip Distribution	8
6. Future Traffic Conditions	8
7. Traffic Operations with Project Buildout.....	13
8. Access Management	19
9. Traffic Calming	20
10. Alternate Modes of Transportation	20
11. Mitigation	20

Appendices

Appendix A – Thurston County Traffic Scoping Review Letter

Appendix B – Preliminary Site Plan

Appendix C – Existing Traffic Counts

Appendix D – Trip Generation Calculations

Appendix E – SZA 88 Model Distribution

Appendix F – Level of Service (LOS) Methodology and Calculations

List of Figures and Tables

Figure 1 Project Site Vicinity	3
Figure 2 Study Area.....	5
Figure 3 2023 Existing Weekday PM Peak Hour Traffic Volumes	6
Figure 4 Weekday PM Peak Hour Project Trip Assignment	10
Figure 5 2025 No Action Weekday PM Peak Hour Traffic Volumes	11
Figure 6 2025 With Project Weekday PM Peak Hour Traffic Volumes	12
Table 1 Trip Generation Summary	7
Table 2 2023 Existing PM Peak Hour LOS Summary	14
Table 3 2025 Future PM Peak Hour LOS Summary	16
Table 4 Site Access PM Peak Hour LOS and Queue Summary.....	19

EXECUTIVE SUMMARY

Project Proposal. The proposed Aurora Oaks site is located south of 58th Ave SE and east of Kagy Street SE. The proposed project is expected to have a total of up to 180 single-family homes at full buildout. The existing site includes one (1) single-family home which will be removed with the proposed project. The horizon year for full buildout of the proposed project in this Traffic Impact Analysis is 2025.

Vehicular Access. Vehicular access is proposed via a new road that will intersect with 58th Ave SE.

Trip Generation. The project at full buildout is estimated to generate 1,688 net new daily vehicular trips with 125 net new trips (33 entering, 92 exiting) occurring during the weekday AM peak hour and 168 net new trips (105 entering, 63 exiting) occurring during the weekday PM peak hour.

Level of Service. Based on scoping comments provided by the City of Lacey and Thurston County, future 2025 PM peak hour LOS analyses were conducted at 18 off-site study intersections to determine traffic impacts of the project buildout. The results of the LOS analyses indicate that 11 of the 18 study intersections are anticipated to operate at LOS D or better during the weekday PM peak hour in 2025 with the proposed Aurora Oaks development. The following intersections are anticipated to operate at LOS E or F:

Intersections located on Strategy Corridors:

The following intersections are located on City of Lacey or Thurston County Strategy Corridors and are therefore exempt from LOS standards.

1. Marvin Rd SE/Steilacoom Rd SE
13. College St SE/Yelm Hwy SE
14. Ruddell Rd SE/Yelm Hwy SE

Intersections with Future Planned Improvements:

The following intersections include future planned improvements that will be completed by the City, County, or other development which are expected to result in acceptable LOS. No mitigation is proposed at these intersections.

3. Marvin Rd SE/Union Mills Rd SE
4. Marvin Rd SE/19th Ave SE
9. Marvin Rd SE/Mullen Rd SE
10. Kagy St SE/Mullen Rd SE

Access Management. The results of the LOS analyses indicate that all individual movements at the proposed site access location are anticipated to operate at LOS A with minimal queuing during the weekday PM peak hour in 2025. In addition, the new site access intersection onto 58th Ave SE is located approximately 550 feet to the east of the existing Kagy St SE/58th Ave SE intersection, meeting the City of Lacey's spacing requirement of 330 feet for a collector roadway.

Traffic Calming. City development guidelines require that internal traffic calming be incorporated into all developments to control cut-through traffic and reduce speed within the development. Since

the project is only proposing access to 58th Ave SE, cut-through traffic is not anticipated to be a concern within the proposed Aurora Oaks project. It should also be noted that a non-motorized and emergency access only connection between Aurora Oaks and Waldon Drive SE will be created to allow pedestrians and bicycles access between the two neighborhoods.

Alternate Modes of Transportation. Sidewalks are proposed on the internal site roadways and will be included on the south side of 58th Ave SE as part of the required frontage improvements. Additionally, a new non-motorized and emergency access only connection between Aurora Oaks and Waldon Drive SE will be created to allow pedestrians and bicycles access between the two neighborhoods.

Mitigation. The following measures have been identified to mitigate the transportation impacts of the proposed Aurora Oaks development.

- **Lacey Impact Fees.** To mitigate impacts to City of Lacey roads, payment of a transportation mitigation cost is required. The mitigation cost calculation will be determined by the City of Lacey Transportation Department and based on the number of PM peak hour trips generated by the final unit count affecting the current City TIP project list.
- **Thurston County Impact Fees.** To mitigate impacts to Thurston County roads, payment of a transportation impact fee is required. The transportation impact fee is based on the type of land use and the size of the development. Based on the current *Thurston County 2023 Transportation Impact Fee Rate Schedule*, the County collects \$3,191 per single-family dwelling unit in Central Urban Growth Areas. Impact fees will be based on the final unit count.
- **Level of Service Deficiencies.** Based on the results of the LOS analysis, all study intersections anticipated to operate at LOS E/F are either located on City of Lacey or Thurston County Strategy Corridors or have future planned improvements that are anticipated to result in acceptable LOS. Therefore, no mitigation is proposed at these intersections.

INTRODUCTION

This Traffic Impact Analysis (TIA) for the Aurora Oaks development was prepared consistent with City of Lacey TIA guidelines. Section 4B.035 of the City of Lacey Development Guidelines and Public Works Standards, Chapter 4 – Transportation, identifies a standardized format for a TIA. A TIA is a specialized study of impacts a proposed development project will have on the transportation system.

The proposed Aurora Oaks site is located south of 58th Ave SE and east of Kagy Street SE. The current project proposal includes up to 180 single-family homes. The existing site consists of one (1) single-family home which will be removed with the proposed project. Vehicular access to/from the project site is proposed via a single new full access driveway on 58th Ave SE.

Traffic Scoping Report

The scope of work for this TIA was established based on the information provided to the City of Lacey and Thurston County in the Traffic Scoping Memo (dated January 27, 2023). Confirmation of scope was received in the County's Traffic Scoping Review letter dated March 9, 2023, and discussed with County staff at the traffic scoping meeting on March 21, 2023. Additionally, an email confirmation of scope from the City of Lacey was received on March 22, 2023.

A total of 18 off-site study intersections were identified for evaluation during weekday PM peak hour conditions. The County Traffic Scoping Review letter is provided in **Appendix A**.

Project Approach

To analyze the traffic impacts of the Aurora Oaks development, the following tasks were undertaken consistent with City of Lacey TIA guidelines:

- | | |
|------------------------------|---------------------------------------|
| 1. Prospectus | 7. Traffic Operations |
| 2. Existing Conditions | 8. Access Management |
| 3. Development Traffic | 9. Traffic Calming |
| 4. Trip Generation | 10. Alternate Modes of Transportation |
| 5. Trip Distribution | 11. Mitigation |
| 6. Future Traffic Conditions | |

Primary Data and Information Sources

- TENW Traffic Scoping Memo – dated January 27, 2023
- Thurston County Traffic Scoping Review Letter – dated March 9, 2023
- ITE *Trip Generation Manual*, 11th Edition, 2021.
- *Highway Capacity Manual*, 6th Edition.
- Year 2022 and 2023 PM Peak Period Traffic Volumes, All Traffic Data.
- City of Lacey *2030 Transportation Plan*.
- City of Lacey *2023-2028 Six-Year Transportation Improvement Program (TIP)*.
- City of Lacey *2019-2038 Capital Facilities Plan (CFP)*.
- TRPC *Annual Listing of Obligated MPO Projects 2022*.
- TRPC *2023-2026 Regional Transportation Improvement Program (RTIP)*.
- Thurston County *2023-2028 TIP*.
- Washington State Department of Transportation (WSDOT) *2023-2026 STIP*.

TRAFFIC IMPACT ANALYSIS

1. Prospectus

- a) The proposed Aurora Oaks site is located south of 58th Ave SE and east of Kagy Street SE as shown in **Figure 1** vicinity map.
- b) A preliminary site plan concept is provided in **Appendix B**. Full buildout is anticipated to include one (1) full access driveway on 58th Ave SE.
- c) The current project proposal includes up to 180 single-family homes. The existing site consists of one (1) single-family home which will be removed with the proposed project resulting in up to 179 net new single-family homes with the development of the proposed project.
- d) The horizon year for full buildout of the proposed project in this Traffic Impact Analysis is 2025.

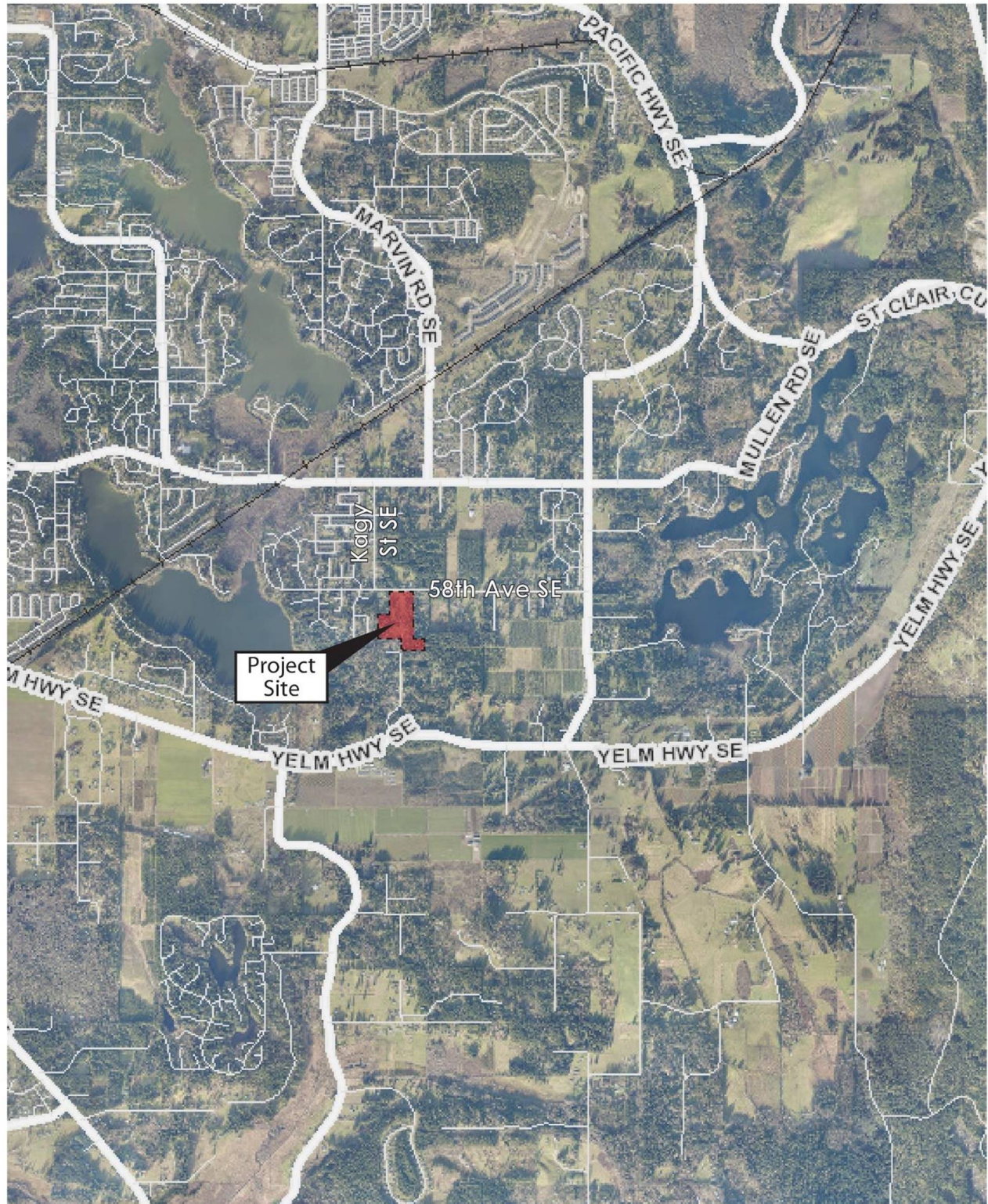


Figure 1: Project Site Vicinity



2. Existing Conditions

- a) The following describes existing transportation conditions in the study area, including an inventory of existing roads, existing traffic volumes, and public transportation services.

Marvin Road SE is a north-south arterial with a posted speed limit of 40 mph in the project vicinity. The road has 2-3 lanes north of Mullen Road SE, then widens to 5 lanes north of Pacific Ave SE. There are intermittent curb, gutter, and sidewalks on both sides of the street.

Mullen Road SE is an east-west arterial with a posted speed limit of 35 mph. The road has 2 lanes in each direction. Edge conditions include paved shoulders in the vicinity of the proposed project.

Meridian Road SE is a north-south arterial with a posted speed limit of 40 mph. The road has 2 lanes in each direction in the project vicinity. Edge conditions include paved shoulders in the vicinity of the proposed project.

Kagy St SE is a two-lane north-south collector with a posted speed limit of 35 mph. Edge conditions include gravel shoulders in the vicinity of the proposed project.

58th Ave SE is a two-lane east-west collector with a posted speed limit of 25-35 mph in the project vicinity. Edge conditions include unpaved shoulders in the vicinity of the proposed project.

- b) Weekday PM peak hour trips from approved pipeline projects were provided by the City of Lacey in March 2023 and are included in this traffic analysis.
- c) The layout and design of the proposed site driveway will take into consideration sight distance, crash potential, and pedestrian conflicts.
- d) Existing PM peak hour traffic counts used in the traffic analysis of the off-site study intersections were collected by All Traffic Data.
- e) The PM peak hour traffic count data sheets for each of the 18 off-site study intersections are provided in **Appendix C**. The traffic counts were conducted in November 2022 and March 2023.
- f) The study area is shown graphically in **Figure 2**. **Figure 3** illustrates the 2023 existing weekday PM peak hour traffic volumes at the 18 study intersections. The weekday PM peak hour traffic volumes represent the highest hourly volume of vehicles traveling through an intersection during a typical 4:00 to 6:00 PM peak period. Note that a 4 percent annual background growth rate was applied to the counts conducted in 2022 to estimate 2023 existing PM peak hour volumes.
- g) Public transit service in the project vicinity is provided by Intercity Transit. The nearest public transit stops are located at the Marvin Rd SE/Mullen Rd SE intersection which serves Intercity Transit route 67. Route 67 operates along Marvin Rd and Mullen Rd from approximately 6:00 AM to 7:30 PM during weekdays and 9:00 AM to 7:30 PM during weekends with approximately 60-minute headways.



Figure 2: Study Area

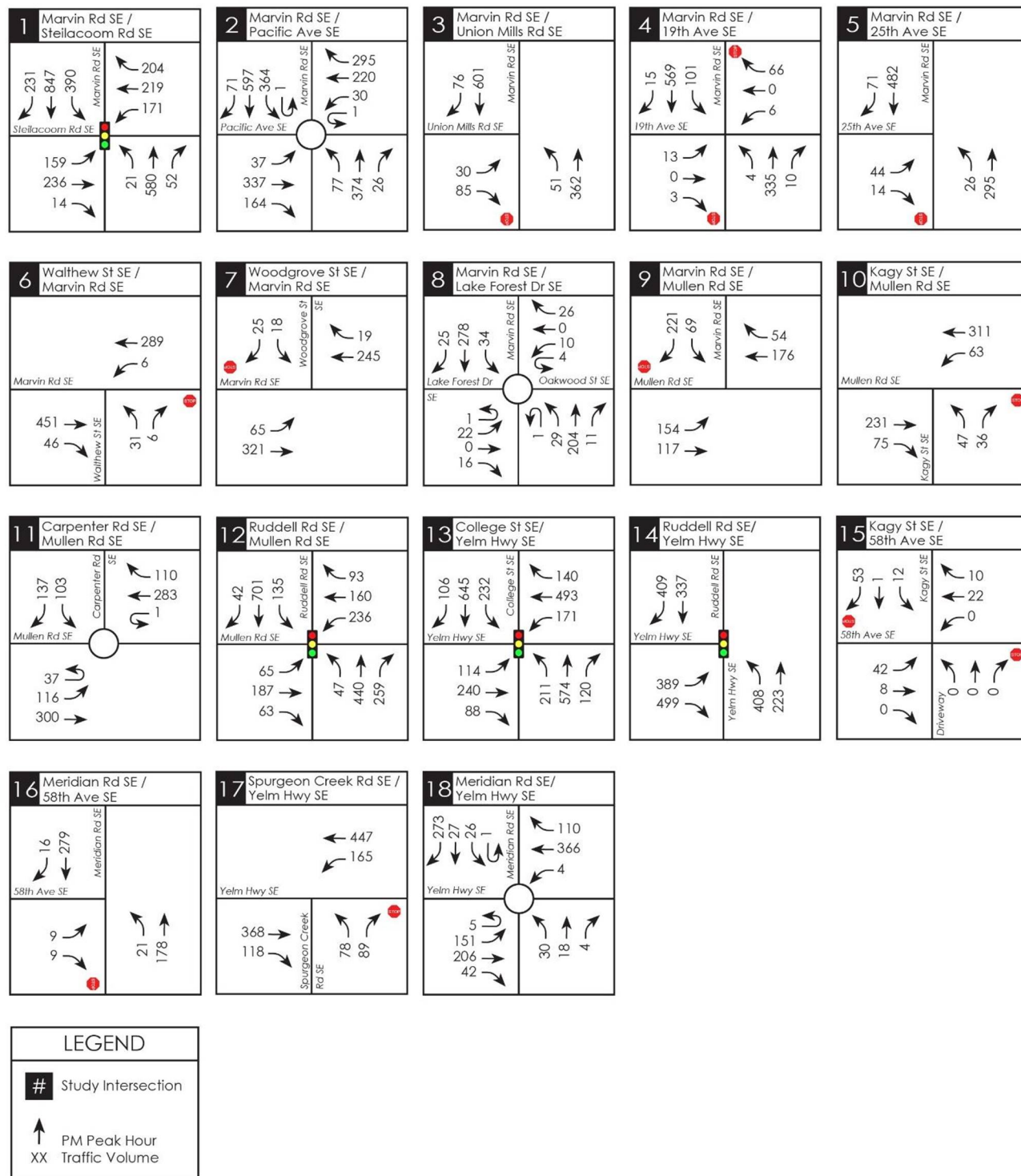


Figure 3: 2023 Existing Weekday PM Peak Hour Traffic Volumes

3. Development Traffic

Based on scoping confirmed by the City of Lacey and Thurston County, the following 18 off-site study intersections were identified for evaluation in this traffic analysis. LOS at each intersection was evaluated during weekday PM peak hour conditions.

1. Marvin Rd SE/Steilacoom Rd SE	Signal
2. Marvin Rd SE/Pacific Ave SE	Roundabout
3. Marvin Rd SE/Union Mills Rd SE	Stop-Controlled
4. Marvin Rd SE/19 th Ave SE	Stop-Controlled
5. Marvin Rd SE/25 th Ave SE	Stop-Controlled
6. Walthew St SE/Marvin Rd SE	Stop-Controlled
7. Marvin Rd SE/Woodgrove St SE	Stop-Controlled
8. Marvin Rd SE/Lake Forest Dr SE	Roundabout
9. Marvin Rd SE/Mullen Rd SE	Stop-Controlled
10. Kagy St SE/Mullen Rd SE	Stop-Controlled
11. Carpenter Rd SE/Mullen Rd SE	Roundabout
12. Ruddell Rd SE/Mullen Rd SE	Signal
13. College St SE/Yelm Hwy SE	Signal
14. Ruddell Rd SE/Yelm Hwy SE	Signal
15. Kagy St SE/58 th Ave SE	Stop-Controlled
16. Meridian Rd SE/58 th Ave SE	Stop-Controlled
17. Spurgeon Creek Rd SE/Yelm Hwy	Stop-Controlled
18. Meridian Rd SE/Yelm Hwy	Roundabout

4. Project Trip Generation

The weekday daily, AM and PM peak hour trip generation estimates for the proposed Aurora Oaks development were based on trip rates documented in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition. The current project proposal includes a total of up to 180 single-family homes. The existing site consists of one (1) single-family home which will be removed with the proposed project resulting in up to 179 net new single-family homes with the development of the proposed project. **Table 1** summarizes the net trip generation. Detailed trip generation calculations are provided in **Appendix D**.

Table 1
Trip Generation Summary

Time Period	Net New Trips Generated		
	In	Out	Total
Weekday Daily	844	844	1,688
Weekday AM Peak Hour	33	92	125
Weekday PM Peak Hour	105	63	168

5. Project Trip Distribution

The distribution of Aurora Oaks project trips during the weekday PM peak hour was based on traffic model distribution (SZA 88) as provided by the City of Lacey (included in **Appendix E**). The weekday PM peak hour assignment of project trips with full project buildout of the Aurora Oaks development is shown at each of the study intersections and the site access location in **Figure 4**.

6. Future Traffic Conditions

Future weekday PM peak hour traffic volumes without the proposed Aurora Oaks development were estimated for future year 2025 conditions without and with project buildout. Future No Action (without project) traffic volumes at the study intersections were developed by applying a four (4) percent annual growth rate to existing PM peak hour traffic counts and including known pipeline project developments. Use of a four (4) percent annual growth rate in addition to the inclusion of pipeline traffic is conservative and would likely result in an overestimation of future traffic volumes.

The future 2025 No Action (without project) weekday PM peak hour traffic volumes are illustrated in **Figure 5**. Future pipeline project traffic volumes were provided by the City of Lacey.

Adding the project-generated PM peak hour trips (shown in **Figure 4**) to the 2025 No Action traffic volumes (**Figure 5**), results in future 2025 With Project traffic volumes, as shown in **Figure 6**.

The following documents were reviewed to identify planned improvements in the project vicinity:

- City of Lacey *Six-Year 2023-2028 Transportation Improvement Program (TIP)*
- City of Lacey *2019-2038 Capital Facilities Plan (CFP)*
- City of Lacey *2030 Transportation Plan*
- Thurston County *2023-2028 TIP*
- TRPC *2023-2026 Regional TIP*
- TRPC *Annual Listing of Obligated MPO Projects (CY 2022)*
- WSDOT *2023-2026 Statewide Transportation Improvement Program (STIP)*
- TENW, *Manor House Residential Traffic Impact Analysis*, April 28, 2021
- Manor House Subdivision MDNS, September 24, 2021

Based on a review of the above planning documents, the following planned improvements were identified in the project vicinity:

- Rainier Rd Improvements (from Yelm Hwy to City Limits): This project is expected to begin in 2025 and will include improvements to tapers and storage lanes at intersections including the study intersection of Yelm Highway SE/College Street SE/Rainier Road SE.
- Yelm Hwy Improvements: This project is expected to begin in 2027 and will widen the eastern side of Yelm Hwy (between Ruddell Rd and the Amtrak Bridge/Compton Blvd) to accommodate an additional northbound lane, a bike lane, sidewalk, and other urban amenities. Future widening of Yelm Hwy from Compton Blvd to the future Marvin Rd Extension is also planned per City of Lacey's *2030 Transportation Plan*; however, a project timeline is currently unknown.

- Marvin Rd Extension: This project is a feasibility study for extending Marvin Road south to Yelm Highway, including identification of appropriate configuration and alignment. The City will support Thurston County for their project.
- Mullen Rd Enhancements from Rumac Rd SE to Kagy St SE: This project will extend the enhancements completed along Mullen Rd between Ruddell Rd and Timberline High School further east to Afflerbaugh Dr. The enhanced roadway section is a major collector with medians, bike lanes, planter strips, and sidewalks. This project is expected to eventually extend to Meridian Rd. The City will support Thurston County for their portion of the project. The project timeline is currently unknown.
- Marvin Rd Corridor Improvements (Thurston County): This project will improve several intersections and segments of Marvin Rd between Pacific Ave SE and Mullen Rd SE. Segment improvements include providing 2 to 3 lanes, bike lanes, pedestrian refuge islands, planter strips, medians, sidewalks, lighting, and drainage. Intersection improvements include a new roundabout at Marvin Rd SE/Mullen Rd SE (study intersection #9), a new roundabout at Marvin Rd SE/19th Ave SE (study intersection #4), and access control at Marvin Rd SE/Union Mills Rd SE (study intersection #3). The project is anticipated to be implemented by the County or other development and the timeline for these improvements is currently unknown.
- Spurgeon Creek Rd SE/Yelm Hwy Improvements (Thurston County): This project will construct a new roundabout at the intersection. The project is anticipated to start in 2024 and is currently not fully funded.
- Steilacoom Rd Improvements (Thurston County): This project will improve Steilacoom Rd between Pacific Ave SE to SR 510 which would include widening, pavement rehabilitation, bike lanes, sidewalks, lighting, and drainage. A traffic alternatives study is also planned to determine future intersection improvements at Pacific Ave SE/Steilacoom Rd SE/Union Mills Rd SE. This project is currently not fully funded.
- Kagy St SE/Mullen Rd SE Improvement: The Manor House residential project will provide a refuge lane for northbound left-turning vehicle. The timeline for this improvement is currently unknown.

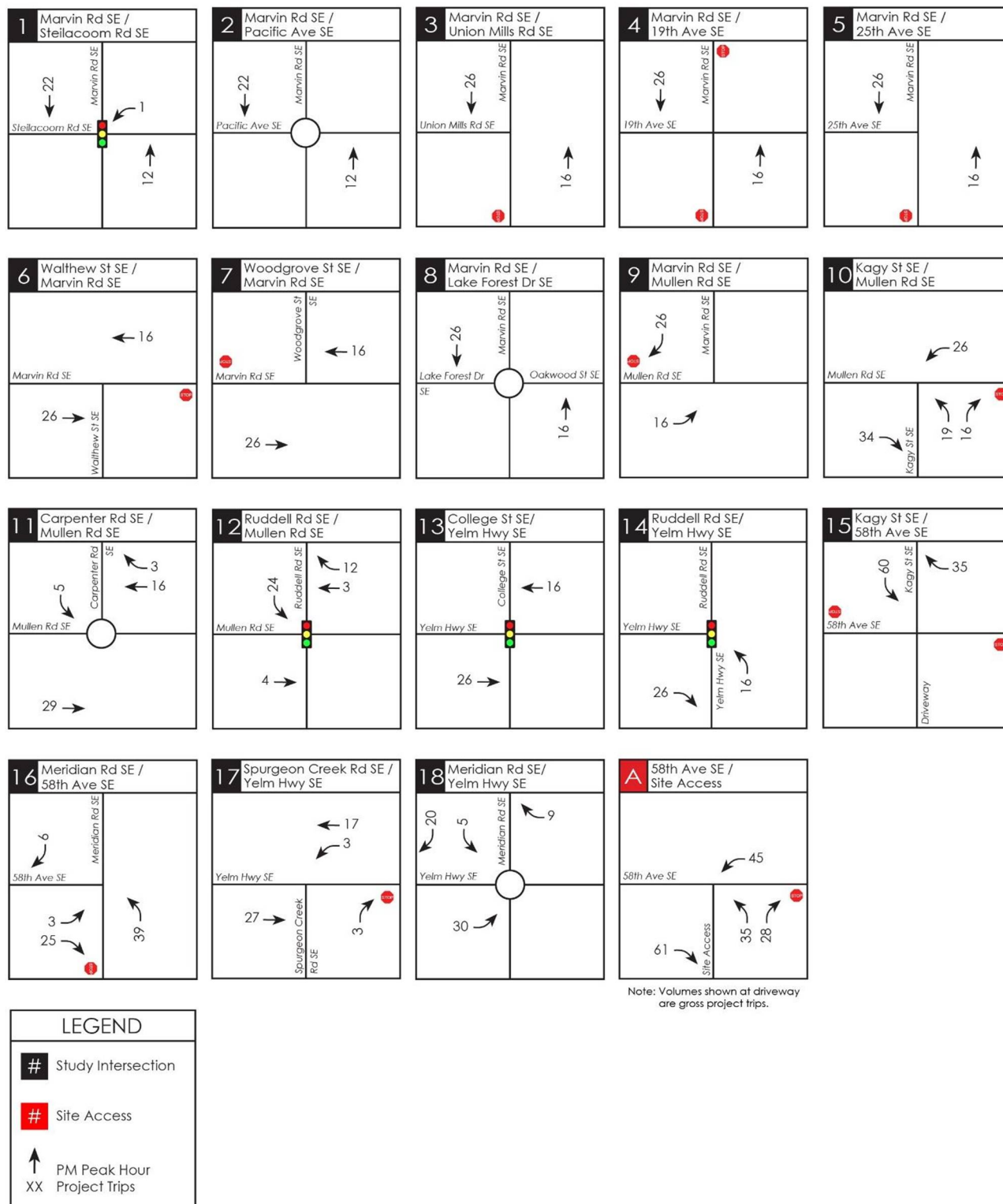


Figure 4: Weekday PM Peak Hour Project Trip Assignment

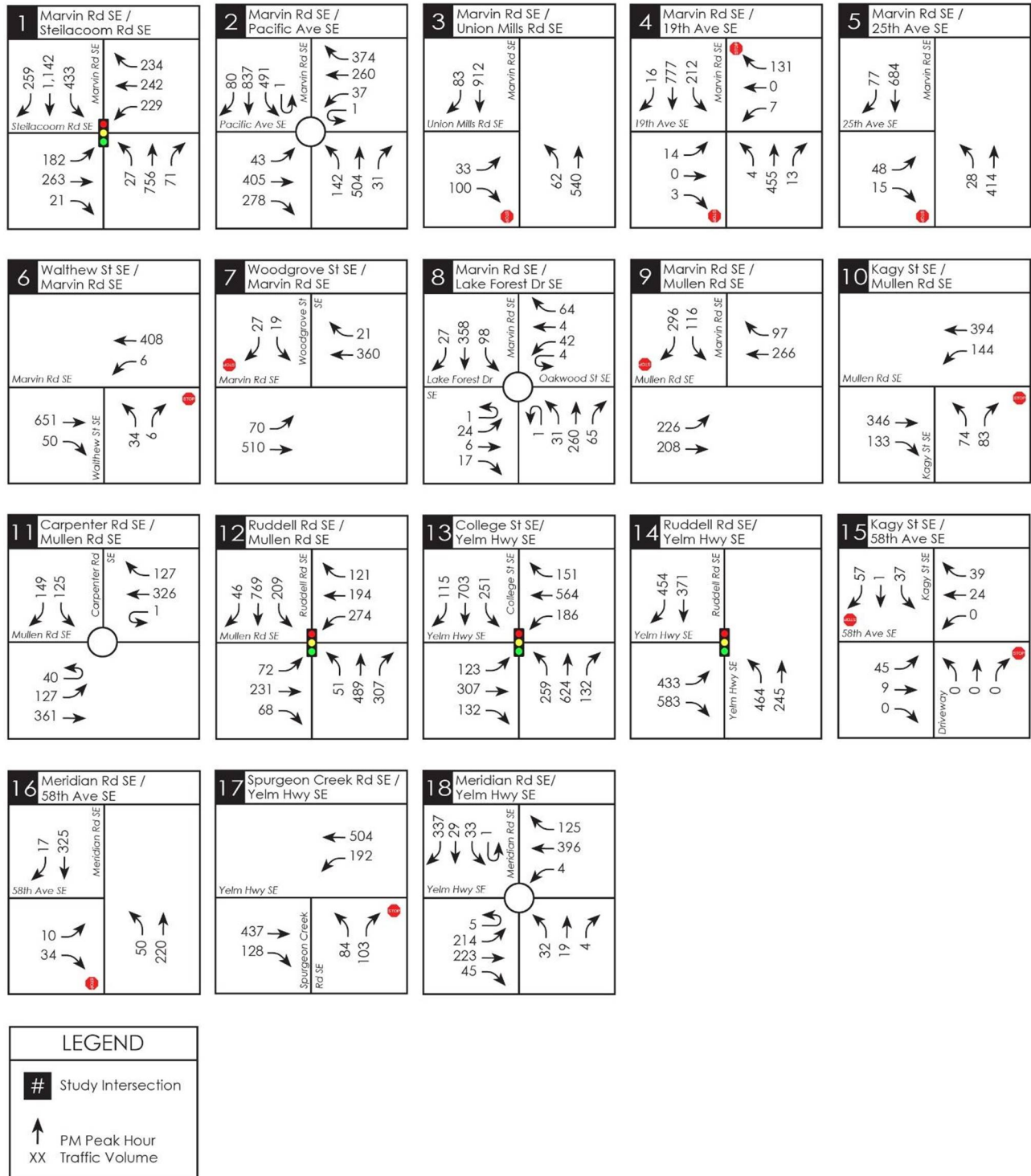


Figure 5: 2025 No Action Weekday PM Peak Hour Traffic Volumes

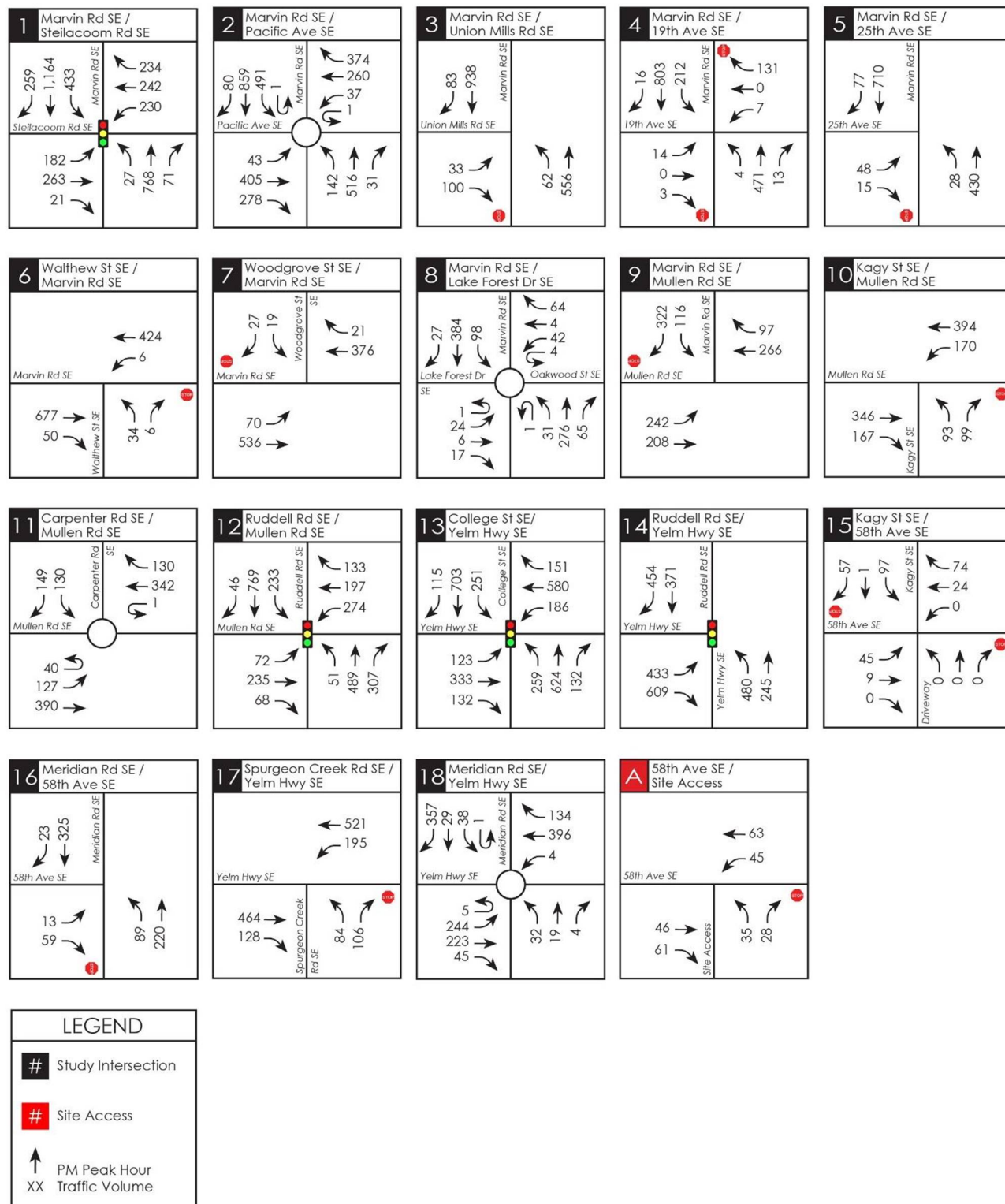


Figure 6: 2025 With Project Weekday PM Peak Hour Traffic Volumes

7. Traffic Operations with Project Buildout

Weekday PM peak hour level of service (LOS) analyses were conducted at the 18 off-site study intersections for three scenarios: (1) 2023 Existing, (2) 2025 No Action (without project), and (3) 2025 With Project.

Level of service calculations were based on the use of *Synchro 11* traffic analysis software for signalized intersections, stop-controlled intersections, and single-lane roundabouts, and *Sidra 9* traffic analysis software for multilane roundabouts. The LOS methodology is included in **Appendix F**.

The City of Lacey, Thurston County, and WSDOT intersection LOS standard is LOS D for the study area. It should be noted that the following study intersections are located on one of the City of Lacey or Thurston County *Strategy Corridors*, which are exempt from LOS standards.

- #1) Marvin Rd SE/Steilacoom Rd SE
- #2) Marvin Rd SE/Pacific Ave SE
- #13) College St SE/Yelm Hwy SE
- #14) Ruddell Rd SE/Yelm Hwy SE
- #18) Meridian Rd SE/Yelm Hwy SE

The 2023 existing weekday PM peak hour LOS analysis results are summarized in **Table 2**. **Table 3** summarizes the future 2025 weekday PM peak hour LOS without and with full buildout of the proposed Aurora Oaks development. Detailed LOS worksheets are provided in **Appendix F**.

Table 2
2023 Existing PM Peak Hour LOS Summary

Study Intersection (approach movement)	LOS ¹	Delay (sec)
<u>Signalized:</u>		
1. Marvin Rd SE/Steilacoom Rd SE ²	E	79.0
12. Ruddell Rd SE/Mullen Rd SE	C	21.6
13. College St SE/Yelm Hwy SE ²	D	49.8
14. Ruddell Rd SE/Yelm Hwy SE ²	E	56.8
<u>Roundabout:</u>		
2. Marvin Rd SE/Pacific Ave SE ²	A	7.8
Eastbound Approach	A	9.3
Westbound Approach	A	6.9
Northbound Approach	A	9.1
Southbound Approach	A	7.0
8. Marvin Rd SE/Lake Forest Dr SE	A	4.9
Eastbound Approach	A	4.4
Westbound Approach	A	4.1
Northbound Approach	A	4.6
Southbound Approach	A	5.2
11. Carpenter Rd SE/Mullen Rd SE	A	7.0
Eastbound Approach	A	7.1
Westbound Approach	A	7.0
Southbound Approach	A	6.7
18. Meridian Rd SE/Yelm Hwy SE ²	A	7.3
Eastbound Approach	A	5.7
Westbound Approach	A	8.2
Northbound Approach	A	4.6
Southbound Approach	A	8.4
<u>Stop-Controlled:</u>		
3. Marvin Rd SE/Union Mills Rd SE		
Northbound Left-Turn	A	9.3
Eastbound Shared Left-Right	C	17.4
4. Marvin Rd SE/19 th Ave SE		
Northbound Left-Turn	A	8.8
Eastbound Shared Left-Thru-Right	D	32.9
Westbound Shared Left-Thru-Right	B	13.1
Southbound Left-Turn	A	8.3
5. Marvin Rd SE/25 th Ave SE		
Northbound Left-Turn	A	8.7
Eastbound Shared Left-Right	B	14.4
6. Walthew St SE/Marvin Rd SE		
Northbound Shared Left-Right	B	14.5
Westbound Left-Turn	A	8.5
7. Woodgrove St SE/Marvin Rd SE		
Eastbound Left-Turn	A	8.1
Southbound Share Left-Right	B	12.2

Table 2
2023 Existing PM Peak Hour LOS Summary

Study Intersection (approach movement)	LOS ¹	Delay (sec)
9. Marvin Rd SE/Mullen Rd SE		
Eastbound Shared Left-Thru	A	8.2
Southbound Shared Left-Right	C	17.3
10. Kagy St SE/Mullen Rd SE		
Northbound Shared Left-Right	C	16.5
Westbound Shared Left-Thru	A	8.1
15. Kagy St SE/58 th Ave SE		
Eastbound Shared Left-Thru	A	7.4
Southbound Shared Left-Right	A	9.0
16. Meridian Rd SE/58 th Ave SE		
Northbound Shared Left-Thru	A	8.0
Eastbound Shared Left-Right	B	11.7
17. Spurgeon Creek Rd SE/Yelm Hwy SE		
Northbound Left-Turn	C	24.3
Northbound Right-Turn	B	12.1
Westbound Left-Turn	A	9.1

1. LOS = Level of Service, reported as intersection average and by movement for stop-controlled intersections and roundabouts.
2. Intersection is part of a Strategy Corridor as defined by the City of Lacey or Thurston County.

Table 3
2025 Future PM Peak Hour LOS Summary

Study Intersection (approach movement)	2025 No Action		2025 With Project	
	LOS ¹	Delay (sec)	LOS ¹	Delay (sec)
<u>Signalized:</u>				
1. Marvin Rd SE/Steilacoom Rd SE ²	F	131.8	F	133.4
12. Ruddell Rd SE/Mullen Rd SE	C	30.3	C	31.2
13. College St SE/Yelm Hwy SE ²	E	70.1	F	70.8
14. Ruddell Rd SE/Yelm Hwy SE ²	F	87.5	F	90.4
<u>Roundabout:</u>				
2. Marvin Rd SE/Pacific Ave SE ²	B	11.8	B	12.1
Eastbound Approach	B	14.5	B	14.9
Westbound Approach	A	7.6	A	7.7
Northbound Approach	B	16.8	B	17.1
Southbound Approach	B	10.1	B	10.2
8. Marvin Rd SE/Lake Forest Dr SE	A	6.5	A	6.7
Eastbound Approach	A	5.5	A	5.7
Westbound Approach	A	5.2	A	5.3
Northbound Approach	A	6.3	A	6.4
Southbound Approach	A	7.1	A	7.4
11. Carpenter Rd SE/Mullen Rd SE	A	8.2	A	8.6
Eastbound Approach	A	8.5	A	9.0
Westbound Approach	A	8.1	A	8.4
Southbound Approach	A	7.8	A	8.1
18. Meridian Rd SE/Yelm Hwy SE ²	A	8.8	A	9.3
Eastbound Approach	A	6.6	A	6.9
Westbound Approach	B	10.0	B	10.8
Northbound Approach	A	5.1	A	5.3
Southbound Approach	B	10.3	B	10.9
<u>Stop-Controlled:</u>				
3. Marvin Rd SE/Union Mills Rd SE				
Northbound Left-Turn	B	11.1	B	11.2
Eastbound Shared Left-Right	D	33.1	E	35.2
4. Marvin Rd SE/19 th Ave SE				
Northbound Left-Turn	A	9.6	A	9.7
Eastbound Shared Left-Thru-Right	F	145.1	F	167.7
Westbound Shared Left-Thru-Right	C	20.5	C	21.5
Southbound Left-Turn	A	9.3	A	9.4
5. Marvin Rd SE/25 th Ave SE				
Northbound Left-Turn	A	9.5	A	9.7
Eastbound Shared Left-Right	C	18.5	C	19.1
6. Walthew St SE/Marvin Rd SE				
Northbound Shared Left-Right	C	18.9	C	19.6
Westbound Left-Turn	A	9.2	A	9.3
7. Woodgrove St SE/Marvin Rd SE				
Eastbound Left-Turn	A	8.6	A	8.7
Southbound Share Left-Right	B	14.8	C	15.2

Table 3
2025 Future PM Peak Hour LOS Summary

Study Intersection (approach movement)	2025 No Action		2025 With Project	
	LOS ¹	Delay (sec)	LOS ¹	Delay (sec)
9. Marvin Rd SE/Mullen Rd SE				
Eastbound Shared Left-Thru	A	9.0	A	9.1
Southbound Shared Left-Right	F	152.1	F	190.9
10. Kagy St SE/Mullen Rd SE				
Northbound Shared Left-Right	F	53.7	F	126.7
Westbound Shared Left-Thru	A	9.0	A	9.3
15. Kagy St SE/58 th Ave SE				
Eastbound Shared Left-Thru	A	7.5	A	7.5
Southbound Shared Left-Right	A	9.6	B	10.6
16. Meridian Rd SE/58 th Ave SE				
Northbound Shared Left-Thru	A	8.2	A	8.4
Eastbound Shared Left-Right	B	12.2	B	12.8
17. Spurgeon Creek Rd SE/Yelm Hwy SE				
Northbound Left-Turn	D	31.9	D	33.8
Northbound Right-Turn	B	13.3	B	13.7
Westbound Left-Turn	A	9.7	A	9.9

1. LOS = Level of Service, reported as intersection average and by movement for stop-controlled intersections and roundabouts.
2. Intersection is part of a Strategy Corridor as defined by the City of Lacey or Thurston County.

The results of the LOS analyses shown in **Table 3** indicate that 11 of the 18 study intersections are anticipated to operate at LOS D or better during the weekday PM peak hour in 2025 with full buildout of the proposed Aurora Oaks development. The following intersections are anticipated to operate below City of Lacey/Thurston County standards:

Intersections located on City of Lacey/Thurston County Strategy Corridors:

The following intersections are anticipated to operate at LOS E/F in 2025 during the weekday PM peak hour with full buildout of the proposed Aurora Oaks development but are located on City of Lacey or Thurston County Strategy Corridors and are therefore exempt from LOS standards:

1. Marvin Rd SE/Steilacoom Rd SE
13. College St SE/Yelm Hwy SE
14. Ruddell Rd SE/Yelm Hwy SE

Intersections with Future Planned Improvements:

The following intersections are anticipated to operate at LOS E/F in 2025 during the weekday PM peak hour with full buildout of the proposed Aurora Oaks development and include future planned improvements that are expected to result in acceptable LOS. No mitigation is proposed at these intersections.

3. Marvin Rd SE/Union Mills Rd SE – As part of the Oak Tree Preserve development, new c-curb will be installed on Marvin Rd SE to prohibit left-turns from Union Mills Rd SE.

4. Marvin Rd SE/19th Ave SE – As part of the Oak Tree Preserve development, this intersection will be signalized and provide a southbound to northbound U-turn for vehicles destined to the north on Marvin Rd SE from Union Mills Rd SE.
9. Marvin Rd SE/Mullen Rd SE – As part of the Oak Tree Preserve development, a roundabout will be constructed at this location.
10. Kagy St SE/Mullen Rd SE – The approved Manor House residential project will provide a refuge lane for northbound left-turning vehicles which would result in acceptable LOS.

8. Access Management

Vehicular access to the Aurora Oaks project is proposed via a new road that will intersect with 58th Ave SE. Weekday PM peak hour LOS and queues were evaluated at the proposed site access location. The 2025 weekday PM peak hour traffic volumes at the proposed site access location are shown below.

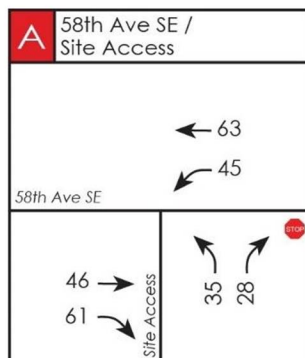


Table 4 summarizes the LOS and queue results at the site access location for future 2025 With Project conditions during the weekday PM peak hour.

Table 4
Site Access PM Peak Hour LOS and Queue Summary

Site Access / Movement	LOS	Delay (sec)	95 th % Queue (ft)
A. Site Access/58th Ave SE			
Northbound Shared Left-Right (exiting trips)	A	9.9	< 25 ft
Westbound Left-Turn (entering trips)	A	7.6	< 25 ft

As shown in Table 4, the individual movements at the proposed site access location are anticipated to operate at LOS A during the PM peak hour in 2025 with the proposed project. Additionally, 95th-percentile queues for movements entering and exiting the site are estimated to be 25 feet or less at the proposed site access location.

The new site access intersection onto 58th Ave SE is located approximately 550 feet to the east of the existing Kagy St SE/58th Ave SE intersection, meeting the City of Lacey's spacing requirement of 330 feet for a collector roadway.

9. Traffic Calming

City development guidelines require that internal traffic calming be incorporated into all developments to control cut-through traffic and reduce speed within the development. As directed by County staff during the traffic scoping process, a vehicular connection from the proposed Aurora Oaks project south to Waldon Drive SE is not required and not desired. Since the project is only proposing access to 58th Ave SE, cut-through traffic is not anticipated to be a concern within the proposed Aurora Oaks project.

It should also be noted that a non-motorized and emergency access only connection between Aurora Oaks and Waldon Drive SE will be created to allow pedestrians and bicycles access between the two neighborhoods.

10. Alternate Modes of Transportation

The City of Lacey TIA guidelines encourages alternate modes of transportation. New developments are encouraged to implement Transportation Demand Management (TDM) practices. Sidewalks are proposed on the internal site roadways and will be included on the south side of 58th Ave SE as part of the required frontage improvements.

Additionally, a new non-motorized and emergency access only connection between Aurora Oaks and Waldon Drive SE will be created to allow pedestrians and bicycles access between the two neighborhoods.

11. Mitigation

The following measures have been identified to mitigate the transportation impacts of the proposed Aurora Oaks development.

- **Lacey Impact Fees.** To mitigate impacts to City of Lacey roads, payment of a transportation mitigation cost is required. The mitigation cost calculation will be determined by the City of Lacey Transportation Department and based on the number of PM peak hour trips generated by the final unit count affecting the current City TIP project list.
- **Thurston County Impact Fees.** To mitigate impacts to Thurston County roads, payment of a transportation impact fee is required. The transportation impact fee is based on the type of land use and the size of the development. Based on the current *Thurston County 2023 Transportation Impact Fee Rate Schedule*, the County collects \$3,191 per single-family dwelling unit in Central Urban Growth Areas. Impact fees will be based on the final unit count.
- **Level of Service Deficiencies.** Based on the results of the LOS analysis, all study intersections anticipated to operate at LOS E/F are either located on City of Lacey or Thurston County Strategy Corridors or have future planned improvements that are anticipated to result in acceptable LOS. Therefore, no mitigation is proposed at these intersections.

Appendix A

Thurston County Traffic Scoping Review Letter (dated March 9, 2023)



COUNTY COMMISSIONERS

Carolina Mejia
District One

Gary Edwards
District Two

Tye Menser
District Three



PUBLIC WORKS

An Accredited Agency of the
American Public Works Association

Jennifer D. Walker, Director

March 9, 2023

Mark Steepy
KPFF
4200 6TH AVE SE SUITE 309
LACEY WA 98503

SUBJECT: **Aurora Oaks, Folder Sequence#23-101520**
Project #: 2023100588
TRAFFIC SCOPING REVIEW

REFERENCE: Traffic Scoping Memo – Dated 1-27-23

Dear Mr. Steepy:

Upon review of the proposed project referenced above, Public Works has the following comments:

1. The City of Lacey has requested the following intersections be included in the TIA
 1. Marvin Rd SE/Steilacoom Rd SE
 2. Carpenter Rd SE/Mullen Rd SE
 3. Ruddell Rd SE/Mullen Rd SE
 4. Ruddell Rd SE/Yelm Hwy SE
 5. College St SE/Yelm Hwy SE
2. The County would like the following intersections to be included in the TIA
 1. Marvin Rd SE / Mullen Rd SE
 2. Marvin Rd SE / Lake Forest Dr SE
 3. Marvin Rd SE / 19th Ave SE
 4. Marvin Rd SE / Union Mills Rd SE
 5. Marvin Rd SE / Pacific Ave SE
 6. Kagy Street SE / Mullen Rd SE
 7. Kagy Street SE / 58th Ave SE
 8. Meridian Rd SE/58th Ave SE
 9. Meridian Rd SE/Yelm Hwy SE
 10. Spurgeon Creek Rd SE/Yelm Hwy SE
 11. Marvin Rd SE/ 25th Ave SE
 12. Marvin Rd SE/ Walthew St SE

13. Marvin Rd SE/ Woodgrove St SE

Please be aware, further issues may be addressed as discovered, or as changes are made to the plans.

If you have any questions or comments, please call me at (360) 867-2043.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Art St', with a stylized flourish at the end.

Arthur Saint, PE
Thurston County Public Works
Development Review Section

cc: Project File

Appendix B

Preliminary Site Plan

Appendix C

Existing PM Peak Hour Traffic Counts



(303) 216-2439
www.alltrafficdata.net

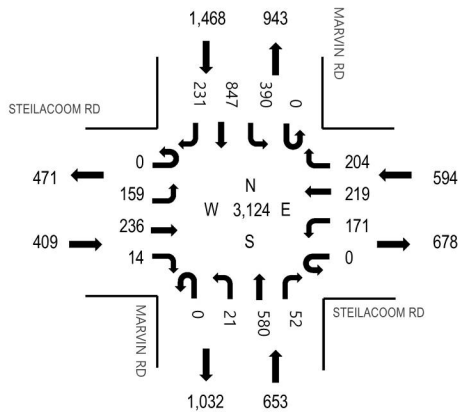
Location: 1 MARVIN RD & STEILACOOM RD PM

Date: Tuesday, April 11, 2023

Peak Hour: 05:00 PM - 06:00 PM

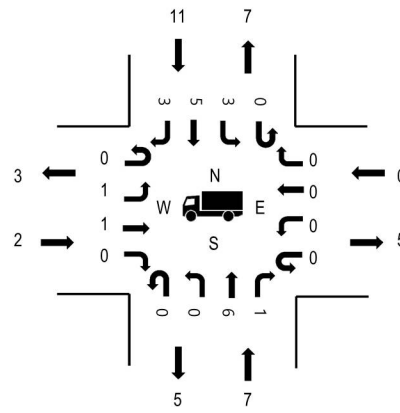
Peak Hour

Motorized Vehicles

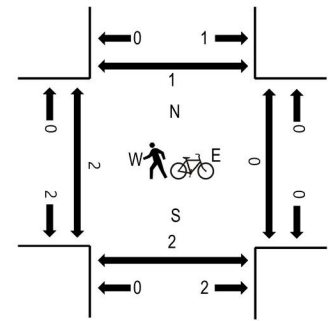


	HV%	PHF
EB	0.5%	0.90
WB	0.0%	0.89
NB	1.1%	0.92
SB	0.7%	0.91
All	0.6%	0.95

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	STEILACOOM RD Eastbound				STEILACOOM RD Westbound				MARVIN RD Northbound				MARVIN RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	60	59	29	0	54	42	40	0	10	114	20	0	57	216	58	759	2,941
4:15 PM	0	47	42	6	0	24	48	37	0	3	125	15	0	63	218	56	684	2,943
4:30 PM	0	41	60	3	0	35	62	44	0	3	142	14	0	78	224	64	770	3,077
4:45 PM	0	34	38	4	0	40	56	41	0	3	156	18	0	71	206	61	728	3,117
5:00 PM	0	49	62	2	0	44	59	57	0	2	130	13	0	77	203	63	761	3,124
5:15 PM	0	42	63	3	0	46	52	41	0	14	138	16	0	119	218	66	818	
5:30 PM	0	32	60	8	0	46	65	56	0	4	146	12	0	100	234	47	810	
5:45 PM	0	36	51	1	0	35	43	50	0	1	166	11	0	94	192	55	735	
Count Total	0	341	435	56	0	324	427	366	0	40	1,117	119	0	659	1,711	470	6,065	
Peak Hour	0	159	236	14	0	171	219	204	0	21	580	52	0	390	847	231	3,124	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	10	3	2	2	17	4:00 PM	1	1	16	14	32
4:15 PM	1	1	6	5	13	4:15 PM	0	0	5	8	13
4:30 PM	1	3	2	3	9	4:30 PM	0	2	1	1	4
4:45 PM	0	2	3	4	9	4:45 PM	0	0	0	1	1
5:00 PM	1	2	0	5	8	5:00 PM	2	2	0	0	4
5:15 PM	0	2	0	0	2	5:15 PM	0	0	0	1	1
5:30 PM	1	1	0	3	5	5:30 PM	0	0	0	0	0
5:45 PM	0	2	0	3	5	5:45 PM	0	0	0	0	0
Count Total	14	16	13	25	68	Count Total	3	5	22	25	55
Peak Hour	2	7	0	11	20	Peak Hour	2	2	0	1	5



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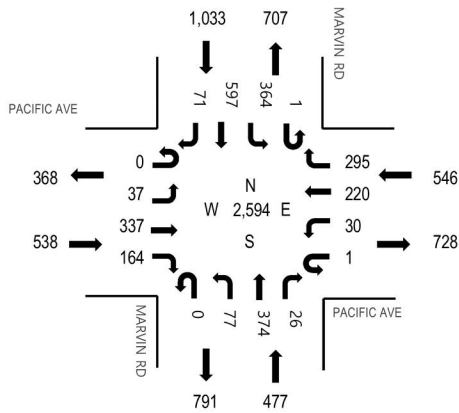
Location: 2 MARVIN RD & PACIFIC AVE PM

Date: Tuesday, April 11, 2023

Peak Hour: 04:45 PM - 05:45 PM

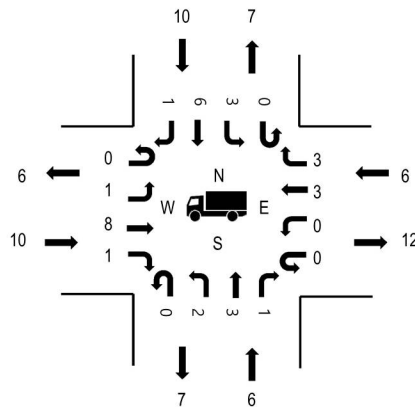
Peak Hour

Motorized Vehicles

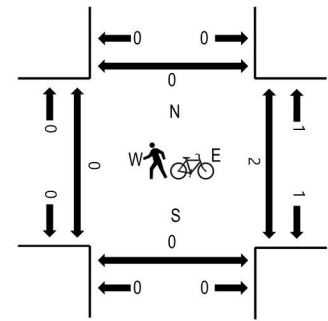


	HV%	PHF
EB	1.9%	0.91
WB	1.1%	0.91
NB	1.3%	0.85
SB	1.0%	0.93
All	1.2%	1.00

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	PACIFIC AVE Eastbound				PACIFIC AVE Westbound				MARVIN RD Northbound				MARVIN RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	5	63	34	0	7	56	52	0	15	77	11	0	96	186	20	622	2,430
4:15 PM	0	4	63	33	1	12	66	61	0	16	80	7	1	79	124	20	567	2,456
4:30 PM	0	9	64	22	0	9	49	71	0	18	84	3	1	95	147	22	594	2,538
4:45 PM	0	5	81	34	0	14	57	79	0	19	115	7	0	90	131	15	647	2,594
5:00 PM	0	8	83	48	0	4	64	68	0	14	87	7	0	95	151	19	648	2,506
5:15 PM	0	14	88	46	1	4	55	69	0	27	83	8	1	94	145	14	649	
5:30 PM	0	10	85	36	0	8	44	79	0	17	89	4	0	85	170	23	650	
5:45 PM	0	5	61	30	1	9	53	67	0	10	107	3	0	60	141	12	559	
Count Total	0	60	588	283	3	67	444	546	0	136	722	50	3	694	1,195	145	4,936	
Peak Hour	0	37	337	164	1	30	220	295	0	77	374	26	1	364	597	71	2,594	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	7	0	3	10	20	4:00 PM	0	0	0	0	0
4:15 PM	3	4	3	6	16	4:15 PM	0	0	0	1	1
4:30 PM	1	4	4	2	11	4:30 PM	0	0	0	0	0
4:45 PM	1	2	1	5	9	4:45 PM	0	0	0	0	0
5:00 PM	5	1	3	2	11	5:00 PM	0	0	0	0	0
5:15 PM	2	3	0	1	6	5:15 PM	0	0	1	0	1
5:30 PM	2	0	2	2	6	5:30 PM	0	0	1	0	1
5:45 PM	1	3	0	1	5	5:45 PM	0	0	0	0	0
Count Total	22	17	16	29	84	Count Total	0	0	2	1	3
Peak Hour	10	6	6	10	32	Peak Hour	0	0	2	0	2



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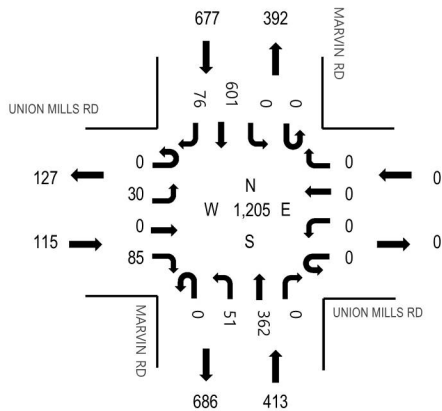
Location: 3 MARVIN RD & UNION MILLS RD PM

Date: Tuesday, April 11, 2023

Peak Hour: 04:45 PM - 05:45 PM

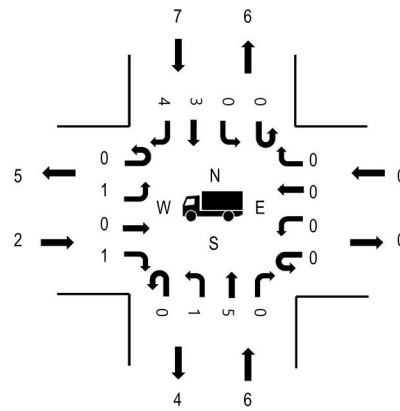
Peak Hour

Motorized Vehicles

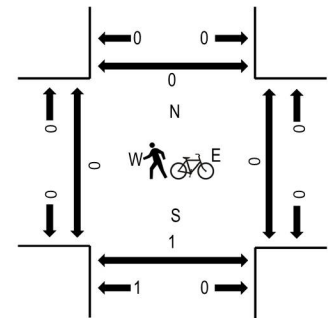


	HV%	PHF
EB	1.7%	0.87
WB	0.0%	0.00
NB	1.5%	0.90
SB	1.0%	0.92
All	1.2%	0.94

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	UNION MILLS RD Eastbound				UNION MILLS RD Westbound				MARVIN RD Northbound				MARVIN RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	8	0	26	0	0	0	0	0	16	91	0	0	0	178	13	332	1,190
4:15 PM	0	7	0	30	0	0	0	0	0	10	82	0	0	0	140	14	283	1,134
4:30 PM	0	4	0	24	0	0	0	0	0	13	85	0	0	0	126	14	266	1,152
4:45 PM	0	10	0	20	0	0	0	0	0	11	104	0	0	0	135	29	309	1,205
5:00 PM	0	9	0	24	0	0	0	0	0	9	81	0	0	0	148	5	276	1,184
5:15 PM	0	4	0	20	0	0	0	0	0	14	86	0	0	0	153	24	301	
5:30 PM	0	7	0	21	0	0	0	0	0	17	91	0	0	0	165	18	319	
5:45 PM	0	8	0	17	0	0	0	0	0	8	102	0	0	0	131	22	288	
Count Total	0	57	0	182	0	0	0	0	0	98	722	0	0	0	1,176	139	2,374	
Peak Hour	0	30	0	85	0	0	0	0	0	51	362	0	0	0	601	76	1,205	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	9	9	4:00 PM	0	1	0	0	1
4:15 PM	1	2	0	3	6	4:15 PM	0	2	0	0	2
4:30 PM	0	4	0	3	7	4:30 PM	0	0	0	0	0
4:45 PM	0	1	0	2	3	4:45 PM	0	0	0	0	0
5:00 PM	1	1	0	3	5	5:00 PM	0	1	0	0	1
5:15 PM	0	3	0	0	3	5:15 PM	0	0	0	0	0
5:30 PM	1	1	0	2	4	5:30 PM	0	0	0	0	0
5:45 PM	1	1	0	0	2	5:45 PM	0	0	0	0	0
Count Total	4	13	0	22	39	Count Total	0	4	0	0	4
Peak Hour	2	6	0	7	15	Peak Hour	0	1	0	0	1



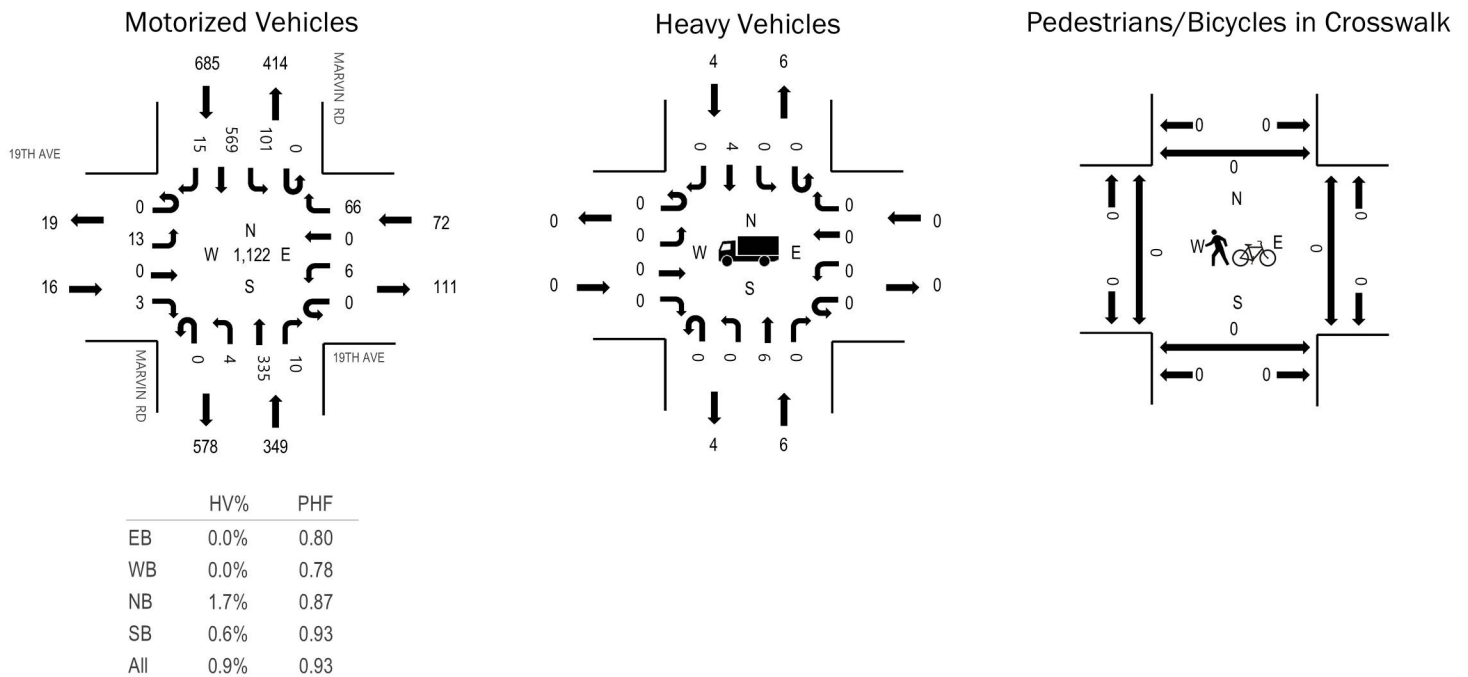
(303) 216-2439
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Location: 4 MARVIN RD & 19TH AVE PM

Date: Tuesday, April 11, 2023

Peak Hour: 04:45 PM - 05:45 PM

Peak Hour



Traffic Counts - Motorized Vehicles

Interval Start Time	19TH AVE Eastbound				19TH AVE Westbound				MARVIN RD Northbound				MARVIN RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	0	0	0	1	0	20	0	0	86	4	0	26	175	7	319	1,107
4:15 PM	0	0	0	1	0	1	0	17	0	2	76	1	0	25	144	1	268	1,053
4:30 PM	0	1	0	1	0	1	0	11	0	1	82	1	0	16	124	4	242	1,062
4:45 PM	0	4	0	1	0	0	0	17	0	2	96	2	0	24	128	4	278	1,122
5:00 PM	0	2	0	1	0	3	0	12	0	0	77	0	0	34	130	6	265	1,111
5:15 PM	0	2	0	1	0	2	0	15	0	1	80	2	0	25	146	3	277	
5:30 PM	0	5	0	0	0	1	0	22	0	1	82	6	0	18	165	2	302	
5:45 PM	0	4	0	2	0	1	0	6	0	0	101	1	0	25	124	3	267	
Count Total	0	18	0	7	0	10	0	120	0	7	680	17	0	193	1,136	30	2,218	
Peak Hour	0	13	0	3	0	6	0	66	0	4	335	10	0	101	569	15	1,122	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	8	8	4:00 PM	0	0	0	0	0
4:15 PM	0	2	0	3	5	4:15 PM	0	0	0	0	0
4:30 PM	0	4	0	3	7	4:30 PM	0	0	0	0	0
4:45 PM	0	1	0	0	1	4:45 PM	0	0	0	0	0
5:00 PM	0	1	0	4	5	5:00 PM	0	0	0	0	0
5:15 PM	0	3	0	0	3	5:15 PM	0	0	0	0	0
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0
5:45 PM	0	1	1	0	2	5:45 PM	0	0	2	0	2
Count Total	0	13	1	18	32	Count Total	0	0	2	0	2
Peak Hour	0	6	0	4	10	Peak Hour	0	0	0	0	0



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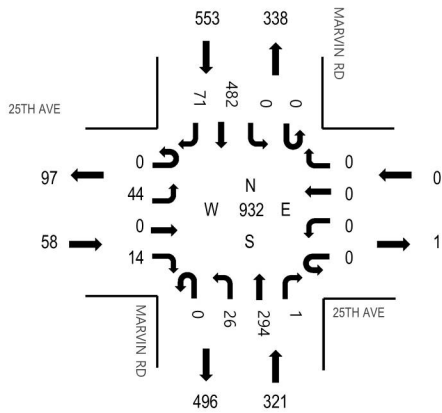
Location: 5 : MARVIN RD & 25TH AVE PM

Date: Tuesday, April 11, 2023

Peak Hour: 04:45 PM - 05:45 PM

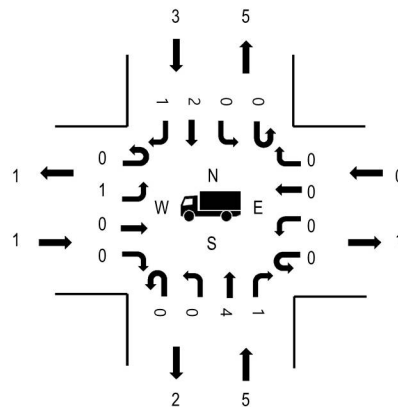
Peak Hour

Motorized Vehicles

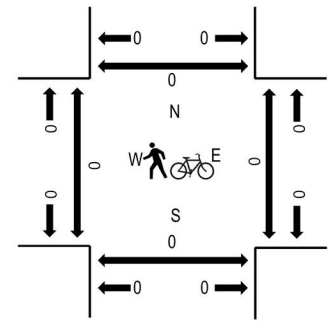


	HV%	PHF
EB	1.7%	0.81
WB	0.0%	0.00
NB	1.6%	0.89
SB	0.5%	0.92
All	1.0%	0.95

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	25TH AVE Eastbound				25TH AVE Westbound				MARVIN RD Northbound				MARVIN RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	6	0	7	0	0	0	0	0	4	80	0	0	0	141	19	257	905
4:15 PM	0	9	0	3	0	0	0	0	0	1	72	0	0	0	124	15	224	857
4:30 PM	0	11	0	3	0	0	0	0	0	3	61	0	0	0	96	18	192	878
4:45 PM	0	10	0	3	0	0	0	0	0	5	85	0	0	0	109	20	232	932
5:00 PM	0	13	0	5	0	0	0	0	0	7	60	0	0	0	108	16	209	919
5:15 PM	0	12	0	2	0	0	0	0	0	10	71	0	0	0	134	16	245	
5:30 PM	0	9	0	4	0	0	0	0	0	4	78	1	0	0	131	19	246	
5:45 PM	0	9	0	5	0	0	0	0	0	1	86	0	0	0	102	16	219	
Count Total	0	79	0	32	0	0	0	0	0	35	593	1	0	0	945	139	1,824	
Peak Hour	0	44	0	14	0	0	0	0	0	26	294	1	0	0	482	71	932	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	0	7	8	4:00 PM	0	0	0	0	0
4:15 PM	1	2	0	3	6	4:15 PM	0	0	0	0	0
4:30 PM	2	1	0	3	6	4:30 PM	0	0	0	0	0
4:45 PM	0	1	0	0	1	4:45 PM	0	0	0	0	0
5:00 PM	0	1	0	3	4	5:00 PM	0	0	0	0	0
5:15 PM	1	2	0	0	3	5:15 PM	0	0	0	0	0
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0
5:45 PM	0	1	0	0	1	5:45 PM	0	0	0	0	0
Count Total	5	9	0	16	30	Count Total	0	0	0	0	0
Peak Hour	1	5	0	3	9	Peak Hour	0	0	0	0	0



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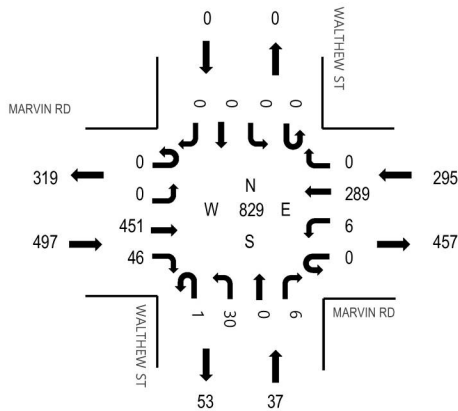
Location: **6** : WALTHER ST & MARVIN RD PM

Date: Tuesday, April 11, 2023

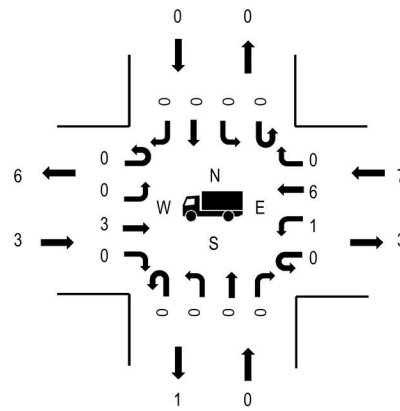
Peak Hour: 04:45 PM - 05:45 PM

Peak Hour

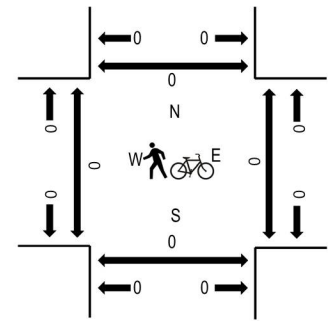
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	0.6%	0.89
WB	2.4%	0.88
NB	0.0%	0.62
SB	0.0%	0.00
All	1.2%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	MARVIN RD Eastbound				MARVIN RD Westbound				WALTHER ST Northbound				WALTHER ST Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	140	11	0	7	77	0	0	8	0	2	0	0	0	0	245	820
4:15 PM	0	0	118	9	0	1	66	0	0	7	0	1	0	0	0	0	202	756
4:30 PM	0	0	89	11	0	1	57	0	0	7	0	1	0	0	0	0	166	771
4:45 PM	0	0	100	12	0	3	81	0	0	9	0	2	0	0	0	0	207	829
5:00 PM	0	0	99	9	0	1	65	0	0	6	0	1	0	0	0	0	181	815
5:15 PM	0	0	125	12	0	2	74	0	0	3	0	1	0	0	0	0	217	
5:30 PM	0	0	127	13	0	0	69	0	1	12	0	2	0	0	0	0	224	
5:45 PM	0	0	89	14	0	1	80	0	0	5	0	4	0	0	0	0	193	
Count Total	0	0	887	91	0	16	569	0	1	57	0	14	0	0	0	0	1,635	
Peak Hour	0	0	451	46	0	6	289	0	1	30	0	6	0	0	0	0	829	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	6	0	0	0	6	4:00 PM	0	1	0	0	1
4:15 PM	3	0	3	0	6	4:15 PM	0	0	0	0	0
4:30 PM	2	0	0	0	2	4:30 PM	0	0	0	0	0
4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0
5:00 PM	3	0	1	0	4	5:00 PM	0	0	0	0	0
5:15 PM	0	0	3	0	3	5:15 PM	0	0	0	0	0
5:30 PM	0	0	2	0	2	5:30 PM	0	0	0	0	0
5:45 PM	0	1	0	0	1	5:45 PM	0	0	0	0	0
Count Total	14	1	10	0	25	Count Total	0	1	0	0	1
Peak Hour	3	0	7	0	10	Peak Hour	0	0	0	0	0



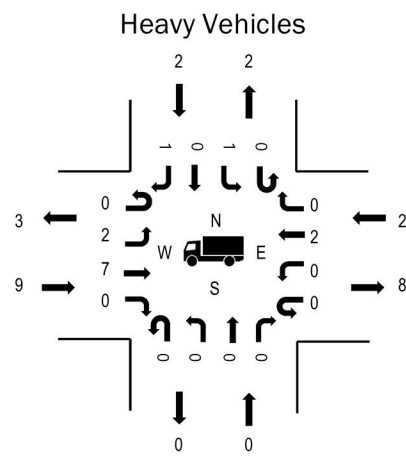
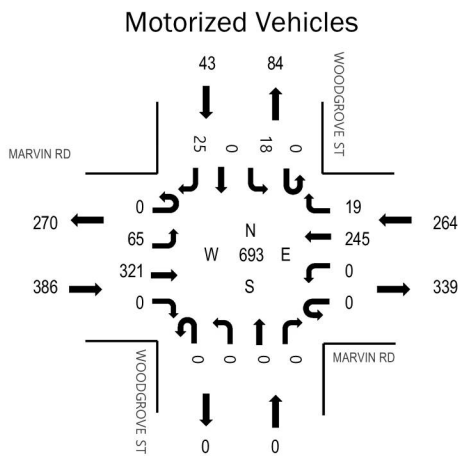
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Location: 7 · WOODGROVE ST & MARVIN RD PM

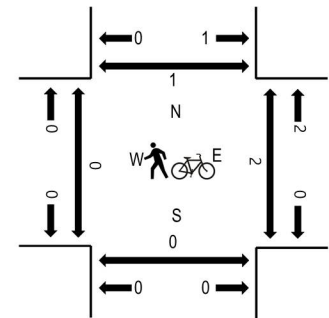
Date: Tuesday, April 11, 2023

Peak Hour: 04:00 PM - 05:00 PM

Peak Hour



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	2.3%	0.79
WB	0.8%	0.80
NB	0.0%	0.00
SB	4.7%	0.90
All	1.9%	0.81

Traffic Counts - Motorized Vehicles

Interval Start Time	MARVIN RD Eastbound				MARVIN RD Westbound				WOODGROVE ST Northbound				WOODGROVE ST Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	16	106	0	0	0	72	9	0	0	0	0	0	5	0	6	214	693
4:15 PM	0	21	81	0	0	0	56	3	0	0	0	0	0	3	0	8	172	636
4:30 PM	0	16	64	0	0	0	42	0	0	0	0	0	0	3	0	6	131	630
4:45 PM	0	12	70	0	0	0	75	7	0	0	0	0	0	7	0	5	176	690
5:00 PM	0	14	71	0	0	0	51	7	0	0	0	0	0	5	0	9	157	672
5:15 PM	0	11	79	0	0	0	53	12	0	0	0	0	0	4	0	7	166	
5:30 PM	0	17	105	0	0	0	55	6	0	0	0	0	0	4	0	4	191	
5:45 PM	0	10	68	0	0	0	64	1	0	0	0	0	0	4	0	11	158	
Count Total	0	117	644	0	0	0	468	45	0	0	0	0	0	35	0	56	1,365	
Peak Hour	0	65	321	0	0	0	245	19	0	0	0	0	0	18	0	25	693	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	4	0	0	0	4	4:00 PM	0	0	0	0	0
4:15 PM	3	0	1	2	6	4:15 PM	0	0	0	0	0
4:30 PM	2	0	1	0	3	4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	2	1	3
5:00 PM	1	0	1	0	2	5:00 PM	0	0	0	0	0
5:15 PM	0	0	2	0	2	5:15 PM	0	0	1	1	2
5:30 PM	0	0	1	1	2	5:30 PM	1	0	0	0	1
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
Count Total	10	0	6	3	19	Count Total	1	0	3	2	6
Peak Hour	9	0	2	2	13	Peak Hour	0	0	2	1	3

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Location: 8 MARVIN RD & OAKWOOD ST PM

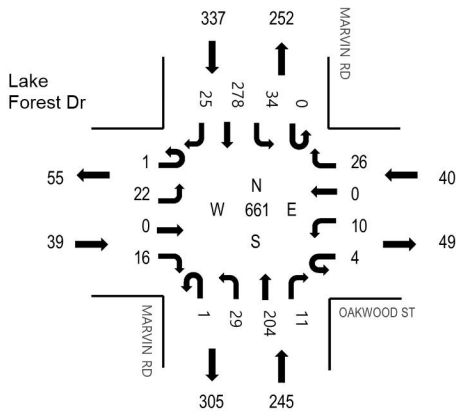
Date: Tuesday, April 11, 2023

Peak Hour: 05:00 PM - 06:00 PM

*Marvin Rd & Lake Forest Dr
SE & Oakwood St SE

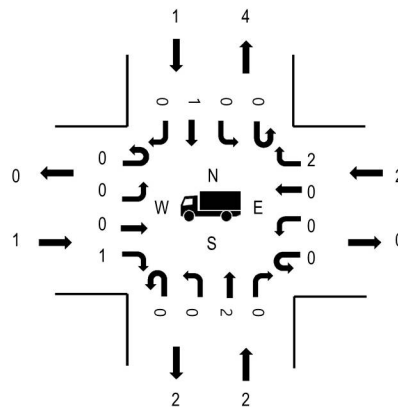
Peak Hour

Motorized Vehicles

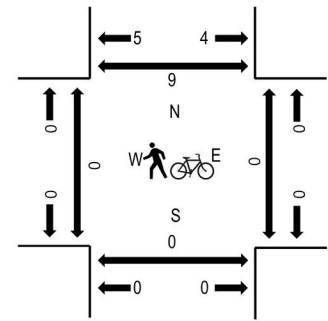


	HV%	PHF
EB	2.6%	0.61
WB	5.0%	0.71
NB	0.8%	0.85
SB	0.3%	0.81
All	0.9%	0.91

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	Lake Forest Dr Eastbound				OAKWOOD ST Westbound				MARVIN RD Northbound				MARVIN RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	5	0	4	0	2	0	4	0	5	38	2	2	11	101	5	179	626
4:15 PM	0	1	0	3	0	2	0	12	0	8	47	1	0	7	72	12	165	603
4:30 PM	0	5	1	3	0	1	0	6	0	1	35	1	0	6	53	9	121	597
4:45 PM	0	4	0	6	0	1	0	6	0	3	60	3	0	8	60	10	161	657
5:00 PM	0	7	0	1	0	4	0	5	0	11	52	1	0	11	60	4	156	661
5:15 PM	1	5	0	3	0	1	0	8	1	8	44	3	0	7	74	4	159	
5:30 PM	0	6	0	10	0	1	0	7	0	4	45	4	0	9	87	8	181	
5:45 PM	0	4	0	2	4	4	0	6	0	6	63	3	0	7	57	9	165	
Count Total	1	37	1	32	4	16	0	54	1	46	384	18	2	66	564	61	1,287	
Peak Hour	1	22	0	16	4	10	0	26	1	29	204	11	0	34	278	25	661	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	0	0	5	7	4:00 PM	0	0	0	0	0
4:15 PM	2	1	0	2	5	4:15 PM	0	0	0	0	0
4:30 PM	0	1	0	2	3	4:30 PM	0	0	2	1	3
4:45 PM	0	0	0	0	0	4:45 PM	0	0	1	4	5
5:00 PM	1	1	1	1	4	5:00 PM	0	0	0	3	3
5:15 PM	0	0	1	0	1	5:15 PM	0	0	0	1	1
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	3	3
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	2	2
Count Total	5	4	2	10	21	Count Total	0	0	3	14	17
Peak Hour	1	2	2	1	6	Peak Hour	0	0	0	9	9



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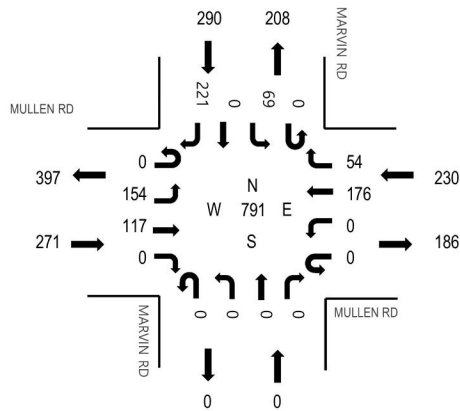
Location: 9 MARVIN RD & MULLEN RD PM

Date: Tuesday, April 11, 2023

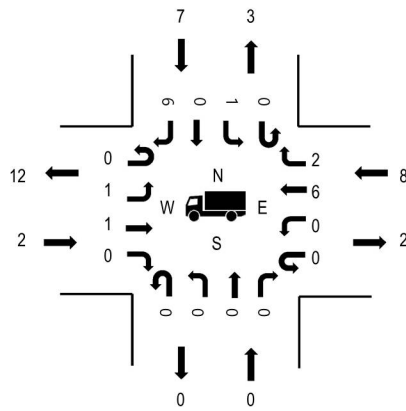
Peak Hour: 04:00 PM - 05:00 PM

Peak Hour

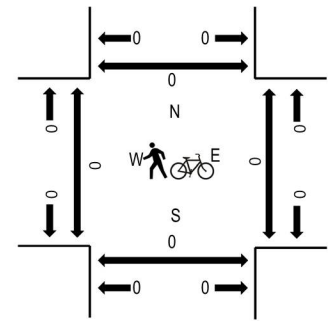
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	0.7%	0.90
WB	3.5%	0.91
NB	0.0%	0.00
SB	2.4%	0.85
All	2.1%	0.89

Traffic Counts - Motorized Vehicles

Interval Start Time	MULLEN RD Eastbound				MULLEN RD Westbound				MARVIN RD Northbound				MARVIN RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	37	36	0	0	0	53	11	0	0	0	0	0	26	0	59	222	791
4:15 PM	0	38	27	0	0	0	40	10	0	0	0	0	0	20	0	60	195	760
4:30 PM	0	39	25	0	0	0	42	20	0	0	0	0	0	14	0	42	182	778
4:45 PM	0	40	29	0	0	0	41	13	0	0	0	0	0	9	0	60	192	791
5:00 PM	0	32	27	0	0	0	50	17	0	0	0	0	0	12	0	53	191	767
5:15 PM	0	33	33	0	0	0	53	13	0	0	0	0	0	20	0	61	213	
5:30 PM	0	45	30	0	0	0	45	11	0	0	0	0	0	21	0	43	195	
5:45 PM	0	36	20	0	0	0	41	14	0	0	0	0	0	15	0	42	168	
Count Total	0	300	227	0	0	0	365	109	0	0	0	0	0	137	0	420	1,558	
Peak Hour	0	154	117	0	0	0	176	54	0	0	0	0	0	69	0	221	791	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	0	1	3	5	4:00 PM	0	0	0	0	0
4:15 PM	1	0	5	4	10	4:15 PM	0	0	0	0	0
4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0
4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1	5:00 PM	0	0	0	0	0
5:15 PM	0	0	4	3	7	5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	1	1	5:30 PM	0	0	0	0	0
5:45 PM	1	0	0	0	1	5:45 PM	0	0	0	0	0
Count Total	3	0	13	11	27	Count Total	0	0	0	0	0
Peak Hour	2	0	8	7	17	Peak Hour	0	0	0	0	0



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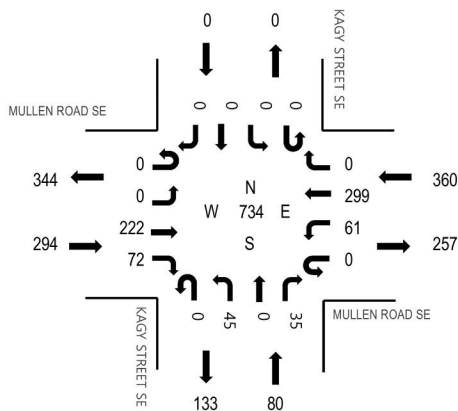
Location: 10 KAGY STREET SE & MULLEN ROAD SE PM

Date: Tuesday, November 15, 2022

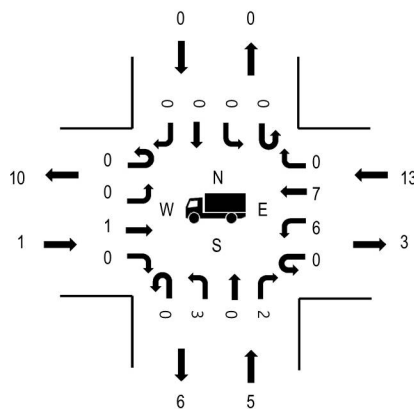
Peak Hour: 04:00 PM - 05:00 PM

Peak Hour

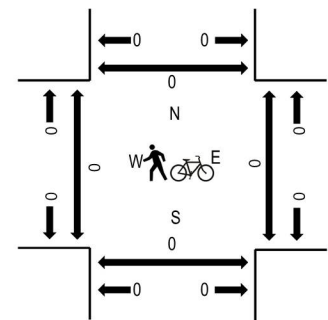
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	0.3%	0.83
WB	3.6%	0.90
NB	6.3%	0.80
SB	0.0%	0.00
All	2.6%	0.95

Traffic Counts - Motorized Vehicles

Interval Start Time	MULLEN ROAD SE Eastbound				MULLEN ROAD SE Westbound				KAGY STREET SE Northbound				KAGY STREET SE Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	52	9	0	19	69	0	0	7	0	8	0	0	0	0	164	734
4:15 PM	0	0	50	24	0	20	80	0	0	10	0	10	0	0	0	0	194	733
4:30 PM	0	0	66	23	0	9	64	0	0	13	0	12	0	0	0	0	187	721
4:45 PM	0	0	54	16	0	13	86	0	0	15	0	5	0	0	0	0	189	722
5:00 PM	0	0	46	22	0	12	68	0	0	9	0	6	0	0	0	0	163	699
5:15 PM	0	0	61	19	0	13	74	0	0	8	0	7	0	0	0	0	182	
5:30 PM	0	0	45	33	0	12	74	0	0	19	0	5	0	0	0	0	188	
5:45 PM	0	0	47	25	0	10	73	0	0	6	0	5	0	0	0	0	166	
Count Total	0	0	421	171	0	108	588	0	0	87	0	58	0	0	0	0	1,433	
Peak Hour	0	0	222	72	0	61	299	0	0	45	0	35	0	0	0	0	734	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	2	5	0	7	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:15 PM	0	1	4	0	5	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:30 PM	1	2	2	0	5	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:45 PM	0	0	2	0	2	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
5:00 PM	0	3	1	0	4	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	0	1	2	0	3	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
Count Total	1	10	16	0	27	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	1	5	13	0	19	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0



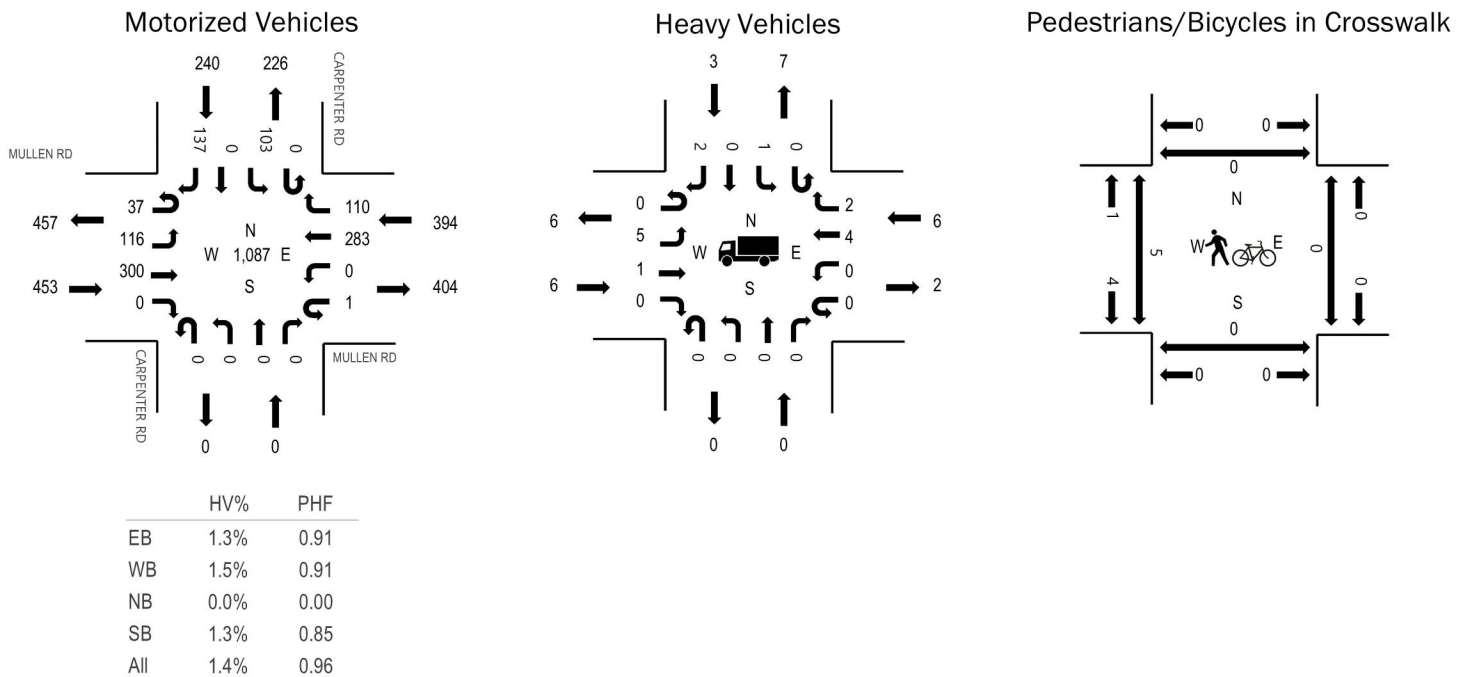
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Location: 11 CARPENTER RD & MULLEN RD PM

Date: Tuesday, April 11, 2023

Peak Hour: 04:45 PM - 05:45 PM

Peak Hour



Traffic Counts - Motorized Vehicles

Interval Start Time	MULLEN RD Eastbound				MULLEN RD Westbound				CARPENTER RD Northbound				CARPENTER RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	3	29	57	0	1	0	81	14	0	0	0	0	0	21	0	23	229	1,000
4:15 PM	5	34	68	0	0	0	71	28	0	0	0	0	0	21	0	26	253	1,029
4:30 PM	11	31	72	0	0	0	60	21	0	0	0	0	1	18	0	32	246	1,058
4:45 PM	11	30	68	0	0	0	66	26	0	0	0	0	0	31	0	40	272	1,087
5:00 PM	6	27	65	0	0	0	72	36	0	0	0	0	0	18	0	34	258	1,060
5:15 PM	10	29	83	0	1	0	69	23	0	0	0	0	0	28	0	39	282	
5:30 PM	10	30	84	0	0	0	76	25	0	0	0	0	0	26	0	24	275	
5:45 PM	8	19	75	0	0	0	75	22	0	0	0	0	0	18	0	28	245	
Count Total	64	229	572	0	2	0	570	195	0	0	0	0	1	181	0	246	2,060	
Peak Hour	37	116	300	0	1	0	283	110	0	0	0	0	0	103	0	137	1,087	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	6	0	3	0	9	4:00 PM	1	0	0	0	1
4:15 PM	8	0	5	2	15	4:15 PM	1	0	1	0	2
4:30 PM	4	0	0	2	6	4:30 PM	0	0	1	0	1
4:45 PM	0	0	3	1	4	4:45 PM	2	0	0	0	2
5:00 PM	2	0	3	1	6	5:00 PM	3	0	0	0	3
5:15 PM	2	0	0	1	3	5:15 PM	0	0	0	0	0
5:30 PM	2	0	0	0	2	5:30 PM	0	0	0	0	0
5:45 PM	1	0	0	1	2	5:45 PM	0	0	0	0	0
Count Total	25	0	14	8	47	Count Total	7	0	2	0	9
Peak Hour	6	0	6	3	15	Peak Hour	5	0	0	0	5



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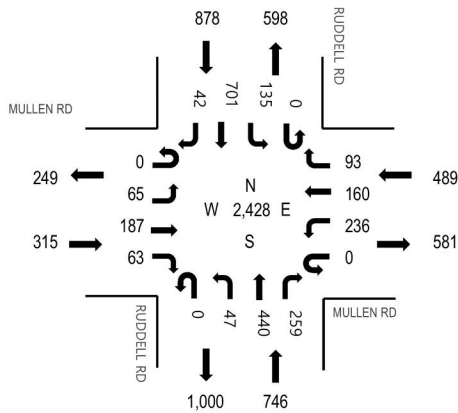
Location: 12 RUDDELL RD & MULLEN RD PM

Date: Tuesday, April 11, 2023

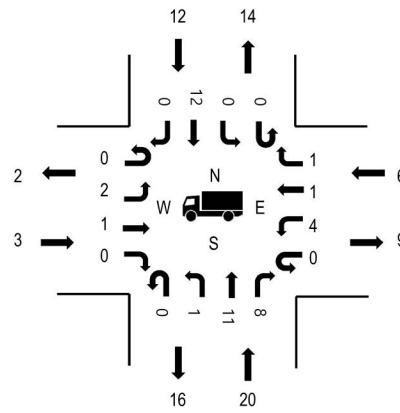
Peak Hour: 04:30 PM - 05:30 PM

Peak Hour

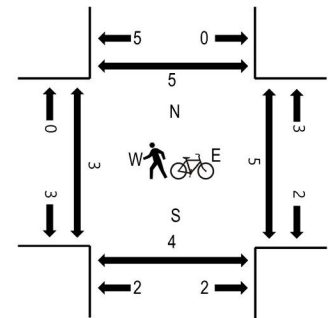
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	1.0%	0.83
WB	1.2%	0.97
NB	2.7%	0.79
SB	1.4%	0.93
All	1.7%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	MULLEN RD Eastbound				MULLEN RD Westbound				RUDDELL RD Northbound				RUDDELL RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	22	45	29	0	37	34	31	0	13	121	56	0	31	154	9	582	2,305
4:15 PM	0	14	37	23	0	49	28	20	0	11	98	47	0	41	147	7	522	2,317
4:30 PM	0	16	36	14	0	60	37	21	0	23	118	94	0	35	171	6	631	2,428
4:45 PM	0	15	49	12	0	59	46	21	0	10	99	50	0	31	164	14	570	2,357
5:00 PM	0	16	43	19	0	62	37	27	0	7	115	48	0	25	186	9	594	2,377
5:15 PM	0	18	59	18	0	55	40	24	0	7	108	67	0	44	180	13	633	
5:30 PM	0	12	49	14	0	52	33	23	0	10	110	46	0	35	168	8	560	
5:45 PM	0	9	49	14	0	72	43	29	0	8	113	53	0	47	146	7	590	
Count Total	0	122	367	143	0	446	298	196	0	89	882	461	0	289	1,316	73	4,682	
Peak Hour	0	65	187	63	0	236	160	93	0	47	440	259	0	135	701	42	2,428	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	7	4	0	1	12	4:00 PM	0	1	0	2	3
4:15 PM	4	7	1	3	15	4:15 PM	2	1	1	0	4
4:30 PM	1	13	2	1	17	4:30 PM	0	1	0	2	3
4:45 PM	1	1	3	3	8	4:45 PM	2	0	3	3	8
5:00 PM	0	4	0	4	8	5:00 PM	0	1	0	0	1
5:15 PM	1	2	1	4	8	5:15 PM	1	2	2	0	5
5:30 PM	0	3	0	0	3	5:30 PM	3	0	1	0	4
5:45 PM	0	0	2	1	3	5:45 PM	0	0	0	2	2
Count Total	14	34	9	17	74	Count Total	8	6	7	9	30
Peak Hour	3	20	6	12	41	Peak Hour	3	4	5	5	17



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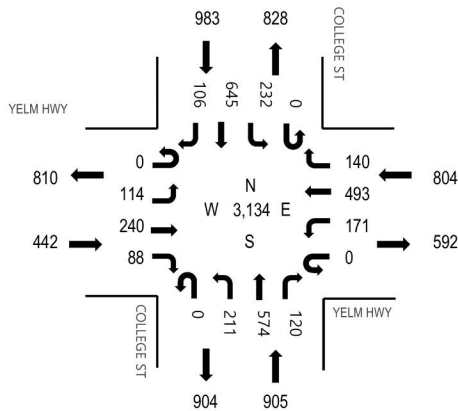
Location: 13 COLLEGE ST & YELM HWY PM

Date: Tuesday, April 11, 2023

Peak Hour: 04:45 PM - 05:45 PM

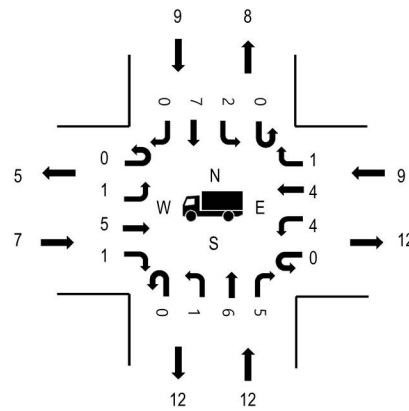
Peak Hour

Motorized Vehicles

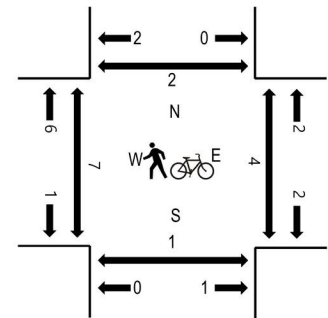


	HV%	PHF
EB	1.6%	0.88
WB	1.1%	0.94
NB	1.3%	0.91
SB	0.9%	0.95
All	1.2%	0.94

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	YELM HWY Eastbound				YELM HWY Westbound				COLLEGE ST Northbound				COLLEGE ST Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	29	47	25	0	48	98	34	0	42	128	26	0	41	152	19	689	2,873
4:15 PM	0	36	60	22	0	49	108	29	0	48	119	43	0	48	131	29	722	2,979
4:30 PM	0	30	69	28	0	34	103	36	0	43	126	34	0	37	145	16	701	3,092
4:45 PM	0	26	56	20	0	41	126	29	0	52	136	26	0	58	166	25	761	3,134
5:00 PM	0	29	49	25	0	52	104	36	0	50	163	37	0	51	165	34	795	3,034
5:15 PM	0	30	71	25	0	37	141	36	0	56	144	36	0	68	167	24	835	
5:30 PM	0	29	64	18	0	41	122	39	0	53	131	21	0	55	147	23	743	
5:45 PM	0	22	50	20	0	42	94	25	0	42	119	44	0	51	135	17	661	
Count Total	0	231	466	183	0	344	896	264	0	386	1,066	267	0	409	1,208	187	5,907	
Peak Hour	0	114	240	88	0	171	493	140	0	211	574	120	0	232	645	106	3,134	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	3	8	4	15	4:00 PM	1	1	1	1	4
4:15 PM	4	2	2	2	10	4:15 PM	2	3	2	3	10
4:30 PM	2	2	1	5	10	4:30 PM	1	0	3	2	6
4:45 PM	2	2	4	3	11	4:45 PM	1	0	0	0	1
5:00 PM	3	4	2	4	13	5:00 PM	1	0	1	1	3
5:15 PM	1	5	1	0	7	5:15 PM	3	0	1	0	4
5:30 PM	1	1	2	2	6	5:30 PM	2	1	2	1	6
5:45 PM	1	2	2	1	6	5:45 PM	0	0	0	1	1
Count Total	14	21	22	21	78	Count Total	11	5	10	9	35
Peak Hour	7	12	9	9	37	Peak Hour	7	1	4	2	14



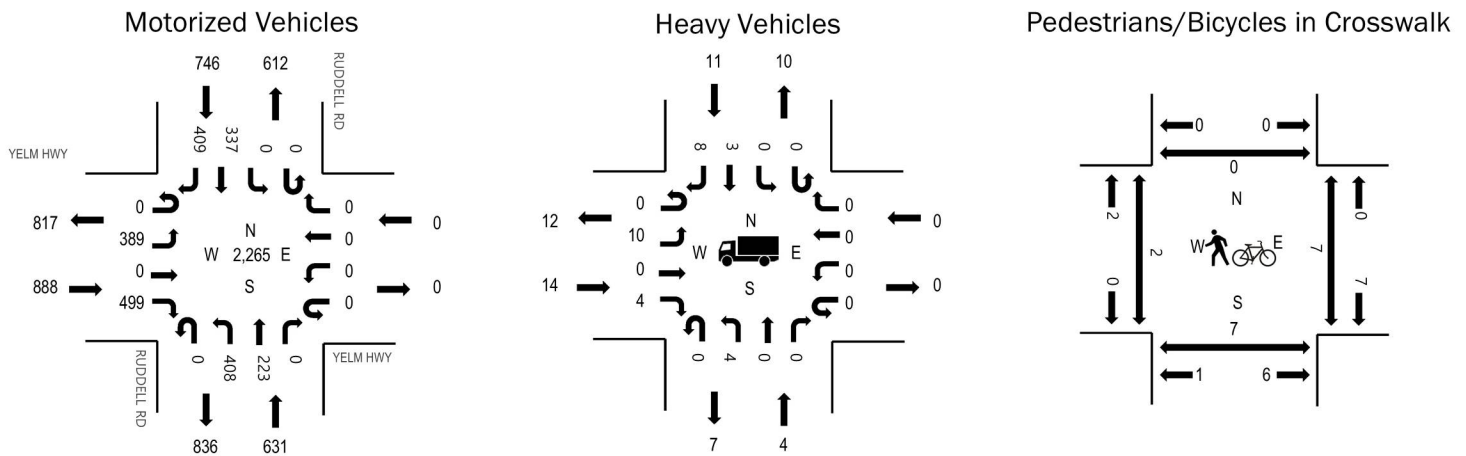
(303) 216-2439
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Location: 14 RUDDELL RD & YELM HWY PM

Date: Tuesday, April 11, 2023

Peak Hour: 04:30 PM - 05:30 PM

Peak Hour



	HV%	PHF
EB	1.6%	0.91
WB	0.0%	0.00
NB	0.6%	0.91
SB	1.5%	0.95
All	1.3%	0.98

Traffic Counts - Motorized Vehicles

Interval Start Time	YELM HWY Eastbound				YELM HWY Westbound				RUDDELL RD Northbound				RUDDELL RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	87	0	94	0	0	0	0	0	94	69	0	0	0	58	74	476	2,101
4:15 PM	0	98	0	98	0	0	0	0	0	113	54	0	0	0	68	87	518	2,205
4:30 PM	0	89	0	117	0	0	0	0	0	89	47	0	0	0	94	103	539	2,265
4:45 PM	0	84	0	131	0	0	0	0	0	116	58	0	0	0	68	111	568	2,219
5:00 PM	0	100	0	124	0	0	0	0	0	98	67	0	0	0	79	112	580	2,164
5:15 PM	0	116	0	127	0	0	0	0	0	105	51	0	0	0	96	83	578	
5:30 PM	0	103	0	119	0	0	0	0	0	75	44	0	0	0	69	83	493	
5:45 PM	0	93	0	111	0	0	0	0	0	90	48	0	0	0	76	95	513	
Count Total	0	770	0	921	0	0	0	0	0	780	438	0	0	0	608	748	4,265	
Peak Hour	0	389	0	499	0	0	0	0	0	408	223	0	0	0	337	409	2,265	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	4	4	0	4	12	4:00 PM	4	1	0	0	5
4:15 PM	3	7	0	5	15	4:15 PM	0	0	0	0	0
4:30 PM	6	1	0	2	9	4:30 PM	1	1	4	0	6
4:45 PM	4	0	0	3	7	4:45 PM	0	6	2	0	8
5:00 PM	2	1	0	2	5	5:00 PM	0	0	1	0	1
5:15 PM	2	2	0	4	8	5:15 PM	1	0	0	0	1
5:30 PM	3	1	0	0	4	5:30 PM	2	0	1	0	3
5:45 PM	1	0	0	2	3	5:45 PM	0	2	4	0	6
Count Total	25	16	0	22	63	Count Total	8	10	12	0	30
Peak Hour	14	4	0	11	29	Peak Hour	2	7	7	0	16



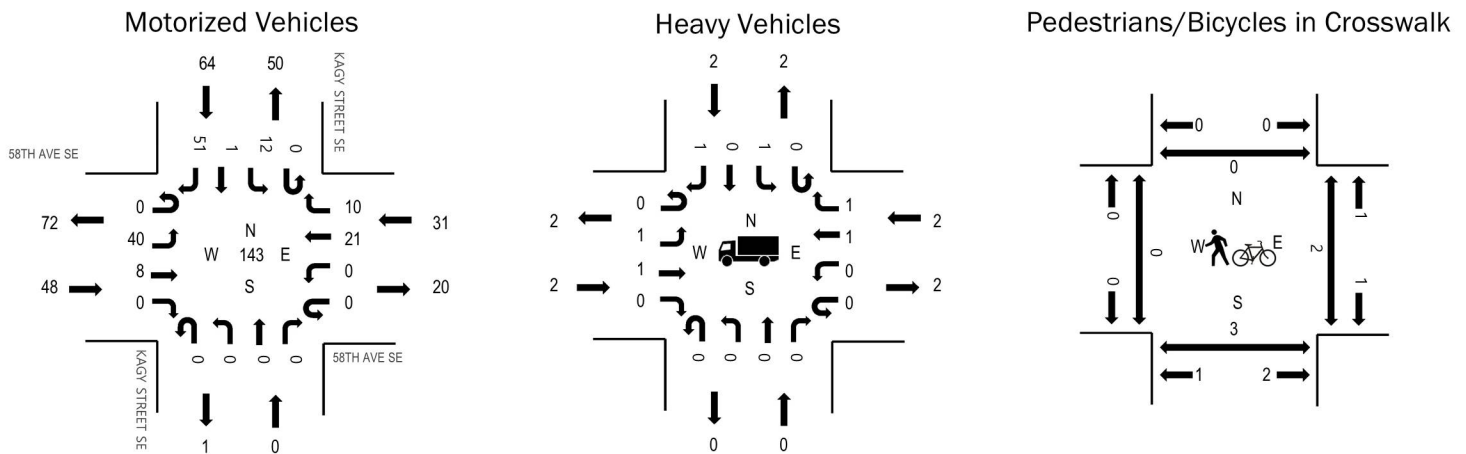
(303) 216-2439
www.alltrafficdata.net

Location: 15 KAGY STREET SE & 58TH AVE SE PM

Date: Tuesday, November 15, 2022

Peak Hour: 04:00 PM - 05:00 PM

Peak Hour



	HV%	PHF
EB	4.2%	0.89
WB	6.5%	0.78
NB	0.0%	0.00
SB	3.1%	0.89
All	4.2%	0.87

Traffic Counts - Motorized Vehicles

Interval Start Time	58TH AVE SE Eastbound				58TH AVE SE Westbound				KAGY STREET SE Northbound				KAGY STREET SE Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	7	3	0	0	0	3	4	0	0	0	0	0	4	0	11	32	143
4:15 PM	0	8	3	0	0	0	7	2	0	0	0	0	0	2	1	15	38	143
4:30 PM	0	12	2	0	0	0	7	3	0	0	0	0	0	5	0	12	41	126
4:45 PM	0	13	0	0	0	0	4	1	0	0	0	0	0	1	0	13	32	126
5:00 PM	0	7	5	0	0	0	5	2	0	0	0	0	0	1	1	11	32	120
5:15 PM	0	3	0	0	0	0	3	1	0	0	0	0	0	6	0	8	21	
5:30 PM	0	10	3	0	0	0	4	7	0	0	0	1	0	5	2	9	41	
5:45 PM	0	1	2	0	0	0	4	1	0	0	0	0	0	4	0	14	26	
Count Total	0	61	18	0	0	0	37	21	0	0	0	1	0	28	4	93	263	
Peak Hour	0	40	8	0	0	0	21	10	0	0	0	0	0	12	1	51	143	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	1	2	3	4:00 PM	0	0	0	0	0	4:00 PM	0	1	1	0	2
4:15 PM	1	0	0	0	1	4:15 PM	0	0	0	0	0	4:15 PM	0	2	1	0	3
4:30 PM	1	0	1	0	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
5:00 PM	2	0	0	2	4	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	1	0	1	0	2	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
Count Total	5	0	3	4	12	Count Total	0	0	0	0	0	Count Total	0	3	2	0	5
Peak Hour	2	0	2	2	6	Peak Hour	0	0	0	0	0	Peak Hour	0	3	2	0	5



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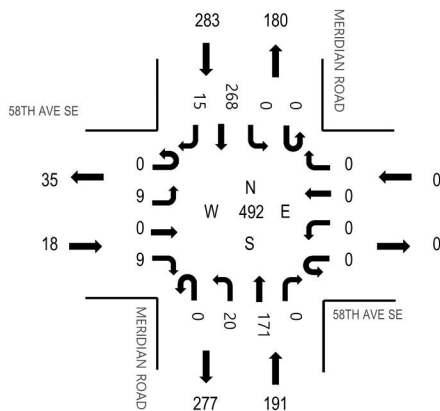
Location: 16 MERIDIAN ROAD SE & 58TH AVE SE PM

Date: Tuesday, November 15, 2022

Peak Hour: 04:00 PM - 05:00 PM

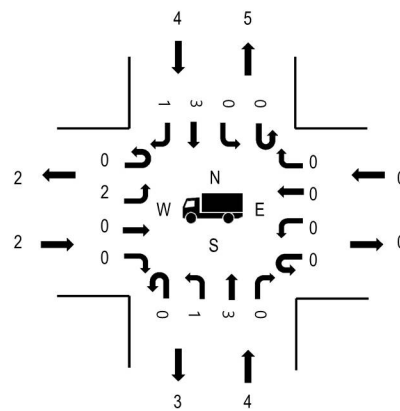
Peak Hour

Motorized Vehicles

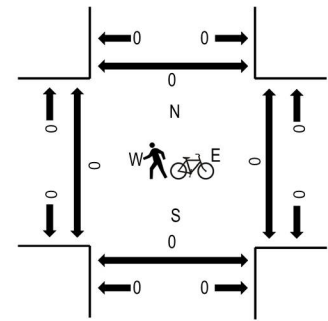


	HV%	PHF
EB	11.1%	0.56
WB	0.0%	0.00
NB	2.1%	0.88
SB	1.4%	0.82
All	2.0%	0.90

Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Traffic Counts - Motorized Vehicles

Interval Start Time	58TH AVE SE Eastbound				58TH AVE SE Westbound				MERIDIAN ROAD SE Northbound				MERIDIAN ROAD SE Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	4	0	4	0	0	0	0	0	6	36	0	0	0	62	3	115	492
4:15 PM	0	2	0	2	0	0	0	0	0	4	46	0	0	0	58	7	119	481
4:30 PM	0	2	0	3	0	0	0	0	0	6	39	0	0	0	82	4	136	480
4:45 PM	0	1	0	0	0	0	0	0	0	4	50	0	0	0	66	1	122	455
5:00 PM	0	1	0	5	0	0	0	0	0	5	33	0	0	0	55	5	104	445
5:15 PM	0	0	0	5	0	0	0	0	0	3	42	0	0	0	66	2	118	
5:30 PM	0	3	0	5	0	0	0	0	0	4	37	0	0	0	60	2	111	
5:45 PM	0	1	0	3	0	0	0	0	0	2	36	0	0	0	65	5	112	
Count Total	0	14	0	27	0	0	0	0	0	34	319	0	0	0	514	29	937	
Peak Hour	0	9	0	9	0	0	0	0	0	20	171	0	0	0	268	15	492	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	1	0	1	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:15 PM	1	1	0	1	3	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:30 PM	1	0	0	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:45 PM	0	2	0	2	4	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	1	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:45 PM	0	1	0	0	1	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
Count Total	2	6	0	5	13	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	2	4	0	4	10	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0



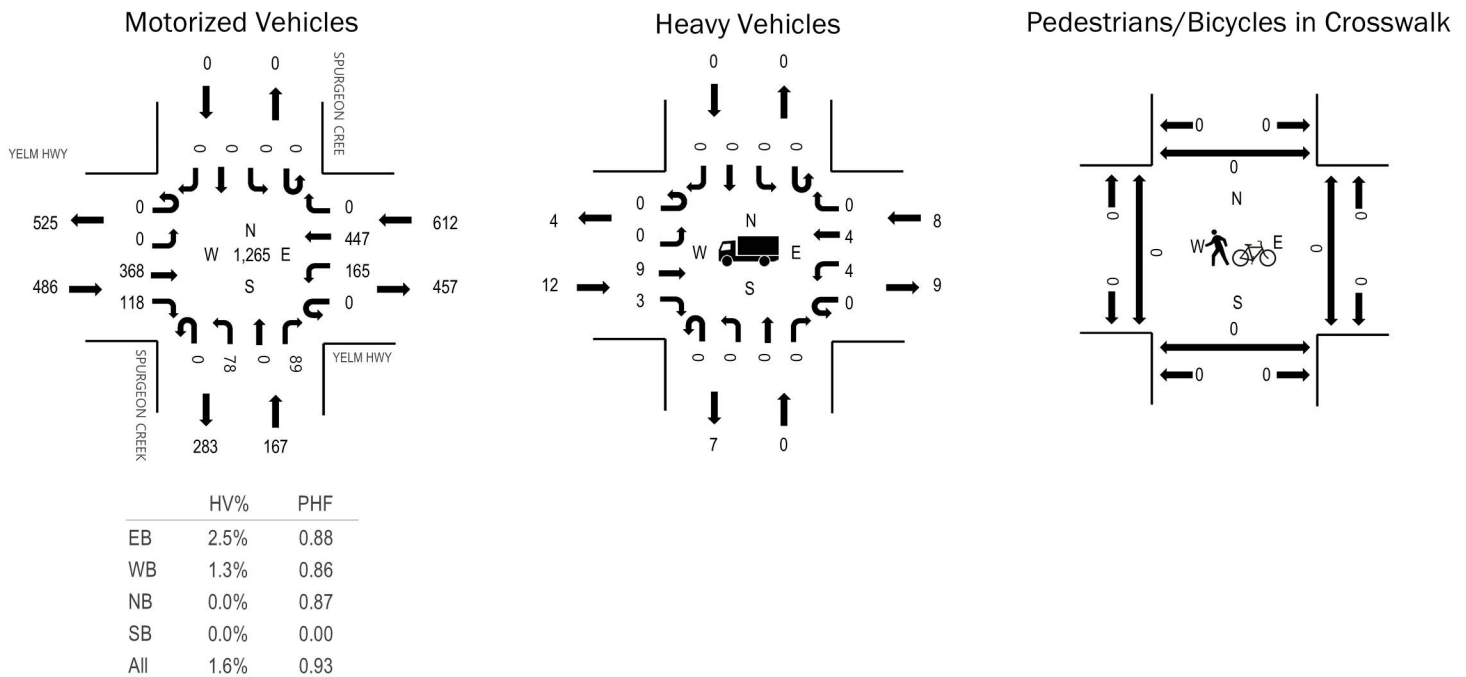
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Location: 17 . SPURGEON CREEK RD & YELM HWY PM

Date: Tuesday, April 11, 2023

Peak Hour: 04:15 PM - 05:15 PM

Peak Hour



Traffic Counts - Motorized Vehicles

Interval Start Time	YELM HWY Eastbound				YELM HWY Westbound				SPURGEON CREEK RD Northbound				SPURGEON CREEK RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	80	16	0	38	95	0	0	27	0	20	0	0	0	0	276	1,202
4:15 PM	0	0	94	24	0	42	104	0	0	24	0	19	0	0	0	0	307	1,265
4:30 PM	0	0	92	24	0	44	93	0	0	17	0	24	0	0	0	0	294	1,248
4:45 PM	0	0	103	35	0	38	114	0	0	15	0	20	0	0	0	0	325	1,241
5:00 PM	0	0	79	35	0	41	136	0	0	22	0	26	0	0	0	0	339	1,166
5:15 PM	0	0	91	45	0	28	92	0	0	17	0	17	0	0	0	0	290	
5:30 PM	0	0	82	25	0	42	105	0	0	14	0	19	0	0	0	0	287	
5:45 PM	0	0	82	26	0	33	82	0	0	16	0	11	0	0	0	0	250	
Count Total	0	0	703	230	0	306	821	0	0	152	0	156	0	0	0	0	2,368	
Peak Hour	0	0	368	118	0	165	447	0	0	78	0	89	0	0	0	0	1,265	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	1	1	0	2	4:00 PM	0	0	0	0	0
4:15 PM	2	0	2	0	4	4:15 PM	0	0	0	0	0
4:30 PM	3	0	2	0	5	4:30 PM	0	0	0	0	0
4:45 PM	4	0	1	0	5	4:45 PM	0	0	0	0	0
5:00 PM	3	0	3	0	6	5:00 PM	0	0	0	0	0
5:15 PM	2	0	0	0	2	5:15 PM	0	0	0	0	0
5:30 PM	0	1	2	0	3	5:30 PM	0	0	0	0	0
5:45 PM	2	1	0	0	3	5:45 PM	0	0	0	0	0
Count Total	16	3	11	0	30	Count Total	0	0	0	0	0
Peak Hour	12	0	8	0	20	Peak Hour	0	0	0	0	0



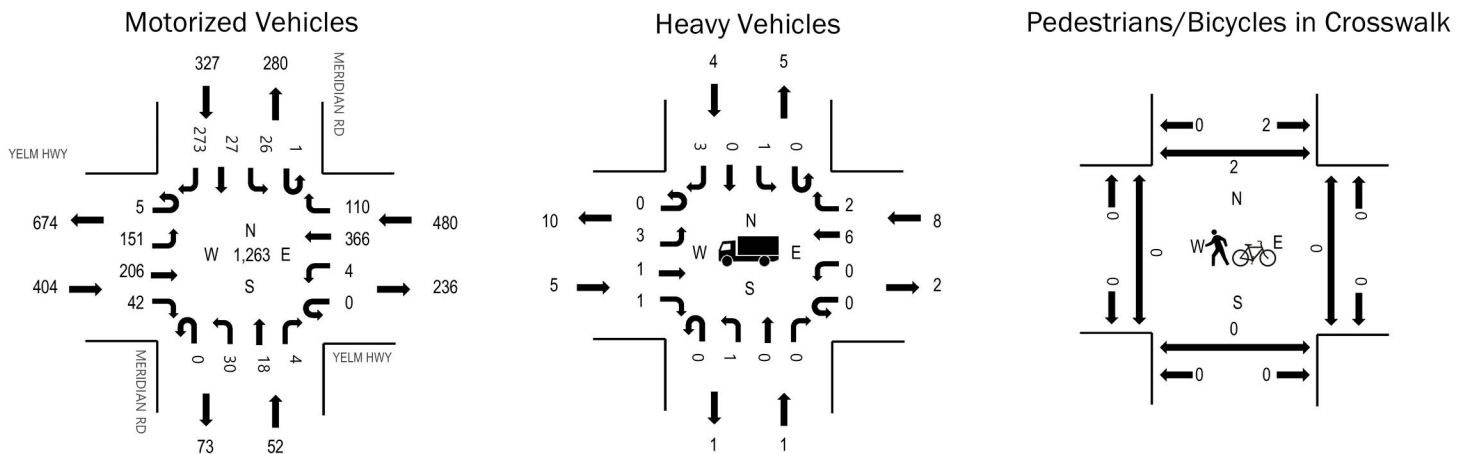
(303) 216-2439
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Location: **18** | MERIDIAN RD & YELM HWY PM

Date: Tuesday, April 11, 2023

Peak Hour: 04:15 PM - 05:15 PM

Peak Hour



	HV%	PHF
EB	1.2%	0.91
WB	1.7%	0.84
NB	1.9%	0.76
SB	1.2%	0.93
All	1.4%	0.98

Traffic Counts - Motorized Vehicles

Interval Start Time	YELM HWY Eastbound				YELM HWY Westbound				MERIDIAN RD Northbound				MERIDIAN RD Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	4	29	65	7	0	1	62	16	0	10	5	2	0	9	5	56	271	1,216
4:15 PM	2	33	60	11	0	1	88	17	0	7	3	1	1	10	8	63	305	1,263
4:30 PM	2	43	55	11	0	1	89	24	0	9	7	0	0	2	8	66	317	1,252
4:45 PM	1	37	53	10	0	1	83	33	0	8	7	2	0	8	9	71	323	1,261
5:00 PM	0	38	38	10	0	1	106	36	0	6	1	1	0	6	2	73	318	1,181
5:15 PM	0	47	50	15	0	1	69	29	0	5	3	1	0	10	6	58	294	
5:30 PM	2	33	70	8	0	2	78	24	0	10	3	0	0	11	6	79	326	
5:45 PM	1	29	45	8	0	1	64	20	0	7	4	1	0	3	2	58	243	
Count Total	12	289	436	80	0	9	639	199	0	62	33	8	1	59	46	524	2,397	
Peak Hour	5	151	206	42	0	4	366	110	0	30	18	4	1	26	27	273	1,263	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	2	1	0	2	5	4:00 PM	0	0	0	0	0
4:15 PM	1	0	2	1	4	4:15 PM	0	0	0	0	0
4:30 PM	0	0	1	1	2	4:30 PM	0	0	0	0	0
4:45 PM	2	0	2	1	5	4:45 PM	0	0	0	2	2
5:00 PM	2	1	3	1	7	5:00 PM	0	0	0	0	0
5:15 PM	1	1	1	0	3	5:15 PM	0	0	0	0	0
5:30 PM	2	0	1	0	3	5:30 PM	0	0	0	0	0
5:45 PM	1	0	1	0	2	5:45 PM	0	0	0	0	0
Count Total	11	3	11	6	31	Count Total	0	0	0	2	2
Peak Hour	5	1	8	4	18	Peak Hour	0	0	0	2	2

Appendix D

Trip Generation Calculations

Aurora Oaks Trip Generation Summary

Land Use	Units ¹	ITE LUC ²	Directional Distribution		Trip Rate	Trips Generated		
			In	Out		In	Out	Total
Daily								
Proposed Use:								
Single-Family Homes	180 DU	210	50%	50%	9.43	849	848	1,697
Existing Use:								
Single-Family Homes	1 DU	210	50%	50%	9.43	-5	-4	-9
Net New Daily Trips =						844	844	1,688
AM Peak Hour								
Proposed Use:								
Single-Family Homes	180 DU	210	26%	74%	0.70	33	93	126
Existing Use:								
Single-Family Homes	1 DU	210	26%	74%	0.70	0	-1	-1
Net New AM Peak Hour Trips =						33	92	125
PM Peak Hour								
Proposed Use:								
Single-Family Homes	180 DU	210	63%	37%	0.94	106	63	169
Existing Use:								
Single-Family Homes	1 DU	210	63%	37%	0.94	-1	0	-1
Net New PM Peak Hour Trips =						105	63	168

Notes:

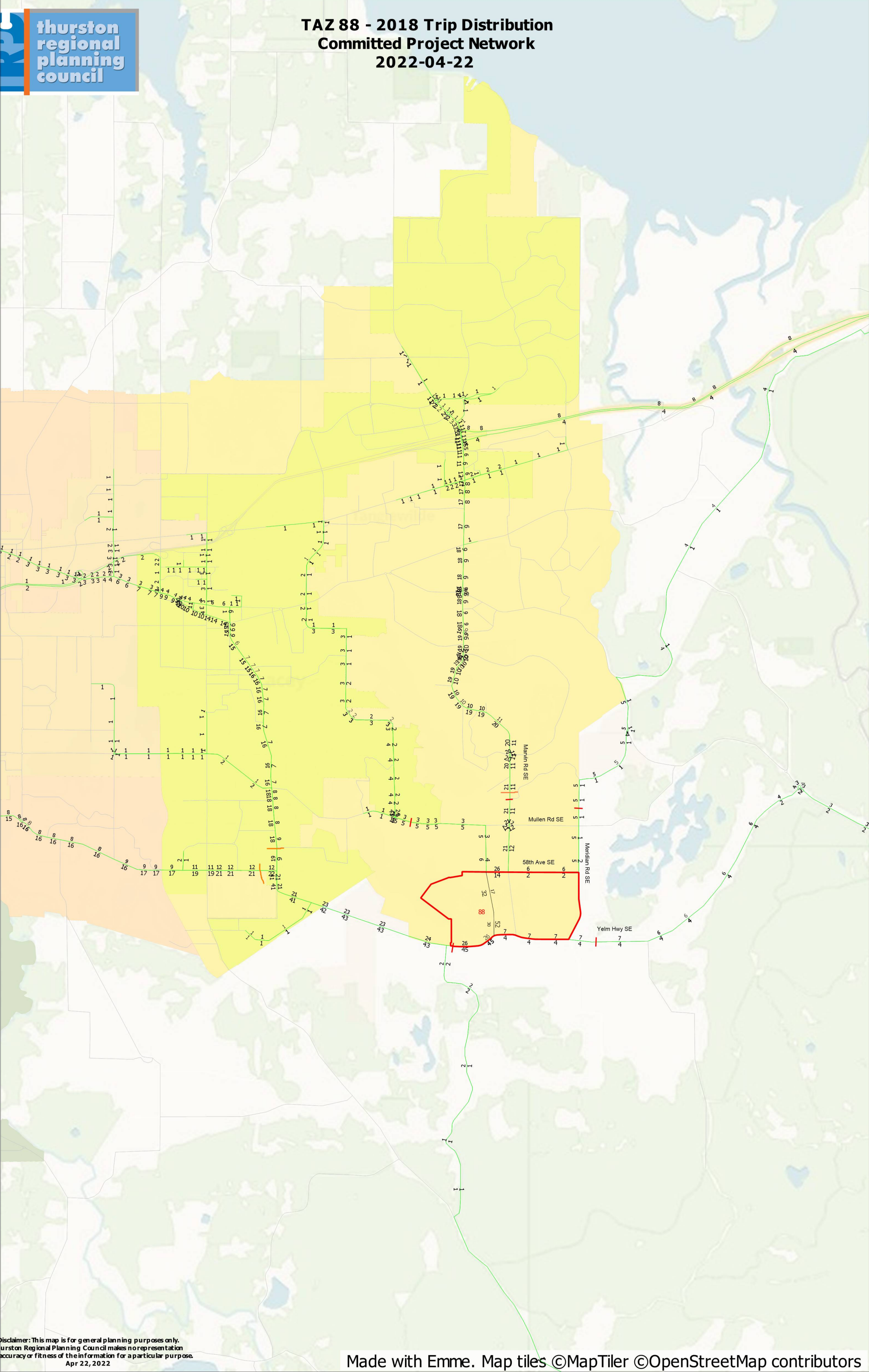
¹ DU = Dwelling Units.

² Institute of Transportation Engineers, *Trip Generation* Manual (11th edition) Land Use Code.

Appendix E

SZA 88 Model Distribution

TAZ 88 - 2018 Trip Distribution
Committed Project Network
2022-04-22



Disclaimer: This map is for general planning purposes only.
Thurston Regional Planning Council makes no representation
as to accuracy or fitness of the information for a particular purpose.
Apr 22, 2022

Appendix F

Level of Service (LOS) Methodology and Calculations

Level of Service Methodology

Level of Service (LOS) generally refers to the degree of congestion at an intersection. It is a measure of vehicle operating speed, travel time, travel delays, and driving comfort. A letter scale from A to F generally describes intersection LOS.

Signalized Intersection LOS represents the average control delay (sec./veh) and can be reported for the overall intersection, for each approach, and for each lane group (additional v/c ratio criteria apply to lane group LOS only). The table below outlines the HCM (6th Edition) LOS criteria for signalized intersections.

LOS Criteria for Signalized Intersections ¹

Control Delay (sec./veh)	Level of Service ²	General Description ³
≤ 10	A	Exceptionally Favorable Progression (or very short cycle lengths) – Most vehicles arrive during the green indication and travel through the intersection without stopping.
> 10 to ≤ 20	B	Highly Favorable Progression (or short cycle lengths) – While more vehicles than LOS A stop, most vehicles still pass through the intersection without stopping.
> 20 to ≤ 35	C	Favorable Progression (or moderate cycle lengths) – Individual cycle failures begin to appear, but many vehicles still pass through the intersection without stopping.
> 35 to ≤ 55	D	Ineffective Progression (or long cycle lengths) – Many vehicles stop and individual cycle failures are noticeable.
> 55 to ≤ 80	E	Unfavorable Progression (and long cycle lengths) – Individual cycle failures are frequent.
> 80	F	Very Poor Progression (and long cycle lengths) – Most cycles fail to clear the queue at this level.

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

² If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0, LOS F is assigned to the individual lane group. For approach-based and intersection-wide assessments at signals, LOS is defined solely by control delay.

³ Individual cycle failures: one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle.

Synchro 11 and/or HCM 2000 LOS methodology may be used when HCM 6th Edition methodology is not supported at an intersection (i.e., intersection geometry and/or custom phasing) or jurisdictional standards require use of an alternative methodology.

Unsignalized Intersection LOS (two-way stop control, all-way stop control, and roundabouts) is based on the average control delay. For two-way stop-controlled intersections, the LOS criteria apply to each controlled minor-street approach, controlled minor-street lane group, and controlled major-street movement (additional v/c ratio criteria apply to lane group LOS only). LOS is not calculated for major-street approaches or for the intersection as a whole at two-way stop-controlled intersections. For all-way stop-controlled intersections and roundabouts, LOS can be reported for the overall intersection, for each approach, and for each lane group (additional v/c ratio criteria apply to lane group LOS only). The table below outlines the HCM (6th Edition) LOS criteria for unsignalized intersections based on these methodologies.

LOS Criteria for Unsignalized Intersections¹

Control Delay (sec./veh)	Level of Service ²
≤ 10	A
> 10 to ≤ 15	B
> 15 to ≤ 25	C
> 25 to ≤ 35	D
> 35 to ≤ 50	E
> 50	F

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

² If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0, LOS F is assigned to the individual lane group. For approach-based and intersection-wide assessments at unsignalized intersections, LOS is defined solely by control delay.

2023 Existing LOS

Lanes, Volumes, Timings
1: Marvin Rd SE & Steilacoom Rd SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	236	14	171	219	204	21	580	52	390	847	231
Future Volume (vph)	159	236	14	171	219	204	21	580	52	390	847	231
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		4%			0%			0%			0%	
Storage Length (ft)	350		0	225		0	275		0	225		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		749			828			615			398	
Travel Time (s)		14.6			16.1			12.0			7.8	
Confl. Peds. (#/hr)	1		2	2		1	2					2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	8.0		6.0	8.0		6.0	10.0		6.0	10.0	
Minimum Split (s)	10.6	39.6		10.6	40.6		10.6	30.9		10.6	36.9	
Total Split (s)	29.6	33.6		19.6	33.6		19.6	45.9		45.6	45.9	
Total Split (%)	19.1%	21.7%		12.7%	21.7%		12.7%	29.7%		29.5%	29.7%	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.9		3.6	3.9	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.6	4.6		4.6	4.6		4.6	4.9		4.6	4.9	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	

Intersection Summary

Area Type: Other

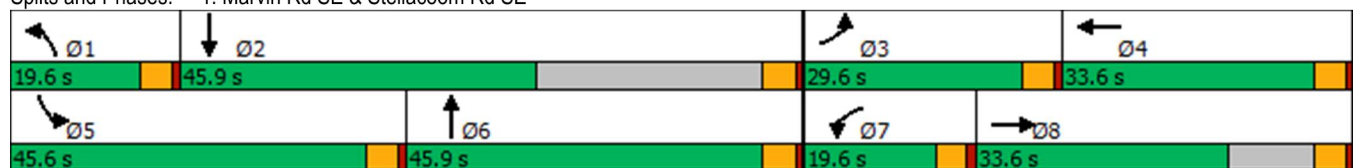
Cycle Length: 154.7

Actuated Cycle Length: 145.7

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Marvin Rd SE & Steilacoom Rd SE



HCM 6th Signalized Intersection Summary

1: Marvin Rd SE & Steilacoom Rd SE

05/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	236	14	171	219	204	21	580	52	390	847	231
Future Volume (veh/h)	159	236	14	171	219	204	21	580	52	390	847	231
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1650	1650	1650	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	177	262	16	190	243	227	23	644	58	433	941	257
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	200	357	22	187	180	168	43	737	66	456	1256	342
Arrive On Green	0.13	0.23	0.23	0.11	0.22	0.22	0.03	0.24	0.24	0.28	0.49	0.49
Sat Flow, veh/h	1571	1538	94	1667	831	776	1654	3060	275	1654	2561	698
Grp Volume(v), veh/h	177	0	278	190	0	470	23	347	355	433	605	593
Grp Sat Flow(s),veh/h/ln	1571	0	1632	1667	0	1608	1654	1650	1685	1654	1650	1609
Q Serve(g_s), s	14.8	0.0	21.1	15.0	0.0	29.0	1.8	27.0	27.1	34.4	39.5	39.8
Cycle Q Clear(g_c), s	14.8	0.0	21.1	15.0	0.0	29.0	1.8	27.0	27.1	34.4	39.5	39.8
Prop In Lane	1.00		0.06	1.00		0.48	1.00		0.16	1.00		0.43
Lane Grp Cap(c), veh/h	200	0	378	187	0	348	43	397	406	456	809	789
V/C Ratio(X)	0.89	0.00	0.73	1.02	0.00	1.35	0.54	0.87	0.88	0.95	0.75	0.75
Avail Cap(c_a), veh/h	294	0	378	187	0	348	185	506	517	507	809	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.4	0.0	47.6	59.4	0.0	52.4	64.4	48.8	48.9	47.6	27.4	27.5
Incr Delay (d2), s/veh	17.4	0.0	7.1	70.3	0.0	174.8	7.7	12.7	12.6	26.2	3.8	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.0	9.3	9.9	0.0	28.5	0.9	12.4	12.7	17.3	16.0	15.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.9	0.0	54.7	129.7	0.0	227.2	72.0	61.5	61.5	73.8	31.2	31.5
LnGrp LOS	E	A	D	F	A	F	E	E	E	E	C	C
Approach Vol, veh/h		455			660			725			1631	
Approach Delay, s/veh		62.6			199.2			61.8			42.6	
Approach LOS		E			F			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	70.5	21.6	33.6	41.5	37.1	19.6	35.6				
Change Period (Y+Rc), s	4.6	4.9	4.6	4.6	4.6	4.9	4.6	4.6				
Max Green Setting (Gmax), s	15.0	41.0	25.0	29.0	41.0	41.0	15.0	29.0				
Max Q Clear Time (g_c+I1), s	3.8	41.8	16.8	31.0	36.4	29.1	17.0	23.1				
Green Ext Time (p_c), s	0.0	0.0	0.2	0.0	0.5	3.1	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			79.0									
HCM 6th LOS			E									
Notes												
User approved pedestrian interval to be less than phase max green.												

LANE LEVEL OF SERVICE

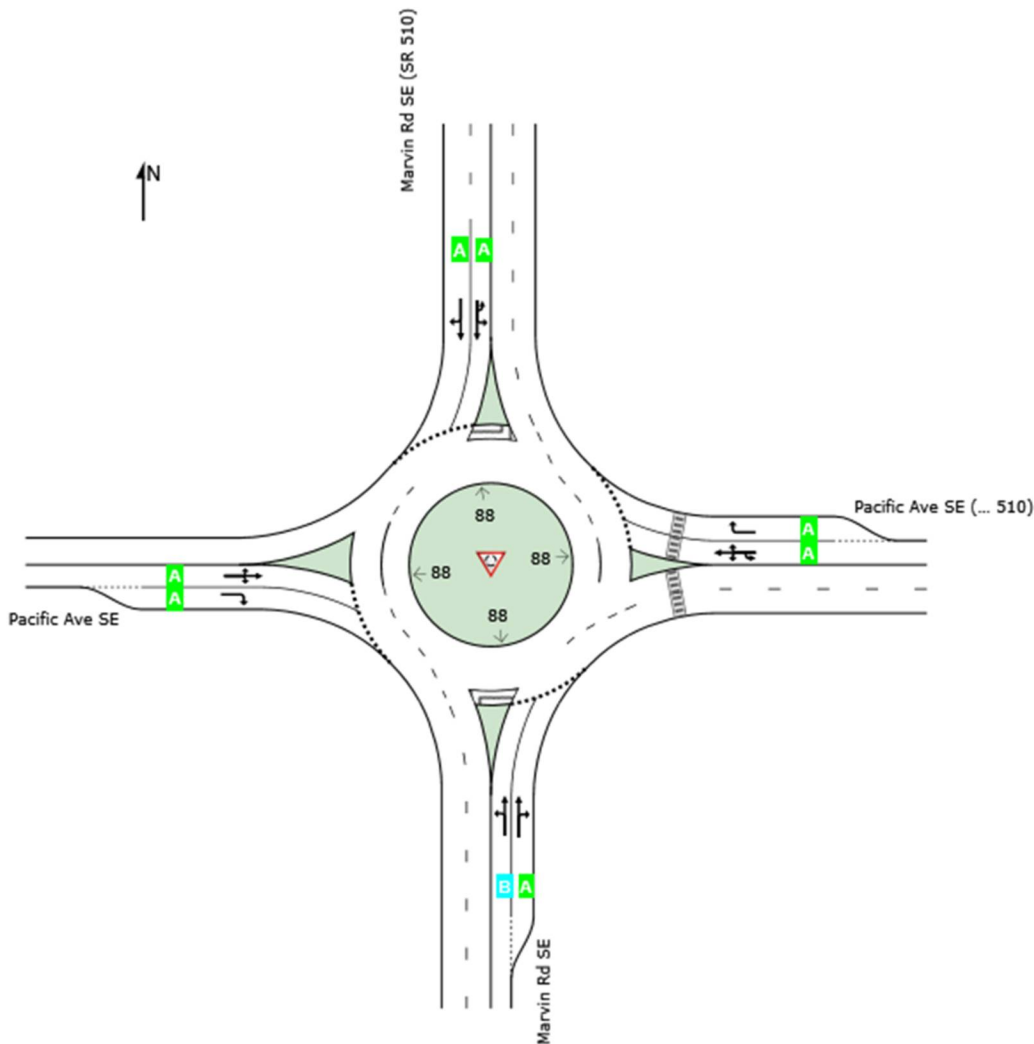
Lane Level of Service

 **Site: 2 [Marvin Rd SE / Pacific Ave SE (Site Folder: 2023 Existing - PM Peak Hour)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Aurora Oaks
Marvin Rd SE & Pacific Hwy SE
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	A	A	A



Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

MOVEMENT SUMMARY

 **Site: 2 [Marvin Rd SE / Pacific Ave SE (Site Folder: 2023 Existing - PM Peak Hour)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Aurora Oaks
Marvin Rd SE & Pacific Hwy SE
Site Category: (None)
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh ft		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Marvin Rd SE															
3	L2	All MCs	77	1.3	77	1.3	0.303	14.3	LOS B	2.1	52.4	0.83	0.73	0.83	29.2
8	T1	All MCs	374	1.3	374	1.3	0.303	8.1	LOS A	2.3	58.0	0.83	0.69	0.83	30.4
18	R2	All MCs	26	1.3	26	1.3	0.303	7.9	LOS A	2.3	58.0	0.83	0.67	0.83	30.5
Approach			477	1.3	477	1.3	0.303	9.1	LOS A	2.3	58.0	0.83	0.70	0.83	30.2
East: Pacific Ave SE (SR 510)															
1u	U	All MCs	1	1.1	1	1.1	0.270	14.8	LOS B	1.3	32.9	0.56	0.62	0.56	36.1
1	L2	All MCs	30	1.1	30	1.1	0.270	12.4	LOS B	1.3	32.9	0.56	0.62	0.56	36.1
6	T1	All MCs	220	1.1	220	1.1	0.270	6.8	LOS A	1.3	32.9	0.56	0.62	0.56	37.0
16	R2	All MCs	295	1.1	295	1.1	0.270	6.4	LOS A	1.3	34.0	0.54	0.64	0.54	37.3
Approach			546	1.1	546	1.1	0.270	6.9	LOS A	1.3	34.0	0.55	0.63	0.55	37.1
North: Marvin Rd SE (SR 510)															
7u	U	All MCs	1	1.0	1	1.0	0.439	12.8	LOS B	3.2	80.1	0.64	0.64	0.64	29.6
7	L2	All MCs	364	1.0	364	1.0	0.439	10.7	LOS B	3.2	80.1	0.64	0.64	0.64	29.6
4	T1	All MCs	597	1.0	597	1.0	0.439	4.9	LOS A	3.3	83.8	0.62	0.55	0.62	31.1
14	R2	All MCs	71	1.0	71	1.0	0.439	5.2	LOS A	3.3	83.8	0.61	0.52	0.61	31.1
Approach			1033	1.0	1033	1.0	0.439	7.0	LOS A	3.3	83.8	0.62	0.58	0.62	30.6
West: Pacific Ave SE															
5	L2	All MCs	37	1.9	37	1.9	0.456	14.4	LOS B	2.7	68.6	0.76	0.82	0.86	35.3
2	T1	All MCs	337	1.9	337	1.9	0.456	8.8	LOS A	2.7	68.6	0.76	0.82	0.86	36.1
12	R2	All MCs	164	1.9	164	1.9	0.283	9.2	LOS A	1.3	32.5	0.71	0.81	0.71	36.2
Approach			538	1.9	538	1.9	0.456	9.3	LOS A	2.7	68.6	0.75	0.82	0.81	36.1
All Vehicles			2594	1.3	2594	1.3	0.456	7.8	LOS A	3.3	83.8	0.67	0.66	0.68	32.7

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Lanes, Volumes, Timings 3: Marvin Rd SE & Union Mills Rd

05/08/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	30	85	51	362	601	76
Future Volume (vph)	30	85	51	362	601	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	275			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Link Speed (mph)	35			35	35	
Link Distance (ft)	498			557	345	
Travel Time (s)	9.7			10.9	6.7	
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
3: Marvin Rd SE & Union Mills Rd

05/08/2023

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	85	51	362	601	76
Future Vol, veh/h	30	85	51	362	601	76
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	275	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	32	90	54	385	639	81
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1173	681	720	0	-	0
Stage 1	680	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	212	450	882	-	-	-
Stage 1	503	-	-	-	-	-
Stage 2	614	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	199	450	882	-	-	-
Mov Cap-2 Maneuver	332	-	-	-	-	-
Stage 1	472	-	-	-	-	-
Stage 2	614	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.4	1.2		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	882	-	412	-	-	
HCM Lane V/C Ratio	0.062	-	0.297	-	-	
HCM Control Delay (s)	9.3	-	17.4	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0.2	-	1.2	-	-	

Lanes, Volumes, Timings
4: Marvin Rd SE & 19th Ave SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	0	3	6	0	66	4	335	10	101	569	15
Future Volume (vph)	13	0	3	6	0	66	4	335	10	101	569	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	225		0	200		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		25			25			35			40	
Link Distance (ft)		174			564			1931			557	
Travel Time (s)		4.7			15.4			37.6			9.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

HCM 6th TWSC
4: Marvin Rd SE & 19th Ave SE

05/08/2023

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	0	3	6	0	66	4	335	10	101	569	15
Future Vol, veh/h	13	0	3	6	0	66	4	335	10	101	569	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	225	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	2	2	2	1	1	1
Mvmt Flow	14	0	3	6	0	71	4	360	11	109	612	16
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1247	1217	620	1214	1220	366	628	0	0	371	0	0
Stage 1	838	838	-	374	374	-	-	-	-	-	-	-
Stage 2	409	379	-	840	846	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	152	182	492	160	182	684	954	-	-	1193	-	-
Stage 1	364	384	-	651	621	-	-	-	-	-	-	-
Stage 2	623	618	-	363	381	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	126	165	492	147	165	684	954	-	-	1193	-	-
Mov Cap-2 Maneuver	126	165	-	147	165	-	-	-	-	-	-	-
Stage 1	363	349	-	648	619	-	-	-	-	-	-	-
Stage 2	556	616	-	328	346	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	32.9		13.1			0.1			1.2			
HCM LOS	D		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	954	-	-	146	524	1193	-	-				
HCM Lane V/C Ratio	0.005	-	-	0.118	0.148	0.091	-	-				
HCM Control Delay (s)	8.8	-	-	32.9	13.1	8.3	-	-				
HCM Lane LOS	A	-	-	D	B	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0.4	0.5	0.3	-	-				

Lanes, Volumes, Timings
5: Marvin Rd SE & 25th Ave SE

05/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	44	14	26	295	482	71
Future Volume (vph)	44	14	26	295	482	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			-5%	0%	
Storage Length (ft)	0	0	200			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			35	35	
Link Distance (ft)	615			499	1931	
Travel Time (s)	16.8			9.7	37.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
5: Marvin Rd SE & 25th Ave SE

05/08/2023

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	44	14	26	295	482	71
Future Vol, veh/h	44	14	26	295	482	71
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	200	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	-5	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	46	15	27	311	507	75
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	910	545	582	0	-	0
Stage 1	545	-	-	-	-	-
Stage 2	365	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	305	538	992	-	-	-
Stage 1	581	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	297	538	992	-	-	-
Mov Cap-2 Maneuver	418	-	-	-	-	-
Stage 1	565	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.4	0.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	992	-	442	-	-	
HCM Lane V/C Ratio	0.028	-	0.138	-	-	
HCM Control Delay (s)	8.7	-	14.4	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-	

Lanes, Volumes, Timings
6: Walthew St SE & Marvin Rd SE

05/08/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↙	↗	↘	
Traffic Volume (vph)	451	46	6	289	31	6
Future Volume (vph)	451	46	6	289	31	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	592			577	479	
Travel Time (s)	11.5			11.2	9.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

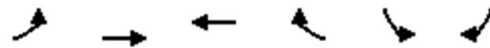
HCM 6th TWSC
6: Walthew St SE & Marvin Rd SE

05/08/2023

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	451	46	6	289	31	6
Future Vol, veh/h	451	46	6	289	31	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	4	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	485	49	6	311	33	6
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	534	0	833	510
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	323	-
Critical Hdwy	-	-	4.12	-	7.2	6.6
Critical Hdwy Stg 1	-	-	-	-	6.2	-
Critical Hdwy Stg 2	-	-	-	-	6.2	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1034	-	284	536
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	687	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1034	-	282	536
Mov Cap-2 Maneuver	-	-	-	-	401	-
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	683	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.2		14.5		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	418	-	-	1034	-	
HCM Lane V/C Ratio	0.095	-	-	0.006	-	
HCM Control Delay (s)	14.5	-	-	8.5	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

Lanes, Volumes, Timings
7: Marvin Rd SE & Woodgrove St SE

05/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	321	245	19	18	25
Future Volume (vph)	65	321	245	19	18	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Link Speed (mph)		35	35		25	
Link Distance (ft)		489	537		575	
Travel Time (s)		9.5	10.5		15.7	
Confl. Peds. (#/hr)	1			1	2	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	1%	1%	5%	5%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
7: Marvin Rd SE & Woodgrove St SE

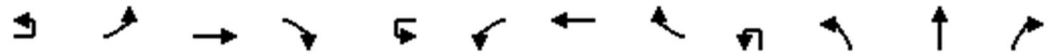
05/08/2023

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	65	321	245	19	18	25
Future Vol, veh/h	65	321	245	19	18	25
Conflicting Peds, #/hr	1	0	0	1	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	1	1	5	5
Mvmt Flow	80	396	302	23	22	31
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	326	0	-	0	873	315
Stage 1	-	-	-	-	315	-
Stage 2	-	-	-	-	558	-
Critical Hdwy	4.12	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.218	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1234	-	-	-	317	718
Stage 1	-	-	-	-	733	-
Stage 2	-	-	-	-	567	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1233	-	-	-	296	717
Mov Cap-2 Maneuver	-	-	-	-	416	-
Stage 1	-	-	-	-	685	-
Stage 2	-	-	-	-	566	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.4	0		12.2		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1233	-	-	-	550	
HCM Lane V/C Ratio	0.065	-	-	-	0.097	
HCM Control Delay (s)	8.1	-	-	-	12.2	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3	

Lanes, Volumes, Timings

8: Marvin Rd SE & Lake Forest Dr SE/Oakwood St SE

05/08/2023



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	1	22	0	16	4	10	0	26	1	29	204	11
Future Volume (vph)	1	22	0	16	4	10	0	26	1	29	204	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)			25				25				35	
Link Distance (ft)			569				602				355	
Travel Time (s)			15.5				16.4				6.9	
Confl. Peds. (#/hr)		9						9				
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	3%	3%	3%	5%	5%	5%	5%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Sign Control			Yield				Yield				Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout



Lane Group	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	34	278	25
Future Volume (vph)	34	278	25
Ideal Flow (vphpl)	1900	1900	1900
Link Speed (mph)		35	
Link Distance (ft)		443	
Travel Time (s)		8.6	
Confl. Peds. (#/hr)			
Peak Hour Factor	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%
Shared Lane Traffic (%)			
Sign Control		Yield	

Intersection Summary

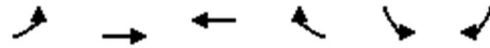
HCM 6th Roundabout
8: Marvin Rd SE & Lake Forest Dr SE/Oakwood St SE

05/08/2023

Intersection				
Intersection Delay, s/veh	4.9			
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	43	44	269	369
Demand Flow Rate, veh/h	45	46	271	369
Vehicles Circulating, veh/h	359	285	67	50
Vehicles Exiting, veh/h	60	53	337	281
Ped Vol Crossing Leg, #/h	0	0	0	9
Ped Cap Adj	1.000	1.000	1.000	0.999
Approach Delay, s/veh	4.4	4.1	4.6	5.2
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
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	4.976	4.976
Entry Flow, veh/h	45	46	271	369
Cap Entry Lane, veh/h	957	1032	1289	1311
Entry HV Adj Factor	0.955	0.952	0.992	1.000
Flow Entry, veh/h	43	44	269	369
Cap Entry, veh/h	914	983	1278	1310
V/C Ratio	0.047	0.045	0.210	0.282
Control Delay, s/veh	4.4	4.1	4.6	5.2
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	1

Lanes, Volumes, Timings
9: Mullen Rd SE & Marvin Rd SE

05/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	154	117	176	54	69	221
Future Volume (vph)	154	117	176	54	69	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35	35		40	
Link Distance (ft)		1330	487		456	
Travel Time (s)		25.9	9.5		7.8	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	1%	1%	4%	4%	2%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
9: Mullen Rd SE & Marvin Rd SE

05/08/2023

Intersection						
Int Delay, s/veh	7.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	154	117	176	54	69	221
Future Vol, veh/h	154	117	176	54	69	221
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	1	1	4	4	2	2
Mvmt Flow	173	131	198	61	78	248
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	259	0	-	0	706	229
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	477	-
Critical Hdwy	4.11	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.209	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1311	-	-	-	402	810
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	624	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1311	-	-	-	345	810
Mov Cap-2 Maneuver	-	-	-	-	345	-
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	624	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.6	0		17.3		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1311	-	-	-	613	
HCM Lane V/C Ratio	0.132	-	-	-	0.532	
HCM Control Delay (s)	8.2	0	-	-	17.3	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.5	-	-	-	3.1	

Lanes, Volumes, Timings
10: Kagy St SE & Mullen Rd SE

05/08/2023

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	231	75	63	311	47	36
Future Volume (vph)	231	75	63	311	47	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Link Speed (mph)	35			35	35	
Link Distance (ft)	405			1330	701	
Travel Time (s)	7.9			25.9	13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	4%	4%	6%	6%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

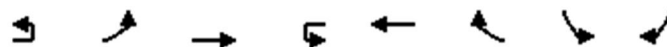
HCM 6th TWSC
10: Kagy St SE & Mullen Rd SE

05/08/2023

Intersection						
Int Delay, s/veh	2.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	231	75	63	311	47	36
Future Vol, veh/h	231	75	63	311	47	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	4	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	4	4	6	6
Mvmt Flow	243	79	66	327	49	38
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	322	0	742	283
Stage 1	-	-	-	-	283	-
Stage 2	-	-	-	-	459	-
Critical Hdwy	-	-	4.14	-	7.26	6.66
Critical Hdwy Stg 1	-	-	-	-	6.26	-
Critical Hdwy Stg 2	-	-	-	-	6.26	-
Follow-up Hdwy	-	-	2.236	-	3.554	3.354
Pot Cap-1 Maneuver	-	-	1227	-	320	723
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	567	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1227	-	299	723
Mov Cap-2 Maneuver	-	-	-	-	299	-
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	530	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	1.4		16.5		
HCM LOS				C		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	401	-	-	1227	-	
HCM Lane V/C Ratio	0.218	-	-	0.054	-	
HCM Control Delay (s)	16.5	-	-	8.1	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	0.8	-	-	0.2	-	

Lanes, Volumes, Timings
11: Mullen Rd SE & Carpenter Rd SE

05/08/2023



Lane Group	EBU	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations								
Traffic Volume (vph)	37	116	300	1	283	110	103	137
Future Volume (vph)	37	116	300	1	283	110	103	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)			35		35		35	
Link Distance (ft)			721		714		832	
Travel Time (s)			14.0		13.9		16.2	
Confl. Peds. (#/hr)								5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)		10%						
Sign Control			Yield		Yield		Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

HCM 6th Roundabout
11: Mullen Rd SE & Carpenter Rd SE

05/08/2023

Intersection			
Intersection Delay, s/veh	7.0		
Intersection LOS	A		
Approach	EB	WB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	503	437	266
Demand Flow Rate, veh/h	507	445	269
Vehicles Circulating, veh/h	116	171	362
Vehicles Exiting, veh/h	515	452	254
Ped Vol Crossing Leg, #/h	5	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	7.1	7.0	6.7
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	L	LTR	LR
Assumed Moves	L	LTR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	507	445	269
Cap Entry Lane, veh/h	1226	1159	954
Entry HV Adj Factor	0.991	0.981	0.989
Flow Entry, veh/h	502	437	266
Cap Entry, veh/h	1214	1137	943
V/C Ratio	0.414	0.384	0.282
Control Delay, s/veh	7.1	7.0	6.7
LOS	A	A	A
95th %tile Queue, veh	2	2	1

Lanes, Volumes, Timings
12: Ruddell Rd SE & Mullen Rd SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	187	63	236	160	93	47	440	259	135	701	42
Future Volume (vph)	65	187	63	236	160	93	47	440	259	135	701	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			-5%			0%			0%	
Storage Length (ft)	150		0	175		150	200		0	175		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		722			649			536			532	
Travel Time (s)		14.1			12.6			10.4			10.4	
Confl. Peds. (#/hr)	5		4	4		5	3		5	5		3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		6			2	3	7	4		3	8	
Permitted Phases	6			2		2	4			8		
Detector Phase	6	6		2	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	4.0	4.0	6.0		4.0	6.0	
Minimum Split (s)	33.0	33.0		29.0	29.0	10.0	10.0	34.0		10.0	26.0	
Total Split (s)	41.0	41.0		41.0	41.0	21.0	21.0	36.0		21.0	36.0	
Total Split (%)	41.8%	41.8%		41.8%	41.8%	21.4%	21.4%	36.7%		21.4%	36.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag						Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None	None	None	Min		None	Min	

Intersection Summary

Area Type: Other

Cycle Length: 98

Actuated Cycle Length: 76.3

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Ruddell Rd SE & Mullen Rd SE

 Ø2	 Ø3	 Ø4
41 s	21 s	36 s
 Ø6	 Ø7	 Ø8
41 s	21 s	36 s

HCM 6th Signalized Intersection Summary 12: Ruddell Rd SE & Mullen Rd SE

05/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	187	63	236	160	93	47	440	259	135	701	42
Future Volume (veh/h)	65	187	63	236	160	93	47	440	259	135	701	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	2003	2003	2003	2082	2082	2082	1856	1856	1856	1885	1885	1885
Adj Flow Rate, veh/h	72	208	70	262	178	103	52	489	288	150	779	47
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	3	3	3	1	1	1
Cap, veh/h	457	520	175	412	757	782	268	649	380	313	1200	72
Arrive On Green	0.36	0.36	0.36	0.36	0.36	0.36	0.04	0.30	0.30	0.08	0.35	0.35
Sat Flow, veh/h	1173	1432	482	1223	2082	1757	1767	2131	1250	1795	3430	207
Grp Volume(v), veh/h	72	0	278	262	178	103	52	404	373	150	407	419
Grp Sat Flow(s),veh/h/ln	1173	0	1914	1223	2082	1757	1767	1763	1618	1795	1791	1846
Q Serve(g_s), s	3.3	0.0	7.8	14.6	4.3	2.5	1.4	14.8	14.9	4.0	13.7	13.7
Cycle Q Clear(g_c), s	7.5	0.0	7.8	22.3	4.3	2.5	1.4	14.8	14.9	4.0	13.7	13.7
Prop In Lane	1.00		0.25	1.00		1.00	1.00		0.77	1.00		0.11
Lane Grp Cap(c), veh/h	457	0	696	412	757	782	268	537	493	313	626	646
V/C Ratio(X)	0.16	0.00	0.40	0.64	0.24	0.13	0.19	0.75	0.76	0.48	0.65	0.65
Avail Cap(c_a), veh/h	603	0	934	564	1015	1000	574	737	677	543	749	772
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	0.0	17.0	25.3	15.9	11.8	16.9	22.5	22.6	16.8	19.6	19.6
Incr Delay (d2), s/veh	0.2	0.0	0.4	1.6	0.2	0.1	0.1	3.2	3.6	0.4	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	3.2	4.1	1.9	0.9	0.5	6.1	5.7	1.5	5.4	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	0.0	17.4	26.9	16.1	11.8	17.0	25.7	26.2	17.2	21.1	21.1
LnGrp LOS	B	A	B	C	B	B	B	C	C	B	C	C
Approach Vol, veh/h	350			543			829			976		
Approach Delay, s/veh	17.6			20.5			25.4			20.5		
Approach LOS	B			C			C			C		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	32.1		11.8	27.8		32.1	8.6	31.1				
Change Period (Y+Rc), s	6.0		6.0	6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s	35.0		15.0	30.0		35.0	15.0	30.0				
Max Q Clear Time (g_c+I1), s	24.3		6.0	16.9		9.8	3.4	15.7				
Green Ext Time (p_c), s	1.7		0.1	4.6		1.9	0.0	4.4				
Intersection Summary												
HCM 6th Ctrl Delay	21.6											
HCM 6th LOS	C											

Lanes, Volumes, Timings
13: Rainier Rd SE/College St SE & Yelm Hwy SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	240	88	171	493	140	211	574	120	232	645	106
Future Volume (vph)	114	240	88	171	493	140	211	574	120	232	645	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	175		0	150		225	575		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		927			3948			437			874	
Travel Time (s)		18.1			76.9			8.5			17.0	
Confl. Peds. (#/hr)	2		1	1		2	7		4	4		7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	10.0	32.0		10.0	31.0		10.0	32.0		10.0	32.0	
Total Split (s)	25.0	37.0		21.0	33.0		17.0	32.0		20.0	35.0	
Total Split (%)	22.7%	33.6%		19.1%	30.0%		15.5%	29.1%		18.2%	31.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other

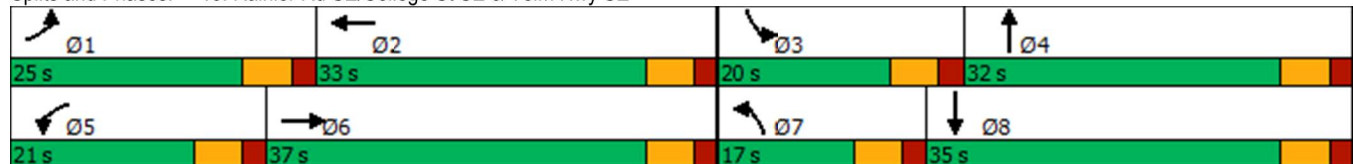
Cycle Length: 110

Actuated Cycle Length: 99.8

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Splits and Phases: 13: Rainier Rd SE/College St SE & Yelm Hwy SE



HCM 6th Signalized Intersection Summary 13: Rainier Rd SE/College St SE & Yelm Hwy SE

05/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	240	88	171	493	140	211	574	120	232	645	106
Future Volume (veh/h)	114	240	88	171	493	140	211	574	120	232	645	106
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	127	267	98	190	548	156	234	638	133	258	717	118
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	160	524	188	226	662	188	216	749	156	275	883	145
Arrive On Green	0.09	0.20	0.20	0.13	0.24	0.24	0.12	0.25	0.25	0.15	0.29	0.29
Sat Flow, veh/h	1781	2562	917	1795	2753	781	1795	2946	613	1795	3075	506
Grp Volume(v), veh/h	127	183	182	190	356	348	234	387	384	258	417	418
Grp Sat Flow(s),veh/h/ln	1781	1777	1702	1795	1791	1742	1795	1791	1769	1795	1791	1790
Q Serve(g_s), s	6.4	8.4	8.7	9.5	17.2	17.3	11.0	18.8	18.9	13.0	19.8	19.8
Cycle Q Clear(g_c), s	6.4	8.4	8.7	9.5	17.2	17.3	11.0	18.8	18.9	13.0	19.8	19.8
Prop In Lane	1.00		0.54	1.00		0.45	1.00		0.35	1.00		0.28
Lane Grp Cap(c), veh/h	160	364	348	226	431	419	216	455	450	275	514	514
V/C Ratio(X)	0.79	0.50	0.52	0.84	0.83	0.83	1.08	0.85	0.85	0.94	0.81	0.81
Avail Cap(c_a), veh/h	370	602	577	294	529	514	216	509	503	275	568	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.8	32.3	32.4	39.1	32.9	33.0	40.2	32.5	32.5	38.3	30.3	30.3
Incr Delay (d2), s/veh	6.5	1.1	1.2	14.3	8.7	9.3	85.3	12.0	12.3	37.9	8.1	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	3.6	3.6	5.0	8.2	8.1	9.8	9.3	9.3	8.4	9.3	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	33.3	33.6	53.4	41.6	42.2	125.6	44.4	44.8	76.3	38.4	38.5
LnGrp LOS	D	C	C	D	D	D	F	D	D	E	D	D
Approach Vol, veh/h	492			894			1005			1093		
Approach Delay, s/veh	37.0			44.4			63.5			47.3		
Approach LOS	D			D			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.2	28.0	20.0	29.3	17.5	24.7	17.0	32.3				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	19.0	27.0	14.0	26.0	15.0	31.0	11.0	29.0				
Max Q Clear Time (g_c+I1), s	8.4	19.3	15.0	20.9	11.5	10.7	13.0	21.8				
Green Ext Time (p_c), s	0.2	2.6	0.0	2.1	0.1	2.0	0.0	2.9				
Intersection Summary												
HCM 6th Ctrl Delay	49.8											
HCM 6th LOS	D											

Lanes, Volumes, Timings
14: Yelm Hwy SE & Ruddell Rd SE

05/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	389	499	408	223	337	409
Future Volume (vph)	389	499	408	223	337	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Right Turn on Red	Yes					Yes
Link Speed (mph)	35			35	35	
Link Distance (ft)	3948			576	576	
Travel Time (s)	76.9			11.2	11.2	
Confl. Peds. (#/hr)		7	2			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	21.0	21.0	12.0	12.0	28.0	28.0
Total Split (s)	35.0	35.0	31.0	60.0	29.0	29.0
Total Split (%)	36.8%	36.8%	32.6%	63.2%	30.5%	30.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min

Intersection Summary

Area Type: Other

Cycle Length: 95

Actuated Cycle Length: 90

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 14: Yelm Hwy SE & Ruddell Rd SE

 Ø2	 Ø4
60 s	35 s
 Ø5	 Ø6
31 s	29 s

HCM 6th Signalized Intersection Summary 14: Yelm Hwy SE & Ruddell Rd SE

05/08/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	389	499	408	223	337	409
Future Volume (veh/h)	389	499	408	223	337	409
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1885	1885	1870	1870
Adj Flow Rate, veh/h	432	0	453	248	374	454
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	1	1	2	2
Cap, veh/h	474		486	1128	486	410
Arrive On Green	0.27	0.00	0.27	0.60	0.26	0.26
Sat Flow, veh/h	1781	1585	1795	1885	1870	1579
Grp Volume(v), veh/h	432	0	453	248	374	454
Grp Sat Flow(s),veh/h/ln	1781	1585	1795	1885	1870	1579
Q Serve(g_s), s	20.8	0.0	21.8	5.4	16.4	23.0
Cycle Q Clear(g_c), s	20.8	0.0	21.8	5.4	16.4	23.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	474		486	1128	486	410
V/C Ratio(X)	0.91		0.93	0.22	0.77	1.11
Avail Cap(c_a), veh/h	583		507	1150	486	410
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.5	0.0	31.5	8.2	30.3	32.8
Incr Delay (d2), s/veh	16.3	0.0	23.6	0.1	7.4	76.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.7	0.0	12.2	2.0	8.1	17.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	47.8	0.0	55.1	8.3	37.7	109.4
LnGrp LOS	D		E	A	D	F
Approach Vol, veh/h	432			701	828	
Approach Delay, s/veh	47.8			38.5	77.0	
Approach LOS	D			D	E	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	59.0			29.6	30.0	29.0
Change Period (Y+Rc), s	6.0			6.0	6.0	6.0
Max Green Setting (Gmax), s	54.0			29.0	25.0	23.0
Max Q Clear Time (g_c+I1), s	7.4			22.8	23.8	25.0
Green Ext Time (p_c), s	1.5			0.8	0.2	0.0
Intersection Summary						
HCM 6th Ctrl Delay			56.8			
HCM 6th LOS			E			
Notes						

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

Lanes, Volumes, Timings
15: 58th Ave SE & Kagy St SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	8	0	0	22	10	0	0	0	12	1	53
Future Volume (vph)	42	8	0	0	22	10	0	0	0	12	1	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			35			25			35	
Link Distance (ft)		379			439			455			418	
Travel Time (s)		10.3			8.6			12.4			8.1	
Confl. Peds. (#/hr)			3	3					2	2		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	4%	4%	4%	7%	7%	7%	0%	0%	0%	3%	3%	3%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

HCM 6th TWSC
15: 58th Ave SE & Kagy St SE

05/08/2023

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	42	8	0	0	22	10	0	0	0	12	1	53
Future Vol, veh/h	42	8	0	0	22	10	0	0	0	12	1	53
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	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	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	4	4	4	7	7	7	0	0	0	3	3	3
Mvmt Flow	48	9	0	0	25	11	0	0	0	14	1	61
Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	36	0	0	12	0	0	170	144	14	138	139	31
Stage 1	-	-	-	-	-	-	108	108	-	31	31	-
Stage 2	-	-	-	-	-	-	62	36	-	107	108	-
Critical Hdwy	4.14	-	-	4.17	-	-	7.1	6.5	6.2	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Follow-up Hdwy	2.236	-	-	2.263	-	-	3.5	4	3.3	3.527	4.027	3.327
Pot Cap-1 Maneuver	1562	-	-	1575	-	-	798	751	1072	830	750	1040
Stage 1	-	-	-	-	-	-	902	810	-	983	867	-
Stage 2	-	-	-	-	-	-	954	869	-	896	804	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1562	-	-	1571	-	-	731	726	1068	809	725	1040
Mov Cap-2 Maneuver	-	-	-	-	-	-	731	726	-	809	725	-
Stage 1	-	-	-	-	-	-	872	783	-	953	867	-
Stage 2	-	-	-	-	-	-	897	869	-	867	777	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	6.2		0			0			9			
HCM LOS						A			A			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	1562	-	-	1571	-	-	983				
HCM Lane V/C Ratio	-	0.031	-	-	-	-	-	0.077				
HCM Control Delay (s)	0	7.4	0	-	0	-	-	9				
HCM Lane LOS	A	A	A	-	A	-	-	A				
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.2				

Lanes, Volumes, Timings
16: Meridian Rd SE & 58th Ave SE

05/08/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	9	9	21	178	279	16
Future Volume (vph)	9	9	21	178	279	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	35			40	40	
Link Distance (ft)	598			613	615	
Travel Time (s)	11.6			10.4	10.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	11%	11%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
16: Meridian Rd SE & 58th Ave SE

05/08/2023

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	9	21	178	279	16
Future Vol, veh/h	9	9	21	178	279	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	11	11	2	2	1	1
Mvmt Flow	10	10	23	198	310	18
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	563	319	328	0	-	0
Stage 1	319	-	-	-	-	-
Stage 2	244	-	-	-	-	-
Critical Hdwy	6.51	6.31	4.12	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	2.218	-	-	-
Pot Cap-1 Maneuver	473	701	1232	-	-	-
Stage 1	717	-	-	-	-	-
Stage 2	776	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	463	701	1232	-	-	-
Mov Cap-2 Maneuver	463	-	-	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	776	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.7	0.8		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1232	-	558	-	-	
HCM Lane V/C Ratio	0.019	-	0.036	-	-	
HCM Control Delay (s)	8	0	11.7	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

Lanes, Volumes, Timings
17: Spurgeon Creek Rd SE & Yelm Hwy SE

05/08/2023

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	368	118	165	447	78	89
Future Volume (vph)	368	118	165	447	78	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0	125
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	562			635	694	
Travel Time (s)	10.9			12.4	13.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						

HCM 6th TWSC
17: Spurgeon Creek Rd SE & Yelm Hwy SE

05/08/2023

Intersection						
Int Delay, s/veh	3.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	368	118	165	447	78	89
Future Vol, veh/h	368	118	165	447	78	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	125
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	3	3	1	1	0	0
Mvmt Flow	396	127	177	481	84	96
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	523	0	1295	460
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	835	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1049	-	181	605
Stage 1	-	-	-	-	640	-
Stage 2	-	-	-	-	429	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1049	-	150	605
Mov Cap-2 Maneuver	-	-	-	-	269	-
Stage 1	-	-	-	-	640	-
Stage 2	-	-	-	-	356	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.5		17.8	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	269	605	-	-	1049	-
HCM Lane V/C Ratio	0.312	0.158	-	-	0.169	-
HCM Control Delay (s)	24.3	12.1	-	-	9.1	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.3	0.6	-	-	0.6	-

Lanes, Volumes, Timings
18: Meridian Rd SE & Yelm Hwy SE

05/08/2023



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	5	151	206	42	4	366	110	30	18	4	1	26
Future Volume (vph)	5	151	206	42	4	366	110	30	18	4	1	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)			35			35			45			
Link Distance (ft)			757			688			698			
Travel Time (s)			14.7			13.4			10.6			
Confl. Peds. (#/hr)		2					2					
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)												
Sign Control			Yield			Yield			Yield			

Intersection Summary

Area Type: Other

Control Type: Roundabout



Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	27	273
Future Volume (vph)	27	273
Ideal Flow (vphpl)	1900	1900
Link Speed (mph)	40	
Link Distance (ft)	704	
Travel Time (s)	12.0	
Confl. Peds. (#/hr)		
Peak Hour Factor	0.98	0.98
Heavy Vehicles (%)	1%	1%
Shared Lane Traffic (%)		
Sign Control	Yield	

Intersection Summary

HCM 6th Roundabout
18: Meridian Rd SE & Yelm Hwy SE

05/08/2023

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	412	489	53	335
Demand Flow Rate, veh/h	416	498	54	338
Vehicles Circulating, veh/h	60	212	401	421
Vehicles Exiting, veh/h	699	243	75	289
Ped Vol Crossing Leg, #/h	0	0	0	2
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.7	8.2	4.6	8.4
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
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	4.976	4.976
Entry Flow, veh/h	416	498	54	338
Cap Entry Lane, veh/h	1298	1112	917	898
Entry HV Adj Factor	0.990	0.981	0.975	0.990
Flow Entry, veh/h	412	489	53	335
Cap Entry, veh/h	1285	1090	894	889
V/C Ratio	0.321	0.448	0.059	0.376
Control Delay, s/veh	5.7	8.2	4.6	8.4
LOS	A	A	A	A
95th %tile Queue, veh	1	2	0	2

2025 No Action LOS

Lanes, Volumes, Timings
1: Marvin Rd SE & Steilacoom Rd SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	263	21	229	242	234	27	756	71	433	1142	259
Future Volume (vph)	182	263	21	229	242	234	27	756	71	433	1142	259
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)	4%			0%			0%			0%		
Storage Length (ft)	350		0	225		0	275		0	225		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red	Yes			Yes			Yes			Yes		
Link Speed (mph)	35			35			35			35		
Link Distance (ft)	749			828			615			398		
Travel Time (s)	14.6			16.1			12.0			7.8		
Confl. Peds. (#/hr)	1		2	2		1	2					2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	8.0		6.0	8.0		6.0	10.0		6.0	10.0	
Minimum Split (s)	10.6	39.6		10.6	40.6		10.6	30.9		10.6	36.9	
Total Split (s)	29.6	33.6		19.6	33.6		19.6	45.9		45.6	45.9	
Total Split (%)	19.1%	21.7%		12.7%	21.7%		12.7%	29.7%		29.5%	29.7%	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.9		3.6	3.9	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.6	4.6		4.6	4.6		4.6	4.9		4.6	4.9	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	

Intersection Summary

Area Type: Other

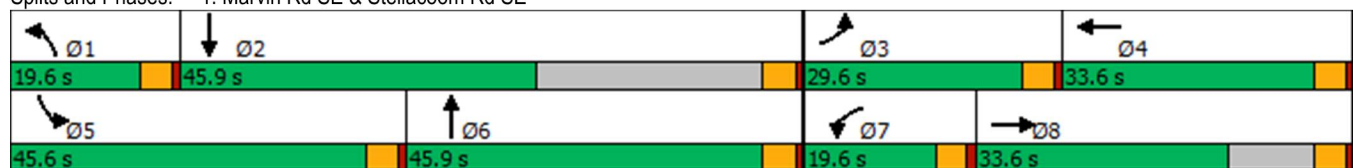
Cycle Length: 154.7

Actuated Cycle Length: 153.4

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Marvin Rd SE & Steilacoom Rd SE



HCM 6th Signalized Intersection Summary

1: Marvin Rd SE & Steilacoom Rd SE

05/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	182	263	21	229	242	234	27	756	71	433	1142	259
Future Volume (veh/h)	182	263	21	229	242	234	27	756	71	433	1142	259
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1650	1650	1650	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	202	292	23	254	269	260	30	840	79	481	1269	288
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	221	353	28	166	157	152	47	827	78	449	1378	308
Arrive On Green	0.14	0.23	0.23	0.10	0.19	0.19	0.03	0.27	0.27	0.27	0.51	0.51
Sat Flow, veh/h	1571	1509	119	1667	816	789	1654	3047	287	1654	2677	599
Grp Volume(v), veh/h	202	0	315	254	0	529	30	455	464	481	775	782
Grp Sat Flow(s),veh/h/ln	1571	0	1628	1667	0	1605	1654	1650	1684	1654	1650	1627
Q Serve(g_s), s	19.1	0.0	27.8	15.0	0.0	29.0	2.7	41.0	41.0	41.0	64.9	67.8
Cycle Q Clear(g_c), s	19.1	0.0	27.8	15.0	0.0	29.0	2.7	41.0	41.0	41.0	64.9	67.8
Prop In Lane	1.00		0.07	1.00		0.49	1.00		0.17	1.00		0.37
Lane Grp Cap(c), veh/h	221	0	380	166	0	308	47	448	457	449	849	837
V/C Ratio(X)	0.91	0.00	0.83	1.53	0.00	1.72	0.64	1.02	1.02	1.07	0.91	0.93
Avail Cap(c_a), veh/h	260	0	380	166	0	308	164	448	457	449	849	837
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.9	0.0	55.0	68.0	0.0	61.0	72.6	55.0	55.0	55.0	33.5	34.2
Incr Delay (d2), s/veh	30.0	0.0	14.0	268.2	0.0	335.6	10.2	46.4	46.0	62.8	14.0	17.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	0.0	12.8	18.7	0.0	40.5	1.3	22.6	23.1	24.7	28.5	30.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.9	0.0	68.9	336.2	0.0	396.5	82.7	101.4	101.0	117.8	47.6	51.4
LnGrp LOS	F	A	E	F	A	F	F	F	F	F	D	D
Approach Vol, veh/h		517			783			949			2038	
Approach Delay, s/veh		78.7			377.0			100.6			65.6	
Approach LOS		E			F			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	82.6	25.9	33.6	45.6	45.9	19.6	39.9				
Change Period (Y+Rc), s	4.6	4.9	4.6	4.6	4.6	4.9	4.6	4.6				
Max Green Setting (Gmax), s	15.0	41.0	25.0	29.0	41.0	41.0	15.0	29.0				
Max Q Clear Time (g_c+I1), s	4.7	69.8	21.1	31.0	43.0	43.0	17.0	29.8				
Green Ext Time (p_c), s	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			131.8									
HCM 6th LOS			F									
Notes												
User approved pedestrian interval to be less than phase max green.												

LANE LEVEL OF SERVICE

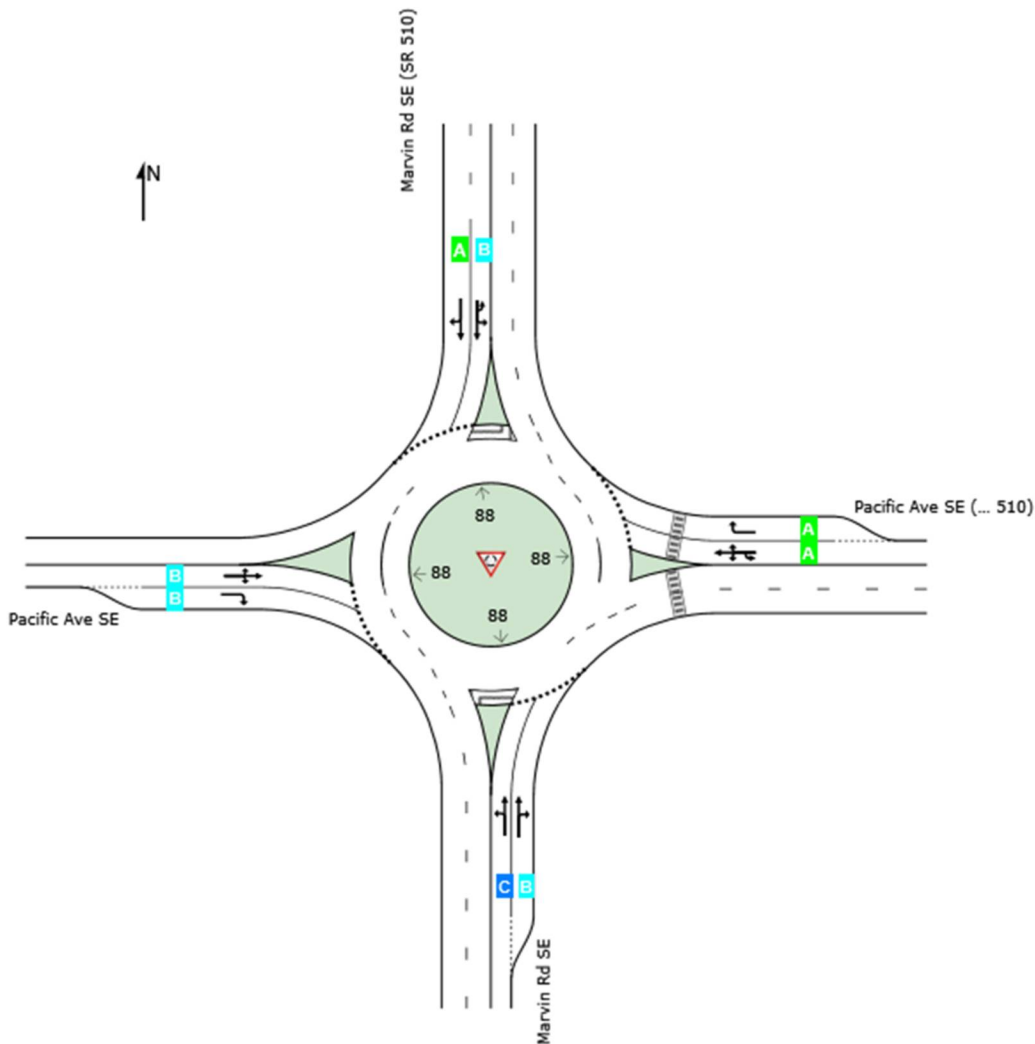
Lane Level of Service

 **Site: 2 [Marvin Rd SE / Pacific Ave SE (Site Folder: 2025 No Action - PM Peak Hour)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Aurora Oaks
Marvin Rd SE & Pacific Hwy SE
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	B	B	B



Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

MOVEMENT SUMMARY

 **Site: 2 [Marvin Rd SE / Pacific Ave SE (Site Folder: 2025 No Action - PM Peak Hour)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Aurora Oaks
Marvin Rd SE & Pacific Hwy SE
Site Category: (None)
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] ft		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Marvin Rd SE															
3	L2	All MCs	142	1.3	142	1.3	0.553	22.8	LOS C	5.2	132.0	0.99	0.96	1.31	26.2
8	T1	All MCs	504	1.3	504	1.3	0.553	15.2	LOS B	5.9	150.2	1.00	0.93	1.28	27.8
18	R2	All MCs	31	1.3	31	1.3	0.553	14.6	LOS B	5.9	150.2	1.00	0.92	1.27	28.2
Approach			677	1.3	677	1.3	0.553	16.8	LOS B	5.9	150.2	1.00	0.94	1.29	27.5
East: Pacific Ave SE (SR 510)															
1u	U	All MCs	1	1.1	1	1.1	0.389	15.8	LOS B	2.1	52.9	0.69	0.71	0.72	35.7
1	L2	All MCs	37	1.1	37	1.1	0.389	13.3	LOS B	2.1	52.9	0.69	0.71	0.72	35.7
6	T1	All MCs	260	1.1	260	1.1	0.389	7.7	LOS A	2.1	52.9	0.69	0.71	0.72	36.5
16	R2	All MCs	374	1.1	374	1.1	0.389	7.0	LOS A	2.2	55.0	0.69	0.73	0.69	36.9
Approach			672	1.1	672	1.1	0.389	7.6	LOS A	2.2	55.0	0.69	0.72	0.70	36.7
North: Marvin Rd SE (SR 510)															
7u	U	All MCs	1	1.0	1	1.0	0.660	16.4	LOS B	7.2	182.6	0.85	0.81	1.03	28.5
7	L2	All MCs	491	1.0	491	1.0	0.660	14.2	LOS B	7.2	182.6	0.85	0.81	1.03	28.5
4	T1	All MCs	837	1.0	837	1.0	0.660	7.8	LOS A	7.5	188.9	0.84	0.74	0.98	30.4
14	R2	All MCs	80	1.0	80	1.0	0.660	7.9	LOS A	7.5	188.9	0.83	0.73	0.97	30.5
Approach			1409	1.0	1409	1.0	0.660	10.1	LOS B	7.5	188.9	0.84	0.77	1.00	29.7
West: Pacific Ave SE															
5	L2	All MCs	43	1.9	43	1.9	0.734	19.6	LOS B	5.9	150.8	0.94	1.04	1.35	33.1
2	T1	All MCs	405	1.9	405	1.9	0.734	14.0	LOS B	5.9	150.8	0.94	1.04	1.35	33.8
12	R2	All MCs	278	1.9	278	1.9	0.631	14.4	LOS B	4.0	100.9	0.89	1.01	1.19	33.3
Approach			726	1.9	726	1.9	0.734	14.5	LOS B	5.9	150.8	0.92	1.03	1.29	33.6
All Vehicles			3484	1.3	3484	1.3	0.734	11.8	LOS B	7.5	188.9	0.86	0.84	1.06	31.1

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Lanes, Volumes, Timings
3: Marvin Rd SE & Union Mills Rd

05/08/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	33	100	62	540	912	83
Future Volume (vph)	33	100	62	540	912	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	275			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Link Speed (mph)	35			35	35	
Link Distance (ft)	498			557	345	
Travel Time (s)	9.7			10.9	6.7	
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
3: Marvin Rd SE & Union Mills Rd

05/08/2023

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	33	100	62	540	912	83
Future Vol, veh/h	33	100	62	540	912	83
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	275	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	35	106	66	574	970	88
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1720	1015	1058	0	-	0
Stage 1	1014	-	-	-	-	-
Stage 2	706	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	98	289	658	-	-	-
Stage 1	350	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	88	289	658	-	-	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	315	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	33.1	1.1		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	658	-	265	-	-	
HCM Lane V/C Ratio	0.1	-	0.534	-	-	
HCM Control Delay (s)	11.1	-	33.1	-	-	
HCM Lane LOS	B	-	D	-	-	
HCM 95th %tile Q(veh)	0.3	-	2.9	-	-	

Lanes, Volumes, Timings
4: Marvin Rd SE & 19th Ave SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	0	3	7	0	131	4	455	13	212	777	16
Future Volume (vph)	14	0	3	7	0	131	4	455	13	212	777	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	225		0	200		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		25			25			35			40	
Link Distance (ft)		174			564			1931			557	
Travel Time (s)		4.7			15.4			37.6			9.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

HCM 6th TWSC
4: Marvin Rd SE & 19th Ave SE

05/08/2023

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	0	3	7	0	131	4	455	13	212	777	16
Future Vol, veh/h	14	0	3	7	0	131	4	455	13	212	777	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	225	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	2	2	2	1	1	1
Mvmt Flow	15	0	3	8	0	141	4	489	14	228	835	17
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	1875	1811	844	1805	1812	496	852	0	0	503	0	0
Stage 1	1300	1300	-	504	504	-	-	-	-	-	-	-
Stage 2	575	511	-	1301	1308	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	55	79	366	62	79	578	787	-	-	1067	-	-
Stage 1	200	233	-	554	544	-	-	-	-	-	-	-
Stage 2	507	540	-	200	231	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	35	62	366	51	62	578	787	-	-	1067	-	-
Mov Cap-2 Maneuver	35	62	-	51	62	-	-	-	-	-	-	-
Stage 1	199	183	-	551	541	-	-	-	-	-	-	-
Stage 2	381	537	-	156	182	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	145.1		20.5			0.1			2			
HCM LOS	F		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	787	-	-	42	379	1067	-	-				
HCM Lane V/C Ratio	0.005	-	-	0.435	0.392	0.214	-	-				
HCM Control Delay (s)	9.6	-	-	145.1	20.5	9.3	-	-				
HCM Lane LOS	A	-	-	F	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.5	1.8	0.8	-	-				

Lanes, Volumes, Timings
5: Marvin Rd SE & 25th Ave SE

05/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	48	15	28	414	684	77
Future Volume (vph)	48	15	28	414	684	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			-5%	0%	
Storage Length (ft)	0	0	200			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			35	35	
Link Distance (ft)	615			499	1931	
Travel Time (s)	16.8			9.7	37.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
5: Marvin Rd SE & 25th Ave SE

05/08/2023

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	48	15	28	414	684	77
Future Vol, veh/h	48	15	28	414	684	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	200	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	-5	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	51	16	29	436	720	81
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1255	761	801	0	-	0
Stage 1	761	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	189	405	822	-	-	-
Stage 1	461	-	-	-	-	-
Stage 2	613	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	182	405	822	-	-	-
Mov Cap-2 Maneuver	315	-	-	-	-	-
Stage 1	445	-	-	-	-	-
Stage 2	613	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	18.5	0.6		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	822	-	333	-	-	
HCM Lane V/C Ratio	0.036	-	0.199	-	-	
HCM Control Delay (s)	9.5	-	18.5	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-	

Lanes, Volumes, Timings
6: Walthew St SE & Marvin Rd SE

05/08/2023

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	651	50	6	408	34	6
Future Volume (vph)	651	50	6	408	34	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	592			577	479	
Travel Time (s)	11.5			11.2	9.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

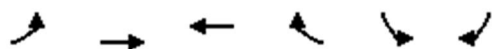
HCM 6th TWSC
6: Walthew St SE & Marvin Rd SE

05/08/2023

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↷		↶	↷	↶↷	
Traffic Vol, veh/h	651	50	6	408	34	6
Future Vol, veh/h	651	50	6	408	34	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	4	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	700	54	6	439	37	6
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	754	0	1178	727
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	451	-
Critical Hdwy	-	-	4.12	-	7.2	6.6
Critical Hdwy Stg 1	-	-	-	-	6.2	-
Critical Hdwy Stg 2	-	-	-	-	6.2	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	856	-	164	394
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	584	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	856	-	163	394
Mov Cap-2 Maneuver	-	-	-	-	290	-
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	580	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.1		18.9		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	302	-	-	856	-	
HCM Lane V/C Ratio	0.142	-	-	0.008	-	
HCM Control Delay (s)	18.9	-	-	9.2	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	0.5	-	-	0	-	

Lanes, Volumes, Timings
7: Marvin Rd SE & Woodgrove St SE

05/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	70	510	360	21	19	27
Future Volume (vph)	70	510	360	21	19	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Link Speed (mph)		35	35		25	
Link Distance (ft)		489	537		575	
Travel Time (s)		9.5	10.5		15.7	
Confl. Peds. (#/hr)	1			1	2	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	1%	1%	5%	5%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
7: Marvin Rd SE & Woodgrove St SE

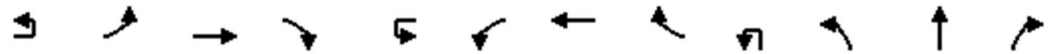
05/08/2023

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	70	510	360	21	19	27
Future Vol, veh/h	70	510	360	21	19	27
Conflicting Peds, #/hr	1	0	0	1	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	1	1	5	5
Mvmt Flow	86	630	444	26	23	33
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	471	0	-	0	1262	458
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	804	-
Critical Hdwy	4.12	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.218	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1091	-	-	-	185	597
Stage 1	-	-	-	-	631	-
Stage 2	-	-	-	-	435	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1090	-	-	-	170	597
Mov Cap-2 Maneuver	-	-	-	-	302	-
Stage 1	-	-	-	-	581	-
Stage 2	-	-	-	-	435	-
Approach	EB	WB		SB		
HCM Control Delay, s	1	0		14.8		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1090	-	-	-	425	
HCM Lane V/C Ratio	0.079	-	-	-	0.134	
HCM Control Delay (s)	8.6	-	-	-	14.8	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0.3	-	-	-	0.5	

Lanes, Volumes, Timings

8: Marvin Rd SE & Lake Forest Dr SE/Oakwood St SE

05/08/2023



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Volume (vph)	1	24	6	17	4	42	4	64	1	31	260	65
Future Volume (vph)	1	24	6	17	4	42	4	64	1	31	260	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)			25				25				35	
Link Distance (ft)			569				602				355	
Travel Time (s)			15.5				16.4				6.9	
Confl. Peds. (#/hr)		9						9				
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	3%	3%	3%	5%	5%	5%	5%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Sign Control			Yield				Yield				Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout



Lane Group	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	98	358	27
Future Volume (vph)	98	358	27
Ideal Flow (vphpl)	1900	1900	1900
Link Speed (mph)		35	
Link Distance (ft)		443	
Travel Time (s)		8.6	
Confl. Peds. (#/hr)			
Peak Hour Factor	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%
Shared Lane Traffic (%)			
Sign Control		Yield	

Intersection Summary

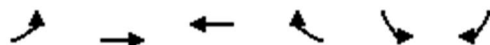
HCM 6th Roundabout
8: Marvin Rd SE & Lake Forest Dr SE/Oakwood St SE

05/08/2023

Intersection				
Intersection Delay, s/veh	6.5			
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	53	124	392	531
Demand Flow Rate, veh/h	55	130	396	531
Vehicles Circulating, veh/h	554	352	147	92
Vehicles Exiting, veh/h	69	191	462	389
Ped Vol Crossing Leg, #/h	0	0	0	9
Ped Cap Adj	1.000	1.000	1.000	0.999
Approach Delay, s/veh	5.5	5.2	6.3	7.1
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
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	4.976	4.976
Entry Flow, veh/h	55	130	396	531
Cap Entry Lane, veh/h	784	964	1188	1256
Entry HV Adj Factor	0.959	0.951	0.990	1.000
Flow Entry, veh/h	53	124	392	531
Cap Entry, veh/h	752	916	1176	1255
V/C Ratio	0.070	0.135	0.333	0.423
Control Delay, s/veh	5.5	5.2	6.3	7.1
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	2

Lanes, Volumes, Timings
9: Mullen Rd SE & Marvin Rd SE

05/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	226	208	266	97	116	296
Future Volume (vph)	226	208	266	97	116	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		35	35		40	
Link Distance (ft)		1330	487		456	
Travel Time (s)		25.9	9.5		7.8	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	1%	1%	4%	4%	2%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
9: Mullen Rd SE & Marvin Rd SE

05/08/2023

Intersection						
Int Delay, s/veh	53.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	226	208	266	97	116	296
Future Vol, veh/h	226	208	266	97	116	296
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	1	1	4	4	2	2
Mvmt Flow	254	234	299	109	130	333
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	408	0	-	0	1096	354
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	742	-
Critical Hdwy	4.11	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.209	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1156	-	-	-	236	690
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	471	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1156	-	-	-	176	690
Mov Cap-2 Maneuver	-	-	-	-	176	-
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	471	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.7	0		152.1		
HCM LOS				F		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1156	-	-	-	379	
HCM Lane V/C Ratio	0.22	-	-	-	1.221	
HCM Control Delay (s)	9	0	-	-	152.1	
HCM Lane LOS	A	A	-	-	F	
HCM 95th %tile Q(veh)	0.8	-	-	-	19.4	

Lanes, Volumes, Timings
10: Kagy St SE & Mullen Rd SE

05/08/2023

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	346	133	144	394	74	83
Future Volume (vph)	346	133	144	394	74	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Link Speed (mph)	35			35	35	
Link Distance (ft)	405			1330	701	
Travel Time (s)	7.9			25.9	13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	4%	4%	6%	6%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

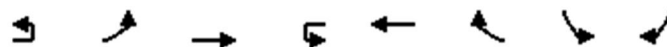
HCM 6th TWSC
10: Kagy St SE & Mullen Rd SE

05/08/2023

Intersection						
Int Delay, s/veh	8.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	346	133	144	394	74	83
Future Vol, veh/h	346	133	144	394	74	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	4	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	4	4	6	6
Mvmt Flow	364	140	152	415	78	87
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	504	0	1153	434
Stage 1	-	-	-	-	434	-
Stage 2	-	-	-	-	719	-
Critical Hdwy	-	-	4.14	-	7.26	6.66
Critical Hdwy Stg 1	-	-	-	-	6.26	-
Critical Hdwy Stg 2	-	-	-	-	6.26	-
Follow-up Hdwy	-	-	2.236	-	3.554	3.354
Pot Cap-1 Maneuver	-	-	1050	-	166	585
Stage 1	-	-	-	-	586	-
Stage 2	-	-	-	-	405	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1050	-	135	585
Mov Cap-2 Maneuver	-	-	-	-	135	-
Stage 1	-	-	-	-	586	-
Stage 2	-	-	-	-	329	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	2.4		53.7		
HCM LOS	F					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	228	-	-	1050	-	
HCM Lane V/C Ratio	0.725	-	-	0.144	-	
HCM Control Delay (s)	53.7	-	-	9	0	
HCM Lane LOS	F	-	-	A	A	
HCM 95th %tile Q(veh)	4.9	-	-	0.5	-	

Lanes, Volumes, Timings
11: Mullen Rd SE & Carpenter Rd SE

05/08/2023



Lane Group	EBU	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations								
Traffic Volume (vph)	40	127	361	1	326	127	125	149
Future Volume (vph)	40	127	361	1	326	127	125	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)			35		35		35	
Link Distance (ft)			721		714		832	
Travel Time (s)			14.0		13.9		16.2	
Confl. Peds. (#/hr)								5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)		10%						
Sign Control			Yield		Yield		Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout

HCM 6th Roundabout
11: Mullen Rd SE & Carpenter Rd SE

05/08/2023

Intersection			
Intersection Delay, s/veh	8.2		
Intersection LOS	A		
Approach	EB	WB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	586	504	305
Demand Flow Rate, veh/h	591	514	308
Vehicles Circulating, veh/h	141	186	414
Vehicles Exiting, veh/h	581	546	286
Ped Vol Crossing Leg, #/h	5	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	8.5	8.1	7.8
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	L	LTR	LR
Assumed Moves	L	LTR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	591	514	308
Cap Entry Lane, veh/h	1195	1141	905
Entry HV Adj Factor	0.991	0.980	0.990
Flow Entry, veh/h	586	504	305
Cap Entry, veh/h	1183	1119	896
V/C Ratio	0.495	0.450	0.340
Control Delay, s/veh	8.5	8.1	7.8
LOS	A	A	A
95th %tile Queue, veh	3	2	2

Lanes, Volumes, Timings
12: Ruddell Rd SE & Mullen Rd SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	231	68	274	194	121	51	489	307	209	769	46
Future Volume (vph)	72	231	68	274	194	121	51	489	307	209	769	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			-5%			0%			0%	
Storage Length (ft)	150		0	175		150	200		0	175		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		722			649			536			532	
Travel Time (s)		14.1			12.6			10.4			10.4	
Confl. Peds. (#/hr)	5		4	4		5	3		5	5		3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		6			2	3	7	4		3	8	
Permitted Phases	6			2		2	4			8		
Detector Phase	6	6		2	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	4.0	4.0	6.0		4.0	6.0	
Minimum Split (s)	33.0	33.0		29.0	29.0	10.0	10.0	34.0		10.0	26.0	
Total Split (s)	41.0	41.0		41.0	41.0	21.0	21.0	36.0		21.0	36.0	
Total Split (%)	41.8%	41.8%		41.8%	41.8%	21.4%	21.4%	36.7%		21.4%	36.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag						Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None	None	None	Min		None	Min	

Intersection Summary

Area Type: Other

Cycle Length: 98

Actuated Cycle Length: 91.5

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Ruddell Rd SE & Mullen Rd SE

 Ø2	 Ø3	 Ø4
41 s	21 s	36 s
 Ø6	 Ø7	 Ø8
41 s	21 s	36 s

HCM 6th Signalized Intersection Summary 12: Ruddell Rd SE & Mullen Rd SE

05/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	231	68	274	194	121	51	489	307	209	769	46
Future Volume (veh/h)	72	231	68	274	194	121	51	489	307	209	769	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	2003	2003	2003	2082	2082	2082	1856	1856	1856	1885	1885	1885
Adj Flow Rate, veh/h	80	257	76	304	216	134	57	543	341	232	854	51
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	3	3	3	1	1	1
Cap, veh/h	431	577	171	384	810	874	244	628	394	309	1294	77
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.03	0.30	0.30	0.11	0.38	0.38
Sat Flow, veh/h	1102	1483	439	1164	2082	1757	1767	2072	1300	1795	3433	205
Grp Volume(v), veh/h	80	0	333	304	216	134	57	462	422	232	446	459
Grp Sat Flow(s),veh/h/ln	1102	0	1922	1164	2082	1757	1767	1763	1609	1795	1791	1847
Q Serve(g_s), s	4.8	0.0	11.5	23.5	6.4	3.7	2.0	22.3	22.3	7.6	18.6	18.6
Cycle Q Clear(g_c), s	11.2	0.0	11.5	35.0	6.4	3.7	2.0	22.3	22.3	7.6	18.6	18.6
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.81	1.00		0.11
Lane Grp Cap(c), veh/h	431	0	748	384	810	874	244	534	488	309	675	696
V/C Ratio(X)	0.19	0.00	0.45	0.79	0.27	0.15	0.23	0.86	0.87	0.75	0.66	0.66
Avail Cap(c_a), veh/h	431	0	748	384	810	874	479	588	536	414	675	696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.6	0.0	20.3	33.3	18.7	12.3	21.3	29.6	29.6	21.0	23.2	23.2
Incr Delay (d2), s/veh	0.2	0.0	0.4	10.8	0.2	0.1	0.2	12.2	13.2	3.3	2.4	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	5.0	7.5	3.0	1.4	0.8	10.7	10.0	3.2	7.8	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	0.0	20.7	44.1	18.9	12.4	21.5	41.8	42.9	24.3	25.6	25.5
LnGrp LOS	C	A	C	D	B	B	C	D	D	C	C	C
Approach Vol, veh/h	413			654			941			1137		
Approach Delay, s/veh	21.1			29.3			41.0			25.3		
Approach LOS	C			C			D			C		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	41.0			15.7			33.3			41.0		
Change Period (Y+Rc), s	6.0			6.0			6.0			6.0		
Max Green Setting (Gmax), s	35.0			15.0			30.0			35.0		
Max Q Clear Time (g_c+I1), s	37.0			9.6			24.3			13.5		
Green Ext Time (p_c), s	0.0			0.2			2.9			2.3		
Intersection Summary												
HCM 6th Ctrl Delay	30.3											
HCM 6th LOS	C											

Lanes, Volumes, Timings
13: Rainier Rd SE/College St SE & Yelm Hwy SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	307	132	186	564	151	259	624	132	251	703	115
Future Volume (vph)	123	307	132	186	564	151	259	624	132	251	703	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	175		0	150		225	575		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		927			3948			437			874	
Travel Time (s)		18.1			76.9			8.5			17.0	
Confl. Peds. (#/hr)	2		1	1		2	7		4	4		7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	10.0	32.0		10.0	31.0		10.0	32.0		10.0	32.0	
Total Split (s)	25.0	37.0		21.0	33.0		17.0	32.0		20.0	35.0	
Total Split (%)	22.7%	33.6%		19.1%	30.0%		15.5%	29.1%		18.2%	31.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other

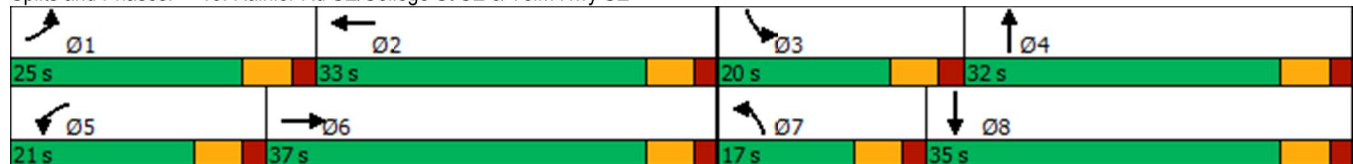
Cycle Length: 110

Actuated Cycle Length: 103.1

Natural Cycle: 105

Control Type: Actuated-Uncoordinated

Splits and Phases: 13: Rainier Rd SE/College St SE & Yelm Hwy SE



HCM 6th Signalized Intersection Summary 13: Rainier Rd SE/College St SE & Yelm Hwy SE

05/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	307	132	186	564	151	259	624	132	251	703	115
Future Volume (veh/h)	123	307	132	186	564	151	259	624	132	251	703	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	137	341	147	207	627	168	288	693	147	279	781	128
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	170	526	222	240	712	190	203	762	161	258	893	146
Arrive On Green	0.10	0.22	0.22	0.13	0.25	0.25	0.11	0.26	0.26	0.14	0.29	0.29
Sat Flow, veh/h	1781	2430	1028	1795	2792	747	1795	2936	622	1795	3077	504
Grp Volume(v), veh/h	137	248	240	207	402	393	288	423	417	279	455	454
Grp Sat Flow(s),veh/h/ln	1781	1777	1682	1795	1791	1749	1795	1791	1767	1795	1791	1790
Q Serve(g_s), s	7.3	12.4	12.7	11.0	21.0	21.0	11.0	22.3	22.3	14.0	23.5	23.5
Cycle Q Clear(g_c), s	7.3	12.4	12.7	11.0	21.0	21.0	11.0	22.3	22.3	14.0	23.5	23.5
Prop In Lane	1.00		0.61	1.00		0.43	1.00		0.35	1.00		0.28
Lane Grp Cap(c), veh/h	170	384	364	240	457	446	203	465	459	258	520	520
V/C Ratio(X)	0.81	0.64	0.66	0.86	0.88	0.88	1.42	0.91	0.91	1.08	0.87	0.87
Avail Cap(c_a), veh/h	348	566	536	277	497	485	203	478	472	258	534	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	34.7	34.9	41.3	34.8	34.9	43.2	34.9	34.9	41.7	32.9	32.9
Incr Delay (d2), s/veh	6.7	1.8	2.1	20.3	15.7	16.2	215.1	21.0	21.4	79.1	14.7	14.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	5.4	5.3	6.1	10.8	10.7	16.9	12.1	12.0	11.7	11.9	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.8	36.5	36.9	61.6	50.5	51.1	258.3	55.9	56.3	120.7	47.5	47.6
LnGrp LOS	D	D	D	E	D	D	F	E	E	F	D	D
Approach Vol, veh/h	625			1002			1128			1188		
Approach Delay, s/veh	39.6			53.0			107.7			64.7		
Approach LOS	D			D			F			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.3	30.8	20.0	31.3	19.0	27.1	17.0	34.3				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	19.0	27.0	14.0	26.0	15.0	31.0	11.0	29.0				
Max Q Clear Time (g_c+I1), s	9.3	23.0	16.0	24.3	13.0	14.7	13.0	25.5				
Green Ext Time (p_c), s	0.2	1.8	0.0	0.9	0.1	2.6	0.0	1.8				
Intersection Summary												
HCM 6th Ctrl Delay	70.1											
HCM 6th LOS	E											

Lanes, Volumes, Timings
14: Yelm Hwy SE & Ruddell Rd SE

05/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	433	583	464	245	371	454
Future Volume (vph)	433	583	464	245	371	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Right Turn on Red	Yes					Yes
Link Speed (mph)	35			35	35	
Link Distance (ft)	3948			576	576	
Travel Time (s)	76.9			11.2	11.2	
Confl. Peds. (#/hr)		7	2			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	21.0	21.0	12.0	12.0	28.0	28.0
Total Split (s)	35.0	35.0	31.0	60.0	29.0	29.0
Total Split (%)	36.8%	36.8%	32.6%	63.2%	30.5%	30.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min

Intersection Summary

Area Type: Other

Cycle Length: 95

Actuated Cycle Length: 93.4

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 14: Yelm Hwy SE & Ruddell Rd SE

 Ø2		 Ø4
60 s		35 s
 Ø5	 Ø6	
31 s	29 s	

HCM 6th Signalized Intersection Summary 14: Yelm Hwy SE & Ruddell Rd SE

05/08/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	433	583	464	245	371	454
Future Volume (veh/h)	433	583	464	245	371	454
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1885	1885	1870	1870
Adj Flow Rate, veh/h	481	0	516	272	412	504
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	1	1	2	2
Cap, veh/h	516		483	1096	463	391
Arrive On Green	0.29	0.00	0.27	0.58	0.25	0.25
Sat Flow, veh/h	1781	1585	1795	1885	1870	1579
Grp Volume(v), veh/h	481	0	516	272	412	504
Grp Sat Flow(s),veh/h/ln	1781	1585	1795	1885	1870	1579
Q Serve(g_s), s	24.4	0.0	25.0	6.6	19.7	23.0
Cycle Q Clear(g_c), s	24.4	0.0	25.0	6.6	19.7	23.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	516		483	1096	463	391
V/C Ratio(X)	0.93		1.07	0.25	0.89	1.29
Avail Cap(c_a), veh/h	556		483	1096	463	391
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	0.0	33.9	9.5	33.7	34.9
Incr Delay (d2), s/veh	22.1	0.0	60.2	0.1	18.8	148.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.2	0.0	18.5	2.5	11.0	24.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.2	0.0	94.1	9.6	52.5	183.1
LnGrp LOS	D		F	A	D	F
Approach Vol, veh/h	481			788	916	
Approach Delay, s/veh	54.2			65.0	124.4	
Approach LOS	D			E	F	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		60.0		32.9	31.0	29.0
Change Period (Y+Rc), s		6.0		6.0	6.0	6.0
Max Green Setting (Gmax), s		54.0		29.0	25.0	23.0
Max Q Clear Time (g_c+I1), s		8.6		26.4	27.0	25.0
Green Ext Time (p_c), s		1.7		0.5	0.0	0.0
Intersection Summary						
HCM 6th Ctrl Delay			87.5			
HCM 6th LOS			F			
Notes						
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.						

Lanes, Volumes, Timings
15: 58th Ave SE & Kagy St SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	9	0	0	24	39	0	0	0	37	1	57
Future Volume (vph)	45	9	0	0	24	39	0	0	0	37	1	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			35			25			35	
Link Distance (ft)		379			439			455			418	
Travel Time (s)		10.3			8.6			12.4			8.1	
Confl. Peds. (#/hr)			3	3					2	2		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	4%	4%	4%	7%	7%	7%	0%	0%	0%	3%	3%	3%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

HCM 6th TWSC
15: 58th Ave SE & Kagy St SE

05/08/2023

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	9	0	0	24	39	0	0	0	37	1	57
Future Vol, veh/h	45	9	0	0	24	39	0	0	0	37	1	57
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	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	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	4	4	4	7	7	7	0	0	0	3	3	3
Mvmt Flow	52	10	0	0	28	45	0	0	0	43	1	66
Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	73	0	0	13	0	0	201	190	15	167	168	51
Stage 1	-	-	-	-	-	-	117	117	-	51	51	-
Stage 2	-	-	-	-	-	-	84	73	-	116	117	-
Critical Hdwy	4.14	-	-	4.17	-	-	7.1	6.5	6.2	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Follow-up Hdwy	2.236	-	-	2.263	-	-	3.5	4	3.3	3.527	4.027	3.327
Pot Cap-1 Maneuver	1514	-	-	1573	-	-	762	708	1070	795	723	1014
Stage 1	-	-	-	-	-	-	892	803	-	959	850	-
Stage 2	-	-	-	-	-	-	929	838	-	886	797	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1514	-	-	1569	-	-	691	682	1066	773	696	1014
Mov Cap-2 Maneuver	-	-	-	-	-	-	691	682	-	773	696	-
Stage 1	-	-	-	-	-	-	859	773	-	925	850	-
Stage 2	-	-	-	-	-	-	868	838	-	854	768	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	6.2		0			0			9.6			
HCM LOS						A			A			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	1514	-	-	1569	-	-	900				
HCM Lane V/C Ratio	-	0.034	-	-	-	-	-	0.121				
HCM Control Delay (s)	0	7.5	0	-	0	-	-	9.6				
HCM Lane LOS	A	A	A	-	A	-	-	A				
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.4				

Lanes, Volumes, Timings
16: Meridian Rd SE & 58th Ave SE

05/08/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	34	50	220	325	17
Future Volume (vph)	10	34	50	220	325	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	35			40	40	
Link Distance (ft)	598			613	615	
Travel Time (s)	11.6			10.4	10.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	11%	11%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	34	50	220	325	17
Future Vol, veh/h	10	34	50	220	325	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	11	11	2	2	1	1
Mvmt Flow	11	38	56	244	361	19
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	727	371	380	0	-	0
Stage 1	371	-	-	-	-	-
Stage 2	356	-	-	-	-	-
Critical Hdwy	6.51	6.31	4.12	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	2.218	-	-	-
Pot Cap-1 Maneuver	378	655	1178	-	-	-
Stage 1	679	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	357	655	1178	-	-	-
Mov Cap-2 Maneuver	357	-	-	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.2	1.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1178	-	551	-	-	
HCM Lane V/C Ratio	0.047	-	0.089	-	-	
HCM Control Delay (s)	8.2	0	12.2	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-	

Lanes, Volumes, Timings
17: Spurgeon Creek Rd SE & Yelm Hwy SE

05/08/2023

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	437	128	192	504	84	103
Future Volume (vph)	437	128	192	504	84	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0	125
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	562			635	694	
Travel Time (s)	10.9			12.4	13.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type: Unsignalized						

HCM 6th TWSC
17: Spurgeon Creek Rd SE & Yelm Hwy SE

05/08/2023

Intersection						
Int Delay, s/veh	4.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	437	128	192	504	84	103
Future Vol, veh/h	437	128	192	504	84	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	125
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	3	3	1	1	0	0
Mvmt Flow	470	138	206	542	90	111
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	608	0	1493	539
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	954	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	975	-	137	546
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	377	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	975	-	108	546
Mov Cap-2 Maneuver	-	-	-	-	222	-
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	297	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.7		21.7	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	222	546	-	-	975	-
HCM Lane V/C Ratio	0.407	0.203	-	-	0.212	-
HCM Control Delay (s)	31.9	13.3	-	-	9.7	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	1.9	0.8	-	-	0.8	-

Lanes, Volumes, Timings
18: Meridian Rd SE & Yelm Hwy SE

05/08/2023



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	5	214	223	45	4	396	125	32	19	4	1	33
Future Volume (vph)	5	214	223	45	4	396	125	32	19	4	1	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)			35			35			45			
Link Distance (ft)			757			688			698			
Travel Time (s)			14.7			13.4			10.6			
Confl. Peds. (#/hr)		2					2					
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)												
Sign Control			Yield			Yield			Yield			

Intersection Summary

Area Type: Other

Control Type: Roundabout



Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	29	337
Future Volume (vph)	29	337
Ideal Flow (vphpl)	1900	1900
Link Speed (mph)	40	
Link Distance (ft)	704	
Travel Time (s)	12.0	
Confl. Peds. (#/hr)		
Peak Hour Factor	0.98	0.98
Heavy Vehicles (%)	1%	1%
Shared Lane Traffic (%)		
Sign Control	Yield	

Intersection Summary

HCM 6th Roundabout
18: Meridian Rd SE & Yelm Hwy SE

05/08/2023

Intersection				
Intersection Delay, s/veh	8.8			
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	497	536	56	409
Demand Flow Rate, veh/h	501	547	57	412
Vehicles Circulating, veh/h	69	279	490	455
Vehicles Exiting, veh/h	798	268	80	371
Ped Vol Crossing Leg, #/h	0	0	0	2
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.6	10.0	5.1	10.3
Approach LOS	A	B	A	B
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
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	4.976	4.976
Entry Flow, veh/h	501	547	57	412
Cap Entry Lane, veh/h	1286	1038	837	868
Entry HV Adj Factor	0.991	0.980	0.976	0.992
Flow Entry, veh/h	497	536	56	409
Cap Entry, veh/h	1275	1017	817	860
V/C Ratio	0.390	0.527	0.068	0.475
Control Delay, s/veh	6.6	10.0	5.1	10.3
LOS	A	B	A	B
95th %tile Queue, veh	2	3	0	3

2025 With Project LOS

Lanes, Volumes, Timings
1: Marvin Rd SE & Steilacoom Rd SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	263	21	230	242	234	27	768	71	433	1164	259
Future Volume (vph)	182	263	21	230	242	234	27	768	71	433	1164	259
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		4%			0%			0%			0%	
Storage Length (ft)	350		0	225		0	275		0	225		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		749			828			615			398	
Travel Time (s)		14.6			16.1			12.0			7.8	
Confl. Peds. (#/hr)	1		2	2		1	2					2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Detector Phase	3	8		7	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)	6.0	8.0		6.0	8.0		6.0	10.0		6.0	10.0	
Minimum Split (s)	10.6	39.6		10.6	40.6		10.6	30.9		10.6	36.9	
Total Split (s)	29.6	33.6		19.6	33.6		19.6	45.9		45.6	45.9	
Total Split (%)	19.1%	21.7%		12.7%	21.7%		12.7%	29.7%		29.5%	29.7%	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.9		3.6	3.9	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.6	4.6		4.6	4.6		4.6	4.9		4.6	4.9	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		None	Min		None	Min	

Intersection Summary

Area Type: Other

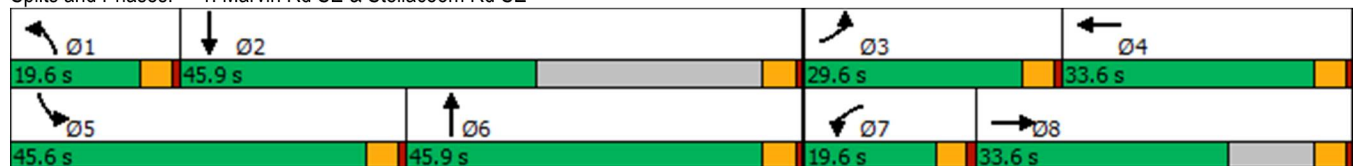
Cycle Length: 154.7

Actuated Cycle Length: 153.4

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Marvin Rd SE & Steilacoom Rd SE



HCM 6th Signalized Intersection Summary

1: Marvin Rd SE & Steilacoom Rd SE

05/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	182	263	21	230	242	234	27	768	71	433	1164	259
Future Volume (veh/h)	182	263	21	230	242	234	27	768	71	433	1164	259
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1650	1650	1650	1750	1750	1750	1736	1736	1736	1736	1736	1736
Adj Flow Rate, veh/h	202	292	23	256	269	260	30	853	79	481	1293	288
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	0	0	0	1	1	1	1	1	1
Cap, veh/h	221	353	28	166	157	152	47	829	77	449	1384	304
Arrive On Green	0.14	0.23	0.23	0.10	0.19	0.19	0.03	0.27	0.27	0.27	0.51	0.51
Sat Flow, veh/h	1571	1509	119	1667	816	789	1654	3051	283	1654	2688	590
Grp Volume(v), veh/h	202	0	315	256	0	529	30	461	471	481	786	795
Grp Sat Flow(s),veh/h/ln	1571	0	1628	1667	0	1605	1654	1650	1684	1654	1650	1629
Q Serve(g_s), s	19.1	0.0	27.8	15.0	0.0	29.0	2.7	41.0	41.0	41.0	66.7	69.9
Cycle Q Clear(g_c), s	19.1	0.0	27.8	15.0	0.0	29.0	2.7	41.0	41.0	41.0	66.7	69.9
Prop In Lane	1.00		0.07	1.00		0.49	1.00		0.17	1.00		0.36
Lane Grp Cap(c), veh/h	221	0	380	166	0	308	47	448	457	449	849	838
V/C Ratio(X)	0.91	0.00	0.83	1.55	0.00	1.72	0.64	1.03	1.03	1.07	0.93	0.95
Avail Cap(c_a), veh/h	260	0	380	166	0	308	164	448	457	449	849	838
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.9	0.0	55.0	68.0	0.0	61.0	72.6	55.0	55.0	55.0	34.0	34.7
Incr Delay (d2), s/veh	30.0	0.0	14.0	273.4	0.0	335.6	10.2	50.3	49.8	62.8	15.8	19.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	0.0	12.8	18.9	0.0	40.5	1.3	23.1	23.6	24.7	29.6	31.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.9	0.0	68.9	341.4	0.0	396.5	82.7	105.3	104.8	117.8	49.7	54.4
LnGrp LOS	F	A	E	F	A	F	F	F	F	F	D	D
Approach Vol, veh/h		517			785			962			2062	
Approach Delay, s/veh		78.7			378.5			104.3			67.4	
Approach LOS		E			F			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	82.6	25.9	33.6	45.6	45.9	19.6	39.9				
Change Period (Y+Rc), s	4.6	4.9	4.6	4.6	4.6	4.9	4.6	4.6				
Max Green Setting (Gmax), s	15.0	41.0	25.0	29.0	41.0	41.0	15.0	29.0				
Max Q Clear Time (g_c+I1), s	4.7	71.9	21.1	31.0	43.0	43.0	17.0	29.8				
Green Ext Time (p_c), s	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			133.4									
HCM 6th LOS			F									
Notes												
User approved pedestrian interval to be less than phase max green.												

LANE LEVEL OF SERVICE

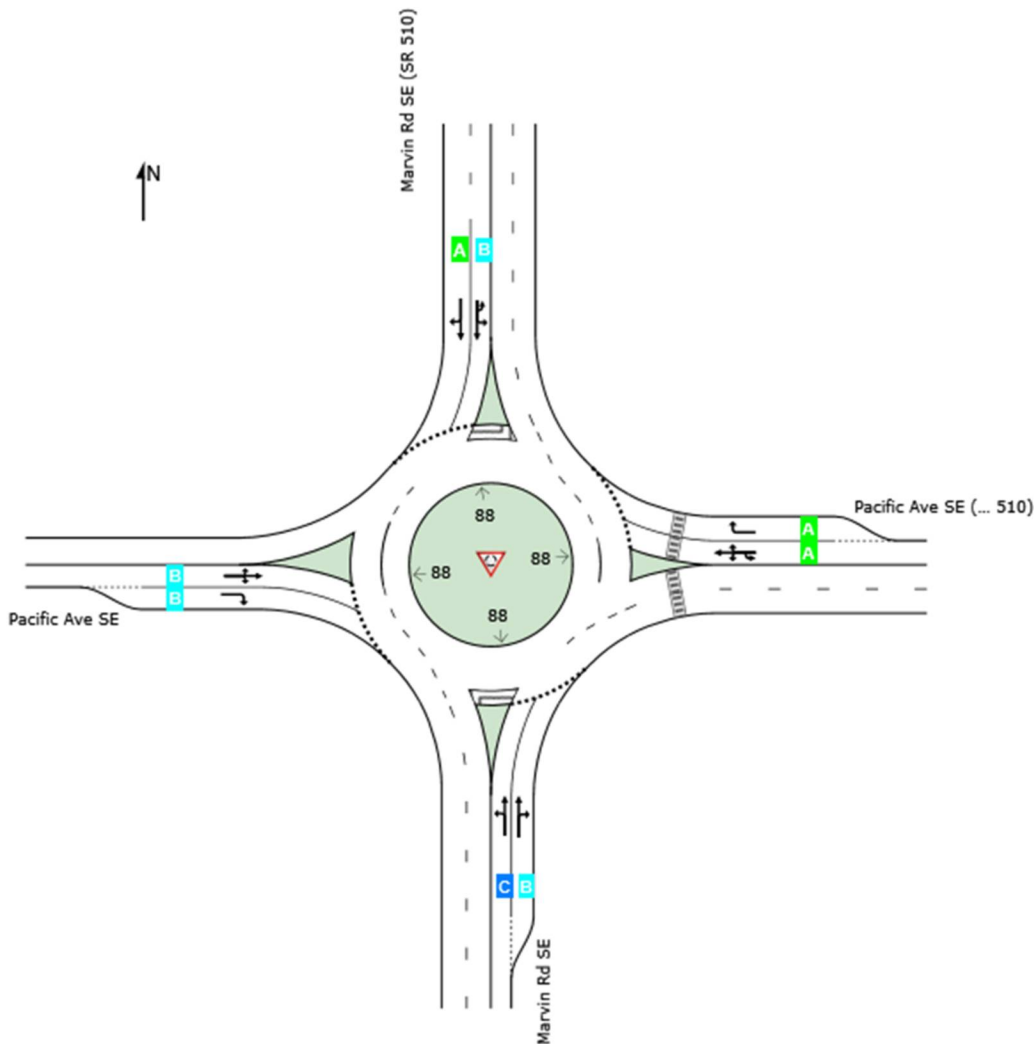
Lane Level of Service

 **Site: 2 [Marvin Rd SE / Pacific Ave SE (Site Folder: 2025 With Project - PM Peak Hour)]**

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Aurora Oaks
Marvin Rd SE & Pacific Hwy SE
Site Category: (None)
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	B	A	B	B	B



Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

MOVEMENT SUMMARY

 Site: 2 [Marvin Rd SE / Pacific Ave SE (Site Folder: 2025 With Project - PM Peak Hour)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Aurora Oaks
Marvin Rd SE & Pacific Hwy SE
Site Category: (None)
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Marvin Rd SE															
3	L2	All MCs	142	1.3	142	1.3	0.564	23.2	LOS C	5.4	136.6	1.00	0.97	1.33	26.1
8	T1	All MCs	516	1.3	516	1.3	0.564	15.6	LOS B	6.2	155.8	1.00	0.94	1.30	27.7
18	R2	All MCs	31	1.3	31	1.3	0.564	14.9	LOS B	6.2	155.8	1.00	0.93	1.29	28.1
Approach			689	1.3	689	1.3	0.564	17.1	LOS B	6.2	155.8	1.00	0.95	1.31	27.4
East: Pacific Ave SE (SR 510)															
1u	U	All MCs	1	1.1	1	1.1	0.392	15.8	LOS B	2.1	53.6	0.70	0.72	0.73	35.6
1	L2	All MCs	37	1.1	37	1.1	0.392	13.3	LOS B	2.1	53.6	0.70	0.72	0.73	35.6
6	T1	All MCs	260	1.1	260	1.1	0.392	7.8	LOS A	2.1	53.6	0.70	0.72	0.73	36.4
16	R2	All MCs	374	1.1	374	1.1	0.392	7.1	LOS A	2.2	55.8	0.69	0.73	0.70	36.9
Approach			672	1.1	672	1.1	0.392	7.7	LOS A	2.2	55.8	0.70	0.72	0.71	36.6
North: Marvin Rd SE (SR 510)															
7u	U	All MCs	1	1.0	1	1.0	0.671	16.6	LOS B	7.5	189.9	0.86	0.82	1.06	28.5
7	L2	All MCs	491	1.0	491	1.0	0.671	14.4	LOS B	7.5	189.9	0.86	0.82	1.06	28.5
4	T1	All MCs	859	1.0	859	1.0	0.671	8.0	LOS A	7.8	196.8	0.85	0.75	1.00	30.4
14	R2	All MCs	80	1.0	80	1.0	0.671	8.1	LOS A	7.8	196.8	0.84	0.74	0.99	30.4
Approach			1431	1.0	1431	1.0	0.671	10.2	LOS B	7.8	196.8	0.85	0.77	1.02	29.7
West: Pacific Ave SE															
5	L2	All MCs	43	1.9	43	1.9	0.747	20.1	LOS C	6.1	156.0	0.95	1.05	1.39	32.9
2	T1	All MCs	405	1.9	405	1.9	0.747	14.5	LOS B	6.1	156.0	0.95	1.05	1.39	33.6
12	R2	All MCs	278	1.9	278	1.9	0.644	14.8	LOS B	4.1	104.0	0.89	1.02	1.21	33.1
Approach			726	1.9	726	1.9	0.747	14.9	LOS B	6.1	156.0	0.93	1.04	1.32	33.4
All Vehicles			3518	1.3	3518	1.3	0.747	12.1	LOS B	7.8	196.8	0.87	0.85	1.08	31.0

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Lanes, Volumes, Timings
3: Marvin Rd SE & Union Mills Rd

05/08/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	33	100	62	556	938	83
Future Volume (vph)	33	100	62	556	938	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	275			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Link Speed (mph)	35			35	35	
Link Distance (ft)	498			557	345	
Travel Time (s)	9.7			10.9	6.7	
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
3: Marvin Rd SE & Union Mills Rd

05/08/2023

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	33	100	62	556	938	83
Future Vol, veh/h	33	100	62	556	938	83
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	275	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	35	106	66	591	998	88
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1765	1043	1086	0	-	0
Stage 1	1042	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	92	279	642	-	-	-
Stage 1	340	-	-	-	-	-
Stage 2	481	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	83	279	642	-	-	-
Mov Cap-2 Maneuver	206	-	-	-	-	-
Stage 1	305	-	-	-	-	-
Stage 2	481	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	35.2	1.1		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	642	-	256	-	-	
HCM Lane V/C Ratio	0.103	-	0.553	-	-	
HCM Control Delay (s)	11.2	-	35.2	-	-	
HCM Lane LOS	B	-	E	-	-	
HCM 95th %tile Q(veh)	0.3	-	3.1	-	-	

Lanes, Volumes, Timings
4: Marvin Rd SE & 19th Ave SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	0	3	7	0	131	4	471	13	212	803	16
Future Volume (vph)	14	0	3	7	0	131	4	471	13	212	803	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	225		0	200		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		25			25			35			40	
Link Distance (ft)		174			564			1931			557	
Travel Time (s)		4.7			15.4			37.6			9.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	2%	1%	1%	1%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

HCM 6th TWSC
4: Marvin Rd SE & 19th Ave SE

05/08/2023

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	0	3	7	0	131	4	471	13	212	803	16
Future Vol, veh/h	14	0	3	7	0	131	4	471	13	212	803	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	225	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	2	2	2	1	1	1
Mvmt Flow	15	0	3	8	0	141	4	506	14	228	863	17
Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1920	1856	872	1850	1857	513	880	0	0	520	0	0
Stage 1	1328	1328	-	521	521	-	-	-	-	-	-	-
Stage 2	592	528	-	1329	1336	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	51	75	353	58	74	565	768	-	-	1051	-	-
Stage 1	193	226	-	542	535	-	-	-	-	-	-	-
Stage 2	496	531	-	193	224	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	32	58	353	48	58	565	768	-	-	1051	-	-
Mov Cap-2 Maneuver	32	58	-	48	58	-	-	-	-	-	-	-
Stage 1	192	177	-	539	532	-	-	-	-	-	-	-
Stage 2	370	528	-	150	175	-	-	-	-	-	-	-
Approach	EB		WB		NB			SB				
HCM Control Delay, s	167.7		21.5		0.1			1.9				
HCM LOS	F		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	768	-	-	38	365	1051	-	-				
HCM Lane V/C Ratio	0.006	-	-	0.481	0.407	0.217	-	-				
HCM Control Delay (s)	9.7	-	-	167.7	21.5	9.4	-	-				
HCM Lane LOS	A	-	-	F	C	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	1.7	1.9	0.8	-	-				

Lanes, Volumes, Timings
5: Marvin Rd SE & 25th Ave SE

05/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	48	15	28	430	710	77
Future Volume (vph)	48	15	28	430	710	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			-5%	0%	
Storage Length (ft)	0	0	200			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Link Speed (mph)	25			35	35	
Link Distance (ft)	615			499	1931	
Travel Time (s)	16.8			9.7	37.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
5: Marvin Rd SE & 25th Ave SE

05/08/2023

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	48	15	28	430	710	77
Future Vol, veh/h	48	15	28	430	710	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	200	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	-5	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	1	1
Mvmt Flow	51	16	29	453	747	81
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1299	788	828	0	-	0
Stage 1	788	-	-	-	-	-
Stage 2	511	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	178	391	803	-	-	-
Stage 1	448	-	-	-	-	-
Stage 2	602	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	172	391	803	-	-	-
Mov Cap-2 Maneuver	305	-	-	-	-	-
Stage 1	432	-	-	-	-	-
Stage 2	602	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	19.1	0.6		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	803	-	322	-	-	
HCM Lane V/C Ratio	0.037	-	0.206	-	-	
HCM Control Delay (s)	9.7	-	19.1	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-	

Lanes, Volumes, Timings
6: Walthew St SE & Marvin Rd SE

05/08/2023

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	677	50	6	424	34	6
Future Volume (vph)	677	50	6	424	34	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Storage Length (ft)		0	150		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	592			577	479	
Travel Time (s)	11.5			11.2	9.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	2%	2%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

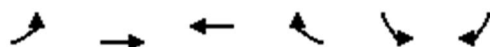
HCM 6th TWSC
6: Walthew St SE & Marvin Rd SE

05/08/2023

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	677	50	6	424	34	6
Future Vol, veh/h	677	50	6	424	34	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	4	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	2	0	0
Mvmt Flow	728	54	6	456	37	6
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	782	0	1223	755
Stage 1	-	-	-	-	755	-
Stage 2	-	-	-	-	468	-
Critical Hdwy	-	-	4.12	-	7.2	6.6
Critical Hdwy Stg 1	-	-	-	-	6.2	-
Critical Hdwy Stg 2	-	-	-	-	6.2	-
Follow-up Hdwy	-	-	2.218	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	836	-	152	379
Stage 1	-	-	-	-	396	-
Stage 2	-	-	-	-	572	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	836	-	151	379
Mov Cap-2 Maneuver	-	-	-	-	279	-
Stage 1	-	-	-	-	396	-
Stage 2	-	-	-	-	568	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.1		19.6		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	290	-	-	836	-	
HCM Lane V/C Ratio	0.148	-	-	0.008	-	
HCM Control Delay (s)	19.6	-	-	9.3	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	0.5	-	-	0	-	

Lanes, Volumes, Timings
7: Marvin Rd SE & Woodgrove St SE

05/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	70	536	376	21	19	27
Future Volume (vph)	70	536	376	21	19	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125			0	0	0
Storage Lanes	1			0	1	0
Taper Length (ft)	25				25	
Link Speed (mph)		35	35		25	
Link Distance (ft)		489	537		575	
Travel Time (s)		9.5	10.5		15.7	
Confl. Peds. (#/hr)	1			1	2	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	1%	1%	5%	5%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
7: Marvin Rd SE & Woodgrove St SE

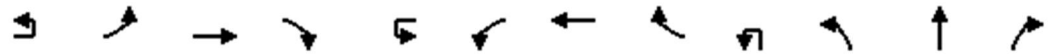
05/08/2023

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	70	536	376	21	19	27
Future Vol, veh/h	70	536	376	21	19	27
Conflicting Peds, #/hr	1	0	0	1	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	125	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	1	1	5	5
Mvmt Flow	86	662	464	26	23	33
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	491	0	-	0	1314	478
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	836	-
Critical Hdwy	4.12	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.218	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1072	-	-	-	172	581
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	420	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1071	-	-	-	158	581
Mov Cap-2 Maneuver	-	-	-	-	290	-
Stage 1	-	-	-	-	567	-
Stage 2	-	-	-	-	420	-
Approach	EB	WB		SB		
HCM Control Delay, s	1	0		15.2		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1071	-	-	-	411	
HCM Lane V/C Ratio	0.081	-	-	-	0.138	
HCM Control Delay (s)	8.7	-	-	-	15.2	
HCM Lane LOS	A	-	-	-	C	
HCM 95th %tile Q(veh)	0.3	-	-	-	0.5	

Lanes, Volumes, Timings

8: Marvin Rd SE & Lake Forest Dr SE/Oakwood St SE

05/08/2023



Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Volume (vph)	1	24	6	17	4	42	4	64	1	31	276	65
Future Volume (vph)	1	24	6	17	4	42	4	64	1	31	276	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)			25				25				35	
Link Distance (ft)			569				602				355	
Travel Time (s)			15.5				16.4				6.9	
Confl. Peds. (#/hr)		9						9				
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	3%	3%	3%	3%	5%	5%	5%	5%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Sign Control			Yield				Yield				Yield	

Intersection Summary

Area Type: Other

Control Type: Roundabout



Lane Group	SBL	SBT	SBR
Lane Configurations		↕	
Traffic Volume (vph)	98	384	27
Future Volume (vph)	98	384	27
Ideal Flow (vphpl)	1900	1900	1900
Link Speed (mph)		35	
Link Distance (ft)		443	
Travel Time (s)		8.6	
Confl. Peds. (#/hr)			
Peak Hour Factor	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%
Shared Lane Traffic (%)			
Sign Control		Yield	

Intersection Summary

HCM 6th Roundabout
8: Marvin Rd SE & Lake Forest Dr SE/Oakwood St SE

05/08/2023

Intersection				
Intersection Delay, s/veh	6.7			
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	53	124	409	560
Demand Flow Rate, veh/h	55	130	413	560
Vehicles Circulating, veh/h	583	369	147	92
Vehicles Exiting, veh/h	69	191	491	406
Ped Vol Crossing Leg, #/h	0	0	0	9
Ped Cap Adj	1.000	1.000	1.000	0.999
Approach Delay, s/veh	5.7	5.3	6.4	7.4
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
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	4.976	4.976
Entry Flow, veh/h	55	130	413	560
Cap Entry Lane, veh/h	761	947	1188	1256
Entry HV Adj Factor	0.959	0.951	0.990	1.000
Flow Entry, veh/h	53	124	409	560
Cap Entry, veh/h	730	901	1176	1255
V/C Ratio	0.072	0.137	0.348	0.446
Control Delay, s/veh	5.7	5.3	6.4	7.4
LOS	A	A	A	A
95th %tile Queue, veh	0	0	2	2

HCM 6th TWSC
9: Mullen Rd SE & Marvin Rd SE

05/08/2023

Intersection						
Int Delay, s/veh	68.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	242	208	266	97	116	322
Future Vol, veh/h	242	208	266	97	116	322
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	1	1	4	4	2	2
Mvmt Flow	272	234	299	109	130	362
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	408	0	-	0	1132	354
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	778	-
Critical Hdwy	4.11	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.209	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1156	-	-	-	225	690
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	453	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1156	-	-	-	164	690
Mov Cap-2 Maneuver	-	-	-	-	164	-
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	453	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.9	0		190.9		
HCM LOS				F		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1156	-	-	-	373	
HCM Lane V/C Ratio	0.235	-	-	-	1.319	
HCM Control Delay (s)	9.1	0	-	-	190.9	
HCM Lane LOS	A	A	-	-	F	
HCM 95th %tile Q(veh)	0.9	-	-	-	22.9	

Lanes, Volumes, Timings
10: Kagy St SE & Mullen Rd SE

05/08/2023

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	346	167	170	394	93	99
Future Volume (vph)	346	167	170	394	93	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%			0%	4%	
Link Speed (mph)	35			35	35	
Link Distance (ft)	405			1330	701	
Travel Time (s)	7.9			25.9	13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	4%	4%	6%	6%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

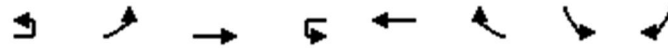
HCM 6th TWSC
10: Kagy St SE & Mullen Rd SE

05/08/2023

Intersection						
Int Delay, s/veh	20.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	346	167	170	394	93	99
Future Vol, veh/h	346	167	170	394	93	99
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	4	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	4	4	6	6
Mvmt Flow	364	176	179	415	98	104
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	540	0	1225	452
Stage 1	-	-	-	-	452	-
Stage 2	-	-	-	-	773	-
Critical Hdwy	-	-	4.14	-	7.26	6.66
Critical Hdwy Stg 1	-	-	-	-	6.26	-
Critical Hdwy Stg 2	-	-	-	-	6.26	-
Follow-up Hdwy	-	-	2.236	-	3.554	3.354
Pot Cap-1 Maneuver	-	-	1018	-	148	570
Stage 1	-	-	-	-	572	-
Stage 2	-	-	-	-	378	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1018	-	114	570
Mov Cap-2 Maneuver	-	-	-	-	114	-
Stage 1	-	-	-	-	572	-
Stage 2	-	-	-	-	292	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	2.8		126.7		
HCM LOS				F		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	194	-	-	1018	-	
HCM Lane V/C Ratio	1.042	-	-	0.176	-	
HCM Control Delay (s)	126.7	-	-	9.3	0	
HCM Lane LOS	F	-	-	A	A	
HCM 95th %tile Q(veh)	9.2	-	-	0.6	-	

Lanes, Volumes, Timings
11: Mullen Rd SE & Carpenter Rd SE

05/08/2023



Lane Group	EBU	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations								
Traffic Volume (vph)	40	127	390	1	342	130	130	149
Future Volume (vph)	40	127	390	1	342	130	130	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)			35		35		35	
Link Distance (ft)			721		714		832	
Travel Time (s)			14.0		13.9		16.2	
Confl. Peds. (#/hr)								5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)		10%						
Sign Control			Yield		Yield		Yield	
Intersection Summary								
Area Type:	Other							
Control Type:	Roundabout							

HCM 6th Roundabout
11: Mullen Rd SE & Carpenter Rd SE

05/08/2023

Intersection			
Intersection Delay, s/veh	8.6		
Intersection LOS	A		
Approach	EB	WB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	618	525	310
Demand Flow Rate, veh/h	623	536	313
Vehicles Circulating, veh/h	146	186	433
Vehicles Exiting, veh/h	600	583	289
Ped Vol Crossing Leg, #/h	5	0	0
Ped Cap Adj	0.999	1.000	1.000
Approach Delay, s/veh	9.0	8.4	8.1
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	L	LTR	LR
Assumed Moves	L	LTR	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	623	536	313
Cap Entry Lane, veh/h	1189	1141	887
Entry HV Adj Factor	0.991	0.980	0.990
Flow Entry, veh/h	617	525	310
Cap Entry, veh/h	1177	1119	879
V/C Ratio	0.524	0.470	0.353
Control Delay, s/veh	9.0	8.4	8.1
LOS	A	A	A
95th %tile Queue, veh	3	3	2

Lanes, Volumes, Timings
12: Ruddell Rd SE & Mullen Rd SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	235	68	274	197	133	51	489	307	233	769	46
Future Volume (vph)	72	235	68	274	197	133	51	489	307	233	769	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			-5%			0%			0%	
Storage Length (ft)	150		0	175		150	200		0	175		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		722			649			536			532	
Travel Time (s)		14.1			12.6			10.4			10.4	
Confl. Peds. (#/hr)	5		4	4		5	3		5	5		3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		Perm	NA	pm+ov	pm+pt	NA		pm+pt	NA	
Protected Phases		6			2	3	7	4		3	8	
Permitted Phases	6			2		2	4			8		
Detector Phase	6	6		2	2	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	4.0	4.0	6.0		4.0	6.0	
Minimum Split (s)	33.0	33.0		29.0	29.0	10.0	10.0	34.0		10.0	26.0	
Total Split (s)	41.0	41.0		41.0	41.0	21.0	21.0	36.0		21.0	36.0	
Total Split (%)	41.8%	41.8%		41.8%	41.8%	21.4%	21.4%	36.7%		21.4%	36.7%	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag						Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None	None	None	Min		None	Min	

Intersection Summary

Area Type: Other

Cycle Length: 98

Actuated Cycle Length: 92.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Ruddell Rd SE & Mullen Rd SE

 Ø2	 Ø3	 Ø4
41 s	21 s	36 s
 Ø6	 Ø7	 Ø8
41 s	21 s	36 s

HCM 6th Signalized Intersection Summary
12: Ruddell Rd SE & Mullen Rd SE

05/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	235	68	274	197	133	51	489	307	233	769	46
Future Volume (veh/h)	72	235	68	274	197	133	51	489	307	233	769	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	2003	2003	2003	2082	2082	2082	1856	1856	1856	1885	1885	1885
Adj Flow Rate, veh/h	80	261	76	304	219	148	57	543	341	259	854	51
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	3	3	3	1	1	1
Cap, veh/h	417	571	166	372	799	882	250	624	392	324	1322	79
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.03	0.30	0.30	0.12	0.39	0.39
Sat Flow, veh/h	1085	1489	434	1159	2082	1757	1767	2072	1300	1795	3433	205
Grp Volume(v), veh/h	80	0	337	304	219	148	57	462	422	259	446	459
Grp Sat Flow(s),veh/h/ln	1085	0	1923	1159	2082	1757	1767	1763	1609	1795	1791	1847
Q Serve(g_s), s	5.0	0.0	11.9	23.1	6.6	4.2	2.0	22.6	22.7	8.6	18.6	18.6
Cycle Q Clear(g_c), s	11.6	0.0	11.9	35.0	6.6	4.2	2.0	22.6	22.7	8.6	18.6	18.6
Prop In Lane	1.00		0.23	1.00		1.00	1.00		0.81	1.00		0.11
Lane Grp Cap(c), veh/h	417	0	738	372	799	882	250	531	485	324	690	711
V/C Ratio(X)	0.19	0.00	0.46	0.82	0.27	0.17	0.23	0.87	0.87	0.80	0.65	0.65
Avail Cap(c_a), veh/h	417	0	738	372	799	882	480	580	529	408	690	711
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	0.0	21.0	34.5	19.4	12.4	21.6	30.2	30.2	21.1	23.0	23.0
Incr Delay (d2), s/veh	0.2	0.0	0.4	13.3	0.2	0.1	0.2	12.9	14.1	6.8	2.1	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	5.2	7.9	3.1	1.6	0.8	11.0	10.3	3.9	7.8	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.6	0.0	21.5	47.8	19.6	12.5	21.7	43.1	44.2	27.9	25.1	25.0
LnGrp LOS	C	A	C	D	B	B	C	D	D	C	C	C
Approach Vol, veh/h	417			671			941			1164		
Approach Delay, s/veh	21.9			30.8			42.3			25.7		
Approach LOS	C			C			D			C		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	41.0		16.7	33.5		41.0		9.1	41.1			
Change Period (Y+Rc), s	6.0		6.0	6.0		6.0		6.0	6.0			
Max Green Setting (Gmax), s	35.0		15.0	30.0		35.0		15.0	30.0			
Max Q Clear Time (g_c+I1), s	37.0		10.6	24.7		13.9		4.0	20.6			
Green Ext Time (p_c), s	0.0		0.2	2.8		2.3		0.0	3.8			
Intersection Summary												
HCM 6th Ctrl Delay	31.2											
HCM 6th LOS	C											

Lanes, Volumes, Timings
13: Rainier Rd SE/College St SE & Yelm Hwy SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	333	132	186	580	151	259	624	132	251	703	115
Future Volume (vph)	123	333	132	186	580	151	259	624	132	251	703	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	175		0	150		225	575		0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		927			3948			437			874	
Travel Time (s)		18.1			76.9			8.5			17.0	
Confl. Peds. (#/hr)	2		1	1		2	7		4	4		7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Detector Phase	1	6		5	2		7	4		3	8	
Switch Phase												
Minimum Initial (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Minimum Split (s)	10.0	32.0		10.0	31.0		10.0	32.0		10.0	32.0	
Total Split (s)	25.0	37.0		21.0	33.0		17.0	32.0		20.0	35.0	
Total Split (%)	22.7%	33.6%		19.1%	30.0%		15.5%	29.1%		18.2%	31.8%	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	Min		None	Min		None	None		None	None	

Intersection Summary

Area Type: Other

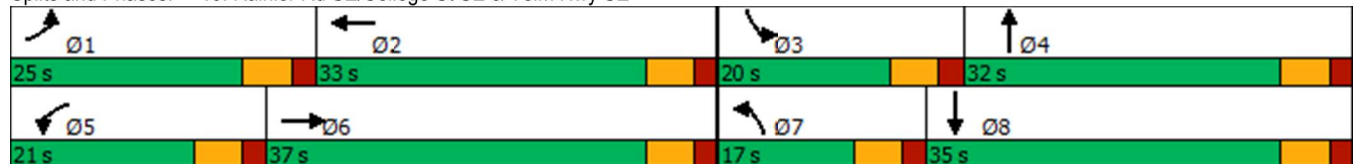
Cycle Length: 110

Actuated Cycle Length: 103.3

Natural Cycle: 105

Control Type: Actuated-Uncoordinated

Splits and Phases: 13: Rainier Rd SE/College St SE & Yelm Hwy SE



HCM 6th Signalized Intersection Summary
13: Rainier Rd SE/College St SE & Yelm Hwy SE

05/08/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	333	132	186	580	151	259	624	132	251	703	115
Future Volume (veh/h)	123	333	132	186	580	151	259	624	132	251	703	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	137	370	147	207	644	168	288	693	147	279	781	128
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	169	546	214	240	724	189	202	760	161	257	891	146
Arrive On Green	0.10	0.22	0.22	0.13	0.26	0.26	0.11	0.26	0.26	0.14	0.29	0.29
Sat Flow, veh/h	1781	2493	976	1795	2810	732	1795	2936	622	1795	3077	504
Grp Volume(v), veh/h	137	262	255	207	410	402	288	423	417	279	455	454
Grp Sat Flow(s),veh/h/ln	1781	1777	1692	1795	1791	1751	1795	1791	1767	1795	1791	1790
Q Serve(g_s), s	7.4	13.2	13.6	11.0	21.6	21.6	11.0	22.4	22.4	14.0	23.6	23.7
Cycle Q Clear(g_c), s	7.4	13.2	13.6	11.0	21.6	21.6	11.0	22.4	22.4	14.0	23.6	23.7
Prop In Lane	1.00		0.58	1.00		0.42	1.00		0.35	1.00		0.28
Lane Grp Cap(c), veh/h	169	389	371	240	461	451	202	463	457	257	518	518
V/C Ratio(X)	0.81	0.67	0.69	0.86	0.89	0.89	1.43	0.91	0.91	1.09	0.88	0.88
Avail Cap(c_a), veh/h	346	563	536	275	494	483	202	476	470	257	531	531
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.4	35.0	35.1	41.5	35.0	35.0	43.4	35.2	35.2	41.9	33.1	33.1
Incr Delay (d2), s/veh	6.7	2.0	2.3	20.6	17.0	17.6	218.2	21.5	21.8	80.9	15.1	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	5.8	5.7	6.1	11.3	11.1	17.0	12.2	12.1	11.8	12.0	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.1	37.0	37.4	62.1	52.0	52.6	261.6	56.6	57.0	122.9	48.2	48.2
LnGrp LOS	D	D	D	E	D	D	F	E	E	F	D	D
Approach Vol, veh/h		654			1019			1128			1188	
Approach Delay, s/veh		39.9			54.3			109.1			65.7	
Approach LOS		D			D			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.3	31.2	20.0	31.3	19.1	27.4	17.0	34.3				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	19.0	27.0	14.0	26.0	15.0	31.0	11.0	29.0				
Max Q Clear Time (g_c+I1), s	9.4	23.6	16.0	24.4	13.0	15.6	13.0	25.7				
Green Ext Time (p_c), s	0.2	1.6	0.0	0.8	0.1	2.7	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay			70.8									
HCM 6th LOS			E									

Lanes, Volumes, Timings
14: Yelm Hwy SE & Ruddell Rd SE

05/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	433	609	480	245	371	454
Future Volume (vph)	433	609	480	245	371	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Right Turn on Red	Yes					Yes
Link Speed (mph)	35			35	35	
Link Distance (ft)	3948			576	576	
Travel Time (s)	76.9			11.2	11.2	
Confl. Peds. (#/hr)		7	2			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	1%	1%	2%	2%
Shared Lane Traffic (%)						
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phase	4	4	5	2	6	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	21.0	21.0	12.0	12.0	28.0	28.0
Total Split (s)	35.0	35.0	31.0	60.0	29.0	29.0
Total Split (%)	36.8%	36.8%	32.6%	63.2%	30.5%	30.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min

Intersection Summary

Area Type: Other

Cycle Length: 95

Actuated Cycle Length: 93.4

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 14: Yelm Hwy SE & Ruddell Rd SE



HCM 6th Signalized Intersection Summary 14: Yelm Hwy SE & Ruddell Rd SE

05/08/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	433	609	480	245	371	454
Future Volume (veh/h)	433	609	480	245	371	454
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1885	1885	1870	1870
Adj Flow Rate, veh/h	481	0	533	272	412	504
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	1	1	2	2
Cap, veh/h	516		483	1096	463	391
Arrive On Green	0.29	0.00	0.27	0.58	0.25	0.25
Sat Flow, veh/h	1781	1585	1795	1885	1870	1579
Grp Volume(v), veh/h	481	0	533	272	412	504
Grp Sat Flow(s),veh/h/ln	1781	1585	1795	1885	1870	1579
Q Serve(g_s), s	24.4	0.0	25.0	6.6	19.7	23.0
Cycle Q Clear(g_c), s	24.4	0.0	25.0	6.6	19.7	23.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	516		483	1096	463	391
V/C Ratio(X)	0.93		1.10	0.25	0.89	1.29
Avail Cap(c_a), veh/h	556		483	1096	463	391
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	0.0	33.9	9.5	33.7	34.9
Incr Delay (d2), s/veh	22.1	0.0	72.0	0.1	18.8	148.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.2	0.0	20.1	2.5	11.0	24.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.2	0.0	105.9	9.6	52.5	183.1
LnGrp LOS	D		F	A	D	F
Approach Vol, veh/h	481			805	916	
Approach Delay, s/veh	54.2			73.4	124.4	
Approach LOS	D			E	F	
Timer - Assigned Phs	2			4	5	6
Phs Duration (G+Y+Rc), s	60.0			32.9	31.0	29.0
Change Period (Y+Rc), s	6.0			6.0	6.0	6.0
Max Green Setting (Gmax), s	54.0			29.0	25.0	23.0
Max Q Clear Time (g_c+I1), s	8.6			26.4	27.0	25.0
Green Ext Time (p_c), s	1.7			0.5	0.0	0.0
Intersection Summary						
HCM 6th Ctrl Delay			90.4			
HCM 6th LOS			F			
Notes						

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

Lanes, Volumes, Timings
15: 58th Ave SE & Kagy St SE

05/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	9	0	0	24	74	0	0	0	97	1	57
Future Volume (vph)	45	9	0	0	24	74	0	0	0	97	1	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			35			25			35	
Link Distance (ft)		379			439			455			418	
Travel Time (s)		10.3			8.6			12.4			8.1	
Confl. Peds. (#/hr)			3	3					2	2		
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	4%	4%	4%	7%	7%	7%	0%	0%	0%	3%	3%	3%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

HCM 6th TWSC
15: 58th Ave SE & Kagy St SE

05/08/2023

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	45	9	0	0	24	74	0	0	0	97	1	57
Future Vol, veh/h	45	9	0	0	24	74	0	0	0	97	1	57
Conflicting Peds, #/hr	0	0	3	3	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	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	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	4	4	4	7	7	7	0	0	0	3	3	3
Mvmt Flow	52	10	0	0	28	85	0	0	0	111	1	66
Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	113	0	0	13	0	0	221	230	15	187	188	71
Stage 1	-	-	-	-	-	-	117	117	-	71	71	-
Stage 2	-	-	-	-	-	-	104	113	-	116	117	-
Critical Hdwy	4.14	-	-	4.17	-	-	7.1	6.5	6.2	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.13	5.53	-
Follow-up Hdwy	2.236	-	-	2.263	-	-	3.5	4	3.3	3.527	4.027	3.327
Pot Cap-1 Maneuver	1464	-	-	1573	-	-	739	673	1070	771	705	989
Stage 1	-	-	-	-	-	-	892	803	-	936	834	-
Stage 2	-	-	-	-	-	-	907	806	-	886	797	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1464	-	-	1569	-	-	669	647	1066	749	678	989
Mov Cap-2 Maneuver	-	-	-	-	-	-	669	647	-	749	678	-
Stage 1	-	-	-	-	-	-	858	772	-	902	834	-
Stage 2	-	-	-	-	-	-	846	806	-	853	767	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	6.3		0			0			10.6			
HCM LOS						A			B			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	1464	-	-	1569	-	-	822				
HCM Lane V/C Ratio	-	0.035	-	-	-	-	-	0.217				
HCM Control Delay (s)	0	7.5	0	-	0	-	-	10.6				
HCM Lane LOS	A	A	A	-	A	-	-	B				
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	0.8				

Lanes, Volumes, Timings
16: Meridian Rd SE & 58th Ave SE

05/08/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	13	59	89	220	325	23
Future Volume (vph)	13	59	89	220	325	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	35			40	40	
Link Distance (ft)	598			613	615	
Travel Time (s)	11.6			10.4	10.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	11%	11%	2%	2%	1%	1%
Shared Lane Traffic (%)						
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
16: Meridian Rd SE & 58th Ave SE

05/08/2023

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	59	89	220	325	23
Future Vol, veh/h	13	59	89	220	325	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	11	11	2	2	1	1
Mvmt Flow	14	66	99	244	361	26
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	816	374	387	0	-	0
Stage 1	374	-	-	-	-	-
Stage 2	442	-	-	-	-	-
Critical Hdwy	6.51	6.31	4.12	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	2.218	-	-	-
Pot Cap-1 Maneuver	335	653	1171	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	302	653	1171	-	-	-
Mov Cap-2 Maneuver	302	-	-	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.8	2.4		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1171	-	540	-	-	
HCM Lane V/C Ratio	0.084	-	0.148	-	-	
HCM Control Delay (s)	8.4	0	12.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.5	-	-	

Lanes, Volumes, Timings
17: Spurgeon Creek Rd SE & Yelm Hwy SE

05/08/2023

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	464	128	195	521	84	106
Future Volume (vph)	464	128	195	521	84	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	150		0	125
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Link Speed (mph)	35			35	35	
Link Distance (ft)	562			635	694	
Travel Time (s)	10.9			12.4	13.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
17: Spurgeon Creek Rd SE & Yelm Hwy SE

05/08/2023

Intersection						
Int Delay, s/veh	4.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	464	128	195	521	84	106
Future Vol, veh/h	464	128	195	521	84	106
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	125
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	3	3	1	1	0	0
Mvmt Flow	499	138	210	560	90	114
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	637	0	1548	568
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	980	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	951	-	127	526
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	367	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	951	-	99	526
Mov Cap-2 Maneuver	-	-	-	-	213	-
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	286	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.7		22.6	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	213	526	-	-	951	-
HCM Lane V/C Ratio	0.424	0.217	-	-	0.22	-
HCM Control Delay (s)	33.8	13.7	-	-	9.9	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	2	0.8	-	-	0.8	-

Lanes, Volumes, Timings
18: Meridian Rd SE & Yelm Hwy SE

05/08/2023



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	5	244	223	45	4	396	134	32	19	4	1	38
Future Volume (vph)	5	244	223	45	4	396	134	32	19	4	1	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)			35			35			45			
Link Distance (ft)			757			688			698			
Travel Time (s)			14.7			13.4			10.6			
Confl. Peds. (#/hr)		2					2					
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%	1%	1%
Shared Lane Traffic (%)												
Sign Control			Yield			Yield			Yield			

Intersection Summary

Area Type: Other

Control Type: Roundabout



Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	29	357
Future Volume (vph)	29	357
Ideal Flow (vphpl)	1900	1900
Link Speed (mph)	40	
Link Distance (ft)	704	
Travel Time (s)	12.0	
Confl. Peds. (#/hr)		
Peak Hour Factor	0.98	0.98
Heavy Vehicles (%)	1%	1%
Shared Lane Traffic (%)		
Sign Control	Yield	

Intersection Summary

HCM 6th Roundabout
18: Meridian Rd SE & Yelm Hwy SE

05/08/2023

Intersection				
Intersection Delay, s/veh	9.3			
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	528	545	56	434
Demand Flow Rate, veh/h	532	556	57	438
Vehicles Circulating, veh/h	74	310	526	455
Vehicles Exiting, veh/h	819	273	80	411
Ped Vol Crossing Leg, #/h	0	0	0	2
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.9	10.8	5.3	10.9
Approach LOS	A	B	A	B
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
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	4.976	4.976
Entry Flow, veh/h	532	556	57	438
Cap Entry Lane, veh/h	1280	1006	807	868
Entry HV Adj Factor	0.992	0.980	0.976	0.990
Flow Entry, veh/h	528	545	56	434
Cap Entry, veh/h	1269	986	788	859
V/C Ratio	0.416	0.553	0.071	0.505
Control Delay, s/veh	6.9	10.8	5.3	10.9
LOS	A	B	A	B
95th %tile Queue, veh	2	3	0	3

Lanes, Volumes, Timings
19: Site Access & 58th Ave SE

05/08/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	
Traffic Volume (vph)	46	61	45	63	35	28
Future Volume (vph)	46	61	45	63	35	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	35			35	25	
Link Distance (ft)	439			370	527	
Travel Time (s)	8.6			7.2	14.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	10%	10%	7%	7%	3%	3%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					

HCM 6th TWSC
19: Site Access & 58th Ave SE

05/08/2023

Intersection						
Int Delay, s/veh	3.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	46	61	45	63	35	28
Future Vol, veh/h	46	61	45	63	35	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	7	7	3	3
Mvmt Flow	50	66	49	68	38	30
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	116	0	249	83
Stage 1	-	-	-	-	83	-
Stage 2	-	-	-	-	166	-
Critical Hdwy	-	-	4.17	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.263	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1442	-	737	974
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	861	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1442	-	711	974
Mov Cap-2 Maneuver	-	-	-	-	711	-
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	831	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.2		9.9	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1		EBT	EBR	WBL	WBT
Capacity (veh/h)	808		-	-	1442	-
HCM Lane V/C Ratio	0.085		-	-	0.034	-
HCM Control Delay (s)	9.9		-	-	7.6	0
HCM Lane LOS	A		-	-	A	A
HCM 95th %tile Q(veh)	0.3		-	-	0.1	-