English Crossing

Marysville, WA

UPDATED

Traffic Impact Analysis

August 8, 2023

Prepared for:

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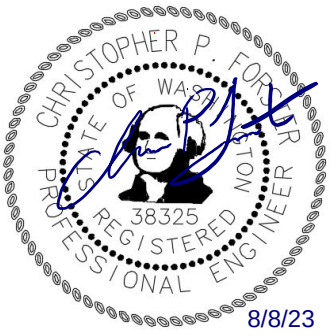

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FINDINGS/CONCLUSIONS

This updated traffic impact analysis (TIA) has been prepared for the proposed *English Crossing* project in the Lakewood area of the City of Marysville, WA. This study has been updated based on comments received from the City of Marysville dated June 20, 2023 in response to review of the initial TIA dated April 24, 2023.

Project Proposal. The proposed *English Crossing* project site is located west of 19th Ave NE and north of 172nd Street NE. The proposed project will include up to 250 Single-Family Attached townhome units on a site that is currently vacant.

Vehicular access to the site would be provided be provided via a new site access roadway connection to 19th Ave NE, aligned with 174th Street NE. Secondary access for emergency vehicles only would be provided north of 174th Street NE via another new site access roadway connection to 19th Ave NE.

Trip Generation. The *English Crossing* project is estimated to generate 1,855 new weekday daily trips, with 124 new trips (31 in, 93 out) occurring during the AM peak hour and 146 new trips (86 in, 60 out) occurring during the PM peak hour.

Intersection Level of Service (LOS). The LOS analyses documented in this report were assessed during the weekday PM peak hour at seven (7) off-site study intersections. The City of Marysville and WSDOT LOS standard at all study intersections is LOS D with one exception, as noted in the City of Marysville *Traffic Impact Analysis Guidelines,* which state that intersections on the 172nd Street NE (SR 531) corridor that have an existing LOS E prior to development submittal shall only be required to mitigate upon falling below LOS E.

All study intersections are anticipated to operate at LOS D or better in 2026 (buildout year) and 2032 (horizon year) during the weekday PM peak hour without or with the proposed project with one exception: the intersection of 27th Avenue NE / 172nd Street NE which is anticipated to operate at LOS E in 2026 and LOS F in 2032 (without or with the proposed project).

The City's long-term plan for addressing this future LOS condition at the 27th Avenue NE/172nd Street NE intersection is the 156th Street NE Interchange project planned by WSDOT (TIP #61). The 156th Street NE interchange with I-5 is expected to shift some traffic away from the 27th Avenue NE/172nd Street NE intersection, reducing demand on the 172nd Street NE corridor and improving LOS at this intersection and other intersections along the 172nd Street corridor. Until funding is identified for the 156th Street NE interchange, the 27th Avenue NE/172nd Street NE intersection is anticipated to function at LOS E or F during peak hours in the future with or without this project.

Additionally, and in response to City comments, several transportation improvement options were considered at the 27th Avenue NE/172nd Street NE intersection in 2032 with the proposed *English Crossing* project such as eastbound and southbound right-turn lanes, a dual northbound right-turn lane, and a two-lane roundabout. Based on this preliminary alternative analysis, it is anticipated that adding a second northbound right-turn lane (resulting in dual northbound right-turn lanes) would be the most optimal improvement to reduce delay at the 27th Avenue NE/172nd Street NE intersection. To accomplish this improvement, the City would have to provide sufficient right of way for the second turn lane.

Site Access Evaluation. The LOS results indicate that the individual movements at the proposed site access intersection are expected to operate at LOS B or better with minimal queuing during the weekday PM peak hour in 2026 (buildout year) and 2032 (horizon year).

Future City Road Plans. The City of Marysville has identified several future road improvements and connections in the vicinity of the project site. These connector roads are identified on the City's Comprehensive Plan, City's Lakewood Neighborhood Plan, the City's six-year 2023-2028 Transportation Improvement Plan (TIP), and/or the City's traffic impact fee program. The following eight (8) City planned road improvements were identified in the study area.

- 172nd Street NE / 19th Avenue NE Roundabout – construct new roundabout at 19th Avenue NE / 172nd Street NE (Marysville TIP Project #24)
- 172nd Street NE / 11th Avenue NE Roundabout – construct new roundabout at 11th Avenue NE / 172nd Street NE (Marysville TIP Project #25)
- 172nd Street NE from 27th Avenue NE to 19th Avenue NE – widen to a 4/5-lane section with pedestrian and bicycle facilities between 27th Avenue NE and 19th Avenue NE. (Marysville TIP Project #30)
- 172nd Street NW from 19th Drive NE to 11th Avenue NE – widen to a 3-lane section with pedestrian and bicycle facilities between 19th Drive NE and 11th Avenue NE. (Marysville TIP Project #31)
- 172nd Street NE Railroad Crossing – widen to a 3-lane section with pedestrian and bicycle facilities and railroad crossing improvements; this project is unfunded. (Marysville TIP Project #36)
- New 19th Avenue NE Extension – construct new 3-lane roadway between 156th Street NE and 172nd Street NE that would include pedestrian and bicycle facilities. (Marysville TIP Project #51)
- 156th Street NE Interchange – convert existing overcrossing to a full single-point urban interchange (SPUI) with Interstate 5. (Marysville TIP Project #61)
- New 23rd Avenue NE and 169th Street NE – construct new 3-lane roadways connecting to the existing street network at the existing roundabout at 23rd Avenue NE / 172nd Street NE and the existing western terminus of 169th Street NE. (Marysville TIP Project #48)

Note that portions of some of these City improvements would be completed by the *English Crossing* project as mitigation, which is further described in the Mitigation section next.

Mitigation. The following measures have been identified to mitigate traffic impacts of the proposed *English Crossing* project.

- **City of Marysville Traffic Impact Fees.** The City of Marysville requires payment of transportation impact fees to help fund planned roadway improvements throughout the City. Transportation impact fees for the proposed *English Crossing* project were calculated based on the trip generation estimate documented in this TIA and the City of Marysville's currently adopted transportation impact fee rate of $6,300 per PM peak hour trip.

  The proposed *English Crossing* project is estimated to generate 146 new PM peak hour trips. As a result, the estimated City of Marysville transportation impact fee is **$919,800** ($6,300 X 146 PM peak hour trips). Actual impact fees will be calculated by the City at the time of building permit issuance.

- **27th Ave NE/172nd Street NE Intersection.** This intersection is anticipated to operate at LOS F in the future 2032 horizon year PM peak hour as a result of the funding loss for the 156th Street NE interchange with I-5. A couple options that should be considered by the City include: (1) adding a 2nd northbound right-turn lane, and/or (2) allowing the intersection operation to exceed the LOS threshold until funding for the 156th Street NE interchange is funded.
- **Snohomish County Mitigation.** The City of Marysville and Snohomish County have adopted an interlocal agreement whereby developments in Marysville must assess potential mitigation for impacts on Snohomish County roadway facilities. Mitigation fees to Snohomish County are based on predetermined distribution percentages according to location or specific project impacts to planned roadway improvements.

  Mitigation fees to Snohomish County were based on the use of the standard distribution percentage based on the project location (20%) multiplied by the daily trip generation (1,855 new daily project trips) and adopted cost per ADT ($185 for residential developments within TSA A and the UGA). The resulting Snohomish County transportation impact fee is **$68,635**. A mitigation offer form to Snohomish County will be submitted separately.
- **Future City Road Plans.** The *English Crossing* project would build a portion of the following City planned roadway improvements:
  - Construct and dedicate right-of-way for the western half-street of a 3-lane section on 19th Avenue NE from 172nd Street NE to the northern site property line.
  - Construct and dedicate right-of-way for the northern half-street of a 3-lane section on 172nd Street NE from 19th Avenue NE to the western site property line.
  - Construct a new roundabout (or a portion of a new roundabout) at 19th Avenue NE / 172nd Street NE if not already completed by other development.

It should be noted that it is anticipated the applicant would receive transportation impact fee credit for construction and ROW dedication of these roadway construction projects as confirmed by the City.

INTRODUCTION

This updated traffic impact analysis (TIA) has been prepared for the proposed *English Crossing* project located in the Lakewood area of the City of Marysville, WA. The proposed project will include up to 250 Single-Family Attached townhome units on a currently vacant site. A site vicinity map is provided in Figure 1. This study has been updated based on comments received from the City of Marysville dated June 20, 2023 in response to review of the initial TIA dated April 24, 2023.

Project Description

The proposed project will include up to 250 Single-Family Attached townhome units on a currently vacant site. Vehicular access to the site would be provided be provided via a new site access roadway connection to 19th Ave NE, aligned with 174th Street NE. Secondary access for emergency vehicles only would be provided north of 174th Street NE via another new site access roadway connection to 19th Ave NE. A preliminary site plan is shown in Figure 2.

Traffic Scoping & Study Area

The scope of work for this Traffic Impact Analysis was prepared consistent with City of Maryville's adopted Traffic Impact Analysis guidelines (December 2021) and confirmed by the City during the scoping process. A total of seven (7) off-site study intersections were identified for evaluation during future weekday PM peak hour conditions in 2026 (buildout year) and 2032 (horizon year):

1. 11th Ave NE / 172nd St NE
2. 19th Dr NE / 172nd St NE
3. 19th Ave NE / 172nd St NE
4. 23rd Ave NE /172nd St NE
5. 27th Ave NE /172nd St NE
6. I-5 SB Ramps /172nd St NE
7. I-5 NB Ramps /172nd St NE

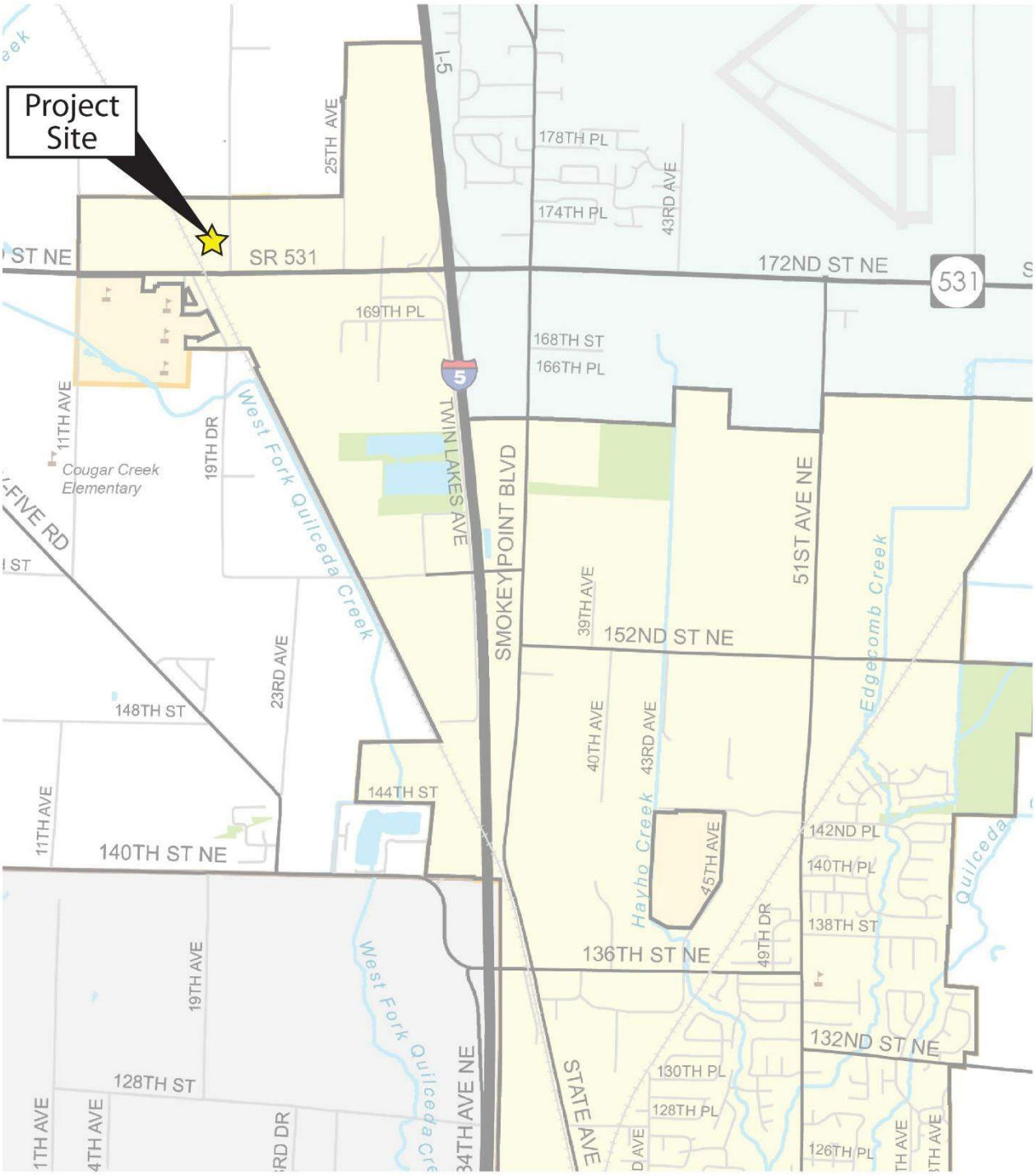
Project Approach

To analyze the traffic impacts of the *English Crossing* development, the following tasks were undertaken:

- Assessment of existing conditions through field reconnaissance and review of existing planning documents.
- Estimation of weekday vehicular AM peak hour, PM peak hour, and weekday daily trips generated by the development.
- Evaluation of weekday PM peak hour level of service (LOS) at seven (7) off-site study intersections.
- Analyzed the weekday PM peak hour operations at the proposed site access intersection including LOS and queues. Review of City planning documents to evaluate long-term road improvements plans in project vicinity.
- Documentation of trip impacts at Snohomish County Key Intersections.
- Summary of mitigation including transportation impact fees to City of Marysville and Snohomish County, and construction of local roadway improvements adjacent to the site.

Primary Data and Information Sources

- Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition, 2021.
- City of Marysville *Traffic Impact Analysis Guidelines,* December 22, 2021.
- *Highway Capacity Manual (HCM 6th Edition)*, 2016.
- 2022 and 2023 weekday PM peak period traffic counts, All Traffic Data (ATD).
- City of Marysville 2023-2028 Six Year Transportation Improvement Plan (TIP).
- *City of Marysville Comprehensive Plan – Transportation Element*, 2015.
- *Snohomish County Traffic Worksheet and Traffic Study Requirements for Developments in the City of Marysville*, October 2015.



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NOT TO SCALE

Figure 1: Project Site Vicinity

Figure 2: Preliminary Site Plan

EXISTING CONDITIONS

This section describes existing transportation system conditions in the study area. Existing conditions described include an inventory of existing roadways, public transportation services, non-motorized transportation facilities, existing traffic volumes, and intersection levels of service (LOS).

Roadway Network

The existing street characteristics in the vicinity of the proposed *English Crossing* project are described below in Table 1.

Table 1
Existing Roadway Network Summary – Project Site Vicinity

Roadway	Orientation	Classification	Speed Limit	Number of Travel Lanes	Street Parking	Sidewalks	Bicycle Facilities
172nd St NE (SR 531)	East-West	State Highway	35 mph	3 - 4	None	Intermittent	Intermittent Bike Lanes
19th Ave NE	North-South	Collector Arterial	35 mph	2	None	None	None
23rd Ave NE	North-South	Minor Arterial	25 mph	2	None	Both Sides	None
27th Ave NE	North-South	Minor Arterial	25 mph	2	None	None	None

Transit Service

Transit service in the project site vicinity is provided by Community Transit. The closest bus stops are located on 172nd Street NE at 19th Drive NE and 23rd Ave NE. The bus stops provide access to Community Transit Route 240 which provides service between Stanwood Downtown Park & Ride and Smokey Point Transit Center throughout the day with approximately 1-hour headways.

Non-motorized Transportation Facilities

Non-motorized transportation facilities in the project site vicinity include a mix of sidewalks and paved shoulders. Existing pedestrian activity is minimal in the project vicinity based on recent PM peak period traffic counts.

Collision History

Historical collisions at the seven (7) off-site study intersections and seven (7) roadway segments were analyzed for the four-year period from 2019 to 2022. Collision data was provided by WSDOT. Summaries of the total and yearly average collisions during this period at the off-site study intersections are provided in Table 2. Summaries of collisions by type at the off-site study intersections are provided in Table 3. Summaries of the total and yearly average collisions along the roadway segments are provided in Table 4.

The detailed collision history is included in Appendix A.

Table 2
Collision Data Summary, January 1, 2019, to December 31, 2022

Roadway Segment	2019	2020	2021	2022	4-Year Total Collisions	Avg. Annual Collisions	Est. AWDT[1]	Collisions per MEV[2]
1) 11th Ave NE / 172nd St NE	0	1	2	1	4	1.00	7,030	0.39
2) 19th Dr NE / 172nd St NE	1	2	1	0	4	1.00	8,090	0.34
3) 19th Ave NE / 172nd St NE	0	2	3	2	7	1.75	8,360	0.57
4) 23rd Ave NE / 172nd St NE	0	1	2	3	6	1.50	15,420	0.27
5) 27th Ave NE / 172nd St NE	7	5	7	4	23	5.75	35,750	0.44
6) I-5 SB Ramps / 172nd St NE	8	4	7	8	27	6.75	39,750	0.46
7) I-5 NB Ramps / 172nd St NE	5	6	3	7	21	5.25	44,570	0.32

Source: WSDOT Collision Records.
[1] AWDT = Average Weekday Daily Traffic. Estimated daily volumes are based on 2022/2023 PM volumes and a K-factor of 10.
[2] MEV = Million Entering Vehicles.

Table 3
Collision Data Summary by Type, January 1, 2019 to December 31, 2022

	Collision Type							
Intersection	Angle (Left/Right)	Angle (T)	Head-on	Other	Parked Veh/Fixed Object	Ped/Bike	Rear end	Sideswipe
1) 11th Ave NE / 172nd St NE	1	0	0	0	0	0	0	0
2) 19th Dr NE / 172nd St NE	0	1	0	0	0	0	0	0
3) 19th Ave NE / 172nd St NE	1	0	0	0	0	0	1	0
4) 23rd Ave NE / 172nd St NE	1	0	0	0	0	0	1	0
5) 27th Ave NE / 172nd St NE	1	1	0	0	0	0	3	0
6) I-5 SB Ramps / 172nd St NE	3	0	0	0	0	0	4	1
7) I-5 NB Ramps / 172nd St NE	3	0	0	1	1	0	1	0

Source: WSDOT Collision Records.

Table 4
Collision Data Summary, January 1, 2019, to December 31, 2022

Roadway Segment	2019	2020	2021	2022	4-Year Total Collisions	Avg. Annual Collisions	Est. AWDT[1]	Collisions per MEV[2]	Collisions per MVM[3]
172nd St NE between									
11th Ave NE and 19th Dr NE	5	0	0	0	5	1.25	7,100	0.48	1.30
19th Dr NE and 19th Ave NE	2	3	2	0	7	1.75	8,040	0.60	4.97
19th Ave NE and 23rd Ave NE	3	5	3	1	12	3.00	9,800	0.84	3.35
23rd Ave NE and 27th Ave NE	5	3	8	3	19	4.75	14,680	0.89	3.55
27th Ave NE and I-5 SB Ramps	5	3	5	5	18	4.50	30,590	0.40	3.10
I-5 SB Ramps and I-5 NB Ramps	0	3	11	7	30	7.50	32,310	0.64	3.74
19th Ave NE between									
174th Street NE and 172nd St NE	0	0	0	0	0	0.00	920	0.00	0.00

Source: WSDOT Collision Records.
[1] AWDT = Average Weekday Daily Traffic. Estimated daily volumes are based on 2022/2023 PM volumes and a K-factor of 10.
[2] MEV = Million Entering Vehicles.
[3] MVM = Million Vehicle Miles.

Per the City of Marysville's *Traffic Impact Analysis Guidelines* (December 2021) intersection collision rates over 1.0 collision per MEV and roadway segment collision rates over 10.0 collisions per MEV generally warrant further review to determine if any patterns exist. Based on the collision data, none of the seven (7) off-site study intersections have rates that exceed 1.0 collision per MEV. Additionally, none of the seven (7) roadway segments have rates that exceed 10.0 collisions per MEV or 10.0 collisions per MVM.

Traffic Volumes

Existing weekday PM peak hour traffic volumes at the seven (7) off-site study intersections were based on counts conducted by All Traffic Data in 2022 and 2023. The PM peak hour represents the highest one-hour time period between 4:00 and 6:00 PM. To estimate existing 2023 traffic volumes, a three (3) percent annual growth rate was applied to the 2022 traffic volumes, consistent with City of Marysville guidelines. Figure 3 illustrates the estimated 2023 existing weekday PM peak hour traffic volumes at the seven (7) off-site study intersections. Appendix B includes the PM peak hour traffic count data sheets.

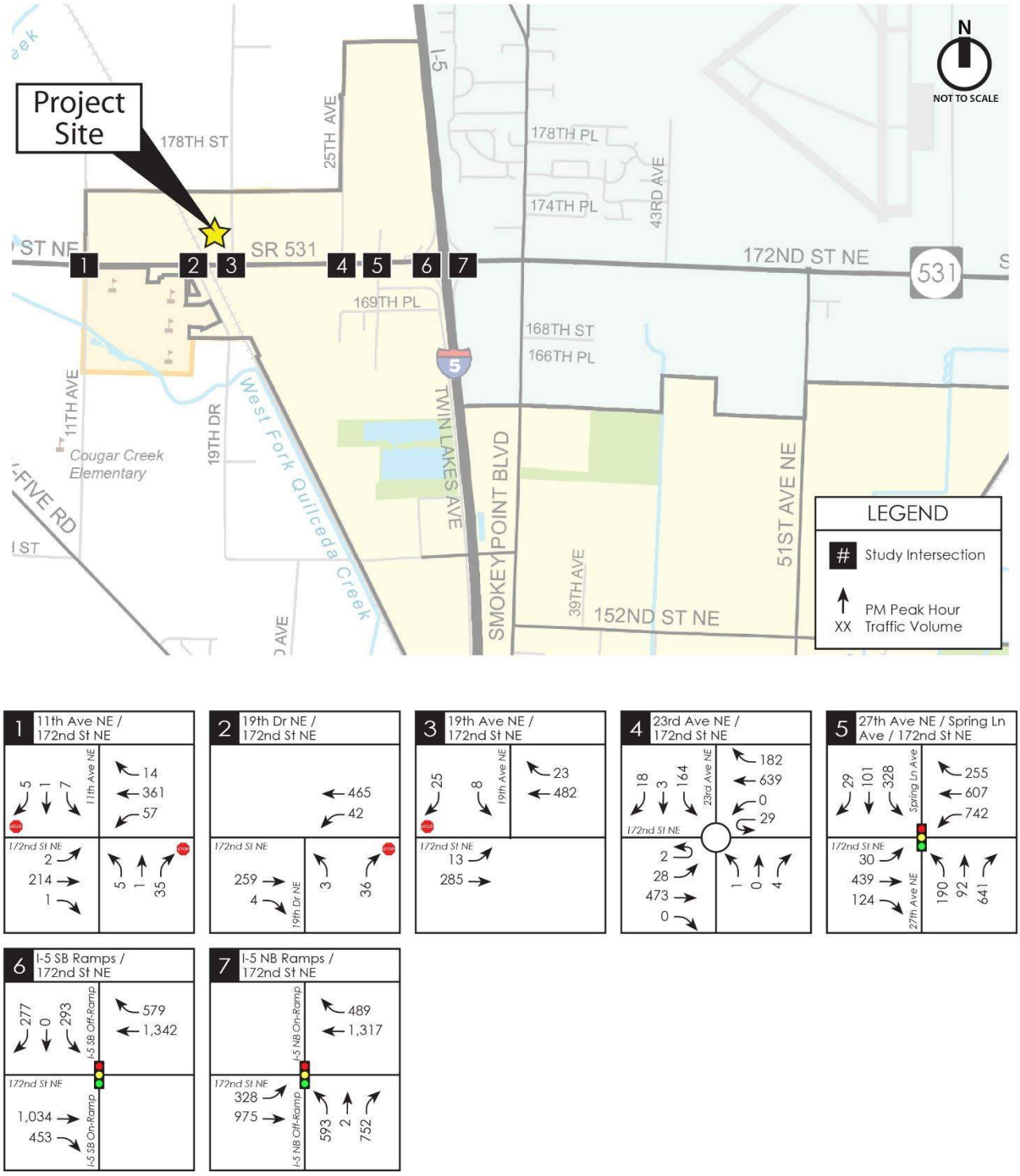


Figure 3: 2023 Existing PM Peak Hour Traffic Volumes

Intersection Levels of Service

LOS generally refers to the degree of congestion on a roadway or 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. At signalized intersections, LOS A represents free-flow conditions (motorists experience little or no delays), and LOS F represents forced-flow conditions where motorists experience an average delay in excess of 80 seconds per vehicle.

The LOS reported for signalized intersections 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 LOS reported at stop-controlled intersections is based on the average control delay and can be reported for each controlled minor approach, controlled minor lane group, and controlled major-street movement (and for the overall intersection at all-way stop controlled intersections. Additional v/c ratio criteria apply to lane group or movement LOS only). Table 5 outlines the current HCM 6th Edition LOS criteria for signalized and stop-controlled intersections based on these methodologies.

Table 5
LOS Criteria for Signalized and Two-Way Stop Controlled Intersections[1]

SIGNALIZED INTERSECTIONS			UNSGINALIZED INTERSECTIONS		
	LOS by Volume-to Capacity (V/C) Ratio[2]			LOS by Volume-to Capacity (V/C) Ratio[3]	
Control Delay (sec/veh)	≤ 1.0	> 1.0	Control Delay (sec/veh)	≤ 1.0	> 1.0
≤ 10	A	F	≤ 10	A	F
> 10 to ≤ 20	B	F	> 10 to ≤ 15	B	F
> 20 to ≤ 35	C	F	> 15 to ≤ 25	C	F
> 35 to ≤ 55	D	F	> 25 to ≤ 35	D	F
> 55 to ≤ 80	E	F	> 35 to ≤ 50	E	F
> 80	F	F	> 50	F	F

[1] Source: Highway Capacity Manual (6th Edition), Transportation Research Board, 2016.

[2] For approach-based and intersection-wide assessments at signals, LOS is defined solely by control delay.

[3] For two-way stop controlled intersections, the LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole at two-way stop controlled intersections. For approach-based and intersection-wide assessments at all-way stop controlled intersections, LOS is solely defined by control delay.

Level of service calculations for signalized and stop-controlled study intersections were based on methodology and procedures outlined in the latest Highway Capacity Manual (6th Edition) using *Synchro 11* traffic analysis software. Existing signal timing was provided by WSDOT and City of Marysville at the signalized study intersections. Level of service calculations for the roundabout study intersections were based on WSDOT methodology and procedures outlined in the *WSDOT Sidra Policy Settings* document using *Sidra 9* traffic analysis software. The existing LOS results at the seven (7) off-site study intersections are summarized in Table 6. Detailed LOS summary worksheets are provided in Appendix C.

Table 6
2023 Existing Weekday PM Peak Hour LOS Summary

Study Intersection / Movement	LOS	Delay (sec)
Stop-Controlled Intersections:		
1) 11th Ave NE / 172nd St NE		
Eastbound Left-Turn	A	8.1
Westbound Left-Turn	A	7.8
Northbound Approach	B	11.6
Southbound Approach	B	13.8
2) 19th Dr NE / 172nd St NE		
Westbound Left-Turn	A	8.0
Northbound Approach	B	10.6
3) 19th Ave NE / 172nd St NE		
Eastbound Left-Turn	A	8.7
Southbound Approach	B	14.1
Roundabout:		
4) 23rd Ave NE / 172nd St NE	A	4.3
Signalized Intersections:		
5) 27th Ave NE / 172nd St NE	E	63.4
6) I-5 SB / 172nd St NE	A	6.9
7) I-5 NB / 172nd St NE	C	21.2

As shown in Table 6, all study intersections operate at LOS C or better during the weekday PM peak hour under 2023 existing conditions with the exception of the following intersection:

5. 27th Ave NE / 172nd St NE (LOS E)

The City of Marysville and WSDOT LOS standard at intersections is LOS D with one exception. The City of Marysville *Traffic Impact Analysis Guidelines* state that intersections on the 172nd Street NE (SR 531) corridor which have an existing LOS E prior to development submittal shall only be required to mitigate upon falling below LOS E. Currently the 27th Ave NE / 172nd St NE intersection operates at LOS E, which applies to this statement.

FUTURE CONDITIONS & PROJECT IMPACTS

This section of the report describes the traffic impacts of the proposed *English Crossing* project on the surrounding and adjacent road network, and at identified off-site study intersections in the project site vicinity. The analysis of traffic impacts includes a trip generation estimate, distribution/assignment of project trips, and PM peak hour LOS evaluation at the seven (7) off-site study intersections and the site access. Consideration of future planned roadway projects identified by the City of Marysville is also documented and considered in the evaluation of intersection LOS.

Future Planned Roadway Improvements

Marysville Comprehensive Plan

The Transportation Element of the *City of Marysville Comprehensive Plan 2015* includes a depiction of the functional classification of existing and planned future roadways within the City limits and adjacent jurisdictions. The planned roadways are intended to serve anticipated growth in Marysville and the surrounding area through 2035.

Marysville's Lakewood Neighborhood Master Plan

The City's Lakewood Neighborhood Master Plan (dated March 2017) cites that it is "consistent with the Marysville Comprehensive Plan and provides additional detail for the Lakewood Neighborhood. This plan focuses on the infrastructure and urban design aspects of the neighborhood."

The *Neighborhood Roadways* section of the Plan identifies roadway improvements to support growth in vehicular and non-motorized demand. The Plan further states that the neighborhood roads create network of minor and collector arterials that create a secondary network to provide alternate routes to 172nd Street NE and 27th Ave NE, and also supports the City's vision of a second I-5 interchange at 156th Street NE.

The Lakewood Neighborhood Master Plan identifies a similar system of north-south and east-west arterials (collector and minor) that were also identified in the City's Comprehensive Plan Transportation Element.

It should be noted that the roadway alignments shown in the Lakewood Neighborhood Master Plan and the City's Comprehensive Plan are intended to represent a planned roadway connection and not necessarily the exact alignment for a planned future roadway. The City's six-year Transportation Improvement Plan (TIP), which is typically adopted annually, implements the elements of the City Comprehensive Plan and Lakewood Neighborhood Plan; that plan is described next.

Marysville Transportation Improvement Plan

The City's plan for funding and implementing new roadway and intersection improvement projects that come out of the Comprehensive Plan and Neighborhood Master Plans is administered through a six-year Transportation Improvement Plan which is typically adopted and updated annually.

Based on review of the currently adopted *City of Marysville 2023-2028 Six Year Transportation Improvement Plan (TIP),* there are eight (8) planned improvements in the vicinity of the *English Crossing* project that impact the off-site study intersections or connectivity of the adjacent street network.

Most of these projects are included in the City's Transportation Element of the Comprehensive Plan, the City's Lakewood Neighborhood Master Plan, and the City's Traffic Impact Fee program.

The eight (8) planned improvements in the vicinity of the *English Crossing* project that impact the off-site study intersections or connectivity of the adjacent street network are as-follows:

- Marysville TIP #24 – 172nd Street NE / 19th Avenue NE Roundabout – construct new roundabout at the 19th Avenue NE / 172nd Street NE intersection. The project is anticipated to be funded by new development in the vicinity.

  Note: this improvement is required as a condition of approval for the Lodge Apartments project and is expected to be a condition of approval for English Crossing. As such, this improvement is assumed to be completed in the 2026 No Action and 2026 With Project scenarios.

- Marysville TIP #25 – 172nd Street NE / 11th Avenue NE Roundabout – construct new roundabout at the 11th Avenue NE / 172nd Street NE intersection. The project is anticipated to be funded by new development in the vicinity.

  Note: this project is not yet a condition of approval of any development and is not otherwise funded. Therefore, this improvement is not assumed in the future roadway network or traffic analysis herein.

- Marysville TIP #30 – 172nd Street NE: 27th Avenue NE to 19th Avenue NE – widen 172nd Street NE from a 3-lane section to a 4/5-lane section with pedestrian and bicycle facilities between 27th Avenue NE and 19th Avenue NE. The project is anticipated to be funded by new development in the vicinity.

  Note: this improvement is assumed to be completed in the 2032 No Action and 2032 With Project scenarios only.

- Marysville TIP #31 – 172nd Street NE: 11th Avenue NE to 19th Drive NE – widen 172nd Street NE from a 2-lane section to a 3-lane section with pedestrian and bicycle facilities between 11th Avenue NE and 19th Drive NE. The project is anticipated to be funded by new development in the vicinity.

  Note: this improvement is assumed to be completed along the English Crossing project frontage in the 2032 No Action and 2032 With Project scenarios only.

- Marysville TIP #36 – 172nd Street NE Railroad Crossing Improvements – widen 172nd Street NE from a 2-lane section to a 3-lane section with pedestrian and bicycle facilities and provide railroad crossing improvements.

  Note: this project is not yet a condition of approval of any development and is not otherwise funded. Therefore, this improvement is not assumed in the future roadway network.

- TIP #48 – 23rd Avenue NE & 169th Street NE – construct new 3-lane roadways including pedestrian and bicycle facilities. Connections to the existing street network would be provided at the existing roundabout at 23rd Avenue NE / 172nd Street NE and the existing western terminus of 169th Street NE. The project is anticipated to be funded by new development in the vicinity.

  Note: this project is not yet a condition of approval of any development and is not otherwise funded. Therefore, this improvement is not assumed in the future roadway network or traffic analysis herein .

- TIP #51 – 19th Avenue NE Extension from 156th Street NE to 172nd Street NE – construct new 3-lane roadway between 156th Street NE and 172nd Street NE that would include pedestrian and bicycle facilities. The project is anticipated to be funded by new development in the vicinity.

  Note: this improvement is assumed to be completed in the 2032 No Action and 2032 With Project scenarios only.

- TIP #61 – 156th Street NE Interchange – convert the existing road overcrossing at 156th Street NE and Interstate 5 to a full single-point urban interchange (SPUI). The project is funded under Connecting Washington and WSDOT is the lead agency.

  Note: the recent Washington State transportation budget delays the start of construction of the 156th Street NE Interchange project indefinitely past 2030. Therefore, this improvement is not assumed in the future roadway network or traffic analysis herein although it is still in the City's current TIP list.

Project Trip Generation

Trip generation estimates associated with full buildout of the proposed *English Crossing* project for weekday daily, AM peak hour, and PM peak hour were based on methodology documented in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition for Land Use Code (LUC) 215 (Single-Family Attached Housing). Table 7 summarizes the net new weekday daily, AM peak hour, and PM peak hour trip generation. Detailed trip generation estimates are provided in Appendix D.

Table 7
English Crossing – Trip Generation Summary

	New Trips Generated		
Time Period	In	Out	Total
Weekday Daily	927	928	1,855
Weekday AM Peak Hour	31	93	124
Weekday PM Peak Hour	86	60	146

Project Trip Distribution and Assignment

The distribution of project-generated trips during the weekday PM peak hour was estimated based on traffic model distribution figures provided by the City of Marysville. These figures are included in Appendix E. The model distribution was used to assign the new weekday PM peak hour (86 inbound and 60 outbound) trips generated by the *English Crossing* project to the adjacent street network. Based on the trip distribution percentages, new PM peak hour project trips were assigned through the study intersections. The distribution and assignment of the new weekday PM peak hour trips through study intersections are shown in Figure 4.

Future Traffic Volumes

Future year 2026 and 2032 No Action PM peak hour traffic volumes were estimated by applying a three (3) percent annual growth rate to the existing traffic counts, consistent with City of Marysville guidelines. No additional pipeline projects were included in the 2026 and 2032 No Action volumes since a three (3) percent annual growth rate was used, which is also consistent with City of Marysville guidelines.

It should be noted that based on City comments reviewing the prior TIA, no future adjustments to baseline traffic volumes were made to account for the future planned 156th Street interchange with I-5 since it is not currently funded. The resulting future 2026 (buildout year) and 2032 horizon year No Action PM peak hour traffic volumes at the seven (7) off-site study intersections are shown in Figures 5 and 7, respectively. The 2026 and 2032 With Project traffic volumes were determined by adding the trip assignment from the

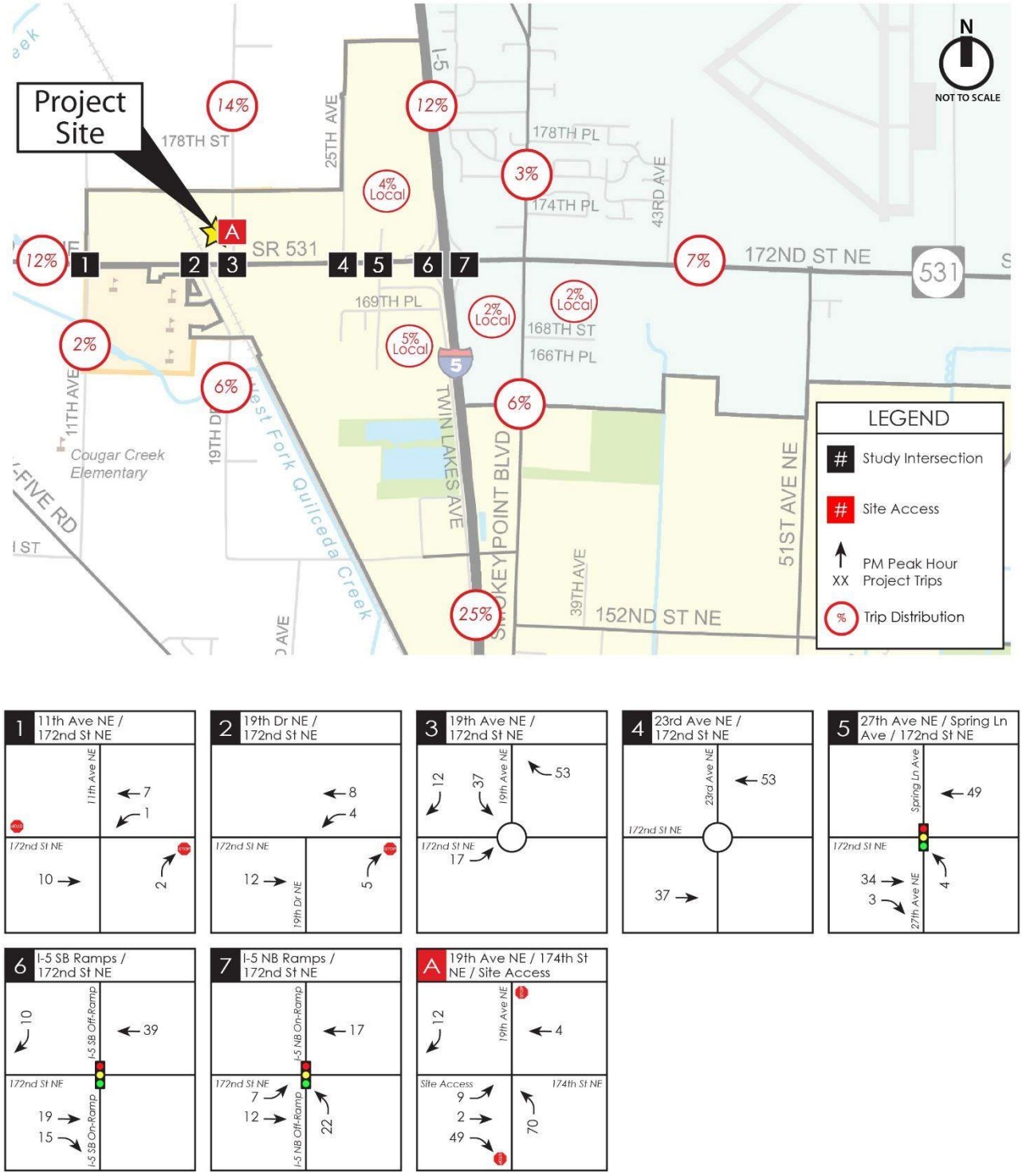


Figure 4: Weekday PM Peak Hour Project Trip Distribution and Assignment

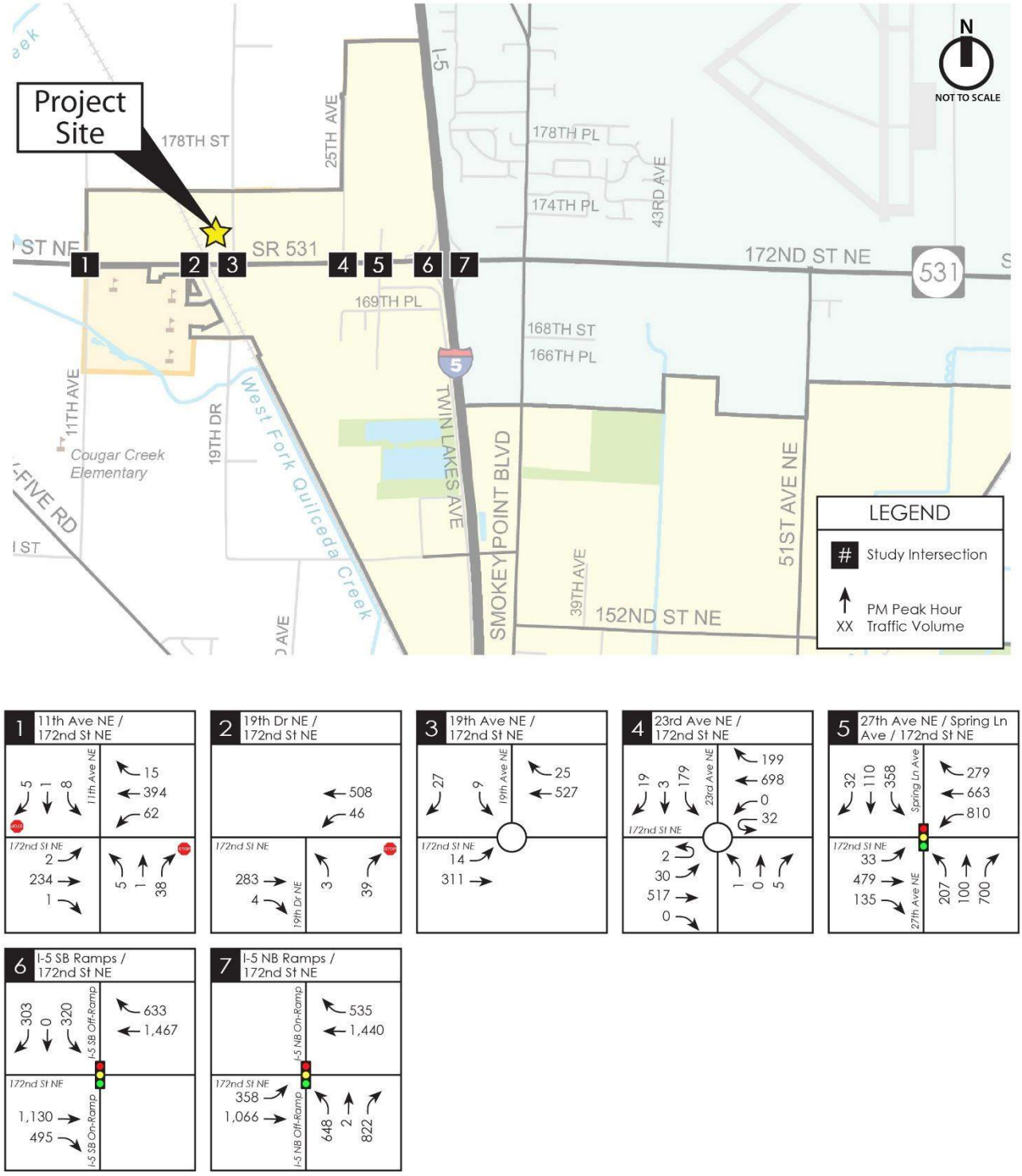


Figure 5: 2026 No Action Weekday PM Peak Hour Traffic Volumes (Buildout)

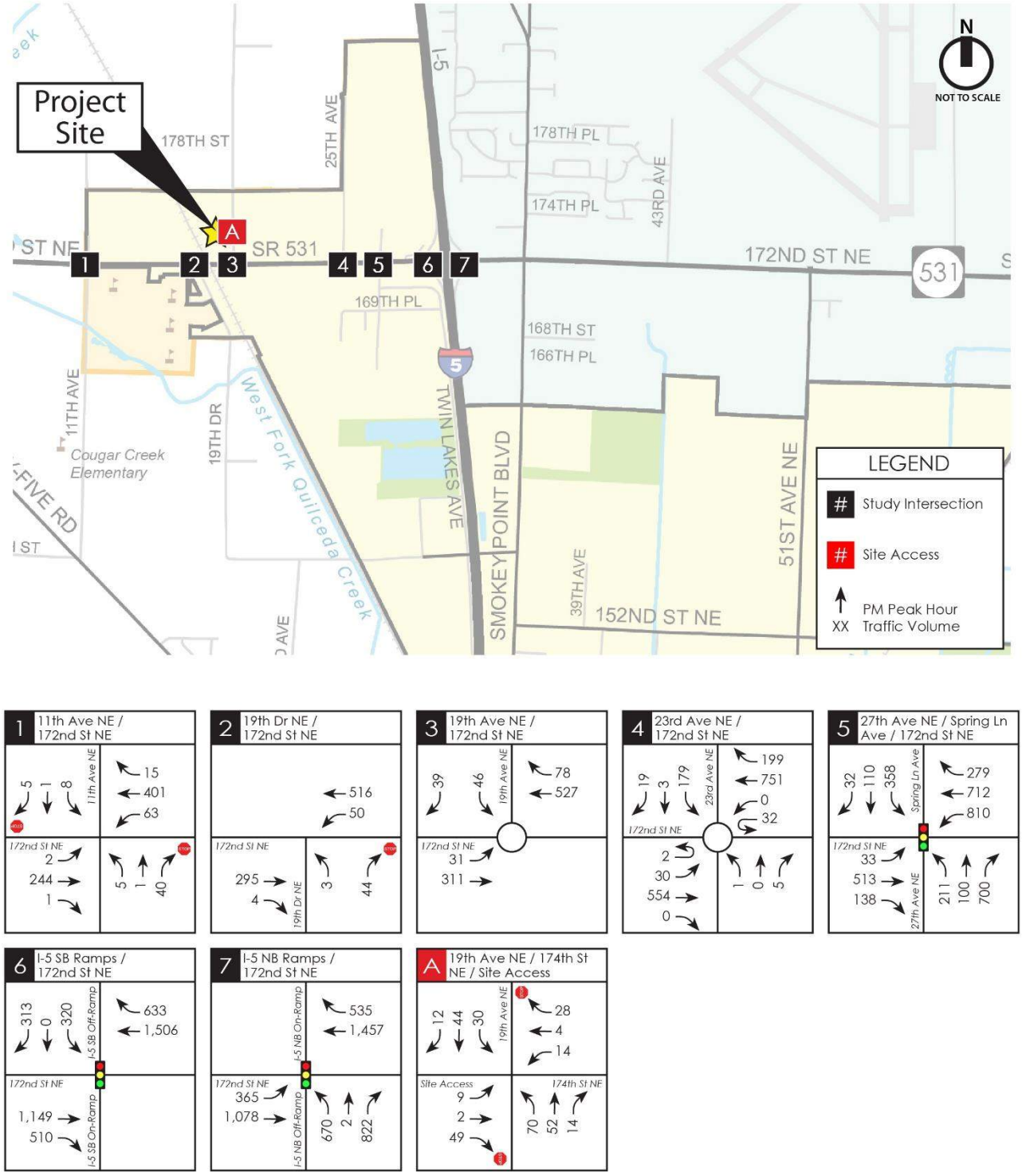


Figure 6: 2026 With Project Weekday PM Peak Hour Traffic Volumes (Buildout)

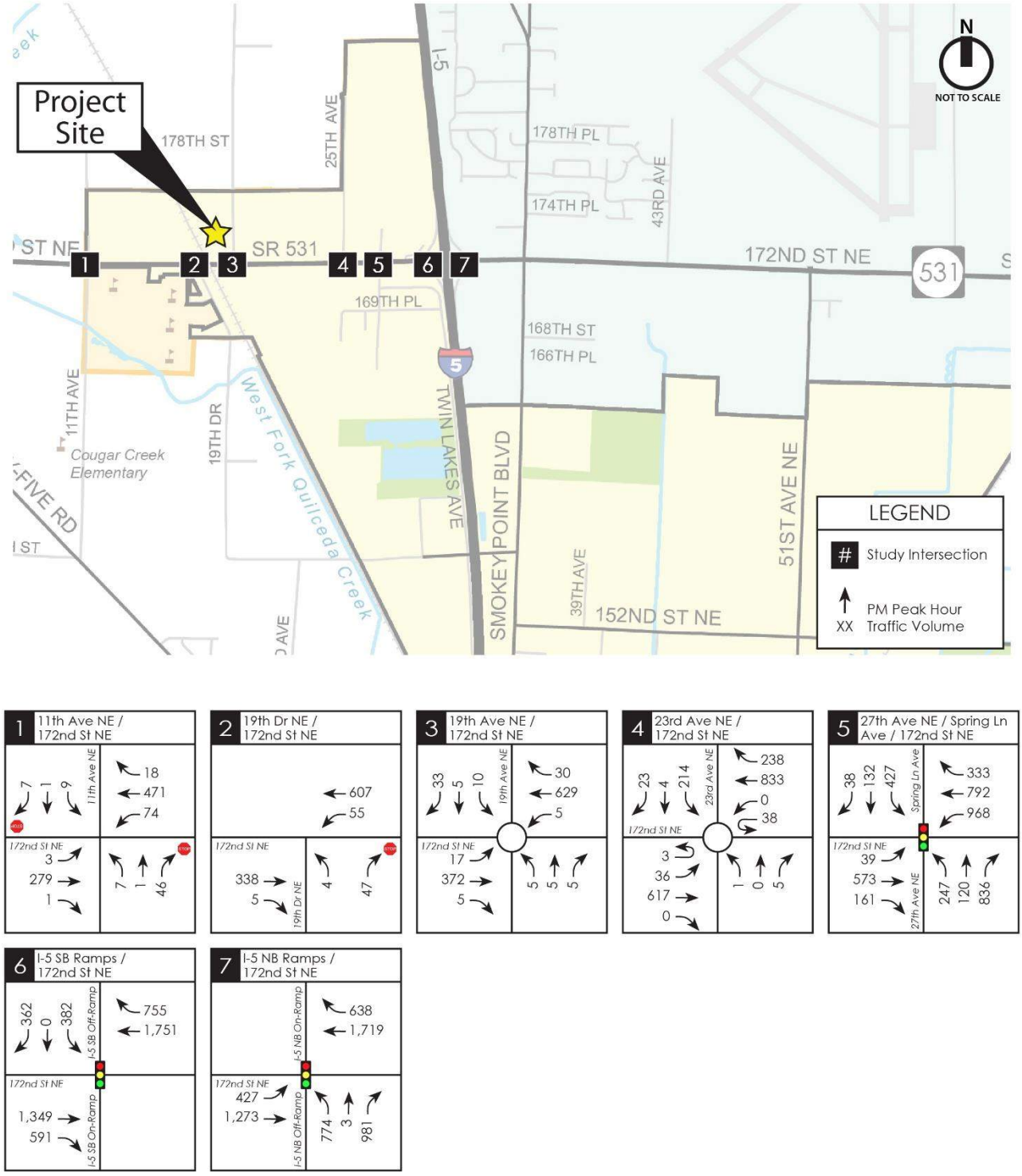


Figure 7: 2032 No Action Weekday PM Peak Hour Traffic Volumes (Horizon Year)

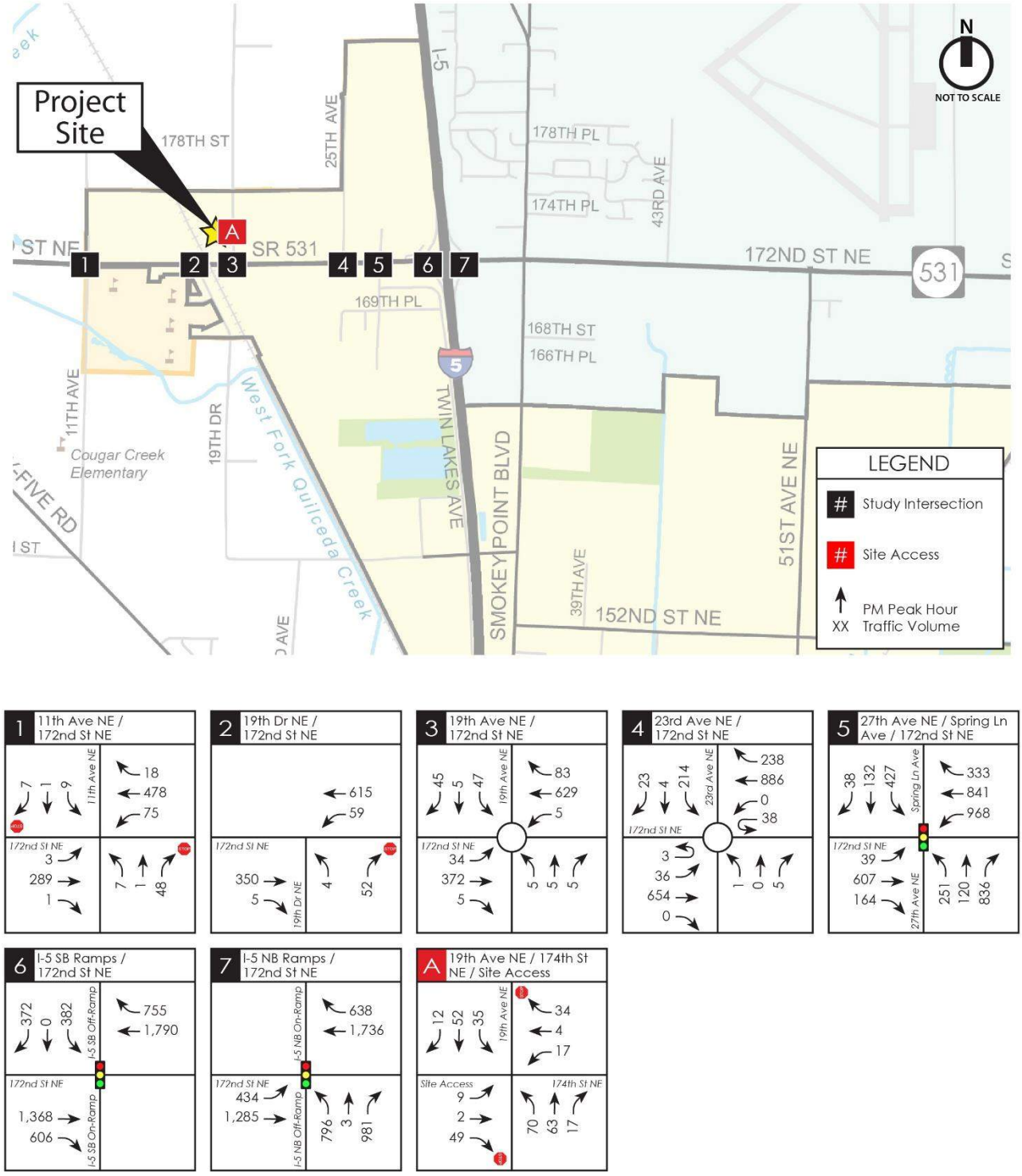


Figure 8: 2032 With Project Weekday PM Peak Hour Traffic Volumes (Horizon Year)

Intersection LOS Analysis

Future intersection LOS analyses during the weekday PM peak hour were evaluated at the seven (7) off-site study intersections for future year 2026 (buildout year) and 2032 (horizon year) conditions with and without the *English Crossing* project. Off-site study intersections were identified based on the City of Marysville's *Traffic Impact Analysis Guidelines (December 2021),* and confirmed through the traffic scoping process. The signal timing data used at the off-site signalized study intersections were based on data provided by the City of Marysville and WSDOT.

The 2026 and 2032 roadway networks assumed in the future LOS analyses were based on existing intersection geometry, plus at least partial completion of the following City planned improvements:

- 172nd Street NE / 19th Avenue NE Roundabout – construct new roundabout at the 19th Avenue NE / 172nd Street NE intersection. (Marysville TIP Project #24)

  Note: this improvement is required as a condition of approval for the Lodge Apartments project and is expected to be a condition of approval for English Crossing. As such, this improvement is assumed to be completed in the 2026 No Action and 2026 With Project scenarios.

- 172nd Street NE from 27th Avenue NE to 19th Avenue NE – widen to a 4/5-lane section with pedestrian and bicycle facilities between 27th Avenue NE and 19th Avenue NE. (Marysville TIP 30)

  Note: this improvement is assumed to be completed in the 2032 No Action and 2032 With Project scenarios as development is completed along the corridor.

- 172nd Street NW from 19th Drive NE to 11th Avenue NE – widen to a 3-lane section with pedestrian and bicycle facilities between 19th Drive NE and 11th Avenue NE.

  Note: this improvement is assumed to be completed in the 2032 No Action and 2032 With Project scenarios as development is completed along the corridor but does not change roadway geometry at any of the off-site intersections.

- New 19th Avenue NE Extension – construct new 3-lane roadway between 156th Street NE and 172nd Street NE that would include pedestrian and bicycle facilities. (Marysville TIP #51)

  Note: this improvement is assumed to be completed in the 2032 No Action and 2032 With Project scenarios as development is completed along the corridor.

The intersection LOS results are summarized in Tables 8 and 9 and detailed LOS worksheets are provided in Appendix C.

Table 8
2026 Buildout Year – Weekday PM Peak Hour LOS Summary

	No Action		With Project	
Study Intersection / Movement	LOS	Delay (sec)	LOS	Delay (sec)
Stop-Controlled Intersections:				
1) 11th Ave NE / 172nd St NE				
Eastbound Left-Turn	A	8.2	A	8.3
Westbound Left-Turn	A	7.9	A	7.9
Northbound Approach	B	12.0	B	12.1
Southbound Approach	B	14.9	C	15.2
2) 19th Dr NE / 172nd St NE				
Westbound Left-Turn	A	8.1	A	8.1
Northbound Approach	B	10.8	B	10.9
Roundabouts:				
3) 19th Ave NE / 172nd St NE	A	3.9	A	4.3
4) 23rd Ave NE / 172nd St NE	A	4.5	A	4.5
Signalized Intersections:				
5) 27th Ave NE / 172nd St NE	E	68.2	E	66.3
6) I-5 SB / 172nd St NE	A	6.8	A	6.7
7) I-5 NB / 172nd St NE	C	24.8	C	26.1

Table 9
2032 Horizon Year – Weekday PM Peak Hour LOS Summary

	No Action		With Project	
Study Intersection / Movement	LOS	Delay (sec)	LOS	Delay (sec)
Stop-Controlled Intersections:				
1) 11th Ave NE / 172nd St NE				
Eastbound Left-Turn	A	8.5	A	8.5
Westbound Left-Turn	A	8.1	A	8.1
Northbound Approach	B	13.8	B	14.0
Southbound Approach	C	17.1	C	17.4
2) 19th Dr NE / 172nd St NE				
Westbound Left-Turn	A	8.3	A	8.3
Northbound Approach	B	11.6	B	11.8
Roundabouts:				
3) 19th Ave NE / 172nd St NE	A	3.3	A	3.8
4) 23rd Ave NE / 172nd St NE	A	4.7	A	4.8
Signalized Intersections:				
5) 27th Ave NE / 172nd St NE	F	92.5	F	90.4
6) I-5 SB / 172nd St NE	A	6.5	A	6.4
7) I-5 NB / 172nd St NE	D	44.5	D	49.0

As shown in **Table 8,** at the time of anticipated project opening (year 2026), all off-site study intersections are expected to meet the applicable LOS standards during the weekday PM peak hour in year 2026 without or with the proposed project. This includes the 27th Ave NE / 172nd St NE intersection since it currently operates at LOS E and will remain at LOS E in 2026.

As shown in **Table 9,** by 2032, all off-site study intersections are expected to meet the applicable level of service standards during the weekday PM peak hour without or with the proposed project with one exception. The intersection of 27th Avenue NE/172nd Street NE is anticipated to operate at LOS F during the weekday PM peak hour under the 2032 No Action and 2032 With Project scenarios.

The City of Marysville and WSDOT LOS standard at intersections is LOS D with one exception. The City of Marysville *Traffic Impact Analysis Guidelines* state that intersections on the 172nd Street NE (SR 531) corridor which have an existing LOS E prior to development submittal shall only be required to mitigate upon falling below LOS E. This applies to the 27th Ave NE / 172nd St NE intersection for the buildout year 2026 analysis. However, for the 2032 horizon year analysis, this intersection is anticipated to operate at LOS F with or without the project.

The City's long-term plan for addressing this anticipated LOS F condition at the 27th Avenue NE/172nd Street NE intersection is the 156th Street NE Interchange project planned by WSDOT (TIP #61). The 156th Street NE interchange with I-5 is expected to shift some traffic away from the 27th Avenue NE/172nd Street NE intersection, also reducing demand on the 172nd Street NE corridor and improving LOS at this and other intersection. Until funding is identified for the new interchange, it is expected that the 27th Avenue NE / 172nd Street NE intersection in the future will function at LOS E/F during peak hours.

Additionally, and in response to City comments, several transportation improvement options were evaluated at the 27th Avenue NE/172nd Street NE intersection in 2032 with the proposed English Crossing project such as eastbound and southbound right-turn lanes, a dual northbound right-turn lane, and a two-lane roundabout. Based on this preliminary alternative analysis, the improvement that would be anticipated to improve operations at the 27th Avenue NE/172nd Street NE to level of service (LOS) D is adding a second northbound right-turn lane which would result in dual right-turn lanes.

It should also be noted that the addition of project traffic to intersections #5 and #6 results in a decrease (improvement) in the overall average intersection delay during the weekday PM peak hour. This occurs because the project adds trips to non-critical movements instead of movements with higher levels of delay. While counterintuitive, this phenomenon results in a decrease in the average delay for the entire intersection.

Site Access Evaluation

Vehicular access to the site would be provided be provided via a new site access roadway connection to 19th Ave NE, aligned with 174th Street NE. Secondary access for emergency vehicles only would be provided north of 174th Street NE via another new site access roadway connection to 19th Ave NE. To evaluate the operations of the site access intersection, a level of service (LOS) and queue analysis was completed. The weekday PM peak hour LOS and queue analysis at the site access intersection was based on the methodology outlined in the 6th Edition of the *Highway Capacity Manual* using *Synchro 11* software.

Table 10
PM Peak Hour Site Access LOS and Queuing

	2026 With Project			2032 With Project		
Controlled Movements	LOS [1]	Delay	95th % Queue (ft)[3]	LOS [1]	Delay	95th % Queue (ft)[3]
A. 19th Ave NE / 174th St NE / Site Access						
Eastbound Approach	A	9.5	<25'	A	9.6	<25'
Westbound Approach	B	10.2	<25'	B	10.4	<25'
Northbound Left-Turn	A	7.5	<25'	A	7.5	<25'
Southbound Left-Turn	A	7.4	<25'	A	7.5	<25'

1. LOS = Level of Service
2. Delay refers to average control delay expressed in seconds per vehicle.
3. Queues are 95th Percentile queues. <25' indicates 95th Percentile queue statistically less than 1 vehicle.

Table 9 summarizes the calculated LOS and the 95th percentile queues of the controlled movements at the site access intersection during the weekday PM peak hour in 2026 (buildout year) and 2032 (horizon year) with the proposed project. The reported 95th percentile queues represent a condition that is exceeded only 5 percent of the time. Detailed LOS and queue calculation worksheets are included in Appendix C.

Snohomish County Key Intersections

In accordance with the *Snohomish County Traffic Worksheet and Traffic Study Requirements for Developments in the City of Marysville*, project trip impacts at Snohomish County key intersections were identified. Weekday AM and PM peak hour Trip Distribution and Assignment figures and tables were prepared consistent with these guidelines and are included in Appendix F.

MITIGATION

The following measures have been identified to mitigate traffic impacts of the proposed *English Crossing* project.

City of Marysville Traffic Impact Fees. The City of Marysville requires payment of transportation impact fees to help fund planned roadway improvements throughout the City. Transportation impact fees for the proposed *English Crossing* project were calculated based on the trip generation estimate documented in this TIA and the City of Marysville's currently adopted transportation impact fee rate of $6,300 per PM peak hour trip. The proposed *English Crossing* project is estimated to generate 250 new PM peak hour trips. As a result, the estimated City of Marysville transportation impact fee is **$919,800** ($6,300 X 146 PM peak hour trips). Actual impact fees will be calculated by the City at the time of building permit issuance.

27th Ave NE/172nd Street NE Intersection. This intersection is anticipated to operate at LOS F in the future 2032 horizon year PM peak hour as a result of the funding loss for the 156th Street NE interchange with I-5. A couple options that should be considered by the City include: (1) adding a 2nd northbound right-turn lane, and/or (2) allowing the intersection operation to exceed the LOS threshold until funding for the 156th Street NE interchange is funded.

Snohomish County Mitigation. The City of Marysville and Snohomish County have adopted an interlocal agreement whereby developments in Marysville must assess potential mitigation for impacts on Snohomish County roadway facilities. Mitigation fees to Snohomish County are based on predetermined distribution percentages according to location or specific project impacts to planned roadway improvements. Mitigation fees to Snohomish County were based on the use of the standard distribution percentage based on the project location (20%) multiplied by the daily trip generation (1,855 new daily project trips) and adopted cost per ADT ($185 for residential developments within TSA A and the UGA). The resulting Snohomish County transportation impact fee is **$68,635**. A mitigation offer form to Snohomish County will be submitted separately and is included in **Appendix G**.

Future City Road Plans. The *English Crossing* project would build a portion of the following City planned roadway improvements:

- Construct and dedicate right-of-way for the western half-street of a 3-lane section on 19th Avenue NE from 172nd Street NE to the northern site property line.
- Construct and dedicate right-of-way for the northern half-street of a 3-lane section on 172nd Street NE from 19th Avenue NE to the western site property line.
- Construct a new roundabout (or a portion of a new roundabout) at 19th Avenue NE / 172nd Street NE if not already completed by other development.

It should be noted that it is anticipated the applicant would receive transportation impact fee credit for construction and ROW dedication of all of these roadway construction projects as confirmed by the City.

Appendix A

Crash Data

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	MILEPOST	DATE	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO
City Street	Snohomish	Marysville	19TH AVE E	17400		300	F	N	172ND ST NE		11/22/2018	No Apparent Injury	0	0	1	0	0	Going Straight Ahead		North	South		
City Street	Snohomish	Marysville	19TH AVE E	17400		0.1	M	N	172ND ST NE		01/27/2019	No Apparent Injury	0	0	1	0	0	Going Straight Ahead		South	North		
City Street	Snohomish	Marysville	27TH AVE E	17200		137	F	N	SR 531		01/23/2019	No Apparent Injury	0	0	1	0	0	Going Straight Ahead		South	North		
State Route	Snohomish	Arlington	531							6.22	05/05/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Arlington	531							6.23	05/18/2019	No Apparent Injury	0	0	2	0	0	Making Right Turn	Going Straight Ahead	North	West	East	West
State Route	Snohomish	Arlington	531							6.24	10/21/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.25	08/31/2022	Suspected Serious Inju	1	0	1	0	1	Stopped at Signal or Stop Sign		Vehicle Stopped	Vehicle Stopped		
State Route	Snohomish	Arlington	531							6.25	08/17/2021	No Apparent Injury	0	0	2	0	0	Making Right Turn	Stopped for Traffic	North	South	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.26	03/30/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	East	West	East	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.26	06/28/2020	No Apparent Injury	0	0	2	0	0	Making Right Turn	Going Straight Ahead	North	West	East	West
State Route	Snohomish	Arlington	531							6.26	08/20/2019	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Making Left Turn	East	West	North	East
State Route	Snohomish	Arlington	531							6.26	01/24/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Arlington	531							6.26	11/27/2019	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.26	01/06/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	East	West	North	East
State Route	Snohomish	Arlington	531							6.26	11/23/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	North	South	East	West
State Route	Snohomish	Arlington	531							6.26	07/20/2018	Possible Injury	1	0	2	0	0	Going Straight Ahead	Making Left Turn	East	West	North	East
State Route	Snohomish	Arlington	531							6.26	01/08/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	East	West	North	East
State Route	Snohomish	Arlington	531							6.26	04/27/2022	Suspected Minor Injur	1	0	2	0	0	Going Straight Ahead	Going Straight Ahead	East	West	North	South
State Route	Snohomish	Arlington	531							6.26	06/07/2022	Suspected Minor Injur	1	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	North	East
State Route	Snohomish	Arlington	531							6.26	01/17/2021	Possible Injury	1	0	3	0	0	Going Straight Ahead	Making Left Turn	East	West	North	East
State Route	Snohomish	Arlington	531							6.26	11/16/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	North	East
State Route	Snohomish	Arlington	531							6.26	09/03/2021	No Apparent Injury	0	0	2	0	0	Making Left Turn	Going Straight Ahead	North	East	East	West
State Route	Snohomish	Arlington	531							6.26	05/22/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	East	West	East	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.26	04/30/2022	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	East	West	North	East
State Route	Snohomish	Arlington	531							6.26	07/26/2022	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	East	West	North	East
State Route	Snohomish	Arlington	531							6.28	05/02/2021	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.28	02/07/2019	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.29	03/17/2018	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	Southeast	Northwest	East	West
State Route	Snohomish	Arlington	531							6.31	01/30/2022	Possible Injury	1	0	2	0	0	Changing Lanes	Going Straight Ahead	West	East	West	East
State Route	Snohomish	Arlington	531							6.32	08/10/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	East	West	East	West
State Route	Snohomish	Arlington	531							6.33	05/04/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Changing Lanes	East	West	East	West
State Route	Snohomish	Arlington	531							6.35	05/10/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	North	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.35	01/15/2022	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.36	01/03/2019	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Arlington	531							6.36	05/29/2020	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Arlington	531							6.37	04/20/2021	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	West	East	West	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.37	02/03/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.38	11/27/2018	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Arlington	531							6.38	10/28/2021	Possible Injury	3	0	3	0	0	Going Straight Ahead	Slowing	West	East	West	East
State Route	Snohomish	Arlington	531							6.40	12/23/2021	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Slowing	East	West	East	West
State Route	Snohomish	Arlington	531							6.40	04/16/2022	No Apparent Injury	0	0	2	0	0	Starting in Traffic Lane	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Arlington	531							6.40	11/16/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Arlington	531							6.41	01/25/2022	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	West	East
State Route	Snohomish	Arlington	531							6.42	03/14/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	East	West	South	North
State Route	Snohomish	Arlington	531							6.42	03/26/2018	Possible Injury	4	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	South	North
State Route	Snohomish	Arlington	531							6.42	05/31/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	South	North	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.42	10/22/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	West	West	South	West
State Route	Snohomish	Arlington	531							6.42	10/31/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	West	East	South	North
State Route	Snohomish	Arlington	531							6.42	01/08/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	South	West
State Route	Snohomish	Arlington	531							6.42	08/14/2022	Possible Injury	1	0	2	0	0	Making Left Turn	Going Straight Ahead	South	West	West	East
State Route	Snohomish	Arlington	531							6.42	10/16/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	West	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.42	10/20/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	South	West
State Route	Snohomish	Arlington	531							6.42	09/23/2021	No Apparent Injury	0	0	2	0	0	Making U-Turn	Going Straight Ahead	West	West	West	East
State Route	Snohomish	Arlington	531							6.42	07/31/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	North	East
State Route	Snohomish	Arlington	531							6.42	05/05/2019	No Apparent Injury	0	0	1	0	0	Going Straight Ahead		East	South		
State Route	Snohomish	Arlington	531							6.42	12/24/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	South	West
State Route	Snohomish	Arlington	531							6.42	04/03/2022	Suspected Serious Inju	1	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	West	East	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.42	11/10/2020	No Apparent Injury	0	0	2	0	0	Making Left Turn	Making Left Turn	South	West	South	West
State Route	Snohomish	Arlington	531							6.42	09/13/2019	Suspected Minor Injur	1	0	2	0	0	Going Straight Ahead	Going Straight Ahead	West	East	South	North
State Route	Snohomish	Arlington	531							6.42	10/21/2022	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Making Left Turn	West	East	South	West
State Route	Snohomish	Arlington	531							6.42	11/05/2021	No Apparent Injury	1	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	West	North
State Route	Snohomish	Arlington	531							6.42	01/15/2022	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Making Left Turn	West	East	South	West
State Route	Snohomish	Arlington	531							6.42	05/13/2021	Suspected Minor Injur	2	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	South	West
State Route	Snohomish	Arlington	531							6.42	05/13/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	South	West
State Route	Snohomish	Arlington	531							6.42	01/12/2019	Possible Injury	1	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	South	West
State Route	Snohomish	Arlington	531							6.43	01/23/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	West	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.43	11/18/2019	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	East	Southwest	East	West
State Route	Snohomish	Arlington	531							6.43	12/14/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.44	07/25/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	West	East	West	East
State Route	Snohomish	Arlington	531							6.44	12/19/2019	No Apparent Injury	0	0	2	0	0	Making Right Turn	Stopped for Traffic	South	East	South	East
State Route	Snohomish	Arlington	531							6.44	12/15/2018	No Apparent Injury	0	0	2	0	0	Changing Lanes	Slowing	East	West	East	West
State Route	Snohomish	Arlington	531							6.44	12/27/2019	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.45	10/03/2018	Possible Injury	1	0	2	0	0	Other*	Other*	West	East	West	East
State Route	Snohomish	Arlington	531							6.45	08/29/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	West	East	West
State Route	Snohomish	Arlington	531							6.45	06/25/2021	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	West	East	West	East
State Route	Snohomish	Arlington	531							6.46	04/07/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead		East	West		
State Route	Snohomish	Arlington	531							6.46	11/06/2019	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	West	East	West	East
State Route	Snohomish	Arlington	531							6.46	12/30/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.47	01/31/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	West	East	East	West
State Route	Snohomish	Arlington	531							6.47	09/23/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	East	West	East	West
State Route	Snohomish	Arlington	531							6.47	03/22/2021	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	West	Northeast	West	East
State Route	Snohomish	Arlington	531							6.48	03/08/2021	Possible Injury	1	0	2	0	0	Going Straight Ahead	Slowing	East	West	East	West
State Route	Snohomish	Arlington	531							6.49	08/21/2018	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	531							6.49	05/08/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	West	East
State Route	Snohomish	Arlington	005P120538							0.60	05/13/2022	No Apparent Injury	0	0	2	0	0	Changing Lanes	Starting in Traffic Lane	South	North	South	North
State Route	Snohomish	Arlington	005P120538							0.60	04/13/2021	No Apparent Injury	0	0	1	0	0	Going Straight Ahead		South	North		
State Route	Snohomish	Arlington	005P120538							0.60	12/05/2022	Possible Injury	1	0	2	0	0	Starting in Traffic Lane	Stopped for Traffic	Vehicle Stopped	North	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	005P120538							0.64	03/02/2022	Possible Injury	1	0	2	0	0	Going Straight Ahead	Slowing	South	North	South	North
State Route	Snohomish	Arlington	005P120538							0.64	11/02/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	South	North	South	North
State Route	Snohomish	Arlington	005P120538							0.66	10/04/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	South	North	South	North
State Route	Snohomish	Arlington	005P120538							0.66	01/02/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	South	North	South	Vehicle Stopped
State Route	Snohomish	Arlington	005P120538							0.67	08/24/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	South	North	South	North
State Route	Snohomish	Arlington	005P120538							0.68	07/19/2019	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	South	North	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	005P120538							0.68	12/03/2021	No Apparent Injury	0	0	2	0	0	Changing Lanes	Starting in Traffic Lane	South	North	South	North
State Route	Snohomish	Arlington	005P120538							0.68	11/09/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	South	North	South	North
State Route	Snohomish	Arlington	005P120538							0.68	11/12/2018	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped for Traffic	South	North	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	005P120538							0.69	10/23/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Starting in Traffic Lane	South	North	South	North
State Route	Snohomish	Arlington	005P120538							0.70	02/09/2020	No Apparent Injury	0	0	1	0	0	Negotiating a Curve		South	East		
State Route	Snohomish	Arlington	005P120538							0.70	04/03/2022	Possible Injury	1	0	1	1	0	Making Right Turn		North	East		
State Route	Snohomish	Arlington	005P120538							0.70	06/29/2022	No Apparent Injury	0	0	2	0	0	Making Right Turn	Stopped for Traffic	South	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	005P120538							0.71	08/07/2018	Possible Injury	2	0	2	0	0	Making Right Turn	Making Right Turn	West	East	West	East
State Route	Snohomish	Arlington	005P120538							0.71	06/06/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	South	North	North	Vehicle Stopped
State Route	Snohomish	Arlington	005P120538							0.71	04/22/2022	Possible Injury	1	0	2	0	0	Making Right Turn	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Arlington	005Q120660							0.02	09/22/2018	No Apparent Injury	0	0	2	0	0	Making Right Turn	Making Right Turn	South	North	South	North
State Route	Snohomish	Arlington	005Q120660							0.05	08/28/2018	No Apparent Injury	0	0	2	0	0	Overtaking and Passing	Going Straight Ahead	South	North	South	North
State Route	Snohomish	Arlington	005Q120660							0.05	03/31/2022	Possible Injury	1	0	2	0	0	Merging (Entering Traffic)	Going Straight Ahead	South	North	South	North
State Route	Snohomish	Arlington	005S120553							0.04	05/21/2019	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	West	South	West	South
State Route	Snohomish	Arlington	005S520553							0.07	04/17/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	West
State Route	Snohomish	Marysville	531							5.12	05/06/2022	No Apparent Injury	0	0	2	0	0	Making Left Turn	Going Straight Ahead	South	West	East	West
State Route	Snohomish	Marysville	531							5.12	06/10/2021	No Apparent Injury	0	0	2	0	0	Overtaking and Passing	Stopped at Signal or Stop Si	South	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.12	08/07/2021	Suspected Minor Injur	2	0	2	0	0	Going Straight Ahead	Going Straight Ahead	North	South	West	East
State Route	Snohomish	Marysville	531							5.12	12/20/2020	Possible Injury	2	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	East	South
State Route	Snohomish	Marysville	531							5.18	04/06/2018	Suspected Minor Injur	4	0	2	0	0	Going Straight Ahead	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Marysville	531							5.20	01/21/2019	No Apparent Injury	0	0	1	0	0	Going Straight Ahead		East	West		
State Route	Snohomish	Marysville	531							5.30	09/25/2018	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.31	12/07/2019	No Apparent Injury	0	0	2	0	0	Making Right Turn	Going Straight Ahead	North	West	East	West
State Route	Snohomish	Marysville	531							5.38	07/06/2019	No Apparent Injury	0	0	2	0	0	Making Left Turn	Going Straight Ahead	West	North	East	West
State Route	Snohomish	Marysville	531							5.43	11/25/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.45	11/19/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.50	04/26/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	South	North	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.50	12/17/2020	Possible Injury	2	0	2	0	0	Making Left Turn	Going Straight Ahead	West	Northwest	West	East
State Route	Snohomish	Marysville	531							5.50	01/25/2019	Possible Injury	1	0	2	0	0	Making Left Turn	Going Straight Ahead	East	South	West	East
State Route	Snohomish	Marysville	531							5.50	02/27/2020	Possible Injury	2	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	East	South
State Route	Snohomish	Marysville	531							5.54	04/23/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.54	03/27/2019	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.54	01/30/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	East	West	East	West
State Route	Snohomish	Marysville	531							5.56	01/29/2020	Possible Injury	1	0	3	0	0	Going Straight Ahead	Stopped for Traffic	East	West	East	West
State Route	Snohomish	Marysville	531							5.56	03/04/2020	Suspected Minor Injur	3	0	3	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.58	02/27/2018	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Stopped for Traffic	West	East	West	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.59	02/14/2018	Possible Injury	2	0	3	0	0	Going Straight Ahead	Slowing	West	East	West	West
State Route	Snohomish	Marysville	531							5.60	01/24/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.60	10/17/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.61	06/27/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	West	East	West	East
State Route	Snohomish	Marysville	531							5.61	05/24/2021	Possible Injury	1	0	3	0	0	Slowing	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.61	08/19/2018	Possible Injury	2	0	3	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.62	12/17/2018	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped

State Route	Snohomish	Marysville	531							5.62	01/08/2020	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.62	12/17/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Legally Parked, Unoccupied	North	South	North	South
State Route	Snohomish	Marysville	531							5.62	04/26/2020	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped in Roadway	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.62	04/09/2022	No Apparent Injury	0	0	2	0	0	Making Left Turn	Going Straight Ahead	East	North	North	South
State Route	Snohomish	Marysville	531							5.62	05/07/2022	Possible Injury	1	0	2	0	0	Making Left Turn	Going Straight Ahead	North	East	West	East
State Route	Snohomish	Marysville	531							5.62	03/17/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	West	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.62	06/27/2021	No Apparent Injury	0	0	2	0	0	Slowing	Slowing	West	East	West	East
State Route	Snohomish	Marysville	531							5.63	03/06/2019	No Apparent Injury	0	0	2	0	0	Slowing	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.63	05/30/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	West	East	West	East
State Route	Snohomish	Marysville	531							5.64	05/10/2020	No Apparent Injury	0	0	2	0	0	Slowing	Slowing	East	West	East	West
State Route	Snohomish	Marysville	531							5.64	10/09/2018	Possible Injury	2	0	2	0	0	Going Straight Ahead	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Marysville	531							5.68	05/24/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	West	East
State Route	Snohomish	Marysville	531							5.72	11/07/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	East	West	East	West
State Route	Snohomish	Marysville	531							5.75	03/04/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.77	11/20/2020	Possible Injury	2	0	2	0	0	Going Straight Ahead	Slowing	East	West	East	West
State Route	Snohomish	Marysville	531							5.77	01/02/2018	Possible Injury	1	0	1	0	0	Going Straight Ahead		West	East		
State Route	Snohomish	Marysville	531							5.82	10/03/2019	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Marysville	531							5.83	10/09/2022	Possible Injury	1	0	1	0	0	Going Straight Ahead		West	East		
State Route	Snohomish	Marysville	531							5.83	08/21/2021	Possible Injury	1	0	1	0	0	Going Straight Ahead		West	East		
State Route	Snohomish	Marysville	531							5.85	11/19/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	East	West	East	West
State Route	Snohomish	Marysville	531							5.85	12/13/2018	Possible Injury	2	0	2	0	0	Going Straight Ahead	Slowing	West	East	West	East
State Route	Snohomish	Marysville	531							5.86	09/28/2018	No Apparent Injury	0	0	2	0	0	Making Left Turn	Going Straight Ahead	North	East	West	East
State Route	Snohomish	Marysville	531							5.86	11/03/2020	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	West	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.87	01/02/2021	No Apparent Injury	0	0	2	0	0	Merging (Entering Traffic)	Going Straight Ahead	West	East	North	South
State Route	Snohomish	Marysville	531							5.87	01/19/2022	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	West	East	North	East
State Route	Snohomish	Marysville	531							5.88	08/06/2020	Suspected Minor Injur	1	0	2	0	0	Going Straight Ahead	Making Right Turn	East	West	East	North
State Route	Snohomish	Marysville	531							5.88	10/13/2022	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.88	01/09/2021	No Apparent Injury	0	0	2	0	0	Making Right Turn	Going Straight Ahead	West	East	South	North
State Route	Snohomish	Marysville	531							5.88	09/02/2022	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	East	West	East	West
State Route	Snohomish	Marysville	531							5.90	01/05/2018	Possible Injury	1	0	1	1	0	Going Straight Ahead		East	West		
State Route	Snohomish	Marysville	531							5.92	01/18/2018	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	Northeast	Southwest	East	West
State Route	Snohomish	Marysville	531							5.92	12/29/2020	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							5.94	05/10/2020	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Marysville	531							5.96	08/24/2021	Suspected Minor Injur	1	0	1	0	0	Other*		West	East		
State Route	Snohomish	Marysville	531							5.97	01/23/2018	No Apparent Injury	0	0	1	0	0	Going Straight Ahead		West	East		
State Route	Snohomish	Marysville	531							6.04	10/26/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	West	East	West	East
State Route	Snohomish	Marysville	531							6.07	04/06/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	East	West	West	East
State Route	Snohomish	Marysville	531							6.07	11/05/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	East	West	West	East
State Route	Snohomish	Marysville	531							6.07	07/28/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.10	05/21/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	West	East	West	East
State Route	Snohomish	Marysville	531							6.11	05/01/2018	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Slowing	East	West	East	West
State Route	Snohomish	Marysville	531							6.11	08/16/2021	No Apparent Injury	0	0	2	0	0	Changing Lanes	Stopped for Traffic	West	Northeast	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.13	08/02/2022	No Apparent Injury	0	0	2	0	0	Making Right Turn	Making Left Turn	South	East	North	East
State Route	Snohomish	Marysville	531							6.13	09/13/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.13	12/10/2020	No Apparent Injury	0	0	2	0	0	Overtaking and Passing	Stopped at Signal or Stop Si	North	South	North	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.13	11/11/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Left Turn	West	South	South	West
State Route	Snohomish	Marysville	531							6.13	12/13/2019	Possible Injury	1	0	2	0	0	Stopped at Signal or Stop Sign	Going Straight Ahead	Vehicle Stopped	Vehicle Stopped	North	South
State Route	Snohomish	Marysville	531							6.13	11/19/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.13	09/19/2022	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	East	West	East	West
State Route	Snohomish	Marysville	531							6.13	08/09/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	North	South	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.13	11/16/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	North	South	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.13	01/03/2020	No Apparent Injury	0	0	1	0	0	Making Left Turn		South	West		
State Route	Snohomish	Marysville	531							6.13	03/13/2022	Possible Injury	2	0	2	0	0	Going Straight Ahead	Stopped in Roadway	West	East	West	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.13	09/24/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	North	South	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.13	07/26/2021	No Apparent Injury	0	0	3	0	0	Making Left Turn	Going Straight Ahead	West	North	East	West
State Route	Snohomish	Marysville	531							6.13	02/04/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.13	05/12/2020	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Going Straight Ahead	West	East	South	North
State Route	Snohomish	Marysville	531							6.13	12/05/2021	No Apparent Injury	0	0	2	0	0	Making U-Turn	Making Left Turn	East	East	East	South
State Route	Snohomish	Marysville	531							6.13	07/17/2021	Possible Injury	1	0	2	0	0	Going Straight Ahead	Going Straight Ahead	East	West	South	North
State Route	Snohomish	Marysville	531							6.13	09/07/2018	No Apparent Injury	0	0	2	0	0	Making Left Turn	Going Straight Ahead	East	South	West	East
State Route	Snohomish	Marysville	531							6.13	07/26/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.13	07/09/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.13	12/28/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	East	West	East	West
State Route	Snohomish	Marysville	531							6.13	02/25/2020	Possible Injury	2	0	2	0	0	Going Straight Ahead	Going Straight Ahead	South	North	East	West
State Route	Snohomish	Marysville	531							6.13	12/28/2019	No Apparent Injury	0	0	2	0	0	Making Left Turn	Making Left Turn	East	South	East	South
State Route	Snohomish	Marysville	531							6.13	12/31/2018	No Apparent Injury	0	0	2	0	0	Stopped at Signal or Stop Sign	Going Straight Ahead	Vehicle Stopped	North	South	North
State Route	Snohomish	Marysville	531							6.13	02/17/2022	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	East	West	South	North
State Route	Snohomish	Marysville	531							6.13	01/07/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.14	09/07/2019	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Going Straight Ahead	West	East	West	East
State Route	Snohomish	Marysville	531							6.14	04/07/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	North	West	North	West
State Route	Snohomish	Marysville	531							6.14	11/15/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.15	04/11/2018	Possible Injury	1	0	1	0	0	Going Straight Ahead		West	East		
State Route	Snohomish	Marysville	531							6.15	06/03/2022	No Apparent Injury	0	0	3	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.16	01/09/2021	No Apparent Injury	0	0	2	0	0	Changing Lanes	Stopped for Traffic	East	North	East	South
State Route	Snohomish	Marysville	531							6.16	10/15/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Marysville	531							6.17	11/09/2018	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Marysville	531							6.18	09/24/2020	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	West	East	West	East
State Route	Snohomish	Marysville	531							6.18	02/05/2022	Possible Injury	1	0	3	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.19	05/17/2021	Suspected Minor Injur	1	0	3	0	0	Going Straight Ahead	Stopped for Traffic	West	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.19	12/05/2021	Possible Injury	1	0	2	0	0	Going Straight Ahead	Stopped for Traffic	East	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.19	06/07/2019	Possible Injury	1	0	2	0	0	Changing Lanes	Going Straight Ahead	West	East	West	East
State Route	Snohomish	Marysville	531							6.19	03/02/2018	No Apparent Injury	0	0	2	0	0	Backing	Stopped at Signal or Stop Si	Vehicle Backing	Vehicle Backing	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.19	02/20/2020	No Apparent Injury	0	0	2	0	0	Making Right Turn	Changing Lanes	South	East	West	East
State Route	Snohomish	Marysville	531							6.19	12/29/2021	Possible Injury	1	0	2	0	0	Making Right Turn	Stopped for Traffic	South	East	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	531							6.19	12/04/2021	No Apparent Injury	0	0	2	0	0	Making Right Turn	Going Straight Ahead	South	East	West	East
State Route	Snohomish	Marysville	531							6.19	08/04/2021	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	West	East	West	East
State Route	Snohomish	Marysville	531							6.19	02/02/2022	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Making Right Turn	West	East	South	East
State Route	Snohomish	Marysville	531							6.20	05/29/2019	No Apparent Injury	0	0	2	0	0	Changing Lanes	Going Straight Ahead	East	West	East	West
State Route	Snohomish	Marysville	531							6.21	04/24/2019	Suspected Minor Injur	1	0	2	0	0	Going Straight Ahead	Stopped for Traffic	North	South	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.34	12/01/2022	No Apparent Injury	0	0	1	0	0	Negotiating a Curve		North	South		
State Route	Snohomish	Marysville	005R120644							0.36	09/23/2022	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	North	South	North	South
State Route	Snohomish	Marysville	005R120644							0.37	04/23/2020	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	North	South	North	South
State Route	Snohomish	Marysville	005R120644							0.37	06/21/2022	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	North	South	North	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.37	07/26/2021	No Apparent Injury	0	0	2	0	0	Making Right Turn	Stopped for Traffic	North	South	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.38	06/03/2021	No Apparent Injury	0	0	2	0	0	Making Right Turn	Stopped for Traffic	North	South	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.38	09/13/2020	Suspected Serious Inju	2	0	2	0	0	Making Right Turn	Stopped at Signal or Stop Si	North	Southwest	North	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.38	08/02/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	North	South	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.38	08/16/2022	Suspected Minor Injur	2	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	North	South	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.38	02/18/2019	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped at Signal or Stop Si	North	Southwest	North	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.38	04/08/2018	No Apparent Injury	0	0	2	0	0	Making Right Turn	Slowing	North	West	North	West
State Route	Snohomish	Marysville	005R120644							0.38	03/24/2019	No Apparent Injury	0	0	2	0	0	Making Right Turn	Stopped for Traffic	Vehicle Stopped	South	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.38	07/11/2018	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Stopped for Traffic	North	South	North	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.38	11/21/2021	No Apparent Injury	0	0	2	0	0	Going Straight Ahead	Slowing	North	South	North	South
State Route	Snohomish	Marysville	005R120644							0.39	06/24/2022	Possible Injury	3	0	2	0	0	Going Straight Ahead	Stopped for Traffic	North	South	North	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.39	06/03/2020	No Apparent Injury	0	0	2	0	0	Making Right Turn	Stopped for Traffic	North	West	Vehicle Stopped	Vehicle Stopped
State Route	Snohomish	Marysville	005R120644							0.39	12/10/2018	No Apparent Injury	0	0	2	0	0	Starting in Traffic Lane	Slowing	Vehicle Stopped	South	North	South
State Route	Snohomish	Marysville	005S520553							0.08	10/01/2022	No Apparent Injury	0	0	3	0	0	Making Right Turn	Stopped for Traffic	East	West	East	West
State Route	Snohomish	Marysville	005S520553							0.09	12/31/2018	No Apparent Injury	0	0	2	0	0	Stopped in Roadway	Slowing	West	South	West	South
State Route	Snohomish	Marysville	005S520553							0.09	10/31/2022	No Apparent Injury	0	0	1	0	0	Going Straight Ahead		North	South		

Appendix B

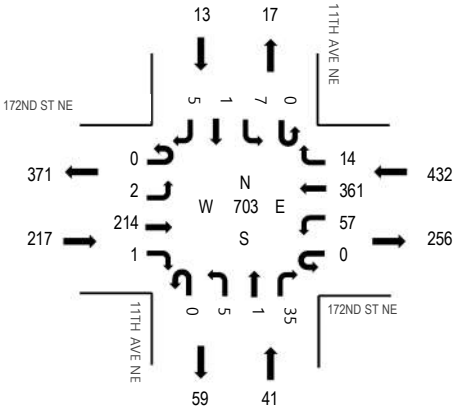
Existing Traffic Count Data

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

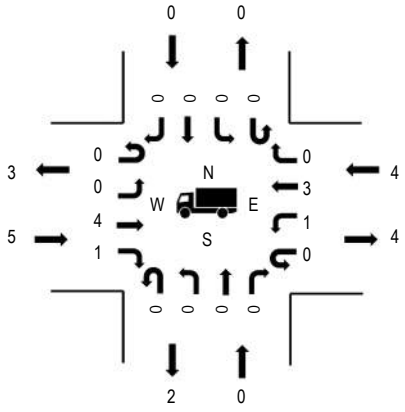
Location: 1 11TH AVE NE & 172ND ST NE PM
Date: Tuesday, February 28, 2023
Peak Hour: 05:00 PM - 06:00 PM

Peak Hour

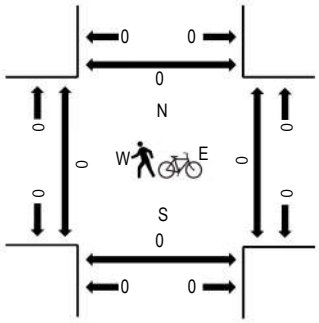
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	2.3%	0.82
WB	0.9%	0.95
NB	0.0%	0.85
SB	0.0%	0.81
All	1.3%	0.91

Traffic Counts - Motorized Vehicles

Interval Start Time	172ND ST NE Eastbound				172ND ST NE Westbound				11TH AVE NE Northbound				11TH AVE NE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	40	1	0	11	93	1	0	3	0	12	0	3	0	0	164	698
4:15 PM	0	0	54	4	0	20	104	0	0	1	1	12	0	0	0	0	196	701
4:30 PM	0	0	56	1	0	13	88	5	0	2	1	11	0	0	1	0	178	658
4:45 PM	0	1	40	1	0	15	88	3	0	1	1	9	0	1	0	0	160	670
5:00 PM	0	0	42	0	0	17	89	3	0	0	0	12	0	3	0	1	167	703
5:15 PM	0	0	46	0	0	12	78	6	0	1	0	8	0	0	1	1	153	
5:30 PM	0	1	62	0	0	14	97	2	0	1	1	9	0	3	0	0	190	
5:45 PM	0	1	64	1	0	14	97	3	0	3	0	6	0	1	0	3	193	
Count Total	0	3	404	8	0	116	734	23	0	12	4	79	0	11	2	5	1,401	
Peak Hour	0	2	214	1	0	57	361	14	0	5	1	35	0	7	1	5	703	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

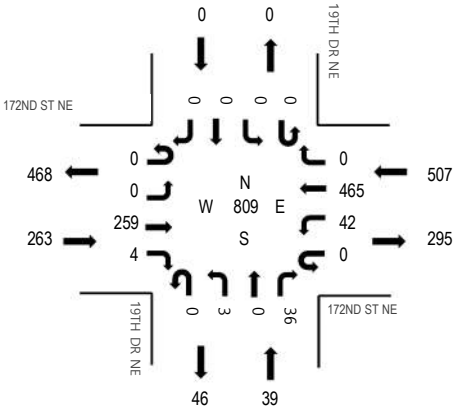
Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	1	0	1	4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0
4:45 PM	2	0	0	0	2	4:45 PM	0	0	0	0	0
5:00 PM	1	0	1	0	2	5:00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

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

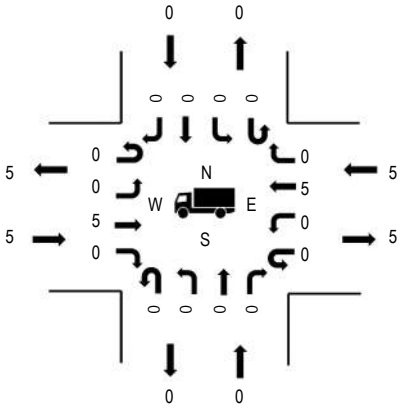
Location: 2 19TH DR NE & 172ND ST NE PM
Date: Tuesday, February 28, 2023
Peak Hour: 04:00 PM - 05:00 PM

Peak Hour

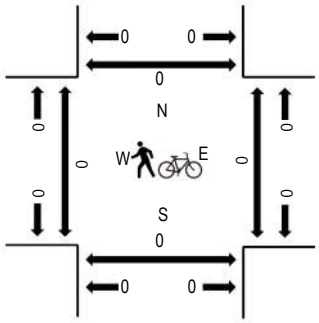
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	1.9%	0.88
WB	1.0%	0.87
NB	0.0%	0.70
SB	0.0%	0.00
All	1.2%	0.86

Traffic Counts - Motorized Vehicles

Interval Start Time	172ND ST NE Eastbound				172ND ST NE Westbound				19TH DR NE Northbound				19TH DR NE 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	59	2	0	11	111	0	0	0	0	10	0	0	0	0	193	809
4:15 PM	0	0	74	1	0	9	136	0	0	2	0	12	0	0	0	0	234	794
4:30 PM	0	0	74	0	0	11	94	0	0	1	0	4	0	0	0	0	184	750
4:45 PM	0	0	52	1	0	11	124	0	0	0	0	10	0	0	0	0	198	782
5:00 PM	0	0	60	0	0	9	100	0	0	1	0	8	0	0	0	0	178	802
5:15 PM	0	0	57	1	0	9	106	0	0	1	0	16	0	0	0	0	190	
5:30 PM	0	0	76	1	0	12	117	0	0	1	0	9	0	0	0	0	216	
5:45 PM	0	0	80	0	0	15	117	0	0	0	0	6	0	0	0	0	218	
Count Total	0	0	532	6	0	87	905	0	0	6	0	75	0	0	0	0	1,611	
Peak Hour	0	0	259	4	0	42	465	0	0	3	0	36	0	0	0	0	809	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

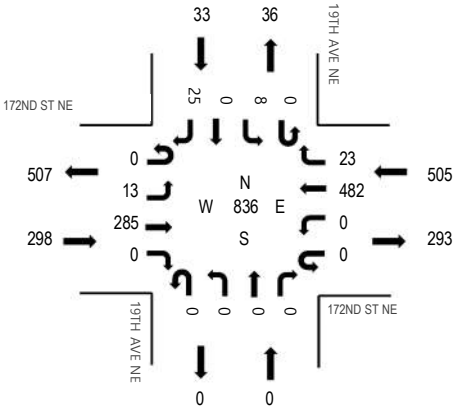
Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	2	0	2	4:00 PM	0	0	0	0	0
4:15 PM	2	0	2	0	4	4:15 PM	0	0	0	0	0
4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0
4:45 PM	3	0	0	0	3	4:45 PM	0	0	0	0	0
5:00 PM	1	0	1	0	2	5:00 PM	0	0	0	0	0
5:15 PM	0	0	2	0	2	5:15 PM	0	0	0	0	0
5:30 PM	0	0	1	0	1	5:30 PM	0	0	0	0	0
5:45 PM	3	0	0	0	3	5:45 PM	0	0	0	0	0
Count Total	9	0	9	0	18	Count Total	0	0	0	0	0
Peak Hour	5	0	5	0	10	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

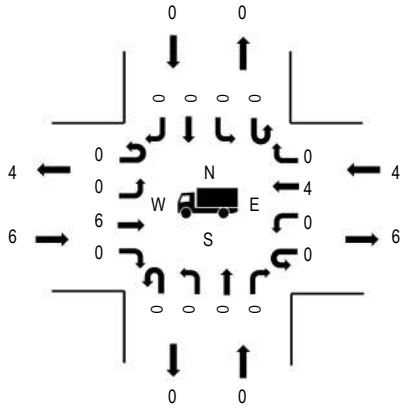
Location: 3 19TH AVE NE & 172ND ST NE PM
Date: Tuesday, February 28, 2023
Peak Hour: 04:00 PM - 05:00 PM

Peak Hour

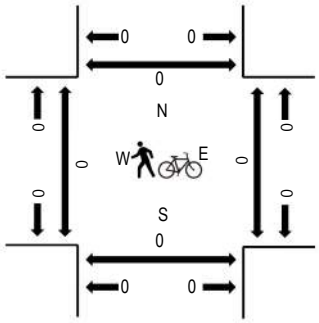
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	2.0%	0.84
WB	0.8%	0.87
NB	0.0%	0.00
SB	0.0%	0.63
All	1.2%	0.85

Traffic Counts - Motorized Vehicles

Interval Start Time	172ND ST NE Eastbound				172ND ST NE Westbound				19TH AVE NE Northbound				19TH AVE NE 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	2	66	0	0	0	117	8	0	0	0	0	0	1	0	5	199	836
4:15 PM	0	7	82	0	0	0	138	7	0	0	0	0	0	3	0	10	247	817
4:30 PM	0	4	74	0	0	0	104	4	0	0	0	0	0	3	0	3	192	765
4:45 PM	0	0	63	0	0	0	123	4	0	0	0	0	0	1	0	7	198	805
5:00 PM	0	1	66	0	0	0	106	3	0	0	0	0	0	1	0	3	180	825
5:15 PM	0	5	69	0	0	0	109	6	0	0	0	0	0	1	0	5	195	
5:30 PM	0	12	74	0	0	0	128	9	0	0	0	0	0	5	0	4	232	
5:45 PM	0	5	82	0	0	0	118	4	0	0	0	0	0	3	0	6	218	
Count Total	0	36	576	0	0	0	943	45	0	0	0	0	0	18	0	43	1,661	
Peak Hour	0	13	285	0	0	0	482	23	0	0	0	0	0	8	0	25	836	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

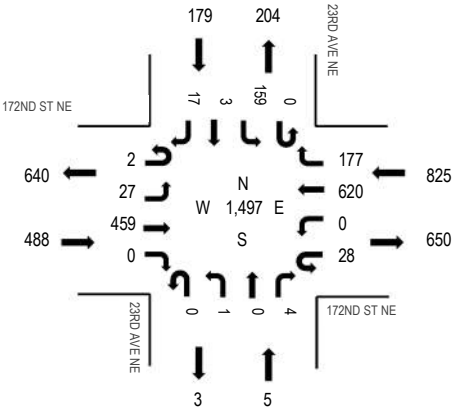
Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	2	0	2	4:00 PM	0	0	0	0	0
4:15 PM	3	0	1	0	4	4:15 PM	0	0	0	0	0
4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0
4:45 PM	3	0	0	0	3	4:45 PM	0	0	0	0	0
5:00 PM	1	0	1	0	2	5:00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

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

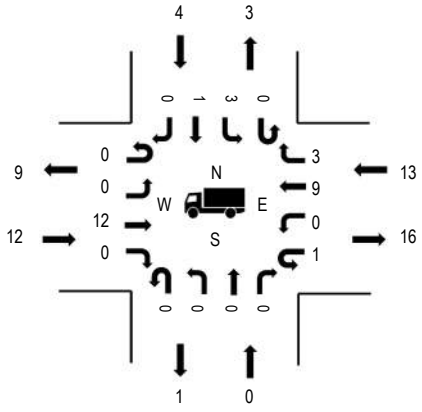
Location: 1 23RD AVE NE & 172ND ST NE PM
Date: Thursday, June 2, 2022
Peak Hour: 04:30 PM - 05:30 PM

Peak Hour

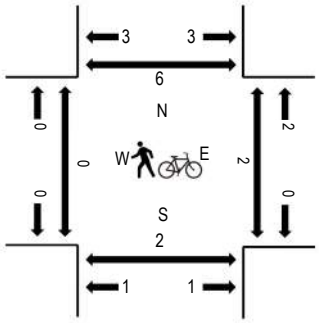
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	2.5%	0.90
WB	1.6%	0.92
NB	0.0%	0.63
SB	2.2%	0.95
All	1.9%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	172ND ST NE Eastbound				172ND ST NE Westbound				23RD AVE NE Northbound				23RD AVE NE 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	11	134	0	11	0	147	29	0	0	0	4	0	33	0	8	377	1,468
4:15 PM	0	9	125	0	5	0	164	36	0	0	0	0	0	33	1	7	380	1,478
4:30 PM	0	8	127	0	7	0	141	40	0	0	0	2	0	39	0	2	366	1,497
4:45 PM	0	2	101	0	5	0	150	39	0	0	0	1	0	41	0	6	345	1,443
5:00 PM	1	6	111	0	5	0	165	53	0	0	0	0	0	40	3	3	387	1,449
5:15 PM	1	11	120	0	11	0	164	45	0	1	0	1	0	39	0	6	399	
5:30 PM	1	8	94	0	4	0	133	45	0	0	0	0	0	25	0	2	312	
5:45 PM	3	10	111	0	7	0	141	46	0	1	0	0	0	28	0	4	351	
Count Total	6	65	923	0	55	0	1,205	333	0	2	0	8	0	278	4	38	2,917	
Peak Hour	2	27	459	0	28	0	620	177	0	1	0	4	0	159	3	17	1,497	

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	3	3	2	0	8	4:00 PM	0	0	0	0	0	4:00 PM	0	1	0	0	1
4:15 PM	2	0	3	0	5	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	1	1
4:30 PM	2	0	6	1	9	4:30 PM	0	0	0	0	0	4:30 PM	0	1	0	1	2
4:45 PM	5	0	1	1	7	4:45 PM	0	0	0	0	0	4:45 PM	0	1	2	5	8
5:00 PM	4	0	3	2	9	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:15 PM	1	0	3	0	4	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:30 PM	3	0	4	0	7	5:30 PM	0	0	0	0	0	5:30 PM	1	3	0	0	4
5:45 PM	3	1	0	0	4	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
Count Total	23	4	22	4	53	Count Total	0	0	0	0	0	Count Total	1	6	2	7	16
Peak Hour	12	0	13	4	29	Peak Hour	0	0	0	0	0	Peak Hour	0	2	2	6	10

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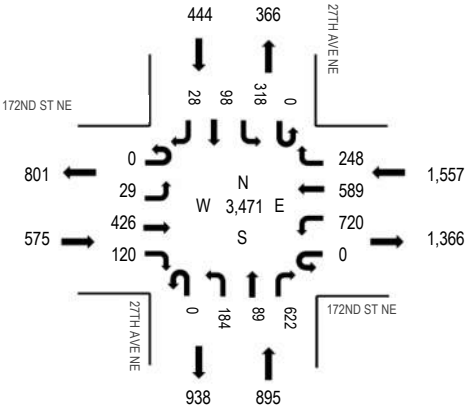
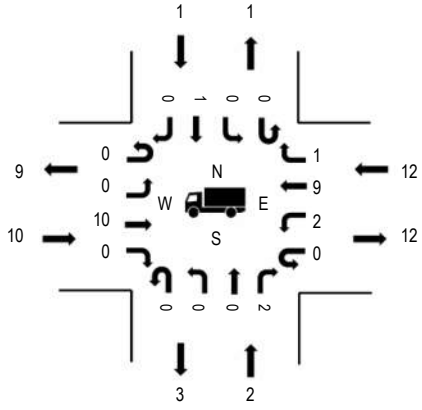
Location: 2 27TH AVE NE & 172ND ST NE PM
Date: Tuesday, June 7, 2022
Peak Hour: 04:15 PM - 05:15 PM

Peak Hour

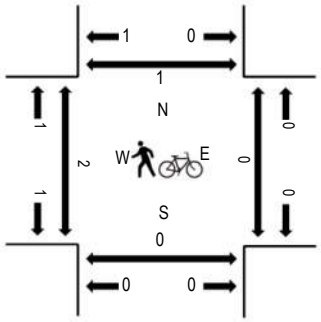
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	1.7%	0.91
WB	0.8%	0.95
NB	0.2%	0.97
SB	0.2%	0.85
All	0.7%	1.00

Traffic Counts - Motorized Vehicles

Interval Start Time	172ND ST NE Eastbound				172ND ST NE Westbound				27TH AVE NE Northbound				27TH AVE NE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	3	115	36	0	147	104	57	0	62	23	145	0	77	32	3	804	3,405
4:15 PM	0	9	102	28	0	194	139	77	0	45	23	157	0	61	22	8	865	3,471
4:30 PM	0	8	116	34	0	149	148	66	0	42	28	161	0	83	21	8	864	3,457
4:45 PM	0	7	100	26	0	191	140	57	0	52	16	153	0	93	33	4	872	3,459
5:00 PM	0	5	108	32	0	186	162	48	0	45	22	151	0	81	22	8	870	3,328
5:15 PM	0	5	112	32	0	174	156	58	0	38	15	159	0	70	24	8	851	
5:30 PM	0	3	122	31	0	192	142	59	0	39	26	147	0	74	21	10	866	
5:45 PM	0	5	71	24	0	152	136	58	1	41	13	165	0	49	23	3	741	
Count Total	0	45	846	243	0	1,385	1,127	480	1	364	166	1,238	0	588	198	52	6,733	
Peak Hour	0	29	426	120	0	720	589	248	0	184	89	622	0	318	98	28	3,471	

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	3	1	2	1	7	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:15 PM	1	0	4	0	5	4:15 PM	0	0	0	0	0	4:15 PM	1	0	0	0	1
4:30 PM	3	2	5	0	10	4:30 PM	0	0	0	0	0	4:30 PM	1	0	0	1	2
4:45 PM	5	0	2	1	8	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
5:00 PM	1	0	1	0	2	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	3	0	2	0	5	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:45 PM	1	0	5	0	6	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
Count Total	17	4	23	2	46	Count Total	0	0	0	0	0	Count Total	2	0	0	1	3
Peak Hour	10	2	12	1	25	Peak Hour	0	0	0	0	0	Peak Hour	2	0	0	1	3

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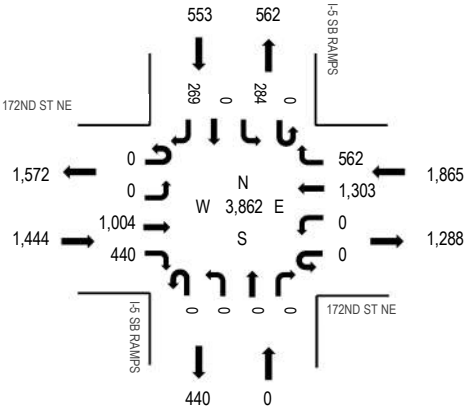
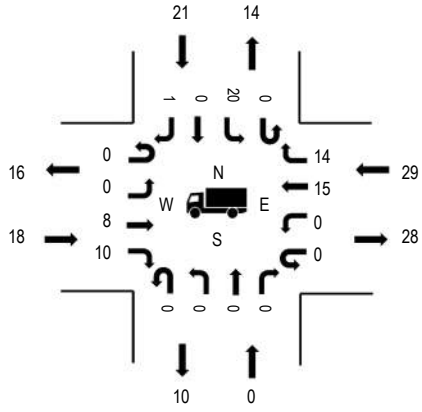
Location: 4 I-5 SB RAMPS & 172ND ST NE PM
Date: Thursday, June 2, 2022
Peak Hour: 04:15 PM - 05:15 PM

Peak Hour

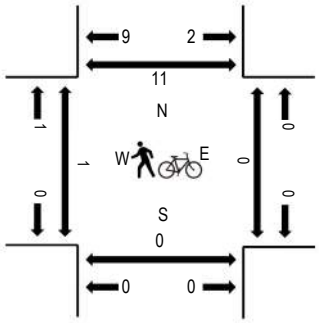
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	1.2%	0.95
WB	1.6%	0.97
NB	0.0%	0.00
SB	3.8%	0.89
All	1.8%	0.97

Traffic Counts - Motorized Vehicles

Interval Start Time	172ND ST NE Eastbound				172ND ST NE Westbound				I-5 SB RAMPS Northbound				I-5 SB RAMPS Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	258	123	0	0	274	148	0	0	0	0	0	73	0	68	944	3,828
4:15 PM	0	0	266	113	0	0	328	134	0	0	0	0	0	88	0	67	996	3,862
4:30 PM	0	0	235	114	0	0	299	165	0	0	0	0	0	70	0	58	941	3,798
4:45 PM	0	0	262	103	0	0	336	120	0	0	0	0	0	62	0	64	947	3,788
5:00 PM	0	0	241	110	0	0	340	143	0	0	0	0	0	64	0	80	978	3,724
5:15 PM	0	0	224	116	0	0	323	127	0	0	0	0	0	67	0	75	932	
5:30 PM	0	0	224	121	0	0	315	130	0	0	0	0	0	74	0	67	931	
5:45 PM	0	0	215	89	0	0	323	110	0	0	0	0	0	63	0	83	883	
Count Total	0	0	1,925	889	0	0	2,538	1,077	0	0	0	0	0	561	0	562	7,552	
Peak Hour	0	0	1,004	440	0	0	1,303	562	0	0	0	0	0	284	0	269	3,862	

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	11	0	7	5	23	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	4	4
4:15 PM	4	0	10	6	20	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	1	1
4:30 PM	4	0	11	3	18	4:30 PM	1	0	0	0	1	4:30 PM	0	0	0	2	2
4:45 PM	6	0	2	7	15	4:45 PM	0	0	0	0	0	4:45 PM	1	0	0	2	3
5:00 PM	4	0	6	5	15	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	6	6
5:15 PM	0	0	6	4	10	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	2	2
5:30 PM	2	0	3	5	10	5:30 PM	0	0	0	0	0	5:30 PM	3	0	0	2	5
5:45 PM	11	0	1	1	13	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
Count Total	42	0	46	36	124	Count Total	1	0	0	0	1	Count Total	4	0	0	19	23
Peak Hour	18	0	29	21	68	Peak Hour	1	0	0	0	1	Peak Hour	1	0	0	11	12

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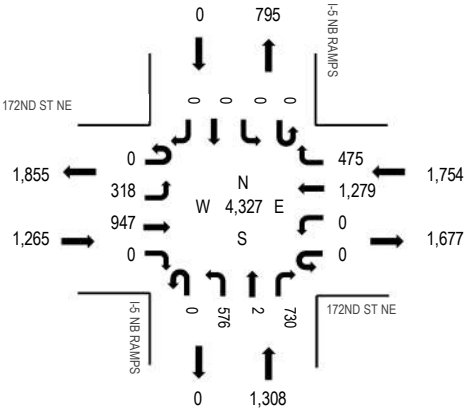
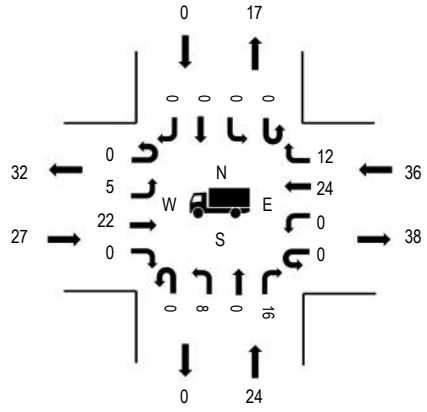
Location: 5 I-5 NB RAMPS & 172ND ST NE PM
Date: Thursday, June 2, 2022
Peak Hour: 04:15 PM - 05:15 PM

Peak Hour

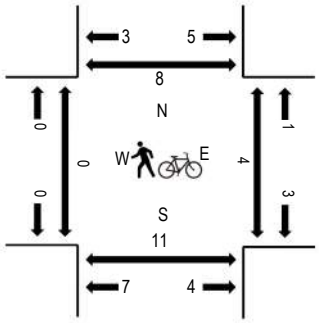
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	2.1%	0.90
WB	2.1%	0.93
NB	1.8%	0.96
SB	0.0%	0.00
All	2.0%	0.98

Traffic Counts - Motorized Vehicles

Interval Start Time	172ND ST NE Eastbound				172ND ST NE Westbound				I-5 NB RAMPS Northbound				I-5 NB RAMPS Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	86	241	0	0	0	296	101	0	115	0	189	0	0	0	0	1,028	4,300
4:15 PM	0	83	270	0	0	0	306	129	0	138	0	176	0	0	0	0	1,102	4,327
4:30 PM	0	76	230	0	0	0	355	119	0	133	1	191	0	0	0	0	1,105	4,235
4:45 PM	0	77	229	0	0	0	306	111	0	150	0	192	0	0	0	0	1,065	4,139
5:00 PM	0	82	218	0	0	0	312	116	0	155	1	171	0	0	0	0	1,055	4,004
5:15 PM	0	52	214	0	0	0	312	113	0	135	0	184	0	0	0	0	1,010	
5:30 PM	0	86	209	0	0	0	310	111	0	131	1	161	0	0	0	0	1,009	
5:45 PM	1	72	203	0	0	0	273	85	0	141	0	155	0	0	0	0	930	
Count Total	1	614	1,814	0	0	0	2,470	885	0	1,098	3	1,419	0	0	0	0	8,304	
Peak Hour	0	318	947	0	0	0	1,279	475	0	576	2	730	0	0	0	0	4,327	

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	12	6	11	0	29	4:00 PM	0	0	0	0	0	4:00 PM	0	2	0	4	6
4:15 PM	7	8	17	0	32	4:15 PM	0	0	0	0	0	4:15 PM	0	5	0	1	6
4:30 PM	2	8	4	0	14	4:30 PM	0	0	0	0	0	4:30 PM	0	3	2	0	5
4:45 PM	11	6	5	0	22	4:45 PM	0	0	0	0	0	4:45 PM	0	1	0	2	3
5:00 PM	7	2	10	0	19	5:00 PM	0	0	0	0	0	5:00 PM	0	2	2	5	9
5:15 PM	5	10	6	0	21	5:15 PM	0	0	0	0	0	5:15 PM	0	5	0	0	5
5:30 PM	6	1	3	0	10	5:30 PM	0	0	0	0	0	5:30 PM	0	2	0	2	4
5:45 PM	5	2	2	0	9	5:45 PM	0	0	0	0	0	5:45 PM	0	3	0	0	3
Count Total	55	43	58	0	156	Count Total	0	0	0	0	0	Count Total	0	23	4	14	41
Peak Hour	27	24	36	0	87	Peak Hour	0	0	0	0	0	Peak Hour	0	11	4	8	23

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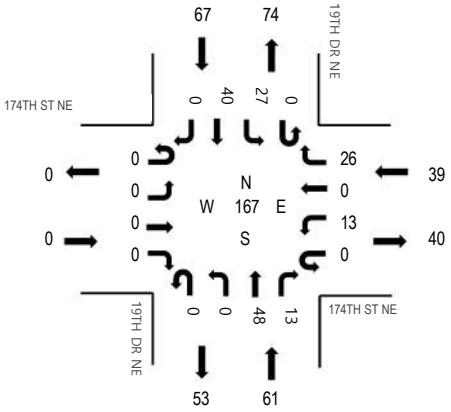
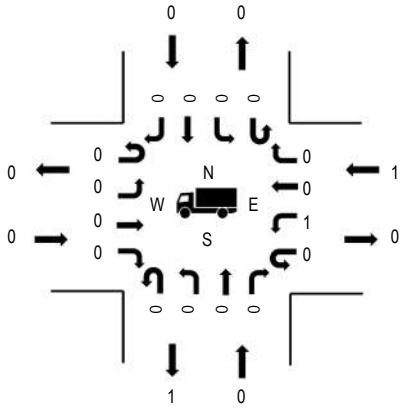
Location: 1 19TH DR NE & 174TH ST NE PM
Date: Tuesday, March 14, 2023
Peak Hour: 04:00 PM - 05:00 PM

Peak Hour

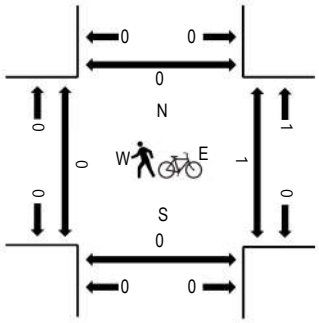
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	0.0%	0.00
WB	2.6%	0.81
NB	0.0%	0.85
SB	0.0%	0.84
All	0.6%	0.84

Traffic Counts - Motorized Vehicles

Interval Start Time	174TH ST NE Eastbound				174TH ST NE Westbound				19TH DR NE Northbound				19TH DR NE Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	0	0	0	2	0	5	0	0	15	0	0	6	10	0	38	167
4:15 PM	0	0	0	0	0	4	0	7	0	0	10	5	0	11	8	0	45	164
4:30 PM	0	0	0	0	0	5	0	7	0	0	12	6	0	7	13	0	50	147
4:45 PM	0	0	0	0	0	2	0	7	0	0	11	2	0	3	9	0	34	127
5:00 PM	0	0	0	0	0	5	0	3	0	0	14	1	0	4	8	0	35	127
5:15 PM	0	0	0	0	0	3	0	5	0	0	13	1	0	2	4	0	28	
5:30 PM	0	0	0	0	0	1	0	5	0	0	7	0	0	8	9	0	30	
5:45 PM	0	0	0	0	0	1	0	9	0	0	9	1	0	3	11	0	34	
Count Total	0	0	0	0	0	23	0	48	0	0	91	16	0	44	72	0	294	
Peak Hour	0	0	0	0	0	13	0	26	0	0	48	13	0	27	40	0	167	

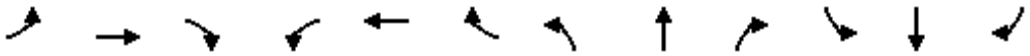
Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

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	0	0	4:00 PM	0	0	1	0	1
4:15 PM	0	0	0	0	0	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	0	0	0	4:45 PM	0	0	0	0	0
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
5:30 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
Count Total	0	1	1	0	2	Count Total	0	0	1	0	1
Peak Hour	0	0	1	0	1	Peak Hour	0	0	1	0	1

Appendix C

Level of Service (LOS) Calculations

2023 Existing – Weekday PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	214	1	57	361	14	5	1	35	7	1	5
Future Volume (vph)	2	214	1	57	361	14	5	1	35	7	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			-4%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		35			25			25			25	
Link Distance (ft)		369			1809			529			387	
Travel Time (s)		7.2			49.3			14.4			10.6	
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 (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	214	1	57	361	14	5	1	35	7	1	5
Future Vol, veh/h	2	214	1	57	361	14	5	1	35	7	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	5	-	-	-4	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	1	1	1	0	0	0	0	0	0
Mvmt Flow	2	235	1	63	397	15	5	1	38	8	1	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	412	0	0	236	0	0	774	778	236	790	771	405
Stage 1	-	-	-	-	-	-	240	240	-	531	531	-
Stage 2	-	-	-	-	-	-	534	538	-	259	240	-
Critical Hdwy	4.12	-	-	4.11	-	-	8.1	7.5	6.7	6.3	5.7	5.8
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	6.5	-	5.3	4.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	6.5	-	5.3	4.7	-
Follow-up Hdwy	2.218	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1147	-	-	1337	-	-	257	266	782	370	395	680
Stage 1	-	-	-	-	-	-	718	665	-	603	596	-
Stage 2	-	-	-	-	-	-	460	453	-	795	750	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1147	-	-	1337	-	-	245	253	782	337	376	680
Mov Cap-2 Maneuver	-	-	-	-	-	-	245	253	-	337	376	-
Stage 1	-	-	-	-	-	-	717	664	-	602	568	-
Stage 2	-	-	-	-	-	-	434	432	-	753	749	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	11.6	13.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	593	1147	-	-	1337	-	-	422
HCM Lane V/C Ratio	0.076	0.002	-	-	0.047	-	-	0.034
HCM Control Delay (s)	11.6	8.1	0	-	7.8	-	-	13.8
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0.1

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	259	4	42	465	3	36
Future Volume (vph)	259	4	42	465	3	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	25		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	35	
Link Distance (ft)	124			686	769	
Travel Time (s)	3.4			18.7	15.0	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

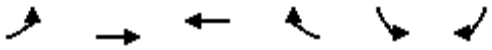
Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	259	4	42	465	3	36
Future Vol, veh/h	259	4	42	465	3	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	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	1	1	0	0
Mvmt Flow	301	5	49	541	3	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	306	0	943	304
Stage 1	-	-	-	-	304	-
Stage 2	-	-	-	-	639	-
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	-	-	1260	-	294	740
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	530	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1260	-	283	740
Mov Cap-2 Maneuver	-	-	-	-	398	-
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	509	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	694	-	-	1260	-
HCM Lane V/C Ratio	0.065	-	-	0.039	-
HCM Control Delay (s)	10.6	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	13	285	482	23	8	25
Future Volume (vph)	13	285	482	23	8	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		35	
Link Distance (ft)		686	653		670	
Travel Time (s)		18.7	17.8		13.1	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	2%	2%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	285	482	23	8	25
Future Vol, veh/h	13	285	482	23	8	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	1	1	0	0
Mvmt Flow	15	335	567	27	9	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	594	0	-	0	946	581
Stage 1	-	-	-	-	581	-
Stage 2	-	-	-	-	365	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	982	-	-	-	293	517
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	707	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	982	-	-	-	287	517
Mov Cap-2 Maneuver	-	-	-	-	287	-
Stage 1	-	-	-	-	552	-
Stage 2	-	-	-	-	707	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	982	-	-	-	433
HCM Lane V/C Ratio	0.016	-	-	-	0.09
HCM Control Delay (s)	8.7	0	-	-	14.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

LANE LEVEL OF SERVICE

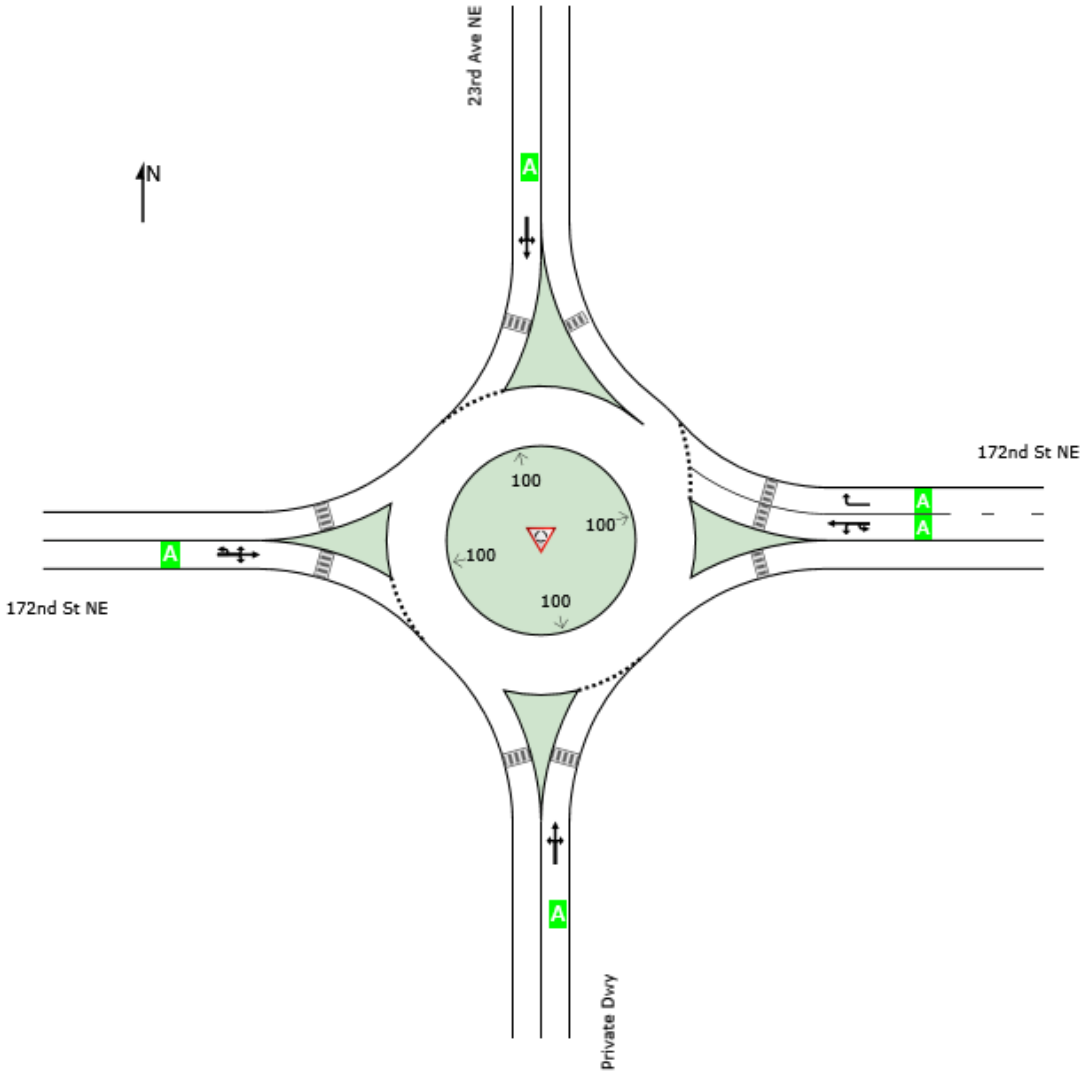
Lane Level of Service

Site: 4 [2023 Existing - PM Peak Hour (Site Folder: 23rd Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

23rd Ave NE / 172nd St NE
Site Category: 2023 Existing - PM Peak Hour
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: 4 [2023 Existing - PM Peak Hour (Site Folder: 23rd Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

23rd Ave NE / 172nd St NE
Site Category: 2023 Existing - PM Peak Hour
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	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: Private Dwy															
3	L2	All MCs	1	0.0	1	0.0	0.008	8.6	LOS A	0.0	1.1	0.66	0.49	0.66	23.5
8	T1	All MCs	1	0.0	1	0.0	0.008	3.6	LOS A	0.0	1.1	0.66	0.49	0.66	23.7
18	R2	All MCs	4	0.0	4	0.0	0.008	4.3	LOS A	0.0	1.1	0.66	0.49	0.66	23.6
Approach			6	0.0	6	0.0	0.008	4.9	LOS A	0.0	1.1	0.66	0.49	0.66	23.6
East: 172nd St NE															
1u	U	All MCs	31	1.6	31	1.6	0.422	10.9	LOS B	3.2	82.2	0.18	0.33	0.18	31.9
1	L2	All MCs	1	1.6	1	1.6	0.422	8.7	LOS A	3.2	82.2	0.18	0.33	0.18	31.9
6	T1	All MCs	680	1.6	680	1.6	0.422	3.1	LOS A	3.2	82.2	0.18	0.33	0.18	32.5
16	R2	All MCs	194	1.6	194	1.6	0.157	3.6	LOS A	0.9	21.8	0.16	0.41	0.16	32.2
Approach			905	1.6	905	1.6	0.422	3.5	LOS A	3.2	82.2	0.18	0.35	0.18	32.4
North: 23rd Ave NE															
7	L2	All MCs	174	2.2	174	2.2	0.226	9.2	LOS A	1.3	33.4	0.68	0.68	0.68	22.7
4	T1	All MCs	3	2.2	3	2.2	0.226	3.9	LOS A	1.3	33.4	0.68	0.68	0.68	22.9
14	R2	All MCs	19	2.2	19	2.2	0.226	5.0	LOS A	1.3	33.4	0.68	0.68	0.68	22.8
Approach			197	2.2	197	2.2	0.226	8.7	LOS A	1.3	33.4	0.68	0.68	0.68	22.7
West: 172nd St NE															
5u	U	All MCs	2	2.5	2	2.5	0.436	11.9	LOS B	3.0	76.8	0.49	0.44	0.49	31.3
5	L2	All MCs	30	2.5	30	2.5	0.436	9.7	LOS A	3.0	76.8	0.49	0.44	0.49	31.3
2	T1	All MCs	503	2.5	503	2.5	0.436	3.7	LOS A	3.0	76.8	0.49	0.44	0.49	31.8
12	R2	All MCs	1	2.5	1	2.5	0.436	4.0	LOS A	3.0	76.8	0.49	0.44	0.49	31.6
Approach			536	2.5	536	2.5	0.436	4.1	LOS A	3.0	76.8	0.49	0.44	0.49	31.8
All Vehicles			1645	2.0	1645	2.0	0.436	4.3	LOS A	3.2	82.2	0.34	0.42	0.34	30.6

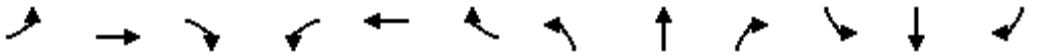
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	439	124	742	607	255	190	92	641	328	101	29
Future Volume (vph)	30	439	124	742	607	255	190	92	641	328	101	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	425		200	125		0	150		150
Storage Lanes	1		0	2		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		394			613			444			470	
Travel Time (s)		7.7			11.9			12.1			12.8	
Confl. Peds. (#/hr)	1					1	2					2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8	8 1	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0		3.0	5.0	
Minimum Split (s)	9.0	38.0		9.0	38.0	38.0	9.0	11.0		9.0	46.0	
Total Split (s)	20.0	40.0		40.0	60.0	60.0	35.0	15.0		35.0	15.0	
Total Split (%)	15.4%	30.8%		30.8%	46.2%	46.2%	26.9%	11.5%		26.9%	11.5%	
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	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	Min		C-Min	C-Min	C-Min	None	None		Min	Min	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 75 (58%), Referenced to phase 1:WBL and 6:WBT, Start of Red
Natural Cycle: 135
Control Type: Actuated-Coordinated

Splits and Phases: 5: 27th Ave NE/Spring Ln Ave & 172nd St NE



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	439	124	742	607	255	190	92	641	328	101	29
Future Volume (veh/h)	30	439	124	742	607	255	190	92	641	328	101	29
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	30	439	124	742	607	255	190	92	641	328	101	29
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	38	1084	304	797	2160	963	218	146	488	396	97	28
Arrive On Green	0.02	0.40	0.40	0.38	1.00	1.00	0.12	0.08	0.08	0.11	0.07	0.07
Sat Flow, veh/h	1781	2741	768	3483	3582	1596	1795	1885	1585	3483	1405	403
Grp Volume(v), veh/h	30	283	280	742	607	255	190	92	641	328	0	130
Grp Sat Flow(s),veh/h/ln	1781	1777	1732	1742	1791	1596	1795	1885	1585	1742	0	1808
Q Serve(g_s), s	2.2	14.9	15.1	26.6	0.0	0.0	13.5	6.2	9.2	12.0	0.0	9.0
Cycle Q Clear(g_c), s	2.2	14.9	15.1	26.6	0.0	0.0	13.5	6.2	9.2	12.0	0.0	9.0
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	38	703	685	797	2160	963	218	146	488	396	0	125
V/C Ratio(X)	0.79	0.40	0.41	0.93	0.28	0.26	0.87	0.63	1.31	0.83	0.00	1.04
Avail Cap(c_a), veh/h	192	703	685	911	2160	963	401	146	488	777	0	125
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.3	28.3	28.3	39.2	0.0	0.0	56.1	58.2	20.7	56.4	0.0	60.5
Incr Delay (d2), s/veh	22.9	0.4	0.4	11.8	0.3	0.5	7.8	8.5	154.8	3.4	0.0	91.0
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	1.2	6.4	6.3	11.2	0.1	0.1	6.6	3.3	30.3	5.5	0.0	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.2	28.6	28.7	50.9	0.3	0.5	63.9	66.7	175.4	59.8	0.0	151.5
LnGrp LOS	F	C	C	D	A	A	E	E	F	E	A	F
Approach Vol, veh/h		593			1604			923			458	
Approach Delay, s/veh		31.6			23.7			141.6			85.8	
Approach LOS		C			C			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	35.8	57.4	21.8	15.0	8.8	84.4	20.8	16.1
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	34.0	34.0	29.0	9.0	14.0	54.0	29.0	9.0
Max Q Clear Time (g_c+I1), s	28.6	17.1	15.5	11.0	4.2	2.0	14.0	11.2
Green Ext Time (p_c), s	1.2	3.1	0.3	0.0	0.0	5.6	0.8	0.0

Intersection Summary	
HCM 6th Ctrl Delay	63.4
HCM 6th LOS	E

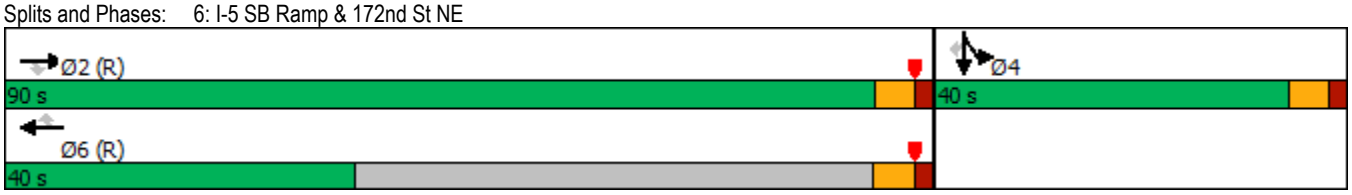
Notes

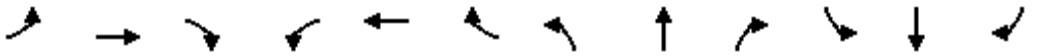
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1034	453	0	1342	579	0	0	0	293	0	277
Future Volume (vph)	0	1034	453	0	1342	579	0	0	0	293	0	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-3%			0%			3%	
Storage Length (ft)	0		250	0		0	0		0	400		400
Storage Lanes	0		1	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		613			915			299			608	
Travel Time (s)		11.9			17.8			6.8			13.8	
Confl. Peds. (#/hr)	11					11	1					1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										50%		
Turn Type		NA	Perm		NA	Perm				Split	NA	Perm
Protected Phases		2			6					4	4	
Permitted Phases			2			6						4
Detector Phase		2	2		6	6				4	4	4
Switch Phase												
Minimum Initial (s)		7.0	7.0		7.0	7.0				5.0	5.0	5.0
Minimum Split (s)		24.8	24.8		34.1	34.1				33.8	33.8	33.8
Total Split (s)		90.0	90.0		40.0	40.0				40.0	40.0	40.0
Total Split (%)		69.2%	69.2%		30.8%	30.8%				30.8%	30.8%	30.8%
Yellow Time (s)		3.8	3.8		4.1	4.1				3.8	3.8	3.8
All-Red Time (s)		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
Total Lost Time (s)		5.8	5.8		6.1	6.1				5.8	5.8	5.8
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Min	C-Min		C-Min	C-Min				None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Red	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: I-5 SB Ramp & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1034	453	0	1342	579	0	0	0	293	0	277
Future Volume (veh/h)	0	1034	453	0	1342	579	0	0	0	293	0	277
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1832	1832	0	1988	1988				1788	1788	1788
Adj Flow Rate, veh/h	0	1066	0	0	1384	0				302	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	1	1	0	2	2				4	4	4
Cap, veh/h	0	2752		0	2986					401	0	
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00				0.12	0.00	0.00
Sat Flow, veh/h	0	3573	1553	0	3877	1685				3405	0	1515
Grp Volume(v), veh/h	0	1066	0	0	1384	0				302	0	0
Grp Sat Flow(s),veh/h/ln	0	1741	1553	0	1889	1685				1703	0	1515
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				11.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				11.2	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2752		0	2986					401	0	
V/C Ratio(X)	0.00	0.39		0.00	0.46					0.75	0.00	
Avail Cap(c_a), veh/h	0	2752		0	2986					896	0	
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.56	0.00	0.00	0.69	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				55.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.4	0.0				4.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	0.1	0.0				5.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.2	0.0	0.0	0.4	0.0				60.4	0.0	0.0
LnGrp LOS	A	A		A	A					E	A	
Approach Vol, veh/h		1066			1384						302	
Approach Delay, s/veh		0.2			0.4						60.4	
Approach LOS		A			A						E	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		108.9		21.1		108.9						
Change Period (Y+Rc), s		* 6.1		* 5.8		6.1						
Max Green Setting (Gmax), s		* 84		* 34		33.9						
Max Q Clear Time (g_c+I1), s		2.0		13.2		2.0						
Green Ext Time (p_c), s		15.7		1.9		17.6						

Intersection Summary												
HCM 6th Ctrl Delay			6.9									
HCM 6th LOS			A									

Notes

User approved volume balancing among the lanes for turning movement.

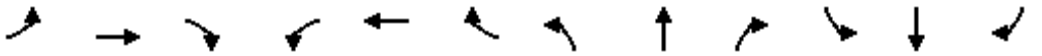
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	328	975	0	0	1317	489	593	2	752	0	0	0
Future Volume (vph)	328	975	0	0	1317	489	593	2	752	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			6%			5%			0%	
Storage Length (ft)	600		0	0		300	400		0	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		915			978			589			234	
Travel Time (s)		17.8			19.1			13.4			5.3	
Confl. Peds. (#/hr)	8		11	11		8			4	4		
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 (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	pm+pt	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases	2					6			8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	5.0	7.0			7.0	7.0	5.0	5.0	5.0			
Minimum Split (s)	10.6	24.1			23.8	23.8	40.8	40.8	40.8			
Total Split (s)	40.0	89.0			49.0	49.0	41.0	41.0	41.0			
Total Split (%)	30.8%	68.5%			37.7%	37.7%	31.5%	31.5%	31.5%			
Yellow Time (s)	3.6	4.1			3.8	3.8	3.8	3.8	3.8			
All-Red Time (s)	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			
Total Lost Time (s)	5.6	6.1			5.8	5.8	5.8	5.8	5.8			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Red	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-5 NB Ramps & 172nd St NE



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	328	975	0	0	1317	489	593	2	752	0	0	0
Future Volume (veh/h)	328	975	0	0	1317	489	593	2	752	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1658	1658	1723	1723	1723			
Adj Flow Rate, veh/h	335	995	0	0	1344	0	606	0	0			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	392	2450	0	0	2419		719	0				
Arrive On Green	0.22	1.00	0.00	0.00	0.53	0.00	0.22	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	4676	1405	3282	0	1460			
Grp Volume(v), veh/h	335	995	0	0	1344	0	606	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1509	1405	1641	0	1460			
Q Serve(g_s), s	11.6	0.0	0.0	0.0	25.6	0.0	23.0	0.0	0.0			
Cycle Q Clear(g_c), s	11.6	0.0	0.0	0.0	25.6	0.0	23.0	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	392	2450	0	0	2419		719	0				
V/C Ratio(X)	0.85	0.41	0.00	0.00	0.56		0.84	0.00				
Avail Cap(c_a), veh/h	664	2450	0	0	2419		889	0				
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.90	0.90	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	16.4	0.0	0.0	0.0	20.0	0.0	48.6	0.0	0.0			
Incr Delay (d2), s/veh	5.0	0.5	0.0	0.0	0.9	0.0	7.3	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.3	0.2	0.0	0.0	8.9	0.0	10.1	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.4	0.5	0.0	0.0	21.0	0.0	55.9	0.0	0.0			
LnGrp LOS	C	A	A	A	C		E	A				
Approach Vol, veh/h		1330			1344			606				
Approach Delay, s/veh		5.7			21.0			55.9				
Approach LOS		A			C			E				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		95.7			20.1	75.6		34.3				
Change Period (Y+Rc), s		6.1			5.6	* 6.1		5.8				
Max Green Setting (Gmax), s		82.9			34.4	* 43		35.2				
Max Q Clear Time (g_c+I1), s		2.0			13.6	27.6		25.0				
Green Ext Time (p_c), s		14.0			1.0	10.3		3.0				

Intersection Summary	
HCM 6th Ctrl Delay	21.2
HCM 6th LOS	C

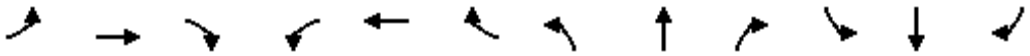
Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

2026 No Action – Weekday PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	234	1	62	394	15	5	1	38	8	1	5
Future Volume (vph)	2	234	1	62	394	15	5	1	38	8	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			-4%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		35			25			25			25	
Link Distance (ft)		369			1809			529			387	
Travel Time (s)		7.2			49.3			14.4			10.6	
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 (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	234	1	62	394	15	5	1	38	8	1	5
Future Vol, veh/h	2	234	1	62	394	15	5	1	38	8	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	5	-	-	-4	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	1	1	1	0	0	0	0	0	0
Mvmt Flow	2	257	1	68	433	16	5	1	42	9	1	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	449	0	0	258	0	0	842	847	258	860	839	441
Stage 1	-	-	-	-	-	-	262	262	-	577	577	-
Stage 2	-	-	-	-	-	-	580	585	-	283	262	-
Critical Hdwy	4.12	-	-	4.11	-	-	8.1	7.5	6.7	6.3	5.7	5.8
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	6.5	-	5.3	4.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	6.5	-	5.3	4.7	-
Follow-up Hdwy	2.218	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1111	-	-	1313	-	-	227	238	758	337	367	652
Stage 1	-	-	-	-	-	-	695	646	-	575	574	-
Stage 2	-	-	-	-	-	-	429	426	-	776	737	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1111	-	-	1313	-	-	215	225	758	304	347	652
Mov Cap-2 Maneuver	-	-	-	-	-	-	215	225	-	304	347	-
Stage 1	-	-	-	-	-	-	694	645	-	574	544	-
Stage 2	-	-	-	-	-	-	403	404	-	731	736	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	12	14.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	565	1111	-	-	1313	-	-	380
HCM Lane V/C Ratio	0.086	0.002	-	-	0.052	-	-	0.04
HCM Control Delay (s)	12	8.2	0	-	7.9	-	-	14.9
HCM Lane LOS	B	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.1

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	283	4	46	508	3	39
Future Volume (vph)	283	4	46	508	3	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	25		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	35	
Link Distance (ft)	124			686	769	
Travel Time (s)	3.4			18.7	15.0	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	283	4	46	508	3	39
Future Vol, veh/h	283	4	46	508	3	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	1	1	0	0
Mvmt Flow	329	5	53	591	3	45

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	334	0	1029	332
Stage 1	-	-	-	-	332	-
Stage 2	-	-	-	-	697	-
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	-	-	1231	-	261	714
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	498	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1231	-	250	714
Mov Cap-2 Maneuver	-	-	-	-	369	-
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	477	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	669	-	-	1231	-
HCM Lane V/C Ratio	0.073	-	-	0.043	-
HCM Control Delay (s)	10.8	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

LANE LEVEL OF SERVICE

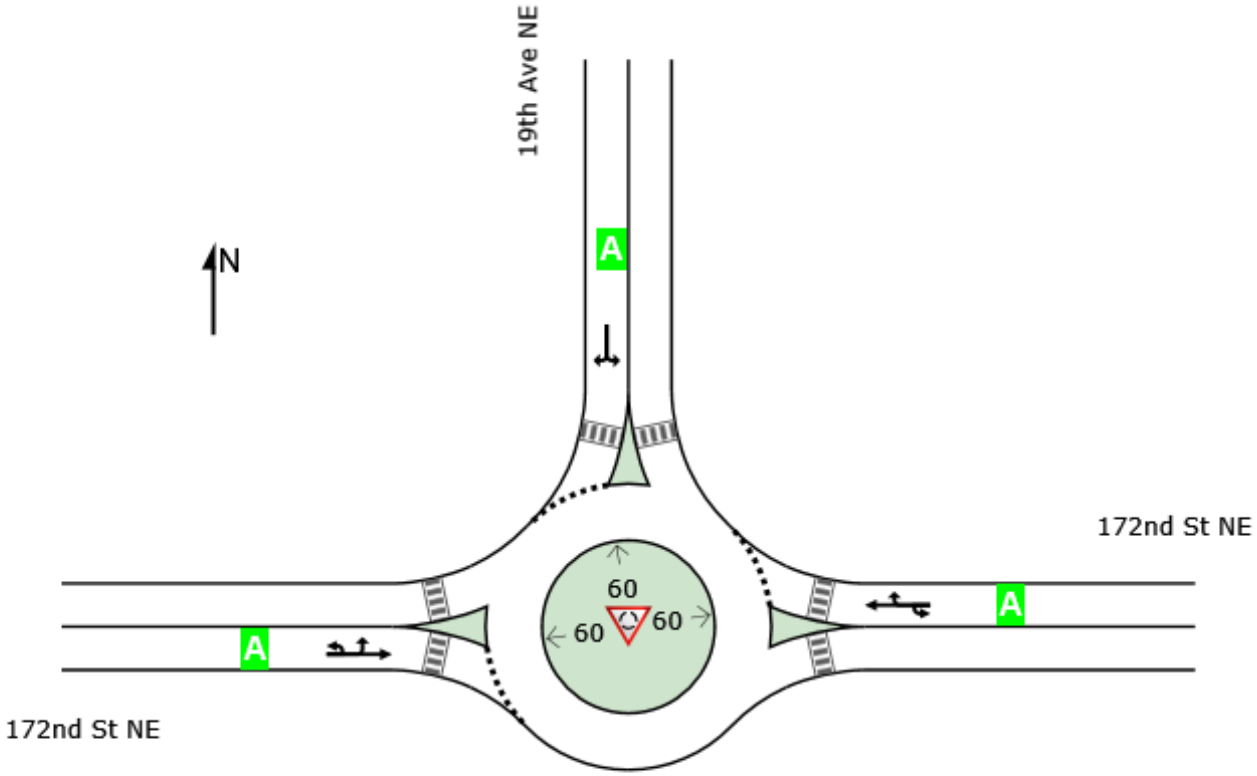
Lane Level of Service

Site: 3 [2026 No Action - PM Peak Hour (Site Folder: 19th Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

19th Ave NE / 172nd St NE
Site Category: 2026 No Action - PM Peak Hour
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	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: 3 [2026 No Action - PM Peak Hour (Site Folder: 19th Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

19th Ave NE / 172nd St NE
Site Category: 2026 No Action - PM Peak Hour
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	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
East: 172nd St NE															
1u	U	All MCs	1	0.8	1	0.8	0.486	10.1	LOS B	3.4	85.4	0.13	0.38	0.13	31.7
6	T1	All MCs	620	0.8	620	0.8	0.486	3.7	LOS A	3.4	85.4	0.13	0.38	0.13	32.2
16	R2	All MCs	29	0.8	29	0.8	0.486	3.7	LOS A	3.4	85.4	0.13	0.38	0.13	32.0
Approach			651	0.8	651	0.8	0.486	3.8	LOS A	3.4	85.4	0.13	0.38	0.13	32.2
North: 19th Ave NE															
7	L2	All MCs	11	0.0	11	0.0	0.048	8.4	LOS A	0.2	5.9	0.57	0.59	0.57	23.3
14	R2	All MCs	32	0.0	32	0.0	0.048	4.7	LOS A	0.2	5.9	0.57	0.59	0.57	23.4
Approach			42	0.0	42	0.0	0.048	5.6	LOS A	0.2	5.9	0.57	0.59	0.57	23.4
West: 172nd St NE															
5u	U	All MCs	1	2.0	1	2.0	0.289	10.0	LOS B	1.8	44.9	0.09	0.39	0.09	31.7
5	L2	All MCs	16	2.0	16	2.0	0.289	8.1	LOS A	1.8	44.9	0.09	0.39	0.09	31.7
2	T1	All MCs	366	2.0	366	2.0	0.289	3.7	LOS A	1.8	44.9	0.09	0.39	0.09	32.2
Approach			384	2.0	384	2.0	0.289	3.9	LOS A	1.8	44.9	0.09	0.39	0.09	32.2
All Vehicles			1076	1.2	1076	1.2	0.486	3.9	LOS A	3.4	85.4	0.13	0.39	0.13	31.8

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.

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LANE LEVEL OF SERVICE

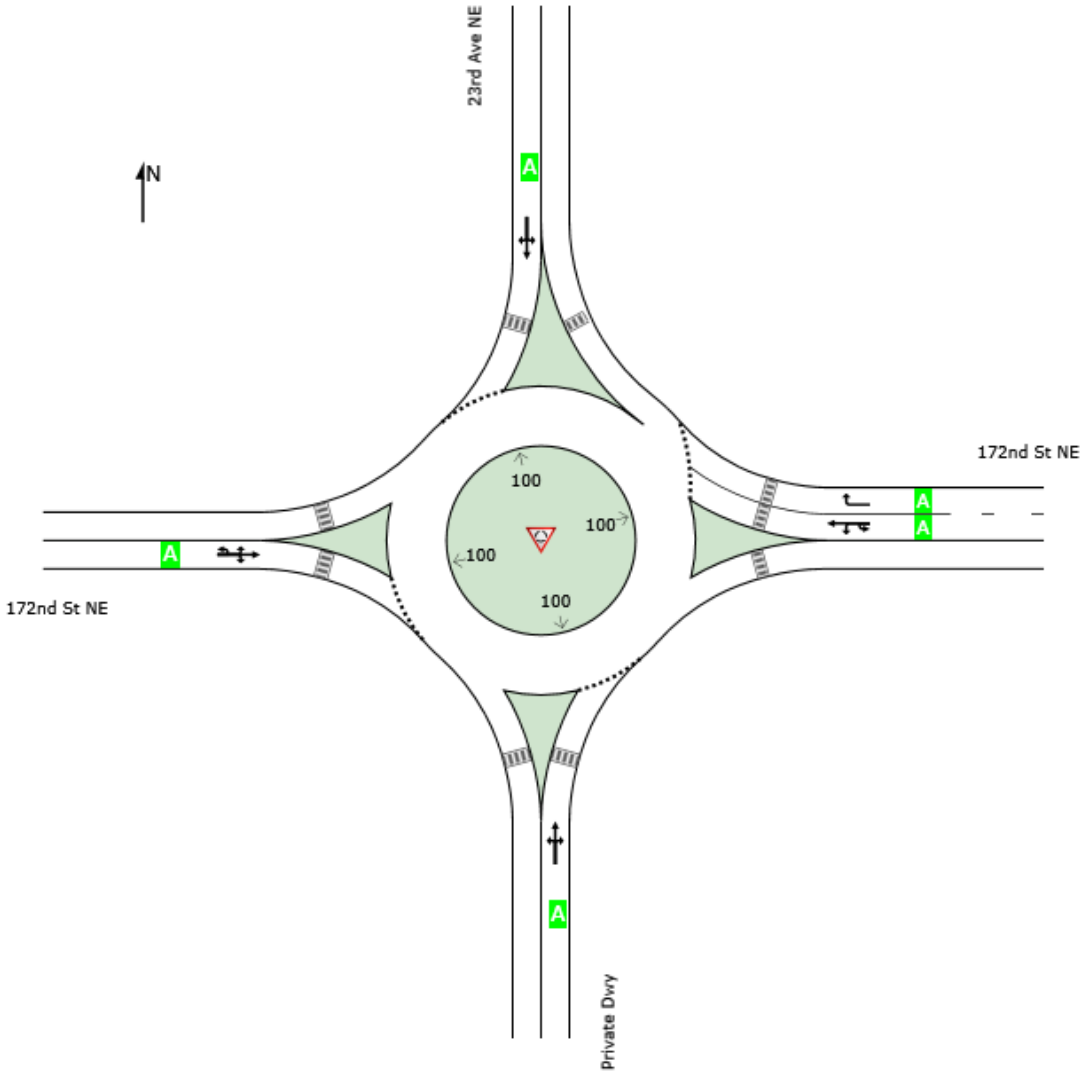
Lane Level of Service

Site: 4 [2026 No Action - PM Peak Hour (Site Folder: 23rd Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

23rd Ave NE / 172nd St NE
Site Category: 2026 No Action - PM Peak Hour
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: 4 [2026 No Action - PM Peak Hour (Site Folder: 23rd Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

23rd Ave NE / 172nd St NE
Site Category: 2026 No Action - PM Peak Hour
Roundabout

Vehicle Movement Performance

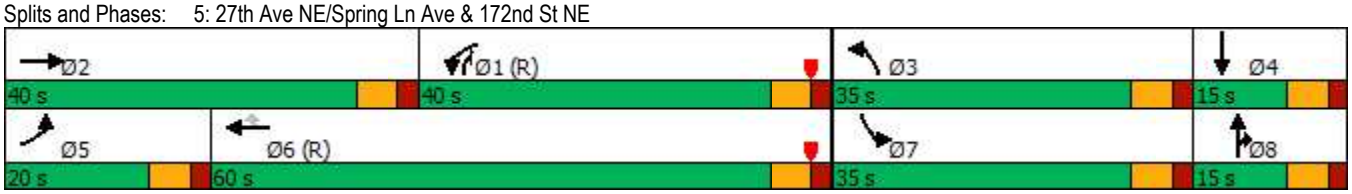
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Private Dwy															
3	L2	All MCs	1	0.0	1	0.0	0.009	9.2	LOS A	0.1	1.4	0.71	0.53	0.71	23.4
8	T1	All MCs	1	0.0	1	0.0	0.009	4.2	LOS A	0.1	1.4	0.71	0.53	0.71	23.6
18	R2	All MCs	5	0.0	5	0.0	0.009	4.9	LOS A	0.1	1.4	0.71	0.53	0.71	23.5
Approach			7	0.0	7	0.0	0.009	5.4	LOS A	0.1	1.4	0.71	0.53	0.71	23.5
East: 172nd St NE															
1u	U	All MCs	34	1.6	34	1.6	0.462	11.0	LOS B	3.8	96.6	0.20	0.34	0.20	31.9
1	L2	All MCs	1	1.6	1	1.6	0.462	8.7	LOS A	3.8	96.6	0.20	0.34	0.20	31.9
6	T1	All MCs	743	1.6	743	1.6	0.462	3.2	LOS A	3.8	96.6	0.20	0.34	0.20	32.4
16	R2	All MCs	212	1.6	212	1.6	0.172	3.6	LOS A	1.0	24.5	0.17	0.41	0.17	32.2
Approach			989	1.6	989	1.6	0.462	3.5	LOS A	3.8	96.6	0.20	0.35	0.20	32.3
North: 23rd Ave NE															
7	L2	All MCs	190	2.2	190	2.2	0.261	9.9	LOS A	1.6	40.4	0.73	0.70	0.73	22.6
4	T1	All MCs	3	2.2	3	2.2	0.261	4.6	LOS A	1.6	40.4	0.73	0.70	0.73	22.7
14	R2	All MCs	20	2.2	20	2.2	0.261	5.7	LOS A	1.6	40.4	0.73	0.70	0.73	22.7
Approach			214	2.2	214	2.2	0.261	9.4	LOS A	1.6	40.4	0.73	0.70	0.73	22.6
West: 172nd St NE															
5u	U	All MCs	2	2.5	2	2.5	0.484	12.1	LOS B	3.5	90.2	0.54	0.45	0.54	31.1
5	L2	All MCs	32	2.5	32	2.5	0.484	9.9	LOS A	3.5	90.2	0.54	0.45	0.54	31.1
2	T1	All MCs	550	2.5	550	2.5	0.484	3.9	LOS A	3.5	90.2	0.54	0.45	0.54	31.7
12	R2	All MCs	1	2.5	1	2.5	0.484	4.2	LOS A	3.5	90.2	0.54	0.45	0.54	31.5
Approach			585	2.5	585	2.5	0.484	4.3	LOS A	3.5	90.2	0.54	0.45	0.54	31.7
All Vehicles			1796	2.0	1796	2.0	0.484	4.5	LOS A	3.8	96.6	0.38	0.43	0.38	30.5

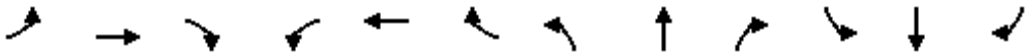
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	479	135	810	663	279	207	100	700	358	110	32
Future Volume (vph)	33	479	135	810	663	279	207	100	700	358	110	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	425		200	125		0	150		150
Storage Lanes	1		0	2		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		394			613			444			470	
Travel Time (s)		7.7			11.9			12.1			12.8	
Confl. Peds. (#/hr)	1					1	2					2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8	8 1	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0		3.0	5.0	
Minimum Split (s)	9.0	38.0		9.0	38.0	38.0	9.0	11.0		9.0	46.0	
Total Split (s)	20.0	40.0		40.0	60.0	60.0	35.0	15.0		35.0	15.0	
Total Split (%)	15.4%	30.8%		30.8%	46.2%	46.2%	26.9%	11.5%		26.9%	11.5%	
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	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	Min		C-Min	C-Min	C-Min	None	None		Min	Min	

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 75 (58%), Referenced to phase 1:WBL and 6:WBT, Start of Red	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: 27th Ave NE/Spring Ln Ave & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	479	135	810	663	279	207	100	700	358	110	32
Future Volume (veh/h)	33	479	135	810	663	279	207	100	700	358	110	32
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	33	479	135	810	663	279	207	100	700	358	110	32
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	42	1012	283	857	2118	944	235	147	516	426	97	28
Arrive On Green	0.02	0.37	0.37	0.41	0.99	0.99	0.13	0.08	0.08	0.12	0.07	0.07
Sat Flow, veh/h	1781	2741	767	3483	3582	1596	1795	1885	1585	3483	1400	407
Grp Volume(v), veh/h	33	309	305	810	663	279	207	100	700	358	0	142
Grp Sat Flow(s),veh/h/ln	1781	1777	1731	1742	1791	1596	1795	1885	1585	1742	0	1808
Q Serve(g_s), s	2.4	17.3	17.5	29.1	0.4	0.4	14.7	6.7	10.1	13.1	0.0	9.0
Cycle Q Clear(g_c), s	2.4	17.3	17.5	29.1	0.4	0.4	14.7	6.7	10.1	13.1	0.0	9.0
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	42	656	639	857	2118	944	235	147	516	426	0	125
V/C Ratio(X)	0.78	0.47	0.48	0.95	0.31	0.30	0.88	0.68	1.36	0.84	0.00	1.13
Avail Cap(c_a), veh/h	192	656	639	911	2118	944	401	147	516	777	0	125
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.71	0.71	0.71	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.1	31.3	31.4	37.5	0.3	0.3	55.5	58.4	19.9	55.8	0.0	60.5
Incr Delay (d2), s/veh	20.5	0.5	0.6	13.6	0.3	0.6	9.0	12.0	172.3	3.4	0.0	121.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	7.5	7.4	12.3	0.2	0.3	7.3	3.7	34.3	6.0	0.0	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.6	31.9	31.9	51.1	0.6	0.9	64.5	70.4	192.1	59.2	0.0	181.7
LnGrp LOS	F	C	C	D	A	A	E	E	F	E	A	F
Approach Vol, veh/h		647			1752			1007			500	
Approach Delay, s/veh		34.5			24.0			153.8			94.0	
Approach LOS		C			C			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	38.0	54.0	23.0	15.0	9.1	82.9	21.9	16.1
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	34.0	34.0	29.0	9.0	14.0	54.0	29.0	9.0
Max Q Clear Time (g_c+I1), s	31.1	19.5	16.7	11.0	4.4	2.4	15.1	12.1
Green Ext Time (p_c), s	0.8	3.2	0.3	0.0	0.0	6.3	0.8	0.0

Intersection Summary	
HCM 6th Ctrl Delay	68.2
HCM 6th LOS	E

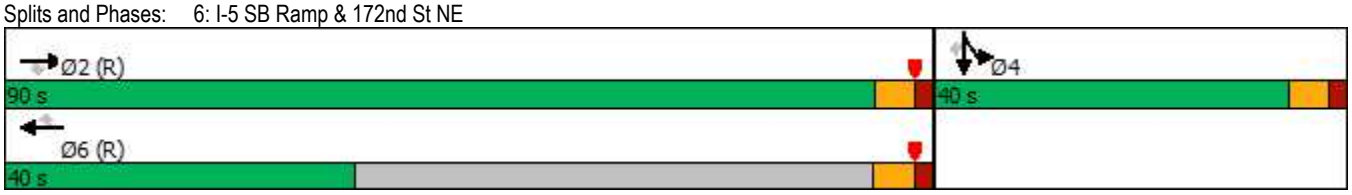
Notes

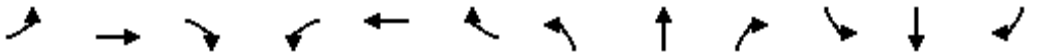
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1130	495	0	1467	633	0	0	0	320	0	303
Future Volume (vph)	0	1130	495	0	1467	633	0	0	0	320	0	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-3%			0%			3%	
Storage Length (ft)	0		250	0		0	0		0	400		400
Storage Lanes	0		1	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		613			915			299			608	
Travel Time (s)		11.9			17.8			6.8			13.8	
Confl. Peds. (#/hr)	11					11	1					1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										50%		
Turn Type		NA	Perm		NA	Perm				Split	NA	Perm
Protected Phases		2			6					4	4	
Permitted Phases			2			6						4
Detector Phase		2	2		6	6				4	4	4
Switch Phase												
Minimum Initial (s)		7.0	7.0		7.0	7.0				5.0	5.0	5.0
Minimum Split (s)		24.8	24.8		34.1	34.1				33.8	33.8	33.8
Total Split (s)		90.0	90.0		40.0	40.0				40.0	40.0	40.0
Total Split (%)		69.2%	69.2%		30.8%	30.8%				30.8%	30.8%	30.8%
Yellow Time (s)		3.8	3.8		4.1	4.1				3.8	3.8	3.8
All-Red Time (s)		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
Total Lost Time (s)		5.8	5.8		6.1	6.1				5.8	5.8	5.8
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Min	C-Min		C-Min	C-Min				None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Red	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: I-5 SB Ramp & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1130	495	0	1467	633	0	0	0	320	0	303
Future Volume (veh/h)	0	1130	495	0	1467	633	0	0	0	320	0	303
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1832	1832	0	1988	1988				1788	1788	1788
Adj Flow Rate, veh/h	0	1165	0	0	1512	0				330	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	1	1	0	2	2				4	4	4
Cap, veh/h	0	2721		0	2952					432	0	
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00				0.13	0.00	0.00
Sat Flow, veh/h	0	3573	1553	0	3877	1685				3405	0	1515
Grp Volume(v), veh/h	0	1165	0	0	1512	0				330	0	0
Grp Sat Flow(s),veh/h/ln	0	1741	1553	0	1889	1685				1703	0	1515
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				12.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				12.2	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2721		0	2952					432	0	
V/C Ratio(X)	0.00	0.43		0.00	0.51					0.76	0.00	
Avail Cap(c_a), veh/h	0	2721		0	2952					896	0	
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.47	0.00	0.00	0.58	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				54.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.4	0.0				4.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	0.2	0.0				5.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.2	0.0	0.0	0.4	0.0				59.7	0.0	0.0
LnGrp LOS	A	A		A	A					E	A	
Approach Vol, veh/h		1165			1512						330	
Approach Delay, s/veh		0.2			0.4						59.7	
Approach LOS		A			A						E	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	107.7	22.3	107.7
Change Period (Y+Rc), s	* 6.1	* 5.8	6.1
Max Green Setting (Gmax), s	* 84	* 34	33.9
Max Q Clear Time (g_c+I1), s	2.0	14.2	2.0
Green Ext Time (p_c), s	18.4	2.1	19.6

Intersection Summary	
HCM 6th Ctrl Delay	6.8
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

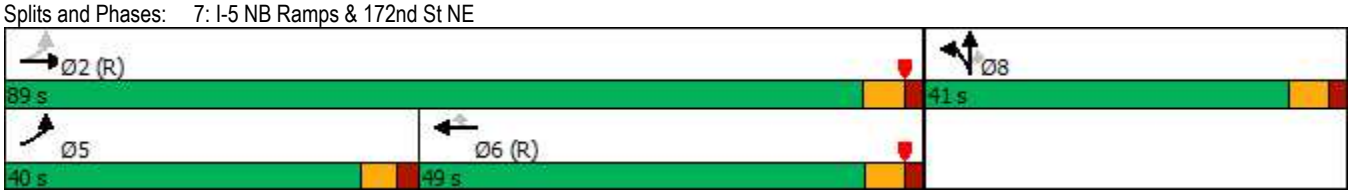
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

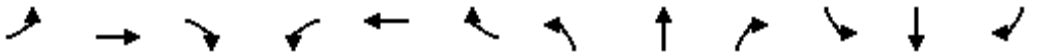
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	358	1066	0	0	1440	535	648	2	822	0	0	0
Future Volume (vph)	358	1066	0	0	1440	535	648	2	822	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			6%			5%			0%	
Storage Length (ft)	600		0	0		300	400		0	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		915			978			589			234	
Travel Time (s)		17.8			19.1			13.4			5.3	
Confl. Peds. (#/hr)	8		11	11		8			4	4		
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 (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	pm+pt	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases	2					6			8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	5.0	7.0			7.0	7.0	5.0	5.0	5.0			
Minimum Split (s)	10.6	24.1			23.8	23.8	40.8	40.8	40.8			
Total Split (s)	40.0	89.0			49.0	49.0	41.0	41.0	41.0			
Total Split (%)	30.8%	68.5%			37.7%	37.7%	31.5%	31.5%	31.5%			
Yellow Time (s)	3.6	4.1			3.8	3.8	3.8	3.8	3.8			
All-Red Time (s)	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			
Total Lost Time (s)	5.6	6.1			5.8	5.8	5.8	5.8	5.8			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Red	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-5 NB Ramps & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	358	1066	0	0	1440	535	648	2	822	0	0	0
Future Volume (veh/h)	358	1066	0	0	1440	535	648	2	822	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1658	1658	1723	1723	1723			
Adj Flow Rate, veh/h	365	1088	0	0	1469	0	662	0	0			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	389	2399	0	0	2244		766	0				
Arrive On Green	0.27	1.00	0.00	0.00	0.50	0.00	0.23	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	4676	1405	3282	0	1460			
Grp Volume(v), veh/h	365	1088	0	0	1469	0	662	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1509	1405	1641	0	1460			
Q Serve(g_s), s	14.7	0.0	0.0	0.0	31.5	0.0	25.2	0.0	0.0			
Cycle Q Clear(g_c), s	14.7	0.0	0.0	0.0	31.5	0.0	25.2	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	389	2399	0	0	2244		766	0				
V/C Ratio(X)	0.94	0.45	0.00	0.00	0.65		0.86	0.00				
Avail Cap(c_a), veh/h	618	2399	0	0	2244		889	0				
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.87	0.87	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	20.7	0.0	0.0	0.0	24.5	0.0	47.8	0.0	0.0			
Incr Delay (d2), s/veh	14.3	0.5	0.0	0.0	1.5	0.0	8.9	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.3	0.2	0.0	0.0	11.3	0.0	11.2	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	0.5	0.0	0.0	26.0	0.0	56.7	0.0	0.0			
LnGrp LOS	C	A	A	A	C		E	A				
Approach Vol, veh/h		1453			1469			662				
Approach Delay, s/veh		9.2			26.0			56.7				
Approach LOS		A			C			E				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		93.9			23.3	70.5		36.1				
Change Period (Y+Rc), s		6.1			5.6	* 6.1		5.8				
Max Green Setting (Gmax), s		82.9			34.4	* 43		35.2				
Max Q Clear Time (g_c+I1), s		2.0			16.7	33.5		27.2				
Green Ext Time (p_c), s		16.3			1.0	7.5		2.8				

Intersection Summary	
HCM 6th Ctrl Delay	24.8
HCM 6th LOS	C

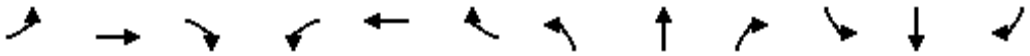
Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

2026 With Project – Weekday PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	244	1	63	401	15	5	1	40	8	1	5
Future Volume (vph)	2	244	1	63	401	15	5	1	40	8	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			-4%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		35			25			25			25	
Link Distance (ft)		369			1809			529			387	
Travel Time (s)		7.2			49.3			14.4			10.6	
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 (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	244	1	63	401	15	5	1	40	8	1	5
Future Vol, veh/h	2	244	1	63	401	15	5	1	40	8	1	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	5	-	-	-4	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	1	1	1	0	0	0	0	0	0
Mvmt Flow	2	268	1	69	441	16	5	1	44	9	1	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	457	0	0	269	0	0	863	868	269	882	860	449
Stage 1	-	-	-	-	-	-	273	273	-	587	587	-
Stage 2	-	-	-	-	-	-	590	595	-	295	273	-
Critical Hdwy	4.12	-	-	4.11	-	-	8.1	7.5	6.7	6.3	5.7	5.8
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	6.5	-	5.3	4.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	6.5	-	5.3	4.7	-
Follow-up Hdwy	2.218	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1104	-	-	1300	-	-	218	230	746	327	358	646
Stage 1	-	-	-	-	-	-	684	637	-	569	569	-
Stage 2	-	-	-	-	-	-	422	420	-	766	731	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1104	-	-	1300	-	-	207	217	746	294	338	646
Mov Cap-2 Maneuver	-	-	-	-	-	-	207	217	-	294	338	-
Stage 1	-	-	-	-	-	-	683	636	-	568	539	-
Stage 2	-	-	-	-	-	-	395	398	-	718	730	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	12.1	15.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	558	1104	-	-	1300	-	-	369
HCM Lane V/C Ratio	0.091	0.002	-	-	0.053	-	-	0.042
HCM Control Delay (s)	12.1	8.3	0	-	7.9	-	-	15.2
HCM Lane LOS	B	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.1

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	295	4	50	516	3	44
Future Volume (vph)	295	4	50	516	3	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	25		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	35	
Link Distance (ft)	124			686	769	
Travel Time (s)	3.4			18.7	15.0	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	295	4	50	516	3	44
Future Vol, veh/h	295	4	50	516	3	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	1	1	0	0
Mvmt Flow	343	5	58	600	3	51

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	348	0	1062	346
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	716	-
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	-	-	1216	-	250	702
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	488	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1216	-	238	702
Mov Cap-2 Maneuver	-	-	-	-	358	-
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	465	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	661	-	-	1216	-
HCM Lane V/C Ratio	0.083	-	-	0.048	-
HCM Control Delay (s)	10.9	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	295	4	50	516	3	44
Future Volume (vph)	295	4	50	516	3	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	25		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	35	
Link Distance (ft)	124			686	769	
Travel Time (s)	3.4			18.7	15.0	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	295	4	50	516	3	44
Future Vol, veh/h	295	4	50	516	3	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	1	1	0	0
Mvmt Flow	343	5	58	600	3	51

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	348	0	1062	346
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	716	-
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	-	-	1216	-	250	702
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	488	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1216	-	238	702
Mov Cap-2 Maneuver	-	-	-	-	358	-
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	465	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	661	-	-	1216	-
HCM Lane V/C Ratio	0.083	-	-	0.048	-
HCM Control Delay (s)	10.9	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

LANE LEVEL OF SERVICE

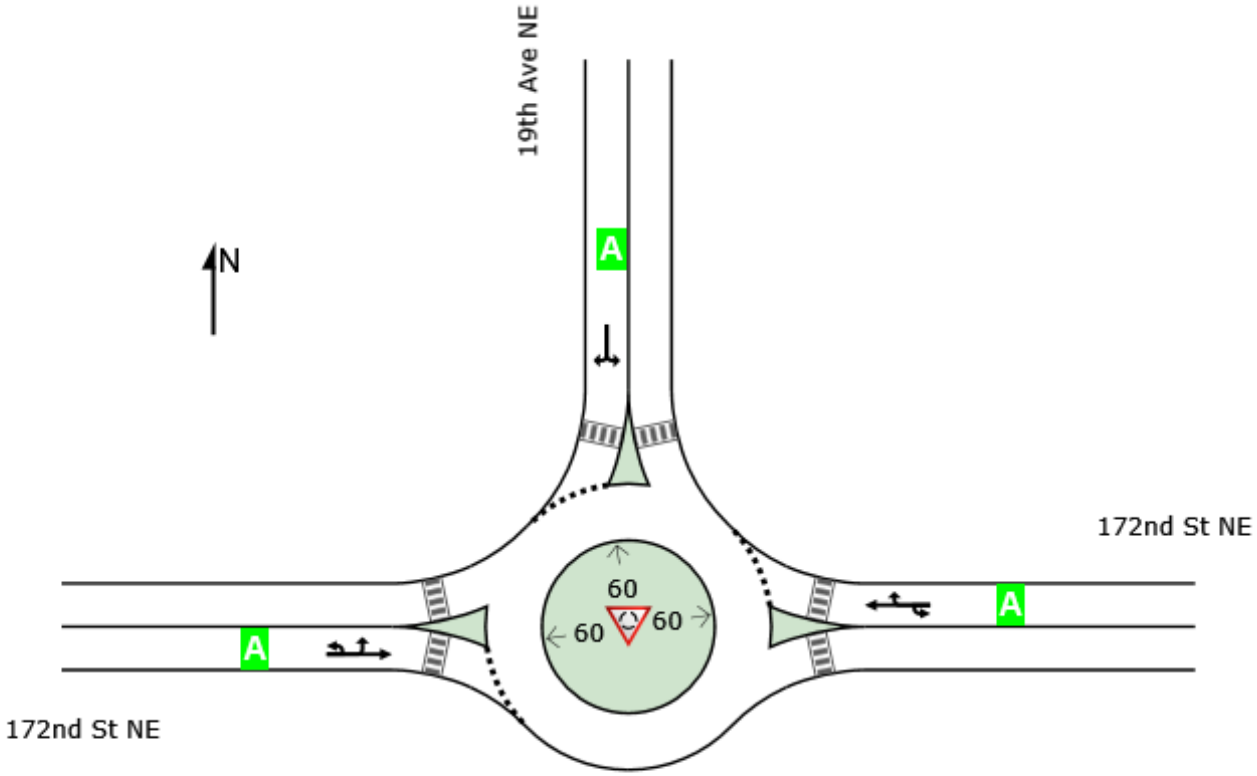
Lane Level of Service

Site: 3 [2026 With Project - PM Peak Hour (Site Folder: 19th Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

19th Ave NE / 172nd St NE
Site Category: 2026 With Project - PM Peak Hour
Roundabout

	Approaches			Intersection
	East	North	West	
LOS	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: 3 [2026 With Project - PM Peak Hour (Site Folder: 19th Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

19th Ave NE / 172nd St NE
Site Category: 2026 With Project - PM Peak Hour
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	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
East: 172nd St NE															
1u	U	All MCs	1	0.8	1	0.8	0.542	10.3	LOS B	4.3	108.5	0.23	0.39	0.23	31.5
6	T1	All MCs	620	0.8	620	0.8	0.542	3.9	LOS A	4.3	108.5	0.23	0.39	0.23	32.0
16	R2	All MCs	92	0.8	92	0.8	0.542	3.9	LOS A	4.3	108.5	0.23	0.39	0.23	31.8
Approach			713	0.8	713	0.8	0.542	4.0	LOS A	4.3	108.5	0.23	0.39	0.23	32.0
North: 19th Ave NE															
7	L2	All MCs	54	0.0	54	0.0	0.115	8.6	LOS A	0.6	15.1	0.60	0.64	0.60	23.0
14	R2	All MCs	46	0.0	46	0.0	0.115	4.9	LOS A	0.6	15.1	0.60	0.64	0.60	23.1
Approach			100	0.0	100	0.0	0.115	6.9	LOS A	0.6	15.1	0.60	0.64	0.60	23.0
West: 172nd St NE															
5u	U	All MCs	1	2.0	1	2.0	0.317	10.3	LOS B	2.0	50.9	0.23	0.42	0.23	31.3
5	L2	All MCs	36	2.0	36	2.0	0.317	8.4	LOS A	2.0	50.9	0.23	0.42	0.23	31.3
2	T1	All MCs	366	2.0	366	2.0	0.317	4.0	LOS A	2.0	50.9	0.23	0.42	0.23	31.8
Approach			404	2.0	404	2.0	0.317	4.4	LOS A	2.0	50.9	0.23	0.42	0.23	31.8
All Vehicles			1216	1.1	1216	1.1	0.542	4.3	LOS A	4.3	108.5	0.26	0.42	0.26	30.9

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.

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LANE LEVEL OF SERVICE

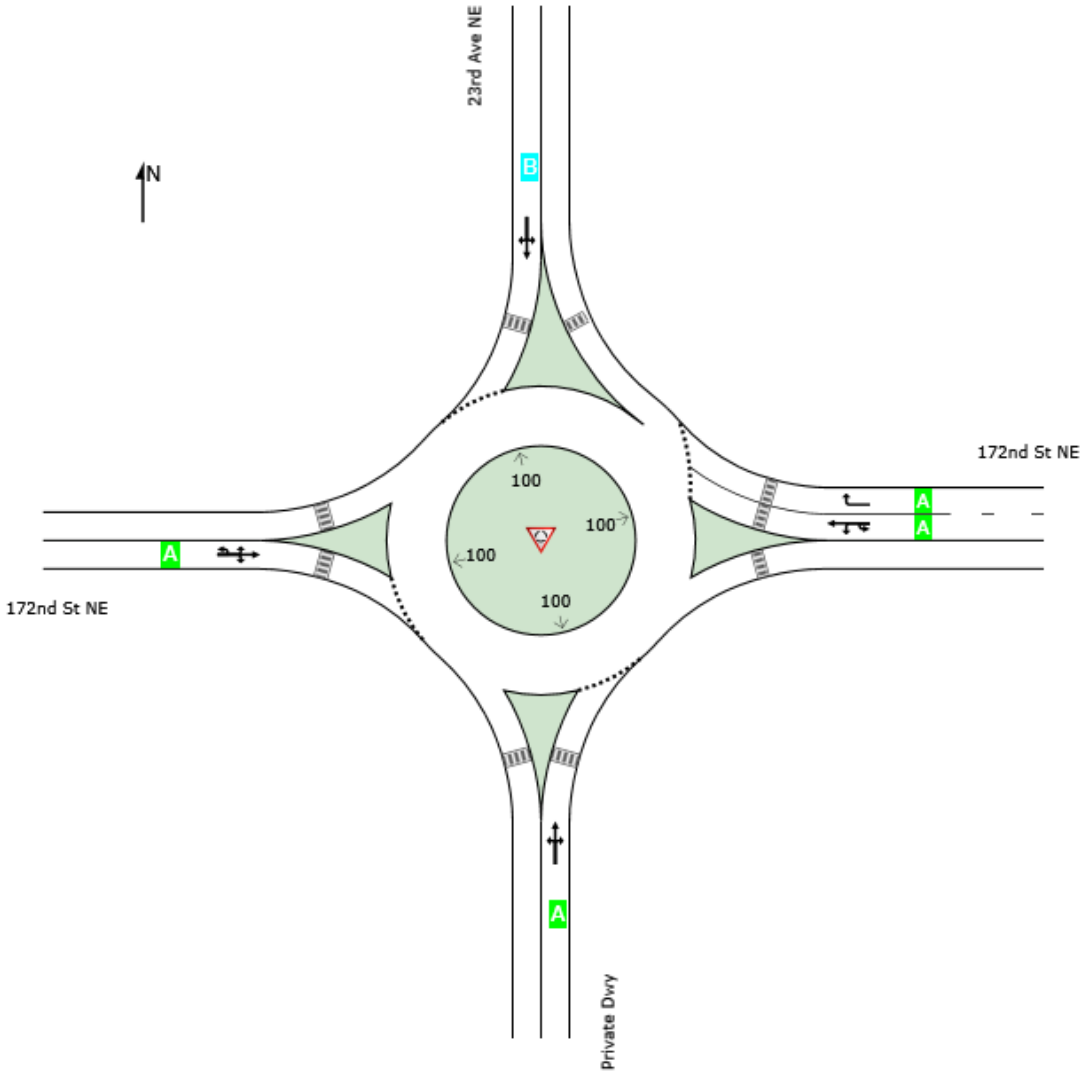
Lane Level of Service

Site: 4 [2026 With Project - PM Peak Hour (Site Folder: 23rd Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

23rd Ave NE / 172nd St NE
Site Category: 2026 With Project - PM Peak Hour
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	B	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: 4 [2026 With Project - PM Peak Hour (Site Folder: 23rd Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

23rd Ave NE / 172nd St NE
Site Category: 2026 With Project - PM Peak Hour
Roundabout

Vehicle Movement Performance

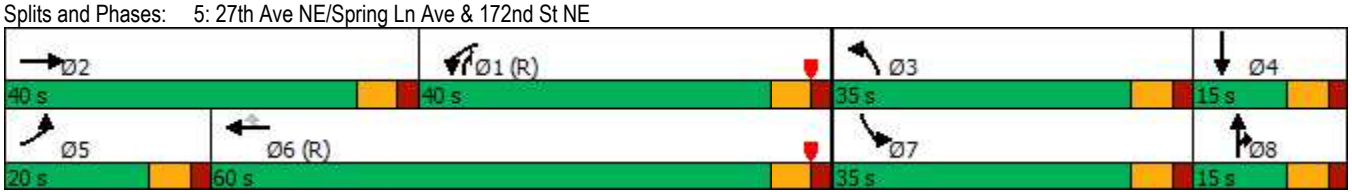
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Private Dwy															
3	L2	All MCs	1	0.0	1	0.0	0.010	9.5	LOS A	0.1	1.5	0.74	0.54	0.74	23.3
8	T1	All MCs	1	0.0	1	0.0	0.010	4.5	LOS A	0.1	1.5	0.74	0.54	0.74	23.5
18	R2	All MCs	5	0.0	5	0.0	0.010	5.3	LOS A	0.1	1.5	0.74	0.54	0.74	23.4
Approach			7	0.0	7	0.0	0.010	5.8	LOS A	0.1	1.5	0.74	0.54	0.74	23.4
East: 172nd St NE															
1u	U	All MCs	34	1.6	34	1.6	0.495	11.0	LOS B	4.3	109.7	0.22	0.33	0.22	31.8
1	L2	All MCs	1	1.6	1	1.6	0.495	8.8	LOS A	4.3	109.7	0.22	0.33	0.22	31.8
6	T1	All MCs	799	1.6	799	1.6	0.495	3.2	LOS A	4.3	109.7	0.22	0.33	0.22	32.4
16	R2	All MCs	212	1.6	212	1.6	0.175	3.6	LOS A	1.0	25.1	0.17	0.41	0.17	32.2
Approach			1046	1.6	1046	1.6	0.495	3.5	LOS A	4.3	109.7	0.21	0.35	0.21	32.3
North: 23rd Ave NE															
7	L2	All MCs	190	2.2	190	2.2	0.276	10.5	LOS B	1.7	43.9	0.77	0.72	0.77	22.4
4	T1	All MCs	3	2.2	3	2.2	0.276	5.2	LOS A	1.7	43.9	0.77	0.72	0.77	22.6
14	R2	All MCs	20	2.2	20	2.2	0.276	6.3	LOS A	1.7	43.9	0.77	0.72	0.77	22.5
Approach			214	2.2	214	2.2	0.276	10.1	LOS B	1.7	43.9	0.77	0.72	0.77	22.4
West: 172nd St NE															
5u	U	All MCs	2	2.5	2	2.5	0.518	12.2	LOS B	4.0	101.0	0.57	0.46	0.57	31.1
5	L2	All MCs	32	2.5	32	2.5	0.518	10.0	LOS A	4.0	101.0	0.57	0.46	0.57	31.1
2	T1	All MCs	589	2.5	589	2.5	0.518	4.0	LOS A	4.0	101.0	0.57	0.46	0.57	31.7
12	R2	All MCs	1	2.5	1	2.5	0.518	4.3	LOS A	4.0	101.0	0.57	0.46	0.57	31.4
Approach			624	2.5	624	2.5	0.518	4.3	LOS A	4.0	101.0	0.57	0.46	0.57	31.6
All Vehicles			1891	2.0	1891	2.0	0.518	4.5	LOS A	4.3	109.7	0.39	0.43	0.39	30.5

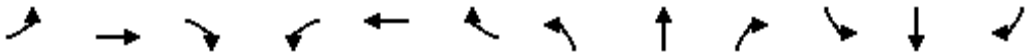
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	513	138	810	712	279	211	100	700	358	110	32
Future Volume (vph)	33	513	138	810	712	279	211	100	700	358	110	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	425		200	125		0	150		150
Storage Lanes	1		0	2		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		394			613			444			470	
Travel Time (s)		7.7			11.9			12.1			12.8	
Confl. Peds. (#/hr)	1					1	2					2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8	8 1	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0		3.0	5.0	
Minimum Split (s)	9.0	38.0		9.0	38.0	38.0	9.0	11.0		9.0	46.0	
Total Split (s)	20.0	40.0		40.0	60.0	60.0	35.0	15.0		35.0	15.0	
Total Split (%)	15.4%	30.8%		30.8%	46.2%	46.2%	26.9%	11.5%		26.9%	11.5%	
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	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	Min		C-Min	C-Min	C-Min	None	None		Min	Min	

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 75 (58%), Referenced to phase 1:WBL and 6:WBT, Start of Red	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: 27th Ave NE/Spring Ln Ave & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	513	138	810	712	279	211	100	700	358	110	32
Future Volume (veh/h)	33	513	138	810	712	279	211	100	700	358	110	32
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	33	513	138	810	712	279	211	100	700	358	110	32
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	42	1017	272	857	2110	940	239	151	520	426	97	28
Arrive On Green	0.02	0.37	0.37	0.41	0.98	0.98	0.13	0.08	0.08	0.12	0.07	0.07
Sat Flow, veh/h	1781	2771	742	3483	3582	1596	1795	1885	1586	3483	1400	407
Grp Volume(v), veh/h	33	328	323	810	712	279	211	100	700	358	0	142
Grp Sat Flow(s),veh/h/ln	1781	1777	1736	1742	1791	1596	1795	1885	1586	1742	0	1808
Q Serve(g_s), s	2.4	18.6	18.8	29.1	0.6	0.5	15.0	6.7	10.4	13.1	0.0	9.0
Cycle Q Clear(g_c), s	2.4	18.6	18.8	29.1	0.6	0.5	15.0	6.7	10.4	13.1	0.0	9.0
Prop In Lane	1.00		0.43	1.00		1.00	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	42	652	637	857	2110	940	239	151	520	426	0	125
V/C Ratio(X)	0.78	0.50	0.51	0.95	0.34	0.30	0.88	0.66	1.35	0.84	0.00	1.13
Avail Cap(c_a), veh/h	192	652	637	911	2110	940	401	151	520	777	0	125
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.68	0.68	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.1	32.0	32.0	37.5	0.4	0.4	55.3	58.1	19.5	55.8	0.0	60.5
Incr Delay (d2), s/veh	20.5	0.6	0.7	13.2	0.3	0.5	9.7	10.2	168.2	3.4	0.0	121.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	8.1	8.0	12.2	0.3	0.3	7.5	3.7	33.8	6.0	0.0	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.6	32.6	32.7	50.6	0.7	1.0	65.0	68.3	187.7	59.2	0.0	181.7
LnGrp LOS	F	C	C	D	A	A	E	E	F	E	A	F
Approach Vol, veh/h		684			1801			1011			500	
Approach Delay, s/veh		35.1			23.2			150.3			94.0	
Approach LOS		D			C			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	38.0	53.7	23.3	15.0	9.1	82.6	21.9	16.4
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	34.0	34.0	29.0	9.0	14.0	54.0	29.0	9.0
Max Q Clear Time (g_c+I1), s	31.1	20.8	17.0	11.0	4.4	2.6	15.1	12.4
Green Ext Time (p_c), s	0.8	3.3	0.3	0.0	0.0	6.8	0.8	0.0

Intersection Summary	
HCM 6th Ctrl Delay	66.3
HCM 6th LOS	E

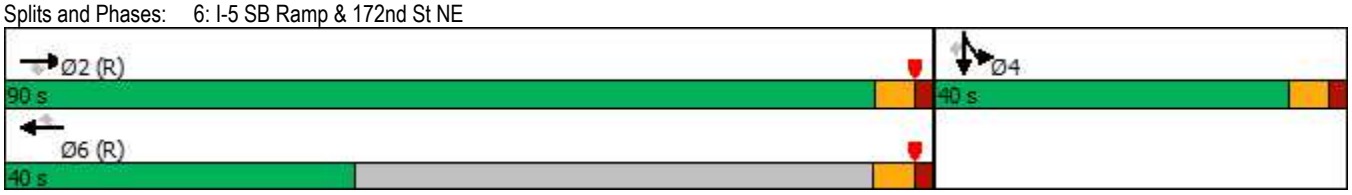
Notes

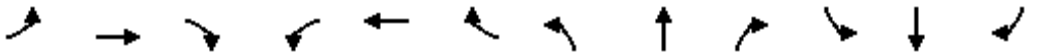
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1149	510	0	1506	633	0	0	0	320	0	313
Future Volume (vph)	0	1149	510	0	1506	633	0	0	0	320	0	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-3%			0%			3%	
Storage Length (ft)	0		250	0		0	0		0	400		400
Storage Lanes	0		1	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		613			915			299			608	
Travel Time (s)		11.9			17.8			6.8			13.8	
Confl. Peds. (#/hr)	11					11	1					1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										50%		
Turn Type		NA	Perm		NA	Perm				Split	NA	Perm
Protected Phases		2			6					4	4	
Permitted Phases			2			6						4
Detector Phase		2	2		6	6				4	4	4
Switch Phase												
Minimum Initial (s)		7.0	7.0		7.0	7.0				5.0	5.0	5.0
Minimum Split (s)		24.8	24.8		34.1	34.1				33.8	33.8	33.8
Total Split (s)		90.0	90.0		40.0	40.0				40.0	40.0	40.0
Total Split (%)		69.2%	69.2%		30.8%	30.8%				30.8%	30.8%	30.8%
Yellow Time (s)		3.8	3.8		4.1	4.1				3.8	3.8	3.8
All-Red Time (s)		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
Total Lost Time (s)		5.8	5.8		6.1	6.1				5.8	5.8	5.8
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Min	C-Min		C-Min	C-Min				None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Red	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: I-5 SB Ramp & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1149	510	0	1506	633	0	0	0	320	0	313
Future Volume (veh/h)	0	1149	510	0	1506	633	0	0	0	320	0	313
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1832	1832	0	1988	1988				1788	1788	1788
Adj Flow Rate, veh/h	0	1185	0	0	1553	0				330	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	1	1	0	2	2				4	4	4
Cap, veh/h	0	2721		0	2952					432	0	
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00				0.13	0.00	0.00
Sat Flow, veh/h	0	3573	1553	0	3877	1685				3405	0	1515
Grp Volume(v), veh/h	0	1185	0	0	1553	0				330	0	0
Grp Sat Flow(s),veh/h/ln	0	1741	1553	0	1889	1685				1703	0	1515
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				12.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				12.2	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2721		0	2952					432	0	
V/C Ratio(X)	0.00	0.44		0.00	0.53					0.76	0.00	
Avail Cap(c_a), veh/h	0	2721		0	2952					896	0	
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.45	0.00	0.00	0.55	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				54.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	0.4	0.0				4.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	0.2	0.0				5.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.2	0.0	0.0	0.4	0.0				59.7	0.0	0.0
LnGrp LOS	A	A		A	A					E	A	
Approach Vol, veh/h		1185			1553						330	
Approach Delay, s/veh		0.2			0.4						59.7	
Approach LOS		A			A						E	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	107.7	22.3	107.7
Change Period (Y+Rc), s	* 6.1	* 5.8	6.1
Max Green Setting (Gmax), s	* 84	* 34	33.9
Max Q Clear Time (g_c+I1), s	2.0	14.2	2.0
Green Ext Time (p_c), s	19.0	2.1	20.2

Intersection Summary	
HCM 6th Ctrl Delay	6.7
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

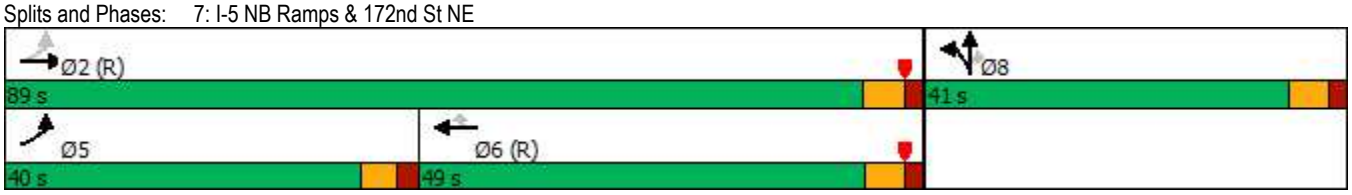
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

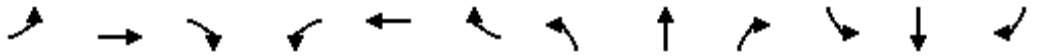
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	365	1078	0	0	1457	535	670	2	822	0	0	0
Future Volume (vph)	365	1078	0	0	1457	535	670	2	822	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			6%			5%			0%	
Storage Length (ft)	600		0	0		300	400		0	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		915			978			589			234	
Travel Time (s)		17.8			19.1			13.4			5.3	
Confl. Peds. (#/hr)	8		11	11		8			4	4		
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 (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	pm+pt	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases	2					6			8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	5.0	7.0			7.0	7.0	5.0	5.0	5.0			
Minimum Split (s)	10.6	24.1			23.8	23.8	40.8	40.8	40.8			
Total Split (s)	40.0	89.0			49.0	49.0	41.0	41.0	41.0			
Total Split (%)	30.8%	68.5%			37.7%	37.7%	31.5%	31.5%	31.5%			
Yellow Time (s)	3.6	4.1			3.8	3.8	3.8	3.8	3.8			
All-Red Time (s)	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			
Total Lost Time (s)	5.6	6.1			5.8	5.8	5.8	5.8	5.8			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Red	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-5 NB Ramps & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	365	1078	0	0	1457	535	670	2	822	0	0	0
Future Volume (veh/h)	365	1078	0	0	1457	535	670	2	822	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1658	1658	1723	1723	1723			
Adj Flow Rate, veh/h	372	1100	0	0	1487	0	685	0	0			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	396	2379	0	0	2173		784	0				
Arrive On Green	0.29	1.00	0.00	0.00	0.48	0.00	0.24	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	4676	1405	3282	0	1460			
Grp Volume(v), veh/h	372	1100	0	0	1487	0	685	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1509	1405	1641	0	1460			
Q Serve(g_s), s	16.0	0.0	0.0	0.0	33.1	0.0	26.1	0.0	0.0			
Cycle Q Clear(g_c), s	16.0	0.0	0.0	0.0	33.1	0.0	26.1	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	396	2379	0	0	2173		784	0				
V/C Ratio(X)	0.94	0.46	0.00	0.00	0.68		0.87	0.00				
Avail Cap(c_a), veh/h	607	2379	0	0	2173		889	0				
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.87	0.87	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	21.9	0.0	0.0	0.0	26.2	0.0	47.6	0.0	0.0			
Incr Delay (d2), s/veh	15.4	0.6	0.0	0.0	1.8	0.0	9.6	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.2	0.2	0.0	0.0	11.9	0.0	11.7	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.3	0.6	0.0	0.0	27.9	0.0	57.2	0.0	0.0			
LnGrp LOS	D	A	A	A	C		E	A				
Approach Vol, veh/h		1472			1487			685				
Approach Delay, s/veh		9.8			27.9			57.2				
Approach LOS		A			C			E				

Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		93.1			24.6	68.5		36.9				
Change Period (Y+Rc), s		6.1			5.6	* 6.1		5.8				
Max Green Setting (Gmax), s		82.9			34.4	* 43		35.2				
Max Q Clear Time (g_c+I1), s		2.0			18.0	35.1		28.1				
Green Ext Time (p_c), s		16.6			1.0	6.4		2.7				

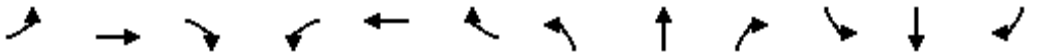
Intersection Summary												
HCM 6th Ctrl Delay			26.1									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	2	49	14	4	28	70	52	14	30	44	12
Future Volume (vph)	9	2	49	14	4	28	70	52	14	30	44	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	50		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		94			694			670			298	
Travel Time (s)		2.6			18.9			13.1			5.8	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	0%	0%	0%	0%	3%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	5.5

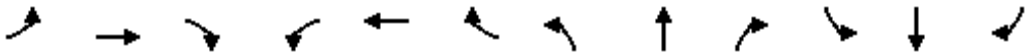
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	2	49	14	4	28	70	52	14	30	44	12
Future Vol, veh/h	9	2	49	14	4	28	70	52	14	30	44	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	3	3	3	3	3	3	3	0	0	0	0	3
Mvmt Flow	11	2	58	17	5	33	83	62	17	36	52	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	387	377	59	399	376	72	66	0	0	80	0	0
Stage 1	131	131	-	238	238	-	-	-	-	-	-	-
Stage 2	256	246	-	161	138	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	570	553	1004	560	554	987	1529	-	-	1531	-	-
Stage 1	870	786	-	763	706	-	-	-	-	-	-	-
Stage 2	746	701	-	839	780	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	515	510	1004	494	511	986	1529	-	-	1530	-	-
Mov Cap-2 Maneuver	552	538	-	546	540	-	-	-	-	-	-	-
Stage 1	823	767	-	721	667	-	-	-	-	-	-	-
Stage 2	677	662	-	769	761	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	10.2	3.9	2.6
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1529	-	-	872	749	1530	-	-
HCM Lane V/C Ratio	0.055	-	-	0.082	0.073	0.023	-	-
HCM Control Delay (s)	7.5	-	-	9.5	10.2	7.4	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	0.2	0.1	-	-

2032 No Action – Weekday PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	279	1	74	471	18	7	1	46	9	1	7
Future Volume (vph)	3	279	1	74	471	18	7	1	46	9	1	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			-4%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		35			25			25			25	
Link Distance (ft)		369			1809			529			387	
Travel Time (s)		7.2			49.3			14.4			10.6	
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 (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	279	1	74	471	18	7	1	46	9	1	7
Future Vol, veh/h	3	279	1	74	471	18	7	1	46	9	1	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	5	-	-	-4	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	1	1	1	0	0	0	0	0	0
Mvmt Flow	3	307	1	81	518	20	8	1	51	10	1	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	538	0	0	308	0	0	1009	1014	308	1030	1004	528
Stage 1	-	-	-	-	-	-	314	314	-	690	690	-
Stage 2	-	-	-	-	-	-	695	700	-	340	314	-
Critical Hdwy	4.12	-	-	4.11	-	-	8.1	7.5	6.7	6.3	5.7	5.8
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	6.5	-	5.3	4.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	6.5	-	5.3	4.7	-
Follow-up Hdwy	2.218	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1030	-	-	1258	-	-	167	181	706	268	305	588
Stage 1	-	-	-	-	-	-	643	605	-	511	523	-
Stage 2	-	-	-	-	-	-	359	366	-	732	708	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1030	-	-	1258	-	-	156	169	706	235	284	588
Mov Cap-2 Maneuver	-	-	-	-	-	-	156	169	-	235	284	-
Stage 1	-	-	-	-	-	-	640	603	-	509	490	-
Stage 2	-	-	-	-	-	-	331	343	-	676	705	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.1	13.8	17.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	466	1030	-	-	1258	-	-	316
HCM Lane V/C Ratio	0.127	0.003	-	-	0.065	-	-	0.059
HCM Control Delay (s)	13.8	8.5	0	-	8.1	-	-	17.1
HCM Lane LOS	B	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	0.2

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	338	5	55	607	4	47
Future Volume (vph)	338	5	55	607	4	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	25		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	35	
Link Distance (ft)	124			686	769	
Travel Time (s)	3.4			18.7	15.0	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	338	5	55	607	4	47
Future Vol, veh/h	338	5	55	607	4	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	1	1	0	0
Mvmt Flow	393	6	64	706	5	55

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	399	0	1230	396
Stage 1	-	-	-	-	396	-
Stage 2	-	-	-	-	834	-
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	-	-	1165	-	198	658
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	430	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1165	-	187	658
Mov Cap-2 Maneuver	-	-	-	-	309	-
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	406	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	604	-	-	1165	-
HCM Lane V/C Ratio	0.098	-	-	0.055	-
HCM Control Delay (s)	11.6	-	-	8.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-

LANE LEVEL OF SERVICE

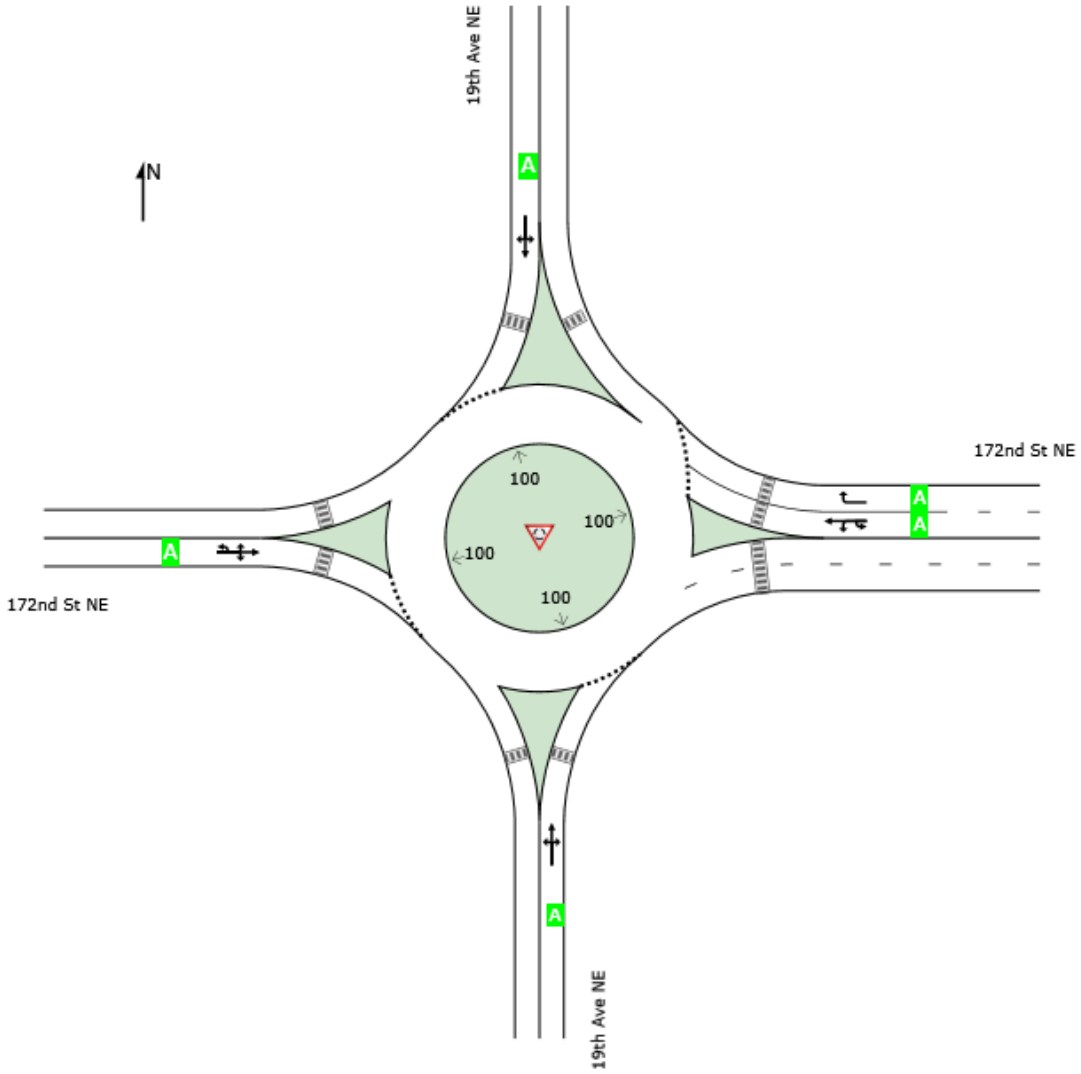
Lane Level of Service

Site: 3 [2032 No Action - PM Peak Hour (Site Folder: 19th Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

19th Ave NE / 172nd St NE
Site Category: 2032 No Action - PM Peak Hour
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: 3 [2032 No Action - PM Peak Hour (Site Folder: 19th Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

19th Ave NE / 172nd St NE
Site Category: 2032 No Action - PM Peak Hour
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	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: 19th Ave NE															
3	L2	All MCs	6	3.0	6	3.0	0.018	12.0	LOS B	0.1	2.3	0.53	0.58	0.53	33.5
8	T1	All MCs	6	3.0	6	3.0	0.018	6.3	LOS A	0.1	2.3	0.53	0.58	0.53	34.2
18	R2	All MCs	6	3.0	6	3.0	0.018	6.1	LOS A	0.1	2.3	0.53	0.58	0.53	33.9
Approach			18	3.0	18	3.0	0.018	8.1	LOS A	0.1	2.3	0.53	0.58	0.53	33.8
East: 172nd St NE															
1u	U	All MCs	1	3.0	1	3.0	0.447	11.0	LOS B	3.2	82.6	0.17	0.32	0.17	32.0
1	L2	All MCs	6	3.0	6	3.0	0.447	10.0	LOS A	3.2	82.6	0.17	0.32	0.17	33.6
6	T1	All MCs	740	3.0	740	3.0	0.447	3.2	LOS A	3.2	82.6	0.17	0.32	0.17	32.6
16	R2	All MCs	35	3.0	35	3.0	0.029	3.6	LOS A	0.1	3.4	0.13	0.41	0.13	32.3
Approach			782	3.0	782	3.0	0.447	3.2	LOS A	3.2	82.6	0.17	0.32	0.17	32.6
North: 19th Ave NE															
7	L2	All MCs	12	3.0	12	3.0	0.068	9.2	LOS A	0.4	9.5	0.66	0.61	0.66	23.7
4	T1	All MCs	6	3.0	6	3.0	0.068	7.5	LOS A	0.4	9.5	0.66	0.61	0.66	28.5
14	R2	All MCs	39	3.0	39	3.0	0.068	5.0	LOS A	0.4	9.5	0.66	0.61	0.66	23.8
Approach			56	3.0	56	3.0	0.068	6.1	LOS A	0.4	9.5	0.66	0.61	0.66	24.2
West: 172nd St NE															
5u	U	All MCs	1	3.0	1	3.0	0.327	10.9	LOS B	2.1	53.1	0.14	0.30	0.14	32.3
5	L2	All MCs	20	3.0	20	3.0	0.327	8.7	LOS A	2.1	53.1	0.14	0.30	0.14	32.3
2	T1	All MCs	438	3.0	438	3.0	0.327	2.6	LOS A	2.1	53.1	0.14	0.30	0.14	32.9
12	R2	All MCs	6	3.0	6	3.0	0.327	3.9	LOS A	2.1	53.1	0.14	0.30	0.14	34.3
Approach			465	3.0	465	3.0	0.327	2.9	LOS A	2.1	53.1	0.14	0.30	0.14	32.9
All Vehicles			1321	3.0	1321	3.0	0.447	3.3	LOS A	3.2	82.6	0.19	0.33	0.19	32.2

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.

LANE LEVEL OF SERVICE

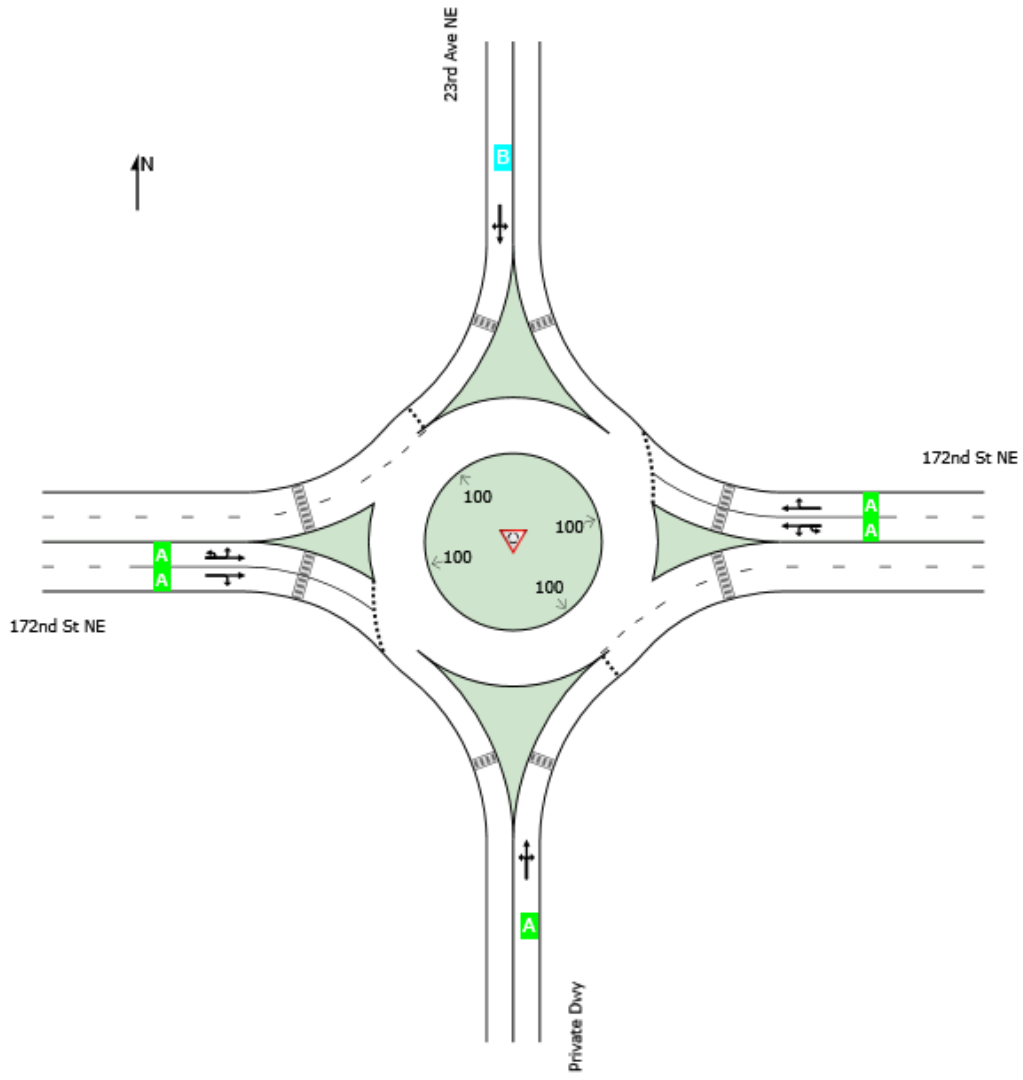
Lane Level of Service

Site: 4 [2032 No Action - PM Peak Hour (Site Folder: 23rd Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

23rd Ave NE / 172nd St NE
Site Category: 2032 No Action - PM Peak Hour
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	B	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: 4 [2032 No Action - PM Peak Hour (Site Folder: 23rd Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

23rd Ave NE / 172nd St NE
Site Category: 2032 No Action - PM Peak Hour
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	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: Private Dwy															
3	L2	All MCs	1	0.0	1	0.0	0.011	10.9	LOS B	0.1	1.7	0.77	0.57	0.77	23.0
8	T1	All MCs	1	0.0	1	0.0	0.011	5.8	LOS A	0.1	1.7	0.77	0.57	0.77	23.2
18	R2	All MCs	5	0.0	5	0.0	0.011	6.6	LOS A	0.1	1.7	0.77	0.57	0.77	23.1
Approach			7	0.0	7	0.0	0.011	7.1	LOS A	0.1	1.7	0.77	0.57	0.77	23.1
East: 172nd St NE															
1u	U	All MCs	40	1.6	40	1.6	0.373	11.1	LOS B	2.7	67.4	0.22	0.35	0.22	31.8
1	L2	All MCs	1	1.6	1	1.6	0.373	8.8	LOS A	2.7	67.4	0.22	0.35	0.22	31.8
6	T1	All MCs	886	1.6	886	1.6	0.373	3.1	LOS A	2.7	68.7	0.21	0.34	0.21	32.5
16	R2	All MCs	253	1.6	253	1.6	0.373	3.4	LOS A	2.7	68.7	0.20	0.34	0.20	32.3
Approach			1181	1.6	1181	1.6	0.373	3.4	LOS A	2.7	68.7	0.21	0.34	0.21	32.4
North: 23rd Ave NE															
7	L2	All MCs	228	2.2	228	2.2	0.352	12.0	LOS B	2.3	58.8	0.82	0.75	0.82	22.1
4	T1	All MCs	4	2.2	4	2.2	0.352	6.9	LOS A	2.3	58.8	0.82	0.75	0.82	22.2
14	R2	All MCs	24	2.2	24	2.2	0.352	7.8	LOS A	2.3	58.8	0.82	0.75	0.82	22.2
Approach			256	2.2	256	2.2	0.352	11.6	LOS B	2.3	58.8	0.82	0.75	0.82	22.1
West: 172nd St NE															
5u	U	All MCs	3	2.5	3	2.5	0.269	12.2	LOS B	1.7	43.5	0.51	0.48	0.51	31.0
5	L2	All MCs	38	2.5	38	2.5	0.269	9.9	LOS A	1.7	43.5	0.51	0.48	0.51	31.0
2	T1	All MCs	656	2.5	656	2.5	0.269	4.0	LOS A	1.8	46.3	0.50	0.44	0.50	31.7
12	R2	All MCs	1	2.5	1	2.5	0.269	4.2	LOS A	1.8	46.3	0.49	0.41	0.49	31.5
Approach			699	2.5	699	2.5	0.269	4.3	LOS A	1.8	46.3	0.50	0.44	0.50	31.6
All Vehicles			2144	2.0	2144	2.0	0.373	4.7	LOS A	2.7	68.7	0.38	0.43	0.38	30.4

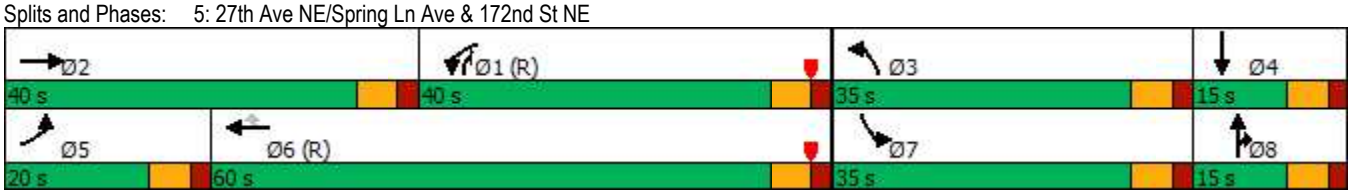
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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.

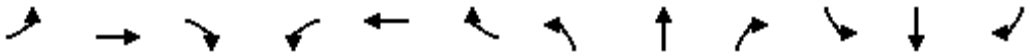
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	573	161	968	792	333	247	120	836	427	132	38
Future Volume (vph)	39	573	161	968	792	333	247	120	836	427	132	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	425		200	125		0	150		150
Storage Lanes	1		0	2		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		394			613			444			470	
Travel Time (s)		7.7			11.9			12.1			12.8	
Confl. Peds. (#/hr)	1					1	2					2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8	8 1	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0		3.0	5.0	
Minimum Split (s)	9.0	38.0		9.0	38.0	38.0	9.0	11.0		9.0	46.0	
Total Split (s)	20.0	40.0		40.0	60.0	60.0	35.0	15.0		35.0	15.0	
Total Split (%)	15.4%	30.8%		30.8%	46.2%	46.2%	26.9%	11.5%		26.9%	11.5%	
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	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	Min		C-Min	C-Min	C-Min	None	None		Min	Min	

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 75 (58%), Referenced to phase 1:WBL and 6:WBT, Start of Red
Natural Cycle: 145
Control Type: Actuated-Coordinated

Splits and Phases: 5: 27th Ave NE/Spring Ln Ave & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	573	161	968	792	333	247	120	836	427	132	38
Future Volume (veh/h)	39	573	161	968	792	333	247	120	836	427	132	38
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	39	573	161	968	792	333	247	120	836	427	132	38
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	50	908	254	911	2023	901	275	151	545	497	97	28
Arrive On Green	0.03	0.33	0.33	0.44	0.94	0.94	0.15	0.08	0.08	0.14	0.07	0.07
Sat Flow, veh/h	1781	2740	768	3483	3582	1596	1795	1885	1586	3483	1404	404
Grp Volume(v), veh/h	39	371	363	968	792	333	247	120	836	427	0	170
Grp Sat Flow(s),veh/h/ln	1781	1777	1731	1742	1791	1596	1795	1885	1586	1742	0	1808
Q Serve(g_s), s	2.8	22.9	23.1	34.0	2.6	2.4	17.6	8.1	10.4	15.6	0.0	9.0
Cycle Q Clear(g_c), s	2.8	22.9	23.1	34.0	2.6	2.4	17.6	8.1	10.4	15.6	0.0	9.0
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	50	589	574	911	2023	901	275	151	545	497	0	125
V/C Ratio(X)	0.78	0.63	0.63	1.06	0.39	0.37	0.90	0.80	1.54	0.86	0.00	1.36
Avail Cap(c_a), veh/h	192	589	574	911	2023	901	401	151	545	777	0	125
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.51	0.51	0.51	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.8	36.7	36.8	36.6	1.7	1.7	54.0	58.8	20.3	54.5	0.0	60.5
Incr Delay (d2), s/veh	17.1	2.2	2.3	40.2	0.3	0.6	15.3	25.0	250.0	5.0	0.0	204.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	10.2	10.0	17.3	0.8	0.7	9.2	5.0	47.9	7.2	0.0	11.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.8	38.9	39.0	76.8	2.0	2.3	69.3	83.8	270.2	59.5	0.0	264.6
LnGrp LOS	E	D	D	F	A	A	E	F	F	E	A	F
Approach Vol, veh/h		773			2093			1203			597	
Approach Delay, s/veh		41.0			36.6			210.4			117.9	
Approach LOS		D			D			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	40.0	49.1	25.9	15.0	9.7	79.4	24.5	16.4
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	34.0	34.0	29.0	9.0	14.0	54.0	29.0	9.0
Max Q Clear Time (g_c+I1), s	36.0	25.1	19.6	11.0	4.8	4.6	17.6	12.4
Green Ext Time (p_c), s	0.0	3.0	0.4	0.0	0.0	8.1	1.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	92.5
HCM 6th LOS	F

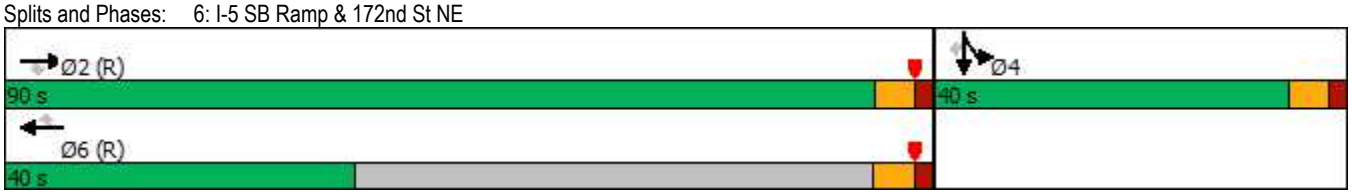
Notes

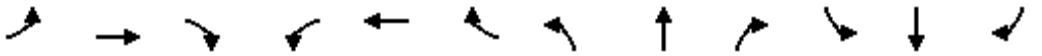
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1349	591	0	1751	755	0	0	0	382	0	362
Future Volume (vph)	0	1349	591	0	1751	755	0	0	0	382	0	362
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-3%			0%			3%	
Storage Length (ft)	0		250	0		0	0		0	400		400
Storage Lanes	0		1	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		613			915			299			608	
Travel Time (s)		11.9			17.8			6.8			13.8	
Confl. Peds. (#/hr)	11					11	1					1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										50%		
Turn Type		NA	Perm		NA	Perm				Split	NA	Perm
Protected Phases		2			6					4	4	
Permitted Phases			2			6						4
Detector Phase		2	2		6	6				4	4	4
Switch Phase												
Minimum Initial (s)		7.0	7.0		7.0	7.0				5.0	5.0	5.0
Minimum Split (s)		24.8	24.8		34.1	34.1				33.8	33.8	33.8
Total Split (s)		90.0	90.0		40.0	40.0				40.0	40.0	40.0
Total Split (%)		69.2%	69.2%		30.8%	30.8%				30.8%	30.8%	30.8%
Yellow Time (s)		3.8	3.8		4.1	4.1				3.8	3.8	3.8
All-Red Time (s)		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
Total Lost Time (s)		5.8	5.8		6.1	6.1				5.8	5.8	5.8
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Min	C-Min		C-Min	C-Min				None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Red	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: I-5 SB Ramp & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1349	591	0	1751	755	0	0	0	382	0	362
Future Volume (veh/h)	0	1349	591	0	1751	755	0	0	0	382	0	362
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1832	1832	0	1988	1988				1788	1788	1788
Adj Flow Rate, veh/h	0	1391	0	0	1805	0				394	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	1	1	0	2	2				4	4	4
Cap, veh/h	0	2651		0	2876					501	0	
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00				0.15	0.00	0.00
Sat Flow, veh/h	0	3573	1553	0	3877	1685				3405	0	1515
Grp Volume(v), veh/h	0	1391	0	0	1805	0				394	0	0
Grp Sat Flow(s),veh/h/ln	0	1741	1553	0	1889	1685				1703	0	1515
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				14.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				14.5	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2651		0	2876					501	0	
V/C Ratio(X)	0.00	0.52		0.00	0.63					0.79	0.00	
Avail Cap(c_a), veh/h	0	2651		0	2876					896	0	
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.19	0.00	0.00	0.17	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				53.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.2	0.0				4.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	0.1	0.0				6.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.1	0.0	0.0	0.2	0.0				58.2	0.0	0.0
LnGrp LOS	A	A		A	A					E	A	
Approach Vol, veh/h		1391			1805						394	
Approach Delay, s/veh		0.1			0.2						58.2	
Approach LOS		A			A						E	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	105.1	24.9	105.1
Change Period (Y+Rc), s	* 6.1	* 5.8	6.1
Max Green Setting (Gmax), s	* 84	* 34	33.9
Max Q Clear Time (g_c+I1), s	2.0	16.5	2.0
Green Ext Time (p_c), s	25.7	2.4	23.7

Intersection Summary	
HCM 6th Ctrl Delay	6.5
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

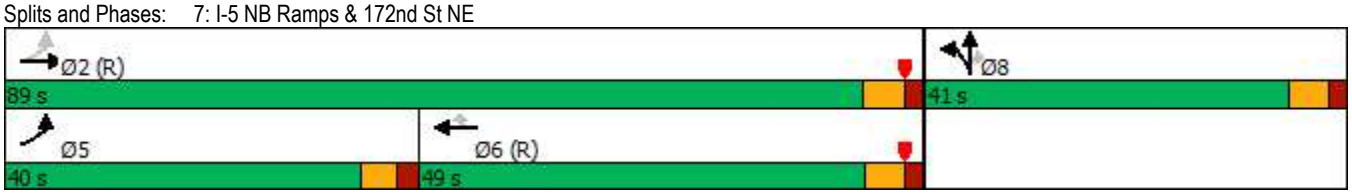
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

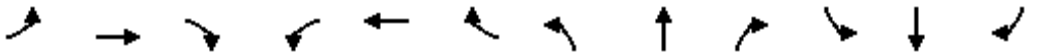
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	427	1273	0	0	1719	638	774	3	981	0	0	0
Future Volume (vph)	427	1273	0	0	1719	638	774	3	981	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			6%			5%			0%	
Storage Length (ft)	600		0	0		300	400		0	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		915			978			589			234	
Travel Time (s)		17.8			19.1			13.4			5.3	
Confl. Peds. (#/hr)	8		11	11		8			4	4		
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 (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	pm+pt	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases	2					6			8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	5.0	7.0			7.0	7.0	5.0	5.0	5.0			
Minimum Split (s)	10.6	24.1			23.8	23.8	40.8	40.8	40.8			
Total Split (s)	40.0	89.0			49.0	49.0	41.0	41.0	41.0			
Total Split (%)	30.8%	68.5%			37.7%	37.7%	31.5%	31.5%	31.5%			
Yellow Time (s)	3.6	4.1			3.8	3.8	3.8	3.8	3.8			
All-Red Time (s)	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			
Total Lost Time (s)	5.6	6.1			5.8	5.8	5.8	5.8	5.8			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Red	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-5 NB Ramps & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	427	1273	0	0	1719	638	774	3	981	0	0	0
Future Volume (veh/h)	427	1273	0	0	1719	638	774	3	981	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1658	1658	1723	1723	1723			
Adj Flow Rate, veh/h	436	1299	0	0	1754	0	792	0	0			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	455	2299	0	0	1718		858	0				
Arrive On Green	0.45	1.00	0.00	0.00	0.38	0.00	0.26	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	4676	1405	3282	0	1460			
Grp Volume(v), veh/h	436	1299	0	0	1754	0	792	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1509	1405	1641	0	1460			
Q Serve(g_s), s	26.4	0.0	0.0	0.0	49.3	0.0	30.5	0.0	0.0			
Cycle Q Clear(g_c), s	26.4	0.0	0.0	0.0	49.3	0.0	30.5	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	455	2299	0	0	1718		858	0				
V/C Ratio(X)	0.96	0.56	0.00	0.00	1.02		0.92	0.00				
Avail Cap(c_a), veh/h	527	2299	0	0	1718		889	0				
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.78	0.78	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	27.1	0.0	0.0	0.0	40.3	0.0	46.7	0.0	0.0			
Incr Delay (d2), s/veh	23.0	0.8	0.0	0.0	27.2	0.0	15.1	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.7	0.3	0.0	0.0	22.1	0.0	14.2	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.1	0.8	0.0	0.0	67.6	0.0	61.8	0.0	0.0			
LnGrp LOS	D	A	A	A	F		E	A				
Approach Vol, veh/h		1735			1754			792				
Approach Delay, s/veh		13.2			67.6			61.8				
Approach LOS		B			E			E				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		90.2			34.8	55.4		39.8				
Change Period (Y+Rc), s		6.1			5.6	* 6.1		5.8				
Max Green Setting (Gmax), s		82.9			34.4	* 43		35.2				
Max Q Clear Time (g_c+I1), s		2.0			28.4	51.3		32.5				
Green Ext Time (p_c), s		22.5			0.8	0.0		1.4				

Intersection Summary	
HCM 6th Ctrl Delay	44.5
HCM 6th LOS	D

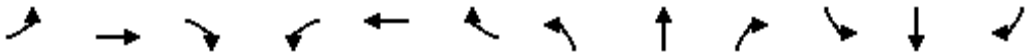
Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

2032 With Project – Weekday PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	289	1	75	478	18	7	1	48	9	1	7
Future Volume (vph)	3	289	1	75	478	18	7	1	48	9	1	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			5%			-4%	
Storage Length (ft)	0		0	175		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		35			25			25			25	
Link Distance (ft)		369			1809			529			387	
Travel Time (s)		7.2			49.3			14.4			10.6	
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 (%)	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)												
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	289	1	75	478	18	7	1	48	9	1	7
Future Vol, veh/h	3	289	1	75	478	18	7	1	48	9	1	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	5	-	-	-4	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	1	1	1	0	0	0	0	0	0
Mvmt Flow	3	318	1	82	525	20	8	1	53	10	1	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	545	0	0	319	0	0	1029	1034	319	1051	1024	535
Stage 1	-	-	-	-	-	-	325	325	-	699	699	-
Stage 2	-	-	-	-	-	-	704	709	-	352	325	-
Critical Hdwy	4.12	-	-	4.11	-	-	8.1	7.5	6.7	6.3	5.7	5.8
Critical Hdwy Stg 1	-	-	-	-	-	-	7.1	6.5	-	5.3	4.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	7.1	6.5	-	5.3	4.7	-
Follow-up Hdwy	2.218	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1024	-	-	1247	-	-	161	176	695	261	298	583
Stage 1	-	-	-	-	-	-	632	596	-	506	520	-
Stage 2	-	-	-	-	-	-	354	362	-	723	701	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1024	-	-	1247	-	-	150	164	695	227	277	583
Mov Cap-2 Maneuver	-	-	-	-	-	-	150	164	-	227	277	-
Stage 1	-	-	-	-	-	-	629	594	-	504	486	-
Stage 2	-	-	-	-	-	-	326	338	-	664	698	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.1	14	17.4
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	460	1024	-	-	1247	-	-	308
HCM Lane V/C Ratio	0.134	0.003	-	-	0.066	-	-	0.061
HCM Control Delay (s)	14	8.5	0	-	8.1	-	-	17.4
HCM Lane LOS	B	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.2	-	-	0.2

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	350	5	59	615	4	52
Future Volume (vph)	350	5	59	615	4	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	25		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Link Speed (mph)	25			25	35	
Link Distance (ft)	124			686	769	
Travel Time (s)	3.4			18.7	15.0	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	2%	2%	1%	1%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	350	5	59	615	4	52
Future Vol, veh/h	350	5	59	615	4	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	25	-	0	-
Veh in Median Storage, #	0	-	-	0	1	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	1	1	0	0
Mvmt Flow	407	6	69	715	5	60

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	413	0	1263	410
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	853	-
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	-	-	1151	-	189	646
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	421	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1151	-	178	646
Mov Cap-2 Maneuver	-	-	-	-	301	-
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	396	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	597	-	-	1151	-
HCM Lane V/C Ratio	0.109	-	-	0.06	-
HCM Control Delay (s)	11.8	-	-	8.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-

LANE LEVEL OF SERVICE

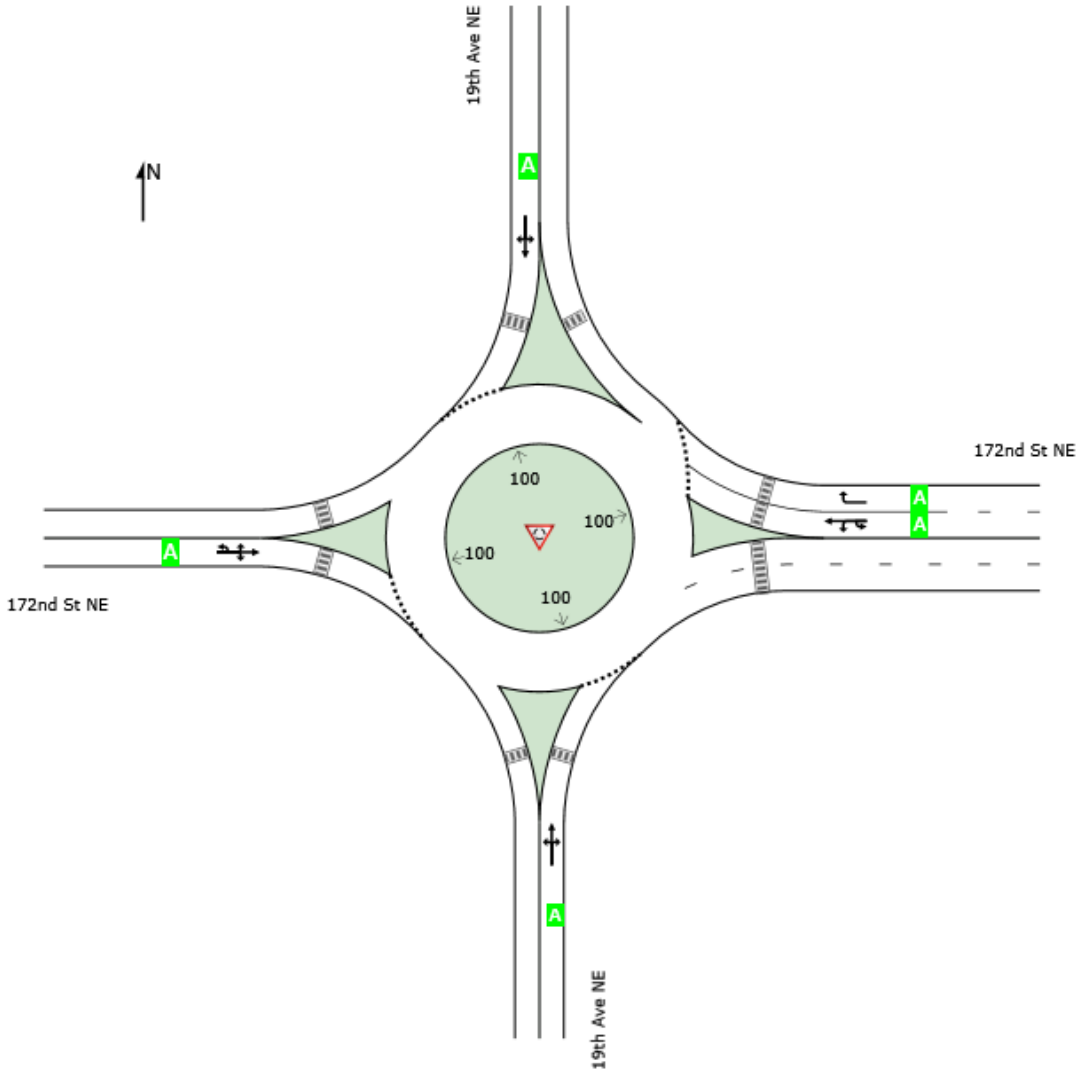
Lane Level of Service

Site: 3 [2032 With Project - PM Peak Hour (Site Folder: 19th Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

19th Ave NE / 172nd St NE
Site Category: 2032 With Project - PM Peak Hour
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: 3 [2032 With Project - PM Peak Hour (Site Folder: 19th Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

19th Ave NE / 172nd St NE
Site Category: 2032 With Project - PM Peak Hour
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	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: 19th Ave NE															
3	L2	All MCs	6	3.0	6	3.0	0.019	12.4	LOS B	0.1	2.6	0.58	0.60	0.58	33.3
8	T1	All MCs	6	3.0	6	3.0	0.019	6.7	LOS A	0.1	2.6	0.58	0.60	0.58	34.0
18	R2	All MCs	6	3.0	6	3.0	0.019	6.5	LOS A	0.1	2.6	0.58	0.60	0.58	33.7
Approach			18	3.0	18	3.0	0.019	8.5	LOS A	0.1	2.6	0.58	0.60	0.58	33.7
East: 172nd St NE															
1u	U	All MCs	1	3.0	1	3.0	0.454	11.1	LOS B	3.3	84.4	0.23	0.33	0.23	31.9
1	L2	All MCs	6	3.0	6	3.0	0.454	10.1	LOS B	3.3	84.4	0.23	0.33	0.23	33.4
6	T1	All MCs	740	3.0	740	3.0	0.454	3.3	LOS A	3.3	84.4	0.23	0.33	0.23	32.4
16	R2	All MCs	98	3.0	98	3.0	0.083	3.7	LOS A	0.4	10.0	0.18	0.42	0.18	32.2
Approach			845	3.0	845	3.0	0.454	3.4	LOS A	3.3	84.4	0.22	0.34	0.22	32.4
North: 19th Ave NE															
7	L2	All MCs	55	3.0	55	3.0	0.140	9.4	LOS A	0.8	20.5	0.69	0.65	0.69	23.2
4	T1	All MCs	6	3.0	6	3.0	0.140	7.7	LOS A	0.8	20.5	0.69	0.65	0.69	27.7
14	R2	All MCs	53	3.0	53	3.0	0.140	5.2	LOS A	0.8	20.5	0.69	0.65	0.69	23.3
Approach			114	3.0	114	3.0	0.140	7.4	LOS A	0.8	20.5	0.69	0.65	0.69	23.4
West: 172nd St NE															
5u	U	All MCs	1	3.0	1	3.0	0.355	11.1	LOS B	2.4	60.9	0.27	0.35	0.27	31.8
5	L2	All MCs	40	3.0	40	3.0	0.355	8.9	LOS A	2.4	60.9	0.27	0.35	0.27	31.8
2	T1	All MCs	438	3.0	438	3.0	0.355	2.9	LOS A	2.4	60.9	0.27	0.35	0.27	32.5
12	R2	All MCs	6	3.0	6	3.0	0.355	4.1	LOS A	2.4	60.9	0.27	0.35	0.27	33.8
Approach			485	3.0	485	3.0	0.355	3.4	LOS A	2.4	60.9	0.27	0.35	0.27	32.4
All Vehicles			1461	3.0	1461	3.0	0.454	3.8	LOS A	3.3	84.4	0.28	0.37	0.28	31.5

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.

LANE LEVEL OF SERVICE

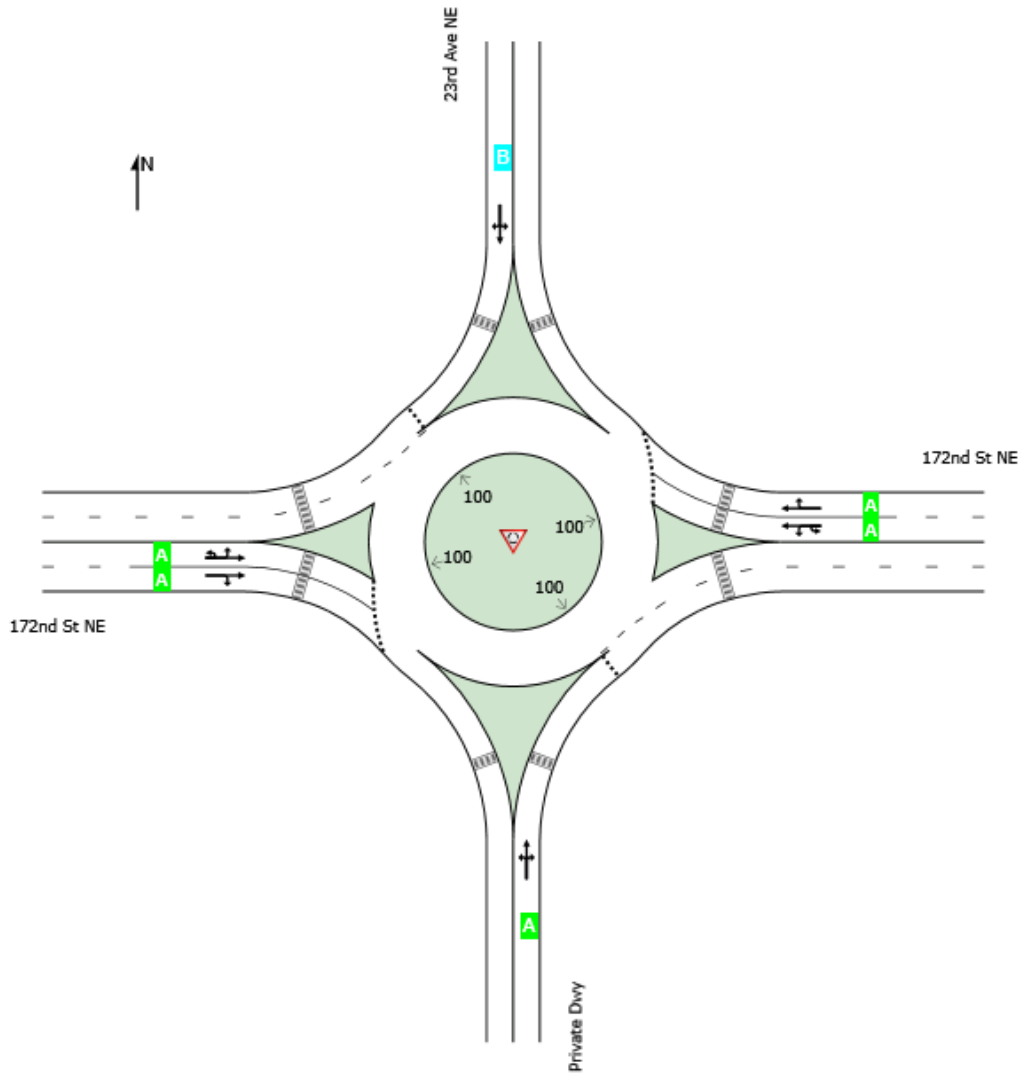
Lane Level of Service

Site: 4 [2032 With Project - PM Peak Hour (Site Folder: 23rd Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

23rd Ave NE / 172nd St NE
Site Category: 2032 With Project - PM Peak Hour
Roundabout

	Approaches				Intersection
	South	East	North	West	
LOS	A	A	B	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: 4 [2032 With Project - PM Peak Hour (Site Folder: 23rd Ave NE / 172nd St NE)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

23rd Ave NE / 172nd St NE
Site Category: 2032 With Project - PM Peak Hour
Roundabout

Vehicle Movement Performance

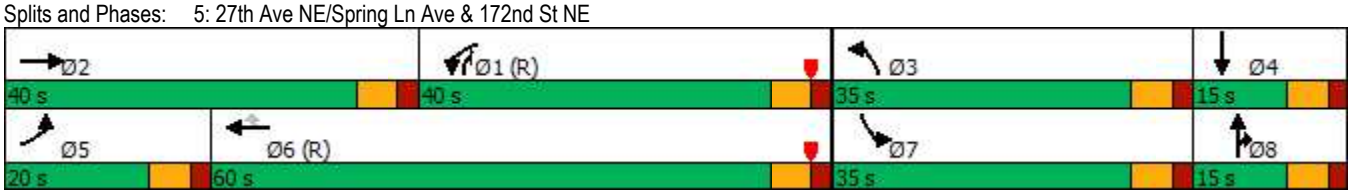
Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: Private Dwy															
3	L2	All MCs	1	0.0	1	0.0	0.011	11.4	LOS B	0.1	1.8	0.80	0.59	0.80	22.9
8	T1	All MCs	1	0.0	1	0.0	0.011	6.3	LOS A	0.1	1.8	0.80	0.59	0.80	23.0
18	R2	All MCs	5	0.0	5	0.0	0.011	7.2	LOS A	0.1	1.8	0.80	0.59	0.80	23.0
Approach			7	0.0	7	0.0	0.011	7.7	LOS A	0.1	1.8	0.80	0.59	0.80	23.0
East: 172nd St NE															
1u	U	All MCs	40	1.6	40	1.6	0.391	11.1	LOS B	2.9	72.5	0.22	0.35	0.22	31.8
1	L2	All MCs	1	1.6	1	1.6	0.391	8.8	LOS A	2.9	72.5	0.22	0.35	0.22	31.8
6	T1	All MCs	943	1.6	943	1.6	0.391	3.1	LOS A	2.9	73.8	0.21	0.34	0.21	32.4
16	R2	All MCs	253	1.6	253	1.6	0.391	3.4	LOS A	2.9	73.8	0.20	0.34	0.20	32.3
Approach			1237	1.6	1237	1.6	0.391	3.4	LOS A	2.9	73.8	0.21	0.34	0.21	32.4
North: 23rd Ave NE															
7	L2	All MCs	228	2.2	228	2.2	0.373	13.1	LOS B	2.5	64.6	0.86	0.77	0.87	21.9
4	T1	All MCs	4	2.2	4	2.2	0.373	7.9	LOS A	2.5	64.6	0.86	0.77	0.87	22.0
14	R2	All MCs	24	2.2	24	2.2	0.373	8.8	LOS A	2.5	64.6	0.86	0.77	0.87	22.0
Approach			256	2.2	256	2.2	0.373	12.6	LOS B	2.5	64.6	0.86	0.77	0.87	21.9
West: 172nd St NE															
5u	U	All MCs	3	2.5	3	2.5	0.285	12.2	LOS B	1.8	46.9	0.52	0.48	0.52	30.9
5	L2	All MCs	38	2.5	38	2.5	0.285	9.9	LOS A	1.8	46.9	0.52	0.48	0.52	31.0
2	T1	All MCs	696	2.5	696	2.5	0.285	4.0	LOS A	2.0	50.0	0.51	0.44	0.51	31.6
12	R2	All MCs	1	2.5	1	2.5	0.285	4.3	LOS A	2.0	50.0	0.50	0.41	0.50	31.5
Approach			738	2.5	738	2.5	0.285	4.3	LOS A	2.0	50.0	0.51	0.44	0.51	31.6
All Vehicles			2239	2.0	2239	2.0	0.391	4.8	LOS A	2.9	73.8	0.39	0.43	0.39	30.4

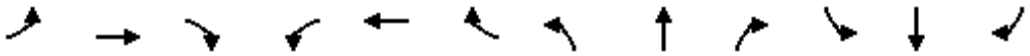
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	607	164	968	841	333	251	120	836	427	132	38
Future Volume (vph)	39	607	164	968	841	333	251	120	836	427	132	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	425		200	125		0	150		150
Storage Lanes	1		0	2		1	1		1	2		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		394			613			444			470	
Travel Time (s)		7.7			11.9			12.1			12.8	
Confl. Peds. (#/hr)	1					1	2					2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pt+ov	Prot	NA	
Protected Phases	5	2		1	6		3	8	8 1	7	4	
Permitted Phases						6						
Detector Phase	5	2		1	6	6	3	8	8 1	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0		3.0	5.0	
Minimum Split (s)	9.0	38.0		9.0	38.0	38.0	9.0	11.0		9.0	46.0	
Total Split (s)	20.0	40.0		40.0	60.0	60.0	35.0	15.0		35.0	15.0	
Total Split (%)	15.4%	30.8%		30.8%	46.2%	46.2%	26.9%	11.5%		26.9%	11.5%	
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	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Recall Mode	None	Min		C-Min	C-Min	C-Min	None	None		Min	Min	

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 75 (58%), Referenced to phase 1:WBL and 6:WBT, Start of Red	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	

Splits and Phases: 5: 27th Ave NE/Spring Ln Ave & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	607	164	968	841	333	251	120	836	427	132	38
Future Volume (veh/h)	39	607	164	968	841	333	251	120	836	427	132	38
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	39	607	164	968	841	333	251	120	836	427	132	38
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	1	1	1	1	1	1	1	1	1
Cap, veh/h	50	910	245	911	2015	898	279	155	548	497	97	28
Arrive On Green	0.03	0.33	0.33	0.44	0.94	0.94	0.16	0.08	0.08	0.14	0.07	0.07
Sat Flow, veh/h	1781	2766	746	3483	3582	1596	1795	1885	1586	3483	1404	404
Grp Volume(v), veh/h	39	389	382	968	841	333	251	120	836	427	0	170
Grp Sat Flow(s),veh/h/ln	1781	1777	1735	1742	1791	1596	1795	1885	1586	1742	0	1808
Q Serve(g_s), s	2.8	24.5	24.6	34.0	3.0	2.5	17.8	8.1	10.7	15.6	0.0	9.0
Cycle Q Clear(g_c), s	2.8	24.5	24.6	34.0	3.0	2.5	17.8	8.1	10.7	15.6	0.0	9.0
Prop In Lane	1.00		0.43	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	50	585	571	911	2015	898	279	155	548	497	0	125
V/C Ratio(X)	0.78	0.67	0.67	1.06	0.42	0.37	0.90	0.78	1.53	0.86	0.00	1.36
Avail Cap(c_a), veh/h	192	585	571	911	2015	898	401	155	548	777	0	125
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.47	0.47	0.47	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.8	37.5	37.5	36.6	1.8	1.8	53.9	58.5	19.9	54.5	0.0	60.5
Incr Delay (d2), s/veh	17.1	2.9	3.0	39.4	0.3	0.6	15.9	21.4	245.6	5.0	0.0	204.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	11.0	10.8	17.2	0.8	0.8	9.3	4.8	47.5	7.2	0.0	11.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.8	40.3	40.5	76.0	2.1	2.4	69.8	79.9	265.5	59.5	0.0	264.6
LnGrp LOS	E	D	D	F	A	A	E	E	F	E	A	F
Approach Vol, veh/h		810			2142			1207			597	
Approach Delay, s/veh		42.3			35.6			206.4			117.9	
Approach LOS		D			D			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	40.0	48.8	26.2	15.0	9.7	79.1	24.5	16.7
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	34.0	34.0	29.0	9.0	14.0	54.0	29.0	9.0
Max Q Clear Time (g_c+I1), s	36.0	26.6	19.8	11.0	4.8	5.0	17.6	12.7
Green Ext Time (p_c), s	0.0	2.8	0.4	0.0	0.0	8.6	1.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	90.4
HCM 6th LOS	F

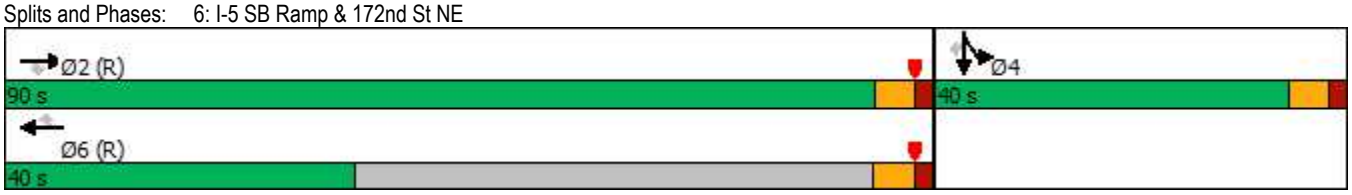
Notes

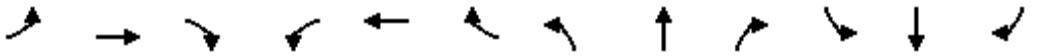
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1368	606	0	1790	755	0	0	0	382	0	372
Future Volume (vph)	0	1368	606	0	1790	755	0	0	0	382	0	372
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		3%			-3%			0%			3%	
Storage Length (ft)	0		250	0		0	0		0	400		400
Storage Lanes	0		1	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		613			915			299			608	
Travel Time (s)		11.9			17.8			6.8			13.8	
Confl. Peds. (#/hr)	11					11	1					1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	0%	0%	0%	4%	4%	4%
Shared Lane Traffic (%)										50%		
Turn Type		NA	Perm		NA	Perm				Split	NA	Perm
Protected Phases		2			6					4	4	
Permitted Phases			2			6						4
Detector Phase		2	2		6	6				4	4	4
Switch Phase												
Minimum Initial (s)		7.0	7.0		7.0	7.0				5.0	5.0	5.0
Minimum Split (s)		24.8	24.8		34.1	34.1				33.8	33.8	33.8
Total Split (s)		90.0	90.0		40.0	40.0				40.0	40.0	40.0
Total Split (%)		69.2%	69.2%		30.8%	30.8%				30.8%	30.8%	30.8%
Yellow Time (s)		3.8	3.8		4.1	4.1				3.8	3.8	3.8
All-Red Time (s)		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
Total Lost Time (s)		5.8	5.8		6.1	6.1				5.8	5.8	5.8
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		C-Min	C-Min		C-Min	C-Min				None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Red	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	

Splits and Phases: 6: I-5 SB Ramp & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1368	606	0	1790	755	0	0	0	382	0	372
Future Volume (veh/h)	0	1368	606	0	1790	755	0	0	0	382	0	372
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1832	1832	0	1988	1988				1788	1788	1788
Adj Flow Rate, veh/h	0	1410	0	0	1845	0				394	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	1	1	0	2	2				4	4	4
Cap, veh/h	0	2651		0	2876					501	0	
Arrive On Green	0.00	1.00	0.00	0.00	1.00	0.00				0.15	0.00	0.00
Sat Flow, veh/h	0	3573	1553	0	3877	1685				3405	0	1515
Grp Volume(v), veh/h	0	1410	0	0	1845	0				394	0	0
Grp Sat Flow(s),veh/h/ln	0	1741	1553	0	1889	1685				1703	0	1515
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0				14.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0				14.5	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2651		0	2876					501	0	
V/C Ratio(X)	0.00	0.53		0.00	0.64					0.79	0.00	
Avail Cap(c_a), veh/h	0	2651		0	2876					896	0	
HCM Platoon Ratio	1.00	2.00	2.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.16	0.00	0.00	0.13	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				53.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	0.1	0.0				4.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.1	0.0				6.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.1	0.0	0.0	0.1	0.0				58.2	0.0	0.0
LnGrp LOS	A	A		A	A					E	A	
Approach Vol, veh/h		1410			1845						394	
Approach Delay, s/veh		0.1			0.1						58.2	
Approach LOS		A			A						E	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	105.1	24.9	105.1
Change Period (Y+Rc), s	* 6.1	* 5.8	6.1
Max Green Setting (Gmax), s	* 84	* 34	33.9
Max Q Clear Time (g_c+I1), s	2.0	16.5	2.0
Green Ext Time (p_c), s	26.4	2.4	24.2

Intersection Summary	
HCM 6th Ctrl Delay	6.4
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

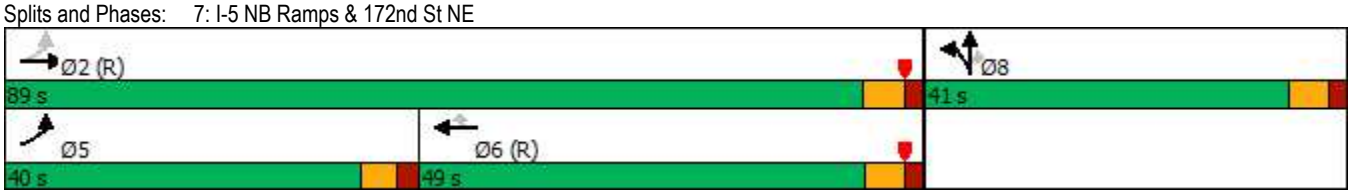
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

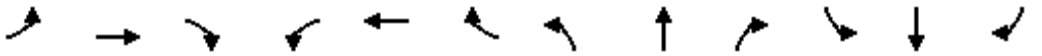
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	434	1285	0	0	1736	638	796	3	981	0	0	0
Future Volume (vph)	434	1285	0	0	1736	638	796	3	981	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			6%			5%			0%	
Storage Length (ft)	600		0	0		300	400		0	0		0
Storage Lanes	1		0	0		1	1		1	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		915			978			589			234	
Travel Time (s)		17.8			19.1			13.4			5.3	
Confl. Peds. (#/hr)	8		11	11		8			4	4		
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 (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)							50%					
Turn Type	pm+pt	NA			NA	Perm	Split	NA	Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases	2					6			8			
Detector Phase	5	2			6	6	8	8	8			
Switch Phase												
Minimum Initial (s)	5.0	7.0			7.0	7.0	5.0	5.0	5.0			
Minimum Split (s)	10.6	24.1			23.8	23.8	40.8	40.8	40.8			
Total Split (s)	40.0	89.0			49.0	49.0	41.0	41.0	41.0			
Total Split (%)	30.8%	68.5%			37.7%	37.7%	31.5%	31.5%	31.5%			
Yellow Time (s)	3.6	4.1			3.8	3.8	3.8	3.8	3.8			
All-Red Time (s)	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			
Total Lost Time (s)	5.6	6.1			5.8	5.8	5.8	5.8	5.8			
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Recall Mode	None	C-Min			C-Min	C-Min	None	None	None			

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Red	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	

Splits and Phases: 7: I-5 NB Ramps & 172nd St NE





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	434	1285	0	0	1736	638	796	3	981	0	0	0
Future Volume (veh/h)	434	1285	0	0	1736	638	796	3	981	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1658	1658	1723	1723	1723			
Adj Flow Rate, veh/h	443	1311	0	0	1771	0	814	0	0			
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	462	2286	0	0	1684		870	0				
Arrive On Green	0.46	1.00	0.00	0.00	0.37	0.00	0.27	0.00	0.00			
Sat Flow, veh/h	1781	3647	0	0	4676	1405	3282	0	1460			
Grp Volume(v), veh/h	443	1311	0	0	1771	0	814	0	0			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1509	1405	1641	0	1460			
Q Serve(g_s), s	26.9	0.0	0.0	0.0	48.4	0.0	31.5	0.0	0.0			
Cycle Q Clear(g_c), s	26.9	0.0	0.0	0.0	48.4	0.0	31.5	0.0	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	462	2286	0	0	1684		870	0				
V/C Ratio(X)	0.96	0.57	0.00	0.00	1.05		0.94	0.00				
Avail Cap(c_a), veh/h	527	2286	0	0	1684		889	0				
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.77	0.77	0.00	0.00	1.00	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	26.7	0.0	0.0	0.0	40.8	0.0	46.7	0.0	0.0			
Incr Delay (d2), s/veh	23.3	0.8	0.0	0.0	36.9	0.0	16.9	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.8	0.3	0.0	0.0	23.3	0.0	14.8	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.0	0.8	0.0	0.0	77.7	0.0	63.6	0.0	0.0			
LnGrp LOS	D	A	A	A	F		E	A				
Approach Vol, veh/h		1754			1771			814				
Approach Delay, s/veh		13.2			77.7			63.6				
Approach LOS		B			E			E				
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		89.7			35.3	54.5		40.3				
Change Period (Y+Rc), s		6.1			5.6	* 6.1		5.8				
Max Green Setting (Gmax), s		82.9			34.4	* 43		35.2				
Max Q Clear Time (g_c+I1), s		2.0			28.9	50.4		33.5				
Green Ext Time (p_c), s		22.9			0.7	0.0		0.9				

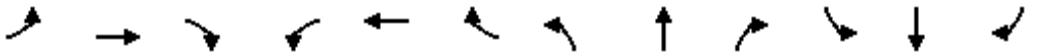
Intersection Summary	
HCM 6th Ctrl Delay	49.0
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	2	49	17	4	34	70	63	17	35	52	12
Future Volume (vph)	9	2	49	17	4	34	70	63	17	35	52	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	50		0	50		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		94			694			670			298	
Travel Time (s)		2.6			18.9			13.1			5.8	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	0%	0%	0%	0%	3%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	2	49	17	4	34	70	63	17	35	52	12
Future Vol, veh/h	9	2	49	17	4	34	70	63	17	35	52	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	3	3	3	3	3	3	3	0	0	0	0	3
Mvmt Flow	11	2	58	20	5	40	83	75	20	42	62	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	427	415	69	435	412	86	76	0	0	96	0	0
Stage 1	153	153	-	252	252	-	-	-	-	-	-	-
Stage 2	274	262	-	183	160	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.1	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.2	-	-
Pot Cap-1 Maneuver	536	526	991	530	528	970	1517	-	-	1510	-	-
Stage 1	847	769	-	750	697	-	-	-	-	-	-	-
Stage 2	730	690	-	816	764	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	479	483	991	466	485	969	1517	-	-	1509	-	-
Mov Cap-2 Maneuver	524	519	-	524	522	-	-	-	-	-	-	-
Stage 1	800	747	-	708	658	-	-	-	-	-	-	-
Stage 2	656	651	-	744	743	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	10.4	3.5	2.6
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1517	-	-	851	731	1509	-	-
HCM Lane V/C Ratio	0.055	-	-	0.084	0.09	0.028	-	-
HCM Control Delay (s)	7.5	-	-	9.6	10.4	7.5	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	0.3	0.1	-	-

Appendix D

Trip Generation Calculations

English Crossing (Marysville)
Weekday Trip Generation Summary

Land Use	Units [1]	ITE LUC [2]	Trip Rate or Equation [2]	Directional Distribution		Trips Generated		
				In	Out	In	Out	Total
DAILY								
Proposed Use:								
Single-Family Attached Housing	250 DU	215	T = 7.62(X) - 50.48	50%	50%	927	928	1,855
					New Daily Trips =	**927**	**928**	**1,855**
AM PEAK HOUR								
Proposed Use:								
Single-Family Attached Housing	250 DU	215	T = 0.52(X) - 5.70	25%	75%	31	93	124
					New AM Peak Hour Trips =	**31**	**93**	**124**
PM PEAK HOUR								
Proposed Use:								
Single-Family Attached Housing	250 DU	215	T = 0.60(X) - 3.93	59%	41%	86	60	146
					New PM Peak Hour Trips =	**86**	**60**	**146**

Notes:

[1] DU = Dwelling Units.

[2] Based on Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, 2021.

Appendix E

City of Marysville Model Distribution

LAKEWOOD N/O 172ND ST NE - EXISTING

Existing Distribution

Marysville

November 2017

- Marysville City Limits
- Other City Limits
- Urban Growth Boundary
- Tulalip Reservation
- Parks and open space
- Interstate Highway
- State Highway
- Arterial
- Schools

N

0 2,000 4,000 6,000 Feet

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14% 12% 3% 20% 20% 4% 7% 12% 14% 2% 5% 66% 2% 2% 2% 6% 6% 2% 4% 1% 25% 3% 6% 4% 1% 2% 3% 1% 1% 4% 3% 1% 1% 4% 5% 4% 16% 1% 1% 1% 4% 3% 1% 2% 12% 1% 1% 2% 1% 1% 9% 1%

SR 531 SR 9 SR 529 I-5

Fish Creek Lakewood Schools Cougar Creek Elementary Twin Lakes Park West Fork Quilceda Creek Edgecomb Creek Olaf Strad Creek Strawberry Fields Park Hayho Creek Shoultes Elementary Tulalip Indian Reservation Marshall Elementary Mountain View Liberty Elementary Marysville Middle Jennings Park Marysville Pilchuck High Cascade Elementary Kellogg Marsh Elementary Pinewood Elementary Cedarcrest Middle Marysville Getchell High Cedarcrest Golf Course Grove Elementary North Pointe Park Quil Ceda Elementary Sunnyside Elementary Harborview Park Deering Wildflower Acres Lake Cassidy Sunnycrest Elementary Sch Allen Creek Little Coho Creek Munson Creek Jones Creek Sturgeon Creek Centennial Trail

City of Marysville City of Everett City of Lake Stevens

Future Distribution

City of Marysville

City Limits	Fire Station	Street	**Marysville Street Classification**
City of Marysville Urban Growth Area	Police Station	Burlington Norther RR	Interstate
Tulalip Reservation	School	Trails	State Highway
Park			Principal Arterial
City Park			Minor Arterial
			Collector Arterial
			Future Arterial

0 1,250 2,500 5,000 7,500 10,000 Feet

Map Plotted: May, 2018

CITY OF Marysville WASHINGTON

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Appendix F

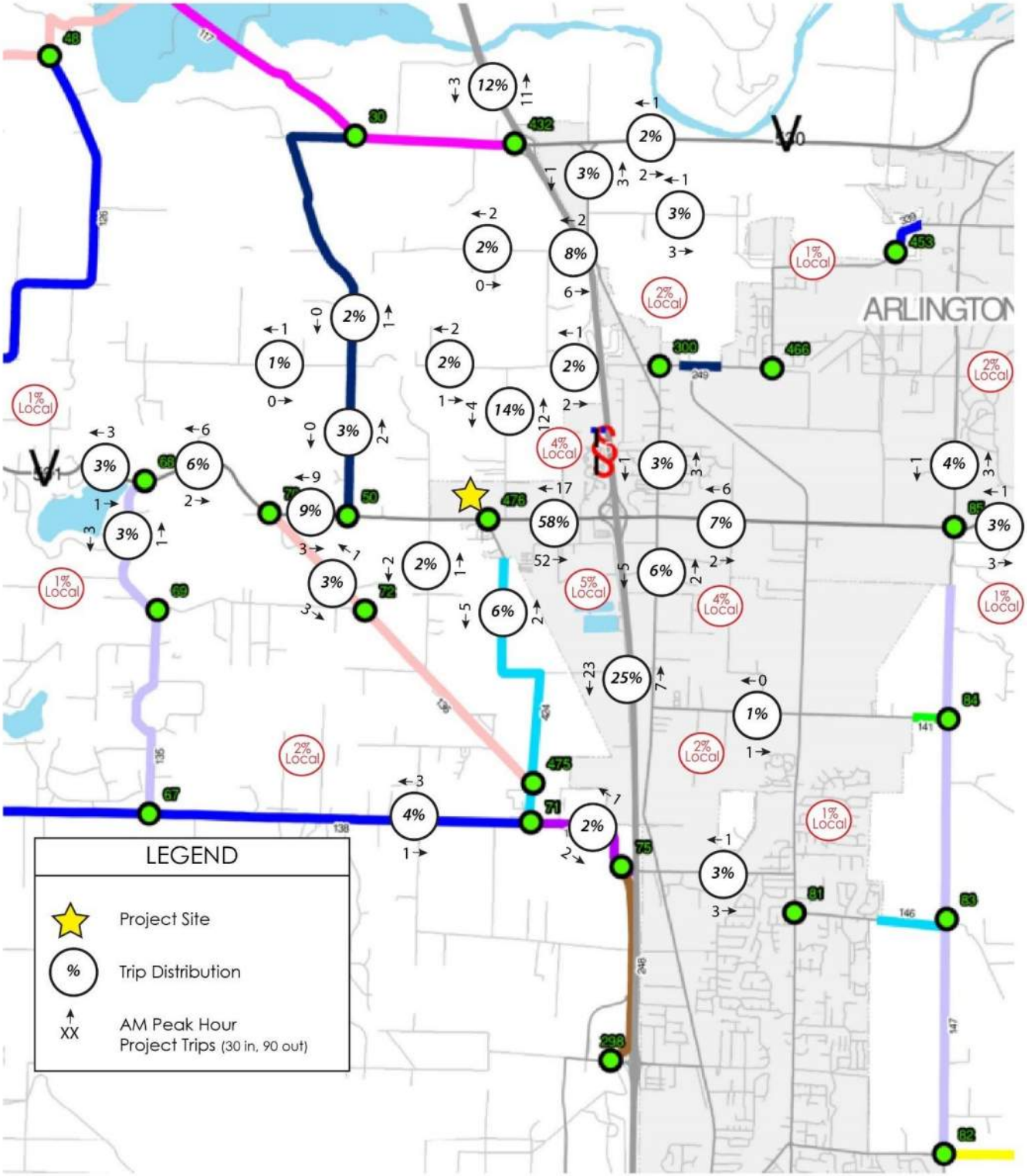
Snohomish County Key Intersection Impacts

Table F1
AM Peak Hour Trip Assignment at Key Intersections

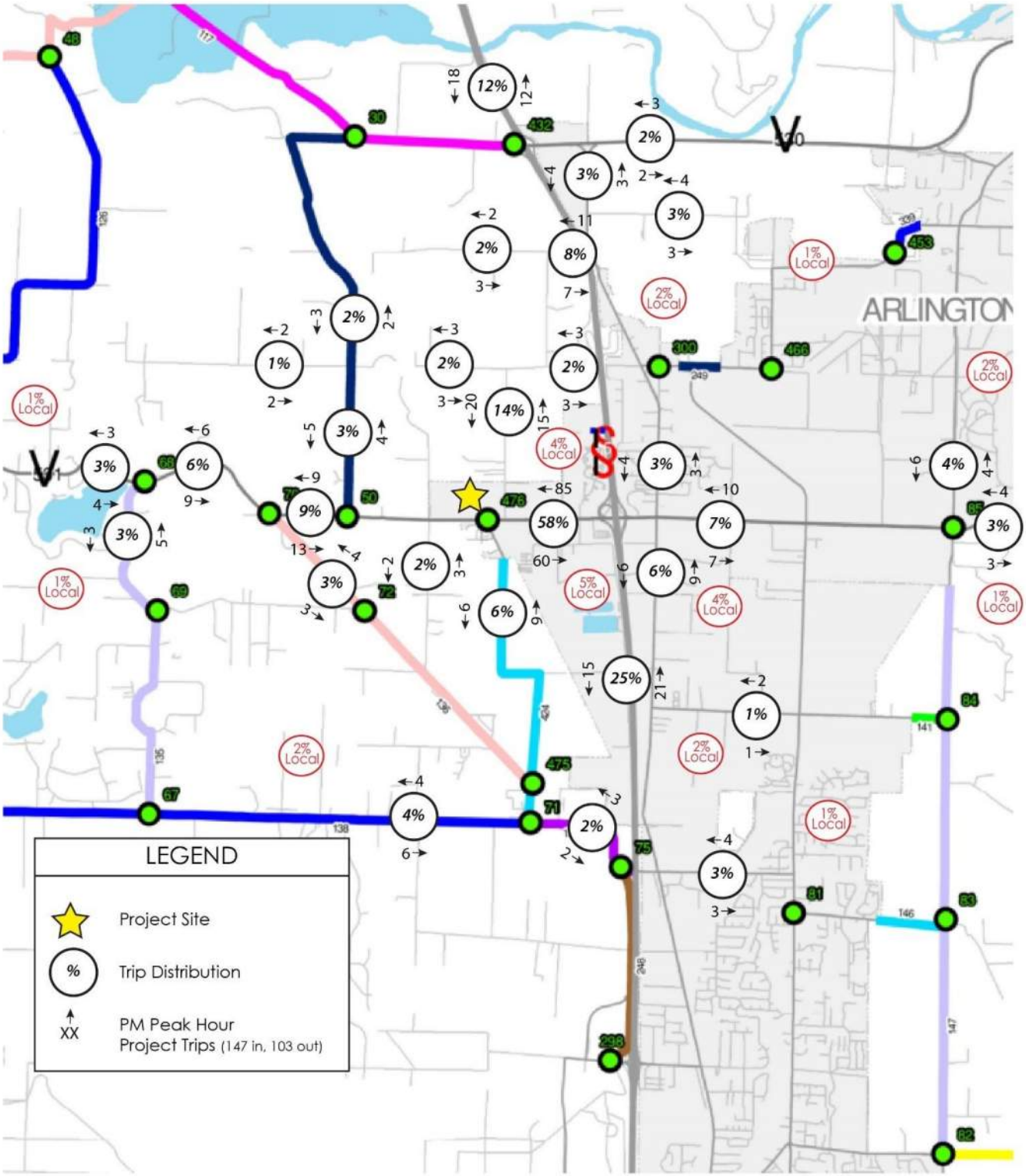
Key Intersection ID#	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
476	0	4	0	5	13	0	0	0	2	0	0	0
50	0	3	0	0	9	3	0	0	0	1	0	0
70	0	0	0	3	0	6	0	0	1	2	0	0
68	0	1	0	3	3	0	0	0	1	0	0	0
85	3	3	0	0	1	0	0	0	0	0	0	1
475	0	0	0	0	0	0	0	2	0	0	5	0
71	1	0	0	0	0	1	0	0	0	2	0	3
72	1	0	0	0	0	0	0	0	0	0	1	2

Table F2
PM Peak Hour Trip Assignment at Key Intersections

Key Intersection ID#	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
476	0	21	0	6	15	0	0	0	9	0	0	0
50	0	13	0	0	9	4	0	0	0	5	0	0
70	0	0	0	3	0	6	0	0	4	9	0	0
68	0	4	0	3	3	0	0	0	5	0	0	0
85	4	3	0	0	4	0	0	0	0	0	0	6
475	0	0	0	0	0	0	0	9	0	0	6	0
71	6	0	0	0	0	3	0	0	0	2	0	4
72	3	0	0	0	0	0	0	1	0	0	1	2



Attachment F1: Weekday AM Peak Hour Project Trip Distribution & Assignment



Attachment F2: Weekday PM Peak Hour Project Trip Distribution & Assignment

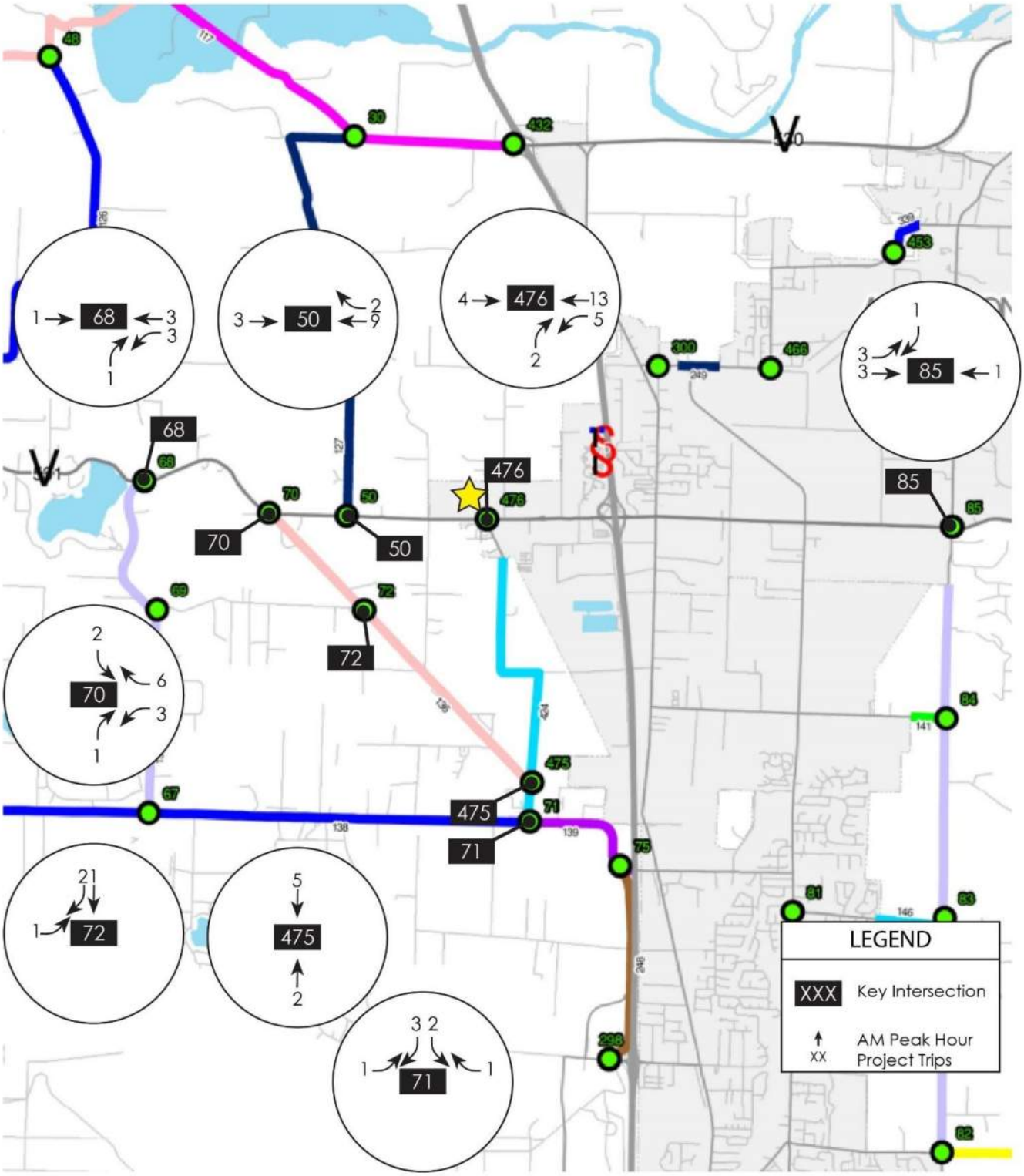


Figure F3: Weekday AM Peak Hour Project Trip Assignment at Key Intersections

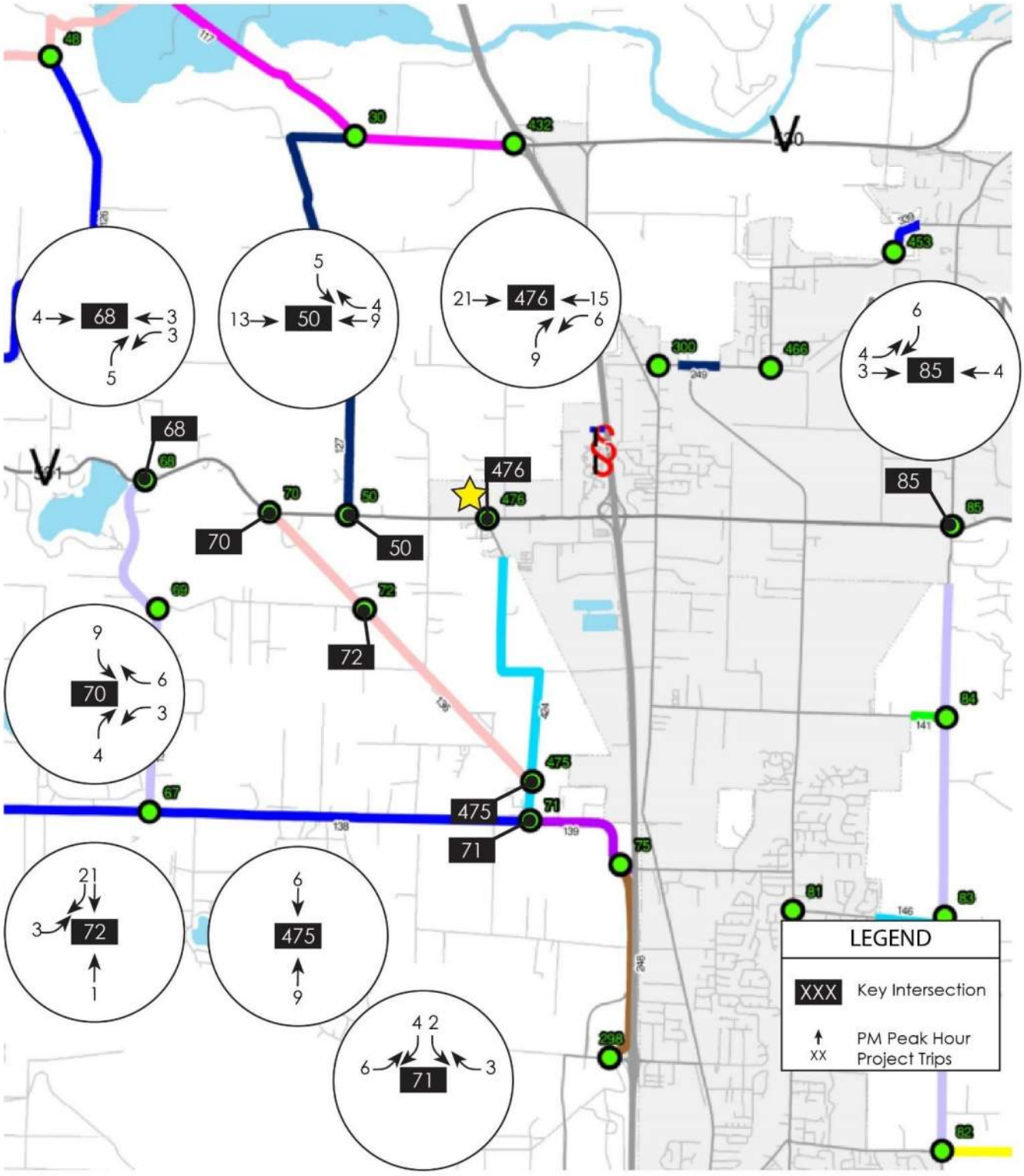


Figure F4: Weekday PM Peak Hour Project Trip Assignment at Key Intersections

Appendix G

Snohomish County Mitigation Offer Form

Traffic Mitigation Offer to Snohomish County

The applicant completes part one and submits it to the City with a completed county traffic worksheet. The City completes part two and sends it to the County. The County completes part three and sends it back to the City.

Part One to be completed by Applicant

Basic Development Information

Name of City in which development is located Marysville

Name of Proposed Development English Crossing

City Project File Number (if known) PA23012

Name of Applicant Huseby Homes

Address of Applicant 13110 NE 177th Place #228 Woodinvile, WA 98072

Proportionate Share Calculation: *Choose Option A or B*

☒ Option A: Based on a percentage of the County's adopted impact fee (attach traffic worksheet.)

1. The applicable percentage of the County's fee: 20 %
2. Net New Average Daily Traffic: 1,855 ADT
3. The adopted County impact fee for this development: 185 $/ADT
4. Total Proportionate Share Amount: $ 68,635

☐ Option B: Based on a comprehensive traffic study (attach traffic worksheet and traffic study)

_____ No road improvements are impacted. Hence, proportionate share amount is zero ($0).

_____ The following road improvements are impacted. The calculation of proportionate shares is summarized below.

List by Names/Description the Impacted County Projects (attach other pages if necessary)	County Project ID#	PHTs Impacting Project	Capacity Cost per PHT	Proportionate Share Obligation per Impacted Project
1.				
2.				
3.				
4. Total Proportionate Share Amount (sum of obligations for each impacted project)				$_____

☒ **Trip Distribution and Assignment if required**

If required, attach AM and PM peak-hour trip distribution and assignment. Attach traffic worksheet showing whether or not it is required and traffic study.

☒ **Mitigation of other impacts if required for developments generating more than 50 Peak-Hour Trips**

Mitigation of Impacts on Level of Service

☒ No impact or not applicable ☐ Mitigation as described in attached traffic study.

Mitigation of Impacts on Inadequate Road Conditions

☒ No impact or not applicable ☐ Mitigation as described in attached traffic study.

Mitigation for Impacts on Access or Circulation

☒ No impact or not applicable ☐ Mitigation as described in attached traffic study.

☒ **Written Offer**

The Applicant hereby voluntarily agrees to pay the total proportionate share amount shown above for impacts of the proposed development on the capacity of Snohomish County roads and provide mitigation of all other impacts as indicated above and described in attached documents.

BY: _____ Date: _____

Signature by Authorized Official of Applicant or Authorized Representative

Print Name and Title _____

Instructions to Applicant. Submit this Offer, a completed county traffic worksheet, and any other attachments to the City with your initial application or send directly to Contact.pwCMS@snoco.org.

Part Two: To be completed by the City

Receipt of Written Offer and attachments by City and routing to County

Name of Proposed Development

City Project File Number

Date Received

City Staffer Assigned to Project

Address

Phone

Instructions to City. Send this offer and all attachments to Contact.pwCMS@snoco.org

Received by:

_____ Date: _____ _____

Initialed by City Staffer Print Name and Title

Part Three: To be completed by Snohomish County

Receipt of Offer and attachments by Snohomish County and routing back to City

Name of Proposed Development

City Project File Number

Received by:

_____ Date: _____ _____

Initialed by County Staffer Print Name and Title

Snohomish County Mitigation Request to City

Snohomish County has reviewed the traffic study worksheet and mitigation offer submitted by the applicant and has determined as follows:

☐ Snohomish County requests that the City impose the mitigation offered above as a condition of approval for the Development. Snohomish County agrees to accept changes in the mitigation payment amount shown above resulting from TDM or lot-yield adjustments approved by the City.

☐ Snohomish County requests that the City require additional supplemental information to adequately evaluate the proposed development's impacts.

☐ The information requested is shown in the notes below.

By:

_____ Date: _____ _____

Signature by Authorized County Staffer Print Name and Title

Routing Back to City

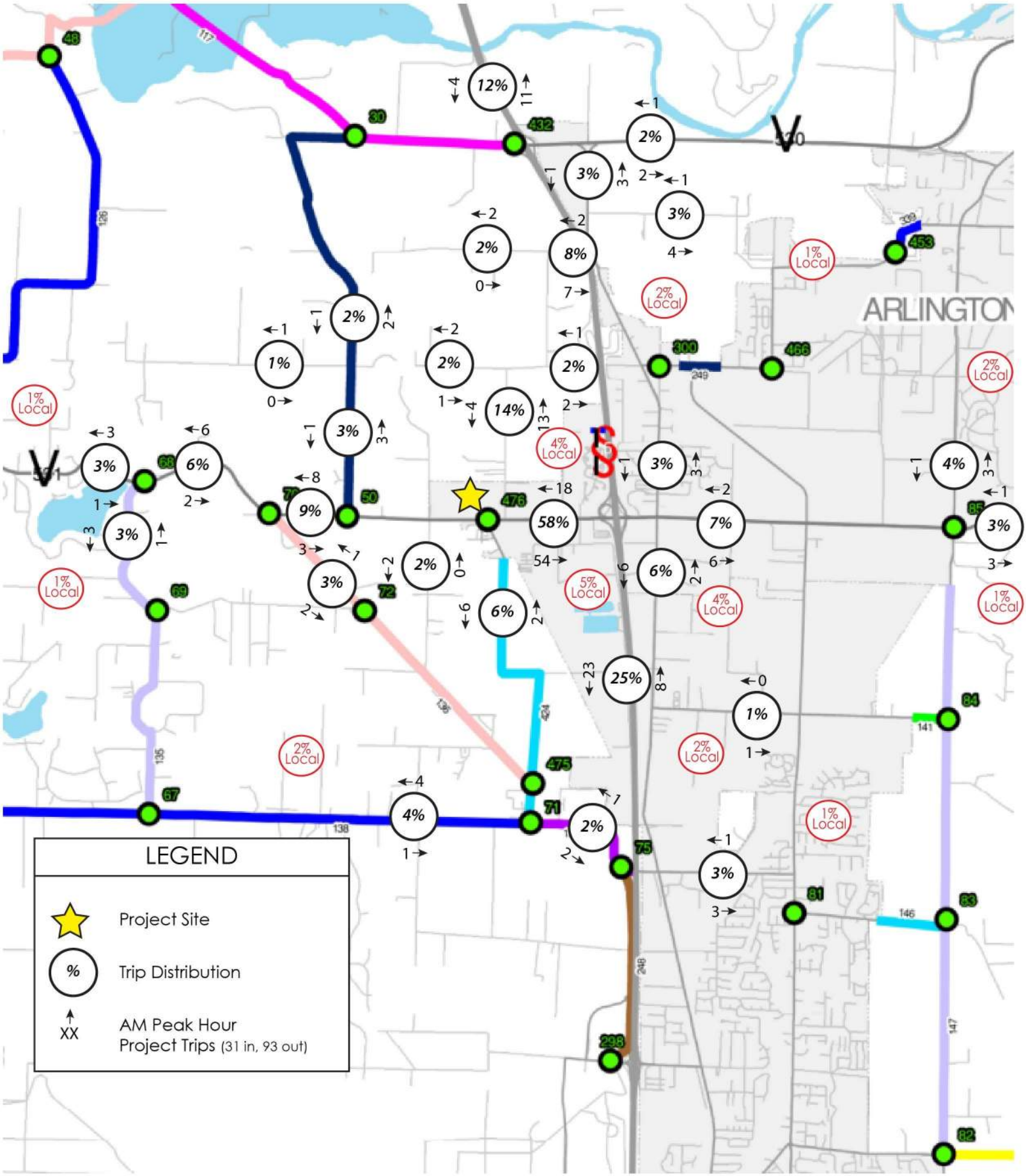
Instructions to County Send this offer and all attachments to the City Staffer shown in Part Two above.

Sent by:

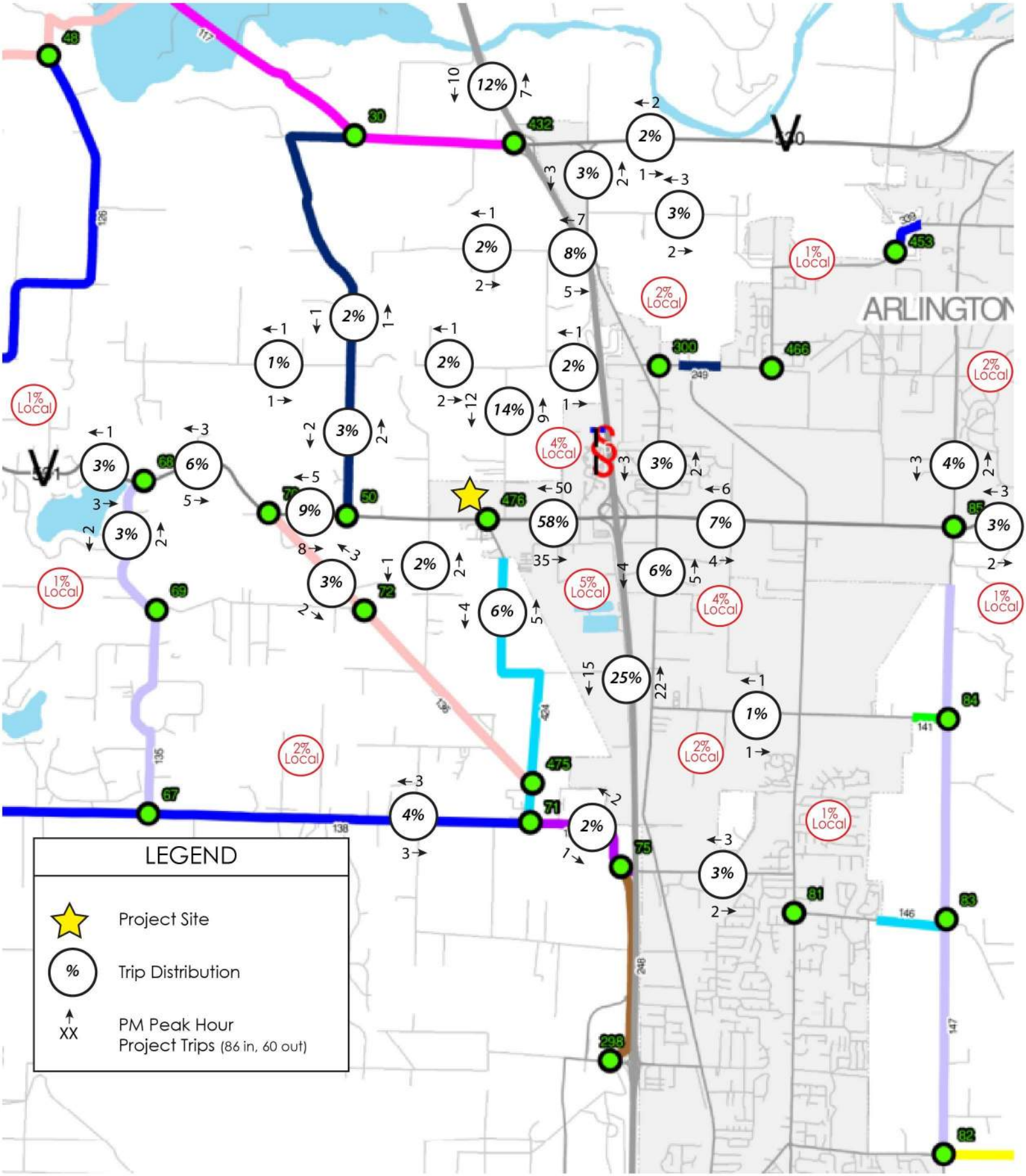
_____ Date: _____ _____

Initialed by City Staffer Print Name and Title

Notes



Attachment F1: Weekday AM Peak Hour Project Trip Distribution & Assignment



Attachment F2: Weekday PM Peak Hour Project Trip Distribution & Assignment

Snohomish County Traffic Worksheet and Traffic Study Requirements for Developments in the City of Marysville

Snohomish County government, through an interlocal agreement (ILA) with the City of Marysville, may request traffic mitigation measures from any new development in the city that impacts roads in the unincorporated county. The City will impose the requested mitigation to the extent that the City determines that the mitigation is reasonably related to the impacts of the development. To determine the impacts, and to determine reasonable mitigation measures, the City of Marysville requires a traffic study from any development in the city that may have impacts on county roads. This 'traffic study' may be as simple as completing sections one and two of the county traffic worksheet below, or having a professional traffic engineer conduct a formal traffic study consistent with the requirements in section three below.

- If a development generates less than ten peak-hour trips and the applicant chooses Option A for mitigation payment (standard payment by percent of county impact fee), then the applicant will generally only have to fill out the first two sections of this traffic worksheet and complete a mitigation offer (see section four).
- However, if a development generates more than ten peak-hour trips, or if the applicant chooses Option B for mitigation payment (comprehensive impact analysis), then the applicant will have to fill out the first section of this worksheet, complete a separate traffic study consistent with the requirements in section three, and complete a mitigation offer (see Section Four).
- Applicants should submit all documents *to the City* as part of their initial submittal.
- Traffic study requirements for impacts on county roads are based on the County's traffic mitigation ordinance (Chapter 30.66B) and the city/county ILA. At the end of this document find references to the county contacts and county web site (sources for may of the documents related to traffic mitigation).
- Following review of the documents submitted, the County may request supplemental information and analysis as necessary to determine the impacts of the development in accordance with the city/county ILA. The City will require the proposed development to submit the supplemental information and analysis to the extent that the City determines that it is necessary to determine the impacts of the development.

Section One (1) Worksheet General Information

1. Name of Proposed Development English Crossing

   City Development File Number (if known) PA23012

2. Name, Address and Phone Number of Applicant

   Huseby Homes, 13110 NE 177th Place #228 Woodinville, WA 98072

   Phone #: 425-286-9757

3. Development Site Address 17406 19th Ave NE, Marysville, WA

4. Is it a residential or commercial development? Yes

5. Description of Development (size and specific type)
   The proposed project will include up to 250 Single-Family Attached townhome units on a site that is currently vacant.

6. How many new vehicle trips are expected to be generated by the proposed development? (For many common types of developments this information can be provided by the city or the county. For more complex developments trip generation may have to be determined under section three below)

   124 AM Peak Hour 146 PM Peak Hour 1,855 Average Daily Trips (ADT)

7. Proportionate Share Impact Mitigation: All applicants have two options in determining the amount of their traffic mitigation payment:

   x For determining the amount based on a percentage of the county fee go to section two.

   _____ For determining the amount based on a comprehensive traffic study go to section three.

Section Two (2) Proportionate Share Determined by Percentage of County Impact Fee

2(a) Calculation of Payment Amount

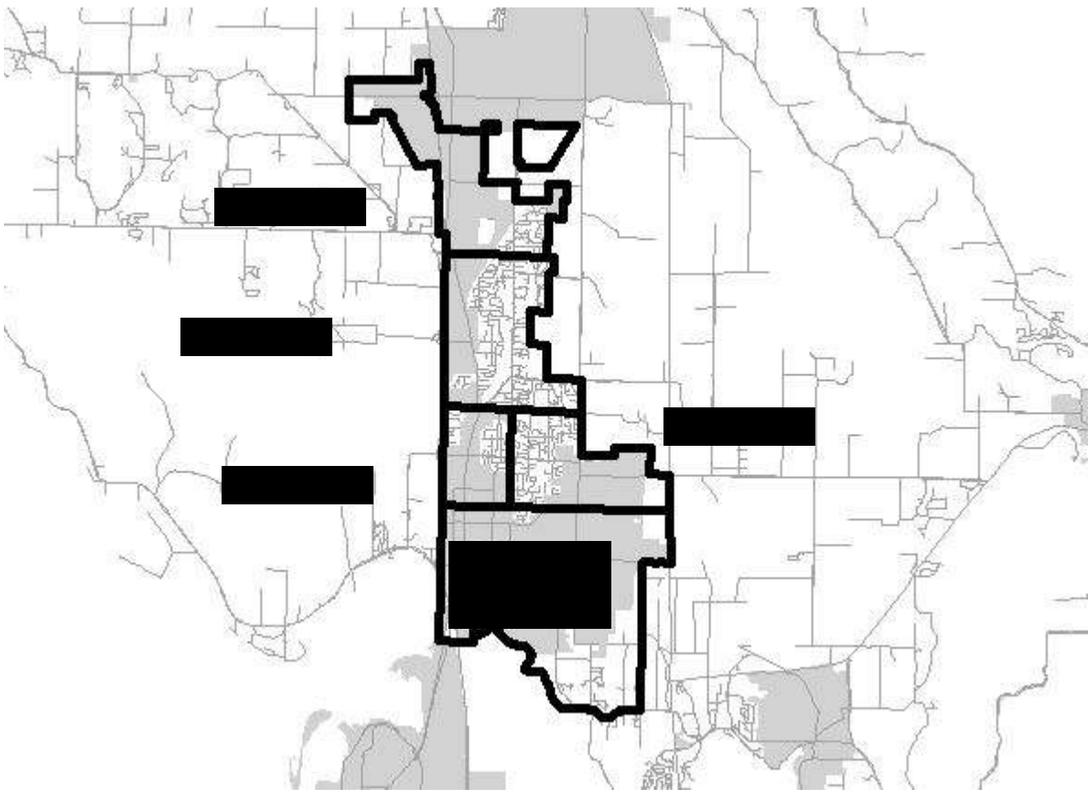
1. Standard default estimated percentage of trips impacting the City streets based on subareas (See below) 20 %

or

2. Other Percentage: (Note: See author's qualifications in section three below.) Estimated percentage of trips impacting county roads from attached trip distribution: _____ %

Sub-Area ID #	* City Subarea Description	Residential Developments	Commercial Developments
CI-MA-1	North of 136th ST SE.	20%	20%
CI-MA-2	North of 100th ST NE and South of 136th ST SE.	20%	20%
CI-MA-3	North of 76th ST NE, South of 100th ST SE, and West of 51st AV NE.	25%	25%
CI-MA-4	North of 76th ST NE, South of 100th ST SE, and East of 51st AV NE.	30%	30%
CI-MA-5	South of 76th ST NE.	15%	10%

* Note: Boundaries are either street centerlines or imaginary extensions of street centerlines in places where the actual streets do not exist.



3. Development New Average Daily Trip Generation (ADT) 1,855

4. Type of Development (Residential or Commercial) Residential

5. County Commercial Fee Rate $_____ 6. County Residential Fee Rate $ 185

(Note: Consistent with county code and the ILA, developments pay the rate in effect at the time of their submittal. As of 07/13/11 the rates were $39 for commercial developments and $46 for residential developments. Through ordinance, the County Council can change these rates at any time, so consult with the County or look at Snohomish County Code 30.66B.330 to find the latest fee rates.)

7. Calculation of Proportionate Share Impact Mitigation

20%	×	1,855	×	185	=	$ 68,635
#1 or #2 above: % of trips		#3 above: ADT		#5 or #6 above: Fee Rate		proportionate share mitigating payment

2(b) Determining whether or not an additional traffic study is necessary

Will the development generate more than 10 peak-hour trips *or* are there other impacts that need to be addressed (e.g., level of service, safety, or access and circulation)

_____ No. Skip section three and go to section four.

__X__ Yes. Read the introduction to section three and skip to section 3(b).

Section Three (3) Traffic Study Requirements

Introduction: This section outlines requirements for traffic studies for impacts on County roads. If an applicant chooses (or is required) to complete a traffic study, then it should be submitted along with this worksheet and a mitigation offer. (Note on Author's Qualifications: A traffic study under this section must be conducted by an engineer licensed to practice in the state of Washington with special training and experience in traffic engineering and, preferably, membership in the institute of transportation engineers. For individuals/firms not on the City's approved list, the developer will provide, with the traffic study, the credentials of the individual or firm performing the traffic study certifying compliance with these qualifications.)

3(a) Proportionate share impact mitigation based on comprehensive traffic study

1. Development's Trip Generation and Distribution. Determine the PM peak-hour trip generation and distribution for the development consistent with Section 3(b) below.
2. Impacted Improvements. Determine which of the road sections with planned improvements in the county's impact fee cost basis (Transportation Needs Report Appendix D) are impacted by three or more development-generated *directional* PM peak hour trips (PM PHT).
3. Current Counts. For each impacted improvement, provide current traffic counts to determine the PM PHT.
4. Reserve Capacity. Determine "reserve capacity" for each impacted improvement by subtracting the current PM PHT from the maximum service volume (MSV) for the existing facility. Reserve capacity is set to zero if current PM PHT exceeds the MSV. For MSVs see County DPW Rule 4224.
5. New Capacity. New capacity is the incremental increase in PHT that could be accommodated with the planned improvement. Determine the new capacity of each impacted improvement by subtracting the current MSV from the future MSV after the improvement.
6. Chargeable Capacity. For each impacted improvement, add the reserve capacity to the new capacity.
7. Final Adjusted Cost. Find the cost of each impacted improvement and make any adjustments used by the County for tax credits (see Transportation Needs Report Appendix D).
8. Capacity Cost per Peak-Hour Trip. For each impacted improvement, determine the capacity cost per PM PHT by dividing the final adjusted improvement cost by the chargeable capacity.
9. Traffic Impacts. From step one above, take the *total* number of PM PHT (in both directions) impacting each planned improvement.
10. Proportionate Share. For each impacted improvement, determine the proportionate share impact mitigation by multiplying the capacity cost per peak-hour trip by the number of PM PHT impacting the improvement.

3(b) Trip Generation and AM and PM Peak Hour Trip Distribution and Assignment

Calculate AM, PM and Daily trip generation consistent with the ITE Trip Generation Handbook and Snohomish County Public Works Rule 4220. Determine the trip distribution and assignments consistent with the County's document titled "Format for Trip Distributions"(available at County web site, see below).

- Within the developments transportation service area (TSA) the distributions will be carried out to each key intersection at which the approach or departure volumes on any leg have three (3) or more peak hour trips. Get the most current list of key intersections on the web site described below. Trips should be distributed onto the road system as it is expected to be in six years.
- The distribution should be a schematic map showing the broad distributions of trips in terms of percentages on different roads. Show all City boundaries.
- The assignment should be a schematic map with the impacted key intersections identified by ID# and turning movements for each shown in separate diagrams on the same page or on different pages. The assignment should also be presented in tabular form listing each intersection by intersection ID#, and the number of trips at each movement.

3(c) Additional Analysis for Developments Generating More Than Fifty (50) Peak Hour Trips

For large developments (i.e., those generating more than 50 peak-hour trips), the County may request mitigation for impacts on the level of service of County roads, documented safety locations (the County calls such locations "inadequate road conditions" or "IRCs"), and access or circulation. The traffic study requirements below are intended to disclose impacts. Based on this information the County may request through the City that the applicant provide additional information showing possible mitigation measures. If any off-site improvements were needed for mitigation the County would work with the applicant to determine requirements for right-of-way, construction plans, right-of-way use permits, construction/maintenance bonds, and other issues.

Impacts on Level of Service (LOS) of County Arterials

Contact Snohomish County Public Works for the most current list of arterial units in arrears and critical arterial units. Identify any arterial units in arrears or critical arterial units impacted by three or more directional peak-hour trips.

Impacts on Inadequate Road Conditions

Contact Snohomish County Public Works for a list of the current IRCs. Identify any IRCs impacted by three or more peak-hour trips. Note: Unlike LOS impacts in which at least three or more peak hour trips have to be added in one direction to require disclosure (e.g., 3 westbound), for IRCs, any three peak hour trips added to IRC locations are considered an impact for which disclosure is necessary (e.g., 2 westbound plus 1 eastbound).

Impacts on Access or Circulation

The County may request improvements to existing roads to provide safe and efficient access and/or circulation. In some instances, the County may request provisions for future County roads identified in the Comprehensive Plan or in Small Area Transportation Studies. If so, the County will request specific additional information through the City.

Section Four (4) Traffic Mitigation Offer to Snohomish County

The applicant should complete a traffic mitigation offer to Snohomish County that summarizes the mitigation identified in the county traffic worksheet and any additional traffic study. This will facilitate timely review of the development and processing of the application. The form to use for the mitigation offer is titled "Traffic Mitigation Offer to Snohomish County." This form is typically provided to all applicants along with this traffic study checklist. In addition, copies are available from the county contacts or the Snohomish County web site shown below.

Additional Information

County Web Site

Snohomish County Public Works has a web site with many documents related to traffic studies and mitigation requirements for developers. From the Snohomish County Home Page go to:

Departments/Public Works/Divisions/TES/ProgramPlanning/3066B

County Contacts

- Elbert Esparza, Snohomish County DPW Traffic, 3000 Rockefeller M/S 607, Everett WA 98201, (425) 388-3184, elbert.esparza@snoco.org