TRAFFIC IMPACT ANALYSIS

# MINOR PRD

**JURISDICTION: CITY OF MARYSVILLE, WA**
**LOCATION: 83$^{RD}$ AVE NE, SOUTH OF E SUNNYSIDE SCHOOL RD**

*Prepared for:*
**South Lake Ridge, LLC**
10515 20$^{th}$ Street SE
Suite 202
Lake Stevens, Washington 98258

*Prepared by:*
Kimley»Horn

April 2024
090223206

Kimley»Horn

## TRAFFIC IMPACT ANALYSIS

## FOR

# MINOR PRD


***Prepared for:***
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Kimley»Horn

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## 1. Development Identification

Kimley-Horn and Associates, Inc. (Kimley-Horn) has been retained to provide a traffic impact analysis for the Minor PRD Development (Development). This report is intended to provide the City of Marysville (City) and Snohomish County (County) with the necessary traffic generation, trip distribution, and mitigation fee determination to facilitate their reviews of the Development. The Development is located on the east side of 83rd Avenue NE, south of E Sunnyside School Road. A site vicinity map is included in **Figure 1**. The Development is proposed to consist of 29 single-family detached residential units. The site is currently listed as developed with a single-family detached residential unit per the *Snohomish County Online Property Information (SCOPI)* web map. The site will primarily access the City street network via one proposed access drive connected to 83rd Avenue NE through internal connectivity proposed with the Cornelius Lacey Development to the west of the site.

Brad Lincoln, responsible for this report and traffic analysis, is a licensed professional engineer (Civil) in the State of Washington and member of the Washington State section of the Institute of Transportation Engineers (ITE).

## 2. Methodology

Congestion at intersections and along arterials is generally measured in terms of level of service (LOS). In accordance with *Highway Capacity Manual (HCM), 6th Edition* by the Transportation Research Board, road facilities and intersections are rated between LOS A and LOS F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. The LOS at signalized, roundabout, and all-way stop-controlled intersections is based on the average delay of all approaches. The LOS for two-way stop-controlled intersections is based on average delays for the critical stopped approach. Geometric characteristics and conflicting traffic movements are taken into consideration when determining LOS values. A summary of the intersection LOS criteria is included in **Table 1**.


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FIGURE 1 - SITE VICINITY MAP

**MINOR PRD - CITY OF MARYSVILLE, WA 090223206**

*Table 1: Level of Service Criteria*

| Level of Service[1] | Expected Delay | Intersection Control Delay (Seconds per Vehicle) | |
|---|---|---|---|
| | | Unsignalized Intersections | Signalized Intersections |
| A | Little/No Delay | ≤10 | ≤10 |
| B | Short Delays | >10 and ≤15 | >10 and ≤20 |
| C | Average Delays | >15 and ≤25 | >20 and ≤35 |
| D | Long Delays | >25 and ≤35 | >35 and ≤55 |
| E | Very Long Delays | >35 and ≤50 | >55 and ≤80 |
| F | Extreme Delays[2] | >50 | >80 |

The LOS at two-way stop-controlled intersections is based on the average delay for the stopped approach with the highest delay. The LOS at all-way stop-controlled intersections and signalized intersections is based on the average delay for all vehicles. The LOS analysis for unsignalized and signalized intersections has been performed utilizing the *Synchro 11* software. The City identifies acceptable level of service for intersections as LOS D for all intersections in the vicinity of the development.

The trip generation calculations for the Development are based on average trip generation rates published in the ITE *Trip Generation Manual, 11th Edition (2021)*. The opening year has been estimated for the year 2026, which accounts for a three-year construction window. The horizon year has therefore been evaluated for the year 2032.

[1] **Source:** *Highway Capacity Manual, 6th Edition.*
LOS A: Free-flow traffic conditions, with minimal delay to stopped vehicles (no vehicle is delayed longer than one cycle at signalized intersection).
LOS B: Generally stable traffic flow conditions.
LOS C: Occasional back-ups may develop but delay to vehicles is short term and still tolerable.
LOS D: During short periods of the peak hour, delays to approaching vehicles may be substantial but are tolerable during times of less demand (i.e., vehicles delayed one cycle or less at signal).
LOS E: Intersections operate at or near capacity, with long queues developing on all approaches and long delays.
LOS F: Jammed conditions on all approaches with excessively long delays and vehicles unable to move at times.
[2] When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection.

# 3. Trip Generation

The Development is proposed to consist of 29 single-family detached units. The site is currently developed with one single-family detached residential unit that will be removed during construction. The trip generation calculations have been performed using data published by the ITE *Trip Generation Manual, 11st Edition* (*2021*) and the City rate of 1.0 PM peak-hour trips per single-family residential unit. The average trip generation rates for ITE Land Use Codes (LUC) 210, Single-Family Detached Housing, have been used for the trip generation calculations. The trip generation calculations for the Development are summarized in **Table 2**.

***Table 2: Trip Generation Summary***

| Land Use | Size | Average Daily Trips (ADTs) | AM Peak-Hour Trips | | | PM Peak-Hour Trips | | |
|---|---|---|---|---|---|---|---|---|
| | | | In | Out | Total | In | Out | Total |
| Single-Family Detached Housing ITE LUC 210 | 29 Units | 273 | 5 | 15 | 20 | 18 | 11 | 29 |
| Single-Family Detached Housing ITE LUC 210 (Removed) | -1 Unit | -9 | 0 | -1 | -1 | -1 | 0 | -1 |
| **TOTAL** | | **264** | **5** | **14** | **19** | **17** | **11** | **28** |

The Development is anticipated to generate approximately 264 new ADTs with approximately 19 new AM peak-hour trips and 28 new PM peak-hour trips. The trip generation calculations are provided in **Appendix A**.

# 4. Trip Distribution

The trip distribution for the Development is based on comparison of Whiskey Ridge North and Whiskey Ridge East distributions established by the City since the site is located in the middle of the two areas. The trip distribution for the 2026 opening year is:

- 30% to and from the north along 83rd Avenue NE
- 28% to and from the east
  - 20% to and from the south along SR-9
  - 5% to and from the east along SR-92
  - 3% to and from the north along SR-9
- 22% to and from the south along 83rd Avenue NE
- 20% to and from the west along 44th Street NE

The trip distribution for the 2032 horizon year is:

- 30% to and from the east
  - 20% to and from the south along SR-9
  - 5% to and from the east along SR-92
  - 3% to and from the north along SR-9
  - 2% to and from the north along 87th Avenue NE
- 30% to and from the north along 83rd Avenue NE
- 20% to and from the south along 83rd Avenue NE
- 20% to and from the west along 44th Street NE

Detailed trip distributions for the AM peak-hour and PM peak-hour during existing conditions are shown in **Figure 2** and **Figure 3**, respectively. Detailed trip distributions for the AM peak-hour and PM peak-hour during horizon-year conditions are shown in **Figure 4** and **Figure 5**, respectively. The established distributions are provided in **Appendix B**.

## 5. INTERSECTION LEVEL OF SERVICE ANALYSIS

The following intersections have been analyzed based on an impact of 25 trips generated by the Development:

1. 83rd Avenue NE at Line Road/44th Street NE
2. 83rd Avenue NE at E Sunnyside School Road

The intersections have been analyzed for the weekday PM peak-hour.

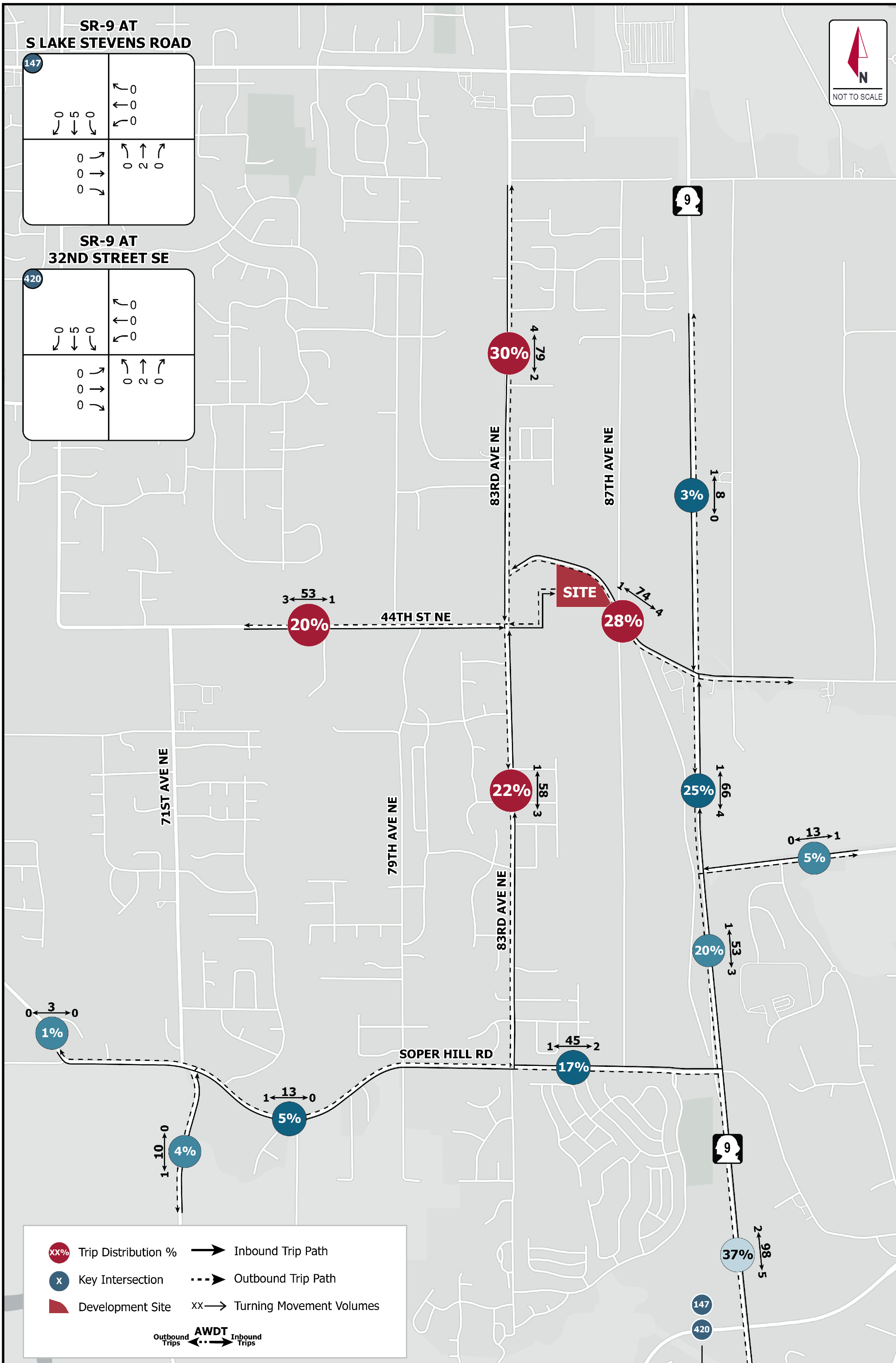


FIGURE 2 - AM PEAK HOUR OPENING YEAR TRIP DISTRIBUTION

**MINOR PRD - CITY OF MARYSVILLE, WA 090223206**

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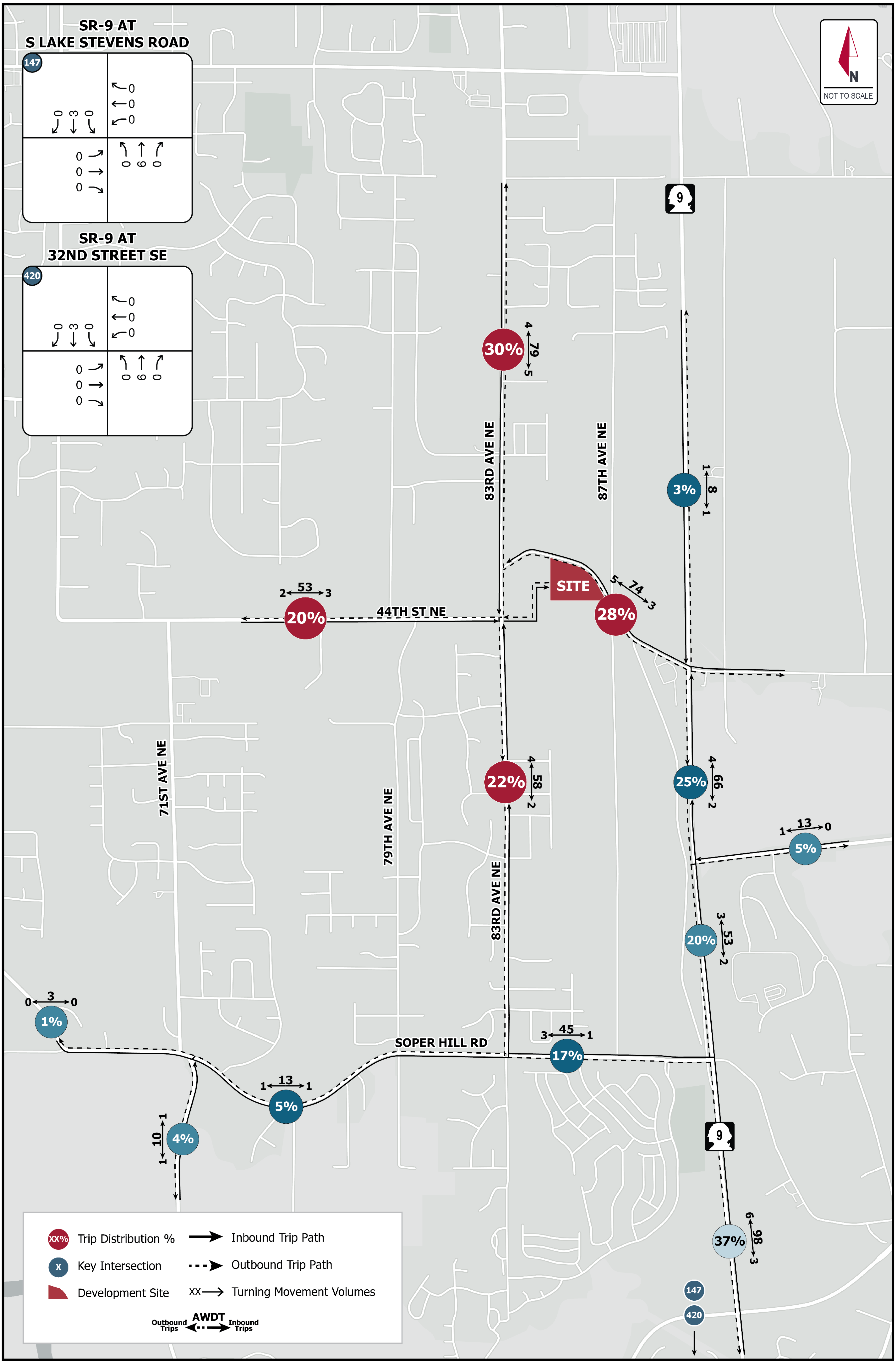
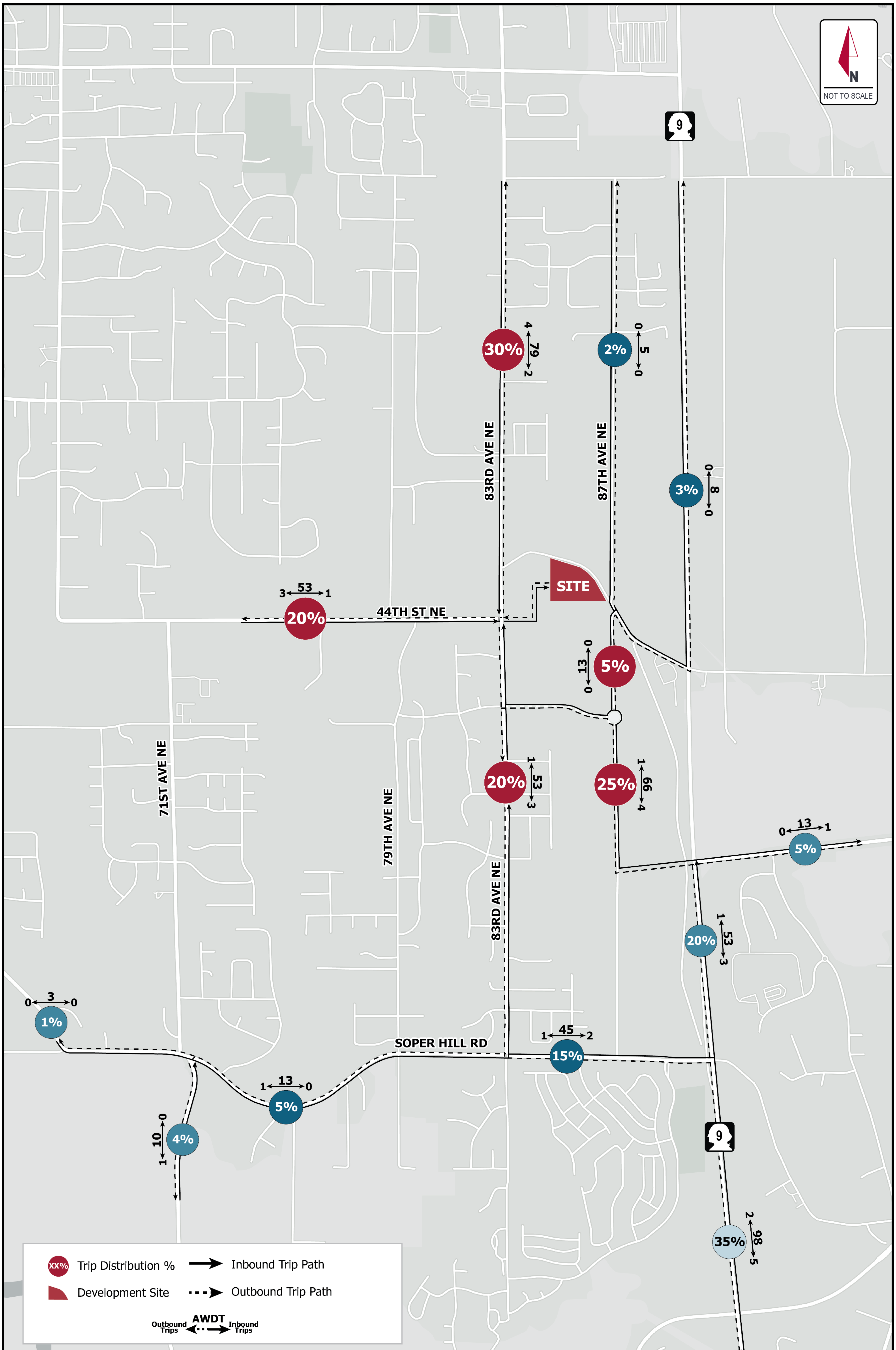



FIGURE 3 - PM PEAK HOUR OPENING YEAR TRIP DISTRIBUTION

**MINOR PRD - CITY OF MARYSVILLE, WA 090223206**

Kimley-Horn


N
NOT TO SCALE
9
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87TH AVE NE
44TH ST NE
SITE
71ST AVE NE
79TH AVE NE
SOPER HILL RD
30%
4
79
2
2%
0
5
0
3%
0
8
0
20%
3
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1
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3
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4%
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10
1
35%
2
98
5
Trip Distribution %
Development Site
Inbound Trip Path
Outbound Trip Path
Outbound Trips
AWDT
Inbound Trips

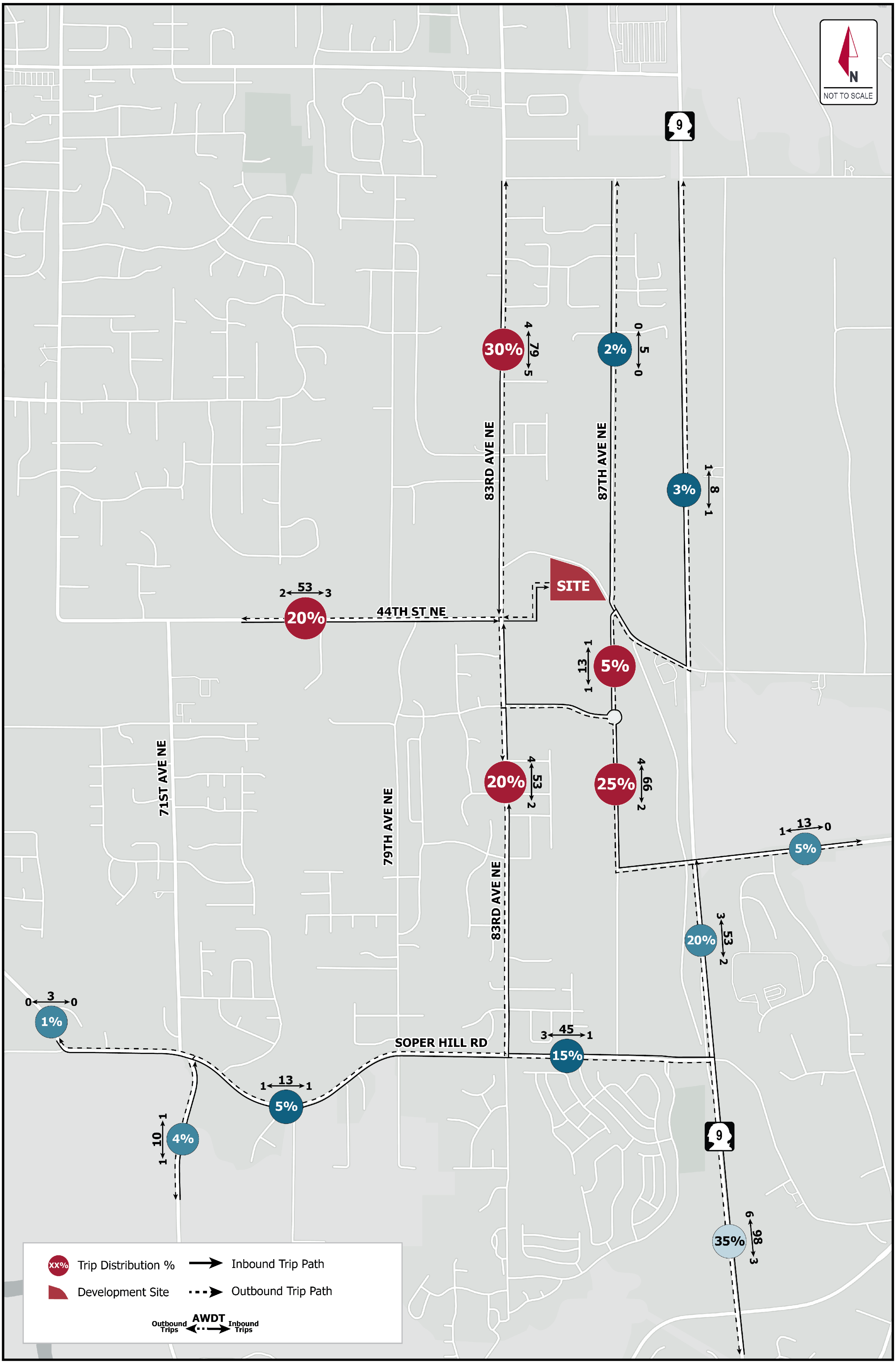


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FIGURE 5 - PM PEAK HOUR HORIZON YEAR TRIP DISTRIBUTION

**MINOR PRD - CITY OF MARYSVILLE, WA 090223206**

## 5.1. Turning Movement Calculations

### 5.1.1. Snohomish County Intersections

The interlocal agreement between the City and County requires detailed development trip turning movement data at County key intersections impacted with three or more directional trips on an approach or departure. The Development will impact two key intersections during the AM peak-hour and PM Peak-hour. The AM peak-hour key intersection impacts are shown in tabular form in **Table 3** and the PM peak-hour key intersection impacts are shown in tabular form in **Table 4**.

***Table 3: Key Intersection Volumes – AM Peak Hour***

| Intersection | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #147: SR-9 at S Lake Stevens Road | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 5 | 0 |
| #420: SR-9 at 32nd Street SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 5 | 0 |

***Table 4: Key Intersection Volumes – PM Peak Hour***

| Intersection | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #147: SR-9 at S Lake Stevens Road | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 3 | 0 |
| #420: SR-9 at 32nd Street SE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 3 | 0 |

The key intersection impacts are also shown in graphical form in **Figure 2** and **Figure 3** for the AM and PM peak-hours, respectively.

### 5.1.2. Intersection Volumes

The existing PM peak-hour turning movements at the study intersections were collected by the independent count firm Traffic Data Gathering (TDG) in September 2023. The 2023 existing turning movements at the study intersections are shown in **Figure 6**. The count data is included in **Appendix B**.

The future analysis has been performed for an opening year of 2026, which represents when the Development is expected to be constructed and occupied. The 2026 opening year baseline turning movements have been calculated by applying a 3% annually compounding growth rate applied to the 2023 existing turning movements. Additionally, development trips from the Cornelius Lacey and Taylor Property Developments have been added as pipeline to the 2026 baseline volumes to account for impacts to the study intersections by future developments. The 2026 opening year baseline turning movements at the study intersections are shown in **Figure 7**. The 2026 opening year future with development turning movements at the study intersections have been calculated by adding the trips generated by the Development to the 2026 opening year baseline turning movements, which include development trips from the two pipeline projects. The 2026 opening year future with development turning movements are shown in **Figure 8**. The pipeline data is included with the existing count data in **Appendix B**.

The study intersections have also been analyzed for the 2032 horizon year conditions (baseline and with development). The horizon year analysis accounts for the typical six-year concurrency period after the expected opening year. The 2032 horizon year baseline turning movements have been calculated using the same 3% annually compounding growth rate. Sunnyside School Road is planned to be converted to a pedestrian trail and will therefore not be an intersection under the 2032 horizon year conditions. The volumes calculated to be turning to and from Sunnyside School Road under the 2032 baseline conditions have been assigned to the 44th Street NE intersection with the addition of 50 eastbound and westbound through trips to account for the potential diversion of trips with the closure. The 2032 horizon year baseline turning movements at the study intersections are shown in **Figure 9**. The 2032 horizon year future with development turning movements at the study intersections have been calculated by adding the trips generated by the Development to the 2032 horizon year baseline turning movements. The 2032 horizon year future with development turning movements are shown in **Figure 10**. The turning movement calculations are included in **Appendix C**.

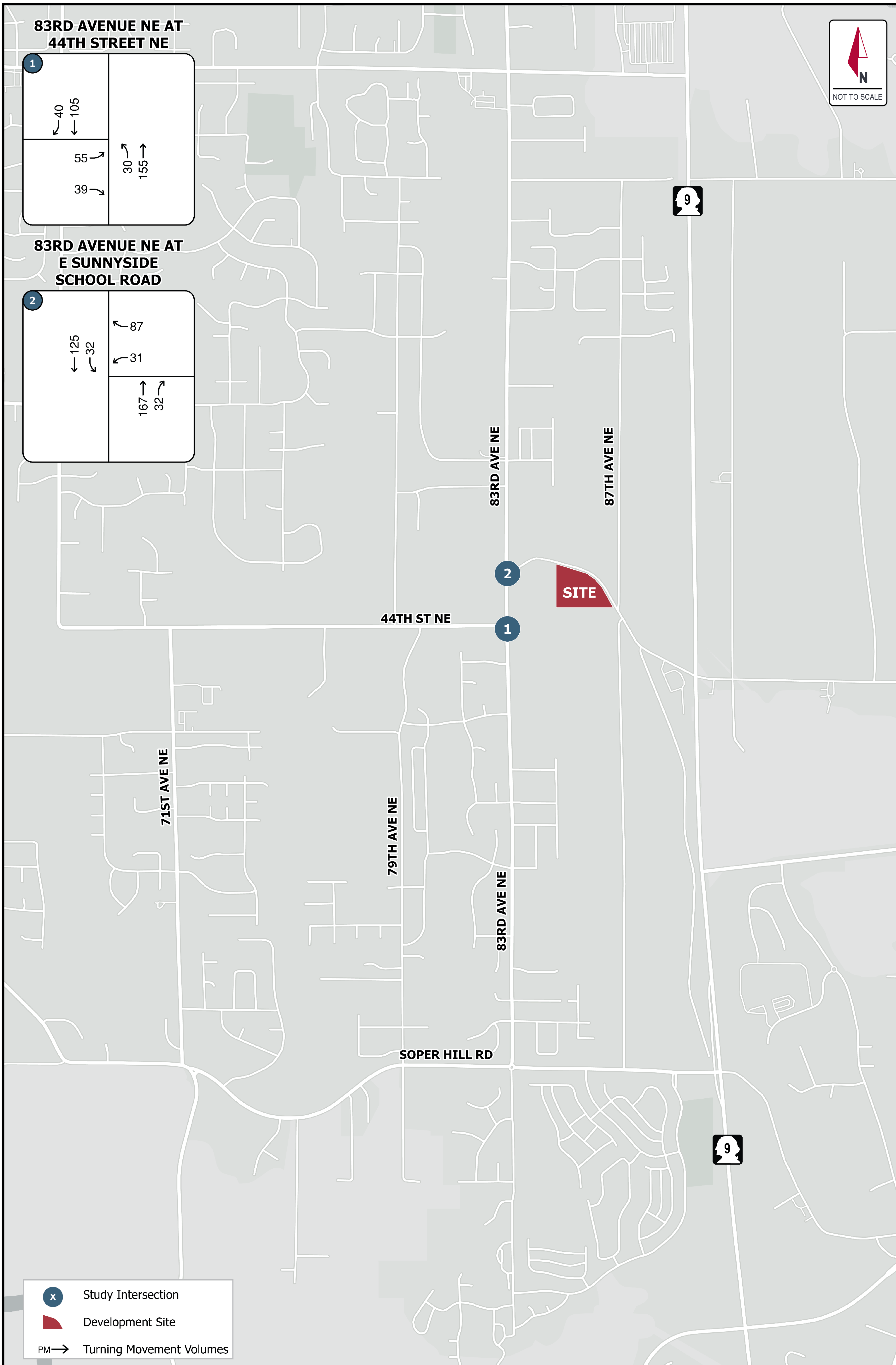


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FIGURE 6 - 2023 EXISTING TURNING MOVEMENTS

**MINOR PRD - CITY OF MARYSVILLE, WA 090223206**

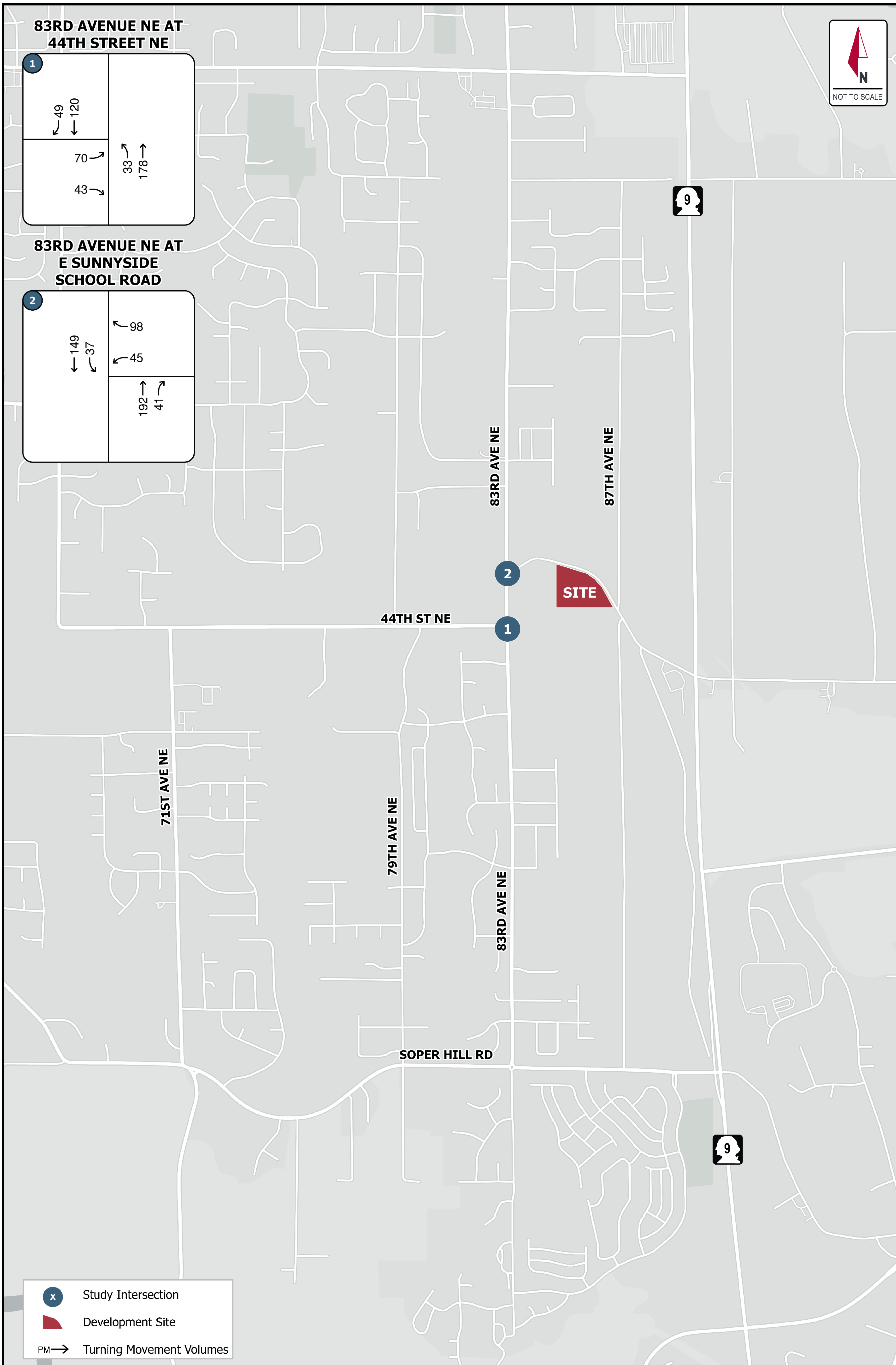


FIGURE 7 - 2026 BASELINE TURNING MOVEMENTS
MINOR PRD - CITY OF MARYSVILLE, WA 090223206

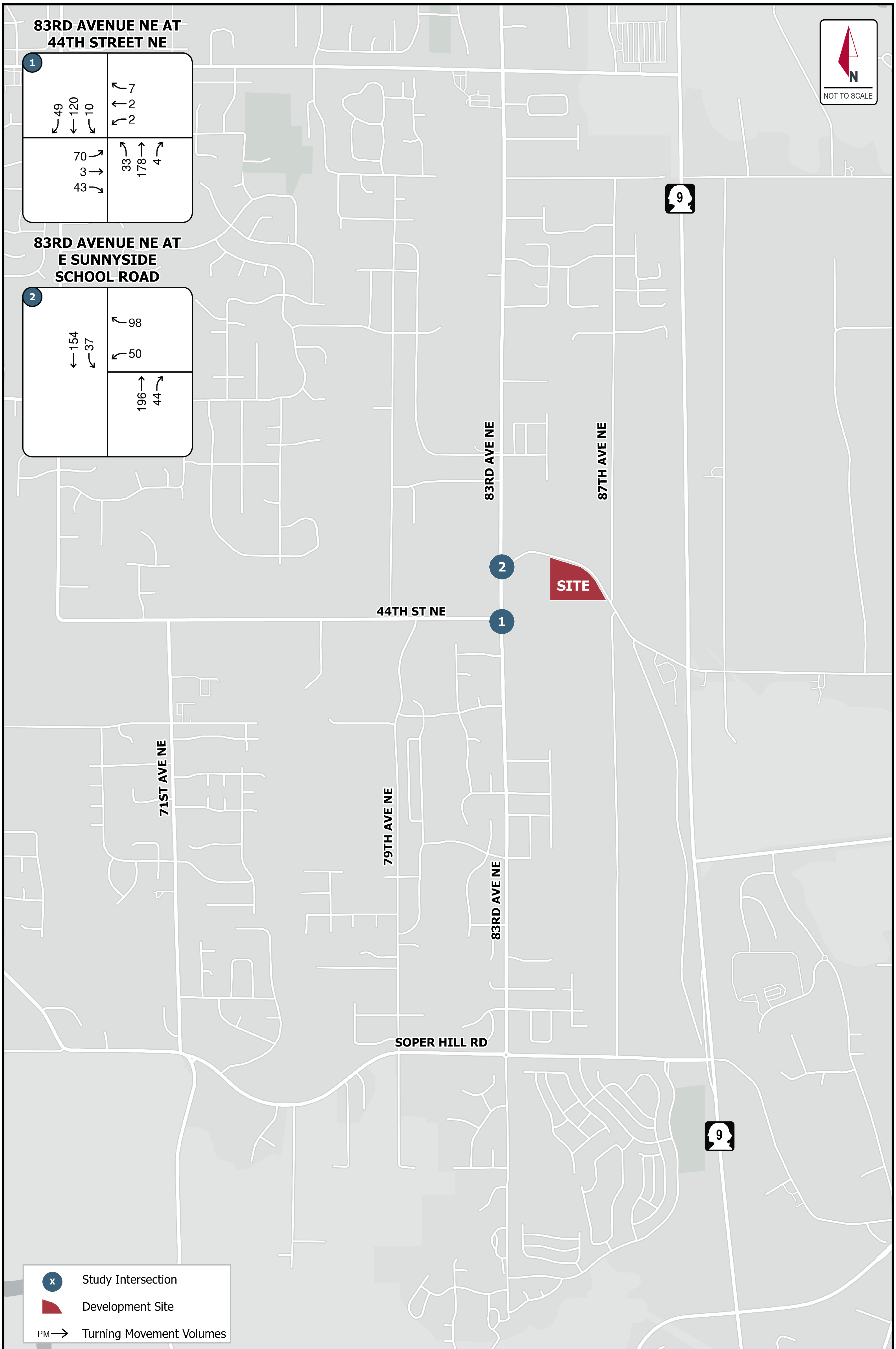


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FIGURE 8 - 2026 FUTURE TURNING MOVEMENTS

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FIGURE 9 - 2032 BASELINE TURNING MOVEMENTS
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FIGURE 10 - 2032 FUTURE TURNING MOVEMENTS

**MINOR PRD - CITY OF MARYSVILLE, WA 090223206**

## 5.2. Level of Service Calculations

The level of service calculations have been performed utilizing the existing channelization, existing intersection control and peak-hour factors and heavy vehicle factors from the 2023 turning movement counts. All Development trips have been assigned to the extension of 44th Street NE for feasibility and demonstrate the "worst-case" delay scenario. The level of service summary for the opening-year is included in **Table 5** and the level of service summary for the horizon-year is included in **Table 6** for the PM peak-hour.

***Table 5: Level of Service Summary – Opening-Year***

| Intersection | Approach | 2023 Existing | | 2026 Baseline | | 2026 Future w Dev. | |
|---|---|---|---|---|---|---|---|
| | | LOS | Delay | LOS | Delay | LOS | Delay |
| 1: 83rd Avenue NE at 44th Street NE | Two-Way Stop Control | B | 11.3 sec | B | 12.2 sec | B | 12.7 sec |
| 2: 83rd Avenue NE at E Sunnyside School Road | Two-Way Stop Control | B | 10.8 sec | B | 11.8 sec | B | 12.0 sec |

***Table 6: Level of Service Summary – Horizon-Year***

| Intersection | Approach | 2023 Existing | | 2032 Baseline | | 2032 Future w Dev. | |
|---|---|---|---|---|---|---|---|
| | | LOS | Delay | LOS | Delay | LOS | Delay |
| 1: 83rd Avenue NE at 44th Street NE | Two-Way Stop Control | B | 11.3 sec | D | 30.7 sec | D | 34.0 sec |
| 2: 83rd Avenue NE at E Sunnyside School Road | Two-Lane Roadway | B | 10.8 sec | --- | --- | --- | --- |

The analysis shows that the study intersections currently operate at LOS B during the PM peak-hour and are anticipated to remain at LOS B under the 2026 opening-year baseline and future with development conditions. The intersection of 83rd Avenue NE at 44th Street NE is anticipated to change to LOS D with the reassignment from E Sunnyside School Road under the 2032 horizon-year baseline and future with development conditions. The intersection LOS calculations are provided in the **Appendix D**.

# 6. Site Access

The Development is proposed to have connectivity to 83rd Avenue NE west of the site via the adjacent Cornelius Lacey Development. The Development will not create any new connections to the public road network.

# 7. Transportation Impact Fees

The City has interlocal agreements with the County and Washington State Department of Transportation (WSDOT) for transportation impact fees. These transportation impact fees are based on the area wide traffic mitigation fee or actual impacts to improvement projects.

## 7.1. City of Marysville

The City traffic mitigation fees have been calculated using the residential rates of $6,300 per new single-family unit. The Development is anticipated to consist of 29 total single-family units with credit for one existing single-family detached unit. The City traffic mitigation fees for the Development should therefore be $176,400.00 for the 28 new single-family units.

## 7.2. Snohomish County

The City and County have an interlocal agreement that provides for the payment of traffic mitigation for impacts to County roadways by City developments. Traffic mitigation fees are based on predetermined area impacts or impacts to actual improvement projects. The only County improvement project in the area is along 88th Street NE, between approximately 44th Drive NE to 66th Drive NE. This improvement project is not anticipated to be impacted by three directional PM peak-hour trips from the Development. County traffic mitigation fees should therefore not be required for the Development.

## 7.3. Washington State Department of Transportation

The WSDOT mitigation fees are based on impacts to improvement projects identified in the Exhibit C List included in the interlocal agreement between the County and WSDOT. There are not any WSDOT intersections on the Exhibit C List that will be impacted by three directional PM peak-hour trips generated by the Development. WSDOT transportation impact fees should therefore not be required for the Development.

# 8. CONCLUSIONS

The Development is proposed to consist of 29 single-family detached residential units. The site is currently listed as occupied with one single-family detached residential unit. The Development is anticipated to generate approximately 264 new ADTs with approximately 19 new AM peak-hour trips and 28 new PM peak-hour trips. The Development is anticipated to construct 28 new single-family units. The City traffic mitigation fees for the Development should therefore be $176,400.00. Neither County nor WSDOT traffic mitigation fees should be required for the Development. The study intersections are anticipated to operate at an acceptable level of service with the development.

# APPENDIX A

## TRIP GENERATION CALCULATIONS

**Trip Generation for:** **Weekday**
**(a.k.a.):** **Average Weekday Daily Trips (AWDT)**

| LAND USES | VARIABLE | ITE LU code | Gross Trips: Trip Rate | Gross Trips: % IN | Gross Trips: % OUT | Gross Trips: In+Out (Total) | Internal Crossover: % of Gross Trips | Internal Crossover: Trips In+Out (Total) | NET EXTERNAL TRIPS BY TYPE – IN BOTH DIRECTIONS: TOTAL In+Out (Total) | PASS-BY: % of Ext. Trips | PASS-BY: In+Out (Total) | DIVERTED LINK: % of Ext. Trips | DIVERTED LINK: In+Out (Total) | NEW: In+Out (Total) | DIRECTIONAL ASSIGNMENTS – PASS-BY: In | PASS-BY: Out | DIVERTED LINK: In | DIVERTED LINK: Out | NEW: In | NEW: Out |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single-Family Detached Housing | 29 units | 210 | 9.43 | 50% | 50% | 273 | 0% | 0 | 273 | 0% | 0 | 0% | 0 | 273 | 0 | 0 | 0 | 0 | 137 | 136 |
| Single-Family Detached Housing (Removed) | -1 unit | 210 | 9.43 | 50% | 50% | -9 | 0% | 0 | -9 | 0% | 0 | 0% | 0 | -9 | 0 | 0 | 0 | 0 | -5 | -4 |
| **Total** | | | | | | 264 | | 0 | 264 | | 0 | | 0 | 264 | 0 | 0 | 0 | 0 | 132 | 132 |

Minor PRD
090223206

**Trip Generation for:** **Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 7 and 9 AM**
**(a.k.a.):** **Weekday AM Peak Hour**

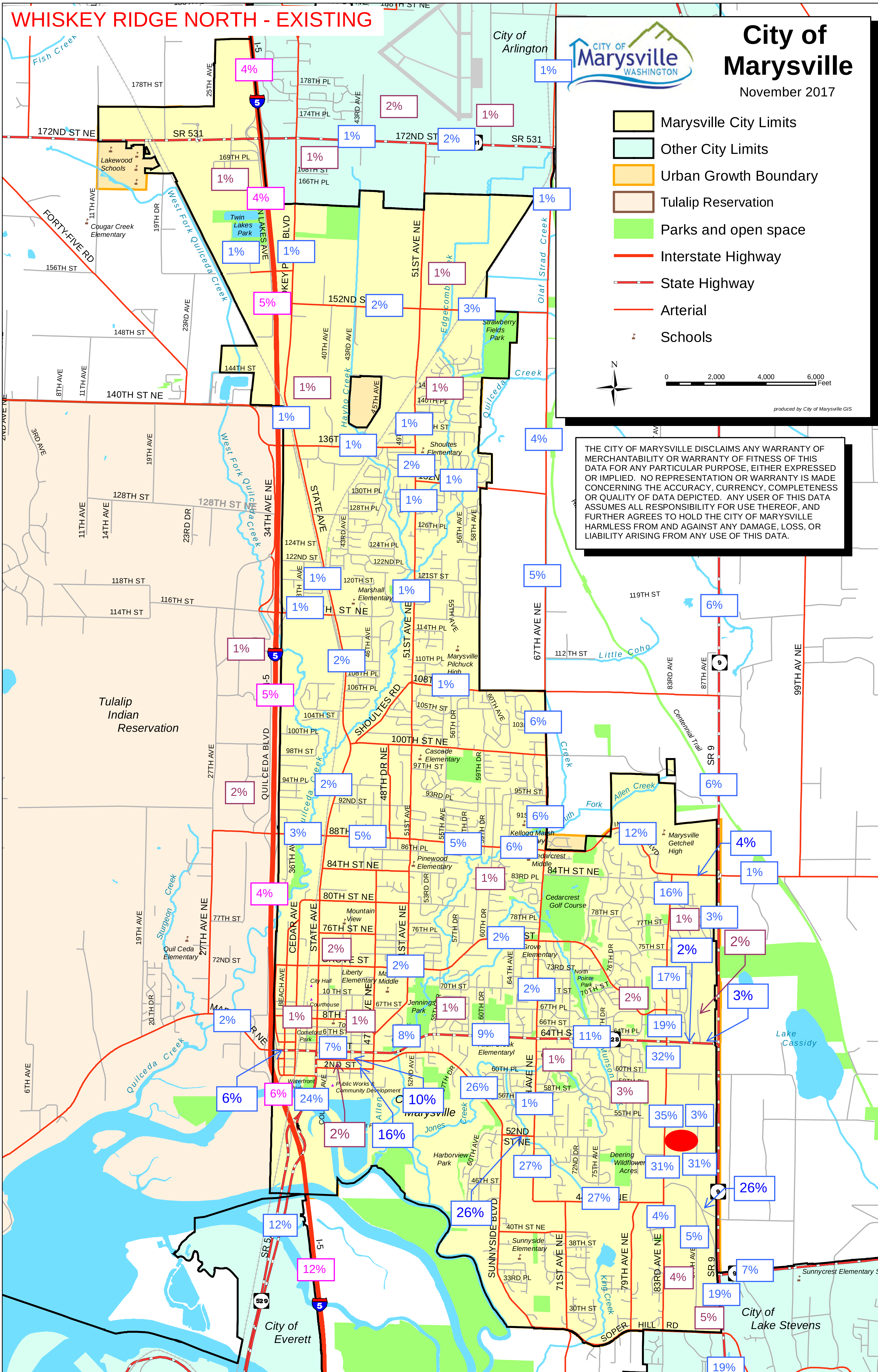
| | | | | | | | | | NET EXTERNAL TRIPS BY TYPE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | IN BOTH DIRECTIONS | | | | | | DIRECTIONAL ASSIGNMENTS | | | | | | |
| | | | Gross Trips | | | | Internal Crossover | | TOTAL | PASS-BY | | DIVERTED LINK | | NEW | PASS-BY | | DIVERTED LINK | | NEW | | |
| LAND USES | VARIABLE | ITE LU code | Trip Rate | % IN | % OUT | In+Out (Total) | % of Gross Trips | Trips In+Out (Total) | In+Out (Total) | % of Ext. Trips | In+Out (Total) | % of Ext. Trips | In+Out (Total) | In+Out (Total) | In | Out | In | Out | In | Out |
| Single-Family Detached Housing | 29 units | 210 | 0.70 | 26% | 74% | 20 | 0% | 0 | 20 | 0% | 0 | 0% | 0 | 20 | 0 | 0 | 0 | 0 | 5 | 15 |
| Single-Family Detached Housing (Removed) | -1 unit | 210 | 0.70 | 26% | 74% | -1 | 0% | 0 | -1 | 0% | 0 | 0% | 0 | -1 | 0 | 0 | 0 | 0 | 0 | -1 |
| **Total** | | | | | | 19 | | 0 | 19 | | 0 | | 0 | 19 | 0 | 0 | 0 | 0 | 5 | 14 |

**Trip Generation for:** **Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 4 and 6 PM**
**(a.k.a.):** **Weekday PM Peak Hour**

| | | | | | | | | | NET EXTERNAL TRIPS BY TYPE | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | IN BOTH DIRECTIONS | | | | | | DIRECTIONAL ASSIGNMENTS | | | | | |
| | | | Gross Trips | | | | Internal Crossover | | TOTAL | PASS-BY | | DIVERTED LINK | | NEW | PASS-BY | | DIVERTED LINK | | NEW | |
| **LAND USES** | **VARIABLE** | **ITE LU code** | **Trip Rate** | **% IN** | **% OUT** | **In+Out (Total)** | **% of Gross Trips** | **Trips In+Out (Total)** | **In+Out (Total)** | **% of Ext. Trips** | **In+Out (Total)** | **% of Ext. Trips** | **In+Out (Total)** | **In+Out (Total)** | **In** | **Out** | **In** | **Out** | **In** | **Out** |
| Single-Family Detached Housing | 29 units | 210 | 1.00 | 63% | 37% | 29 | 0% | 0 | 29 | 0% | 0 | 0% | 0 | 29 | 0 | 0 | 0 | 0 | 18 | 11 |
| Single-Family Detached Housing (Removed) | -1 unit | 210 | 1.00 | 63% | 37% | -1 | 0% | 0 | -1 | 0% | 0 | 0% | 0 | -1 | 0 | 0 | 0 | 0 | -1 | 0 |
| **Total** | | | | | | 28 | | 0 | 28 | | 0 | | 0 | 28 | 0 | 0 | 0 | 0 | 17 | 11 |

# APPENDIX B

## DISTRIBUTION AND COUNT DATA



WHISKEY RIDGE NORTH - EXISTING
City of Marysville
November 2017
CITY OF Marysville WASHINGTON
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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City of Arlington
Tulalip Indian Reservation
City of Everett
City of Lake Stevens
Marysville
172ND ST NE
SR 531
140TH ST NE
152ND ST
100TH ST NE
88TH ST
84TH ST NE
80TH ST NE
76TH ST NE
64TH ST
52ND ST NE
SOPER HILL RD
STATE AVE
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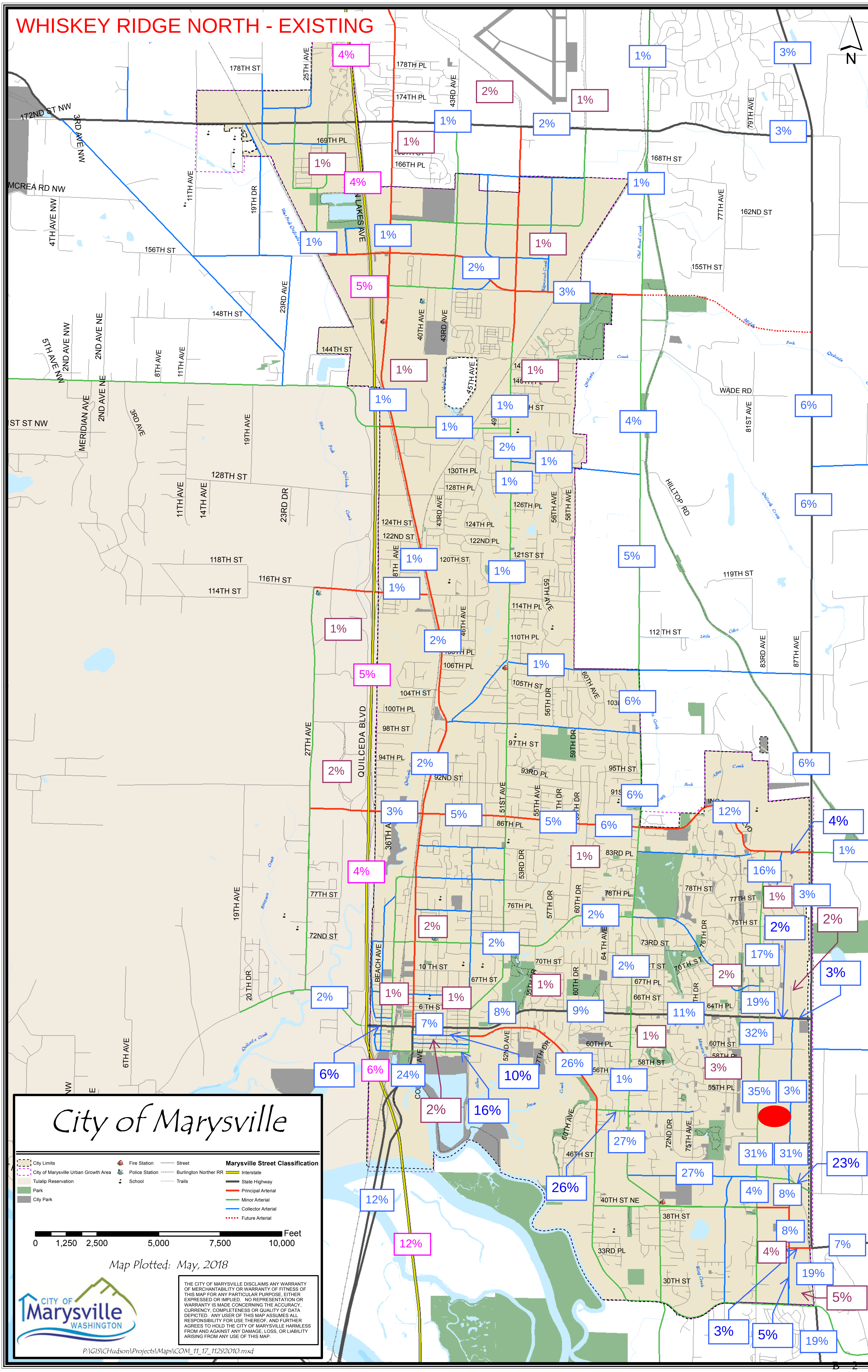
67TH AVE NE
SR 9
I-5
SUNNYSIDE BLVD
SHOULTES RD
QUILCEDA BLVD
Lake Cassidy


WHISKEY RIDGE NORTH - EXISTING
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City of Marysville
City Limits
City of Marysville Urban Growth Area
Tulalip Reservation
Park
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Fire Station
Police Station
School
Street
Burlington Northern RR
Trails
Marysville Street Classification
Interstate
State Highway
Principal Arterial
Minor Arterial
Collector Arterial
Future Arterial
Feet
0 1,250 2,500 5,000 7,500 10,000
Map Plotted: May, 2018
CITY OF Marysville WASHINGTON
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67TH PL
66TH ST
64TH PL
60TH PL
60TH ST
58TH ST
55TH PL
46TH ST
40TH ST NE
38TH ST
33RD PL
30TH ST
MCREA RD NW
HILLTOP RD
QUILCEDA BLVD
STATE AVE
SMOKEY POINT BLVD
25TH AVE
43RD AVE
79TH AVE
77TH AVE
81ST AVE
83RD AVE
87TH AVE
3RD AVE NW
4TH AVE NW
5TH AVE NW
2ND AVE NW
2ND AVE NE
MERIDIAN AVE
3RD AVE
8TH AVE
11TH AVE
19TH AVE
19TH DR
23RD AVE
23RD DR
14TH AVE
27TH AVE
40TH AVE
45TH AVE
46TH AVE
51ST AVE
55TH AVE
56TH AVE
58TH AVE
56TH DR
59TH DR
60TH AVE
60TH DR
53RD DR
57TH DR
64 TH AVE
72ND DR
75TH AVE
76TH DR
52ND AVE
60TH AVE
36TH AVE
BEACH AVE
20 TH DR
6TH AVE
4%
1%
3%
2%
1%
1%
2%
1%
3%
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16%
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27%
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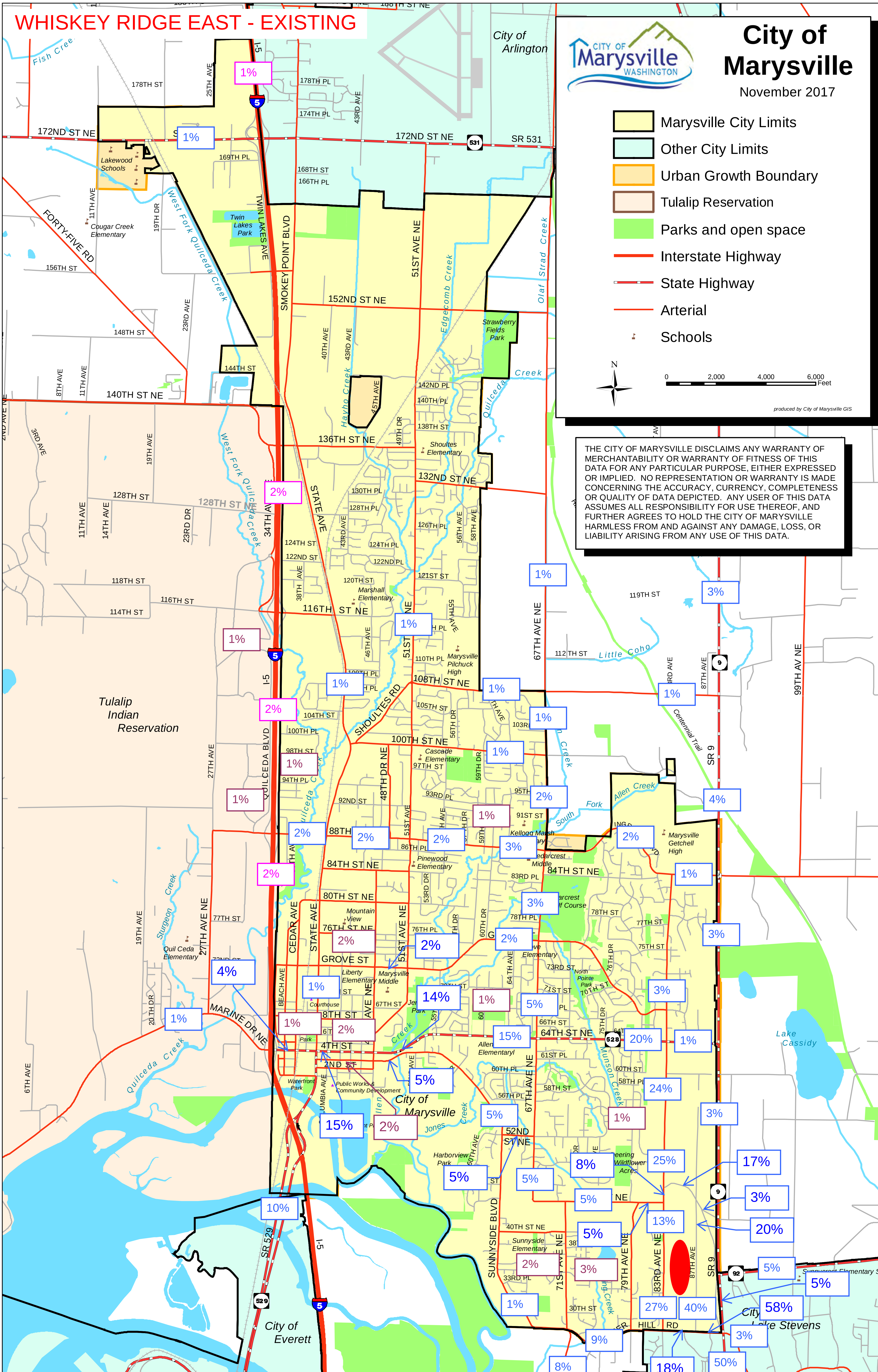
4%
7%
19%
5%
3%
5%
19%


WHISKEY RIDGE EAST - EXISTING
City of Marysville
November 2017
CITY OF Marysville WASHINGTON
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
produced by City of Marysville GIS
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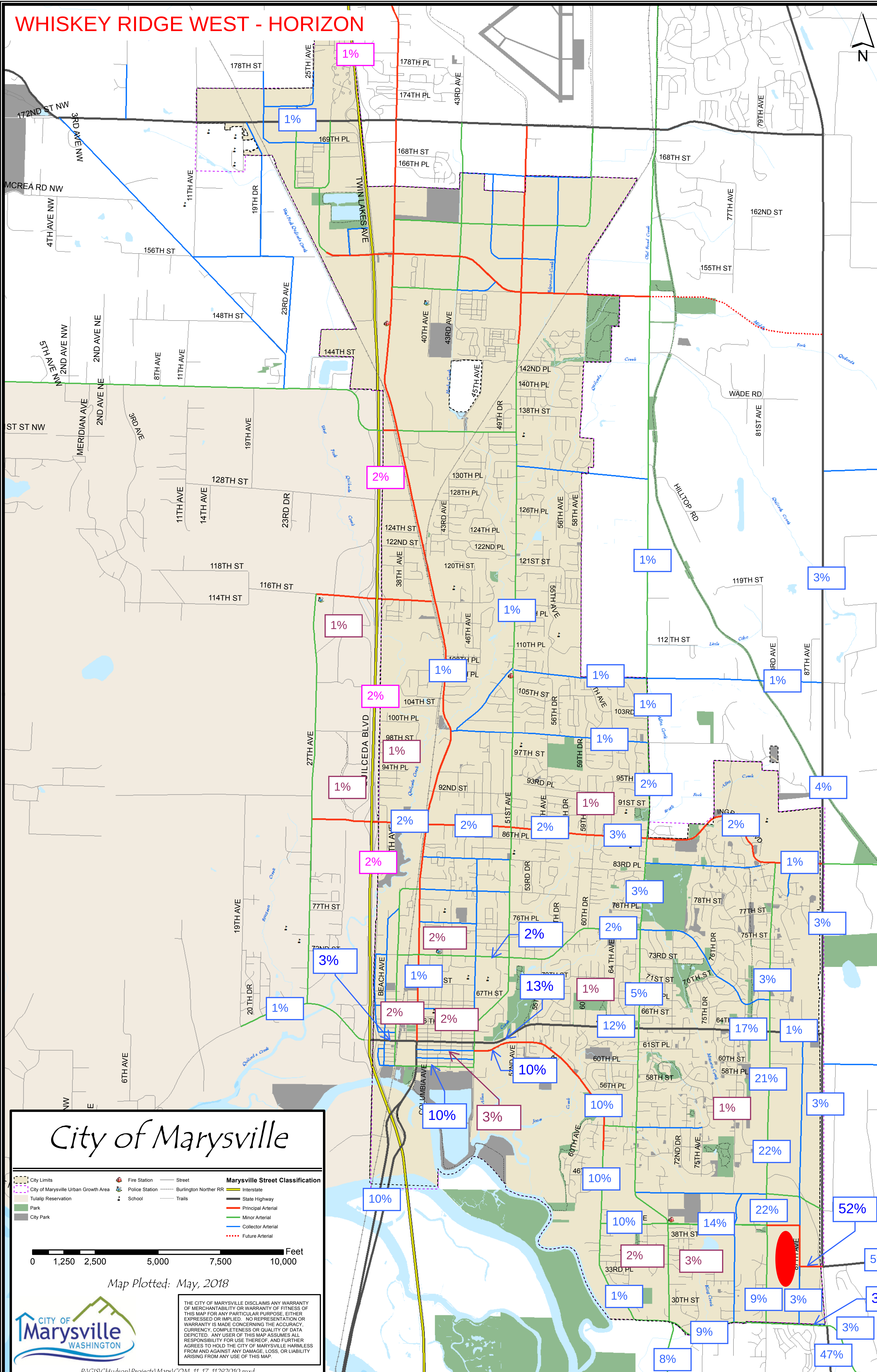
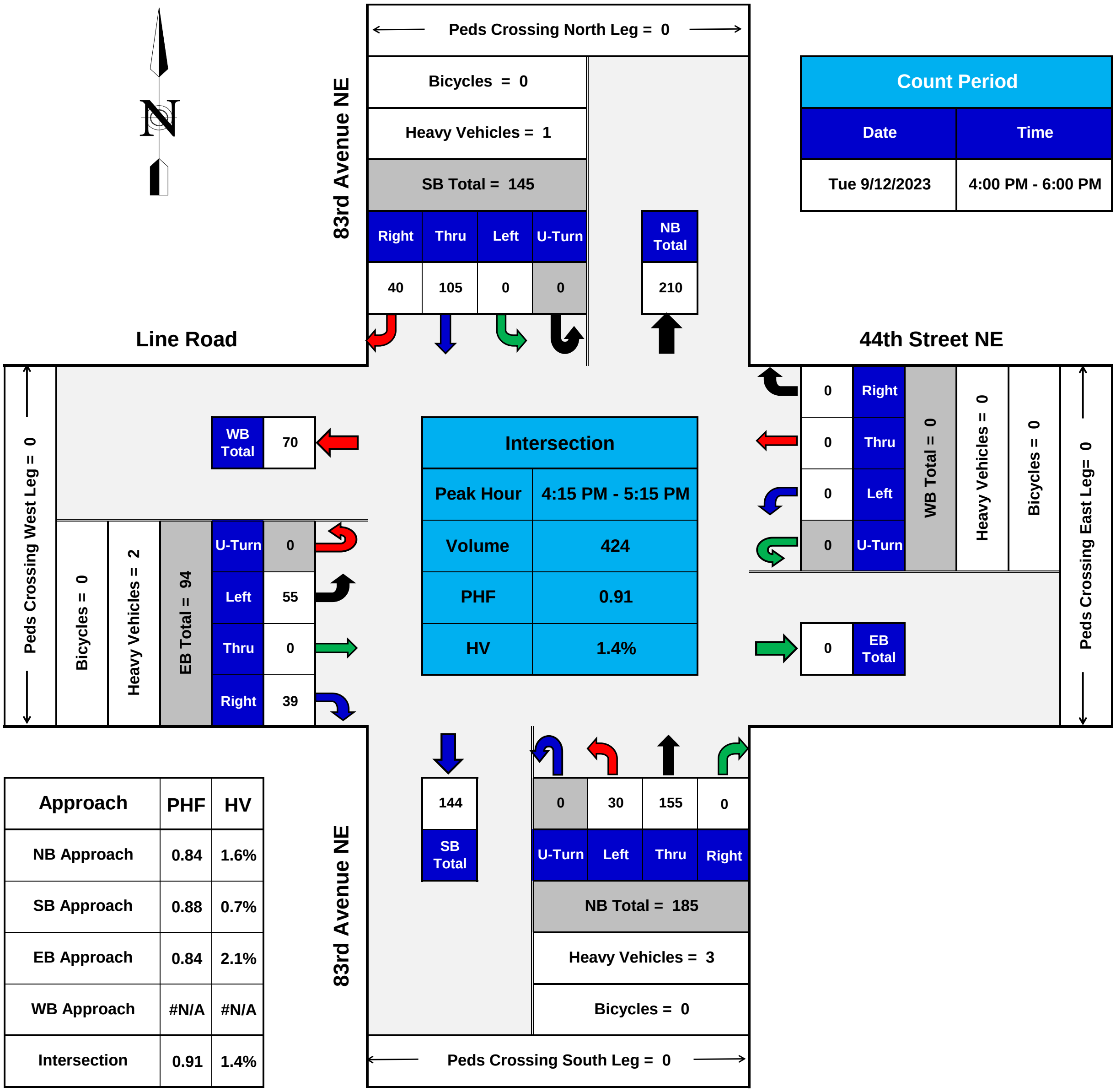
City of Arlington
Tulalip Indian Reservation
City of Marysville
City of Everett
Lake Stevens
Lake Cassidy

# WHISKEY RIDGE WEST - HORIZON



## 83rd Avenue NE @ Line Road/44th Street NE

## Marysville, WA




| Count Period | |
|---|---|
| Date | Time |
| Tue 9/12/2023 | 4:00 PM - 6:00 PM |

| Intersection | |
|---|---|
| Peak Hour | 4:15 PM - 5:15 PM |
| Volume | 424 |
| PHF | 0.91 |
| HV | 1.4% |

| Approach | PHF | HV |
|---|---|---|
| NB Approach | 0.84 | 1.6% |
| SB Approach | 0.88 | 0.7% |
| EB Approach | 0.84 | 2.1% |
| WB Approach | #N/A | #N/A |
| Intersection | 0.91 | 1.4% |

PHF = Peak Hour Factor
HV = Heavy Vehicles

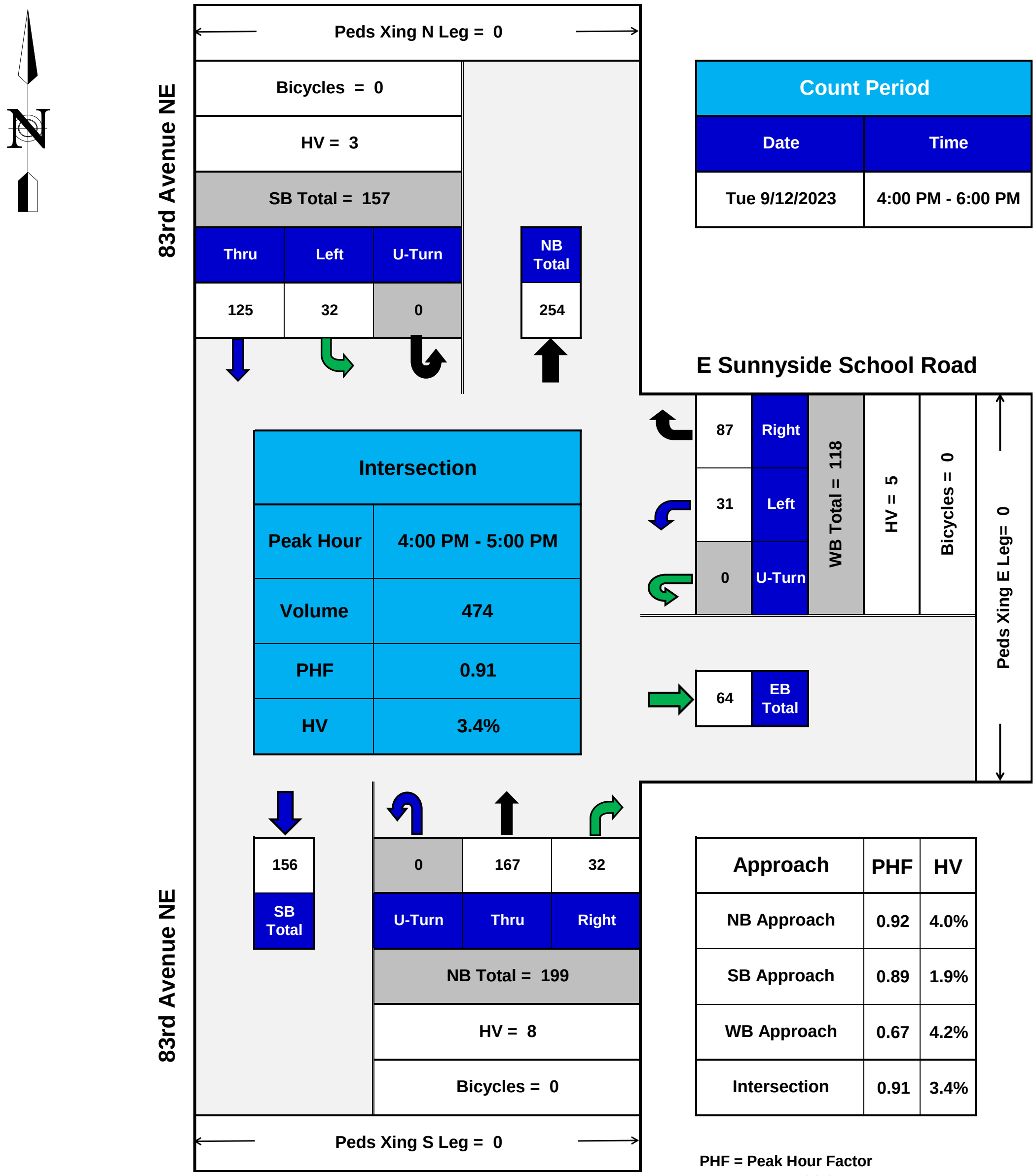
## TURNING MOVEMENTS DIAGRAM

### PEAK HOUR SUMMARY

DTG TRAFFIC DATA GATHERING

## 83rd Avenue NE @ E Sunnyside School Road

## Marysville, WA




| Count Period | |
|---|---|
| Date | Time |
| Tue 9/12/2023 | 4:00 PM - 6:00 PM |

| Intersection | |
|---|---|
| Peak Hour | 4:00 PM - 5:00 PM |
| Volume | 474 |
| PHF | 0.91 |
| HV | 3.4% |

| Approach | PHF | HV |
|---|---|---|
| NB Approach | 0.92 | 4.0% |
| SB Approach | 0.89 | 1.9% |
| WB Approach | 0.67 | 4.2% |
| Intersection | 0.91 | 3.4% |

PHF = Peak Hour Factor
HV = Heavy Vehicles

## TURNING MOVEMENTS DIAGRAM

### PEAK HOUR SUMMARY

TRAFFIC DATA GATHERING

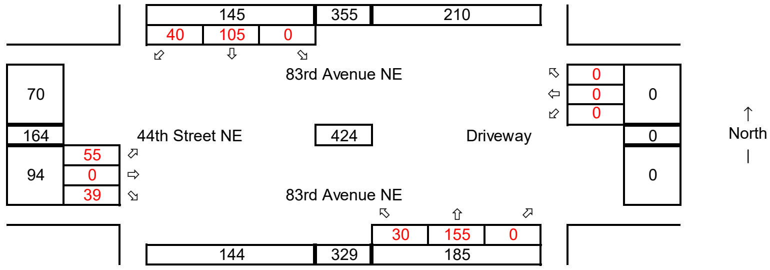
# APPENDIX C

## TURNING MOVEMENT CALCULATIONS

Synchro ID: 1
**Existing**
Average Weekday
PM Peak-Hour

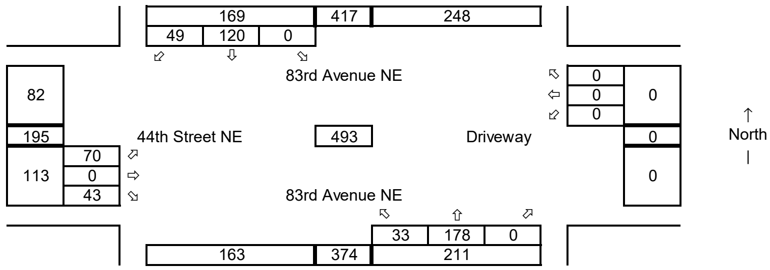
Year: 9/12/2023

Data Source: TDG

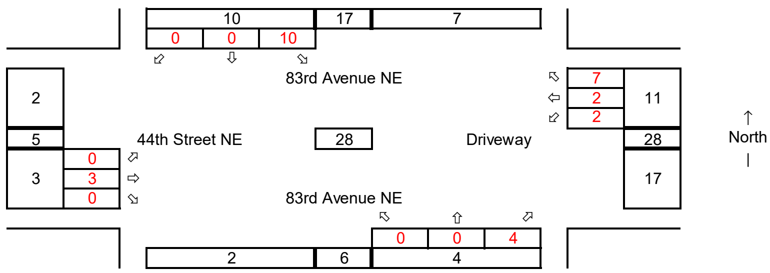



**Future without Development**
Average Weekday
PM Peak-Hour

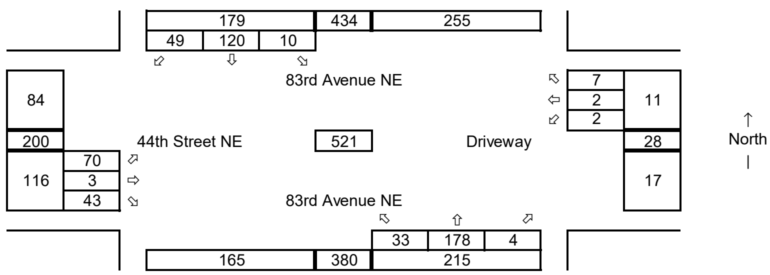
Year: 2026
Growth Rate = 3.0%
Years of Growth = 3
Total Growth = 1.0927




**Total Development Trips**
Average Weekday
PM Peak-Hour

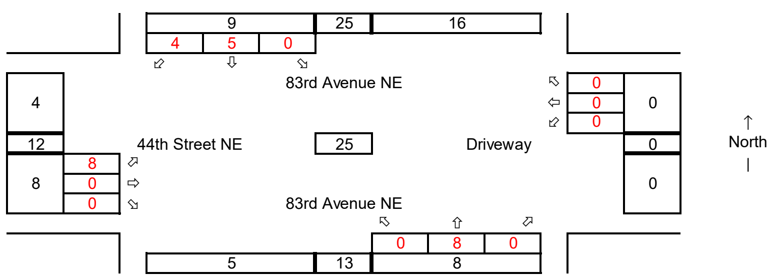



**Future with Development**
Average Weekday
PM Peak-Hour



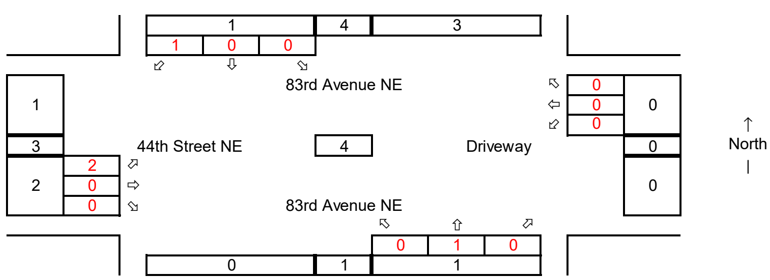

**Pipeline Trips**
Average Weekday
PM Peak-Hour

Cornelius Lacey




**Total Project Trips**
Average Weekday
PM Peak-Hour

Taylor Property



Synchro ID: 2
**Existing**
Average Weekday
PM Peak-Hour

Year: 9/12/2023

Data Source: TDG

157 411 254
0 125 32
83rd Avenue NE
87 0 31 118
0
0 --- 474 E Sunnyside School Road 182
0 0 0 0 64
83rd Avenue NE
0 167 32
156 355 199
North

**Future without Development**
Average Weekday
PM Peak-Hour

Year: 2026
Growth Rate = 3.0%
Years of Growth = 3
Total Growth = 1.0927

186 476 290
0 149 37
83rd Avenue NE
98 0 45 143
0
0 --- 562 E Sunnyside School Road 221
0 0 0 0 78
83rd Avenue NE
0 192 41
194 427 233
North

**Total Development Trips**
Average Weekday
PM Peak-Hour

5 9 4
0 5 0
83rd Avenue NE
0 0 5 5
0
0 --- 17 E Sunnyside School Road 8
0 0 0 0 3
83rd Avenue NE
0 4 3
10 17 7
North

**Future with Development**
Average Weekday
PM Peak-Hour

191 485 294
0 154 37
83rd Avenue NE
98 0 50 148
0
0 --- 579 E Sunnyside School Road 229
0 0 0 0 81
83rd Avenue NE
0 196 44
204 444 240
North

**Pipeline Trips**
Average Weekday
PM Peak-Hour

Cornelius Lacey

11 18 7
0 11 0
83rd Avenue NE
0 0 11 11
0
0 --- 35 E Sunnyside School Road 17
0 0 0 0 6
83rd Avenue NE
0 7 6
22 35 13
North

**Total Project Trips**
Average Weekday
PM Peak-Hour

Taylor Property

3 9 6
0 1 2
83rd Avenue NE
3 0 0 3
0
0 --- 9 E Sunnyside School Road 5
0 0 0 0 2
83rd Avenue NE
0 3 0
1 4 3
North

Synchro ID: 1
**Existing**
Average Weekday
PM Peak-Hour

Year: 9/12/2023

Data Source: TDG

145 355 210
40 105 0
83rd Avenue NE
70
0 0 0 | 0
164 44th Street NE 424 Driveway 0
55 0 39 | 94
0
83rd Avenue NE
30 155 0
144 329 185
North

**Future without Development**
Average Weekday
PM Peak-Hour

Year: 2032
Growth Rate = 3.0%
Years of Growth = 9
Total Growth = 1.3048

243 641 398
53 137 53
83rd Avenue NE
147
121 55 43 | 219
330 44th Street NE 935 Driveway 378
74 58 51 | 183
159
83rd Avenue NE
39 203 48
231 521 290
North

**Total Development Trips**
Average Weekday
PM Peak-Hour

5 9 4
0 0 5
83rd Avenue NE
2
4 2 5 | 11
5 44th Street NE 28 Driveway 28
0 3 0 | 3
17
83rd Avenue NE
0 0 9
5 14 9
North

**Future with Development**
Average Weekday
PM Peak-Hour

248 650 402
53 137 58
83rd Avenue NE
149
125 57 48 | 230
335 44th Street NE 963 Driveway 406
74 61 51 | 186
176
83rd Avenue NE
39 203 57
236 535 299
North

**Pipeline Trips**
Average Weekday
PM Peak-Hour

Cornelius Lacey

11 18 7
0 0 11
83rd Avenue NE
5
7 5 3 | 15
13 44th Street NE 40 Driveway 40
0 8 0 | 8
25
83rd Avenue NE
0 0 6
3 9 6
North

**Total Project Trips**
Average Weekday
PM Peak-Hour

Taylor Property

1 4 3
1 0 0
83rd Avenue NE
1
0 0 0 | 0
3 44th Street NE 4 Driveway 0
2 0 0 | 2
0
83rd Avenue NE
0 1 0
0 1 1
North

**Total Project Trips**
Average Weekday
PM Peak-Hour

E Sunnyside Reassignment

42 156 114
0 0 42
83rd Avenue NE
50
114 50 40 | 204
100 44th Street NE 338 Driveway 338
0 50 0 | 50
134
83rd Avenue NE
0 0 42
40 82 42
North

# APPENDIX D

## LEVEL OF SERVICE CALCULATIONS

| Intersection | |
|---|---|
| Int Delay, s/veh | 3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 55 | 0 | 39 | 0 | 0 | 0 | 30 | 155 | 0 | 0 | 105 | 40 |
| Future Vol, veh/h | 55 | 0 | 39 | 0 | 0 | 0 | 30 | 155 | 0 | 0 | 105 | 40 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mvmt Flow | 60 | 0 | 43 | 0 | 0 | 0 | 33 | 170 | 0 | 0 | 115 | 44 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 373 | 373 | 137 | 395 | 395 | 170 | 159 | 0 | 0 | 170 | 0 | 0 |
| Stage 1 | 137 | 137 | - | 236 | 236 | - | - | - | - | - | - | - |
| Stage 2 | 236 | 236 | - | 159 | 159 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.11 | 6.51 | 6.21 | 7.11 | 6.51 | 6.21 | 4.11 | - | - | 4.11 | - | - |
| Critical Hdwy Stg 1 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.509 | 4.009 | 3.309 | 3.509 | 4.009 | 3.309 | 2.209 | - | - | 2.209 | - | - |
| Pot Cap-1 Maneuver | 586 | 559 | 914 | 567 | 543 | 876 | 1427 | - | - | 1413 | - | - |
| Stage 1 | 869 | 785 | - | 769 | 712 | - | - | - | - | - | - | - |
| Stage 2 | 769 | 712 | - | 846 | 768 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 574 | 544 | 914 | 530 | 529 | 876 | 1427 | - | - | 1413 | - | - |
| Mov Cap-2 Maneuver | 574 | 544 | - | 530 | 529 | - | - | - | - | - | - | - |
| Stage 1 | 846 | 785 | - | 749 | 693 | - | - | - | - | - | - | - |
| Stage 2 | 749 | 693 | - | 806 | 768 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 11.3 | 0 | 1.2 | 0 |
| HCM LOS | B | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1427 | - | - | 679 | - | 1413 | - | - |
| HCM Lane V/C Ratio | 0.023 | - | - | 0.152 | - | - | - | - |
| HCM Control Delay (s) | 7.6 | 0 | - | 11.3 | 0 | 0 | - | - |
| HCM Lane LOS | A | A | - | B | A | A | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0.5 | - | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.2 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 31 | 87 | 167 | 32 | 32 | 125 |
| Future Vol, veh/h | 31 | 87 | 167 | 32 | 32 | 125 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 34 | 96 | 184 | 35 | 35 | 137 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 409 | 202 | 0 | 0 | 219 | 0 |
| Stage 1 | 202 | - | - | - | - | - |
| Stage 2 | 207 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | - | - | 4.13 | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | - | - | 2.227 | - |
| Pot Cap-1 Maneuver | 597 | 836 | - | - | 1344 | - |
| Stage 1 | 830 | - | - | - | - | - |
| Stage 2 | 825 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 580 | 836 | - | - | 1344 | - |
| Mov Cap-2 Maneuver | 580 | - | - | - | - | - |
| Stage 1 | 830 | - | - | - | - | - |
| Stage 2 | 802 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 10.8 | 0 | 1.6 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 749 | 1344 | - |
| HCM Lane V/C Ratio | - | - | 0.173 | 0.026 | - |
| HCM Control Delay (s) | - | - | 10.8 | 7.8 | 0 |
| HCM Lane LOS | - | - | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.6 | 0.1 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 70 | 0 | 43 | 0 | 0 | 0 | 33 | 178 | 0 | 0 | 120 | 49 |
| Future Vol, veh/h | 70 | 0 | 43 | 0 | 0 | 0 | 33 | 178 | 0 | 0 | 120 | 49 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mvmt Flow | 77 | 0 | 47 | 0 | 0 | 0 | 36 | 196 | 0 | 0 | 132 | 54 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 427 | 427 | 159 | 451 | 454 | 196 | 186 | 0 | 0 | 196 | 0 | 0 |
| Stage 1 | 159 | 159 | - | 268 | 268 | - | - | - | - | - | - | - |
| Stage 2 | 268 | 268 | - | 183 | 186 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.11 | 6.51 | 6.21 | 7.11 | 6.51 | 6.21 | 4.11 | - | - | 4.11 | - | - |
| Critical Hdwy Stg 1 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.509 | 4.009 | 3.309 | 3.509 | 4.009 | 3.309 | 2.209 | - | - | 2.209 | - | - |
| Pot Cap-1 Maneuver | 540 | 521 | 889 | 520 | 503 | 848 | 1395 | - | - | 1383 | - | - |
| Stage 1 | 846 | 768 | - | 740 | 689 | - | - | - | - | - | - | - |
| Stage 2 | 740 | 689 | - | 821 | 748 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 528 | 506 | 889 | 482 | 488 | 848 | 1395 | - | - | 1383 | - | - |
| Mov Cap-2 Maneuver | 528 | 506 | - | 482 | 488 | - | - | - | - | - | - | - |
| Stage 1 | 821 | 768 | - | 719 | 669 | - | - | - | - | - | - | - |
| Stage 2 | 719 | 669 | - | 777 | 748 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 12.2 | 0 | 1.2 | 0 |
| HCM LOS | B | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1395 | - | - | 625 | - | 1383 | - | - |
| HCM Lane V/C Ratio | 0.026 | - | - | 0.199 | - | - | - | - |
| HCM Control Delay (s) | 7.7 | 0 | - | 12.2 | 0 | 0 | - | - |
| HCM Lane LOS | A | A | - | B | A | A | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0.7 | - | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.5 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 45 | 98 | 192 | 41 | 37 | 149 |
| Future Vol, veh/h | 45 | 98 | 192 | 41 | 37 | 149 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 49 | 108 | 211 | 45 | 41 | 164 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 480 | 234 | 0 | 0 | 256 | 0 |
| Stage 1 | 234 | - | - | - | - | - |
| Stage 2 | 246 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | - | - | 4.13 | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | - | - | 2.227 | - |
| Pot Cap-1 Maneuver | 543 | 803 | - | - | 1303 | - |
| Stage 1 | 802 | - | - | - | - | - |
| Stage 2 | 793 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 524 | 803 | - | - | 1303 | - |
| Mov Cap-2 Maneuver | 524 | - | - | - | - | - |
| Stage 1 | 802 | - | - | - | - | - |
| Stage 2 | 765 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 11.8 | 0 | 1.6 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 688 | 1303 | - |
| HCM Lane V/C Ratio | - | - | 0.228 | 0.031 | - |
| HCM Control Delay (s) | - | - | 11.8 | 7.9 | 0 |
| HCM Lane LOS | - | - | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.9 | 0.1 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 70 | 3 | 43 | 2 | 2 | 7 | 33 | 178 | 4 | 10 | 120 | 49 |
| Future Vol, veh/h | 70 | 3 | 43 | 2 | 2 | 7 | 33 | 178 | 4 | 10 | 120 | 49 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mvmt Flow | 77 | 3 | 47 | 2 | 2 | 8 | 36 | 196 | 4 | 11 | 132 | 54 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 456 | 453 | 159 | 476 | 478 | 198 | 186 | 0 | 0 | 200 | 0 | 0 |
| Stage 1 | 181 | 181 | - | 270 | 270 | - | - | - | - | - | - | - |
| Stage 2 | 275 | 272 | - | 206 | 208 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.11 | 6.51 | 6.21 | 7.11 | 6.51 | 6.21 | 4.11 | - | - | 4.11 | - | - |
| Critical Hdwy Stg 1 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.509 | 4.009 | 3.309 | 3.509 | 4.009 | 3.309 | 2.209 | - | - | 2.209 | - | - |
| Pot Cap-1 Maneuver | 516 | 504 | 889 | 501 | 488 | 846 | 1395 | - | - | 1378 | - | - |
| Stage 1 | 823 | 752 | - | 738 | 688 | - | - | - | - | - | - | - |
| Stage 2 | 733 | 686 | - | 798 | 732 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 495 | 485 | 889 | 458 | 469 | 846 | 1395 | - | - | 1378 | - | - |
| Mov Cap-2 Maneuver | 495 | 485 | - | 458 | 469 | - | - | - | - | - | - | - |
| Stage 1 | 799 | 745 | - | 717 | 668 | - | - | - | - | - | - | - |
| Stage 2 | 703 | 666 | - | 745 | 725 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 12.7 | 10.6 | 1.2 | 0.4 |
| HCM LOS | B | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1395 | - | - | 592 | 651 | 1378 | - | - |
| HCM Lane V/C Ratio | 0.026 | - | - | 0.215 | 0.019 | 0.008 | - | - |
| HCM Control Delay (s) | 7.7 | 0 | - | 12.7 | 10.6 | 7.6 | 0 | - |
| HCM Lane LOS | A | A | - | B | B | A | A | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0.8 | 0.1 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.6 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 50 | 98 | 196 | 44 | 37 | 154 |
| Future Vol, veh/h | 50 | 98 | 196 | 44 | 37 | 154 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 3 | 3 | 3 | 3 | 3 | 3 |
| Mvmt Flow | 55 | 108 | 215 | 48 | 41 | 169 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 490 | 239 | 0 | 0 | 263 | 0 |
| Stage 1 | 239 | - | - | - | - | - |
| Stage 2 | 251 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | - | - | 4.13 | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | - | - | 2.227 | - |
| Pot Cap-1 Maneuver | 536 | 797 | - | - | 1295 | - |
| Stage 1 | 798 | - | - | - | - | - |
| Stage 2 | 788 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 517 | 797 | - | - | 1295 | - |
| Mov Cap-2 Maneuver | 517 | - | - | - | - | - |
| Stage 1 | 798 | - | - | - | - | - |
| Stage 2 | 760 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 12 | 0 | 1.5 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 674 | 1295 | - |
| HCM Lane V/C Ratio | - | - | 0.241 | 0.031 | - |
| HCM Control Delay (s) | - | - | 12 | 7.9 | 0 |
| HCM Lane LOS | - | - | B | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.9 | 0.1 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 11.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 74 | 58 | 51 | 43 | 55 | 121 | 39 | 203 | 48 | 53 | 137 | 53 |
| Future Vol, veh/h | 74 | 58 | 51 | 43 | 55 | 121 | 39 | 203 | 48 | 53 | 137 | 53 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mvmt Flow | 81 | 64 | 56 | 47 | 60 | 133 | 43 | 223 | 53 | 58 | 151 | 58 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 728 | 658 | 180 | 692 | 661 | 250 | 209 | 0 | 0 | 276 | 0 | 0 |
| Stage 1 | 296 | 296 | - | 336 | 336 | - | - | - | - | - | - | - |
| Stage 2 | 432 | 362 | - | 356 | 325 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.11 | 6.51 | 6.21 | 7.11 | 6.51 | 6.21 | 4.11 | - | - | 4.11 | - | - |
| Critical Hdwy Stg 1 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.509 | 4.009 | 3.309 | 3.509 | 4.009 | 3.309 | 2.209 | - | - | 2.209 | - | - |
| Pot Cap-1 Maneuver | 340 | 385 | 865 | 360 | 384 | 791 | 1368 | - | - | 1293 | - | - |
| Stage 1 | 715 | 670 | - | 680 | 644 | - | - | - | - | - | - | - |
| Stage 2 | 604 | 627 | - | 664 | 651 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 230 | 352 | 865 | 271 | 351 | 791 | 1368 | - | - | 1293 | - | - |
| Mov Cap-2 Maneuver | 230 | 352 | - | 271 | 351 | - | - | - | - | - | - | - |
| Stage 1 | 689 | 636 | - | 655 | 620 | - | - | - | - | - | - | - |
| Stage 2 | 437 | 604 | - | 530 | 618 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 30.7 | 20.6 | 1 | 1.7 |
| HCM LOS | D | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1368 | - | - | 335 | 468 | 1293 | - | - |
| HCM Lane V/C Ratio | 0.031 | - | - | 0.6 | 0.514 | 0.045 | - | - |
| HCM Control Delay (s) | 7.7 | 0 | - | 30.7 | 20.6 | 7.9 | 0 | - |
| HCM Lane LOS | A | A | - | D | C | A | A | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 3.7 | 2.9 | 0.1 | - | - |

| Intersection | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Int Delay, s/veh | 12.8 | | | | | | | | | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 74 | 61 | 51 | 48 | 57 | 125 | 39 | 203 | 57 | 58 | 137 | 53 |
| Future Vol, veh/h | 74 | 61 | 51 | 48 | 57 | 125 | 39 | 203 | 57 | 58 | 137 | 53 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 | 91 |
| Heavy Vehicles, % | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mvmt Flow | 81 | 67 | 56 | 53 | 63 | 137 | 43 | 223 | 63 | 64 | 151 | 58 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 749 | 680 | 180 | 711 | 678 | 255 | 209 | 0 | 0 | 286 | 0 | 0 |
| Stage 1 | 308 | 308 | - | 341 | 341 | - | - | - | - | - | - | - |
| Stage 2 | 441 | 372 | - | 370 | 337 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.11 | 6.51 | 6.21 | 7.11 | 6.51 | 6.21 | 4.11 | - | - | 4.11 | - | - |
| Critical Hdwy Stg 1 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.509 | 4.009 | 3.309 | 3.509 | 4.009 | 3.309 | 2.209 | - | - | 2.209 | - | - |
| Pot Cap-1 Maneuver | 329 | 374 | 865 | 349 | 375 | 786 | 1368 | - | - | 1282 | - | - |
| Stage 1 | 704 | 662 | - | 676 | 640 | - | - | - | - | - | - | - |
| Stage 2 | 597 | 621 | - | 652 | 643 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 217 | 339 | 865 | 258 | 340 | 786 | 1368 | - | - | 1282 | - | - |
| Mov Cap-2 Maneuver | 217 | 339 | - | 258 | 340 | - | - | - | - | - | - | - |
| Stage 1 | 677 | 624 | - | 650 | 616 | - | - | - | - | - | - | - |
| Stage 2 | 426 | 597 | - | 513 | 606 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 34 | 22.9 | 1 | 1.9 |
| HCM LOS | D | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1368 | - | - | 321 | 449 | 1282 | - | - |
| HCM Lane V/C Ratio | 0.031 | - | - | 0.637 | 0.563 | 0.05 | - | - |
| HCM Control Delay (s) | 7.7 | 0 | - | 34 | 22.9 | 8 | 0 | - |
| HCM Lane LOS | A | A | - | D | C | A | A | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 4.1 | 3.4 | 0.2 | - | - |