



22722 29th Drive SE
Suite 100
Bothell, WA 98021
425.339.8266

Marysville 172 & 23 Apartments Traffic Impact Analysis

Jurisdiction: City of Marysville

April 2022

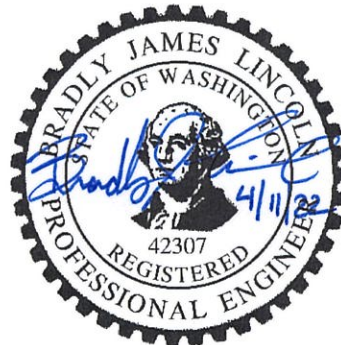


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1. DEVELOPMENT IDENTIFICATION

Kimley-Horn and Associates, Inc. has been retained to provide a traffic impact analysis for the proposed Marysville 172 & 23 Apartments development. This report is intended to provide the City of Marysville, Snohomish County, and the Washington State Department of Transportation (WSDOT) with the necessary trip generation, trip distribution and level of service information to facilitate their reviews of the development. The Marysville 172 & 23 Apartments development is located along the south side of 172nd Street NE between the 19th Avenue NE and 23rd Avenue NE alignments. A site vicinity map is included in Figure 1. The development is proposed to consist of 474 multifamily residential units with 4 existing single-family residential units being removed.

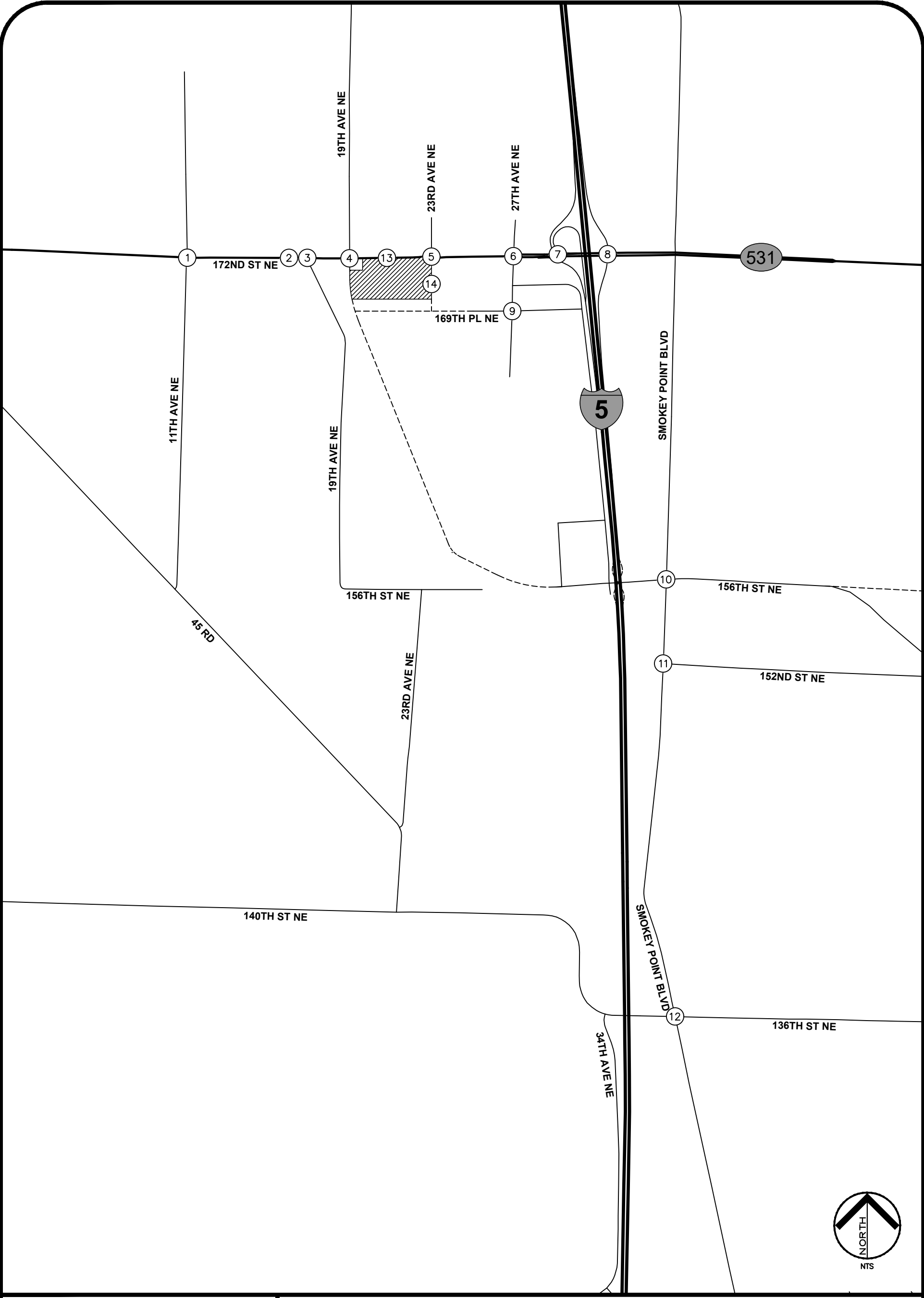
Brad Lincoln, responsible for this report and traffic analysis, is a licensed professional engineer (Civil) in the State of Washington and member of the Washington State section of ITE.

2. METHODOLOGY

The analysis contained in this report is based on the City of Marysville traffic impact analysis guidelines, which requires the analysis of intersections impacted with 25 or more PM peak-hour trips. The trip generation calculations are based on average trip generation rates published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition (2021)*. The trip distribution is based on the approved distributions provided by the City of Marysville for the *Lakewood S/O 172nd St NE* area. The trip generation, trip distribution and scope of analysis was identified during the scoping process for the development.

The level of service analysis at the study intersections has been performed in accordance with the *Highway Capacity Manual (HCM) 6th Edition*. Congestion is generally measured in terms of level of service (LOS). 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. A summary of the level of service criteria is included in Table 1.

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MARYSVILLE 172 & 23 APARTMENTS

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LEGEND

-  DEVELOPMENT SITE
-  STUDY INTERSECTION

FIGURE 1
SITE VICINITY MAP

Table 1: Level of Service Criteria

Level of ¹ Service	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 level of service at two-way stop-controlled intersections is based on the average delay for the stop approach with the highest delay. The level of service at all-way stop-controlled intersections, roundabouts, and signalized intersections is based on the average delay for all vehicles. The level of service analysis has been performed utilizing the *Synchro 11.1, Build 1* software for signalized and stop-controlled intersections. The level of service analysis for roundabout intersection has been performed using the *Sidra Version 9.0.1.9664* software. The City of Marysville identifies acceptable level of service as LOS E for stop-controlled and signalized intersections along the 172nd Street NE and Smokey Point Boulevard corridors. WSDOT has a level of service threshold of LOS E for I-5 intersections, based on the *Development Services Manual, Appendix 29*.

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 trip generation calculations for the Marysville 172 & 23 Apartments development are based on data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual, 11th Edition (2021)*. The average trip generation rates for ITE Land Use Code 220, Multifamily Housing (Low-Rise), were used for the trip generation calculations since the units will be in 3-story buildings. There are 4 single-family residential units that will be removed and are creditable to the development. The trip generation credit for these units is based on the average trip generation rates for ITE Land Use Code 210, Single-Family Detached Housing, and the City of Marysville requirement of 1.00 PM peak-hour trips per unit. The trip generation of the Marysville 172 & 23 Apartments development are summarized in Table 2.

Table 2: Trip Generation Summary – Weekday

Land Use	Units	Average Daily Trips	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
Multifamily Housing (Low-Rise) Proposed Units	474	3,194.76	45.50	144.10	189.60	152.30	89.44	241.74
Single-Family Detached Units Existing (to be removed)	-4	-37.72	-0.73	-2.07	-2.80	-2.52	-1.48	-4.00
TOTAL		3,157.04	44.77	142.03	186.80	149.78	87.96	237.74

The Marysville 172 & 23 Apartments development is anticipated to generate approximately 3,157 new average weekday daily trips with 187 new AM peak-hour trips and 238 new PM peak-hour trips. The Saturday trip generation for the Marysville 172 & 23 Apartments development is summarized in Table 3.

Table 3: Trip Generation Summary – Saturday

Land Use	Units	Average Daily Trips	Peak-Hour Trips		
			In	Out	Total
Multifamily Housing (Low-Rise) Proposed Units	474	2,156.70	99.11	95.23	194.34
Single-Family Detached Units Existing (to be removed)	-4	-37.92	-1.99	-1.69	-3.68
TOTAL		2,118.78	97.12	93.54	190.66

The Marysville 172 & 23 Apartments development is anticipated to generate approximately 2,119 new average Saturday daily trips with 191 new Saturday peak-hour trips. The trip generation calculations are included in the attachments.

4. TRIP DISTRIBUTION

The trip distribution for the Marysville 172 & 23 Apartments development is based on distributions provided by the City of Marysville for new developments in the site vicinity based on the *Lakewood S/O 172nd St NE* distributions. The existing trip distribution has been utilized for the evaluated for the 2025 Opening Year conditions. The horizon trip distribution, used for the 2031 Horizon Year conditions, accounts for connections between 172nd Street NE and 156th Street NE and the Interstate-5 interchange with 156th Street NE. The horizon year trip distribution has been used for the 2031 Horizon Year conditions.

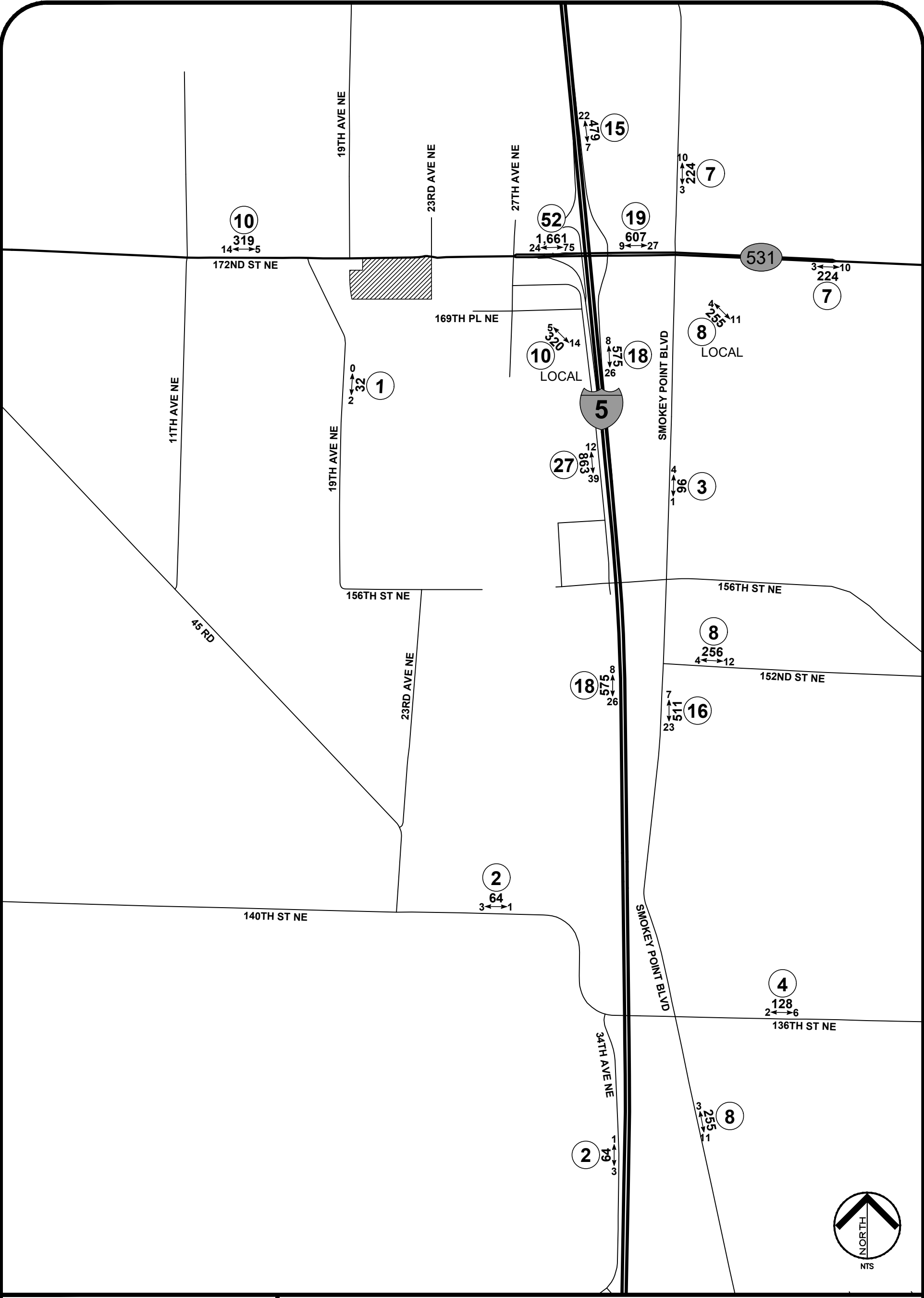
4.1 2025 Opening Year

The opening year trip distribution is based on the existing roadway network. It is anticipated that 30% of the trips generated by the development will travel along 172nd Street NE, eleven percent to and from the west and nineteen percent to and from the east. Approximately 27% of the trips generated by the development will travel to and from the east along 156th Street NE. It is estimated that 33% of the trips generated by the development will travel along Interstate-5, fifteen percent to and from the north and eighteen percent to and from the south. The remaining 10% of the trips generated by the development will be to and from local retail areas in the site vicinity. Detailed trip distributions are shown in Figure 2 and Figure 3 for the weekday AM and PM peak-hours, respectively. A detailed trip distribution for the Saturday peak-hour is shown in Figure 4. It is important to note that the trips shown in the distributions do not include the credit for the existing uses on the site.

4.2 2031 Horizon Year

The horizon year distribution considers future roadway improvements, particularly new roadways between 172nd Street NE and 156th Street NE and a full Interstate-5 interchange with 156th Street NE. These new roadways and the Interstate-5 interchange are anticipated to cause trips to divert from 172nd Street NE to the new north-south roadways. The trip distribution shows 37% of the trips utilizing the new connection between 172nd Street NE and 156th Street NE, which accounts for the twenty-three percent of the trips that are anticipated to use the Twin Lakes Boulevard and ten percent of the trips traveling to and from the south along Interstate-5 under the 2025 opening year distribution. The 2031 horizon year trip distributions for the weekday AM and PM peak-hours are shown in Figure 5 and Figure 6, respectively. A detailed trip distribution for 2031 horizon year for the Saturday peak-hour is shown in Figure 7. It is important to note that the trips shown in the distributions do not include the credit for the existing uses on the site.

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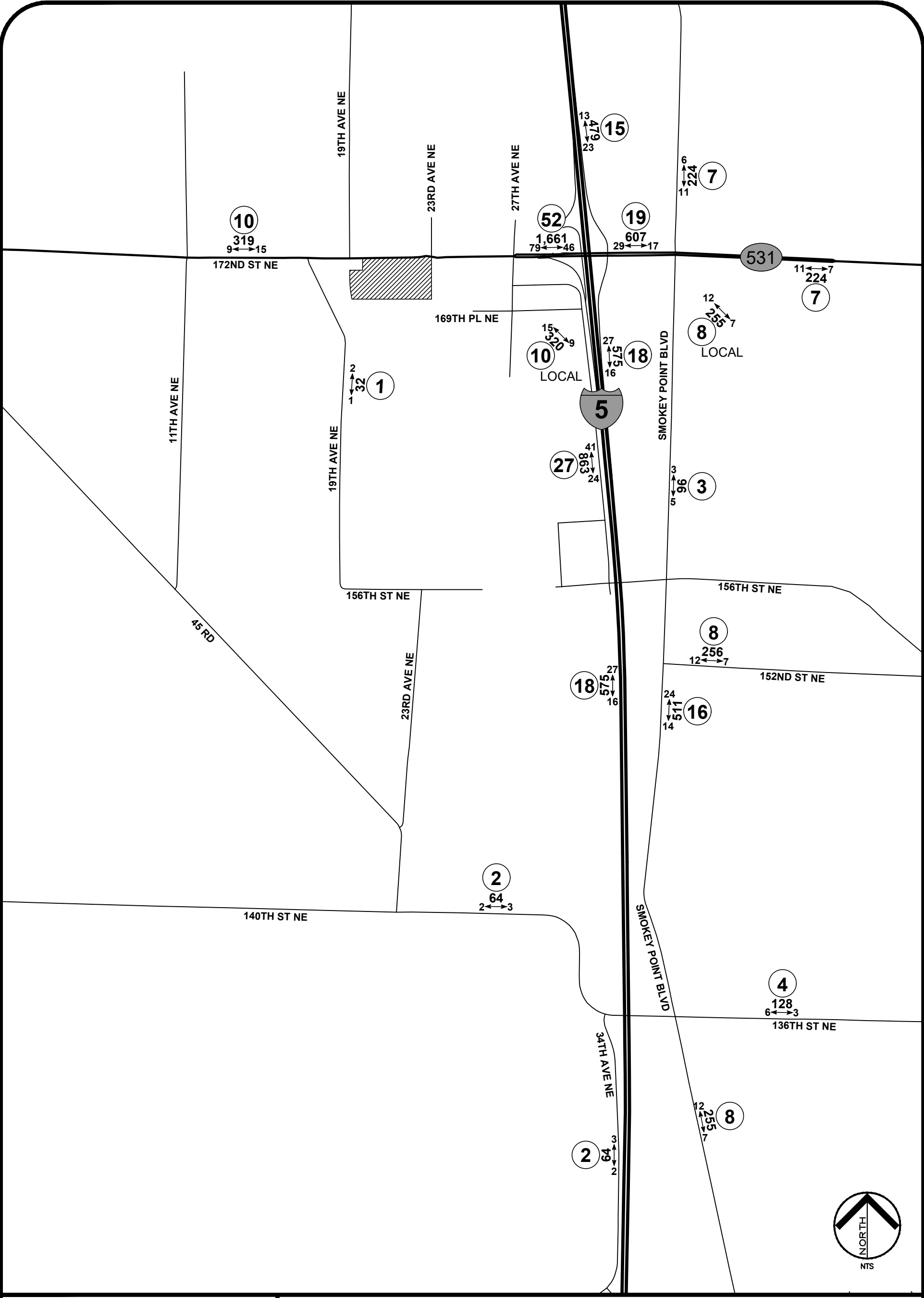
LEGEND

- AWDT** NEW DAILY TRAFFIC
- AM ← PEAK** NEW PEAK-HOUR TRIPS
- (XX)** TRIP DISTRIBUTION %

FIGURE 2

2025 OPENING YEAR
 TRIP DISTRIBUTION
 WEEKDAY AM PEAK-HOUR

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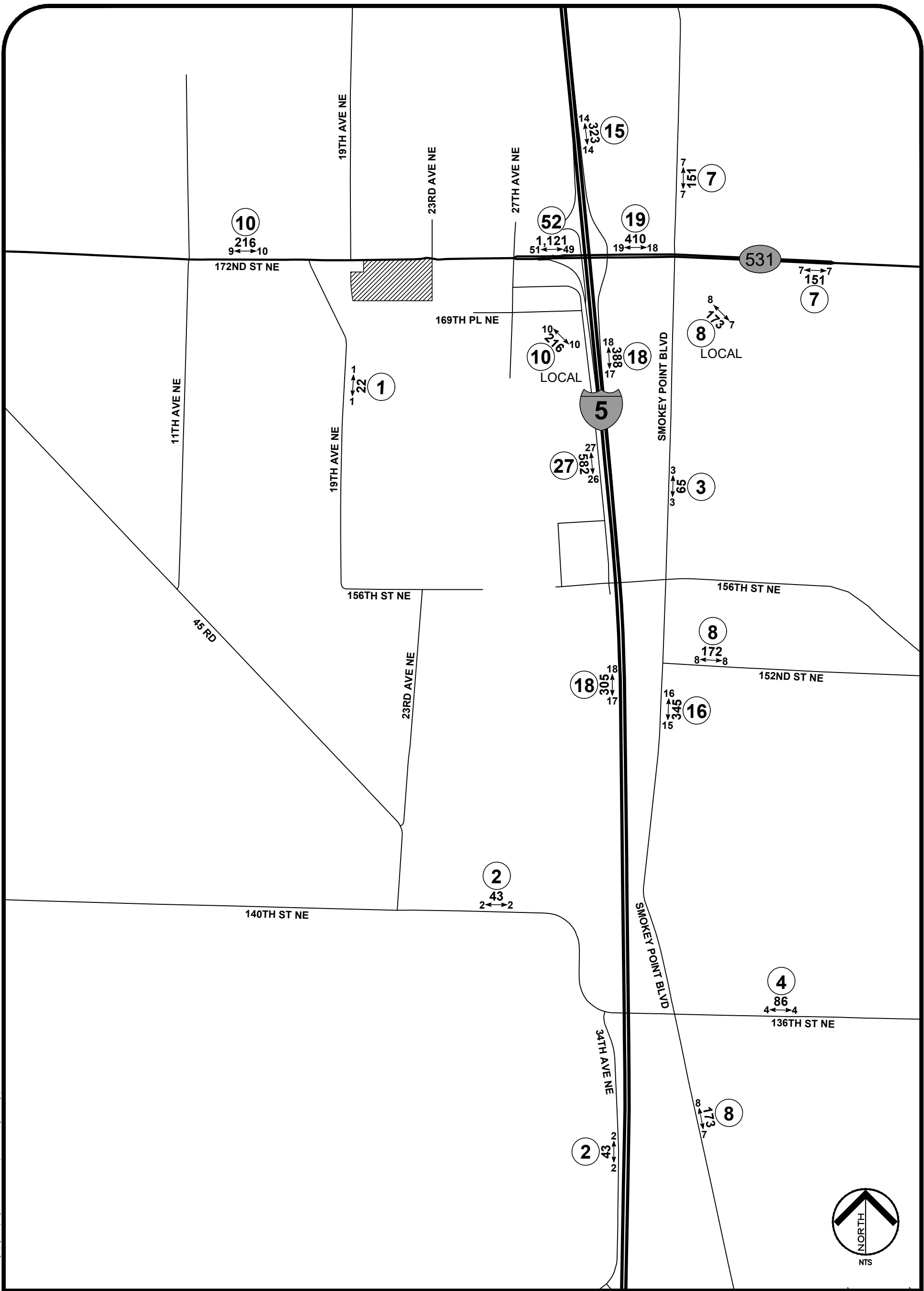
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LEGEND

- AWDT** NEW DAILY TRAFFIC
- PM** ← **PEAK** NEW PEAK-HOUR TRIPS
- XX** TRIP DISTRIBUTION %

FIGURE 3
 2025 OPENING YEAR
 TRIP DISTRIBUTION
 WEEKDAY PM PEAK-HOUR

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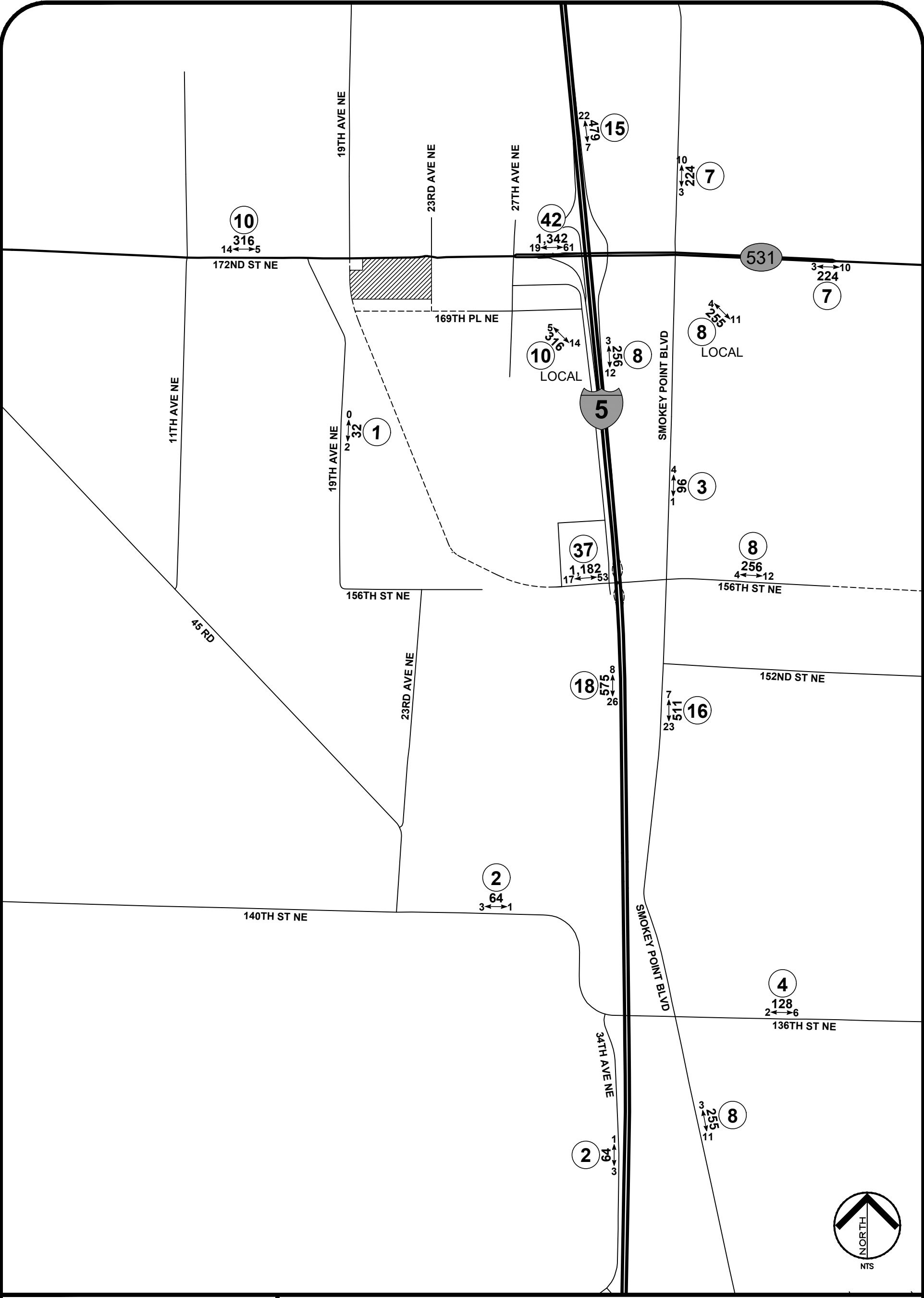
LEGEND

- AWDT NEW DAILY TRAFFIC
- SAT←→PEAK NEW PEAK-HOUR TRIPS
- XX TRIP DISTRIBUTION %

FIGURE 4

2025 OPENING YEAR
 TRIP DISTRIBUTION
 SATURDAY PEAK-HOUR

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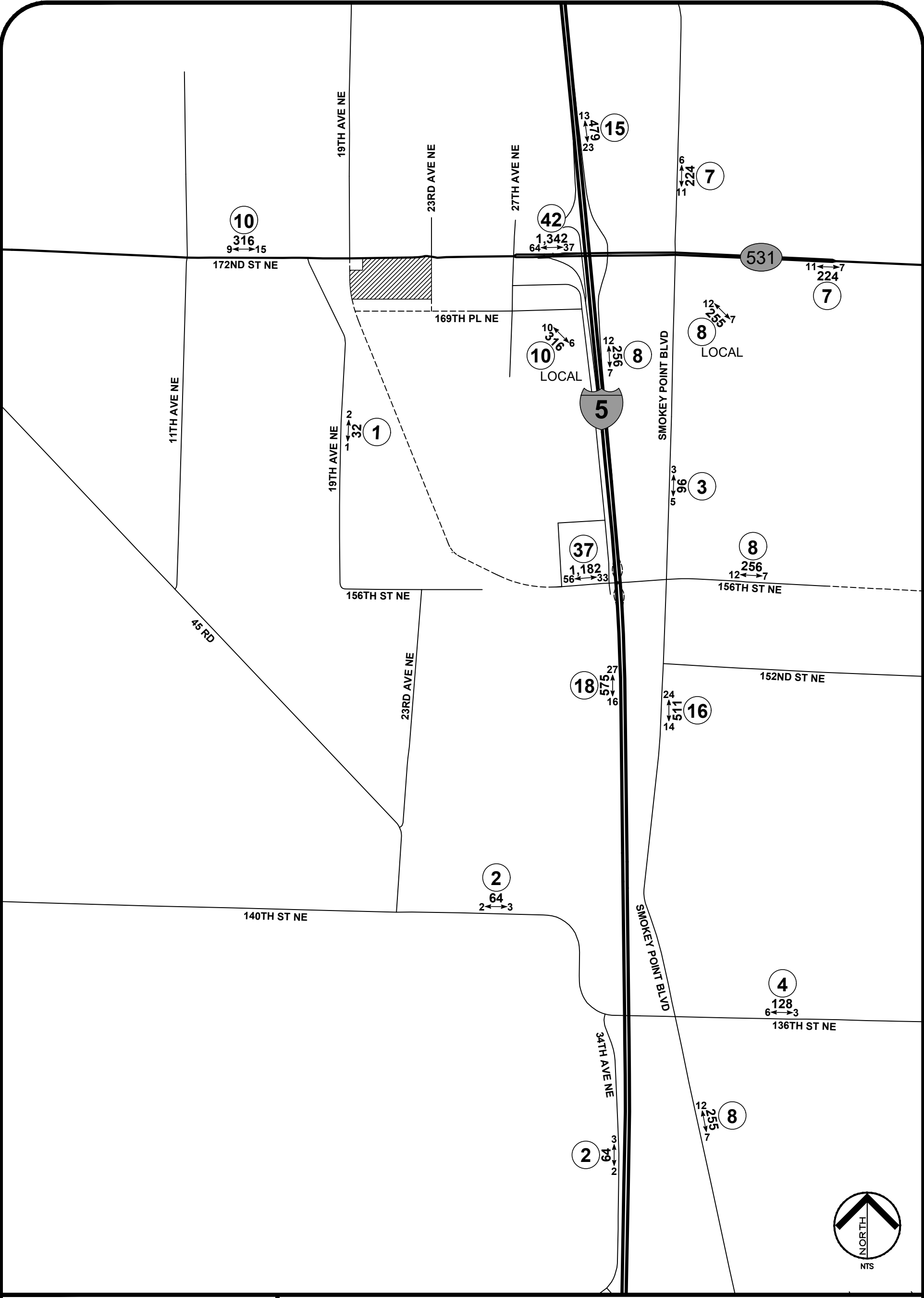
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LEGEND

- AWDT NEW DAILY TRAFFIC
- AM ← PEAK NEW PEAK-HOUR TRIPS
- XX TRIP DISTRIBUTION %

FIGURE 5
 2031 HORIZON YEAR
 TRIP DISTRIBUTION
 WEEKDAY AM PEAK-HOUR

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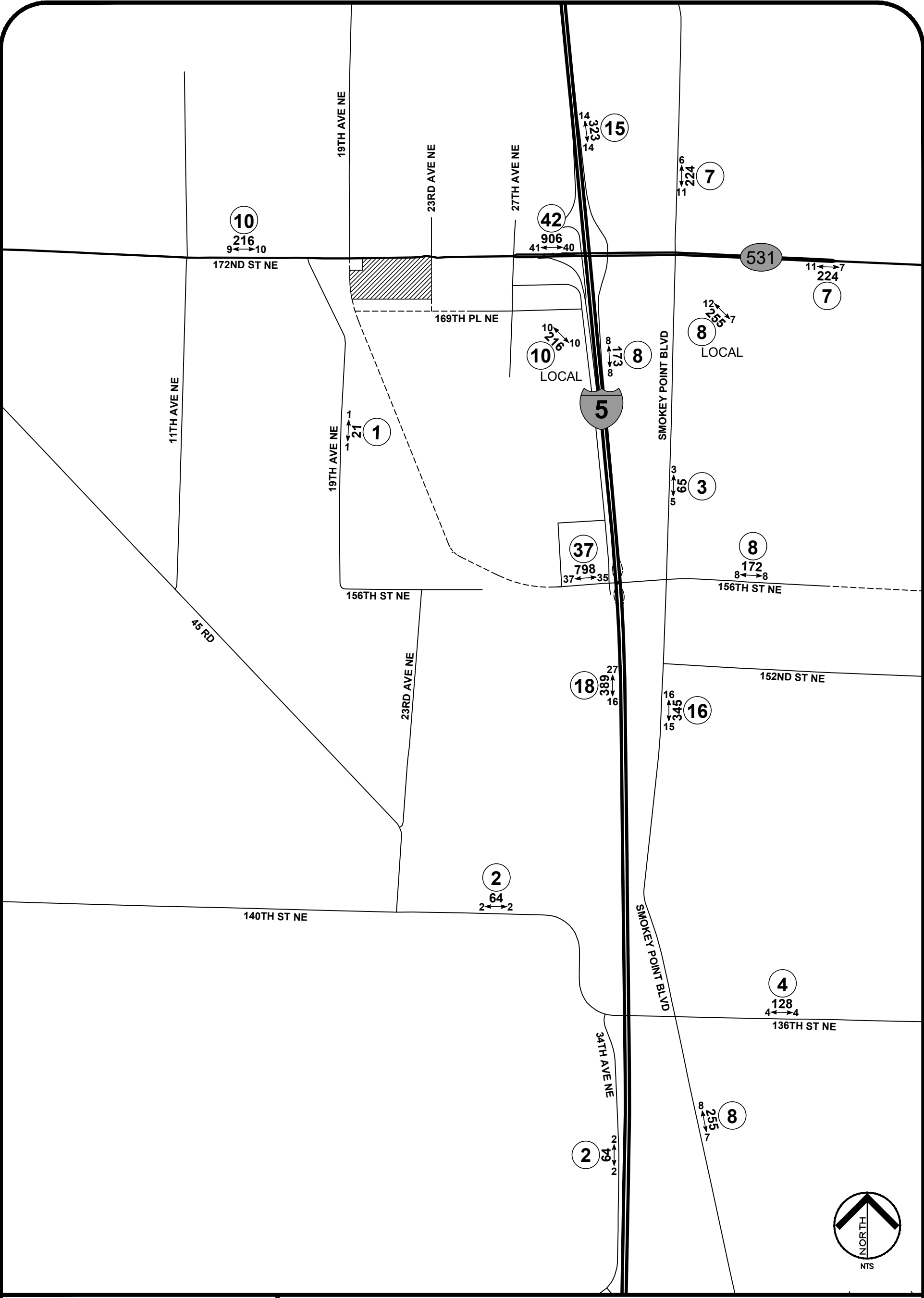
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LEGEND

- AWDT** NEW DAILY TRAFFIC
- PM** ← **PEAK** NEW PEAK-HOUR TRIPS
- (XX)** TRIP DISTRIBUTION %

FIGURE 6
2031 HORIZON YEAR
TRIP DISTRIBUTION
WEEKDAY PM PEAK-HOUR

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MARYSVILLE 172 & 23 APARTMENTS

LEGEND
 AWDT NEW DAILY TRAFFIC
 SAT ← → PEAK NEW PEAK-HOUR TRIPS
 (XX) TRIP DISTRIBUTION %

FIGURE 7
 2031 HORIZON YEAR
 TRIP DISTRIBUTION
 SATURDAY PEAK-HOUR

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4.3 Snohomish County Key Intersection Impacts

The interlocal agreement between the City of Marysville and Snohomish County requires detailed development trip turning movement data at Snohomish County key intersections impacted with three or more directional trips on an approach or departure. The trips generated by the Marysville 172 & 23 Apartments development will impact 5 key intersections during the weekday AM and PM peak-hours. The turning movement volumes at the key intersections are shown in graphical and tabular form in the attachments.

5. INTERSECTION LEVEL OF SERVICE ANALYSIS

The City of Marysville typically requires analysis at intersections impacted with 25 peak-hour trips. Intersection analysis has been performed at the following intersections:

1. 172nd Street NE at 11th Avenue NE – Two-Way Stop-Control
2. 172nd Street NE at 16th Drive NE – Two-Way Stop-Control
3. 172nd Street NE at 19th Drive NE – Two-Way Stop-Control
4. 172nd Street NE at 19th Avenue NE – Two-Way Stop-Control
5. 172nd Street NE at 23rd Avenue NE – Roundabout
6. 172nd Street NE at 27th Avenue NE – Signal
7. 172nd Street NE at Interstate-5 Southbound Ramps – Signal
8. 172nd Street NE at Interstate-5 Northbound Ramps – Signal
9. 169th Street NE at 27th Avenue NE – Signal
10. 156th Street NE at Smokey Point Boulevard – Signal
11. 152nd Street NE at Smokey Point Boulevard – Signal
12. 136th Street NE at Smokey Point Boulevard – Signal
13. 172nd Street NE at Site Access – Two-Way Stop-Control (future with development)
14. Site Access at 23rd Avenue NE – Two-Way Stop-Control (future with development)

The study intersections have been analyzed for the 2022 existing conditions, the 2025 Opening Year conditions, and the 2031 Horizon Year conditions during the weekday PM peak- hour. Additionally, the intersections of 172nd Street NE at 27th Avenue NE and 169th Street NE at 27th Avenue NE have been analyzed for the Saturday peak-hour. The 2031 Horizon Year accounts for a 6-year period beyond the opening date, which is anticipated to occur in 2025. The study intersection locations are shown in Figure 1.

5.1 Turning Movement Calculations

The 2022 existing weekday PM peak-hour (occurring between 4:00 and 6:00 PM) turning movements at the study intersections were collected by the independent count firm Traffic Data Gathering (TDG) in January 2022.

The 2025 and 2031 baseline turning movements at the study intersections have been calculated by applying a 3% annually compounding growth rate to the existing turning movements. The 2031 horizon year turning movement calculations also include a 25% diversion for east-west trips, based on direction from City of Marysville staff, to account for the connections between 172nd Street NE and 156th Street NE. The east-west diversion has been calculated based on east-west through trips at the intersection of 172nd Street NE at 19th Avenue NE.

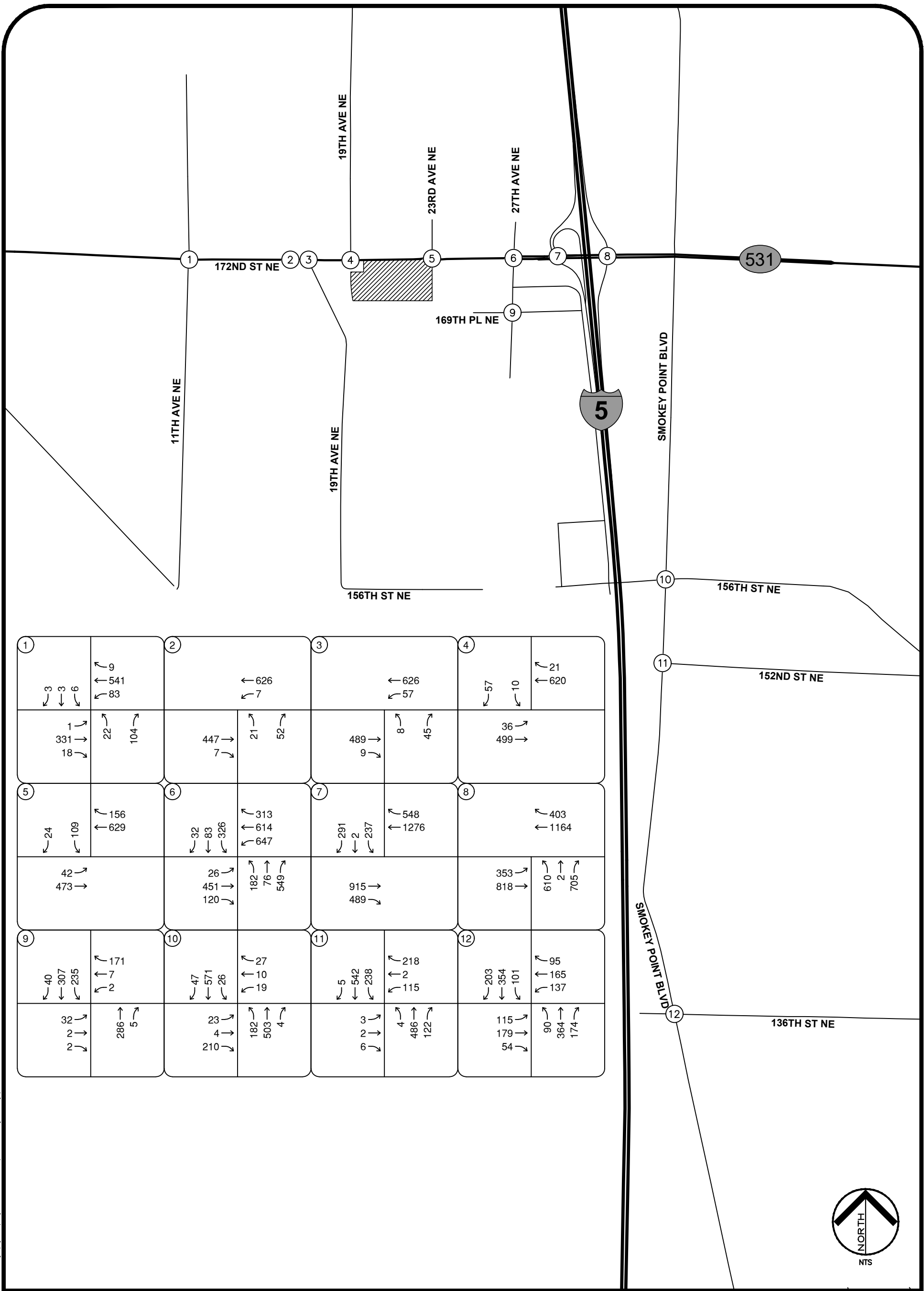
The 2025 and 2031 future with development turning movements at the study intersections have been calculated by adding the trips generated by the development to the 2025 and 2031 baseline turning movements. The turning movement calculations, including detailed distributions of the trips generated by the development, are shown in the attachments. The following figures identify the turning movements for each scenario:

- Figure 8: 2022 Existing Turning Movements – Weekday PM Peak-Hour
- Figure 9: 2022 Existing Turning Movements – Saturday Peak-Hour
- Figure 10: 2025 Baseline Turning Movements – Weekday PM Peak-Hour
- Figure 11: 2025 Baseline Turning Movements – Saturday Peak-Hour
- Figure 12: 2025 Opening Year Turning Movements – Weekday PM Peak-Hour
- Figure 13: 2025 Opening Year Turning Movements – Saturday Peak-Hour
- Figure 14: 2031 Baseline Turning Movements – Weekday PM Peak-Hour
- Figure 15: 2031 Baseline Turning Movements – Saturday Peak-Hour
- Figure 16: 2031 Horizon Year Turning Movements – Weekday PM Peak-Hour
- Figure 17: 2031 Horizon Year Turning Movements – Saturday Peak-Hour

It is important to note that the turning movements shown in these figures to not include a credit for the existing uses.

5.2 2025 Opening Year Level of Service Calculations

The level of service calculations have been performed utilizing the existing channelization, existing intersection control, heavy vehicle factors, and peak-hour factors from the turning movement counts. The parameters have been used for the existing and 2025 opening year conditions. The intersection level of service analysis during the weekday PM peak-hour for the existing and 2025 opening year conditions is summarized in Table 4.



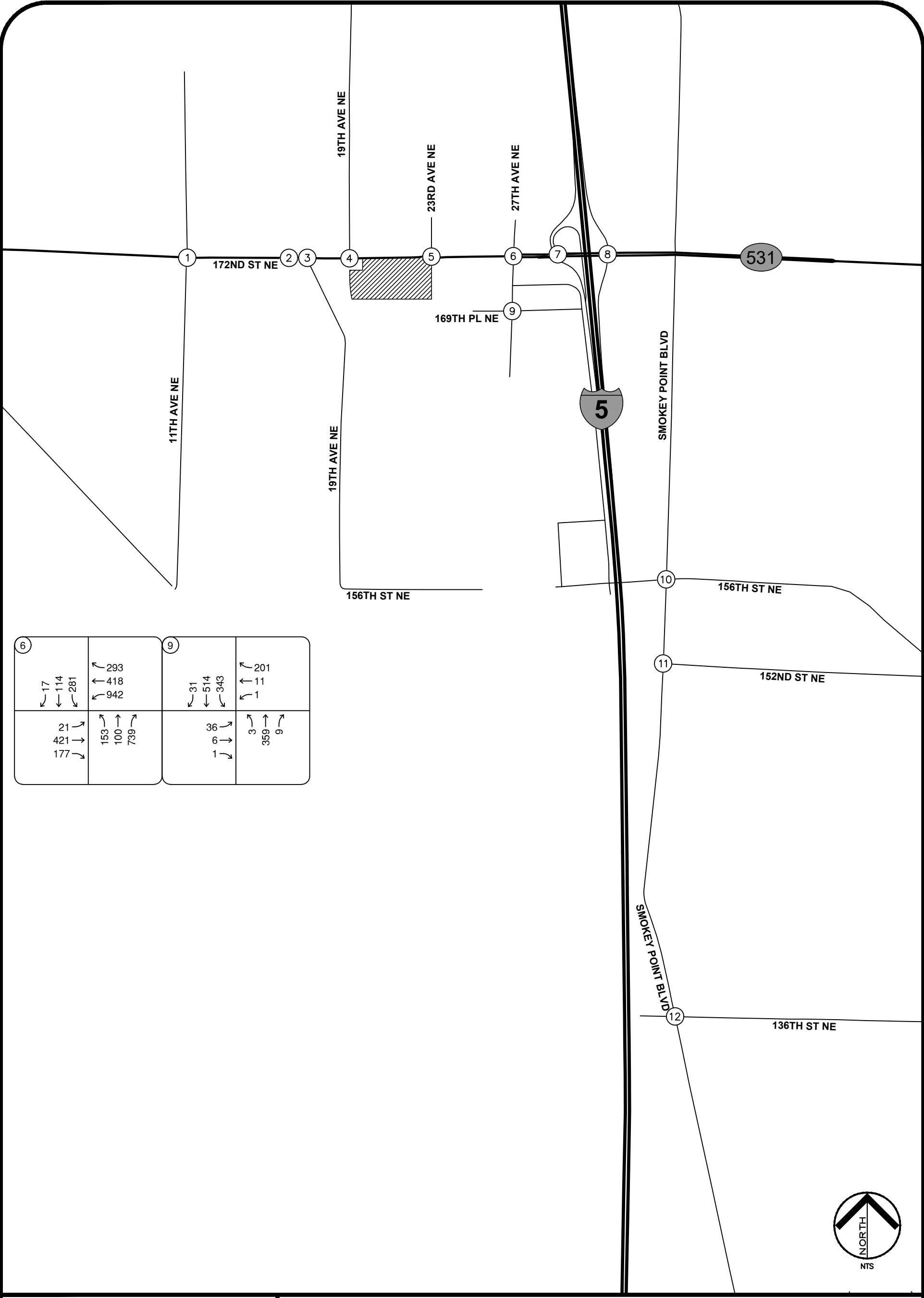
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LEGEND

XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUME

FIGURE 8
 2022 EXISTING TURNING MOVEMENTS
 WEEKDAY PM PEAK-HOUR



6	9
↖ 17 ← 114 ↘ 281 ↗ 293 ↑ 418 ↖ 942	↖ 31 ← 514 ↘ 343 ↗ 201 ↑ 11 ↖ 1
↘ 21 ↓ 421 ↙ 177 ↗ 153 → 100 ↘ 739	↘ 36 ↓ 6 ↙ 1 ↗ 3 → 359 ↘ 9

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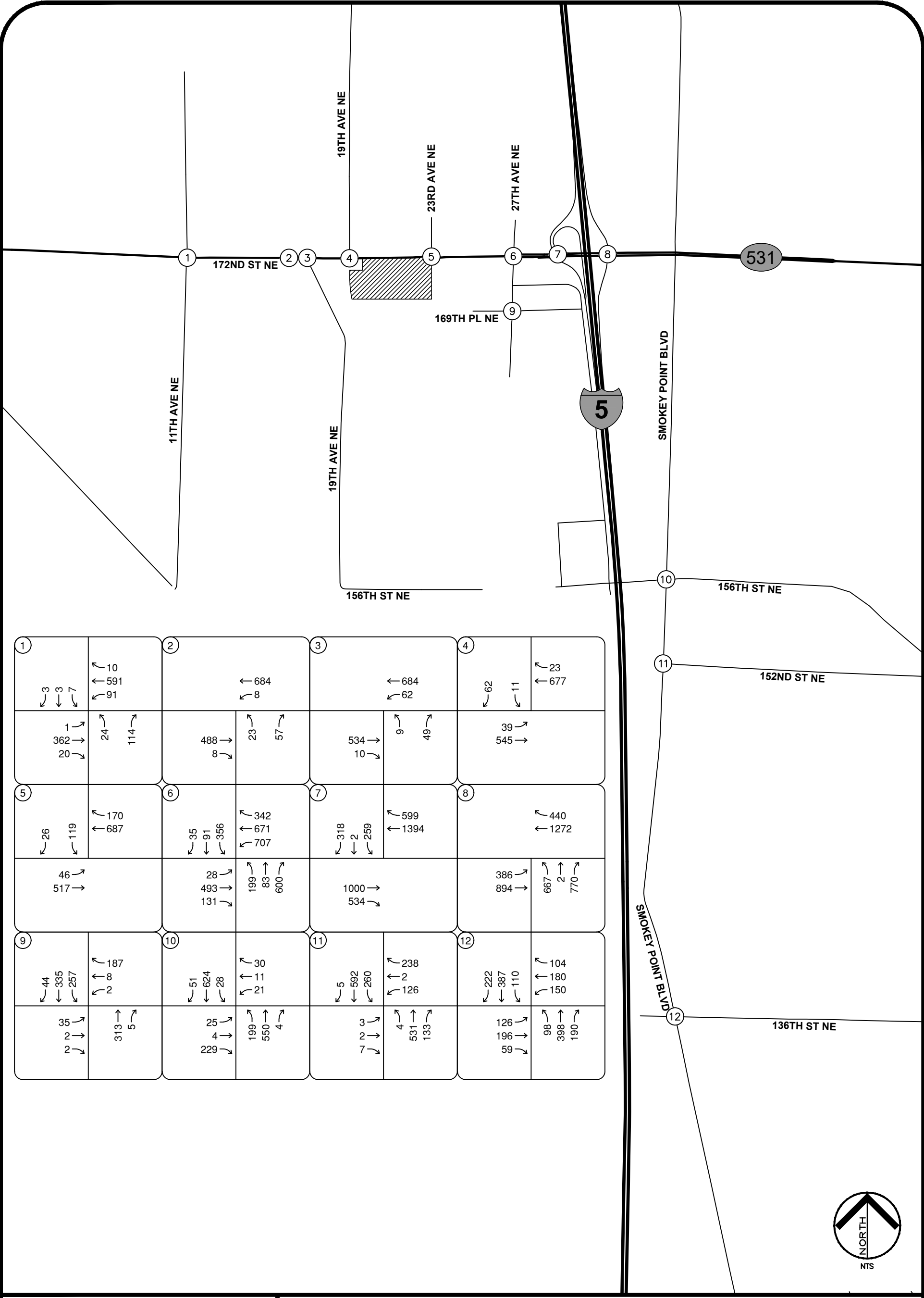
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XXX → SATURDAY PEAK-HOUR TURNING MOVEMENT VOLUME

FIGURE 9

2022 EXISTING TURNING MOVEMENTS SATURDAY PEAK-HOUR

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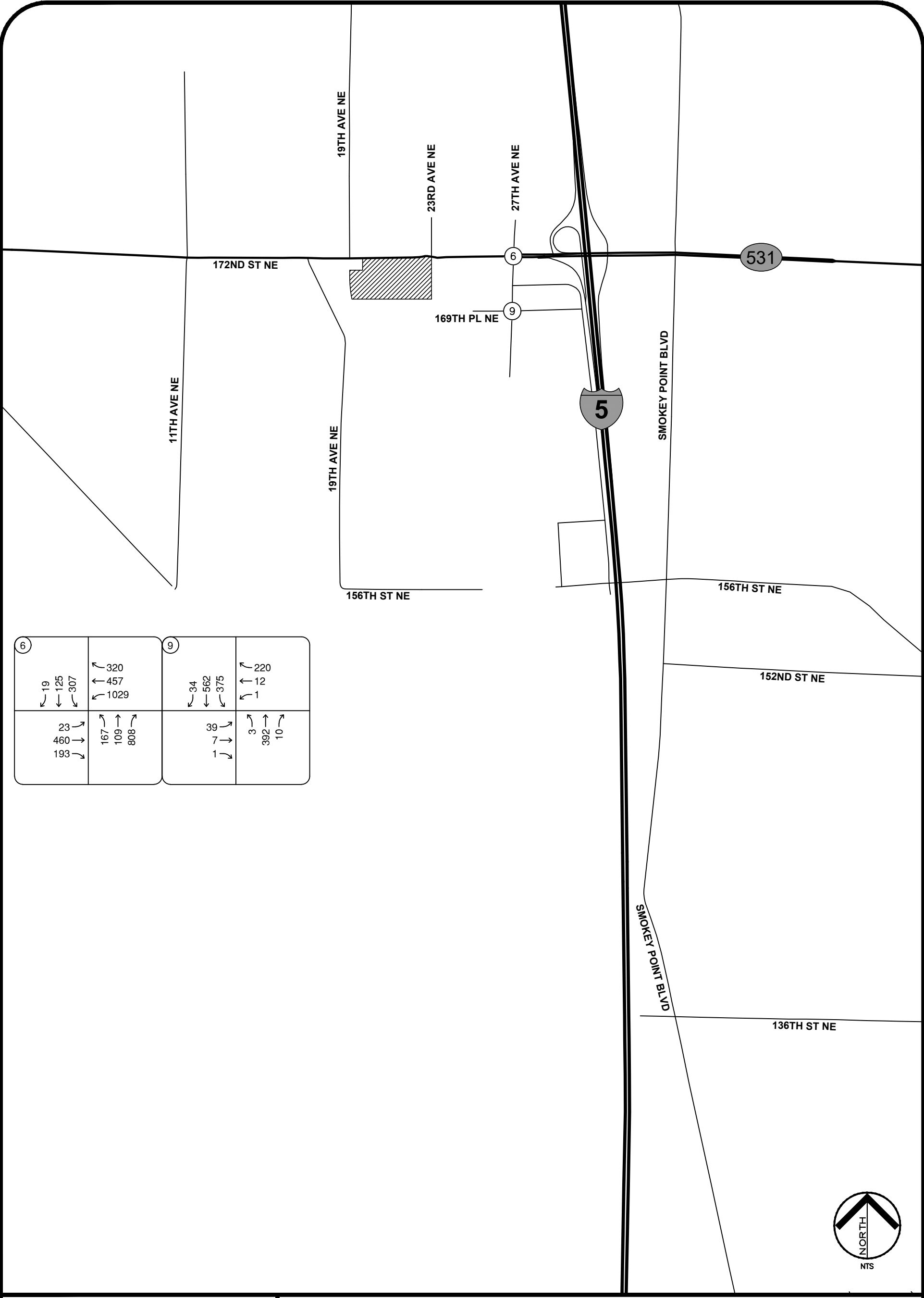
LEGEND

XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUME

FIGURE 10
 2025 BASELINE
 TURNING MOVEMENTS
 WEEKDAY PM PEAK-HOUR

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⑥		⑨	
↖ 19 ← 125 ↘ 307	↖ 320 ← 457 ↘ 1029	↖ 34 ← 562 ↘ 375	↖ 220 ← 12 ↘ 1
↗ 23 → 460 ↘ 193	↗ 167 → 109 ↘ 808	↗ 39 → 7 ↘ 1	↗ 3 → 392 ↘ 10



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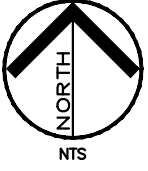
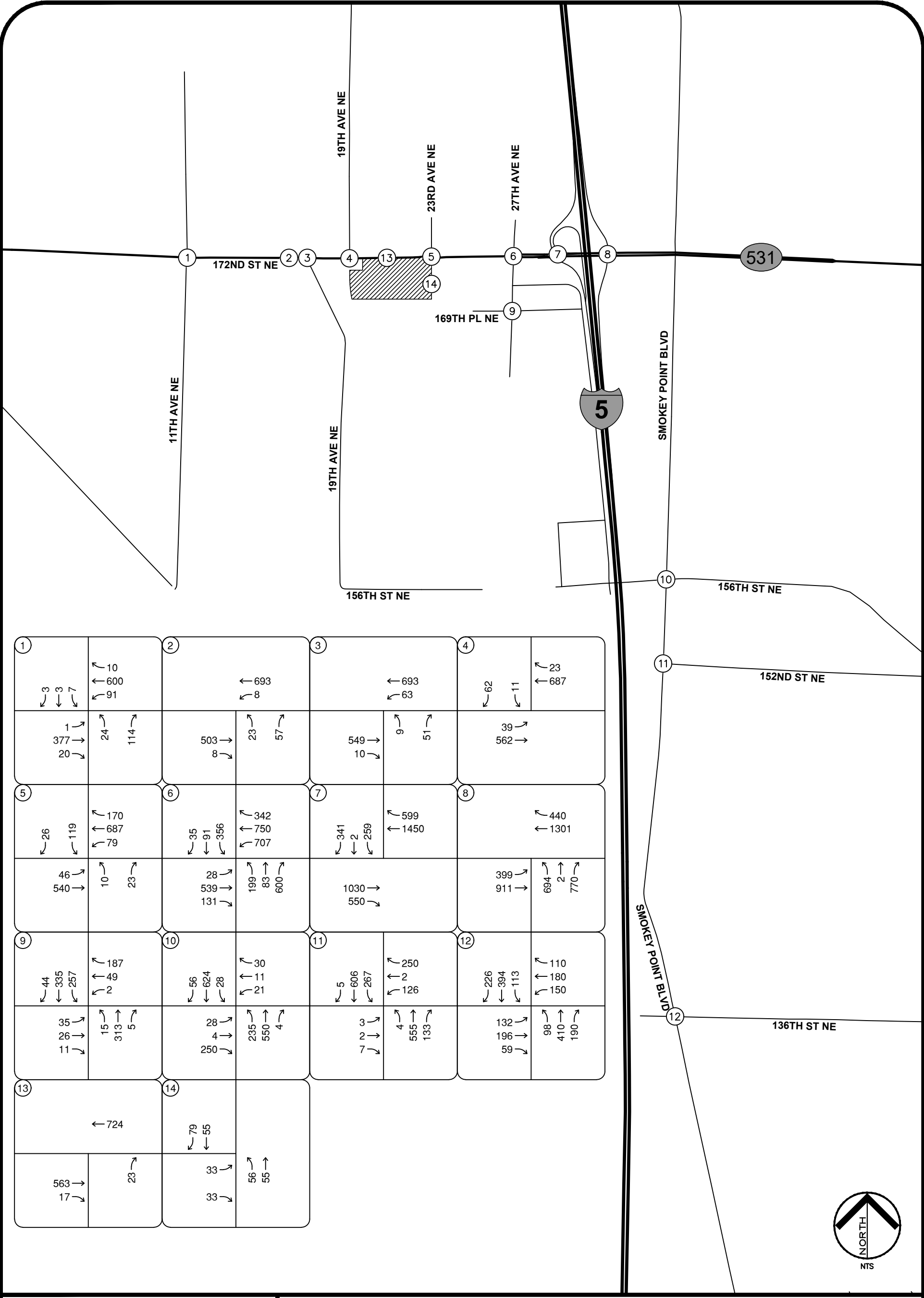
XXX → SATURDAY PEAK-HOUR
TURNING MOVEMENT VOLUME

FIGURE 11

2025 BASELINE
TURNING MOVEMENTS
SATURDAY PEAK-HOUR

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XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUME

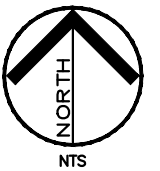
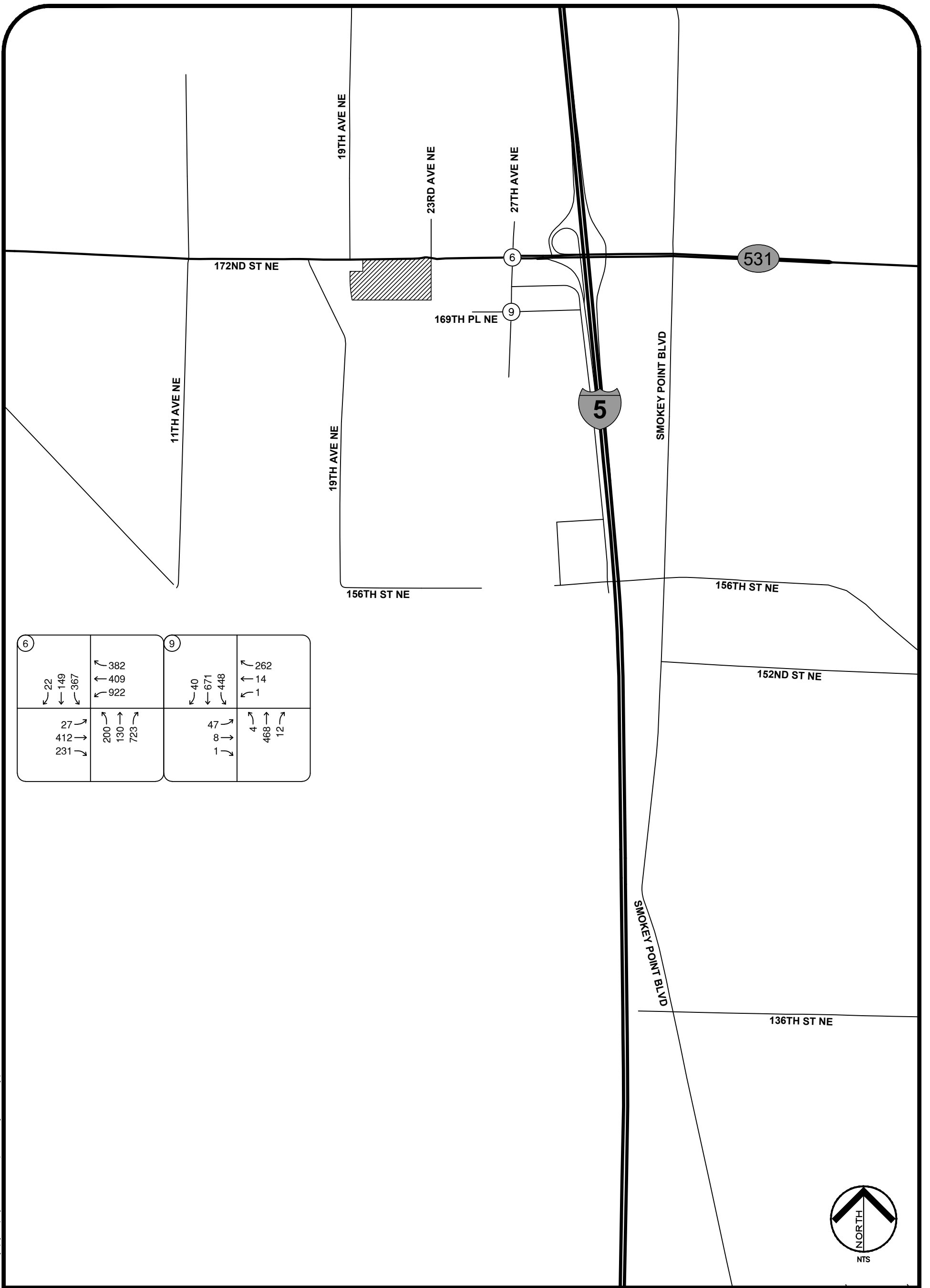
FIGURE 12

2025 OPENING YEAR TURNING MOVEMENTS PM PEAK-HOUR

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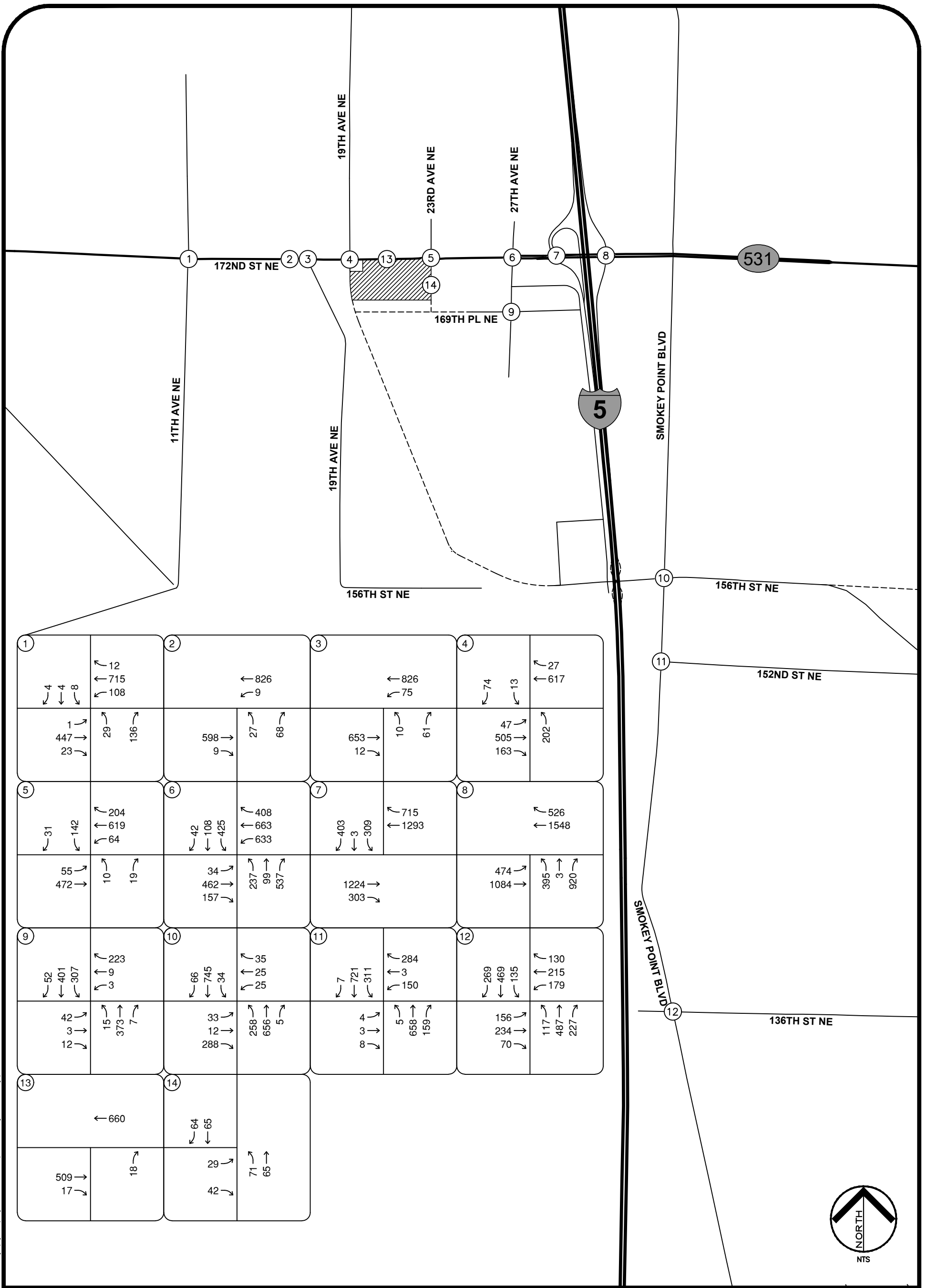
LEGEND

XXX → SATURDAY PEAK-HOUR
TURNING MOVEMENT VOLUME

FIGURE 13
2025 OPENING YEAR
TURNING MOVEMENTS
SATURDAY PEAK-HOUR

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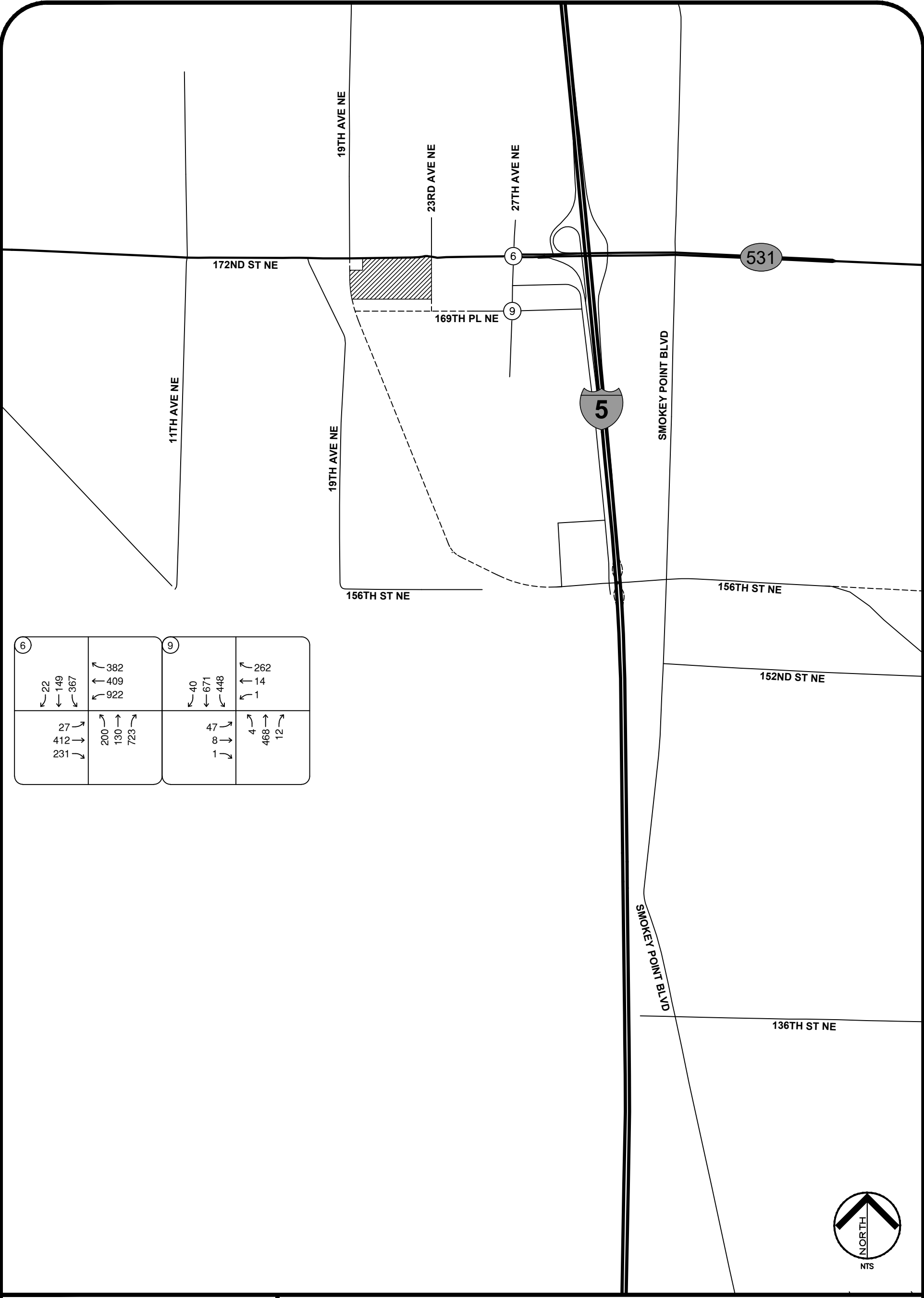
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LEGEND

XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUME

FIGURE 14
2031 BASELINE TURNING MOVEMENTS WEEKDAY PM PEAK-HOUR

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6		9	
↖ 22 ← 149 ↗ 367	↖ 382 ← 409 ↗ 922	↖ 40 ← 671 ↗ 448	↖ 262 ← 14 ↗ 1
27 ↘ 412 → 231 ↘	200 ↘ 130 → 723 ↘	47 ↘ 8 → 1 ↘	4 ↘ 468 → 12 ↘

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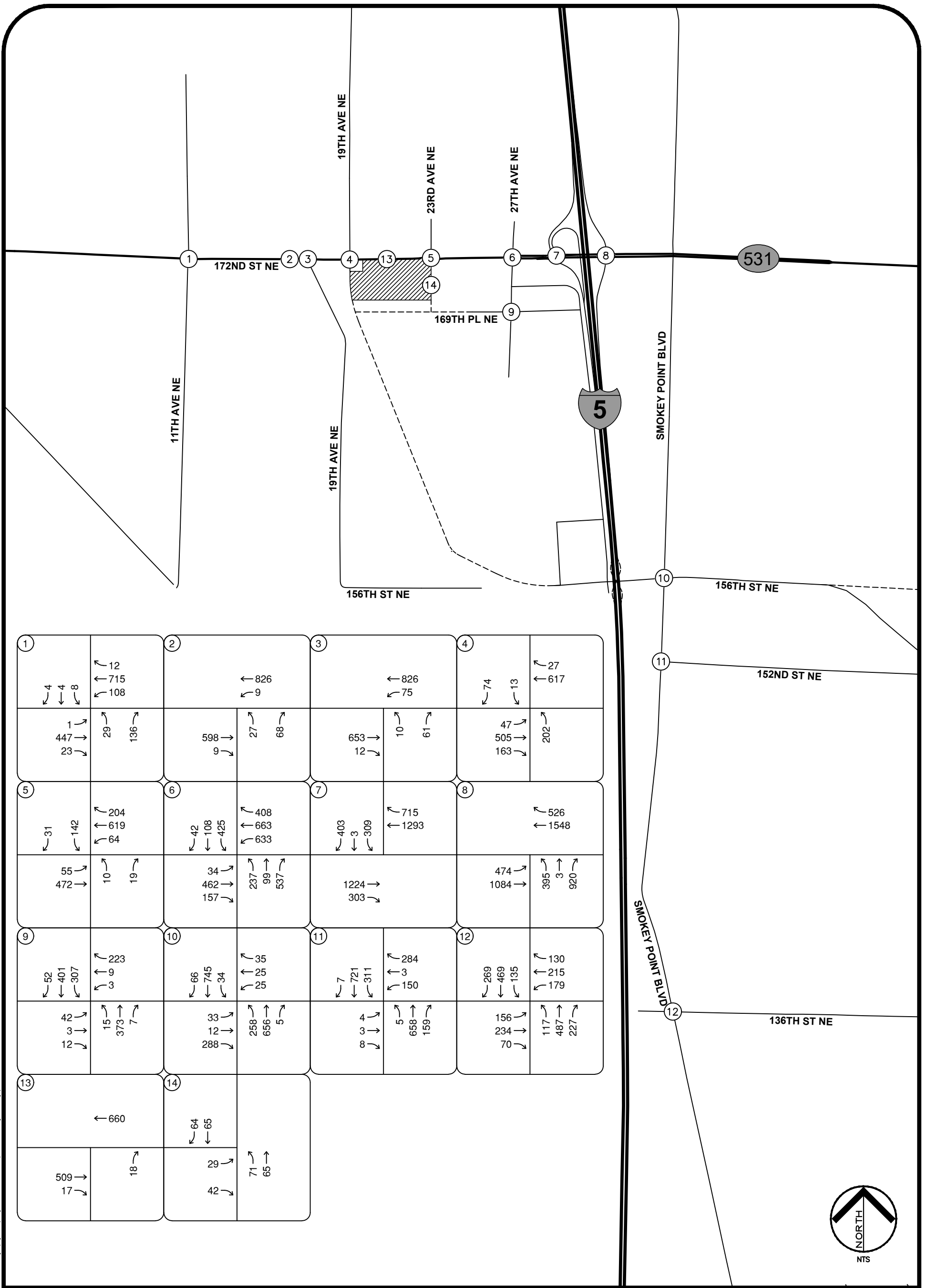
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XXX → SATURDAY PEAK-HOUR TURNING MOVEMENT VOLUME

FIGURE 15

2031 BASELINE TURNING MOVEMENTS SATURDAY PEAK-HOUR



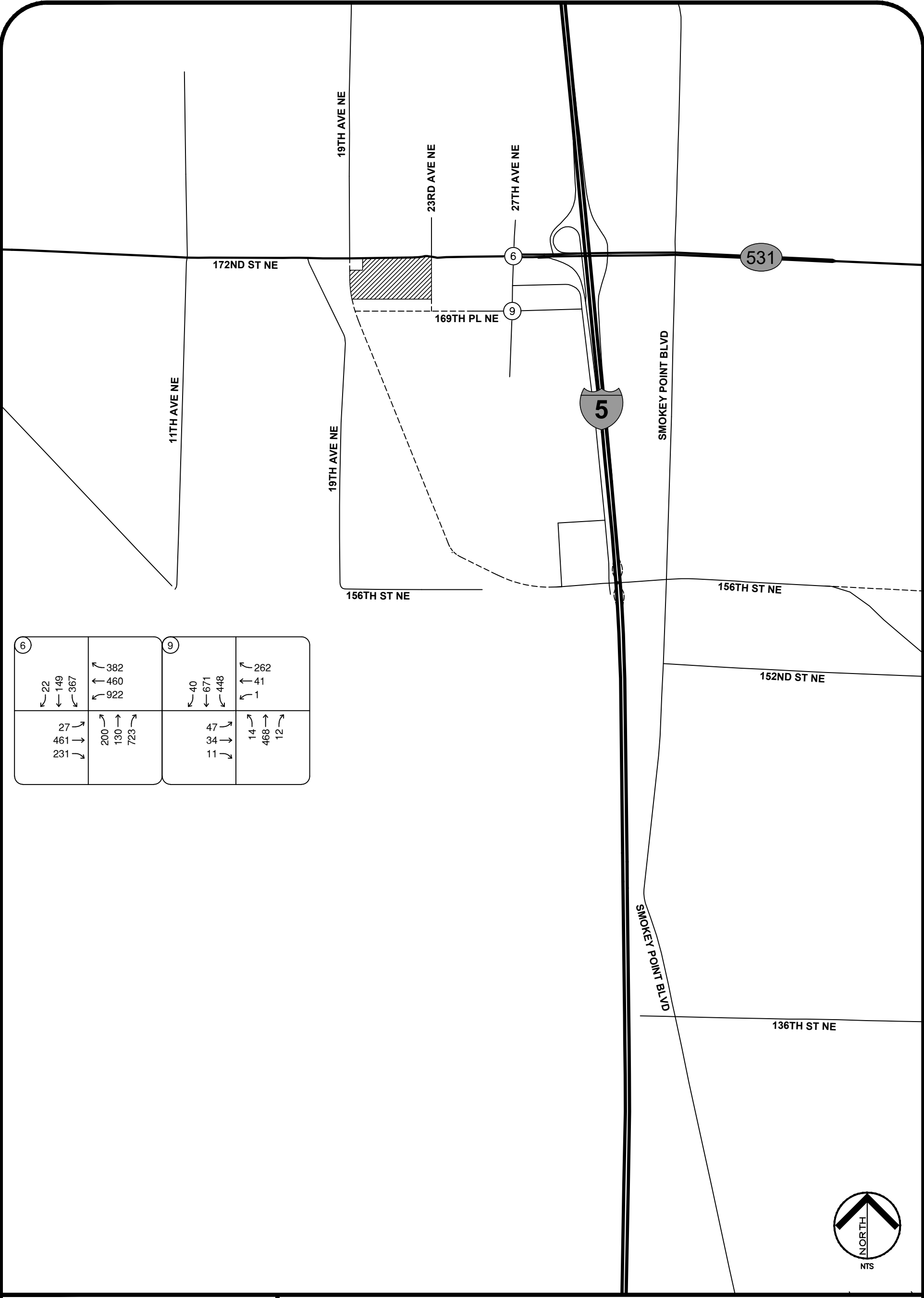
MARYSVILLE 172 & 23 APARTMENTS

LEGEND

XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUME

FIGURE 16
 2031 HORIZON YEAR
 TURNING MOVEMENTS
 WEEKDAY PM PEAK-HOUR

CITY OF MARYSVILLE



MARYSVILLE 172 & 23 APARTMENTS

LEGEND

XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUME

FIGURE 17

2031 HORIZON YEAR TURNING MOVEMENTS SATURDAY PEAK-HOUR

CITY OF MARYSVILLE

Table 4: Level of Service Summary – 2025 Opening Year Conditions - Weekday

Intersection	Control	2022 Existing Conditions		2025 Baseline Conditions		2025 Opening Year Conditions	
		LOS	Delay	LOS	Delay	LOS	Delay
1. 172 nd Street NE at 11 th Avenue NE	Two-Way Stop-Control	D	27.8 sec	D	34.0 sec	E	35.8 sec
2. 172 nd Street NE at 16 th Place NE	Two-Way Stop-Control	B	13.9 sec	B	14.9 sec	C	15.1 sec
3. 172 nd Street NE at 19 th Place NE	Two-Way Stop-Control	C	16.1 sec	C	18.2 sec	C	18.6 sec
4. 172 nd Street NE at 19 th Avenue NE	Two-Way Stop-Control	C	16.8 sec	C	18.8 sec	C	19.3 sec
5. 172 nd Street NE at 23 rd Avenue NE	Roundabout	A	5.2 sec	A	5.6 sec	A	6.3 sec
6. 172 nd Street NE at 27 th Avenue NE	Signal	D	47.2 sec	D	52.1 sec	D	54.0 sec
7. 172 nd Street NE at I-5 Southbound Ramps	Signal	B	12.7 sec	B	14.0 sec	B	15.0 sec
8. 172 nd Street NE at I-5 Northbound Ramps	Signal	C	30.0 sec	C	34.7 sec	D	36.9 sec
9. 169 th Street NE at 27 th Avenue NE	Signal	A	7.4 sec	A	7.7 sec	A	9.6 sec
10. 156 th Street NE at Smokey Point Boulevard	Signal	B	13.3 sec	B	13.9 sec	B	14.1 sec
11. 152 nd Street NE at Smokey Point Boulevard	Signal	B	12.4 sec	B	13.0 sec	B	13.4 sec
12. 136 th Street NE at Smokey Point Boulevard	Signal	C	23.5 sec	C	25.3 sec	C	25.7 sec
13. 172 nd Street NE at Site Access	Two-Way ³ Stop-Control	---	---	---	---	B	12.8 sec
14. Site Access at 23 rd Avenue NE	Two-Way Stop-Control	---	---	---	---	B	10.0 sec

The 2025 opening year analysis shows that the study intersections will operate at acceptable levels of service, based on the City of Marysville criteria of LOS E for the 172nd Street NE corridor, under the 2022 existing, 2025 baseline, and 2025 opening year conditions. The level of service calculations are included in the attachments.

The level of service analysis during the Saturday peak-hour for the 2022 existing, 2025 baseline, and 2025 opening year conditions is summarized in Table 5.

³ Planned to be restricted to right-in/right-out only.

Table 5: Level of Service Summary – 2025 Opening Year Conditions - Saturday

Intersection	Control	2022 Existing Conditions		2025 Baseline Conditions		2025 Opening Year Conditions	
		LOS	Delay	LOS	Delay	LOS	Delay
6. 172 nd Street NE at 27 th Avenue NE	Signal	E	58.8 sec	E	75.8 sec	E	78.3 sec
9. 169 th Street NE at 27 th Avenue NE	Signal	A	8.7 sec	A	9.3 sec	B	10.4 sec

The intersection analysis shows that the two intersection along 27th Avenue NE are anticipated to operate at acceptable levels under the 2022 existing, 2025 baseline, and 2025 opening year conditions during the Saturday peak-hour. The level of service calculations are included in the attachments.

5.3 2031 Horizon Year Level of Service Calculations

The 2031 horizon year level of service calculations account for the planned improvements along 172nd Street NE that are identified in the City of Marysville *Lakewood Neighborhood Master Plan (2017)*. These improvements include:

- 3-lane section between 11th Avenue NE and 19th Avenue NE
- 5-lane section east of 19th Avenue NE
- 19th Avenue NE connection between 172nd Street NE and 156th Street NE
- 169th Street NE connection east of 19th Avenue NE
- Interstate-5 interchange with 156th Street NE
- Roundabouts at major intersections along the 172nd Street NE corridor

It is important to note that there are right-of-way restrictions at several intersections, specifically the intersection of 172nd Street NE at 11th Avenue NE and 172nd Street NE at 19th Avenue NE. There are existing and proposed developments for both of these intersections. However, the west side of the 11th Avenue NE intersection is within Snohomish County and there is not adequate right-of-way for a roundabout. The southeast corner of the 19th Avenue NE intersection is not part of the Marysville 172 & 23 Apartments development site. The proposed roundabouts at these intersections are not likely to be able to be constructed without the additional right-of-way. The City of Marysville may allow a signal for the 11th Avenue NE intersection or deficient levels of service, specifically for the 19th Avenue NE intersection that has alternate connectivity, until sufficient right-of-way is available.

The intersection level of service during the weekday PM peak-hour for the 2022 existing, 2031 baseline, and 2031 horizon year conditions is summarized in Table 6.

Table 6: Level of Service Summary – 2031 Horizon Year Conditions - Weekday

Intersection	Control	2022 Existing Conditions		2031 Baseline Conditions		2031 Horizon Year Conditions	
		LOS	Delay	LOS	Delay	LOS	Delay
1. 172 nd Street NE at 11 th Avenue NE	Two-Way Stop-Control	D	27.8 sec	F	54.3 sec	F	57.2 sec
2. 172 nd Street NE at 16 th Place NE	Two-Way Stop-Control	B	13.9 sec	C	17.6 sec	C	18.0 sec
3. 172 nd Street NE at 19 th Place NE	Two-Way Stop-Control	C	16.1 sec	C	24.8 sec	D	25.9 sec
4. 172 nd Street NE at 19 th Avenue NE	Two-Way Stop-Control	C	16.8 sec	F	>500 sec	F	>500 sec
5. 172 nd Street NE at 23 rd Avenue NE	Roundabout	A	5.2 sec	A	5.6 sec	A	6.0 sec
6. 172 nd Street NE at 27 th Avenue NE	Signal	D	47.2 sec	D	51.9 sec	D	53.4 sec
7. 172 nd Street NE at I-5 Southbound Ramps	Signal	B	12.7 sec	B	15.7 sec	B	17.4 sec
8. 172 nd Street NE at I-5 Northbound Ramps	Signal	C	30.0 sec	D	42.8 sec	D	45.1 sec
9. 169 th Street NE at 27 th Avenue NE	Signal	A	7.4 sec	A	8.4 sec	A	8.9 sec
10. 156 th Street NE at Smokey Point Boulevard	Signal	B	13.3 sec	B	14.9 sec	B	16.2 sec
11. 152 nd Street NE at Smokey Point Boulevard	Signal	B	12.4 sec	B	15.0 sec	B	15.3 sec
12. 136 th Street NE at Smokey Point Boulevard	Signal	C	23.5 sec	C	29.5 sec	C	30.0 sec
13. 172 nd Street NE at Site Access	Two-Way ⁴ Stop-Control	---	---	---	---	B	10.2 sec
14. Site Access at 23 rd Avenue NE	Two-Way Stop-Control	---	---	---	---	B	10.1 sec

The level of service analysis shows that there are two intersections that are anticipated to operate at LOS F under the 2031 baseline and 2031 horizon year conditions without the planned improvements. These are the 11th Avenue NE and 19th Avenue NE intersections that were previously discussed. It is anticipated, based on the operations of the surrounding intersections, that the 11th Avenue NE and 19th Avenue NE intersections would operate at acceptable levels of service with the planned improvements. The level of service calculations are included in the attachments.

The intersection level of service during the Saturday peak-hour for the 2022 existing, 2031 baseline, and 2031 horizon year conditions is summarized in Table 7.

⁴ Planned to be restricted to right-in/right-out only.

Table 7: Level of Service Summary – 2025 Opening Year Conditions - Saturday

Intersection	Control	2022 Existing Conditions		2031 Baseline Conditions		2031 Horizon Year Conditions	
		LOS	Delay	LOS	Delay	LOS	Delay
6. 172 nd Street NE at 27 th Avenue NE	Signal	E	58.8 sec	E	61.1 sec	E	63.6 sec
9. 169 th Street NE at 27 th Avenue NE	Signal	A	8.7 sec	B	11.4 sec	B	12.7 sec

The level of service analysis shows that the intersections analyzed for the Saturday peak-hour are anticipated to operate at acceptable levels with the diversion identified by City of Marysville staff. The level of service calculations are included in the attachments.

6. TRAFFIC MITIGATION FEES

The City of Marysville has an interlocal agreement with Snohomish County that provides for the payment of traffic mitigation fees to Snohomish County for City of Marysville developments. The City of Marysville also has an understanding with WSDOT for the payment of traffic mitigation fees.

6.1 City of Marysville

The City of Marysville traffic mitigation fees have been calculated using the residential rate of \$6,300 per PM peak-hour trip. The Marysville 172 & 23 Apartments development is proposed to generate 237.74 new PM peak-hour trips with the credit for the 4 existing single-family residential units on the site. These trips result in City of Marysville traffic mitigation fees of \$1,497,762.00.

It is important to note that this mitigation fee does not include any credits for frontage improvements along 172nd Street NE or credits for any other roadway or intersection improvements completed as part of the development that are creditable to the City of Marysville traffic mitigation fees. The payment of this fee or roadway improvements equal to this fee should adequately mitigate the impacts of the Marysville 172 & 23 Apartments development.

6.2 Snohomish County

The City of Marysville and Snohomish County have an interlocal agreement that provides for the payment of traffic mitigation for impacts to Snohomish County roadways by City of Marysville developments. Traffic mitigation fees are based on predetermined area impacts or impacts to actual improvement projects. The Marysville 172 & 23 Apartments development is located in CI-MA-1, which has a predetermined impact to Snohomish County roadways of 20%. The current Snohomish County fee for developments located in the City of Marysville is \$185 per daily trip. The generation of 3,157.04 new daily trips with credit for the 4 existing single-family residential units on the site and a 20% impact result in a Snohomish County traffic mitigation fee of \$116,810.48.

6.3 Washington State Department of Transportation

There are two major WSDOT improvements in the site vicinity that are impacted by trips generated by the Marysville 172 & 23 Apartments development. These improvements are the 172nd Street NE/SR-531 corridor improvements and the 156th Street NE interchange with Interstate-5. Both of these improvements are identified as funded as part of the Connecting Washington legislation. Payment of WSDOT traffic mitigation fees should therefore not be a condition of the Marysville 172 & 23 Apartments development.

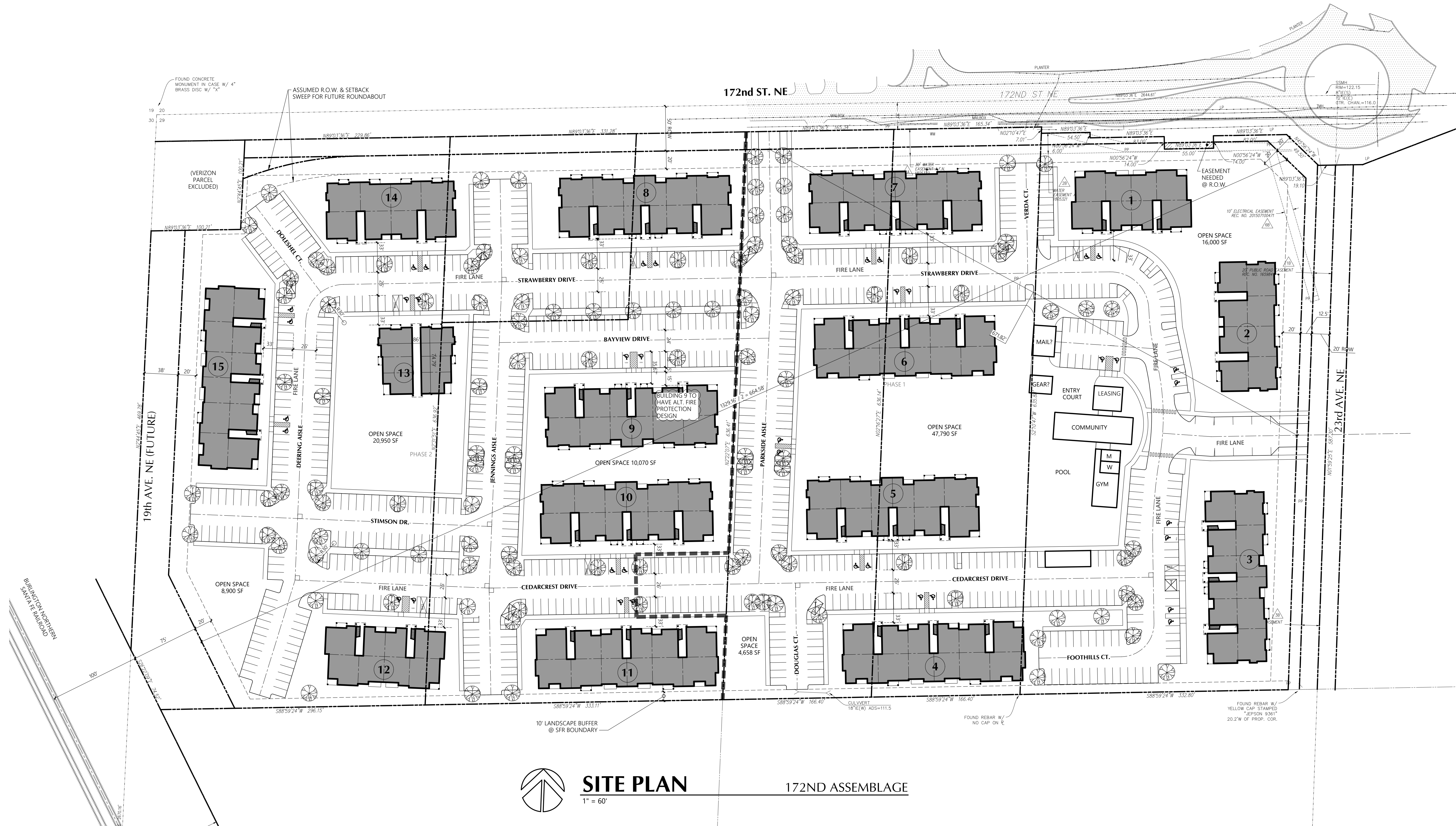
7. CONCLUSIONS

The Marysville 172 & 23 Apartments development is proposed to consist of 474 multifamily residential units. There are 4 existing single-family residential units on the site that will be removed and are creditable to the Marysville 172 & 23 Apartments development. The development is anticipated to generate approximately 3,157 new average weekday daily trips with 187 new weekday AM peak-hour trips and 238 new weekday PM peak-hour trips. The development is anticipated to generate 2,119 new Saturday daily trips with 191 new Saturday peak-hour trips.

The intersections that have been analyzed as part of this report are all anticipated to operate at acceptable levels of service under the 2025 opening year and 2031 horizon year conditions with the exception of 172nd Street NE at 11th Avenue NE and 172nd Street NE at 19th Avenue NE. The operations and improvements at these intersections are impacted by the available right-of-way. Neither of these intersections is along the frontage of the Marysville 172 & 23 Apartments development and only 11% of the trips generated by the development are anticipated to impact these two intersections. The Marysville 172 & 23 Apartments development should only be conditioned to provide frontage improvements and pay traffic mitigation fees, if there are any after applicable credits for frontage improvements, to mitigate the impacts of the development.

The development will have City of Marysville traffic mitigation fees of \$1,497,762.00 before any credit for frontage improvements. It is possible that traffic mitigation fees may not be required if the frontage improvements exceed the traffic mitigation fee amount. There will also be Snohomish County traffic mitigation fees of \$116,810.48. WSDOT traffic mitigation fees should not be required for the Marysville 172 & 23 Apartments development since the major WSDOT improvements in the site vicinity are identified as funded under the Connecting Washington legislation.

Site Plan



SITE PLAN
1" = 60'

172ND ASSEMBLAGE

Trip Generation Calculations

Manysville 172 23 Apartments
090222017

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

LAND USES	VARIABLE	ITE LU code	Gross Trips				Internal Crossover		NET EXTERNAL TRIPS BY TYPE				
			Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	IN BOTH DIRECTIONS		DIRECTIONAL ASSIGNMENTS		
									TOTAL	PASS-BY	NEW	PASS-BY	NEW
								In+Out (Total)	In	Out	In	Out	
Multifamily Housing (Low-Rise)	474 units	220	6.74	50%	50%	3194.76	0%	0.00	3194.76	0.00	0.00	1597.38	1597.38
Single-Family Detached Housing	-4 units	210	9.43	50%	50%	-37.72	0%	0.00	-37.72	0.00	0.00	-18.86	-18.86
Totals						3157.04		0.00	3157.04	0.00	0.00	1578.52	1578.52

Manysville 172 23 Apartments
090222017

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

LAND USES	VARIABLE	ITE LU code	Gross Trips				Internal Crossover		NET EXTERNAL TRIPS BY TYPE								
			Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	IN BOTH DIRECTIONS			DIRECTIONAL ASSIGNMENTS					
									TOTAL	PASS-BY	NEW	PASS-BY	NEW	In	Out	In	Out
Multifamily Housing (Low-Rise)	474 units	220	0.40	24%	76%	189.60	0%	0.00	0.00	0.00	189.60	0.00	0.00	0.00	0.00	45.50	144.10
Single-Family Detached Housing	-4 units	210	0.70	26%	74%	-2.80	0%	0.00	0.00	-2.80	0.00	0.00	0.00	0.00	-0.73	-2.07	
Totals						186.80		0.00	0.00	186.80	0.00	0.00	0.00	0.00	44.77	142.03	

Manysville 172 23 Apartments
090222017

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

LAND USES	VARIABLE	ITE LU code	Trip Rate	Gross Trips			Internal Crossover		NET EXTERNAL TRIPS BY TYPE						
				% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	IN BOTH DIRECTIONS		DIRECTIONAL ASSIGNMENTS				
									TOTAL	PASS-BY	NEW	PASS-BY		NEW	
								In+Out (Total)	% of Ext. Trips	In+Out (Total)	In	Out	In	Out	
Multifamily Housing (Low-Rise)	474 units	220	0.51	63%	37%	241.74	0%	0.00	0%	0.00	241.74	0.00	0.00	152.30	89.44
Single-Family Detached Housing	-4 units	210	1.00	63%	37%	-4.00	0%	0.00	0%	0.00	-4.00	0.00	0.00	-2.52	-1.48
Totals						237.74		0.00		0.00	237.74	0.00	0.00	149.78	87.96

Manysville 172 23 Apartments
090222017

Trip Generation for: Saturday
(a.k.a.): Average Saturday Daily Trips

LAND USES	VARIABLE	ITE LU code	Gross Trips				Internal Crossover		NET EXTERNAL TRIPS BY TYPE				
			Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	IN BOTH DIRECTIONS		DIRECTIONAL ASSIGNMENTS		
									TOTAL	PASS-BY	NEW	PASS-BY	NEW
								In+Out (Total)	% of Ext. Trips	In+Out (Total)	In	Out	
Multifamily Housing (Low-Rise)	474 units	220	4.55	50%	50%	2156.70	0%	0.00	0%	2156.70	0.00	0.00	1078.35
Single-Family Detached Housing	-4 units	210	9.48	50%	50%	-37.92	0%	0.00	0%	-37.92	0.00	0.00	-18.96
Totals						2118.78		0.00		2118.78	0.00	0.00	1059.39

**Trip Generation for: Saturday, Peak Hour of Generator
(a.k.a.): Saturday Peak Hour**

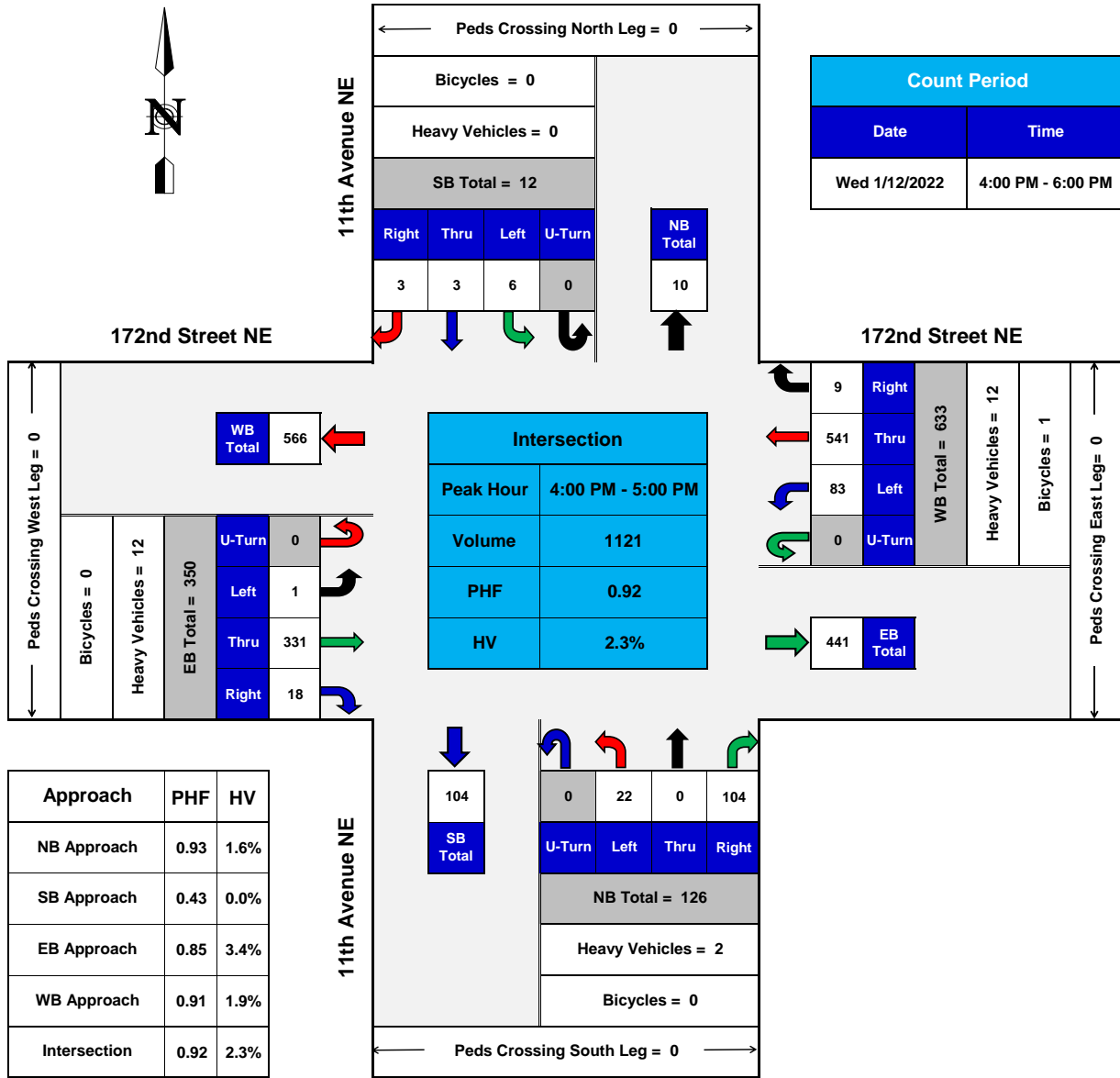
LAND USES	VARIABLE	ITE LU code	Gross Trips				Internal Crossover		IN BOTH DIRECTIONS			NET EXTERNAL TRIPS BY TYPE				
			Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	TOTAL	PASS-BY		NEW				
										%	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In	Out	
Multifamily Housing (Low-Rise)	474 units	220	0.41	51%	49%	194.34	0%	0.00	194.34	0%	0.00	194.34	0.00	0.00	99.11	95.23
Single-Family Detached Housing	-4 units	210	0.92	54%	46%	-3.68	0%	0.00	-3.68	0%	0.00	-3.68	0.00	0.00	-1.99	-1.69
Totals						190.66		0.00	190.66		0.00	190.66	0.00	0.00	97.12	93.54

NOTE: The inbound/outbound split is based on the split for ITE LUC 221 since ITE does not publish data for the Saturday peak-hour split for ITE LUC 220.

Count Data

172nd Street NE @ 11th Avenue NE

Arlington, WA

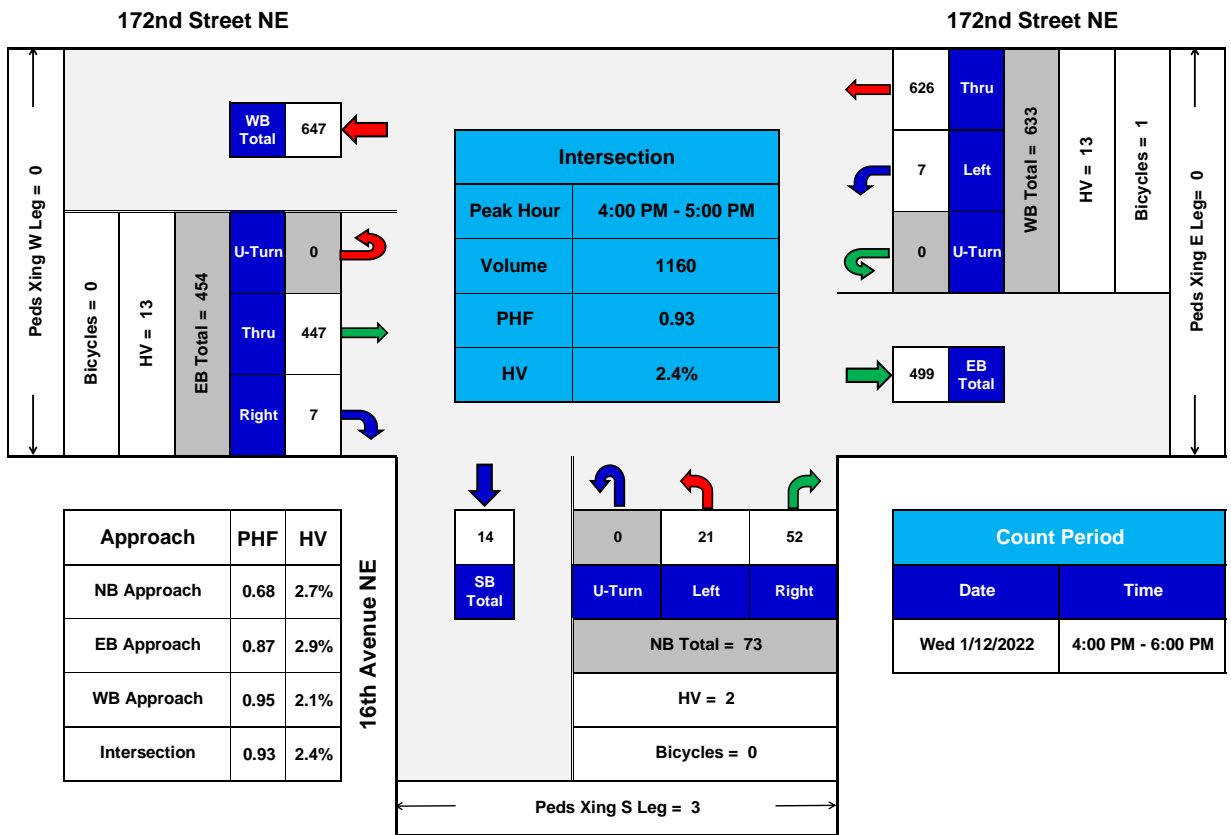


**TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY**





172nd Street NE @ 16th Avenue NE
Arlington, WA

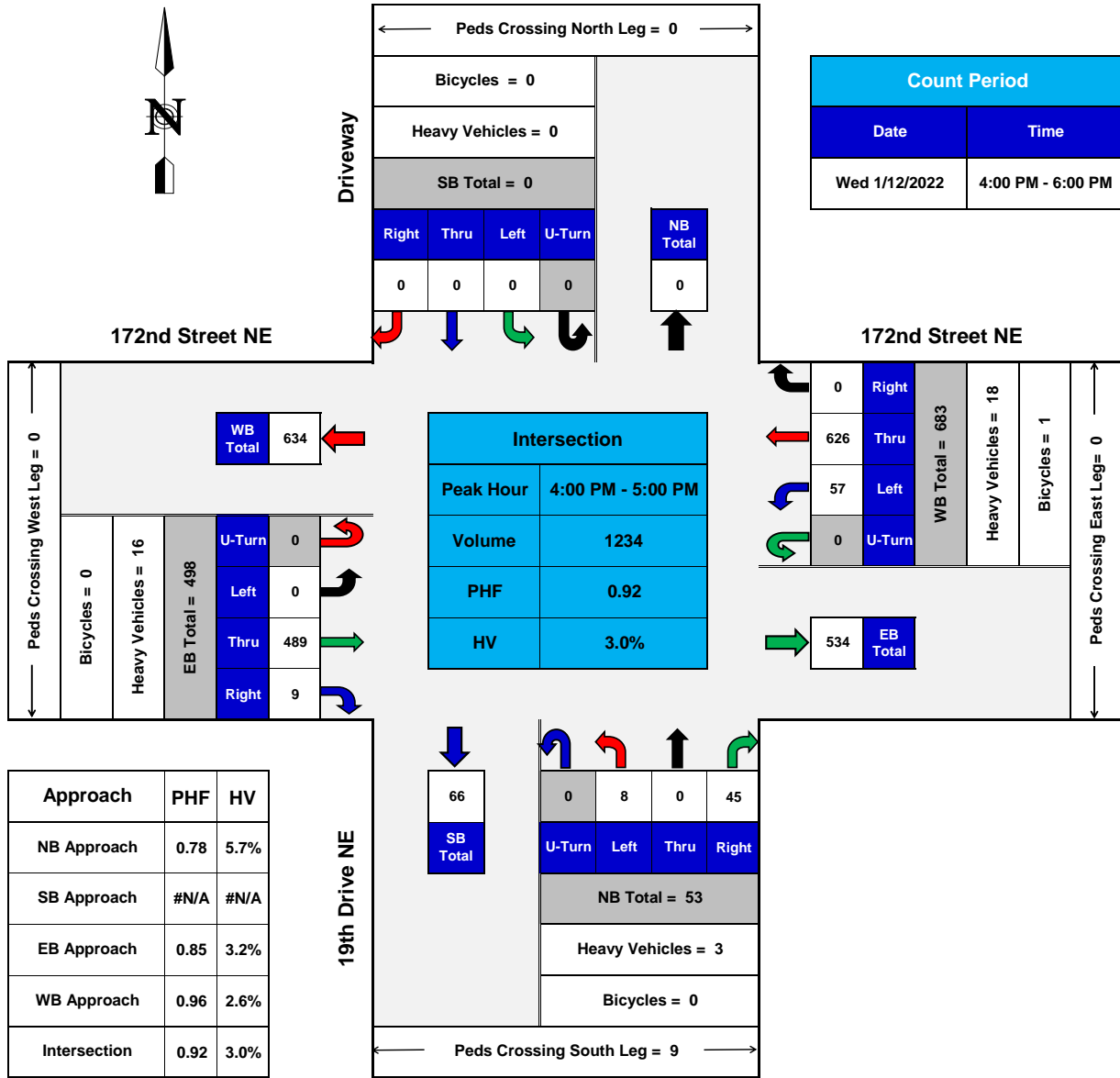


PHF = Peak Hour Factor
HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY



**172nd Street NE @ 19th Drive NE
Arlington, WA**

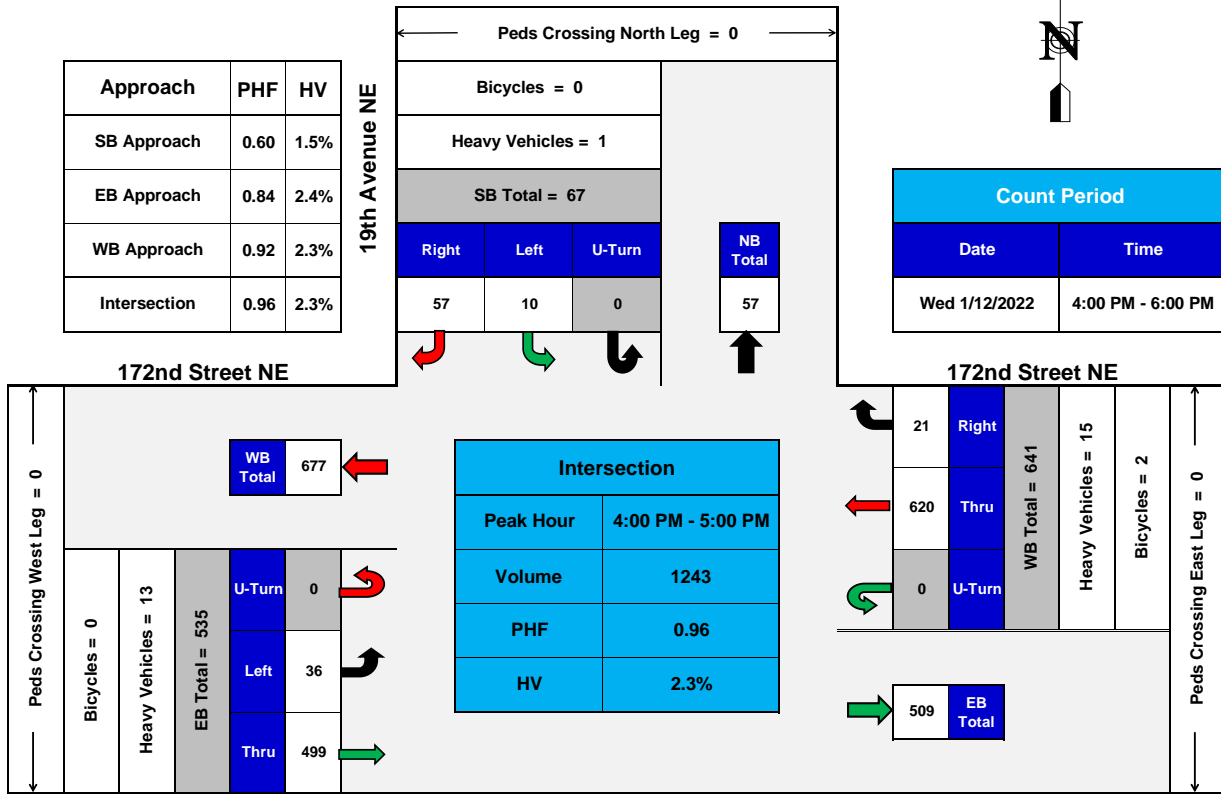


PHF = Peak Hour Factor
HV = Heavy Vehicles

**TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY**



**172nd Street NE @ 19th Avenue NE
Arlington, WA**



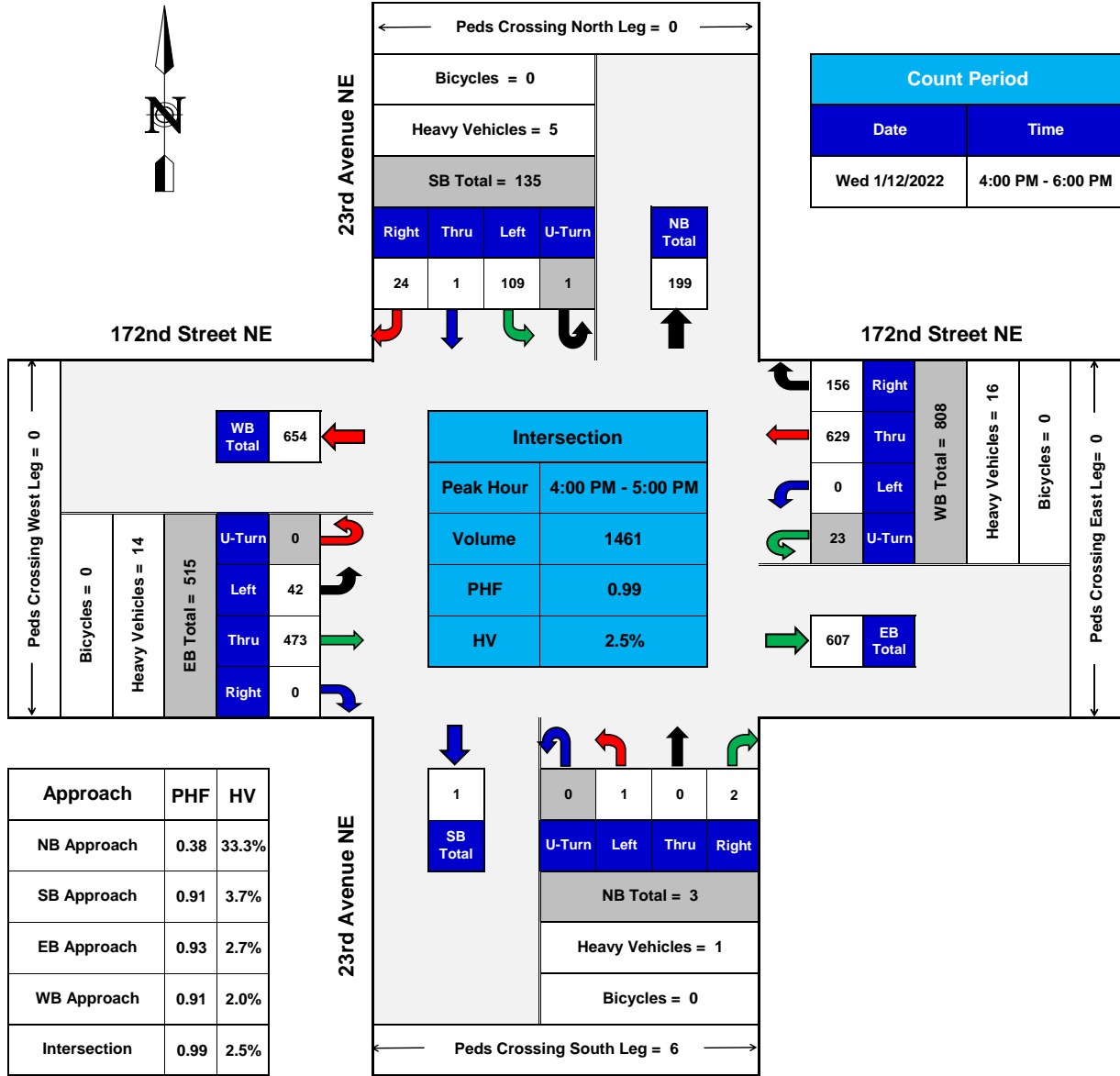
PHF = Peak Hour Factor
HV = Heavy Vehicles

**TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY**



172nd Street NE @ 23rd Avenue NE

Arlington, WA



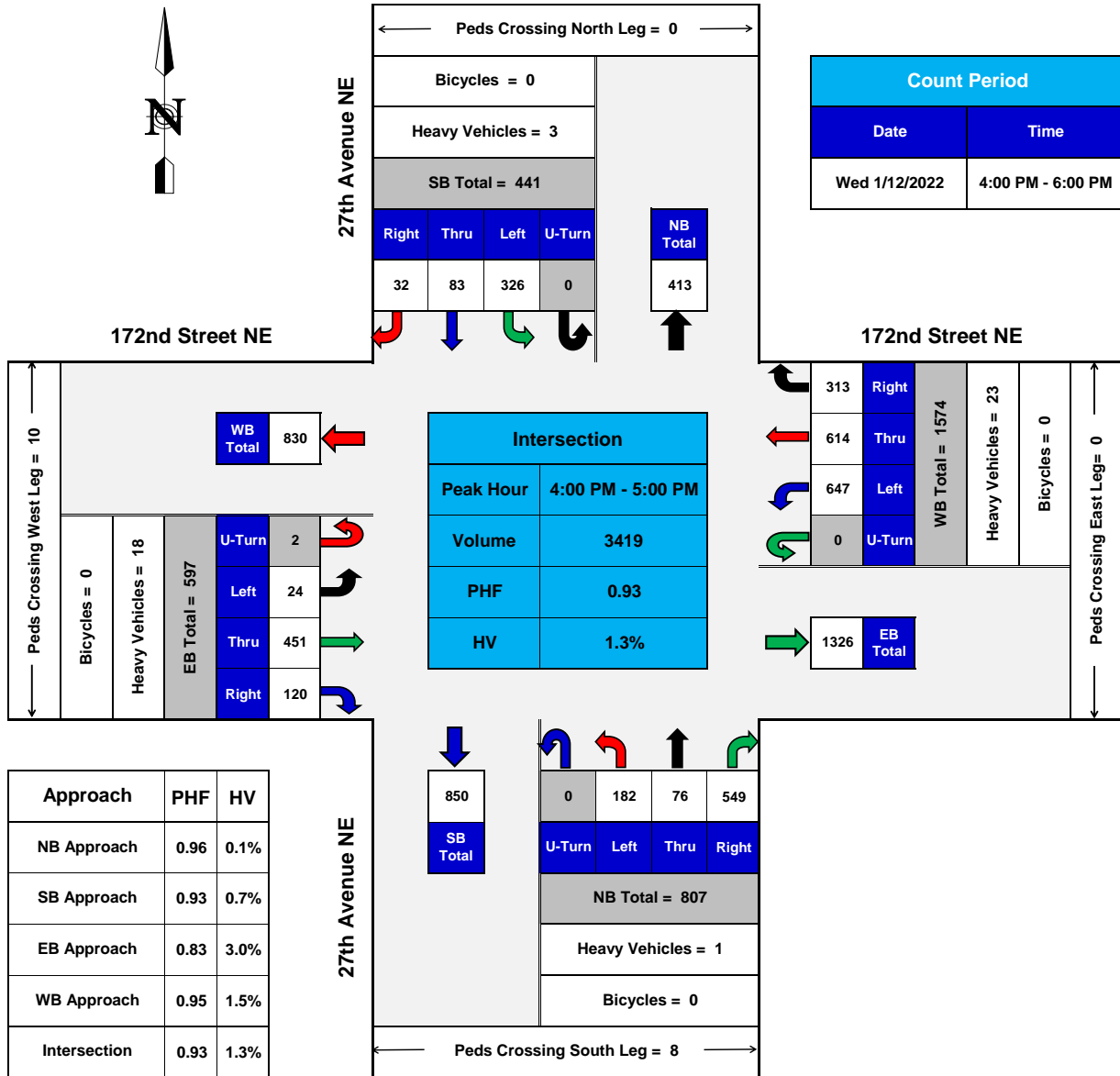
PHF = Peak Hour Factor
HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY



172nd Street NE @ 27th Avenue NE

Arlington, WA

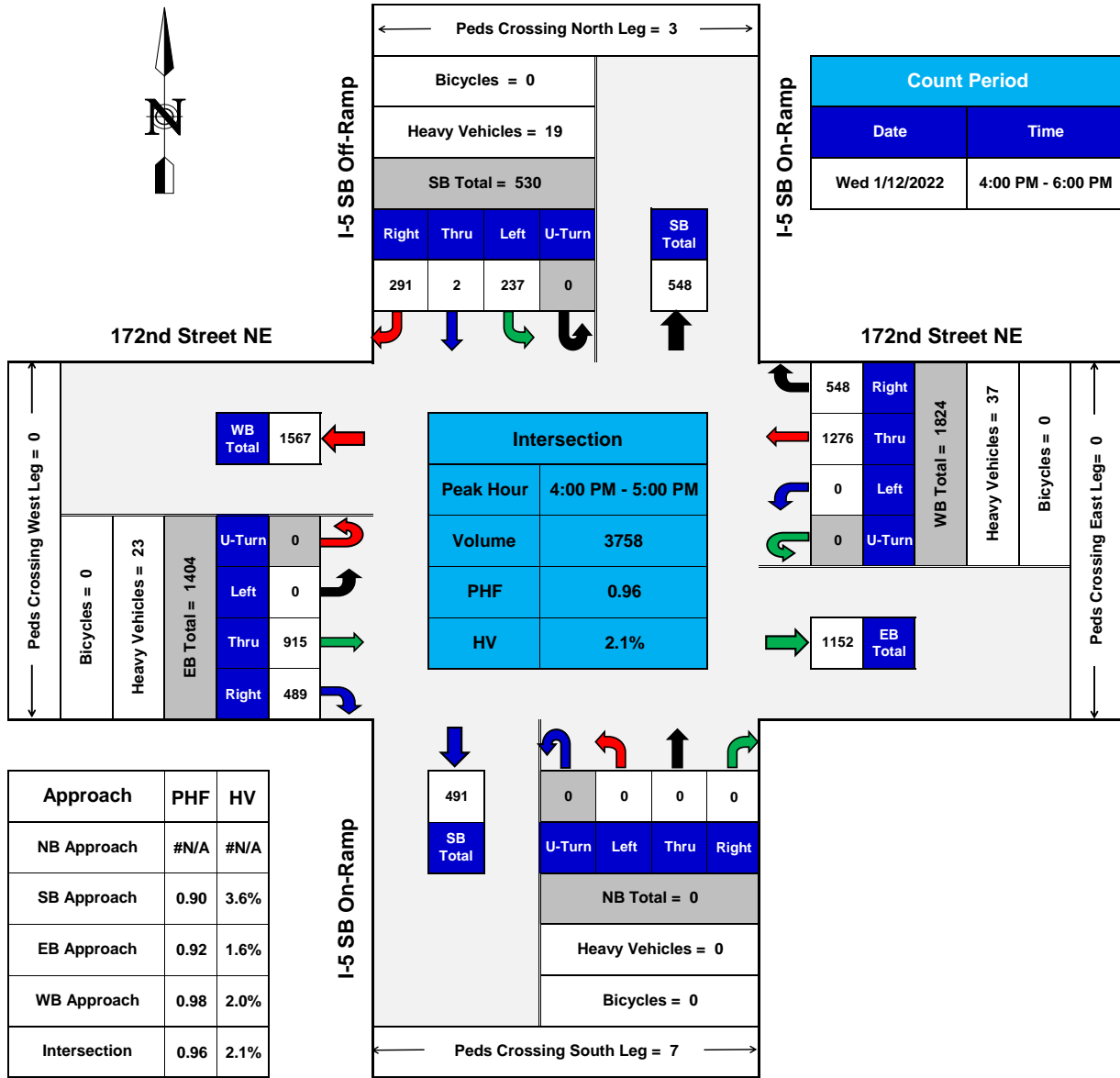


PHF = Peak Hour Factor
HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY



172nd Street NE @ I-5 Southbound Ramps
Arlington, WA

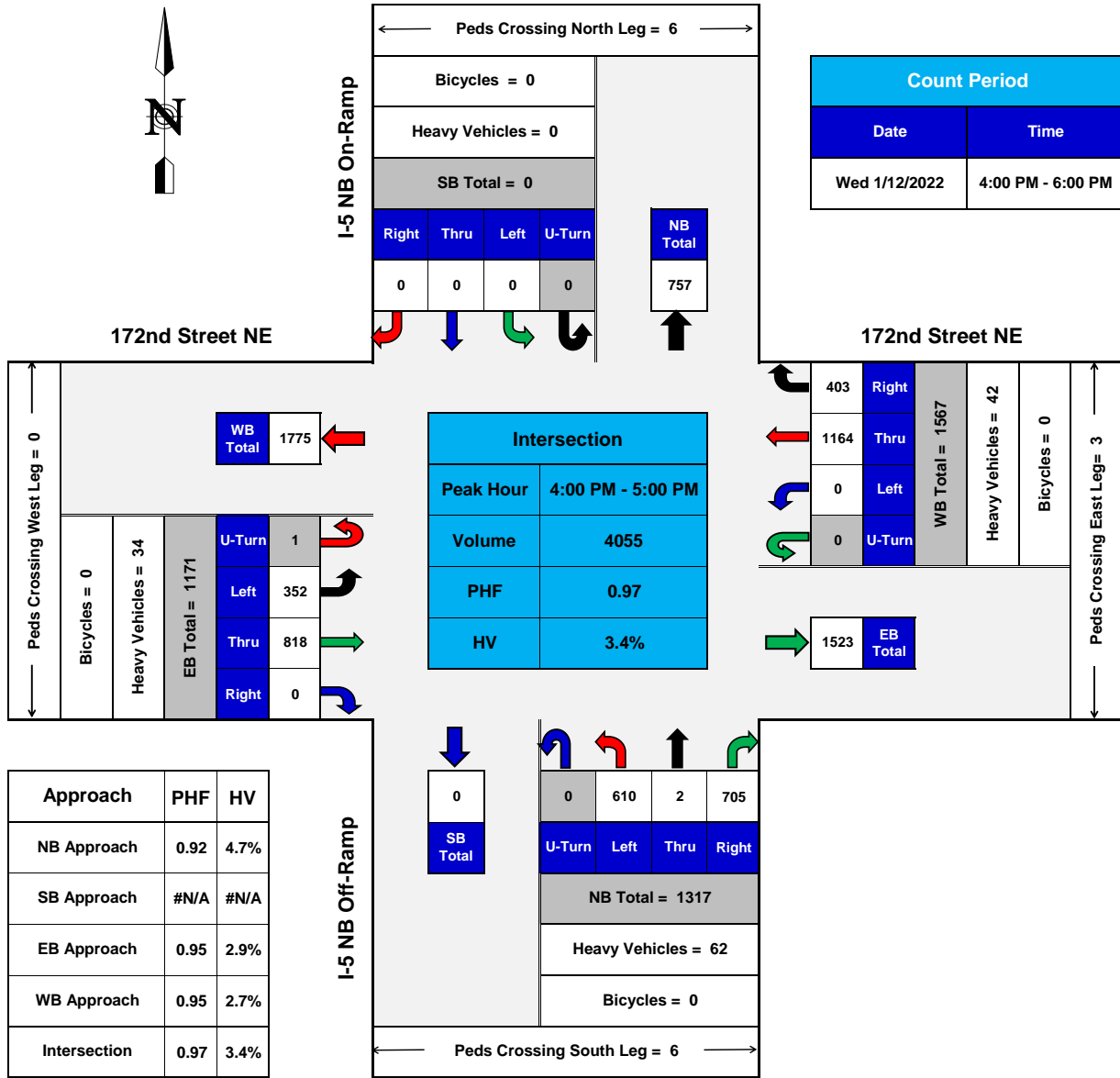


PHF = Peak Hour Factor
HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY



172nd Street NE @ I-5 Northbound Ramps
Arlington, WA



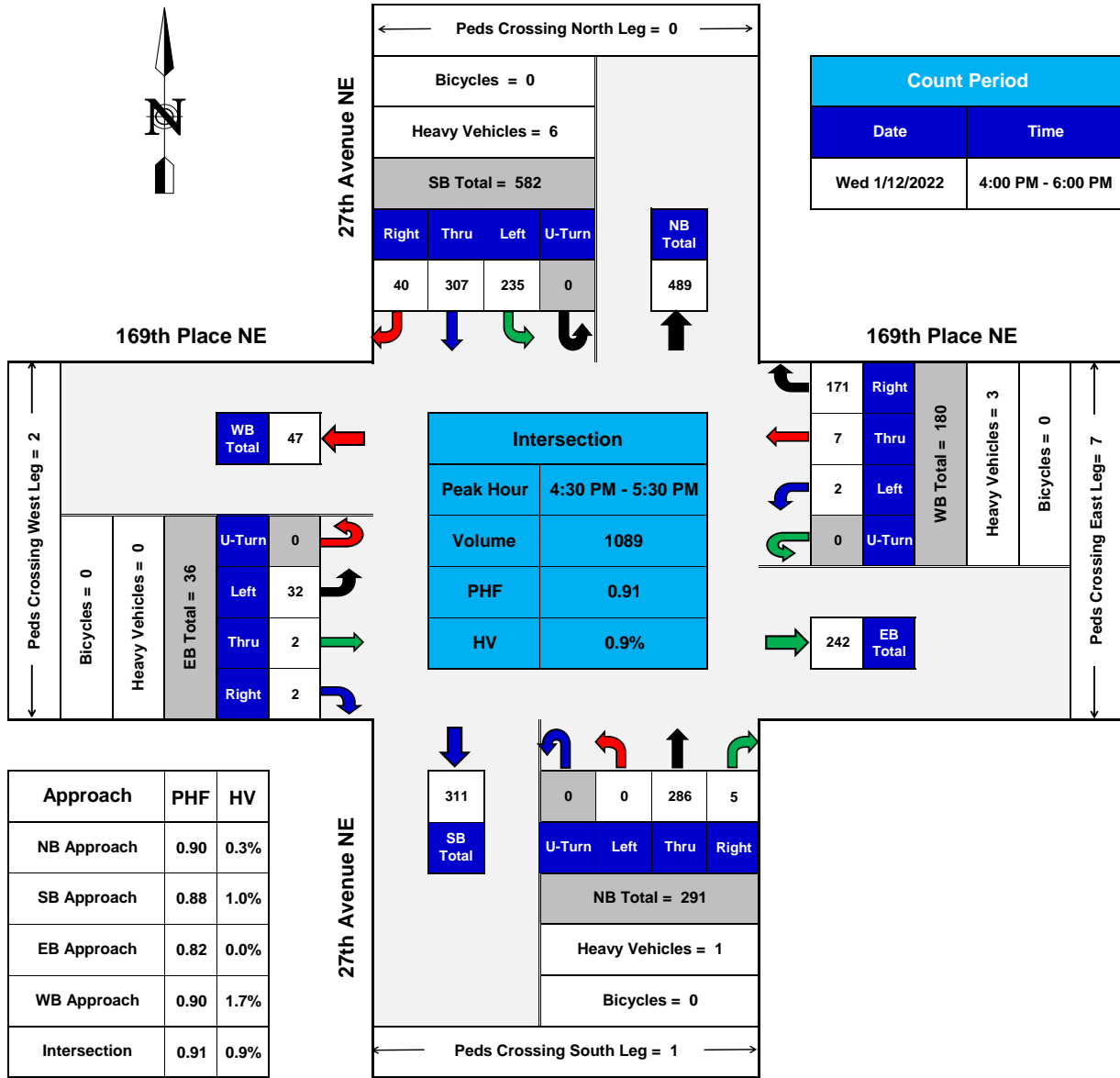
PHF = Peak Hour Factor
 HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY



169th Place NE @ 27th Avenue NE

Arlington, WA



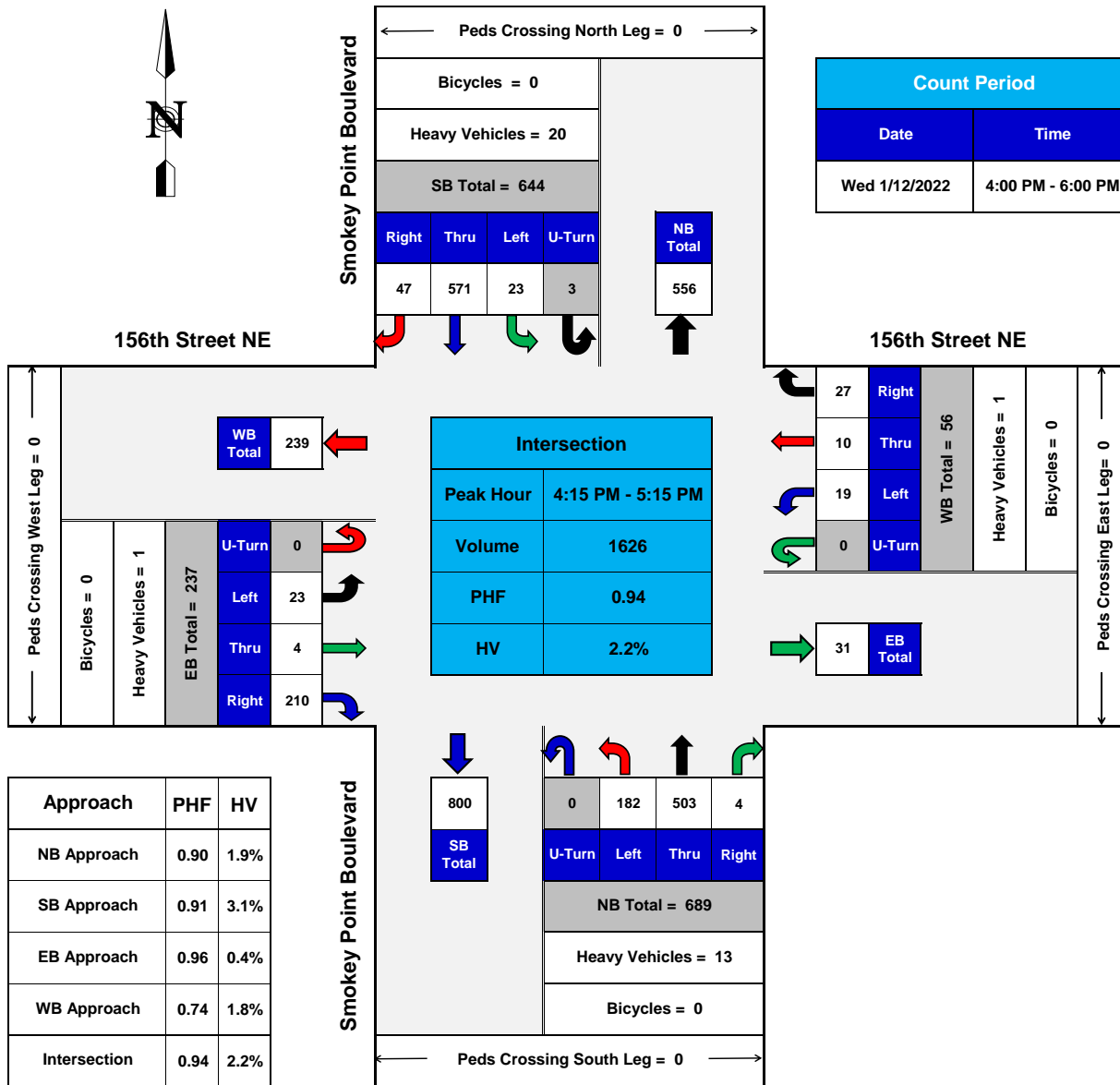
PHF = Peak Hour Factor
HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY



156th Street NE @ Smokey Point Boulevard

Arlington, WA



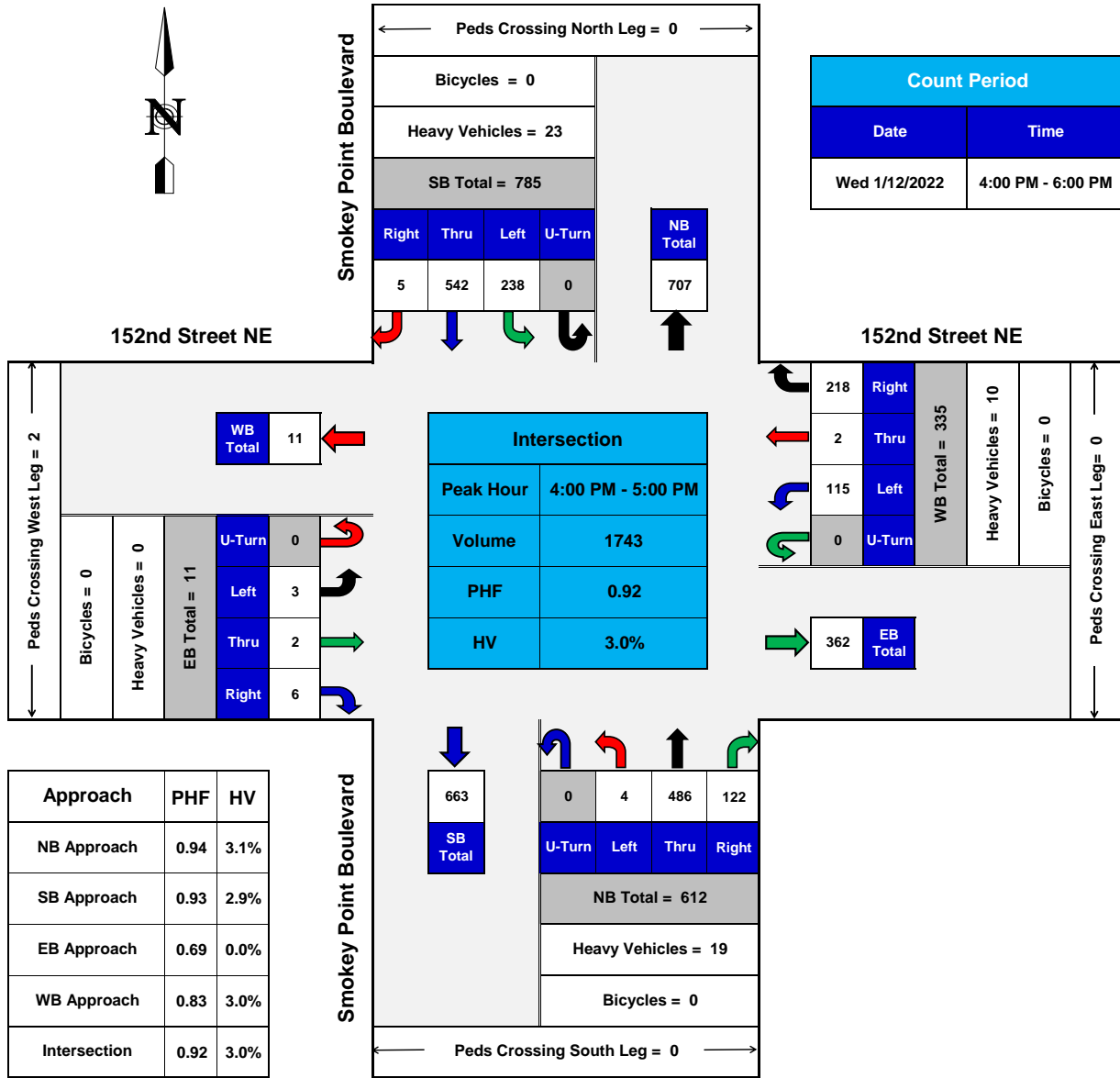
PHF = Peak Hour Factor
 HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY



152nd Street NE @ Smokey Point Boulevard

Arlington, WA

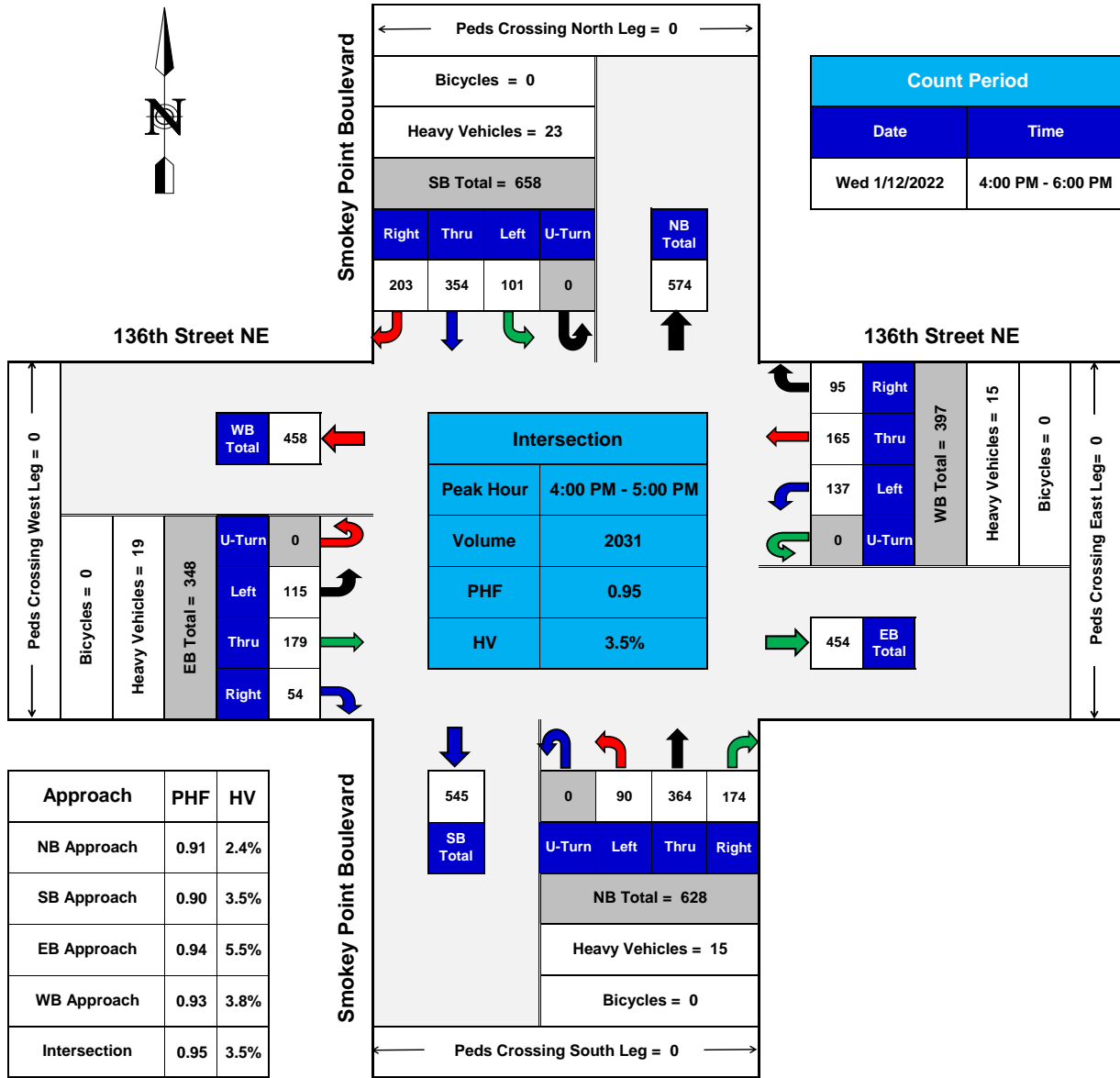


TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY



136th Street NE @ Smokey Point Boulevard

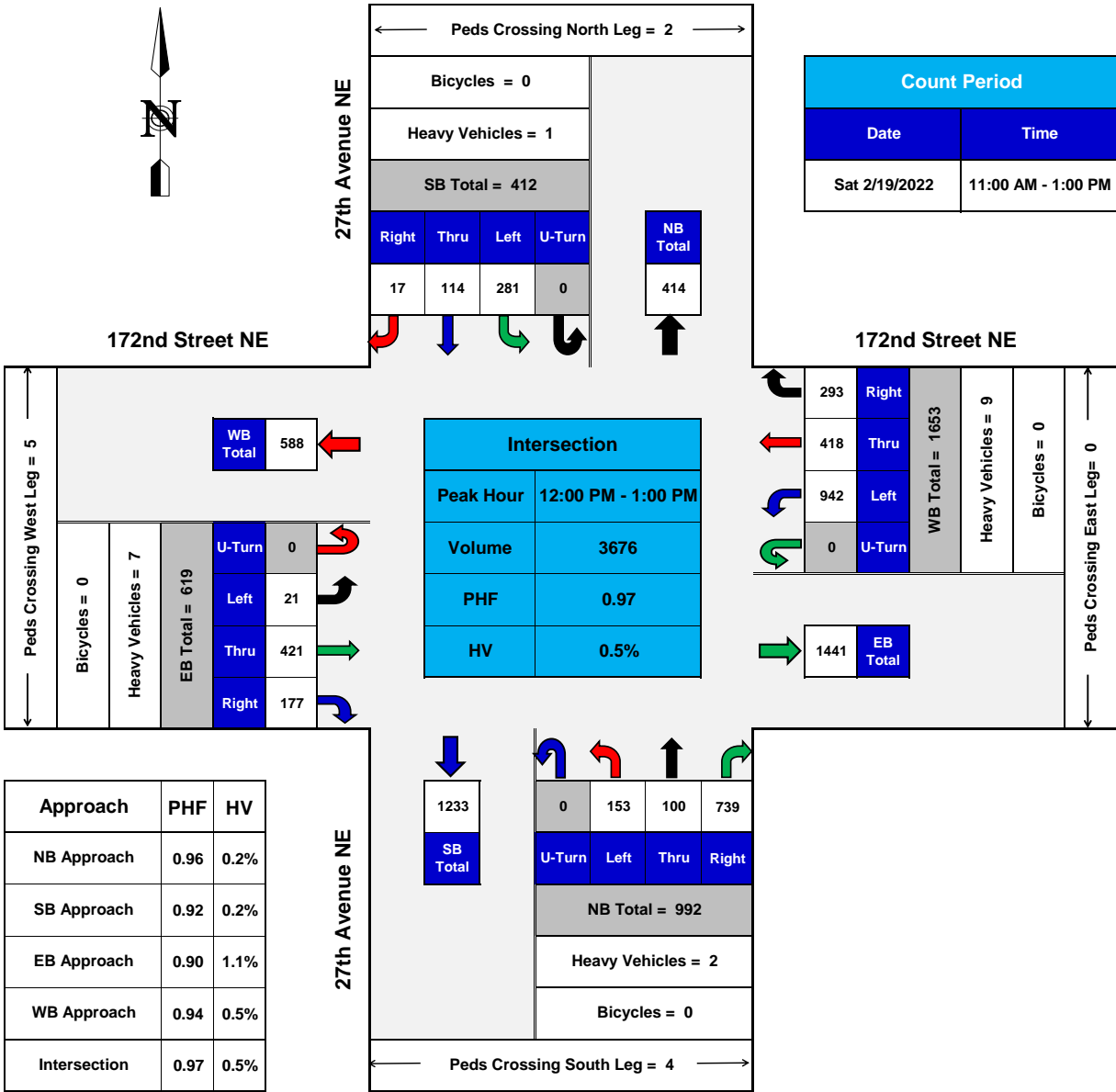
Arlington, WA



TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY



172nd Street NE @ 27th Avenue NE
Marysville, WA



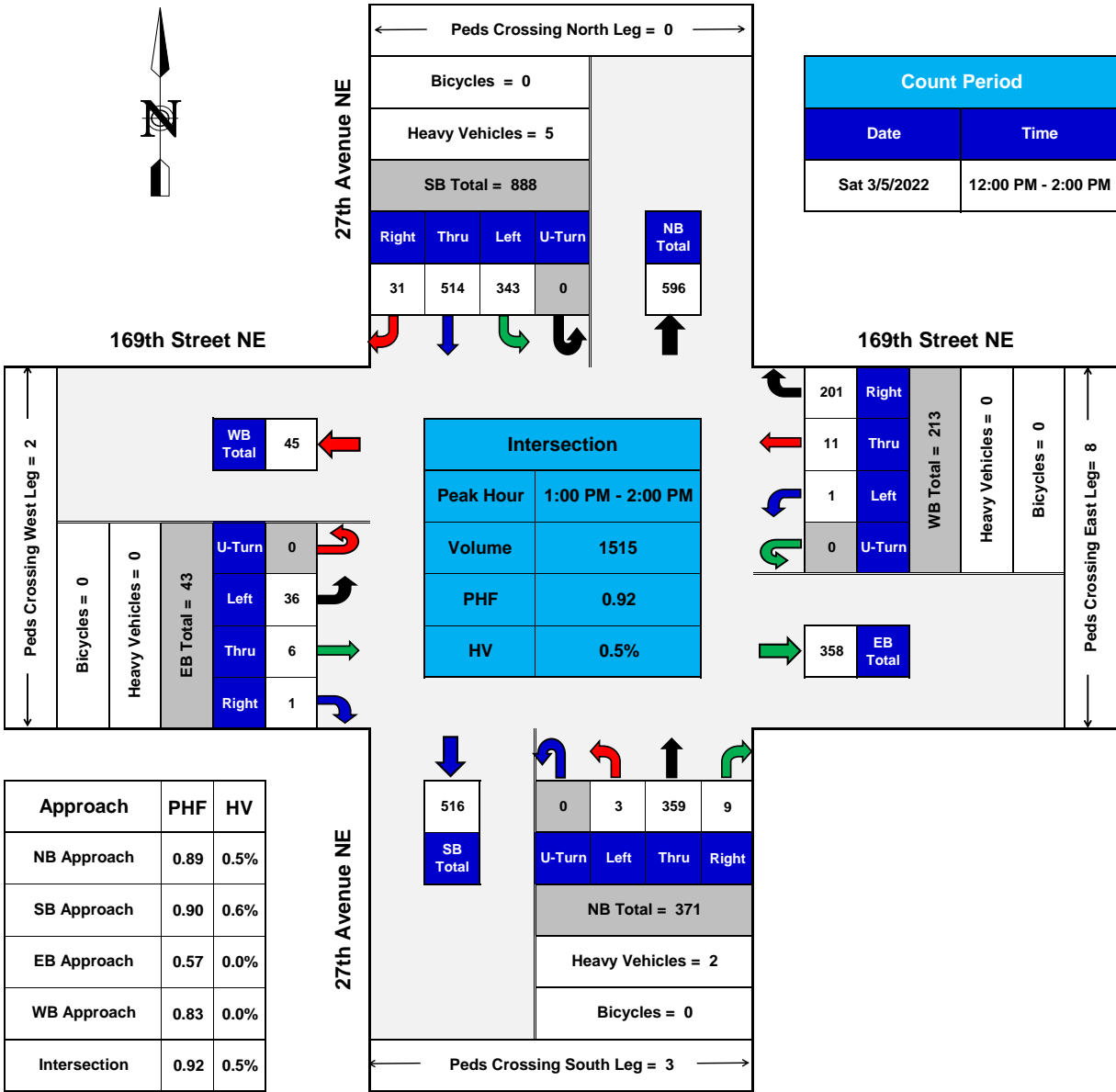
PHF = Peak Hour Factor
 HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY



169th Street NE @ 27th Avenue NE

Marysville, WA



PHF = Peak Hour Factor
HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY



Weekday PM Peak-Hour Turning Movement Calculations

Opening Year

1 172nd St NE at 11th Ave NE

Weekday PM Peak-Hour

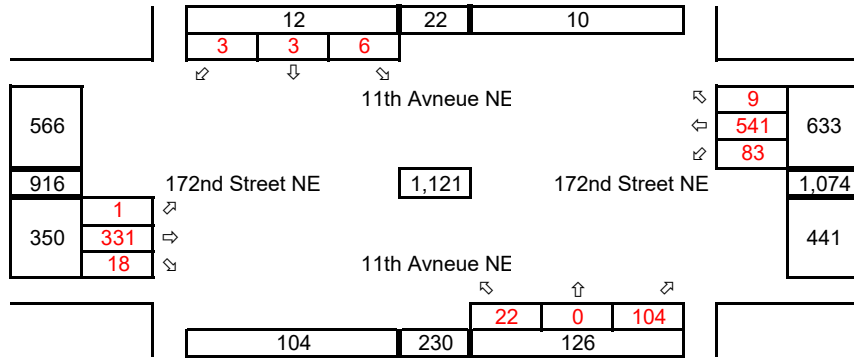
Synchro ID: 1

Existing

Average Weekday
PM Peak-Hour

Year: **1/12/2022**

Data Source: **TDG**



↑ North
|

Future without Development

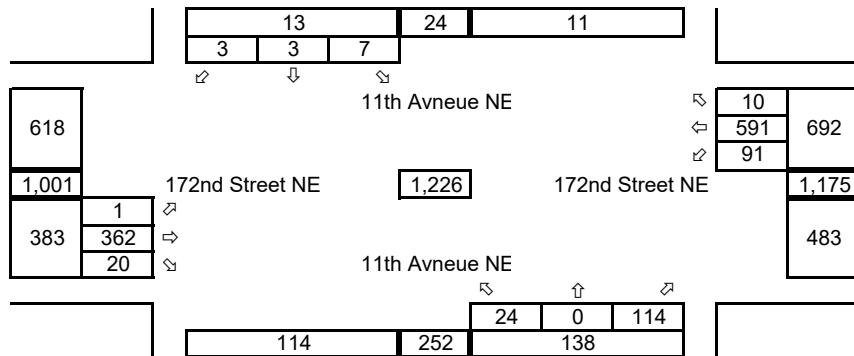
Average Weekday
PM Peak Hour

Year: **2025**

Growth Rate = **3.0%**

Years of Growth = 3

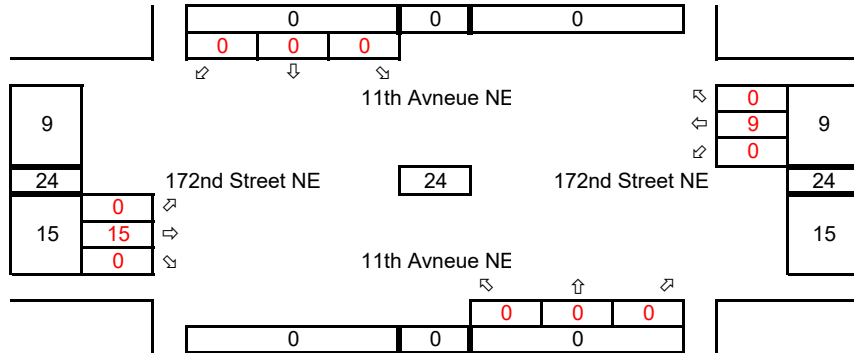
Total Growth = 1.0927



↑ North
|

Total Development Trips

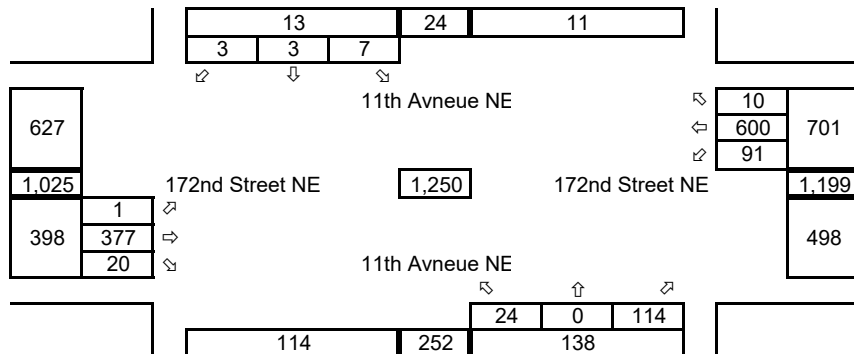
Average Weekday
PM Peak Hour



↑ North
|

Future with Development

Average Weekday
PM Peak Hour



↑ North
|

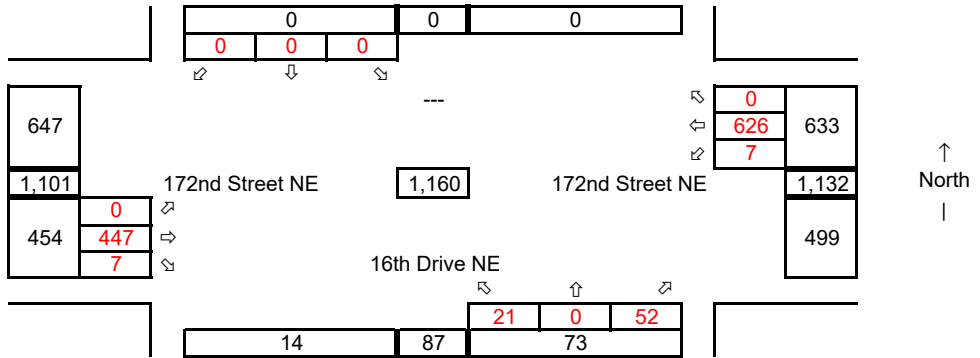
Synchro ID: 2

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

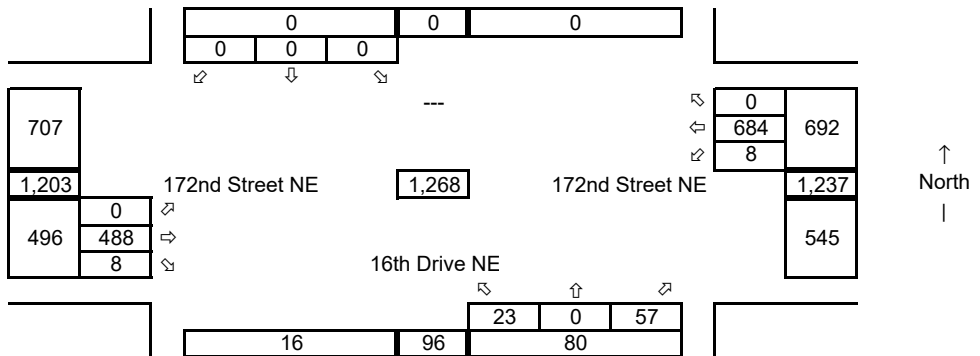
Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

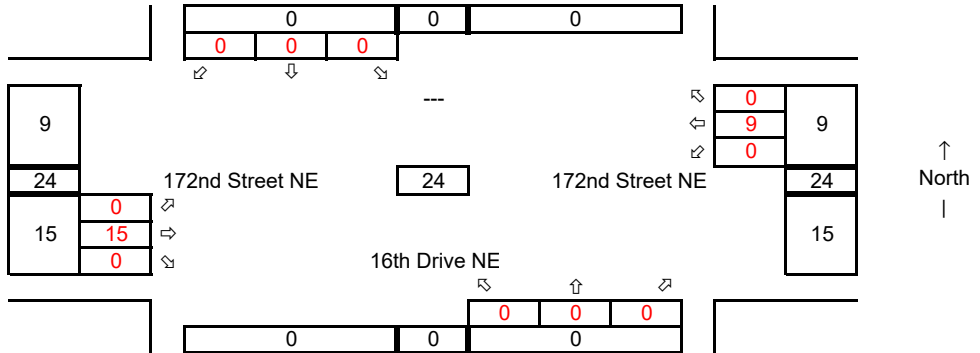
Years of Growth = 3

Total Growth = 1.0927



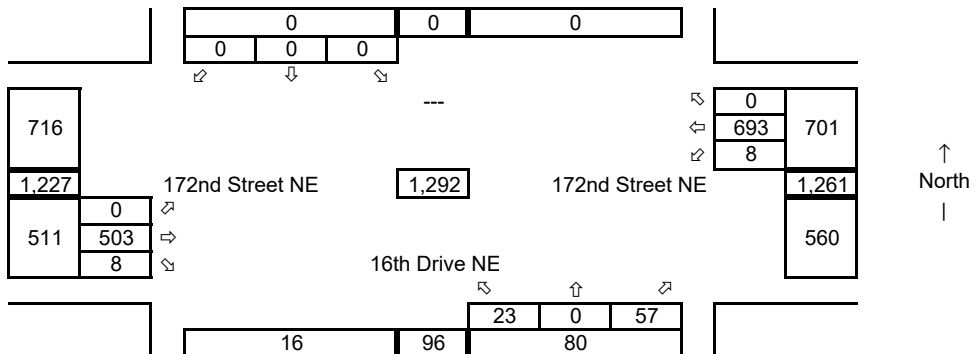
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



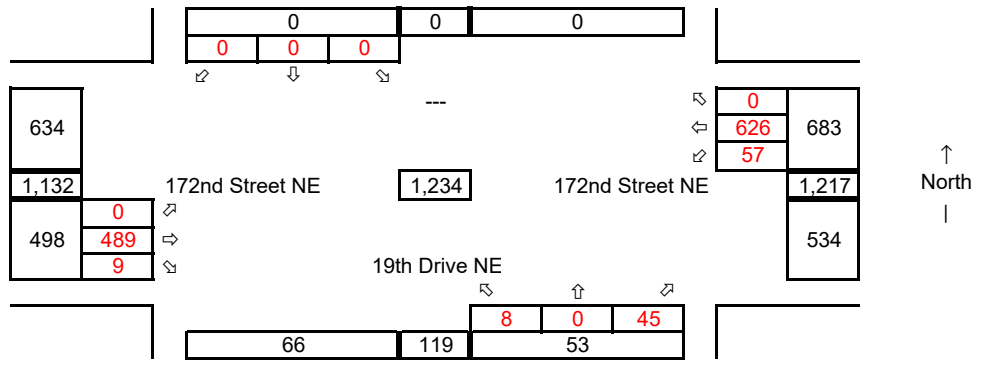
Synchro ID: 3

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

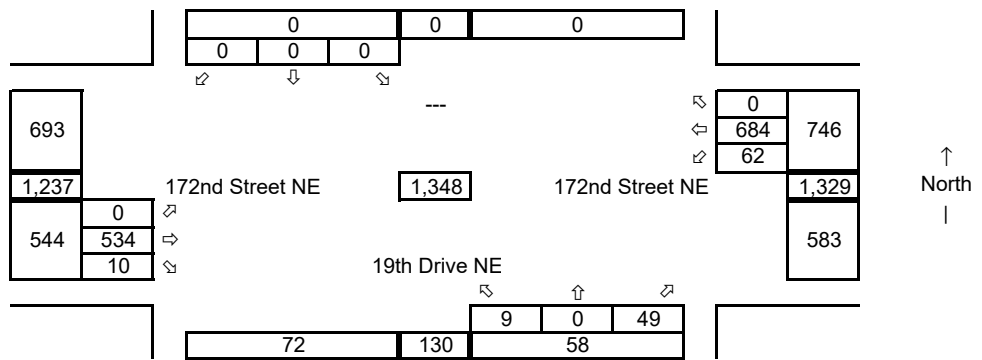
Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

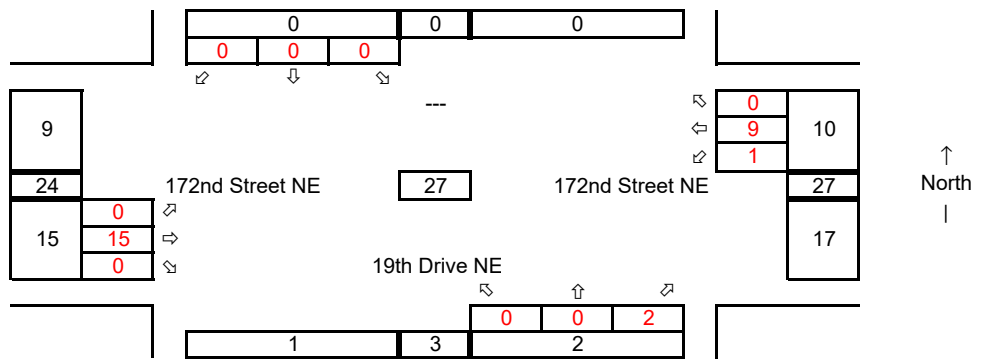
Years of Growth = 3

Total Growth = 1.0927



Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



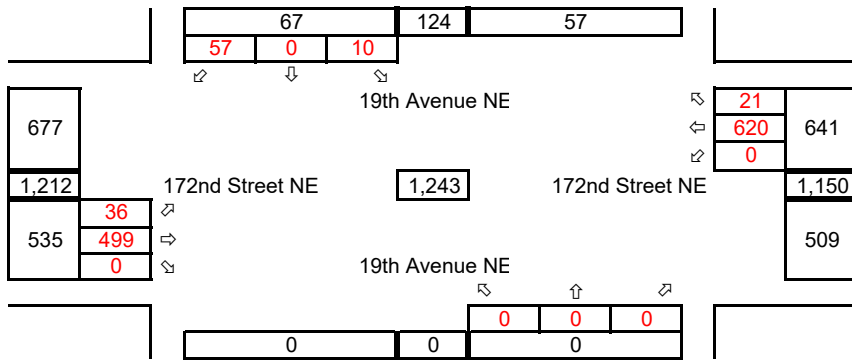
Synchro ID: 4

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



↑ North
|

Future without Development

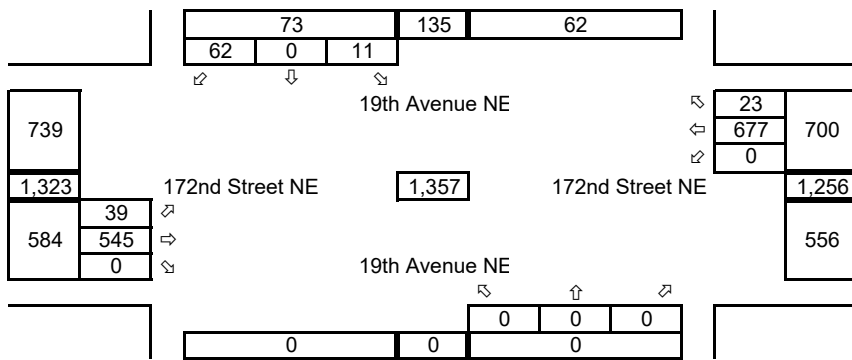
Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

Years of Growth = 3

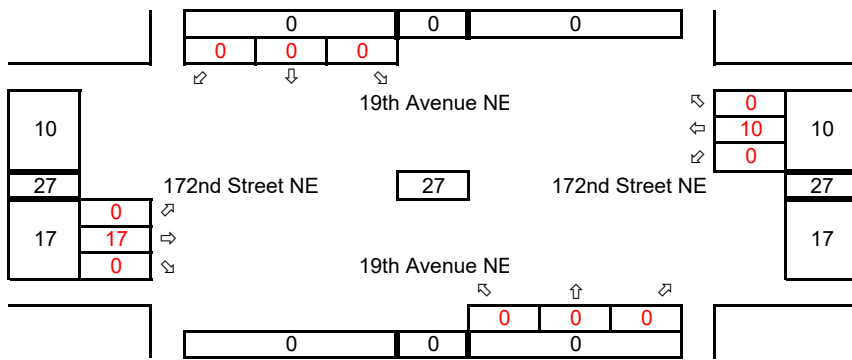
Total Growth = 1.0927



↑ North
|

Total Development Trips

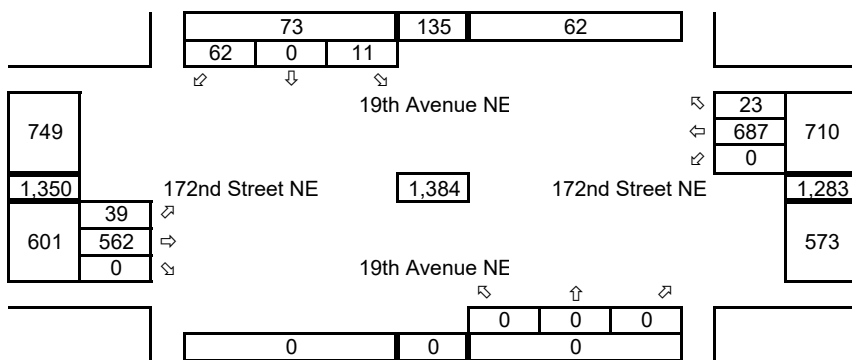
Average Weekday
PM Peak Hour



↑ North
|

Future with Development

Average Weekday
PM Peak Hour



↑ North
|

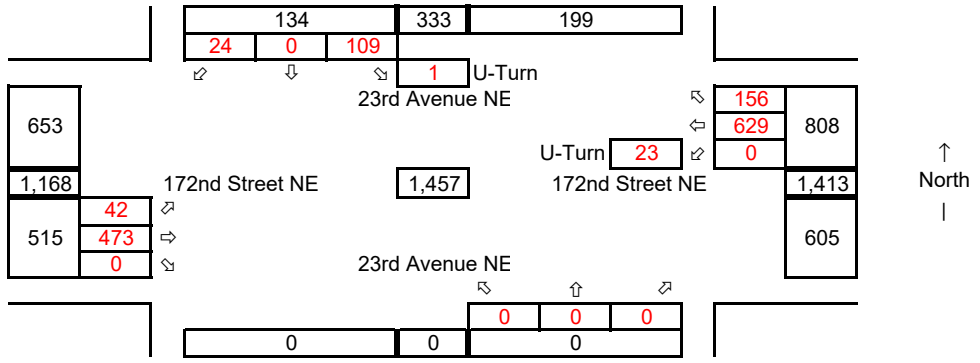
Synchro ID: 5

Existing
Average Weekday
PM Peak-Hour

Year: 1/12/2022

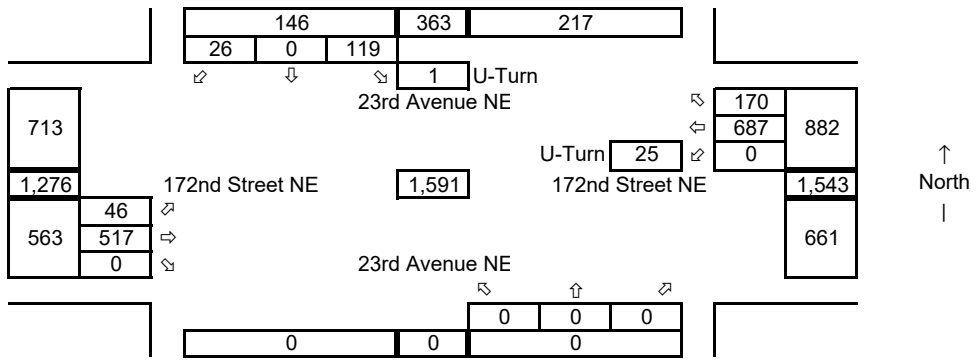
Data Source: TDG

The existing volume on the south leg is construction traffic and has not been included in the existing analysis.

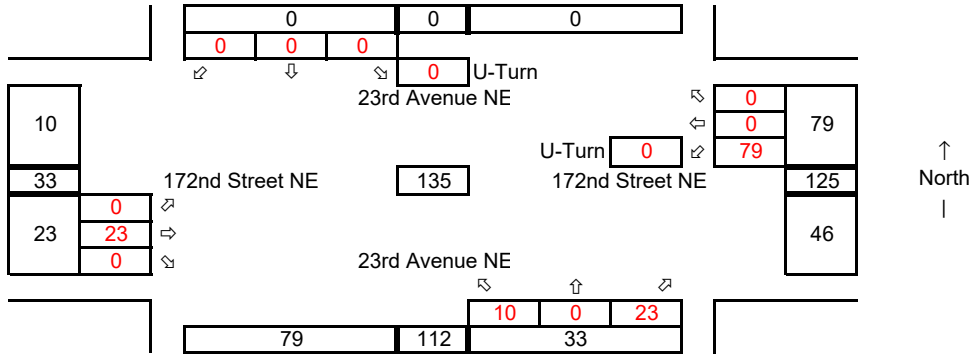


Future without Development
Average Weekday
PM Peak Hour

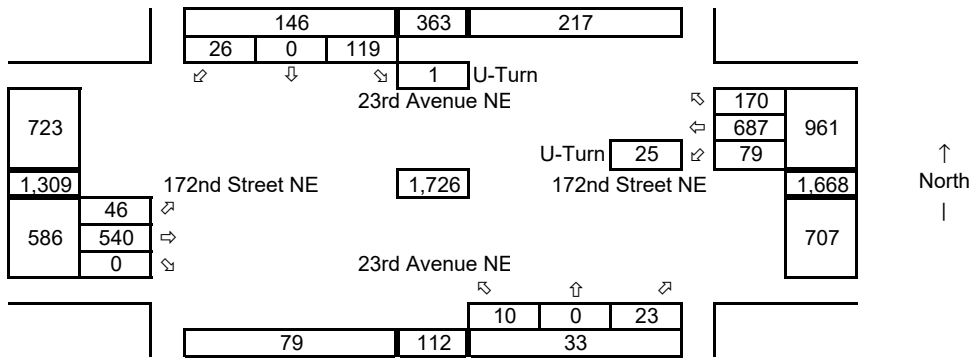
Year: 2025
Growth Rate = 3.0%
Years of Growth = 3
Total Growth = 1.0927



Total Development Trips
Average Weekday
PM Peak Hour



Future with Development
Average Weekday
PM Peak Hour



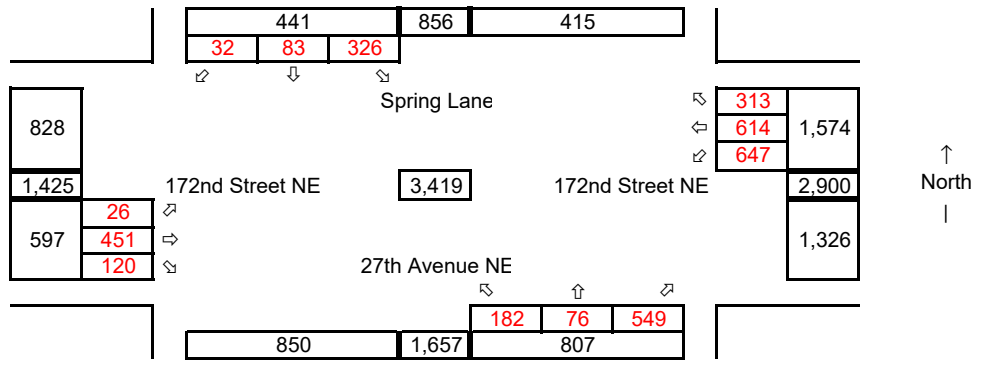
Synchro ID: 6

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

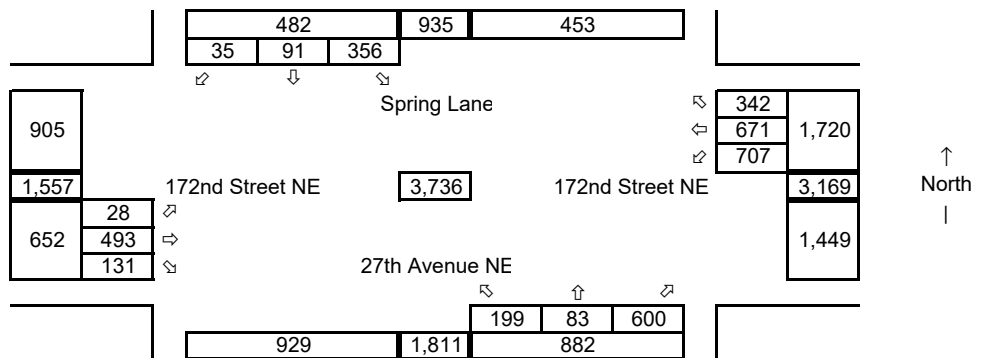
Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

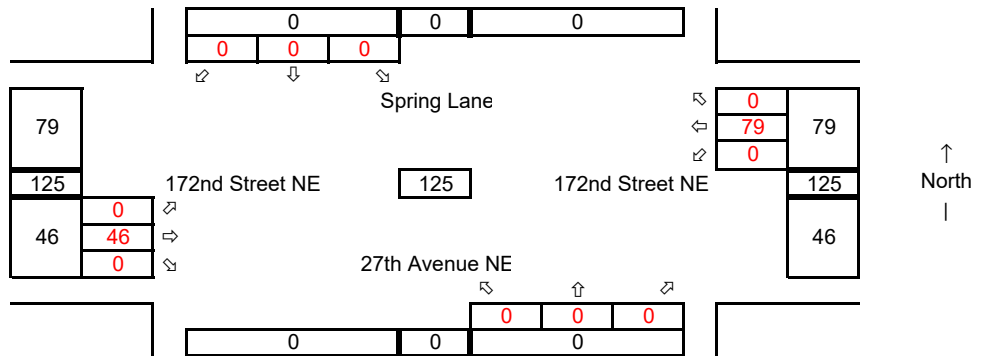
Years of Growth = 3

Total Growth = 1.0927



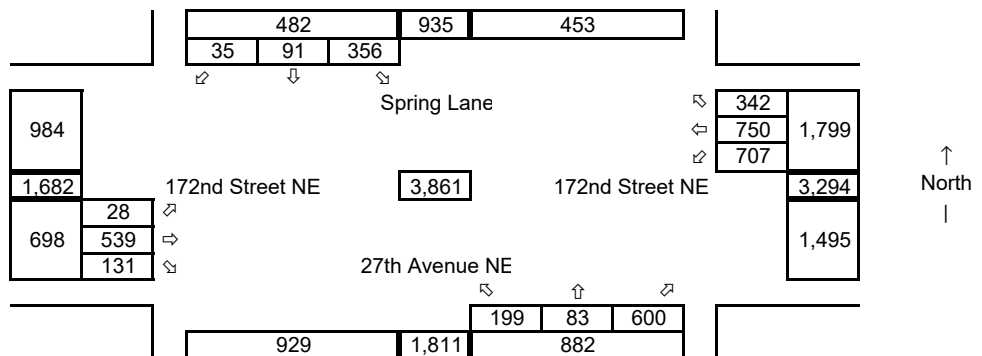
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



Opening Year

7 172nd St NE at I-5 SB Ramps

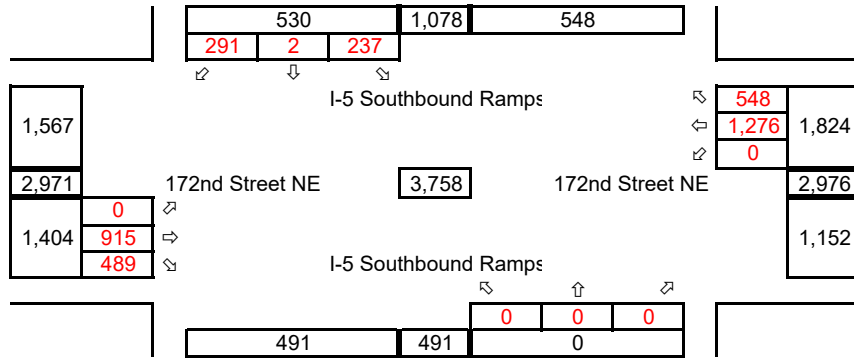
Weekday PM Peak-Hour

Synchro ID: 7

Existing
Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



↑ North
|

Future without Development

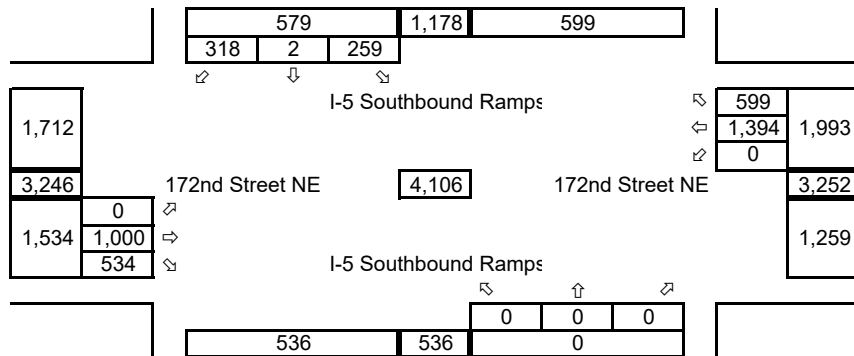
Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

Years of Growth = 3

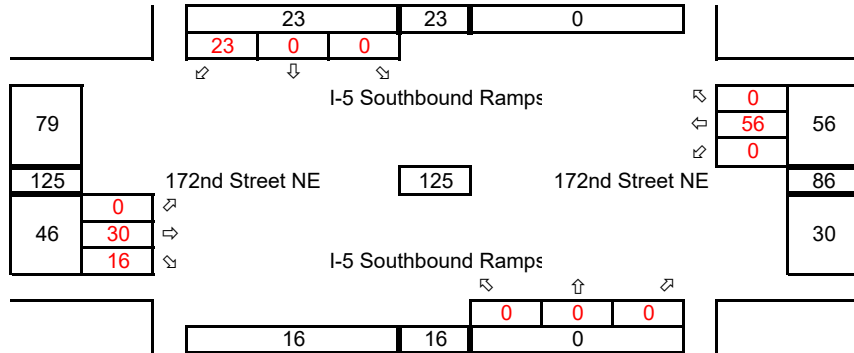
Total Growth = 1.0927



↑ North
|

Total Development Trips

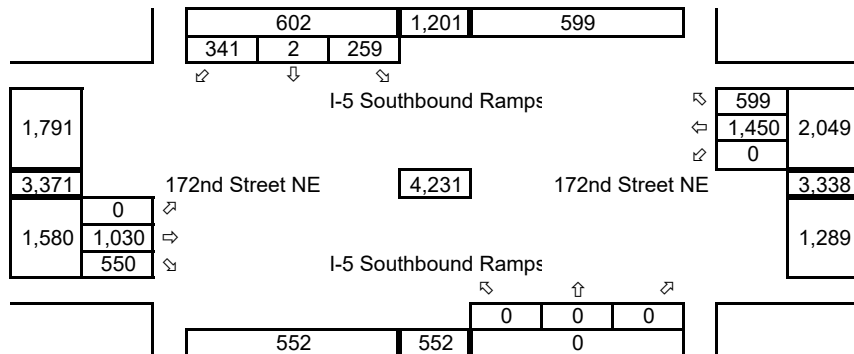
Average Weekday
PM Peak Hour



↑ North
|

Future with Development

Average Weekday
PM Peak Hour



↑ North
|

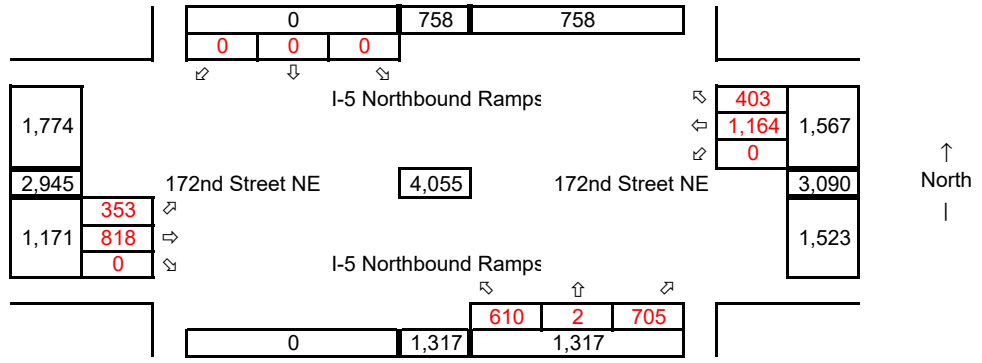
Synchro ID: 8

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

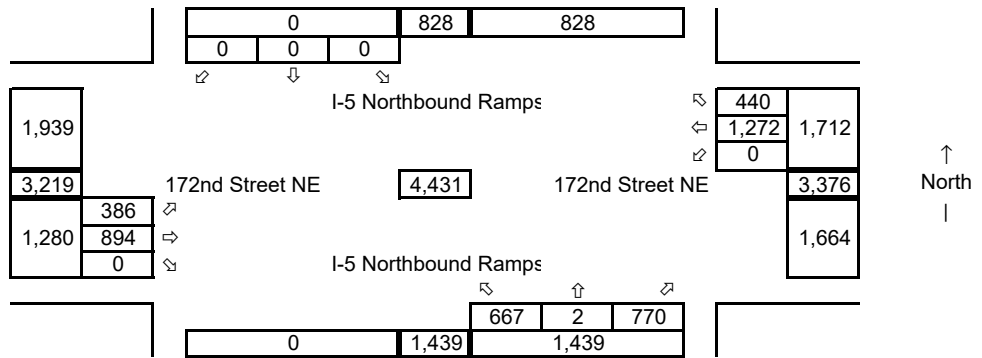
Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

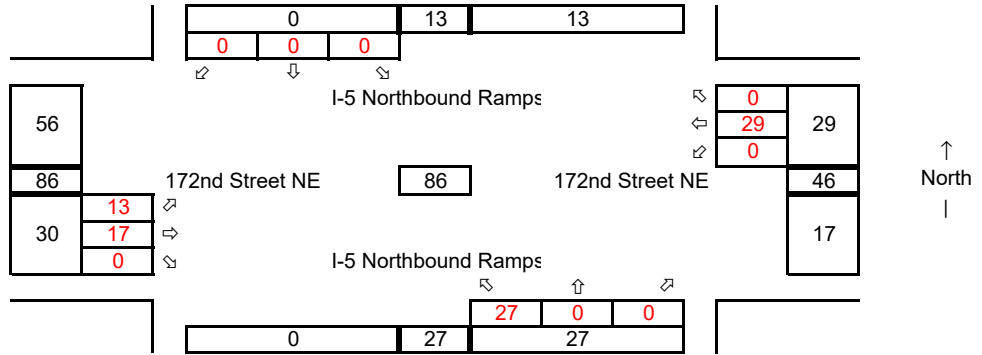
Years of Growth = 3

Total Growth = 1.0927



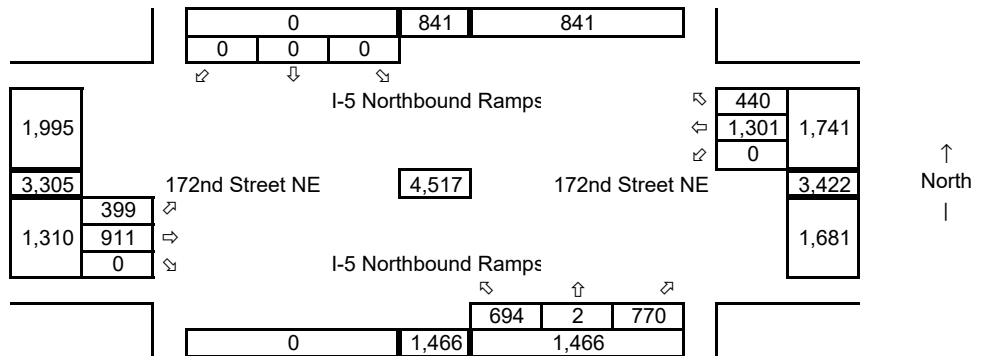
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour

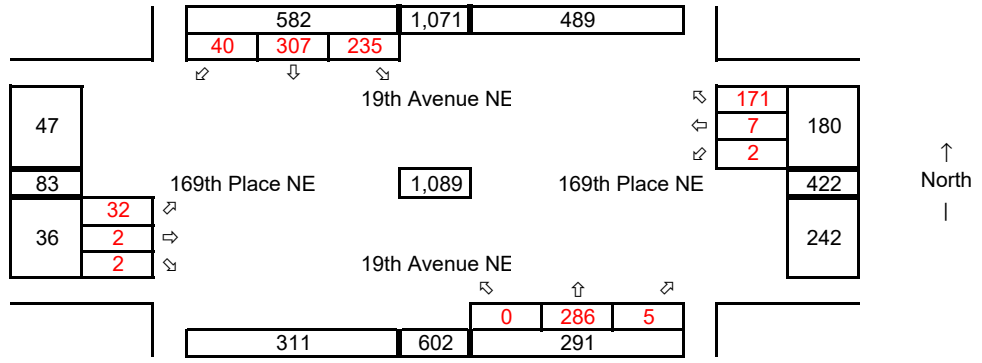


Synchro ID: 9

Existing
Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

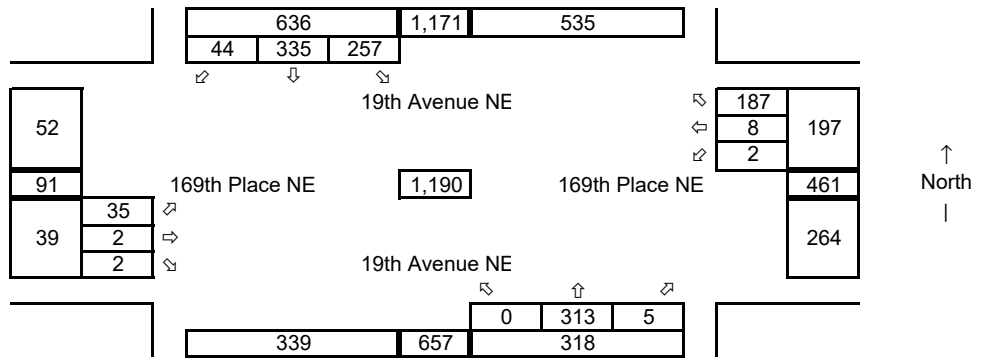
Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

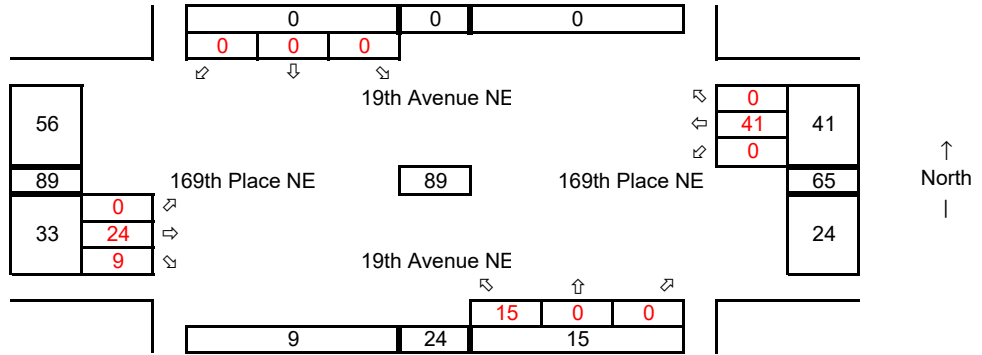
Years of Growth = 3

Total Growth = 1.0927



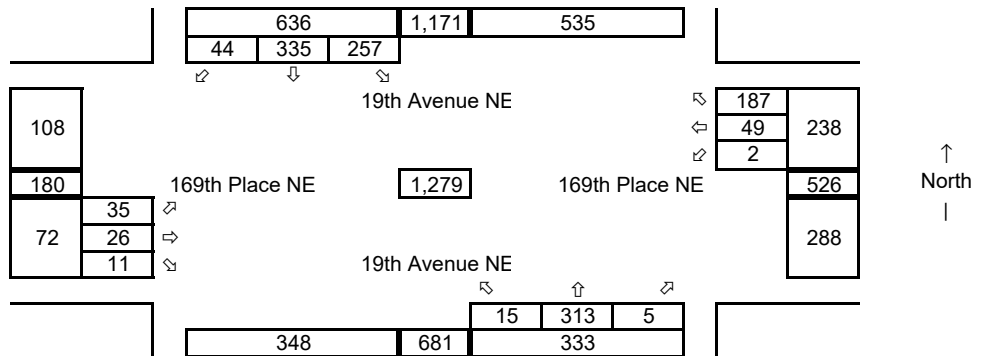
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



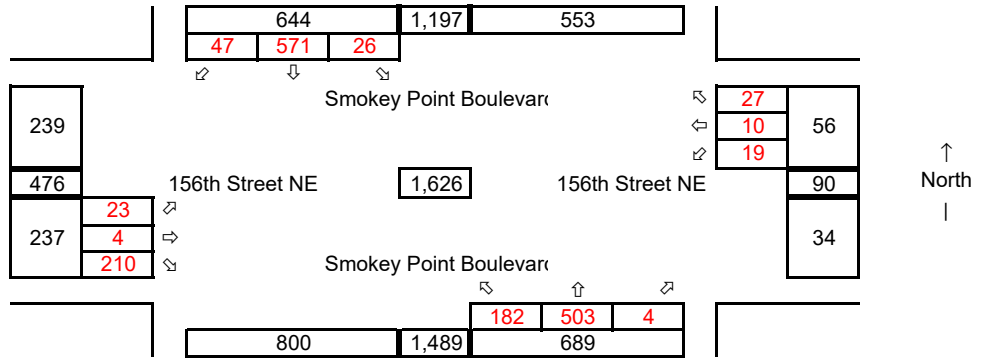
Synchro ID: 10

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

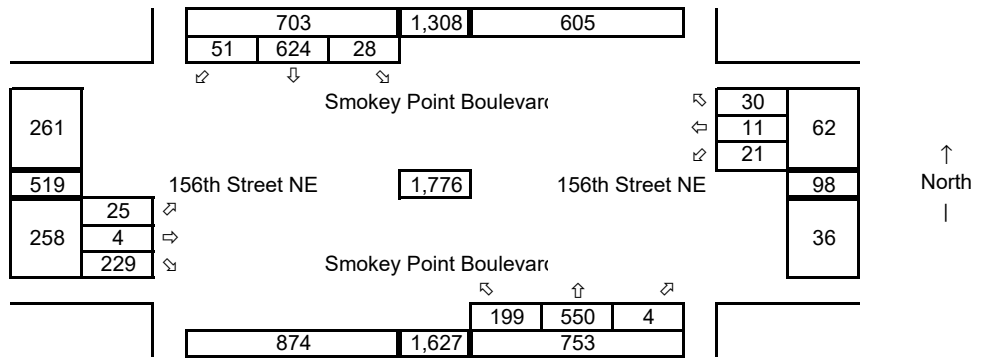
Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

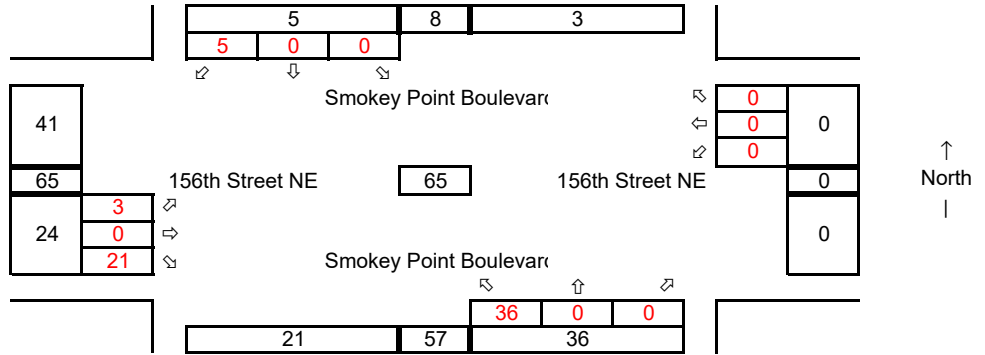
Years of Growth = 3

Total Growth = 1.0927



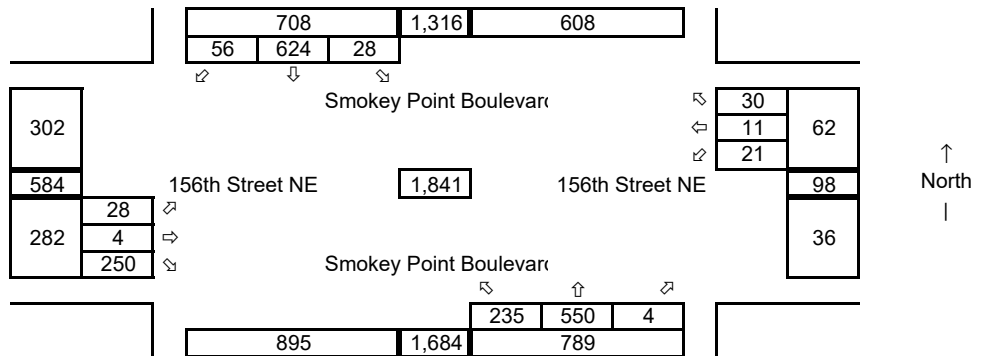
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



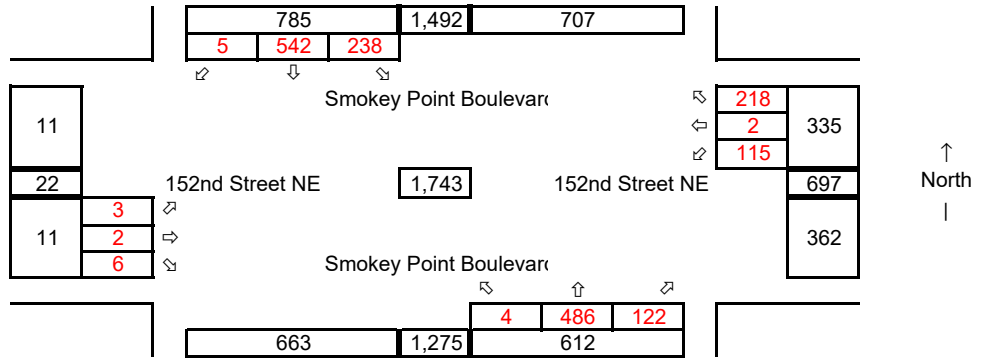
Synchro ID: 11

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

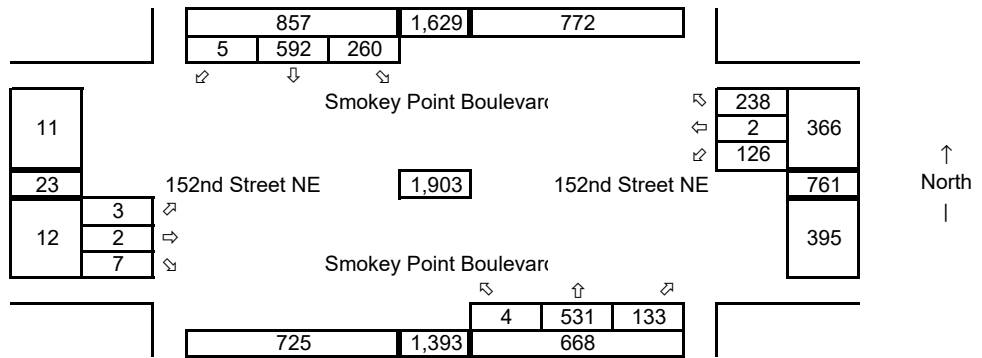
Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

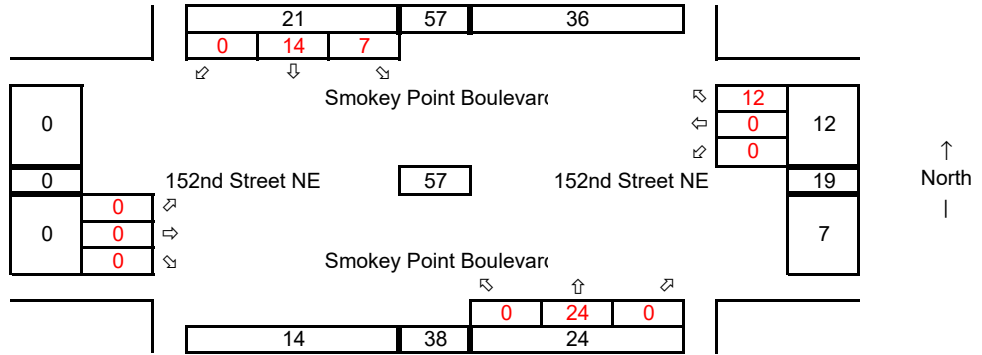
Years of Growth = 3

Total Growth = 1.0927



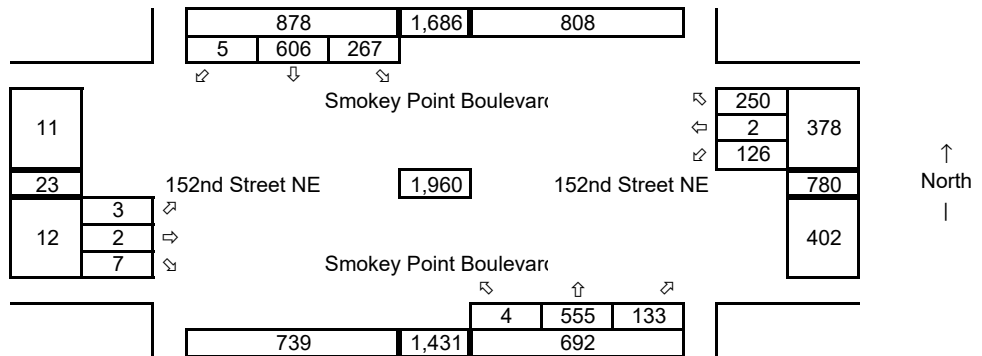
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour

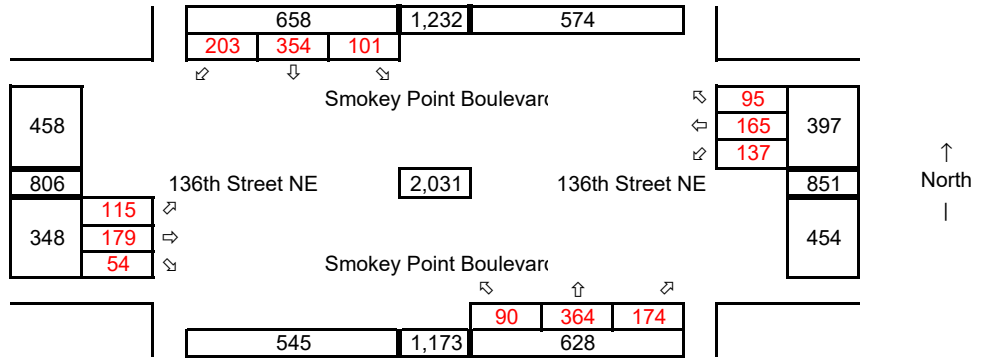


Synchro ID: 12

Existing
Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

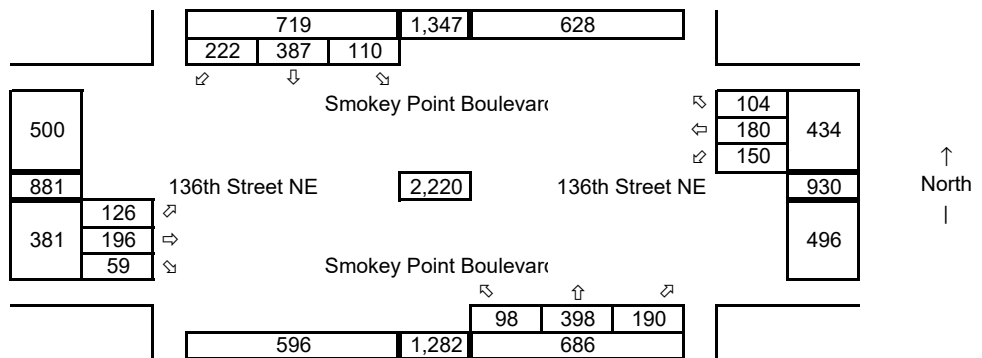
Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

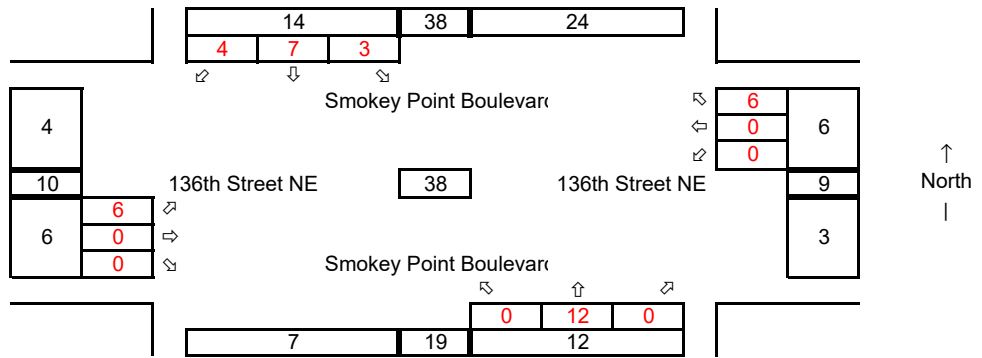
Years of Growth = 3

Total Growth = 1.0927



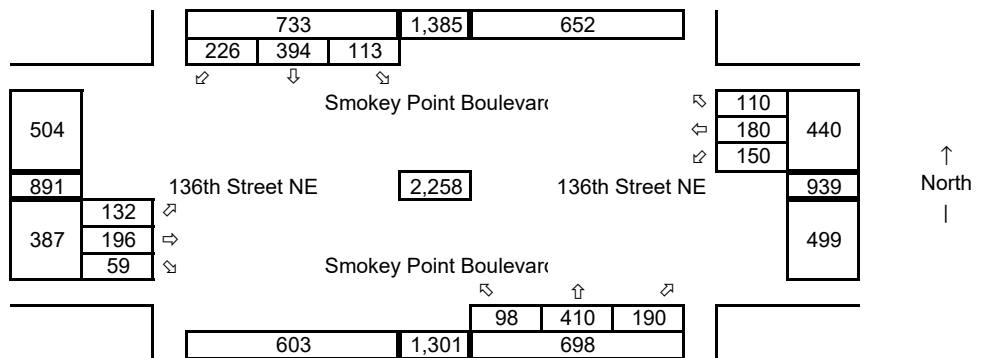
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



Synchro ID: 13

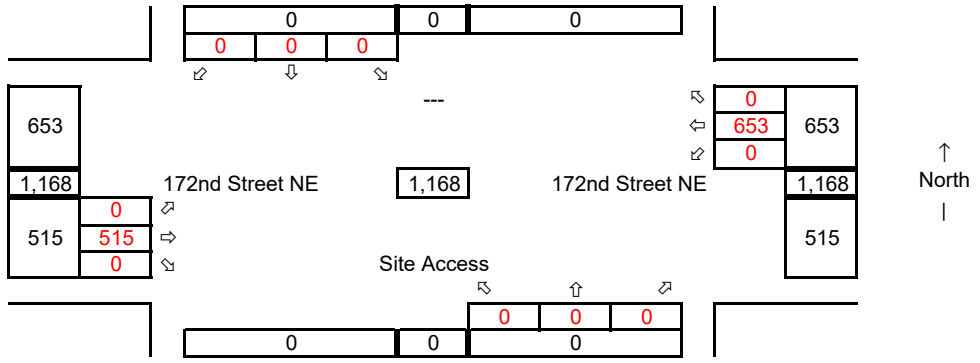
Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG

Based on counts for
intersection of 172nd Street NE
at 23rd Avenue NE.



Future without Development

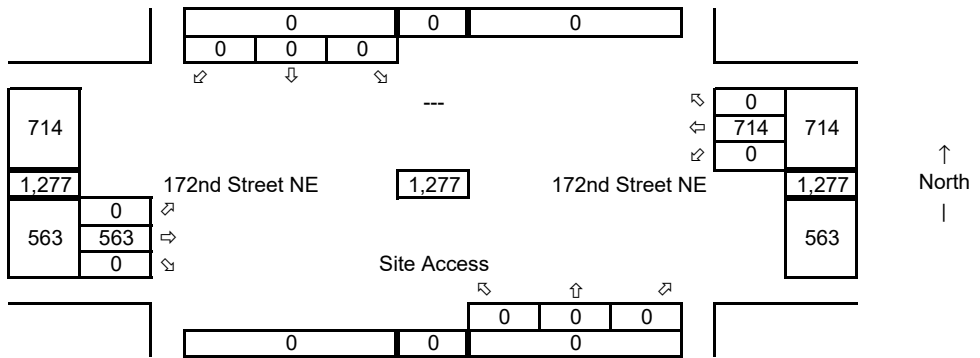
Average Weekday
PM Peak Hour

Year: 2025

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



Synchro ID: 14

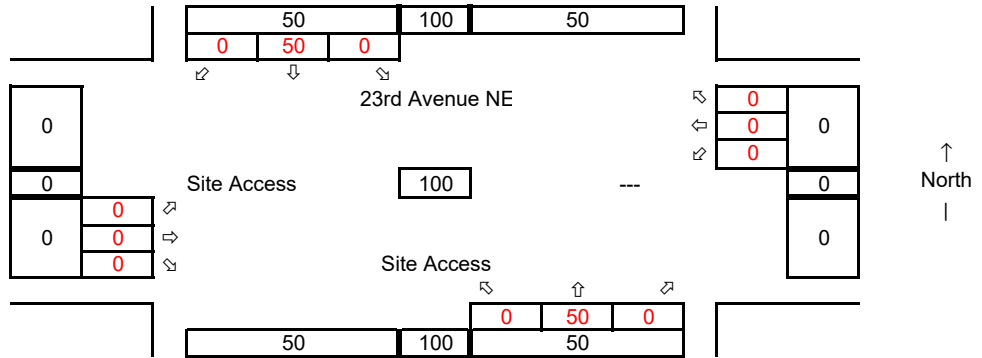
Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG

Based on counts for
intersection of 172nd Street NE
at 23rd Avenue NE.



Future without Development

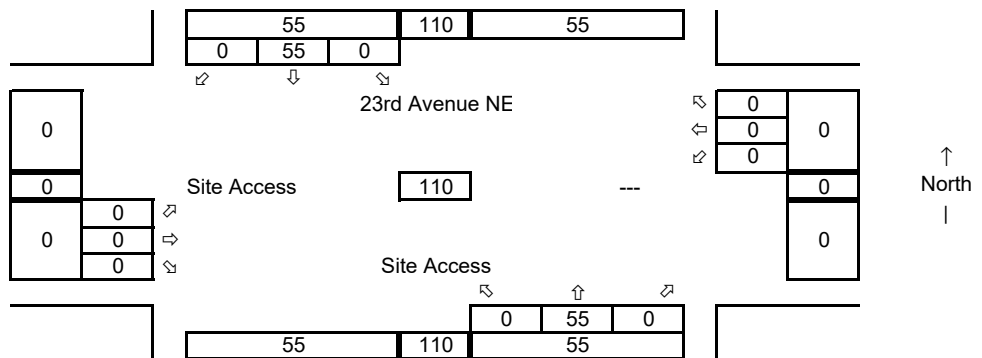
Average Weekday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

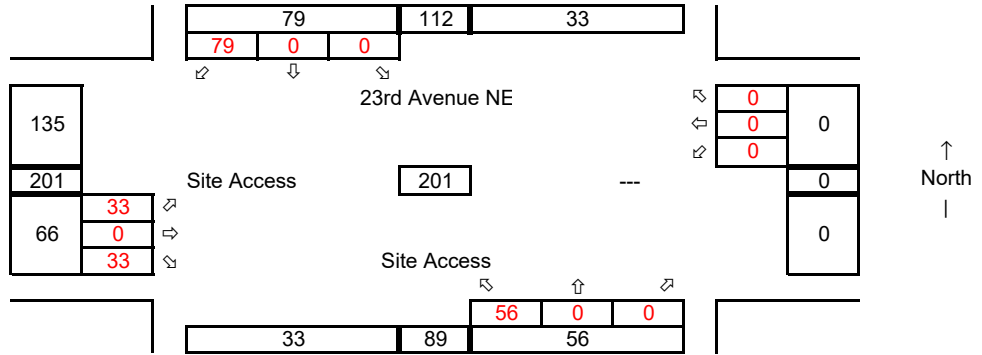
Years of Growth = 3

Total Growth = 1.0927



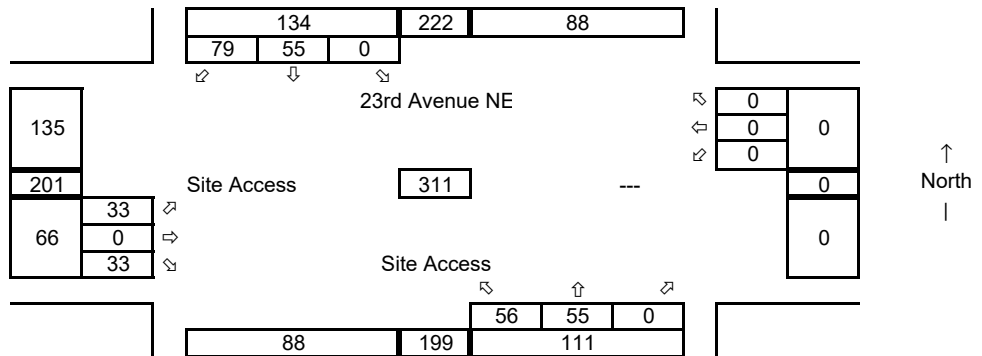
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



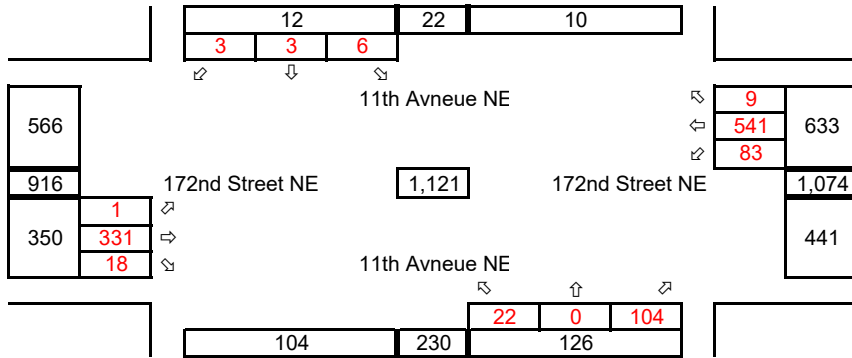
Synchro ID: 1

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



↑ North
|

Future without Development

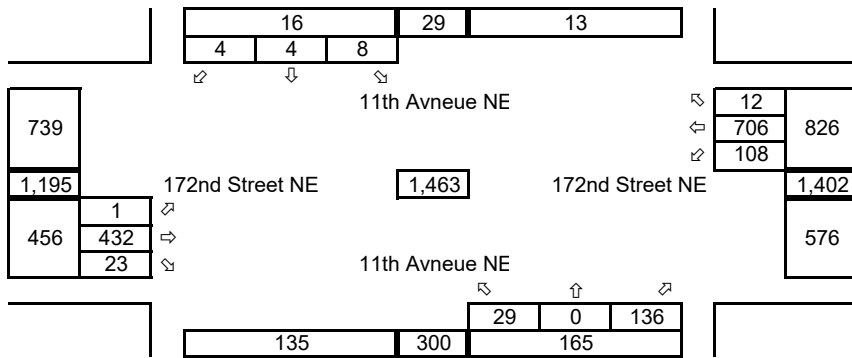
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

Years of Growth = 9

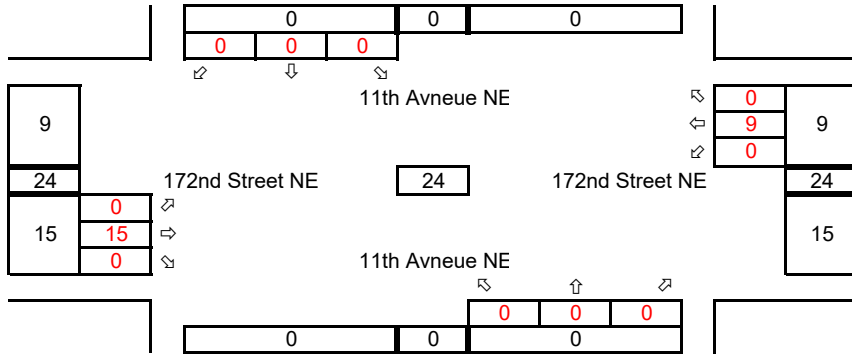
Total Growth = 1.3048



↑ North
|

Total Development Trips

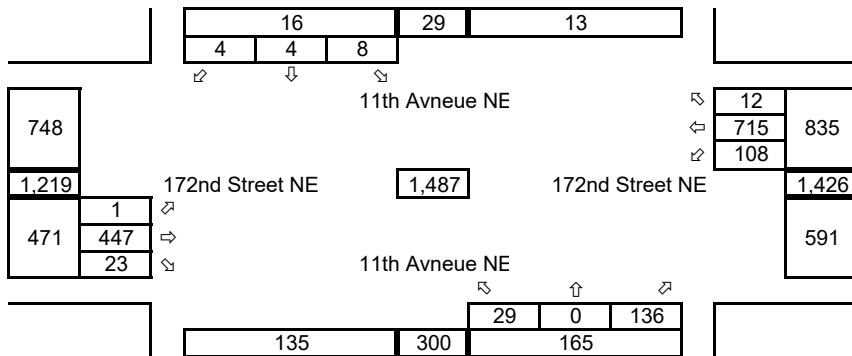
Average Weekday
PM Peak Hour



↑ North
|

Future with Development

Average Weekday
PM Peak Hour



↑ North
|

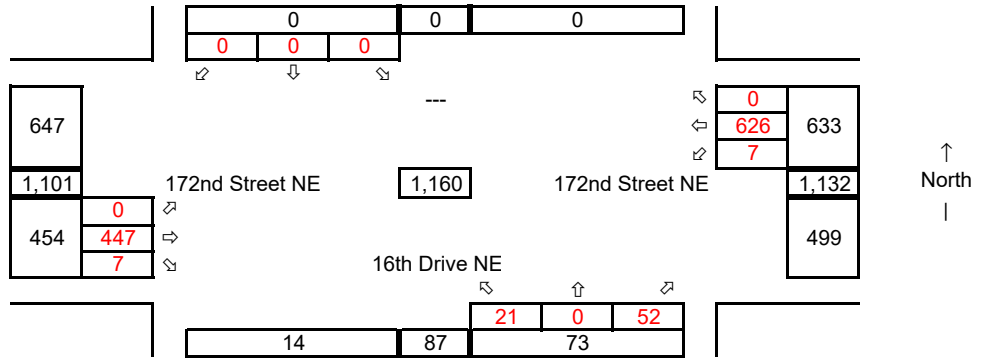
Synchro ID: 2

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

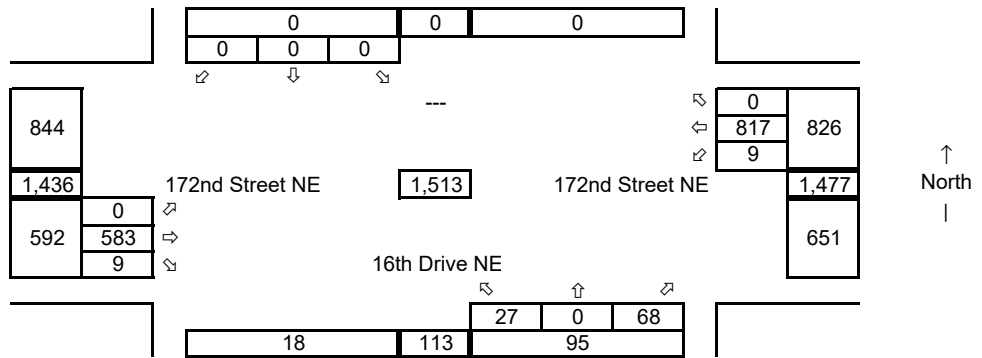
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

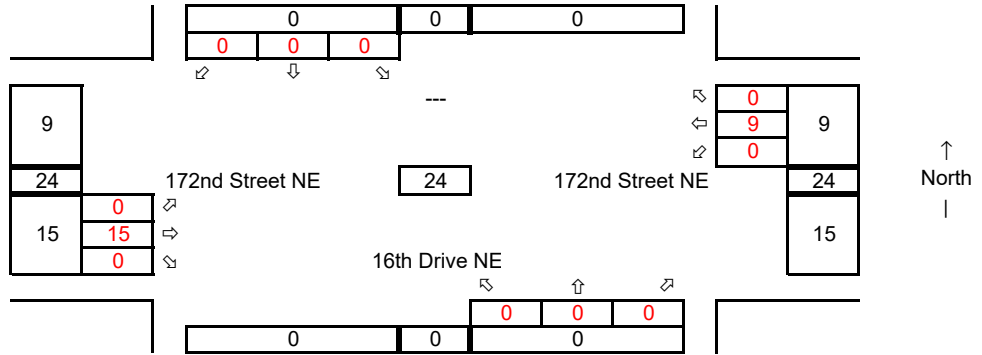
Years of Growth = 9

Total Growth = 1.3048



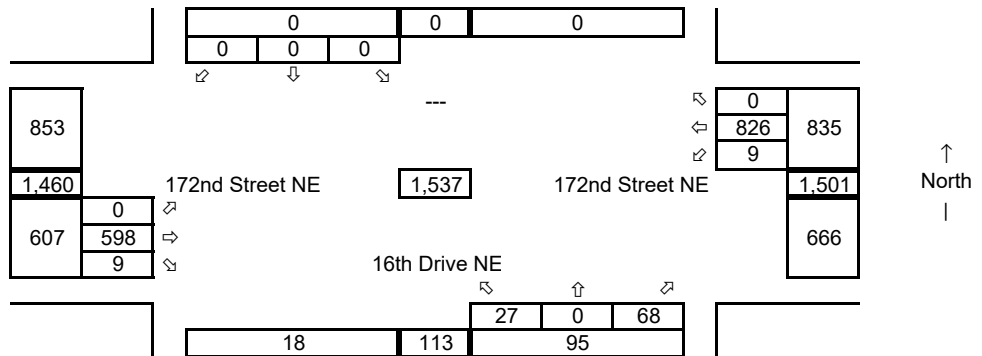
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



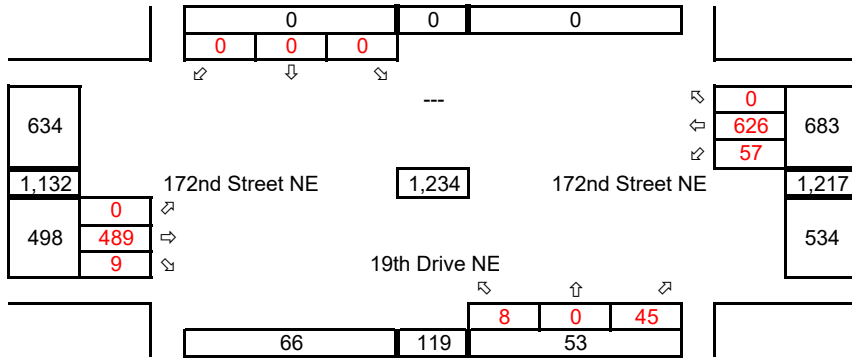
Synchro ID: 3

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

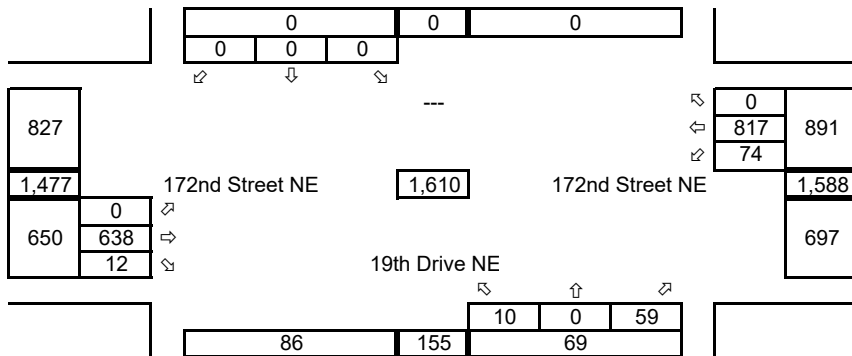
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

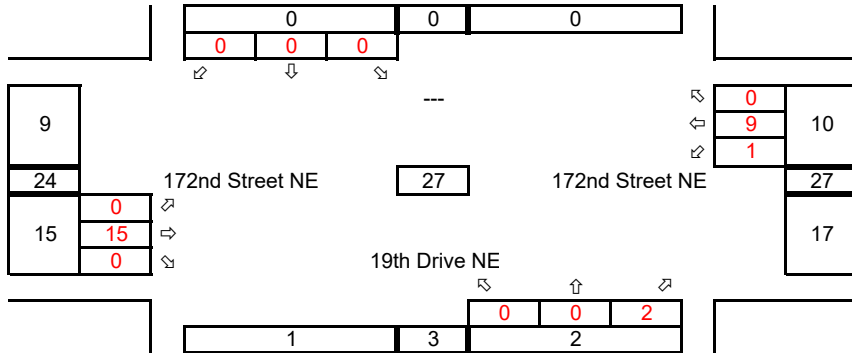
Years of Growth = 9

Total Growth = 1.3048



Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



Horizon Year

4 172nd St NE at 19th Ave NE

Weekday PM Peak-Hour

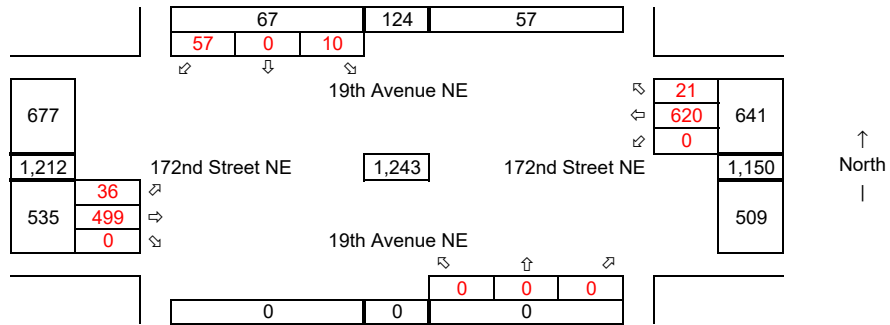
Synchro ID: 4

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: **TDG**



Future without Development

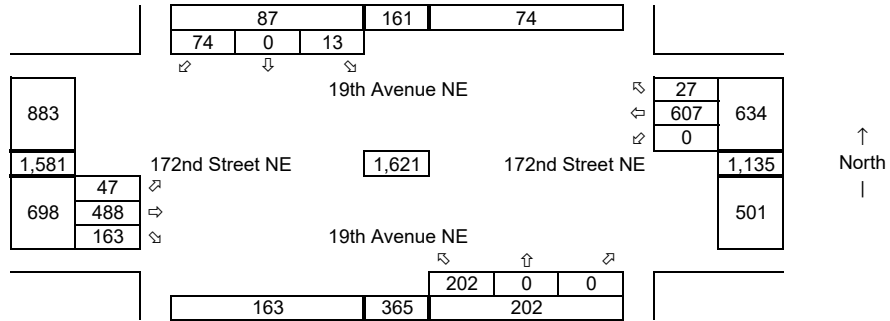
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

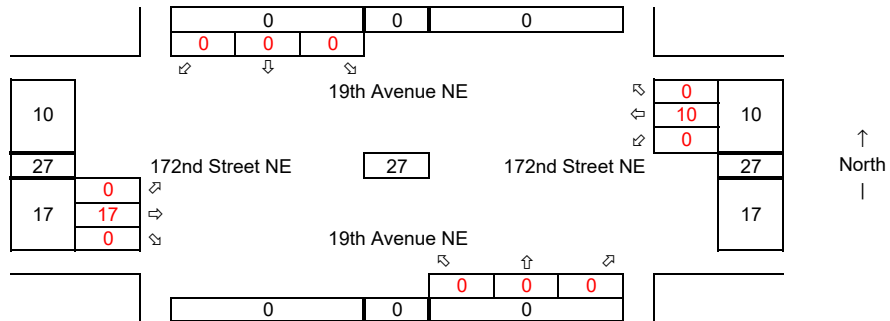
Years of Growth = 9

Total Growth = 1.3048



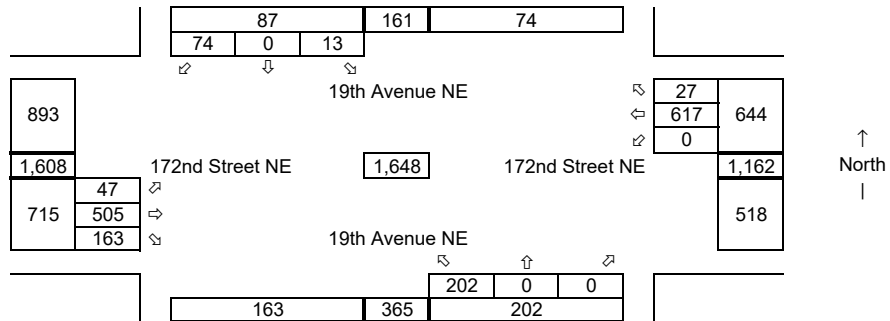
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

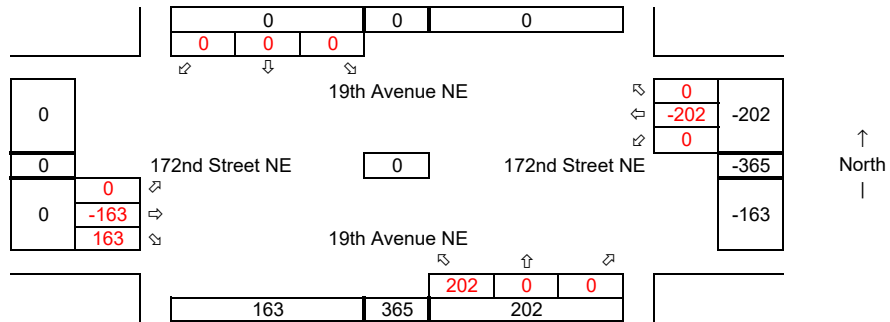
Average Weekday
PM Peak Hour



Future Connection Adjustment

Average Weekday
PM Peak Hour

Reduction: 25%



Horizon Year

5 172nd St NE at 23rd Ave NE

Weekday PM Peak-Hour

Synchro ID: 5

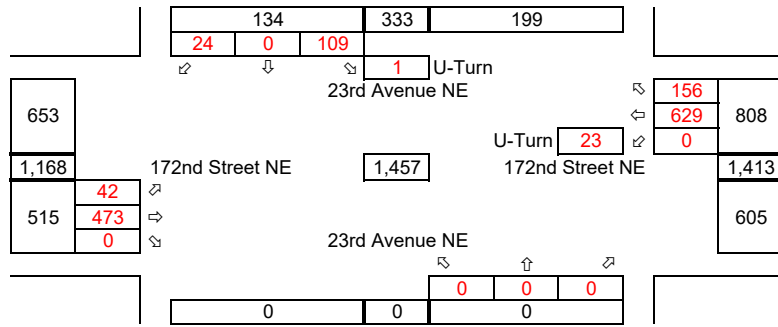
Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: **TDG**

The existing volume on the south leg is construction traffic and has not been included in the existing analysis.



↑
North
↓

Future without Development

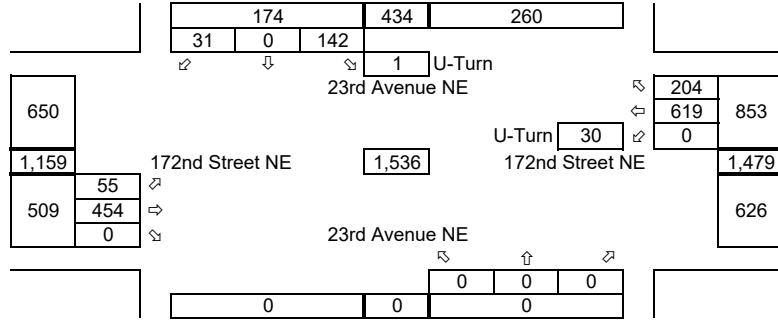
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

Years of Growth = 9

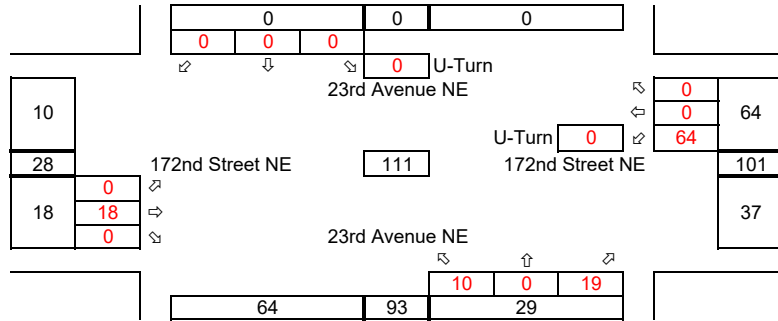
Total Growth = 1.3048



↑
North
↓

Total Development Trips

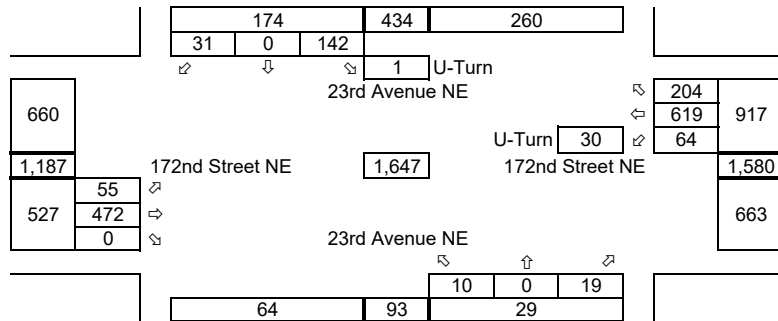
Average Weekday
PM Peak Hour



↑
North
↓

Future with Development

Average Weekday
PM Peak Hour

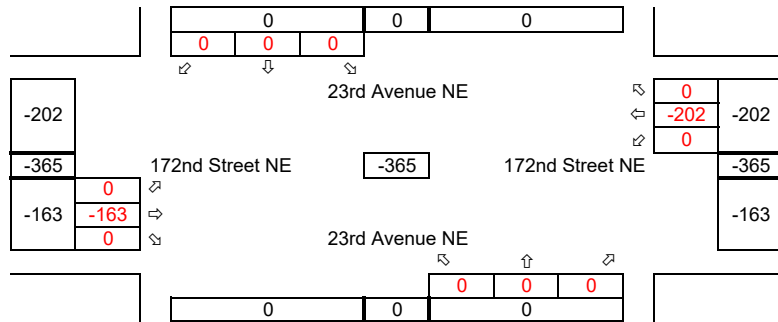


↑
North
↓

Future Connection Adjustment

Average Weekday
PM Peak Hour

Reduction: 25%



↑
North
↓

Horizon Year

6 172nd St NE at 27th Ave NE

Weekday PM Peak-Hour

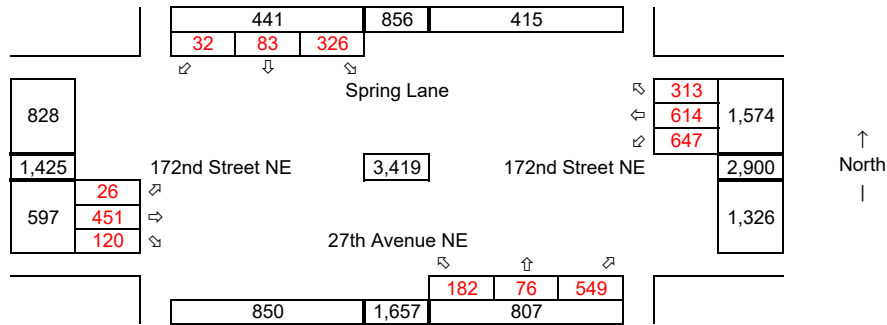
Synchro ID: 6

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: **TDG**



Future without Development

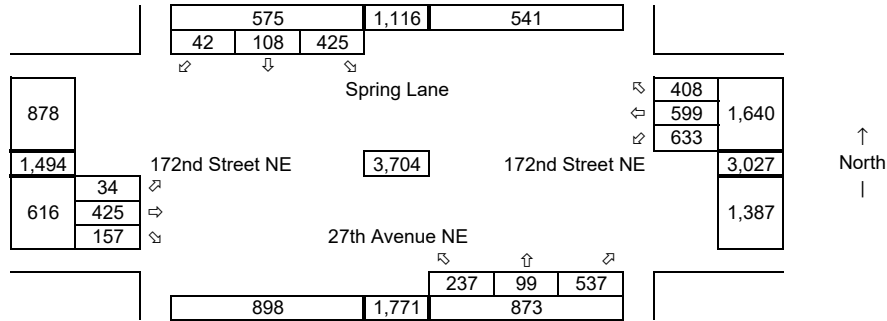
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

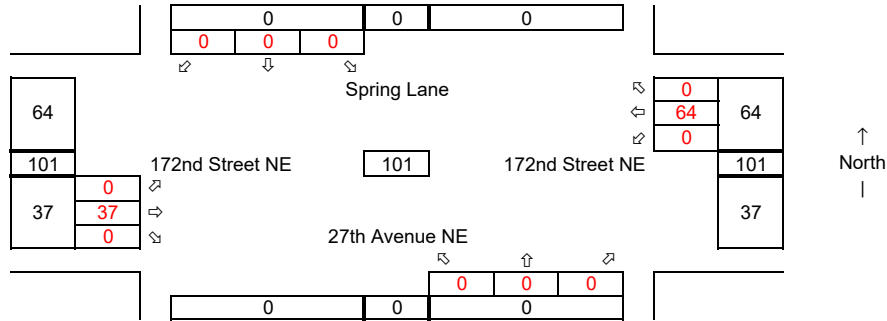
Years of Growth = 9

Total Growth = 1.3048



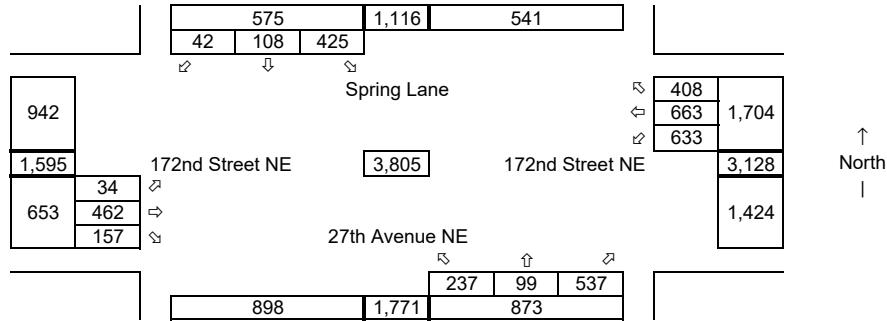
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

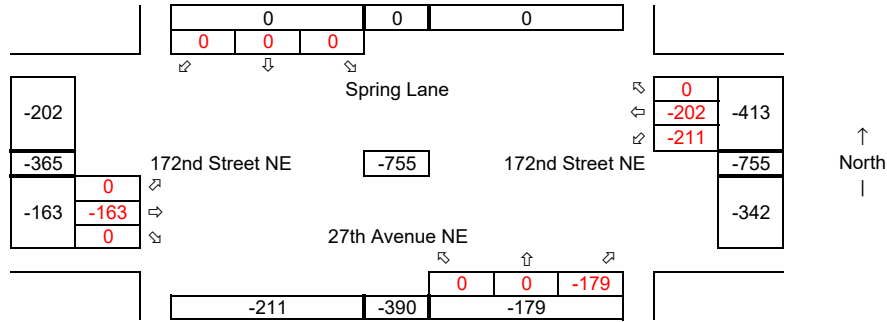
Average Weekday
PM Peak Hour



Future Connection Adjustment

Average Weekday
PM Peak Hour

Reduction: 25%



Horizon Year

7 172nd St NE at I-5 SB Ramps

Weekday PM Peak-Hour

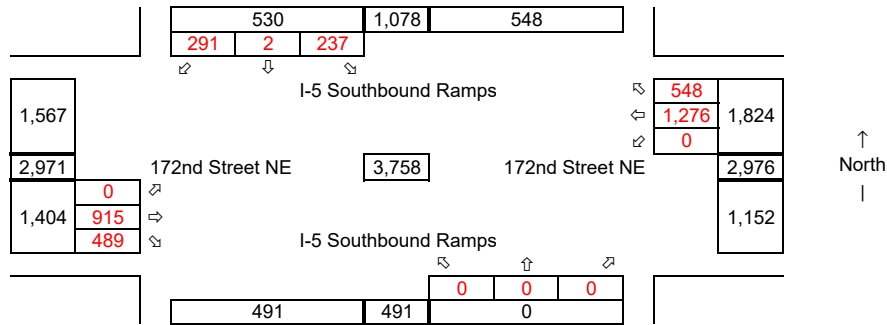
Synchro ID: 7

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: **TDG**



Future without Development

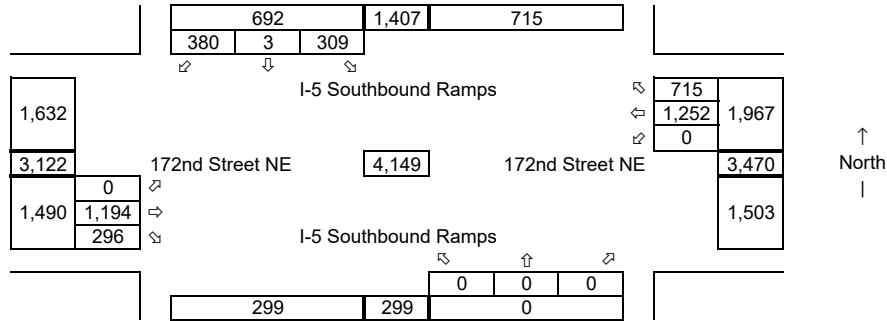
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

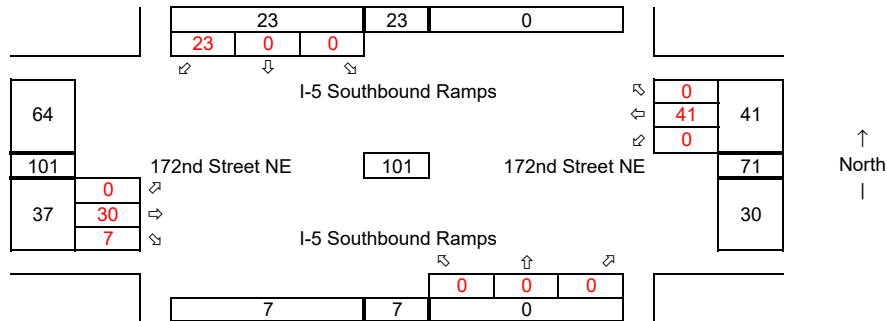
Years of Growth = 9

Total Growth = 1.3048



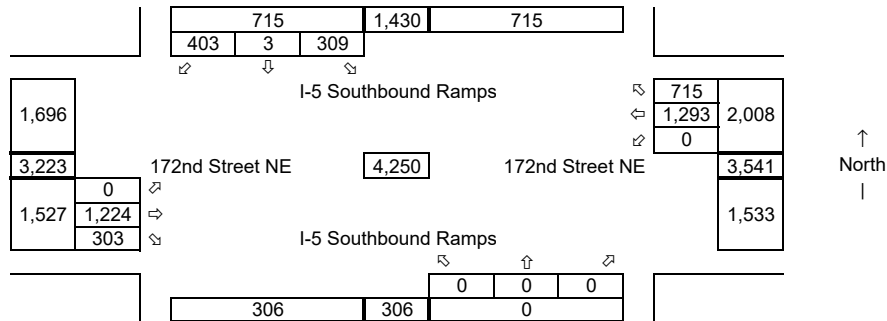
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

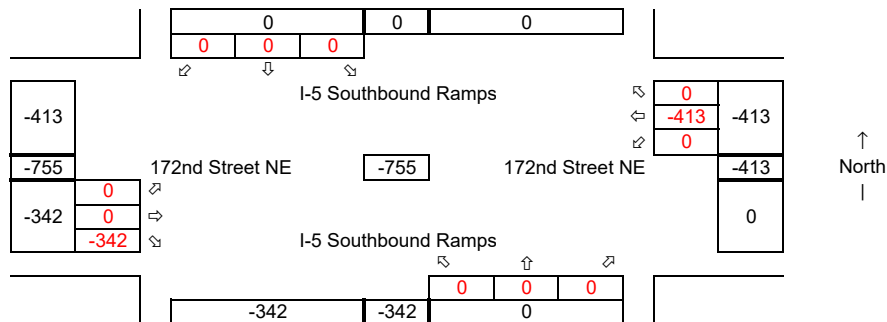
Average Weekday
PM Peak Hour



Future Connection Adjustment

Average Weekday
PM Peak Hour

Reduction: 25%



Horizon Year

8 172nd St NE at I-5 NB Ramps

Weekday PM Peak-Hour

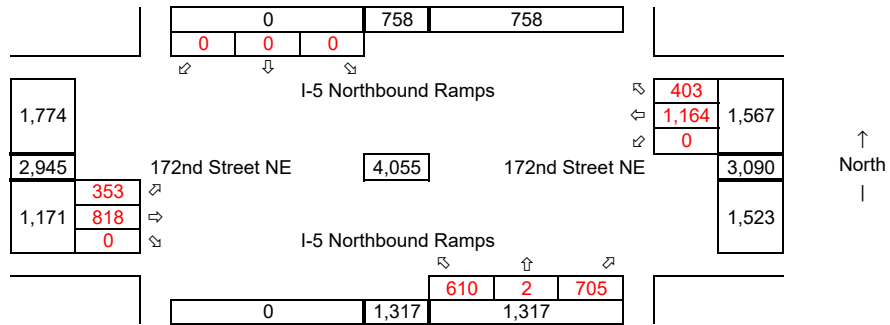
Synchro ID: 8

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: **TDG**



Future without Development

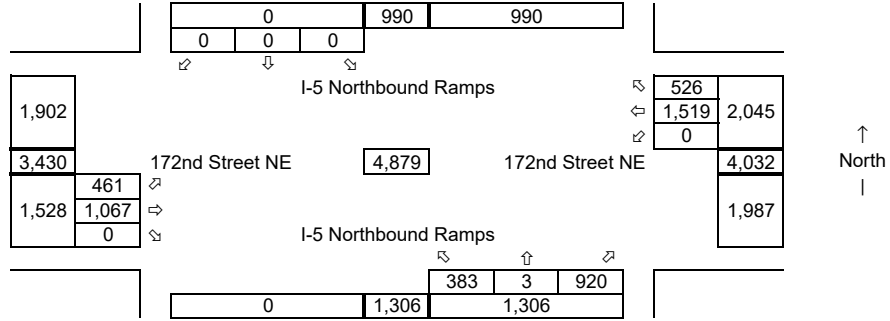
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

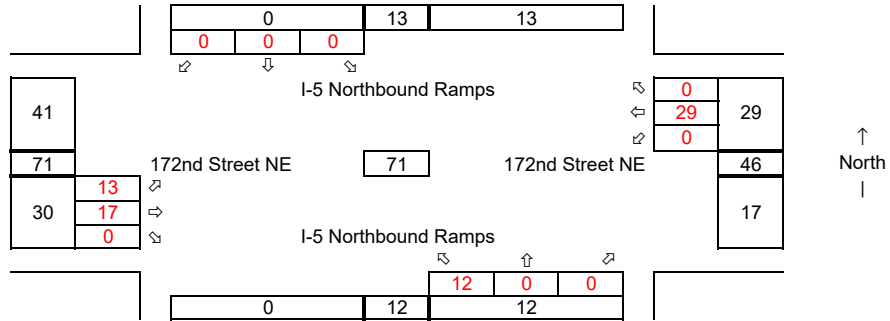
Years of Growth = 9

Total Growth = 1.3048



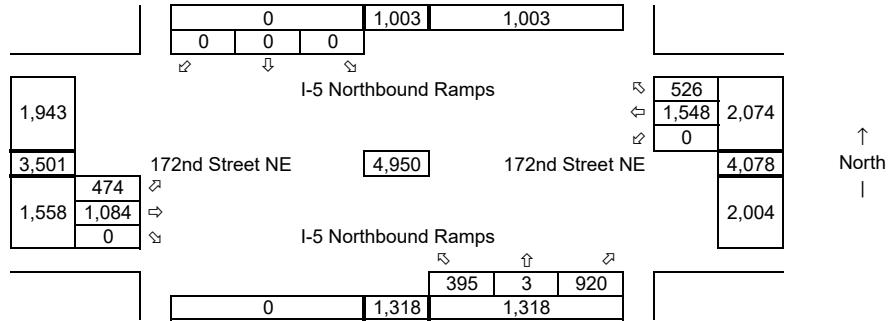
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

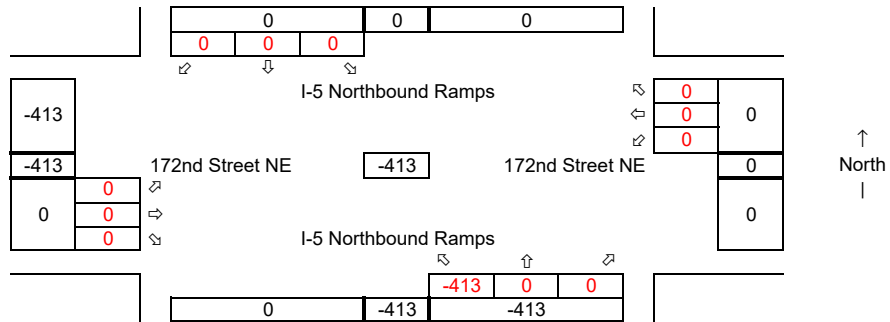
Average Weekday
PM Peak Hour



Future Connection Adjustment

Average Weekday
PM Peak Hour

Reduction: 25%

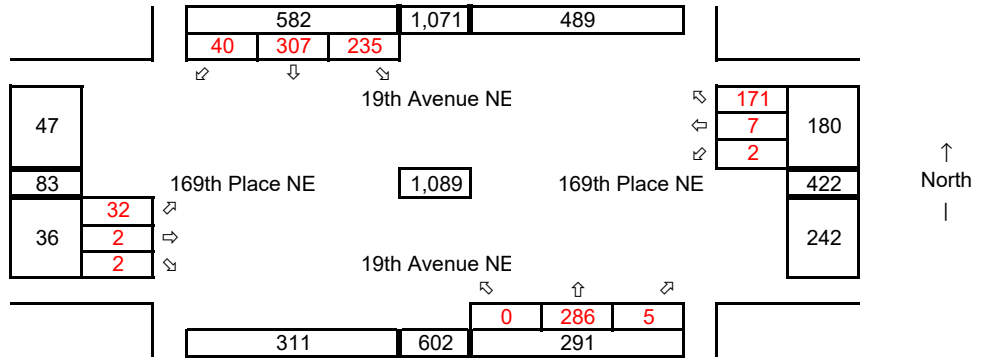


Synchro ID: 9

Existing
Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

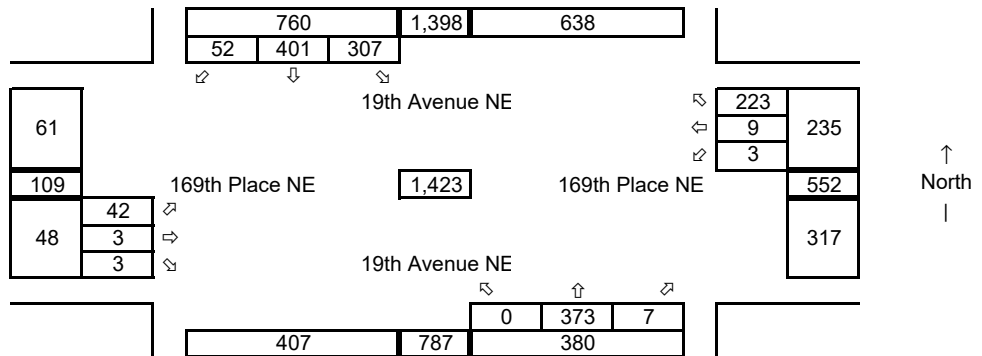
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

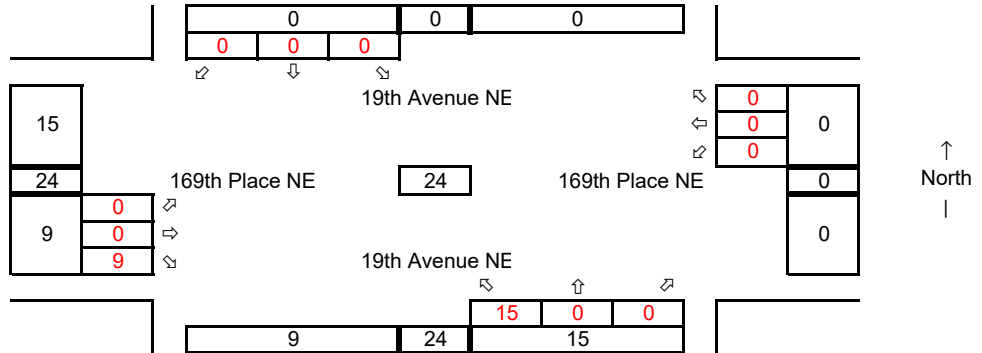
Years of Growth = 9

Total Growth = 1.3048



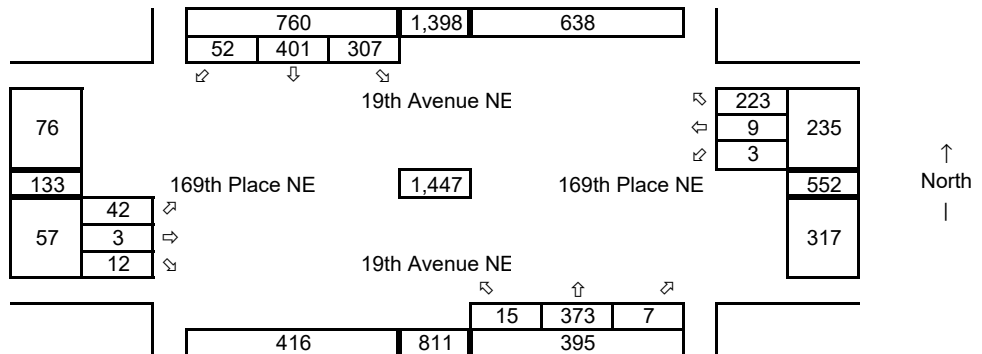
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour

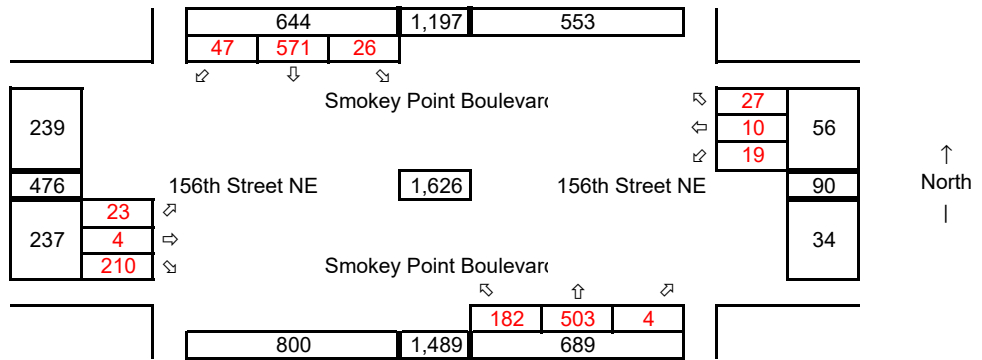


Synchro ID: 10

Existing
Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

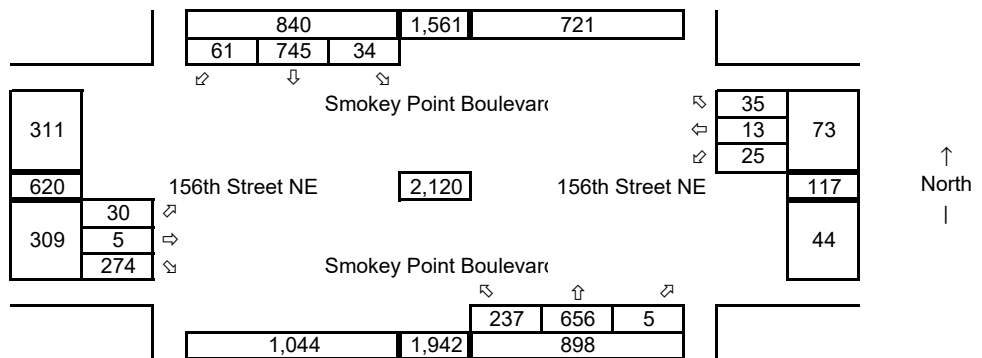
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

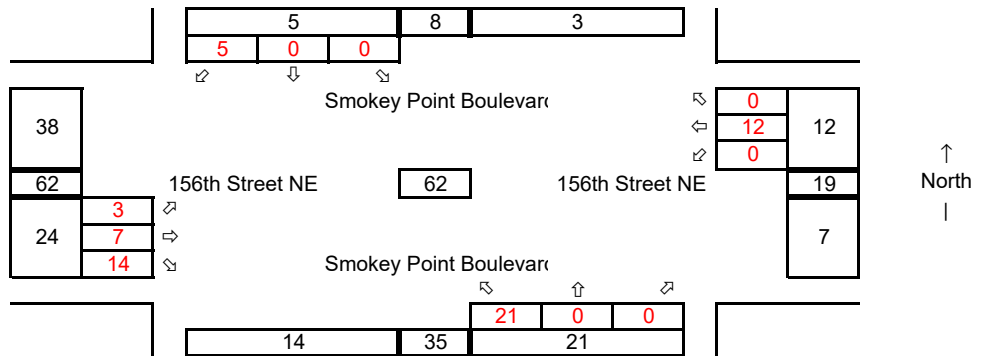
Years of Growth = 9

Total Growth = 1.3048



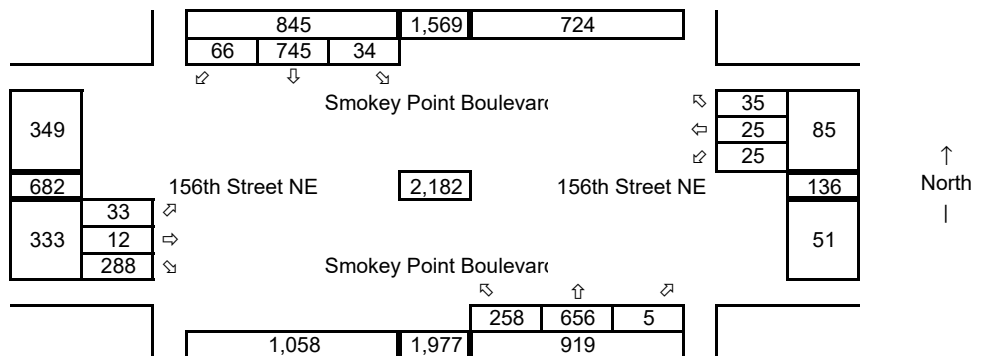
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



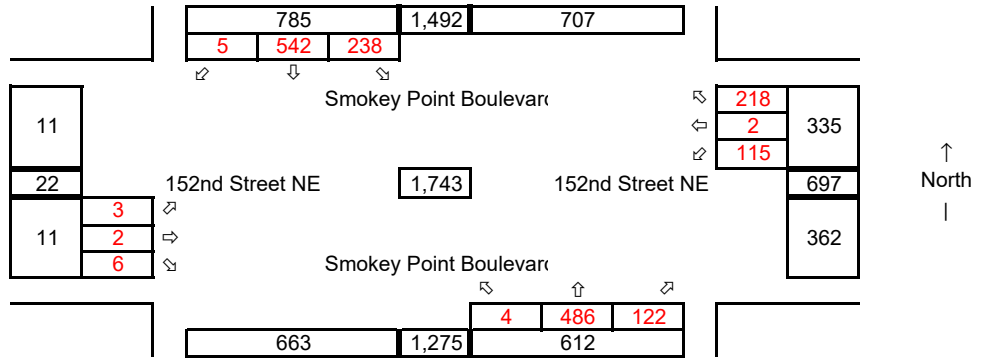
Synchro ID: 11

Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

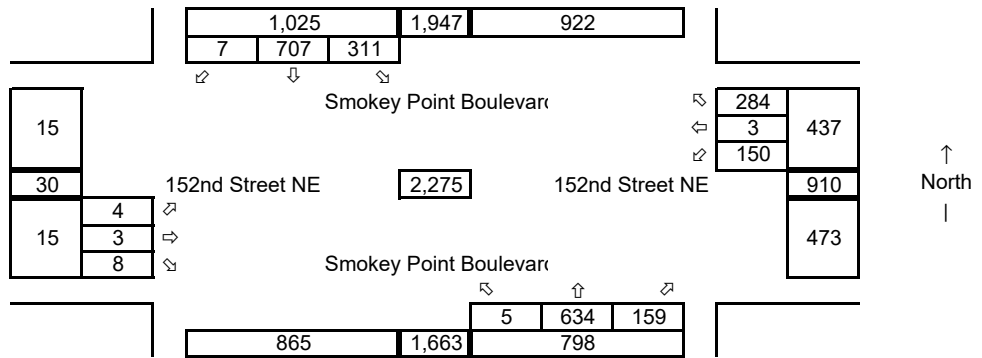
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

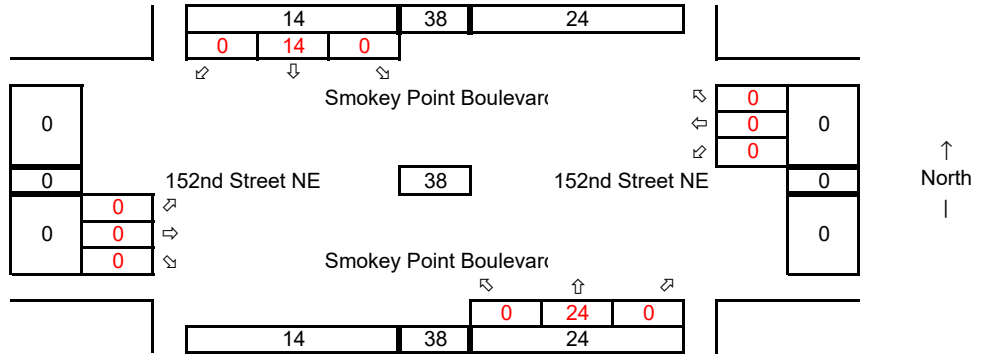
Years of Growth = 9

Total Growth = 1.3048



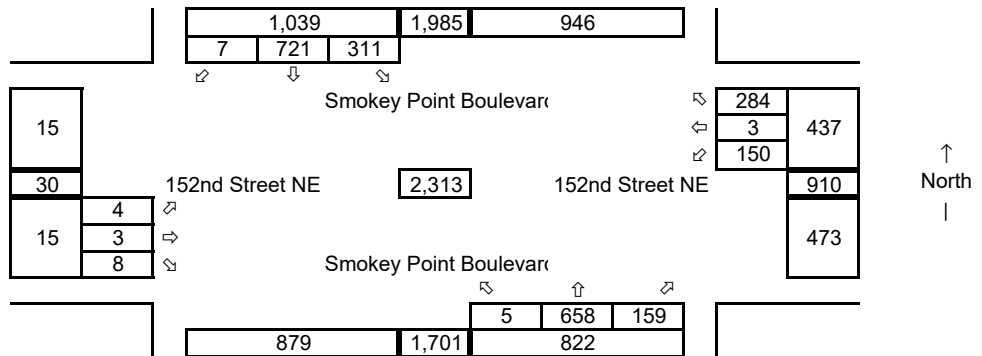
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour

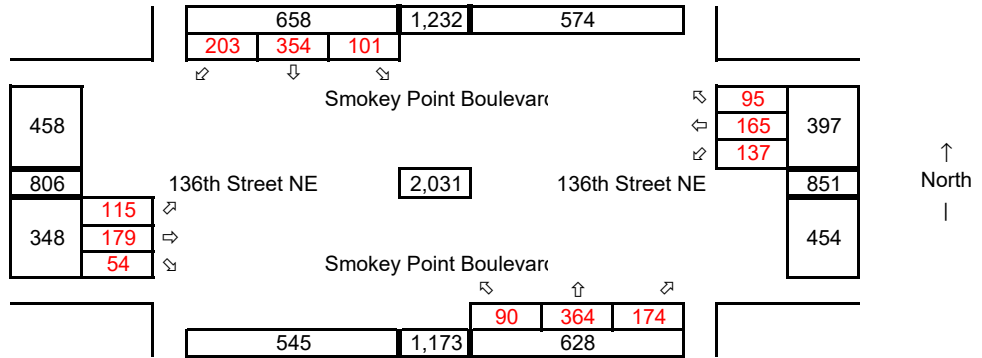


Synchro ID: 12

Existing
Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG



Future without Development

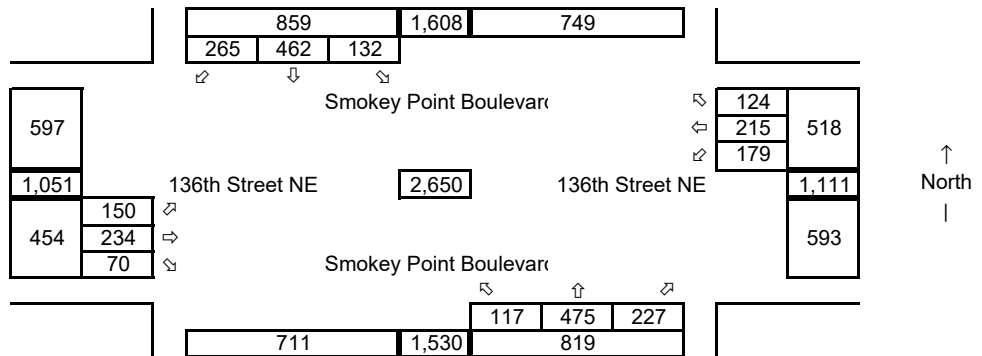
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

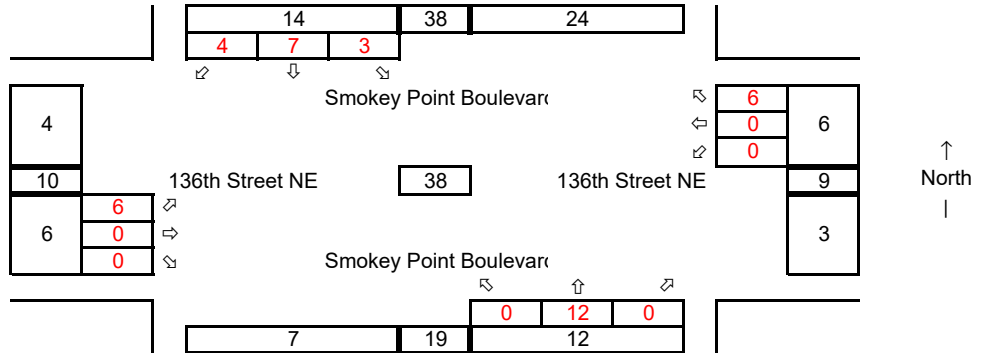
Years of Growth = 9

Total Growth = 1.3048



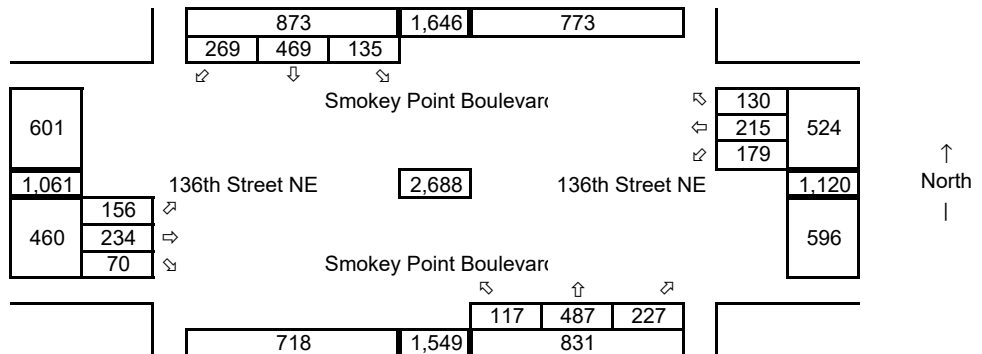
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



Synchro ID: 13

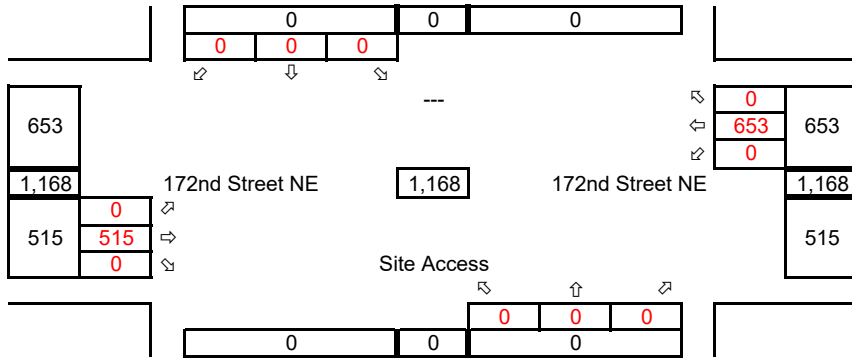
Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG

Based on counts for
intersection of 172nd Street NE
at 23rd Avenue NE.



Future without Development

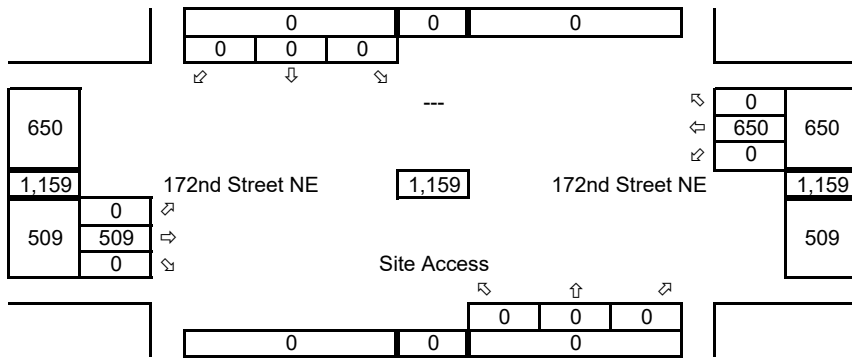
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

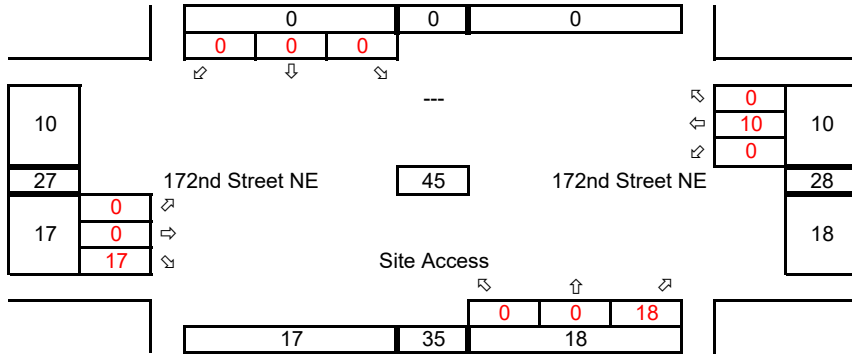
Years of Growth = 9

Total Growth = 1.3048



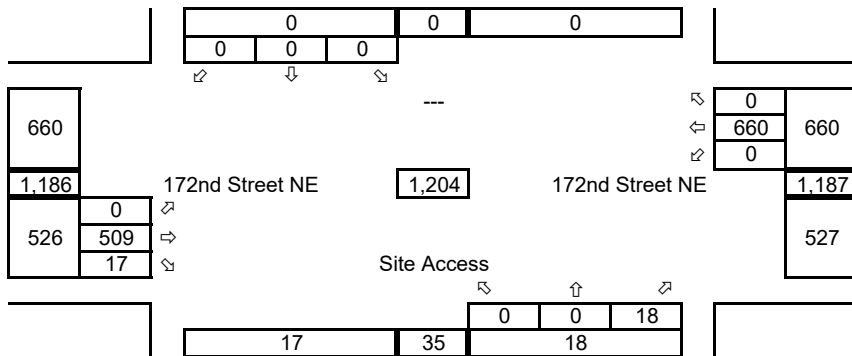
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



Synchro ID: 14

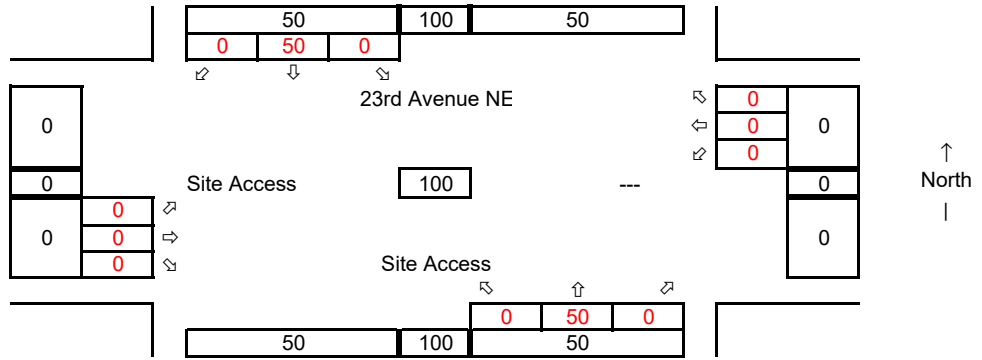
Existing

Average Weekday
PM Peak-Hour

Year: 1/12/2022

Data Source: TDG

Based on counts for
intersection of 172nd Street NE
at 23rd Avenue NE.



Future without Development

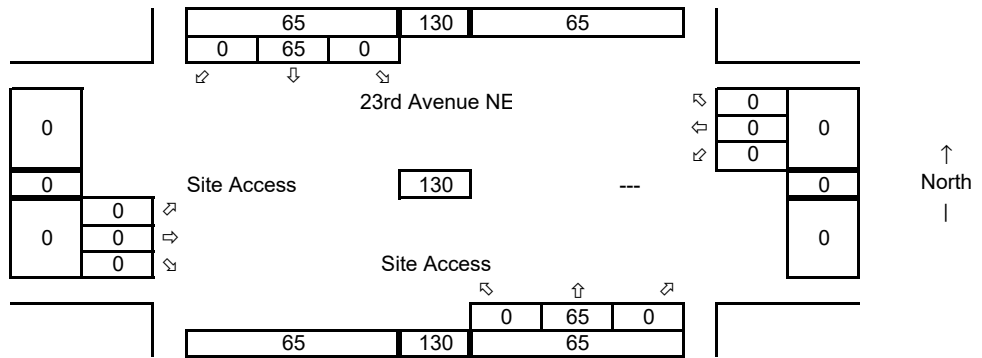
Average Weekday
PM Peak Hour

Year: 2031

Growth Rate = 3.0%

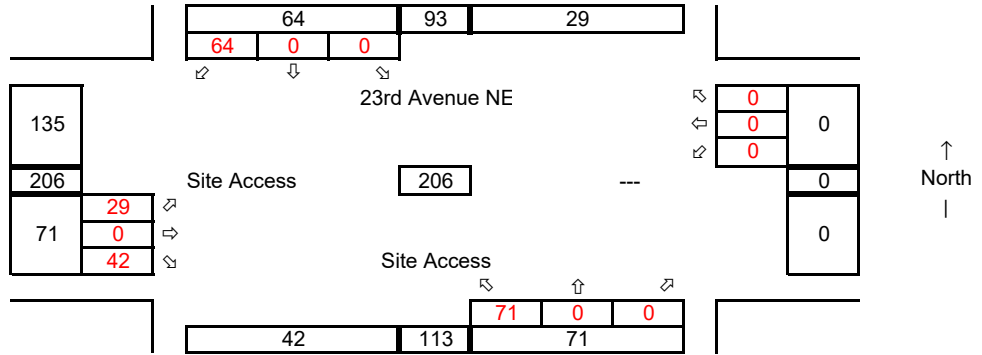
Years of Growth = 9

Total Growth = 1.3048



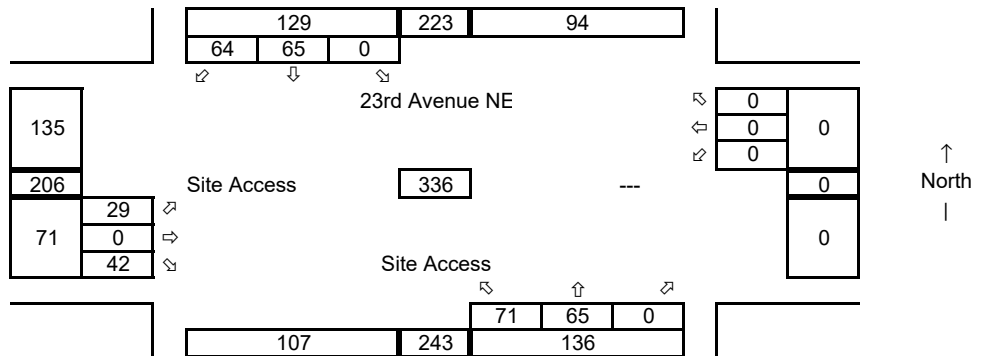
Total Development Trips

Average Weekday
PM Peak Hour



Future with Development

Average Weekday
PM Peak Hour



Saturday Peak-Hour Turning Movement Calculations

Opening Year

6 27th Ave NE at 172nd St NE

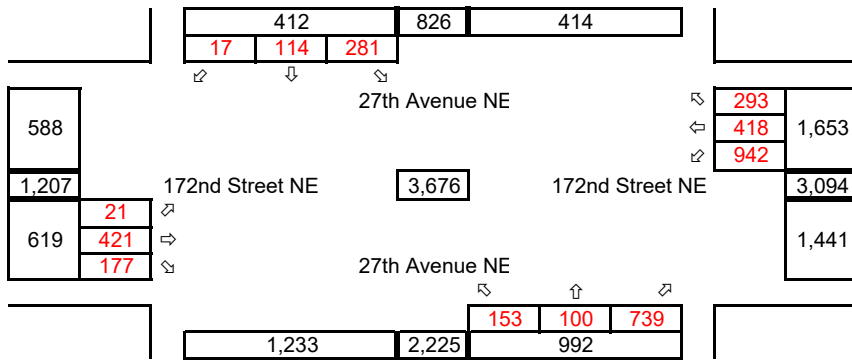
Saturday Peak-Hour

Synchro ID: 6

Existing
Saturday
Peak-Hour

Year: 2/19/2022

Data Source: TDG



↑ North
|

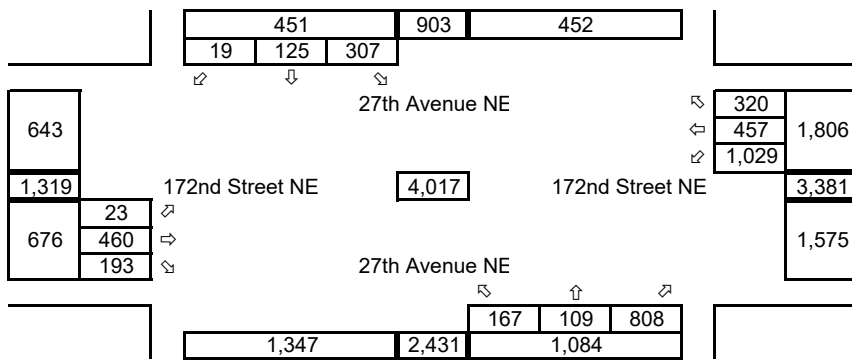
Future without Development
Saturday
PM Peak Hour

Year: 2025

Growth Rate = 3.0%

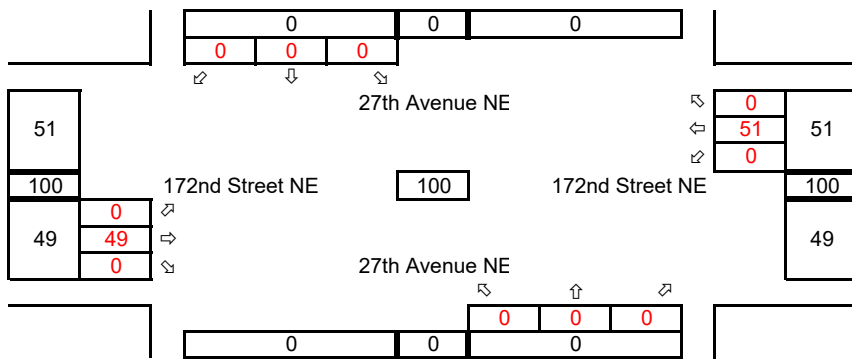
Years of Growth = 3

Total Growth = 1.0927



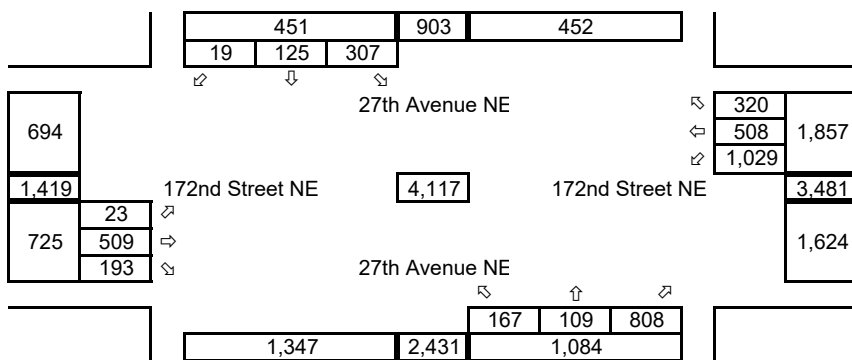
↑ North
|

Total Development Trips
Saturday
PM Peak Hour



↑ North
|

Future with Development
Saturday
PM Peak Hour



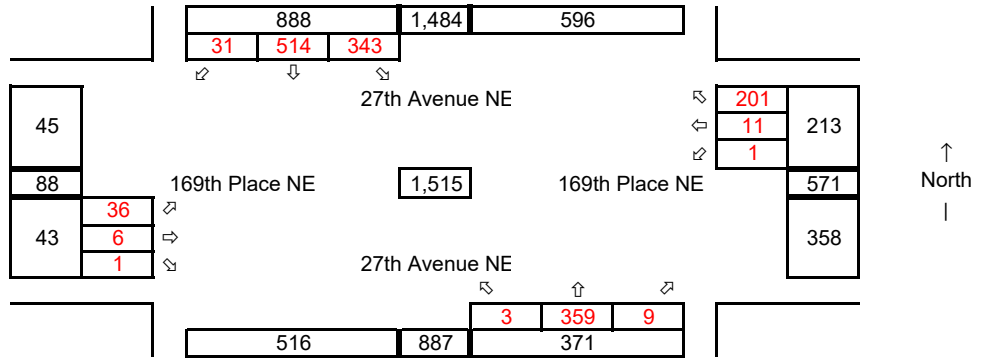
↑ North
|

Synchro ID: 9

Existing
Saturday
Peak-Hour

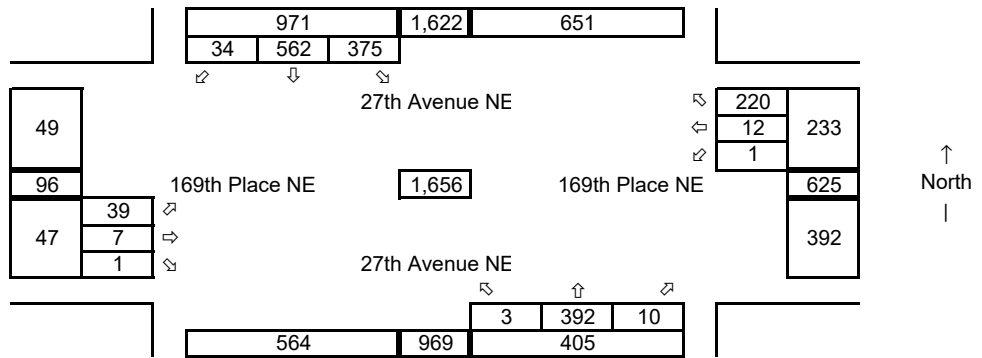
Year: 3/5/2022

Data Source: TDG

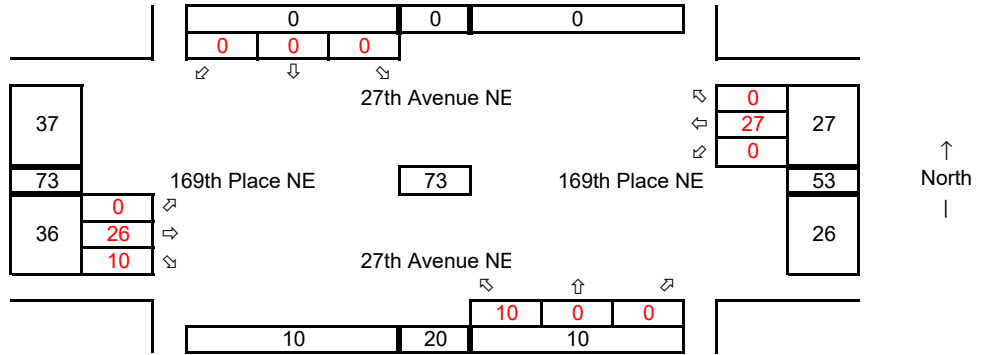


Future without Development
Saturday
PM Peak Hour

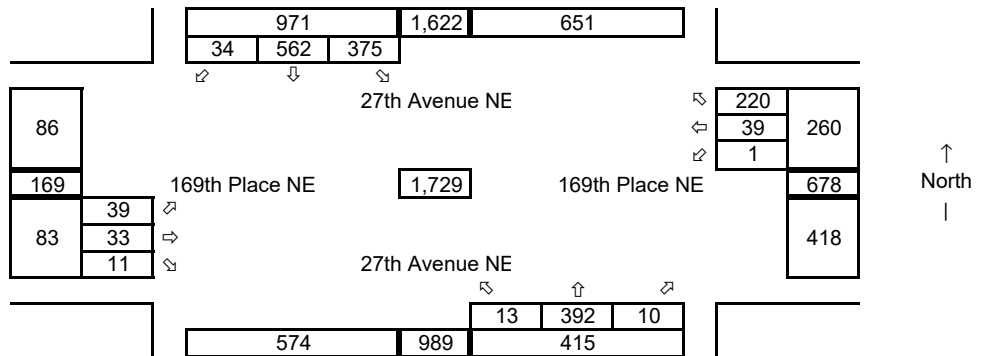
Year: 2025
Growth Rate = 3.0%
Years of Growth = 3
Total Growth = 1.0927



Total Development Trips
Saturday
PM Peak Hour



Future with Development
Saturday
PM Peak Hour



Horizon Year

6 27th Ave NE at 172nd St NE

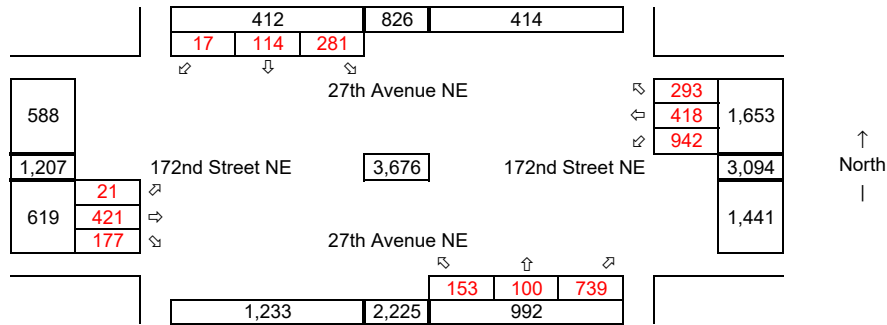
Saturday Peak-Hour

Synchro ID: 6

Existing
Saturday
Peak-Hour

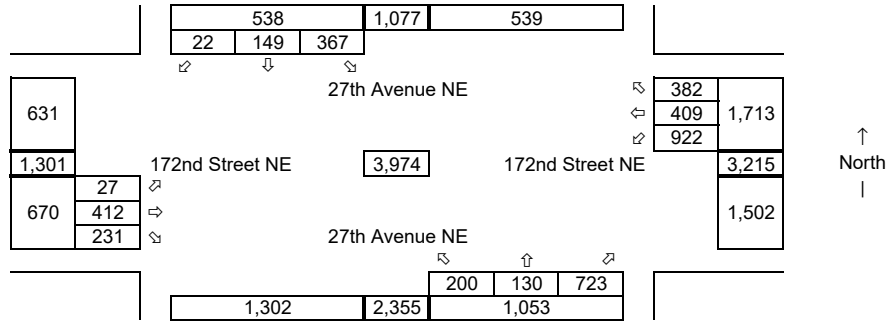
Year: **2/19/2022**

Data Source: **TDG**

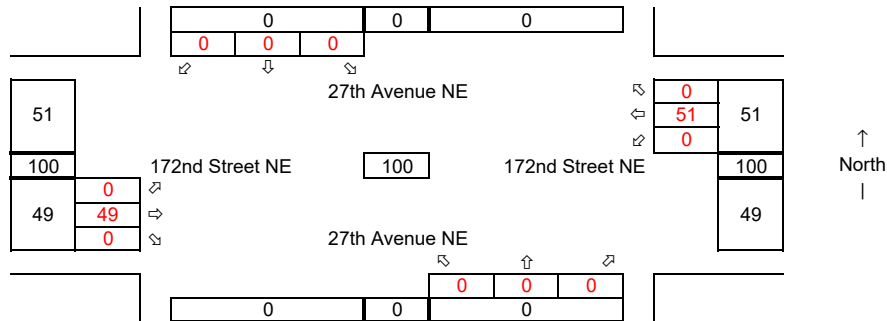


Future without Development
Saturday
PM Peak Hour

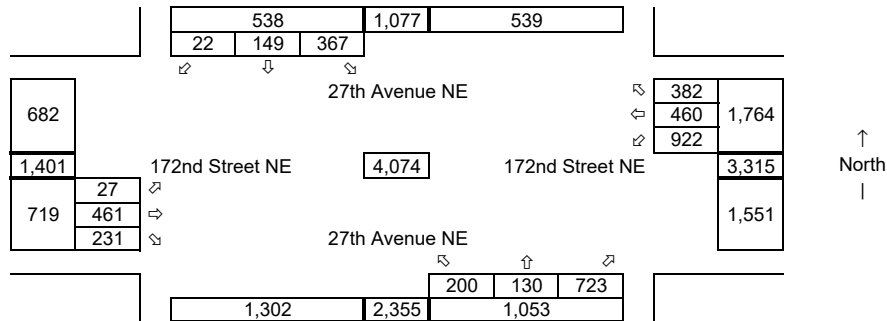
Year: **2031**
Growth Rate = **3.0%**
Years of Growth = **9**
Total Growth = **1.3048**



Total Development Trips
Saturday
PM Peak Hour

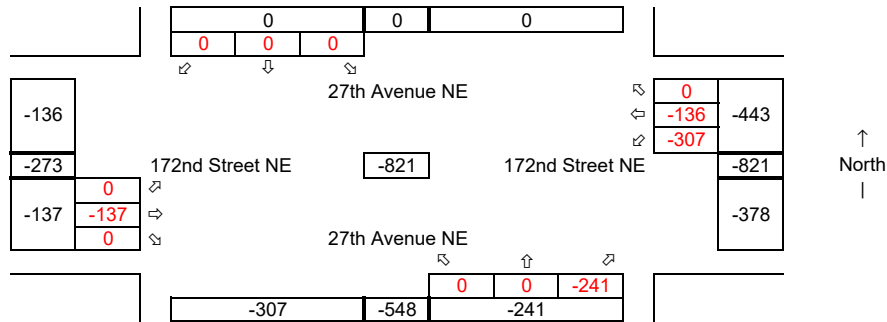


Future with Development
Saturday
PM Peak Hour



Diversion Trips
Saturday
PM Peak Hour

Reduction: **25%**

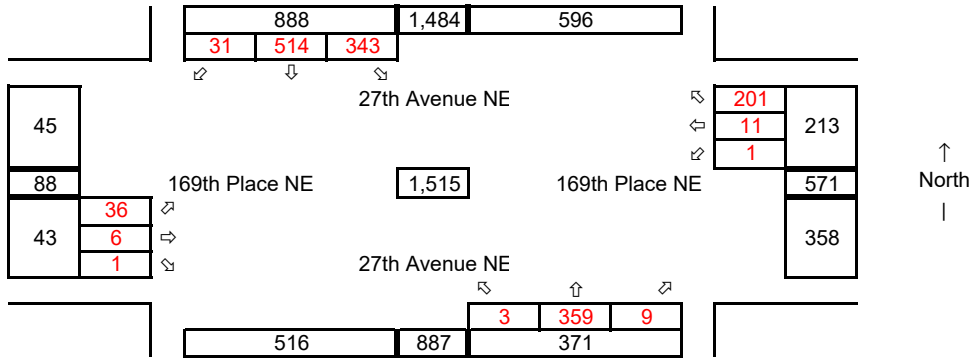


Synchro ID: 9

Existing
Saturday
Peak-Hour

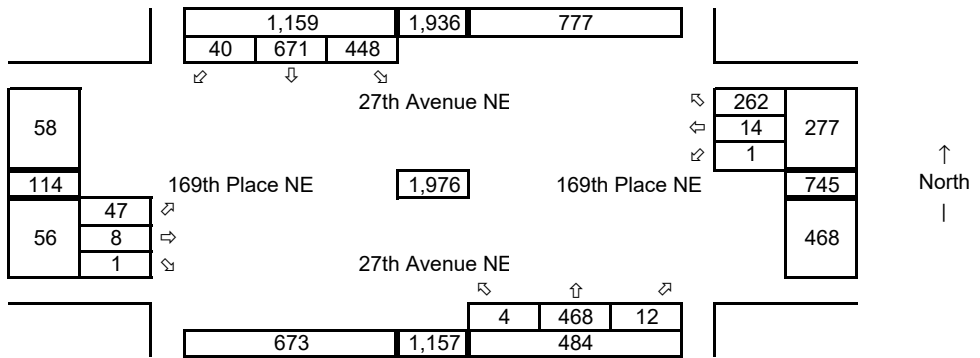
Year: 3/5/2022

Data Source: TDG

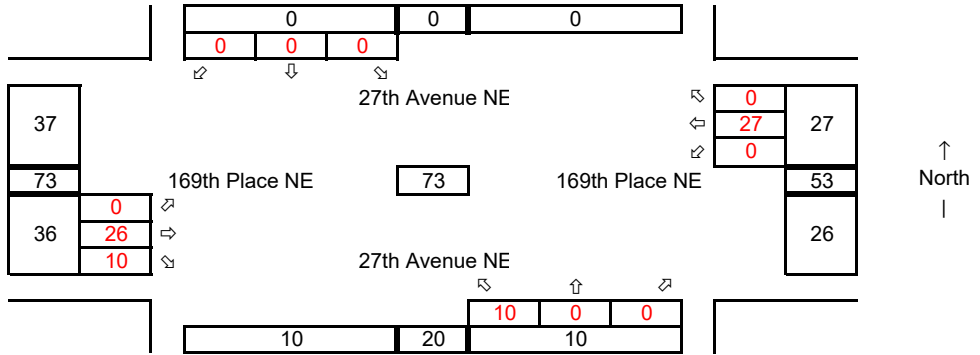


Future without Development
Saturday
PM Peak Hour

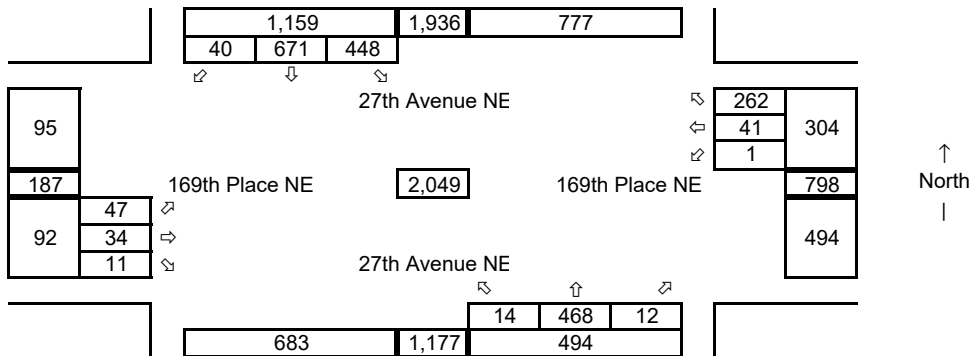
Year: 2031
Growth Rate = 3.0%
Years of Growth = 9
Total Growth = 1.3048



Total Development Trips
Saturday
PM Peak Hour



Future with Development
Saturday
PM Peak Hour



Weekday PM Peak-Hour Level of Service Calculations

HCM 6th TWSC
 1: 11th Avenue NE & 172nd Street NE

2022 Existing Conditions

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	1	331	18	83	541	9	22	0	104	6	3	3
Future Vol, veh/h	1	331	18	83	541	9	22	0	104	6	3	3
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	-	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	360	20	90	588	10	24	0	113	7	3	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	598	0	0	380	0	0	1148	1150	370	1202	1155	593
Stage 1	-	-	-	-	-	-	372	372	-	773	773	-
Stage 2	-	-	-	-	-	-	776	778	-	429	382	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	979	-	-	1178	-	-	176	198	676	161	197	506
Stage 1	-	-	-	-	-	-	648	619	-	392	409	-
Stage 2	-	-	-	-	-	-	390	407	-	604	613	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	979	-	-	1178	-	-	162	183	676	126	182	506
Mov Cap-2 Maneuver	-	-	-	-	-	-	162	183	-	126	182	-
Stage 1	-	-	-	-	-	-	647	618	-	392	378	-
Stage 2	-	-	-	-	-	-	355	376	-	502	612	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.1	17	27.8
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	435	979	-	-	1178	-	-	171
HCM Lane V/C Ratio	0.315	0.001	-	-	0.077	-	-	0.076
HCM Control Delay (s)	17	8.7	0	-	8.3	-	-	27.8
HCM Lane LOS	C	A	A	-	A	-	-	D
HCM 95th %tile Q(veh)	1.3	0	-	-	0.2	-	-	0.2

HCM 6th TWSC
2: 16th Drive NE & 172nd Street NE

2022 Existing Conditions

Intersection

Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	447	7	7	626	21	52
Future Vol, veh/h	447	7	7	626	21	52
Conflicting Peds, #/hr	0	3	3	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	481	8	8	673	23	56

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	492	0	1177
Stage 1	-	-	-	-	488
Stage 2	-	-	-	-	689
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1071	-	211
Stage 1	-	-	-	-	617
Stage 2	-	-	-	-	498
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1068	-	209
Mov Cap-2 Maneuver	-	-	-	-	344
Stage 1	-	-	-	-	615
Stage 2	-	-	-	-	495

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	483	-	-	1068	-
HCM Lane V/C Ratio	0.163	-	-	0.007	-
HCM Control Delay (s)	13.9	-	-	8.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0	-

HCM 6th TWSC
 3: 19th Drive NE & 172nd Street NE

2022 Existing Conditions

Intersection

Int Delay, s/veh	1.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	489	9	57	626	8	45
Future Vol, veh/h	489	9	57	626	8	45
Conflicting Peds, #/hr	0	9	9	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	532	10	62	680	9	49

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	551	0	1350
Stage 1	-	-	-	-	546
Stage 2	-	-	-	-	804
Critical Hdwy	-	-	4.13	-	6.43
Critical Hdwy Stg 1	-	-	-	-	5.43
Critical Hdwy Stg 2	-	-	-	-	5.43
Follow-up Hdwy	-	-	2.227	-	3.527
Pot Cap-1 Maneuver	-	-	1014	-	165
Stage 1	-	-	-	-	578
Stage 2	-	-	-	-	439
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1005	-	147
Mov Cap-2 Maneuver	-	-	-	-	147
Stage 1	-	-	-	-	573
Stage 2	-	-	-	-	396

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	16.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	381	-	-	1005	-
HCM Lane V/C Ratio	0.151	-	-	0.062	-
HCM Control Delay (s)	16.1	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

HCM 6th TWSC
4: 172nd Street NE & 19th Avenue NE

2022 Existing Conditions

Intersection

Int Delay, s/veh 1.2


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	36	499	620	21	10	57
Future Vol, veh/h	36	499	620	21	10	57
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	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	520	646	22	10	59

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	668	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	922	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	922	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	16.8
HCM LOS			C

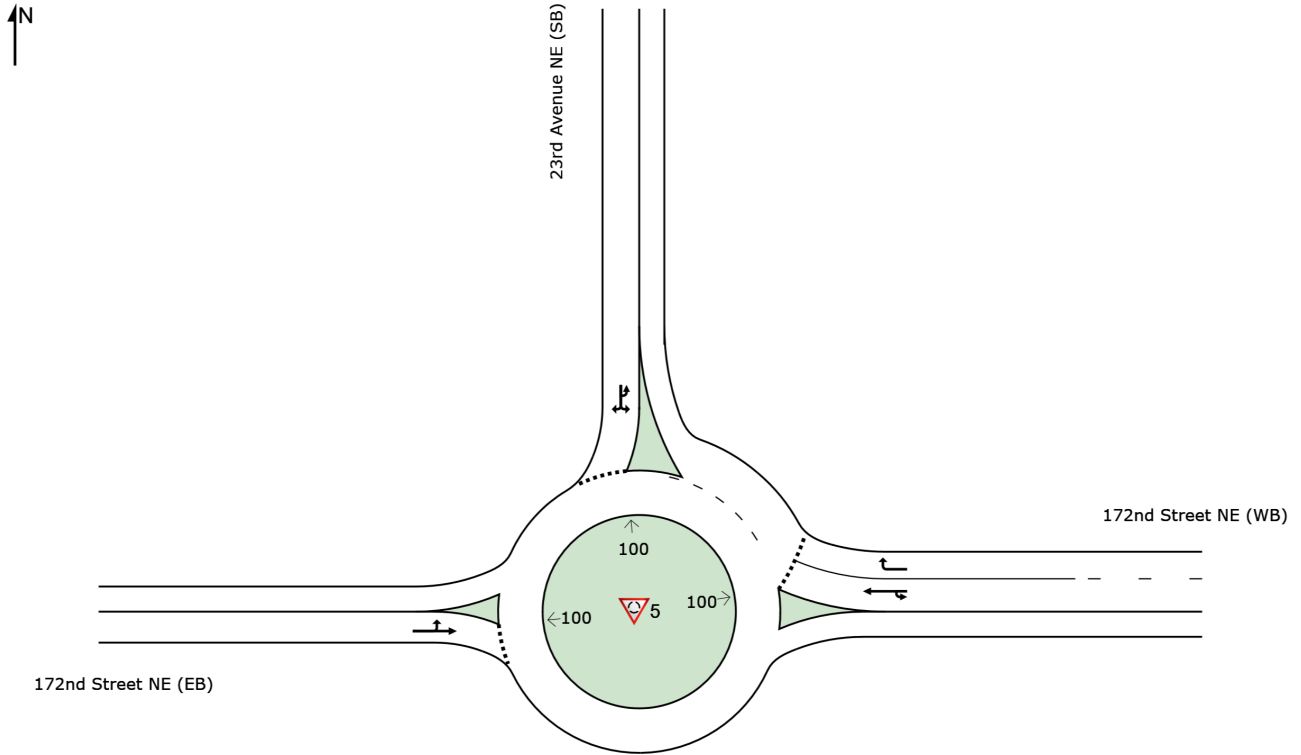
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	922	-	-	-	375
HCM Lane V/C Ratio	0.041	-	-	-	0.186
HCM Control Delay (s)	9.1	0	-	-	16.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

SITE LAYOUT

 Site: 5 [2022 Existing Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
Site Category: 172nd St NE at 23rd Avenue NE
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

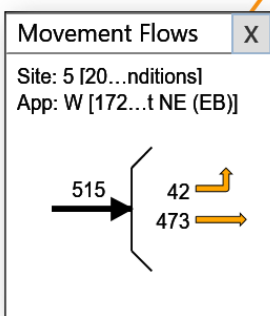
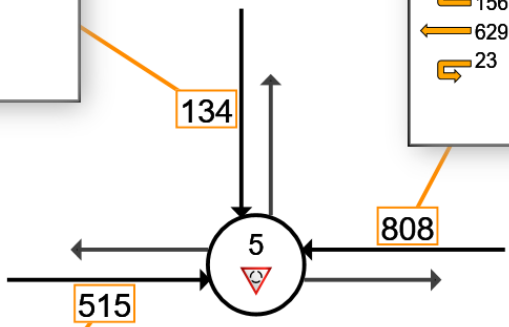
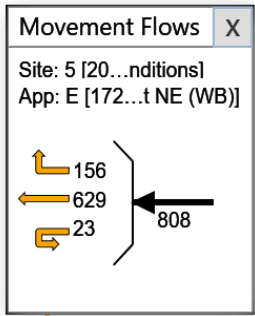
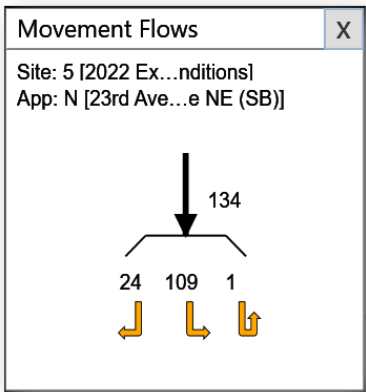
All Movement Classes

Site: 5 [2022 Existing Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
Site Category: 172nd St NE at 23rd Avenue NE
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones. Click and drag popup boxes to move to preferred positions.

Close All Popups



MOVEMENT SUMMARY

Site: 5 [2022 Existing Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
 Site Category: 172nd St NE at 23rd Avenue NE
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
East: 172nd Street NE (WB)														
1u	U	23	3.0	23	3.0	0.409	12.4	LOS B	2.7	68.9	0.19	0.39	0.19	38.4
6	T1	629	3.0	635	3.0	0.409	4.0	LOS A	2.7	68.9	0.19	0.39	0.19	37.3
16	R2	156	3.0	158	3.0	0.140	4.4	LOS A	0.6	16.6	0.16	0.46	0.16	36.2
Approach		808	3.0	816	3.0	0.409	4.3	LOS A	2.7	68.9	0.18	0.40	0.18	37.1
North: 23rd Avenue NE (SB)														
7u	U	1	3.0	1	3.0	0.135	14.5	LOS B	0.6	15.8	0.53	0.74	0.53	35.0
7	L2	109	3.0	110	3.0	0.135	12.1	LOS B	0.6	15.8	0.53	0.74	0.53	34.2
14	R2	24	3.0	24	3.0	0.135	6.3	LOS A	0.6	15.8	0.53	0.74	0.53	33.2
Approach		134	3.0	135	3.0	0.135	11.1	LOS B	0.6	15.8	0.53	0.74	0.53	34.0
West: 172nd Street NE (EB)														
5	L2	42	3.0	42	3.0	0.409	10.5	LOS B	2.5	64.9	0.36	0.47	0.36	36.7
2	T1	473	3.0	478	3.0	0.409	4.5	LOS A	2.5	64.9	0.36	0.47	0.36	36.6
Approach		515	3.0	520	3.0	0.409	5.0	LOS A	2.5	64.9	0.36	0.47	0.36	36.6
All Vehicles		1457	3.0	1472	3.0	0.409	5.2	LOS A	2.7	68.9	0.28	0.46	0.28	36.6

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

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

Queue Model: HCM Queue Formula.

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

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

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Project: K:\SNO_TPTO\2022\22-017 172nd Street Assemblage\Intersection Analysis\Sidra\#5.sip9

Lanes, Volumes, Timings
6: 27th Avenue NE/Spring Lane & 172nd Street NE

2022 Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	451	120	647	614	313	182	76	549	326	83	32
Future Volume (vph)	26	451	120	647	614	313	182	76	549	326	83	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		375	400		200	150		0	175		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor		1.00		0.99			0.99				0.99	1.00
Frt		0.968				0.850			0.850		0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3443	0	3467	3574	1599	1787	1881	1599	3467	1792	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1787	3443	0	3439	3574	1599	1770	1881	1599	3467	1792	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				326			468		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1325			609			730			589	
Travel Time (s)		30.1			13.8			16.6			13.4	
Confl. Peds. (#/hr)			8	8			10					10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	614	0	696	660	337	196	82	590	351	123	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0	5.0	3.0	5.0	
Minimum Split (s)	9.5	38.3		9.5	38.3	38.3	9.5	23.1	23.1	9.5	45.1	
Total Split (s)	20.0	38.3		46.0	60.0	60.0	25.0	25.0	25.0	25.0	45.1	
Total Split (%)	13.0%	24.8%		29.8%	38.9%	38.9%	16.2%	16.2%	16.2%	16.2%	29.2%	
Maximum Green (s)	15.0	32.0		41.0	53.7	53.7	20.0	19.9	19.9	20.0	40.0	
Yellow Time (s)	3.0	4.3		3.0	4.3	4.3	3.0	3.1	3.1	3.0	3.1	
All-Red Time (s)	2.0	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	0.0	
Total Lost Time (s)	5.0	6.3		5.0	6.3	6.3	5.0	5.1	5.1	5.0	5.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0	7.0					7.0	
Flash Dont Walk (s)		25.0			25.0	25.0					33.0	
Pedestrian Calls (#/hr)		0			0	0					0	
Act Effct Green (s)	7.3	28.9		33.1	59.4	59.4	18.5	40.8	40.8	18.0	40.3	
Actuated g/C Ratio	0.05	0.20		0.23	0.42	0.42	0.13	0.29	0.29	0.13	0.28	
v/c Ratio	0.31	0.86		0.86	0.44	0.39	0.84	0.15	0.74	0.80	0.24	
Control Delay	77.2	66.5		64.8	31.6	4.8	91.5	42.2	17.1	75.8	39.4	

Lanes, Volumes, Timings
 6: 27th Avenue NE/Spring Lane & 172nd Street NE

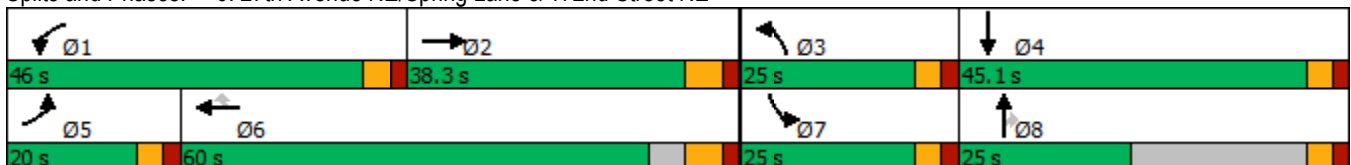
2022 Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.2	66.5		64.8	31.6	4.8	91.5	42.2	17.1	75.8	39.4	
LOS	E	E		E	C	A	F	D	B	E	D	
Approach Delay		66.9			39.9			36.3			66.3	
Approach LOS		E			D			D			E	
Queue Length 50th (ft)	27	288		334	244	6	185	60	105	169	83	
Queue Length 95th (ft)	63	#383		409	311	70	#335	113	285	#238	149	
Internal Link Dist (ft)		1245			529			650			509	
Turn Bay Length (ft)	195			400		200	150			175		
Base Capacity (vph)	189	795		1006	1535	872	253	538	792	490	516	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.15	0.77		0.69	0.43	0.39	0.77	0.15	0.74	0.72	0.24	

Intersection Summary













Area Type: Other
 Cycle Length: 154.4
 Actuated Cycle Length: 142.4
 Natural Cycle: 135
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 47.2
 Intersection Capacity Utilization 84.3%
 Analysis Period (min) 15
 Intersection LOS: D
 ICU Level of Service E
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 6: 27th Avenue NE/Spring Lane & 172nd Street NE



Lanes, Volumes, Timings
7: I-5 Southbound Ramps & 172nd Street NE

2022 Existing Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘	↖	↗
Traffic Volume (vph)	0	915	489	0	1276	548	0	0	0	237	2	291
Future Volume (vph)	0	915	489	0	1276	548	0	0	0	237	2	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	350		435
Storage Lanes	0		1	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.97			0.97						
Frt			0.850			0.850						0.850
Flt Protected										0.950	0.953	
Satd. Flow (prot)	0	3539	1583	0	3539	1583	0	0	0	1681	1686	1583
Flt Permitted										0.950	0.953	
Satd. Flow (perm)	0	3539	1542	0	3539	1541	0	0	0	1681	1686	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			509			571						94
Link Speed (mph)		30			30			30				30
Link Distance (ft)		609			940			979				1126
Travel Time (s)		13.8			21.4			22.3				25.6
Confl. Peds. (#/hr)	3		7	7		3						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	953	509	0	1329	571	0	0	0	123	126	303
Turn Type		NA	Perm		NA	Perm				Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2			6				4		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)		100.0	100.0		100.0	100.0				30.0	30.0	30.0
Total Split (%)		76.9%	76.9%		76.9%	76.9%				23.1%	23.1%	23.1%
Maximum Green (s)		94.2	94.2		93.9	93.9				24.2	24.2	24.2
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?												
Vehicle Extension (s)		4.0	4.0		4.0	4.0				4.5	4.5	4.5
Recall Mode		None	None		None	None				Max	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		21.0	21.0				21.0	21.0	21.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)		72.5	72.5		72.2	72.2				28.9	28.9	28.9
Actuated g/C Ratio		0.64	0.64		0.64	0.64				0.26	0.26	0.26
v/c Ratio		0.42	0.44		0.59	0.48				0.29	0.29	0.64
Control Delay		10.0	1.7		12.4	1.9				41.7	41.8	36.2
Queue Delay		0.1	0.2		0.0	0.0				0.0	0.0	0.0

Marysville 172 & 23 Apartments
Kimley-Horn and Associates, Inc. [BJL 090222017]

PM Peak-Hour

Lanes, Volumes, Timings
 7: I-5 Southbound Ramps & 172nd Street NE

2022 Existing Conditions

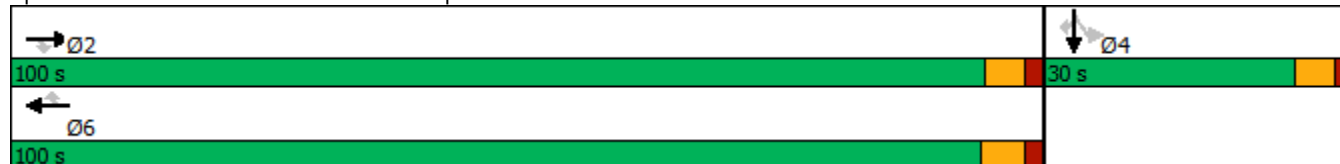
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		10.1	1.9		12.4	1.9				41.7	41.8	36.2
LOS		B	A		B	A				D	D	D
Approach Delay		7.3			9.3						38.7	
Approach LOS		A			A						D	
Queue Length 50th (ft)		160	0		263	0				77	80	140
Queue Length 95th (ft)		194	31		314	33				162	165	#289
Internal Link Dist (ft)		529			860			899			1046	
Turn Bay Length (ft)			200							350		435
Base Capacity (vph)		2955	1371		2948	1379				428	429	473
Starvation Cap Reductn		793	256		0	0				0	0	0
Spillback Cap Reductn		0	0		0	0				0	0	0
Storage Cap Reductn		0	0		0	0				0	0	0
Reduced v/c Ratio		0.44	0.46		0.45	0.41				0.29	0.29	0.64

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 113.3
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 12.7
 Intersection Capacity Utilization 63.2%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 7: I-5 Southbound Ramps & 172nd Street NE



Lanes, Volumes, Timings
 8: I-5 Northbound Ramps & 172nd Street NE

2022 Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	353	818	0	0	1164	403	610	2	705	0	0	0
Future Volume (vph)	353	818	0	0	1164	403	610	2	705	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.97			0.99			
Fr						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	1752	3505	0	0	5036	1568	1665	1670	1568	0	0	0
Flt Permitted	0.950						0.950	0.953				
Satd. Flow (perm)	1748	3505	0	0	5036	1527	1665	1670	1548	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						415			426			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		940			1086			1094			999	
Travel Time (s)		21.4			24.7			24.9			22.7	
Confl. Peds. (#/hr)	6		6	6		6			3			
Confl. Bikes (#/hr)			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 (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	364	843	0	0	1200	415	314	317	727	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Free			
Protected Phases	5	2			6			8				
Permitted Phases						6	8		Free			
Detector Phase	5	2			6	6	8	8				
Switch Phase												
Minimum Initial (s)	5.0	7.0			7.0	7.0	7.0	7.0				
Minimum Split (s)	10.6	24.1			23.8	23.8	40.8	40.8				
Total Split (s)	30.0	90.0			60.0	60.0	30.0	30.0				
Total Split (%)	25.0%	75.0%			50.0%	50.0%	25.0%	25.0%				
Maximum Green (s)	24.4	83.9			54.2	54.2	24.2	24.2				
Yellow Time (s)	3.6	4.1			3.8	3.8	3.8	3.8				
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Total Lost Time (s)	5.6	6.1			5.8	5.8	5.8	5.8				
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	4.0			4.0	4.0	4.5	4.5				
Recall Mode	None	None			None	None	Max	Max				
Walk Time (s)		7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)		10.0			8.0	8.0	28.0	28.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	24.5	78.8			49.0	49.0	35.1	35.1	125.8			
Actuated g/C Ratio	0.19	0.63			0.39	0.39	0.28	0.28	1.00			
v/c Ratio	1.07	0.38			0.61	0.49	0.68	0.68	0.47			

Lanes, Volumes, Timings
 8: I-5 Northbound Ramps & 172nd Street NE

2022 Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	117.2	12.0			32.1	4.4	50.0	50.2	1.0			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	117.2	12.0			32.1	4.4	50.0	50.2	1.0			
LOS	F	B			C	A	D	D	A			
Approach Delay		43.8			24.9			23.8				
Approach LOS		D			C			C				
Queue Length 50th (ft)	~353	165			282	0	253	256	0			
Queue Length 95th (ft)	#551	205			331	62	368	372	0			
Internal Link Dist (ft)		860			1006			1014				919
Turn Bay Length (ft)	600					300	400					
Base Capacity (vph)	340	2344			2175	895	464	465	1548			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	1.07	0.36			0.55	0.46	0.68	0.68	0.47			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 125.8
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.07
 Intersection Signal Delay: 30.0
 Intersection Capacity Utilization 88.6%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 8: I-5 Northbound Ramps & 172nd Street NE



Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

2022 Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	2	2	2	7	171	0	286	5	235	307	40
Future Volume (vph)	32	2	2	2	7	171	0	286	5	235	307	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	75		0	200		0	0		135
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor		1.00			1.00			1.00		0.99		0.98
Frt		0.993				0.850		0.998				0.850
Flt Protected		0.957			0.990					0.950		
Satd. Flow (prot)	0	1786	0	0	1862	1599	1881	1876	0	1787	1881	1599
Flt Permitted		0.760			0.958					0.494		
Satd. Flow (perm)	0	1418	0	0	1801	1599	1881	1876	0	921	1881	1560
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				188		1				52
Link Speed (mph)		30			30			30				30
Link Distance (ft)		967			413			725				730
Travel Time (s)		22.0			9.4			16.5				16.6
Confl. Peds. (#/hr)			1	1			2		7	7		2
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 (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	39	0	0	10	188	0	319	0	258	337	44
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	22.5	22.5		26.0	26.0	26.0	9.5	22.5		9.5	26.0	26.0
Total Split (s)	25.0	25.0		25.0	25.0	25.0	20.0	50.0		30.0	50.0	50.0
Total Split (%)	23.8%	23.8%		23.8%	23.8%	23.8%	19.0%	47.6%		28.6%	47.6%	47.6%
Maximum Green (s)	21.0	21.0		21.0	21.0	21.0	16.0	46.0		26.0	46.0	46.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	8.0	8.0		15.0	15.0	15.0		10.0			15.0	15.0
Pedestrian Calls (#/hr)	3	3		3	3	3		13			13	13
Act Effct Green (s)		9.7			9.7	9.7		46.4		59.2	59.2	59.2
Actuated g/C Ratio		0.13			0.13	0.13		0.60		0.77	0.77	0.77
v/c Ratio		0.22			0.04	0.52		0.28		0.32	0.23	0.04
Control Delay		31.6			29.3	10.3		9.6		4.2	3.6	1.1

Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

2022 Existing Conditions

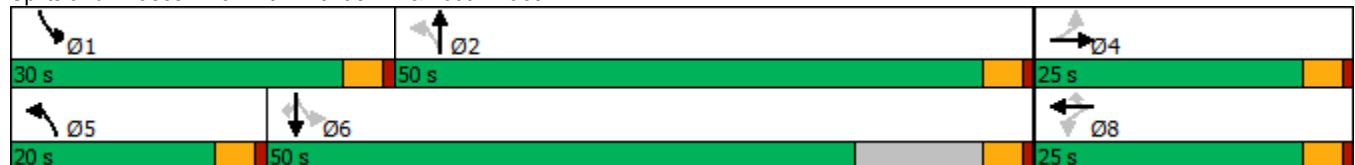
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	0.0
Total Delay		31.6			29.3	10.3		9.6		4.2	3.6	1.1
LOS		C			C	B		A		A	A	A
Approach Delay		31.6			11.2			9.6			3.7	
Approach LOS		C			B			A			A	
Queue Length 50th (ft)		16			4	0		56		19	26	0
Queue Length 95th (ft)		44			18	52		171		81	105	8
Internal Link Dist (ft)		887			333			645			650	
Turn Bay Length (ft)												135
Base Capacity (vph)		394			499	579		1131		1003	1446	1211
Starvation Cap Reductn		0			0	0		0		0	0	0
Spillback Cap Reductn		0			0	0		0		0	0	0
Storage Cap Reductn		0			0	0		0		0	0	0
Reduced v/c Ratio		0.10			0.02	0.32		0.28		0.26	0.23	0.04

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 77
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 7.4
 Intersection Capacity Utilization 47.2%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 9: 27th Avenue NE & 169th Place NE



Lanes, Volumes, Timings

10: Smokey Point Boulevard & 156th Street NE

2022 Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	4	210	19	10	27	182	503	4	26	571	47
Future Volume (vph)	23	4	210	19	10	27	182	503	4	26	571	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		0	250		0	200		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.891			0.999			0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1660	0	1770	3536	0	1770	3500	0
Flt Permitted	0.641			0.755			0.257			0.451		
Satd. Flow (perm)	1194	1863	1583	1406	1660	0	479	3536	0	840	3500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			223		29			1			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1704			1283			1384			4766	
Travel Time (s)		38.7			29.2			31.5			108.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	4	223	20	40	0	194	539	0	28	657	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	25.0	25.0	12.0	25.0		12.0	25.0		12.0	25.0	
Total Split (s)	25.0	20.0	20.0	25.0	10.0		20.0	50.0		20.0	50.0	
Total Split (%)	21.7%	17.4%	17.4%	21.7%	8.7%		17.4%	43.5%		17.4%	43.5%	
Maximum Green (s)	20.0	15.0	15.0	20.0	5.0		15.0	45.0		15.0	45.0	
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)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.5		2.0	3.5	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		13.0	13.0		13.0			13.0			13.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	10.7	9.7	9.7	9.8	7.7		33.9	30.2		25.7	18.2	
Actuated g/C Ratio	0.19	0.17	0.17	0.18	0.14		0.61	0.54		0.46	0.32	
v/c Ratio	0.08	0.01	0.49	0.07	0.16		0.37	0.28		0.06	0.57	
Control Delay	20.3	25.0	8.7	20.3	16.9		7.8	10.0		6.9	18.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.3	25.0	8.7	20.3	16.9		7.8	10.0		6.9	18.7	
LOS	C	C	A	C	B		A	A		A	B	

Lanes, Volumes, Timings

10: Smokey Point Boulevard & 156th Street NE

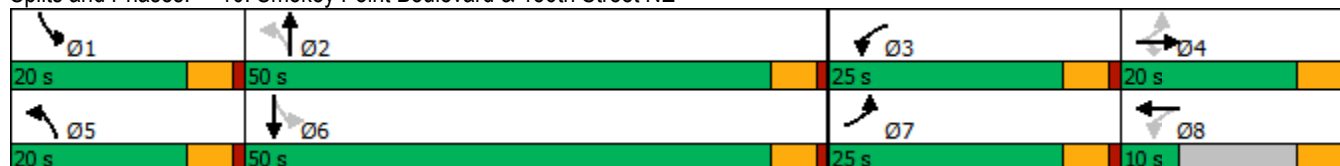
2022 Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		10.1			18.1			9.4			18.2	
Approach LOS		B			B			A			B	
Queue Length 50th (ft)	6	1	0	5	3		17	25		2	75	
Queue Length 95th (ft)	26	10	60	23	32		71	127		15	188	
Internal Link Dist (ft)		1624			1203			1304			4686	
Turn Bay Length (ft)	150		150	200			250			200		
Base Capacity (vph)	682	543	619	684	494		659	2956		760	2927	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.04	0.01	0.36	0.03	0.08		0.29	0.18		0.04	0.22	

Intersection Summary

Area Type: Other
 Cycle Length: 115
 Actuated Cycle Length: 56
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 13.3
 Intersection Capacity Utilization 48.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 10: Smokey Point Boulevard & 156th Street NE



Lanes, Volumes, Timings

11: Smokey Point Boulevard & 152nd Street NE

2022 Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	2	6	115	2	218	4	486	122	238	542	5
Future Volume (vph)	3	2	6	115	2	218	4	486	122	238	542	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	125		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor							1.00				1.00	
Frt		0.883			0.851			0.970			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1629	0	1752	1570	0	1752	3400	0	1752	3501	0
Flt Permitted				0.571			0.428			0.257		
Satd. Flow (perm)	1845	1629	0	1053	1570	0	788	3400	0	474	3501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			237			29			1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		209			5141			1452			1384	
Travel Time (s)		4.8			116.8			33.0			31.5	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	9	0	125	239	0	4	661	0	259	594	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	7.0		4.0	7.0	
Minimum Split (s)	9.5	27.0		11.5	26.0		9.5	24.0		9.5	26.0	
Total Split (s)	16.0	16.0		16.0	40.0		16.0	50.0		16.0	50.0	
Total Split (%)	13.1%	13.1%		13.1%	32.8%		13.1%	41.0%		13.1%	41.0%	
Maximum Green (s)	11.0	11.0		11.0	35.0		11.0	45.0		11.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			14.0			12.0			14.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	5.6	5.0		9.2	7.6		20.7	15.4		29.5	28.1	
Actuated g/C Ratio	0.11	0.10		0.19	0.16		0.42	0.31		0.60	0.57	
v/c Ratio	0.01	0.05		0.41	0.54		0.01	0.61		0.50	0.30	
Control Delay	19.0	18.9		22.5	9.3		6.5	17.1		9.1	7.8	

Lanes, Volumes, Timings
 11: Smokey Point Boulevard & 152nd Street NE

2022 Existing Conditions

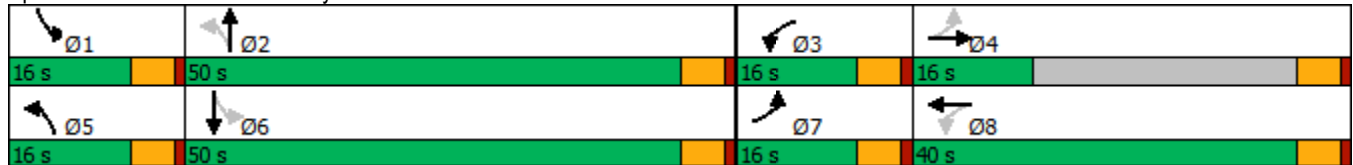
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	19.0	18.9		22.5	9.3		6.5	17.1		9.1	7.8	
LOS	B	B		C	A		A	B		A	A	
Approach Delay		18.9			13.8			17.0			8.2	
Approach LOS		B			B			B			A	
Queue Length 50th (ft)	1	1		30	1		0	71		24	30	
Queue Length 95th (ft)	6	14		79	58		4	170		93	134	
Internal Link Dist (ft)		129			5061			1372			1304	
Turn Bay Length (ft)	50			125			150			200		
Base Capacity (vph)	444	1223		444	1236		660	3078		586	3167	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.01		0.28	0.19		0.01	0.21		0.44	0.19	

Intersection Summary

Area Type: Other
 Cycle Length: 122
 Actuated Cycle Length: 49
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 12.4
 Intersection Capacity Utilization 56.6%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 11: Smokey Point Boulevard & 152nd Street NE



Lanes, Volumes, Timings

12: State Avenue/Smokey Point Boulevard & 136th Street NE

2022 Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	179	54	137	165	95	90	364	174	101	354	203
Future Volume (vph)	115	179	54	137	165	95	90	364	174	101	354	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		0	300		0	300		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.99	1.00							0.99	
Frt			0.850		0.945			0.952			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1827	1553	1736	1726	0	1736	3305	0	1736	3252	0
Flt Permitted	0.352			0.498			0.373			0.348		
Satd. Flow (perm)	643	1827	1532	909	1726	0	681	3305	0	636	3252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143		24			57			77	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		981			4740			2821			4382	
Travel Time (s)		22.3			107.7			64.1			99.6	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	121	188	57	144	274	0	95	566	0	106	587	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0		5.0	7.0		5.0	7.0	
Minimum Split (s)	10.0	34.0	34.0	10.0	23.0		10.0	35.0		10.0	23.0	
Total Split (s)	15.0	35.0	35.0	30.0	40.0		35.0	35.0		30.0	30.0	
Total Split (%)	11.5%	26.9%	26.9%	23.1%	30.8%		26.9%	26.9%		23.1%	23.1%	
Maximum Green (s)	10.0	30.0	30.0	25.0	35.0		30.0	30.0		25.0	25.0	
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)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	Max		None	Max	
Walk Time (s)		8.0	8.0					9.0				
Flash Dont Walk (s)		21.0	21.0					21.0				
Pedestrian Calls (#/hr)		0	0					0				
Act Effct Green (s)	24.4	15.9	15.9	25.8	16.6		37.5	30.3		39.2	32.9	
Actuated g/C Ratio	0.29	0.19	0.19	0.31	0.20		0.45	0.36		0.47	0.40	
v/c Ratio	0.40	0.54	0.14	0.39	0.75		0.24	0.46		0.27	0.44	

Lanes, Volumes, Timings

12: State Avenue/Smokey Point Boulevard & 136th Street NE

2022 Existing Conditions

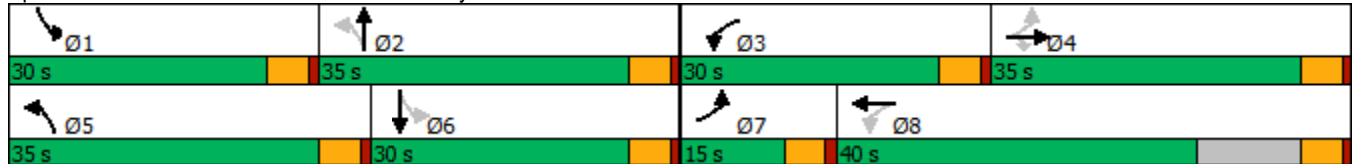
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	22.3	36.9	0.7	21.4	42.4		13.7	20.8		13.9	19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.3	36.9	0.7	21.4	42.4		13.7	20.8		13.9	19.4	
LOS	C	D	A	C	D		B	C		B	B	
Approach Delay		26.4			35.2			19.8			18.5	
Approach LOS		C			D			B			B	
Queue Length 50th (ft)	42	88	0	51	124		24	104		27	104	
Queue Length 95th (ft)	82	164	0	96	216		59	184		64	186	
Internal Link Dist (ft)		901			4660			2741			4302	
Turn Bay Length (ft)	150		150	200			300			300		
Base Capacity (vph)	333	665	649	590	954		735	1240		662	1334	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.36	0.28	0.09	0.24	0.29		0.13	0.46		0.16	0.44	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 83.1
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 23.5
 Intersection Capacity Utilization 58.8%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 12: State Avenue/Smokey Point Boulevard & 136th Street NE



HCM 6th TWSC
 1: 11th Avenue NE & 172nd Street NE

2025 Baseline Conditions

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	1	362	20	91	591	10	24	0	114	7	3	3
Future Vol, veh/h	1	362	20	91	591	10	24	0	114	7	3	3
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	-	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	393	22	99	642	11	26	0	124	8	3	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	653	0	0	415	0	0	1255	1257	404	1314	1263	648
Stage 1	-	-	-	-	-	-	406	406	-	846	846	-
Stage 2	-	-	-	-	-	-	849	851	-	468	417	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	934	-	-	1144	-	-	148	171	647	135	170	470
Stage 1	-	-	-	-	-	-	622	598	-	357	378	-
Stage 2	-	-	-	-	-	-	356	376	-	575	591	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	934	-	-	1144	-	-	135	156	647	102	155	470
Mov Cap-2 Maneuver	-	-	-	-	-	-	135	156	-	102	155	-
Stage 1	-	-	-	-	-	-	621	597	-	357	345	-
Stage 2	-	-	-	-	-	-	320	343	-	464	590	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.1	19.9	34
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	390	934	-	-	1144	-	-	138
HCM Lane V/C Ratio	0.385	0.001	-	-	0.086	-	-	0.102
HCM Control Delay (s)	19.9	8.9	0	-	8.4	-	-	34
HCM Lane LOS	C	A	A	-	A	-	-	D
HCM 95th %tile Q(veh)	1.8	0	-	-	0.3	-	-	0.3

HCM 6th TWSC
 2: 16th Drive NE & 172nd Street NE

2025 Baseline Conditions

Intersection

Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	488	8	8	684	23	57
Future Vol, veh/h	488	8	8	684	23	57
Conflicting Peds, #/hr	0	3	3	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	525	9	9	735	25	61

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	537	0	1286 533
Stage 1	-	-	-	-	533 -
Stage 2	-	-	-	-	753 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1031	-	181 547
Stage 1	-	-	-	-	588 -
Stage 2	-	-	-	-	465 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1028	-	179 545
Mov Cap-2 Maneuver	-	-	-	-	315 -
Stage 1	-	-	-	-	586 -
Stage 2	-	-	-	-	461 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	450	-	-	1028	-
HCM Lane V/C Ratio	0.191	-	-	0.008	-
HCM Control Delay (s)	14.9	-	-	8.5	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	0	-

HCM 6th TWSC
 3: 19th Drive NE & 172nd Street NE

2025 Baseline Conditions

Intersection

Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	534	10	62	684	9	49
Future Vol, veh/h	534	10	62	684	9	49
Conflicting Peds, #/hr	0	9	9	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	580	11	67	743	10	53

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	600	0	1472
Stage 1	-	-	-	-	595
Stage 2	-	-	-	-	877
Critical Hdwy	-	-	4.13	-	6.43
Critical Hdwy Stg 1	-	-	-	-	5.43
Critical Hdwy Stg 2	-	-	-	-	5.43
Follow-up Hdwy	-	-	2.227	-	3.527
Pot Cap-1 Maneuver	-	-	972	-	139
Stage 1	-	-	-	-	549
Stage 2	-	-	-	-	405
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	964	-	121
Mov Cap-2 Maneuver	-	-	-	-	121
Stage 1	-	-	-	-	544
Stage 2	-	-	-	-	357

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	18.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	336	-	-	964	-
HCM Lane V/C Ratio	0.188	-	-	0.07	-
HCM Control Delay (s)	18.2	-	-	9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0.2	-

HCM 6th TWSC
 4: 172nd Street NE & 19th Avenue NE

2025 Baseline Conditions

Intersection

Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Vol, veh/h	39	545	677	23	11	62
Future Vol, veh/h	39	545	677	23	11	62
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	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	568	705	24	11	65

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	729	0	0	1367	717
Stage 1	-	-	-	717	-
Stage 2	-	-	-	650	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	875	-	-	162	430
Stage 1	-	-	-	484	-
Stage 2	-	-	-	520	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	875	-	-	151	430
Mov Cap-2 Maneuver	-	-	-	151	-
Stage 1	-	-	-	451	-
Stage 2	-	-	-	520	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	18.8
HCM LOS			C

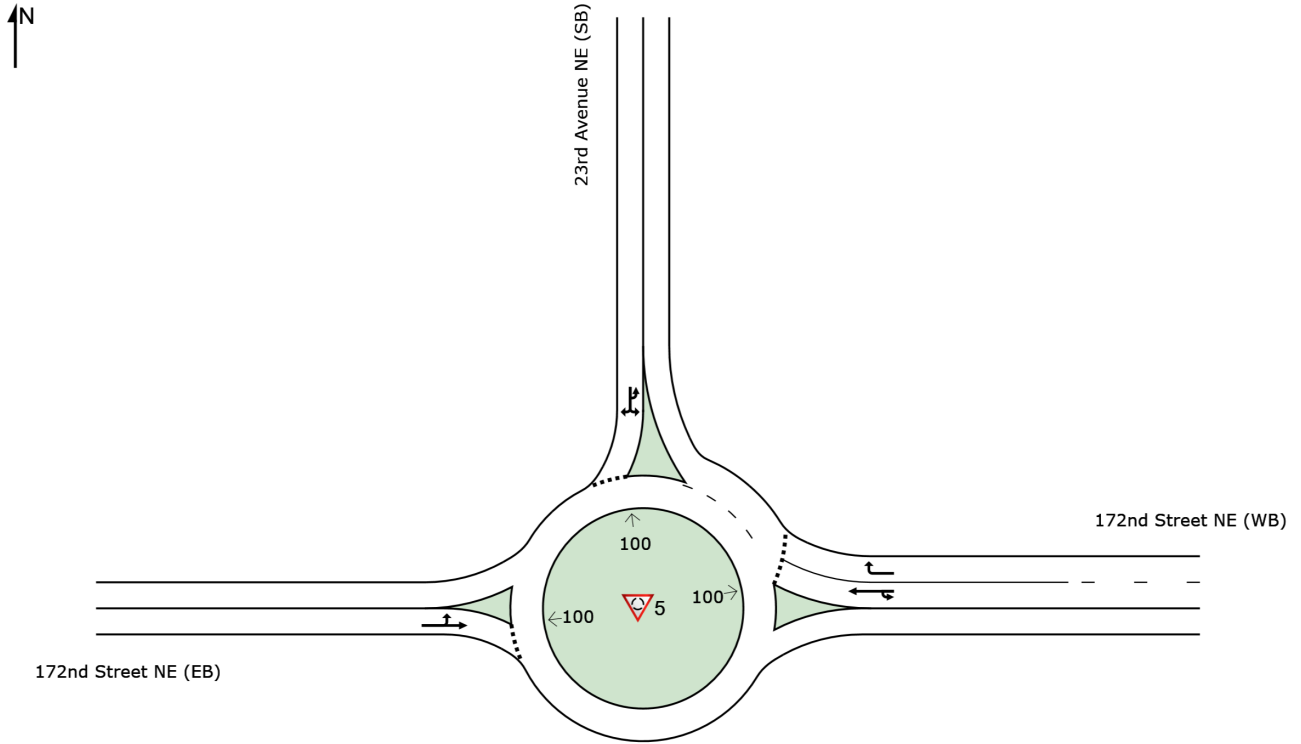
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	875	-	-	-	336
HCM Lane V/C Ratio	0.046	-	-	-	0.226
HCM Control Delay (s)	9.3	0	-	-	18.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

SITE LAYOUT

Site: 5 [2025 Baseline Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
Site Category: 172nd St NE at 23rd Avenue NE
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: K:\SNO_TPTO\2022\22-017 172nd Street Assemblage\Intersection Analysis\Sidra\#5.sip9

MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

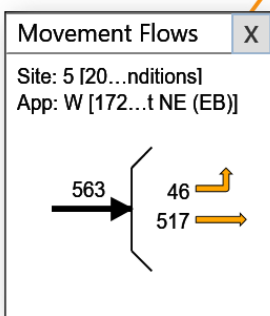
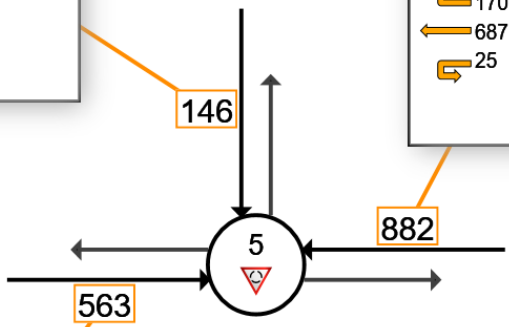
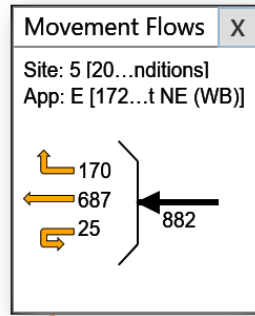
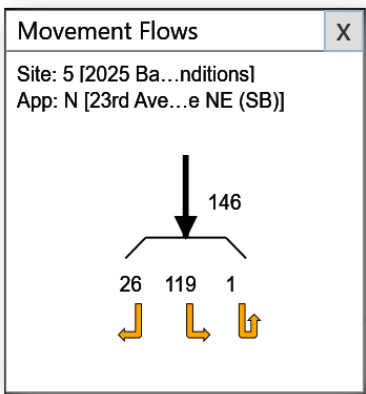
All Movement Classes

Site: 5 [2025 Baseline Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
Site Category: 172nd St NE at 23rd Avenue NE
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones. Click and drag popup boxes to move to preferred positions.

Close All Popups



MOVEMENT SUMMARY

Site: 5 [2025 Baseline Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
 Site Category: 172nd St NE at 23rd Avenue NE
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
East: 172nd Street NE (WB)														
1u	U	25	3.0	25	3.0	0.452	12.5	LOS B	3.8	98.2	0.25	0.39	0.25	38.1
6	T1	687	3.0	694	3.0	0.452	4.1	LOS A	3.8	98.2	0.25	0.39	0.25	37.1
16	R2	170	3.0	172	3.0	0.155	4.4	LOS A	0.9	22.7	0.21	0.46	0.21	36.1
Approach		882	3.0	891	3.0	0.452	4.4	LOS A	3.8	98.2	0.25	0.40	0.25	36.9
North: 23rd Avenue NE (SB)														
7u	U	1	3.0	1	3.0	0.189	16.8	LOS B	1.2	30.1	0.73	0.81	0.73	33.9
7	L2	119	3.0	120	3.0	0.189	14.4	LOS B	1.2	30.1	0.73	0.81	0.73	33.1
14	R2	26	3.0	26	3.0	0.189	8.5	LOS A	1.2	30.1	0.73	0.81	0.73	32.1
Approach		146	3.0	147	3.0	0.189	13.4	LOS B	1.2	30.1	0.73	0.81	0.73	32.9
West: 172nd Street NE (EB)														
5	L2	46	3.0	46	3.0	0.467	10.9	LOS B	3.8	97.3	0.49	0.50	0.49	36.2
2	T1	517	3.0	522	3.0	0.467	4.9	LOS A	3.8	97.3	0.49	0.50	0.49	36.1
Approach		563	3.0	569	3.0	0.467	5.4	LOS A	3.8	97.3	0.49	0.50	0.49	36.1
All Vehicles		1591	3.0	1607	3.0	0.467	5.6	LOS A	3.8	98.2	0.38	0.48	0.38	36.2

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

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

Queue Model: HCM Queue Formula.

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

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























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Project: K:\SNO_TPTO\2022\22-017 172nd Street Assemblage\Intersection Analysis\Sidra\#5.sip9

Lanes, Volumes, Timings
6: 27th Avenue NE/Spring Lane & 172nd Street NE

2025 Baseline Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	493	131	707	671	342	199	83	600	356	91	35
Future Volume (vph)	28	493	131	707	671	342	199	83	600	356	91	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		375	400		200	150		0	175		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor		1.00		0.99			0.99				0.99	1.00
Frt		0.968				0.850			0.850		0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3443	0	3467	3574	1599	1787	1881	1599	3467	1790	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1787	3443	0	3441	3574	1599	1770	1881	1599	3467	1790	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				325			462		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1325			609			730			589	
Travel Time (s)		30.1			13.8			16.6			13.4	
Confl. Peds. (#/hr)			8	8			10					10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	671	0	760	722	368	214	89	645	383	136	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0	5.0	3.0	5.0	
Minimum Split (s)	9.5	38.3		9.5	38.3	38.3	9.5	23.1	23.1	9.5	45.1	
Total Split (s)	20.0	38.3		46.0	60.0	60.0	25.0	25.0	25.0	25.0	45.1	
Total Split (%)	13.0%	24.8%		29.8%	38.9%	38.9%	16.2%	16.2%	16.2%	16.2%	29.2%	
Maximum Green (s)	15.0	32.0		41.0	53.7	53.7	20.0	19.9	19.9	20.0	40.0	
Yellow Time (s)	3.0	4.3		3.0	4.3	4.3	3.0	3.1	3.1	3.0	3.1	
All-Red Time (s)	2.0	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	0.0	
Total Lost Time (s)	5.0	6.3		5.0	6.3	6.3	5.0	5.1	5.1	5.0	5.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0	7.0					7.0	
Flash Dont Walk (s)		25.0			25.0	25.0					33.0	
Pedestrian Calls (#/hr)		0			0	0					0	
Act Effct Green (s)	7.5	31.0		36.1	64.1	64.1	19.5	40.6	40.6	19.0	40.1	
Actuated g/C Ratio	0.05	0.21		0.24	0.43	0.43	0.13	0.27	0.27	0.13	0.27	
v/c Ratio	0.33	0.91		0.90	0.47	0.42	0.91	0.17	0.83	0.86	0.28	
Control Delay	79.5	73.5		68.9	32.0	6.3	103.3	44.1	25.0	83.2	42.0	

Marysville 172 & 23 Apartments
Kimley-Horn and Associates, Inc. [BJL 090222017]

PM Peak-Hour

Lanes, Volumes, Timings
 6: 27th Avenue NE/Spring Lane & 172nd Street NE

2025 Baseline Conditions

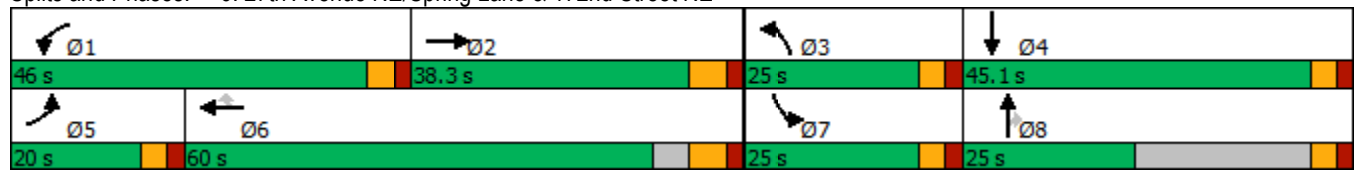
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.5	73.5		68.9	32.0	6.5	103.3	44.1	25.0	83.2	42.0	
LOS	E	E		E	C	A	F	D	C	F	D	
Approach Delay		73.7			42.1			44.5				72.4
Approach LOS		E			D			D				E
Queue Length 50th (ft)	29	333		374	273	25	211	68	192	192	97	
Queue Length 95th (ft)	67	#458		454	345	101	#379	121	#406	#279	164	
Internal Link Dist (ft)		1245			529			650			509	
Turn Bay Length (ft)	195			400		200	150			175		
Base Capacity (vph)	181	761		961	1546	876	241	515	773	469	493	
Starvation Cap Reductn	0	0		0	0	117	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.17	0.88		0.79	0.47	0.48	0.89	0.17	0.83	0.82	0.28	

Intersection Summary

Area Type: Other
 Cycle Length: 154.4
 Actuated Cycle Length: 148.2
 Natural Cycle: 135
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 52.1
 Intersection Capacity Utilization 102.4%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: D
 ICU Level of Service G

Splits and Phases: 6: 27th Avenue NE/Spring Lane & 172nd Street NE



Lanes, Volumes, Timings
7: I-5 Southbound Ramps & 172nd Street NE

2025 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1000	534	0	1394	599	0	0	0	259	2	318
Future Volume (vph)	0	1000	534	0	1394	599	0	0	0	259	2	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	350		435
Storage Lanes	0		1	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.97			0.97						
Frt			0.850			0.850						0.850
Flt Protected										0.950	0.953	
Satd. Flow (prot)	0	3539	1583	0	3539	1583	0	0	0	1681	1686	1583
Flt Permitted										0.950	0.953	
Satd. Flow (perm)	0	3539	1542	0	3539	1541	0	0	0	1681	1686	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			556			624						74
Link Speed (mph)		30			30			30				30
Link Distance (ft)		609			940			979				1126
Travel Time (s)		13.8			21.4			22.3				25.6
Confl. Peds. (#/hr)	3		7	7		3						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1042	556	0	1452	624	0	0	0	135	137	331
Turn Type		NA	Perm		NA	Perm				Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2			6				4		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)		100.0	100.0		100.0	100.0				30.0	30.0	30.0
Total Split (%)		76.9%	76.9%		76.9%	76.9%				23.1%	23.1%	23.1%
Maximum Green (s)		94.2	94.2		93.9	93.9				24.2	24.2	24.2
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?												
Vehicle Extension (s)		4.0	4.0		4.0	4.0				4.5	4.5	4.5
Recall Mode		None	None		None	None				Max	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		21.0	21.0				21.0	21.0	21.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)		82.1	82.1		81.8	81.8				28.5	28.5	28.5
Actuated g/C Ratio		0.67	0.67		0.67	0.67				0.23	0.23	0.23
v/c Ratio		0.44	0.46		0.61	0.50				0.35	0.35	0.78
Control Delay		9.7	1.8		12.3	2.0				45.9	45.9	50.1
Queue Delay		0.3	0.4		0.0	0.0				0.0	0.0	0.0

Lanes, Volumes, Timings
 7: I-5 Southbound Ramps & 172nd Street NE

2025 Baseline Conditions

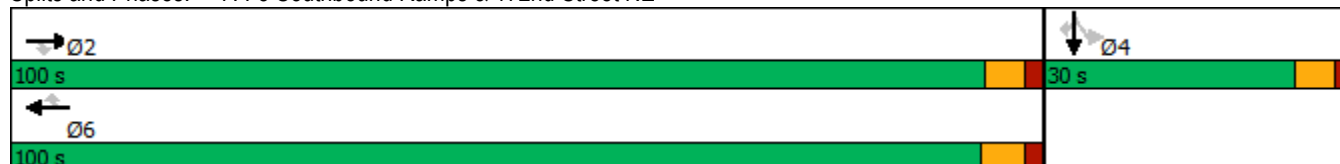
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		9.9	2.1		12.3	2.0				45.9	45.9	50.1
LOS		A	A		B	A				D	D	D
Approach Delay		7.2			9.2						48.2	
Approach LOS		A			A						D	
Queue Length 50th (ft)		181	0		305	0				107	108	221
Queue Length 95th (ft)		218	32		361	33				175	177	#384
Internal Link Dist (ft)		529			860			899			1046	
Turn Bay Length (ft)			200							350		435
Base Capacity (vph)		2774	1329		2765	1340				391	392	425
Starvation Cap Reductn		933	315		0	0				0	0	0
Spillback Cap Reductn		0	0		0	0				0	0	0
Storage Cap Reductn		0	0		0	0				0	0	0
Reduced v/c Ratio		0.57	0.55		0.53	0.47				0.35	0.35	0.78

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 122.4
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 14.0
 Intersection Capacity Utilization 68.1%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 7: I-5 Southbound Ramps & 172nd Street NE



Lanes, Volumes, Timings
8: I-5 Northbound Ramps & 172nd Street NE

2025 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	386	894	0	0	1272	440	667	2	770	0	0	0
Future Volume (vph)	386	894	0	0	1272	440	667	2	770	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.97			0.99			
Fr						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	1752	3505	0	0	5036	1568	1665	1670	1568	0	0	0
Flt Permitted	0.950						0.950	0.953				
Satd. Flow (perm)	1748	3505	0	0	5036	1527	1665	1670	1548	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						454			402			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		940			1086			1094			999	
Travel Time (s)		21.4			24.7			24.9			22.7	
Confl. Peds. (#/hr)	6		6	6		6			3			
Confl. Bikes (#/hr)			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 (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	398	922	0	0	1311	454	344	346	794	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Free			
Protected Phases	5	2			6			8				
Permitted Phases						6	8		Free			
Detector Phase	5	2			6	6	8	8				
Switch Phase												
Minimum Initial (s)	5.0	7.0			7.0	7.0	7.0	7.0				
Minimum Split (s)	10.6	24.1			23.8	23.8	40.8	40.8				
Total Split (s)	30.0	90.0			60.0	60.0	30.0	30.0				
Total Split (%)	25.0%	75.0%			50.0%	50.0%	25.0%	25.0%				
Maximum Green (s)	24.4	83.9			54.2	54.2	24.2	24.2				
Yellow Time (s)	3.6	4.1			3.8	3.8	3.8	3.8				
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Total Lost Time (s)	5.6	6.1			5.8	5.8	5.8	5.8				
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	4.0			4.0	4.0	4.5	4.5				
Recall Mode	None	None			None	None	Max	Max				
Walk Time (s)		7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)		10.0			8.0	8.0	28.0	28.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	24.4	81.5			51.8	51.8	35.1	35.1	128.5			
Actuated g/C Ratio	0.19	0.63			0.40	0.40	0.27	0.27	1.00			
v/c Ratio	1.20	0.41			0.65	0.51	0.76	0.76	0.51			

Lanes, Volumes, Timings
 8: I-5 Northbound Ramps & 172nd Street NE

2025 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	159.0	12.3			32.6	4.4	55.5	55.6	1.2			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	159.0	12.3			32.6	4.4	55.5	55.6	1.2			
LOS	F	B			C	A	E	E	A			
Approach Delay		56.5			25.3			26.5				
Approach LOS		E			C			C				
Queue Length 50th (ft)	~413	187			318	0	285	286	0			
Queue Length 95th (ft)	#616	228			369	64	#428	#431	0			
Internal Link Dist (ft)		860			1006			1014				919
Turn Bay Length (ft)	600					300	400					
Base Capacity (vph)	332	2292			2127	907	454	455	1548			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	1.20	0.40			0.62	0.50	0.76	0.76	0.51			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 128.5
 Natural Cycle: 100
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.20
 Intersection Signal Delay: 34.7
 Intersection Capacity Utilization 92.8%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.





















Intersection LOS: C
 ICU Level of Service F

Splits and Phases: 8: I-5 Northbound Ramps & 172nd Street NE



Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

2025 Baseline Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	2	2	2	8	187	0	313	5	257	335	44
Future Volume (vph)	35	2	2	2	8	187	0	313	5	257	335	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	75		0	200		0	0		135
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor		1.00			1.00			1.00		0.99		0.98
Frt		0.994				0.850		0.998				0.850
Flt Protected		0.957			0.991					0.950		
Satd. Flow (prot)	0	1787	0	0	1864	1599	1881	1876	0	1787	1881	1599
Flt Permitted		0.753			0.961					0.471		
Satd. Flow (perm)	0	1406	0	0	1807	1599	1881	1876	0	879	1881	1560
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				205		1				52
Link Speed (mph)		30			30			30				30
Link Distance (ft)		967			413			725				730
Travel Time (s)		22.0			9.4			16.5				16.6
Confl. Peds. (#/hr)			1	1			2		7	7		2
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 (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	0	0	11	205	0	349	0	282	368	48
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	22.5	22.5		26.0	26.0	26.0	9.5	22.5		9.5	26.0	26.0
Total Split (s)	25.0	25.0		25.0	25.0	25.0	20.0	50.0		30.0	50.0	50.0
Total Split (%)	23.8%	23.8%		23.8%	23.8%	23.8%	19.0%	47.6%		28.6%	47.6%	47.6%
Maximum Green (s)	21.0	21.0		21.0	21.0	21.0	16.0	46.0		26.0	46.0	46.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	8.0	8.0		15.0	15.0	15.0		10.0			15.0	15.0
Pedestrian Calls (#/hr)	3	3		3	3	3		13			13	13
Act Effct Green (s)		9.7			9.7	9.7		46.5		59.7	59.7	59.7
Actuated g/C Ratio		0.13			0.13	0.13		0.60		0.77	0.77	0.77
v/c Ratio		0.24			0.05	0.54		0.31		0.36	0.25	0.04
Control Delay		32.4			29.7	10.4		10.0		4.5	3.7	1.2

Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

2025 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	0.0
Total Delay		32.4			29.7	10.4		10.0		4.5	3.7	1.2
LOS		C			C	B		B		A	A	A
Approach Delay		32.4			11.4			10.0			3.8	
Approach LOS		C			B			B			A	
Queue Length 50th (ft)		17			5	0		63		21	29	0
Queue Length 95th (ft)		47			19	55		192		88	116	9
Internal Link Dist (ft)		887			333			645			650	
Turn Bay Length (ft)												135
Base Capacity (vph)		389			498	589		1125		984	1448	1213
Starvation Cap Reductn		0			0	0		0		0	0	0
Spillback Cap Reductn		0			0	0		0		0	0	0
Storage Cap Reductn		0			0	0		0		0	0	0
Reduced v/c Ratio		0.11			0.02	0.35		0.31		0.29	0.25	0.04

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 77.5
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 7.7
 Intersection Capacity Utilization 50.0%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 9: 27th Avenue NE & 169th Place NE



Lanes, Volumes, Timings
 10: Smokey Point Boulevard & 156th Street NE

2025 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	4	229	21	11	30	199	550	4	28	624	51
Future Volume (vph)	25	4	229	21	11	30	199	550	4	28	624	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		0	250		0	200		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.891			0.999			0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1660	0	1770	3536	0	1770	3500	0
Flt Permitted	0.728			0.755			0.236			0.430		
Satd. Flow (perm)	1356	1863	1583	1406	1660	0	440	3536	0	801	3500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			244		32			1			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1704			1283			1384			4766	
Travel Time (s)		38.7			29.2			31.5			108.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	4	244	22	44	0	212	589	0	30	718	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	25.0	25.0	12.0	25.0		12.0	25.0		12.0	25.0	
Total Split (s)	25.0	20.0	20.0	25.0	10.0		20.0	50.0		20.0	50.0	
Total Split (%)	21.7%	17.4%	17.4%	21.7%	8.7%		17.4%	43.5%		17.4%	43.5%	
Maximum Green (s)	20.0	15.0	15.0	20.0	5.0		15.0	45.0		15.0	45.0	
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)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.5		2.0	3.5	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		13.0	13.0		13.0			13.0			13.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	10.3	8.2	8.2	10.3	8.2		37.0	33.3		28.0	20.5	
Actuated g/C Ratio	0.17	0.14	0.14	0.17	0.14		0.62	0.56		0.47	0.34	
v/c Ratio	0.09	0.02	0.57	0.08	0.17		0.41	0.30		0.06	0.60	
Control Delay	22.0	29.8	10.9	21.9	17.1		8.3	10.0		7.0	19.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.0	29.8	10.9	21.9	17.1		8.3	10.0		7.0	19.2	
LOS	C	C	B	C	B		A	B		A	B	

Lanes, Volumes, Timings
 10: Smokey Point Boulevard & 156th Street NE

2025 Baseline Conditions

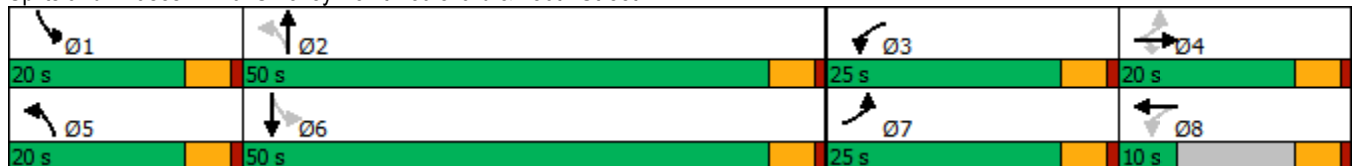
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		12.3			18.7			9.5			18.7	
Approach LOS		B			B			A			B	
Queue Length 50th (ft)	8	1	0	6	3		18	28		2	91	
Queue Length 95th (ft)	30	11	64	26	35		79	142		16	210	
Internal Link Dist (ft)		1624			1203			1304			4686	
Turn Bay Length (ft)	150		150	200			250			200		
Base Capacity (vph)	648	502	605	649	470		631	2800		737	2773	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.04	0.01	0.40	0.03	0.09		0.34	0.21		0.04	0.26	

Intersection Summary

Area Type: Other
 Cycle Length: 115
 Actuated Cycle Length: 59.6
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.60
 Intersection Signal Delay: 13.9
 Intersection Capacity Utilization 51.4%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 10: Smokey Point Boulevard & 156th Street NE



Lanes, Volumes, Timings
 11: Smokey Point Boulevard & 152nd Street NE

2025 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	2	7	126	2	238	4	531	133	260	592	5
Future Volume (vph)	3	2	7	126	2	238	4	531	133	260	592	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	125		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor							1.00				1.00	
Frt		0.880			0.851			0.970			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1623	0	1752	1570	0	1752	3400	0	1752	3501	0
Flt Permitted				0.690			0.406			0.229		
Satd. Flow (perm)	1845	1623	0	1273	1570	0	748	3400	0	422	3501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			259			29			1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		209			5141			1452			1384	
Travel Time (s)		4.8			116.8			33.0			31.5	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	10	0	137	261	0	4	722	0	283	648	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	7.0		4.0	7.0	
Minimum Split (s)	9.5	27.0		11.5	26.0		9.5	24.0		9.5	26.0	
Total Split (s)	16.0	16.0		16.0	40.0		16.0	50.0		16.0	50.0	
Total Split (%)	13.1%	13.1%		13.1%	32.8%		13.1%	41.0%		13.1%	41.0%	
Maximum Green (s)	11.0	11.0		11.0	35.0		11.0	45.0		11.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			14.0			12.0			14.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	5.6	4.9		9.7	8.2		22.5	17.3		33.0	31.5	
Actuated g/C Ratio	0.11	0.09		0.18	0.15		0.42	0.33		0.62	0.59	
v/c Ratio	0.02	0.06		0.45	0.56		0.01	0.64		0.54	0.31	
Control Delay	20.7	19.7		24.9	9.5		6.2	18.1		9.6	7.7	

Lanes, Volumes, Timings
 11: Smokey Point Boulevard & 152nd Street NE

2025 Baseline Conditions

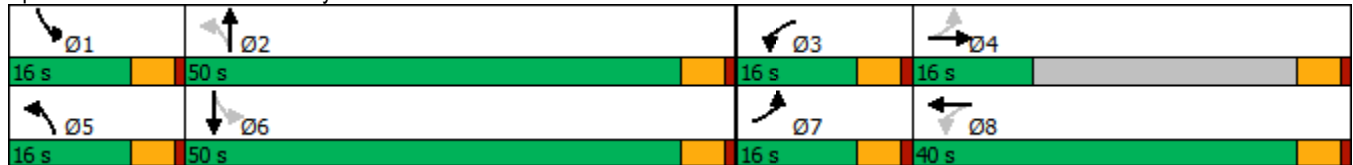
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	20.7	19.7		24.9	9.5		6.2	18.1		9.6	7.7	
LOS	C	B		C	A		A	B		A	A	
Approach Delay		19.9			14.8			18.1			8.3	
Approach LOS		B			B			B			A	
Queue Length 50th (ft)	1	1		38	1		0	88		28	35	
Queue Length 95th (ft)	7	15		91	61		4	187		103	146	
Internal Link Dist (ft)		129			5061			1372			1304	
Turn Bay Length (ft)	50			125			150			200		
Base Capacity (vph)	406	1115		414	1158		620	2941		548	3024	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.01		0.33	0.23		0.01	0.25		0.52	0.21	

Intersection Summary

Area Type: Other
 Cycle Length: 122
 Actuated Cycle Length: 53.1
 Natural Cycle: 80
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 13.0
 Intersection Capacity Utilization 60.7%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 11: Smokey Point Boulevard & 152nd Street NE



Lanes, Volumes, Timings

12: State Avenue/Smokey Point Boulevard & 136th Street NE

2025 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	196	59	150	180	104	98	398	190	110	387	222
Future Volume (vph)	126	196	59	150	180	104	98	398	190	110	387	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		0	300		0	300		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.99	1.00							0.99	
Frt			0.850		0.945			0.952			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1827	1553	1736	1726	0	1736	3305	0	1736	3252	0
Flt Permitted	0.332			0.462			0.310			0.316		
Satd. Flow (perm)	607	1827	1532	843	1726	0	566	3305	0	577	3252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143		24			57			78	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		981			4740			2821			4382	
Travel Time (s)		22.3			107.7			64.1			99.6	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	133	206	62	158	298	0	103	619	0	116	641	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0		5.0	7.0		5.0	7.0	
Minimum Split (s)	10.0	34.0	34.0	10.0	23.0		10.0	35.0		10.0	23.0	
Total Split (s)	15.0	35.0	35.0	30.0	40.0		35.0	35.0		30.0	30.0	
Total Split (%)	11.5%	26.9%	26.9%	23.1%	30.8%		26.9%	26.9%		23.1%	23.1%	
Maximum Green (s)	10.0	30.0	30.0	25.0	35.0		30.0	30.0		25.0	25.0	
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)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	Max		None	Max	
Walk Time (s)		8.0	8.0					9.0				
Flash Dont Walk (s)		21.0	21.0					21.0				
Pedestrian Calls (#/hr)		0	0					0				
Act Effct Green (s)	25.9	17.2	17.2	28.0	18.2		38.0	30.3		38.7	30.7	
Actuated g/C Ratio	0.30	0.20	0.20	0.33	0.21		0.44	0.35		0.45	0.36	
v/c Ratio	0.44	0.56	0.15	0.42	0.77		0.29	0.51		0.31	0.53	

Marysville 172 & 23 Apartments
 Kimley-Horn and Associates, Inc. [BJL 090222017]

PM Peak-Hour

Lanes, Volumes, Timings

12: State Avenue/Smokey Point Boulevard & 136th Street NE

2025 Baseline Conditions

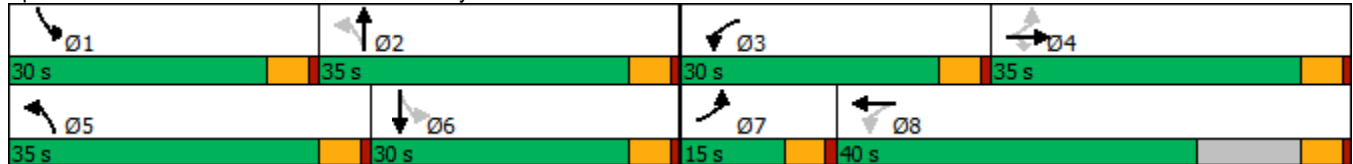
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	23.1	37.7	0.7	21.9	43.6		15.1	22.9		15.3	22.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.1	37.7	0.7	21.9	43.6		15.1	22.9		15.3	22.2	
LOS	C	D	A	C	D		B	C		B	C	
Approach Delay		27.2			36.1			21.8			21.1	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	47	99	0	56	140		28	123		32	124	
Queue Length 95th (ft)	90	183	0	105	240		66	214		72	216	
Internal Link Dist (ft)		901			4660			2741			4302	
Turn Bay Length (ft)	150		150	200			300			300		
Base Capacity (vph)	327	648	635	585	929		702	1209		635	1216	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.41	0.32	0.10	0.27	0.32		0.15	0.51		0.18	0.53	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 85.5
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 25.3
 Intersection Capacity Utilization 62.7%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 12: State Avenue/Smokey Point Boulevard & 136th Street NE



HCM 6th TWSC
 1: 11th Avenue NE & 172nd Street NE

2025 Opening Year Conditions

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	1	377	20	91	600	10	24	0	114	7	3	3
Future Vol, veh/h	1	377	20	91	600	10	24	0	114	7	3	3
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	-	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	410	22	99	652	11	26	0	124	8	3	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	663	0	0	432	0	0	1282	1284	421	1341	1290	658
Stage 1	-	-	-	-	-	-	423	423	-	856	856	-
Stage 2	-	-	-	-	-	-	859	861	-	485	434	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	926	-	-	1128	-	-	142	165	632	129	163	464
Stage 1	-	-	-	-	-	-	609	588	-	352	374	-
Stage 2	-	-	-	-	-	-	351	372	-	563	581	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	926	-	-	1128	-	-	129	150	632	97	148	464
Mov Cap-2 Maneuver	-	-	-	-	-	-	129	150	-	97	148	-
Stage 1	-	-	-	-	-	-	608	587	-	352	341	-
Stage 2	-	-	-	-	-	-	315	339	-	452	580	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			1.1			20.7			35.8		
HCM LOS							C			E		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	377	926	-	-	1128	-	-	131
HCM Lane V/C Ratio	0.398	0.001	-	-	0.088	-	-	0.108
HCM Control Delay (s)	20.7	8.9	0	-	8.5	-	-	35.8
HCM Lane LOS	C	A	A	-	A	-	-	E
HCM 95th %tile Q(veh)	1.9	0	-	-	0.3	-	-	0.4

HCM 6th TWSC
 2: 16th Drive NE & 172nd Street NE

2025 Opening Year Conditions

Intersection

Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	503	8	8	693	23	57
Future Vol, veh/h	503	8	8	693	23	57
Conflicting Peds, #/hr	0	3	3	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	541	9	9	745	25	61

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	553	0	1312 549
Stage 1	-	-	-	-	549 -
Stage 2	-	-	-	-	763 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1017	-	175 535
Stage 1	-	-	-	-	579 -
Stage 2	-	-	-	-	460 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1014	-	173 533
Mov Cap-2 Maneuver	-	-	-	-	310 -
Stage 1	-	-	-	-	577 -
Stage 2	-	-	-	-	456 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	442	-	-	1014	-
HCM Lane V/C Ratio	0.195	-	-	0.008	-
HCM Control Delay (s)	15.1	-	-	8.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	0	-

HCM 6th TWSC
 3: 19th Drive NE & 172nd Street NE

2025 Opening Year Conditions

Intersection

Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	549	10	63	693	9	51
Future Vol, veh/h	549	10	63	693	9	51
Conflicting Peds, #/hr	0	9	9	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	597	11	68	753	10	55

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	617	0	1501
Stage 1	-	-	-	-	612
Stage 2	-	-	-	-	889
Critical Hdwy	-	-	4.13	-	6.43
Critical Hdwy Stg 1	-	-	-	-	5.43
Critical Hdwy Stg 2	-	-	-	-	5.43
Follow-up Hdwy	-	-	2.227	-	3.527
Pot Cap-1 Maneuver	-	-	958	-	133
Stage 1	-	-	-	-	539
Stage 2	-	-	-	-	400
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	950	-	116
Mov Cap-2 Maneuver	-	-	-	-	116
Stage 1	-	-	-	-	534
Stage 2	-	-	-	-	351

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	18.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	329	-	-	950	-
HCM Lane V/C Ratio	0.198	-	-	0.072	-
HCM Control Delay (s)	18.6	-	-	9.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0.2	-

HCM 6th TWSC
 4: 172nd Street NE & 19th Avenue NE

2025 Opening Year Conditions

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	39	562	687	23	11	62
Future Vol, veh/h	39	562	687	23	11	62
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	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	585	716	24	11	65

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	740	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	867	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	867	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	19.3
HCM LOS			C

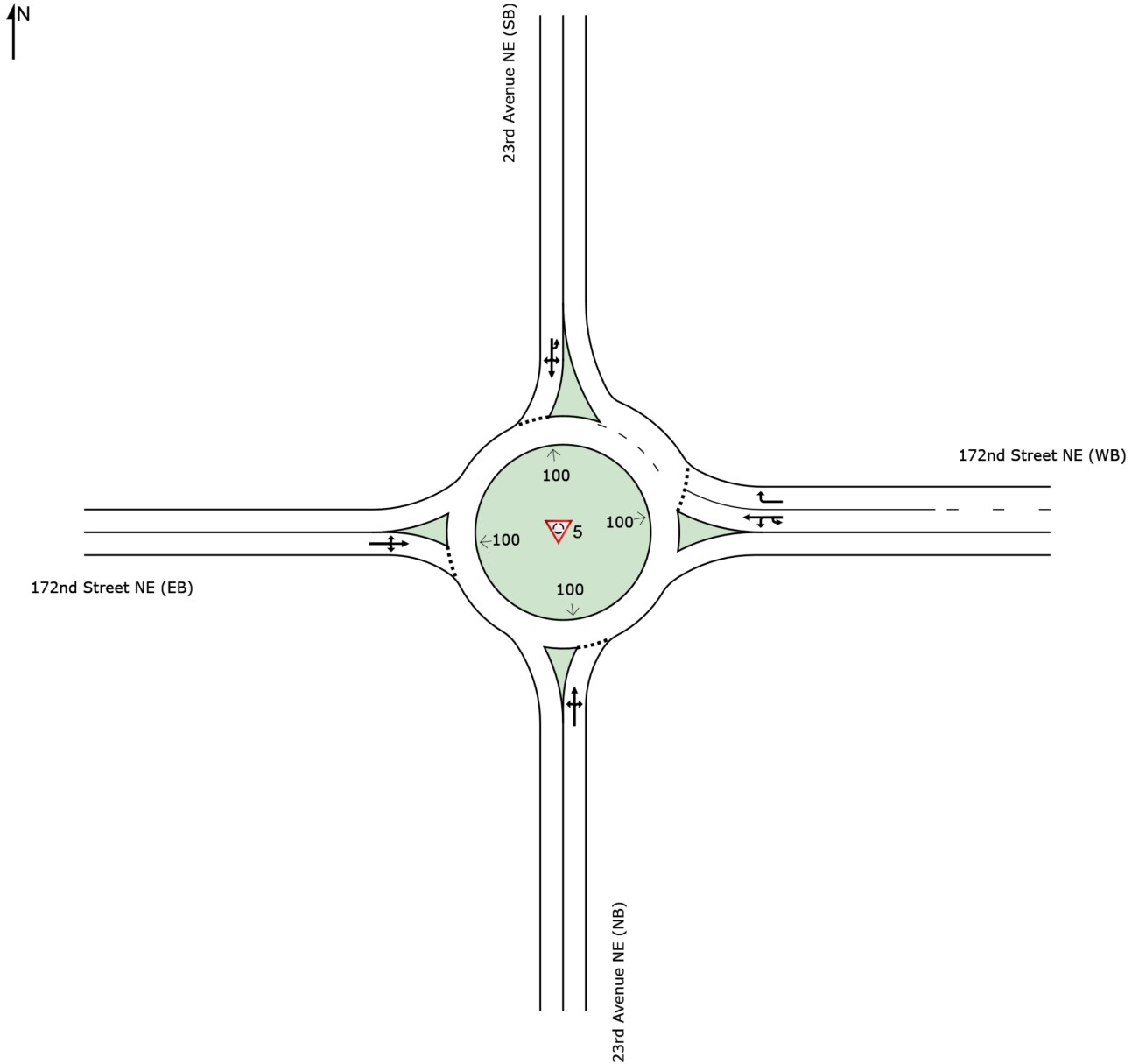
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	867	-	-	-	328
HCM Lane V/C Ratio	0.047	-	-	-	0.232
HCM Control Delay (s)	9.4	0	-	-	19.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

SITE LAYOUT

Site: 5 [2025 Opening Year Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
Site Category: 172nd St NE at 23rd Avenue NE
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: K:\SNO_TPTO\2022\22-017 172nd Street Assemblage\Intersection Analysis\Sidra\#5.sip9

MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

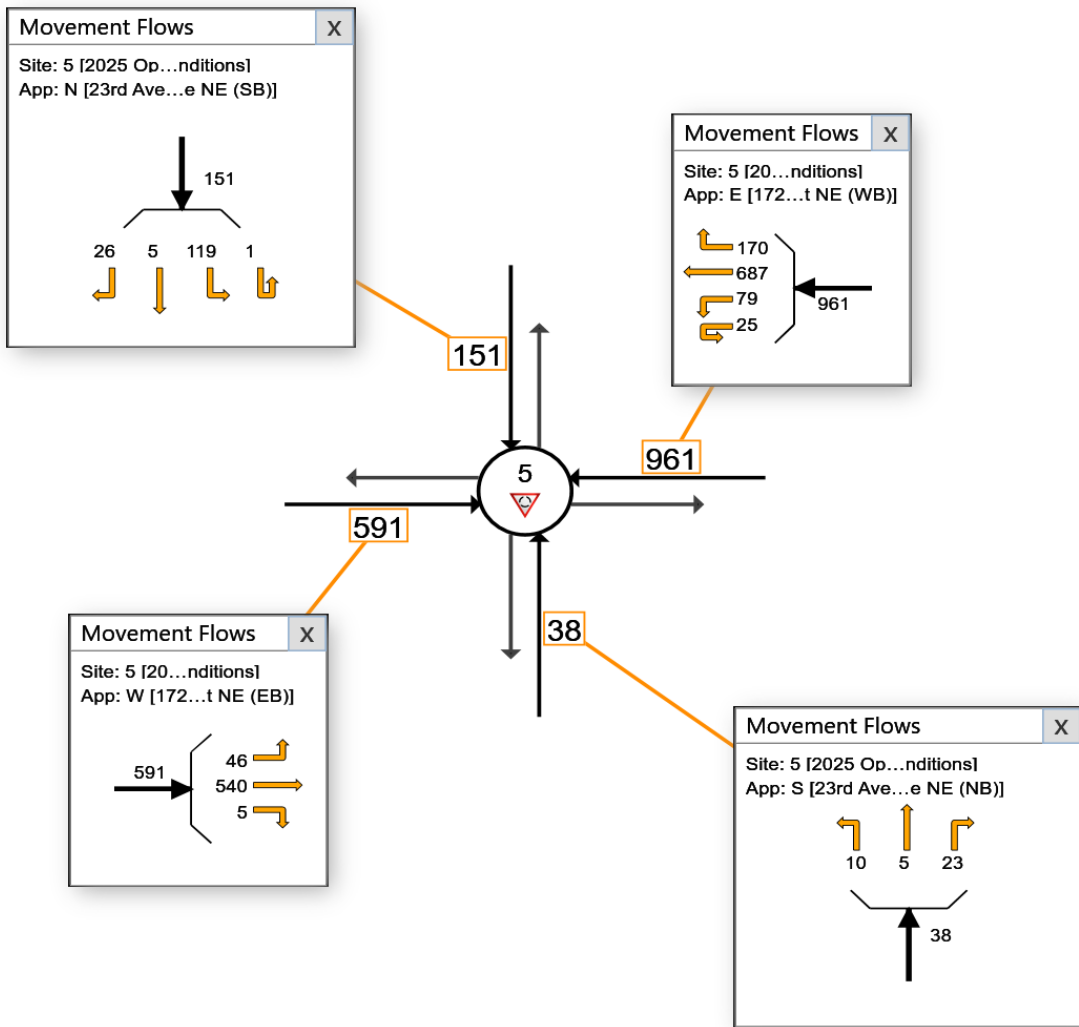
All Movement Classes

Site: 5 [2025 Opening Year Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
 Site Category: 172nd St NE at 23rd Avenue NE
 Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
 Click and drag popup boxes to move to preferred positions.

Close All Popups



MOVEMENT SUMMARY

Site: 5 [2025 Opening Year Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
 Site Category: 172nd St NE at 23rd Avenue NE
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: 23rd Avenue NE (NB)														
3	L2	10	3.0	10	3.0	0.052	14.0	LOS B	0.3	8.4	0.74	0.70	0.74	34.8
8	T1	5	3.0	5	3.0	0.052	8.3	LOS A	0.3	8.4	0.74	0.70	0.74	34.7
18	R2	23	3.0	23	3.0	0.052	8.2	LOS A	0.3	8.4	0.74	0.70	0.74	33.7
Approach		38	3.0	38	3.0	0.052	9.8	LOS A	0.3	8.4	0.74	0.70	0.74	34.1
East: 172nd Street NE (WB)														
1u	U	25	3.0	25	3.0	0.509	12.6	LOS B	4.6	117.2	0.31	0.43	0.31	37.7
1	L2	79	3.0	80	3.0	0.509	10.2	LOS B	4.6	117.2	0.31	0.43	0.31	36.8
6	T1	687	3.0	694	3.0	0.509	4.1	LOS A	4.6	117.2	0.31	0.43	0.31	36.7
16	R2	170	3.0	172	3.0	0.158	4.5	LOS A	0.9	22.9	0.25	0.47	0.25	36.1
Approach		961	3.0	971	3.0	0.509	4.9	LOS A	4.6	117.2	0.30	0.43	0.30	36.6
North: 23rd Avenue NE (SB)														
7u	U	1	3.0	1	3.0	0.212	17.8	LOS B	1.4	35.7	0.79	0.84	0.79	33.5
7	L2	119	3.0	120	3.0	0.212	15.4	LOS B	1.4	35.7	0.79	0.84	0.79	32.8
4	T1	5	3.0	5	3.0	0.212	9.3	LOS A	1.4	35.7	0.79	0.84	0.79	32.8
14	R2	26	3.0	26	3.0	0.212	9.3	LOS A	1.4	35.7	0.79	0.84	0.79	31.9
Approach		151	3.0	153	3.0	0.212	14.1	LOS B	1.4	35.7	0.79	0.84	0.79	32.6
West: 172nd Street NE (EB)														
5	L2	46	3.0	46	3.0	0.525	11.6	LOS B	4.2	107.8	0.61	0.58	0.61	35.6
2	T1	540	3.0	545	3.0	0.525	5.9	LOS A	4.2	107.8	0.61	0.58	0.61	35.6
12	R2	5	3.0	5	3.0	0.525	5.7	LOS A	4.2	107.8	0.61	0.58	0.61	34.5
Approach		591	3.0	597	3.0	0.525	6.3	LOS A	4.2	107.8	0.61	0.58	0.61	35.6
All Vehicles		1741	3.0	1759	3.0	0.525	6.3	LOS A	4.6	117.2	0.46	0.52	0.46	35.8

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

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

Queue Model: HCM Queue Formula.

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

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

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 Project: K:\SNO_TPTO\2022\22-017 172nd Street Assemblage\Intersection Analysis\Sidra\#5.sip9

Lanes, Volumes, Timings
6: 27th Avenue NE/Spring Lane & 172nd Street NE

2025 Opening Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	539	131	707	750	342	199	83	600	356	91	35
Future Volume (vph)	28	539	131	707	750	342	199	83	600	356	91	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		375	400		200	150		0	175		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor		1.00		0.99			0.99				0.99	1.00
Frt		0.971				0.850			0.850		0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3455	0	3467	3574	1599	1787	1881	1599	3467	1790	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1787	3455	0	3442	3574	1599	1770	1881	1599	3467	1790	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				292			459		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1325			609			730			589	
Travel Time (s)		30.1			13.8			16.6			13.4	
Confl. Peds. (#/hr)			8	8			10					10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	721	0	760	806	368	214	89	645	383	136	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0	5.0	3.0	5.0	
Minimum Split (s)	9.5	38.3		9.5	38.3	38.3	9.5	23.1	23.1	9.5	45.1	
Total Split (s)	20.0	38.3		46.0	60.0	60.0	25.0	25.0	25.0	25.0	45.1	
Total Split (%)	13.0%	24.8%		29.8%	38.9%	38.9%	16.2%	16.2%	16.2%	16.2%	29.2%	
Maximum Green (s)	15.0	32.0		41.0	53.7	53.7	20.0	19.9	19.9	20.0	40.0	
Yellow Time (s)	3.0	4.3		3.0	4.3	4.3	3.0	3.1	3.1	3.0	3.1	
All-Red Time (s)	2.0	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	0.0	
Total Lost Time (s)	5.0	6.3		5.0	6.3	6.3	5.0	5.1	5.1	5.0	5.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0	7.0					7.0	
Flash Dont Walk (s)		25.0			25.0	25.0					33.0	
Pedestrian Calls (#/hr)		0			0	0					0	
Act Effct Green (s)	7.5	32.0		36.3	65.2	65.2	19.5	40.5	40.5	19.0	40.0	
Actuated g/C Ratio	0.05	0.21		0.24	0.44	0.44	0.13	0.27	0.27	0.13	0.27	
v/c Ratio	0.34	0.96		0.90	0.52	0.43	0.92	0.17	0.84	0.87	0.28	
Control Delay	79.6	80.0		69.7	33.0	8.4	104.7	44.3	25.7	84.0	42.2	

Marysville 172 & 23 Apartments
Kimley-Horn and Associates, Inc. [BJL 090222017]

PM Peak-Hour

Lanes, Volumes, Timings
 6: 27th Avenue NE/Spring Lane & 172nd Street NE

2025 Opening Year Conditions

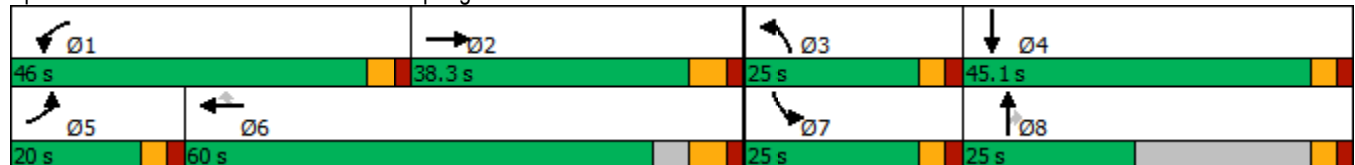
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.6	80.0		69.7	33.5	8.6	104.7	44.3	25.7	84.0	42.2	
LOS	E	F		E	C	A	F	D	C	F	D	
Approach Delay		80.0			43.0			45.3				73.0
Approach LOS		F			D			D				E
Queue Length 50th (ft)	29	366		374	315	46	211	68	196	192	97	
Queue Length 95th (ft)	67	#517		454	393	131	#379	121	#415	#279	164	
Internal Link Dist (ft)		1245			529			650			509	
Turn Bay Length (ft)	195			400		200	150			175		
Base Capacity (vph)	179	754		953	1561	863	239	510	768	465	488	
Starvation Cap Reductn	0	0		0	356	117	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.17	0.96		0.80	0.67	0.49	0.90	0.17	0.84	0.82	0.28	

Intersection Summary

Area Type: Other
 Cycle Length: 154.4
 Actuated Cycle Length: 149.3
 Natural Cycle: 135
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 54.0
 Intersection Capacity Utilization 103.3%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.













Intersection LOS: D
 ICU Level of Service G

Splits and Phases: 6: 27th Avenue NE/Spring Lane & 172nd Street NE



Lanes, Volumes, Timings
7: I-5 Southbound Ramps & 172nd Street NE

2025 Opening Year Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘	↖	↖
Traffic Volume (vph)	0	1030	550	0	1450	599	0	0	0	259	2	341
Future Volume (vph)	0	1030	550	0	1450	599	0	0	0	259	2	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	350		435
Storage Lanes	0		1	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.97			0.97						
Frt			0.850			0.850						0.850
Flt Protected										0.950	0.953	
Satd. Flow (prot)	0	3539	1583	0	3539	1583	0	0	0	1681	1686	1583
Flt Permitted										0.950	0.953	
Satd. Flow (perm)	0	3539	1542	0	3539	1541	0	0	0	1681	1686	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			573			624						66
Link Speed (mph)		30			30			30				30
Link Distance (ft)		609			940			979				1126
Travel Time (s)		13.8			21.4			22.3				25.6
Confl. Peds. (#/hr)	3		7	7		3						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1073	573	0	1510	624	0	0	0	135	137	355
Turn Type		NA	Perm		NA	Perm				Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2			6				4		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)		100.0	100.0		100.0	100.0				30.0	30.0	30.0
Total Split (%)		76.9%	76.9%		76.9%	76.9%				23.1%	23.1%	23.1%
Maximum Green (s)		94.2	94.2		93.9	93.9				24.2	24.2	24.2
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?												
Vehicle Extension (s)		4.0	4.0		4.0	4.0				4.5	4.5	4.5
Recall Mode		None	None		None	None				Max	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		21.0	21.0				21.0	21.0	21.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)		84.0	84.0		83.7	83.7				28.4	28.4	28.4
Actuated g/C Ratio		0.68	0.68		0.67	0.67				0.23	0.23	0.23
v/c Ratio		0.45	0.47		0.63	0.50				0.35	0.36	0.86
Control Delay		9.7	1.8		12.5	2.0				46.5	46.6	60.1
Queue Delay		0.3	0.4		0.0	0.0				0.0	0.0	0.0

Marysville 172 & 23 Apartments
Kimley-Horn and Associates, Inc. [BJL 090222017]

PM Peak-Hour

Lanes, Volumes, Timings
 7: I-5 Southbound Ramps & 172nd Street NE

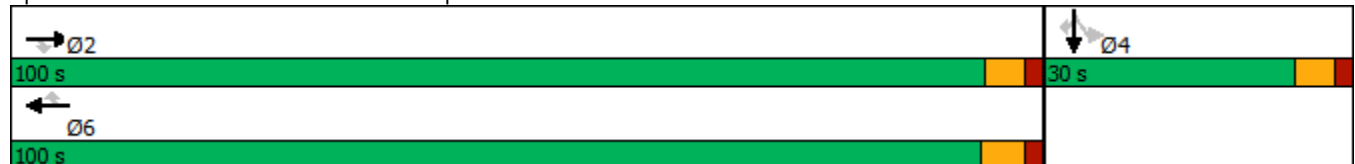
2025 Opening Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		10.0	2.2		12.5	2.0				46.5	46.6	60.1
LOS		A	A		B	A				D	D	E
Approach Delay		7.3			9.5						54.2	
Approach LOS		A			A						D	
Queue Length 50th (ft)		189	0		326	0				107	108	255
Queue Length 95th (ft)		228	32		386	33				175	177	#445
Internal Link Dist (ft)		529			860			899			1046	
Turn Bay Length (ft)			200							350		435
Base Capacity (vph)		2722	1318		2713	1327				384	385	412
Starvation Cap Reductn		921	309		0	0				0	0	0
Spillback Cap Reductn		0	0		0	0				0	0	0
Storage Cap Reductn		0	0		0	0				0	0	0
Reduced v/c Ratio		0.60	0.57		0.56	0.47				0.35	0.36	0.86

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 124.2
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 15.0
 Intersection Capacity Utilization 71.1%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 7: I-5 Southbound Ramps & 172nd Street NE



Lanes, Volumes, Timings
8: I-5 Northbound Ramps & 172nd Street NE

2025 Opening Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	399	911	0	0	1301	440	694	2	770	0	0	0
Future Volume (vph)	399	911	0	0	1301	440	694	2	770	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.97			0.99			
Fr						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	1752	3505	0	0	5036	1568	1665	1670	1568	0	0	0
Flt Permitted	0.950						0.950	0.953				
Satd. Flow (perm)	1749	3505	0	0	5036	1527	1665	1670	1548	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						454			398			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		940			1086			1094			999	
Travel Time (s)		21.4			24.7			24.9			22.7	
Confl. Peds. (#/hr)	6		6	6		6			3			
Confl. Bikes (#/hr)			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 (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	411	939	0	0	1341	454	357	360	794	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Free			
Protected Phases	5	2			6			8				
Permitted Phases						6	8		Free			
Detector Phase	5	2			6	6	8	8				
Switch Phase												
Minimum Initial (s)	5.0	7.0			7.0	7.0	7.0	7.0				
Minimum Split (s)	10.6	24.1			23.8	23.8	40.8	40.8				
Total Split (s)	30.0	90.0			60.0	60.0	30.0	30.0				
Total Split (%)	25.0%	75.0%			50.0%	50.0%	25.0%	25.0%				
Maximum Green (s)	24.4	83.9			54.2	54.2	24.2	24.2				
Yellow Time (s)	3.6	4.1			3.8	3.8	3.8	3.8				
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Total Lost Time (s)	5.6	6.1			5.8	5.8	5.8	5.8				
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	4.0			4.0	4.0	4.5	4.5				
Recall Mode	None	None			None	None	Max	Max				
Walk Time (s)		7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)		10.0			8.0	8.0	28.0	28.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	24.4	81.8			52.1	52.1	35.0	35.0	128.8			
Actuated g/C Ratio	0.19	0.64			0.40	0.40	0.27	0.27	1.00			
v/c Ratio	1.24	0.42			0.66	0.51	0.79	0.79	0.51			

Lanes, Volumes, Timings
 8: I-5 Northbound Ramps & 172nd Street NE

2025 Opening Year Conditions

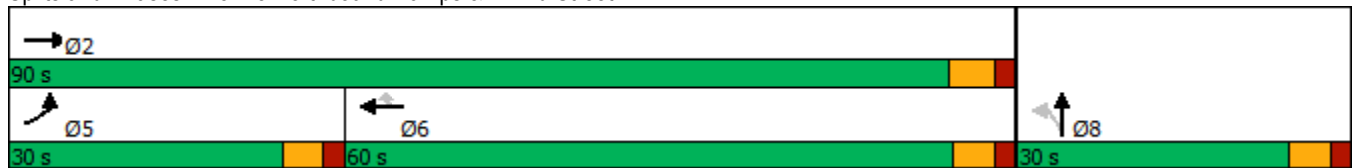
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	174.2	12.3			32.9	4.4	57.8	58.1	1.2			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	174.2	12.3			32.9	4.4	57.8	58.1	1.2			
LOS	F	B			C	A	E	E	A			
Approach Delay		61.6			25.6			28.1				
Approach LOS		E			C			C				
Queue Length 50th (ft)	~436	191			328	0	298	301	0			
Queue Length 95th (ft)	#641	234			380	64	#454	#461	0			
Internal Link Dist (ft)		860			1006			1014				919
Turn Bay Length (ft)	600					300	400					
Base Capacity (vph)	332	2286			2121	905	452	454	1548			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	1.24	0.41			0.63	0.50	0.79	0.79	0.51			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 128.8
 Natural Cycle: 100
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.24
 Intersection Signal Delay: 36.9
 Intersection Capacity Utilization 93.5%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: D
 ICU Level of Service F

Splits and Phases: 8: I-5 Northbound Ramps & 172nd Street NE



Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

2025 Opening Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	26	11	2	49	187	15	313	5	257	335	44
Future Volume (vph)	35	26	11	2	49	187	15	313	5	257	335	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	75		0	200		0	0		135
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor		1.00			1.00		1.00	1.00		0.99		0.98
Frt		0.979				0.850		0.998				0.850
Flt Protected		0.977			0.998		0.950			0.950		
Satd. Flow (prot)	0	1793	0	0	1877	1599	1787	1876	0	1787	1881	1599
Flt Permitted		0.832			0.991		0.542			0.474		
Satd. Flow (perm)	0	1527	0	0	1864	1599	1017	1876	0	885	1881	1560
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				205		1				52
Link Speed (mph)		30			30			30				30
Link Distance (ft)		967			413			725				730
Travel Time (s)		22.0			9.4			16.5				16.6
Confl. Peds. (#/hr)			1	1			2		7	7		2
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 (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	79	0	0	56	205	16	349	0	282	368	48
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	22.5	22.5		26.0	26.0	26.0	9.5	22.5		9.5	26.0	26.0
Total Split (s)	25.0	25.0		25.0	25.0	25.0	20.0	50.0		30.0	50.0	50.0
Total Split (%)	23.8%	23.8%		23.8%	23.8%	23.8%	19.0%	47.6%		28.6%	47.6%	47.6%
Maximum Green (s)	21.0	21.0		21.0	21.0	21.0	16.0	46.0		26.0	46.0	46.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	8.0	8.0		15.0	15.0	15.0		10.0			15.0	15.0
Pedestrian Calls (#/hr)	3	3		3	3	3		13			13	13
Act Effct Green (s)		10.4			10.4	10.4	51.6	46.5		59.8	58.3	58.3
Actuated g/C Ratio		0.13			0.13	0.13	0.66	0.59		0.76	0.74	0.74
v/c Ratio		0.38			0.23	0.53	0.02	0.31		0.36	0.26	0.04
Control Delay		33.5			32.3	9.9	4.2	10.4		4.6	5.2	2.0

Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

2025 Opening Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		33.5			32.3	9.9	4.2	10.4		4.6	5.2	2.0
LOS		C			C	A	A	B		A	A	A
Approach Delay		33.5			14.7			10.1			4.8	
Approach LOS		C			B			B			A	
Queue Length 50th (ft)		31			24	0	1	68		24	33	0
Queue Length 95th (ft)		73			59	55	9	192		88	160	13
Internal Link Dist (ft)		887			333			645			650	
Turn Bay Length (ft)							200					135
Base Capacity (vph)		422			508	585	931	1113		978	1403	1177
Starvation Cap Reductn		0			0	0	0	0		0	0	0
Spillback Cap Reductn		0			0	0	0	0		0	0	0
Storage Cap Reductn		0			0	0	0	0		0	0	0
Reduced v/c Ratio		0.19			0.11	0.35	0.02	0.31		0.29	0.26	0.04

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 78.3
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 9.6
 Intersection Capacity Utilization 51.7%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 9: 27th Avenue NE & 169th Place NE



Lanes, Volumes, Timings

10: Smokey Point Boulevard & 156th Street NE

2025 Opening Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	4	250	21	11	30	235	550	4	28	624	56
Future Volume (vph)	28	4	250	21	11	30	235	550	4	28	624	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		0	250		0	200		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.891			0.999			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1660	0	1770	3536	0	1770	3497	0
Flt Permitted	0.728			0.755			0.231			0.430		
Satd. Flow (perm)	1356	1863	1583	1406	1660	0	430	3536	0	801	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			266		32			1			10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1704			1283			1384			4766	
Travel Time (s)		38.7			29.2			31.5			108.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	4	266	22	44	0	250	589	0	30	724	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	25.0	25.0	12.0	25.0		12.0	25.0		12.0	25.0	
Total Split (s)	25.0	20.0	20.0	25.0	10.0		20.0	50.0		20.0	50.0	
Total Split (%)	21.7%	17.4%	17.4%	21.7%	8.7%		17.4%	43.5%		17.4%	43.5%	
Maximum Green (s)	20.0	15.0	15.0	20.0	5.0		15.0	45.0		15.0	45.0	
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)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.5		2.0	3.5	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		13.0	13.0		13.0			13.0			13.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	10.5	8.3	8.3	10.4	8.3		38.7	35.0		28.4	20.9	
Actuated g/C Ratio	0.17	0.14	0.14	0.17	0.14		0.63	0.57		0.46	0.34	
v/c Ratio	0.11	0.02	0.60	0.08	0.18		0.46	0.29		0.06	0.61	
Control Delay	22.8	30.2	11.1	22.6	17.4		8.8	9.9		7.2	19.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	22.8	30.2	11.1	22.6	17.4		8.8	9.9		7.2	19.9	
LOS	C	C	B	C	B		A	A		A	B	

Lanes, Volumes, Timings

10: Smokey Point Boulevard & 156th Street NE

2025 Opening Year Conditions

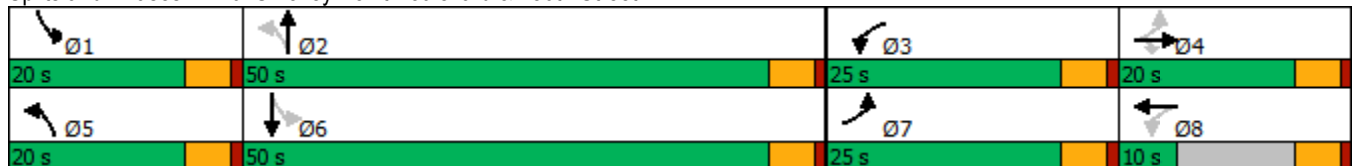
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		12.6			19.1			9.5			19.4	
Approach LOS		B			B			A			B	
Queue Length 50th (ft)	9	1	0	7	4		22	28		2	97	
Queue Length 95th (ft)	32	11	67	26	36		94	143		16	214	
Internal Link Dist (ft)		1624			1203			1304			4686	
Turn Bay Length (ft)	150		150	200			250			200		
Base Capacity (vph)	629	486	609	630	457		621	2730		726	2702	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.05	0.01	0.44	0.03	0.10		0.40	0.22		0.04	0.27	

Intersection Summary

Area Type: Other
 Cycle Length: 115
 Actuated Cycle Length: 61.4
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 14.1
 Intersection Capacity Utilization 52.8%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 10: Smokey Point Boulevard & 156th Street NE



Lanes, Volumes, Timings
 11: Smokey Point Boulevard & 152nd Street NE

2025 Opening Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	2	7	126	2	250	4	555	133	267	606	5
Future Volume (vph)	3	2	7	126	2	250	4	555	133	267	606	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	125		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor							1.00				1.00	
Frt		0.880			0.851			0.971			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1623	0	1752	1570	0	1752	3403	0	1752	3501	0
Flt Permitted				0.678			0.399			0.216		
Satd. Flow (perm)	1845	1623	0	1251	1570	0	735	3403	0	398	3501	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			272			27			1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		209			5141			1452			1384	
Travel Time (s)		4.8			116.8			33.0			31.5	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	3	10	0	137	274	0	4	748	0	290	664	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	7.0		4.0	7.0	
Minimum Split (s)	9.5	27.0		11.5	26.0		9.5	24.0		9.5	26.0	
Total Split (s)	16.0	16.0		16.0	40.0		16.0	50.0		16.0	50.0	
Total Split (%)	13.1%	13.1%		13.1%	32.8%		13.1%	41.0%		13.1%	41.0%	
Maximum Green (s)	11.0	11.0		11.0	35.0		11.0	45.0		11.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			14.0			12.0			14.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	5.7	5.0		9.8	8.3		23.0	17.8		34.2	32.7	
Actuated g/C Ratio	0.10	0.09		0.18	0.15		0.42	0.33		0.63	0.60	
v/c Ratio	0.02	0.06		0.46	0.58		0.01	0.66		0.55	0.32	
Control Delay	21.0	19.9		25.5	9.7		6.2	18.7		10.6	7.6	

Marysville 172 & 23 Apartments
 Kimley-Horn and Associates, Inc. [BJL 090222017]

PM Peak-Hour

Lanes, Volumes, Timings
 11: Smokey Point Boulevard & 152nd Street NE

2025 Opening Year Conditions

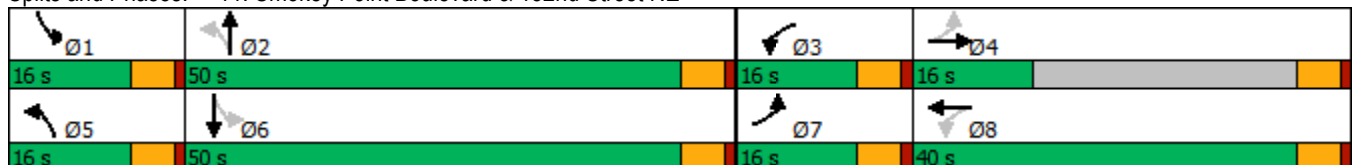
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	21.0	19.9		25.5	9.7		6.2	18.7		10.6	7.6	
LOS	C	B		C	A		A	B		B	A	
Approach Delay		20.1			15.0			18.6			8.5	
Approach LOS		C			B			B			A	
Queue Length 50th (ft)	1	1		38	1		0	94		29	36	
Queue Length 95th (ft)	7	15		92	63		4	196		#123	152	
Internal Link Dist (ft)		129			5061			1372			1304	
Turn Bay Length (ft)	50			125			150			200		
Base Capacity (vph)	397	1085		404	1138		608	2898		534	2978	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.01		0.34	0.24		0.01	0.26		0.54	0.22	

Intersection Summary

Area Type: Other
 Cycle Length: 122
 Actuated Cycle Length: 54.3
 Natural Cycle: 80
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 13.4
 Intersection Capacity Utilization 62.5%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service B

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Smokey Point Boulevard & 152nd Street NE



Lanes, Volumes, Timings

12: State Avenue/Smokey Point Boulevard & 136th Street NE

2025 Opening Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	196	59	150	180	110	98	410	190	113	394	226
Future Volume (vph)	132	196	59	150	180	110	98	410	190	113	394	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		0	300		0	300		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.99	1.00							0.99	
Frt			0.850		0.943			0.953			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1827	1553	1736	1723	0	1736	3308	0	1736	3252	0
Flt Permitted	0.320			0.469			0.303			0.303		
Satd. Flow (perm)	585	1827	1532	856	1723	0	554	3308	0	554	3252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143		26			54			77	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		981			4740			2821			4382	
Travel Time (s)		22.3			107.7			64.1			99.6	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	139	206	62	158	305	0	103	632	0	119	653	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0		5.0	7.0		5.0	7.0	
Minimum Split (s)	10.0	34.0	34.0	10.0	23.0		10.0	35.0		10.0	23.0	
Total Split (s)	15.0	35.0	35.0	30.0	40.0		35.0	35.0		30.0	30.0	
Total Split (%)	11.5%	26.9%	26.9%	23.1%	30.8%		26.9%	26.9%		23.1%	23.1%	
Maximum Green (s)	10.0	30.0	30.0	25.0	35.0		30.0	30.0		25.0	25.0	
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)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	Max		None	Max	
Walk Time (s)		8.0	8.0					9.0				
Flash Dont Walk (s)		21.0	21.0					21.0				
Pedestrian Calls (#/hr)		0	0					0				
Act Effct Green (s)	26.6	17.7	17.7	28.4	18.6		38.0	30.3		38.9	30.8	
Actuated g/C Ratio	0.31	0.21	0.21	0.33	0.22		0.44	0.35		0.45	0.36	
v/c Ratio	0.46	0.55	0.15	0.41	0.78		0.29	0.53		0.33	0.54	

Marysville 172 & 23 Apartments
 Kimley-Horn and Associates, Inc. [BJL 090222017]

PM Peak-Hour

Lanes, Volumes, Timings

12: State Avenue/Smokey Point Boulevard & 136th Street NE

2025 Opening Year Conditions

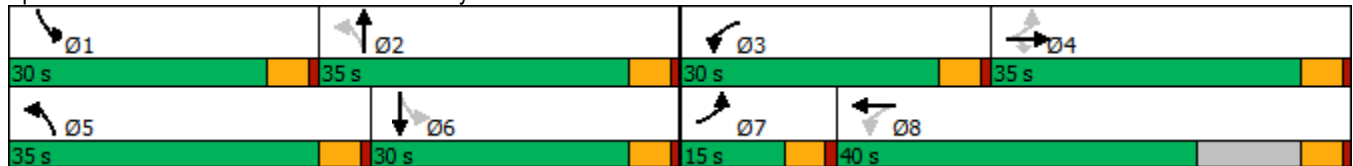
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	23.6	37.3	0.7	21.7	43.8		15.4	23.7		15.7	22.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	23.6	37.3	0.7	21.7	43.8		15.4	23.7		15.7	22.7	
LOS	C	D	A	C	D		B	C		B	C	
Approach Delay		27.0			36.3			22.5				21.6
Approach LOS		C			D			C				C
Queue Length 50th (ft)	49	100	0	57	145		29	130		33	130	
Queue Length 95th (ft)	94	183	0	105	245		66	224		75	223	
Internal Link Dist (ft)		901			4660			2741			4302	
Turn Bay Length (ft)	150		150	200			300			300		
Base Capacity (vph)	323	642	631	586	921		695	1198		626	1210	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.43	0.32	0.10	0.27	0.33		0.15	0.53		0.19	0.54	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 86.2
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 25.7
 Intersection Capacity Utilization 63.8%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service B

Splits and Phases: 12: State Avenue/Smokey Point Boulevard & 136th Street NE



HCM 6th TWSC
 13: Site Access & 172nd Street NE

2025 Opening Year Conditions

Intersection

Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↑		↗
Traffic Vol, veh/h	563	17	0	724	0	23
Future Vol, veh/h	563	17	0	724	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	612	18	0	787	0	25

Major/Minor	Major1	Major2	Minor1	
Conflicting Flow All	0	0	-	621
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.318
Pot Cap-1 Maneuver	-	0	-	487
Stage 1	-	0	-	-
Stage 2	-	0	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	487
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	487	-	-	-
HCM Lane V/C Ratio	0.051	-	-	-
HCM Control Delay (s)	12.8	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

HCM 6th TWSC
 14: 23rd Avenue NE & Site Access

2025 Opening Year Conditions

Intersection

Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	33	33	56	55	55	79
Future Vol, veh/h	33	33	56	55	55	79
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	36	61	60	60	86

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	285	103	146	0	0
Stage 1	103	-	-	-	-
Stage 2	182	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	705	952	1436	-	-
Stage 1	921	-	-	-	-
Stage 2	849	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	674	952	1436	-	-
Mov Cap-2 Maneuver	674	-	-	-	-
Stage 1	880	-	-	-	-
Stage 2	849	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	3.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1436	-	789	-	-
HCM Lane V/C Ratio	0.042	-	0.091	-	-
HCM Control Delay (s)	7.6	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

HCM 6th TWSC
 1: 11th Avenue NE & 172nd Street NE

2025 Baseline Conditions

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	1	432	23	108	706	12	29	0	136	8	4	4
Future Vol, veh/h	1	432	23	108	706	12	29	0	136	8	4	4
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	-	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	470	25	117	767	13	32	0	148	9	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	780	0	0	495	0	0	1497	1499	483	1567	1505	774
Stage 1	-	-	-	-	-	-	485	485	-	1008	1008	-
Stage 2	-	-	-	-	-	-	1012	1014	-	559	497	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	837	-	-	1069	-	-	101	122	584	90	121	398
Stage 1	-	-	-	-	-	-	563	552	-	290	318	-
Stage 2	-	-	-	-	-	-	288	316	-	513	545	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	837	-	-	1069	-	-	89	108	584	61	108	398
Mov Cap-2 Maneuver	-	-	-	-	-	-	89	108	-	61	108	-
Stage 1	-	-	-	-	-	-	562	551	-	289	283	-
Stage 2	-	-	-	-	-	-	250	282	-	382	544	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.1	34.4	54.3
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	295	837	-	-	1069	-	-	90
HCM Lane V/C Ratio	0.608	0.001	-	-	0.11	-	-	0.193
HCM Control Delay (s)	34.4	9.3	0	-	8.8	-	-	54.3
HCM Lane LOS	D	A	A	-	A	-	-	F
HCM 95th %tile Q(veh)	3.7	0	-	-	0.4	-	-	0.7

HCM 6th TWSC
2: 16th Drive NE & 172nd Street NE

2025 Baseline Conditions

Intersection

Int Delay, s/veh 1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	583	9	9	817	27	68
Future Vol, veh/h	583	9	9	817	27	68
Conflicting Peds, #/hr	0	3	3	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	627	10	10	878	29	73

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	640
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	944
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	941
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	17.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	386	-	-	941	-
HCM Lane V/C Ratio	0.265	-	-	0.01	-
HCM Control Delay (s)	17.6	-	-	8.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1	-	-	0	-

HCM 6th TWSC
 3: 19th Drive NE & 172nd Street NE

2025 Baseline Conditions

Intersection

Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	638	12	74	817	10	59
Future Vol, veh/h	638	12	74	817	10	59
Conflicting Peds, #/hr	0	9	9	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	693	13	80	888	11	64

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	715	0	1757 709
Stage 1	-	-	-	-	709 -
Stage 2	-	-	-	-	1048 -
Critical Hdwy	-	-	4.13	-	6.43 6.23
Critical Hdwy Stg 1	-	-	-	-	5.43 -
Critical Hdwy Stg 2	-	-	-	-	5.43 -
Follow-up Hdwy	-	-	2.227	-	3.527 3.327
Pot Cap-1 Maneuver	-	-	881	-	93 432
Stage 1	-	-	-	-	486 -
Stage 2	-	-	-	-	336 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	873	-	76 428
Mov Cap-2 Maneuver	-	-	-	-	76 -
Stage 1	-	-	-	-	482 -
Stage 2	-	-	-	-	275 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	24.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	256	-	-	873	-
HCM Lane V/C Ratio	0.293	-	-	0.092	-
HCM Control Delay (s)	24.8	-	-	9.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0.3	-

HCM 6th TWSC
 4: 19th Avenue NE & 172nd Street NE

2025 Baseline Conditions

Intersection												
Int Delay, s/veh	86.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔		↔	↔	
Traffic Vol, veh/h	47	488	163	0	607	27	202	0	0	13	0	74
Future Vol, veh/h	47	488	163	0	607	27	202	0	0	13	0	74
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	100	-	-	100	-	0	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	92	92	96	96	92	92	92	96	92	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	508	177	0	632	28	220	0	0	14	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	660	0	0	685	0	0	1380	1355	597	1327	1415	632
Stage 1	-	-	-	-	-	-	695	695	-	632	632	-
Stage 2	-	-	-	-	-	-	685	660	-	695	783	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	928	-	-	908	-	-	~ 122	149	503	132	137	480
Stage 1	-	-	-	-	-	-	433	444	-	468	474	-
Stage 2	-	-	-	-	-	-	438	460	-	433	404	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	928	-	-	908	-	-	~ 98	141	503	127	130	480
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 98	141	-	127	130	-
Stage 1	-	-	-	-	-	-	410	420	-	443	474	-
Stage 2	-	-	-	-	-	-	368	460	-	410	383	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0			\$ 659.9			17.3		
HCM LOS							F			C		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	98	-	928	-	-	908	-	-	127	480
HCM Lane V/C Ratio	2.24	-	0.053	-	-	-	-	-	0.107	0.161
HCM Control Delay (s)	\$ 659.9	0	9.1	-	-	0	-	-	36.7	13.9
HCM Lane LOS	F	A	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	19.4	-	0.2	-	-	0	-	-	0.3	0.6

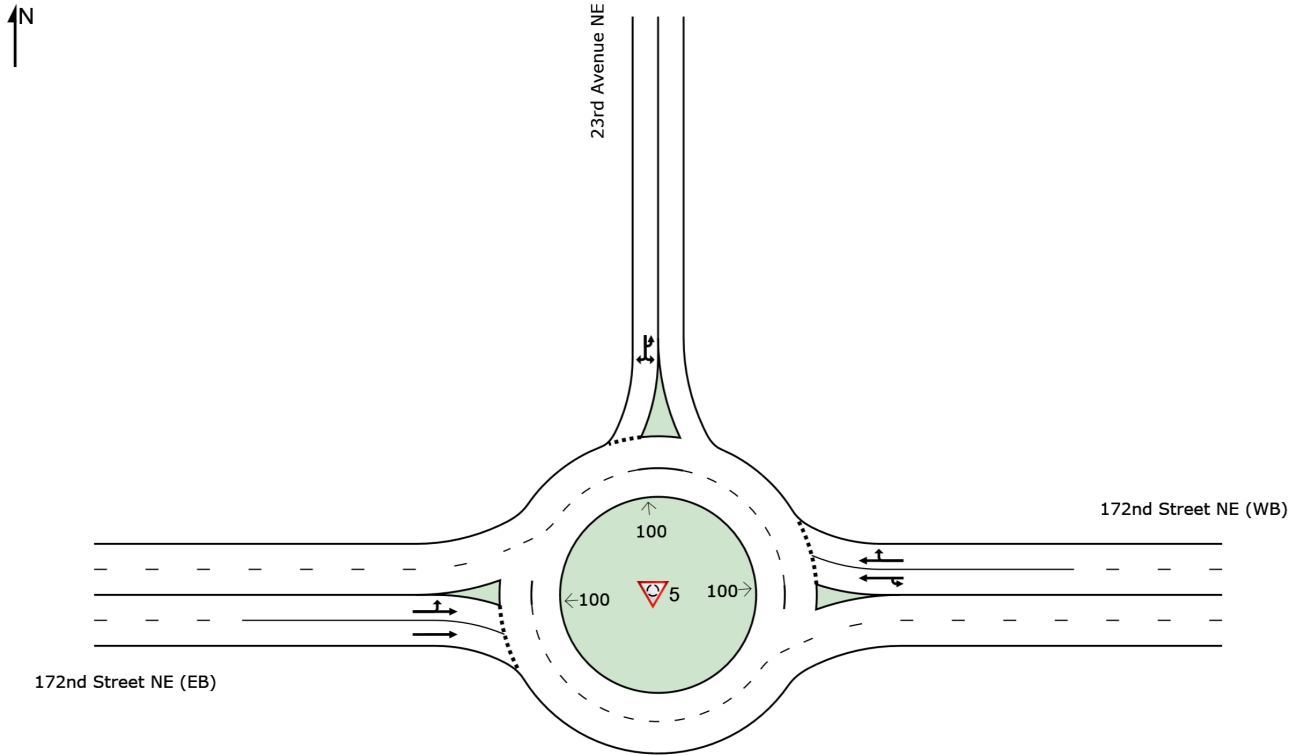
Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

SITE LAYOUT

Site: 5 [2031 Baseline Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
Site Category: 172nd St NE at 23rd Avenue NE
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

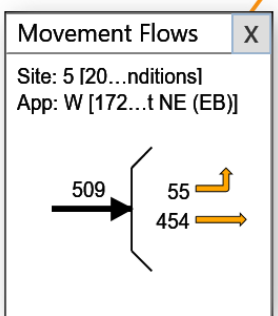
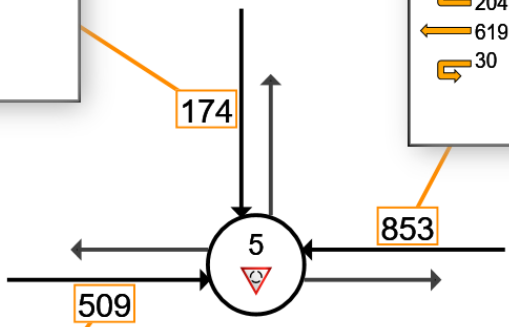
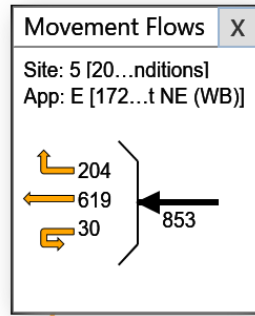
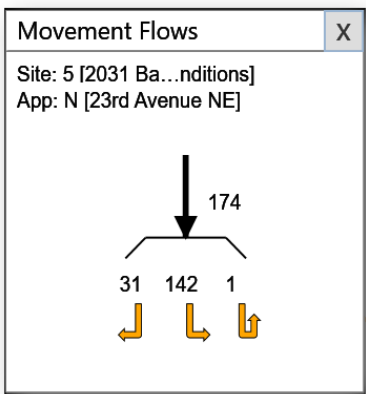
All Movement Classes

Site: 5 [2031 Baseline Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
Site Category: 172nd St NE at 23rd Avenue NE
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones. Click and drag popup boxes to move to preferred positions.

Close All Popups



MOVEMENT SUMMARY

Site: 5 [2031 Baseline Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
 Site Category: 172nd St NE at 23rd Avenue NE
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
East: 172nd Street NE (WB)														
1u	U	30	3.0	30	3.0	0.316	12.6	LOS B	1.8	45.5	0.21	0.42	0.21	38.2
6	T1	619	3.0	625	3.0	0.316	4.3	LOS A	1.8	45.6	0.21	0.42	0.21	37.2
16	R2	204	3.0	206	3.0	0.316	4.3	LOS A	1.8	45.6	0.20	0.42	0.20	36.2
Approach		853	3.0	862	3.0	0.316	4.6	LOS A	1.8	45.6	0.21	0.42	0.21	37.0
North: 23rd Avenue NE														
7u	U	1	3.0	1	3.0	0.206	14.9	LOS B	0.9	22.0	0.54	0.80	0.54	35.2
7	L2	142	3.0	143	3.0	0.206	12.4	LOS B	0.9	22.0	0.54	0.80	0.54	34.3
14	R2	31	3.0	31	3.0	0.206	6.4	LOS A	0.9	22.0	0.54	0.80	0.54	33.2
Approach		174	3.0	176	3.0	0.206	11.3	LOS B	0.9	22.0	0.54	0.80	0.54	34.1
West: 172nd Street NE (EB)														
5	L2	55	3.0	56	3.0	0.207	10.6	LOS B	1.1	27.0	0.35	0.51	0.35	36.4
2	T1	454	3.0	459	3.0	0.207	4.8	LOS A	1.1	27.4	0.34	0.47	0.34	36.6
Approach		509	3.0	514	3.0	0.207	5.4	LOS A	1.1	27.4	0.34	0.47	0.34	36.6
All Vehicles		1536	3.0	1552	3.0	0.316	5.6	LOS A	1.8	45.6	0.29	0.48	0.29	36.5

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

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

Queue Model: HCM Queue Formula.

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

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

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Project: K:\SNO_TPTO\2022\22-017 172nd Street Assemblage\Intersection Analysis\Sidra\#5.sip9

Lanes, Volumes, Timings
6: 27th Avenue NE/Spring Lane & 172nd Street NE

2031 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	425	157	633	599	408	237	99	537	425	108	42
Future Volume (vph)	34	425	157	633	599	408	237	99	537	425	108	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		0	400		200	150		0	175		175
Storage Lanes	1		0	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor		0.99		0.99			0.99				0.99	
Frt		0.960				0.850			0.850		0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3410	0	3467	3574	1599	1787	1881	1599	3467	1790	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1787	3410	0	3439	3574	1599	1771	1881	1599	3467	1790	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31				435			467		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1325			609			730			589	
Travel Time (s)		30.1			13.8			16.6			13.4	
Confl. Peds. (#/hr)			8	8			10					10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	626	0	681	644	439	255	106	577	457	161	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0	5.0	3.0	5.0	
Minimum Split (s)	9.5	38.3		9.5	38.3	38.3	9.5	23.1	23.1	9.5	45.1	
Total Split (s)	20.0	38.3		46.0	60.0	60.0	25.0	25.0	25.0	25.0	45.1	
Total Split (%)	13.0%	24.8%		29.8%	38.9%	38.9%	16.2%	16.2%	16.2%	16.2%	29.2%	
Maximum Green (s)	15.0	32.0		41.0	53.7	53.7	20.0	19.9	19.9	20.0	40.0	
Yellow Time (s)	3.0	4.3		3.0	4.3	4.3	3.0	3.1	3.1	3.0	3.1	
All-Red Time (s)	2.0	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	0.0	
Total Lost Time (s)	5.0	6.3		5.0	6.3	6.3	5.0	5.1	5.1	5.0	5.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0	7.0					7.0	
Flash Dont Walk (s)		25.0			25.0	25.0					33.0	
Pedestrian Calls (#/hr)		0			0	0					0	
Act Effct Green (s)	7.9	29.5		32.8	56.6	56.6	20.1	40.2	40.2	20.1	40.2	
Actuated g/C Ratio	0.05	0.20		0.23	0.39	0.39	0.14	0.28	0.28	0.14	0.28	
v/c Ratio	0.38	0.87		0.86	0.46	0.49	1.02	0.20	0.74	0.95	0.32	
Control Delay	78.6	66.2		65.7	34.1	4.7	123.8	43.1	16.2	90.9	41.7	

Lanes, Volumes, Timings
 6: 27th Avenue NE/Spring Lane & 172nd Street NE

2031 Baseline Conditions

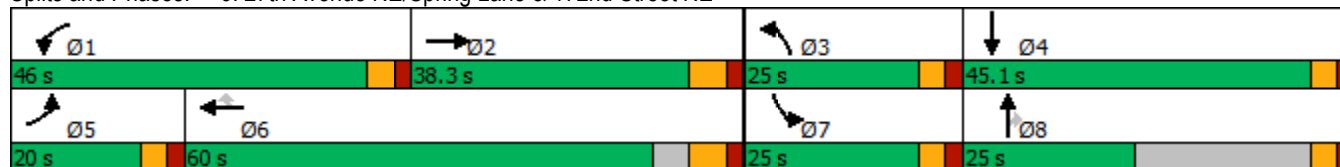
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.6	66.2		65.7	34.1	4.9	123.8	43.1	16.2	90.9	41.7	
LOS	E	E		E	C	A	F	D	B	F	D	
Approach Delay		66.9			39.0			48.5				78.1
Approach LOS		E			D			D				E
Queue Length 50th (ft)	35	288		325	239	2	~264	79	90	227	114	
Queue Length 95th (ft)	77	#401		398	306	73	#477	140	263	#365	194	
Internal Link Dist (ft)		1245			529			650				509
Turn Bay Length (ft)	195			400		200	150			175		
Base Capacity (vph)	186	784		991	1469	913	249	524	782	483	507	
Starvation Cap Reductn	0	0		0	0	84	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.80		0.69	0.44	0.53	1.02	0.20	0.74	0.95	0.32	

Intersection Summary

Area Type: Other
 Cycle Length: 154.4
 Actuated Cycle Length: 144
 Natural Cycle: 135
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 51.9
 Intersection Capacity Utilization 101.6%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: D
 ICU Level of Service G

Splits and Phases: 6: 27th Avenue NE/Spring Lane & 172nd Street NE



Lanes, Volumes, Timings
 7: I-5 Southbound Ramps & 172nd Street NE

2031 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘	↖	↗
Traffic Volume (vph)	0	1194	296	0	1252	715	0	0	0	309	3	380
Future Volume (vph)	0	1194	296	0	1252	715	0	0	0	309	3	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	350		435
Storage Lanes	0		1	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.97			0.97						
Frt			0.850			0.850						0.850
Flt Protected										0.950	0.953	
Satd. Flow (prot)	0	3539	1583	0	3539	1583	0	0	0	1681	1686	1583
Flt Permitted										0.950	0.953	
Satd. Flow (perm)	0	3539	1542	0	3539	1541	0	0	0	1681	1686	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			308			745						99
Link Speed (mph)		30			30			30				30
Link Distance (ft)		609			940			979				1126
Travel Time (s)		13.8			21.4			22.3				25.6
Confl. Peds. (#/hr)	3		7	7		3						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1244	308	0	1304	745	0	0	0	161	164	396
Turn Type		NA	Perm		NA	Perm				Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2			6				4		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)		100.0	100.0		100.0	100.0				30.0	30.0	30.0
Total Split (%)		76.9%	76.9%		76.9%	76.9%				23.1%	23.1%	23.1%
Maximum Green (s)		94.2	94.2		93.9	93.9				24.2	24.2	24.2
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?												
Vehicle Extension (s)		4.0	4.0		4.0	4.0				4.5	4.5	4.5
Recall Mode		None	None		None	None				Max	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		21.0	21.0				21.0	21.0	21.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)		78.1	78.1		77.8	77.8				28.7	28.7	28.7
Actuated g/C Ratio		0.66	0.66		0.66	0.66				0.24	0.24	0.24
v/c Ratio		0.53	0.28		0.56	0.59				0.40	0.40	0.87
Control Delay		11.1	1.3		11.6	2.5				45.6	45.7	54.5
Queue Delay		0.3	0.0		0.0	0.1				0.0	0.0	0.0

Marysville 172 & 23 Apartments
 Kimley-Horn and Associates, Inc. [BJL 090222017]

PM Peak-Hour

Lanes, Volumes, Timings
 7: I-5 Southbound Ramps & 172nd Street NE

2031 Baseline Conditions

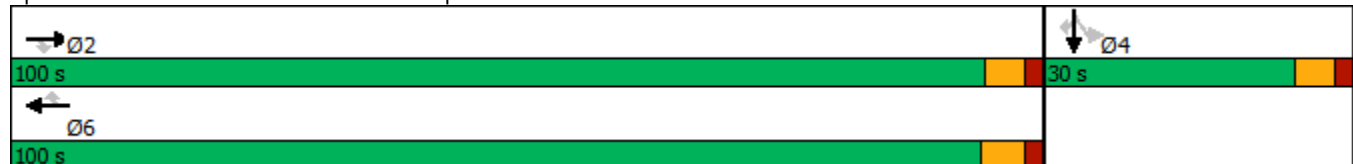
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		11.4	1.3		11.6	2.6				45.6	45.7	54.5
LOS		B	A		B	A				D	D	D
Approach Delay		9.4			8.3						50.5	
Approach LOS		A			A						D	
Queue Length 50th (ft)		235	0		256	0				121	123	251
Queue Length 95th (ft)		282	26		305	35				206	210	#479
Internal Link Dist (ft)		529			860			899			1046	
Turn Bay Length (ft)			200							350		435
Base Capacity (vph)		2839	1298		2832	1382				406	407	457
Starvation Cap Reductn		803	0		0	55				0	0	0
Spillback Cap Reductn		0	0		0	0				0	0	0
Storage Cap Reductn		0	0		0	0				0	0	0
Reduced v/c Ratio		0.61	0.24		0.46	0.56				0.40	0.40	0.87

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 118.7
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 15.7
 Intersection Capacity Utilization 68.1%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 7: I-5 Southbound Ramps & 172nd Street NE



Lanes, Volumes, Timings
 8: I-5 Northbound Ramps & 172nd Street NE

2031 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	461	1067	0	0	1519	526	383	3	920	0	0	0
Future Volume (vph)	461	1067	0	0	1519	526	383	3	920	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.97			0.99			
Fr						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	1752	3505	0	0	5036	1568	1665	1670	1568	0	0	0
Flt Permitted	0.950						0.950	0.953				
Satd. Flow (perm)	1750	3505	0	0	5036	1527	1665	1670	1548	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						537			360			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		940			1086			1094			999	
Travel Time (s)		21.4			24.7			24.9			22.7	
Confl. Peds. (#/hr)	6		6	6		6			3			
Confl. Bikes (#/hr)			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 (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	475	1100	0	0	1566	542	197	201	948	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Free			
Protected Phases	5	2			6			8				
Permitted Phases						6	8		Free			
Detector Phase	5	2			6	6	8	8				
Switch Phase												
Minimum Initial (s)	5.0	7.0			7.0	7.0	7.0	7.0				
Minimum Split (s)	10.6	24.1			23.8	23.8	40.8	40.8				
Total Split (s)	30.0	90.0			60.0	60.0	30.0	30.0				
Total Split (%)	25.0%	75.0%			50.0%	50.0%	25.0%	25.0%				
Maximum Green (s)	24.4	83.9			54.2	54.2	24.2	24.2				
Yellow Time (s)	3.6	4.1			3.8	3.8	3.8	3.8				
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Total Lost Time (s)	5.6	6.1			5.8	5.8	5.8	5.8				
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	4.0			4.0	4.0	4.5	4.5				
Recall Mode	None	None			None	None	Max	Max				
Walk Time (s)		7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)		10.0			8.0	8.0	28.0	28.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	24.4	83.9			54.2	54.2	35.0	35.0	130.8			
Actuated g/C Ratio	0.19	0.64			0.41	0.41	0.27	0.27	1.00			
v/c Ratio	1.46	0.49			0.75	0.57	0.44	0.45	0.61			

Lanes, Volumes, Timings
 8: I-5 Northbound Ramps & 172nd Street NE

2031 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	259.9	13.2			35.4	4.8	43.6	43.8	1.8			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	259.9	13.2			35.4	4.8	43.6	43.8	1.8			
LOS	F	B			D	A	D	D	A			
Approach Delay		87.6			27.5			14.2				
Approach LOS		F			C			B				
Queue Length 50th (ft)	~549	240			408	2	146	150	0			
Queue Length 95th (ft)	#764	289			468	76	226	231	0			
Internal Link Dist (ft)		860			1006			1014			919	
Turn Bay Length (ft)	600					300	400					
Base Capacity (vph)	326	2248			2086	947	445	446	1548			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	1.46	0.49			0.75	0.57	0.44	0.45	0.61			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 130.8
 Natural Cycle: 120
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.46
 Intersection Signal Delay: 42.8
 Intersection Capacity Utilization 102.2%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: D
 ICU Level of Service G

Splits and Phases: 8: I-5 Northbound Ramps & 172nd Street NE



Lanes, Volumes, Timings
9: 27th Avenue NE & 169th Place NE

2031 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	3	3	3	9	223	0	373	7	307	401	52
Future Volume (vph)	42	3	3	3	9	223	0	373	7	307	401	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	75		0	200		0	0		135
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor		1.00			1.00			1.00				0.98
Frt		0.992				0.850		0.997				0.850
Flt Protected		0.958			0.989					0.950		
Satd. Flow (prot)	0	1785	0	0	1860	1599	1881	1874	0	1787	1881	1599
Flt Permitted		0.747			0.948					0.418		
Satd. Flow (perm)	0	1392	0	0	1782	1599	1881	1874	0	786	1881	1560
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				245		1				57
Link Speed (mph)		30			30			30				30
Link Distance (ft)		967			413			725				730
Travel Time (s)		22.0			9.4			16.5				16.6
Confl. Peds. (#/hr)			1	1			2		7	7		2
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 (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	52	0	0	13	245	0	418	0	337	441	57
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	22.5	22.5		26.0	26.0	26.0	9.5	22.5		9.5	26.0	26.0
Total Split (s)	25.0	25.0		25.0	25.0	25.0	20.0	50.0		30.0	50.0	50.0
Total Split (%)	23.8%	23.8%		23.8%	23.8%	23.8%	19.0%	47.6%		28.6%	47.6%	47.6%
Maximum Green (s)	21.0	21.0		21.0	21.0	21.0	16.0	46.0		26.0	46.0	46.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	8.0	8.0		15.0	15.0	15.0		10.0			15.0	15.0
Pedestrian Calls (#/hr)	3	3		3	3	3		13			13	13
Act Effct Green (s)		10.0			10.0	10.0		46.5		60.6	60.6	60.6
Actuated g/C Ratio		0.13			0.13	0.13		0.59		0.77	0.77	0.77
v/c Ratio		0.29			0.06	0.59		0.38		0.46	0.30	0.05
Control Delay		34.0			30.4	10.7		11.4		5.4	4.0	1.2

Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

2031 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	0.0
Total Delay		34.0			30.4	10.7		11.4		5.4	4.0	1.2
LOS		C			C	B		B		A	A	A
Approach Delay		34.0			11.7			11.4			4.4	
Approach LOS		C			B			B			A	
Queue Length 50th (ft)		22			6	0		85		28	38	0
Queue Length 95th (ft)		57			21	60		247		107	143	11
Internal Link Dist (ft)		887			333			645			650	
Turn Bay Length (ft)												135
Base Capacity (vph)		380			484	613		1107		939	1449	1215
Starvation Cap Reductn		0			0	0		0		0	0	0
Spillback Cap Reductn		0			0	0		0		0	0	0
Storage Cap Reductn		0			0	0		0		0	0	0
Reduced v/c Ratio		0.14			0.03	0.40		0.38		0.36	0.30	0.05

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 78.7
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 8.4
 Intersection Capacity Utilization 56.5%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 9: 27th Avenue NE & 169th Place NE



Lanes, Volumes, Timings
 10: Smokey Point Boulevard & 156th Street NE

2031 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	5	274	25	13	35	237	656	5	34	745	61
Future Volume (vph)	30	5	274	25	13	35	237	656	5	34	745	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		0	250		0	200		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.891			0.999			0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1660	0	1770	3536	0	1770	3500	0
Flt Permitted	0.715			0.754			0.186			0.384		
Satd. Flow (perm)	1332	1863	1583	1405	1660	0	346	3536	0	715	3500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			291		37			1			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1704			1283			1384			4766	
Travel Time (s)		38.7			29.2			31.5			108.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	5	291	27	51	0	252	703	0	36	858	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	25.0	25.0	12.0	25.0		12.0	25.0		12.0	25.0	
Total Split (s)	25.0	20.0	20.0	25.0	10.0		20.0	50.0		20.0	50.0	
Total Split (%)	21.7%	17.4%	17.4%	21.7%	8.7%		17.4%	43.5%		17.4%	43.5%	
Maximum Green (s)	20.0	15.0	15.0	20.0	5.0		15.0	45.0		15.0	45.0	
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)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.5		2.0	3.5	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		13.0	13.0		13.0			13.0			13.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	10.8	8.6	8.6	10.6	8.5		43.5	37.1		33.0	25.5	
Actuated g/C Ratio	0.16	0.13	0.13	0.16	0.13		0.65	0.56		0.50	0.38	
v/c Ratio	0.12	0.02	0.64	0.10	0.21		0.51	0.36		0.08	0.64	
Control Delay	25.6	33.0	11.9	25.5	18.5		10.2	10.9		6.9	19.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	25.6	33.0	11.9	25.5	18.5		10.2	10.9		6.9	19.7	
LOS	C	C	B	C	B		B	B		A	B	

Lanes, Volumes, Timings
 10: Smokey Point Boulevard & 156th Street NE

2031 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		13.5			20.9			10.7				19.2
Approach LOS		B			C			B				B
Queue Length 50th (ft)	11	2	0	9	5		22	73		3		116
Queue Length 95th (ft)	37	13	74	33	41		108	177		19		266
Internal Link Dist (ft)		1624			1203			1304				4686
Turn Bay Length (ft)	150		150	200			250			200		
Base Capacity (vph)	589	451	604	589	430		571	2587		698		2549
Starvation Cap Reductn	0	0	0	0	0		0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0	0		0		0
Reduced v/c Ratio	0.05	0.01	0.48	0.05	0.12		0.44	0.27		0.05		0.34

Intersection Summary

Area Type: Other
 Cycle Length: 115
 Actuated Cycle Length: 66.5
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 14.9
 Intersection Capacity Utilization 57.8%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 10: Smokey Point Boulevard & 156th Street NE



Lanes, Volumes, Timings
 11: Smokey Point Boulevard & 152nd Street NE

2031 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	3	8	150	3	284	5	634	159	311	707	7
Future Volume (vph)	4	3	8	150	3	284	5	634	159	311	707	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	125		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor							1.00				1.00	
Frt		0.887			0.851			0.970			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1636	0	1752	1570	0	1752	3400	0	1752	3497	0
Flt Permitted				0.645			0.358			0.182		
Satd. Flow (perm)	1845	1636	0	1190	1570	0	660	3400	0	336	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			309			29			1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		209			5141			1452			1384	
Travel Time (s)		4.8			116.8			33.0			31.5	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	12	0	163	312	0	5	862	0	338	776	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	7.0		4.0	7.0	
Minimum Split (s)	9.5	27.0		11.5	26.0		9.5	24.0		9.5	26.0	
Total Split (s)	16.0	16.0		16.0	40.0		16.0	50.0		16.0	50.0	
Total Split (%)	13.1%	13.1%		13.1%	32.8%		13.1%	41.0%		13.1%	41.0%	
Maximum Green (s)	11.0	11.0		11.0	35.0		11.0	45.0		11.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			14.0			12.0			14.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	6.0	5.3		11.0	9.5		27.3	21.9		38.6	37.1	
Actuated g/C Ratio	0.10	0.09		0.18	0.16		0.46	0.36		0.64	0.62	
v/c Ratio	0.02	0.08		0.54	0.61		0.01	0.68		0.70	0.36	
Control Delay	24.0	21.6		29.8	9.9		6.4	18.9		18.8	8.0	

Lanes, Volumes, Timings
 11: Smokey Point Boulevard & 152nd Street NE

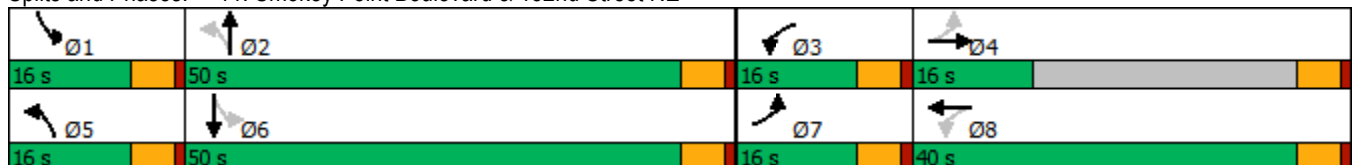
2031 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.0	21.6		29.8	9.9		6.4	18.9		18.8	8.0	
LOS	C	C		C	A		A	B		B	A	
Approach Delay		22.2			16.7			18.9			11.3	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)	1	1		51	1		1	118		39	48	
Queue Length 95th (ft)	9	18		117	71		5	240		#232	188	
Internal Link Dist (ft)		129			5061			1372			1304	
Turn Bay Length (ft)	50			125			150			200		
Base Capacity (vph)	369	997		371	1074		575	2660		486	2730	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.01		0.44	0.29		0.01	0.32		0.70	0.28	

Intersection Summary

Area Type: Other
 Cycle Length: 122
 Actuated Cycle Length: 60
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 15.0
 Intersection Capacity Utilization 70.1%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Smokey Point Boulevard & 152nd Street NE



Lanes, Volumes, Timings

12: State Avenue/Smokey Point Boulevard & 136th Street NE

2031 Baseline Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	234	70	179	215	124	117	475	227	132	462	265
Future Volume (vph)	150	234	70	179	215	124	117	475	227	132	462	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		0	300		0	300		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.99	1.00							0.99	
Frt			0.850		0.945			0.951			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1827	1553	1736	1726	0	1736	3301	0	1736	3252	0
Flt Permitted	0.273			0.388			0.220			0.225		
Satd. Flow (perm)	499	1827	1532	708	1726	0	402	3301	0	411	3252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143		25			57			77	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		981			4740			2821			4382	
Travel Time (s)		22.3			107.7			64.1			99.6	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	158	246	74	188	357	0	123	739	0	139	765	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0		5.0	7.0		5.0	7.0	
Minimum Split (s)	10.0	34.0	34.0	10.0	23.0		10.0	35.0		10.0	23.0	
Total Split (s)	15.0	35.0	35.0	30.0	40.0		35.0	35.0		30.0	30.0	
Total Split (%)	11.5%	26.9%	26.9%	23.1%	30.8%		26.9%	26.9%		23.1%	23.1%	
Maximum Green (s)	10.0	30.0	30.0	25.0	35.0		30.0	30.0		25.0	25.0	
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)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	Max		None	Max	
Walk Time (s)		8.0	8.0					9.0				
Flash Dont Walk (s)		21.0	21.0					21.0				
Pedestrian Calls (#/hr)		0	0					0				
Act Effct Green (s)	29.6	20.4	20.4	33.2	22.2		39.0	30.4		39.9	30.8	
Actuated g/C Ratio	0.32	0.22	0.22	0.36	0.24		0.43	0.33		0.44	0.34	
v/c Ratio	0.55	0.60	0.16	0.49	0.81		0.41	0.65		0.45	0.67	

Lanes, Volumes, Timings

12: State Avenue/Smokey Point Boulevard & 136th Street NE

2031 Baseline Conditions

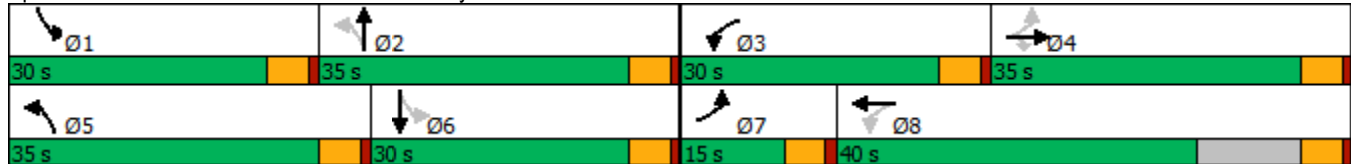
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	26.0	39.2	0.8	22.9	45.7		19.2	28.7		19.6	28.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.0	39.2	0.8	22.9	45.7		19.2	28.7		19.6	28.1	
LOS	C	D	A	C	D		B	C		B	C	
Approach Delay		28.9			37.8			27.4			26.8	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	58	127	0	70	182		38	176		43	178	
Queue Length 95th (ft)	106	224	0	124	296		85	295		95	300	
Internal Link Dist (ft)		901			4660			2741			4302	
Turn Bay Length (ft)	150		150	200			300			300		
Base Capacity (vph)	304	608	605	568	875		640	1137		568	1149	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.52	0.40	0.12	0.33	0.41		0.19	0.65		0.24	0.67	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 91.2
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 29.5
 Intersection Capacity Utilization 71.6%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 12: State Avenue/Smokey Point Boulevard & 136th Street NE



HCM 6th TWSC
1: 11th Avenue NE & 172nd Street NE

2031 Horizon Year Conditions

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	1	447	23	108	715	12	29	0	136	8	4	4
Future Vol, veh/h	1	447	23	108	715	12	29	0	136	8	4	4
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	-	-	-	115	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	486	25	117	777	13	32	0	148	9	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	790	0	0	511	0	0	1523	1525	499	1593	1531	784
Stage 1	-	-	-	-	-	-	501	501	-	1018	1018	-
Stage 2	-	-	-	-	-	-	1022	1024	-	575	513	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	830	-	-	1054	-	-	97	118	572	86	117	393
Stage 1	-	-	-	-	-	-	552	543	-	286	315	-
Stage 2	-	-	-	-	-	-	285	313	-	503	536	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	830	-	-	1054	-	-	85	105	572	58	104	393
Mov Cap-2 Maneuver	-	-	-	-	-	-	85	105	-	58	104	-
Stage 1	-	-	-	-	-	-	551	542	-	285	280	-
Stage 2	-	-	-	-	-	-	247	278	-	372	535	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.1	36.9	57.2
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	285	830	-	-	1054	-	-	86
HCM Lane V/C Ratio	0.629	0.001	-	-	0.111	-	-	0.202
HCM Control Delay (s)	36.9	9.3	0	-	8.8	-	-	57.2
HCM Lane LOS	E	A	A	-	A	-	-	F
HCM 95th %tile Q(veh)	3.9	0	-	-	0.4	-	-	0.7

HCM 6th TWSC
 2: 16th Drive NE & 172nd Street NE

2031 Horizon Year Conditions

Intersection

Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	598	9	9	826	27	68
Future Vol, veh/h	598	9	9	826	27	68
Conflicting Peds, #/hr	0	3	3	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	85	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	643	10	10	888	29	73

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	656	0	1559 651
Stage 1	-	-	-	-	651 -
Stage 2	-	-	-	-	908 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	931	-	124 469
Stage 1	-	-	-	-	519 -
Stage 2	-	-	-	-	393 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	928	-	122 468
Mov Cap-2 Maneuver	-	-	-	-	257 -
Stage 1	-	-	-	-	517 -
Stage 2	-	-	-	-	389 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	18
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	379	-	-	928	-
HCM Lane V/C Ratio	0.27	-	-	0.01	-
HCM Control Delay (s)	18	-	-	8.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.1	-	-	0	-

HCM 6th TWSC
 3: 19th Drive NE & 172nd Street NE

2031 Horizon Year Conditions

Intersection

Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	653	12	75	826	10	61
Future Vol, veh/h	653	12	75	826	10	61
Conflicting Peds, #/hr	0	9	9	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	710	13	82	898	11	66

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	732	0	1788
Stage 1	-	-	-	-	726
Stage 2	-	-	-	-	1062
Critical Hdwy	-	-	4.13	-	6.43
Critical Hdwy Stg 1	-	-	-	-	5.43
Critical Hdwy Stg 2	-	-	-	-	5.43
Follow-up Hdwy	-	-	2.227	-	3.527
Pot Cap-1 Maneuver	-	-	868	-	89
Stage 1	-	-	-	-	477
Stage 2	-	-	-	-	331
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	861	-	71
Mov Cap-2 Maneuver	-	-	-	-	71
Stage 1	-	-	-	-	473
Stage 2	-	-	-	-	268

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	25.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	248	-	-	861	-
HCM Lane V/C Ratio	0.311	-	-	0.095	-
HCM Control Delay (s)	25.9	-	-	9.6	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.3	-

HCM 6th TWSC
4: 19th Avenue NE & 172nd Street NE

2031 Horizon Year Conditions

Intersection												
Int Delay, s/veh	92											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗		↖	↗	
Traffic Vol, veh/h	47	505	163	0	617	27	202	0	0	13	0	74
Future Vol, veh/h	47	505	163	0	617	27	202	0	0	13	0	74
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	100	-	-	100	-	0	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	92	92	96	96	92	92	92	96	92	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	526	177	0	643	28	220	0	0	14	0	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	671	0	0	703	0	0	1409	1384	615	1356	1444	643
Stage 1	-	-	-	-	-	-	713	713	-	643	643	-
Stage 2	-	-	-	-	-	-	696	671	-	713	801	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	919	-	-	895	-	-	~ 116	143	491	126	132	473
Stage 1	-	-	-	-	-	-	423	435	-	462	468	-
Stage 2	-	-	-	-	-	-	432	455	-	423	397	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	919	-	-	895	-	-	~ 93	135	491	121	125	473
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 93	135	-	121	125	-
Stage 1	-	-	-	-	-	-	401	412	-	438	468	-
Stage 2	-	-	-	-	-	-	362	455	-	400	376	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0	\$ 717.2	17.7
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	93	-	919	-	-	895	-	-	121	473
HCM Lane V/C Ratio	2.361	-	0.053	-	-	-	-	-	0.112	0.163
HCM Control Delay (s)	\$ 717.2	0	9.1	-	-	0	-	-	38.5	14.1
HCM Lane LOS	F	A	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	19.9	-	0.2	-	-	0	-	-	0.4	0.6

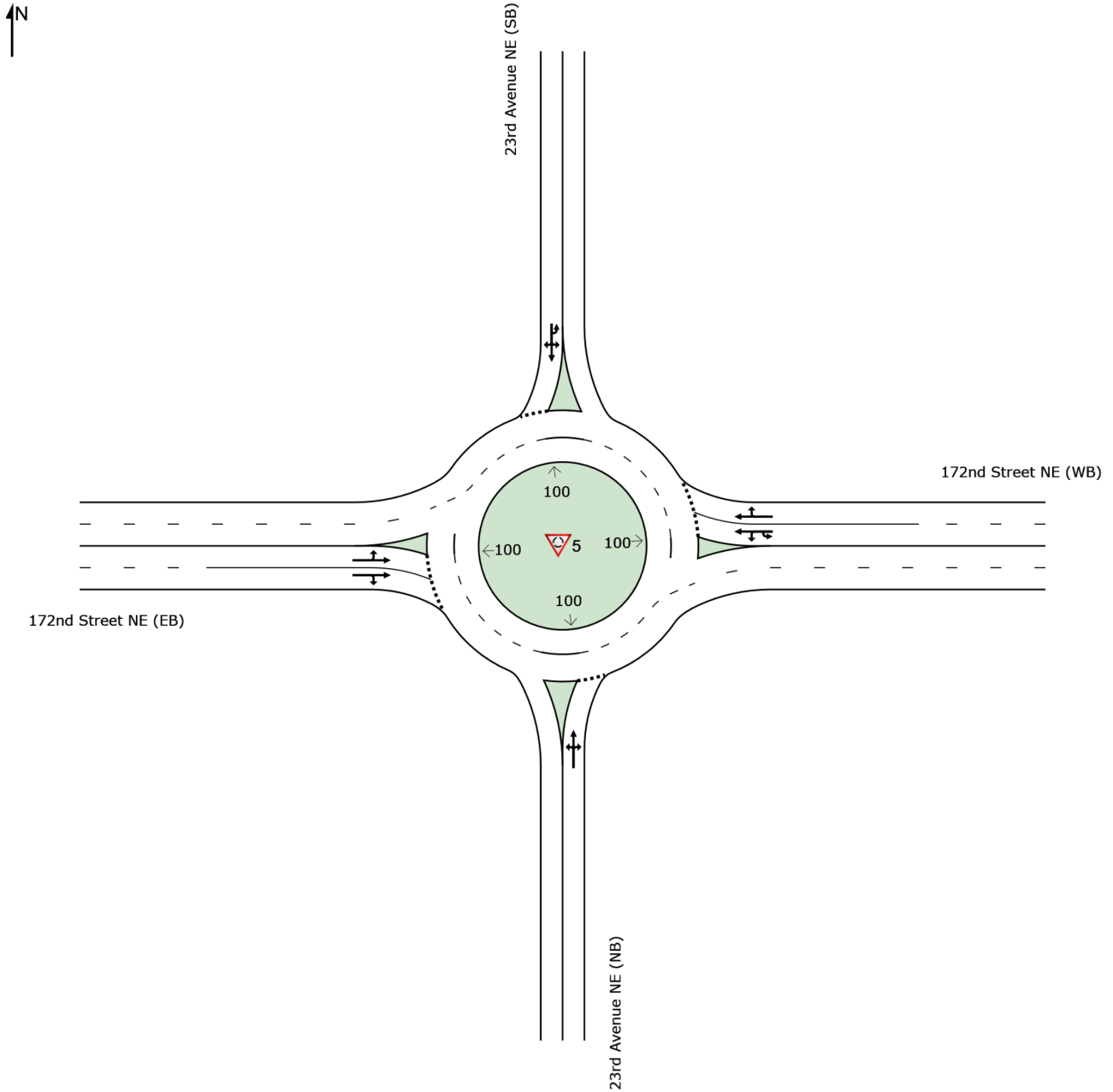
Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

SITE LAYOUT

 **Site: 5 [2031 Horizon Year Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]**

PM Peak-Hour
Site Category: 172nd St NE at 23rd Avenue NE
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: K:\SNO_TPTO\2022\22-017 172nd Street Assemblage\Intersection Analysis\Sidra\#5.sip9

MOVEMENT FLOWS FOR SITE (INPUT)

Approach movement input flow rates (veh/h)

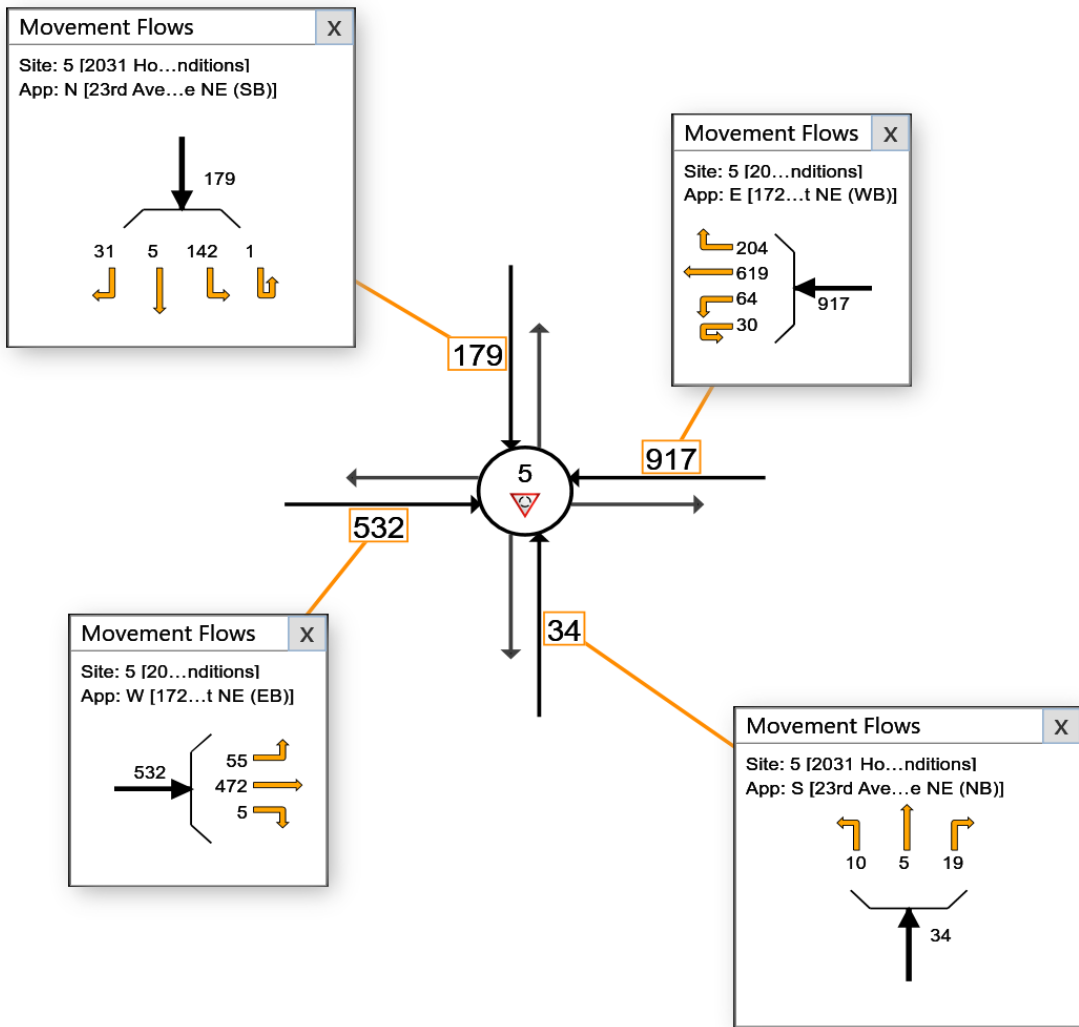
All Movement Classes

Site: 5 [2031 Horizon Year Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
Site Category: 172nd St NE at 23rd Avenue NE
Roundabout

Use the button below to open or close all popup boxes. Click value labels to open selected ones.
Click and drag popup boxes to move to preferred positions.

Close All Popups



MOVEMENT SUMMARY

Site: 5 [2031 Horizon Year Conditions (Site Folder: 5: 172nd St NE at 23rd Ave NE)]

PM Peak-Hour
 Site Category: 172nd St NE at 23rd Avenue NE
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] ft				
South: 23rd Avenue NE (NB)														
3	L2	10	3.0	10	3.0	0.042	12.1	LOS B	0.2	4.2	0.52	0.67	0.52	35.9
8	T1	5	3.0	5	3.0	0.042	6.3	LOS A	0.2	4.2	0.52	0.67	0.52	35.7
18	R2	19	3.0	19	3.0	0.042	6.1	LOS A	0.2	4.2	0.52	0.67	0.52	34.6
Approach		34	3.0	34	3.0	0.042	7.9	LOS A	0.2	4.2	0.52	0.67	0.52	35.1
East: 172nd Street NE (WB)														
1u	U	30	3.0	30	3.0	0.344	12.7	LOS B	2.0	50.5	0.24	0.47	0.24	37.7
1	L2	64	3.0	65	3.0	0.344	10.2	LOS B	2.0	50.5	0.24	0.47	0.24	36.7
6	T1	619	3.0	625	3.0	0.344	4.4	LOS A	2.0	50.7	0.24	0.45	0.24	36.9
16	R2	204	3.0	206	3.0	0.344	4.4	LOS A	2.0	50.7	0.24	0.42	0.24	36.1
Approach		917	3.0	926	3.0	0.344	5.1	LOS A	2.0	50.7	0.24	0.45	0.24	36.7
North: 23rd Avenue NE (SB)														
7u	U	1	3.0	1	3.0	0.221	15.1	LOS B	0.9	23.9	0.57	0.82	0.57	35.1
7	L2	142	3.0	143	3.0	0.221	12.6	LOS B	0.9	23.9	0.57	0.82	0.57	34.2
4	T1	5	3.0	5	3.0	0.221	6.8	LOS A	0.9	23.9	0.57	0.82	0.57	34.1
14	R2	31	3.0	31	3.0	0.221	6.6	LOS A	0.9	23.9	0.57	0.82	0.57	33.1
Approach		179	3.0	181	3.0	0.221	11.4	LOS B	0.9	23.9	0.57	0.82	0.57	34.0
West: 172nd Street NE (EB)														
5	L2	55	3.0	56	3.0	0.227	11.0	LOS B	1.2	29.5	0.41	0.54	0.41	36.2
2	T1	472	3.0	477	3.0	0.227	5.1	LOS A	1.2	30.0	0.40	0.50	0.40	36.4
12	R2	5	3.0	5	3.0	0.227	5.0	LOS A	1.2	30.0	0.40	0.47	0.40	35.4
Approach		532	3.0	537	3.0	0.227	5.7	LOS A	1.2	30.0	0.40	0.50	0.40	36.4
All Vehicles		1662	3.0	1679	3.0	0.344	6.0	LOS A	2.0	50.7	0.33	0.51	0.33	36.3

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

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

Queue Model: HCM Queue Formula.

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
























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

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 Project: K:\SNO_TPTO\2022\22-017 172nd Street Assemblage\Intersection Analysis\Sidra\#5.sip9

Lanes, Volumes, Timings
6: 27th Avenue NE/Spring Lane & 172nd Street NE

2031 Horizon Year Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	462	157	633	663	408	237	99	537	425	108	42
Future Volume (vph)	34	462	157	633	663	408	237	99	537	425	108	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		0	400		200	150		0	175		175
Storage Lanes	1		0	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor		0.99		0.99			0.99				0.99	
Frt		0.962				0.850			0.850		0.958	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3418	0	3467	3574	1599	1787	1881	1599	3467	1790	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1787	3418	0	3440	3574	1599	1771	1881	1599	3467	1790	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27				393			462		12	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1325			609			730			589	
Travel Time (s)		30.1			13.8			16.6			13.4	
Confl. Peds. (#/hr)			8	8			10					10
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	666	0	681	713	439	255	106	577	457	161	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0	5.0	3.0	5.0	
Minimum Split (s)	9.5	38.3		9.5	38.3	38.3	9.5	23.1	23.1	9.5	45.1	
Total Split (s)	20.0	38.3		46.0	60.0	60.0	25.0	25.0	25.0	25.0	45.1	
Total Split (%)	13.0%	24.8%		29.8%	38.9%	38.9%	16.2%	16.2%	16.2%	16.2%	29.2%	
Maximum Green (s)	15.0	32.0		41.0	53.7	53.7	20.0	19.9	19.9	20.0	40.0	
Yellow Time (s)	3.0	4.3		3.0	4.3	4.3	3.0	3.1	3.1	3.0	3.1	
All-Red Time (s)	2.0	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	0.0	
Total Lost Time (s)	5.0	6.3		5.0	6.3	6.3	5.0	5.1	5.1	5.0	5.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0	7.0					7.0	
Flash Dont Walk (s)		25.0			25.0	25.0					33.0	
Pedestrian Calls (#/hr)		0			0	0					0	
Act Effct Green (s)	8.0	30.7		33.0	57.9	57.9	20.1	40.1	40.1	20.1	40.1	
Actuated g/C Ratio	0.06	0.21		0.23	0.40	0.40	0.14	0.28	0.28	0.14	0.28	
v/c Ratio	0.38	0.90		0.87	0.50	0.50	1.04	0.20	0.74	0.96	0.32	
Control Delay	79.0	69.4		66.4	34.8	6.7	127.0	43.4	16.8	93.5	42.1	

Lanes, Volumes, Timings
 6: 27th Avenue NE/Spring Lane & 172nd Street NE

2031 Horizon Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.0	69.4		66.4	34.8	6.9	127.0	43.4	16.8	93.5	42.1	
LOS	E	E		E	C	A	F	D	B	F	D	
Approach Delay		70.0			39.9			49.8				80.1
Approach LOS		E			D			D				F
Queue Length 50th (ft)	35	314		325	271	27	~264	79	96	227	114	
Queue Length 95th (ft)	77	#449		398	344	114	#477	140	270	#365	194	
Internal Link Dist (ft)		1245			529			650				509
Turn Bay Length (ft)	195			400		200	150			175		
Base Capacity (vph)	184	775		981	1455	883	246	519	775	478	502	
Starvation Cap Reductn	0	0		0	0	85	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.20	0.86		0.69	0.49	0.55	1.04	0.20	0.74	0.96	0.32	

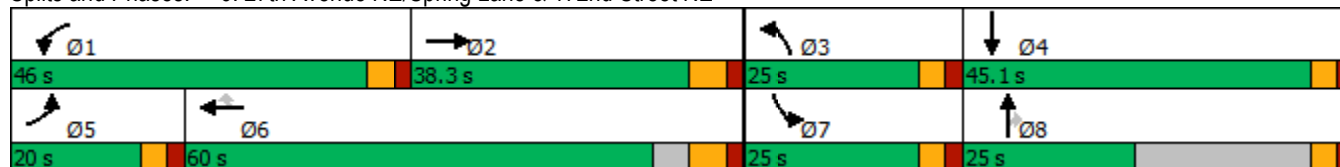
Intersection Summary

Area Type: Other
 Cycle Length: 154.4
 Actuated Cycle Length: 145.3
 Natural Cycle: 135
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 53.4
 Intersection Capacity Utilization 102.4%
 Analysis Period (min) 15

Intersection LOS: D
 ICU Level of Service G

- ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 6: 27th Avenue NE/Spring Lane & 172nd Street NE



Lanes, Volumes, Timings
7: I-5 Southbound Ramps & 172nd Street NE

2031 Horizon Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘	↖	↗
Traffic Volume (vph)	0	1224	303	0	1293	715	0	0	0	309	3	403
Future Volume (vph)	0	1224	303	0	1293	715	0	0	0	309	3	403
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		200	0		0	0		0	350		435
Storage Lanes	0		1	0		1	0		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.97			0.97						
Frt			0.850			0.850						0.850
Flt Protected										0.950	0.953	
Satd. Flow (prot)	0	3539	1583	0	3539	1583	0	0	0	1681	1686	1583
Flt Permitted										0.950	0.953	
Satd. Flow (perm)	0	3539	1542	0	3539	1541	0	0	0	1681	1686	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			316			745						91
Link Speed (mph)		30			30			30				30
Link Distance (ft)		609			940			979				1126
Travel Time (s)		13.8			21.4			22.3				25.6
Confl. Peds. (#/hr)	3		7	7		3						
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1275	316	0	1347	745	0	0	0	161	164	420
Turn Type		NA	Perm		NA	Perm				Perm	NA	Perm
Protected Phases		2			6						4	
Permitted Phases			2			6				4		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)		100.0	100.0		100.0	100.0				30.0	30.0	30.0
Total Split (%)		76.9%	76.9%		76.9%	76.9%				23.1%	23.1%	23.1%
Maximum Green (s)		94.2	94.2		93.9	93.9				24.2	24.2	24.2
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?												
Vehicle Extension (s)		4.0	4.0		4.0	4.0				4.5	4.5	4.5
Recall Mode		None	None		None	None				Max	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0				7.0	7.0	7.0
Flash Dont Walk (s)		12.0	12.0		21.0	21.0				21.0	21.0	21.0
Pedestrian Calls (#/hr)		0	0		0	0				0	0	0
Act Effct Green (s)		80.7	80.7		80.4	80.4				28.6	28.6	28.6
Actuated g/C Ratio		0.67	0.67		0.66	0.66				0.24	0.24	0.24
v/c Ratio		0.54	0.28		0.57	0.59				0.41	0.41	0.95
Control Delay		11.0	1.3		11.7	2.5				46.7	46.8	69.6
Queue Delay		0.3	0.0		0.0	0.1				0.0	0.0	0.0

Marysville 172 & 23 Apartments
Kimley-Horn and Associates, Inc. [BJL 090222017]

PM Peak-Hour

Lanes, Volumes, Timings
 7: I-5 Southbound Ramps & 172nd Street NE

2031 Horizon Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		11.4	1.3		11.7	2.6				46.7	46.8	69.6
LOS		B	A		B	A				D	D	E
Approach Delay		9.4			8.4						59.7	
Approach LOS		A			A						E	
Queue Length 50th (ft)		245	0		270	0				128	130	~321
Queue Length 95th (ft)		292	26		321	35				206	210	#540
Internal Link Dist (ft)		529			860			899			1046	
Turn Bay Length (ft)			200							350		435
Base Capacity (vph)		2795	1284		2789	1372				396	397	443
Starvation Cap Reductn		831	0		0	74				0	0	0
Spillback Cap Reductn		0	0		0	0				0	0	0
Storage Cap Reductn		0	0		0	0				0	0	0
Reduced v/c Ratio		0.65	0.25		0.48	0.57				0.41	0.41	0.95

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 121.2
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 17.4
 Intersection Capacity Utilization 70.6%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 7: I-5 Southbound Ramps & 172nd Street NE



Lanes, Volumes, Timings
8: I-5 Northbound Ramps & 172nd Street NE

2031 Horizon Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	474	1084	0	0	1548	526	395	3	920	0	0	0
Future Volume (vph)	474	1084	0	0	1548	526	395	3	920	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.97			0.99			
Fr						0.850			0.850			
Flt Protected	0.950						0.950	0.953				
Satd. Flow (prot)	1752	3505	0	0	5036	1568	1665	1670	1568	0	0	0
Flt Permitted	0.950						0.950	0.953				
Satd. Flow (perm)	1750	3505	0	0	5036	1527	1665	1670	1548	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						535			356			
Link Speed (mph)		30			30			30				30
Link Distance (ft)		940			1086			1094				999
Travel Time (s)		21.4			24.7			24.9				22.7
Confl. Peds. (#/hr)	6		6	6		6			3			
Confl. Bikes (#/hr)			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 (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	489	1118	0	0	1596	542	203	207	948	0	0	0
Turn Type	Prot	NA			NA	Perm	Perm	NA	Free			
Protected Phases	5	2			6			8				
Permitted Phases						6	8		Free			
Detector Phase	5	2			6	6	8	8				
Switch Phase												
Minimum Initial (s)	5.0	7.0			7.0	7.0	7.0	7.0				
Minimum Split (s)	10.6	24.1			23.8	23.8	40.8	40.8				
Total Split (s)	30.0	90.0			60.0	60.0	30.0	30.0				
Total Split (%)	25.0%	75.0%			50.0%	50.0%	25.0%	25.0%				
Maximum Green (s)	24.4	83.9			54.2	54.2	24.2	24.2				
Yellow Time (s)	3.6	4.1			3.8	3.8	3.8	3.8				
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0	2.0				
Lost Time Adjust (s)	0.0	0.0			0.0	0.0	0.0	0.0				
Total Lost Time (s)	5.6	6.1			5.8	5.8	5.8	5.8				
Lead/Lag	Lead				Lag	Lag						
Lead-Lag Optimize?	Yes				Yes	Yes						
Vehicle Extension (s)	3.0	4.0			4.0	4.0	4.5	4.5				
Recall Mode	None	None			None	None	Max	Max				
Walk Time (s)		7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)		10.0			8.0	8.0	28.0	28.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	24.4	83.9			54.2	54.2	35.0	35.0	130.8			
Actuated g/C Ratio	0.19	0.64			0.41	0.41	0.27	0.27	1.00			
v/c Ratio	1.50	0.50			0.77	0.57	0.46	0.46	0.61			

Marysville 172 & 23 Apartments
Kimley-Horn and Associates, Inc. [BJL 090222017]

PM Peak-Hour

Lanes, Volumes, Timings
 8: I-5 Northbound Ramps & 172nd Street NE

2031 Horizon Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	277.5	13.3			35.9	4.8	43.9	44.1	1.8			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	277.5	13.3			35.9	4.8	43.9	44.1	1.8			
LOS	F	B			D	A	D	D	A			
Approach Delay		93.7			28.0			14.6				
Approach LOS		F			C			B				
Queue Length 50th (ft)	~574	245			420	3	151	154	0			
Queue Length 95th (ft)	#790	296			480	78	233	237	0			
Internal Link Dist (ft)		860			1006			1014			919	
Turn Bay Length (ft)	600					300	400					
Base Capacity (vph)	326	2248			2086	946	445	446	1548			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	1.50	0.50			0.77	0.57	0.46	0.46	0.61			

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 130.8
 Natural Cycle: 130
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.50
 Intersection Signal Delay: 45.1
 Intersection Capacity Utilization 103.0%
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.





















Intersection LOS: D
 ICU Level of Service G

Splits and Phases: 8: I-5 Northbound Ramps & 172nd Street NE



Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

2031 Horizon Year Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	3	12	3	9	223	15	373	7	307	401	52
Future Volume (vph)	42	3	12	3	9	223	15	373	7	307	401	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	75		0	200		0	0		135
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor		1.00			1.00		1.00	1.00				0.98
Frt		0.972				0.850		0.997				0.850
Flt Protected		0.964			0.989		0.950			0.950		
Satd. Flow (prot)	0	1754	0	0	1860	1599	1787	1874	0	1787	1881	1599
Flt Permitted		0.776			0.947		0.507			0.425		
Satd. Flow (perm)	0	1412	0	0	1780	1599	951	1874	0	800	1881	1560
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				245		1				57
Link Speed (mph)		30			30			30				30
Link Distance (ft)		967			413			725				730
Travel Time (s)		22.0			9.4			16.5				16.6
Confl. Peds. (#/hr)			1	1			2		7	7		2
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 (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	62	0	0	13	245	16	418	0	337	441	57
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	22.5	22.5		26.0	26.0	26.0	9.5	22.5		9.5	26.0	26.0
Total Split (s)	25.0	25.0		25.0	25.0	25.0	20.0	50.0		30.0	50.0	50.0
Total Split (%)	23.8%	23.8%		23.8%	23.8%	23.8%	19.0%	47.6%		28.6%	47.6%	47.6%
Maximum Green (s)	21.0	21.0		21.0	21.0	21.0	16.0	46.0		26.0	46.0	46.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	8.0	8.0		15.0	15.0	15.0		10.0			15.0	15.0
Pedestrian Calls (#/hr)	3	3		3	3	3		13			13	13
Act Effct Green (s)		10.0			10.0	10.0	51.6	46.5		60.7	59.2	59.2
Actuated g/C Ratio		0.13			0.13	0.13	0.65	0.59		0.77	0.75	0.75
v/c Ratio		0.33			0.06	0.59	0.02	0.38		0.45	0.31	0.05
Control Delay		31.5			30.4	10.6	4.3	11.4		5.3	5.4	2.0

Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

2031 Horizon Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		31.5			30.4	10.6	4.3	11.4		5.3	5.4	2.0
LOS		C			C	B	A	B		A	A	A
Approach Delay		31.5			11.6			11.1			5.1	
Approach LOS		C			B			B			A	
Queue Length 50th (ft)		23			6	0	1	85		28	38	0
Queue Length 95th (ft)		60			21	60	9	247		107	197	15
Internal Link Dist (ft)		887			333			645			650	
Turn Bay Length (ft)							200					135
Base Capacity (vph)		391			483	612	895	1106		945	1411	1185
Starvation Cap Reductn		0			0	0	0	0		0	0	0
Spillback Cap Reductn		0			0	0	0	0		0	0	0
Storage Cap Reductn		0			0	0	0	0		0	0	0
Reduced v/c Ratio		0.16			0.03	0.40	0.02	0.38		0.36	0.31	0.05

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 78.8
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 8.9
 Intersection Capacity Utilization 57.1%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 9: 27th Avenue NE & 169th Place NE



Lanes, Volumes, Timings

10: Smokey Point Boulevard & 156th Street NE

2031 Horizon Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	12	288	25	25	35	258	656	5	34	745	66
Future Volume (vph)	33	12	288	25	25	35	258	656	5	34	745	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		0	250		0	200		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.913			0.999			0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1701	0	1770	3536	0	1770	3497	0
Flt Permitted	0.614			0.749			0.175			0.384		
Satd. Flow (perm)	1144	1863	1583	1395	1701	0	326	3536	0	715	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			306		37			1			9	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1704			1283			1384			4766	
Travel Time (s)		38.7			29.2			31.5			108.3	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	13	306	27	64	0	274	703	0	36	863	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	10.0		7.0	10.0	
Minimum Split (s)	12.0	25.0	25.0	12.0	25.0		12.0	25.0		12.0	25.0	
Total Split (s)	25.0	20.0	20.0	25.0	10.0		20.0	50.0		20.0	50.0	
Total Split (%)	21.7%	17.4%	17.4%	21.7%	8.7%		17.4%	43.5%		17.4%	43.5%	
Maximum Green (s)	20.0	15.0	15.0	20.0	5.0		15.0	45.0		15.0	45.0	
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)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.5		2.0	3.5	
Recall Mode	None	None	None	None	None		None	Min		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		13.0	13.0		13.0			13.0			13.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	13.0	10.6	10.6	11.8	8.2		44.6	38.5		33.3	25.8	
Actuated g/C Ratio	0.19	0.15	0.15	0.17	0.12		0.64	0.55		0.48	0.37	
v/c Ratio	0.12	0.05	0.61	0.10	0.28		0.56	0.36		0.08	0.66	
Control Delay	25.2	32.7	10.6	25.1	22.4		13.2	11.9		7.5	21.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	25.2	32.7	10.6	25.1	22.4		13.2	11.9		7.5	21.7	
LOS	C	C	B	C	C		B	B		A	C	

Lanes, Volumes, Timings

10: Smokey Point Boulevard & 156th Street NE

2031 Horizon Year Conditions

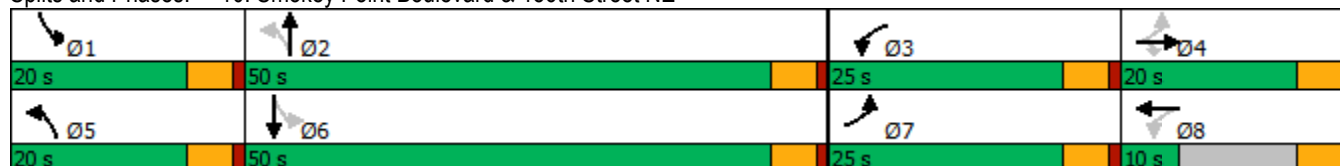
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		12.9			23.2			12.2				21.1
Approach LOS		B			C			B				C
Queue Length 50th (ft)	12	5	0	9	12		47	105		5		165
Queue Length 95th (ft)	40	24	76	33	53		136	178		19		271
Internal Link Dist (ft)		1624			1203			1304				4686
Turn Bay Length (ft)	150		150	200			250			200		
Base Capacity (vph)	557	438	606	560	419		540	2456		669		2415
Starvation Cap Reductn	0	0	0	0	0		0	0		0		0
Spillback Cap Reductn	0	0	0	0	0		0	0		0		0
Storage Cap Reductn	0	0	0	0	0		0	0		0		0
Reduced v/c Ratio	0.06	0.03	0.50	0.05	0.15		0.51	0.29		0.05		0.36

Intersection Summary

Area Type: Other
 Cycle Length: 115
 Actuated Cycle Length: 69.8
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.66
 Intersection Signal Delay: 16.2
 Intersection Capacity Utilization 58.9%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service B























Splits and Phases: 10: Smokey Point Boulevard & 156th Street NE



Lanes, Volumes, Timings

11: Smokey Point Boulevard & 152nd Street NE

2031 Horizon Year Conditions

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 			 	
Traffic Volume (vph)	4	3	8	150	3	284	5	658	159	311	721	7
Future Volume (vph)	4	3	8	150	3	284	5	658	159	311	721	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	125		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor							1.00				1.00	
Frt		0.887			0.851			0.971			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1636	0	1752	1570	0	1752	3403	0	1752	3497	0
Flt Permitted				0.645			0.352			0.174		
Satd. Flow (perm)	1845	1636	0	1190	1570	0	649	3403	0	321	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			309			28			1	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		209			5141			1452			1384	
Travel Time (s)		4.8			116.8			33.0			31.5	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	12	0	163	312	0	5	888	0	338	792	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	7.0		4.0	7.0	
Minimum Split (s)	9.5	27.0		11.5	26.0		9.5	24.0		9.5	26.0	
Total Split (s)	16.0	16.0		16.0	40.0		16.0	50.0		16.0	50.0	
Total Split (%)	13.1%	13.1%		13.1%	32.8%		13.1%	41.0%		13.1%	41.0%	
Maximum Green (s)	11.0	11.0		11.0	35.0		11.0	45.0		11.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.5	2.5		2.5	2.5	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		15.0			14.0			12.0			14.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	6.0	5.3		11.0	9.5		27.9	22.6		39.2	37.7	
Actuated g/C Ratio	0.10	0.09		0.18	0.16		0.46	0.37		0.65	0.62	
v/c Ratio	0.02	0.08		0.54	0.62		0.01	0.69		0.71	0.36	
Control Delay	24.5	22.0		30.4	10.0		6.2	19.0		20.0	7.9	

Lanes, Volumes, Timings
 11: Smokey Point Boulevard & 152nd Street NE

2031 Horizon Year Conditions

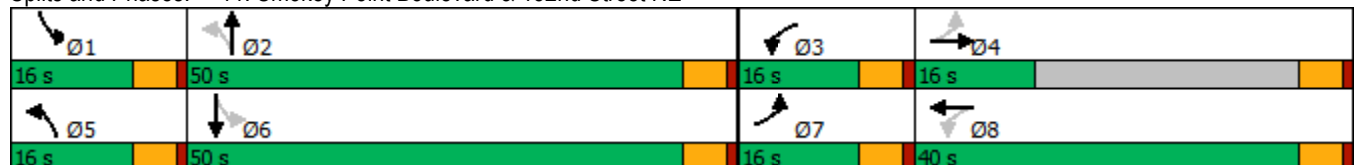
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.5	22.0		30.4	10.0		6.2	19.0		20.0	7.9	
LOS	C	C		C	B		A	B		C	A	
Approach Delay		22.6			17.0			18.9			11.5	
Approach LOS		C			B			B			B	
Queue Length 50th (ft)	1	1		52	1		1	123		43	50	
Queue Length 95th (ft)	9	17		119	71		5	249		#241	192	
Internal Link Dist (ft)		129			5061			1372			1304	
Turn Bay Length (ft)	50			125			150			200		
Base Capacity (vph)	365	986		367	1066		572	2635		478	2701	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.01		0.44	0.29		0.01	0.34		0.71	0.29	

Intersection Summary

Area Type: Other
 Cycle Length: 122
 Actuated Cycle Length: 60.6
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 15.3
 Intersection Capacity Utilization 70.7%
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 11: Smokey Point Boulevard & 152nd Street NE



Lanes, Volumes, Timings

12: State Avenue/Smokey Point Boulevard & 136th Street NE

2031 Horizon Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	156	234	70	179	215	130	117	487	227	135	469	269
Future Volume (vph)	156	234	70	179	215	130	117	487	227	135	469	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	200		0	300		0	300		0
Storage Lanes	1		1	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor			0.99	1.00							0.99	
Frt			0.850		0.943			0.952			0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1827	1553	1736	1723	0	1736	3305	0	1736	3252	0
Flt Permitted	0.265			0.395			0.212			0.215		
Satd. Flow (perm)	484	1827	1532	721	1723	0	387	3305	0	393	3252	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143		26			55			77	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		981			4740			2821			4382	
Travel Time (s)		22.3			107.7			64.1			99.6	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	164	246	74	188	363	0	123	752	0	142	777	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	4	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	7.0		5.0	7.0		5.0	7.0	
Minimum Split (s)	10.0	34.0	34.0	10.0	23.0		10.0	35.0		10.0	23.0	
Total Split (s)	15.0	35.0	35.0	30.0	40.0		35.0	35.0		30.0	30.0	
Total Split (%)	11.5%	26.9%	26.9%	23.1%	30.8%		26.9%	26.9%		23.1%	23.1%	
Maximum Green (s)	10.0	30.0	30.0	25.0	35.0		30.0	30.0		25.0	25.0	
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)	1.0	1.0	1.0	1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Recall Mode	None	None	None	None	None		None	Max		None	Max	
Walk Time (s)		8.0	8.0					9.0				
Flash Dont Walk (s)		21.0	21.0					21.0				
Pedestrian Calls (#/hr)		0	0					0				
Act Effct Green (s)	30.3	20.9	20.9	33.6	22.6		39.1	30.4		40.1	30.9	
Actuated g/C Ratio	0.33	0.23	0.23	0.37	0.25		0.43	0.33		0.44	0.34	
v/c Ratio	0.57	0.59	0.16	0.49	0.82		0.42	0.67		0.46	0.68	

Lanes, Volumes, Timings

12: State Avenue/Smokey Point Boulevard & 136th Street NE

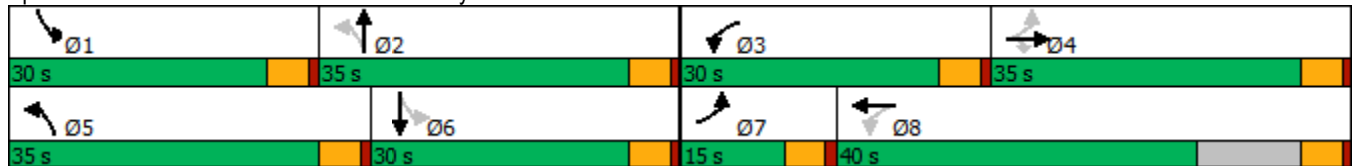
2031 Horizon Year Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	26.7	38.6	0.8	22.8	45.9		19.7	29.6		20.3	28.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.7	38.6	0.8	22.8	45.9		19.7	29.6		20.3	28.7	
LOS	C	D	A	C	D		B	C		C	C	
Approach Delay		28.8			38.0			28.2			27.4	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	61	127	0	71	186		38	182		45	183	
Queue Length 95th (ft)	110	224	0	125	302		86	306		97	309	
Internal Link Dist (ft)		901			4660			2741			4302	
Turn Bay Length (ft)	150		150	200			300			300		
Base Capacity (vph)	301	604	602	570	867		634	1129		561	1145	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.54	0.41	0.12	0.33	0.42		0.19	0.67		0.25	0.68	

Intersection Summary

Area Type: Other
 Cycle Length: 130
 Actuated Cycle Length: 91.9
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.82
 Intersection Signal Delay: 30.0
 Intersection Capacity Utilization 72.8%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 12: State Avenue/Smokey Point Boulevard & 136th Street NE



HCM 6th TWSC
 13: Site Access & 172nd Street NE

2031 Horizon Year Conditions

Intersection

Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Vol, veh/h	509	17	0	660	0	18
Future Vol, veh/h	509	17	0	660	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	553	18	0	717	0	20

Major/Minor	Major1	Major2	Minor1	
Conflicting Flow All	0	0	-	286
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	-	-	-	3.32
Pot Cap-1 Maneuver	-	0	0	711
Stage 1	-	0	0	-
Stage 2	-	0	0	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	711
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	711	-	-	-
HCM Lane V/C Ratio	0.028	-	-	-
HCM Control Delay (s)	10.2	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

HCM 6th TWSC
 14: 23rd Avenue NE & Site Access

2031 Horizon Year Conditions

Intersection

Int Delay, s/veh	3.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	42	71	65	65	64
Future Vol, veh/h	29	42	71	65	65	64
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	46	77	71	71	70

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	331	106	141	0	0
Stage 1	106	-	-	-	-
Stage 2	225	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	664	948	1442	-	-
Stage 1	918	-	-	-	-
Stage 2	812	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	627	948	1442	-	-
Mov Cap-2 Maneuver	627	-	-	-	-
Stage 1	867	-	-	-	-
Stage 2	812	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1442	-	784	-	-
HCM Lane V/C Ratio	0.054	-	0.098	-	-
HCM Control Delay (s)	7.6	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.3	-	-

Saturday Peak-Hour Level of Service Calculations

Lanes, Volumes, Timings
6: 27th Avenue NE/Spring Lane & 172nd Street NE

Marysville 172 & 23 Apartments

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	421	177	942	418	293	153	100	739	281	114	17
Future Volume (vph)	21	421	177	942	418	293	153	100	739	281	114	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		375	400		200	150		0	175		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00	0.99		0.99		0.98	1.00				1.00	
Frt		0.956				0.850			0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3396	0	3467	3574	1599	1787	1881	1599	3467	1839	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1782	3396	0	3446	3574	1559	1779	1881	1599	3467	1839	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38				302			481		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1312			609			730			589	
Travel Time (s)		29.8			13.8			16.6			13.4	
Confl. Peds. (#/hr)	2		6	6		2	5					5
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%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	22	434	182	971	431	302	158	103	762	290	118	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	616	0	971	431	302	158	103	762	290	136	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0	5.0	3.0	5.0	
Minimum Split (s)	9.5	38.3		9.5	38.3	38.3	9.5	23.1	23.1	9.5	45.1	
Total Split (s)	20.0	38.3		46.0	60.0	60.0	25.0	25.0	25.0	25.0	45.1	
Total Split (%)	13.0%	24.8%		29.8%	38.9%	38.9%	16.2%	16.2%	16.2%	16.2%	29.2%	
Maximum Green (s)	15.0	32.0		41.0	53.7	53.7	20.0	19.9	19.9	20.0	40.0	
Yellow Time (s)	3.0	4.3		3.0	4.3	4.3	3.0	3.1	3.1	3.0	3.1	
All-Red Time (s)	2.0	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	0.0	
Total Lost Time (s)	5.0	6.3		5.0	6.3	6.3	5.0	5.1	5.1	5.0	5.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0	7.0					7.0	
Flash Dont Walk (s)		25.0			25.0	25.0					33.0	
Pedestrian Calls (#/hr)		0			0	0					0	
Act Effct Green (s)	6.9	29.4		41.1	68.0	68.0	16.8	40.1	40.1	16.8	40.1	
Actuated g/C Ratio	0.05	0.20		0.28	0.46	0.46	0.11	0.27	0.27	0.11	0.27	
v/c Ratio	0.27	0.88		1.02	0.26	0.35	0.79	0.20	0.97	0.74	0.27	

2022 Existing Conditions

Saturday Peak-Hour

Kimley-Horn and Associates, Inc. [BJL 090222017]

Lanes, Volumes, Timings
 6: 27th Avenue NE/Spring Lane & 172nd Street NE

Marysville 172 & 23 Apartments

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	78.1	69.2		85.7	26.9	4.0	90.6	44.7	46.5	76.5	44.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	78.1	69.2		85.7	26.9	4.0	90.6	44.7	46.5	76.5	44.4	
LOS	E	E		F	C	A	F	D	D	E	D	
Approach Delay		69.5			56.3			53.1				66.2
Approach LOS		E			E			D				E
Queue Length 50th (ft)	22	294		~538	144	0	155	80	357	146	105	
Queue Length 95th (ft)	53	375		#685	195	59	#238	137	#661	197	170	
Internal Link Dist (ft)		1232			529			650			509	
Turn Bay Length (ft)	195			400		200	150			175		
Base Capacity (vph)	180	761		956	1632	875	240	509	784	467	499	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.12	0.81		1.02	0.26	0.35	0.66	0.20	0.97	0.62	0.27	

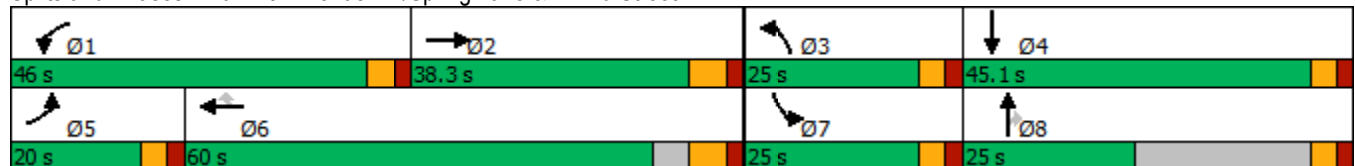
Intersection Summary

Area Type: Other
 Cycle Length: 154.4
 Actuated Cycle Length: 148.9
 Natural Cycle: 145
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 58.8
 Intersection Capacity Utilization 105.7%
 Analysis Period (min) 15

Intersection LOS: E
 ICU Level of Service G





















- ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 6: 27th Avenue NE/Spring Lane & 172nd Street NE



Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

Marysville 172 & 23 Apartments

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	6	1	1	11	201	3	359	9	343	514	31
Future Volume (vph)	36	6	1	1	11	201	3	359	9	343	514	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	75		0	200		0	0		135
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt		0.997				0.850		0.996				0.850
Flt Protected		0.960			0.996		0.950			0.950		
Satd. Flow (prot)	0	1801	0	0	1874	1599	1787	1874	0	1787	1881	1599
Flt Permitted		0.764			0.984		0.455			0.436		
Satd. Flow (perm)	0	1433	0	0	1851	1599	853	1874	0	820	1881	1552
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				218		2				52
Link Speed (mph)		30			30			30				30
Link Distance (ft)		967			413			725				730
Travel Time (s)		22.0			9.4			16.5				16.6
Confl. Peds. (#/hr)							4					4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	39	7	1	1	12	218	3	390	10	373	559	34
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	0	0	13	218	3	400	0	373	559	34
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	22.5	22.5		26.0	26.0	26.0	9.5	22.5		9.5	26.0	26.0
Total Split (s)	25.0	25.0		25.0	25.0	25.0	20.0	50.0		30.0	50.0	50.0
Total Split (%)	23.8%	23.8%		23.8%	23.8%	23.8%	19.0%	47.6%		28.6%	47.6%	47.6%
Maximum Green (s)	21.0	21.0		21.0	21.0	21.0	16.0	46.0		26.0	46.0	46.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	8.0	8.0		15.0	15.0	15.0		10.0			15.0	15.0
Pedestrian Calls (#/hr)	3	3		3	3	3		13			13	13
Act Effct Green (s)		9.9			9.9	9.9	51.6	46.5		61.2	59.8	59.8
Actuated g/C Ratio		0.12			0.12	0.12	0.65	0.59		0.77	0.76	0.76
v/c Ratio		0.26			0.06	0.56	0.00	0.36		0.49	0.39	0.03

Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

Marysville 172 & 23 Apartments

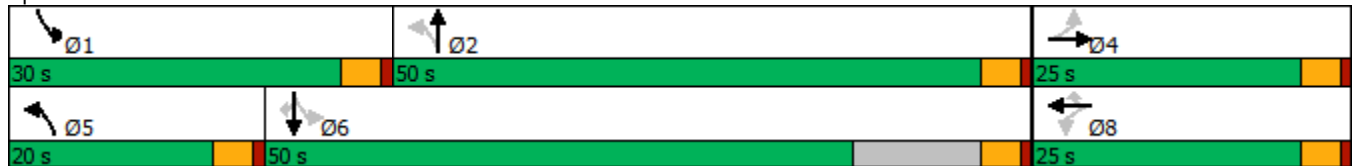
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		34.6			30.9	10.7	4.3	11.5		5.5	5.9	1.3
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		34.6			30.9	10.7	4.3	11.5		5.5	5.9	1.3
LOS		C			C	B	A	B		A	A	A
Approach Delay		34.6			11.8			11.4			5.6	
Approach LOS		C			B			B			A	
Queue Length 50th (ft)		20			6	0	0	81		30	51	0
Queue Length 95th (ft)		54			22	58	3	240		119	265	7
Internal Link Dist (ft)		887			333			645			650	
Turn Bay Length (ft)							200					135
Base Capacity (vph)		388			500	591	840	1102		955	1419	1184
Starvation Cap Reductn		0			0	0	0	0		0	0	0
Spillback Cap Reductn		0			0	0	0	0		0	0	0
Storage Cap Reductn		0			0	0	0	0		0	0	0
Reduced v/c Ratio		0.12			0.03	0.37	0.00	0.36		0.39	0.39	0.03

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 79.2
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 8.7
 Intersection Capacity Utilization 57.5%
 Analysis Period (min) 15























Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 9: 27th Avenue NE & 169th Place NE



Lanes, Volumes, Timings
6: 27th Avenue NE/Spring Lane & 172nd Street NE

Marysville 172 & 23 Apartments

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	460	193	1029	457	320	167	109	808	307	125	19
Future Volume (vph)	23	460	193	1029	457	320	167	109	808	307	125	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		375	400		200	150		0	175		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00	0.99		0.99		0.98	1.00				1.00	
Frt		0.956				0.850			0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3396	0	3467	3574	1599	1787	1881	1599	3467	1839	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1783	3396	0	3447	3574	1559	1779	1881	1599	3467	1839	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38				330			473		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1312			609			730			589	
Travel Time (s)		29.8			13.8			16.6			13.4	
Confl. Peds. (#/hr)	2		6	6		2	5					5
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%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	24	474	199	1061	471	330	172	112	833	316	129	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	673	0	1061	471	330	172	112	833	316	149	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0	5.0	3.0	5.0	
Minimum Split (s)	9.5	38.3		9.5	38.3	38.3	9.5	23.1	23.1	9.5	45.1	
Total Split (s)	20.0	38.3		46.0	60.0	60.0	25.0	25.0	25.0	25.0	45.1	
Total Split (%)	13.0%	24.8%		29.8%	38.9%	38.9%	16.2%	16.2%	16.2%	16.2%	29.2%	
Maximum Green (s)	15.0	32.0		41.0	53.7	53.7	20.0	19.9	19.9	20.0	40.0	
Yellow Time (s)	3.0	4.3		3.0	4.3	4.3	3.0	3.1	3.1	3.0	3.1	
All-Red Time (s)	2.0	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	0.0	
Total Lost Time (s)	5.0	6.3		5.0	6.3	6.3	5.0	5.1	5.1	5.0	5.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0	7.0					7.0	
Flash Dont Walk (s)		25.0			25.0	25.0					33.0	
Pedestrian Calls (#/hr)		0			0	0					0	
Act Effct Green (s)	7.1	31.1		41.0	69.4	69.4	17.9	40.2	40.2	17.7	40.0	
Actuated g/C Ratio	0.05	0.21		0.27	0.46	0.46	0.12	0.27	0.27	0.12	0.26	
v/c Ratio	0.29	0.93		1.13	0.29	0.37	0.82	0.22	1.08	0.78	0.30	

2025 Baseline Conditions

Saturday Peak-Hour

Kimley-Horn and Associates, Inc. [BJL 090222017]

Lanes, Volumes, Timings
 6: 27th Avenue NE/Spring Lane & 172nd Street NE

Marysville 172 & 23 Apartments

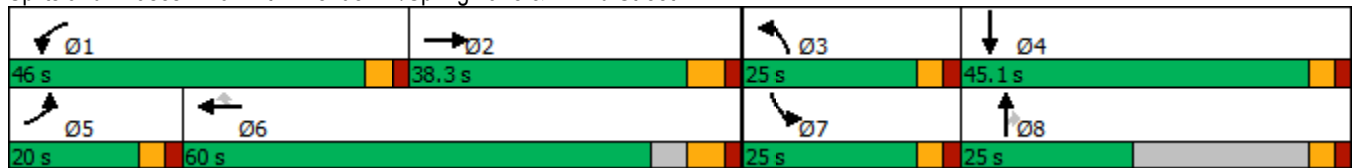
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	79.2	75.1		121.2	27.5	3.9	94.0	45.7	78.6	79.1	45.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	79.2	75.1		121.2	27.5	3.9	94.0	45.7	78.6	79.1	45.8	
LOS	E	E		F	C	A	F	D	E	E	D	
Approach Delay		75.3			76.7			77.7				68.4
Approach LOS		E			E			E				E
Queue Length 50th (ft)	24	335		~646	163	0	170	89	~562	161	118	
Queue Length 95th (ft)	57	#450		#784	214	61	#276	146	#828	214	185	
Internal Link Dist (ft)		1232			529			650				509
Turn Bay Length (ft)	195			400		200	150			175		
Base Capacity (vph)	177	747		939	1637	893	236	501	772	458	490	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.14	0.90		1.13	0.29	0.37	0.73	0.22	1.08	0.69	0.30	

Intersection Summary

Area Type: Other
 Cycle Length: 154.4
 Actuated Cycle Length: 151.5
 Natural Cycle: 145
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.13
 Intersection Signal Delay: 75.8
 Intersection Capacity Utilization 110.2%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service H





















~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 6: 27th Avenue NE/Spring Lane & 172nd Street NE



Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

Marysville 172 & 23 Apartments

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	7	1	1	12	220	3	392	10	375	562	34
Future Volume (vph)	39	7	1	1	12	220	3	392	10	375	562	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	75		0	200		0	0		135
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt		0.997				0.850		0.996				0.850
Flt Protected		0.960			0.996		0.950			0.950		
Satd. Flow (prot)	0	1801	0	0	1874	1599	1787	1874	0	1787	1881	1599
Flt Permitted		0.761			0.985		0.433			0.408		
Satd. Flow (perm)	0	1427	0	0	1853	1599	812	1874	0	768	1881	1552
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				239		2				52
Link Speed (mph)		30			30			30				30
Link Distance (ft)		967			413			725				730
Travel Time (s)		22.0			9.4			16.5				16.6
Confl. Peds. (#/hr)							4					4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	42	8	1	1	13	239	3	426	11	408	611	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	51	0	0	14	239	3	437	0	408	611	37
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	22.5	22.5		26.0	26.0	26.0	9.5	22.5		9.5	26.0	26.0
Total Split (s)	25.0	25.0		25.0	25.0	25.0	20.0	50.0		30.0	50.0	50.0
Total Split (%)	23.8%	23.8%		23.8%	23.8%	23.8%	19.0%	47.6%		28.6%	47.6%	47.6%
Maximum Green (s)	21.0	21.0		21.0	21.0	21.0	16.0	46.0		26.0	46.0	46.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	8.0	8.0		15.0	15.0	15.0		10.0			15.0	15.0
Pedestrian Calls (#/hr)	3	3		3	3	3		13			13	13
Act Effct Green (s)		10.0			10.0	10.0	51.7	46.6		62.0	60.5	60.5
Actuated g/C Ratio		0.12			0.12	0.12	0.65	0.58		0.77	0.76	0.76
v/c Ratio		0.29			0.06	0.59	0.01	0.40		0.55	0.43	0.03

Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

Marysville 172 & 23 Apartments

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		35.7			31.5	10.9	4.7	12.3		6.3	6.2	1.4
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		35.7			31.5	10.9	4.7	12.3		6.3	6.2	1.4
LOS		D			C	B	A	B		A	A	A
Approach Delay		35.7			12.0			12.3			6.1	
Approach LOS		D			B			B			A	
Queue Length 50th (ft)		22			6	0	0	93		35	60	0
Queue Length 95th (ft)		58			23	61	3	274		132	299	8
Internal Link Dist (ft)		887			333			645			650	
Turn Bay Length (ft)							200					135
Base Capacity (vph)		382			496	603	814	1091		929	1421	1185
Starvation Cap Reductn		0			0	0	0	0		0	0	0
Spillback Cap Reductn		0			0	0	0	0		0	0	0
Storage Cap Reductn		0			0	0	0	0		0	0	0
Reduced v/c Ratio		0.13			0.03	0.40	0.00	0.40		0.44	0.43	0.03

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 80.1
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 9.3
 Intersection Capacity Utilization 61.3%
 Analysis Period (min) 15























Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 9: 27th Avenue NE & 169th Place NE



Lanes, Volumes, Timings
6: 27th Avenue NE/Spring Lane & 172nd Street NE

Marysville 172 & 23 Apartments

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	509	193	1029	508	320	167	109	808	307	125	19
Future Volume (vph)	23	509	193	1029	508	320	167	109	808	307	125	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		375	400		200	150		0	175		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00	0.99		0.99		0.98	1.00				1.00	
Frt		0.959				0.850			0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3408	0	3467	3574	1599	1787	1881	1599	3467	1839	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1783	3408	0	3449	3574	1559	1779	1881	1599	3467	1839	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32				330			468		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1312			609			730			589	
Travel Time (s)		29.8			13.8			16.6			13.4	
Confl. Peds. (#/hr)	2		6	6		2	5					5
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%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	24	525	199	1061	524	330	172	112	833	316	129	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	724	0	1061	524	330	172	112	833	316	149	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0	5.0	3.0	5.0	
Minimum Split (s)	9.5	38.3		9.5	38.3	38.3	9.5	23.1	23.1	9.5	45.1	
Total Split (s)	20.0	38.3		46.0	60.0	60.0	25.0	25.0	25.0	25.0	45.1	
Total Split (%)	13.0%	24.8%		29.8%	38.9%	38.9%	16.2%	16.2%	16.2%	16.2%	29.2%	
Maximum Green (s)	15.0	32.0		41.0	53.7	53.7	20.0	19.9	19.9	20.0	40.0	
Yellow Time (s)	3.0	4.3		3.0	4.3	4.3	3.0	3.1	3.1	3.0	3.1	
All-Red Time (s)	2.0	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	0.0	
Total Lost Time (s)	5.0	6.3		5.0	6.3	6.3	5.0	5.1	5.1	5.0	5.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0	7.0					7.0	
Flash Dont Walk (s)		25.0			25.0	25.0					33.0	
Pedestrian Calls (#/hr)		0			0	0					0	
Act Effct Green (s)	7.1	32.0		41.0	70.3	70.3	17.9	40.2	40.2	17.7	40.0	
Actuated g/C Ratio	0.05	0.21		0.27	0.46	0.46	0.12	0.26	0.26	0.12	0.26	
v/c Ratio	0.29	0.98		1.14	0.32	0.37	0.82	0.23	1.09	0.78	0.31	

2025 Opening Year Conditions

Saturday Peak-Hour

Kimley-Horn and Associates, Inc. [BJL 090222017]

Lanes, Volumes, Timings
 6: 27th Avenue NE/Spring Lane & 172nd Street NE

Marysville 172 & 23 Apartments

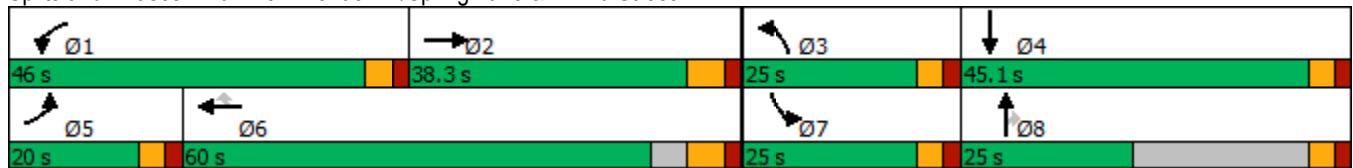
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	79.3	84.7		124.3	28.0	3.9	94.5	45.9	81.7	79.6	46.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	79.3	84.7		124.3	28.0	3.9	94.5	45.9	81.7	79.6	46.0	
LOS	E	F		F	C	A	F	D	F	E	D	
Approach Delay		84.5			77.2			80.1				68.9
Approach LOS		F			E			F				E
Queue Length 50th (ft)	24	373		~646	184	0	170	89	~570	161	118	
Queue Length 95th (ft)	57	#513		#784	239	61	#276	146	#836	214	185	
Internal Link Dist (ft)		1232			529			650			509	
Turn Bay Length (ft)	195			400		200	150			175		
Base Capacity (vph)	176	741		933	1647	896	234	497	767	455	486	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.14	0.98		1.14	0.32	0.37	0.74	0.23	1.09	0.69	0.31	

Intersection Summary

Area Type: Other
 Cycle Length: 154.4
 Actuated Cycle Length: 152.4
 Natural Cycle: 145
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 78.3
 Intersection Capacity Utilization 111.3%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service H






















~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 6: 27th Avenue NE/Spring Lane & 172nd Street NE



Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

Marysville 172 & 23 Apartments

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	33	11	1	39	220	13	392	10	375	562	34
Future Volume (vph)	39	33	11	1	39	220	13	392	10	375	562	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	75		0	200		0	0		135
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt		0.982				0.850		0.996				0.850
Flt Protected		0.977			0.999		0.950			0.950		
Satd. Flow (prot)	0	1805	0	0	1879	1599	1787	1874	0	1787	1881	1599
Flt Permitted		0.839			0.995		0.433			0.405		
Satd. Flow (perm)	0	1550	0	0	1872	1599	812	1874	0	762	1881	1552
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				239		2				52
Link Speed (mph)		30			30			30				30
Link Distance (ft)		967			413			725				730
Travel Time (s)		22.0			9.4			16.5				16.6
Confl. Peds. (#/hr)							4					4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	42	36	12	1	42	239	14	426	11	408	611	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	90	0	0	43	239	14	437	0	408	611	37
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	22.5	22.5		26.0	26.0	26.0	9.5	22.5		9.5	26.0	26.0
Total Split (s)	25.0	25.0		25.0	25.0	25.0	20.0	50.0		30.0	50.0	50.0
Total Split (%)	23.8%	23.8%		23.8%	23.8%	23.8%	19.0%	47.6%		28.6%	47.6%	47.6%
Maximum Green (s)	21.0	21.0		21.0	21.0	21.0	16.0	46.0		26.0	46.0	46.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	8.0	8.0		15.0	15.0	15.0		10.0			15.0	15.0
Pedestrian Calls (#/hr)	3	3		3	3	3		13			13	13
Act Effct Green (s)		10.9			10.9	10.9	51.7	46.6		62.3	60.7	60.7
Actuated g/C Ratio		0.13			0.13	0.13	0.64	0.57		0.77	0.75	0.75
v/c Ratio		0.42			0.17	0.57	0.02	0.41		0.56	0.43	0.03

2025 Opening Year Conditions

Saturday Peak-Hour

Kimley-Horn and Associates, Inc. [BJL 090222017]

Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

Marysville 172 & 23 Apartments

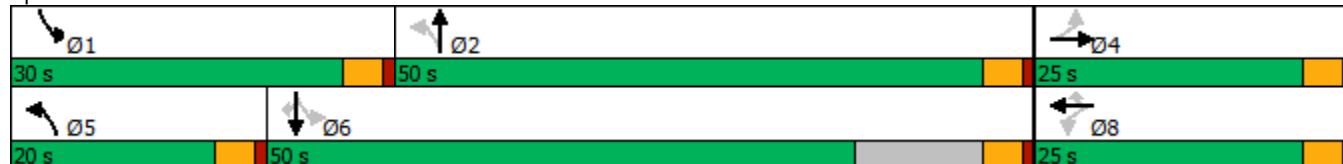
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		36.3			32.9	10.3	4.7	12.9		6.7	6.6	1.4
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		36.3			32.9	10.3	4.7	12.9		6.7	6.6	1.4
LOS		D			C	B	A	B		A	A	A
Approach Delay		36.3			13.7			12.6			6.4	
Approach LOS		D			B			B			A	
Queue Length 50th (ft)		38			19	0	1	102		41	70	0
Queue Length 95th (ft)		88			51	61	8	274		132	301	8
Internal Link Dist (ft)		887			333			645			650	
Turn Bay Length (ft)							200					135
Base Capacity (vph)		414			493	597	804	1075		916	1407	1174
Starvation Cap Reductn		0			0	0	0	0		0	0	0
Spillback Cap Reductn		0			0	0	0	0		0	0	0
Storage Cap Reductn		0			0	0	0	0		0	0	0
Reduced v/c Ratio		0.22			0.09	0.40	0.02	0.41		0.45	0.43	0.03

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 81.2
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 10.4
 Intersection Capacity Utilization 63.2%
 Analysis Period (min) 15























Intersection LOS: B
 ICU Level of Service B

Splits and Phases: 9: 27th Avenue NE & 169th Place NE



Lanes, Volumes, Timings
6: 27th Avenue NE/Spring Lane & 172nd Street NE

Marysville 172 & 23 Apartments

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	412	231	922	409	382	200	130	723	367	149	22
Future Volume (vph)	27	412	231	922	409	382	200	130	723	367	149	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		375	400		200	150		0	175		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00	0.99		0.99		0.98	1.00				1.00	
Frt		0.946				0.850			0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3356	0	3467	3574	1599	1787	1881	1599	3467	1841	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1782	3356	0	3447	3574	1559	1779	1881	1599	3467	1841	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		63				394			475		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1312			609			730			589	
Travel Time (s)		29.8			13.8			16.6			13.4	
Confl. Peds. (#/hr)	2		6	6		2	5					5
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%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	28	425	238	951	422	394	206	134	745	378	154	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	663	0	951	422	394	206	134	745	378	177	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0	5.0	3.0	5.0	
Minimum Split (s)	9.5	38.3		9.5	38.3	38.3	9.5	23.1	23.1	9.5	45.1	
Total Split (s)	20.0	38.3		46.0	60.0	60.0	25.0	25.0	25.0	25.0	45.1	
Total Split (%)	13.0%	24.8%		29.8%	38.9%	38.9%	16.2%	16.2%	16.2%	16.2%	29.2%	
Maximum Green (s)	15.0	32.0		41.0	53.7	53.7	20.0	19.9	19.9	20.0	40.0	
Yellow Time (s)	3.0	4.3		3.0	4.3	4.3	3.0	3.1	3.1	3.0	3.1	
All-Red Time (s)	2.0	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	0.0	
Total Lost Time (s)	5.0	6.3		5.0	6.3	6.3	5.0	5.1	5.1	5.0	5.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0	7.0					7.0	
Flash Dont Walk (s)		25.0			25.0	25.0					33.0	
Pedestrian Calls (#/hr)		0			0	0					0	
Act Effct Green (s)	7.4	30.8		41.0	68.8	68.8	19.3	40.1	40.1	19.2	40.0	
Actuated g/C Ratio	0.05	0.20		0.27	0.45	0.45	0.13	0.26	0.26	0.13	0.26	
v/c Ratio	0.33	0.91		1.02	0.26	0.43	0.92	0.27	0.97	0.87	0.36	

2031 Baseline Conditions

Saturday Peak-Hour

Kimley-Horn and Associates, Inc. [BJL 090222017]

Lanes, Volumes, Timings
 6: 27th Avenue NE/Spring Lane & 172nd Street NE

Marysville 172 & 23 Apartments

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	80.3	71.3		89.0	27.8	4.1	106.6	47.0	45.4	85.5	47.6	
Queue Delay	0.0	0.0		0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	
Total Delay	80.3	71.3		89.0	27.8	4.3	106.6	47.0	45.4	85.5	47.6	
LOS	F	E		F	C	A	F	D	D	F	D	
Approach Delay		71.7			55.5			57.2				73.4
Approach LOS		E			E			E				E
Queue Length 50th (ft)	28	316		~528	144	0	208	109	344	194	143	
Queue Length 95th (ft)	63	#421		#663	193	66	#360	171	#634	#274	218	
Internal Link Dist (ft)		1232			529			650			509	
Turn Bay Length (ft)	195			400		200	150			175		
Base Capacity (vph)	175	754		932	1611	919	234	494	770	455	486	
Starvation Cap Reductn	0	0		0	0	119	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.16	0.88		1.02	0.26	0.49	0.88	0.27	0.97	0.83	0.36	

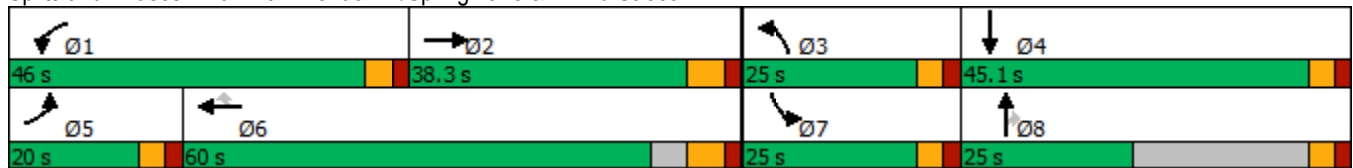
Intersection Summary

Area Type: Other
 Cycle Length: 154.4
 Actuated Cycle Length: 152.5
 Natural Cycle: 145
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 61.1
 Intersection Capacity Utilization 109.0%
 Analysis Period (min) 15

Intersection LOS: E
 ICU Level of Service G

- ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 6: 27th Avenue NE/Spring Lane & 172nd Street NE



Lanes, Volumes, Timings
9: 27th Avenue NE & 169th Place NE

Marysville 172 & 23 Apartments

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	8	1	1	14	262	4	468	12	448	671	40
Future Volume (vph)	47	8	1	1	14	262	4	468	12	448	671	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	75		0	200		0	0		135
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt		0.998				0.850		0.996				0.850
Flt Protected		0.960			0.997		0.950			0.950		
Satd. Flow (prot)	0	1802	0	0	1876	1599	1787	1874	0	1787	1881	1599
Flt Permitted		0.750			0.987		0.388			0.340		
Satd. Flow (perm)	0	1408	0	0	1857	1599	728	1874	0	640	1881	1552
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				285		2				52
Link Speed (mph)		30			30			30				30
Link Distance (ft)		967			413			725				730
Travel Time (s)		22.0			9.4			16.5				16.6
Confl. Peds. (#/hr)							4					4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	51	9	1	1	15	285	4	509	13	487	729	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	61	0	0	16	285	4	522	0	487	729	43
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	22.5	22.5		26.0	26.0	26.0	9.5	22.5		9.5	26.0	26.0
Total Split (s)	25.0	25.0		25.0	25.0	25.0	20.0	50.0		30.0	50.0	50.0
Total Split (%)	23.8%	23.8%		23.8%	23.8%	23.8%	19.0%	47.6%		28.6%	47.6%	47.6%
Maximum Green (s)	21.0	21.0		21.0	21.0	21.0	16.0	46.0		26.0	46.0	46.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	8.0	8.0		15.0	15.0	15.0		10.0			15.0	15.0
Pedestrian Calls (#/hr)	3	3		3	3	3		13			13	13
Act Effct Green (s)		10.4			10.4	10.4	51.9	46.8		65.4	64.0	64.0
Actuated g/C Ratio		0.12			0.12	0.12	0.62	0.56		0.78	0.76	0.76
v/c Ratio		0.35			0.07	0.64	0.01	0.50		0.70	0.51	0.04

Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

Marysville 172 & 23 Apartments

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		39.9			34.3	11.6	5.5	16.0		9.4	7.0	1.5
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.2	0.0
Total Delay		39.9			34.3	11.6	5.5	16.0		9.4	7.2	1.5
LOS		D			C	B	A	B		A	A	A
Approach Delay		39.9			12.8			16.0			7.8	
Approach LOS		D			B			B			A	
Queue Length 50th (ft)		28			7	0	0	136		48	86	0
Queue Length 95th (ft)		72			27	69	4	387		162	387	10
Internal Link Dist (ft)		887			333			645			650	
Turn Bay Length (ft)							200					135
Base Capacity (vph)		361			476	621	742	1046		860	1434	1195
Starvation Cap Reductn		0			0	0	0	0		0	178	0
Spillback Cap Reductn		0			0	0	0	0		0	0	0
Storage Cap Reductn		0			0	0	0	0		0	0	0
Reduced v/c Ratio		0.17			0.03	0.46	0.01	0.50		0.57	0.58	0.04

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 83.9
 Natural Cycle: 80
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 11.4
 Intersection Capacity Utilization 69.9%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 9: 27th Avenue NE & 169th Place NE



Lanes, Volumes, Timings
6: 27th Avenue NE/Spring Lane & 172nd Street NE

Marysville 172 & 23 Apartments

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	461	231	922	460	382	200	130	723	367	149	22
Future Volume (vph)	27	461	231	922	460	382	200	130	723	367	149	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	195		375	400		200	150		0	175		175
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	0.97	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	1.00	0.99		0.99		0.98	1.00				1.00	
Frt		0.950				0.850			0.850		0.981	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1787	3372	0	3467	3574	1599	1787	1881	1599	3467	1841	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1783	3372	0	3448	3574	1559	1779	1881	1599	3467	1841	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		51				394			468		5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1312			609			730			589	
Travel Time (s)		29.8			13.8			16.6			13.4	
Confl. Peds. (#/hr)	2		6	6		2	5					5
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%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	28	475	238	951	474	394	206	134	745	378	154	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	713	0	951	474	394	206	134	745	378	177	0
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			
Detector Phase	5	2		1	6	6	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0	7.0	3.0	5.0	5.0	3.0	5.0	
Minimum Split (s)	9.5	38.3		9.5	38.3	38.3	9.5	23.1	23.1	9.5	45.1	
Total Split (s)	20.0	38.3		46.0	60.0	60.0	25.0	25.0	25.0	25.0	45.1	
Total Split (%)	13.0%	24.8%		29.8%	38.9%	38.9%	16.2%	16.2%	16.2%	16.2%	29.2%	
Maximum Green (s)	15.0	32.0		41.0	53.7	53.7	20.0	19.9	19.9	20.0	40.0	
Yellow Time (s)	3.0	4.3		3.0	4.3	4.3	3.0	3.1	3.1	3.0	3.1	
All-Red Time (s)	2.0	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	0.0	
Total Lost Time (s)	5.0	6.3		5.0	6.3	6.3	5.0	5.1	5.1	5.0	5.1	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	3.0		2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	
Recall Mode	None	None		None	None	None	None	Max	Max	None	Max	
Walk Time (s)		7.0			7.0	7.0					7.0	
Flash Dont Walk (s)		25.0			25.0	25.0					33.0	
Pedestrian Calls (#/hr)		0			0	0					0	
Act Effct Green (s)	7.4	32.0		41.0	69.9	69.9	19.4	40.1	40.1	19.3	40.0	
Actuated g/C Ratio	0.05	0.21		0.27	0.45	0.45	0.13	0.26	0.26	0.13	0.26	
v/c Ratio	0.33	0.96		1.03	0.29	0.43	0.92	0.27	0.98	0.87	0.37	

2031 Horizon Year Conditions

Saturday Peak-Hour

Kimley-Horn and Associates, Inc. [BJL 090222017]

Lanes, Volumes, Timings
6: 27th Avenue NE/Spring Lane & 172nd Street NE

Marysville 172 & 23 Apartments

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	80.4	80.3		91.7	28.1	4.0	107.5	47.3	48.1	86.3	48.0	
Queue Delay	0.0	0.0		0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	
Total Delay	80.4	80.3		91.7	28.1	4.2	107.5	47.3	48.1	86.3	48.0	
LOS	F	F		F	C	A	F	D	D	F	D	
Approach Delay		80.3			56.2			59.3				74.1
Approach LOS		F			E			E				E
Queue Length 50th (ft)	28	355		~528	165	0	208	109	354	194	143	
Queue Length 95th (ft)	63	#487		#663	216	66	#360	171	#646	#274	218	
Internal Link Dist (ft)		1232			529			650			509	
Turn Bay Length (ft)	195			400		200	150			175		
Base Capacity (vph)	174	742		924	1623	923	232	490	763	451	482	
Starvation Cap Reductn	0	0		0	0	119	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.16	0.96		1.03	0.29	0.49	0.89	0.27	0.98	0.84	0.37	

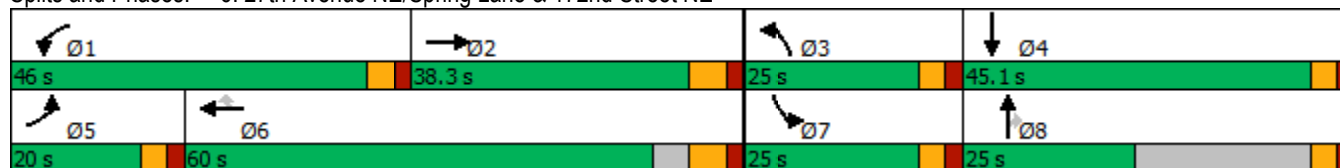
Intersection Summary

Area Type: Other
 Cycle Length: 154.4
 Actuated Cycle Length: 153.8
 Natural Cycle: 145
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 63.6
 Intersection Capacity Utilization 110.0%
 Analysis Period (min) 15

Intersection LOS: E
 ICU Level of Service H





















- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: 27th Avenue NE/Spring Lane & 172nd Street NE



Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

Marysville 172 & 23 Apartments

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	34	11	1	41	262	14	468	12	448	671	40
Future Volume (vph)	47	34	11	1	41	262	14	468	12	448	671	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	75		0	200		0	0		135
Storage Lanes	0		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. 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
Ped Bike Factor							1.00					0.97
Frt		0.984				0.850		0.996				0.850
Flt Protected		0.975			0.999		0.950			0.950		
Satd. Flow (prot)	0	1805	0	0	1879	1599	1787	1874	0	1787	1881	1599
Flt Permitted		0.819			0.995		0.388			0.334		
Satd. Flow (perm)	0	1516	0	0	1872	1599	728	1874	0	628	1881	1552
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				285		2				52
Link Speed (mph)		30			30			30				30
Link Distance (ft)		967			413			725				730
Travel Time (s)		22.0			9.4			16.5				16.6
Confl. Peds. (#/hr)							4					4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	51	37	12	1	45	285	15	509	13	487	729	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	100	0	0	46	285	15	522	0	487	729	43
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8	2			6		6
Detector Phase	4	4		8	8	8	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	22.5	22.5		26.0	26.0	26.0	9.5	22.5		9.5	26.0	26.0
Total Split (s)	25.0	25.0		25.0	25.0	25.0	20.0	50.0		30.0	50.0	50.0
Total Split (%)	23.8%	23.8%		23.8%	23.8%	23.8%	19.0%	47.6%		28.6%	47.6%	47.6%
Maximum Green (s)	21.0	21.0		21.0	21.0	21.0	16.0	46.0		26.0	46.0	46.0
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5		2.5	2.5	2.5	2.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Max		None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0	7.0		7.0			7.0	7.0
Flash Dont Walk (s)	8.0	8.0		15.0	15.0	15.0		10.0			15.0	15.0
Pedestrian Calls (#/hr)	3	3		3	3	3		13			13	13
Act Effct Green (s)		11.4			11.4	11.4	51.9	46.8		65.9	64.4	64.4
Actuated g/C Ratio		0.13			0.13	0.13	0.61	0.55		0.77	0.75	0.75
v/c Ratio		0.48			0.18	0.62	0.03	0.51		0.71	0.51	0.04

Lanes, Volumes, Timings
 9: 27th Avenue NE & 169th Place NE

Marysville 172 & 23 Apartments

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		41.1			35.5	10.9	5.7	16.9		10.2	7.4	1.6
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0	0.2	0.0
Total Delay		41.1			35.5	10.9	5.7	16.9		10.2	7.6	1.6
LOS		D			D	B	A	B		B	A	A
Approach Delay		41.1			14.3			16.5			8.4	
Approach LOS		D			B			B			A	
Queue Length 50th (ft)		46			22	0	1	148		56	100	0
Queue Length 95th (ft)		104			57	69	8	387		163	389	10
Internal Link Dist (ft)		887			333			645			650	
Turn Bay Length (ft)							200					135
Base Capacity (vph)		386			471	616	730	1027		843	1417	1182
Starvation Cap Reductn		0			0	0	0	0		0	180	0
Spillback Cap Reductn		0			0	0	0	0		0	0	0
Storage Cap Reductn		0			0	0	0	0		0	0	0
Reduced v/c Ratio		0.26			0.10	0.46	0.02	0.51		0.58	0.59	0.04

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 85.4
 Natural Cycle: 80
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 12.7
 Intersection Capacity Utilization 71.9%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 9: 27th Avenue NE & 169th Place NE



WSDOT Exhibit C List

LIST OF PROGRAMMED
WSDOT PROJECTS IN
SNOHOMISH COUNTY
AS OF Nov. 2008

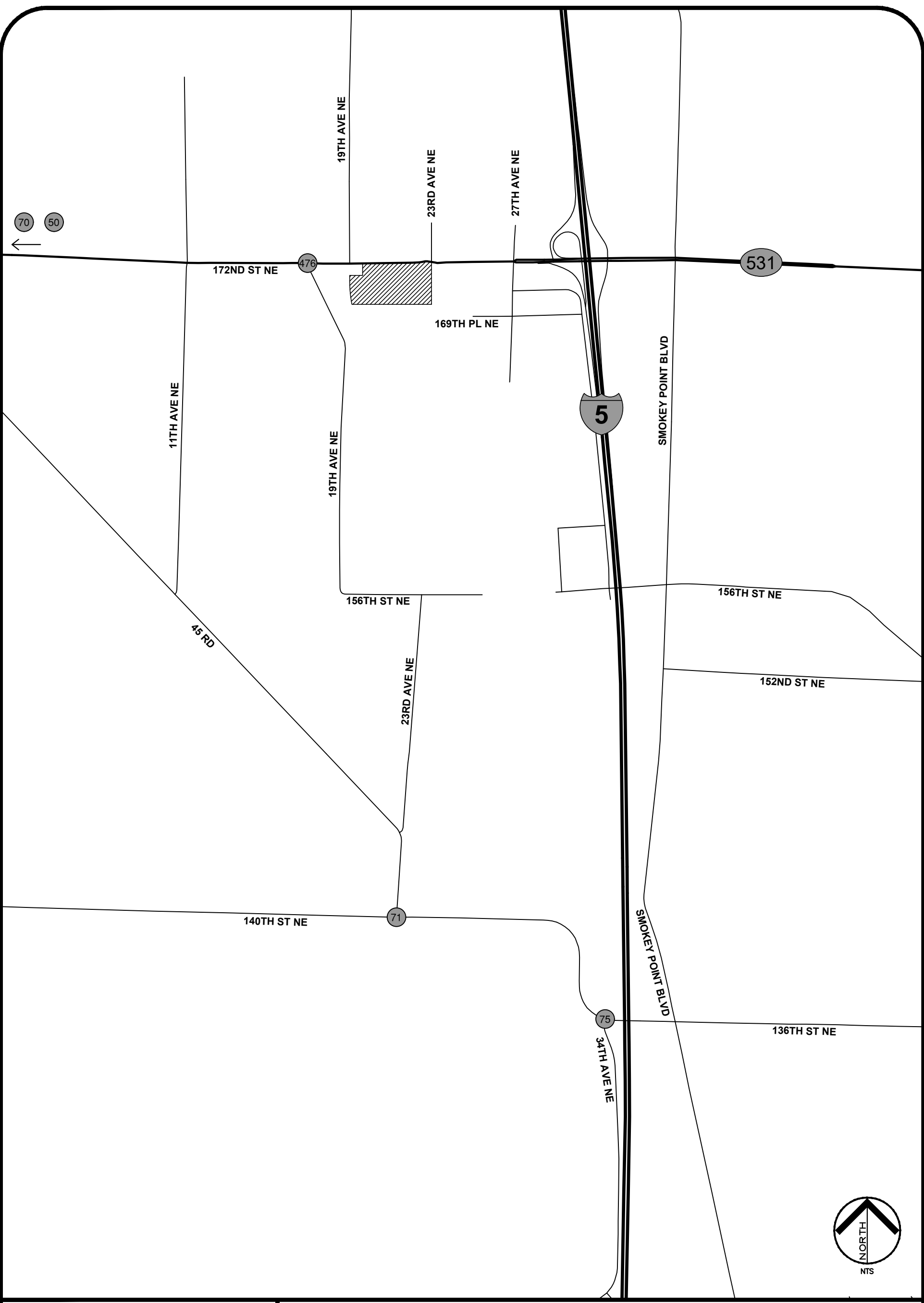
County ID#	TSA	SR	MP1	MP2	Title/Description	Design/Construction year	Total Cost (M)	TOTAL CAPACITY (ADT)	PRESENT VOLUME	RESERVE CAPACITY (ADT)	TRUE CONTRIBUTION PER ADT	50% TRIP END DEDUCTION	TAX DEDUCTION	Proportionate Share Per Development Generated ADT
DOT-11	D	5	186.42	186.42	128th ST SW Interchange - Construct Loop Ramps / HOV Bypass	2014	\$13.30	99,000	65,000	34,000	\$391.18	\$195.15	\$40.98	\$154.17
DOT-01	A	5	205.85	205.85	172nd Street NE (SR 531) interchange improvements, SB loop ramp, bridge widening	2009	\$41.00	90,000	34,900	55,100	\$744.10	\$372.05	\$63.25	\$308.80
DOT-30	E	9	1.66	4.04	212th Street SE to 176th Street SE, widen to 5 lanes	2011	\$80.80	54,000	21,000	33,000	2,448.48	\$1,224.24	\$183.64	\$1,040.60
DOT-56	B	9	16.48	17.49	Lundeen Parkway to SR-92, Widen to 4 lanes & RT-LT lanes	2009	\$38.90	54,000	24,000	30,000	\$1,296.67	\$648.34	\$123.18	\$525.16
DOT-37	B	9	17.96	17.96	SR-9 at 60th Street NE, add LT & RT lanes at Tee intersection	2011	\$2.95	54,000	36,000	18,000	\$163.89	\$81.95	\$13.91	\$67.94
DOT-22	A	9	18.88	19.46	SR 9/SR 528 intersection improvements, Signal & Channelization	2010	\$17.13	54,000	36,000	18,000	\$951.67	\$475.83	\$80.89	\$394.94
DOT-57	A	9	20.51	20.59	SR-9/84th Street NE intersection improvements, LT & RT lanes	2011	\$17.13	54,000	12,000	42,000	\$407.88	\$203.93	\$55.06	\$148.87
DOT-58	A	9	26.00	26.09	SR-9/SR-531/172nd St. NE intersection improvement, Roundabout	2011	\$15.60	54,000	11,000	43,000	\$362.80	\$181.40	\$45.87	\$135.53
DOT-33	B	92	1.46	1.46	SR-92 at 113th Avenue NE, Roundabout	2009	\$2.36	54,000	19,600	34,000	\$68.60	\$34.30	\$6.52	\$27.78
DOT-31	B	92	1.73	1.73	SR-92 at Callow/Grade Road, turn lanes to SR-92	2009	\$1.90	54,000	19,600	34,400	\$55.24	\$27.62	\$5.25	\$22.37
DOT-46	C	203	22.36	22.38	SR-203 at North High Rock/Tualco Roads, Re-align cross street for I/S and add LT & RT lanes on SR-203	2009	\$3.34	18,000	13,000	5,000	\$688.00	\$344.00	\$73.48	\$270.52
DOT-36	C	203	23.01	23.01	Ben Howard Rd channelization, LT lanes on SR-203	2009	\$1.07	54,000	13,000	41,000	\$26.10	\$13.05	\$2.87	\$10.18
DOT-16	E	522	13.82	16.61	Paradise Lake Road I/C, Stage 3, new interchange	2010	\$27.95	81,000	48,000	33,000	\$847.03	\$423.52	\$63.53	\$359.99
DOT-17	E	522	16.80	20.41	Paradise Lake Road to Snohomish River, Bridge, Stage 2, widen to 4 lanes	2009	\$33.48	80,000	21,900	58,100	\$576.25	\$288.13	\$43.22	\$244.91
DOT-28	C	522	20.50	24.68	Snohomish River Bridge to SR 2, widen to 4 lanes	2010	\$171.98	80,000	20,000	60,000	\$2,866.33	\$1,433.17	\$315.30	\$1,117.87

LIST OF PROGRAMMED
WSDOT PROJECTS IN
SNOHOMISH COUNTY
AS OF Nov. 2008

County ID#	TSA SR	MP1	MP2 Title/Description	Design/Construction year	Total Cost (M)	TOTAL CAPACITY (ADT)	PRESENT VOLUME	RESERVE CAPACITY (ADT)	TRUE CONTRIBUTION PER ADT	50% TRIP END DEDUCTION	TAX DEDUCTION	Proportionate Share Per Development Generated ADT
DOT-19	F 524	5.87	9.50 24th Avenue SE to I-405, widen to 5 Lanes	2012	\$33.34	54,000	15,300	38,700	\$861.50	\$430.75	\$77.54	\$353.21
DOT-20	F 524	5.87	9.50 I-405 to Royal Ann Road, widen to 5 Lanes	2011	\$71.06	54,000	15,300	38,700	\$1,836.18	\$918.09	\$165.26	\$752.83
DOT-60	E 524	6.79	Larch Way intersection, LT lanes, signal	2009	\$2.59	54,000	15,300	38,700	\$66.93	\$33.47	\$5.02	\$28.45
DOT-59	D 525	6.25	SR-525/68th St. SW intersection improvements, NBRT, NBLT & SBLT	2011	\$3.70	25,700	17,000	8,700	\$425.29	\$212.64	\$89.31	\$123.33
DOT-49	A 530	17.30	SR-530 at Old 99, Roundabout	2011	\$8.00	18,000	10,000	8,000	\$1,000.00	\$500.00	\$85.00	\$415.00
DOT-62	A 530	19.71	211th Place NE, Intersection Roundabout	2011	\$6.10	24,000	15,000	9,000	\$677.78	\$338.89	\$57.61	\$281.28
DOT-52	A 531	1.95	SR-531/Jct. Freestad Road Intersection, LT lanes	2011	\$1.55	18,000	7,900	10,100	\$140.14	\$70.07	\$11.92	\$58.15
DOT-05	A 531	7.00	8.59 43rd Ave. NE to 67th Ave. NE, NE, Widen to 5 lanes (Arlington)	2014	\$20.78	54,000	11,000	43,000	\$483.14	\$241.57	\$41.07	\$200.50
			270th St. NW Vic. To 72nd Ave. NW, EB Climbing Lane, intersection improvements & signal.	2009	\$19.00	54,000	16,000	38,000	500	\$250.00	\$28.75	\$221.25
DOT-53	A 532	5.25	64th Ave. NW to 12th Ave. NW, Climbing lane & LT Lanes	2010	\$22.40	54,000	17,000	37,000	\$605.41	\$302.70	\$33.75	\$268.95
			TAX DEDUCTIONS									
			TSA A = 17%									
			TSA B = 19%									
			TSA C = 22%									
			TSA D = 21%									
			TSA E = 15%									
			TSA F = 18%									

Snohomish County Key Intersections

Date: April 11, 2023 - 3:55pm / User: Saunee Frider
Path: K:\SNO-PTD\2023\22-017-172nd Street Assembly\Figures\Marysville 172 & 23 Apartments Figures.dwg / Xref:



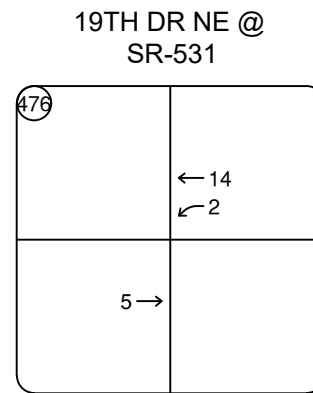
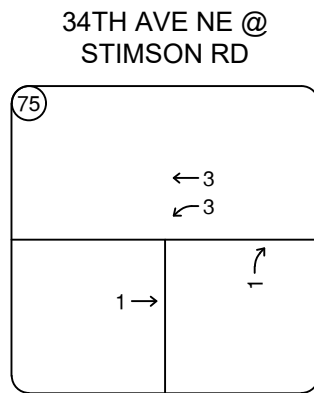
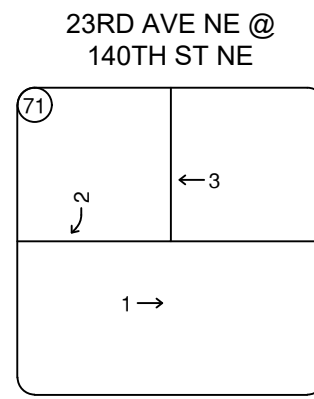
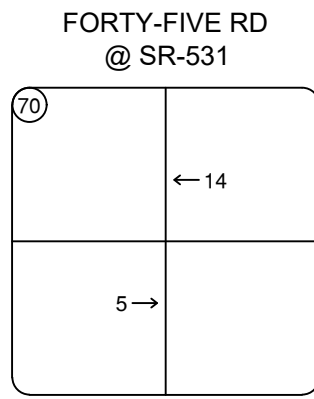
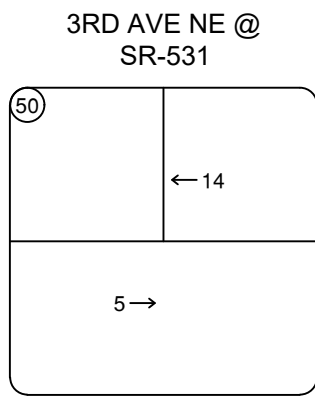
MARYSVILLE 172 &
23 APARTMENTS

CITY OF MARYSVILLE

LEGEND

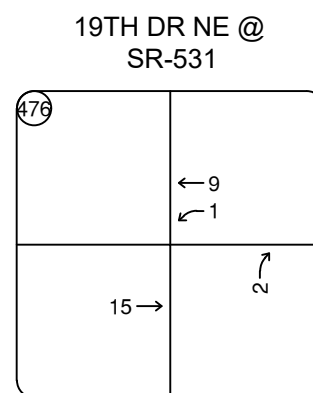
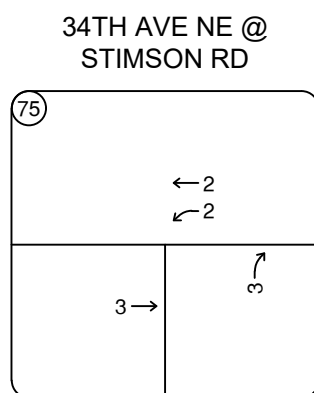
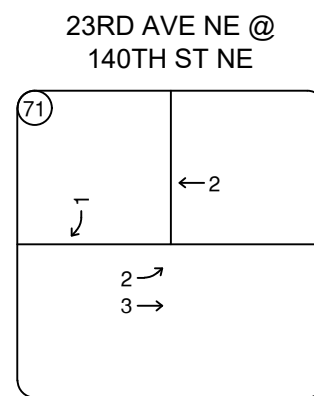
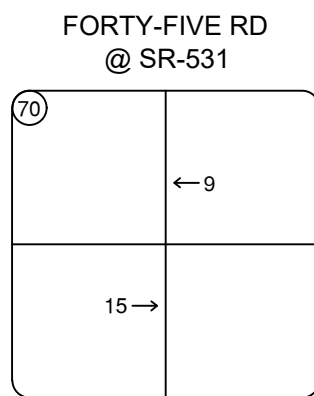
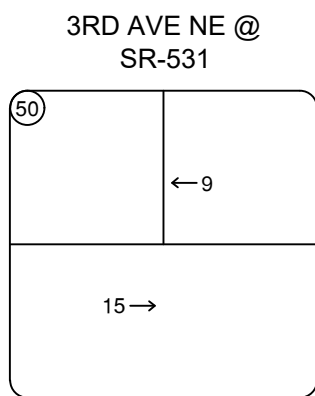
- (X) SNOHOMISH COUNTY KEY INTERSECTION

FIGURE A
SNOHOMISH COUNTY
KEY INTERSECTION
MAP



AM PEAK-HOUR

PM PEAK-HOUR



MARYSVILLE 172 &
23 APARTMENTS

LEGEND

XXX → HORIZON YEAR
AM/PM PEAK-HOUR
TURNING MOVEMENT VOLUME

FIGURE B

SNOHOMISH COUNTY
KEY INTERSECTION VOLUMES
HORIZON YEAR
AM AND PM PEAK-HOURS

CITY OF MARYSVILLE

Table A: AM Peak-Hour Key Intersection Volumes

Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#50: 3rdAve NE at SR-531	0	5	0	0	14	0	0	0	0	0	0	0
#70: Forty-Five Rd at SR-531	0	5	0	0	14	0	0	0	0	0	0	0
#71: 23 rd Ave NE at 140 th St NE	0	1	0	0	3	0	0	0	0	0	0	2
#75: 34 th Ave NE at Stimson Rd	0	1	0	3	3	0	0	0	1	0	0	0
#476: 19 th Dr NE at SR-531	0	5	0	2	14	0	0	0	0	0	0	0

Table B: PM Peak-Hour Key Intersection Volumes

Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#50: 3rdAve NE at SR-531	0	15	0	0	9	0	0	0	0	0	0	0
#70: Forty-Five Rd at SR-531	0	15	0	0	9	0	0	0	0	0	0	0
#71: 23 rd Ave NE at 140 th St NE	2	3	0	0	2	0	0	0	0	0	0	1
#75: 34 th Ave NE at Stimson Rd	0	3	0	2	2	0	0	0	3	0	0	0
#476: 19 th Dr NE at SR-531	0	15	0	1	9	0	0	0	2	0	0	0