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Cascade Commerce Center
Traffic Impact Analysis

Jurisdictions: City of Arlington

August 2021

GTC #20-106

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1. DEVELOPMENT IDENTIFICATION

Gibson Traffic Consultants, Inc. (GTC) has been retained to provide a traffic impact analysis for the proposed Cascade Commerce Center development. This report is intended to provide the City of Arlington with the necessary trip generation, trip distribution and level of service information to facilitate their final review of the development and address verbal comments received from City of Arlington staff. The site plan is shown in Figure 1.

Figure 1: Site Plan

The site includes a total of 1,252,000 square-feet (SF) of warehouse use across two buildings within the City of Arlington. The north building is proposed to be 596,000 SF and the south building is proposed to be 656,000 SF. The build-out of the site is not currently known, but it is anticipated the full site is anticipated to be constructed by the year 2030. However, analysis has also been completed for a horizon year of 2036.

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 trip generation calculations are based on average trip generation rates published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition (2017)*. The trip generation calculations have been performed for three different scenarios. The analysis in this report is based on the highest anticipated trip generation of the site. The trip distribution is based on trip distributions published by the City of Marysville for developments in the site vicinity since there are several roadway improvements in the site vicinity that are accounted for in the distributions published by the City of Marysville. There are separate trip distributions for the opening year conditions and the horizon year conditions.

The level of service analysis at the study intersections has been performed in accordance with the *Highway Capacity Manual 6th Edition* (HCM). 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.

Table 1: Level of Service Criteria

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

The 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, signalized intersections and roundabout intersections is based on the average delay for all vehicles. The level of service analysis has been performed utilizing the *Synchro 10.3, Build 151* software for stop-controlled and signalized intersections. Intersections controlled by roundabouts have been analyzed using the *Sidra 8.0.7.7948* software and WSDOT methodology for analyzing roundabouts. The City of Arlington and WSDOT identify acceptable level of service for intersections as LOS D for the study intersections.

[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 Cascade Commerce Center development have been calculated based on data published by the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition (2017).* It is anticipated that the two building will be warehouses. ITE Land Use Code 154, High-Cube Transload and Short-Term Storage Warehouse, is the most applicable land use based on the anticipated use of the two buildings. The trip generation of the 1,252,000 SF of building space is summarized in Table 2.

Table 2: Land Use Summary

1,252,000 SF High-Cube Warehouse	Average Daily Trips			AM Peak-Hour Trips			PM Peak-Hour Trips		
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
Generation Rate	1.40 trips per 1,000 SF			0.08 trips per 1,000 SF			0.10 trips per 1,000 SF		
Splits	50%	50%	100%	77%	23%	100%	28%	72%	100%
Trips	876	876	1,752	77	23	100	35	91	126

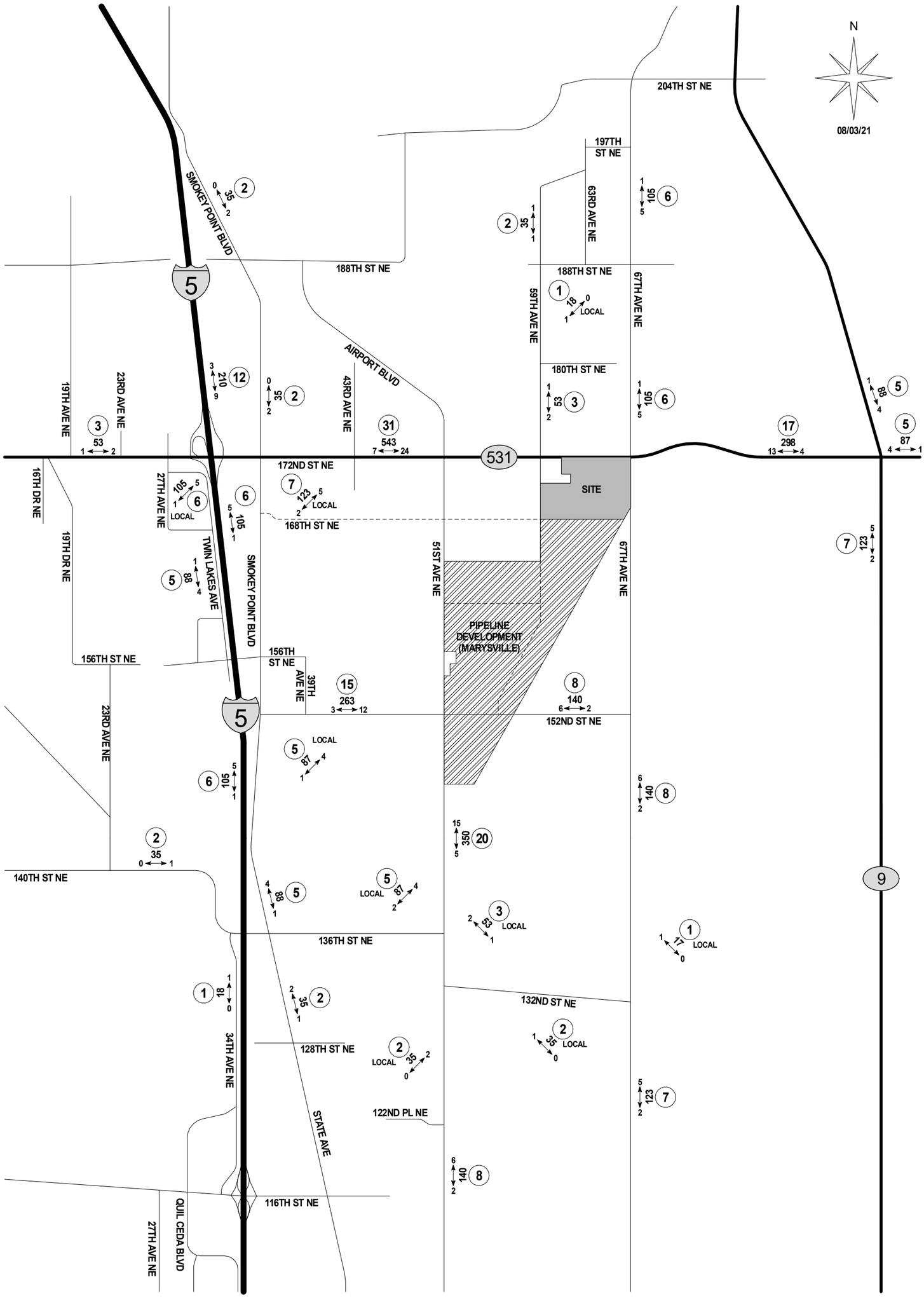
The Cascade Commerce Center development buildings located in the City of Arlington boundaries are anticipated to generate 1,752 average daily trips with 100 AM peak-hour trips and 126 PM peak-hour trips. The City of Arlington utilizes PM peak-hour trips to evaluate traffic impacts. The daily and AM peak-hour trips are shown based on the interlocal agreements and understandings with Snohomish County and WSDOT.

4. TRIP DISTRIBUTION

The trip distribution for the Cascade Commerce Center development is based on distributions provided by the City of Marysville for new developments in the site vicinity. These distributions have been used since they account for future roadways in the sit vicinity. The trips distribution based on the existing roadways has been used for the 2030 opening year conditions. The trip distribution with the future roadways has been used for the 2036 horizon year conditions.

4.1 2030 Opening Year Distribution

For the 2030 opening year distribution it is anticipated that 48% of the trips generated by the development will travel along 172nd Street NE/SR-531, thirty-one percent to and from the west and seventeen percent to and from the east. Approximately 9% of the trips generated by the development will travel to and from the north, three percent along 59th Avenue NE and six percent along 67th Avenue NE. It is anticipated that 23% of the trips will travel along 152nd Street NE, fifteen percent to and from the west and eight percent to and from the east. The remaining 20% of the trips generated by the development will travel to and from the south along 51st Avenue NE. Detailed trip distributions for the opening year are shown in Figure 2 and Figure 3 for the AM and PM peak-hours, respectively.



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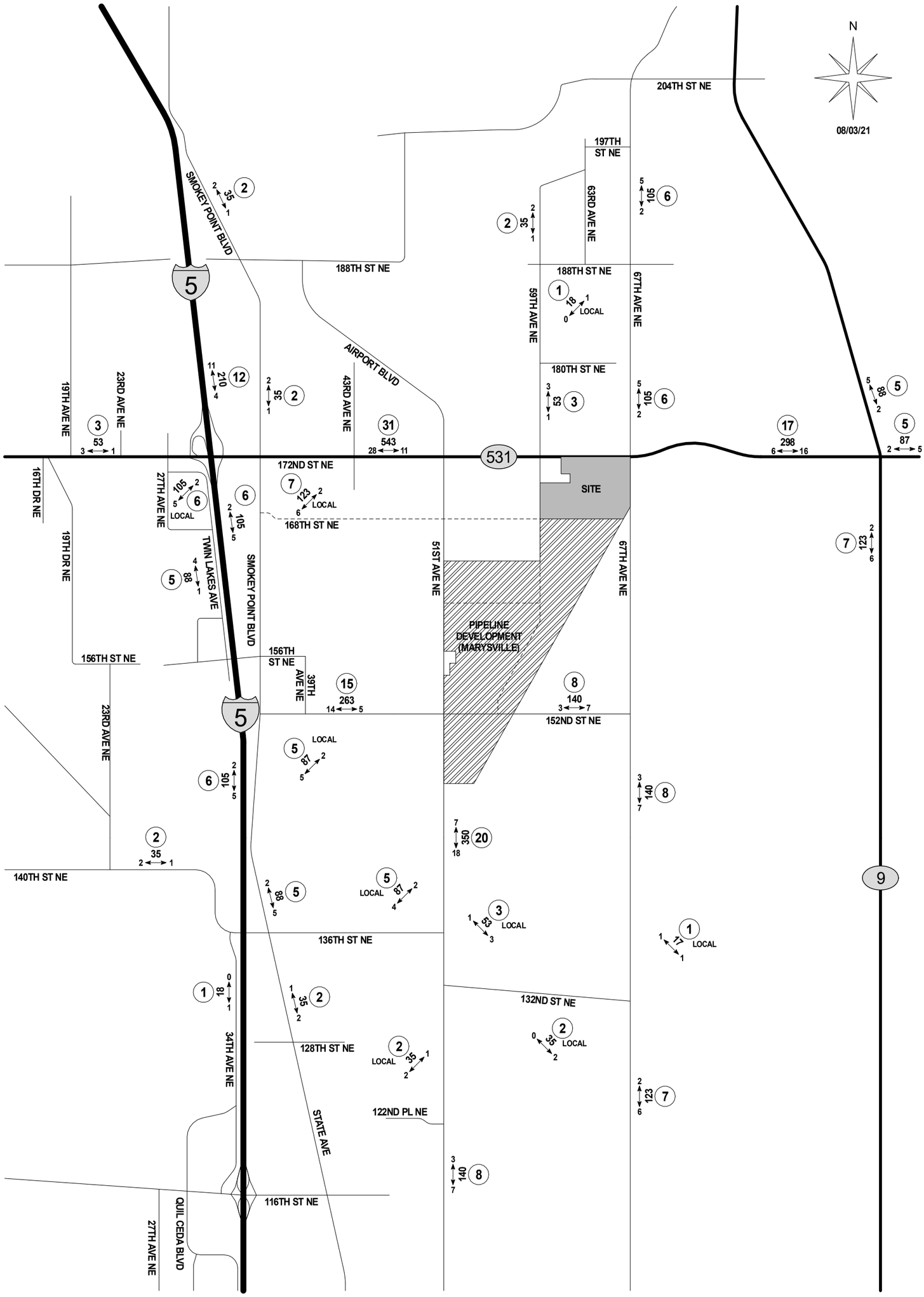
AWDT
AM ↔ PEAK — NEW DAILY TRAFFIC
NEW AM PEAK-HOUR TRIPS

(XX) — TRIP DISTRIBUTION %

FIGURE 2

2030 OPENING YEAR
TRIP DISTRIBUTION
AM PEAK-HOUR



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AWDT — NEW DAILY TRAFFIC
PM ⟷ PEAK — NEW PM PEAK-HOUR TRIPS

(XX) — TRIP DISTRIBUTION %

FIGURE 3

2030 OPENING YEAR TRIP DISTRIBUTION PM PEAK-HOUR

4.2 2036 Horizon Year Distribution

The major changes between the opening year distribution and the horizon year distribution are:

- Interstate-5 interchange at 156th Street NE
- New roadways between Smokey Point Boulevard and 51st Avenue NE
- Extension of 152nd Street NE between 67th Avenue NE and SR-9

These changes will cause a shift in the distribution of trips under the 2036 horizon year conditions. It is anticipated that 19% of the trips generated by the development will travel along 172nd Street NE/SR-531, twelve percent to and from the west and ten percent to and from the east. Approximately 13% of the trips generated by the development will travel to and from the north, eight percent along 51st Avenue NE, two percent along 59th Avenue NE, and three percent along 67th Avenue NE. It is estimated that 22% of the trips generated by the development will travel to and from the west along 160th Street NE. It is anticipated that 26% of the trips will travel along 152nd Street NE, eight percent to and from the west and eighteen percent to and from the east. The remaining 20% of the trips generated by the development will travel to and from the south along 51st Avenue NE. Detailed trip distributions for the horizon year are shown in Figure 4 and Figure 5 for the AM and PM peak-hours, respectively.

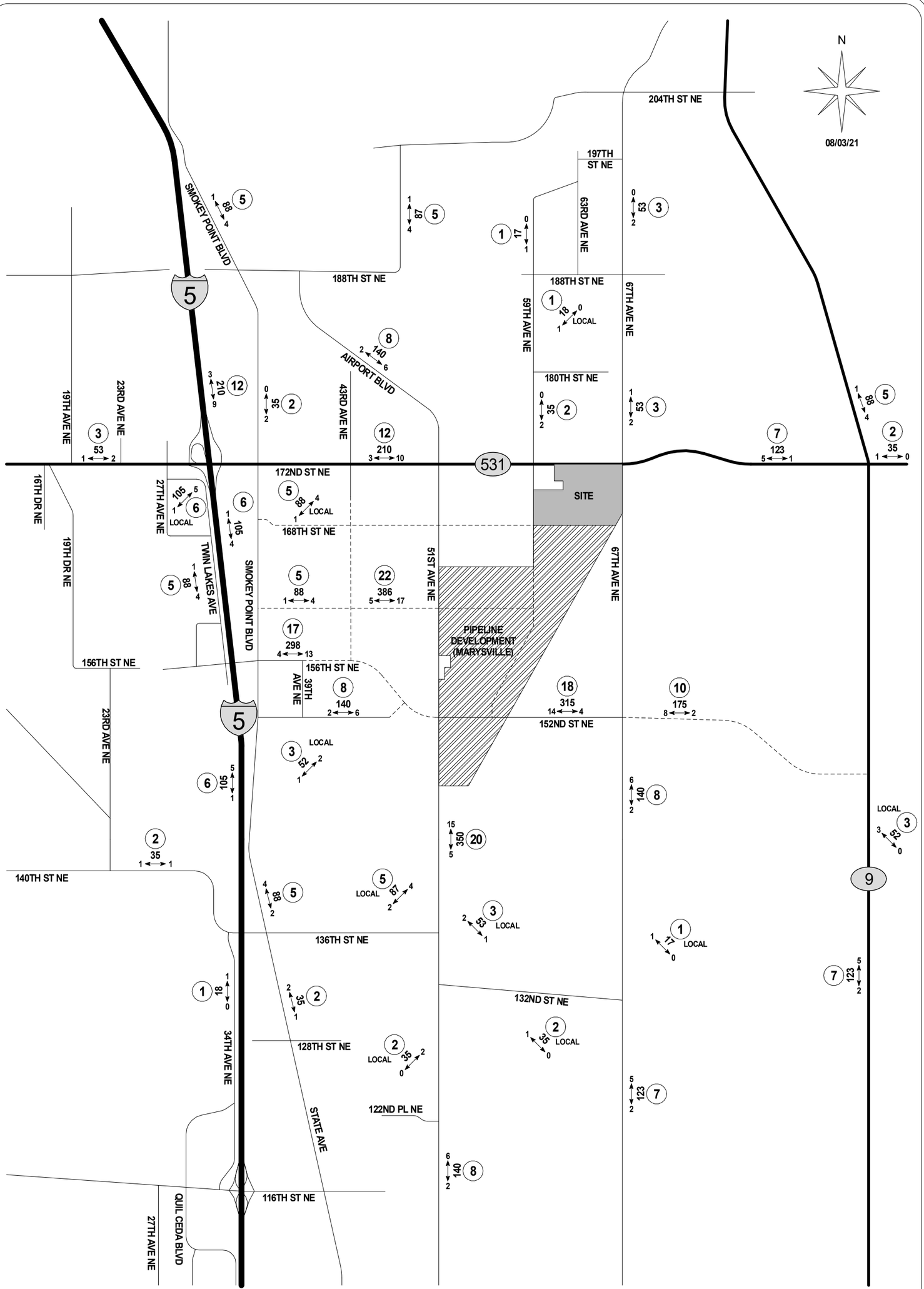
5. SCOPE OF ANALYSIS

The scope of the analysis is based on discussions and comments from City of Arlington staff. The following intersections have been analyzed as part of this report:

1. 172nd Street NE at I-5 Southbound Ramps
2. 172nd Street NE at I-5 Northbound Ramps
3. 172nd Street NE at Smokey Point Boulevard
4. 172nd Street NE at 43rd Avenue NE
5. 172nd Street NE at 51st Avenue NE
6. 172nd Street NE at 59th Avenue NE
7. 172nd Street NE at 63rd Avenue NE (future)
8. 172nd Street NE at 67th Avenue NE
9. 172nd Street NE at SR-9
10. Site Access at 59th Avenue NE (future)
11. 188th Street NE at 59th Avenue NE
12. 188th Street NE at 67th Avenue NE

The study intersections are shown in Figure 6. The study intersections have been analyzed for the weekday PM peak-hour. The intersections that are identified as future intersections do not currently exist, but will be constructed as part of the 172nd Street NE/SR-531 corridor improvements or with the development.

A qualitative analysis of the 168th Street NE corridor has also been performed as part of this report. City of Arlington staff requested analysis of the intersections of 168th Street NE at 51st Avenue NE and 59th Avenue NE, but turning movement volume forecasts have not been provided by City of Arlington staff. A qualitative analysis of the planned 3-lane section has therefore been performed to determine if the 3-lane section will be sufficient for the anticipated volumes.



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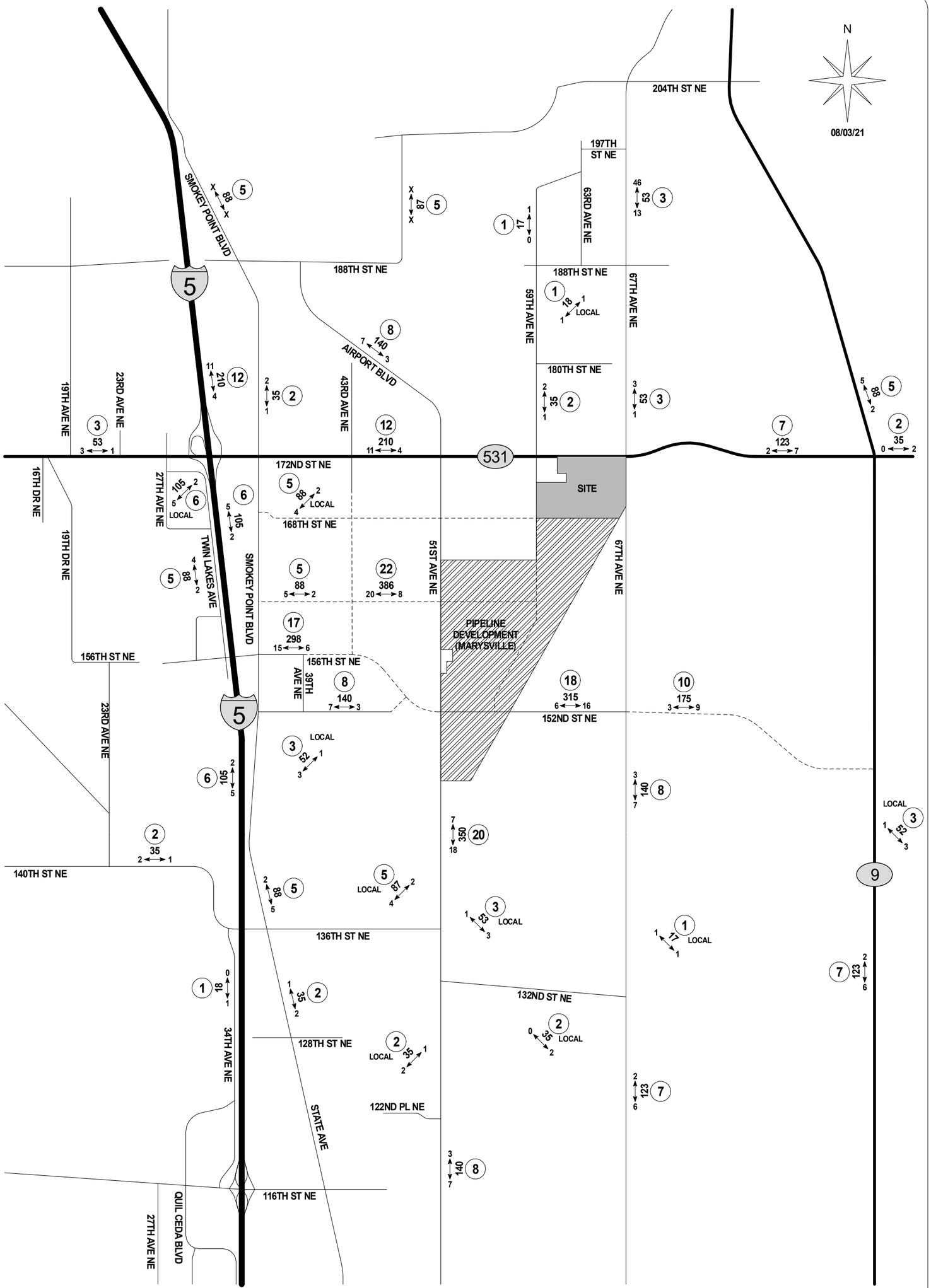
AWDT
AM ⟷ PEAK — NEW DAILY TRAFFIC / NEW AM PEAK-HOUR TRIPS

(XX) — TRIP DISTRIBUTION %

FIGURE 4

2036 HORIZON YEAR TRIP DISTRIBUTION AM PEAK-HOUR



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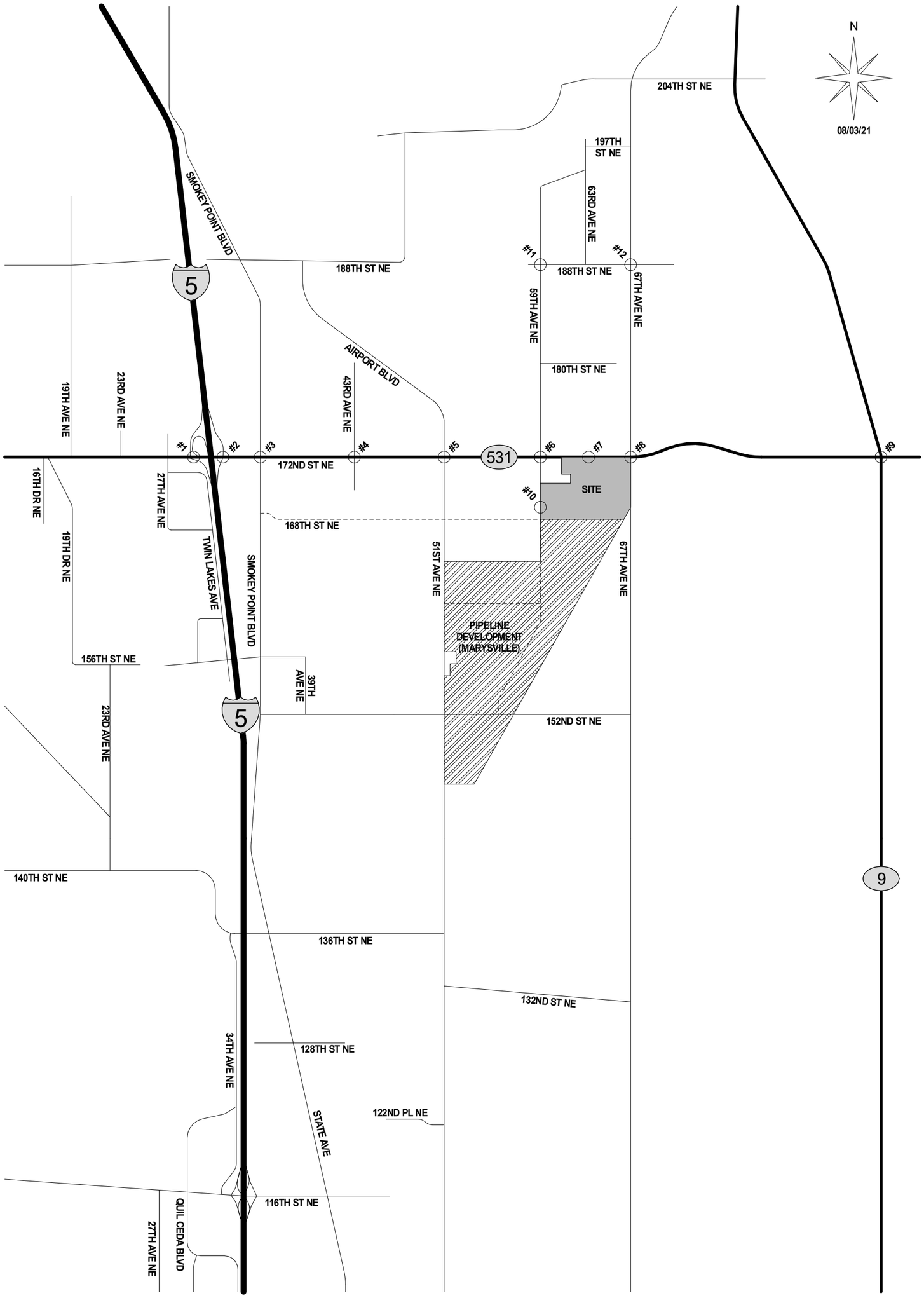
AWDT — NEW DAILY TRAFFIC
PM ↔ PEAK — NEW PM PEAK-HOUR TRIPS

(XX) — TRIP DISTRIBUTION %

FIGURE 5

2036 HORIZON YEAR
TRIP DISTRIBUTION
PM PEAK-HOUR



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DEVELOPMENT SITE

#X STUDY INTERSECTION

FIGURE 6

STUDY INTERSECTIONS

6. TURNING MOVEMENT CALCULATIONS

6.1 2020 Existing Turning Movements

The existing turning movements at the study intersections are based on data provided by WSDOT along the 172nd Street NE/SR-531 corridor and counts collected by the independent count firm Traffic Data Gathering (TDG). The WSDOT counts are consistent with what is being utilized for the 172nd Street NE/SR-531 corridor analysis that is being completed by WSDOT.

The counts collected by TDG were done so in May 2019. These counts were used since they were collected before the impacts of the Covid-19 Pandemic. The 2020 existing PM peak-hour turning movements at the study intersections are shown in Figure 7. The existing turning movement counts are included in the attachments.

6.2 2030 Opening Year Turning Movements

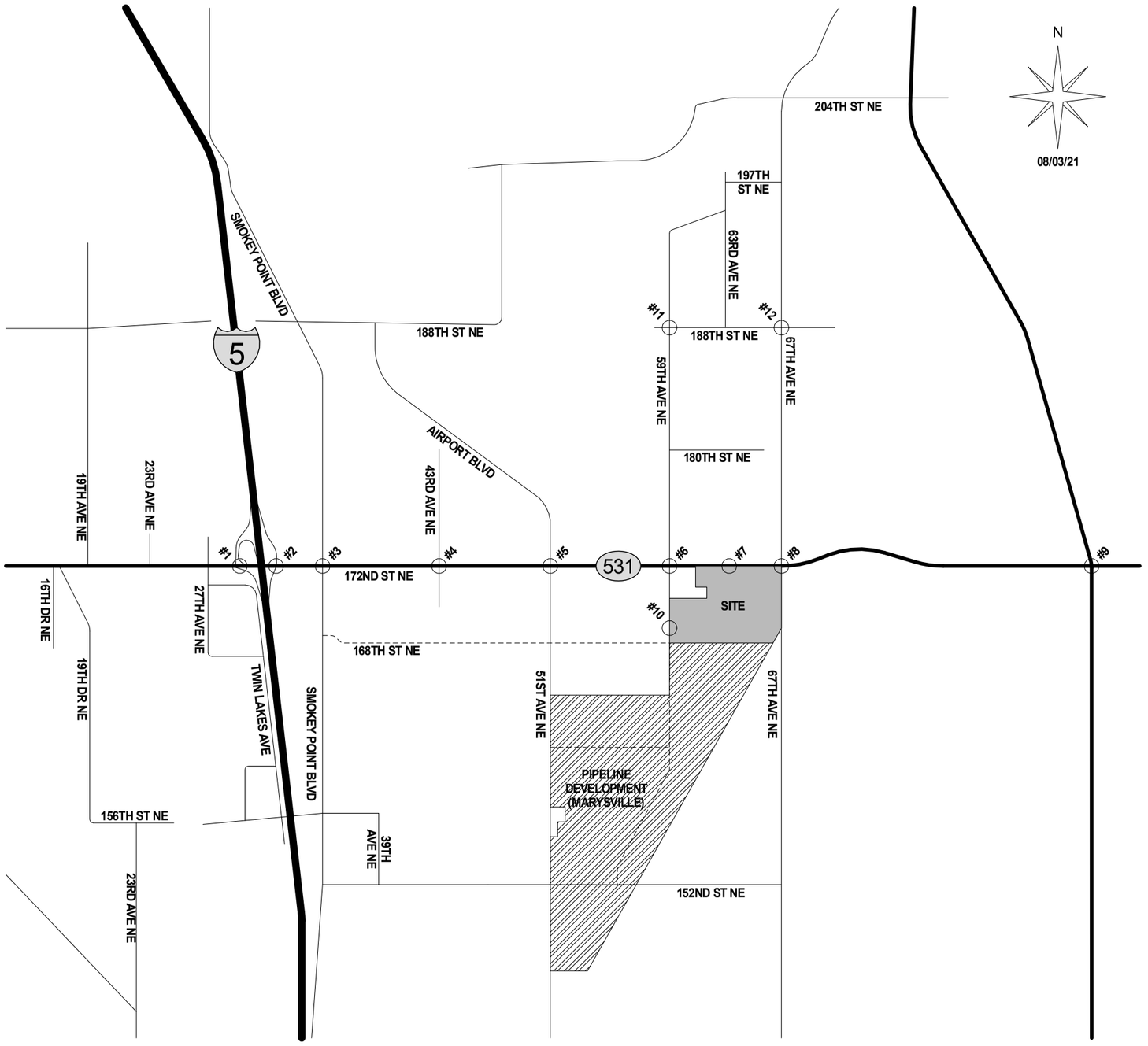
The 2030 baseline turning movements have been calculated by applying a 3% annually compounding growth to the 2020 existing PM peak-hour volumes and volumes from the adjacent industrial development in the City of Marysville. This development has been included as a pipeline development since it will include roadway improvements that will directly affect the trip distribution of the Cascade Commerce Center in the City of Arlington. The 2030 baseline turning movements at the study intersections are shown in Figure 8. The 2030 opening year turning movements have been calculated by adding the trips generated by the development to the 2030 baseline turning movements. The 2030 opening year turning movements at the study intersections are shown in Figure 9.

6.3 2036 Horizon Year Turning Movements

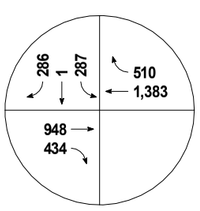
The 2036 baseline turning movements have been calculated by applying a 3% annually compounding growth to the 2020 existing PM peak-hour volumes, accounting for 16 to 17-years of growth, and pipeline trips from the adjacent City of Marysville development. The 2036 baseline turning movements at the study intersections are shown in Figure 10. The 2036 horizon year turning movements have been calculated by adding the trips generated by the development to the 2036 baseline turning movements. The 2036 opening year turning movements at the study intersections are shown in Figure 11.

7. INTERSECTION LEVEL OF SERVICE

The study intersections have been analyzed using existing control, existing signal timing data and peak-hour and heavy vehicle factors from the count data. The levels of service for the study intersections for the 2020 existing, 2030 opening year and 2036 horizon year conditions are summarized in Table 3. The acceptable level of service threshold for the study intersections is LOS D.



#1 172ND ST NE @ I-5 SB RAMPS



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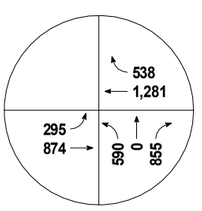

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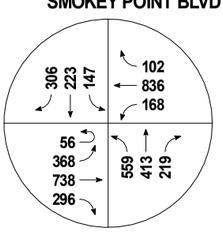

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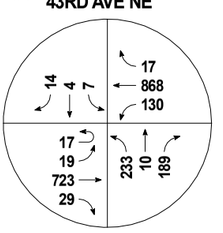
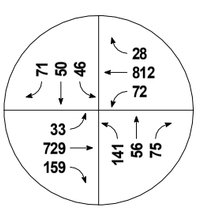


#5 172ND ST NE @ 51ST AVE NE



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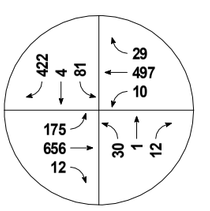
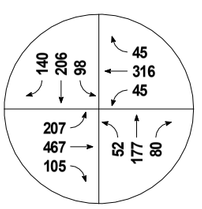


#7 172ND ST NE @ 63RD AVE NE

NOT CURRENTLY AN INTERSECTION

#8 172ND ST NE @ 67TH AVE NE



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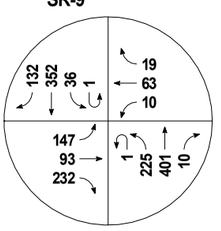
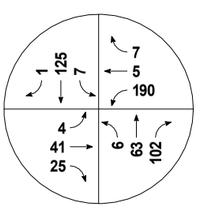


#10 SITE ACCESS @ 59TH AVE NE

NOT CURRENTLY AN INTERSECTION

#11 188TH ST NE @ 59TH AVE NE



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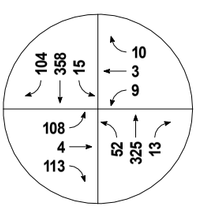

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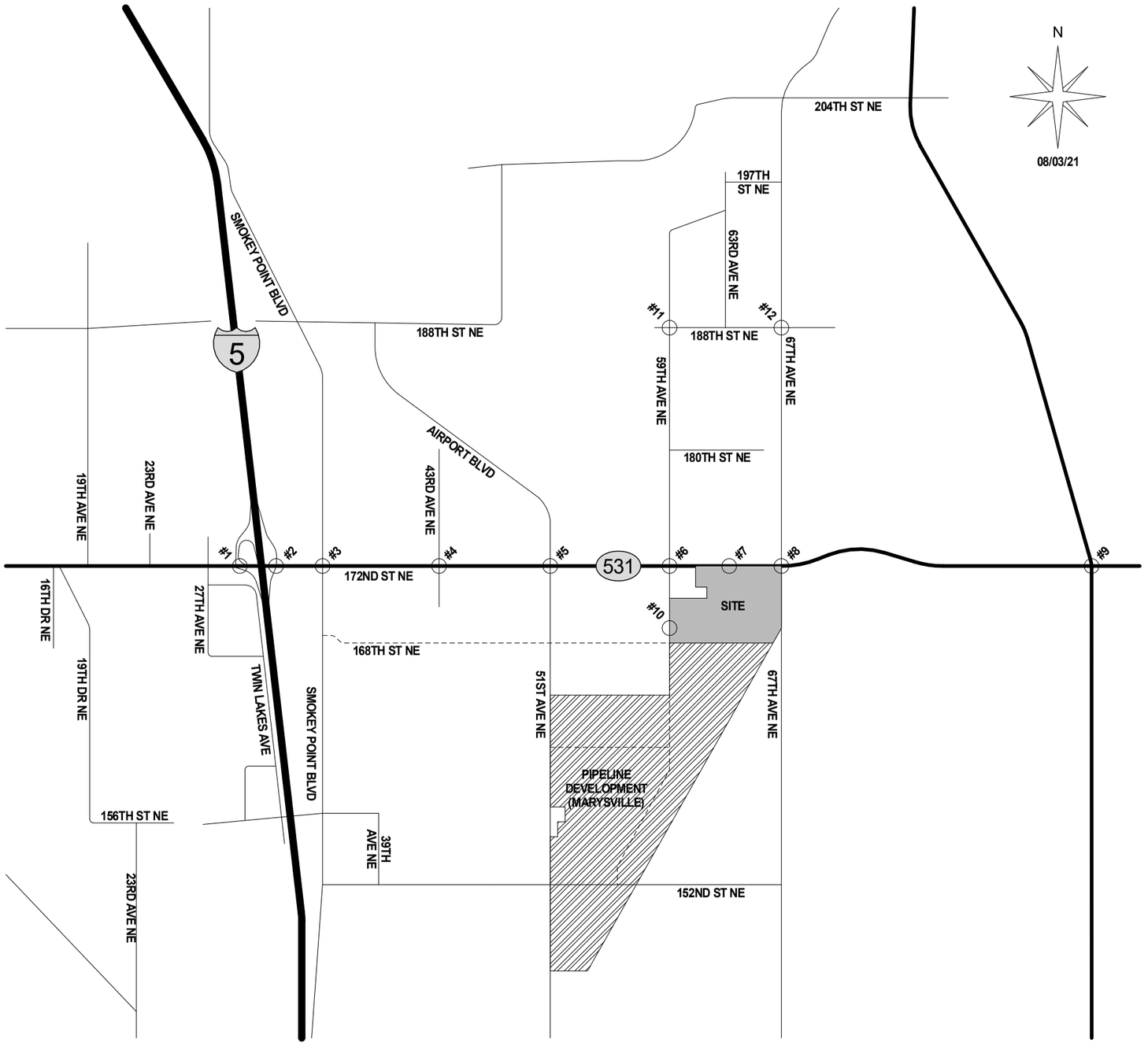
XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 7

2020 EXISTING TURNING MOVEMENTS



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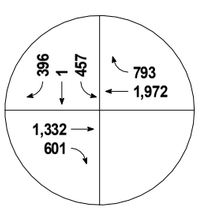

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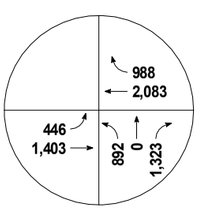

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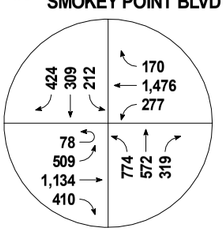

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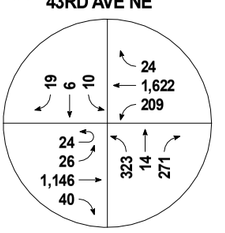

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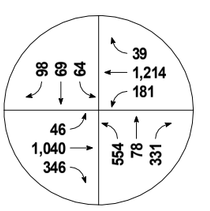

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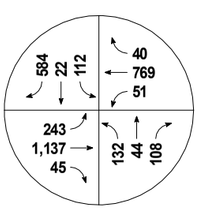

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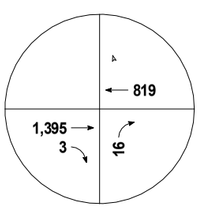

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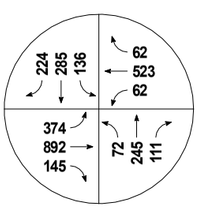

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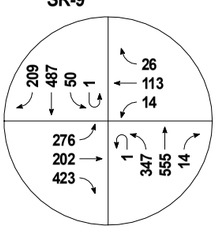

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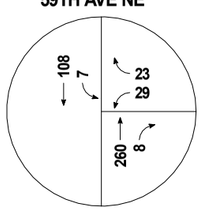

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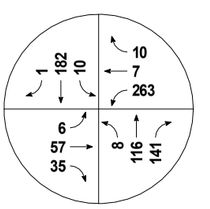

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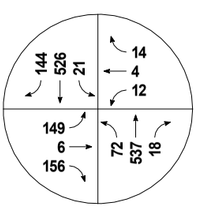

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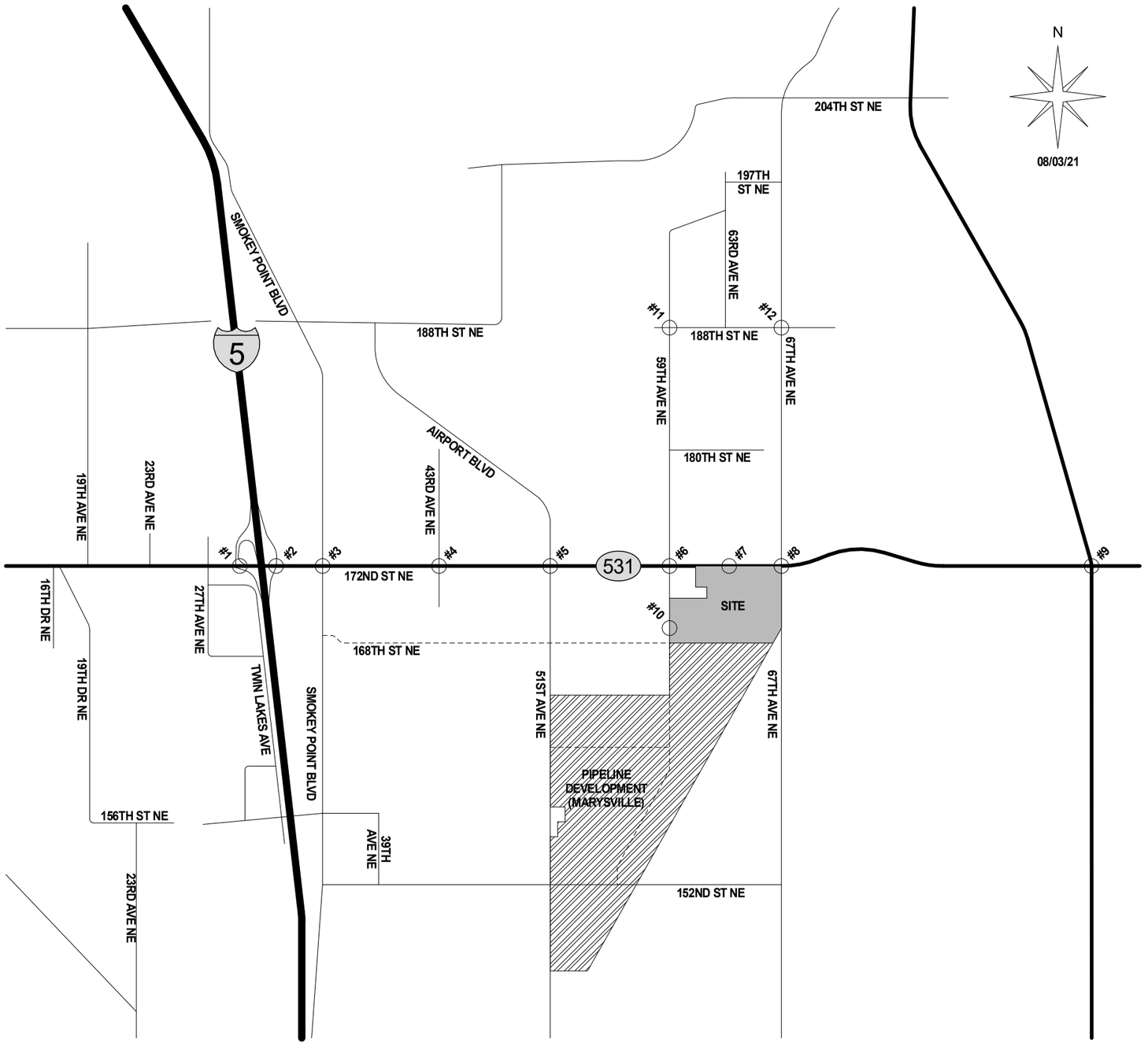
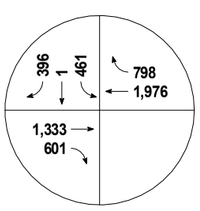
XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 8

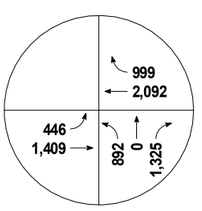
2030 BASELINE TURNING MOVEMENTS



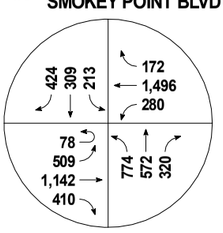
#1 172ND ST NE @ I-5 SB RAMPS



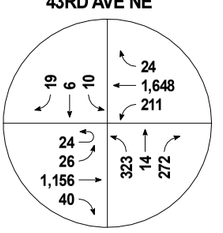
#2 172ND ST NE @ I-5 NB RAMPS



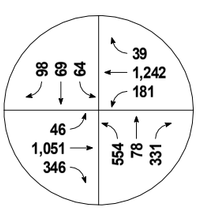
#3 172ND ST NE @ SMOKEY POINT BLVD



#4 172ND ST NE @ 43RD AVE NE



#5 172ND ST NE @ 51ST AVE NE



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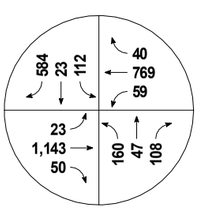

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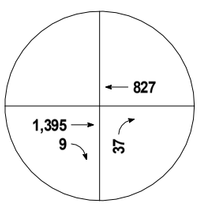

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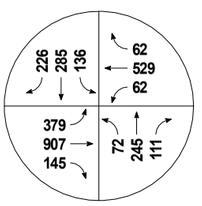

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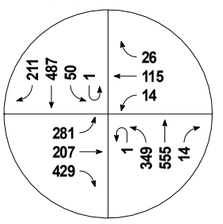

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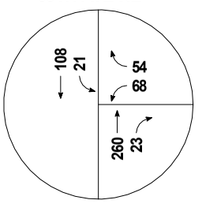

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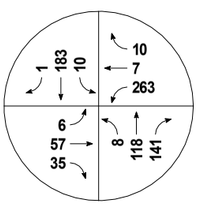

#12 188TH ST NE @ 67TH AVE NE

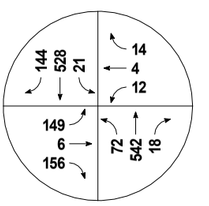

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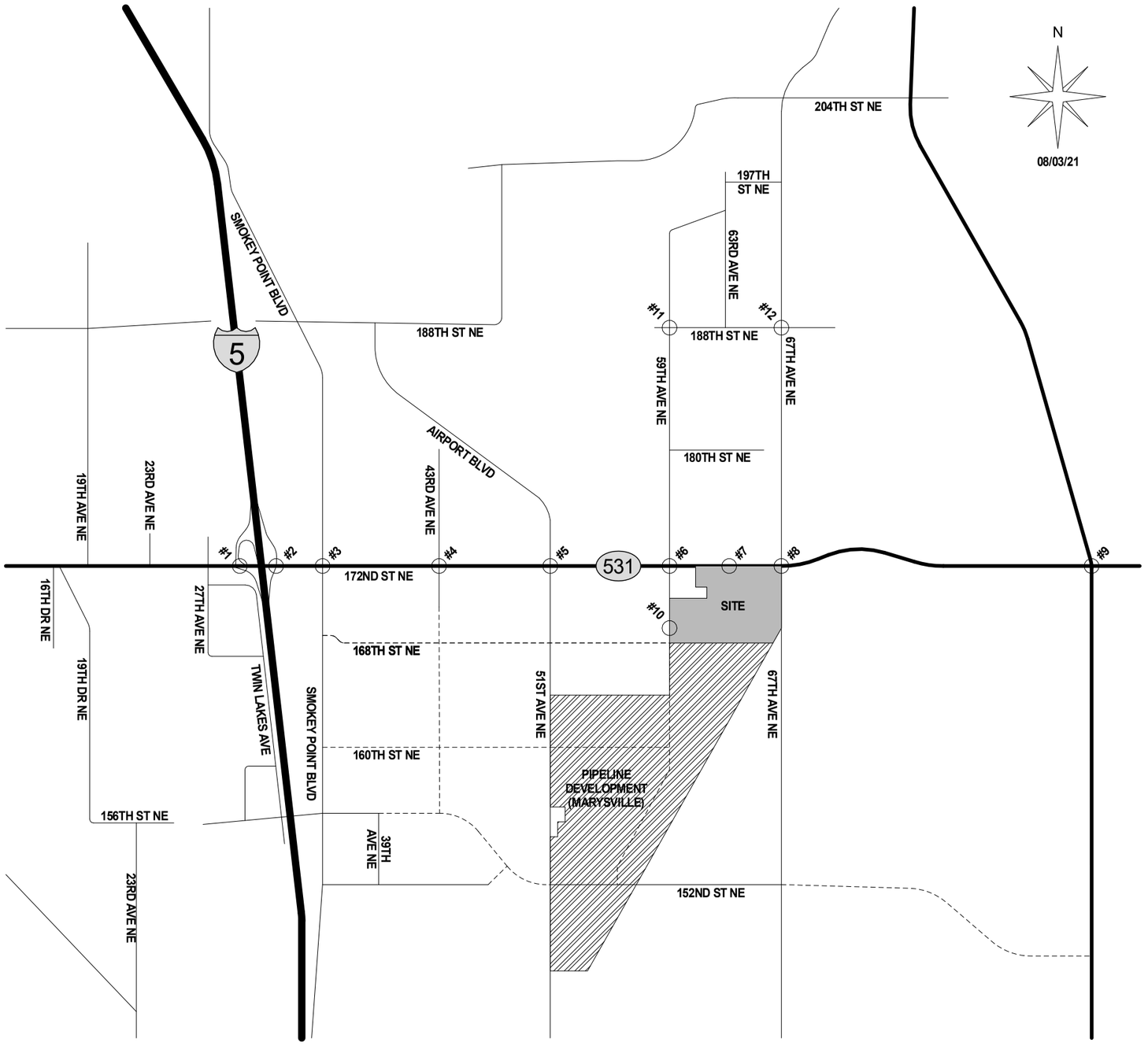
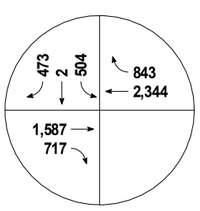
FIGURE 9

2030 OPENING YEAR TURNING MOVEMENTS



#1 172ND ST NE @ I-5 SB RAMPS



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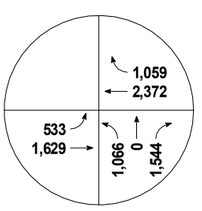
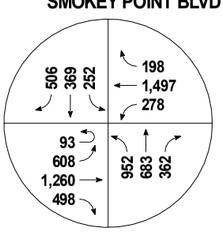


#3 172ND ST NE @ SMOKEY POINT BLVD



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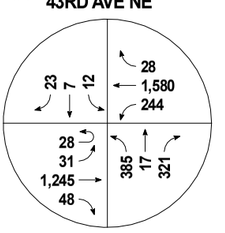
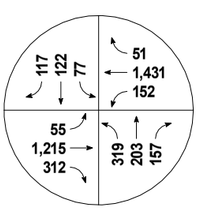
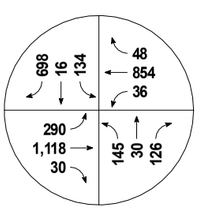


#5 172ND ST NE @ 51ST AVE NE



#6 172ND ST NE @ 59TH AVE NE



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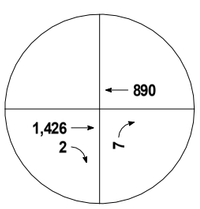

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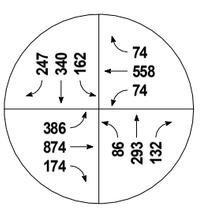

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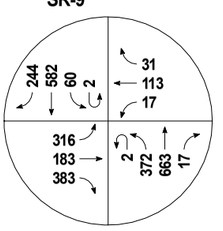

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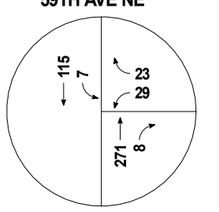
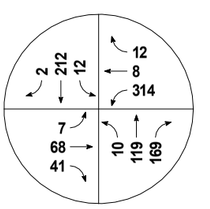


#11 188TH ST NE @ 59TH AVE NE



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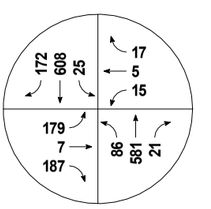

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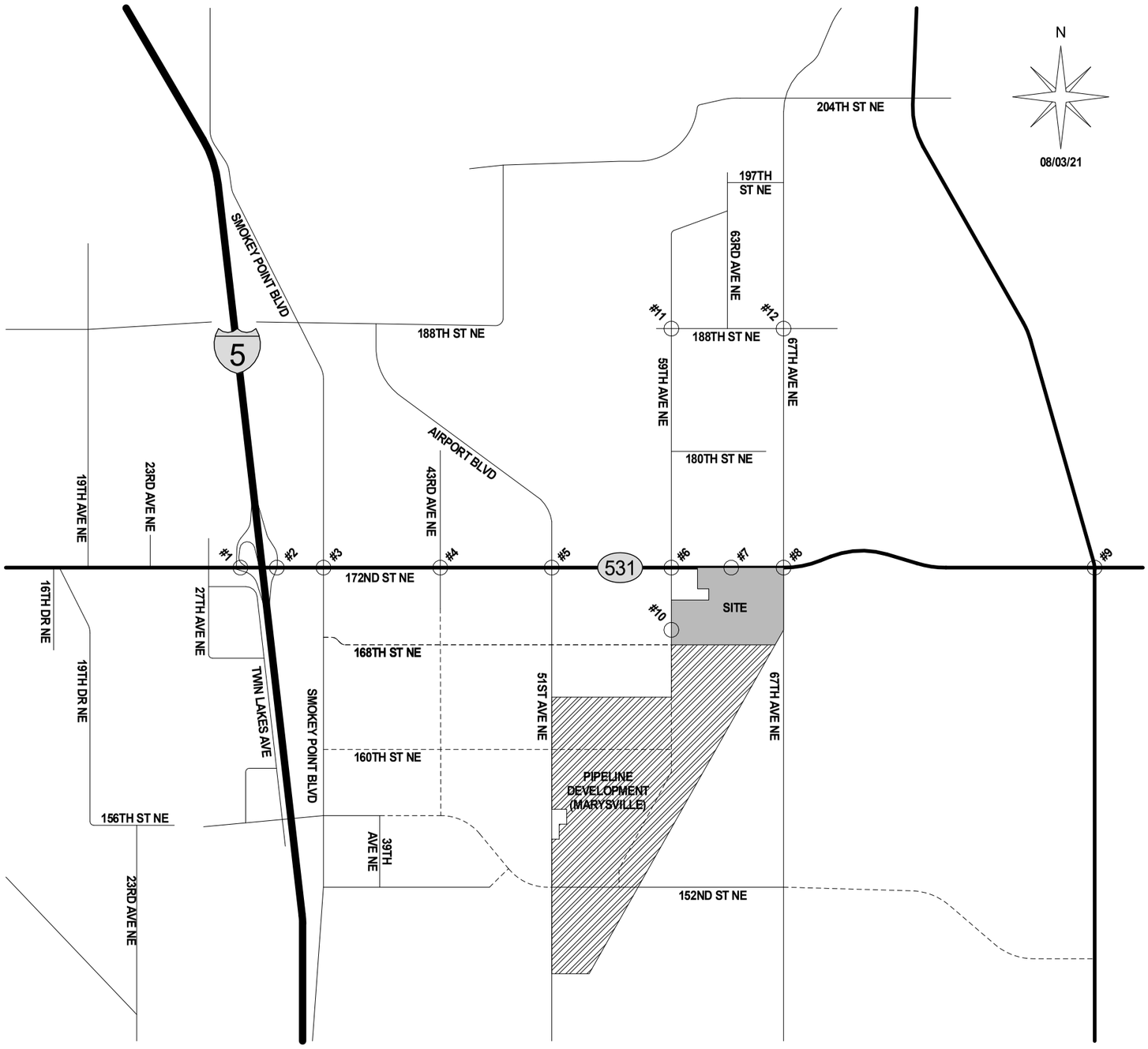
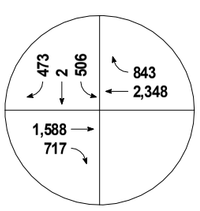
FIGURE 10

2036 BASELINE TURNING MOVEMENTS



#1 172ND ST NE @ I-5 SB RAMPS



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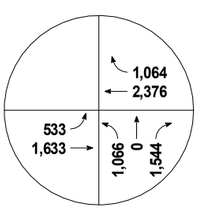
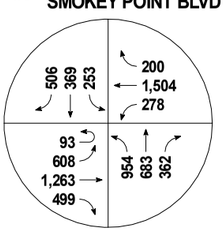
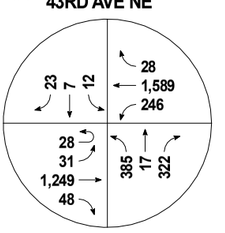


#3 172ND ST NE @ SMOKEY POINT BLVD



#4 172ND ST NE @ 43RD AVE NE



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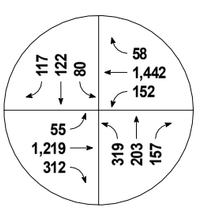

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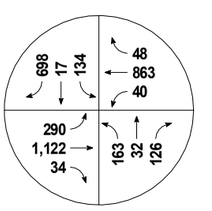

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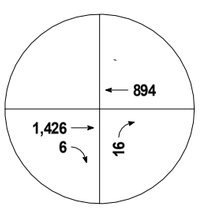
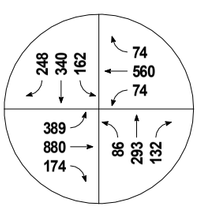


#8 172ND ST NE @ 67TH AVE NE



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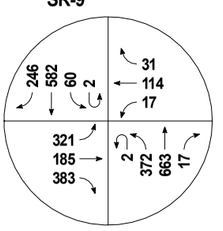
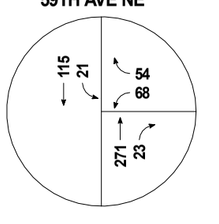
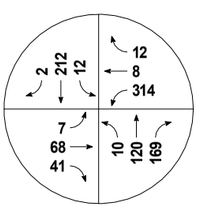


#10 SITE ACCESS @ 59TH AVE NE



#11 188TH ST NE @ 59TH AVE NE



#12 188TH ST NE @ 67TH AVE NE

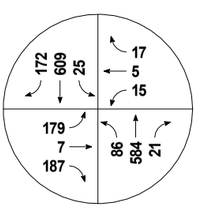


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FIGURE 11

2036 HORIZON YEAR TURNING MOVEMENTS

Table 3: Level of Service Summary with Existing Configuration

Intersection	Existing Intersection Control	2020 Existing Conditions		2030 Baseline Conditions		2030 Opening Conditions		2036 Baseline Conditions		2036 Horizon Conditions	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1. 172nd Street NE at I-5 Southbound Ramps	Signal	B	13.9 sec	C	26.. sec	C	26.4 sec	D	48.6 sec	D	48.9 sec
2. 172nd Street NE at I-5 Northbound Ramps	Signal	C	25.9 sec	E	65.3 sec	E	66.3 sec	F	109.6 sec	F	110.1 sec
3. 172nd Street NE at Smokey Point Boulevard	Signal	E	72.7 sec	F	138.1 sec	F	138.7 sec	F	186.2 sec	F	186.5 sec
4. 172nd Street NE at 43rd Avenue NE	Signal	D	41.1 sec	F	81.0 sec	F	82.2 sec	F	115.4 sec	F	116.2 sec
5. 172nd Street NE at 51st Avenue NE	Signal	C	30.5 sec	F	497.3 sec	F	496.2 sec	F	294.7 sec	F	296.7 sec
6. 172nd Street NE at 59th Avenue NE	Signal	C	30.9 sec	F	117.5 sec	F	127.1 sec	F	159.3 sec	F	162.8 sec
7. 172nd Street NE at 63rd Avenue NE	Two-Way[3] Stop-Control	---	---	---	---	E	35.8 sec	---	---	D	32.4 sec
8. 172nd Street NE at 67th Avenue NE	Signal	D	38.4 sec	F	80.9 sec	F	80.4 sec	F	113.7 sec	F	112.6 sec
9. 172nd Street NE at SR-9	Roundabout	A	6.7 sec	A	8.7 sec	A	8.8 sec	B	10.5 sec	B	10.6 sec
10. Site Access at 59th Avenue NE	Two-Way Stop-Control	---	---	---	---	B	12.4 sec	---	---	B	12.6 sec
11. 188th Street NE at 59th Avenue NE	All-Way Stop-Control	A	9.8 sec	B	13.3 sec	B	13.4 sec	C	17.7 sec	C	17.8 sec
12. 188th Street NE at 59th Avenue NE	Two-Way Stop-Control	D	28.0 sec	F	268.2 sec	F	278.9 sec	F	612.5 sec	F	626.5 sec

There are a few instances where the level of service results show lower average delay with the trips generated by the Cascade Commerce Center development. The change is relatively small and is due to how the analysis software evaluates the intersection and signal operations. The intersections where this occurs are anticipated to operate at LOS F and have planned improvements.

[3] It is assumed this intersection will be restricted to right-turn only based on comments from WSDOT stating that a full access will not be approved.

The level of service analysis shows that the trips generated by the development will not cause any of the off-site study intersections to operate at a deficient level of service. However, there are several study intersections that will operate at deficient levels of service (LOS E or LOS F) under the 2030 baseline, 2030 opening year, 2036 baseline and 2036 horizon year conditions. These intersections have planned and funded improvements. The identified improvements for the study intersection are summarized in Table 4.

Table 4: Identified Intersection Improvements

Intersection	Source	Improvement
4. 172nd Street NE at 43rd Avenue NE	Connecting Washington	Roundabout
5. 172nd Street NE at 51st Avenue NE	Connecting Washington	Roundabout
6. 172nd Street NE at 59th Avenue NE	Connecting Washington	Roundabout
8. 172nd Street NE at 67th Avenue NE	Connecting Washington	Additional east-west channelization
12. 188th Street NE at 67th Avenue NE	City of Arlington TIP	Convert to controlled intersection – anticipated to be a signal

The intersection operations with these planned improvements are summarized in Table 5 with the exception of the three intersections that will be impacted by the Interstate-5 interchange with 156th Street NE that is funded as part of Connecting Washington. These intersections are:

1. 172nd Street NE at I-5 Southbound Ramps
2. 172nd Street NE at I-5 Northbound Ramps
3. 172nd Street NE at I-5 Southbound Ramps – LOS F under 2036 Baseline and beyond
4. 172nd Street NE at Smokey Point Boulevard – LOS F under 2030 Baseline and beyond

The 156th Street NE interchange with Interstate-5 will reduce the volumes at these intersections, which would then improve the operations of these intersections. The ultimate impact of the interchange will be evaluated as part of the 156th Street NE Interchange Justification Report (IJR), funded by Connecting Washington, that will be completed for the interchange. There are also other planned improvements in the site vicinity that are not study intersections, but affect the impacts of the Cascade Commerce Center development on the study intersections. These improvements include the roadway connections along the 160th Street NE and 156th Street NE alignments. These roadway improvements will reduce the impacts along the SR-531/172nd Street NE corridor. The 160th Street NE and 156th Street NE corridor improvements are planned to be constructed through a combination of improvements completed as part of developments and/or improvements completed by the City of Marysville.

Table 5: Level of Service Summary with Identified Improvements

	Intersection	Control	2020 Existing Conditions		2030 Baseline Conditions		2030 Opening Conditions		2036 Baseline Conditions		2036 Horizon Conditions	
			LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
4.	172nd Street NE at 43rd Avenue NE	Signal	D	41.1 sec	F	81.0 sec	F	82.2 sec	F	115.4 sec	F	116.2 sec
	with WSDOT Roundabout	*Roundabout*	---	---	*B*	*10.7 sec*	*B*	*11.1 sec*	*B*	*14.9 sec*	*B*	*15.3 sec*
5.	172nd Street NE at 51st Avenue NE	Signal	C	30.5 sec	F	497.3 sec	F	496.2 sec	F	294.7 sec	F	296.7 sec
	with WSDOT Roundabout	*Roundabout*	---	---	*B*	*18.0 sec*	*B*	*19.3 sec*	*B*	*19.7 sec*	*C*	*20.9 sec*
6.	172nd Street NE at 59th Avenue NE	Signal	C	30.9 sec	F	117.5 sec	F	127.1 sec	F	159.3 sec	F	162.8 sec
	with WSDOT Roundabout	*Roundabout*	---	---	A	7.5 sec	A	7.9 sec	A	8.3 sec	A	8.6 sec
8.	172nd Street NE at 67th Avenue NE	Signal	D	38.4 sec	F	80.9 sec	F	80.4 sec	F	113.7 sec	F	112.6 sec
	with WSDOT Roundabout	*Roundabout*	---	---	*B*	*15.6 sec*	*B*	*16.4 sec*	*D*	*35.9 sec*	*D*	*36.7 sec*
12.	188th Street NE at 67th Avenue NE	Signal	D	28.0 sec	F	268.2 sec	F	278.9 sec	F	612.5 sec	F	626.5 sec
	with Signal	*Signal*	---	---	*B*	*18.1 sec*	*D*	*18.2 sec*	*C*	*21.3 sec*	*C*	*21.4 sec*

The study intersections are all anticipated to operate acceptably under the 2030 opening and 2036 horizon year conditions with the planned improvements. It is important to note that the public road access to SR-531/172nd Street NE is anticipated to be restricted to right-turn only since WSDOT stated that a full access will not be allowed. The access is shown to operate at LOS E under the 2020 opening year conditions without any improvements to SR-531/172nd Street NE. However, the intersection will operate at LOS D or better with the 5-lane section and is anticipated to operate at LOS D under the 2036 horizon year conditions with the existing 2-lane section, but with the future roadway connections in the area. The site is being designed such that a future roundabout could be installed at the access location to SR-531/172nd Street NE if City of Arlington staff is able to get WSDOT to approve a roundabout at this location. The construction of a potential roundabout would not be the responsibility of the Cascade Commerce Center development since the right-turn restricted access analyzed as part of this report operates at LOS D.

8. 168th Street NE Corridor Impacts

The City of Arlington has a planned roadway along the 168th Street NE corridor between Smokey Point Boulevard and 67th Avenue NE. The section between Smokey Point Boulevard and 51st Avenue NE is partially constructed and will be completed as part of the Roxy Development. The section between 51st Avenue NE and 59th Avenue NE is not constructed and the City of Arlington does not currently have the full right-of-way width for the roadway. City of Arlington staff has identified that the section between 59th Avenue NE and 67th Avenue NE is not likely to be fully constructed due to the proximity of the railroad tracks and 67th Avenue NE.

The section of 168th Street NE between Smokey Point Boulevard and 51st Avenue NE is, or will be, constructed to a 3-lane section. This roadway section is the same as the 51st Avenue NE and 59th Avenue NE corridors. It is anticipated that the section of 168th Street NE east of 51st Avenue NE will also be a 3-lane section. The City of Arlington is planning on the intersection of 168th Street NE at 51st Avenue NE being a roundabout. The intersection of 168th Street NE at 59th Avenue NE would likely not need to be a roundabout if 168th Street NE is not extended east of 59th Avenue NE due to the inability to connect over the railroad tracks to 67th Avenue NE.

The trip distribution shows that somewhere between 5% and 10% of the trips generated by the Cascade Commerce Center could travel along 168th Street NE west of 59th Avenue NE based on the 2020 opening and 2036 horizon trip distributions. This equates to approximately 90 to 180 average daily trips and 6 to 12 PM peak-hour trips. These impacts are not anticipated to result in a significant adverse impact by the Cascade Commerce Center.

9. MITIGATION

The City of Arlington collects traffic mitigation fees based on the number of PM peak-hour trips generated by a development.

9.1 City of Arlington

The City of Arlington currently has a traffic mitigation fee of $3,355 per PM peak-hour trip. The 1,252,000 SF of warehouse space of the Cascade Commerce Center development located in the City of Arlington is anticipated to generate 126 new PM peak-hour trips. These trips result in a City of Arlington traffic mitigation fees of $422,730.00.

10. CONCLUSIONS

The Cascade Commerce Center development in the City of Arlington is proposed to consist of two separate buildings totaling 1,252,000 square-feet (SF) of warehouse space. The site is anticipated to generate 1,752 daily trips with between 100 AM peak-hour trips and 126 PM peak-hour trips.

The analysis evaluated the impacts at 12 intersections in the City of Arlington. The analysis was completed for the 2020 existing, 2030 opening and 2036 horizon year conditions. The analysis summarized in Table 5 shows that study intersections are anticipated to operate at acceptable levels with the improvements identified in Table 4.

There are WSDOT planned and funded improvements along the 172nd Street NE/SR-531 corridor, funded improvements for the interchange of Interstate-5 at 156th Street NE and improvements identified in the City of Arlington 6-year TIP that will allow the study intersections to operate acceptably. The traffic mitigation fees for the two buildings have been calculated to be $422,730.00.

Trip Generation Calculations

Cascade Commerce Center
GTC #20-106

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

									NET EXTERNAL TRIPS BY TYPE							
									IN BOTH DIRECTIONS				DIRECTIONAL ASSIGNMENTS			
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		NEW	PASS-BY		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out
North Bldg - High-Cube Warehouse	596.000 ksf	154	1.40	50%	50%	834	0%	0	834	0%	0	834	0	0	417	417
South Bldg - High-Cube Warehouse	656.000 ksf	154	1.40	50%	50%	918	0%	0	918	0%	0	918	0	0	459	459
Totals						1752		0	1752		0	1752	0	0	876	876

Cascade Commerce Center
GTC #20-106

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

									NET EXTERNAL TRIPS BY TYPE							
									IN BOTH DIRECTIONS				DIRECTIONAL ASSIGNMENTS			
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		NEW	PASS-BY		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out
North Bldg - High-Cube Warehouse	596.000 ksf	154	0.08	77%	23%	48	0%	0	48	0%	0	48	0	0	37	11
South Bldg - High-Cube Warehouse	656.000 ksf	154	0.08	77%	23%	52	0%	0	52	0%	0	52	0	0	40	12
Totals						100		0	100		0	100	0	0	77	23

Cascade Commerce Center
GTC #20-106

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

									NET EXTERNAL TRIPS BY TYPE							
									IN BOTH DIRECTIONS				DIRECTIONAL ASSIGNMENTS			
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		NEW	PASS-BY		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out
North Bldg - High-Cube Warehouse	596.000 ksf	154	0.10	28%	72%	60	0%	0	60	0%	0	60	0	0	17	43
South Bldg - High-Cube Warehouse	656.000 ksf	154	0.10	28%	72%	66	0%	0	66	0%	0	66	0	0	18	48
Totals						126		0	126		0	126	0	0	35	91

Count Data

I-5mp206.08_SR531_SB_Ramps_2019-0409 - TMC
Tue Apr 9, 2019
PM Peak (Apr 09 2019 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 643268, Location: 48.152284, -122.191081, Site Code: 00520608SB_0419

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US

Leg	I-5 SB Ramps						SR 531 (172nd St NE)							I-5 SB ON Ramp		SR 531 (172nd St NE)						
Direction	Southbound						Westbound							Northbound		Eastbound						
Time	R	T	L	U	App	Ped*	HR	R	T	L	U	App	Ped*	App	Ped*	R	T	L	U	App	Ped*	Int
2019-04-09 4:30PM	70	0	70	0	**140**	4	147	1	351	0	0	**499**	0	**0**	1	104	230	0	0	**334**	0	**973**
4:45PM	63	0	72	0	**135**	1	92	2	316	0	0	**410**	0	**0**	1	103	237	0	0	**340**	1	**885**
5:00PM	76	0	74	0	**150**	2	131	3	339	0	0	**473**	0	**0**	1	116	245	0	0	**361**	0	**984**
5:15PM	77	1	71	0	**149**	1	132	2	377	0	0	**511**	0	**0**	1	111	236	0	0	**347**	0	**1007**
Total	286	1	287	0	**574**	8	502	8	1383	0	0	**1893**	0	**0**	4	434	948	0	0	**1382**	1	**3849**
% Approach	49.8%	0.2%	50.0%	0%	-	-	26.5%	0.4%	73.1%	0%	0%	-	-	-	-	31.4%	68.6%	0%	0%	-	-	-
% Total	7.4%	0%	7.5%	0%	**14.9%**	-	13.0%	0.2%	35.9%	0%	0%	**49.2%**	-	**0%**	-	11.3%	24.6%	0%	0%	**35.9%**	-	-
PHF	0.929	0.250	0.970	-	**0.957**	-	0.854	0.667	0.917	-	-	**0.926**	-	-	-	0.935	0.967	-	-	**0.957**	-	0.956
Motorcycles	0	0	1	0	**1**	-	1	0	2	0	0	**3**	-	**0**	-	1	1	0	0	**2**	-	6
% Motorcycles	0%	0%	0.3%	0%	**0.2%**	-	0.2%	0%	0.1%	0%	0%	**0.2%**	-	-	-	0.2%	0.1%	0%	0%	**0.1%**	-	0.2%
Lights	284	1	270	0	**555**	-	492	8	1368	0	0	**1868**	-	**0**	-	420	934	0	0	**1354**	-	3777
% Lights	99.3%	100%	94.1%	0%	**96.7%**	-	98.0%	100%	98.9%	0%	0%	**98.7%**	-	-	-	96.8%	98.5%	0%	0%	**98.0%**	-	98.1%
Single-Unit Trucks	2	0	10	0	**12**	-	3	0	8	0	0	**11**	-	**0**	-	8	9	0	0	**17**	-	40
% Single-Unit Trucks	0.7%	0%	3.5%	0%	**2.1%**	-	0.6%	0%	0.6%	0%	0%	**0.6%**	-	-	-	1.8%	0.9%	0%	0%	**1.2%**	-	1.0%
Articulated Trucks	0	0	5	0	**5**	-	3	0	3	0	0	**6**	-	**0**	-	2	0	0	0	**2**	-	13
% Articulated Trucks	0%	0%	1.7%	0%	**0.9%**	-	0.6%	0%	0.2%	0%	0%	**0.3%**	-	-	-	0.5%	0%	0%	0%	**0.1%**	-	0.3%
Buses	0	0	1	0	**1**	-	3	0	2	0	0	**5**	-	**0**	-	3	4	0	0	**7**	-	13
% Buses	0%	0%	0.3%	0%	**0.2%**	-	0.6%	0%	0.1%	0%	0%	**0.3%**	-	-	-	0.7%	0.4%	0%	0%	**0.5%**	-	0.3%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	0	**0**	-	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	0%	**0%**	-	-	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	8	-	-	-	-	-	-	0	-	4	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	0	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

I-5mp206.08_SR531_SB_Ramps_2019-0409 - TMC

Tue Apr 9, 2019

PM Peak (Apr 09 2019 4:30PM - 5:30 PM) - Overall Peak Hour

All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

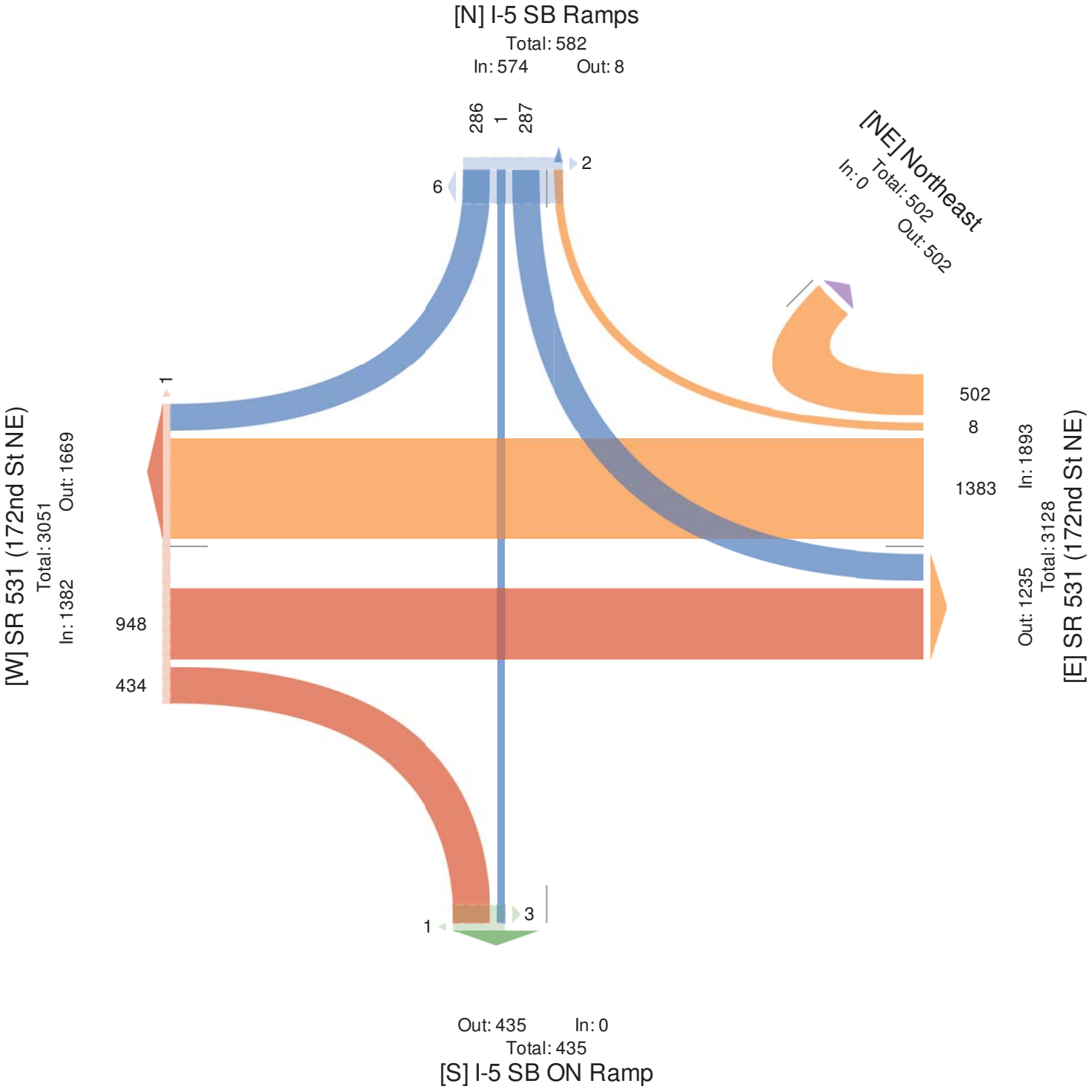
All Movements

ID: 643268, Location: 48.152284, -122.191081, Site Code: 00520608SB_0419

WASHINGTON STATE DEPT. OF TRANSPORTATION

Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US



I-5mp206.08_SR531NB_Ramps_2016-0713 - TMC

Wed Jul 13, 2016

PM Peak (Jul 13 2016 4:30PM - 5:30PM) - Overall Peak Hour

All Classes (Motorcycles, Cars, Light Goods Vehicles, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

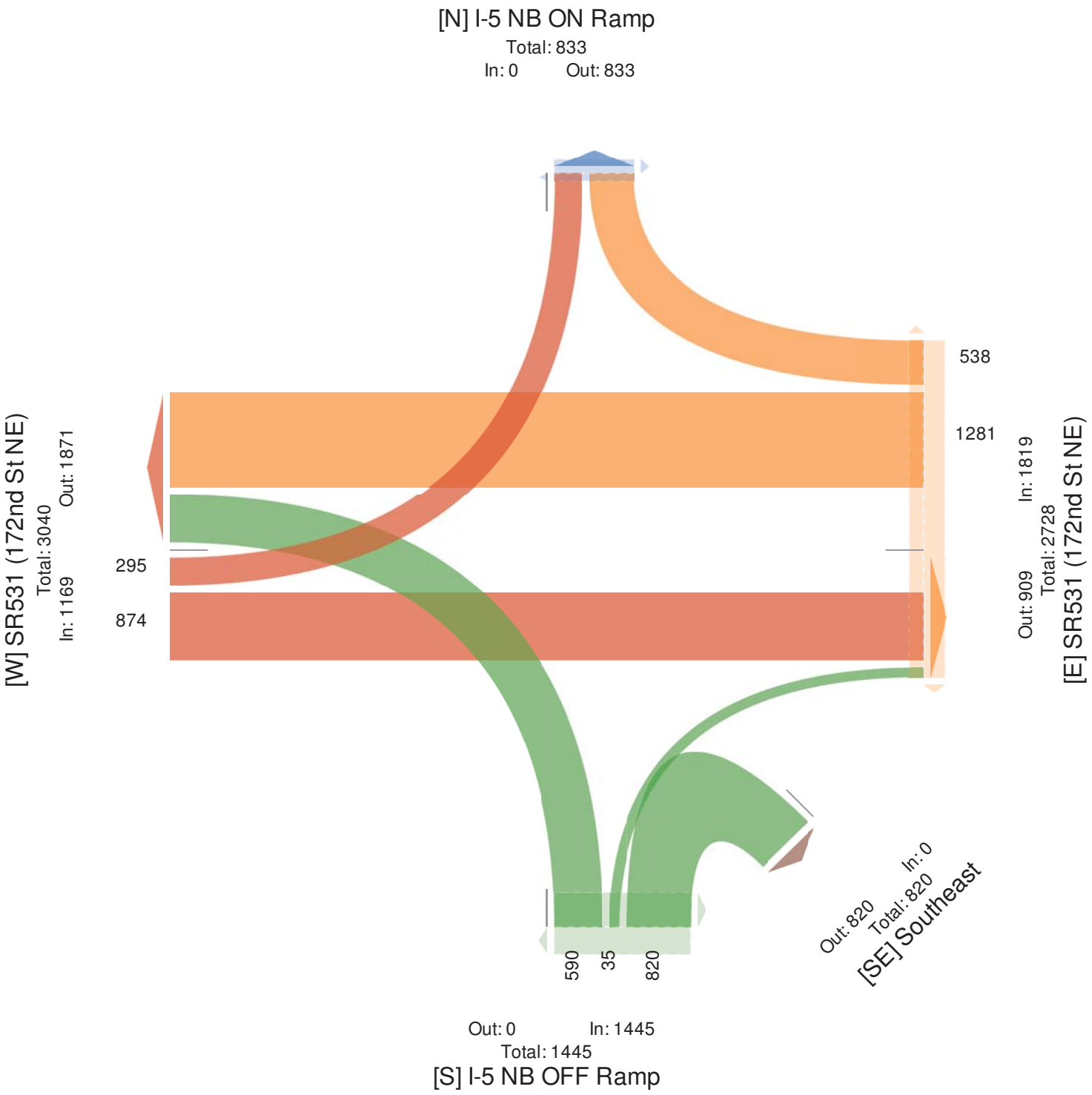
All Movements

ID: 331647, Location: 48.152382, -122.187505, Site Code: 0520608NB0716

Leg	I-5 NB ON Ramp		SR531 (172nd St NE)					I-5 NB OFF Ramp						SR531 (172nd St NE)					
Direction	Southbound		Westbound					Northbound						Eastbound					
Time	**App**	Ped*	T	R	U	**App**	Ped*	L	T	R	HR	**App**	Ped*	L	T	U	**App**	Ped*	**Int**
2016-07-13 4:30PM	**0**	0	292	134	0	**426**	2	140	0	10	194	**344**	2	78	221	0	**299**	0	**1069**
4:45PM	**0**	1	342	132	0	**474**	2	164	0	8	211	**383**	0	75	224	0	**299**	0	**1156**
5:00PM	**0**	2	327	142	0	**469**	1	151	0	12	228	**391**	4	64	212	0	**276**	0	**1136**
5:15PM	**0**	0	320	130	0	**450**	0	135	0	5	187	**327**	3	78	217	0	**295**	0	**1072**
Total	**0**	3	1281	538	0	**1819**	5	590	0	35	820	**1445**	9	295	874	0	**1169**	0	**4433**
% Approach	-	-	70.4%	29.6%	0%	-	-	40.8%	0%	2.4%	56.7%	-	-	25.2%	74.8%	0%	-	-	-
% Total	**0%**	-	28.9%	12.1%	0%	**41.0%**	-	13.3%	0%	0.8%	18.5%	**32.6%**	-	6.7%	19.7%	0%	**26.4%**	-	-
PHF	-	-	0.936	0.947	-	**0.959**	-	0.899	-	0.729	0.899	**0.924**	-	0.946	0.975	-	**0.977**	-	0.959
Motorcycles	**0**	-	18	2	0	**20**	-	4	0	0	4	**8**	-	5	10	0	**15**	-	43
% Motorcycles	-	-	1.4%	0.4%	0%	**1.1%**	-	0.7%	0%	0%	0.5%	**0.6%**	-	1.7%	1.1%	0%	**1.3%**	-	1.0%
Cars	**0**	-	1074	460	0	**1534**	-	492	0	32	659	**1183**	-	239	700	0	**939**	-	3656
% Cars	-	-	83.8%	85.5%	0%	**84.3%**	-	83.4%	0%	91.4%	80.4%	**81.9%**	-	81.0%	80.1%	0%	**80.3%**	-	82.5%
Light Goods Vehicles	**0**	-	170	66	0	**236**	-	89	0	2	134	**225**	-	45	145	0	**190**	-	651
% Light Goods Vehicles	-	-	13.3%	12.3%	0%	**13.0%**	-	15.1%	0%	5.7%	16.3%	**15.6%**	-	15.3%	16.6%	0%	**16.3%**	-	14.7%
Single-Unit Trucks	**0**	-	14	7	0	**21**	-	4	0	0	18	**22**	-	6	14	0	**20**	-	63
% Single-Unit Trucks	-	-	1.1%	1.3%	0%	**1.2%**	-	0.7%	0%	0%	2.2%	**1.5%**	-	2.0%	1.6%	0%	**1.7%**	-	1.4%
Articulated Trucks	**0**	-	3	3	0	**6**	-	0	0	0	3	**3**	-	0	3	0	**3**	-	12
% Articulated Trucks	-	-	0.2%	0.6%	0%	**0.3%**	-	0%	0%	0%	0.4%	**0.2%**	-	0%	0.3%	0%	**0.3%**	-	0.3%
Buses	**0**	-	2	0	0	**2**	-	1	0	1	2	**4**	-	0	1	0	**1**	-	7
% Buses	-	-	0.2%	0%	0%	**0.1%**	-	0.2%	0%	2.9%	0.2%	**0.3%**	-	0%	0.1%	0%	**0.1%**	-	0.2%
Bicycles on Road	**0**	-	0	0	0	**0**	-	0	0	0	0	**0**	-	0	1	0	**1**	-	1
% Bicycles on Road	-	-	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0.1%	0%	**0.1%**	-	0%
Pedestrians		3	-	-	-		5	-	-	-	-		6	-	-	-		0	
% Pedestrians		100%	-	-	-		100%	-	-	-	-		66.7%	-	-	-		-	
Bicycles on Crosswalk		0	-	-	-		0	-	-	-	-		3	-	-	-		0	
% Bicycles on Crosswalk		0%	-	-	-		0%	-	-	-	-		33.3%	-	-	-		-	

*Pedestrians and Bicycles on Crosswalk. HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

I-5mp206.08_SR531NB_Ramps_2016-0713 - TMC
Wed Jul 13, 2016
PM Peak (Jul 13 2016 4:30PM - 5:30PM) - Overall Peak Hour
All Classes (Motorcycles, Cars, Light Goods Vehicles, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 331647, Location: 48.152382, -122.187505, Site Code: 0520608NB0716



SR531mp6.63_Smokey_Point_Blvd_2019-0723 - TMC
Tue Jul 23, 2019
PM Peak (Jul 23 2019 4:45PM - 5:45 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 680546, Location: 48.15245, -122.182971, Site Code: 53100663_0719

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US

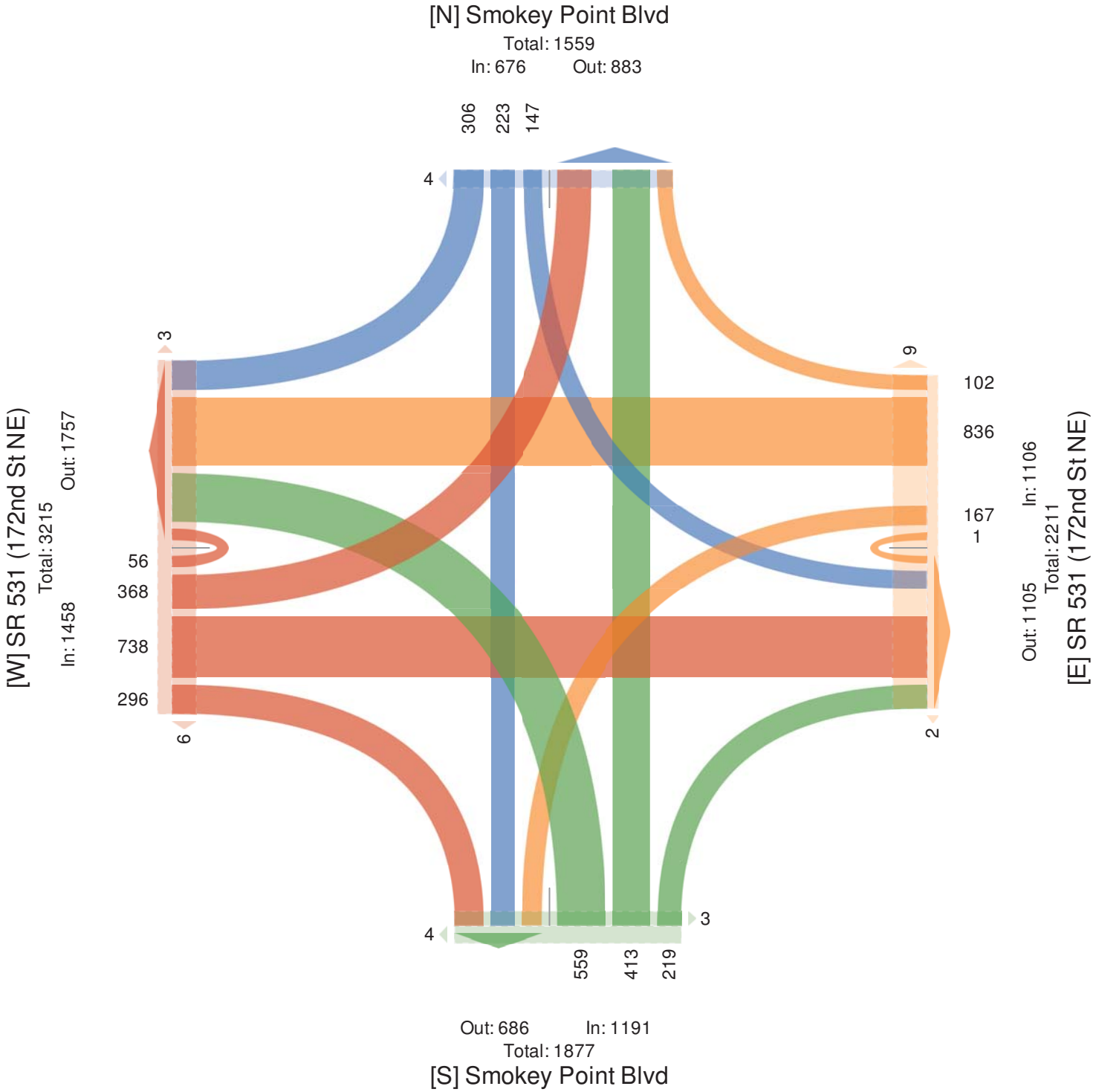
Leg	Smokey Point Blvd						SR 531 (172nd St NE)						Smokey Point Blvd						SR 531 (172nd St NE)						
Direction	Southbound						Westbound						Northbound						Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2019-07-23 4:45PM	74	70	35	0	**179**	1	35	216	53	0	**304**	5	47	95	162	0	**304**	0	83	175	91	13	**362**	0	**1149**
5:00PM	70	50	39	0	**159**	1	26	218	40	0	**284**	1	57	107	136	0	**300**	1	73	186	86	11	**356**	1	**1099**
5:15PM	76	45	29	0	**150**	1	24	225	38	0	**287**	0	48	96	127	0	**271**	3	68	218	104	16	**406**	4	**1114**
5:30PM	86	58	44	0	**188**	1	17	177	36	1	**231**	5	67	115	134	0	**316**	3	72	159	87	16	**334**	4	**1069**
Total	306	223	147	0	**676**	4	102	836	167	1	**1106**	11	219	413	559	0	**1191**	7	296	738	368	56	**1458**	9	**4431**
% Approach	45.3%	33.0%	21.7%	0%	-	-	9.2%	75.6%	15.1%	0.1%	-	-	18.4%	34.7%	46.9%	0%	-	-	20.3%	50.6%	25.2%	3.8%	-	-	-
% Total	6.9%	5.0%	3.3%	0%	**15.3%**	-	2.3%	18.9%	3.8%	0%	**25.0%**	-	4.9%	9.3%	12.6%	0%	**26.9%**	-	6.7%	16.7%	8.3%	1.3%	**32.9%**	-	-
PHF	0.890	0.796	0.835	-	**0.899**	-	0.729	0.929	0.788	0.250	**0.910**	-	0.817	0.898	0.863	-	**0.942**	-	0.892	0.846	0.885	0.875	**0.898**	-	0.964
Motorcycles	0	4	0	0	**4**	-	0	2	1	0	**3**	-	1	5	6	0	**12**	-	3	7	2	0	**12**	-	31
% Motorcycles	0%	1.8%	0%	0%	**0.6%**	-	0%	0.2%	0.6%	0%	**0.3%**	-	0.5%	1.2%	1.1%	0%	**1.0%**	-	1.0%	0.9%	0.5%	0%	**0.8%**	-	0.7%
Lights	297	212	146	0	**655**	-	101	814	162	1	**1078**	-	215	402	544	0	**1161**	-	284	696	356	55	**1391**	-	4285
% Lights	97.1%	95.1%	99.3%	0%	**96.9%**	-	99.0%	97.4%	97.0%	100%	**97.5%**	-	98.2%	97.3%	97.3%	0%	**97.5%**	-	95.9%	94.3%	96.7%	98.2%	**95.4%**	-	96.7%
Single-Unit Trucks	2	3	1	0	**6**	-	1	13	3	0	**17**	-	3	3	4	0	**10**	-	8	25	7	1	**41**	-	74
% Single-Unit Trucks	0.7%	1.3%	0.7%	0%	**0.9%**	-	1.0%	1.6%	1.8%	0%	**1.5%**	-	1.4%	0.7%	0.7%	0%	**0.8%**	-	2.7%	3.4%	1.9%	1.8%	**2.8%**	-	1.7%
Articulated Trucks	1	0	0	0	**1**	-	0	7	1	0	**8**	-	0	0	5	0	**5**	-	1	10	0	0	**11**	-	25
% Articulated Trucks	0.3%	0%	0%	0%	**0.1%**	-	0%	0.8%	0.6%	0%	**0.7%**	-	0%	0%	0.9%	0%	**0.4%**	-	0.3%	1.4%	0%	0%	**0.8%**	-	0.6%
Buses	6	4	0	0	**10**	-	0	0	0	0	**0**	-	0	3	0	0	**3**	-	0	0	3	0	**3**	-	16
% Buses	2.0%	1.8%	0%	0%	**1.5%**	-	0%	0%	0%	0%	**0%**	-	0%	0.7%	0%	0%	**0.3%**	-	0%	0%	0.8%	0%	**0.2%**	-	0.4%
Pedestrians	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Pedestrians	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	3	-	-	-	-	-	10	-	-	-	-	-	6	-	-	-	-	-	9	
% Pedestrians	-	-	-	-	-	75.0%	-	-	-	-	-	90.9%	-	-	-	-	-	85.7%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	25.0%	-	-	-	-	-	9.1%	-	-	-	-	-	14.3%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

SR531mp6.63_Smokey_Point_Blvd_2019-0723 - TMC
Tue Jul 23, 2019
PM Peak (Jul 23 2019 4:45PM - 5:45 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 680546, Location: 48.15245, -122.182971, Site Code: 53100663_0719

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US



SR531mp7.12_43rd_Ave_NE_2019-0710 - TMC
Wed Jul 10, 2019
PM Peak (Jul 10 2019 4PM - 5 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 676657, Location: 48.152292, -122.172292, Site Code: 53100712_0719

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US

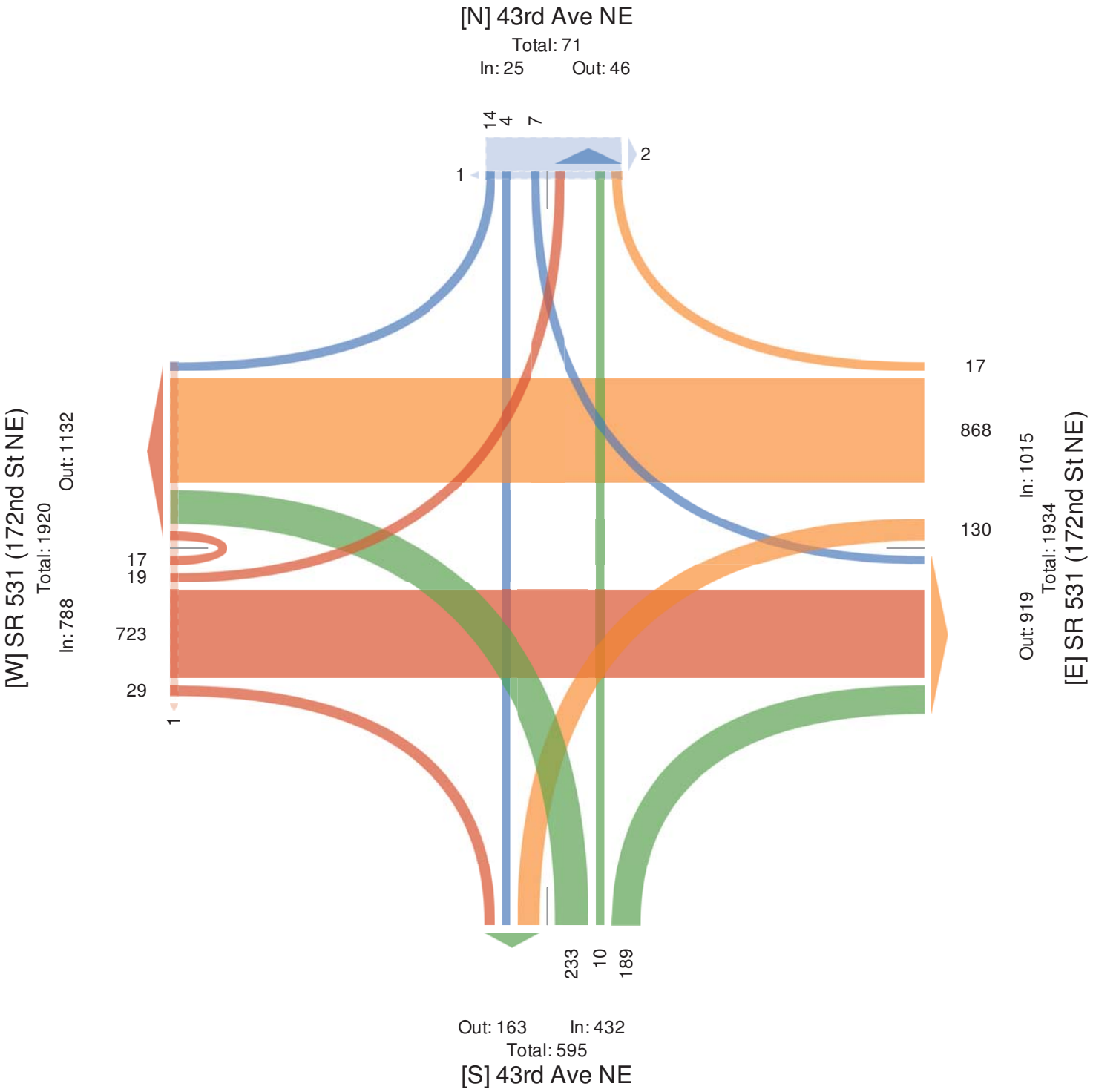
Leg	43rd Ave NE						SR 531 (172nd St NE)						43rd Ave NE						SR 531 (172nd St NE)						
Direction	Southbound						Westbound						Northbound						Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2019-07-10 4:00PM	3	2	3	0	**8**	0	4	216	33	0	**253**	0	52	2	67	0	**121**	0	9	198	3	6	**216**	0	**598**
4:15PM	5	0	1	0	**6**	2	4	208	31	0	**243**	0	54	2	73	0	**129**	0	6	170	6	6	**188**	0	**566**
4:30PM	3	1	0	0	**4**	1	3	229	35	0	**267**	0	48	2	51	0	**101**	0	6	178	3	3	**190**	1	**562**
4:45PM	3	1	3	0	**7**	0	6	215	31	0	**252**	0	35	4	42	0	**81**	0	8	177	7	2	**194**	0	**534**
Total	14	4	7	0	**25**	3	17	868	130	0	**1015**	0	189	10	233	0	**432**	0	29	723	19	17	**788**	1	**2260**
% Approach	56.0%	16.0%	28.0%	0%	**-**	-	1.7%	85.5%	12.8%	0%	**-**	-	43.8%	2.3%	53.9%	0%	**-**	-	3.7%	91.8%	2.4%	2.2%	**-**	-	-
% Total	0.6%	0.2%	0.3%	0%	**1.1%**	-	0.8%	38.4%	5.8%	0%	**44.9%**	-	8.4%	0.4%	10.3%	0%	**19.1%**	-	1.3%	32.0%	0.8%	0.8%	**34.9%**	-	-
PHF	0.700	0.500	0.583		**- 0.781**	-	0.708	0.947	0.929		**- 0.949**	-	0.875	0.625	0.798		**- 0.837**	-	0.806	0.913	0.679	0.708	**0.912**	-	0.944
Motorcycles	0	0	0	0	**0**	-	0	0	1	0	**1**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	2
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0%	0.8%	0%	**0.1%**	-	0%	10.0%	0%	0%	**0.2%**	-	0%	0%	0%	0%	**0%**	-	0.1%
Lights	14	4	7	0	**25**	-	16	847	128	0	**991**	-	188	9	232	0	**429**	-	27	688	19	17	**751**	-	2196
% Lights	100%	100%	100%	0%	**100%**	-	94.1%	97.6%	98.5%	0%	**97.6%**	-	99.5%	90.0%	99.6%	0%	**99.3%**	-	93.1%	95.2%	100%	100%	**95.3%**	-	97.2%
Single-Unit Trucks	0	0	0	0	**0**	-	1	12	1	0	**14**	-	0	0	1	0	**1**	-	2	23	0	0	**25**	-	40
% Single-Unit Trucks	0%	0%	0%	0%	**0%**	-	5.9%	1.4%	0.8%	0%	**1.4%**	-	0%	0%	0.4%	0%	**0.2%**	-	6.9%	3.2%	0%	0%	**3.2%**	-	1.8%
Articulated Trucks	0	0	0	0	**0**	-	0	6	0	0	**6**	-	0	0	0	0	**0**	-	0	12	0	0	**12**	-	18
% Articulated Trucks	0%	0%	0%	0%	**0%**	-	0%	0.7%	0%	0%	**0.6%**	-	0%	0%	0%	0%	**0%**	-	0%	1.7%	0%	0%	**1.5%**	-	0.8%
Buses	0	0	0	0	**0**	-	0	2	0	0	**2**	-	1	0	0	0	**1**	-	0	0	0	0	**0**	-	3
% Buses	0%	0%	0%	0%	**0%**	-	0%	0.2%	0%	0%	**0.2%**	-	0.5%	0%	0%	0%	**0.2%**	-	0%	0%	0%	0%	**0%**	-	0.1%
Bicycles on Road	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	1
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0.1%	0%	0%	**0.1%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

SR531mp7.12_43rd_Ave_NE_2019-0710 - TMC
Wed Jul 10, 2019
PM Peak (Jul 10 2019 4PM - 5 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 676657, Location: 48.152292, -122.172292, Site Code: 53100712_0719

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US



SR531mp7.62_51st_Ave_NE_2019-0710 - TMC
Wed Jul 10, 2019
PM Peak (Jul 10 2019 4PM - 5 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 676655, Location: 48.152117, -122.161569, Site Code: 53100762_0719

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US

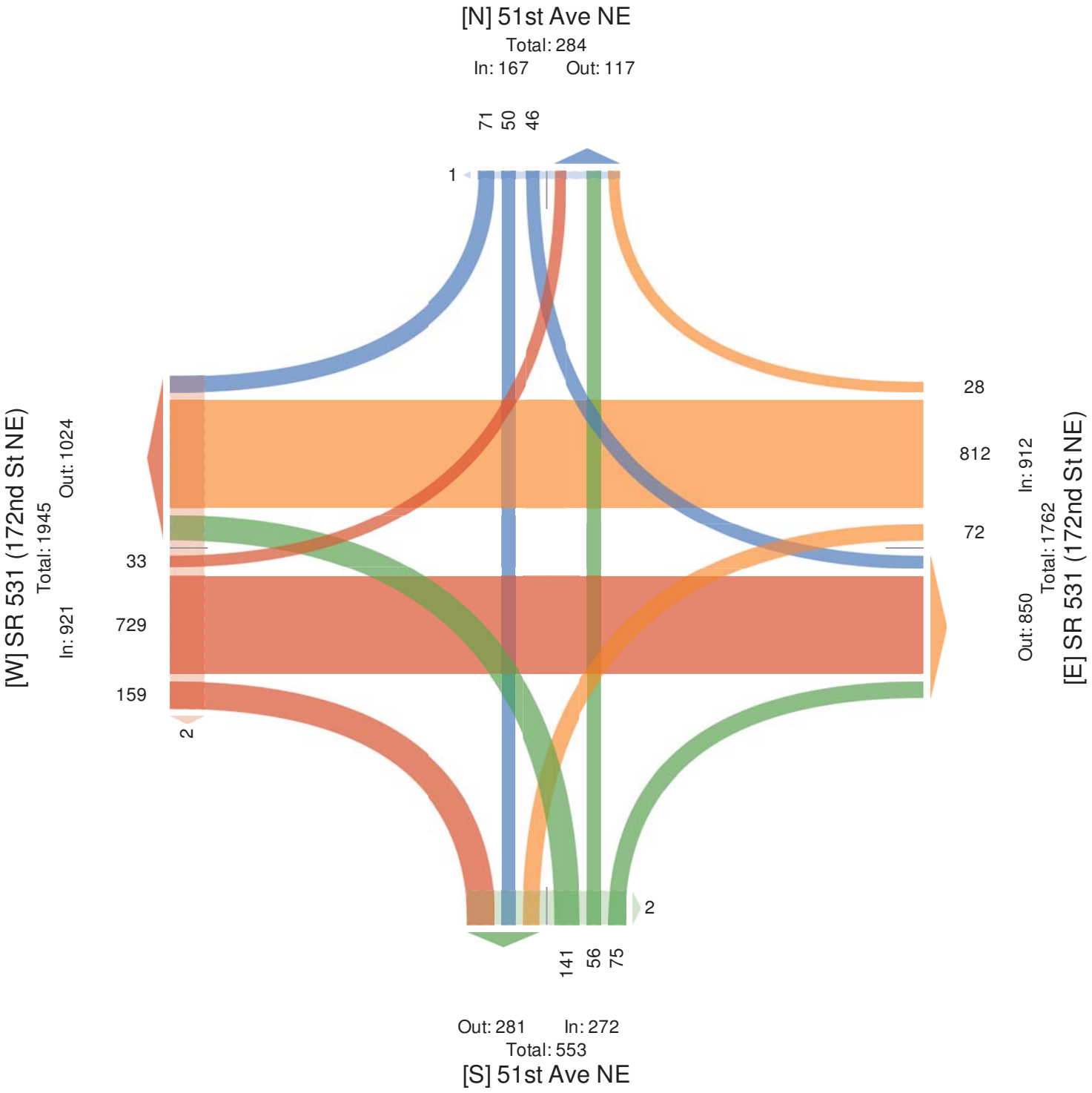
Leg	51st Ave NE						SR 531 (172nd St NE)						51st Ave NE						SR 531 (172nd St NE)						
Direction	Southbound						Westbound						Northbound						Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2019-07-10 4:00PM	15	8	5	0	**28**	0	12	207	11	0	**230**	0	22	10	39	0	**71**	0	37	192	11	0	**240**	0	**569**
4:15PM	14	15	3	0	**32**	0	6	200	21	0	**227**	0	11	15	40	0	**66**	2	40	175	5	0	**220**	2	**545**
4:30PM	27	16	27	0	**70**	1	7	206	21	0	**234**	0	20	19	24	0	**63**	0	39	175	13	0	**227**	0	**594**
4:45PM	15	11	11	0	**37**	0	3	199	19	0	**221**	0	22	12	38	0	**72**	0	43	187	4	0	**234**	0	**564**
Total	71	50	46	0	**167**	1	28	812	72	0	**912**	0	75	56	141	0	**272**	2	159	729	33	0	**921**	2	**2272**
% Approach	42.5%	29.9%	27.5%	0%	**-**	-	3.1%	89.0%	7.9%	0%	**-**	-	27.6%	20.6%	51.8%	0%	**-**	-	17.3%	79.2%	3.6%	0%	**-**	-	-
% Total	3.1%	2.2%	2.0%	0%	**7.4%**	-	1.2%	35.7%	3.2%	0%	**40.1%**	-	3.3%	2.5%	6.2%	0%	**12.0%**	-	7.0%	32.1%	1.5%	0%	**40.5%**	-	-
PHF	0.657	0.781	0.426	-	**0.596**	-	0.583	0.981	0.857	-	**0.974**	-	0.852	0.737	0.881	-	**0.944**	-	0.924	0.949	0.635	-	**0.959**	-	0.956
Motorcycles	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	2
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0.1%	0%	0%	**0.1%**	-	0%	1.8%	0%	0%	**0.4%**	-	0%	0%	0%	0%	**0%**	-	0.1%
Lights	70	48	45	0	**163**	-	27	794	68	0	**889**	-	69	55	136	0	**260**	-	155	696	33	0	**884**	-	2196
% Lights	98.6%	96.0%	97.8%	0%	**97.6%**	-	96.4%	97.8%	94.4%	0%	**97.5%**	-	92.0%	98.2%	96.5%	0%	**95.6%**	-	97.5%	95.5%	100%	0%	**96.0%**	-	96.7%
Single-Unit Trucks	0	2	1	0	**3**	-	0	13	4	0	**17**	-	5	0	4	0	**9**	-	2	21	0	0	**23**	-	52
% Single-Unit Trucks	0%	4.0%	2.2%	0%	**1.8%**	-	0%	1.6%	5.6%	0%	**1.9%**	-	6.7%	0%	2.8%	0%	**3.3%**	-	1.3%	2.9%	0%	0%	**2.5%**	-	2.3%
Articulated Trucks	1	0	0	0	**1**	-	1	4	0	0	**5**	-	1	0	1	0	**2**	-	0	12	0	0	**12**	-	20
% Articulated Trucks	1.4%	0%	0%	0%	**0.6%**	-	3.6%	0.5%	0%	0%	**0.5%**	-	1.3%	0%	0.7%	0%	**0.7%**	-	0%	1.6%	0%	0%	**1.3%**	-	0.9%
Buses	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	2	0	0	0	**2**	-	2
% Buses	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	1.3%	0%	0%	0%	**0.2%**	-	0.1%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	2	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

SR531mp7.62_51st_Ave_NE_2019-0710 - TMC
Wed Jul 10, 2019
PM Peak (Jul 10 2019 4PM - 5 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 676655, Location: 48.152117, -122.161569, Site Code: 53100762_0719

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US



SR531mp8.12_59th_Ave_NE_2019-0710 - TMC
Wed Jul 10, 2019
PM Peak (Jul 10 2019 4PM - 5 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 676656, Location: 48.152048, -122.150767, Site Code: 53100812_0719

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US

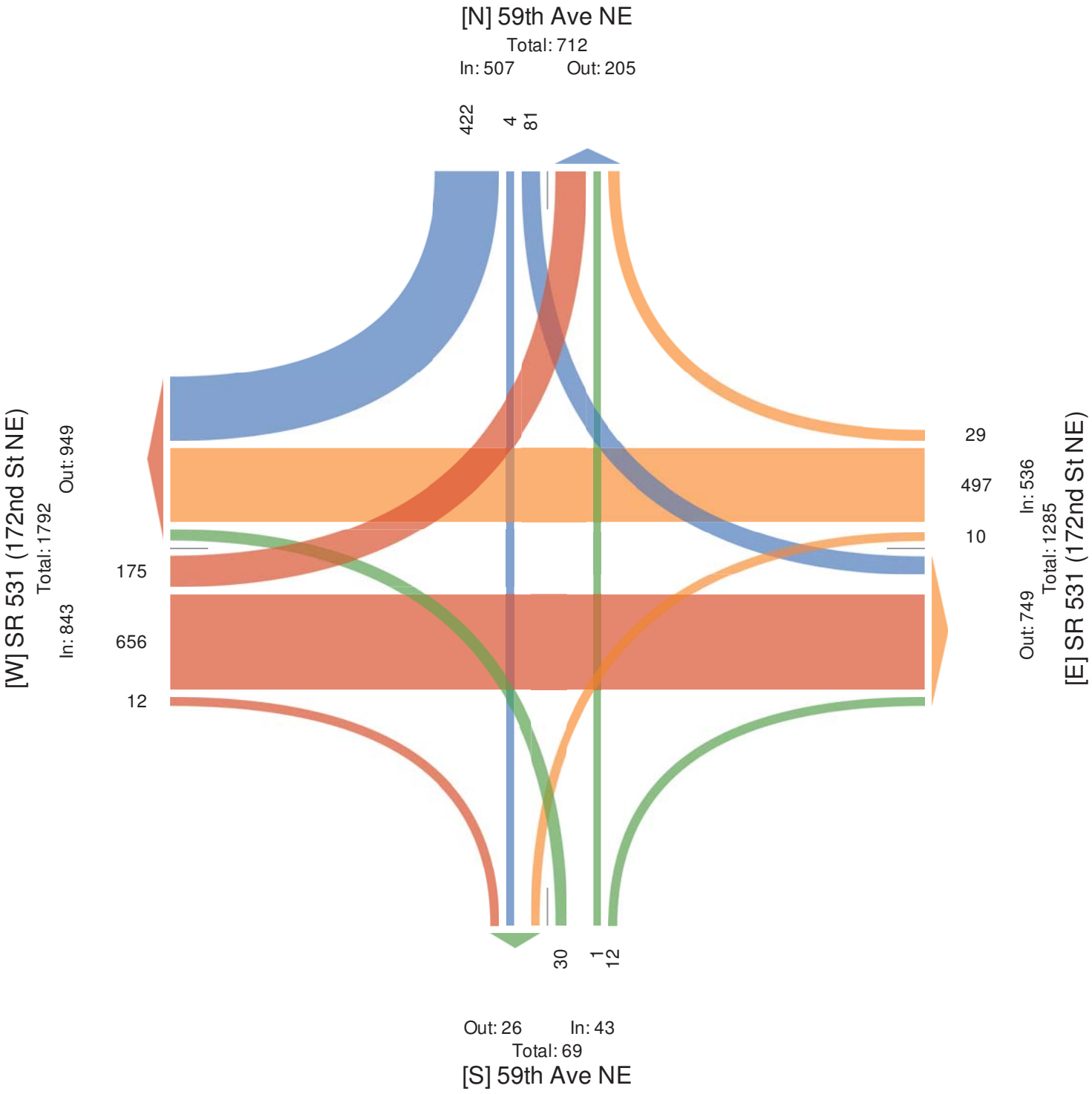
Leg	59th Ave NE						SR 531 (172nd St NE)						59th Ave NE						SR 531 (172nd St NE)						
Direction	Southbound						Westbound						Northbound						Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2019-07-10 4:00PM	122	2	21	0	**145**	0	10	125	1	0	**136**	0	4	1	12	0	**17**	0	4	168	42	0	**214**	0	**512**
4:15PM	89	0	17	0	**106**	0	7	118	3	0	**128**	0	3	0	6	0	**9**	0	2	160	38	0	**200**	0	**443**
4:30PM	143	2	34	0	**179**	0	5	121	3	0	**129**	0	3	0	7	0	**10**	0	1	166	40	0	**207**	0	**525**
4:45PM	68	0	9	0	**77**	0	7	133	3	0	**143**	0	2	0	5	0	**7**	0	5	162	55	0	**222**	0	**449**
Total	422	4	81	0	**507**	0	29	497	10	0	**536**	0	12	1	30	0	**43**	0	12	656	175	0	**843**	0	**1929**
% Approach	83.2%	0.8%	16.0%	0%	-	-	5.4%	92.7%	1.9%	0%	-	-	27.9%	2.3%	69.8%	0%	-	-	1.4%	77.8%	20.8%	0%	-	-	-
% Total	21.9%	0.2%	4.2%	0%	**26.3%**	-	1.5%	25.8%	0.5%	0%	**27.8%**	-	0.6%	0.1%	1.6%	0%	**2.2%**	-	0.6%	34.0%	9.1%	0%	**43.7%**	-	-
PHF	0.738	0.500	0.596	-	**0.708**	-	0.725	0.934	0.833	-	**0.937**	-	0.750	0.250	0.625	-	**0.632**	-	0.600	0.976	0.795	-	**0.949**	-	0.919
Motorcycles	0	0	0	0	**0**	-	0	2	0	0	**2**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	2
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0.4%	0%	0%	**0.4%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.1%
Lights	418	3	81	0	**502**	-	25	479	8	0	**512**	-	10	1	29	0	**40**	-	6	641	159	0	**806**	-	1860
% Lights	99.1%	75.0%	100%	0%	**99.0%**	-	86.2%	96.4%	80.0%	0%	**95.5%**	-	83.3%	100%	96.7%	0%	**93.0%**	-	50.0%	97.7%	90.9%	0%	**95.6%**	-	96.4%
Single-Unit Trucks	1	1	0	0	**2**	-	3	12	2	0	**17**	-	2	0	1	0	**3**	-	5	11	11	0	**27**	-	49
% Single-Unit Trucks	0.2%	25.0%	0%	0%	**0.4%**	-	10.3%	2.4%	20.0%	0%	**3.2%**	-	16.7%	0%	3.3%	0%	**7.0%**	-	41.7%	1.7%	6.3%	0%	**3.2%**	-	2.5%
Articulated Trucks	3	0	0	0	**3**	-	0	3	0	0	**3**	-	0	0	0	0	**0**	-	1	4	5	0	**10**	-	16
% Articulated Trucks	0.7%	0%	0%	0%	**0.6%**	-	0%	0.6%	0%	0%	**0.6%**	-	0%	0%	0%	0%	**0%**	-	8.3%	0.6%	2.9%	0%	**1.2%**	-	0.8%
Buses	0	0	0	0	**0**	-	1	1	0	0	**2**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	2
% Buses	0%	0%	0%	0%	**0%**	-	3.4%	0.2%	0%	0%	**0.4%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.1%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

SR531mp8.12_59th_Ave_NE_2019-0710 - TMC
Wed Jul 10, 2019
PM Peak (Jul 10 2019 4PM - 5 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 676656, Location: 48.152048, -122.150767, Site Code: 53100812_0719

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US



SR531mp8.59_67th_Ave_NE_2019-0710 - TMC
Wed Jul 10, 2019
PM Peak (Jul 10 2019 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Trains, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 676658, Location: 48.151907, -122.14059, Site Code: 53100859-0719

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US

Leg	67th Ave NE						SR 531 (172nd St NE)						67th Ave NE					
Direction	Southbound						Westbound						Northbound					
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*
2019-07-10 4:30PM	36	56	37	0	**129**	0	13	70	13	0	**96**	0	17	50	13	0	**80**	0
4:45PM	31	40	14	0	**85**	0	14	88	10	0	**112**	1	29	35	16	0	**80**	0
5:00PM	41	62	31	0	**134**	0	10	75	13	0	**98**	0	15	42	10	0	**67**	0
5:15PM	32	48	16	0	**96**	0	8	83	9	0	**100**	0	19	50	13	0	**82**	0
Total	140	206	98	0	**444**	0	45	316	45	0	**406**	1	80	177	52	0	**309**	0
% Approach	31.5%	46.4%	22.1%	0%	-	-	11.1%	77.8%	11.1%	0%	-	-	25.9%	57.3%	16.8%	0%	-	-
% Total	7.2%	10.6%	5.1%	0%	**22.9%**	-	2.3%	16.3%	2.3%	0%	**20.9%**	-	4.1%	9.1%	2.7%	0%	**15.9%**	-
PHF	0.854	0.831	0.662	-	**0.828**	-	0.804	0.898	0.865	-	**0.906**	-	0.690	0.880	0.813	-	**0.939**	-
Motorcycles	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0.3%	0%	0%	**0.2%**	-	0%	0%	0%	0%	**0%**	-
Lights	139	204	96	0	**439**	-	37	299	43	0	**379**	-	77	173	50	0	**300**	-
% Lights	99.3%	99.0%	98.0%	0%	**98.9%**	-	82.2%	94.6%	95.6%	0%	**93.3%**	-	96.3%	97.7%	96.2%	0%	**97.1%**	-
Single-Unit Trucks	1	1	2	0	**4**	-	6	13	1	0	**20**	-	3	2	1	0	**6**	-
% Single-Unit Trucks	0.7%	0.5%	2.0%	0%	**0.9%**	-	13.3%	4.1%	2.2%	0%	**4.9%**	-	3.8%	1.1%	1.9%	0%	**1.9%**	-
Articulated Trucks	0	1	0	0	**1**	-	2	2	0	0	**4**	-	0	1	0	0	**1**	-
% Articulated Trucks	0%	0.5%	0%	0%	**0.2%**	-	4.4%	0.6%	0%	0%	**1.0%**	-	0%	0.6%	0%	0%	**0.3%**	-
Buses	0	0	0	0	**0**	-	0	1	1	0	**2**	-	0	0	1	0	**1**	-
% Buses	0%	0%	0%	0%	**0%**	-	0%	0.3%	2.2%	0%	**0.5%**	-	0%	0%	1.9%	0%	**0.3%**	-
Trains	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-
% Trains	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	1	0	0	**1**	-
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0.6%	0%	0%	**0.3%**	-
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

SR531mp8.59_67th_Ave_NE_2019-0710 - TMC
Wed Jul 10, 2019
PM Peak (Jul 10 2019 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Trains, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 676658, Location: 48.151907, -122.14059, Site Code: 53100859-0719

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US

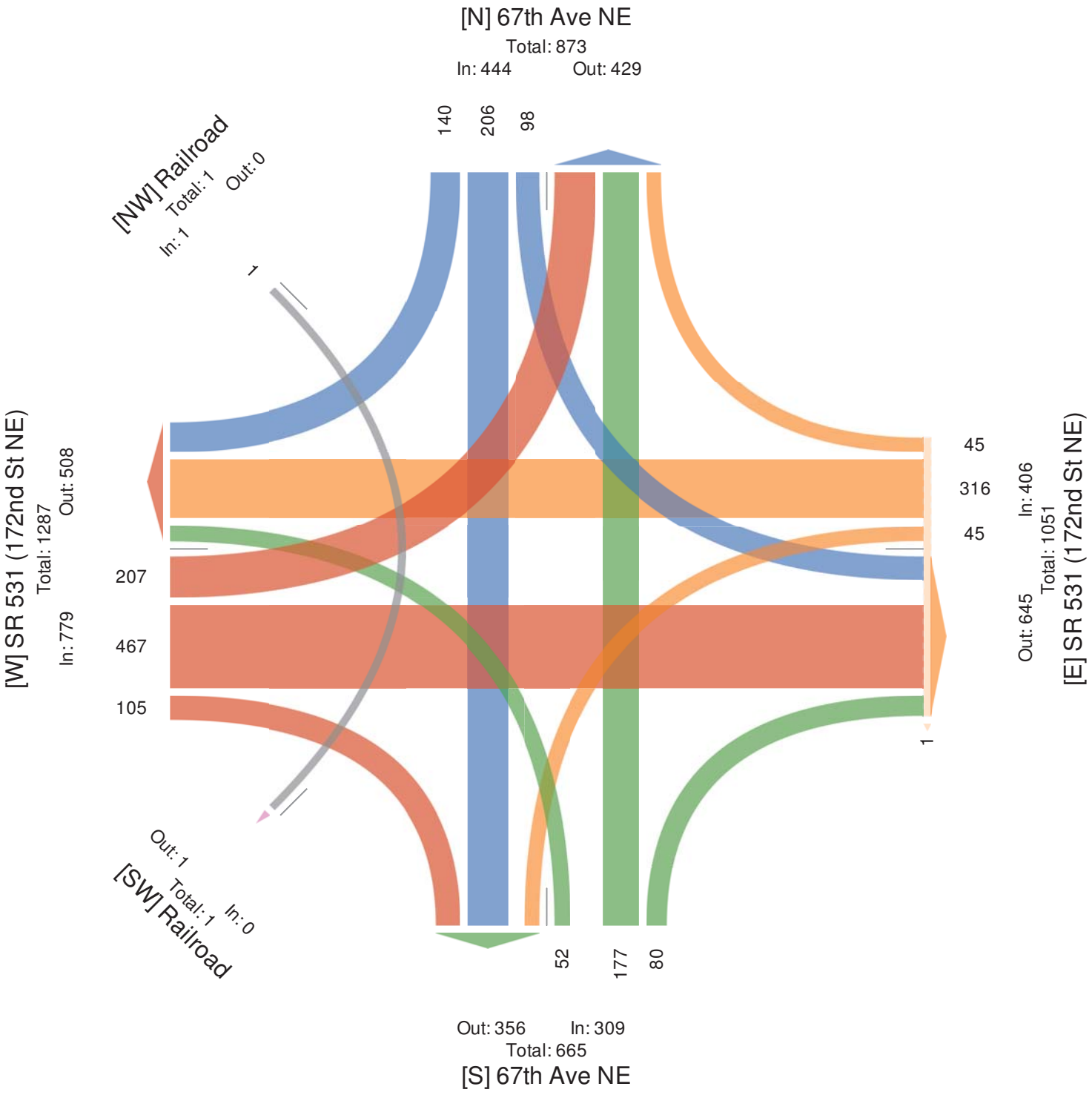
Leg	Railroad			SR 531 (172nd St NE)						Railroad			
Direction	Northeastbound			Eastbound						Southeastbound			
Time	L	App	Ped*	R	T	L	U	App	Ped*	R	App	Ped*	Int
2019-07-10 4:30PM	0	**0**	-	32	109	46	0	**187**	0	0	**0**	-	**492**
4:45PM	0	**0**	-	29	123	44	0	**196**	0	0	**0**	-	**473**
5:00PM	0	**0**	-	24	103	50	0	**177**	0	1	**1**	-	**477**
5:15PM	0	**0**	-	20	132	67	0	**219**	0	0	**0**	-	**497**
Total	0	**0**	-	105	467	207	0	**779**	0	1	**1**	-	**1939**
% Approach	0%	-	-	13.5%	59.9%	26.6%	0%	-	-	100%	-	-	-
% Total	0%	**0%**	-	5.4%	24.1%	10.7%	0%	**40.2%**	-	0.1%	**0.1%**	-	-
PHF	-	-	-	0.820	0.884	0.772	-	**0.889**	-	0.250	**0.250**	-	0.975
Motorcycles	0	**0**	-	1	1	0	0	**2**	-	0	**0**	-	3
% Motorcycles	0%	-	-	1.0%	0.2%	0%	0%	**0.3%**	-	0%	**0%**	-	0.2%
Lights	0	**0**	-	104	463	200	0	**767**	-	0	**0**	-	1885
% Lights	0%	-	-	99.0%	99.1%	96.6%	0%	**98.5%**	-	0%	**0%**	-	97.2%
Single-Unit Trucks	0	**0**	-	0	2	4	0	**6**	-	0	**0**	-	36
% Single-Unit Trucks	0%	-	-	0%	0.4%	1.9%	0%	**0.8%**	-	0%	**0%**	-	1.9%
Articulated Trucks	0	**0**	-	0	1	3	0	**4**	-	0	**0**	-	10
% Articulated Trucks	0%	-	-	0%	0.2%	1.4%	0%	**0.5%**	-	0%	**0%**	-	0.5%
Buses	0	**0**	-	0	0	0	0	**0**	-	0	**0**	-	3
% Buses	0%	-	-	0%	0%	0%	0%	**0%**	-	0%	**0%**	-	0.2%
Trains	0	**0**	-	0	0	0	0	**0**	-	1	**1**	-	1
% Trains	0%	-	-	0%	0%	0%	0%	**0%**	-	100%	**100%**	-	0.1%
Bicycles on Road	0	**0**	-	0	0	0	0	**0**	-	0	**0**	-	1
% Bicycles on Road	0%	-	-	0%	0%	0%	0%	**0%**	-	0%	**0%**	-	0.1%
Pedestrians	-	-	0	-	-	-	-	-	0	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	0	-	-	-	-	-	0	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

SR531mp8.59_67th_Ave_NE_2019-0710 - TMC
Wed Jul 10, 2019
PM Peak (Jul 10 2019 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Trains, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 676658, Location: 48.151907, -122.14059, Site Code: 53100859-0719

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US



SR009mp26.05_SR531-172nd_St_NE_RAB_2019-0305 - TMC
Tue Mar 5, 2019
PM Peak (Mar 05 2019 3:45PM - 4:45 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 645135, Location: 48.151649, -122.113259, Site Code: 00902605_0319

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US

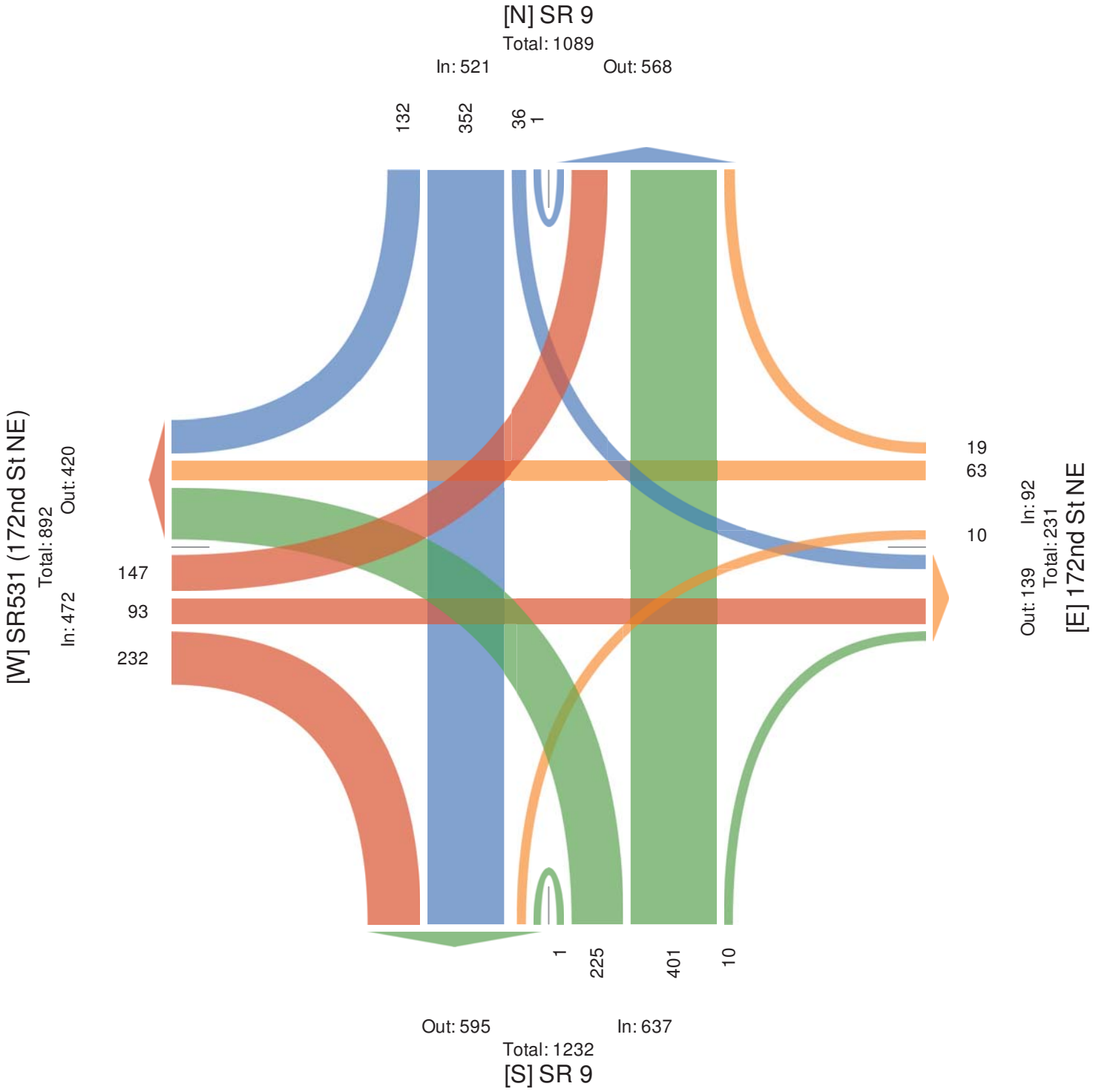
Leg	SR 9						172nd St NE						SR 9						SR531 (172nd St NE)						
Direction	Southbound						Westbound						Northbound						Eastbound						
Time	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	R	T	L	U	**App**	Ped*	**Int**
2019-03-05 3:45PM	47	78	11	0	**136**	0	4	17	1	0	**22**	0	6	116	45	0	**167**	0	46	26	39	0	**111**	0	**436**
4:00PM	23	83	15	0	**121**	0	5	17	4	0	**26**	0	1	96	56	0	**153**	0	57	22	31	0	**110**	0	**410**
4:15PM	29	99	6	1	**135**	0	5	13	5	0	**23**	0	1	98	69	1	**169**	0	67	24	38	0	**129**	0	**456**
4:30PM	33	92	4	0	**129**	0	5	16	0	0	**21**	0	2	91	55	0	**148**	0	62	21	39	0	**122**	0	**420**
Total	132	352	36	1	**521**	0	19	63	10	0	**92**	0	10	401	225	1	**637**	0	232	93	147	0	**472**	0	**1722**
% Approach	25.3%	67.6%	6.9%	0.2%	-	-	20.7%	68.5%	10.9%	0%	-	-	1.6%	63.0%	35.3%	0.2%	-	-	49.2%	19.7%	31.1%	0%	-	-	-
% Total	7.7%	20.4%	2.1%	0.1%	**30.3%**	-	1.1%	3.7%	0.6%	0%	**5.3%**	-	0.6%	23.3%	13.1%	0.1%	**37.0%**	-	13.5%	5.4%	8.5%	0%	**27.4%**	-	-
PHF	0.702	0.889	0.600	0.250	**0.958**	-	0.950	0.926	0.500	-	**0.885**	-	0.417	0.864	0.815	0.250	**0.942**	-	0.866	0.894	0.942	-	**0.915**	-	0.944
Motorcycles	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	1
% Motorcycles	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0.2%	0%	0%	**0.2%**	-	0%	0%	0%	0%	**0%**	-	0.1%
Lights	125	345	35	0	**505**	-	19	63	9	0	**91**	-	10	393	207	0	**610**	-	221	91	145	0	**457**	-	1663
% Lights	94.7%	98.0%	97.2%	0%	**96.9%**	-	100%	100%	90.0%	0%	**98.9%**	-	100%	98.0%	92.0%	0%	**95.8%**	-	95.3%	97.8%	98.6%	0%	**96.8%**	-	96.6%
Single-Unit Trucks	1	3	0	0	**4**	-	0	0	0	0	**0**	-	0	5	13	1	**19**	-	7	2	1	0	**10**	-	33
% Single-Unit Trucks	0.8%	0.9%	0%	0%	**0.8%**	-	0%	0%	0%	0%	**0%**	-	0%	1.2%	5.8%	100%	**3.0%**	-	3.0%	2.2%	0.7%	0%	**2.1%**	-	1.9%
Articulated Trucks	0	1	0	0	**1**	-	0	0	0	0	**0**	-	0	1	1	0	**2**	-	3	0	0	0	**3**	-	6
% Articulated Trucks	0%	0.3%	0%	0%	**0.2%**	-	0%	0%	0%	0%	**0%**	-	0%	0.2%	0.4%	0%	**0.3%**	-	1.3%	0%	0%	0%	**0.6%**	-	0.3%
Buses	6	3	1	1	**11**	-	0	0	1	0	**1**	-	0	1	4	0	**5**	-	1	0	1	0	**2**	-	19
% Buses	4.5%	0.9%	2.8%	100%	**2.1%**	-	0%	0%	10.0%	0%	**1.1%**	-	0%	0.2%	1.8%	0%	**0.8%**	-	0.4%	0%	0.7%	0%	**0.4%**	-	1.1%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

SR009mp26.05_SR531-172nd_St_NE_RAB_2019-0305 - TMC
Tue Mar 5, 2019
PM Peak (Mar 05 2019 3:45PM - 4:45 PM) - Overall Peak Hour
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 645135, Location: 48.151649, -122.113259, Site Code: 00902605_0319

WASHINGTON STATE DEPT. OF TRANSPORTATION
Northwest Region - Traffic Studies

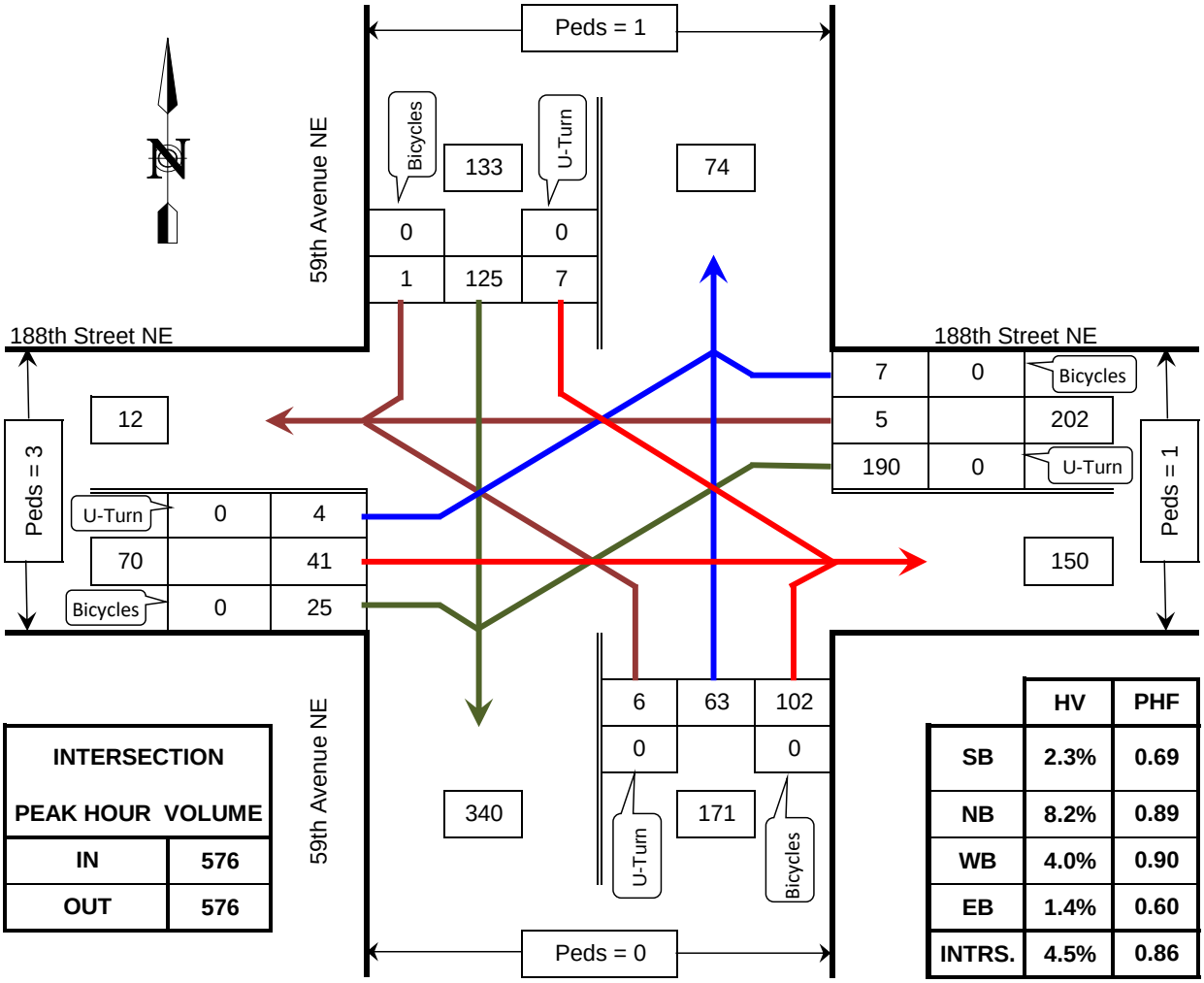
Provided by: Washington State DOT
15700 Dayton Ave North, MS-120, P.O. Box 330310,
Seattle, WA, 98133, US



TRAFFIC DATA GATHERING

TURNING MOVEMENTS DIAGRAM

4:00 PM - 6:00 PM PEAK HOUR: 4:00 PM TO 5:00 PM



INTERSECTION PEAK HOUR VOLUME	
IN	576
OUT	576

	HV	PHF
SB	2.3%	0.69
NB	8.2%	0.89
WB	4.0%	0.90
EB	1.4%	0.60
INTRS.	4.5%	0.86

PHF = Peak Hour Factor
HV = Heavy Vehicle

59th Avenue NE @ 188th Street NE

Arlington, WA

COUNTED BY: TDG

DATE OF COUNT: Tue. 5/7/19

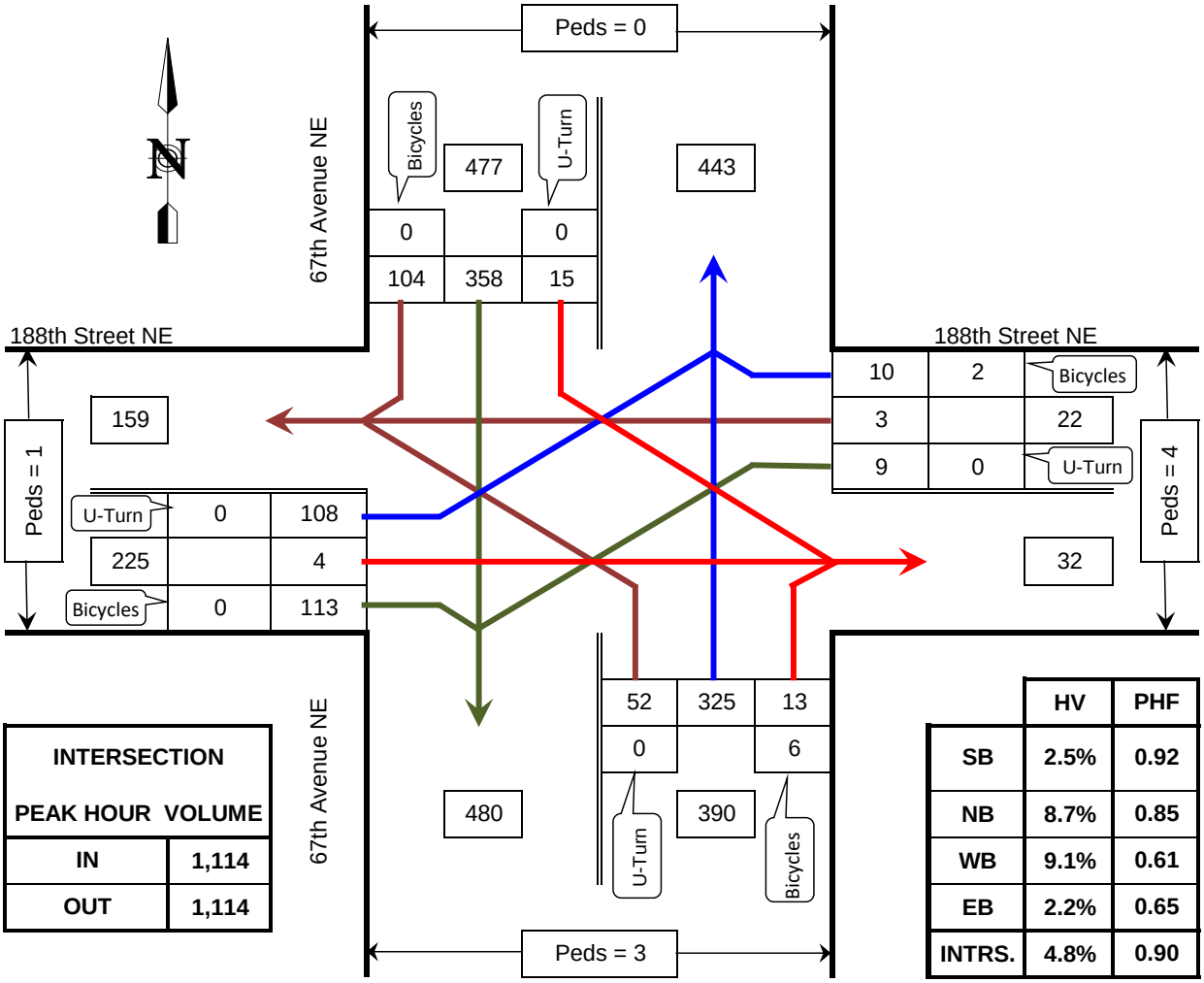
REDUCTION DATE: Wed. 5/8/19

TIME OF COUNT: 4:00 PM - 6:00 PM

TRAFFIC DATA GATHERING

TURNING MOVEMENTS DIAGRAM

4:00 PM - 6:00 PM PEAK HOUR: 4:00 PM TO 5:00 PM



INTERSECTION PEAK HOUR VOLUME	
IN	1,114
OUT	1,114

	HV	PHF
SB	2.5%	0.92
NB	8.7%	0.85
WB	9.1%	0.61
EB	2.2%	0.65
INTRS.	4.8%	0.90

PHF = Peak Hour Factor
HV = Heavy Vehicle

67th Avenue NE @ 188th Street NE

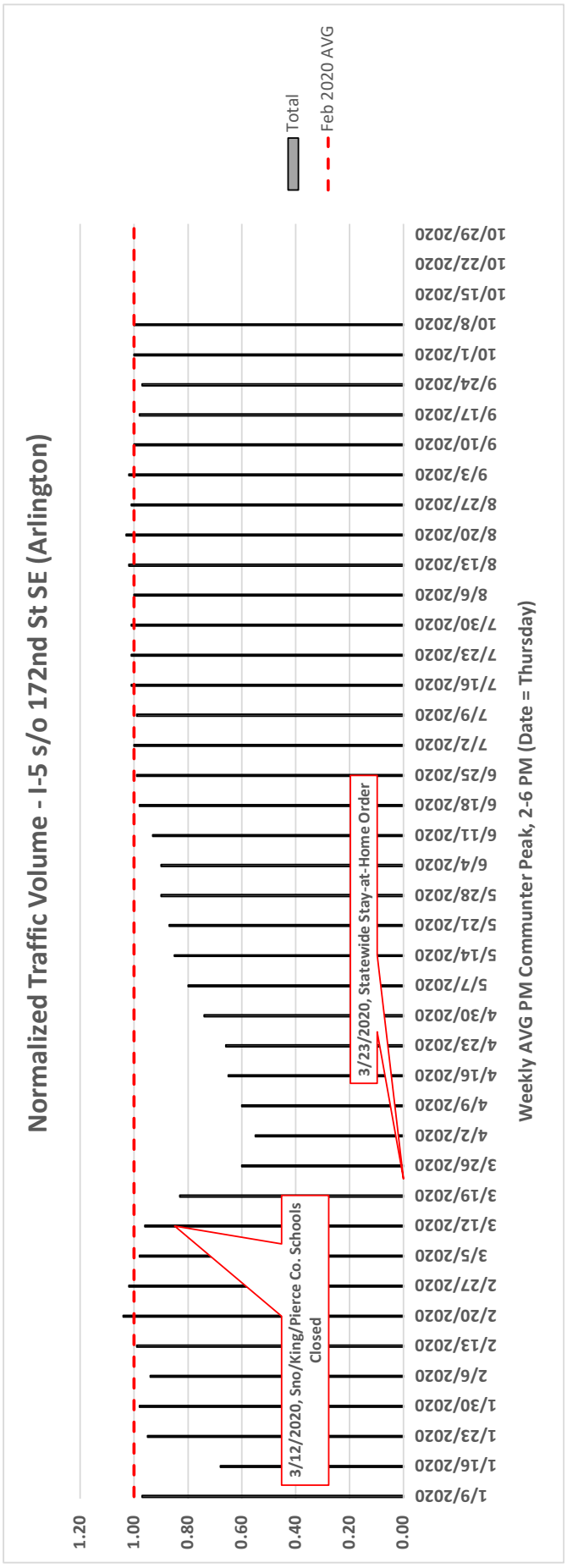
Arlington, WA

COUNTED BY: TDG

DATE OF COUNT: Tue. 5/7/19

REDUCTION DATE: Wed. 5/8/19

TIME OF COUNT: 4:00 PM - 6:00 PM


Normalized Traffic Volume - I-5 s/o 172nd St SE (Arlington)
Total
Feb 2020 AVG
1.20
1.00
0.80
0.60
0.40
0.20
0.00
3/12/2020, Sno/King/Pierce Co. Schools Closed
3/23/2020, Statewide Stay-at-Home Order
1/9/2020
1/16/2020
1/23/2020
1/30/2020
2/6/2020
2/13/2020
2/20/2020
2/27/2020
3/5/2020
3/12/2020
3/19/2020
3/26/2020
4/2/2020
4/9/2020
4/16/2020
4/23/2020
4/30/2020
5/7/2020
5/14/2020
5/21/2020
5/28/2020
6/4/2020
6/11/2020
6/18/2020
6/25/2020
7/2/2020
7/9/2020
7/16/2020
7/23/2020
7/30/2020
8/6/2020
8/13/2020
8/20/2020
8/27/2020
9/3/2020
9/10/2020
9/17/2020
9/24/2020
10/1/2020
10/8/2020
10/15/2020
10/22/2020
10/29/2020
Weekly AVG PM Commuter Peak, 2-6 PM (Date = Thursday)

2030 Opening Year Turning Movement Calculations

2030 Future Year

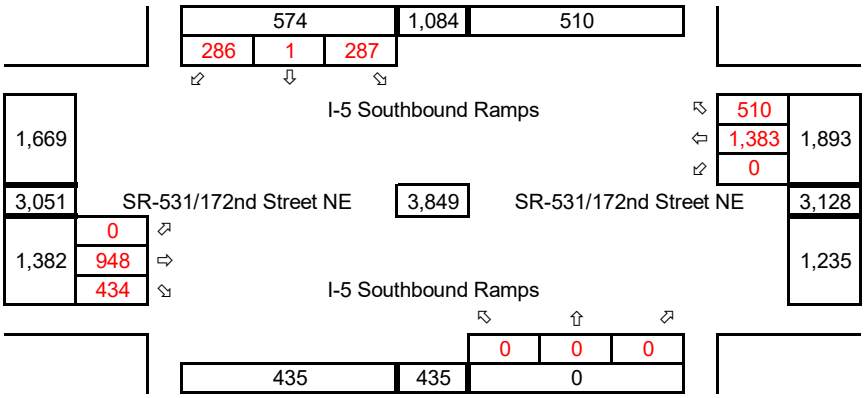
1 172nd St NE at I-5 SB Ramps

Synchro ID: 1

Existing
Average Weekday
PM Peak Hour

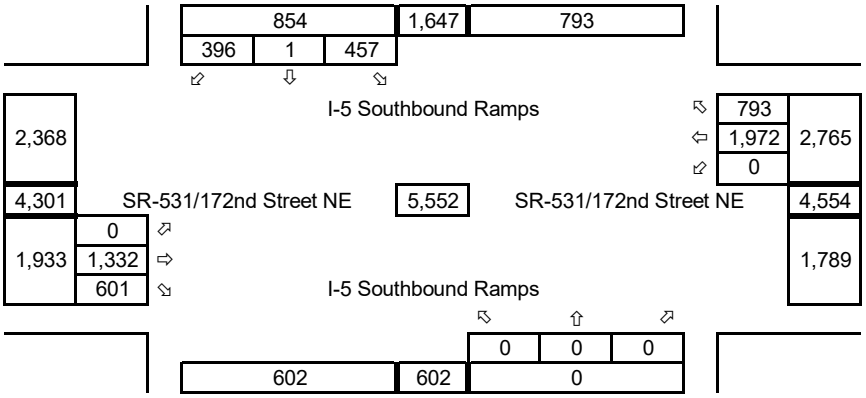
Year: **4/9/2019**

Data Source: **WSDOT**

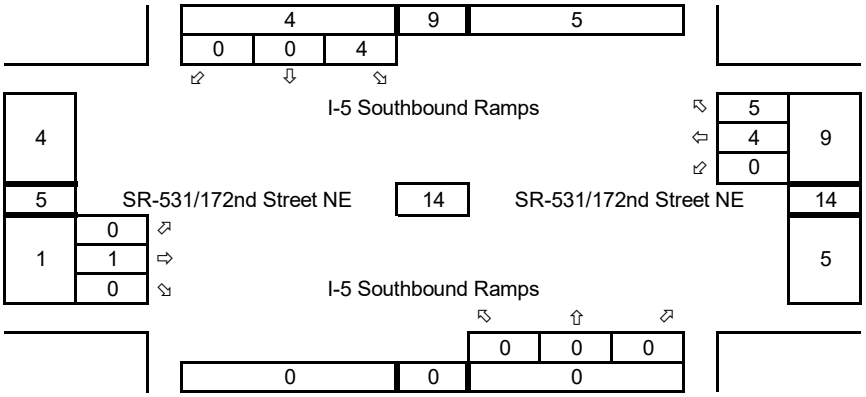


Baseline
Average Weekday
PM Peak Hour

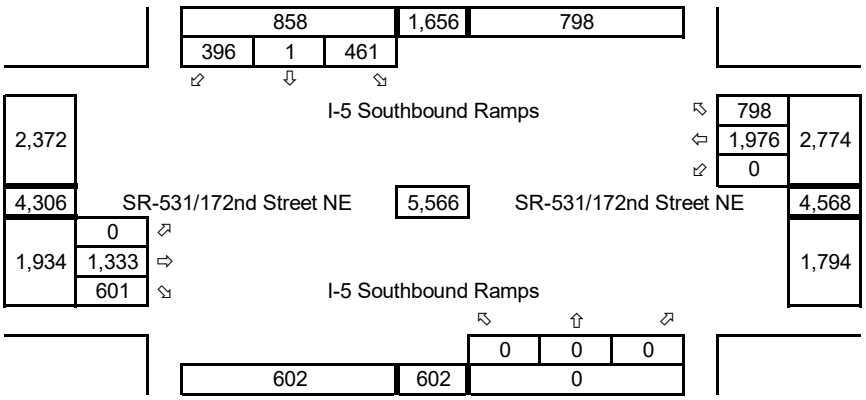
Year: 2030
Growth Rate = 3.0%
Years of Growth = 11
Total Growth = 1.3842



Development Trips
Average Weekday
PM Peak Hour



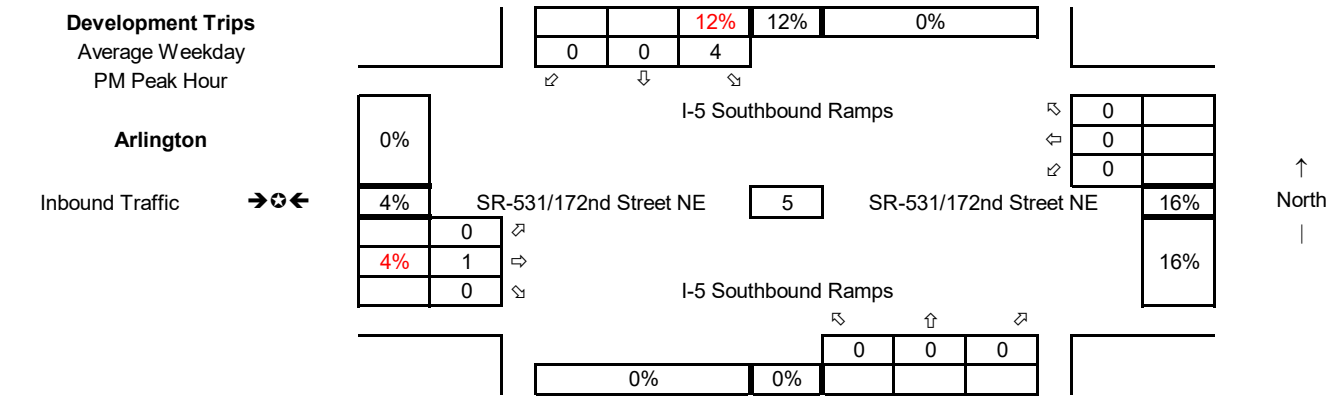
2030 Future w Development
Average Weekday
PM Peak Hour



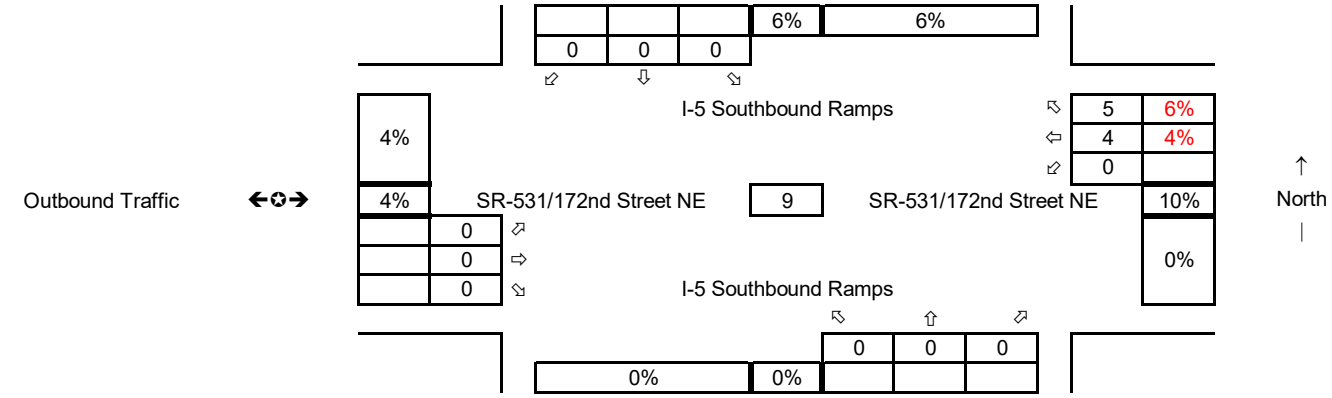
Development Trips
Average Weekday
PM Peak Hour

Arlington

Inbound Traffic



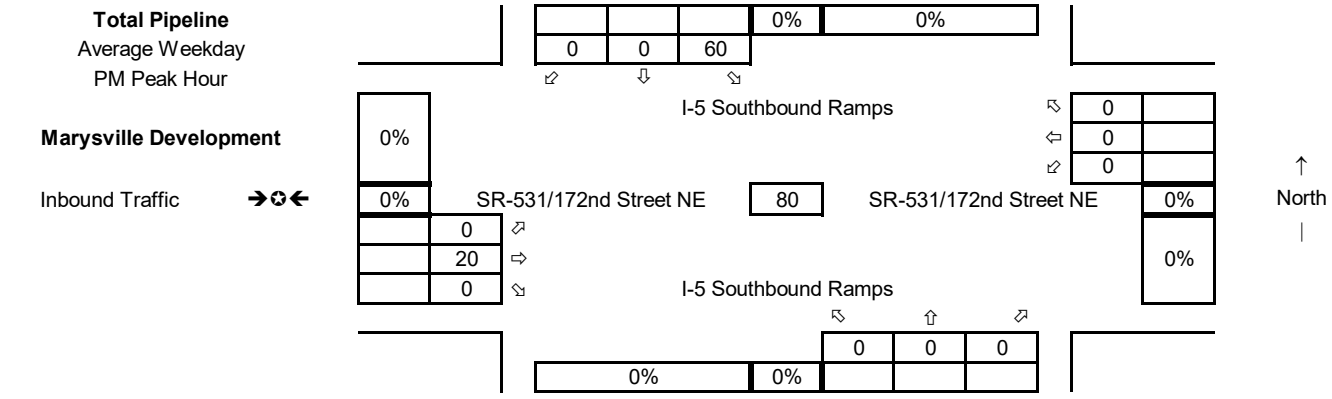
Outbound Traffic



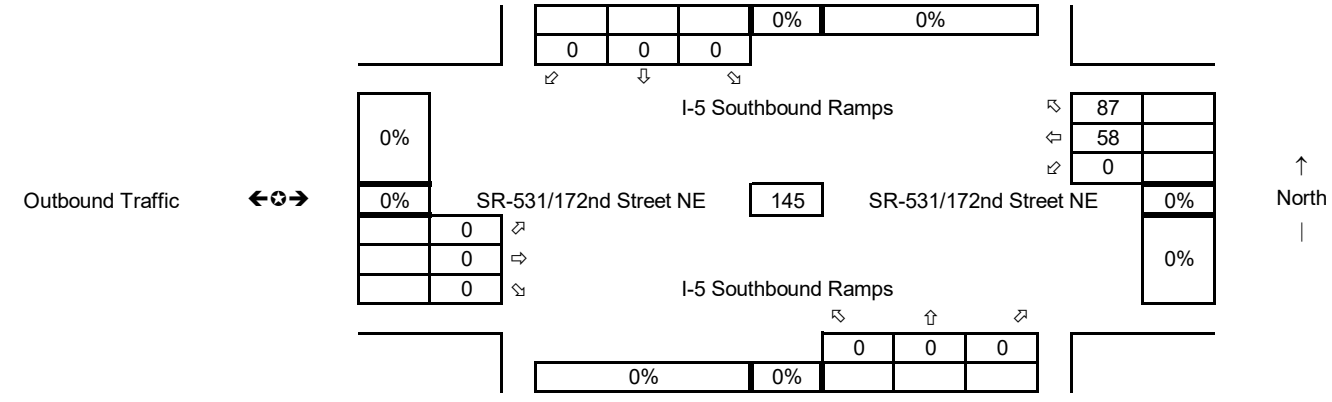
Total Pipeline
Average Weekday
PM Peak Hour

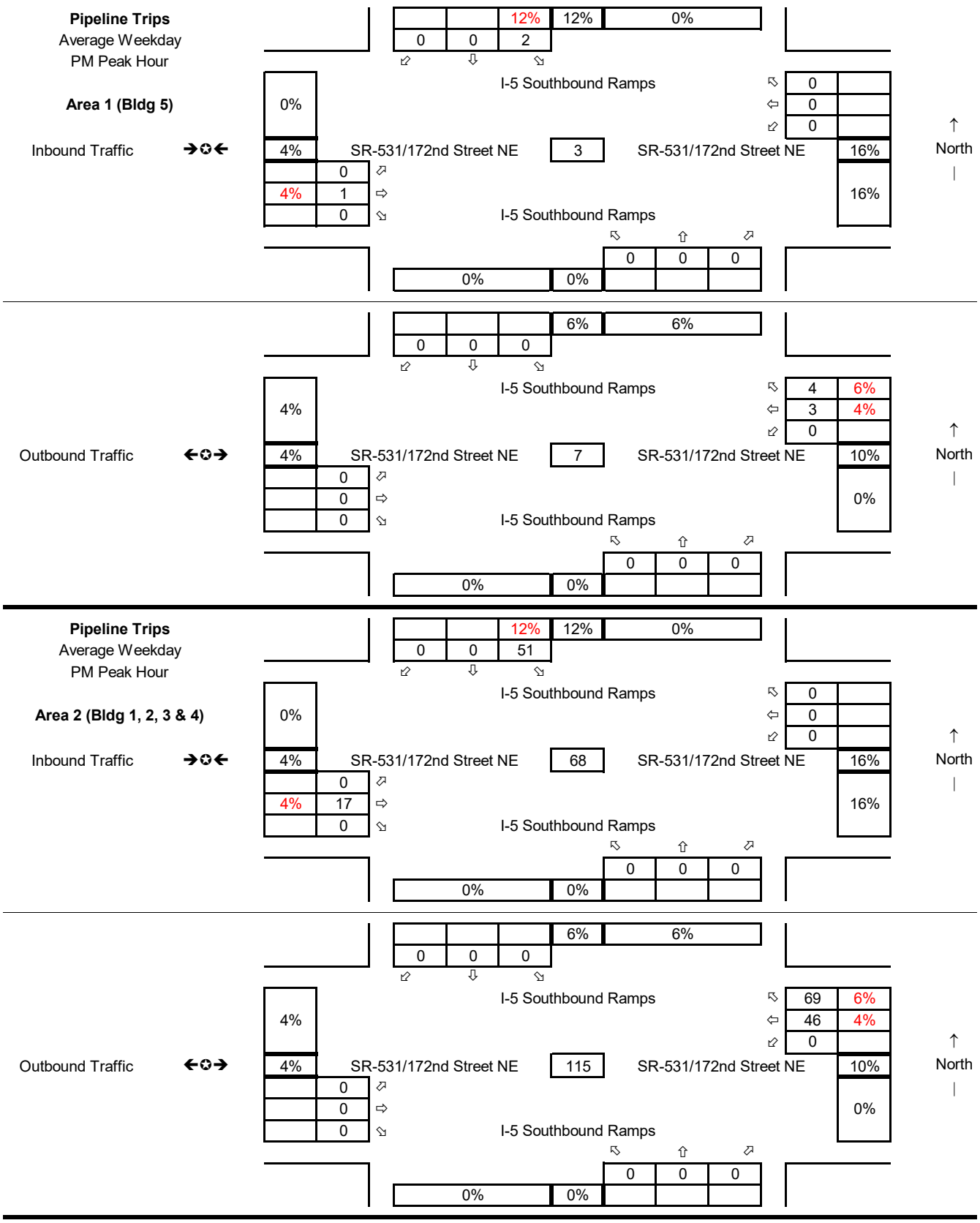
Marysville Development

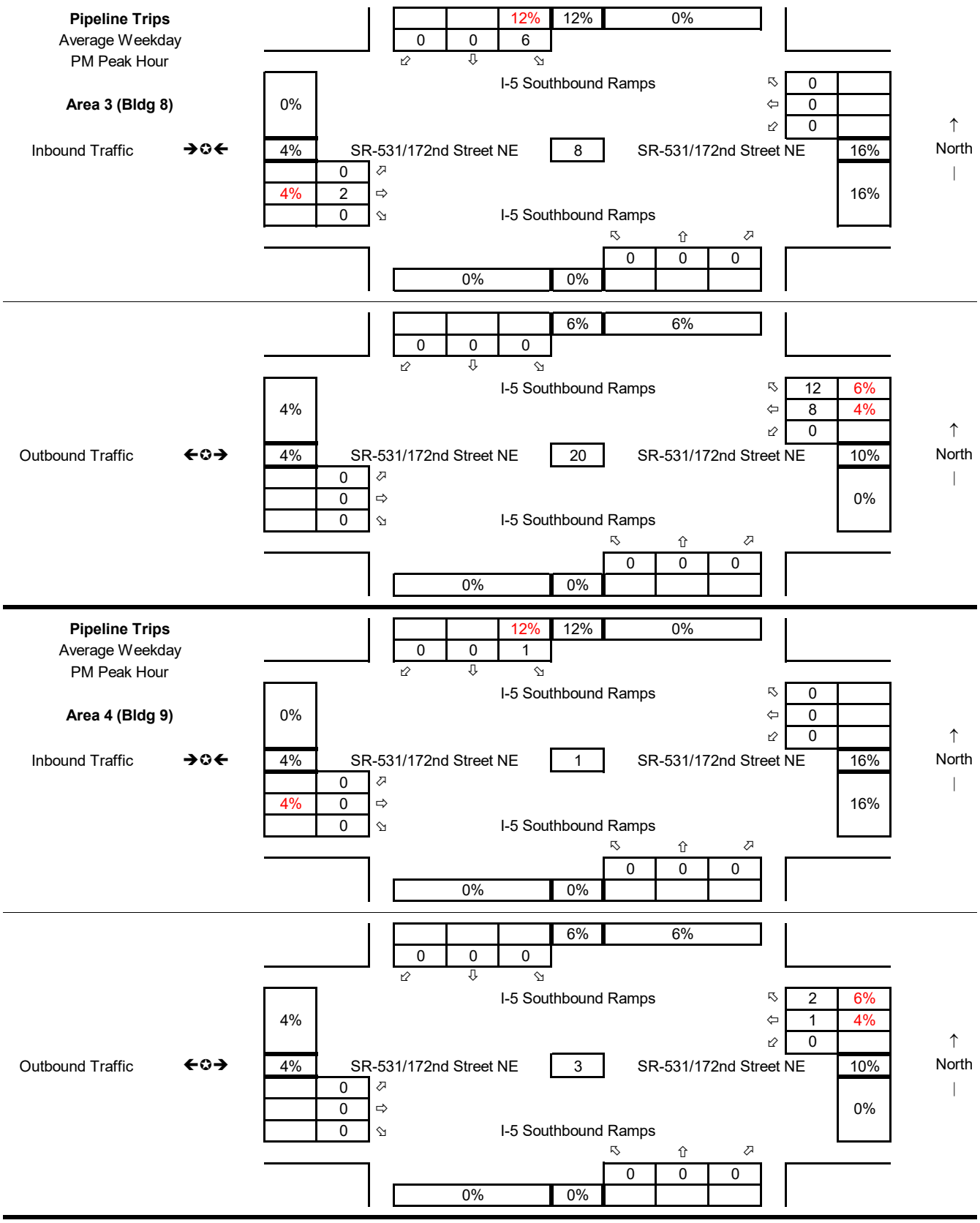
Inbound Traffic



Outbound Traffic




Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
Outbound Traffic
SR-531/172nd Street NE
I-5 Southbound Ramps
North
Area 2 (Bldg 1, 2, 3 & 4)


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
Outbound Traffic
SR-531/172nd Street NE
I-5 Southbound Ramps
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
Outbound Traffic
SR-531/172nd Street NE
I-5 Southbound Ramps
North

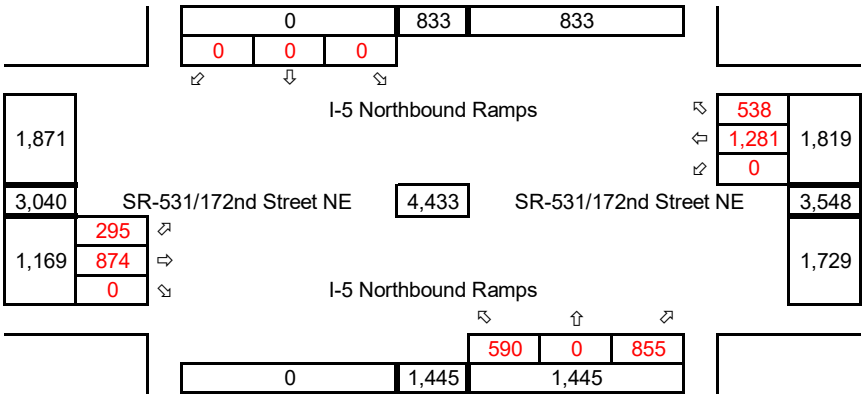
2030 Future Year 2 172nd St NE at I-5 NB Ramps

Synchro ID: 2

Existing
Average Weekday
PM Peak Hour

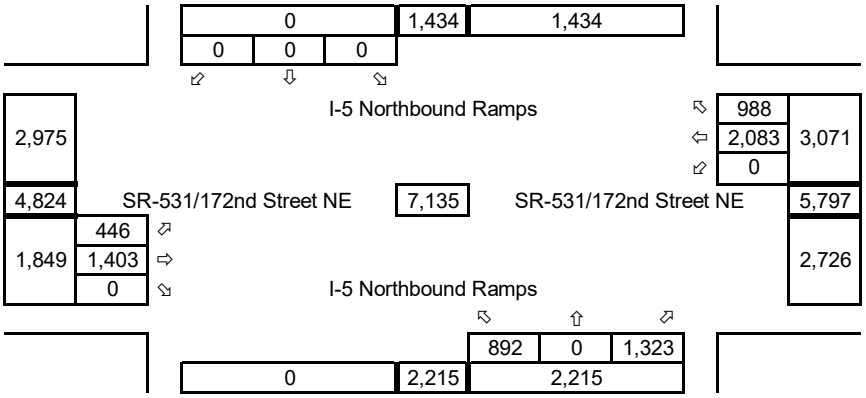
Year: **7/13/2016**

Data Source: **WSDOT**

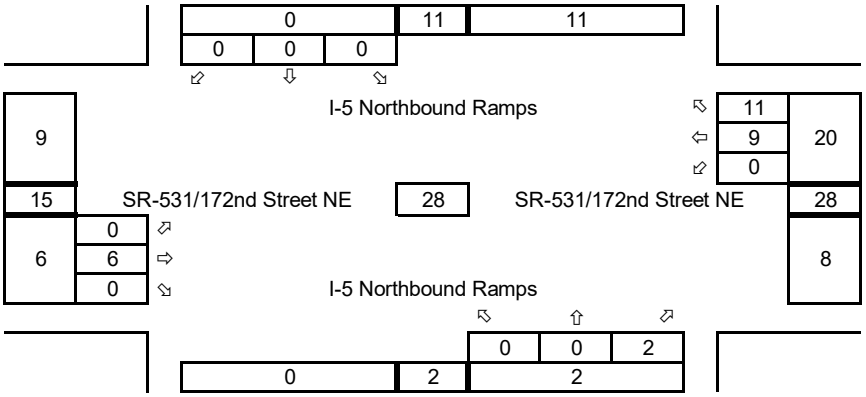


Baseline
Average Weekday
PM Peak Hour

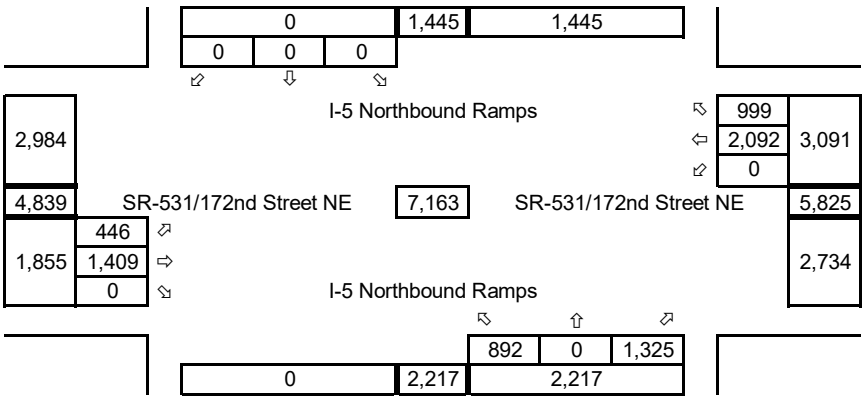
Year: 2030
Growth Rate = 3.0%
Years of Growth = 14
Total Growth = 1.5126

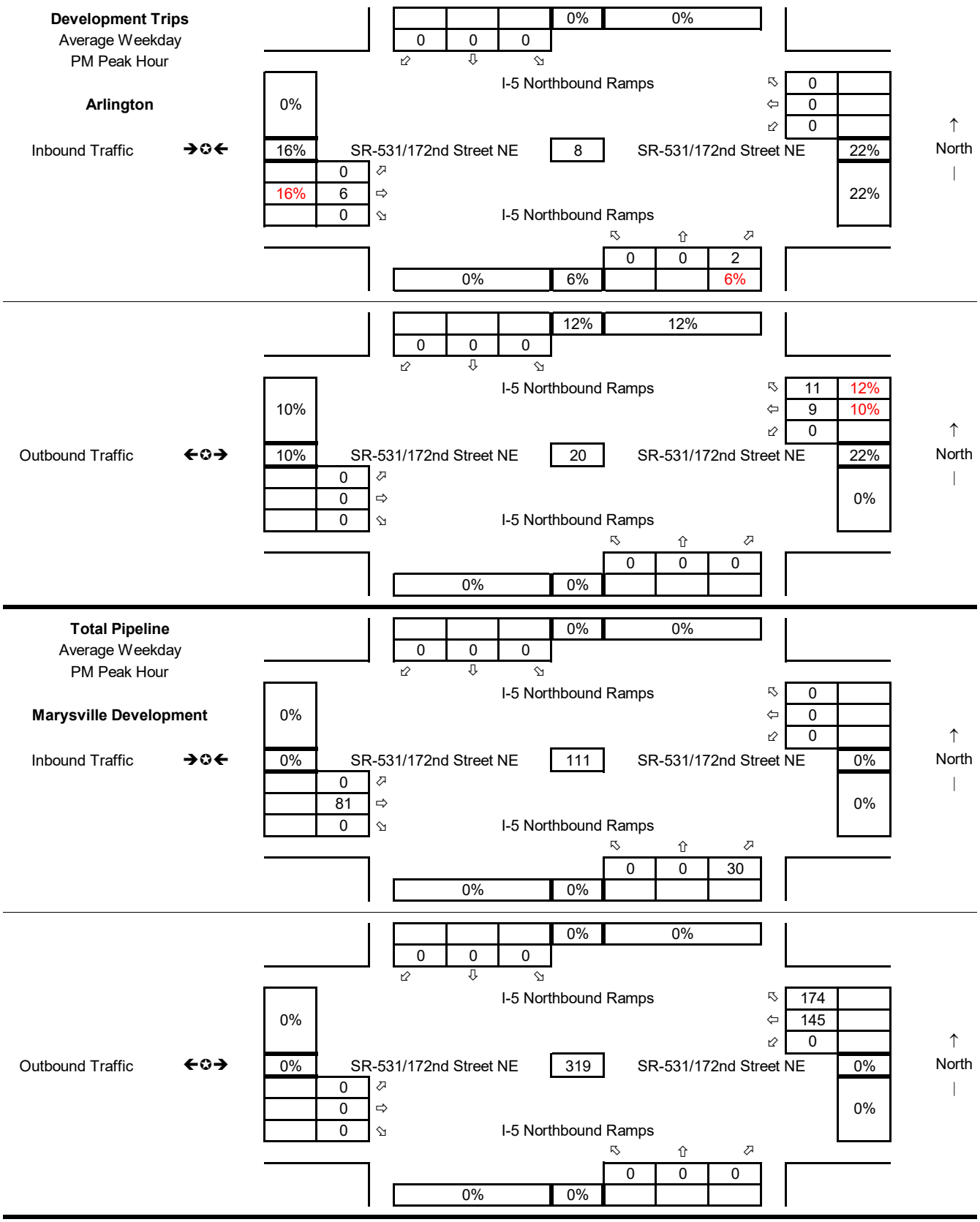


Development Trips
Average Weekday
PM Peak Hour



2030 Future w Development
Average Weekday
PM Peak Hour




Development Trips
Average Weekday
PM Peak Hour
Arlington
Inbound Traffic
Outbound Traffic
Total Pipeline
Average Weekday
PM Peak Hour
Marysville Development
Inbound Traffic
Outbound Traffic
I-5 Northbound Ramps
SR-531/172nd Street NE
North
0% 0% 0 0 0
0% 0 0 0
16% 0 16% 6 0 8 SR-531/172nd Street NE 22% 22%
0 0 2
0% 6%
12% 12% 0 0 0
10% 11 12% 9 10% 0
10% 0 0 0 20 SR-531/172nd Street NE 22% 0%
0 0 0
0% 0%
0% 0% 0 0 0
0% 0 0 0
0% 0 81 0 111 SR-531/172nd Street NE 0% 0%
0 0 30
0% 0%
0% 0% 0 0 0
0% 174 145 0
0% 0 0 0 319 SR-531/172nd Street NE 0% 0%
0 0 0
0% 0%

2030 Future Year 2 172nd St NE at I-5 NB Ramps

Pipeline Trips
Average Weekday
PM Peak Hour

Area 1 (Bldg 5)

Inbound Traffic

0% 0%
0 0 0
I-5 Northbound Ramps
0
0
0
0%
16% SR-531/172nd Street NE 4 SR-531/172nd Street NE 22%
0
16% 3 22%
0
I-5 Northbound Ramps
0 0 1
0% 6% 6%

Outbound Traffic

12% 12%
0 0 0
I-5 Northbound Ramps
8 12%
7 10%
0
10%
10% SR-531/172nd Street NE 15 SR-531/172nd Street NE 22%
0
0 0%
0
I-5 Northbound Ramps
0 0 0
0% 0%

Pipeline Trips
Average Weekday
PM Peak Hour

Area 2 (Bldg 1, 2, 3 & 4)

Inbound Traffic

0% 0%
0 0 0
I-5 Northbound Ramps
0
0
0
0%
16% SR-531/172nd Street NE 93 SR-531/172nd Street NE 22%
0
16% 68 22%
0
I-5 Northbound Ramps
0 0 25
0% 6% 6%

Outbound Traffic

12% 12%
0 0 0
I-5 Northbound Ramps
138 12%
115 10%
0
10%
10% SR-531/172nd Street NE 253 SR-531/172nd Street NE 22%
0
0 0%
0
I-5 Northbound Ramps
0 0 0
0% 0%

North

Pipeline Trips
Average Weekday
PM Peak Hour

Area 3 (Bldg 8)

Inbound Traffic

0% 0%
0 0 0
I-5 Northbound Ramps
0% 0
0
0
16% SR-531/172nd Street NE 11 SR-531/172nd Street NE 22%
0
16% 8 22%
0
I-5 Northbound Ramps
0 0 3
0% 6% 6%

North

Outbound Traffic

12% 12%
0 0 0
I-5 Northbound Ramps
10% 24 12%
20 10%
0
10% SR-531/172nd Street NE 44 SR-531/172nd Street NE 22%
0
0 0%
0
I-5 Northbound Ramps
0 0 0
0% 0%

North

Pipeline Trips
Average Weekday
PM Peak Hour

Area 4 (Bldg 9)

Inbound Traffic

0% 0%
0 0 0
I-5 Northbound Ramps
0% 0
0
0
16% SR-531/172nd Street NE 3 SR-531/172nd Street NE 22%
0
16% 2 22%
0
I-5 Northbound Ramps
0 0 1
0% 6% 6%

North

Outbound Traffic

12% 12%
0 0 0
I-5 Northbound Ramps
10% 4 12%
3 10%
0
10% SR-531/172nd Street NE 7 SR-531/172nd Street NE 22%
0
0 0%
0
I-5 Northbound Ramps
0 0 0
0% 0%

North

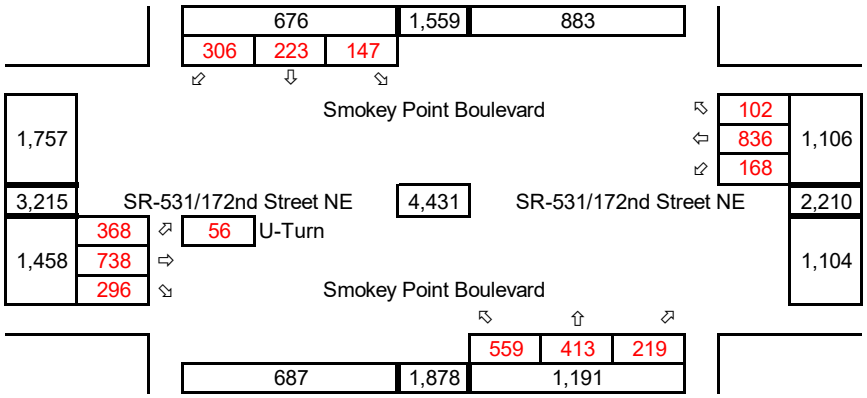
2030 Future Year 3 172nd St NE at Smokey Pt Blvd

Synchro ID: 3

Existing
Average Weekday
PM Peak Hour

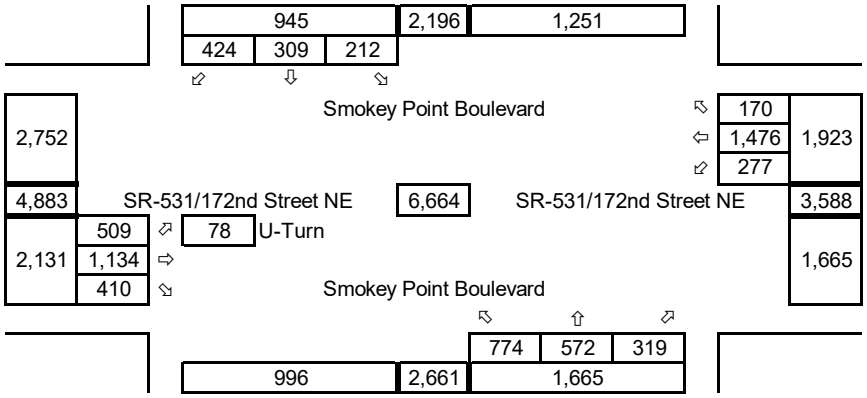
Year: **7/23/2019**

Data Source: **WSDOT**

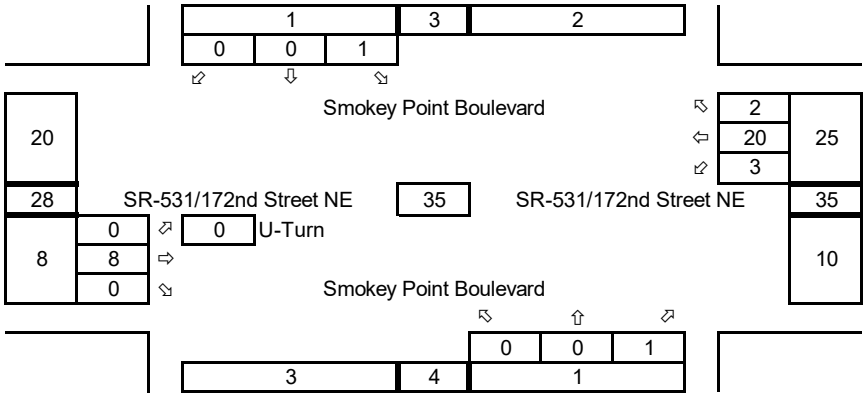


Baseline
Average Weekday
PM Peak Hour

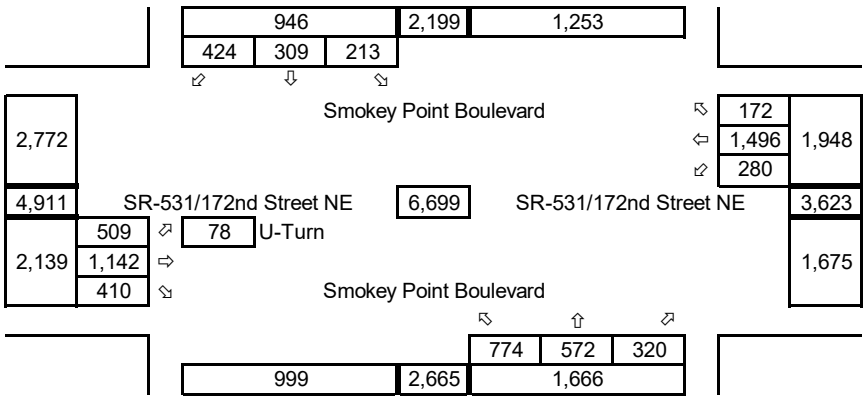
Year: 2030
Growth Rate = 3.0%
Years of Growth = 11
Total Growth = 1.3842

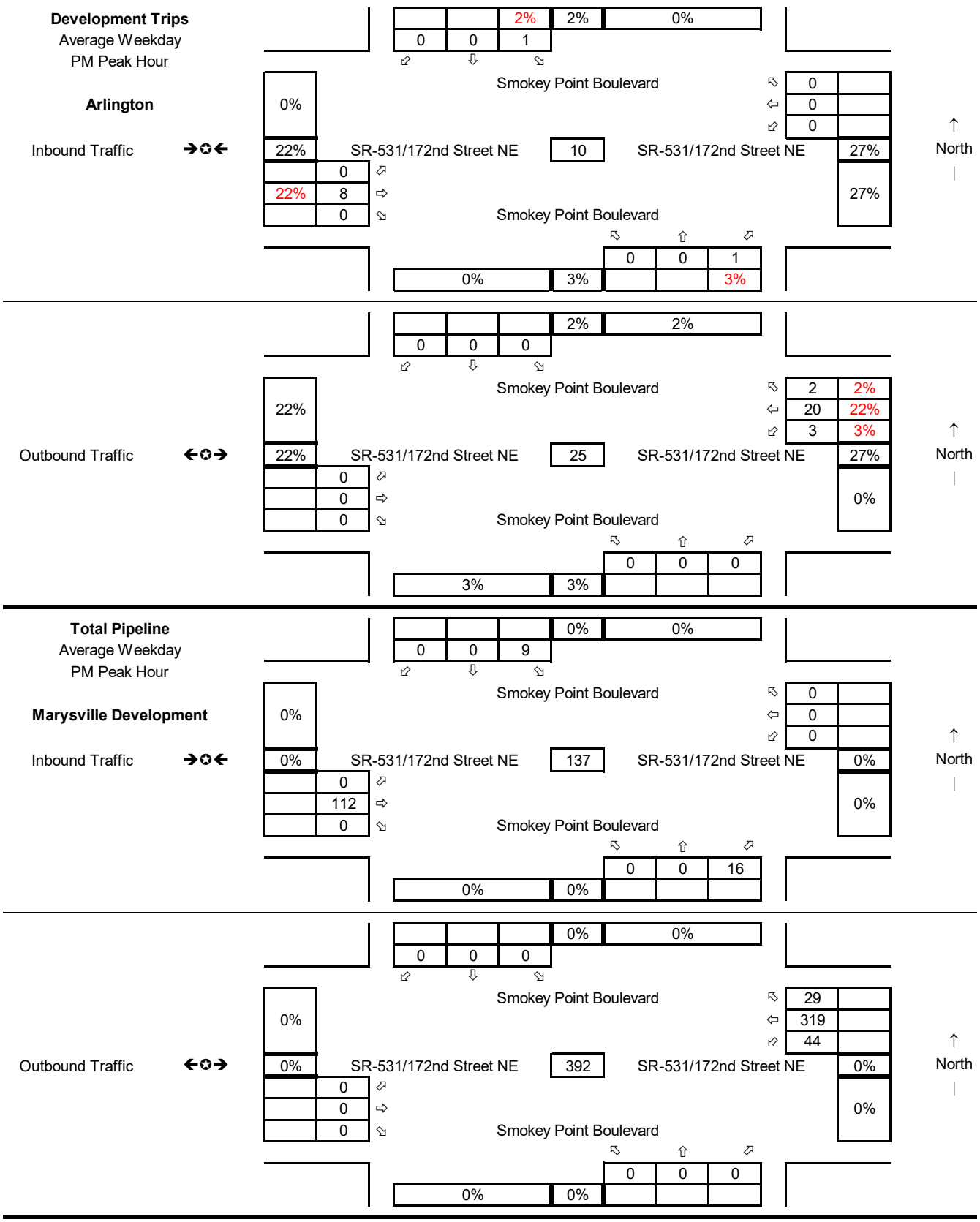


Development Trips
Average Weekday
PM Peak Hour



2030 Future w Development
Average Weekday
PM Peak Hour

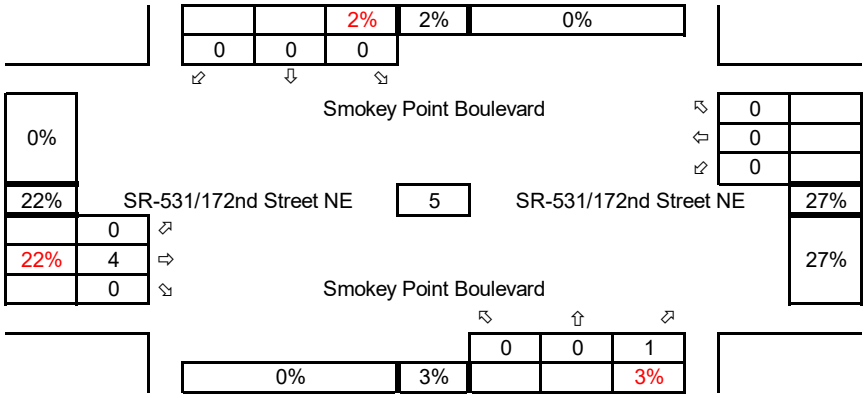



Development Trips
Average Weekday
PM Peak Hour
Arlington
Inbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North
Outbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North
Total Pipeline
Average Weekday
PM Peak Hour
Marysville Development
Inbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North
Outbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North

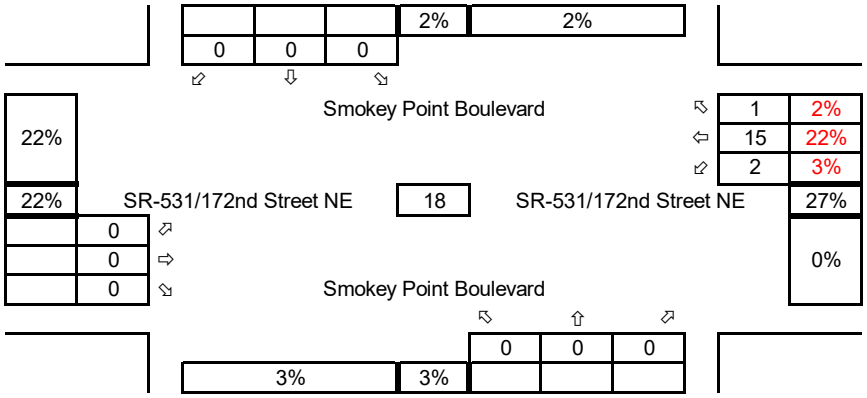
Pipeline Trips
Average Weekday
PM Peak Hour

Area 1 (Bldg 5)

Inbound Traffic



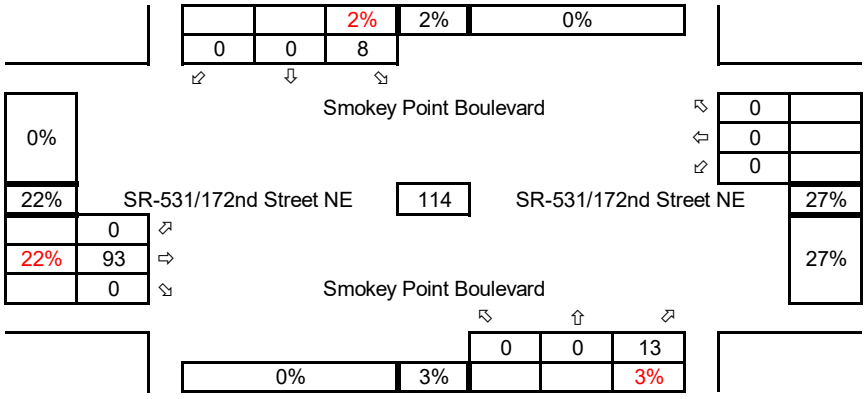
Outbound Traffic



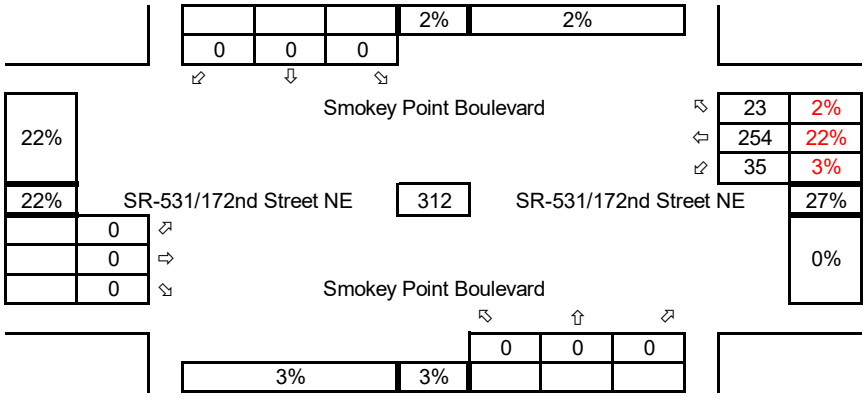
Pipeline Trips
Average Weekday
PM Peak Hour

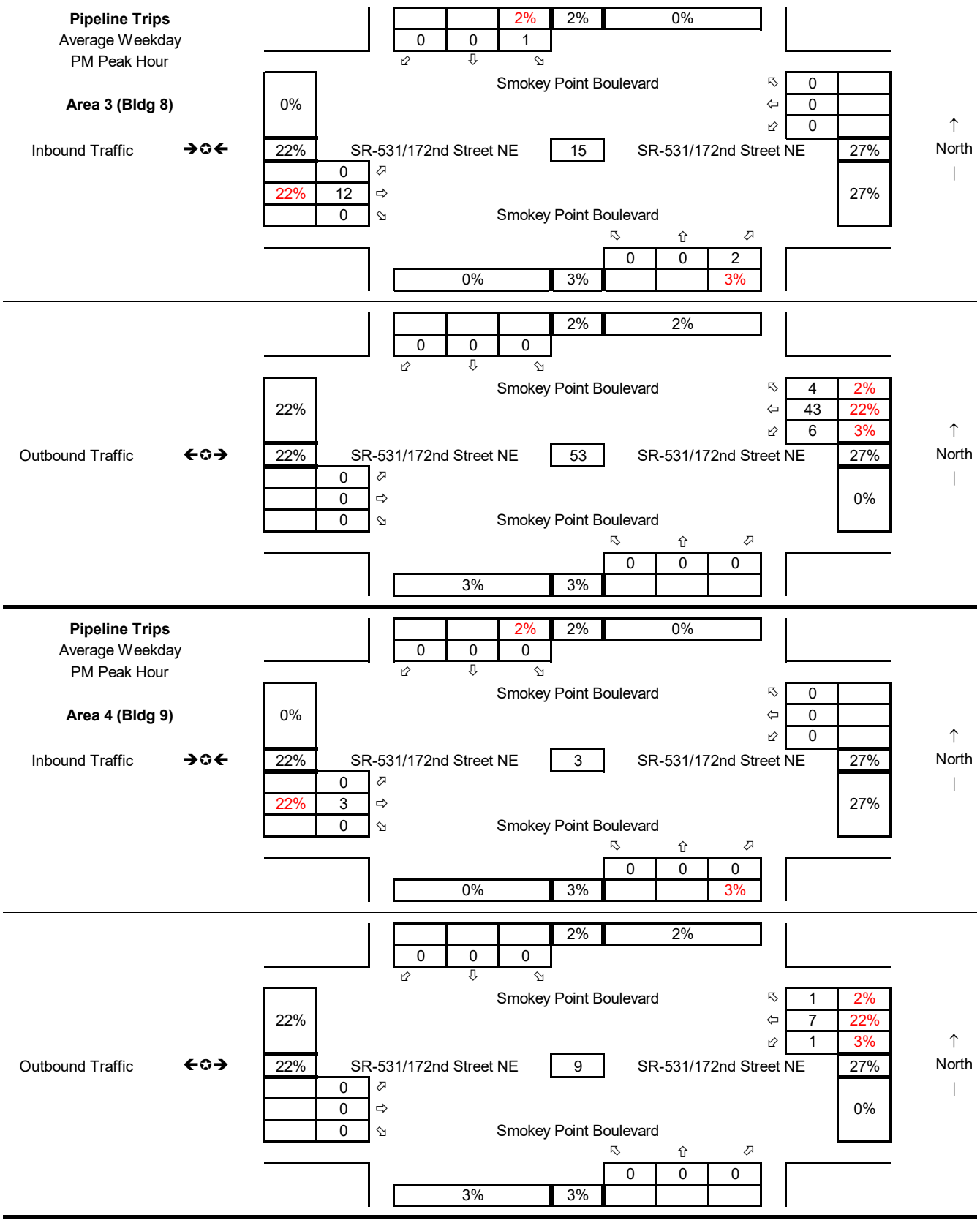
Area 2 (Bldg 1, 2, 3 & 4)

Inbound Traffic



Outbound Traffic




Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
Outbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
Outbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
North

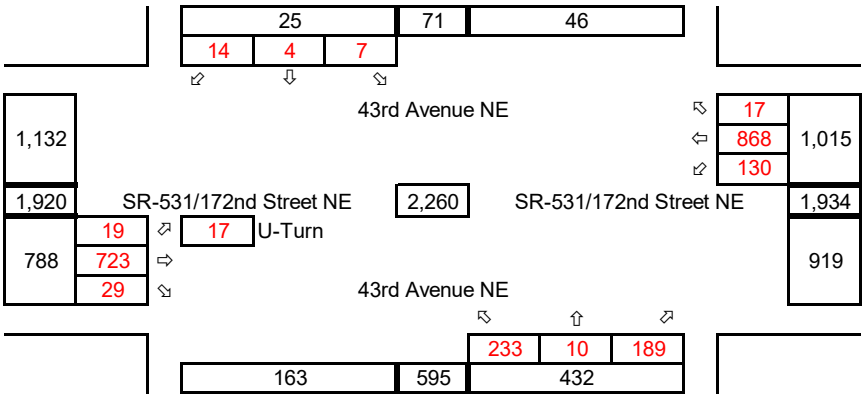
2030 Future Year 4 172nd St NE at 43rd Ave NE

Synchro ID: 4

Existing
Average Weekday
PM Peak Hour

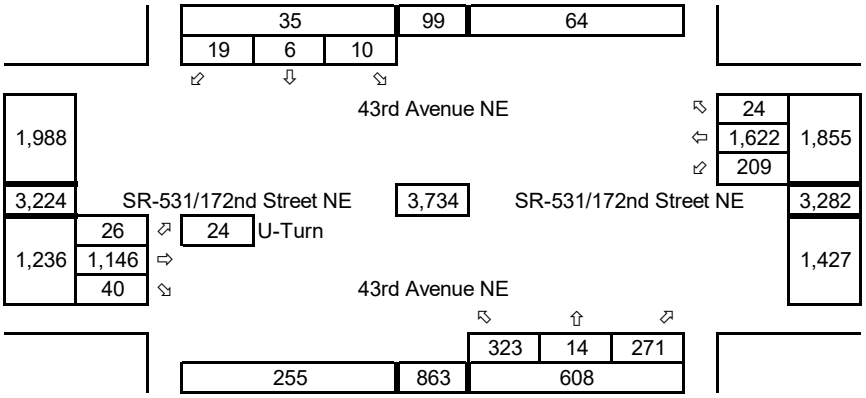
Year: **7/10/2019**

Data Source: **WSDOT**

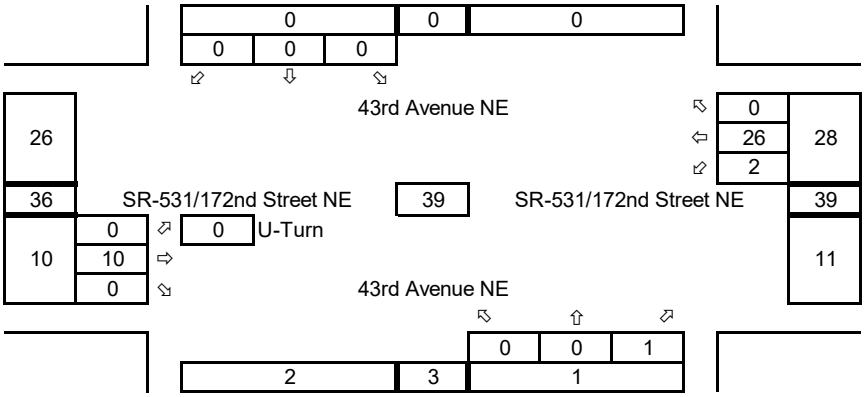


Baseline
Average Weekday
PM Peak Hour

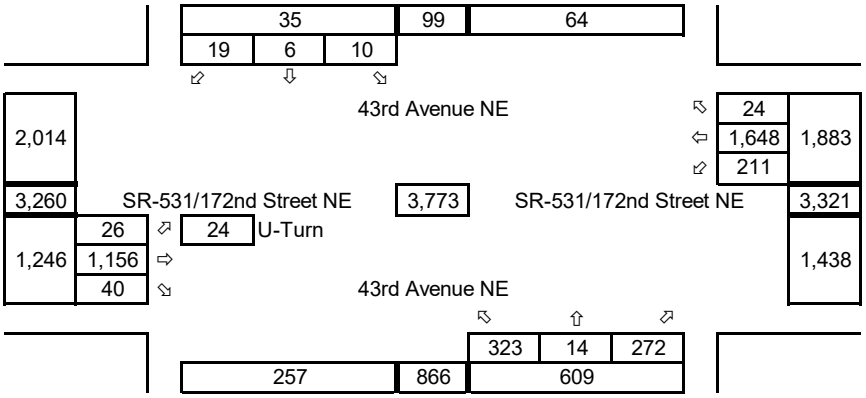
Year: 2030
Growth Rate = 3.0%
Years of Growth = 11
Total Growth = 1.3842



Development Trips
Average Weekday
PM Peak Hour



2030 Future w Development
Average Weekday
PM Peak Hour



2030 Future Year 4 172nd St NE at 43rd Ave NE

Development Trips
Average Weekday
PM Peak Hour

Arlington

Inbound Traffic ➔✪🡐

North bound approach (top): 0% | 0%
Southbound: 0 | 0 | 0
43rd Avenue NE
Westbound (right): 0 | 0 | 0
West leg: 0%
SR-531/172nd Street NE: 29% | 11 | SR-531/172nd Street NE: 31%
Eastbound: 0 | 29% 10 | 0
East leg: 31%
43rd Avenue NE
Northbound: 0 | 0 | 1
Bottom: 0% | 2% | 2%

North

Outbound Traffic 🡐✪➔

Top: 0% | 0%
Southbound: 0 | 0 | 0
43rd Avenue NE
Westbound: 0 | 26 29% | 2 2%
West leg: 29%
SR-531/172nd Street NE: 29% | 28 | SR-531/172nd Street NE: 31%
Eastbound: 0 | 0 | 0
East leg: 0%
43rd Avenue NE
Northbound: 0 | 0 | 0
Bottom: 2% | 2%

North

Total Pipeline
Average Weekday
PM Peak Hour

Marysville Development

Inbound Traffic ➔✪🡐

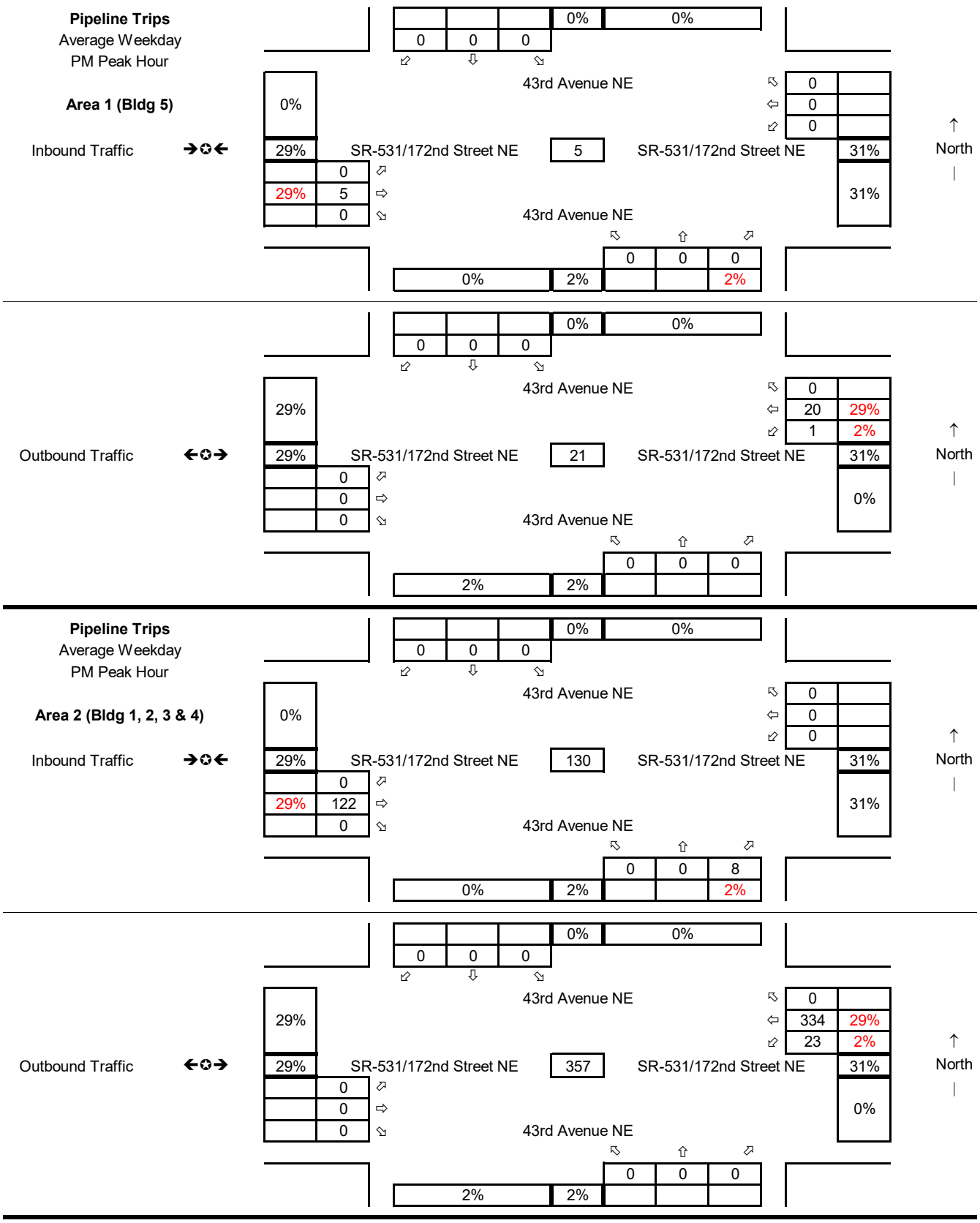
Top: 0% | 0%
Southbound: 0 | 0 | 0
43rd Avenue NE
Westbound: 0 | 0 | 0
West leg: 0%
SR-531/172nd Street NE: 0% | 154 | SR-531/172nd Street NE: 0%
Eastbound: 0 | 145 | 0
East leg: 0%
43rd Avenue NE
Northbound: 0 | 0 | 9
Bottom: 0% | 0%

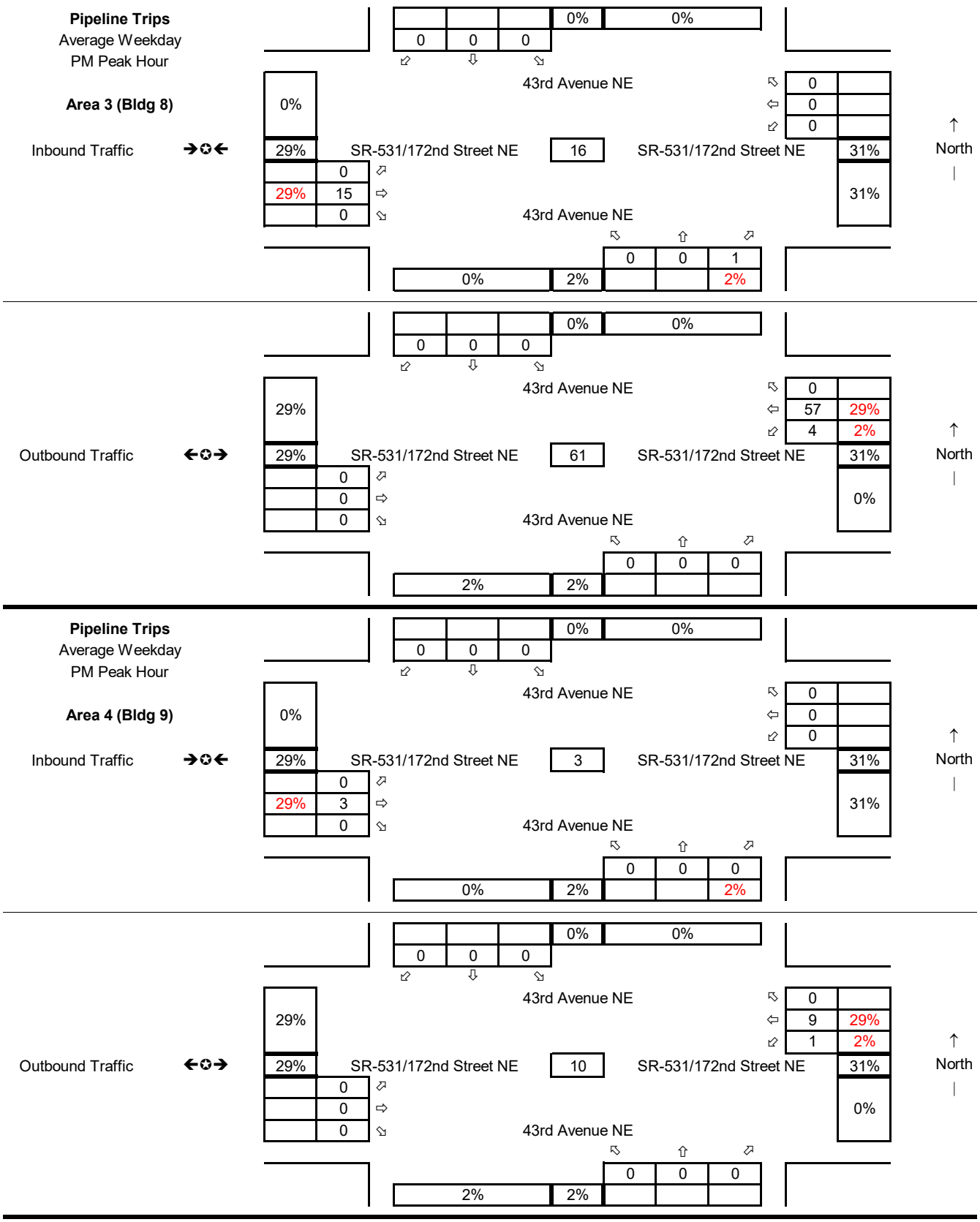
North

Outbound Traffic 🡐✪➔

Top: 0% | 0%
Southbound: 0 | 0 | 0
43rd Avenue NE
Westbound: 0 | 420 | 29
West leg: 0%
SR-531/172nd Street NE: 0% | 449 | SR-531/172nd Street NE: 0%
Eastbound: 0 | 0 | 0
East leg: 0%
43rd Avenue NE
Northbound: 0 | 0 | 0
Bottom: 0% | 0%

North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
0% 0% 0 0 0
43rd Avenue NE
0% 0 0 0
29% SR-531/172nd Street NE 5 SR-531/172nd Street NE 31%
0 29% 5 0 31%
43rd Avenue NE
0 0 0
0% 2% 2%
North
0% 0% 0 0 0
43rd Avenue NE
29% 0 20 29% 1 2%
Outbound Traffic
29% SR-531/172nd Street NE 21 SR-531/172nd Street NE 31%
0 0 0 0%
43rd Avenue NE
0 0 0
2% 2%
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 2 (Bldg 1, 2, 3 & 4)
Inbound Traffic
0% 0% 0 0 0
43rd Avenue NE
0% 0 0 0
29% SR-531/172nd Street NE 130 SR-531/172nd Street NE 31%
0 29% 122 0 31%
43rd Avenue NE
0 0 8
0% 2% 2%
North
0% 0% 0 0 0
43rd Avenue NE
29% 0 334 29% 23 2%
Outbound Traffic
29% SR-531/172nd Street NE 357 SR-531/172nd Street NE 31%
0 0 0 0%
43rd Avenue NE
0 0 0
2% 2%
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
0% 0%
0 0 0
43rd Avenue NE
0 0 0
0%
29% SR-531/172nd Street NE 16 SR-531/172nd Street NE 31%
0 29% 15 0
31%
43rd Avenue NE
0 0 1
0% 2% 2%
North
Outbound Traffic
0% 0%
0 0 0
43rd Avenue NE
0 57 29% 4 2%
29%
29% SR-531/172nd Street NE 61 SR-531/172nd Street NE 31%
0 0 0
0%
43rd Avenue NE
0 0 0
2% 2%
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
0% 0%
0 0 0
43rd Avenue NE
0 0 0
0%
29% SR-531/172nd Street NE 3 SR-531/172nd Street NE 31%
0 29% 3 0
31%
43rd Avenue NE
0 0 0
0% 2% 2%
North
Outbound Traffic
0% 0%
0 0 0
43rd Avenue NE
0 9 29% 1 2%
29%
29% SR-531/172nd Street NE 10 SR-531/172nd Street NE 31%
0 0 0
0%
43rd Avenue NE
0 0 0
2% 2%
North

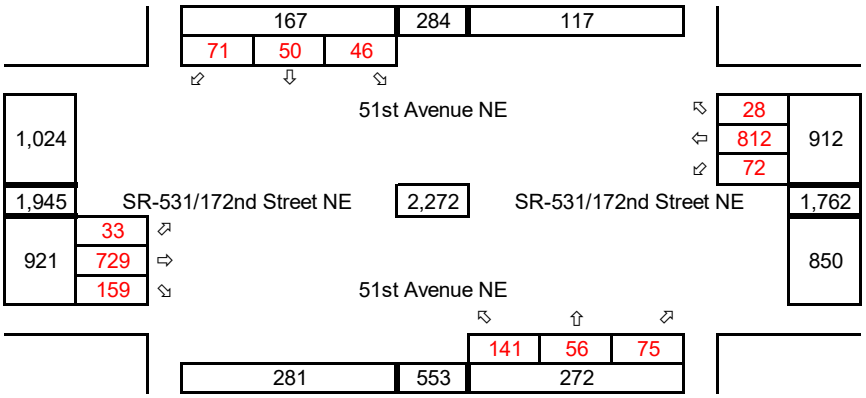
2030 Future Year 5 172nd St NE at 51st Ave NE

Synchro ID: 5

Existing
Average Weekday
PM Peak Hour

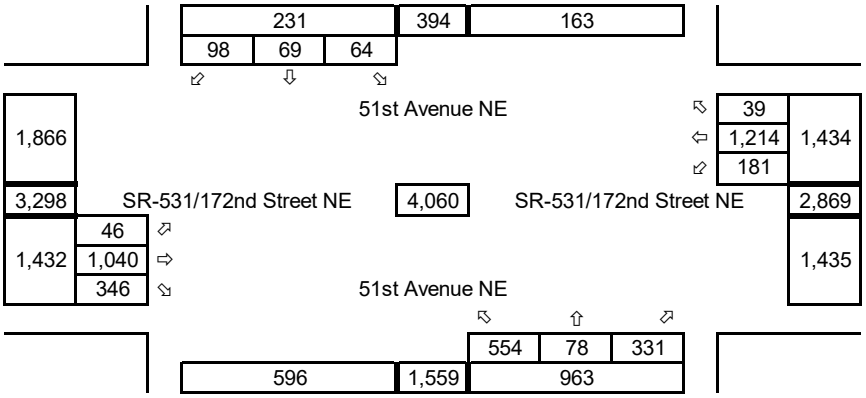
Year: **7/10/2019**

Data Source: **WSDOT**

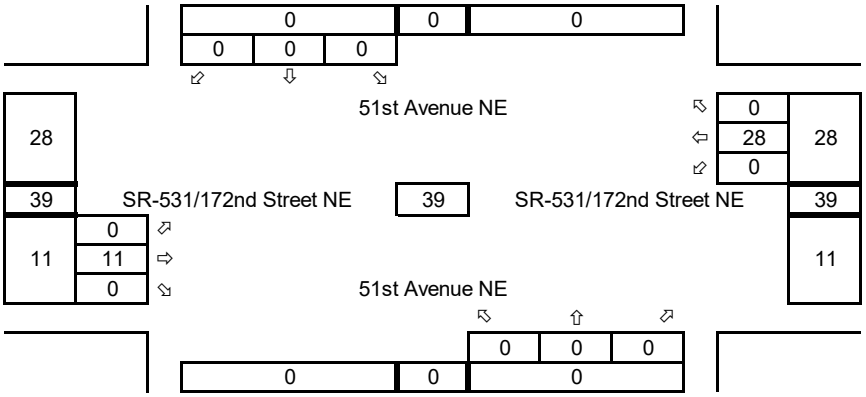


Baseline
Average Weekday
PM Peak Hour

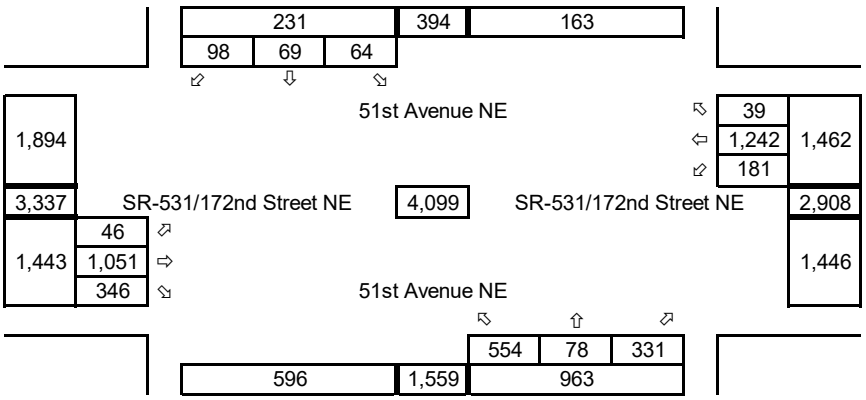
Year: 2030
Growth Rate = 3.0%
Years of Growth = 11
Total Growth = 1.3842

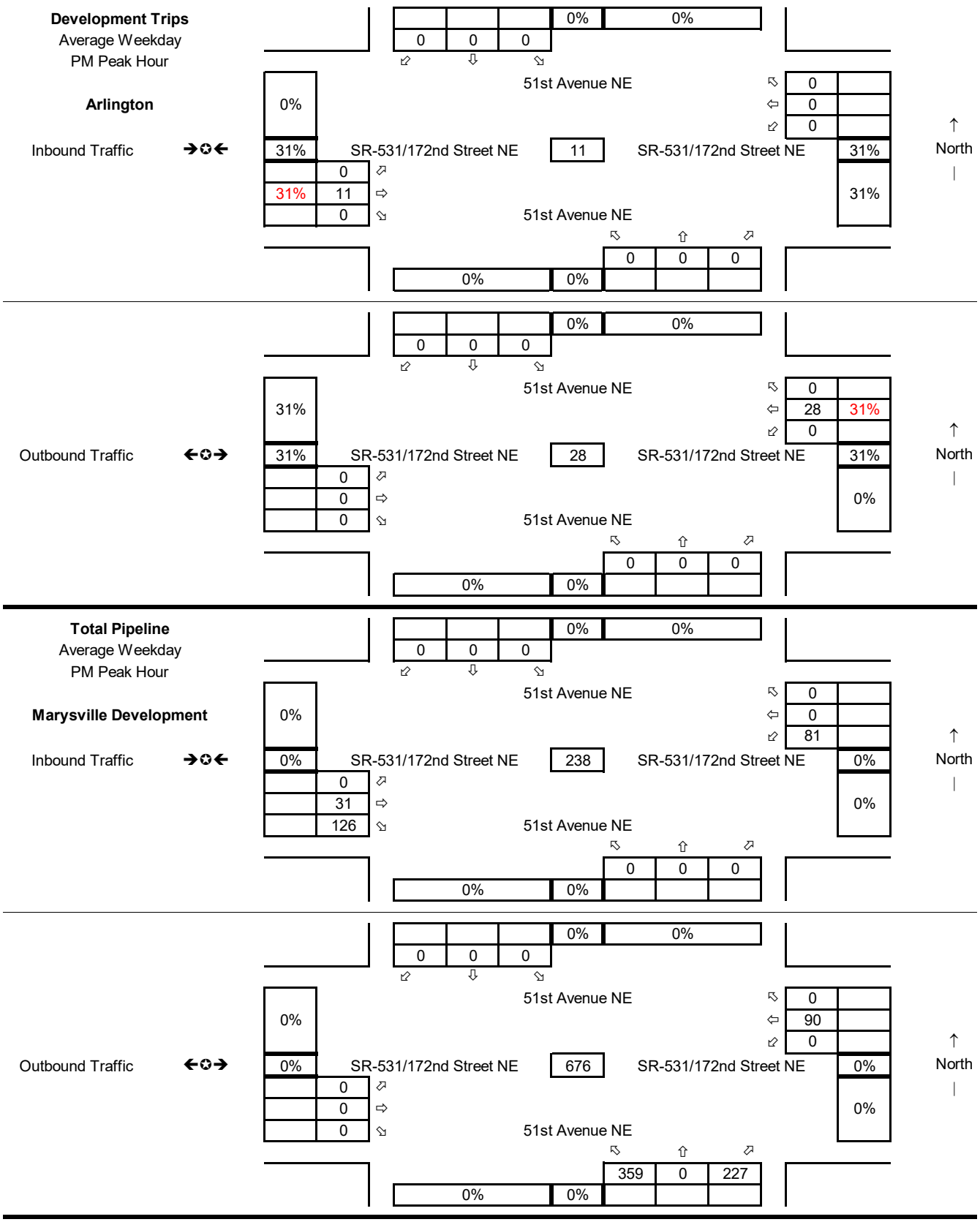


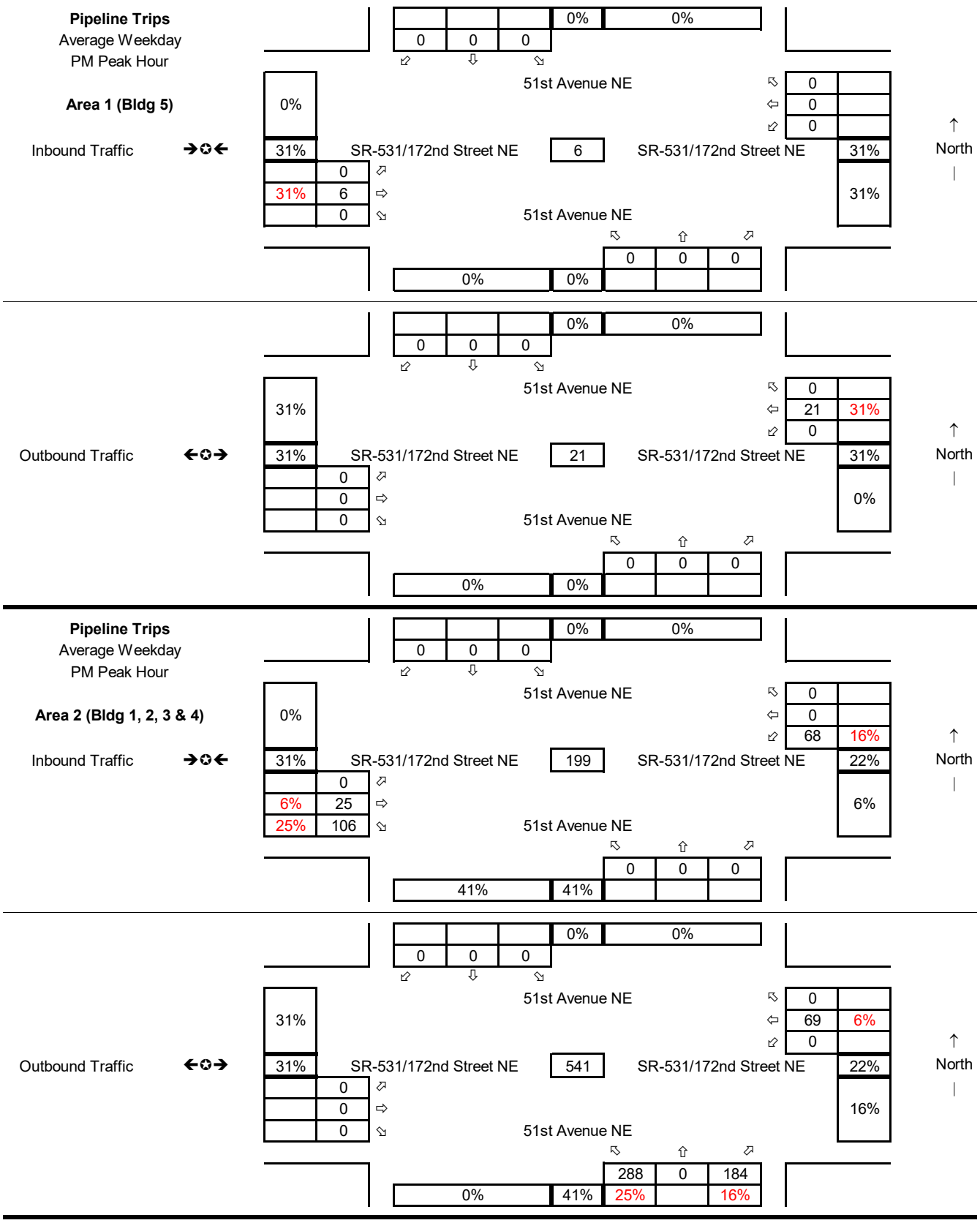
Development Trips
Average Weekday
PM Peak Hour



2030 Future w Development
Average Weekday
PM Peak Hour




Development Trips
Average Weekday
PM Peak Hour
Arlington
Inbound Traffic
Outbound Traffic
Total Pipeline
Average Weekday
PM Peak Hour
Marysville Development
Inbound Traffic
Outbound Traffic
51st Avenue NE
SR-531/172nd Street NE
North
0%
31%
11
28
238
676
0
31
126
81
90
359
227

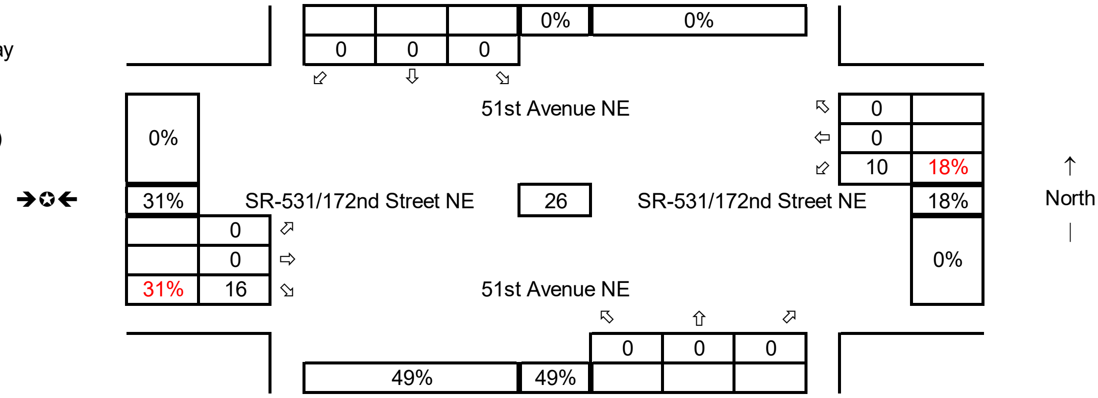

Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
Outbound Traffic
SR-531/172nd Street NE
51st Avenue NE
North
Area 2 (Bldg 1, 2, 3 & 4)

2030 Future Year 5 172nd St NE at 51st Ave NE

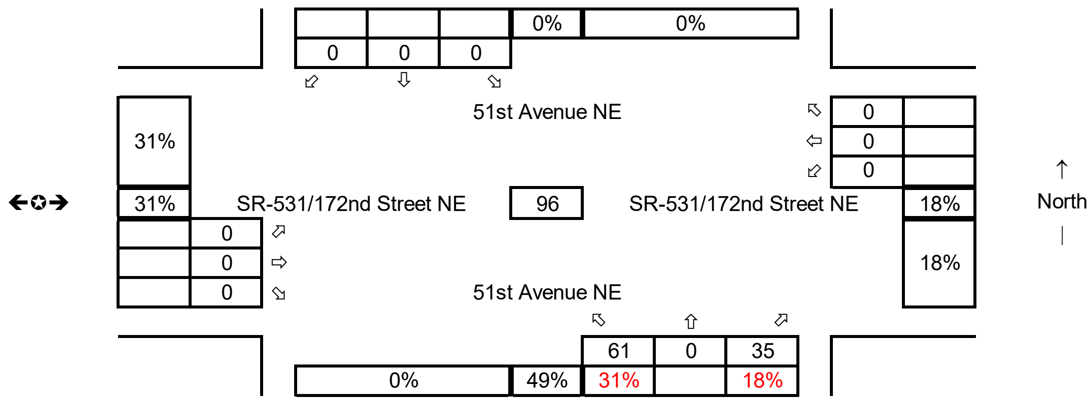
Pipeline Trips
Average Weekday
PM Peak Hour

Area 3 (Bldg 8)

Inbound Traffic



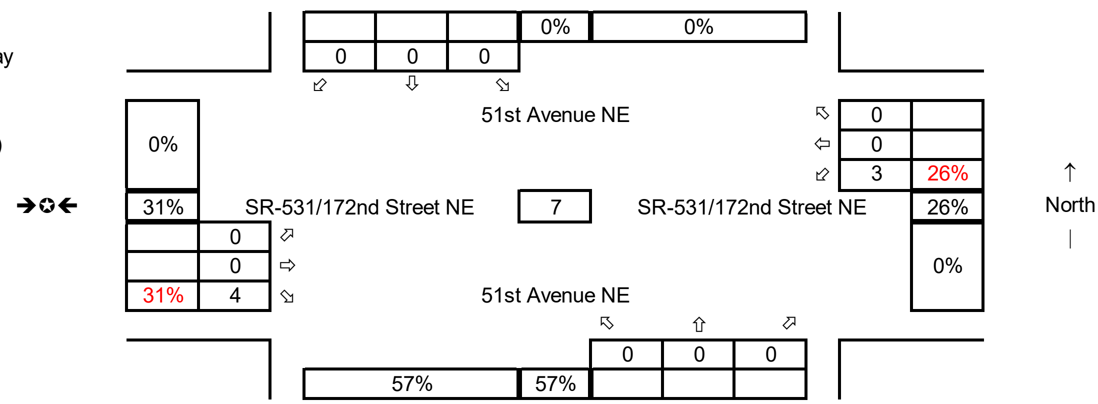
Outbound Traffic



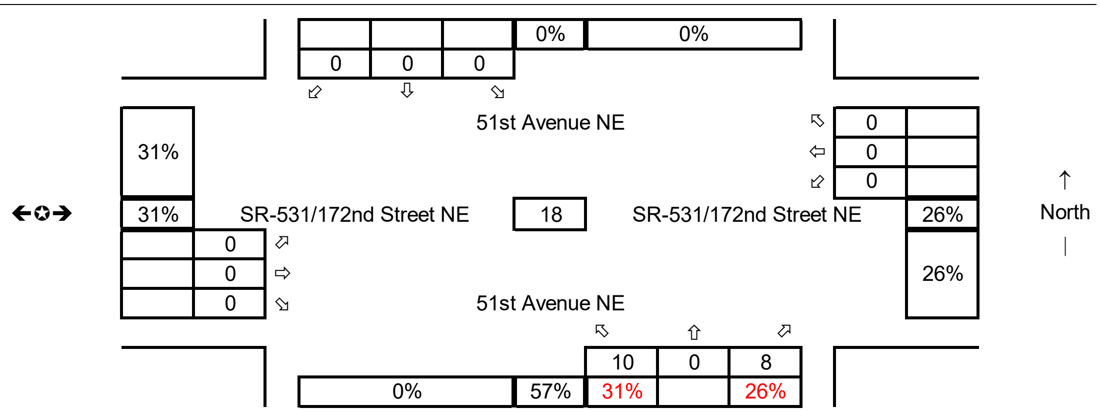
Pipeline Trips
Average Weekday
PM Peak Hour

Area 4 (Bldg 9)

Inbound Traffic



Outbound Traffic



2030 Future Year

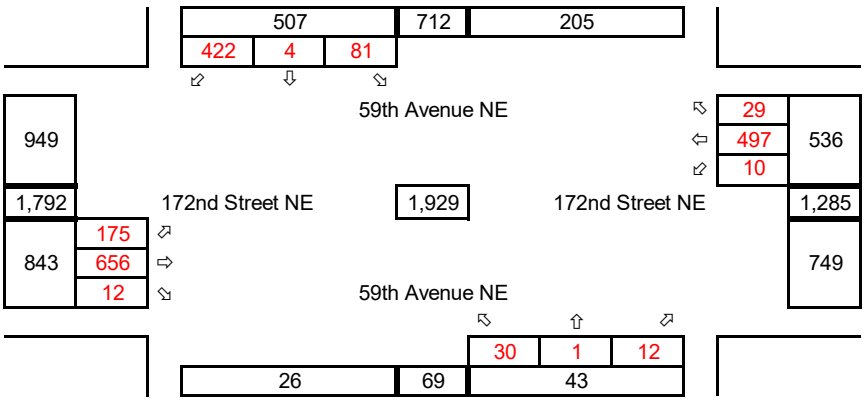
6 172nd St NE at 59th Ave NE

Synchro ID: 6

Existing
Average Weekday
PM Peak Hour

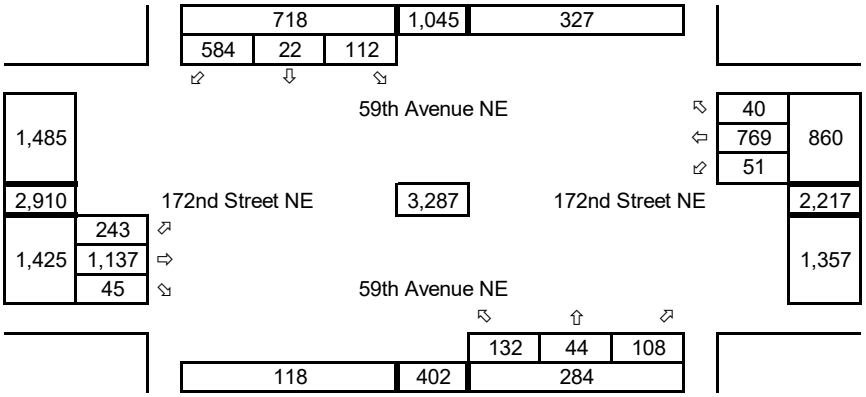
Year: **7/10/2019**

Data Source: **WSDOT**

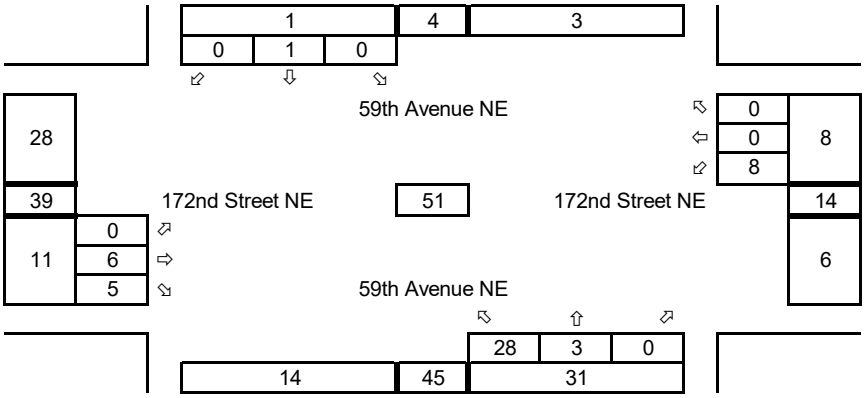


Baseline
Average Weekday
PM Peak Hour

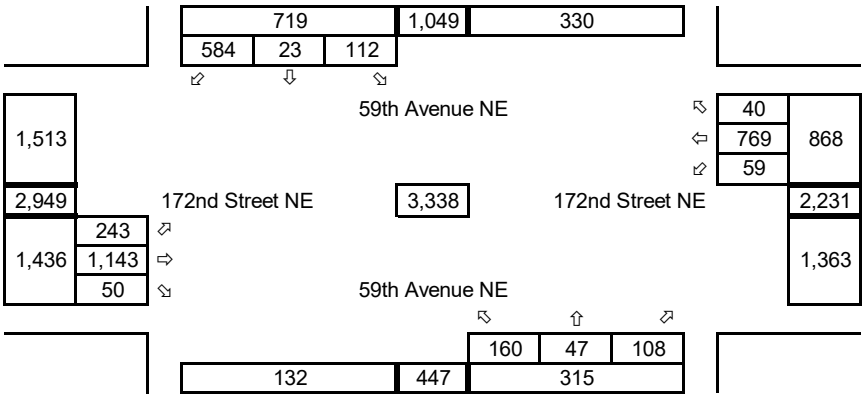
Year: 2030
Growth Rate = 3.0%
Years of Growth = 11
Total Growth = 1.3842

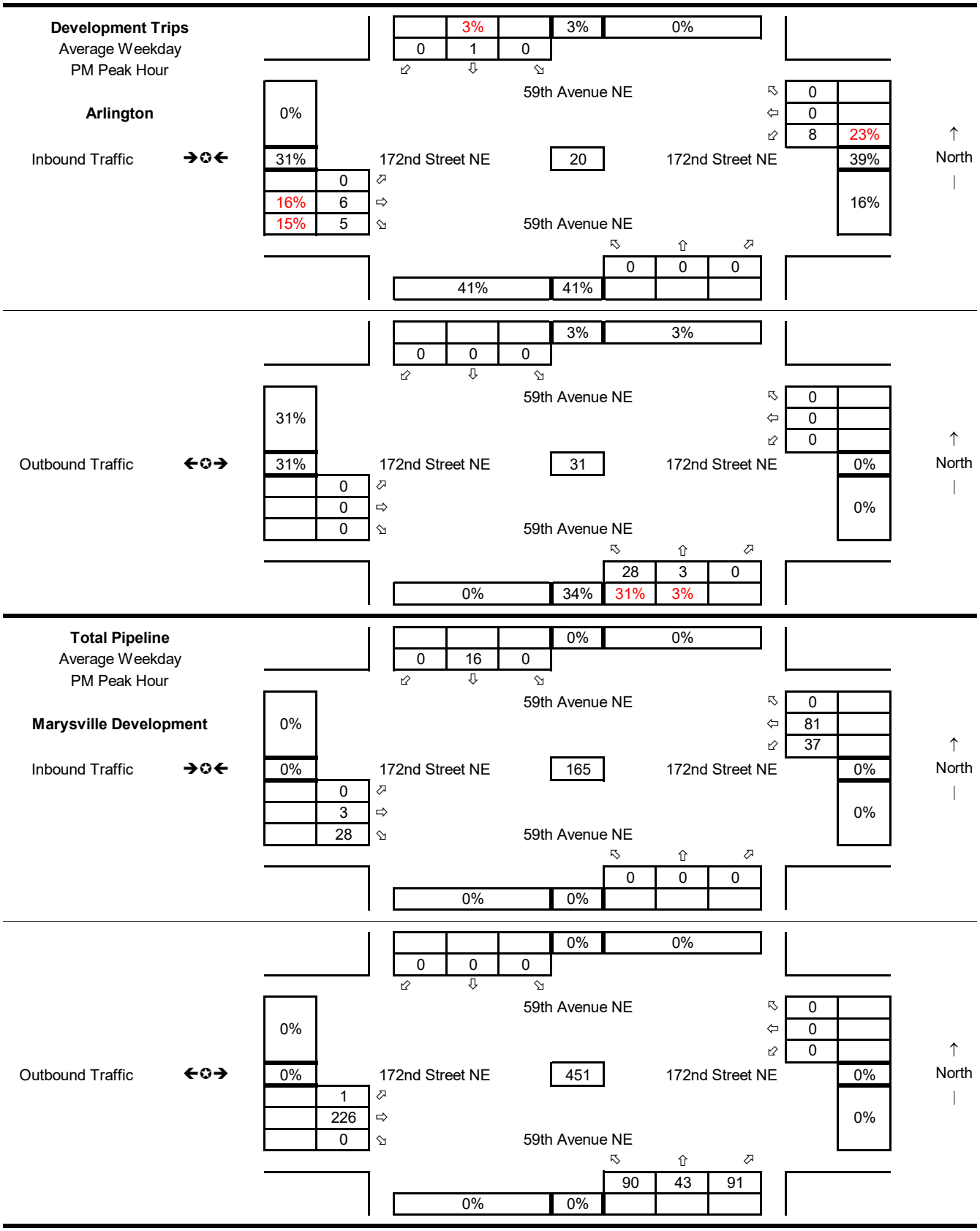


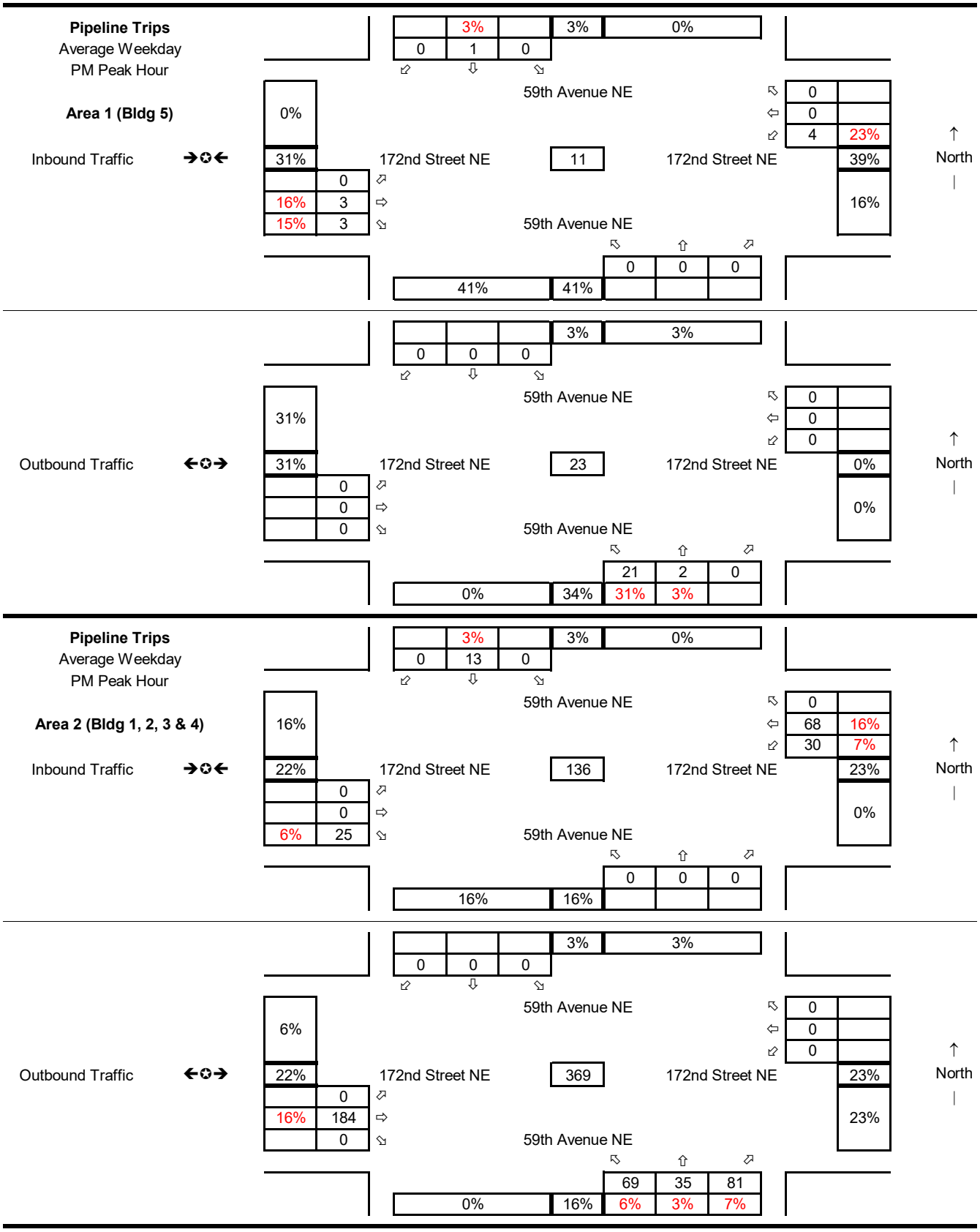
Development Trips
Average Weekday
PM Peak Hour

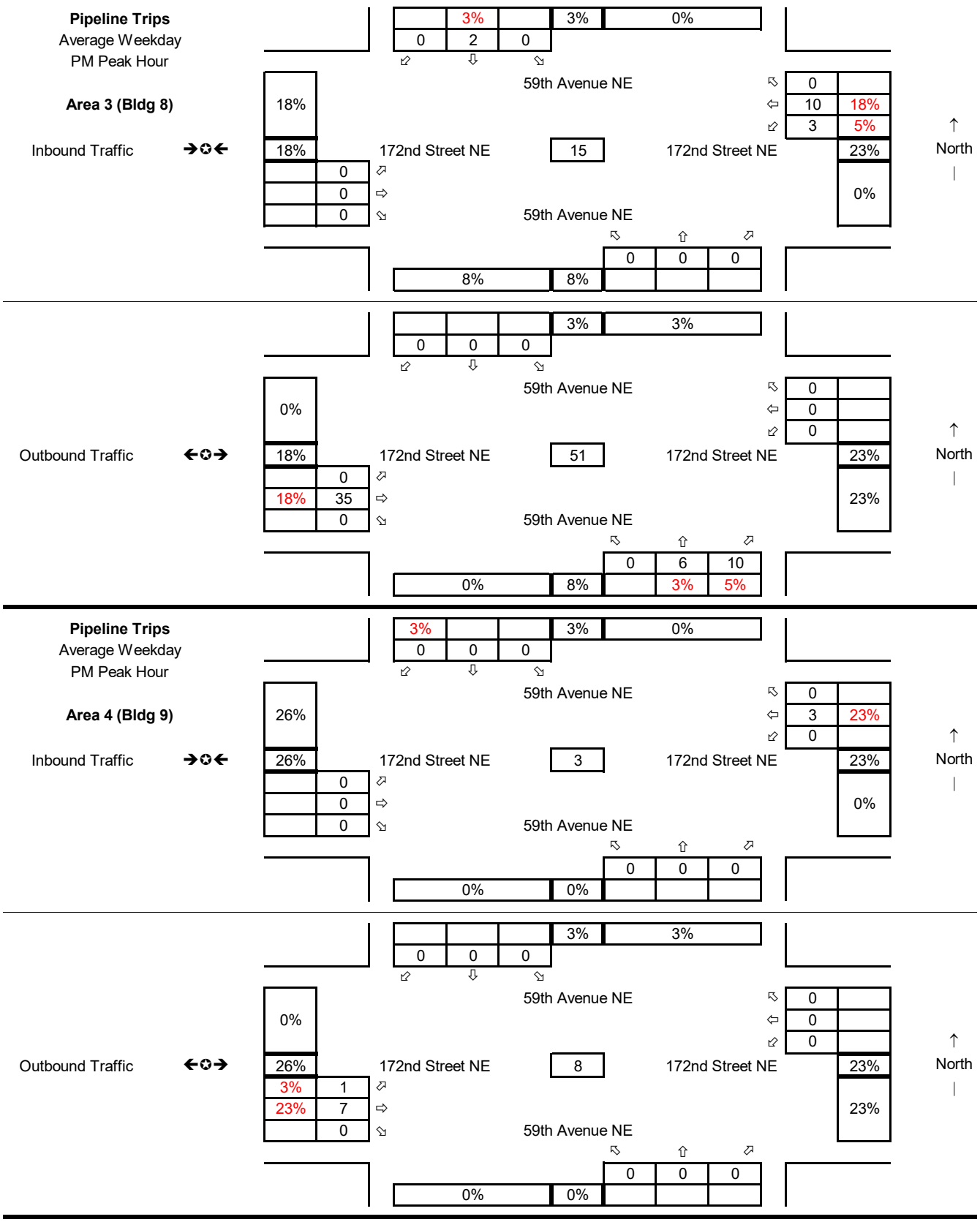


2030 Future w Development
Average Weekday
PM Peak Hour




Development Trips
Average Weekday
PM Peak Hour
Arlington
Inbound Traffic
3%
3%
0%
0 1 0
59th Avenue NE
0%
0
0
8 23%
31%
172nd Street NE
20
172nd Street NE
39%
0
16% 6
15% 5
16%
59th Avenue NE
0 0 0
41%
41%
North
Outbound Traffic
3%
3%
0 0 0
59th Avenue NE
31%
0
0
0
31%
172nd Street NE
31
172nd Street NE
0%
0
0
0
0%
59th Avenue NE
28 3 0
0%
34%
31%
3%
North
Total Pipeline
Average Weekday
PM Peak Hour
Marysville Development
Inbound Traffic
0%
0%
0 16 0
59th Avenue NE
0%
0
81
37
0%
172nd Street NE
165
172nd Street NE
0%
0
3
28
0%
59th Avenue NE
0 0 0
0%
0%
North
Outbound Traffic
0%
0%
0 0 0
59th Avenue NE
0%
0
0
0
0%
172nd Street NE
451
172nd Street NE
0%
1
226
0
0%
59th Avenue NE
90 43 91
0%
0%
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
Outbound Traffic
172nd Street NE
59th Avenue NE
North
11
23
136
369
41%
41%
0%
34%
31%
3%
16%
16%
6%
7%
23%
39%
0%
Pipeline Trips
Average Weekday
PM Peak Hour
Area 2 (Bldg 1, 2, 3 & 4)
Inbound Traffic
Outbound Traffic
172nd Street NE
59th Avenue NE
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
Outbound Traffic
172nd Street NE
59th Avenue NE
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
Outbound Traffic
172nd Street NE
59th Avenue NE
North

2030 Future Year

7 172nd St NE at 63rd Ave NE

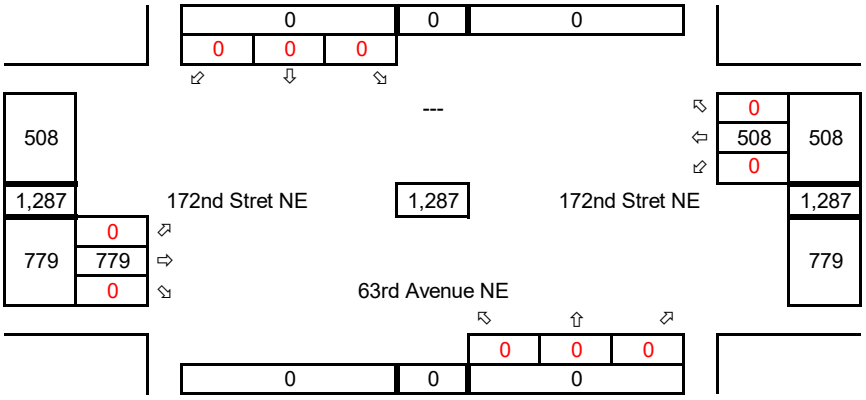
Synchro ID: 7

Existing
Average Weekday
PM Peak Hour

Year: **7/10/2019**

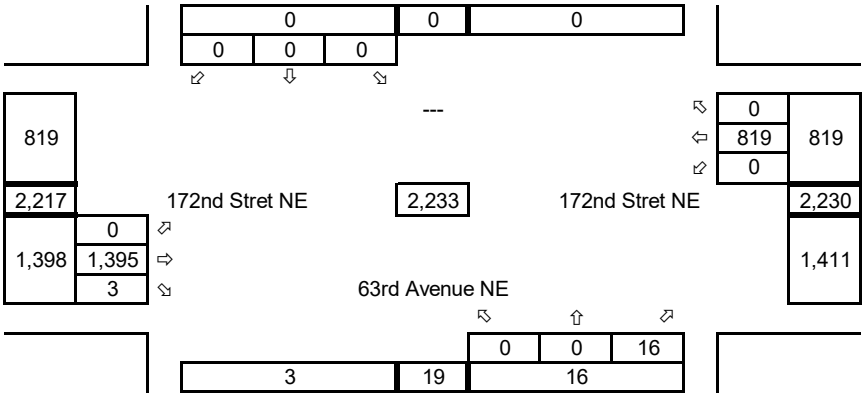
Data Source: **WSDOT**

Based on count from
172nd Street NE at
67th Avenue NE

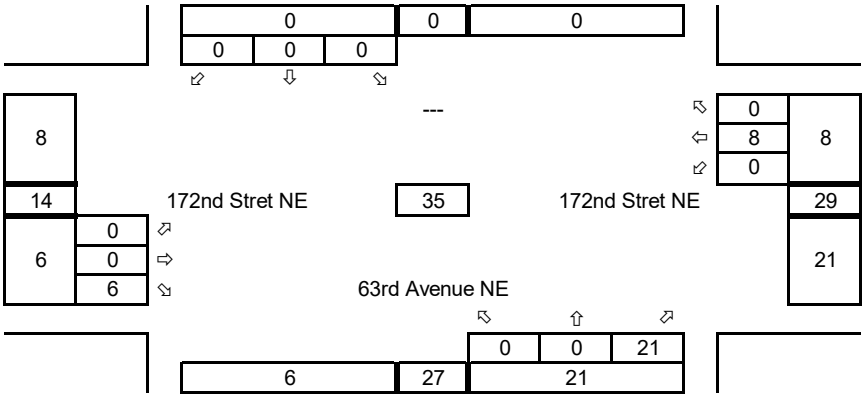


Baseline
Average Weekday
PM Peak Hour

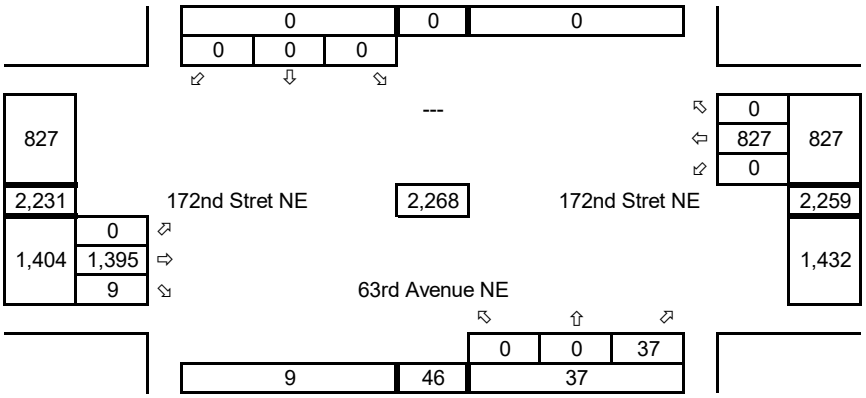
Year: 2030
Growth Rate = 3.0%
Years of Growth = 11
Total Growth = 1.3842



Development Trips
Average Weekday
PM Peak Hour



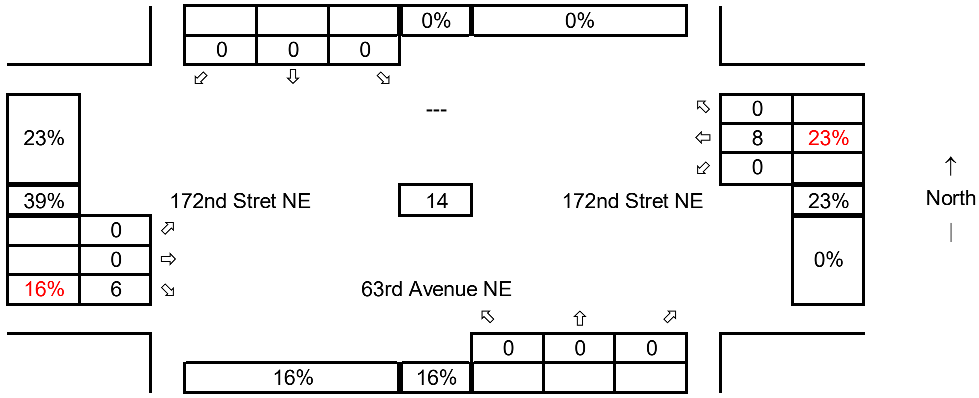
2030 Future w Development
Average Weekday
PM Peak Hour



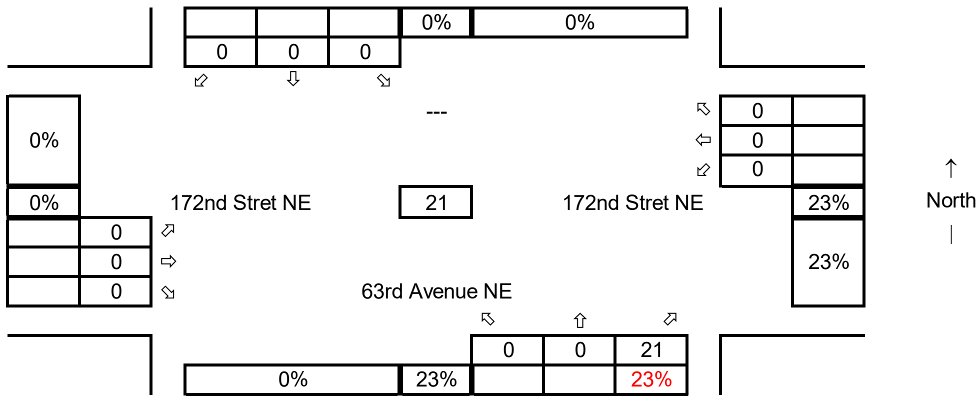
Development Trips
Average Weekday
PM Peak Hour

Arlington

Inbound Traffic ➔✪🡐



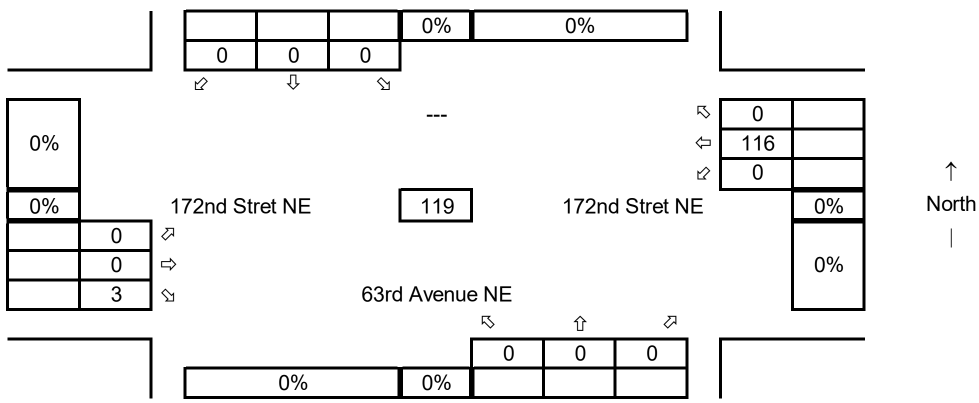
Outbound Traffic 🡐✪➔



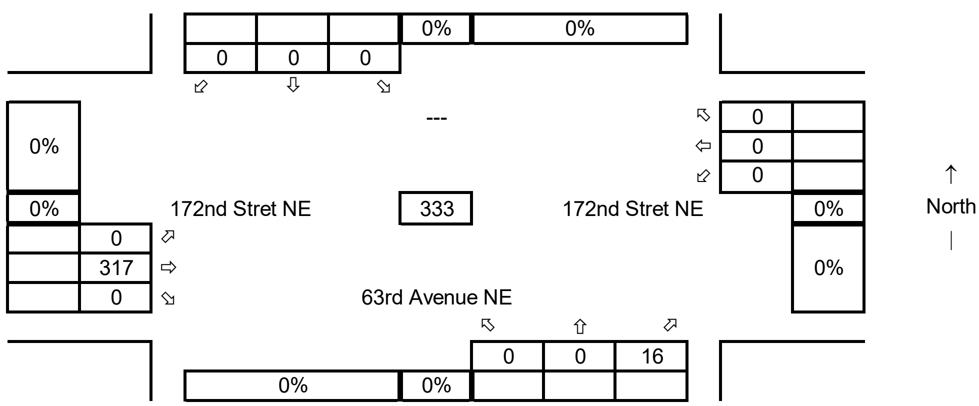
Total Pipeline
Average Weekday
PM Peak Hour

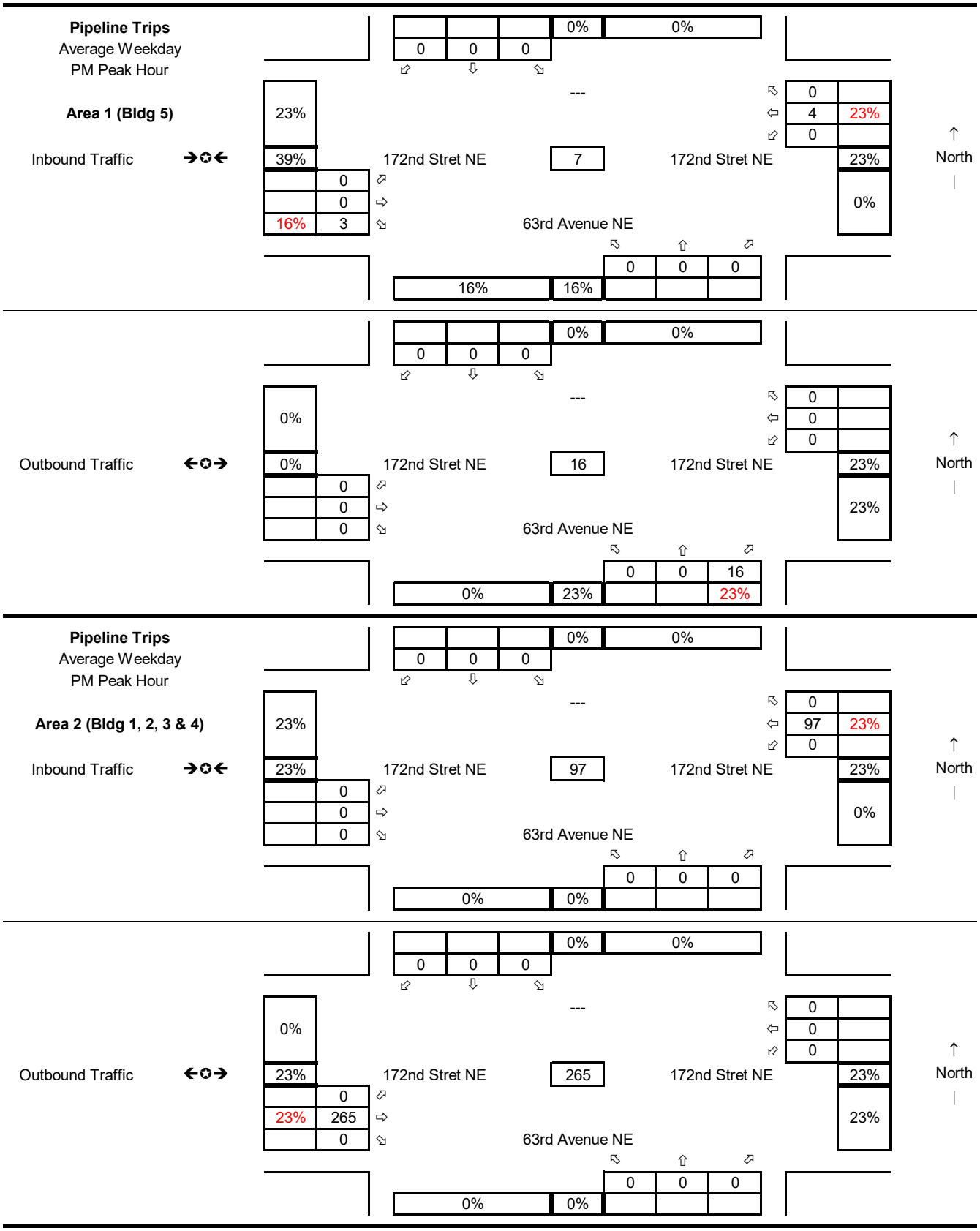
Marysville Development

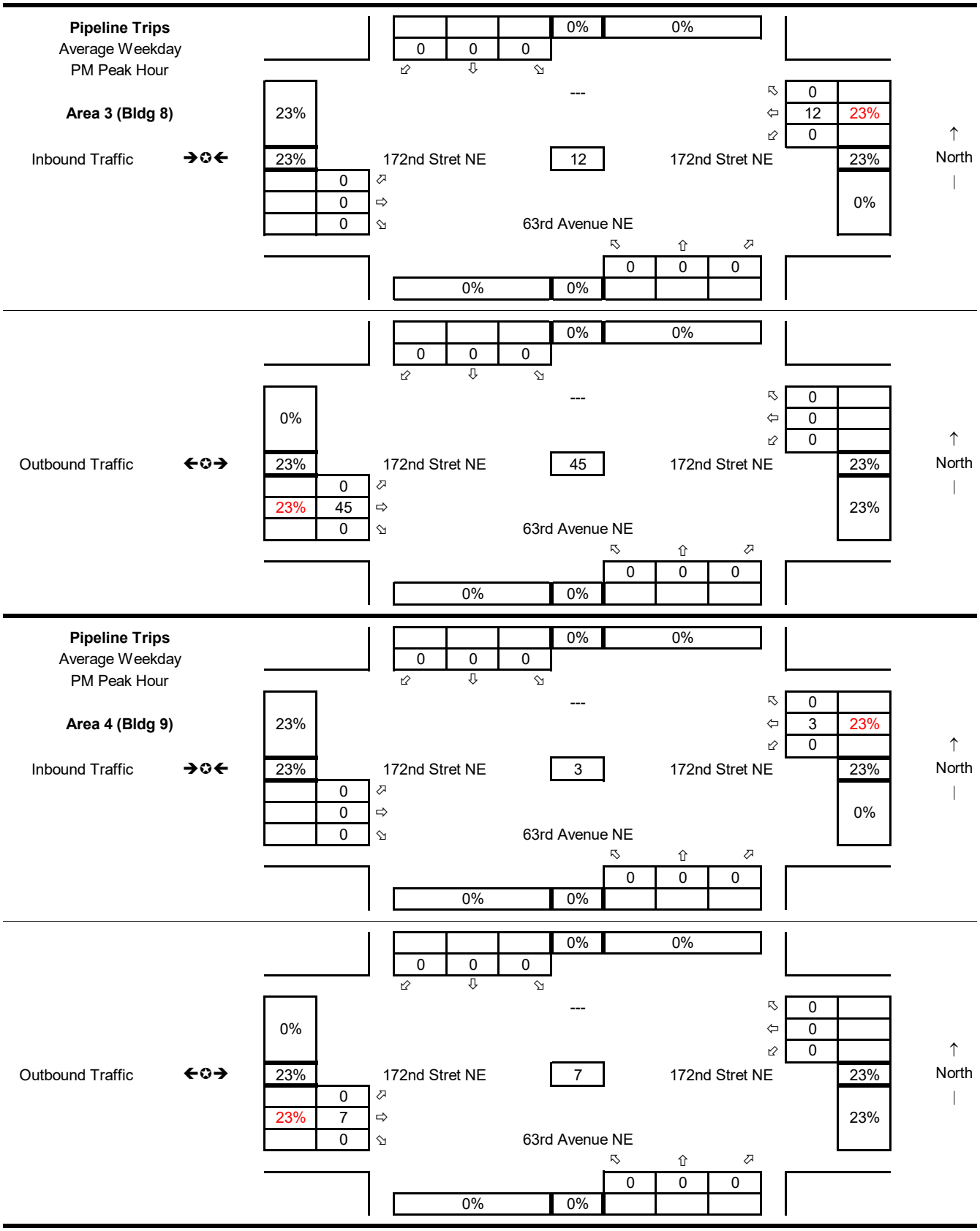
Inbound Traffic ➔✪🡐



Outbound Traffic 🡐✪➔




Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
Outbound Traffic
172nd Stret NE
63rd Avenue NE
North
Area 2 (Bldg 1, 2, 3 & 4)


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
172nd Stret NE
63rd Avenue NE
North
0% 0% 0 0 0 --- 0 12 23% 0 23% 23% 0 0 0 12 23% 0% 0 0 0 0% 0% 0 0 0
Outbound Traffic
172nd Stret NE
63rd Avenue NE
North
0% 0% 0 0 0 --- 0 0 0 0% 23% 0 23% 0 0 0 45 23% 0% 23% 23% 0 23% 45 0 0 0 0% 0% 0 0 0
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
172nd Stret NE
63rd Avenue NE
North
0% 0% 0 0 0 --- 0 3 23% 0 23% 23% 0 0 0 3 23% 0% 0 0 0 0% 0% 0 0 0
Outbound Traffic
172nd Stret NE
63rd Avenue NE
North
0% 0% 0 0 0 --- 0 0 0 0% 23% 0 23% 0 0 0 7 23% 0% 23% 23% 0 23% 7 0 0 0 0% 0% 0 0 0

2030 Future Year

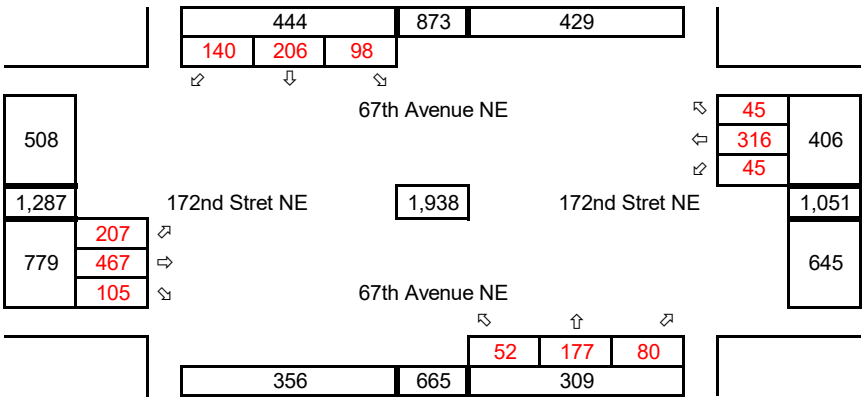
8 172nd St NE at 67th Ave NE

Synchro ID: 8

Existing
Average Weekday
PM Peak Hour

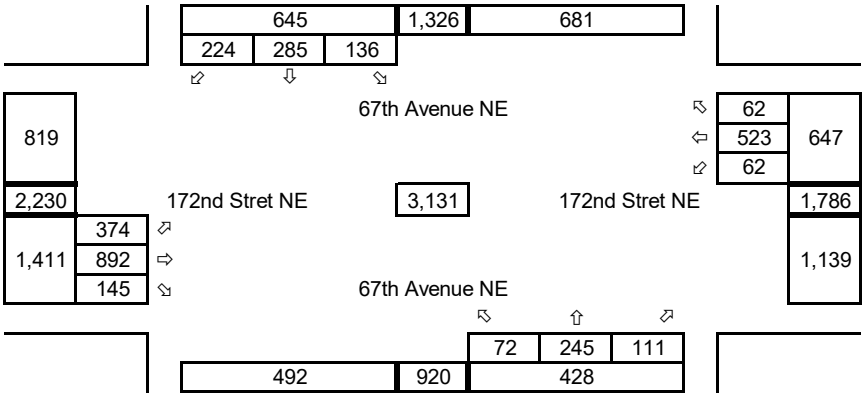
Year: **7/10/2019**

Data Source: **WSDOT**

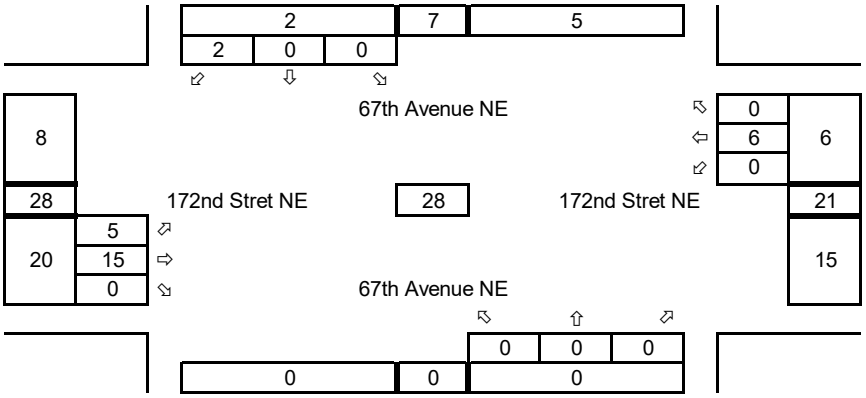


Baseline
Average Weekday
PM Peak Hour

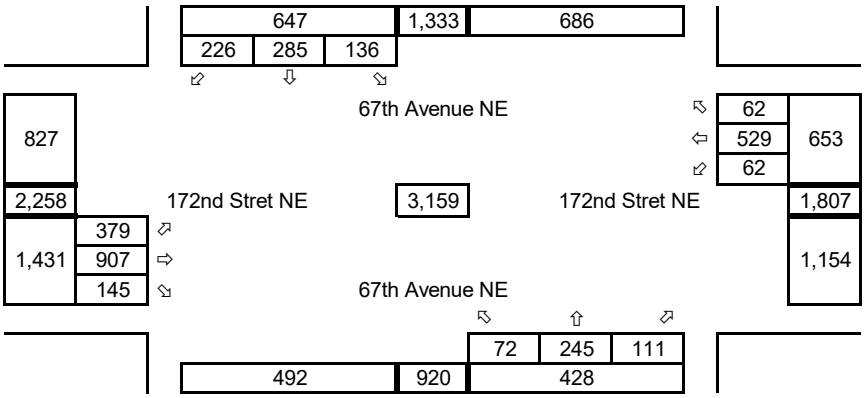
Year: 2030
Growth Rate = 3.0%
Years of Growth = 11
Total Growth = 1.3842

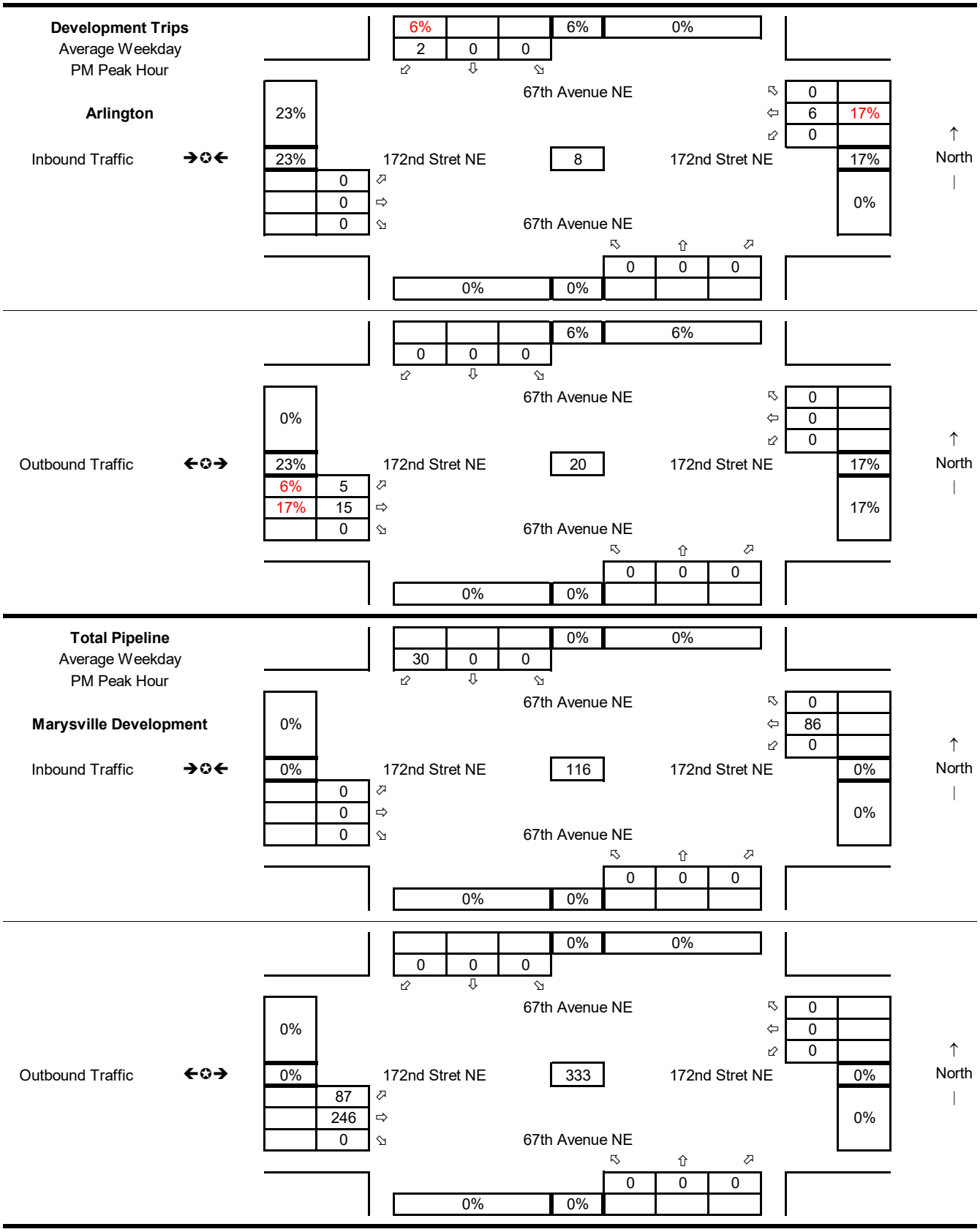


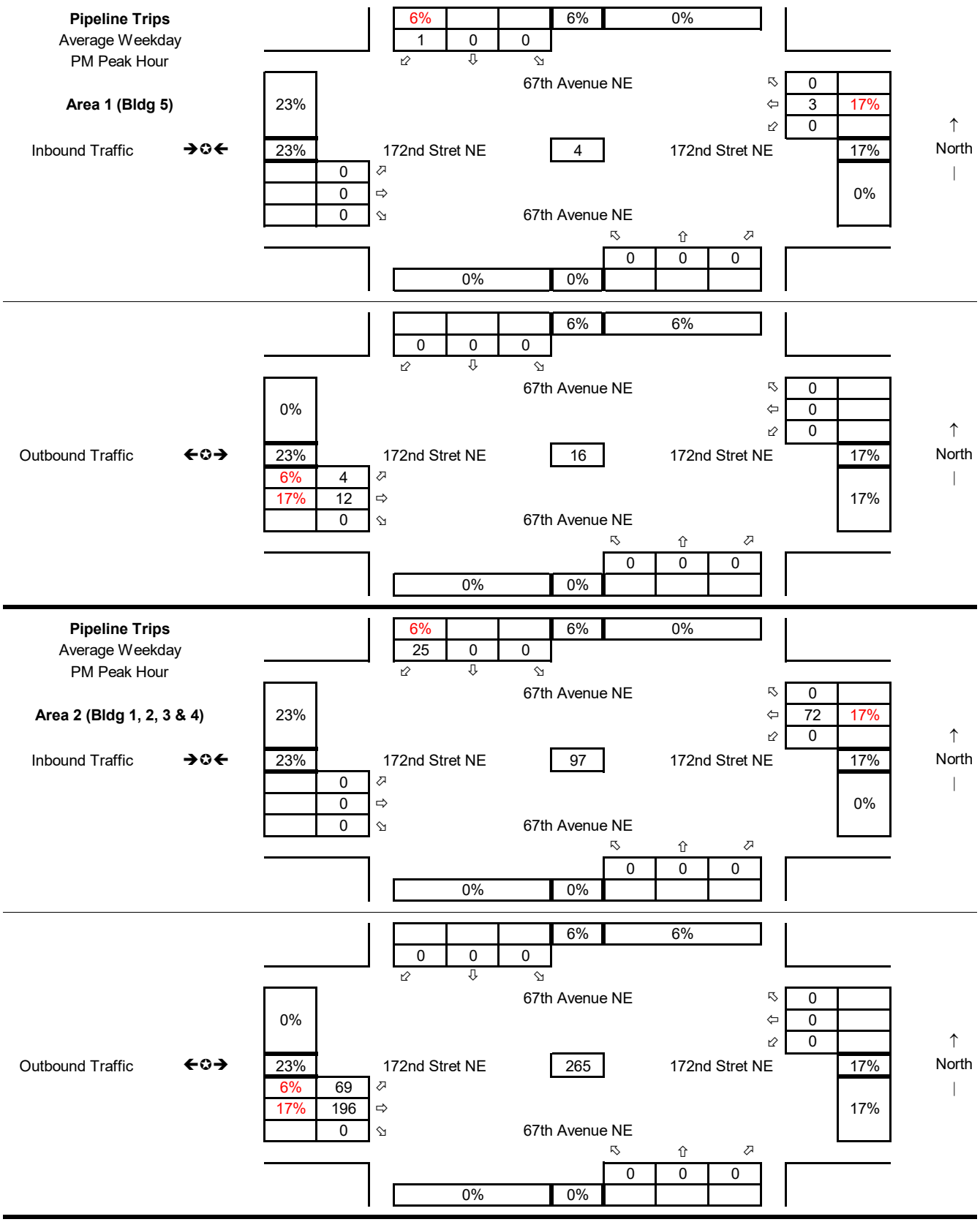
Development Trips
Average Weekday
PM Peak Hour

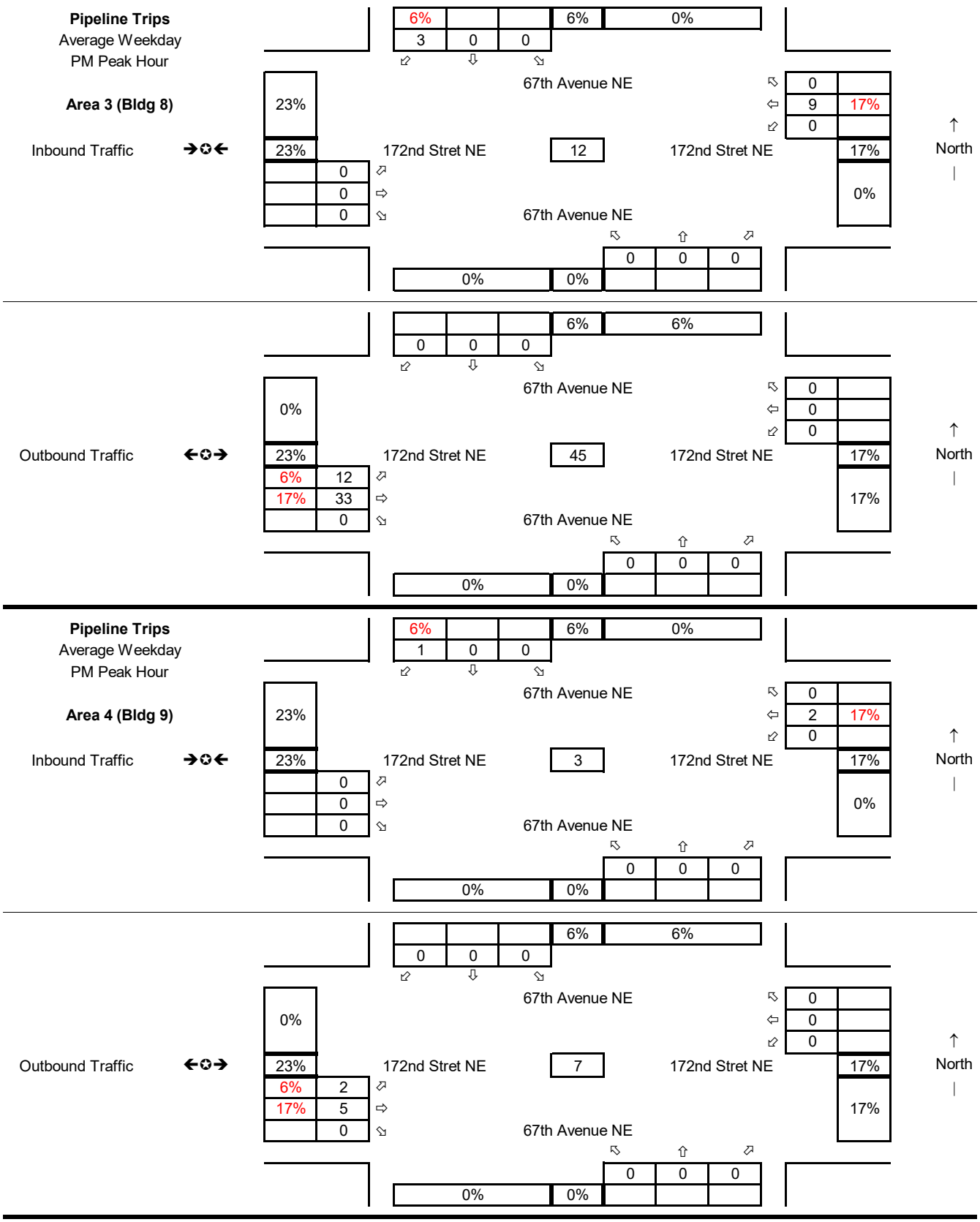


2030 Future w Development
Average Weekday
PM Peak Hour




Development Trips
Average Weekday
PM Peak Hour
Arlington
Inbound Traffic
6%
2
0
0
6%
0%
67th Avenue NE
0
6
17%
0
23%
23%
172nd Stret NE
8
172nd Stret NE
17%
0
0
0
0%
67th Avenue NE
0
0
0
0%
0%
North
Outbound Traffic
6%
0
0
0
6%
6%
67th Avenue NE
0
0
0
0%
23%
172nd Stret NE
20
172nd Stret NE
17%
6%
5
17%
15
0
17%
67th Avenue NE
0
0
0
0%
0%
North
Total Pipeline
Average Weekday
PM Peak Hour
Marysville Development
Inbound Traffic
0%
30
0
0
0%
0%
67th Avenue NE
0
86
0
0%
0%
172nd Stret NE
116
172nd Stret NE
0%
0
0
0
0%
67th Avenue NE
0
0
0
0%
0%
North
Outbound Traffic
0%
0
0
0
0%
0%
67th Avenue NE
0
0
0
0%
0%
172nd Stret NE
333
172nd Stret NE
0%
87
246
0
0%
67th Avenue NE
0
0
0
0%
0%
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
6%
1
0
0
6%
0%
67th Avenue NE
23%
0
3
17%
0
23%
172nd Stret NE
4
172nd Stret NE
17%
0
0
0
0%
67th Avenue NE
0
0
0
0%
0%
North
Outbound Traffic
6%
0
0
0
6%
6%
67th Avenue NE
0%
0
0
0
23%
172nd Stret NE
16
172nd Stret NE
17%
6%
4
17%
12
17%
0
67th Avenue NE
0
0
0
0%
0%
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 2 (Bldg 1, 2, 3 & 4)
Inbound Traffic
6%
25
0
0
6%
0%
67th Avenue NE
23%
0
72
17%
0
23%
172nd Stret NE
97
172nd Stret NE
17%
0
0
0
0%
67th Avenue NE
0
0
0
0%
0%
North
Outbound Traffic
6%
0
0
0
6%
6%
67th Avenue NE
0%
0
0
0
23%
172nd Stret NE
265
172nd Stret NE
17%
6%
69
17%
196
17%
0
67th Avenue NE
0
0
0
0%
0%
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
6%
3
0
0
6%
0%
67th Avenue NE
23%
0
9
17%
0
23%
172nd Stret NE
12
172nd Stret NE
17%
0
0
0
0%
67th Avenue NE
0
0
0
0%
0%
North
Outbound Traffic
6%
0
0
0
6%
6%
67th Avenue NE
0%
0
0
0
23%
172nd Stret NE
45
172nd Stret NE
17%
6%
12
17%
33
17%
0
67th Avenue NE
0
0
0
0%
0%
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
6%
1
0
0
6%
0%
67th Avenue NE
23%
0
2
17%
0
23%
172nd Stret NE
3
172nd Stret NE
17%
0
0
0
0%
67th Avenue NE
0
0
0
0%
0%
North
Outbound Traffic
6%
0
0
0
6%
6%
67th Avenue NE
0%
0
0
0
23%
172nd Stret NE
7
172nd Stret NE
17%
6%
2
17%
5
17%
0
67th Avenue NE
0
0
0
0%
0%
North

2030 Future Year

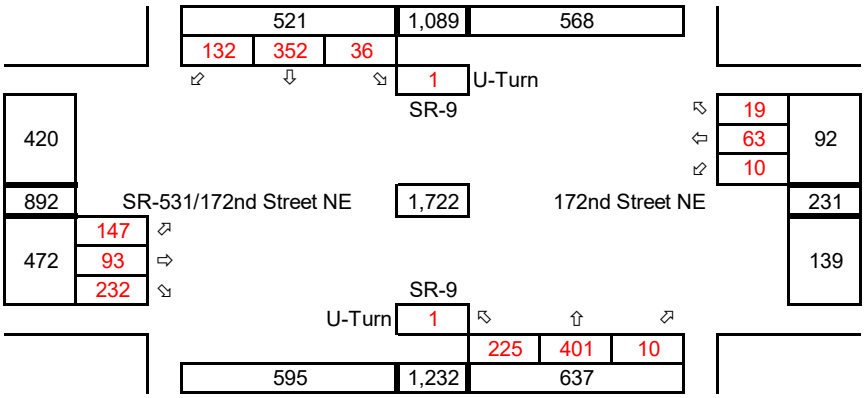
9 172nd St NE at SR-9

Synchro ID: 9

Existing
Average Weekday
PM Peak Hour

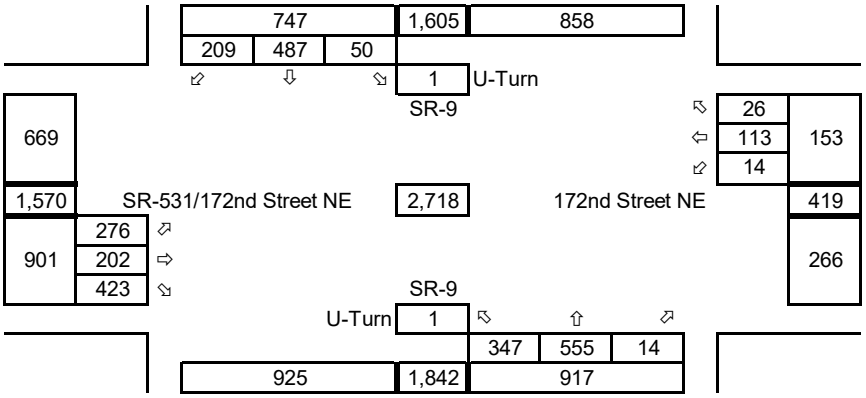
Year: **5/5/2019**

Data Source: **WSDOT**

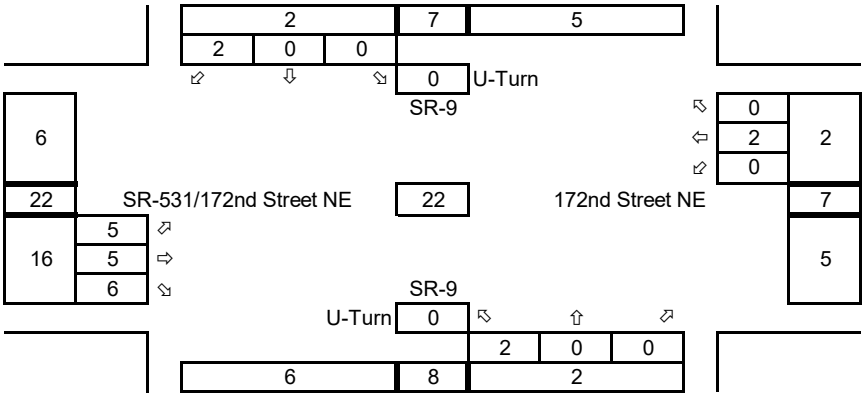


Baseline
Average Weekday
PM Peak Hour

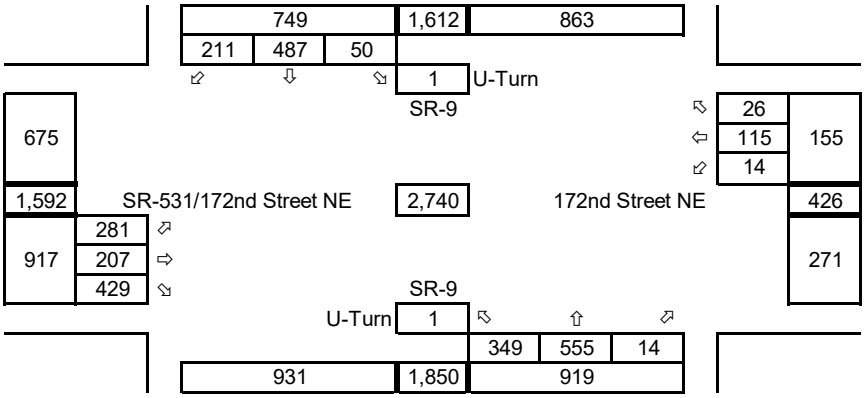
Year: 2030
Growth Rate = 3.0%
Years of Growth = 11
Total Growth = 1.3842

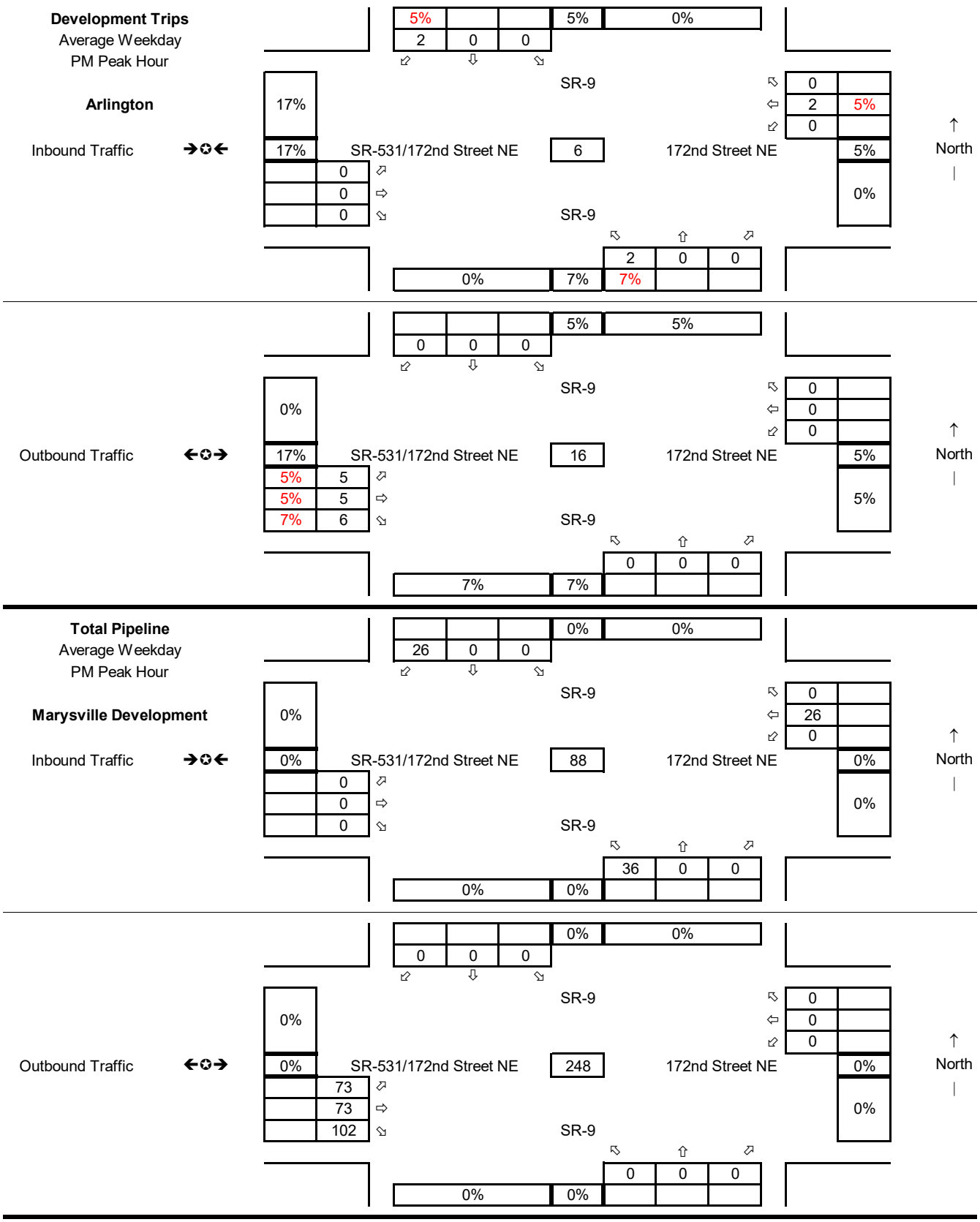


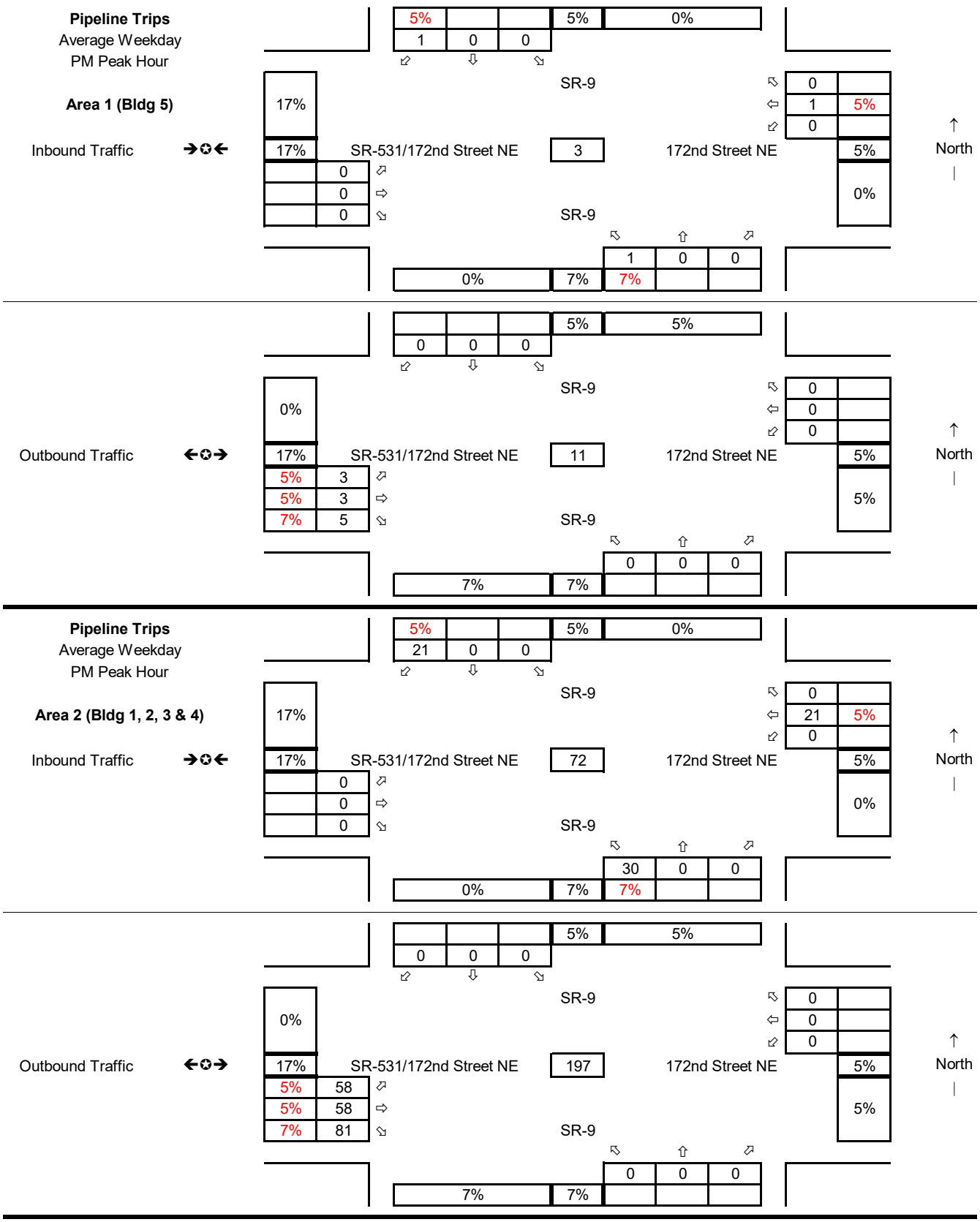
Development Trips
Average Weekday
PM Peak Hour

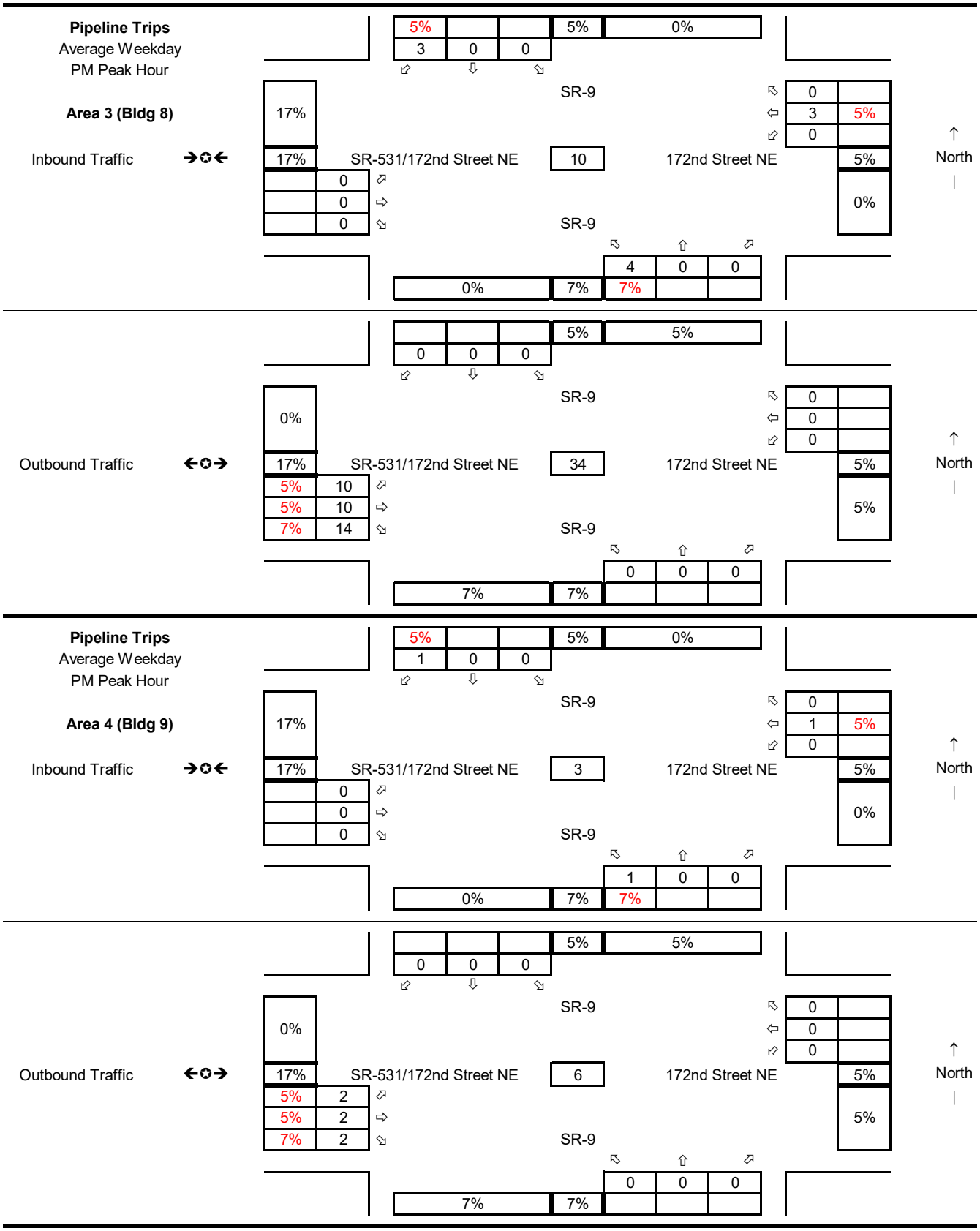


2030 Future w Development
Average Weekday
PM Peak Hour




Development Trips
Average Weekday
PM Peak Hour
Arlington
Inbound Traffic
5% 5% 0%
2 0 0
SR-9
17%
0 2 5% 0
17% SR-531/172nd Street NE 6 172nd Street NE 5%
0 0 0%
0 0 0
SR-9
2 0 0
0% 7% 7%
North
5% 5%
0 0 0
SR-9
0%
0 0 0
Outbound Traffic
17% SR-531/172nd Street NE 16 172nd Street NE 5%
5% 5 5% 5 5%
7% 6
SR-9
0 0 0
7% 7%
North
Total Pipeline
Average Weekday
PM Peak Hour
Marysville Development
Inbound Traffic
0% 0%
26 0 0
SR-9
0%
0 26 0
0% SR-531/172nd Street NE 88 172nd Street NE 0%
0 0 0%
0 0 0
SR-9
36 0 0
0% 0%
North
0% 0%
0 0 0
SR-9
0%
0 0 0
Outbound Traffic
0% SR-531/172nd Street NE 248 172nd Street NE 0%
73 73 0%
73 102
SR-9
0 0 0
0% 0%
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
5% 5% 0%
1 0 0
SR-9
0
1 5%
0
17%
17% SR-531/172nd Street NE 3 172nd Street NE 5%
0
0
0
0%
SR-9
1 0 0
0% 7% 7%
North
5% 5%
0 0 0
SR-9
0
0
0
0%
Outbound Traffic
17% SR-531/172nd Street NE 11 172nd Street NE 5%
5% 3
5% 3
7% 5
5%
SR-9
0 0 0
7% 7%
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 2 (Bldg 1, 2, 3 & 4)
Inbound Traffic
5% 5% 0%
21 0 0
SR-9
0
21 5%
0
17%
17% SR-531/172nd Street NE 72 172nd Street NE 5%
0
0
0
0%
SR-9
30 0 0
0% 7% 7%
North
5% 5%
0 0 0
SR-9
0
0
0
0%
Outbound Traffic
17% SR-531/172nd Street NE 197 172nd Street NE 5%
5% 58
5% 58
7% 81
5%
SR-9
0 0 0
7% 7%
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
5% 5% 0%
3 0 0
SR-9
17%
0 3 5% 0
17% SR-531/172nd Street NE 10 172nd Street NE 5%
0 0 0
0%
SR-9
4 0 0
0% 7% 7%
North
5% 5%
0 0 0
SR-9
0%
0 0 0
Outbound Traffic
17% SR-531/172nd Street NE 34 172nd Street NE 5%
5% 10
5% 10
7% 14
5%
SR-9
0 0 0
7% 7%
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
5% 5% 0%
1 0 0
SR-9
17%
0 1 5% 0
17% SR-531/172nd Street NE 3 172nd Street NE 5%
0 0 0
0%
SR-9
1 0 0
0% 7% 7%
5% 5%
0 0 0
SR-9
0%
0 0 0
Outbound Traffic
17% SR-531/172nd Street NE 6 172nd Street NE 5%
5% 2
5% 2
7% 2
5%
SR-9
0 0 0
7% 7%

2030 Future Year 10 Site Access at 59th Ave NE

Synchro ID: 10

Existing
Average Weekday
PM Peak Hour

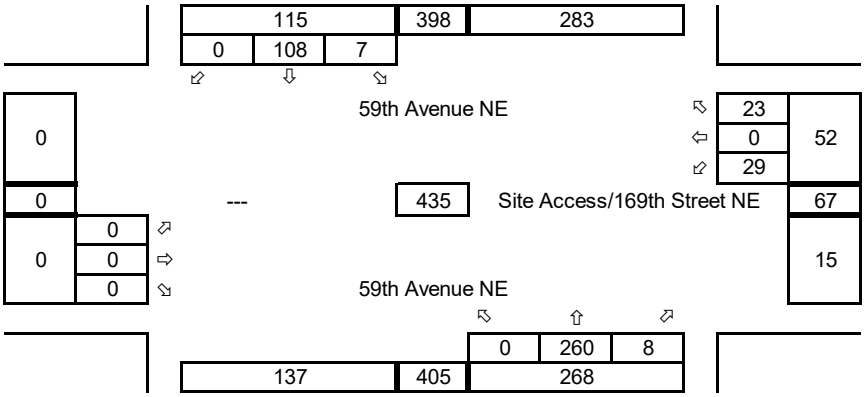
Year: **7/10/2019**

Data Source: **WSDOT**

Volumes are based on
Intersection #6 -
172nd Street NE/SR-531 at
59th Avenue NE

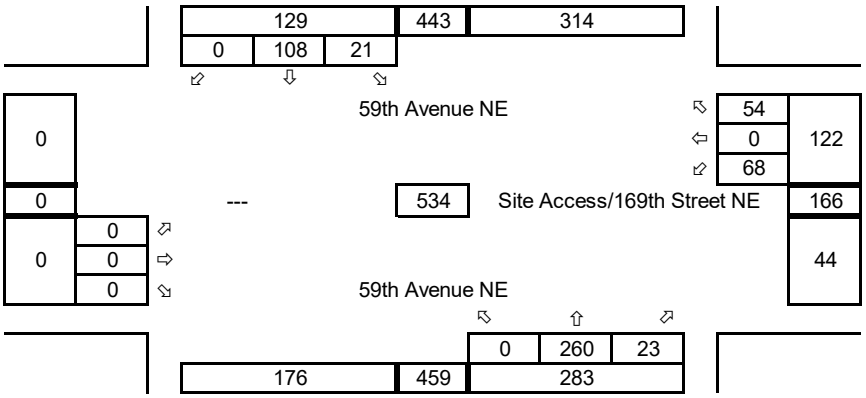
Baseline
Average Weekday
PM Peak Hour

Year: 2030
Growth Rate = 3.0%
Years of Growth = 11
Total Growth = 1.3842



Development Trips
Average Weekday
PM Peak Hour

2030 Future w Development
Average Weekday
PM Peak Hour



Development Trips
Average Weekday
PM Peak Hour

Arlington

Inbound Traffic ➔✪🡐

59th Avenue NE (north leg): 41% | 41% | 0%
Southbound: 0 | 0 | 14

Westbound (Site Access/169th Street NE): 0 | 0 | 0 — 84% — 84%

West leg: 0% — 0%
Eastbound (---): 0 | 0 | 0

29

Site Access/169th Street NE

59th Avenue NE (south leg)
Northbound: 0 | 0 | 15
0% | 43% | 43%

North

Outbound Traffic 🡐✪➔

59th Avenue NE (north leg): 34% | 34%
Southbound: 0 | 0 | 0

Westbound (Site Access/169th Street NE): 31 (34%) | 0 | 39 (43%) — 77% — 0%

West leg: 0% — 0%
Eastbound (---): 0 | 0 | 0

70

Site Access/169th Street NE

59th Avenue NE (south leg)
Northbound: 0 | 0 | 0
43% | 43%

North

Total Pipeline
Average Weekday
PM Peak Hour

Marysville Development

Inbound Traffic ➔✪🡐

59th Avenue NE (north leg): 0% | 0%
Southbound: 0 | 72 | 7

Westbound (Site Access/169th Street NE): 0 | 0 | 0 — 0% — 0%

West leg: 0% — 0%
Eastbound (---): 0 | 0 | 0

87

Site Access/169th Street NE

59th Avenue NE (south leg)
Northbound: 0 | 0 | 8
0% | 0%

North

Outbound Traffic 🡐✪➔

59th Avenue NE (north leg): 0% | 0%
Southbound: 0 | 0 | 0

Westbound (Site Access/169th Street NE): 23 | 0 | 29 — 0% — 0%

West leg: 0% — 0%
Eastbound (---): 0 | 0 | 0

252

Site Access/169th Street NE

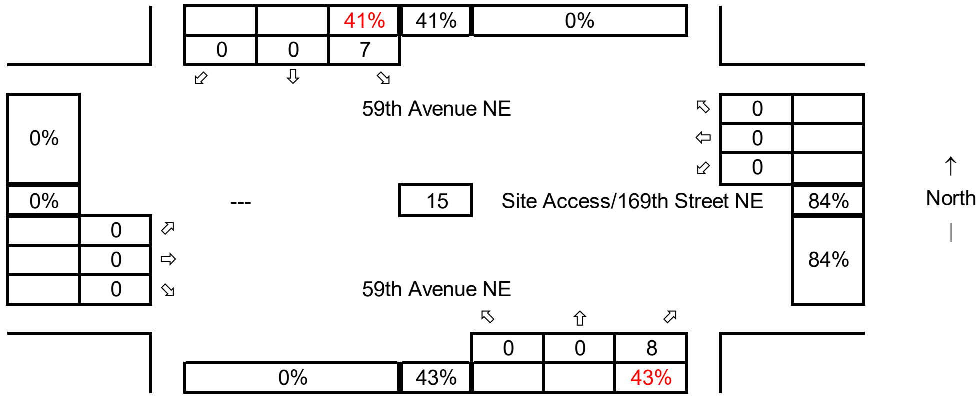
59th Avenue NE (south leg)
Northbound: 0 | 200 | 0
0% | 0%

North

Pipeline Trips
Average Weekday
PM Peak Hour

Area 1 (Bldg 5)

Inbound Traffic

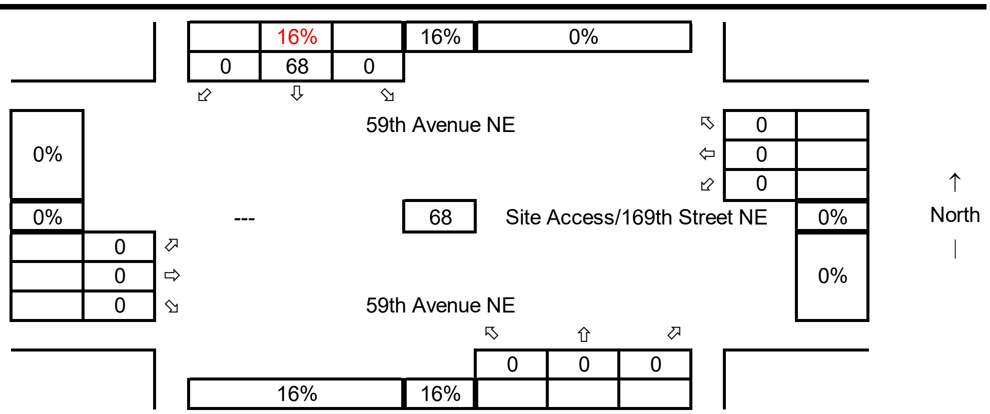


Outbound Traffic

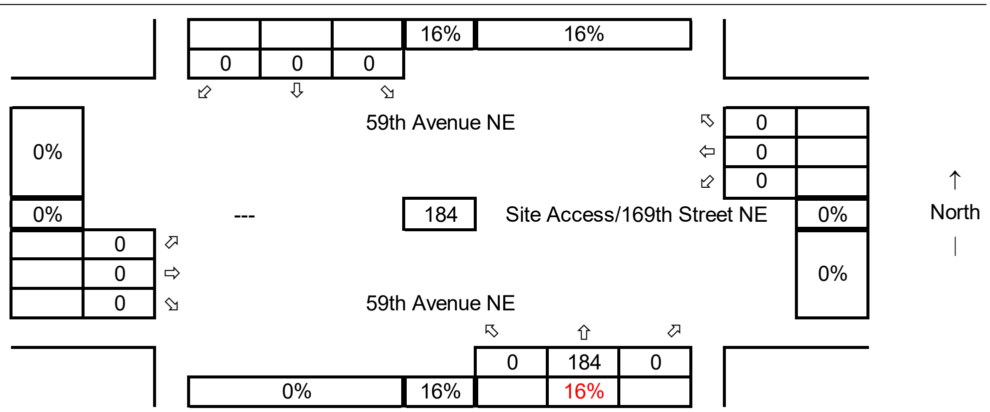
Pipeline Trips
Average Weekday
PM Peak Hour

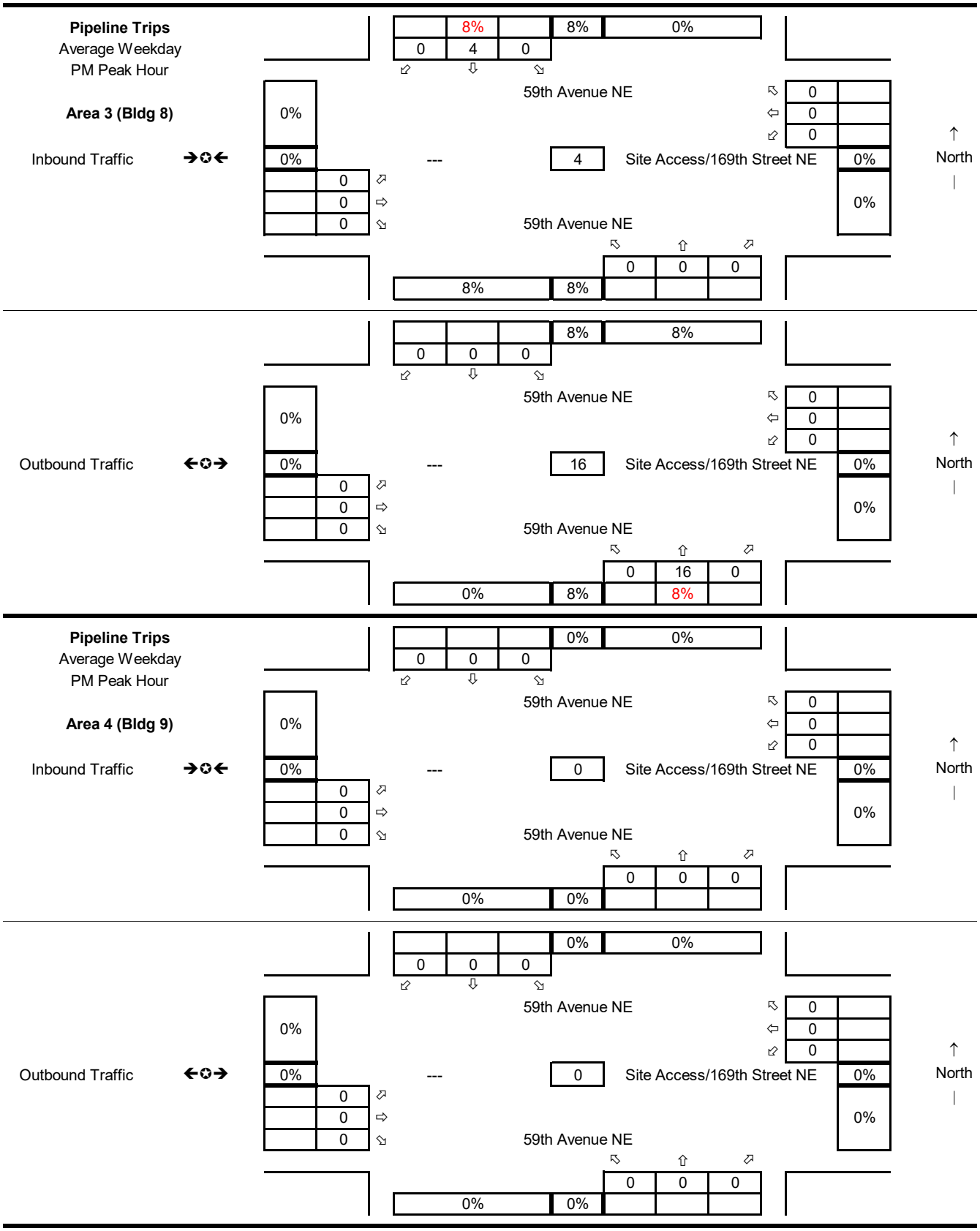
Area 2 (Bldg 1, 2, 3 & 4)

Inbound Traffic



Outbound Traffic




Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
Outbound Traffic
59th Avenue NE
Site Access/169th Street NE
North

Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
Outbound Traffic
59th Avenue NE
Site Access/169th Street NE
North

2036 Horizon Year Turning Movement Calculations

2036 Future Year

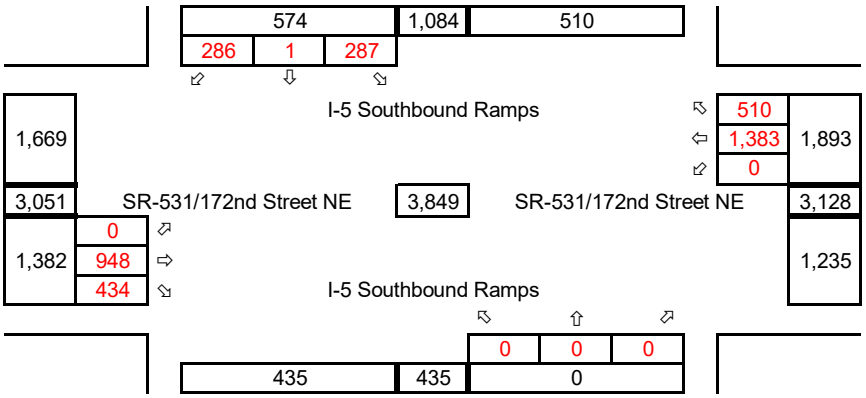
1 172nd St NE at I-5 SB Ramps

Synchro ID: 1

Existing
Average Weekday
PM Peak Hour

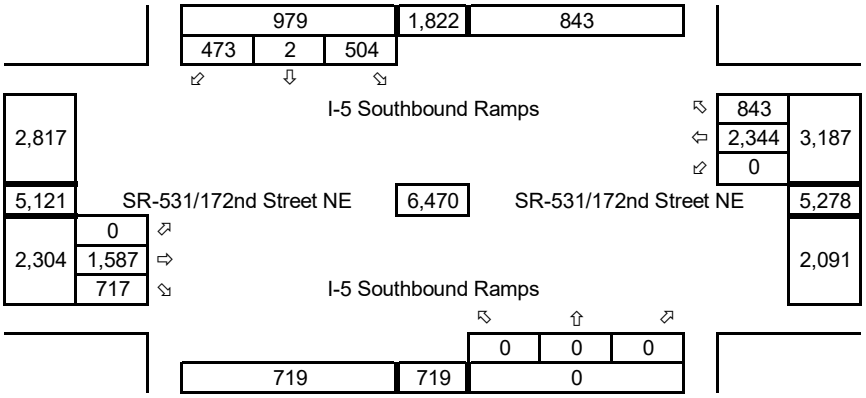
Year: **4/9/2019**

Data Source: **WSDOT**

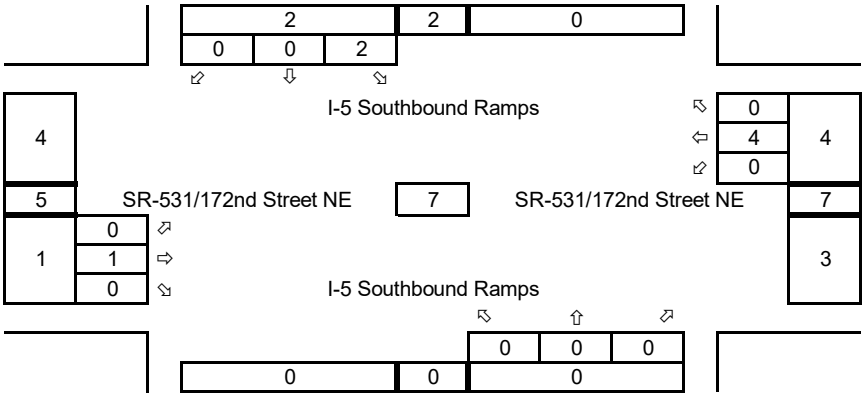


Baseline
Average Weekday
PM Peak Hour

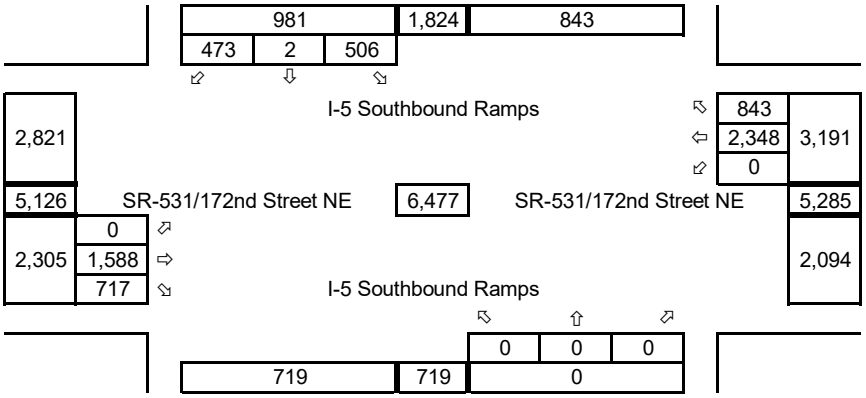
Year: 2036
Growth Rate = 3.0%
Years of Growth = 17
Total Growth = 1.6528



Development Trips
Average Weekday
PM Peak Hour



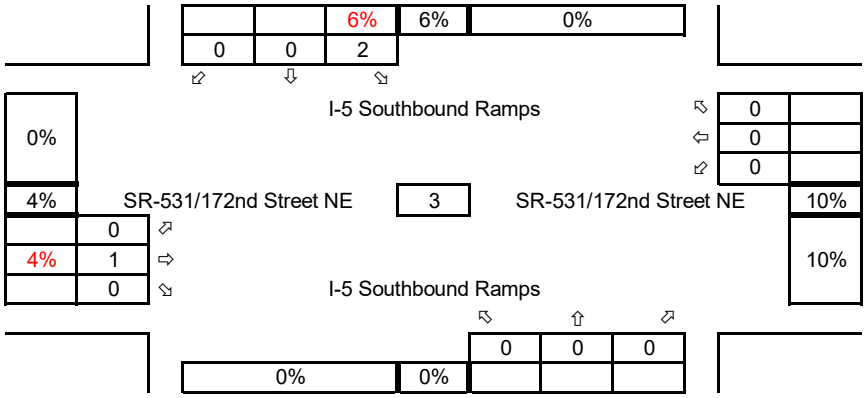
2036 Future w Development
Average Weekday
PM Peak Hour



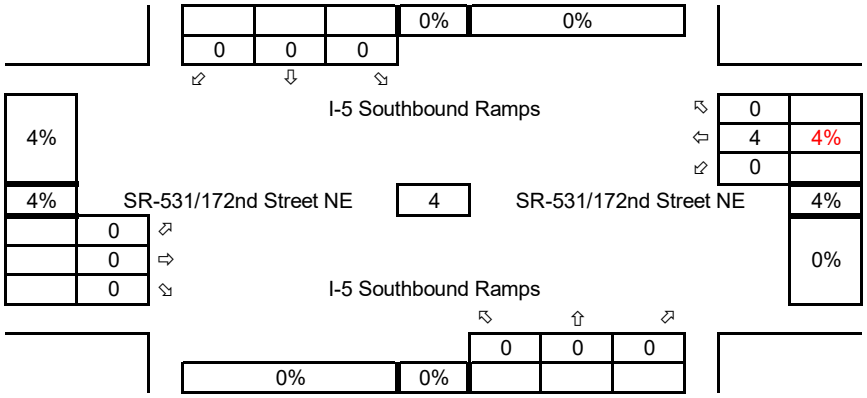
Development Trips
Average Weekday
PM Peak Hour

Arlington

Inbound Traffic



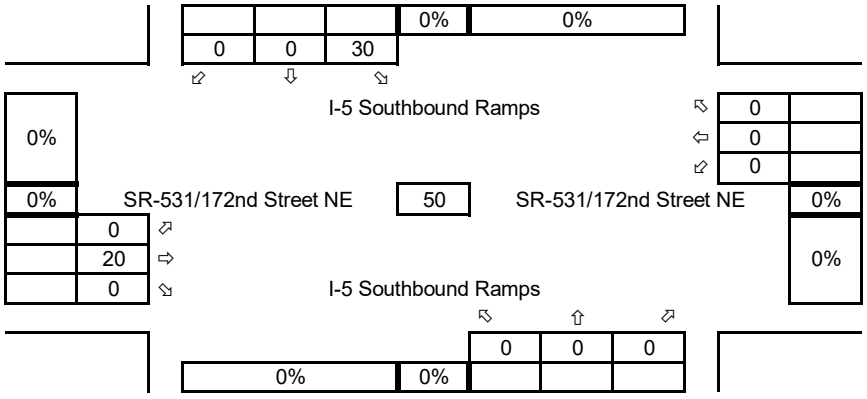
Outbound Traffic



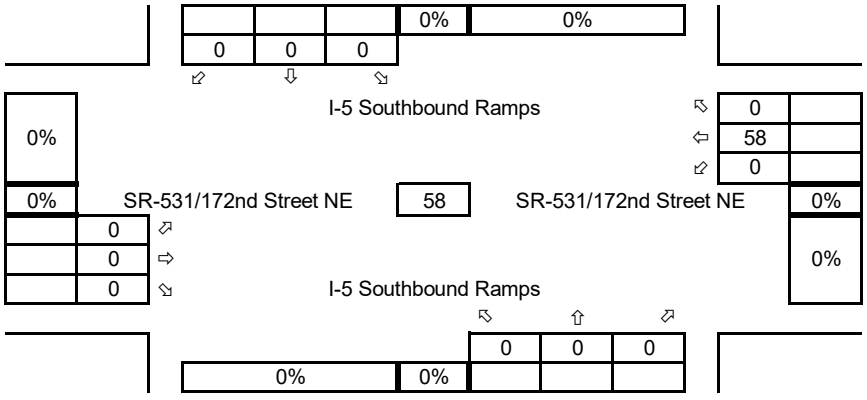
Total Pipeline Trips
Average Weekday
PM Peak Hour

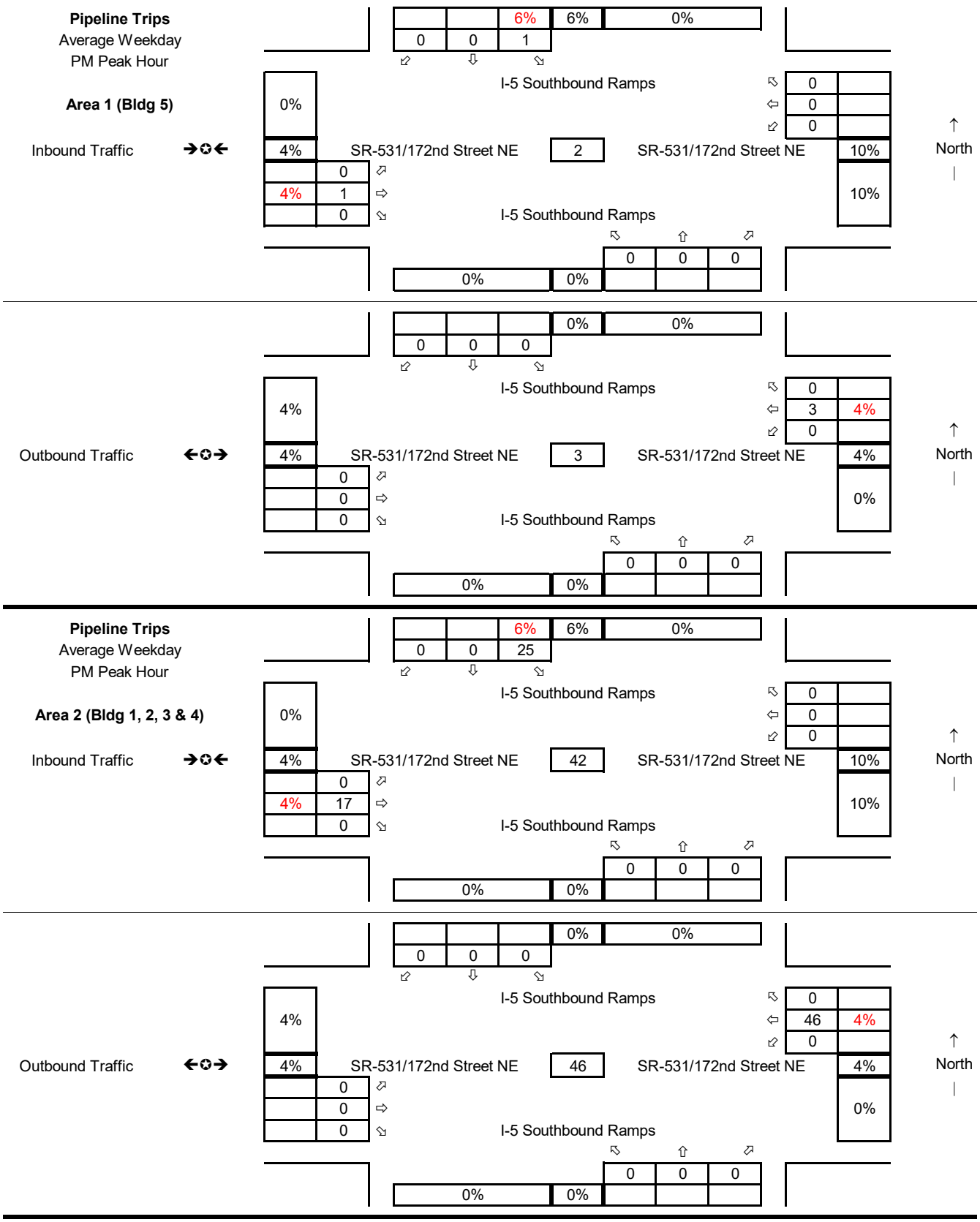
Marysville Development

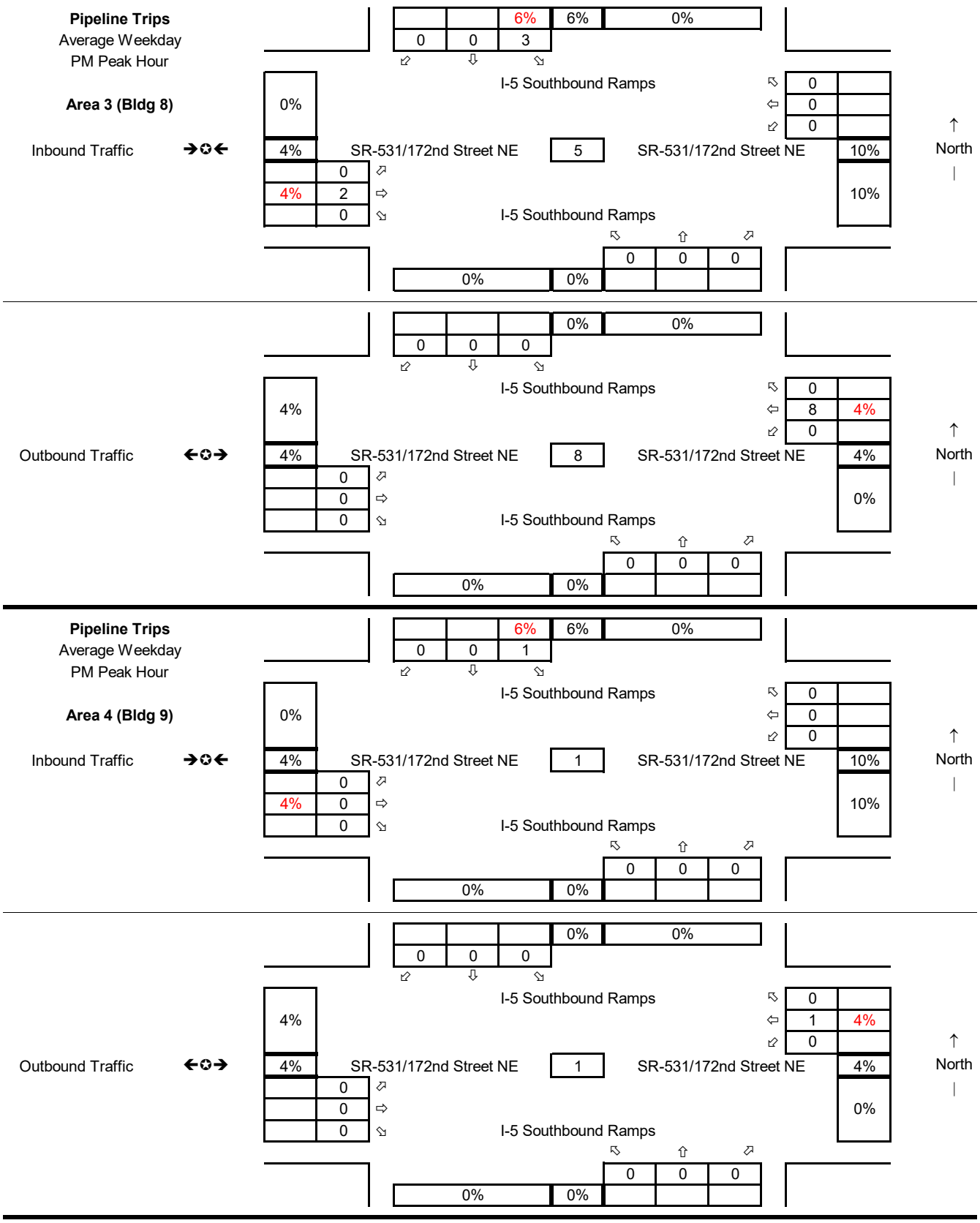
Inbound Traffic



Outbound Traffic




Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
Outbound Traffic
SR-531/172nd Street NE
I-5 Southbound Ramps
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 2 (Bldg 1, 2, 3 & 4)
Inbound Traffic
Outbound Traffic
SR-531/172nd Street NE
I-5 Southbound Ramps
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
6%
6%
0%
0 0 3
I-5 Southbound Ramps
0%
0 0 0
4% 0 4% 2 0
SR-531/172nd Street NE
5
SR-531/172nd Street NE
10%
10%
0 0 0
0% 0%
North
Outbound Traffic
0%
0%
0 0 0
I-5 Southbound Ramps
4%
0 8 4% 0
4%
SR-531/172nd Street NE
8
SR-531/172nd Street NE
4%
0%
0 0 0
0% 0%
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
6%
6%
0%
0 0 1
I-5 Southbound Ramps
0%
0 0 0
4% 0 4% 0 0
SR-531/172nd Street NE
1
SR-531/172nd Street NE
10%
10%
0 0 0
0% 0%
North
Outbound Traffic
0%
0%
0 0 0
I-5 Southbound Ramps
4%
0 1 4% 0
4%
SR-531/172nd Street NE
1
SR-531/172nd Street NE
4%
0%
0 0 0
0% 0%
North

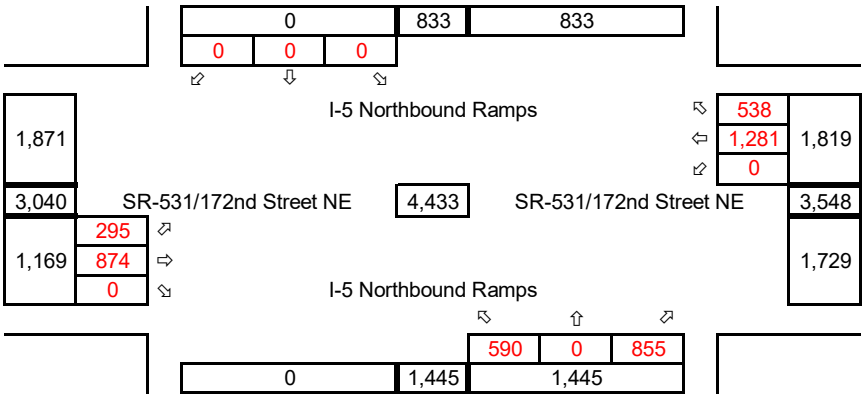
2036 Future Year 2 172nd St NE at I-5 NB Ramps

Synchro ID: 2

Existing
Average Weekday
PM Peak Hour

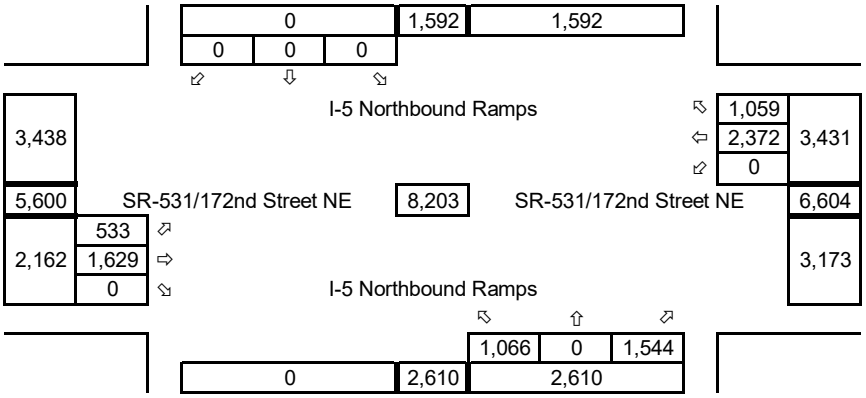
Year: **7/13/2016**

Data Source: **WSDOT**

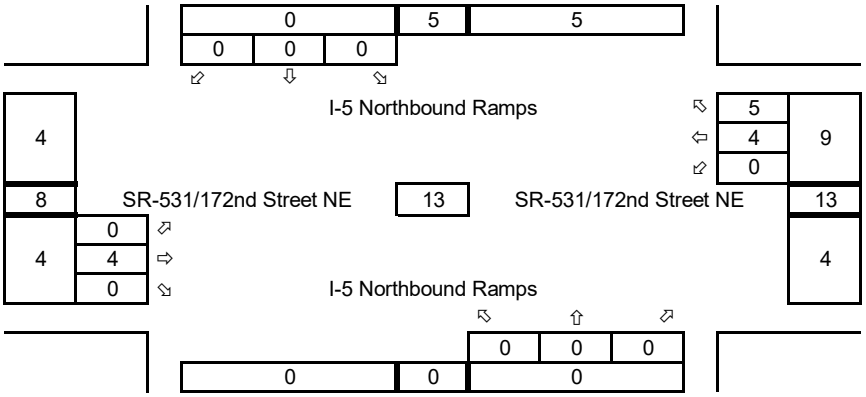


Baseline
Average Weekday
PM Peak Hour

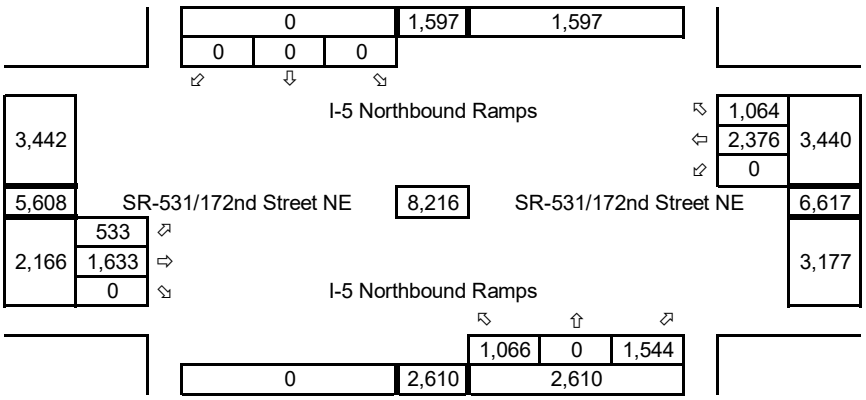
Year: 2036
Growth Rate = 3.0%
Years of Growth = 20
Total Growth = 1.8061



Development Trips
Average Weekday
PM Peak Hour

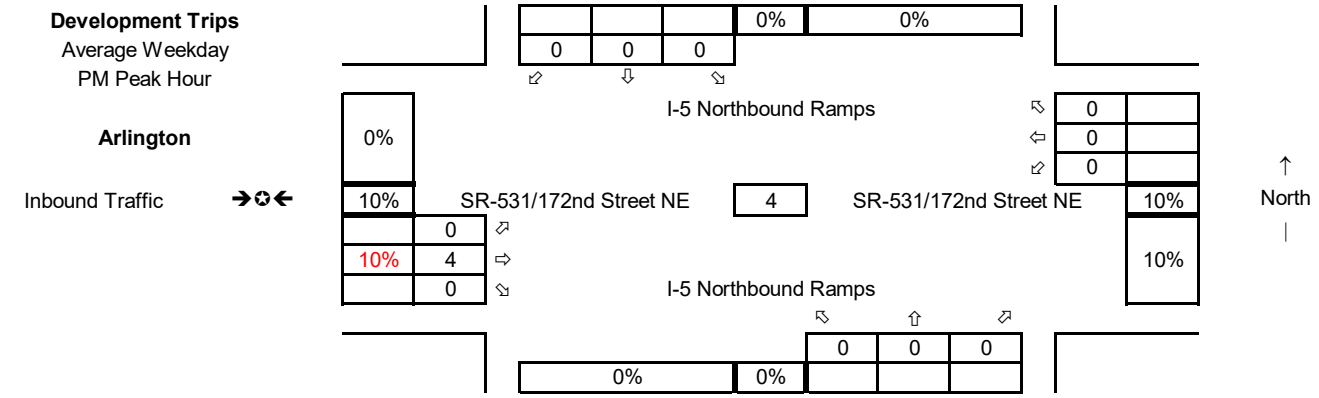


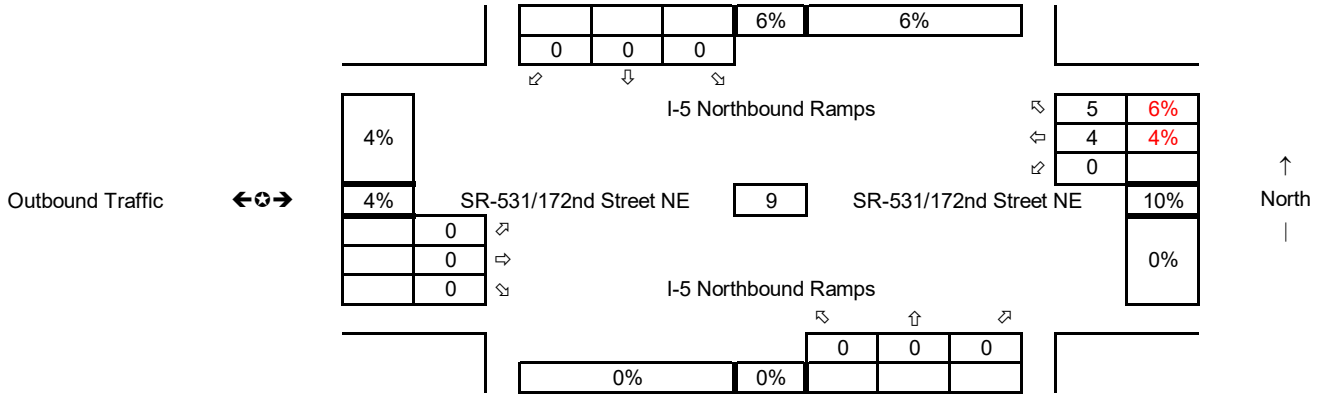
2036 Future w Development
Average Weekday
PM Peak Hour



Development Trips
Average Weekday
PM Peak Hour

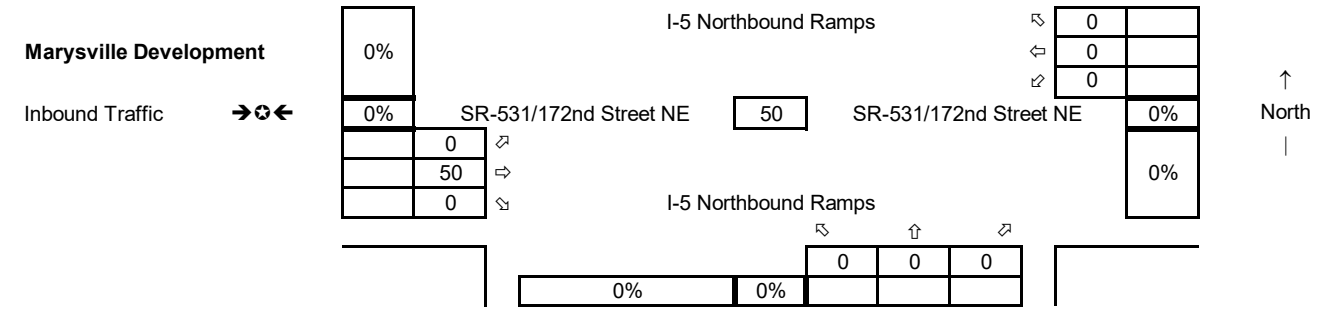
Arlington

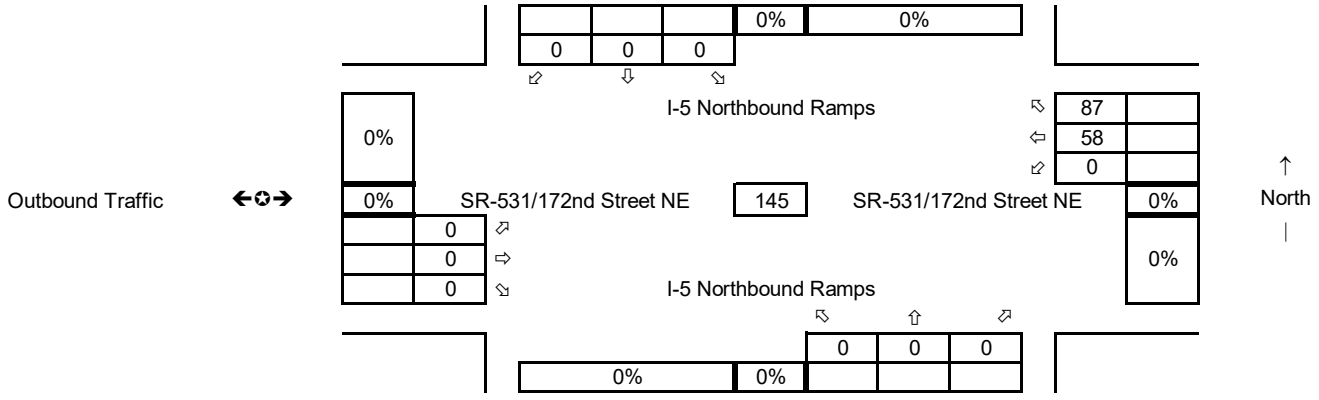


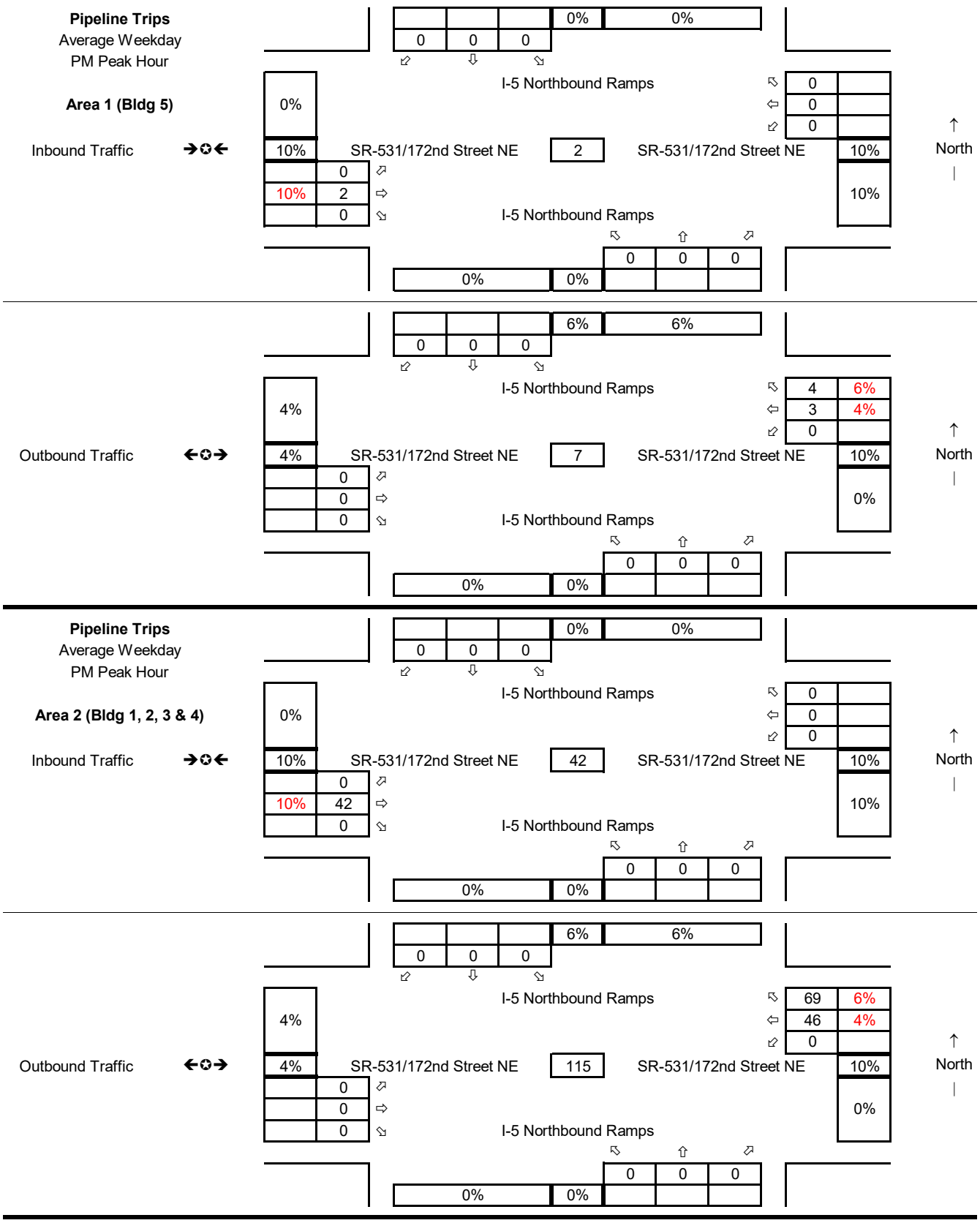


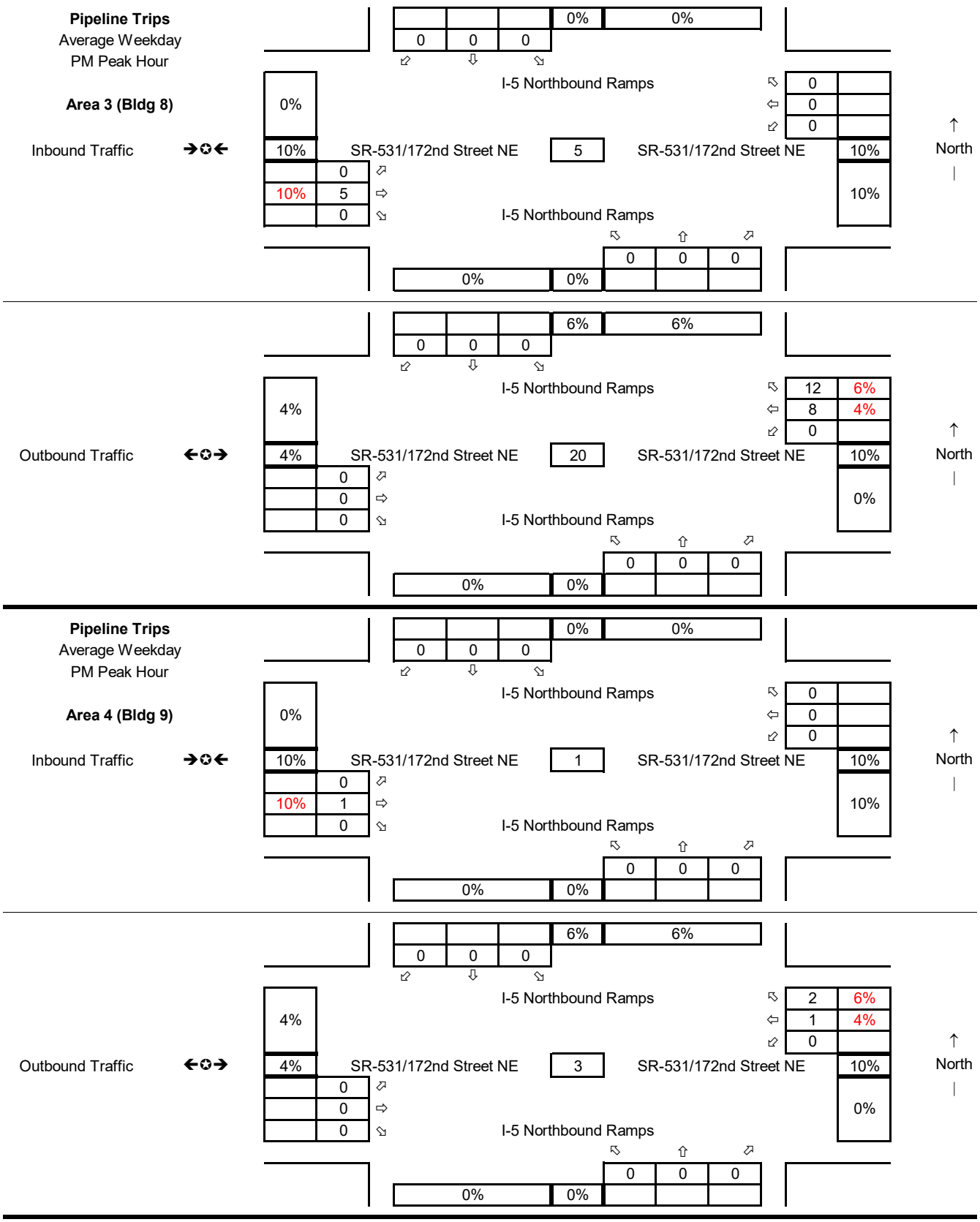
Total Pipeline Trips
Average Weekday
PM Peak Hour

Marysville Development






Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
Outbound Traffic
SR-531/172nd Street NE
I-5 Northbound Ramps
North
2
7
42
115
0%
6%
10%
4%
Area 2 (Bldg 1, 2, 3 & 4)


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
Outbound Traffic
SR-531/172nd Street NE
I-5 Northbound Ramps
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
Outbound Traffic
SR-531/172nd Street NE
I-5 Northbound Ramps
North

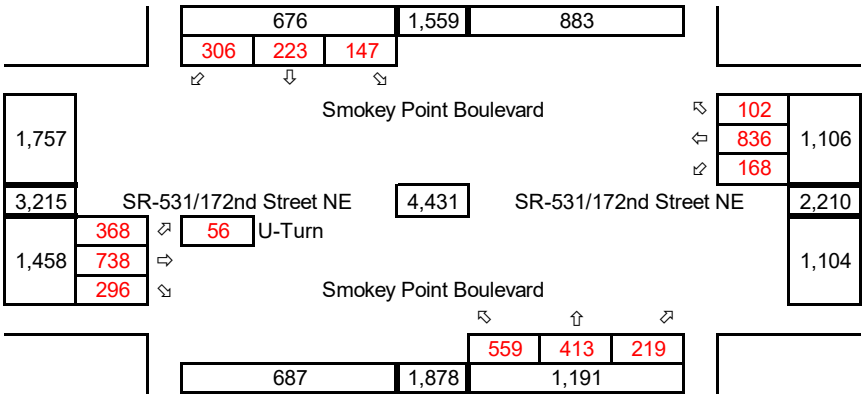
2036 Future Year 3 172nd St NE at Smokey Pt Blvd

Synchro ID: 3

Existing
Average Weekday
PM Peak Hour

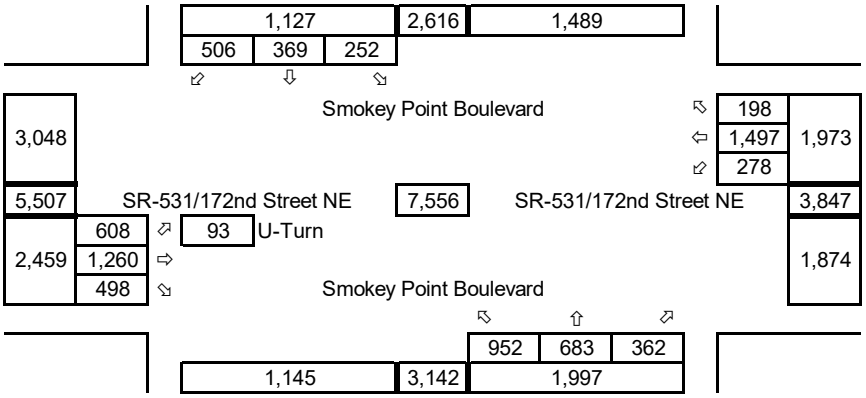
Year: **7/23/2019**

Data Source: **WSDOT**

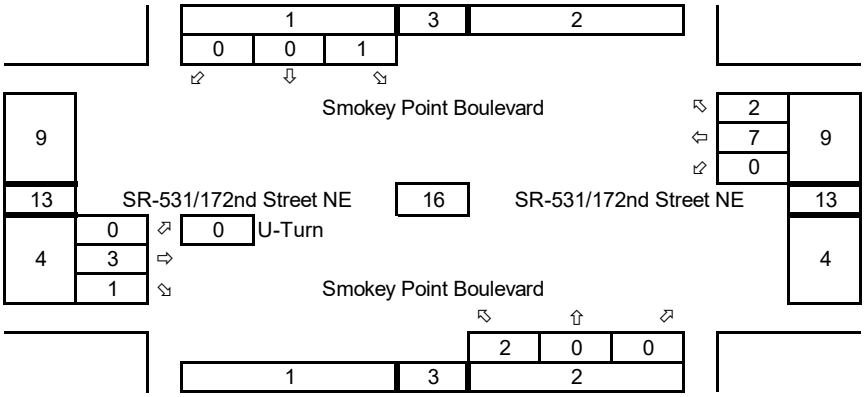


Baseline
Average Weekday
PM Peak Hour

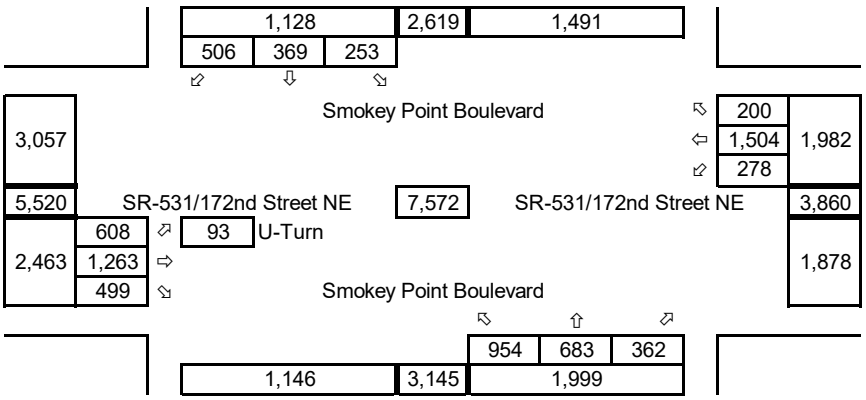
Year: 2036
Growth Rate = 3.0%
Years of Growth = 17
Total Growth = 1.6528

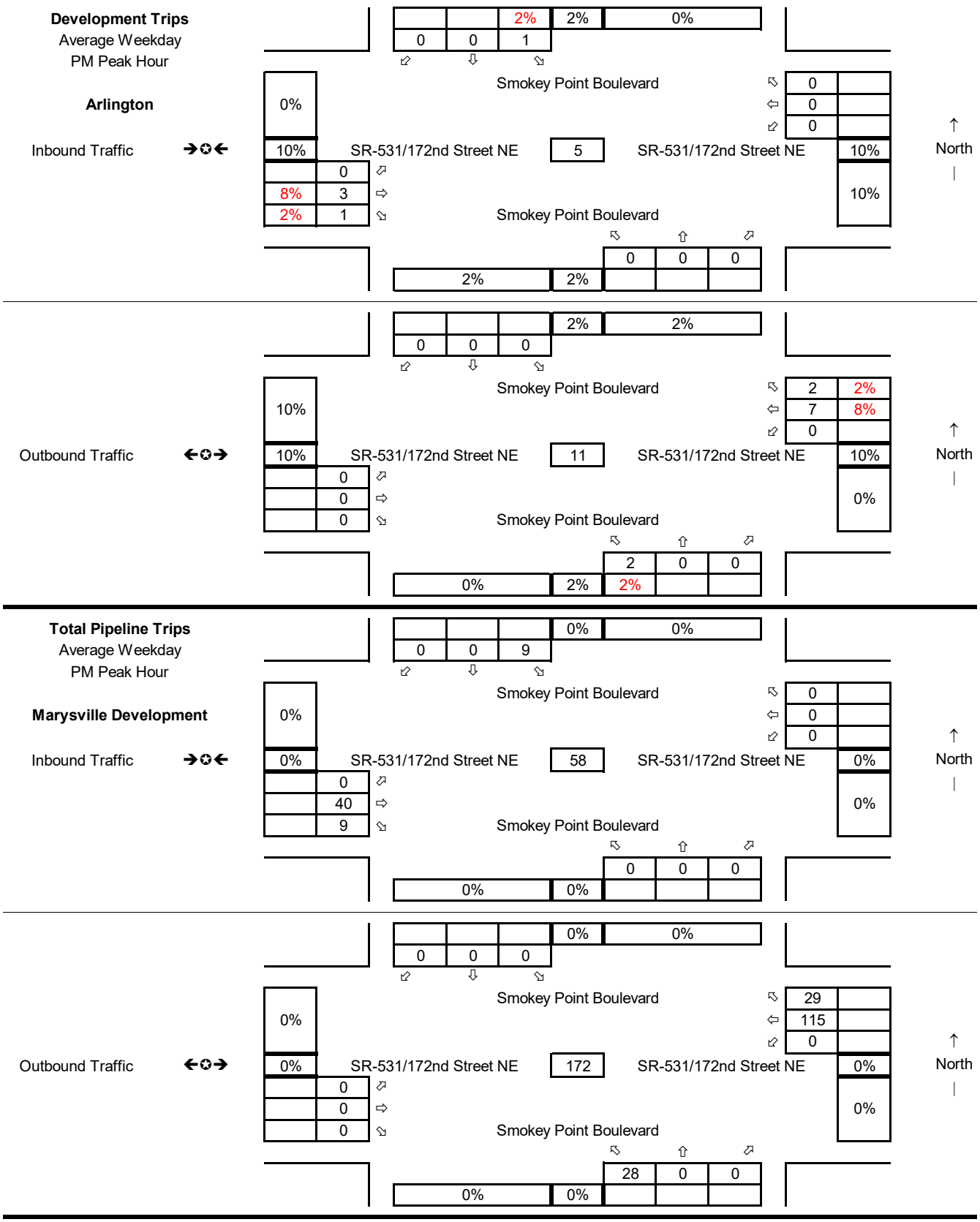


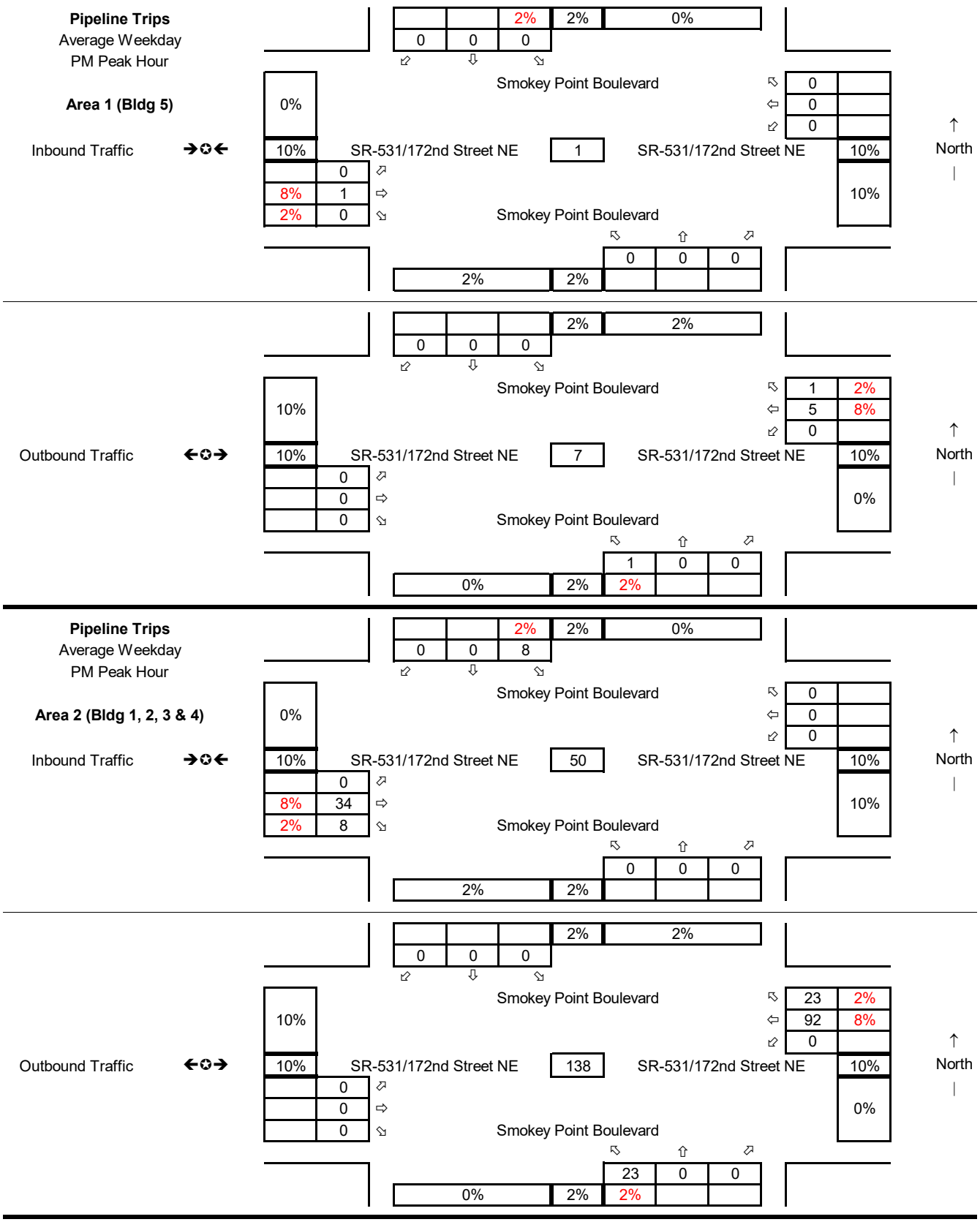
Development Trips
Average Weekday
PM Peak Hour

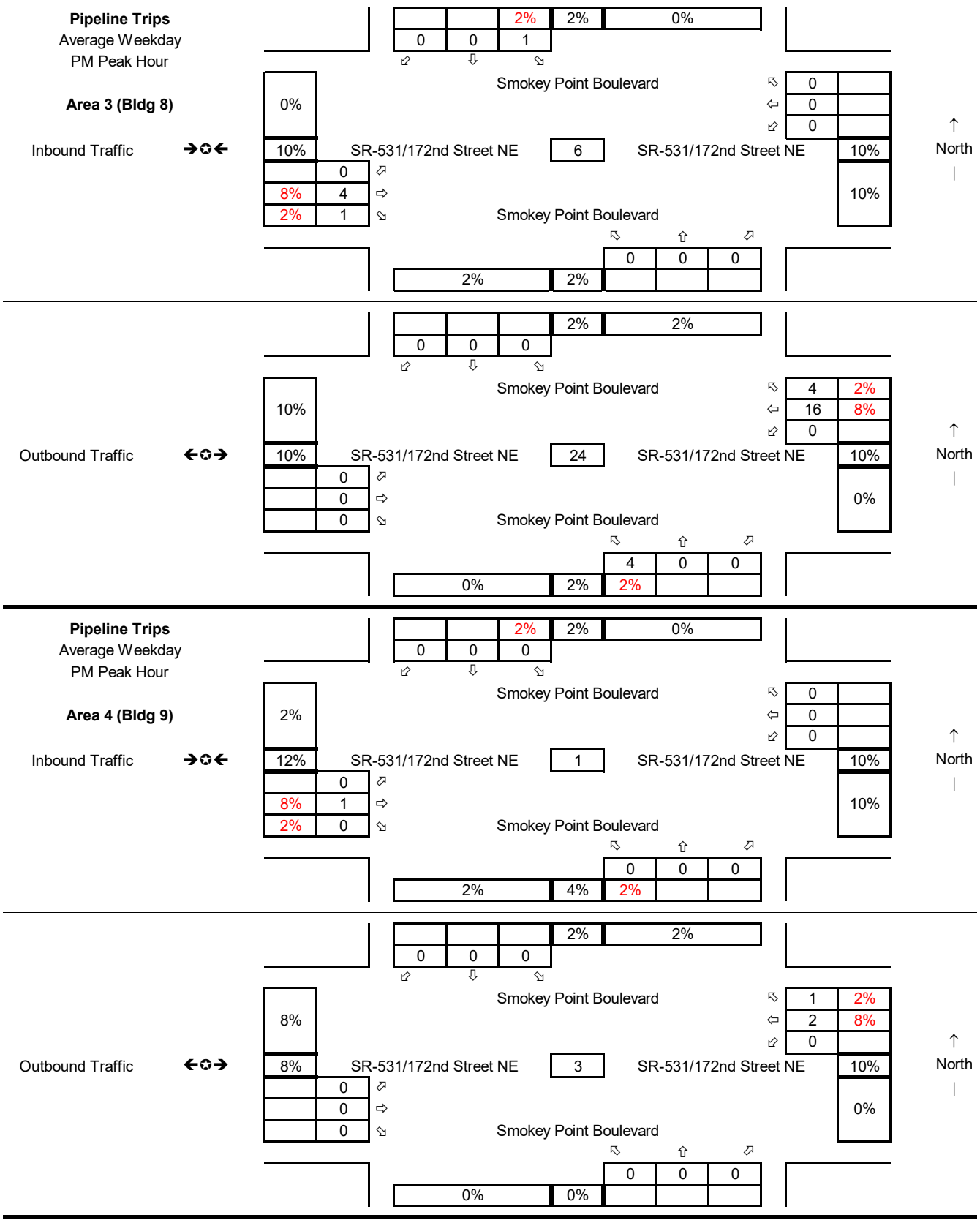


2036 Future w Development
Average Weekday
PM Peak Hour




Development Trips
Average Weekday
PM Peak Hour
Arlington
Inbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North
Outbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North
Total Pipeline Trips
Average Weekday
PM Peak Hour
Marysville Development
Inbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North
Outbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North
Outbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 2 (Bldg 1, 2, 3 & 4)
Inbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North
Outbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
SR-531/172nd Street NE
Smokey Point Boulevard
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
Outbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
Outbound Traffic
Smokey Point Boulevard
SR-531/172nd Street NE
North

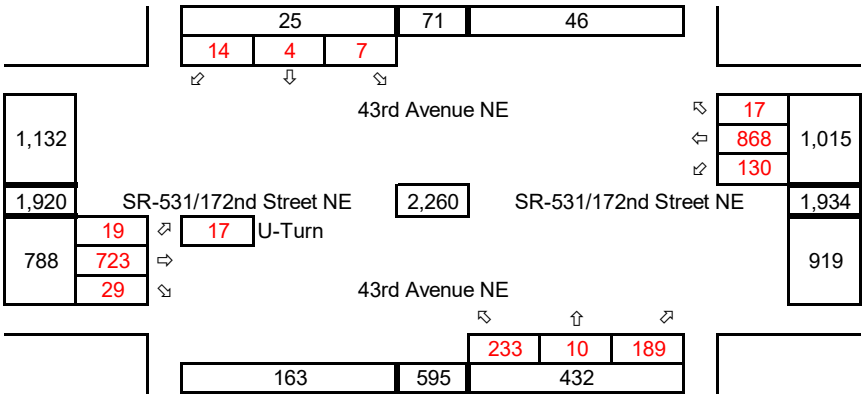
2036 Future Year 4 172nd St NE at 43rd Ave NE

Synchro ID: 4

Existing
Average Weekday
PM Peak Hour

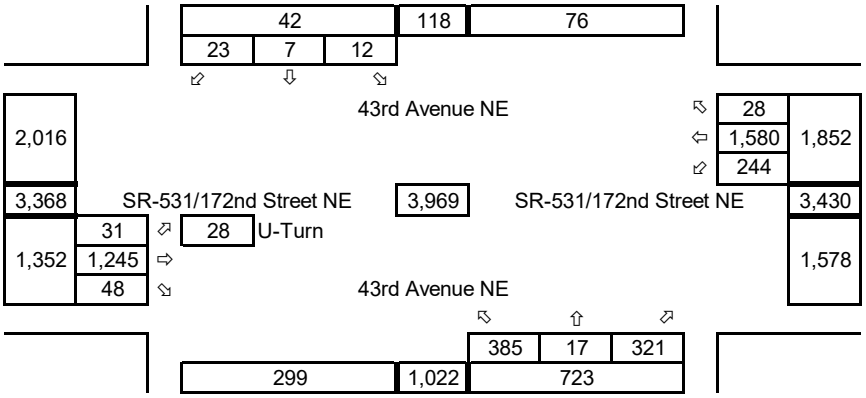
Year: **7/10/2019**

Data Source: **WSDOT**

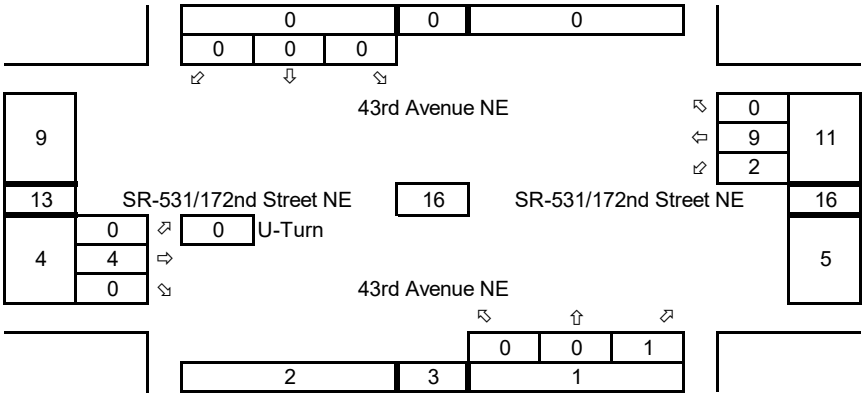


Baseline
Average Weekday
PM Peak Hour

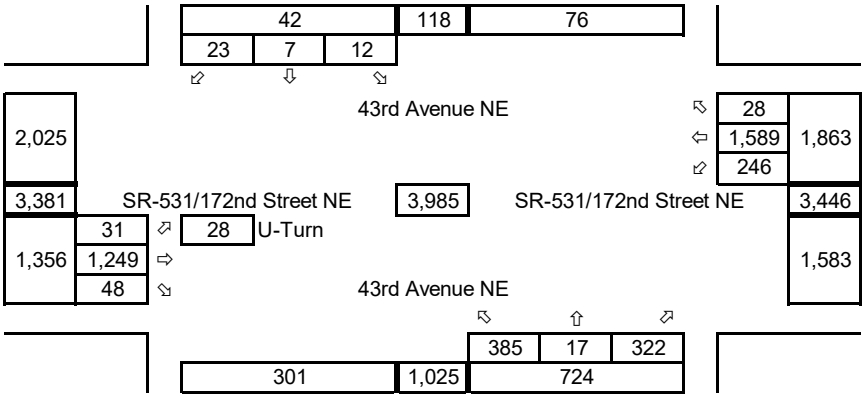
Year: 2036
Growth Rate = 3.0%
Years of Growth = 17
Total Growth = 1.6528



Development Trips
Average Weekday
PM Peak Hour



2036 Future w Development
Average Weekday
PM Peak Hour



2036 Future Year 4 172nd St NE at 43rd Ave NE

Development Trips
Average Weekday
PM Peak Hour

Arlington

Inbound Traffic

43rd Avenue NE (north leg): 0% | 0% ; southbound volumes 0, 0, 0
43rd Avenue NE (west side): 0%
SR-531/172nd Street NE (west): 10% ; eastbound volumes 0, 4 (10%), 0
SR-531/172nd Street NE: 5
SR-531/172nd Street NE (east): 12% ; westbound volumes 0, 0, 0 ; 12%
43rd Avenue NE (south leg): northbound volumes 0, 0, 1 (2%) ; 0% | 2%
North

Outbound Traffic

43rd Avenue NE (north leg): 0% | 0% ; southbound volumes 0, 0, 0
43rd Avenue NE (west side): 10%
SR-531/172nd Street NE (west): 10% ; eastbound volumes 0, 0, 0
SR-531/172nd Street NE: 11
SR-531/172nd Street NE (east): 12% ; westbound volumes 0, 9 (10%), 2 (2%) ; 0%
43rd Avenue NE (south leg): northbound volumes 0, 0, 0 ; 2% | 2%
North

Total Pipeline Trips
Average Weekday
PM Peak Hour

Marysville Development

Inbound Traffic

43rd Avenue NE (north leg): 0% | 0% ; southbound volumes 0, 0, 0
43rd Avenue NE (west side): 0%
SR-531/172nd Street NE (west): 0% ; eastbound volumes 0, 50, 0
SR-531/172nd Street NE: 59
SR-531/172nd Street NE (east): 0% ; westbound volumes 0, 0, 0 ; 0%
43rd Avenue NE (south leg): northbound volumes 0, 0, 9 ; 0% | 0%
North

Outbound Traffic

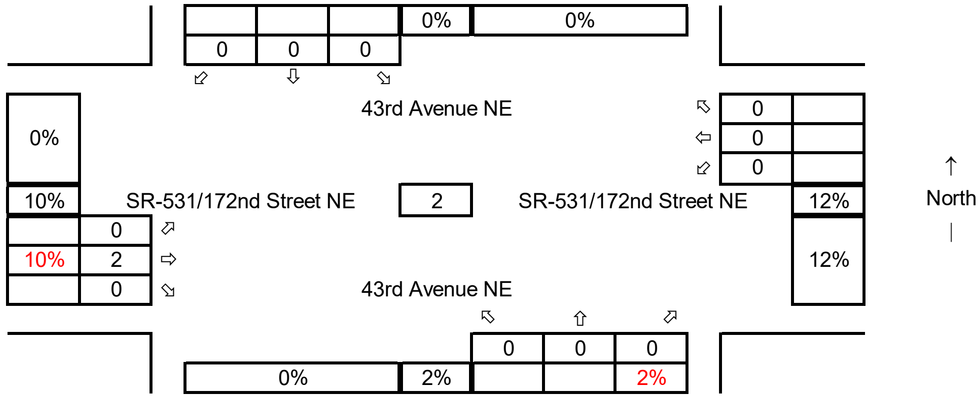
43rd Avenue NE (north leg): 0% | 0% ; southbound volumes 0, 0, 0
43rd Avenue NE (west side): 0%
SR-531/172nd Street NE (west): 0% ; eastbound volumes 0, 0, 0
SR-531/172nd Street NE: 174
SR-531/172nd Street NE (east): 0% ; westbound volumes 0, 145, 29 ; 0%
43rd Avenue NE (south leg): northbound volumes 0, 0, 0 ; 0% | 0%
North

2036 Future Year 4 172nd St NE at 43rd Ave NE

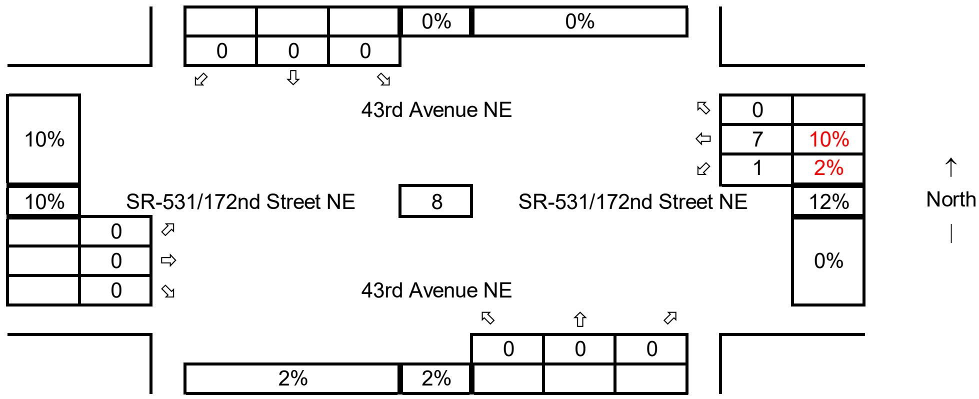
Pipeline Trips
Average Weekday
PM Peak Hour

Area 1 (Bldg 5)

Inbound Traffic ➔✪🡐



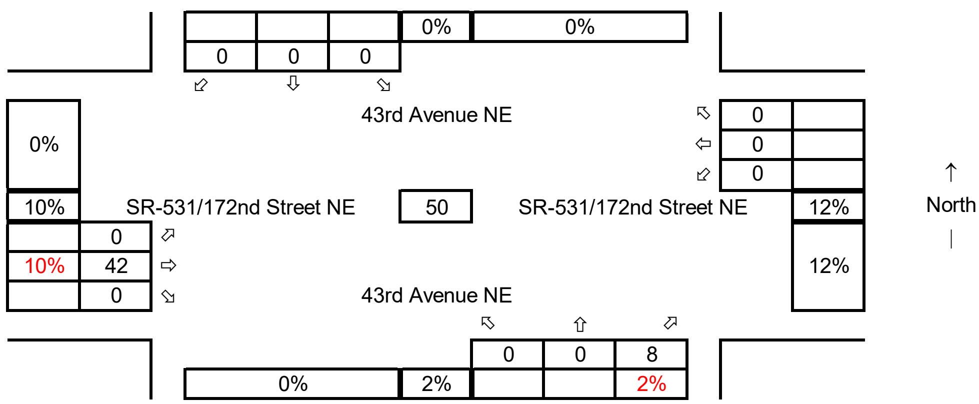
Outbound Traffic 🡐✪➔



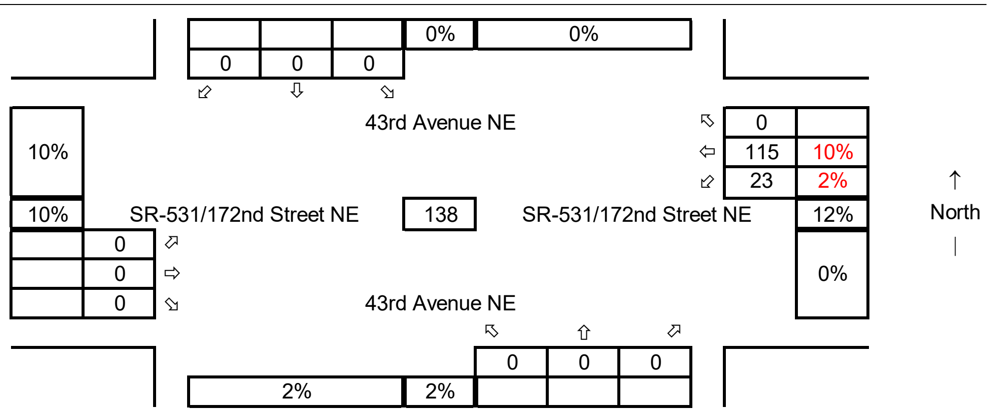
Pipeline Trips
Average Weekday
PM Peak Hour

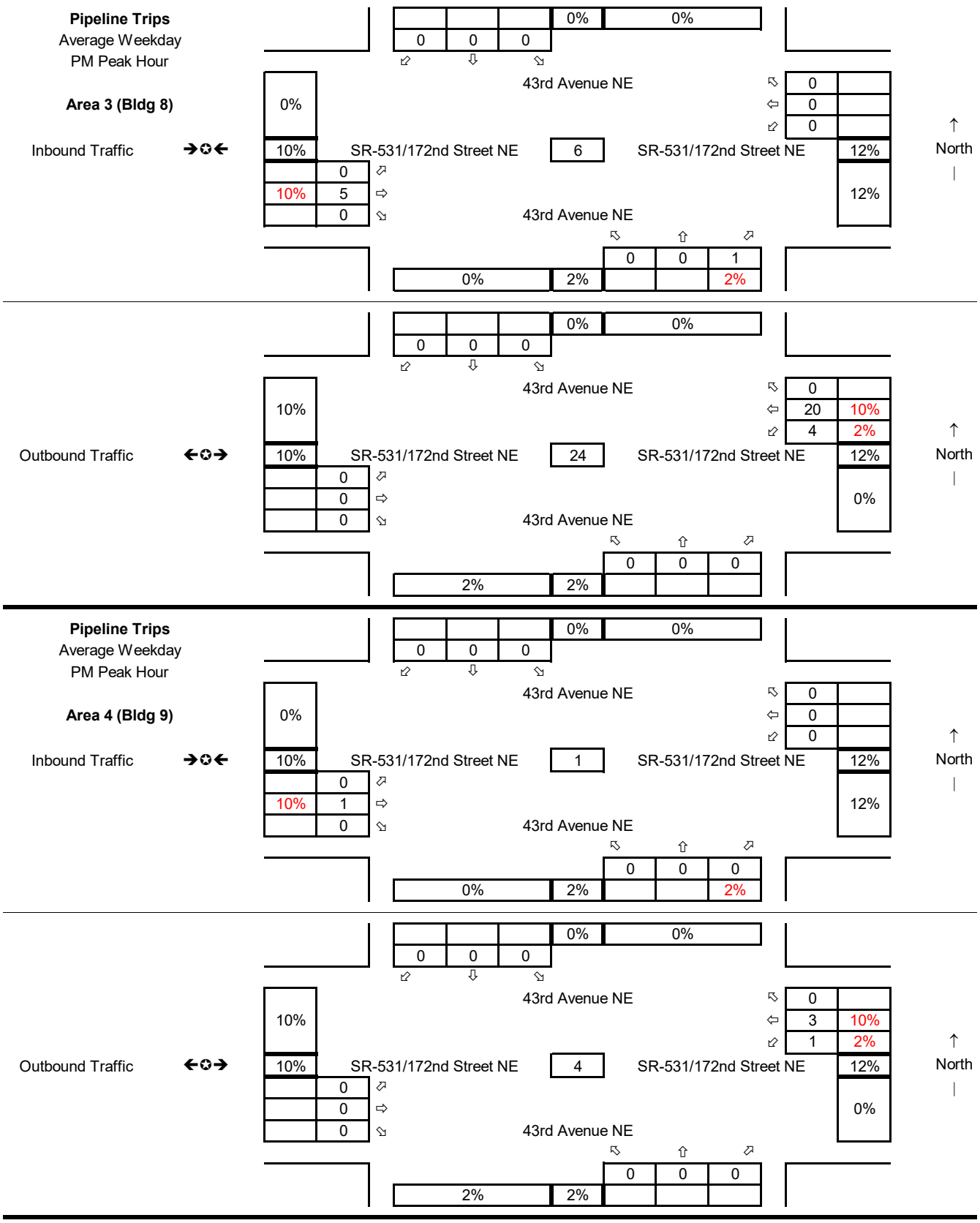
Area 2 (Bldg 1, 2, 3 & 4)

Inbound Traffic ➔✪🡐



Outbound Traffic 🡐✪➔




Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
0% 0% 0 0 0
43rd Avenue NE
0% 0 0 0
10% SR-531/172nd Street NE 6 SR-531/172nd Street NE 12%
0 10% 5 0 12%
43rd Avenue NE
0 0 1
0% 2% 2%
North
0% 0% 0 0 0
43rd Avenue NE
10% 0 20 10% 4 2%
Outbound Traffic
10% SR-531/172nd Street NE 24 SR-531/172nd Street NE 12%
0 0 0 0%
43rd Avenue NE
0 0 0
2% 2%
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
0% 0% 0 0 0
43rd Avenue NE
0% 0 0 0
10% SR-531/172nd Street NE 1 SR-531/172nd Street NE 12%
0 10% 1 0 12%
43rd Avenue NE
0 0 0
0% 2% 2%
North
0% 0% 0 0 0
43rd Avenue NE
10% 0 3 10% 1 2%
Outbound Traffic
10% SR-531/172nd Street NE 4 SR-531/172nd Street NE 12%
0 0 0 0%
43rd Avenue NE
0 0 0
2% 2%
North

2036 Future Year

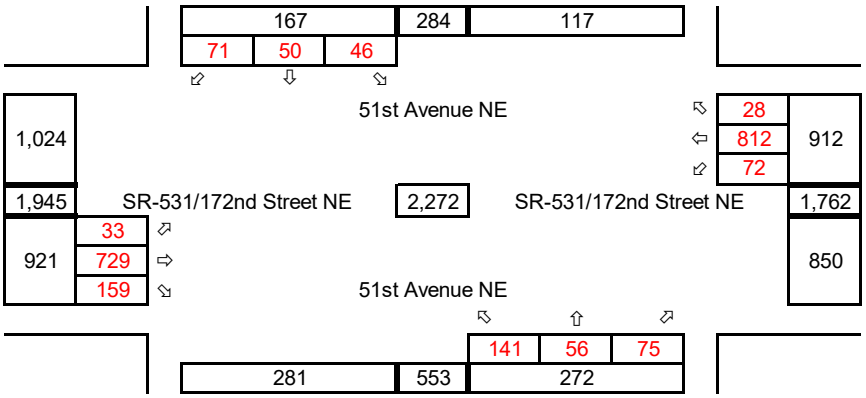
5 172nd St NE at 51st Ave NE

Synchro ID: 5

Existing
Average Weekday
PM Peak Hour

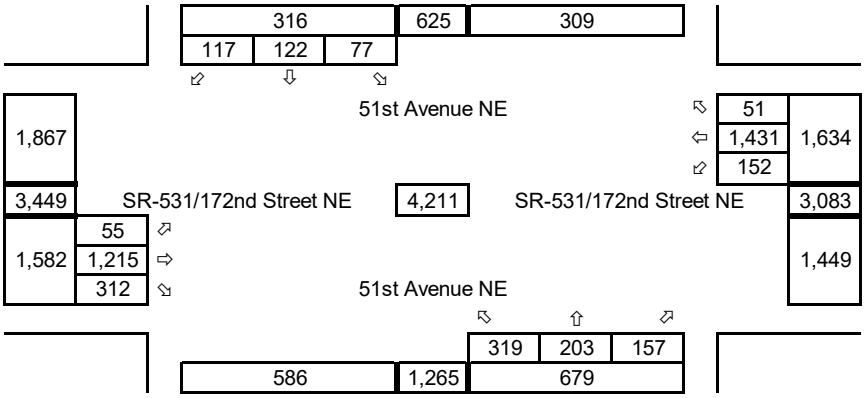
Year: **7/10/2019**

Data Source: **WSDOT**

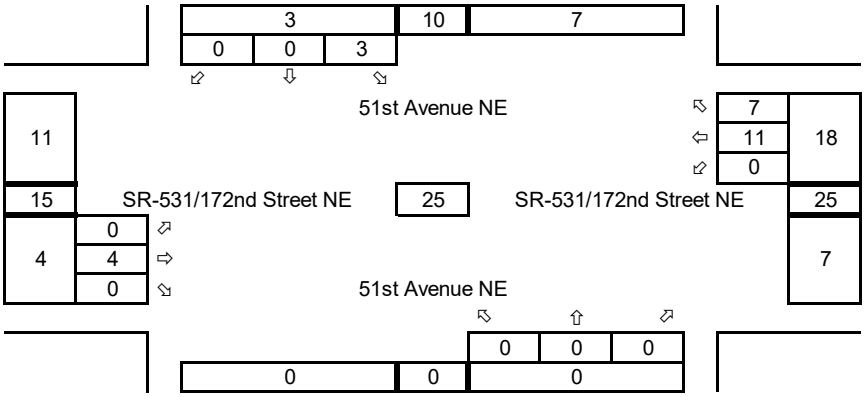


Baseline
Average Weekday
PM Peak Hour

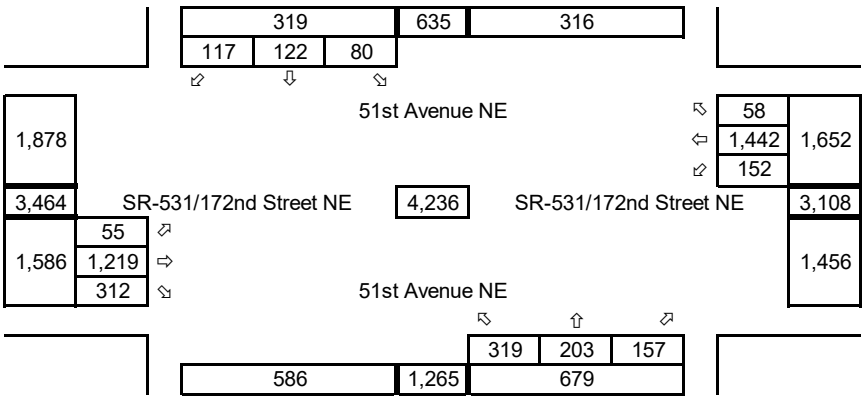
Year: 2036
Growth Rate = 3.0%
Years of Growth = 17
Total Growth = 1.6528



Development Trips
Average Weekday
PM Peak Hour



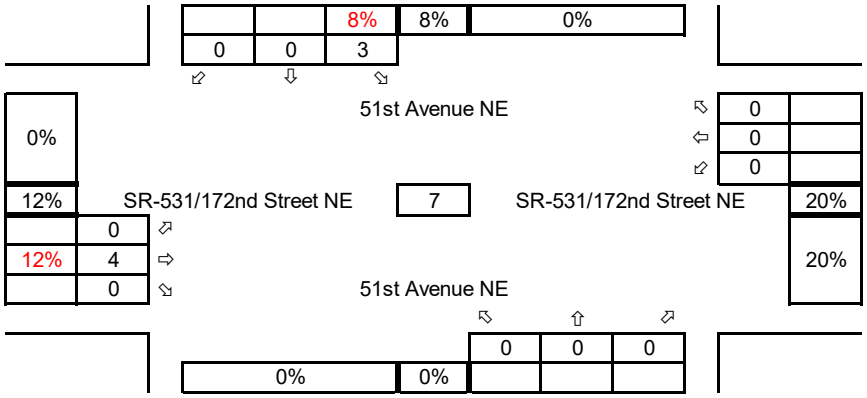
2036 Future w Development
Average Weekday
PM Peak Hour



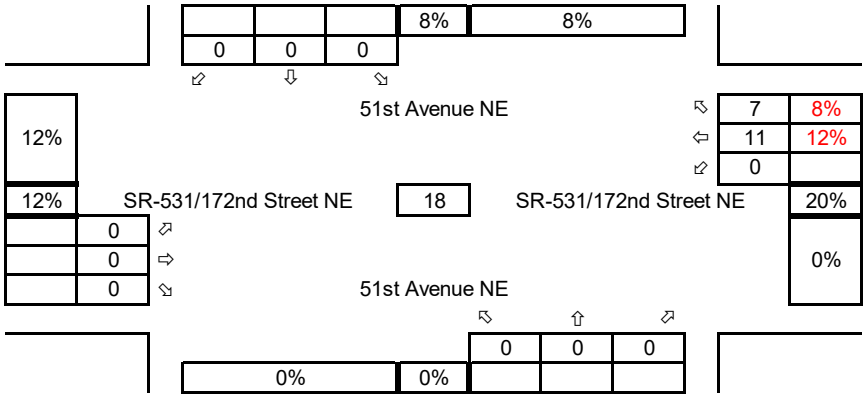
Development Trips
Average Weekday
PM Peak Hour

Arlington

Inbound Traffic



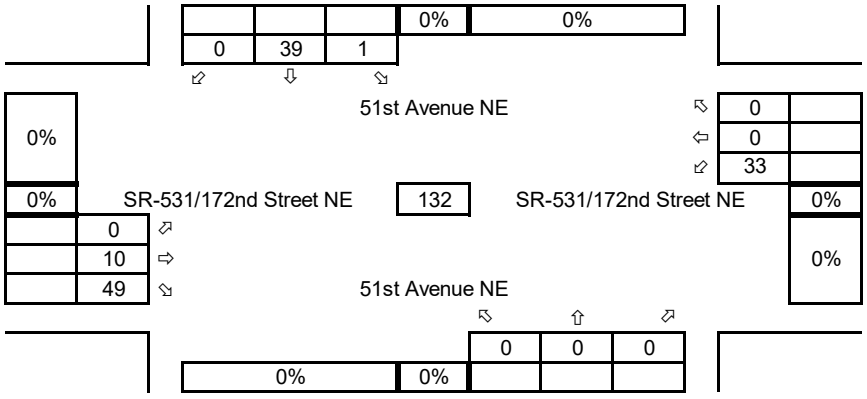
Outbound Traffic



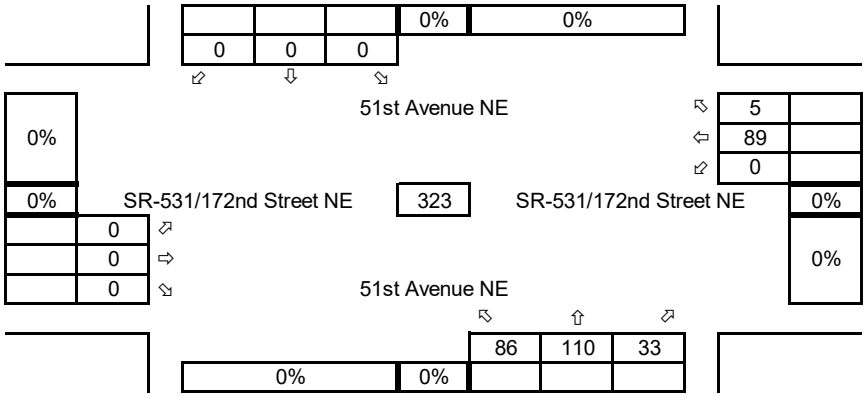
Total Pipeline Trips
Average Weekday
PM Peak Hour

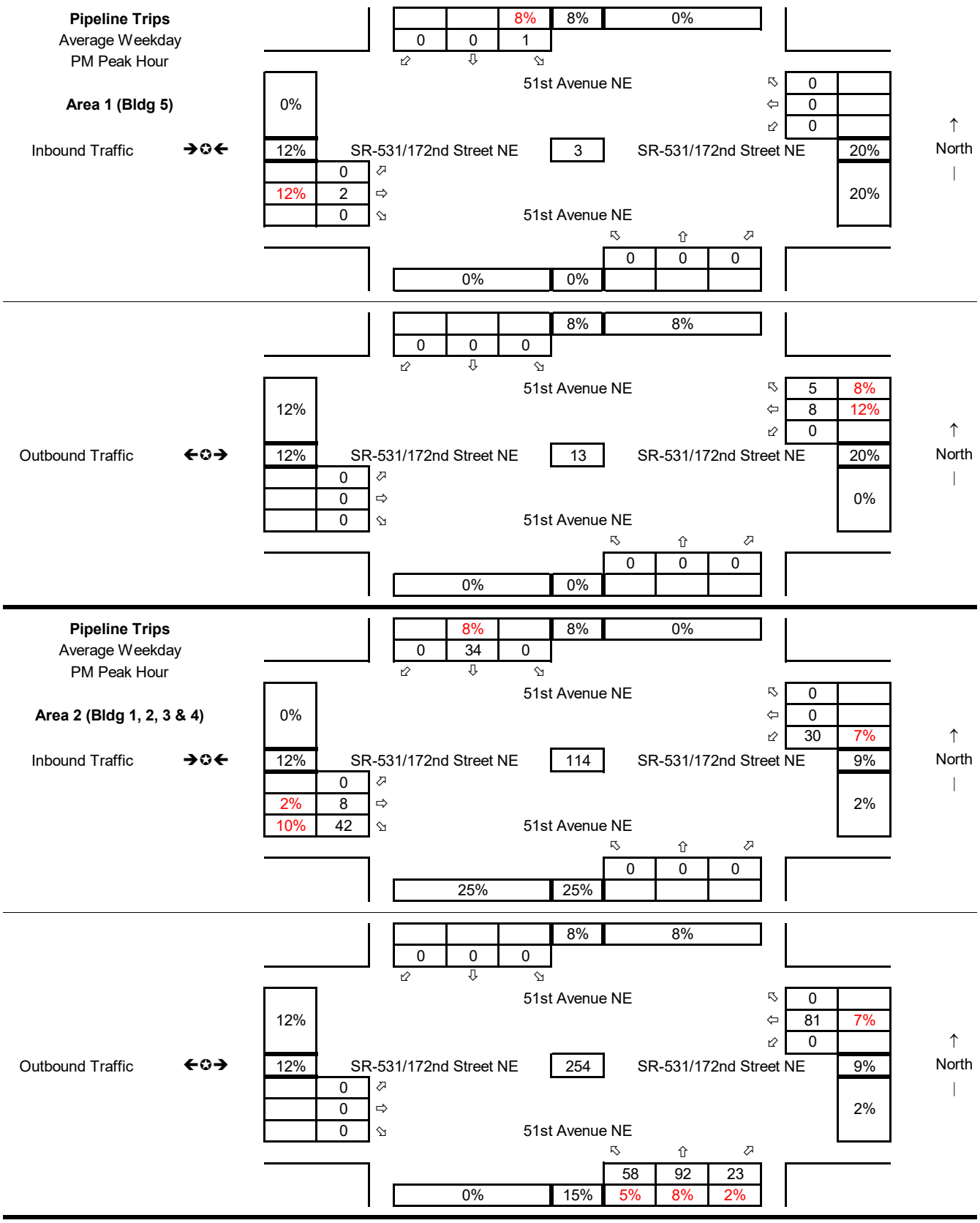
Marysville Development

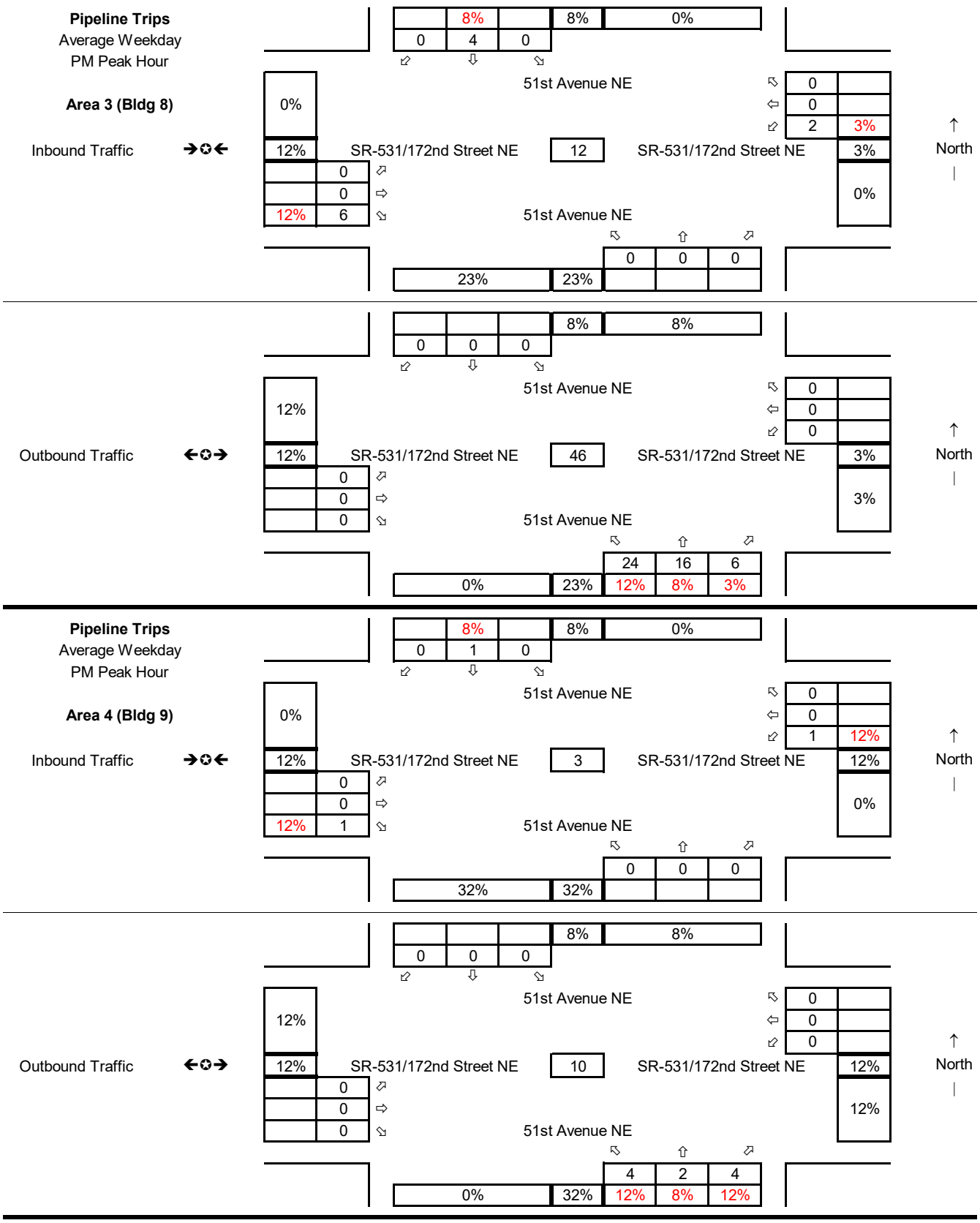
Inbound Traffic



Outbound Traffic




Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
Outbound Traffic
SR-531/172nd Street NE
51st Avenue NE
North
Area 2 (Bldg 1, 2, 3 & 4)


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
8% 8% 0%
0 4 0
51st Avenue NE
0% 0 0 2 3%
12% SR-531/172nd Street NE 12 SR-531/172nd Street NE 3%
0 0 0 0 0%
12% 6
51st Avenue NE
0 0 0
23% 23%
North
8% 8%
0 0 0
51st Avenue NE
12% 0 0 0
Outbound Traffic
12% SR-531/172nd Street NE 46 SR-531/172nd Street NE 3%
0 0 0 3%
51st Avenue NE
24 16 6
0% 23% 12% 8% 3%
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
8% 8% 0%
0 1 0
51st Avenue NE
0% 0 0 1 12%
12% SR-531/172nd Street NE 3 SR-531/172nd Street NE 12%
0 0 0 0%
12% 1
51st Avenue NE
0 0 0
32% 32%
North
8% 8%
0 0 0
51st Avenue NE
12% 0 0 0
Outbound Traffic
12% SR-531/172nd Street NE 10 SR-531/172nd Street NE 12%
0 0 0 12%
51st Avenue NE
4 2 4
0% 32% 12% 8% 12%
North

2036 Future Year

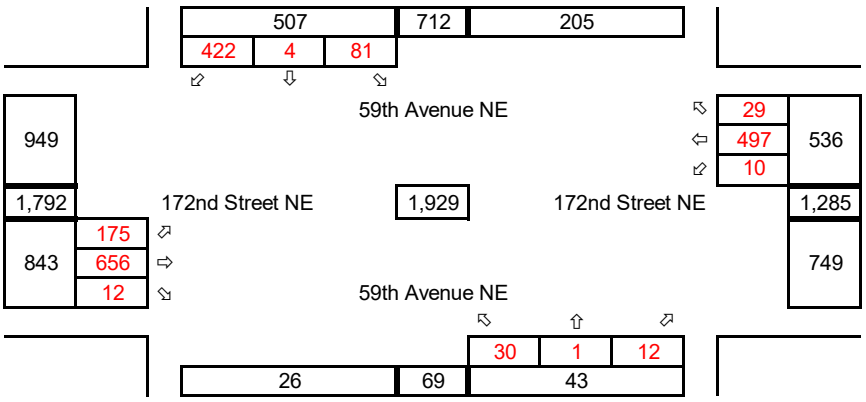
6 172nd St NE at 59th Ave NE

Synchro ID: 6

Existing
Average Weekday
PM Peak Hour

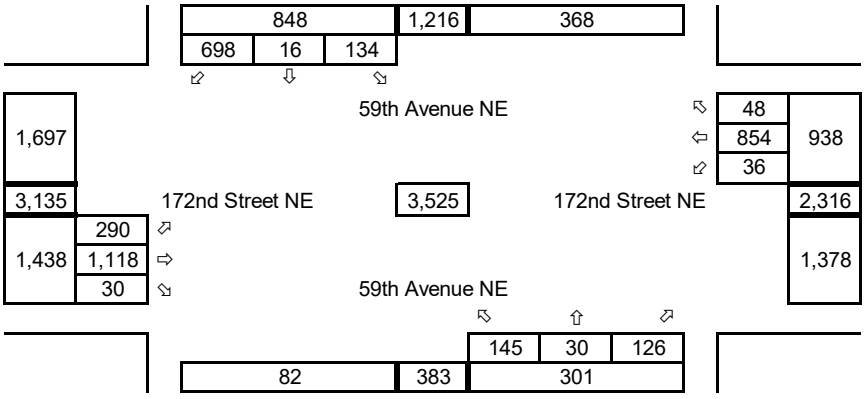
Year: **7/10/2019**

Data Source: **WSDOT**

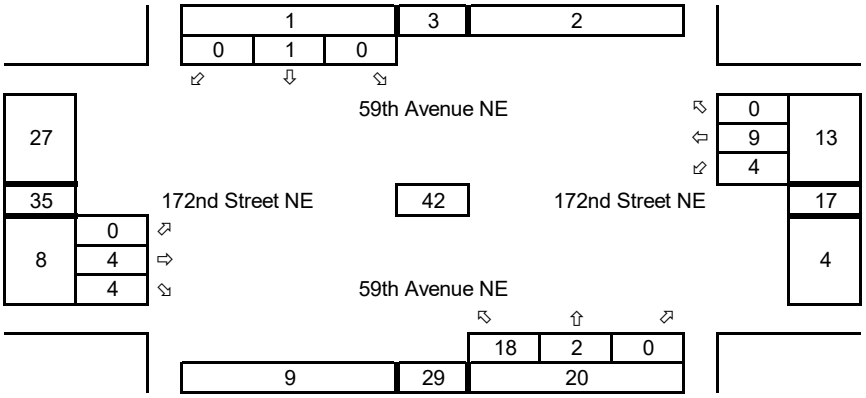


Baseline
Average Weekday
PM Peak Hour

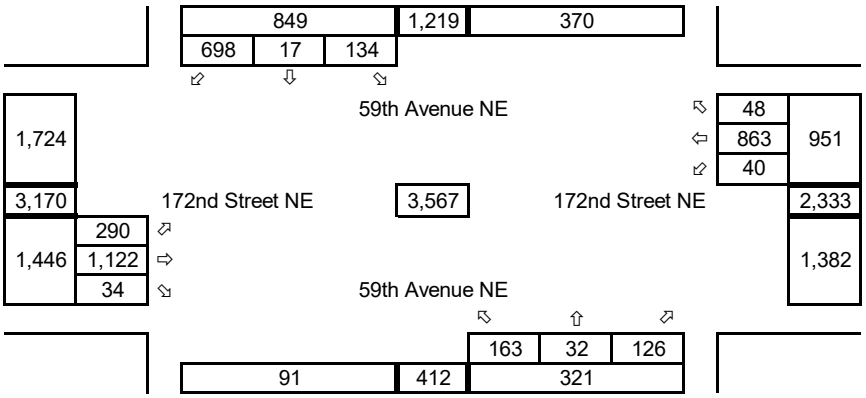
Year: 2036
Growth Rate = 3.0%
Years of Growth = 17
Total Growth = 1.6528



Development Trips
Average Weekday
PM Peak Hour

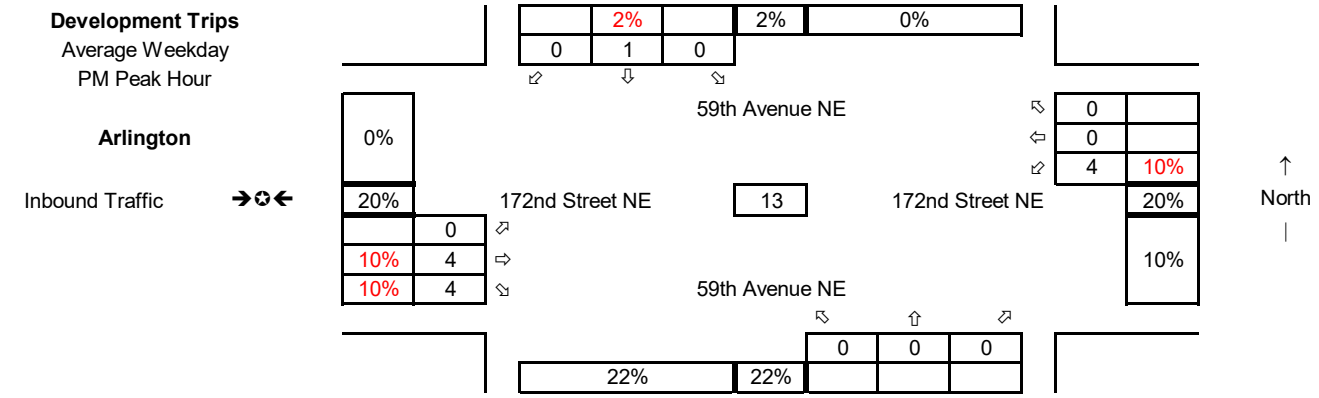


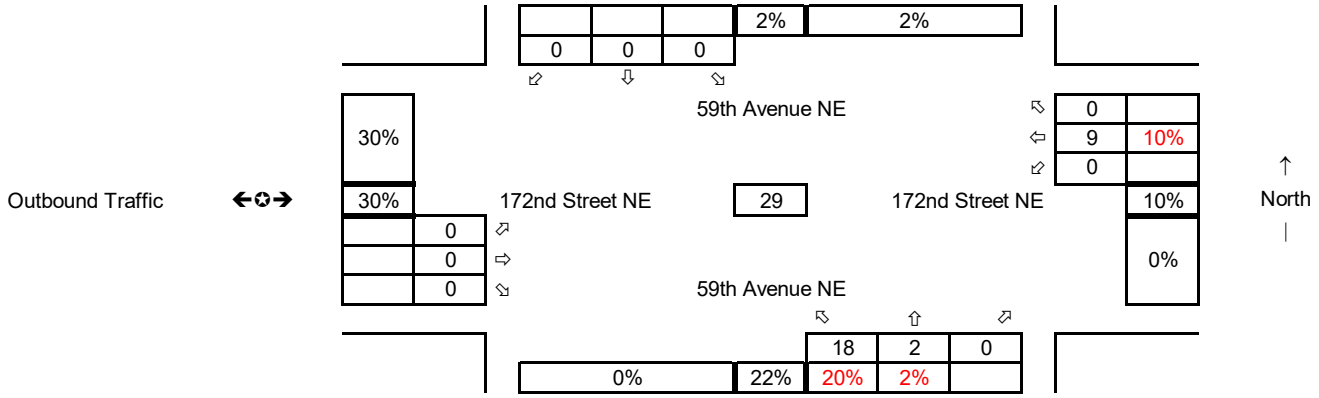
2036 Future w Development
Average Weekday
PM Peak Hour



Development Trips
Average Weekday
PM Peak Hour

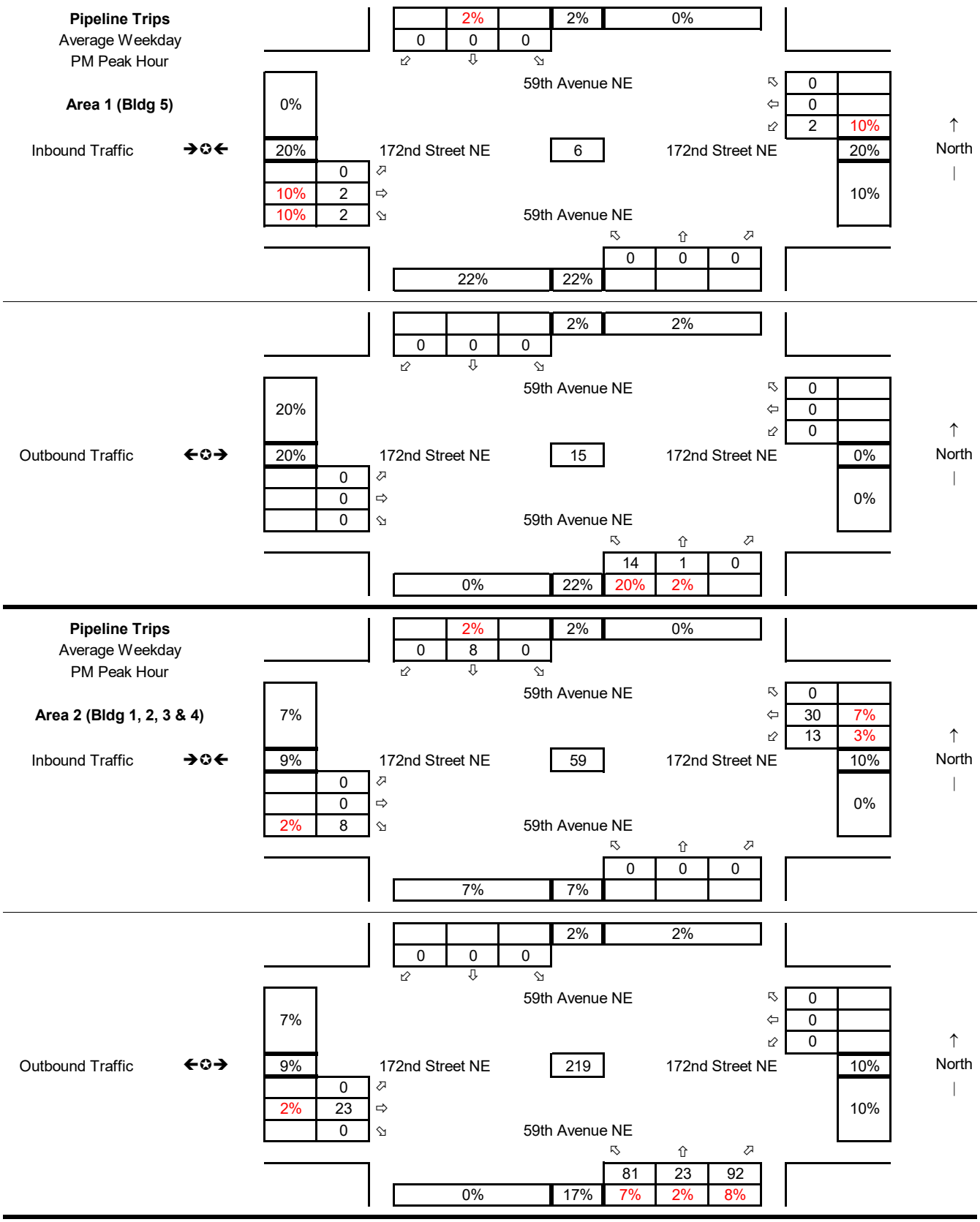
Arlington





Total Pipeline Trips
Average Weekday
PM Peak Hour

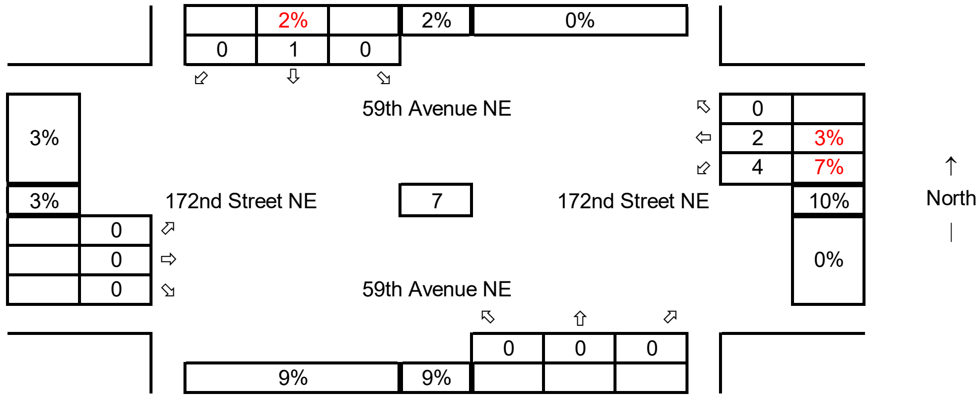
Marysville Development


Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
Outbound Traffic
172nd Street NE
59th Avenue NE
North
Area 2 (Bldg 1, 2, 3 & 4)

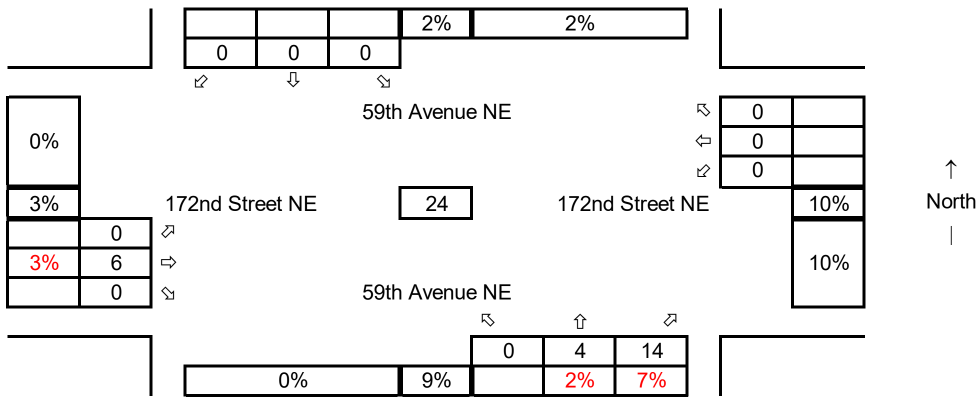
Pipeline Trips
Average Weekday
PM Peak Hour

Area 3 (Bldg 8)

Inbound Traffic



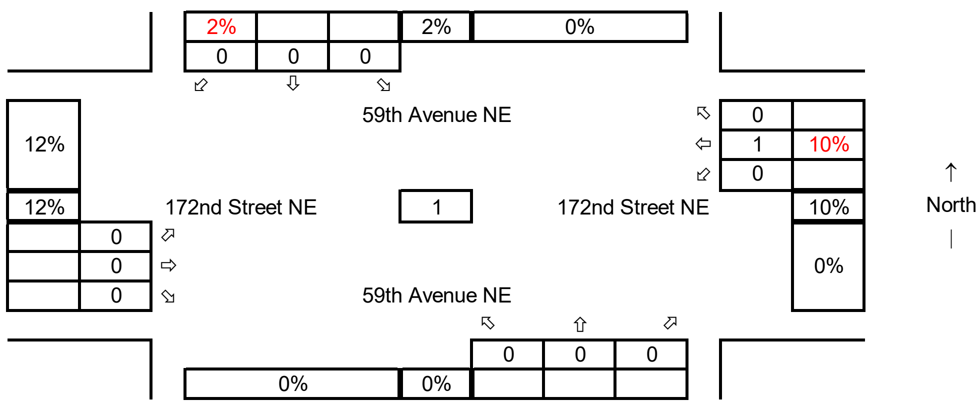
Outbound Traffic



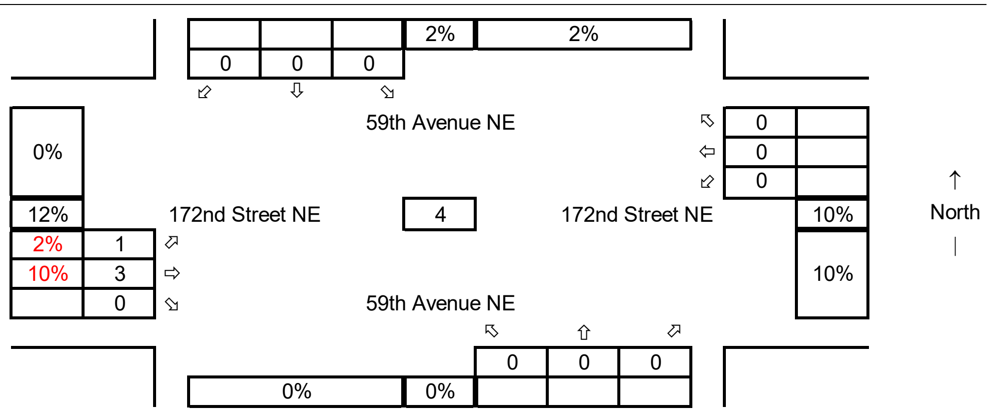
Pipeline Trips
Average Weekday
PM Peak Hour

Area 4 (Bldg 9)

Inbound Traffic



Outbound Traffic



2036 Future Year

7 172nd St NE at 63rd Ave NE

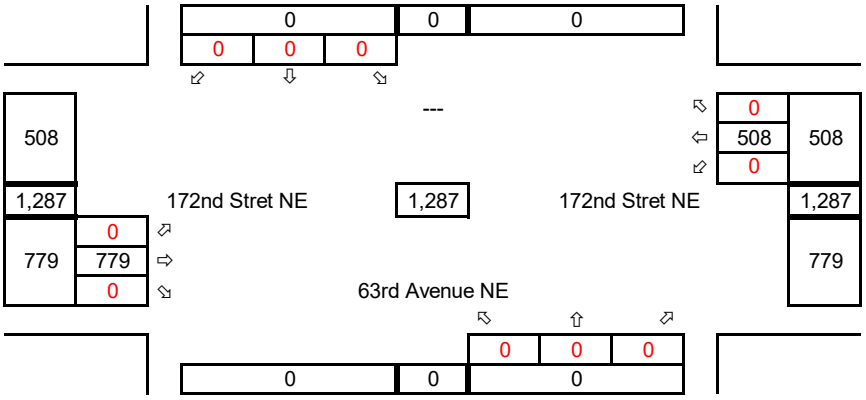
Synchro ID: 7

Existing
Average Weekday
PM Peak Hour

Year: **7/10/2019**

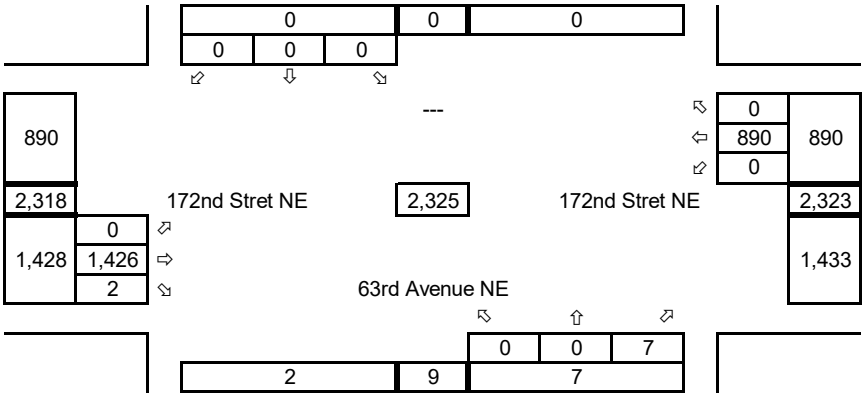
Data Source: **WSDOT**

Based on count from
172nd Street NE at
67th Avenue NE

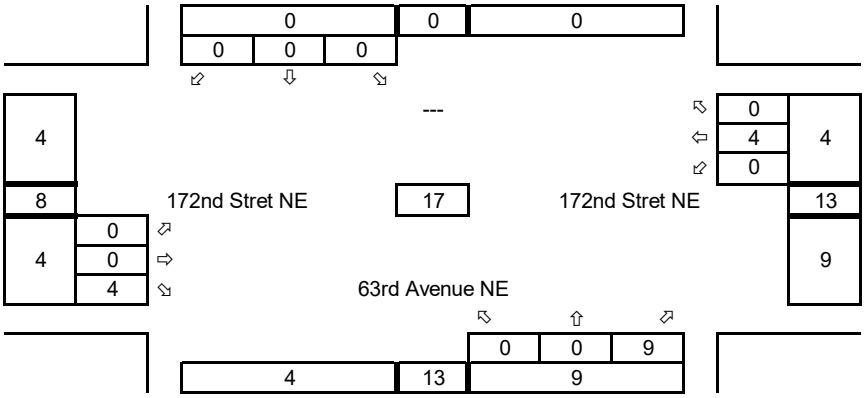


Baseline
Average Weekday
PM Peak Hour

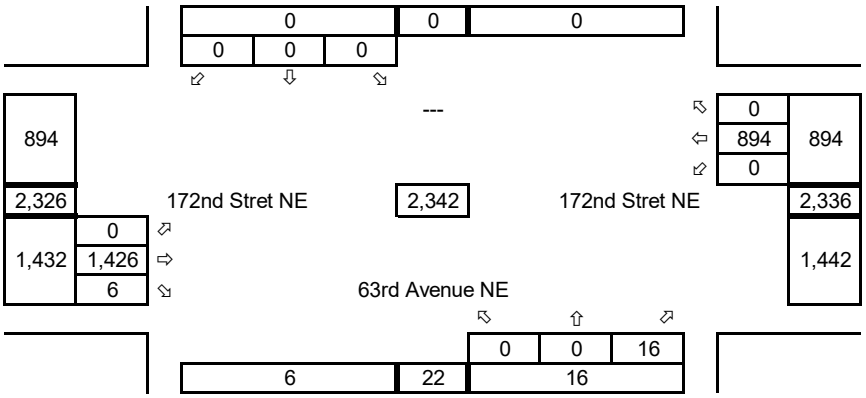
Year: 2036
Growth Rate = 3.0%
Years of Growth = 17
Total Growth = 1.6528



Development Trips
Average Weekday
PM Peak Hour



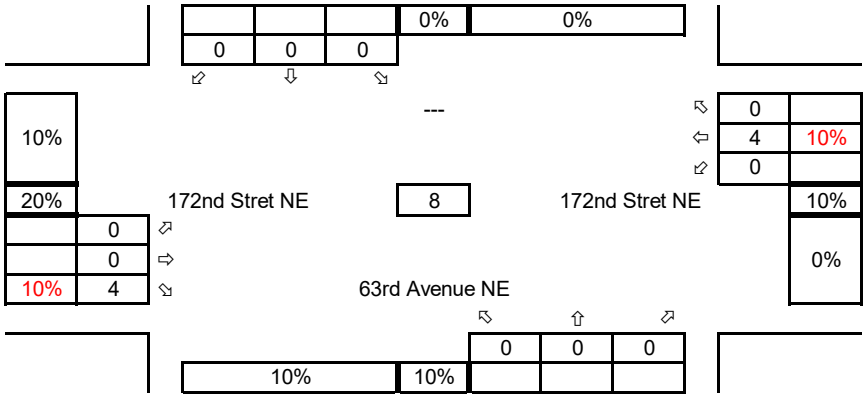
2036 Future w Development
Average Weekday
PM Peak Hour



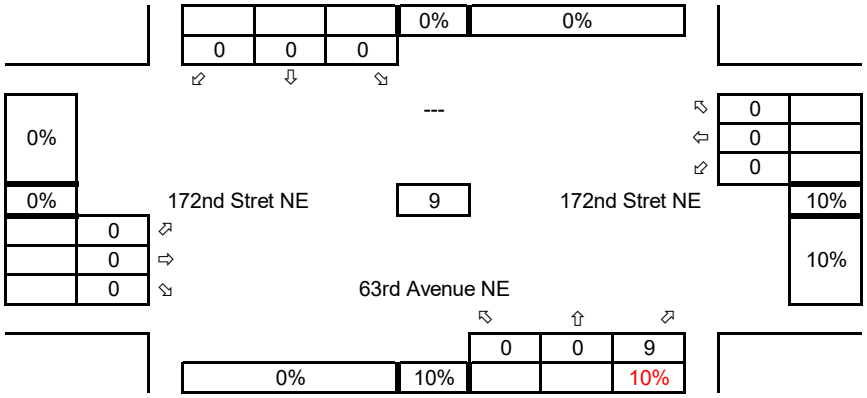
Development Trips
Average Weekday
PM Peak Hour

Arlington

Inbound Traffic



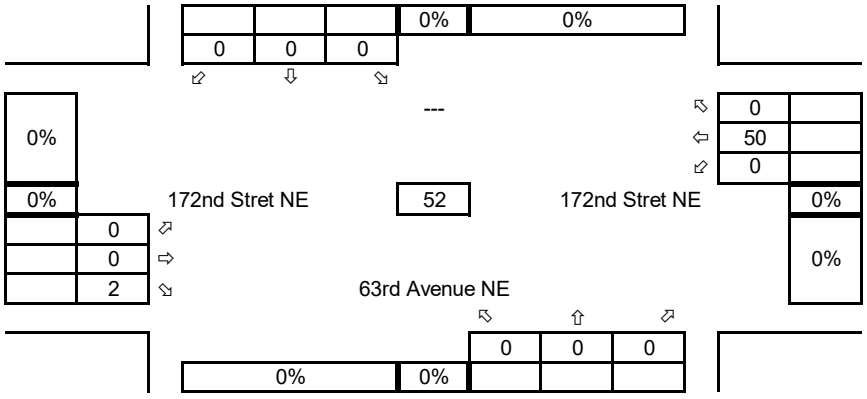
Outbound Traffic



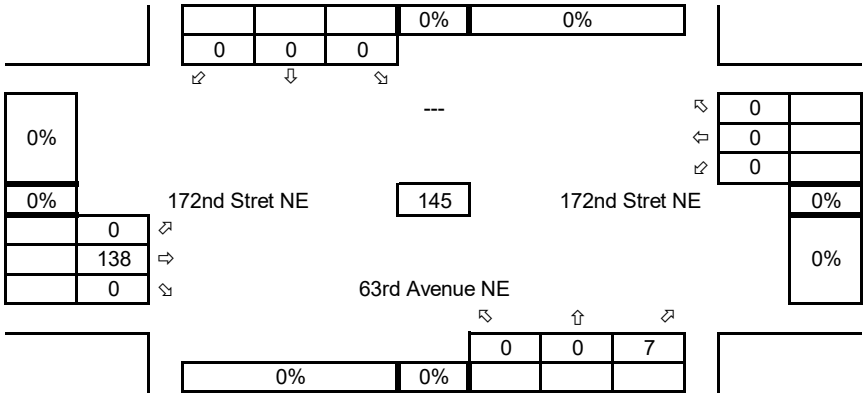
Total Pipeline Trips
Average Weekday
PM Peak Hour

Marysville Development

Inbound Traffic



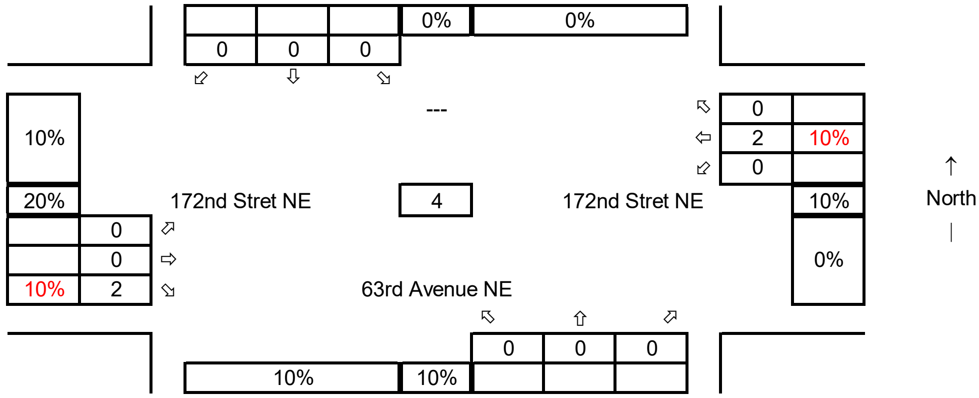
Outbound Traffic



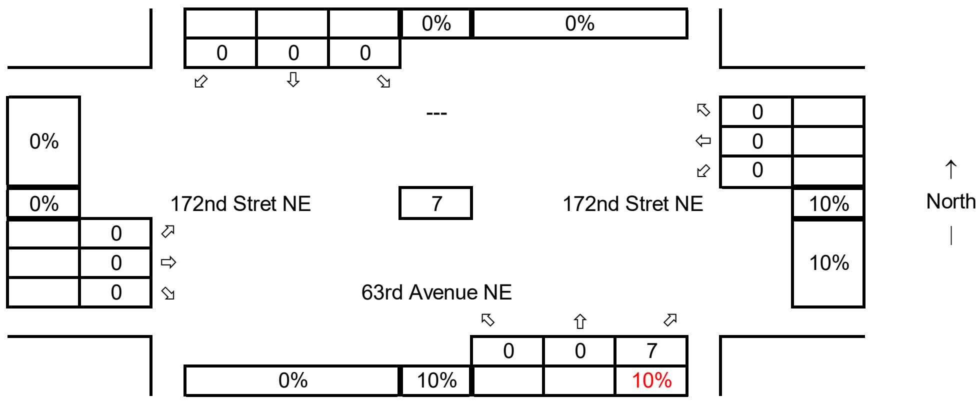
Pipeline Trips
Average Weekday
PM Peak Hour

Area 1 (Bldg 5)

Inbound Traffic ➔✪🡐



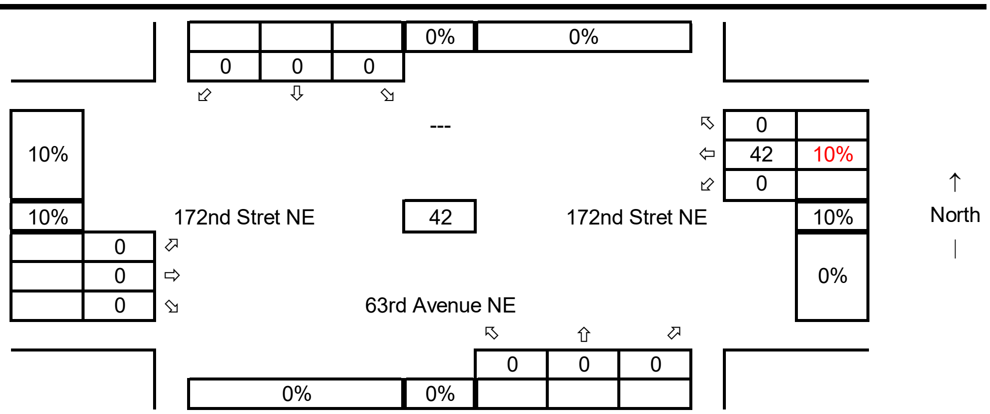
Outbound Traffic 🡐✪➔



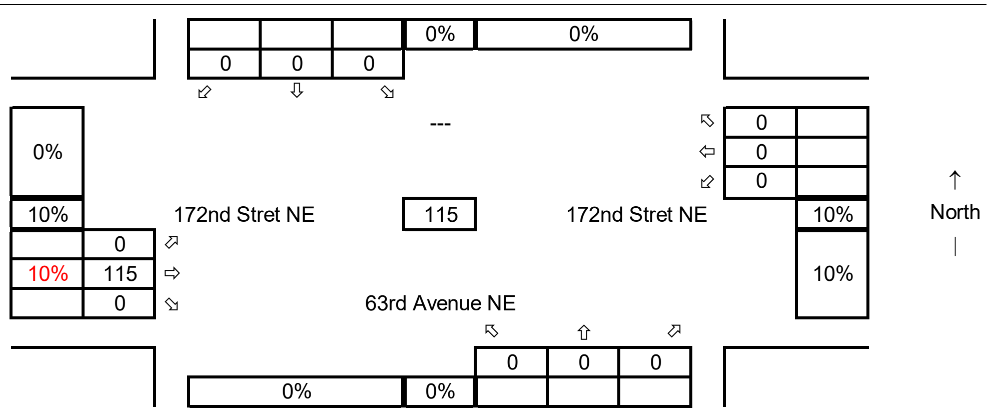
Pipeline Trips
Average Weekday
PM Peak Hour

Area 2 (Bldg 1, 2, 3 & 4)

Inbound Traffic ➔✪🡐



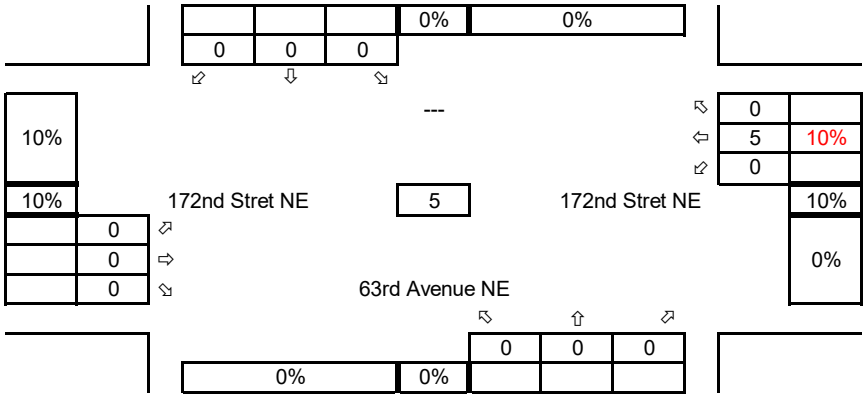
Outbound Traffic 🡐✪➔



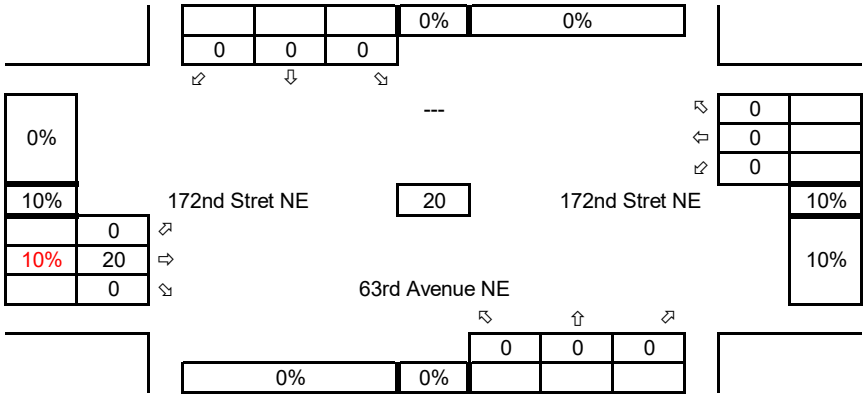
Pipeline Trips
Average Weekday
PM Peak Hour

Area 3 (Bldg 8)

Inbound Traffic



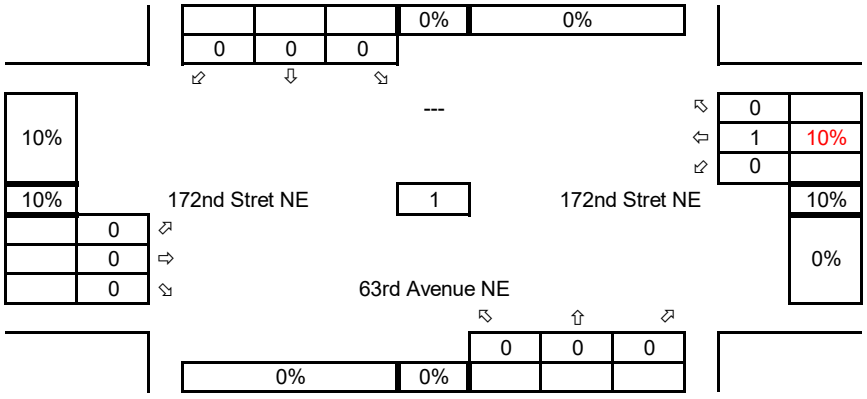
Outbound Traffic



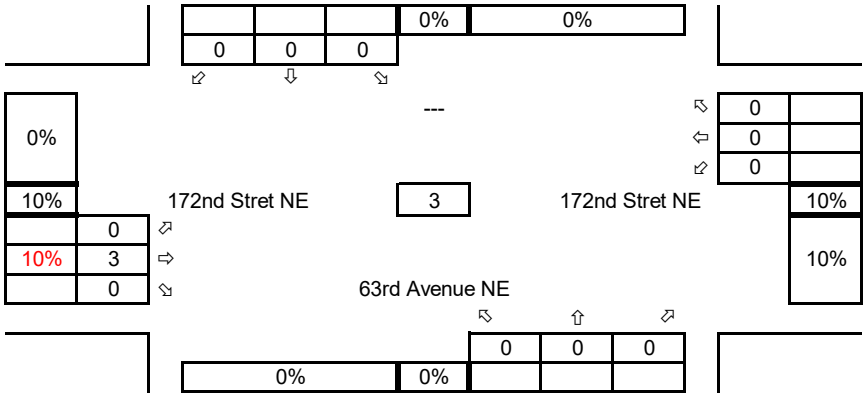
Pipeline Trips
Average Weekday
PM Peak Hour

Area 4 (Bldg 9)

Inbound Traffic



Outbound Traffic



2036 Future Year

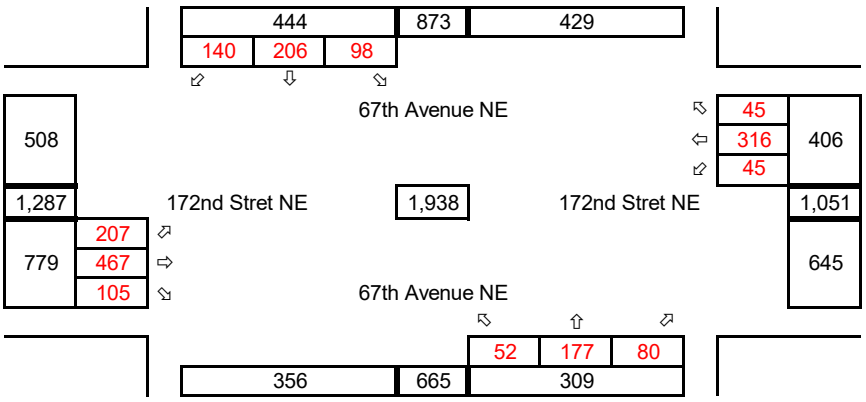
8 172nd St NE at 67th Ave NE

Synchro ID: 8

Existing
Average Weekday
PM Peak Hour

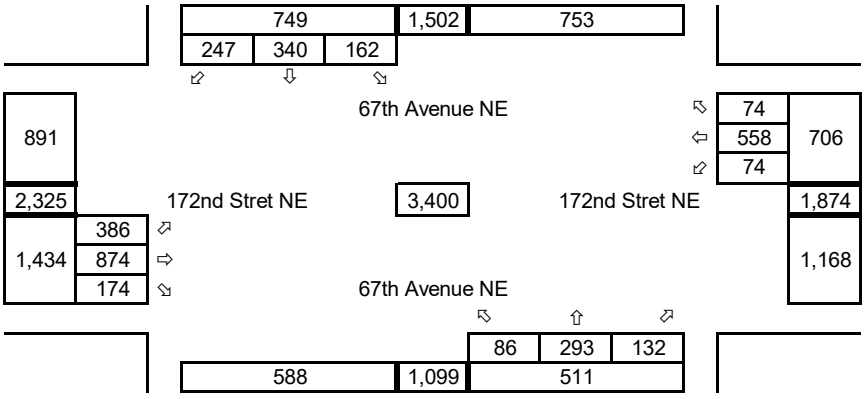
Year: **7/10/2019**

Data Source: **WSDOT**

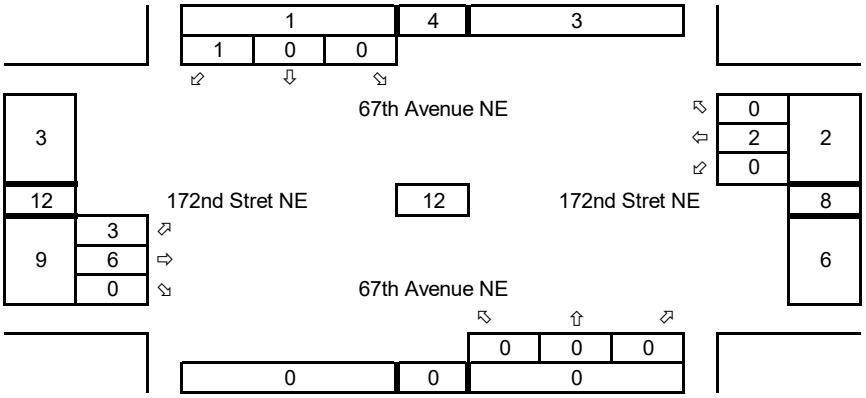


Baseline
Average Weekday
PM Peak Hour

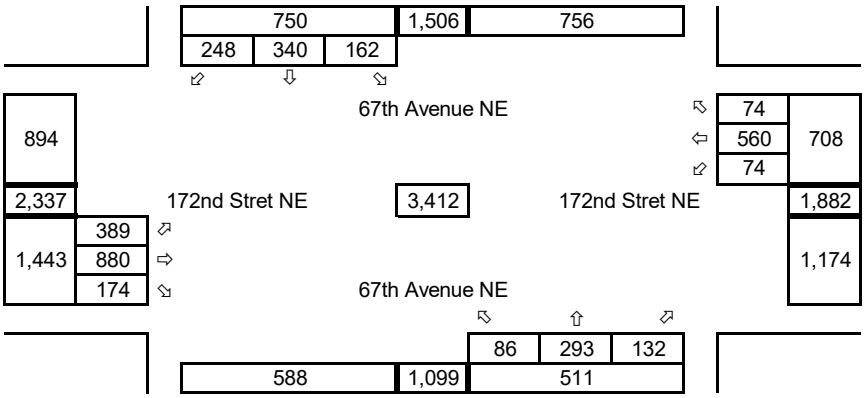
Year: 2036
Growth Rate = 3.0%
Years of Growth = 17
Total Growth = 1.6528

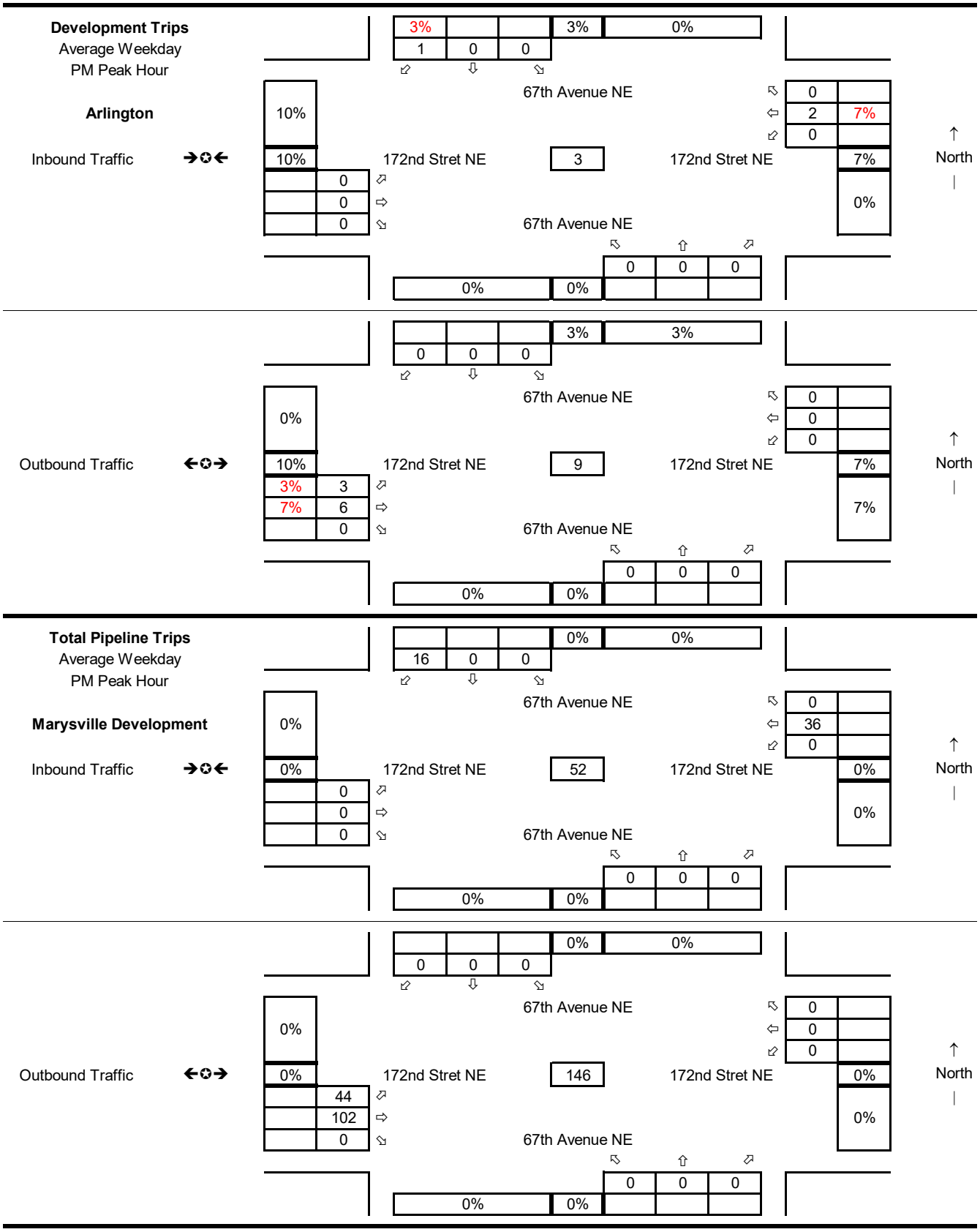


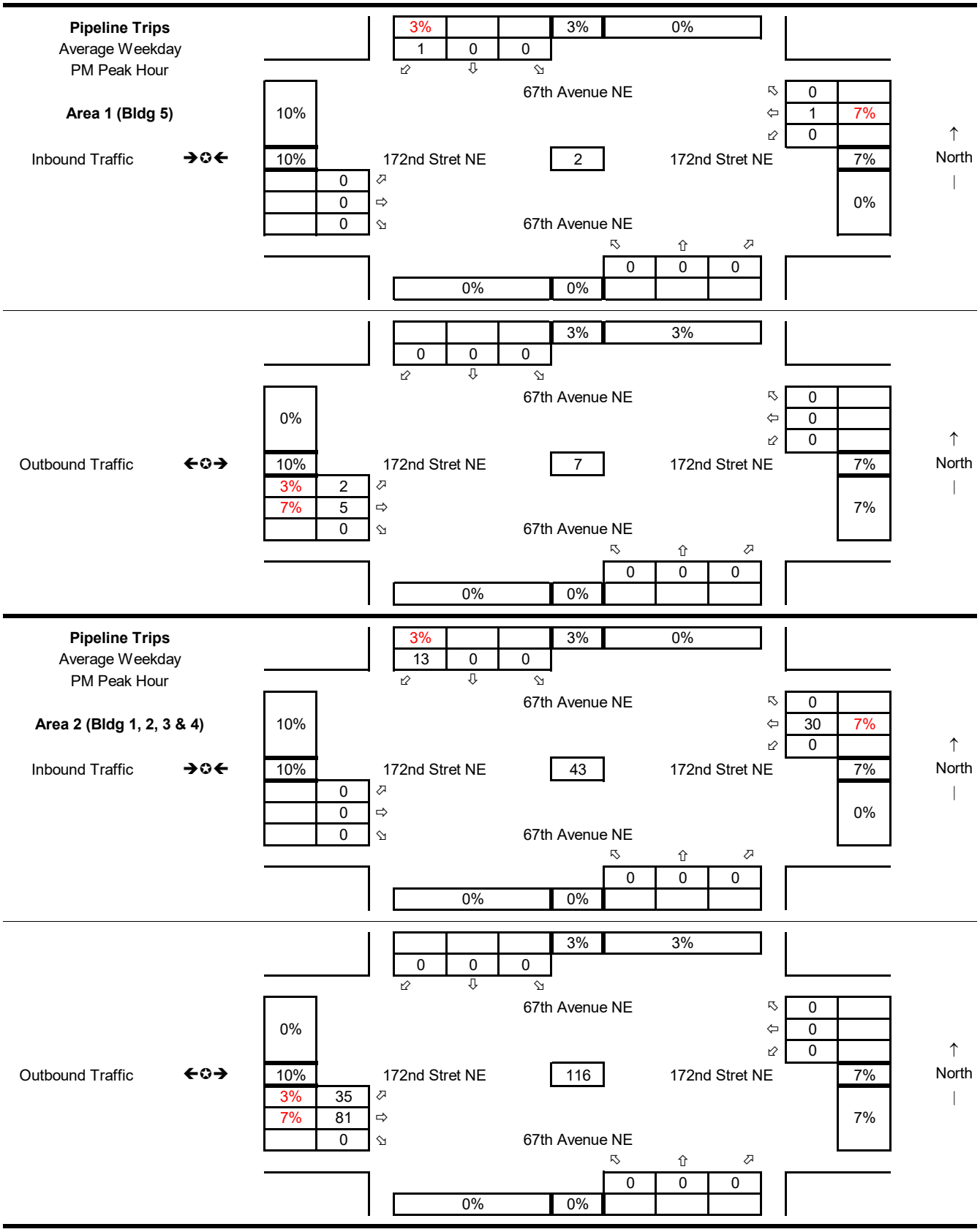
Development Trips
Average Weekday
PM Peak Hour

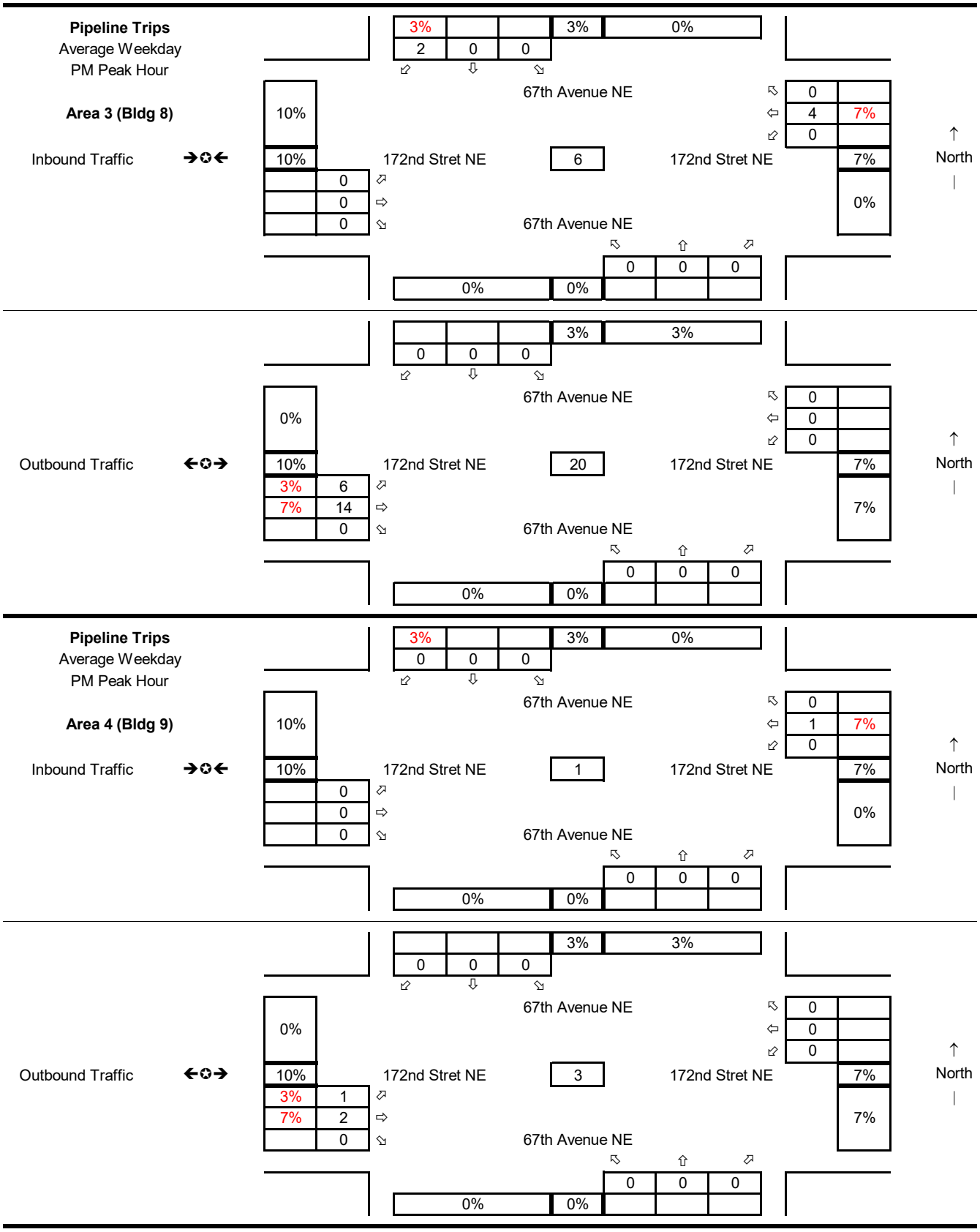


2036 Future w Development
Average Weekday
PM Peak Hour




Development Trips
Average Weekday
PM Peak Hour
Arlington
Inbound Traffic
3% 3% 0%
1 0 0
67th Avenue NE
0
2 7%
0
10%
10% 172nd Stret NE 3 172nd Stret NE 7%
0
0
0
0%
67th Avenue NE
0 0 0
0% 0%
North
3% 3%
0 0 0
67th Avenue NE
0
0
0
0%
Outbound Traffic
10% 172nd Stret NE 9 172nd Stret NE 7%
3% 3
7% 6
0
7%
67th Avenue NE
0 0 0
0% 0%
North
Total Pipeline Trips
Average Weekday
PM Peak Hour
Marysville Development
Inbound Traffic
0% 0%
16 0 0
67th Avenue NE
0
36
0
0%
0% 172nd Stret NE 52 172nd Stret NE 0%
0
0
0
0%
67th Avenue NE
0 0 0
0% 0%
North
0% 0%
0 0 0
67th Avenue NE
0
0
0
0%
Outbound Traffic
0% 172nd Stret NE 146 172nd Stret NE 0%
44
102
0
0%
67th Avenue NE
0 0 0
0% 0%
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
3% 3% 0%
1 0 0
67th Avenue NE
10%
0 1 7% 0
10% 172nd Stret NE 2 172nd Stret NE 7%
0 0 0
0%
67th Avenue NE
0 0 0
0% 0%
North
Outbound Traffic
3% 3%
0 0 0
67th Avenue NE
0%
0 0 0
10% 172nd Stret NE 7 172nd Stret NE 7%
3% 2
7% 5
0
7%
67th Avenue NE
0 0 0
0% 0%
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 2 (Bldg 1, 2, 3 & 4)
Inbound Traffic
3% 3% 0%
13 0 0
67th Avenue NE
10%
0 30 7% 0
10% 172nd Stret NE 43 172nd Stret NE 7%
0 0 0
0%
67th Avenue NE
0 0 0
0% 0%
North
Outbound Traffic
3% 3%
0 0 0
67th Avenue NE
0%
0 0 0
10% 172nd Stret NE 116 172nd Stret NE 7%
3% 35
7% 81
0
7%
67th Avenue NE
0 0 0
0% 0%
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
Outbound Traffic
67th Avenue NE
172nd Stret NE
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
Outbound Traffic
67th Avenue NE
172nd Stret NE
North

2036 Future Year

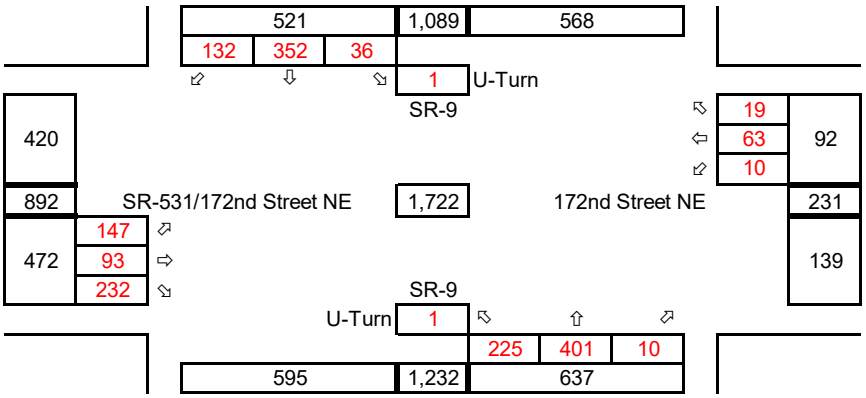
9 172nd St NE at SR-9

Synchro ID: 9

Existing
Average Weekday
PM Peak Hour

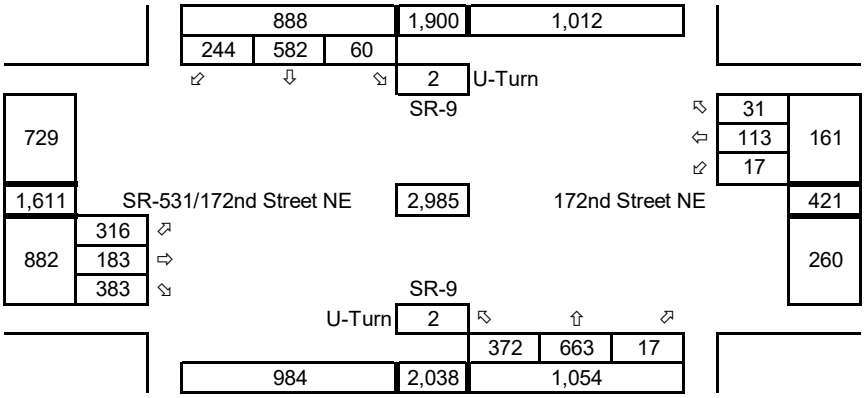
Year: **5/5/2019**

Data Source: **WSDOT**

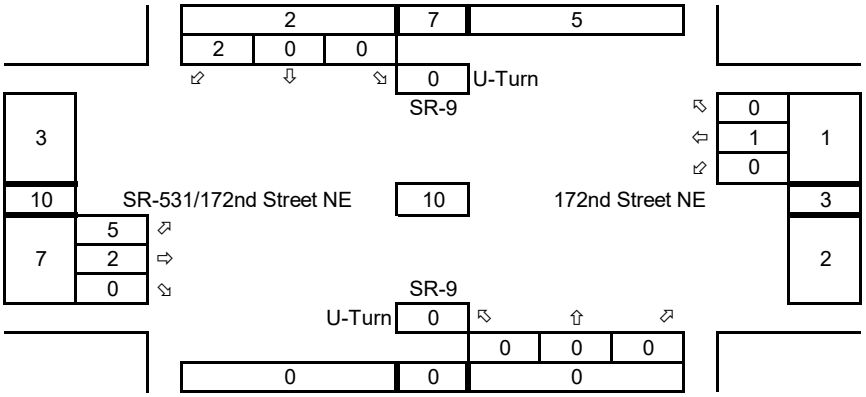


Baseline
Average Weekday
PM Peak Hour

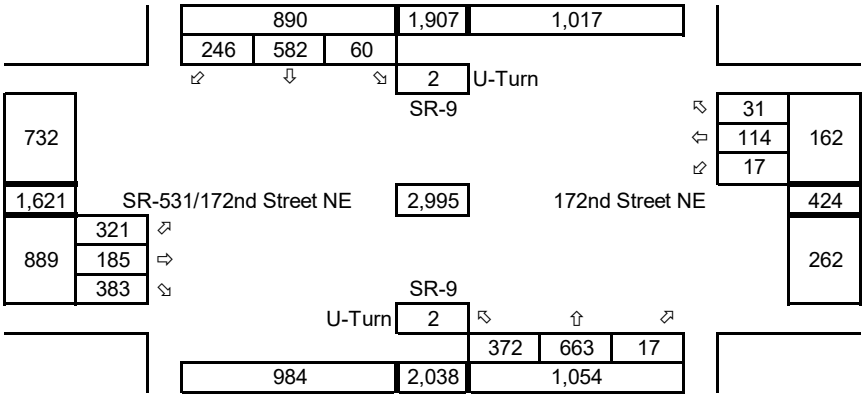
Year: 2036
Growth Rate = 3.0%
Years of Growth = 17
Total Growth = 1.6528

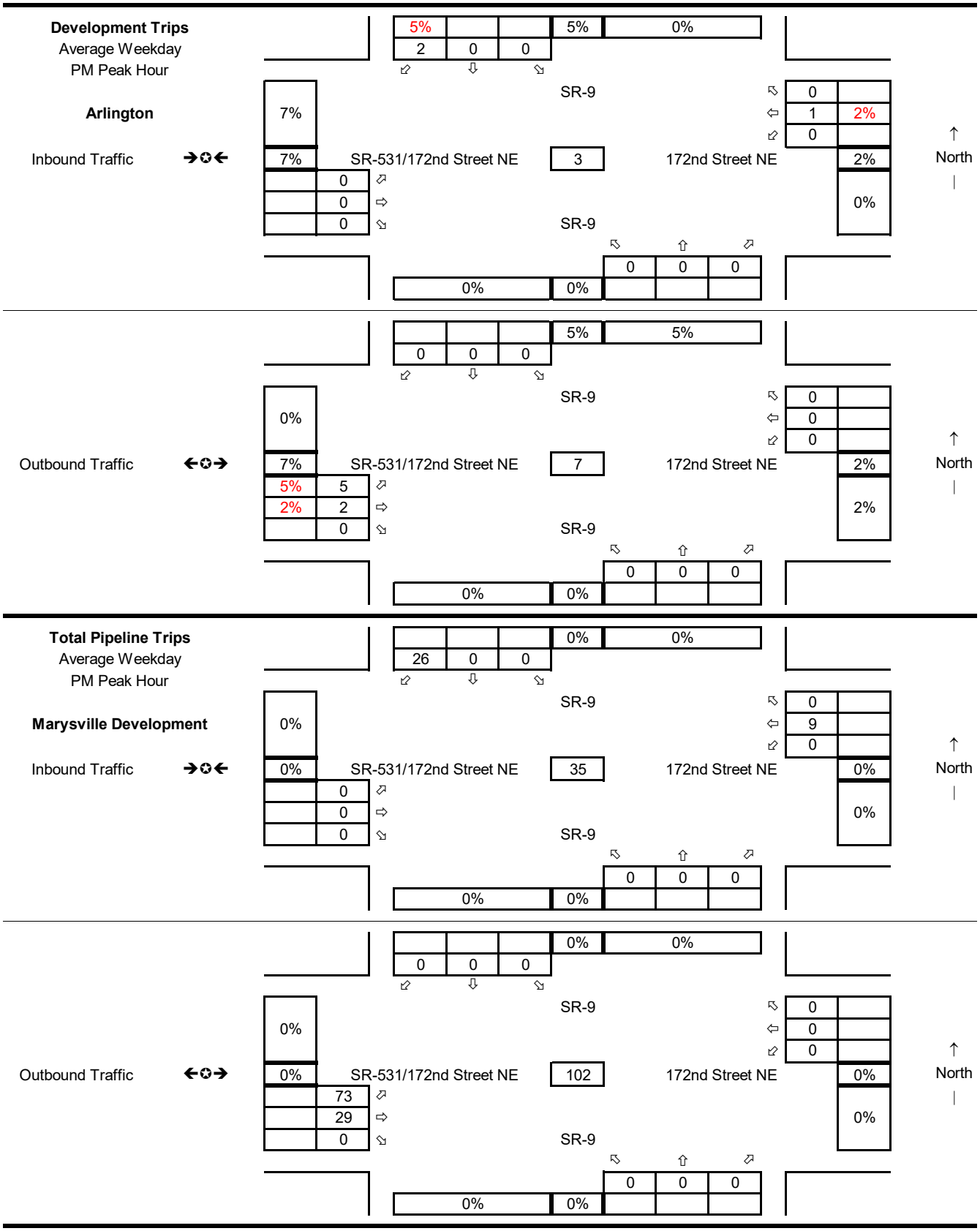


Development Trips
Average Weekday
PM Peak Hour



2036 Future w Development
Average Weekday
PM Peak Hour




Development Trips
Average Weekday
PM Peak Hour
Arlington
Inbound Traffic
5%
2
0
0
5%
0%
SR-9
7%
0
1
2%
0
7%
SR-531/172nd Street NE
3
172nd Street NE
2%
0
0
0
0%
SR-9
0
0
0
0%
0%
North
Outbound Traffic
5%
0
0
0
5%
5%
SR-9
0%
0
0
0
7%
SR-531/172nd Street NE
7
172nd Street NE
2%
5%
5
2%
2
0
2%
SR-9
0
0
0
0%
0%
North
Total Pipeline Trips
Average Weekday
PM Peak Hour
Marysville Development
Inbound Traffic
0%
26
0
0
0%
0%
SR-9
0%
0
9
0
0%
SR-531/172nd Street NE
35
172nd Street NE
0%
0
0
0
0%
SR-9
0
0
0
0%
0%
North
Outbound Traffic
0%
0
0
0
0%
0%
SR-9
0%
0
0
0
0%
SR-531/172nd Street NE
102
172nd Street NE
0%
73
29
0
0%
SR-9
0
0
0
0%
0%
North

Pipeline Trips
Average Weekday
PM Peak Hour

Area 1 (Bldg 5)

Inbound Traffic

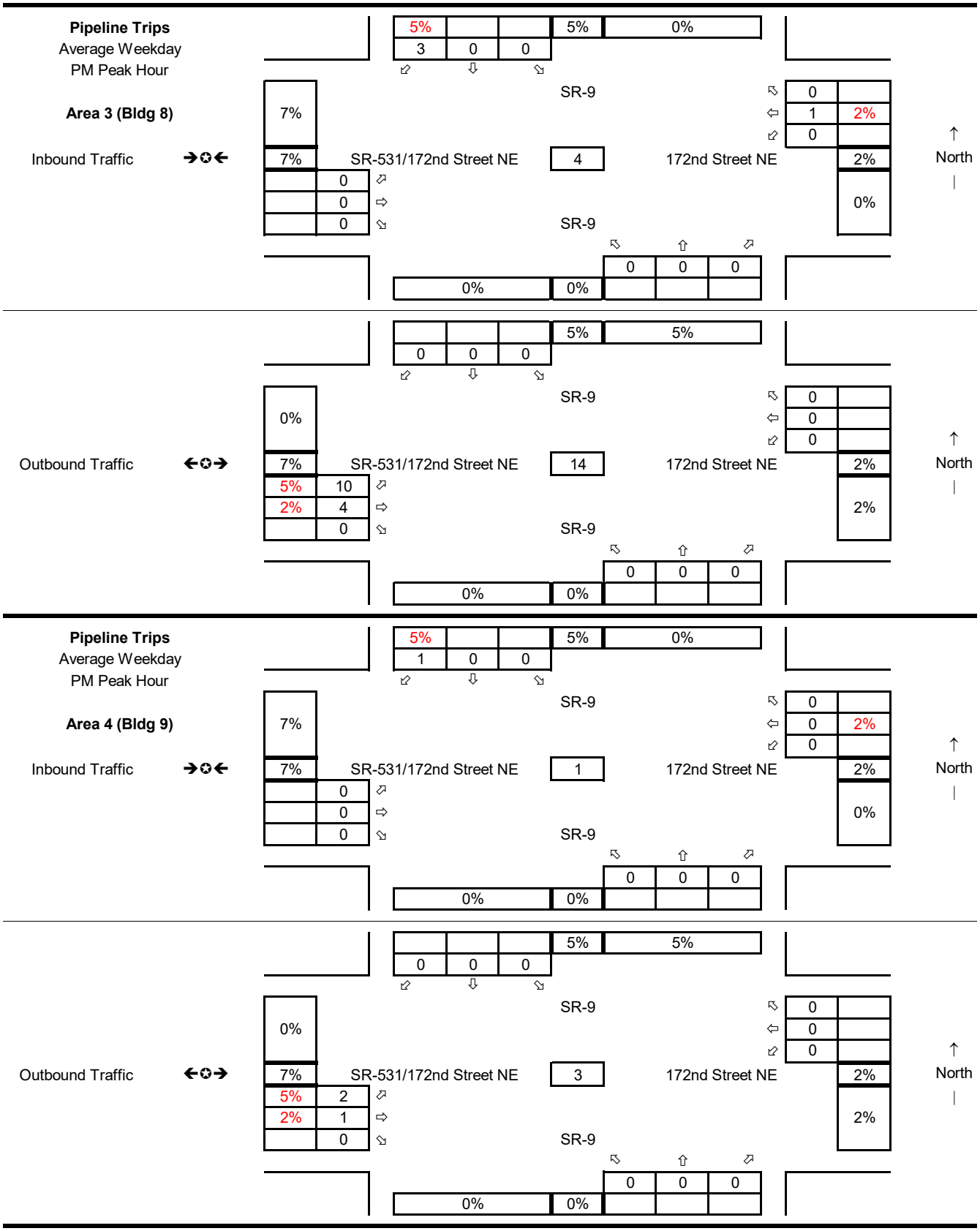
Outbound Traffic

Pipeline Trips
Average Weekday
PM Peak Hour

Area 2 (Bldg 1, 2, 3 & 4)

Inbound Traffic

Outbound Traffic


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
5% 5% 0%
3 0 0
SR-9
7%
0 1 2% 0
7% SR-531/172nd Street NE 4 172nd Street NE 2%
0 0 0
0%
SR-9
0 0 0
0% 0%
North
5% 5%
0 0 0
SR-9
0%
0 0 0
Outbound Traffic
7% SR-531/172nd Street NE 14 172nd Street NE 2%
5% 10
2% 4
0
2%
SR-9
0 0 0
0% 0%
North
Pipeline Trips
Average Weekday
PM Peak Hour
Area 4 (Bldg 9)
Inbound Traffic
5% 5% 0%
1 0 0
SR-9
7%
0 0 2% 0
7% SR-531/172nd Street NE 1 172nd Street NE 2%
0 0 0
0%
SR-9
0 0 0
0% 0%
North
5% 5%
0 0 0
SR-9
0%
0 0 0
Outbound Traffic
7% SR-531/172nd Street NE 3 172nd Street NE 2%
5% 2
2% 1
0
2%
SR-9
0 0 0
0% 0%
North

2036 Future Year 10 Site Access at 59th Ave NE

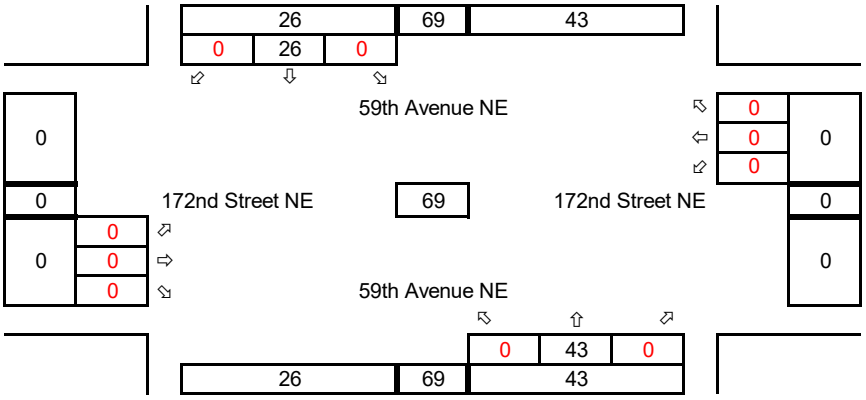
Synchro ID: 10

Existing
Average Weekday
PM Peak Hour

Year: **7/10/2019**

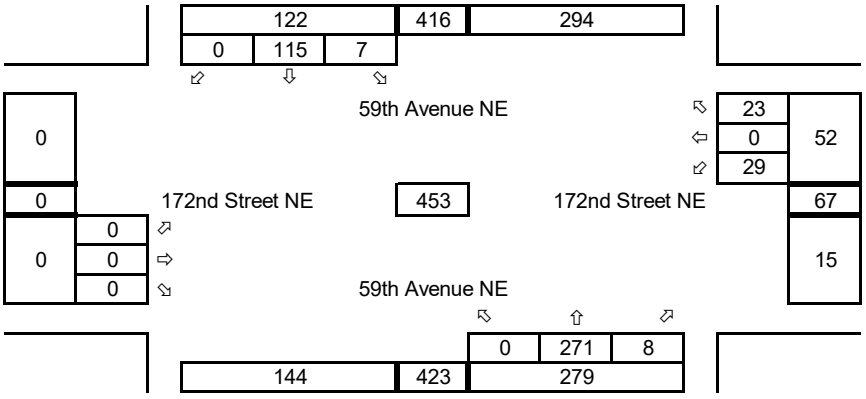
Data Source: **WSDOT**

Volumes are based on
Intersection #6 -
172nd Street NE/SR-531 at
59th Avenue NE

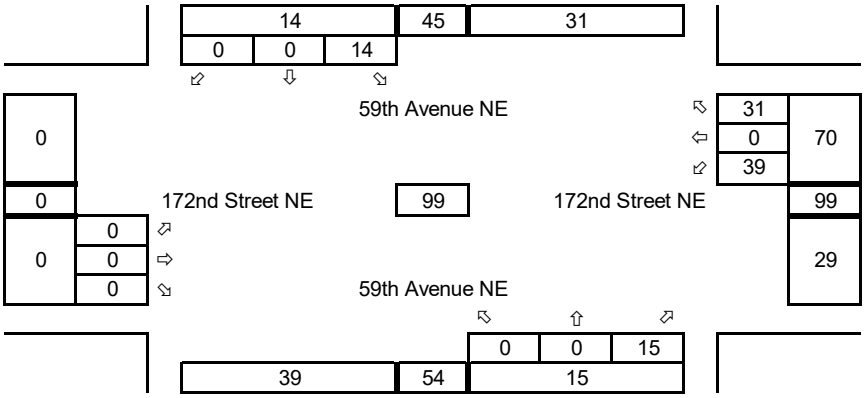


Baseline
Average Weekday
PM Peak Hour

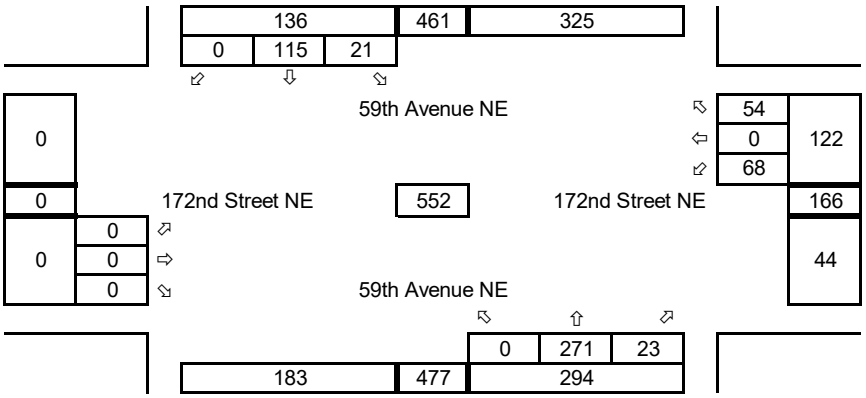
Year: 2036
Growth Rate = 3.0%
Years of Growth = 17
Total Growth = 1.6528

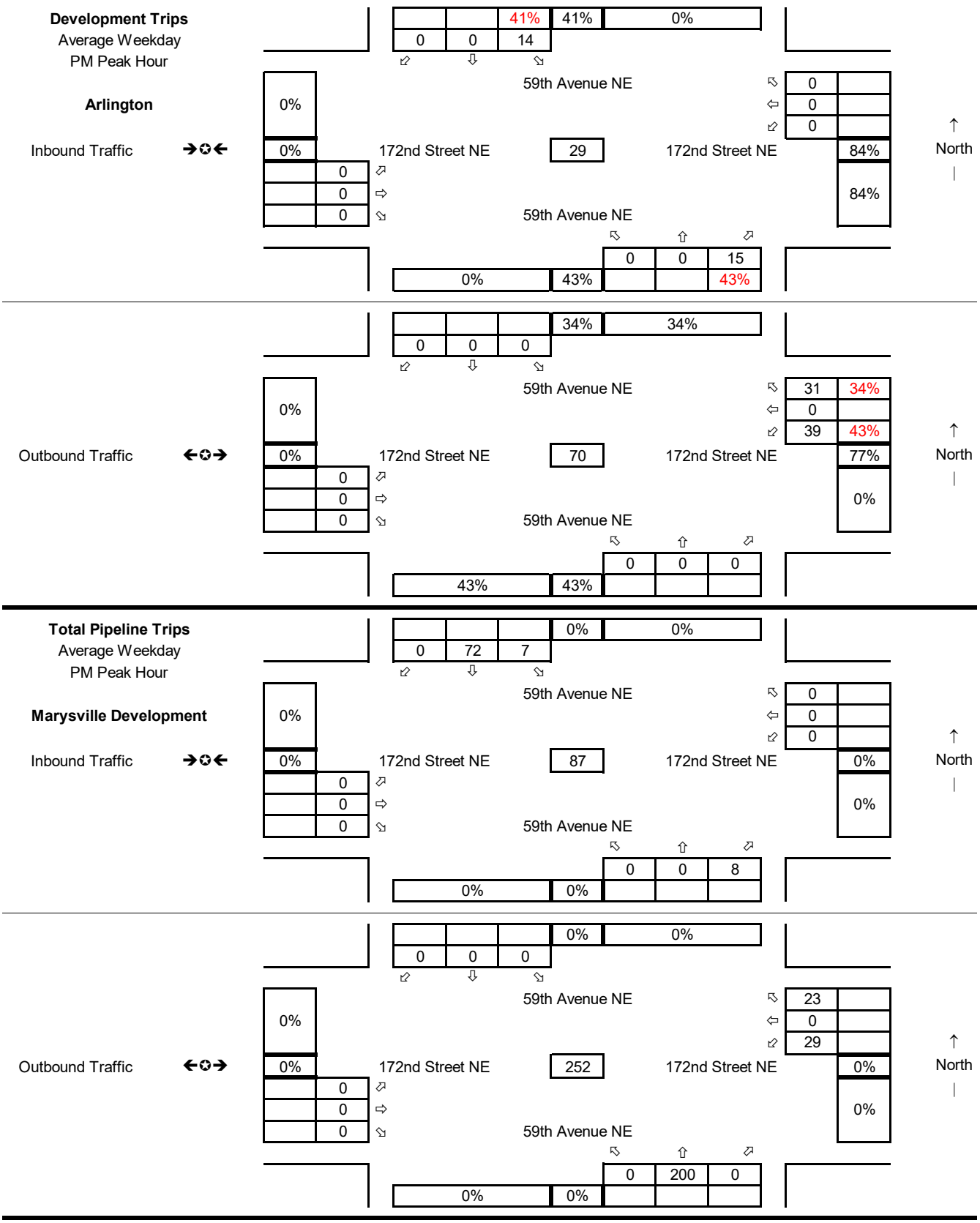


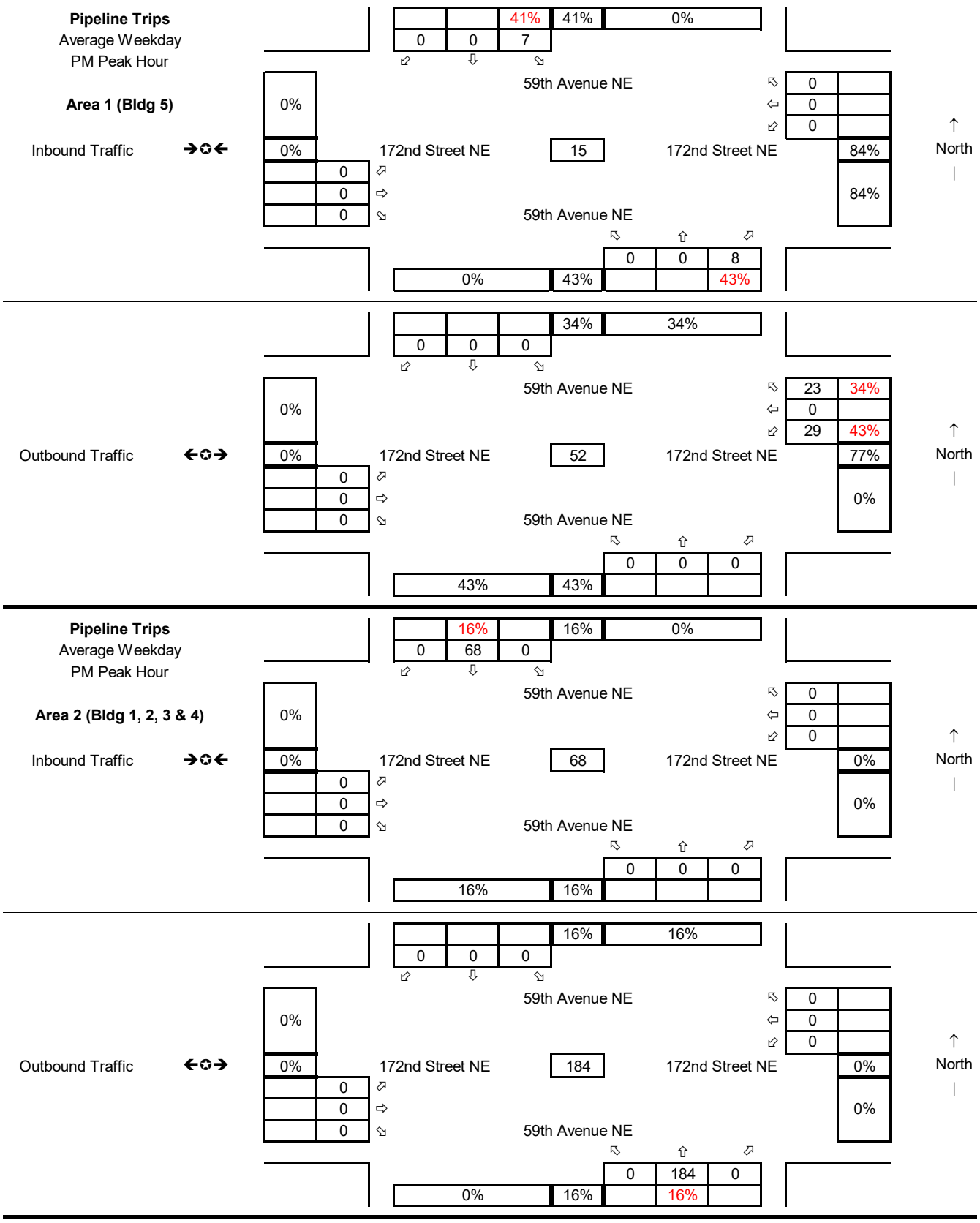
Development Trips
Average Weekday
PM Peak Hour

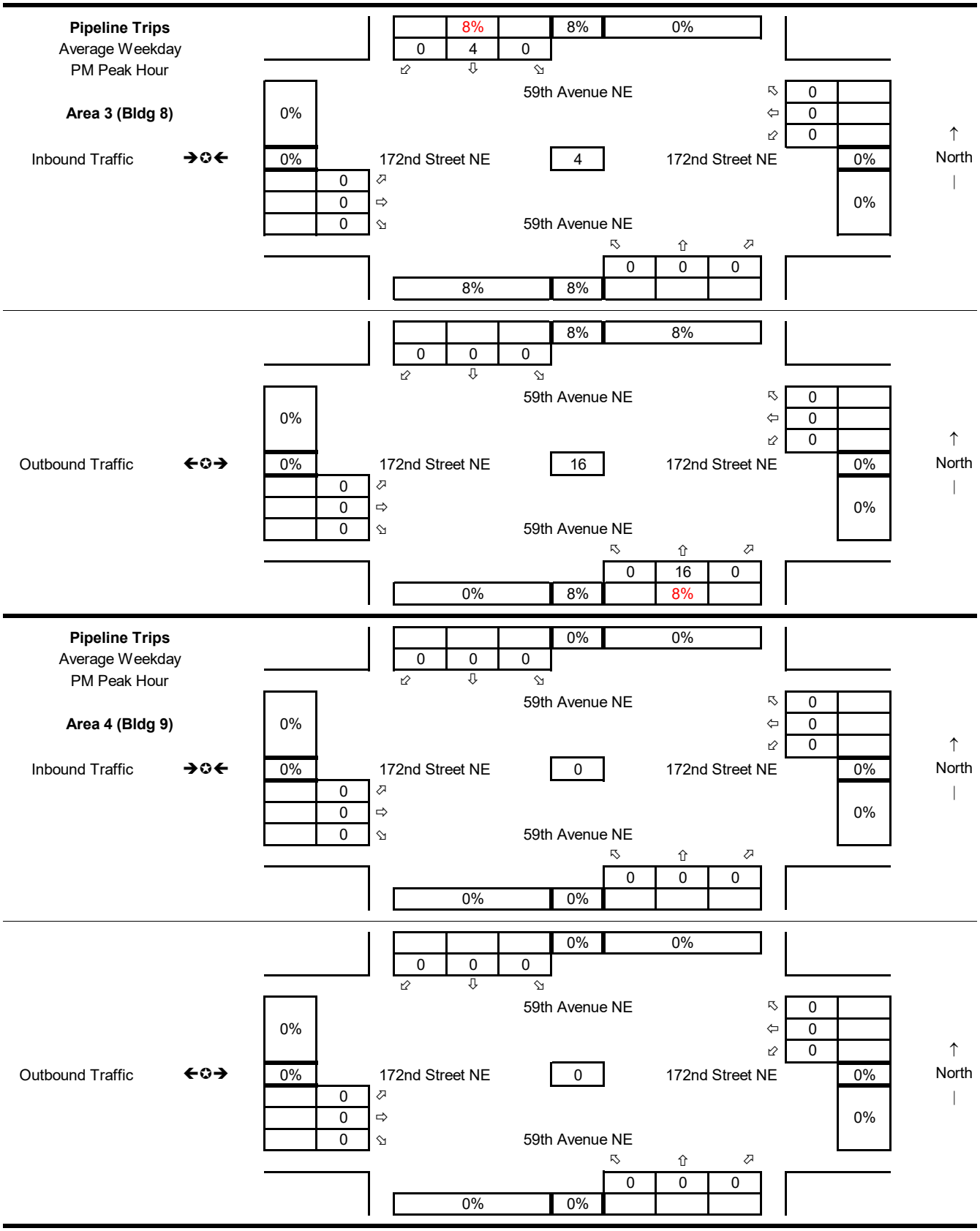


2036 Future w Development
Average Weekday
PM Peak Hour




Development Trips
Average Weekday
PM Peak Hour
Arlington
Inbound Traffic
41%
41%
0%
0 0 14
59th Avenue NE
0 0 0
0%
0% 84%
172nd Street NE 29 172nd Street NE
0 0 0
84%
59th Avenue NE
0 0 15
0% 43% 43%
North
34%
34%
0 0 0
59th Avenue NE
31 34%
0 0 39 43%
Outbound Traffic
0% 77%
172nd Street NE 70 172nd Street NE
0 0 0
0%
59th Avenue NE
0 0 0
43% 43%
Total Pipeline Trips
Average Weekday
PM Peak Hour
Marysville Development
Inbound Traffic
0%
0%
0 72 7
59th Avenue NE
0 0 0
0%
0% 0%
172nd Street NE 87 172nd Street NE
0 0 0
0%
59th Avenue NE
0 0 8
0% 0%
0%
0%
0 0 0
59th Avenue NE
23 0 29
Outbound Traffic
0% 0%
172nd Street NE 252 172nd Street NE
0 0 0
0%
59th Avenue NE
0 200 0
0% 0%


Pipeline Trips
Average Weekday
PM Peak Hour
Area 1 (Bldg 5)
Inbound Traffic
Outbound Traffic
172nd Street NE
59th Avenue NE
North
15
52
68
184
Pipeline Trips
Average Weekday
PM Peak Hour
Area 2 (Bldg 1, 2, 3 & 4)
Inbound Traffic
Outbound Traffic
172nd Street NE
59th Avenue NE
North


Pipeline Trips
Average Weekday
PM Peak Hour
Area 3 (Bldg 8)
Inbound Traffic
Outbound Traffic
Area 4 (Bldg 9)
59th Avenue NE
172nd Street NE
North
8%
0%
4
16
0

2020 Existing Level of Service Calculations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	948	434	0	1383	510	0	0	0	287	1	286
Future Volume (vph)	0	948	434	0	1383	510	0	0	0	287	1	286
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			0.98			0.96						0.99
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	1552	0	3539	1523	0	0	0	1681	1686	1562
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			452			531						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)	8		4	4		8	1					1
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
Adj. Flow (vph)	0	988	452	0	1441	531	0	0	0	299	1	298
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	988	452	0	1441	531	0	0	0	149	151	298
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)		77.1	77.1		76.7	76.7				28.7	28.7	28.7
Actuated g/C Ratio		0.66	0.66		0.65	0.65				0.24	0.24	0.24
v/c Ratio		0.43	0.39		0.62	0.45				0.36	0.37	0.68
Control Delay		9.8	1.5		12.7	1.8				44.4	44.5	42.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		0.2	0.2		0.0	0.0				0.0	0.0	0.0
Total Delay		10.0	1.8		12.7	1.8				44.4	44.5	42.1
LOS		A	A		B	A				D	D	D
Approach Delay		7.4			9.8						43.3	
Approach LOS		A			A						D	
Queue Length 50th (ft)		168	0		301	0				107	108	168
Queue Length 95th (ft)		203	30		357	32				192	194	#322
Internal Link Dist (ft)		529			860			899			1046	
Turn Bay Length (ft)			200							350		435
Base Capacity (vph)		2866	1343		2859	1332				409	410	436
Starvation Cap Reductn		868	318		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		0.49	0.44		0.50	0.40				0.36	0.37	0.68

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 117.6
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 13.9 Intersection LOS: B
Intersection Capacity Utilization 71.5% ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: I-5 Southbound Ramps & 172nd Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	874	0	0	1281	538	590	0	855	0	0	0
Future Volume (vph)	295	874	0	0	1281	538	590	0	855	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					0.98			0.99			
Frt						0.850			0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1736	3471	0	0	4988	1553	1649	1649	1553	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1734	3471	0	0	4988	1523	1649	1649	1532	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						560			404			
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)	3		9	9		3			5	5		
Confl. Bikes (#/hr)			1									
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	307	910	0	0	1334	560	615	0	891	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	307	910	0	0	1334	560	307	308	891	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)	23.3	81.1			52.5	52.5	35.1	35.1	128.1			
Actuated g/C Ratio	0.18	0.63			0.41	0.41	0.27	0.27	1.00			

Lanes, Volumes, Timings
2: I-5 Northbound Ramps & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.97	0.41			0.65	0.59	0.68	0.68	0.58			
Control Delay	96.7	12.3			32.3	4.7	51.1	51.2	1.6			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	96.7	12.3			32.3	4.7	51.1	51.2	1.6			
LOS	F	B			C	A	D	D	A			
Approach Delay		33.6			24.2			21.9				
Approach LOS		C			C			C				
Queue Length 50th (ft)	260	184			327	0	247	248	0			
Queue Length 95th (ft)	#441	226			379	73	361	362	0			
Internal Link Dist (ft)		860			1006			1014			919	
Turn Bay Length (ft)	600					300	400					
Base Capacity (vph)	331	2277			2114	968	451	451	1532			
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	0.93	0.40			0.63	0.58	0.68	0.68	0.58			

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 128.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 25.9 Intersection LOS: C
Intersection Capacity Utilization 93.5% ICU Level of Service F
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: I-5 Northbound Ramps & 172nd Street NE

Existing Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	56	368	738	296	168	836	102	559	413	219	147	223	306
Future Volume (vph)	56	368	738	296	168	836	102	559	413	219	147	223	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		900		0	400		260	200		200	200		170
Storage Lanes		1		1	1		1	2		1	1		1
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00		0.98	1.00		0.98	0.99		0.97	0.99		0.98
Frt				0.850			0.850			0.850			0.850
Flt Protected		0.950			0.950			0.950			0.950		
Satd. Flow (prot)	0	1755	3505	1568	1752	5036	1568	3400	3505	1568	1752	3505	1568
Flt Permitted		0.950			0.950			0.950			0.950		
Satd. Flow (perm)	0	1752	3505	1533	1746	5036	1541	3369	3505	1526	1738	3505	1530
Right Turn on Red				Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				254			116			224			173
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			1086			469			515			2837	
Travel Time (s)			24.7			10.7			11.7			64.5	
Confl. Peds. (#/hr)		4		7	7		4	9		11	11		9
Peak Hour Factor	0.92	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	61	383	769	308	175	871	106	582	430	228	153	232	319
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	444	769	308	175	871	106	582	430	228	153	232	319
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	5	2		1	6		3	8		7	4	
Permitted Phases				2			6			8			4
Detector Phase	5	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase													
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	10.5	10.5	42.5	42.5	10.5	46.5	46.5	10.5	45.9	45.9	10.5	44.9	44.9
Total Split (s)	35.0	35.0	70.0	70.0	35.0	70.0	70.0	45.0	32.0	32.0	35.0	32.0	32.0
Total Split (%)	19.2%	19.2%	38.5%	38.5%	19.2%	38.5%	38.5%	24.7%	17.6%	17.6%	19.2%	17.6%	17.6%

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Maximum Green (s)	29.5	29.5	63.5	63.5	29.5	63.5	63.5	39.5	26.1	26.1	29.5	26.1	26.1
Yellow Time (s)	3.5	3.5	4.5	4.5	3.5	4.5	4.5	3.5	3.9	3.9	3.5	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	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	0.0	0.0
Total Lost Time (s)		5.5	6.5	6.5	5.5	6.5	6.5	5.5	5.9	5.9	5.5	5.9	5.9
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Max	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)			29.0	29.0		33.0	33.0		33.0	33.0		32.0	32.0
Pedestrian Calls (#/hr)			0	0		0	0		0	0		0	0
Act Effct Green (s)		29.9	49.5	49.5	20.9	40.6	40.6	31.8	52.0	52.0	19.3	39.5	39.5
Actuated g/C Ratio		0.18	0.30	0.30	0.13	0.25	0.25	0.19	0.31	0.31	0.12	0.24	0.24
v/c Ratio		1.41	0.73	0.48	0.79	0.71	0.23	0.89	0.39	0.36	0.75	0.28	0.64
Control Delay		245.6	57.6	12.4	96.4	59.9	6.6	82.6	48.3	7.8	94.9	55.5	34.0
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		245.6	57.6	12.4	96.4	59.9	6.6	82.6	48.3	7.8	94.9	55.5	34.0
LOS		F	E	B	F	E	A	F	D	A	F	E	C
Approach Delay			103.3			60.5			57.0			54.3	
Approach LOS			F			E			E			D	
Queue Length 50th (ft)		~615	394	43	180	316	0	307	183	3	158	104	139
Queue Length 95th (ft)		#1057	529	144	309	384	40	450	308	82	274	182	310
Internal Link Dist (ft)			1006			389			435			2757	
Turn Bay Length (ft)		900			400		260	200		200	200		170
Base Capacity (vph)		316	1362	751	316	1957	669	822	1102	633	316	836	496
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	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	0
Reduced v/c Ratio		1.41	0.56	0.41	0.55	0.45	0.16	0.71	0.39	0.36	0.48	0.28	0.64

Intersection Summary

Area Type: Other
Cycle Length: 182

Actuated Cycle Length: 165.4
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.41
Intersection Signal Delay: 72.7
Intersection LOS: E
Intersection Capacity Utilization 109.7%
ICU Level of Service H
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.

Splits and Phases: 3: Smokey Point Boulevard & 172nd Street NE

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	17	19	723	29	130	868	17	233	10	189	7	4	14
Future Volume (vph)	17	19	723	29	130	868	17	233	10	189	7	4	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		155		0	230		60	225		0	100		0
Storage Lanes		1		1	1		1	2		0	1		0
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00				1.00		1.00				0.99	
Frt				0.850		0.997			0.858			0.882	
Flt Protected		0.950			0.950			0.950			0.950		
Satd. Flow (prot)	0	1761	1845	1568	1752	3492	0	3400	1583	0	1752	1610	0
Flt Permitted		0.526			0.950			0.950			0.950		
Satd. Flow (perm)	0	973	1845	1568	1752	3492	0	3391	1583	0	1752	1610	0
Right Turn on Red				Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				124		2			201			15	
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			2130			2599			1049			2423	
Travel Time (s)			48.4			59.1			23.8			55.1	
Confl. Peds. (#/hr)		3					3	1					1
Confl. Bikes (#/hr)							1						
Peak Hour Factor	0.92	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	18	20	769	31	138	923	18	248	11	201	7	4	15
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	38	769	31	138	941	0	248	212	0	7	19	0
Turn Type	custom	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases		5	2		1	6		3	8		7	4	
Permitted Phases	5			2									
Detector Phase	5	5	2	2	1	6		3	8		7	4	
Switch Phase													
Minimum Initial (s)	3.0	3.0	10.0	10.0	3.0	10.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	9.5	9.5	32.9	32.9	9.5	30.9		9.5	32.1		9.5	37.1	
Total Split (s)	15.0	15.0	100.0	100.0	25.0	100.0		15.0	20.0		15.0	20.0	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	9.4%	9.4%	62.5%	62.5%	15.6%	62.5%		9.4%	12.5%		9.4%	12.5%	
Maximum Green (s)	9.5	9.5	94.1	94.1	19.5	94.1		9.9	14.9		9.9	14.9	
Yellow Time (s)	3.5	3.5	3.9	3.9	3.5	3.9		3.1	3.1		3.1	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	
Total Lost Time (s)		5.5	5.9	5.9	5.5	5.9		5.1	5.1		5.1	5.1	
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5	3.0	3.0	2.5	3.0		2.5	3.0		2.5	3.0	
Recall Mode	None	None	C-Max	C-Max	None	C-Max		None	Max		None	Max	
Walk Time (s)			7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)			20.0	20.0		18.0			20.0			25.0	
Pedestrian Calls (#/hr)			0	0		0			0			0	
Act Effct Green (s)		9.2	97.2	97.2	16.4	107.1		9.9	27.5		5.8	14.9	
Actuated g/C Ratio		0.06	0.61	0.61	0.10	0.67		0.06	0.17		0.04	0.09	
v/c Ratio		0.69	0.69	0.03	0.77	0.40		1.18	0.48		0.11	0.12	
Control Delay		125.4	25.8	0.1	96.1	13.0		180.4	13.2		78.0	33.9	
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		125.4	25.8	0.1	96.1	13.0		180.4	13.2		78.0	33.9	
LOS		F	C	A	F	B		F	B		E	C	
Approach Delay			29.3			23.7			103.3			45.8	
Approach LOS			C			C			F			D	
Queue Length 50th (ft)		40	530	0	142	234		~159	10		7	4	
Queue Length 95th (ft)		#104	711	0	219	277		#255	96		26	33	
Internal Link Dist (ft)			2050			2519			969			2343	
Turn Bay Length (ft)		155			230			225			100		
Base Capacity (vph)		57	1120	1000	213	2337		210	438		108	163	
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		0.67	0.69	0.03	0.65	0.40		1.18	0.48		0.06	0.12	

Intersection Summary

Area Type: Other

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 25 (16%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 41.1 Intersection LOS: D
Intersection Capacity Utilization 85.7% ICU Level of Service E
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.

Splits and Phases: 4: 43rd Avenue NE & 172nd Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	729	159	72	812	28	141	56	75	46	50	71
Future Volume (vph)	33	729	159	72	812	28	141	56	75	46	50	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	250		0	180		150	225		0
Storage Lanes	1		0	1		0	1		1	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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00		1.00				0.98	
Frt		0.973			0.995				0.850		0.912	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1787	0	1752	1834	0	1752	1845	1568	1752	1657	0
Flt Permitted	0.251			0.213			0.548			0.719		
Satd. Flow (perm)	463	1787	0	393	1834	0	1006	1845	1568	1326	1657	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			3				78		42	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2599			2632			3339			896	
Travel Time (s)		59.1			59.8			75.9			20.4	
Confl. Peds. (#/hr)	1		2	2		1	2					2
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
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	34	759	166	75	846	29	147	58	78	48	52	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	925	0	75	875	0	147	58	78	48	126	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	10.5	30.9		10.5	33.9		28.1	28.1	28.1	28.3	28.3	
Total Split (s)	15.0	100.0		15.0	100.0		20.0	20.0	20.0	20.0	20.0	
Total Split (%)	11.1%	74.1%		11.1%	74.1%		14.8%	14.8%	14.8%	14.8%	14.8%	
Maximum Green (s)	9.5	94.1		9.5	94.1		14.9	14.9	14.9	13.7	13.7	
Yellow Time (s)	3.5	3.9		3.5	3.9		3.1	3.1	3.1	4.3	4.3	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.9		5.5	5.9		5.1	5.1	5.1	6.3	6.3	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.5	4.0		2.5	4.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		18.0			21.0		16.0	16.0	16.0	15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	104.5	99.6		106.7	102.3		14.9	14.9	14.9	13.7	13.7	
Actuated g/C Ratio	0.77	0.74		0.79	0.76		0.11	0.11	0.11	0.10	0.10	
v/c Ratio	0.08	0.70		0.20	0.63		1.32	0.29	0.32	0.36	0.61	

Lanes, Volumes, Timings
5: 51st Avenue NE & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	3.0	13.6		3.9	10.8		240.5	59.3	15.1	64.8	52.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	3.0	13.6		3.9	10.8		240.5	59.3	15.1	64.8	52.1	
LOS	A	B		A	B		F	E	B	E	D	
Approach Delay		13.2			10.3			141.2			55.6	
Approach LOS		B			B			F			E	
Queue Length 50th (ft)	5	410		11	358		~167	47	0	40	71	
Queue Length 95th (ft)	11	581		20	494		#309	94	49	83	141	
Internal Link Dist (ft)		2519			2552			3259			816	
Turn Bay Length (ft)	250			250			180		150	225		
Base Capacity (vph)	459	1323		411	1390		111	203	242	134	205	
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	0.07	0.70		0.18	0.63		1.32	0.29	0.32	0.36	0.61	

Intersection Summary

Area Type: Other
Cycle Length: 135
Actuated Cycle Length: 135
Offset: 15 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay: 30.5 Intersection LOS: C
Intersection Capacity Utilization 86.9% ICU Level of Service E
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.

Splits and Phases: 5: 51st Avenue NE & 172nd Street NE

Lanes, Volumes, Timings
6: 59th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	656	12	10	497	29	30	1	12	81	4	422
Future Volume (vph)	175	656	12	10	497	29	30	1	12	81	4	422
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	150		0	250		0	400		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	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.992			0.861			0.851	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1821	0	1736	1812	0	1736	1573	0	1736	1555	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	1821	0	1736	1812	0	1736	1573	0	1736	1555	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			3			13			457	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2632			1402			3345			1561	
Travel Time (s)		59.8			31.9			76.0			35.5	
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 (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	190	713	13	11	540	32	33	1	13	88	4	459
Shared Lane Traffic (%)												
Lane Group Flow (vph)	190	726	0	11	572	0	33	14	0	88	463	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0		3.0	5.0		3.0	5.0	
Minimum Split (s)	9.5	34.9		9.5	37.9		9.5	32.9		9.5	32.9	
Total Split (s)	34.0	85.0		14.0	85.0		15.0	26.0		15.0	26.0	
Total Split (%)	21.3%	53.1%		8.8%	53.1%		9.4%	16.3%		9.4%	16.3%	
Maximum Green (s)	28.5	79.1		8.5	79.1		9.5	20.1		9.5	20.1	
Yellow Time (s)	3.5	3.9		3.5	3.9		3.5	3.9		3.5	3.9	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.9		5.5	5.9		5.5	5.9		5.5	5.9	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	C-Max		None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			25.0			20.0			20.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	22.3	116.7		6.6	94.1		8.0	11.2		9.5	14.9	
Actuated g/C Ratio	0.14	0.73		0.04	0.59		0.05	0.07		0.06	0.09	
v/c Ratio	0.79	0.55		0.15	0.54		0.38	0.11		0.85	0.83	
Control Delay	88.1	13.8		78.1	24.0		85.5	29.9		128.4	19.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Lanes, Volumes, Timings
6: 59th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	88.1	13.8		78.1	24.0		85.5	29.9		128.4	19.4	
LOS	F	B		E	C		F	C		F	B	
Approach Delay		29.2			25.1			68.9			36.8	
Approach LOS		C			C			E			D	
Queue Length 50th (ft)	195	234		11	324		34	1		93	6	
Queue Length 95th (ft)	276	595		34	568		73	25		#203	133	
Internal Link Dist (ft)		2552			1322			3265			1481	
Turn Bay Length (ft)	350			150			250			400		
Base Capacity (vph)	309	1328		92	1067		103	208		103	596	
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	0.61	0.55		0.12	0.54		0.32	0.07		0.85	0.78	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 34 (21%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 30.9 Intersection LOS: C
Intersection Capacity Utilization 79.3% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: 59th Avenue NE & 172nd Street NE

Existing Conditions PM Peak-Hour
Gibson Traffic Consultants, Inc. [BJL #20-106]

Lanes, Volumes, Timings
8: 67th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	467	105	45	316	45	52	177	80	98	206	140
Future Volume (vph)	207	467	105	45	316	45	52	177	80	98	206	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		80	125		0	150		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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								0.99		1.00		
Frt			0.850		0.981			0.953			0.939	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1845	1568	1752	1810	0	1752	1745	0	1752	1732	0
Flt Permitted	0.427			0.402			0.202			0.293		
Satd. Flow (perm)	788	1845	1568	742	1810	0	373	1745	0	540	1732	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			88		7			13			19	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1109			3194			1426			2074	
Travel Time (s)		25.2			72.6			32.4			47.1	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	211	477	107	46	322	46	53	181	82	100	210	143
Shared Lane Traffic (%)												
Lane Group Flow (vph)	211	477	107	46	368	0	53	263	0	100	353	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8			4		
Detector Phase	5	2	2	1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	7.0		5.0	7.0	
Minimum Split (s)	10.0	31.9	31.9	10.0	34.9		10.0	33.9		10.0	35.9	
Total Split (s)	16.0	90.0	90.0	16.0	90.0		16.0	38.0		16.0	38.0	
Total Split (%)	10.0%	56.3%	56.3%	10.0%	56.3%		10.0%	23.8%		10.0%	23.8%	
Maximum Green (s)	11.0	84.1	84.1	11.0	84.1		11.0	32.1		11.0	32.1	
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9		3.0	3.9		3.0	3.9	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.9	5.9	5.0	5.9		5.0	5.9		5.0	5.9	
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)	3.0	4.0	4.0	3.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		19.0	19.0		22.0			21.0			23.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	99.9	90.2	90.2	92.3	84.3		42.4	32.7		46.1	36.6	
Actuated g/C Ratio	0.62	0.56	0.56	0.58	0.53		0.26	0.20		0.29	0.23	
v/c Ratio	0.38	0.46	0.12	0.10	0.38		0.30	0.72		0.43	0.86	

Lanes, Volumes, Timings
8: 67th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	14.5	23.0	5.0	11.9	23.5		44.7	68.6		47.0	76.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.5	23.0	5.0	11.9	23.5		44.7	68.6		47.0	76.8	
LOS	B	C	A	B	C		D	E		D	E	
Approach Delay		18.4			22.2			64.6			70.2	
Approach LOS		B			C			E			E	
Queue Length 50th (ft)	88	294	9	17	220		40	248		77	348	
Queue Length 95th (ft)	129	398	40	35	300		77	358		129	#568	
Internal Link Dist (ft)		1029			3114			1346			1994	
Turn Bay Length (ft)	350		80	125			150			200		
Base Capacity (vph)	558	1039	922	515	957		198	367		239	410	
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	0.38	0.46	0.12	0.09	0.38		0.27	0.72		0.42	0.86	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 9.5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 38.4 Intersection LOS: D
Intersection Capacity Utilization 77.8% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

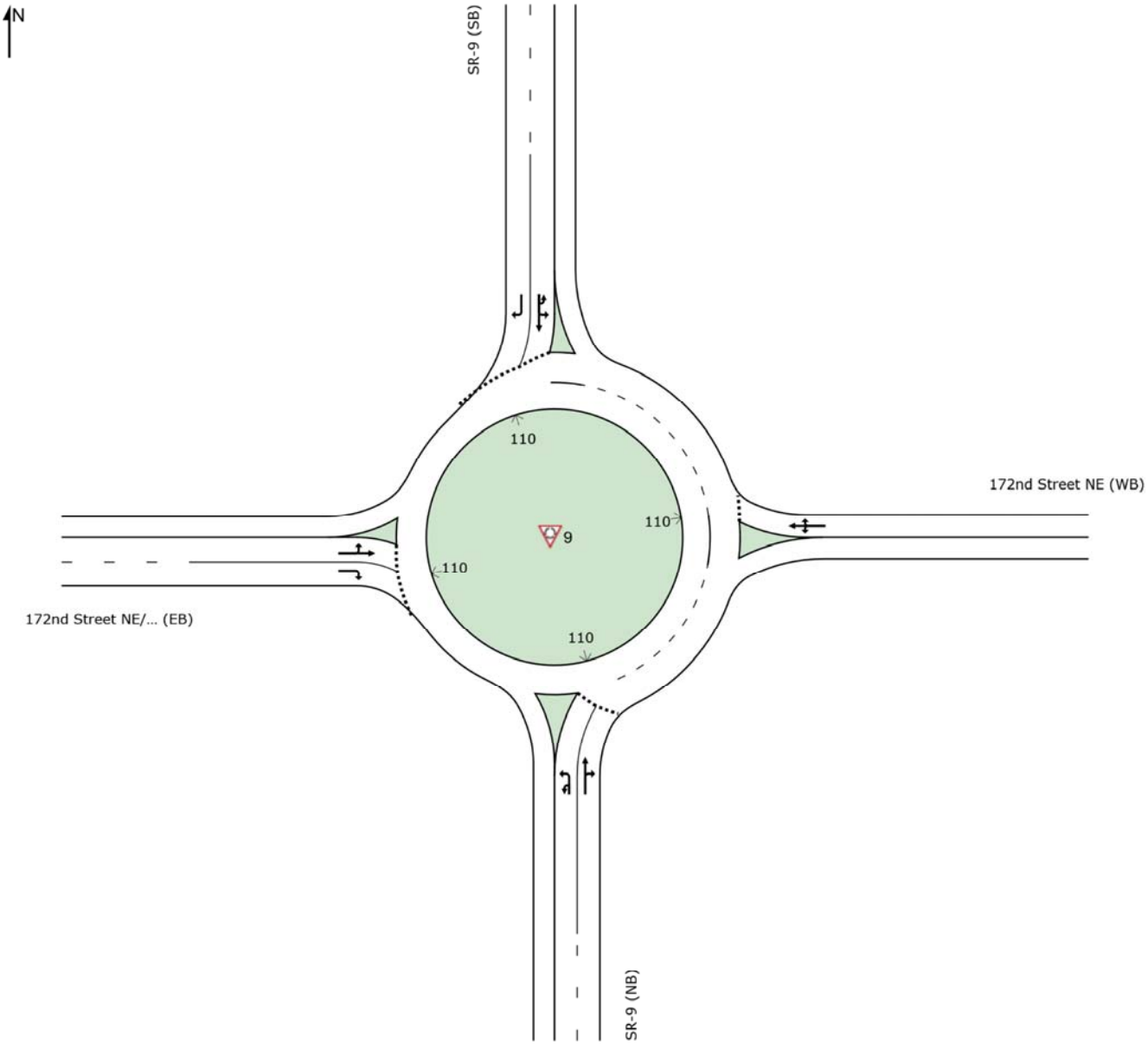
Splits and Phases: 8: 67th Avenue NE & 172nd Street NE

Existing Conditions PM Peak-Hour
Gibson Traffic Consultants, Inc. [BJL #20-106]

SITE LAYOUT

Site: 9 [2020 Existing Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout



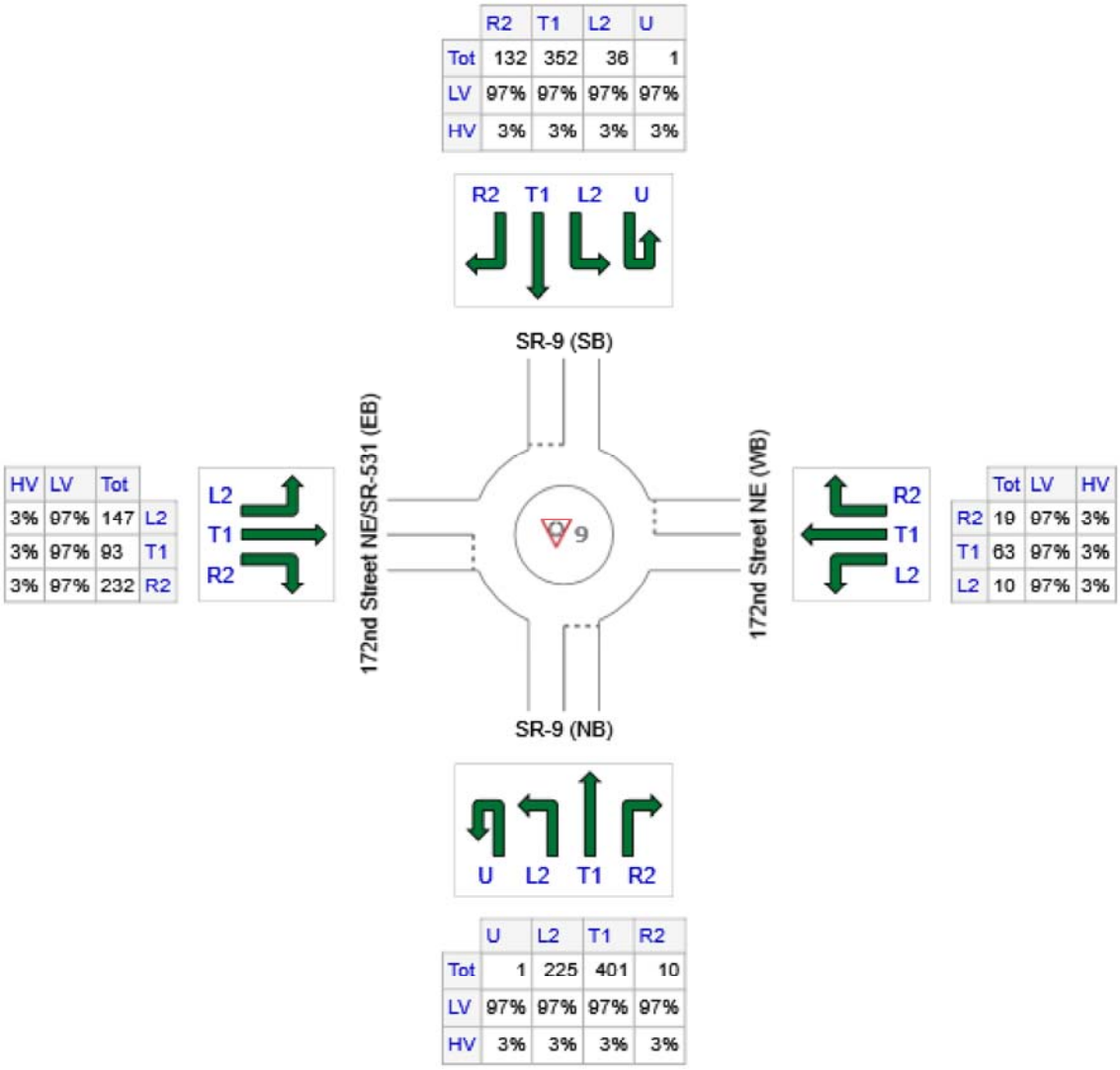
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 9 [2020 Existing Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: SR-9 (NB)	637	618	19
E: 172nd Street NE (WB)	92	89	3
N: SR-9 (SB)	521	505	16
W: 172nd Street NE/SR-531 (EB)	472	458	14
Total	1722	1670	52

MOVEMENT SUMMARY

Site: 9 [2020 Existing Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: SR-9 (NB)												
3u	U	1	3.0	0.215	13.9	LOS B	1.2	31.6	0.49	0.68	0.49	34.8
3	L2	239	3.0	0.215	11.3	LOS B	1.2	31.6	0.49	0.68	0.49	33.9
8	T1	427	3.0	0.305	4.9	LOS A	2.0	51.4	0.50	0.47	0.50	36.5
18	R2	11	3.0	0.305	5.0	LOS A	2.0	51.4	0.50	0.47	0.50	35.3
Approach		678	3.0	0.305	7.2	LOS A	2.0	51.4	0.49	0.55	0.49	35.5
East: 172nd Street NE (WB)												
1	L2	11	3.0	0.123	12.5	LOS B	0.5	13.2	0.58	0.67	0.58	36.0
6	T1	67	3.0	0.123	6.6	LOS A	0.5	13.2	0.58	0.67	0.58	35.8
16	R2	20	3.0	0.123	6.5	LOS A	0.5	13.2	0.58	0.67	0.58	34.7
Approach		98	3.0	0.123	7.2	LOS A	0.5	13.2	0.58	0.67	0.58	35.6
North: SR-9 (SB)												
7u	U	1	3.0	0.333	13.6	LOS B	1.7	44.1	0.44	0.50	0.44	37.7
7	L2	38	3.0	0.333	11.1	LOS B	1.7	44.1	0.44	0.50	0.44	36.7
4	T1	374	3.0	0.333	4.9	LOS A	1.7	44.1	0.44	0.50	0.44	36.5
14	R2	140	3.0	0.157	5.6	LOS A	0.6	16.5	0.41	0.59	0.41	35.6
Approach		554	3.0	0.333	5.5	LOS A	1.7	44.1	0.43	0.52	0.43	36.3
West: 172nd Street NE/SR-531 (EB)												
5	L2	156	3.0	0.189	11.4	LOS B	1.1	29.1	0.53	0.63	0.53	35.2
2	T1	99	3.0	0.189	4.8	LOS A	1.1	29.1	0.53	0.63	0.53	35.1
12	R2	247	3.0	0.231	5.8	LOS A	1.3	33.8	0.56	0.63	0.56	35.5
Approach		502	3.0	0.231	7.3	LOS A	1.3	33.8	0.54	0.63	0.54	35.3
All Vehicles		1832	3.0	0.333	6.7	LOS A	2.0	51.4	0.49	0.57	0.49	35.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	41	25	190	5	7	6	63	102	7	125	1
Future Vol, veh/h	4	41	25	190	5	7	6	63	102	7	125	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	5	48	29	221	6	8	7	73	119	8	145	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	10.7	9.3	9.5
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	6%	94%	5%
Vol Thru, %	37%	59%	2%	94%
Vol Right, %	60%	36%	3%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	171	70	202	133
LT Vol	6	4	190	7
Through Vol	63	41	5	125
RT Vol	102	25	7	1
Lane Flow Rate	199	81	235	155
Geometry Grp	1	1	1	1
Degree of Util (X)	0.256	0.112	0.332	0.217
Departure Headway (Hd)	4.642	4.947	5.095	5.04
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	768	716	700	707
Service Time	2.706	3.032	3.166	3.108
HCM Lane V/C Ratio	0.259	0.113	0.336	0.219
HCM Control Delay	9.3	8.7	10.7	9.5
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	1	0.4	1.5	0.8

Intersection												
Int Delay, s/veh	6.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	108	4	113	9	3	10	52	325	13	15	358	104
Future Vol, veh/h	108	4	113	9	3	10	52	325	13	15	358	104
Conflicting Peds, #/hr	0	0	3	3	0	0	1	0	4	4	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	45	-	-	35	-	-	105	-	-	110	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	120	4	126	10	3	11	58	361	14	17	398	116

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	982	986	460	1046	1037	372	515	0	0	379	0	0
Stage 1	491	491	-	488	488	-	-	-	-	-	-	-
Stage 2	491	495	-	558	549	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	225	245	595	204	228	667	1035	-	-	1163	-	-
Stage 1	554	543	-	556	545	-	-	-	-	-	-	-
Stage 2	554	541	-	509	512	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	207	227	593	149	211	664	1034	-	-	1159	-	-
Mov Cap-2 Maneuver	207	227	-	149	211	-	-	-	-	-	-	-
Stage 1	522	534	-	523	512	-	-	-	-	-	-	-
Stage 2	511	509	-	391	504	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	28	20.6	1.2	0.3
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1034	-	-	207	562	149	444	1159	-	-
HCM Lane V/C Ratio	0.056	-	-	0.58	0.231	0.067	0.033	0.014	-	-
HCM Control Delay (s)	8.7	-	-	43.9	13.3	30.9	13.4	8.2	-	-
HCM Lane LOS	A	-	-	E	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	3.2	0.9	0.2	0.1	0	-	-

2030 Baseline Level of Service Calculations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1332	601	0	1972	793	0	0	0	457	1	396
Future Volume (vph)	0	1332	601	0	1972	793	0	0	0	457	1	396
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			0.98			0.96						0.99
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	1552	0	3539	1523	0	0	0	1681	1686	1562
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			626			826						26
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)	8		4	4		8	1					1
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
Adj. Flow (vph)	0	1388	626	0	2054	826	0	0	0	476	1	413
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1388	626	0	2054	826	0	0	0	238	239	413
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)		94.2	94.2		93.9	93.9				28.0	28.0	28.0
Actuated g/C Ratio		0.70	0.70		0.70	0.70				0.21	0.21	0.21
v/c Ratio		0.56	0.49		0.83	0.63				0.68	0.68	1.19
Control Delay		10.7	1.9		18.0	2.8				59.6	59.6	153.2

Lanes, Volumes, Timings
1: I-5 Southbound Ramps & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		1.1	0.6		1.6	0.1				0.0	0.0	0.0
Total Delay		11.8	2.4		19.6	2.9				59.6	59.6	153.2
LOS		B	A		B	A				E	E	F
Approach Delay		8.9			14.8						103.0	
Approach LOS		A			B						F	
Queue Length 50th (ft)		281	0		606	0				202	203	~414
Queue Length 95th (ft)		333	33		718	36				303	304	#623
Internal Link Dist (ft)		529			860			899			1046	
Turn Bay Length (ft)			200							350		435
Base Capacity (vph)		2491	1277		2483	1315				351	352	347
Starvation Cap Reductn		796	296		255	63				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		0.82	0.64		0.92	0.66				0.68	0.68	1.19

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 133.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.19
Intersection Signal Delay: 26.3 Intersection LOS: C
Intersection Capacity Utilization 89.1% ICU Level of Service E
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.

Splits and Phases: 1: I-5 Southbound Ramps & 172nd Street NE

2030 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	446	1403	0	0	2083	988	892	0	1323	0	0	0
Future Volume (vph)	446	1403	0	0	2083	988	892	0	1323	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					0.98			0.99			
Frt						0.850			0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1736	3471	0	0	4988	1553	1649	1649	1553	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1734	3471	0	0	4988	1523	1649	1649	1532	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						535			307			
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)	3		9	9		3			5	5		
Confl. Bikes (#/hr)			1									
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	465	1461	0	0	2170	1029	929	0	1378	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	465	1461	0	0	2170	1029	464	465	1378	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			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.44	0.66			1.05	1.09	1.05	1.05	0.90			
Control Delay	253.0	16.3			72.0	75.6	103.3	103.9	9.6			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	253.0	16.3			72.0	75.6	103.3	103.9	9.6			
LOS	F	B			E	E	F	F	A			
Approach Delay		73.5			73.1			47.5				
Approach LOS		E			E			D				
Queue Length 50th (ft)	~534	377			~733	~699	~451	~453	0			
Queue Length 95th (ft)	#747	450			#827	#960	#675	#677	0			
Internal Link Dist (ft)		860			1006			1014			919	
Turn Bay Length (ft)	600					300	400					
Base Capacity (vph)	323	2226			2066	944	441	441	1532			
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	1.44	0.66			1.05	1.09	1.05	1.05	0.90			

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 130.8
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.44
Intersection Signal Delay: 65.3 Intersection LOS: E
Intersection Capacity Utilization 129.7% ICU Level of Service H
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.

Splits and Phases: 2: I-5 Northbound Ramps & 172nd Street NE

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	78	509	1134	410	277	1476	170	774	572	319	212	309	424
Future Volume (vph)	78	509	1134	410	277	1476	170	774	572	319	212	309	424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		900		0	400		260	200		200	200		170
Storage Lanes		1		1	1		1	2		1	1		1
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00		0.98	1.00		0.98	0.99		0.97	0.99		0.98
Frt				0.850			0.850			0.850			0.850
Flt Protected		0.950			0.950			0.950			0.950		
Satd. Flow (prot)	0	1755	3505	1568	1752	5036	1568	3400	3505	1568	1752	3505	1568
Flt Permitted		0.950			0.950			0.950			0.950		
Satd. Flow (perm)	0	1754	3505	1533	1749	5036	1541	3372	3505	1526	1741	3505	1530
Right Turn on Red				Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				229			116			235			124
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			1086			469			515			2837	
Travel Time (s)			24.7			10.7			11.7			64.5	
Confl. Peds. (#/hr)		4		7	7		4	9		11	11		9
Peak Hour Factor	0.92	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	85	530	1181	427	289	1538	177	806	596	332	221	322	442
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	615	1181	427	289	1538	177	806	596	332	221	322	442
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	5	2		1	6		3	8		7	4	
Permitted Phases				2			6			8			4
Detector Phase	5	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase													
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	10.5	10.5	42.5	42.5	10.5	46.5	46.5	10.5	45.9	45.9	10.5	44.9	44.9
Total Split (s)	35.0	35.0	70.0	70.0	35.0	70.0	70.0	45.0	32.0	32.0	35.0	32.0	32.0
Total Split (%)	19.2%	19.2%	38.5%	38.5%	19.2%	38.5%	38.5%	24.7%	17.6%	17.6%	19.2%	17.6%	17.6%

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Maximum Green (s)	29.5	29.5	63.5	63.5	29.5	63.5	63.5	39.5	26.1	26.1	29.5	26.1	26.1
Yellow Time (s)	3.5	3.5	4.5	4.5	3.5	4.5	4.5	3.5	3.9	3.9	3.5	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	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	0.0	0.0
Total Lost Time (s)		5.5	6.5	6.5	5.5	6.5	6.5	5.5	5.9	5.9	5.5	5.9	5.9
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Max	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)			29.0	29.0		33.0	33.0		33.0	33.0		32.0	32.0
Pedestrian Calls (#/hr)			0	0		0	0		0	0		0	0
Act Effct Green (s)		29.5	63.5	63.5	29.5	63.5	63.5	39.5	51.4	51.4	27.1	39.0	39.0
Actuated g/C Ratio		0.15	0.33	0.33	0.15	0.33	0.33	0.20	0.26	0.26	0.14	0.20	0.20
v/c Ratio		2.32	1.04	0.65	1.09	0.94	0.31	1.17	0.64	0.58	0.91	0.46	1.09
Control Delay		636.1	98.4	30.1	153.9	75.2	18.4	155.4	67.9	22.2	119.7	71.1	120.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		636.1	98.4	30.1	153.9	75.2	18.4	155.4	67.9	22.2	119.7	71.1	120.4
LOS		F	F	C	F	E	B	F	E	C	F	E	F
Approach Delay			234.0			81.5			99.8			104.1	
Approach LOS			F			F			F			F	
Queue Length 50th (ft)		~1279	~851	226	~415	706	55	~630	367	108	280	194	~502
Queue Length 95th (ft)		#1533	#992	362	#624	771	127	#767	440	227	#425	250	#743
Internal Link Dist (ft)			1006			389			435			2757	
Turn Bay Length (ft)		900			400		260	200		200	200		170
Base Capacity (vph)		265	1141	653	265	1640	580	689	925	575	265	701	405
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	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	0
Reduced v/c Ratio		2.32	1.04	0.65	1.09	0.94	0.31	1.17	0.64	0.58	0.83	0.46	1.09

Intersection Summary

Area Type: Other
Cycle Length: 182

Actuated Cycle Length: 194.9
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 2.32
Intersection Signal Delay: 138.1
Intersection LOS: F
Intersection Capacity Utilization 135.7%
ICU Level of Service H
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.

Splits and Phases: 3: Smokey Point Boulevard & 172nd Street NE

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	24	26	1146	40	209	1622	24	323	14	271	10	6	19
Future Volume (vph)	24	26	1146	40	209	1622	24	323	14	271	10	6	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		155		0	230		60	225		0	100		0
Storage Lanes		1		1	1		1	2		0	1		0
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00				1.00		1.00				0.99	
Frt				0.850		0.998			0.857			0.885	
Flt Protected		0.950			0.950			0.950			0.950		
Satd. Flow (prot)	0	1761	1845	1568	1752	3496	0	3400	1581	0	1752	1616	0
Flt Permitted		0.950			0.950			0.950			0.950		
Satd. Flow (perm)	0	1759	1845	1568	1752	3496	0	3392	1581	0	1752	1616	0
Right Turn on Red				Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				124		2			257			20	
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			2130			2599			1049			2423	
Travel Time (s)			48.4			59.1			23.8			55.1	
Confl. Peds. (#/hr)		3					3	1					1
Confl. Bikes (#/hr)							1						
Peak Hour Factor	0.92	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	26	28	1219	43	222	1726	26	344	15	288	11	6	20
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	54	1219	43	222	1752	0	344	303	0	11	26	0
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	5	2		1	6		3	8		7	4	
Permitted Phases				2									
Detector Phase	5	5	2	2	1	6		3	8		7	4	
Switch Phase													
Minimum Initial (s)	3.0	3.0	10.0	10.0	3.0	10.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	9.5	9.5	32.9	32.9	9.5	30.9		9.5	32.1		9.5	37.1	
Total Split (s)	15.0	15.0	100.0	100.0	25.0	100.0		15.0	20.0		15.0	20.0	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	9.4%	9.4%	62.5%	62.5%	15.6%	62.5%		9.4%	12.5%		9.4%	12.5%	
Maximum Green (s)	9.5	9.5	94.1	94.1	19.5	94.1		9.9	14.9		9.9	14.9	
Yellow Time (s)	3.5	3.5	3.9	3.9	3.5	3.9		3.1	3.1		3.1	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	
Total Lost Time (s)		5.5	5.9	5.9	5.5	5.9		5.1	5.1		5.1	5.1	
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5	3.0	3.0	2.5	3.0		2.5	3.0		2.5	3.0	
Recall Mode	None	None	C-Max	C-Max	None	C-Max		None	Max		None	Max	
Walk Time (s)			7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)			20.0	20.0		18.0			20.0			25.0	
Pedestrian Calls (#/hr)			0	0		0			0			0	
Act Effct Green (s)		8.5	94.1	94.1	19.5	107.4		9.9	25.0		6.1	14.9	
Actuated g/C Ratio		0.05	0.59	0.59	0.12	0.67		0.06	0.16		0.04	0.09	
v/c Ratio		0.58	1.12	0.04	1.04	0.75		1.64	0.65		0.17	0.15	
Control Delay		97.8	99.7	0.1	138.6	20.6		349.9	19.8		79.5	32.7	
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		97.8	99.7	0.1	138.6	20.6		349.9	19.8		79.5	32.7	
LOS		F	F	A	F	C		F	B		E	C	
Approach Delay			96.4			33.9			195.3			46.6	
Approach LOS			F			C			F			D	
Queue Length 50th (ft)		56	~1466	0	~250	640		~267	41		11	6	
Queue Length 95th (ft)		106	#1733	0	#428	733		#374	161		34	39	
Internal Link Dist (ft)			2050			2519			969			2343	
Turn Bay Length (ft)		155			230			225			100		
Base Capacity (vph)		104	1085	973	213	2346		210	463		108	168	
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	1.12	0.04	1.04	0.75		1.64	0.65		0.10	0.15	

Intersection Summary

Area Type: Other

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 25 (16%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.64
Intersection Signal Delay: 81.0 Intersection LOS: F
Intersection Capacity Utilization 112.3% ICU Level of Service H
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.

Splits and Phases: 4: 43rd Avenue NE & 172nd Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	1040	346	181	1214	39	554	78	331	64	69	98
Future Volume (vph)	46	1040	346	181	1214	39	554	78	331	64	69	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	250		0	180		150	225		0
Storage Lanes	1		0	1		0	1		1	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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00		1.00				0.98	
Frt		0.963			0.995				0.850		0.912	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1765	0	1752	1834	0	1752	1845	1568	1752	1657	0
Flt Permitted	0.043			0.040			0.357			0.676		
Satd. Flow (perm)	79	1765	0	74	1834	0	655	1845	1568	1247	1657	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			3				227		42	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2599			2632			3339			896	
Travel Time (s)		59.1			59.8			75.9			20.4	
Confl. Peds. (#/hr)	1		2	2		1	2					2
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
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	48	1083	360	189	1265	41	577	81	345	67	72	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	1443	0	189	1306	0	577	81	345	67	174	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	10.5	30.9		10.5	33.9		28.1	28.1	28.1	28.3	28.3	
Total Split (s)	15.0	100.0		15.0	100.0		20.0	20.0	20.0	20.0	20.0	
Total Split (%)	11.1%	74.1%		11.1%	74.1%		14.8%	14.8%	14.8%	14.8%	14.8%	
Maximum Green (s)	9.5	94.1		9.5	94.1		14.9	14.9	14.9	13.7	13.7	
Yellow Time (s)	3.5	3.9		3.5	3.9		3.1	3.1	3.1	4.3	4.3	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.9		5.5	5.9		5.1	5.1	5.1	6.3	6.3	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.5	4.0		2.5	4.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		18.0			21.0		16.0	16.0	16.0	15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	100.2	94.1		108.0	100.0		14.9	14.9	14.9	13.7	13.7	
Actuated g/C Ratio	0.74	0.70		0.80	0.74		0.11	0.11	0.11	0.10	0.10	
v/c Ratio	0.37	1.16		1.07	0.96		8.01	0.40	0.92	0.53	0.85	

Lanes, Volumes, Timings
5: 51st Avenue NE & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	17.8	105.2		123.6	34.3		3192.0	62.3	50.5	73.8	78.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	17.8	105.2		123.6	34.3		3192.0	62.3	50.5	73.8	78.3	
LOS	B	F		F	C		F	E	D	E	E	
Approach Delay		102.4			45.6			1858.7			77.1	
Approach LOS		F			D			F			E	
Queue Length 50th (ft)	7	~1496		~133	979		~984	67	108	57	116	
Queue Length 95th (ft)	32	#1766		#292	#1443		#1181	121	#296	109	#246	
Internal Link Dist (ft)		2519			2552			3259			816	
Turn Bay Length (ft)	250			250			180		150	225		
Base Capacity (vph)	178	1239		177	1359		72	203	375	126	205	
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	0.27	1.16		1.07	0.96		8.01	0.40	0.92	0.53	0.85	

Intersection Summary

Area Type: Other
Cycle Length: 135
Actuated Cycle Length: 135
Offset: 15 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 8.01
Intersection Signal Delay: 497.3 Intersection LOS: F
Intersection Capacity Utilization 145.9% ICU Level of Service H
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.

Splits and Phases: 5: 51st Avenue NE & 172nd Street NE

2030 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	243	1137	45	51	769	40	132	44	108	112	22	584
Future Volume (vph)	243	1137	45	51	769	40	132	44	108	112	22	584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	150		0	250		0	400		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	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.993			0.894			0.855	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1816	0	1736	1814	0	1736	1633	0	1736	1562	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	1816	0	1736	1814	0	1736	1633	0	1736	1562	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			63			311	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2632			1402			1370			1561	
Travel Time (s)		59.8			31.9			31.1			35.5	
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 (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	264	1236	49	55	836	43	143	48	117	122	24	635
Shared Lane Traffic (%)												
Lane Group Flow (vph)	264	1285	0	55	879	0	143	165	0	122	659	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0		3.0	5.0		3.0	5.0	
Minimum Split (s)	9.5	34.9		9.5	37.9		9.5	32.9		9.5	32.9	
Total Split (s)	34.0	85.0		14.0	85.0		15.0	26.0		15.0	26.0	
Total Split (%)	21.3%	53.1%		8.8%	53.1%		9.4%	16.3%		9.4%	16.3%	
Maximum Green (s)	28.5	79.1		8.5	79.1		9.5	20.1		9.5	20.1	
Yellow Time (s)	3.5	3.9		3.5	3.9		3.5	3.9		3.5	3.9	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.9		5.5	5.9		5.5	5.9		5.5	5.9	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	C-Max		None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			25.0			20.0			20.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	27.0	101.9		8.1	80.6		9.5	20.1		9.5	20.1	
Actuated g/C Ratio	0.17	0.64		0.05	0.50		0.06	0.13		0.06	0.13	
v/c Ratio	0.90	1.11		0.62	0.96		1.39	0.63		1.18	1.41	
Control Delay	97.4	91.2		103.8	60.0		274.1	52.5		206.7	220.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Lanes, Volumes, Timings
6: 59th Avenue NE & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	97.4	91.2		103.8	60.0		274.1	52.5		206.7	220.3	
LOS	F	F		F	E		F	D		F	F	
Approach Delay		92.2			62.6			155.4			218.1	
Approach LOS		F			E			F			F	
Queue Length 50th (ft)	271	~1569		57	885		~198	103		~153	~624	
Queue Length 95th (ft)	#428	#1841		#121	#1194		#348	189		#294	#874	
Internal Link Dist (ft)		2552			1322			1290			1481	
Turn Bay Length (ft)	350			150			250			400		
Base Capacity (vph)	309	1157		92	915		103	260		103	468	
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	0.85	1.11		0.60	0.96		1.39	0.63		1.18	1.41	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 34 (21%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.41
Intersection Signal Delay: 117.5 Intersection LOS: F
Intersection Capacity Utilization 129.5% ICU Level of Service H
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.

Splits and Phases: 6: 59th Avenue NE & 172nd Street NE

2030 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Lanes, Volumes, Timings
8: 67th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	374	892	145	62	523	62	72	245	111	136	285	224
Future Volume (vph)	374	892	145	62	523	62	72	245	111	136	285	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		80	125		0	150		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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								0.99		1.00		
Frt			0.850		0.984			0.953			0.934	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1845	1568	1752	1815	0	1752	1745	0	1752	1723	0
Flt Permitted	0.260			0.081			0.125			0.119		
Satd. Flow (perm)	480	1845	1568	149	1815	0	231	1745	0	219	1723	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			88		6			13			22	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1109			3194			1426			2074	
Travel Time (s)		25.2			72.6			32.4			47.1	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	382	910	148	63	534	63	73	250	113	139	291	229
Shared Lane Traffic (%)												
Lane Group Flow (vph)	382	910	148	63	597	0	73	363	0	139	520	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8			4		
Detector Phase	5	2	2	1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	7.0		5.0	7.0	
Minimum Split (s)	10.0	31.9	31.9	10.0	34.9		10.0	33.9		10.0	35.9	
Total Split (s)	16.0	90.0	90.0	16.0	90.0		16.0	38.0		16.0	38.0	
Total Split (%)	10.0%	56.3%	56.3%	10.0%	56.3%		10.0%	23.8%		10.0%	23.8%	
Maximum Green (s)	11.0	84.1	84.1	11.0	84.1		11.0	32.1		11.0	32.1	
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9		3.0	3.9		3.0	3.9	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.9	5.9	5.0	5.9		5.0	5.9		5.0	5.9	
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)	3.0	4.0	4.0	3.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		19.0	19.0		22.0			21.0			23.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	99.0	89.3	89.3	93.0	84.1		42.6	32.1		45.4	33.5	
Actuated g/C Ratio	0.62	0.56	0.56	0.58	0.53		0.27	0.20		0.28	0.21	
v/c Ratio	0.99	0.88	0.16	0.38	0.62		0.48	1.01		0.83	1.38	

Lanes, Volumes, Timings
8: 67th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	66.4	43.4	8.2	18.2	30.1		51.2	109.3		79.9	228.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	66.4	43.4	8.2	18.2	30.1		51.2	109.3		79.9	228.5	
LOS	E	D	A	B	C		D	F		E	F	
Approach Delay		45.9			29.0			99.6			197.1	
Approach LOS		D			C			F			F	
Queue Length 50th (ft)	180	831	29	24	427		56	~377		110	~710	
Queue Length 95th (ft)	#392	#1184	70	45	560		99	#600		#221	#955	
Internal Link Dist (ft)		1029			3114			1346			1994	
Turn Bay Length (ft)	350		80	125			150			200		
Base Capacity (vph)	384	1029	913	199	956		168	360		167	378	
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	0.99	0.88	0.16	0.32	0.62		0.43	1.01		0.83	1.38	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 9.5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.38
Intersection Signal Delay: 80.9 Intersection LOS: F
Intersection Capacity Utilization 103.0% ICU Level of Service G
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.

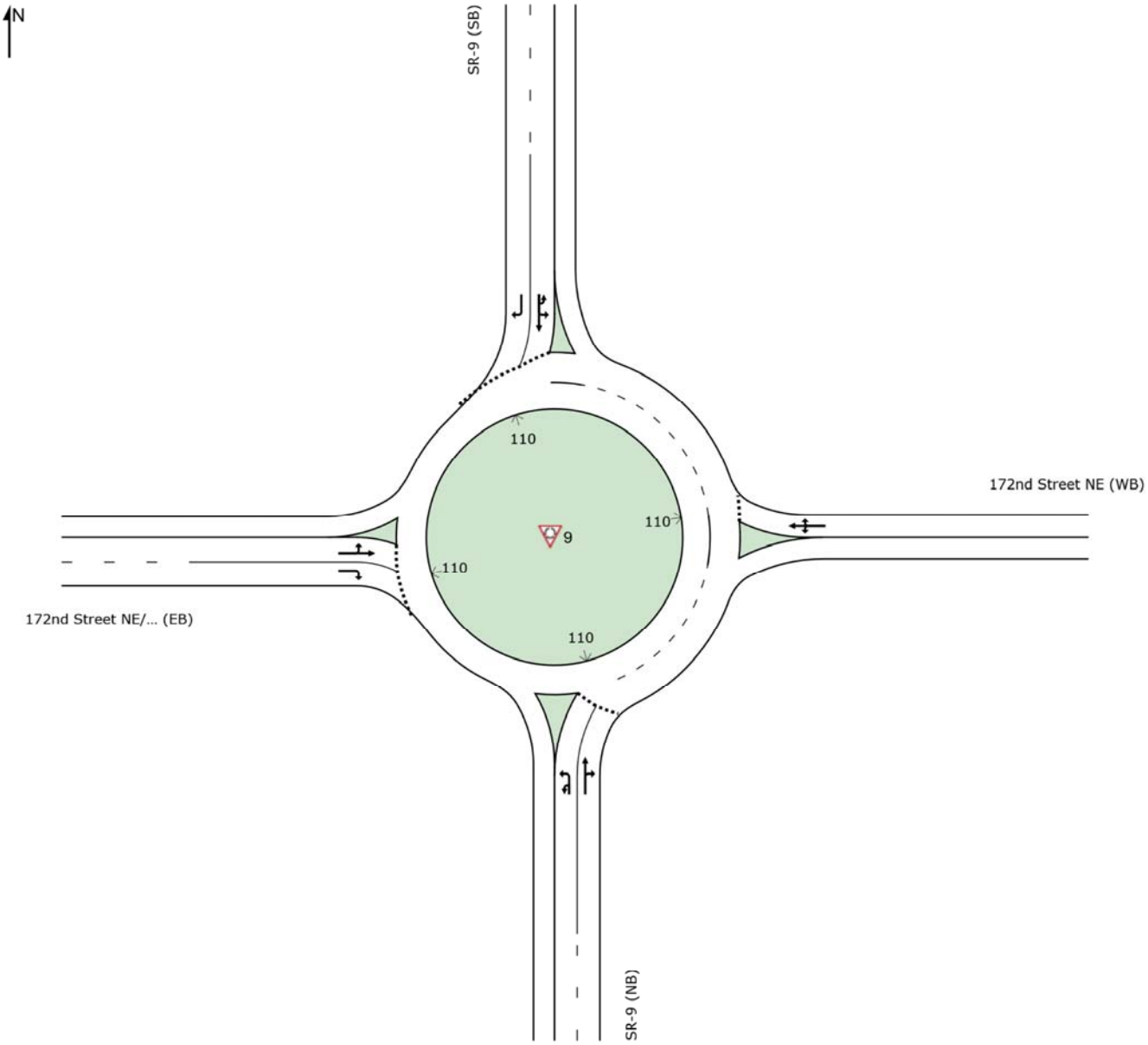
Splits and Phases: 8: 67th Avenue NE & 172nd Street NE

2030 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

SITE LAYOUT

Site: 9 [2030 Baseline Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout



Organisation: GIBSON TRAFFIC CONSULTANTS | Created: Thursday, July 29, 2021 4:13:24 PM
Project: H:\2020\20-106\Full Analysis\Full BSP\Comments\Arlington\Sidra\#9.sip8

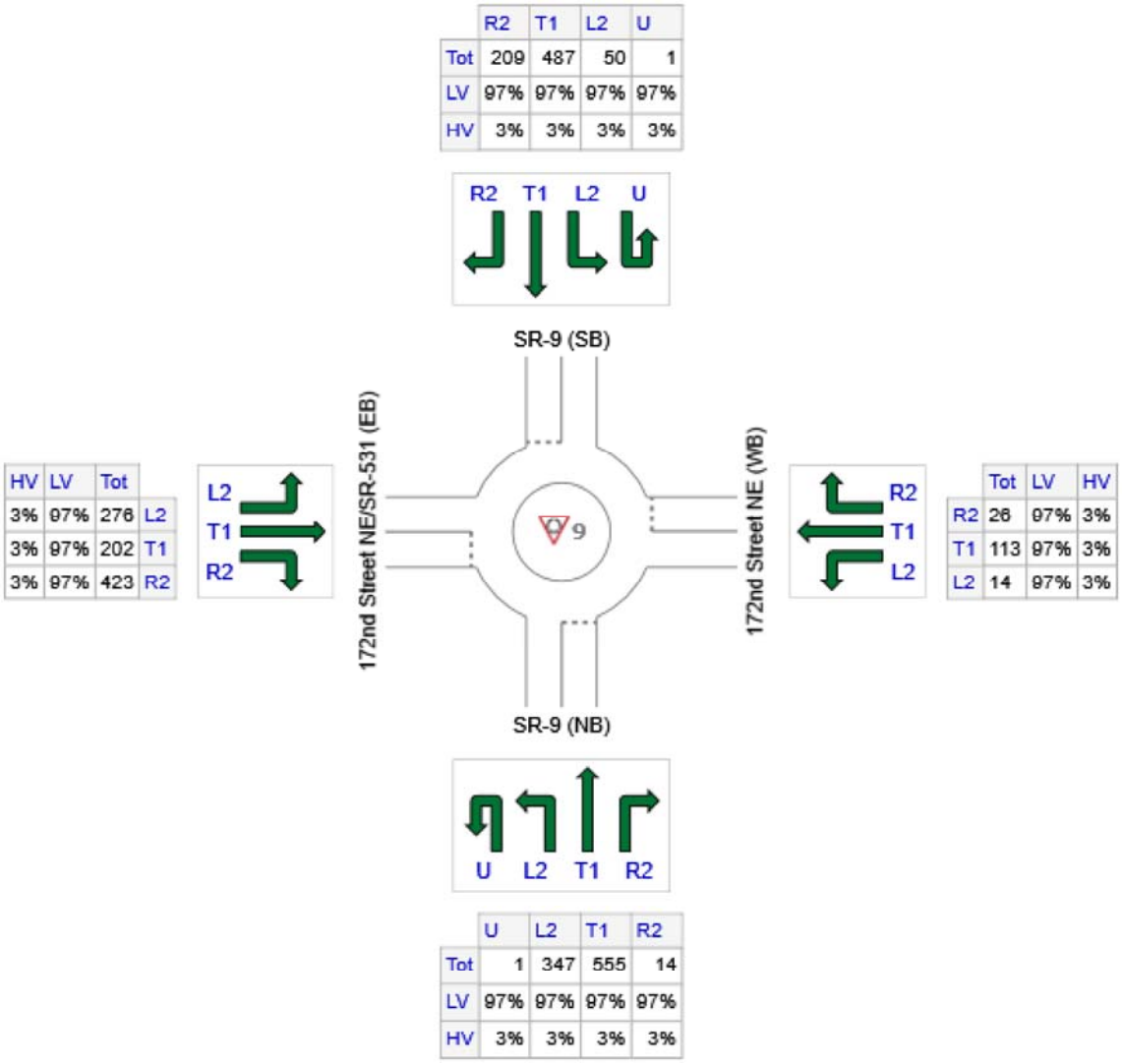
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 9 [2030 Baseline Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: SR-9 (NB)	917	889	28
E: 172nd Street NE (WB)	153	148	5
N: SR-9 (SB)	747	725	22
W: 172nd Street NE/SR-531 (EB)	901	874	27
Total	2718	2636	82

MOVEMENT SUMMARY

Site: 9 [2030 Baseline Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: SR-9 (NB)												
3u	U	1	3.0	0.431	16.0	LOS B	3.2	81.0	0.79	0.84	0.79	34.1
3	L2	369	3.0	0.431	13.4	LOS B	3.2	81.0	0.79	0.84	0.79	33.2
8	T1	590	3.0	0.532	7.1	LOS A	5.0	127.7	0.84	0.71	0.89	35.2
18	R2	15	3.0	0.532	7.2	LOS A	5.0	127.7	0.84	0.71	0.89	34.1
Approach		976	3.0	0.532	9.5	LOS A	5.0	127.7	0.82	0.76	0.85	34.4
East: 172nd Street NE (WB)												
1	L2	15	3.0	0.293	14.6	LOS B	1.5	38.3	0.78	0.84	0.78	35.2
6	T1	120	3.0	0.293	8.7	LOS A	1.5	38.3	0.78	0.84	0.78	35.0
16	R2	28	3.0	0.293	8.5	LOS A	1.5	38.3	0.78	0.84	0.78	33.9
Approach		163	3.0	0.293	9.2	LOS A	1.5	38.3	0.78	0.84	0.78	34.8
North: SR-9 (SB)												
7u	U	1	3.0	0.534	15.3	LOS B	4.0	103.2	0.70	0.68	0.76	36.7
7	L2	53	3.0	0.534	12.8	LOS B	4.0	103.2	0.70	0.68	0.76	35.7
4	T1	518	3.0	0.534	6.6	LOS A	4.0	103.2	0.70	0.68	0.76	35.5
14	R2	222	3.0	0.280	6.7	LOS A	1.4	36.3	0.59	0.72	0.59	35.2
Approach		795	3.0	0.534	7.1	LOS A	4.0	103.2	0.67	0.69	0.71	35.4
West: 172nd Street NE/SR-531 (EB)												
5	L2	294	3.0	0.445	12.6	LOS B	3.6	92.4	0.79	0.73	0.79	34.7
2	T1	215	3.0	0.445	6.1	LOS A	3.6	92.4	0.79	0.73	0.79	34.6
12	R2	450	3.0	0.514	8.3	LOS A	4.3	109.5	0.82	0.86	0.91	34.5
Approach		959	3.0	0.514	9.1	LOS A	4.3	109.5	0.81	0.79	0.85	34.6
All Vehicles		2891	3.0	0.534	8.7	LOS A	5.0	127.7	0.77	0.75	0.81	34.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	57	35	263	7	10	8	116	141	10	182	1
Future Vol, veh/h	6	57	35	263	7	10	8	116	141	10	182	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	7	66	41	306	8	12	9	135	164	12	212	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.4	15.3	13	12.2
HCM LOS	B	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	6%	94%	5%
Vol Thru, %	44%	58%	3%	94%
Vol Right, %	53%	36%	4%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	265	98	280	193
LT Vol	8	6	263	10
Through Vol	116	57	7	182
RT Vol	141	35	10	1
Lane Flow Rate	308	114	326	224
Geometry Grp	1	1	1	1
Degree of Util (X)	0.461	0.187	0.529	0.363
Departure Headway (Hd)	5.388	5.916	5.848	5.83
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	666	602	615	613
Service Time	3.453	3.996	3.908	3.901
HCM Lane V/C Ratio	0.462	0.189	0.53	0.365
HCM Control Delay	13	10.4	15.3	12.2
HCM Lane LOS	B	B	C	B
HCM 95th-tile Q	2.4	0.7	3.1	1.7

Intersection												
Int Delay, s/veh	51.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	149	6	156	12	4	14	72	537	18	21	526	144
Future Vol, veh/h	149	6	156	12	4	14	72	537	18	21	526	144
Conflicting Peds, #/hr	0	0	3	3	0	0	1	0	4	4	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	45	-	-	35	-	-	105	-	-	110	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	166	7	173	13	4	16	80	597	20	23	584	160

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1488	1492	668	1574	1562	611	745	0	0	621	0	0
Stage 1	711	711	-	771	771	-	-	-	-	-	-	-
Stage 2	777	781	-	803	791	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 101	122	453	88	110	488	849	-	-	945	-	-
Stage 1	419	432	-	388	405	-	-	-	-	-	-	-
Stage 2	385	401	-	373	397	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 86	107	451	47	97	486	848	-	-	941	-	-
Mov Cap-2 Maneuver	~ 86	107	-	47	97	-	-	-	-	-	-	-
Stage 1	379	421	-	350	365	-	-	-	-	-	-	-
Stage 2	333	362	-	220	387	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	268.2	55.9	1.1	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	848	-	-	86	403	47	257	941	-	-
HCM Lane V/C Ratio	0.094	-	-	1.925	0.447	0.284	0.078	0.025	-	-
HCM Control Delay (s)	9.7	-	-	$ 537.1	20.9	109.5	20.2	8.9	-	-
HCM Lane LOS	A	-	-	F	C	F	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	14.3	2.2	1	0.3	0.1	-	-

Notes

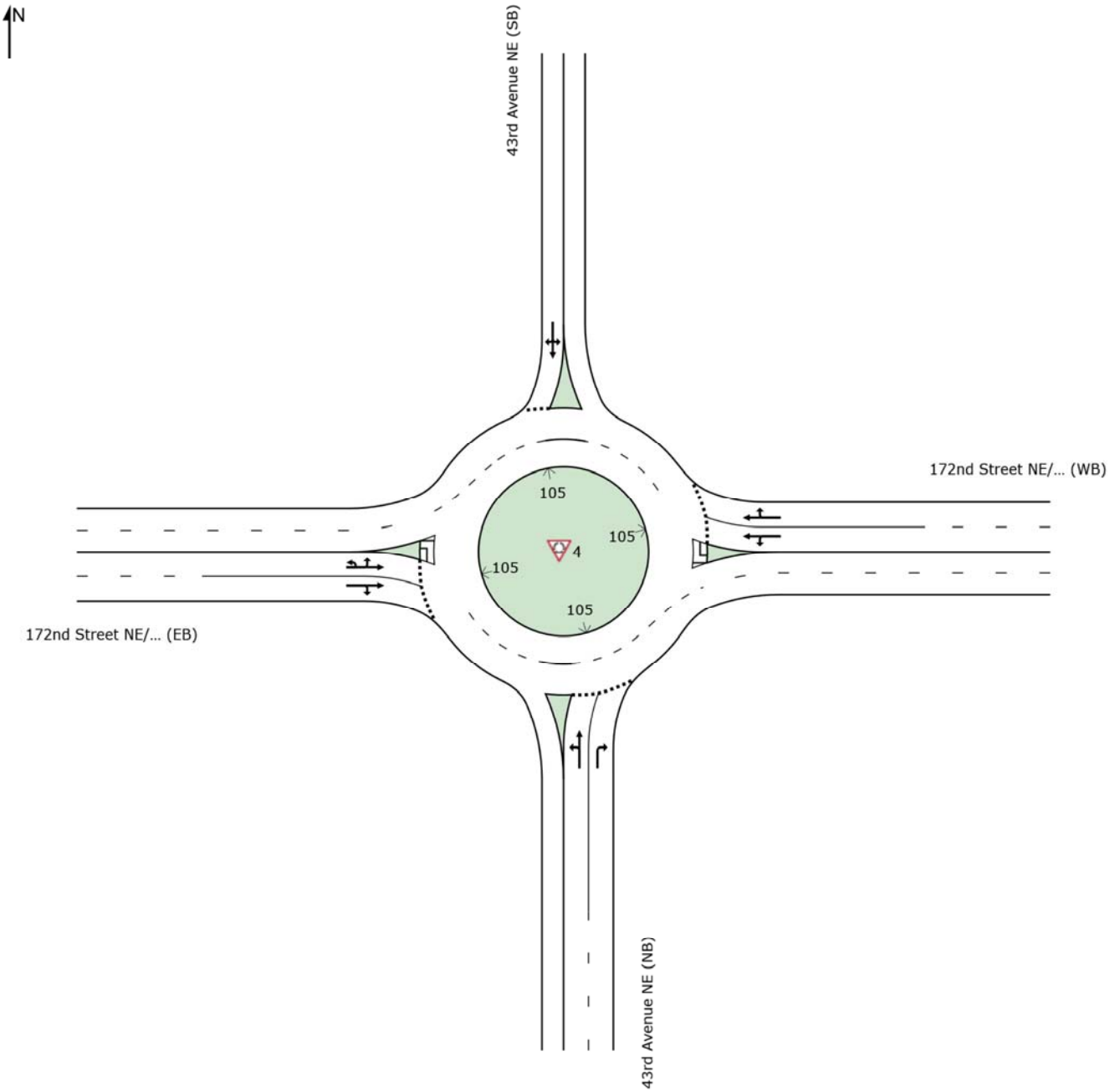
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

2030 Baseline Level of Service Calculations with Improvements

SITE LAYOUT

Site: 4 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout



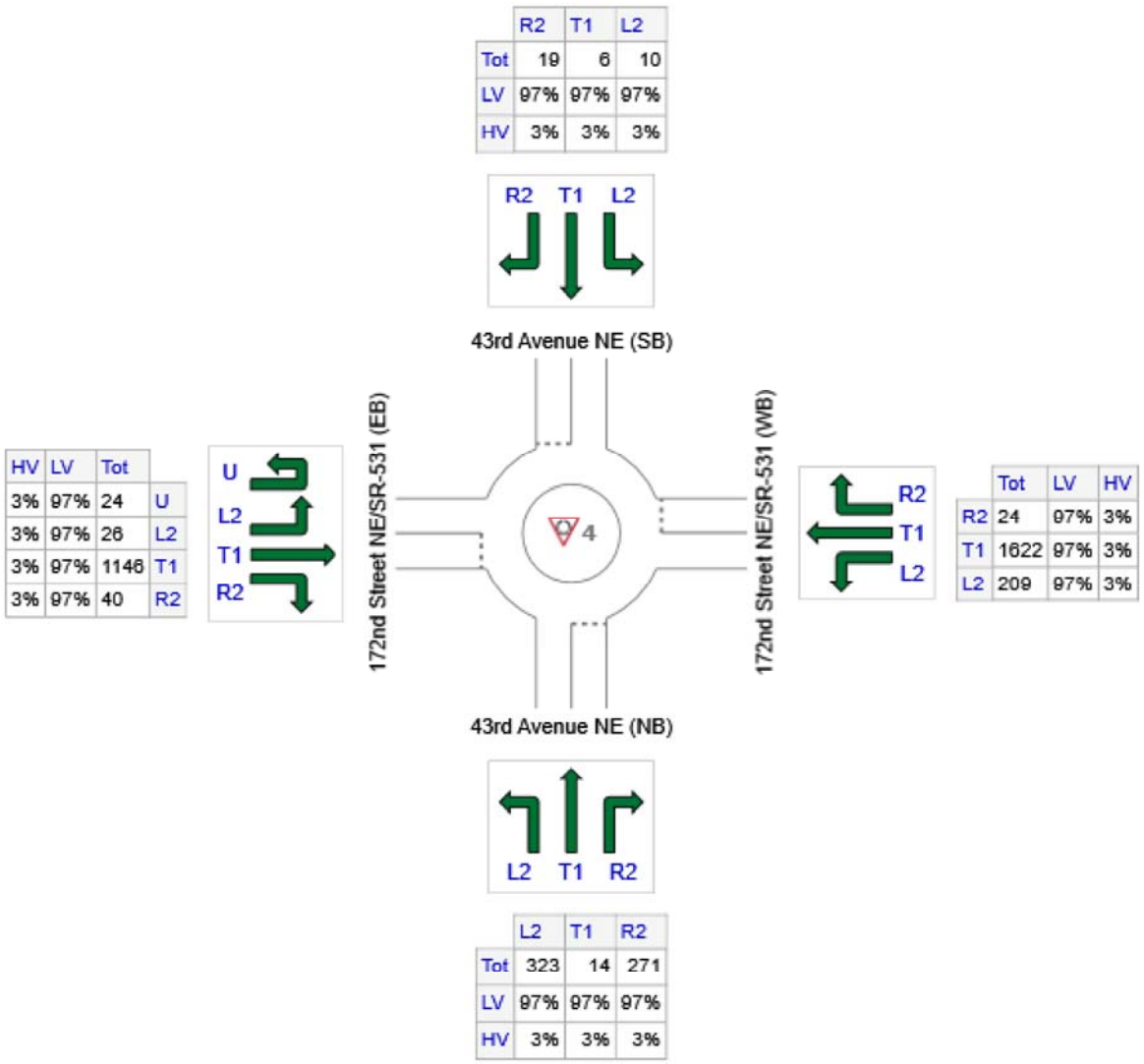
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 4 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 43rd Avenue NE (NB)	608	590	18
E: 172nd Street NE/SR-531 (WB)	1855	1799	56
N: 43rd Avenue NE (SB)	35	34	1
W: 172nd Street NE/SR-531 (EB)	1236	1199	37
Total	3734	3622	112

MOVEMENT SUMMARY

Site: 4 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout

Movement Performance - Vehicles

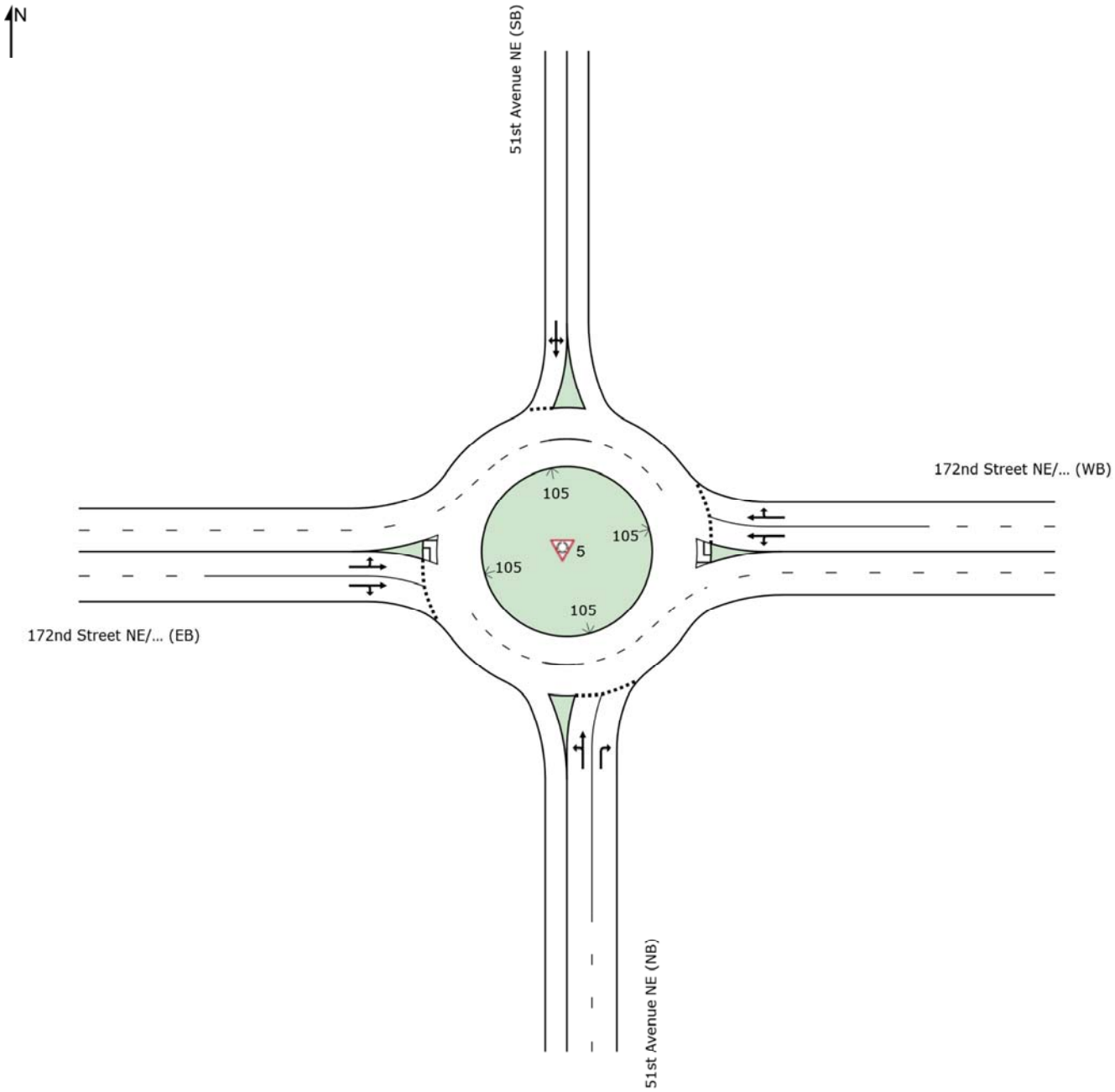
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 43rd Avenue NE (NB)												
3	L2	344	3.0	0.421	12.9	LOS B	2.3	58.6	0.75	0.90	0.82	33.4
8	T1	15	3.0	0.421	6.8	LOS A	2.3	58.6	0.75	0.90	0.82	33.3
18	R2	288	3.0	0.446	8.3	LOS A	2.3	57.7	0.75	0.90	0.86	34.4
Approach		647	3.0	0.446	10.7	LOS B	2.3	58.6	0.75	0.90	0.84	33.9
East: 172nd Street NE/SR-531 (WB)												
1	L2	222	3.0	0.875	20.7	LOS D	16.4	419.4	1.00	1.12	1.53	31.9
6	T1	1726	3.0	0.875	13.3	LOS D	17.2	441.4	1.00	1.07	1.47	32.8
16	R2	26	3.0	0.875	12.7	LOS D	17.2	441.4	1.00	1.04	1.44	32.4
Approach		1973	3.0	0.875	14.1	LOS B	17.2	441.4	1.00	1.08	1.48	32.7
North: 43rd Avenue NE (SB)												
7	L2	11	3.0	0.149	21.1	LOS C	0.8	20.3	0.91	0.96	0.91	31.6
4	T1	6	3.0	0.149	15.0	LOS B	0.8	20.3	0.91	0.96	0.91	31.5
14	R2	20	3.0	0.149	15.0	LOS B	0.8	20.3	0.91	0.96	0.91	30.7
Approach		37	3.0	0.149	16.8	LOS B	0.8	20.3	0.91	0.96	0.91	31.1
West: 172nd Street NE/SR-531 (EB)												
5u	U	26	3.0	0.519	13.8	LOS B	4.2	107.0	0.61	0.54	0.61	36.8
5	L2	28	3.0	0.519	11.3	LOS B	4.2	107.0	0.61	0.54	0.61	35.8
2	T1	1219	3.0	0.519	5.1	LOS A	4.4	112.9	0.60	0.51	0.60	35.9
12	R2	43	3.0	0.519	5.2	LOS A	4.4	112.9	0.59	0.49	0.59	34.8
Approach		1315	3.0	0.519	5.4	LOS A	4.4	112.9	0.60	0.51	0.60	35.9
All Vehicles		3973	3.0	0.875	10.7	LOS B	17.2	441.4	0.83	0.86	1.08	33.9

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 5 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout



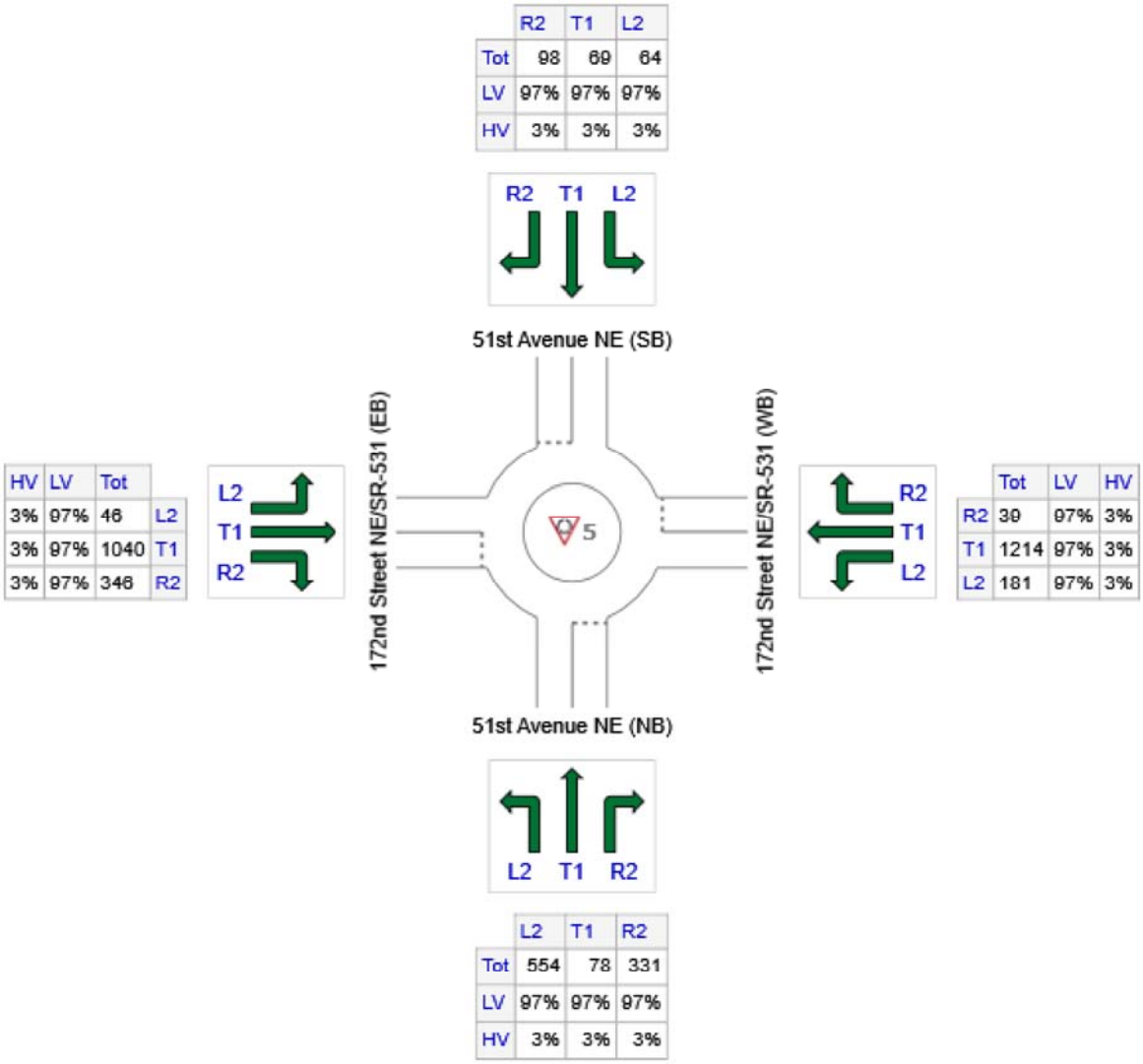
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 5 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 51st Avenue NE (NB)	963	934	29
E: 172nd Street NE/SR-531 (WB)	1434	1391	43
N: 51st Avenue NE (SB)	231	224	7
W: 172nd Street NE/SR-531 (EB)	1432	1389	43
Total	4060	3938	122

MOVEMENT SUMMARY

Site: 5 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout

Movement Performance - Vehicles

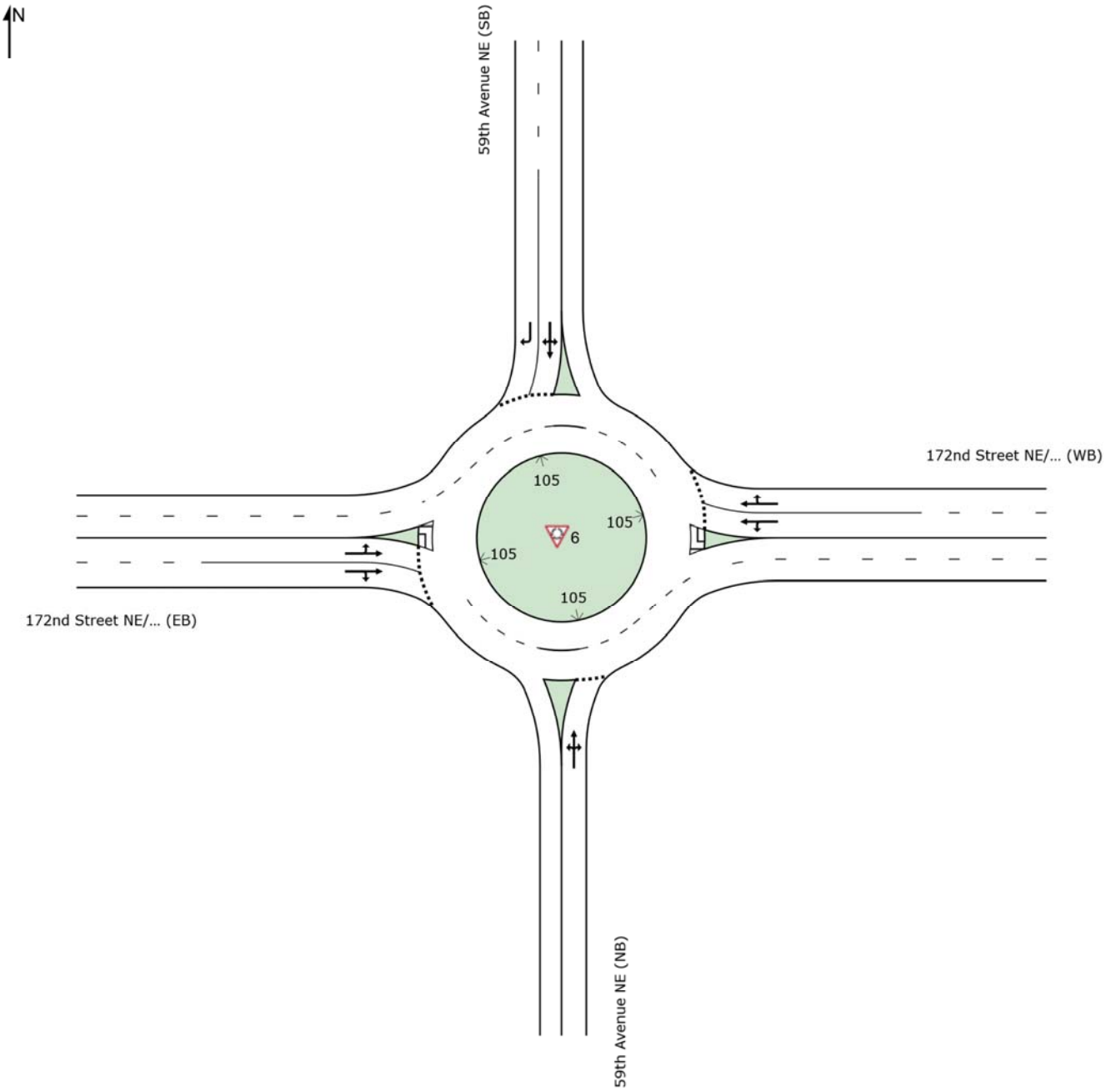
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 51st Avenue NE (NB)												
3	L2	577	3.0	0.801	18.0	LOS B	7.7	198.0	0.92	1.15	1.44	31.6
8	T1	81	3.0	0.801	11.9	LOS B	7.7	198.0	0.92	1.15	1.44	31.5
18	R2	345	3.0	0.563	9.8	LOS A	3.4	86.5	0.81	0.96	1.01	33.7
Approach		1003	3.0	0.801	14.7	LOS B	7.7	198.0	0.88	1.09	1.29	32.2
East: 172nd Street NE/SR-531 (WB)												
1	L2	189	3.0	0.932	36.2	LOS D	19.6	502.2	1.00	1.49	2.24	26.2
6	T1	1265	3.0	0.932	28.0	LOS D	23.1	592.2	1.00	1.47	2.22	27.1
16	R2	41	3.0	0.932	27.0	LOS D	23.1	592.2	1.00	1.46	2.20	26.9
Approach		1494	3.0	0.932	29.0	LOS C	23.1	592.2	1.00	1.47	2.22	27.0
North: 51st Avenue NE (SB)												
7	L2	67	3.0	0.778	38.8	LOS D	6.3	161.0	0.97	1.22	1.74	25.4
4	T1	72	3.0	0.778	32.7	LOS C	6.3	161.0	0.97	1.22	1.74	25.3
14	R2	102	3.0	0.778	32.7	LOS C	6.3	161.0	0.97	1.22	1.74	24.8
Approach		241	3.0	0.778	34.4	LOS C	6.3	161.0	0.97	1.22	1.74	25.1
West: 172nd Street NE/SR-531 (EB)												
5	L2	48	3.0	0.614	12.7	LOS B	5.6	142.3	0.71	0.69	0.77	35.5
2	T1	1083	3.0	0.614	6.3	LOS A	5.6	142.6	0.70	0.66	0.74	35.7
12	R2	360	3.0	0.614	6.1	LOS A	5.6	142.6	0.69	0.62	0.71	34.7
Approach		1492	3.0	0.614	6.5	LOS A	5.6	142.6	0.70	0.65	0.74	35.4
All Vehicles		4229	3.0	0.932	18.0	LOS B	23.1	592.2	0.86	1.08	1.45	30.6

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 6 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout



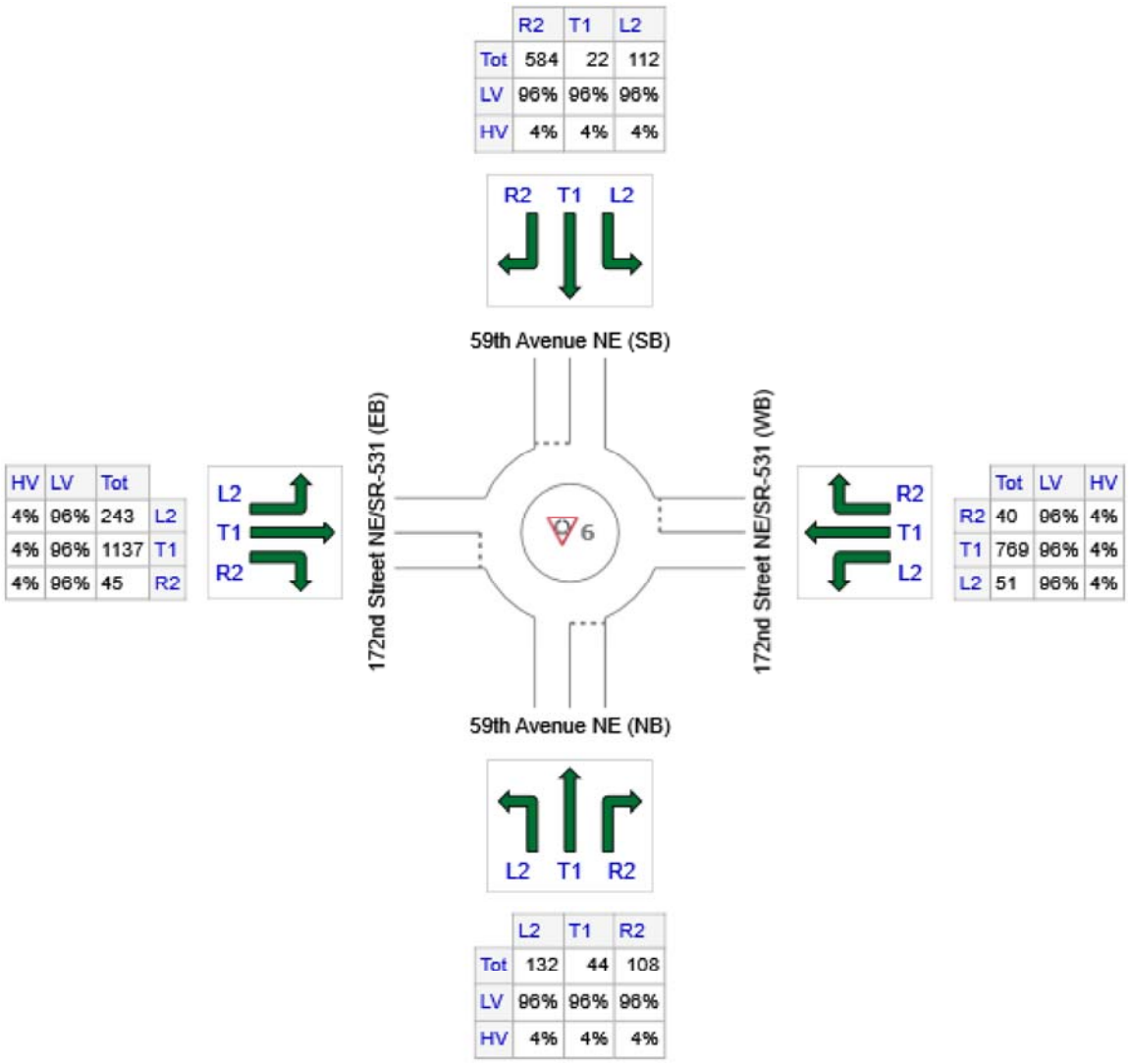
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 6 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 59th Avenue NE (NB)	284	273	11
E: 172nd Street NE/SR-531 (WB)	860	826	34
N: 59th Avenue NE (SB)	718	689	29
W: 172nd Street NE/SR-531 (EB)	1425	1368	57
Total	3287	3156	131

MOVEMENT SUMMARY

Site: 6 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout

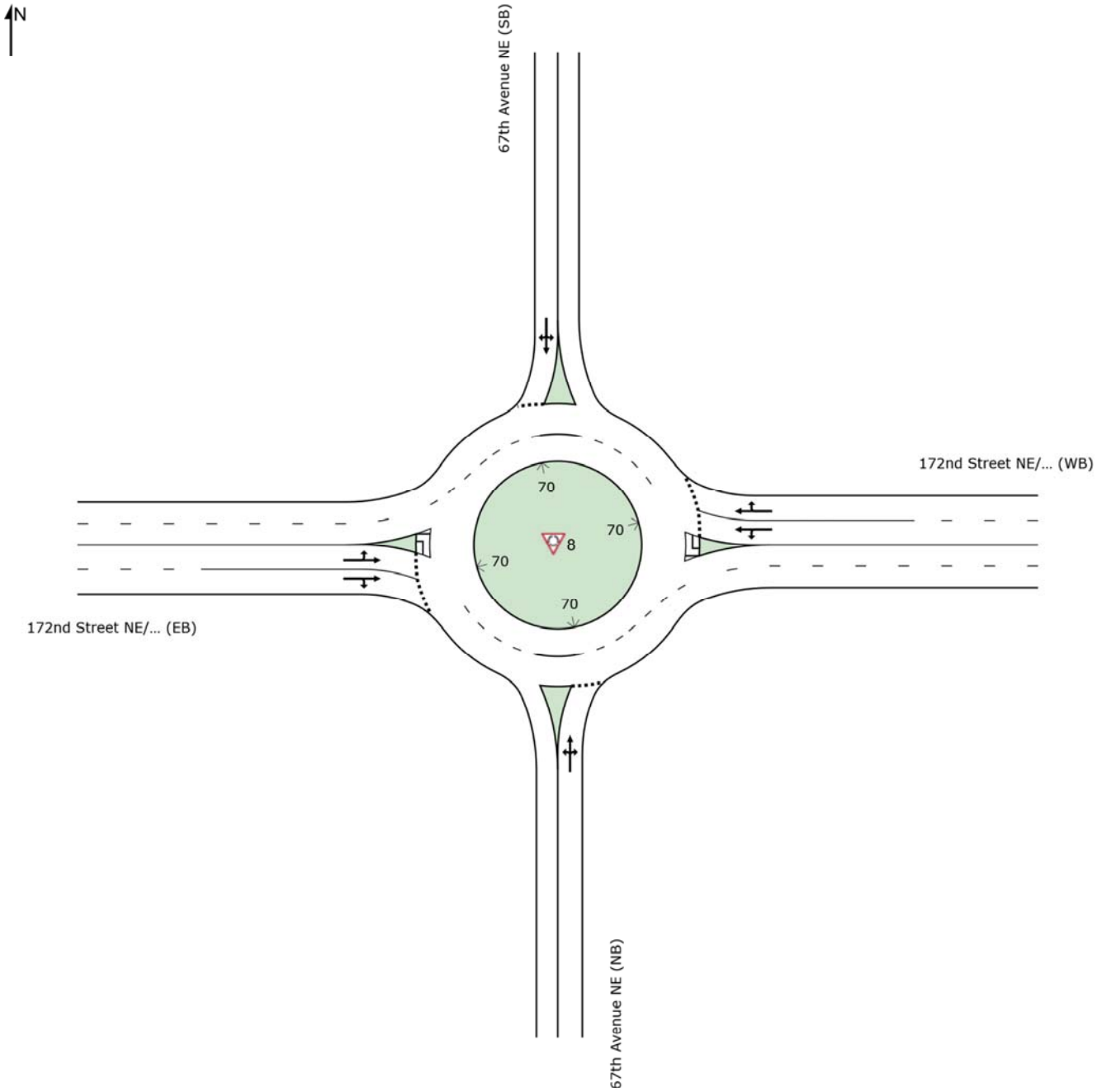
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 59th Avenue NE (NB)												
3	L2	143	4.0	0.553	16.7	LOS B	3.1	79.7	0.82	0.99	1.06	33.2
8	T1	48	4.0	0.553	10.6	LOS B	3.1	79.7	0.82	0.99	1.06	33.0
18	R2	117	4.0	0.553	10.7	LOS B	3.1	79.7	0.82	0.99	1.06	32.1
Approach		309	4.0	0.553	13.5	LOS B	3.1	79.7	0.82	0.99	1.06	32.7
East: 172nd Street NE/SR-531 (WB)												
1	L2	55	4.0	0.425	12.6	LOS B	2.7	70.1	0.66	0.66	0.66	35.5
6	T1	836	4.0	0.425	6.2	LOS A	2.9	75.0	0.65	0.62	0.65	35.7
16	R2	43	4.0	0.425	6.2	LOS A	2.9	75.0	0.64	0.59	0.64	34.6
Approach		935	4.0	0.425	6.6	LOS A	2.9	75.0	0.65	0.62	0.65	35.7
North: 59th Avenue NE (SB)												
7	L2	122	4.0	0.503	14.5	LOS B	2.8	72.2	0.75	0.94	0.90	34.5
4	T1	24	4.0	0.503	8.4	LOS A	2.8	72.2	0.75	0.94	0.90	34.3
14	R2	635	4.0	0.503	7.9	LOS A	3.0	77.8	0.75	0.92	0.88	34.3
Approach		780	4.0	0.503	8.9	LOS A	3.0	77.8	0.75	0.92	0.89	34.4
West: 172nd Street NE/SR-531 (EB)												
5	L2	264	4.0	0.595	11.3	LOS B	4.9	127.5	0.59	0.59	0.59	35.3
2	T1	1236	4.0	0.595	5.1	LOS A	5.1	131.9	0.57	0.53	0.57	35.8
12	R2	49	4.0	0.595	5.2	LOS A	5.1	131.9	0.56	0.49	0.56	34.9
Approach		1549	4.0	0.595	6.2	LOS A	5.1	131.9	0.57	0.54	0.57	35.7
All Vehicles		3573	4.0	0.595	7.5	LOS A	5.1	131.9	0.65	0.68	0.70	35.1

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 8 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout



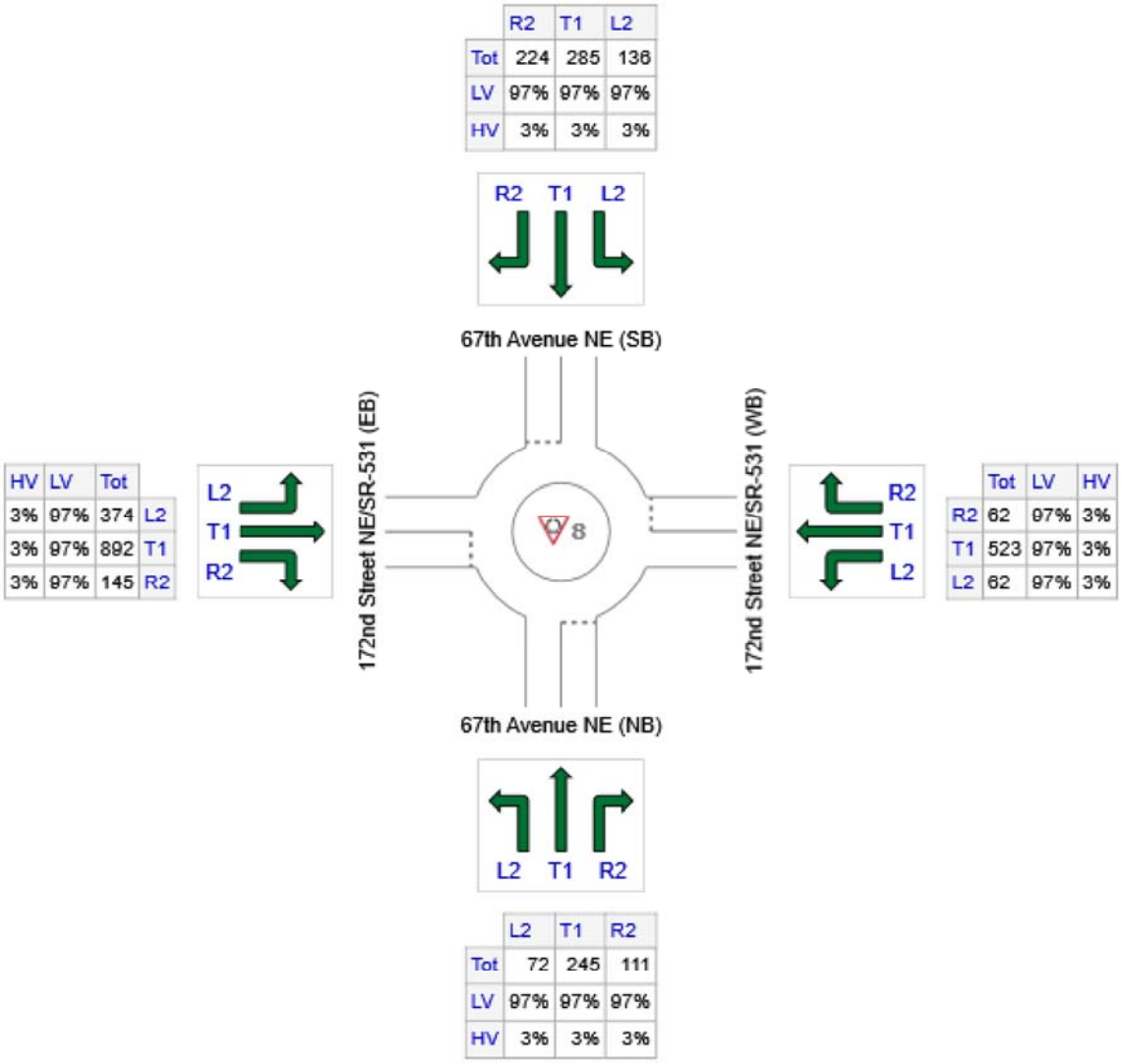
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 8 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 67th Avenue NE (NB)	428	415	13
E: 172nd Street NE/SR-531 (WB)	647	628	19
N: 67th Avenue NE (SB)	645	626	19
W: 172nd Street NE/SR-531 (EB)	1411	1369	42
Total	3131	3037	94

MOVEMENT SUMMARY

Site: 8 [2030 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 67th Avenue NE (NB)												
3	L2	73	3.0	0.962	35.7	LOS E	11.2	287.1	0.99	1.42	2.36	25.7
8	T1	250	3.0	0.962	30.8	LOS E	11.2	287.1	0.99	1.42	2.36	25.7
18	R2	113	3.0	0.962	30.6	LOS E	11.2	287.1	0.99	1.42	2.36	25.3
Approach		437	3.0	0.962	31.6	LOS C	11.2	287.1	0.99	1.42	2.36	25.6
East: 172nd Street NE/SR-531 (WB)												
1	L2	63	3.0	0.412	14.3	LOS B	2.8	72.7	0.81	0.88	0.84	33.7
6	T1	534	3.0	0.412	8.9	LOS A	3.0	77.0	0.81	0.84	0.83	34.2
16	R2	63	3.0	0.412	8.5	LOS A	3.0	77.0	0.82	0.82	0.82	33.5
Approach		660	3.0	0.412	9.4	LOS A	3.0	77.0	0.81	0.84	0.83	34.1
North: 67th Avenue NE (SB)												
7	L2	139	3.0	0.874	19.8	LOS D	10.1	258.2	0.94	1.20	1.58	31.3
4	T1	291	3.0	0.874	14.9	LOS D	10.1	258.2	0.94	1.20	1.58	31.3
14	R2	229	3.0	0.874	14.7	LOS D	10.1	258.2	0.94	1.20	1.58	30.7
Approach		658	3.0	0.874	15.9	LOS B	10.1	258.2	0.94	1.20	1.58	31.1
West: 172nd Street NE/SR-531 (EB)												
5	L2	382	3.0	0.766	17.6	LOS B	10.0	255.7	0.96	1.06	1.31	31.4
2	T1	910	3.0	0.766	11.9	LOS B	10.6	271.5	0.96	1.02	1.28	32.7
12	R2	148	3.0	0.766	11.6	LOS B	10.6	271.5	0.96	1.00	1.26	32.3
Approach		1440	3.0	0.766	13.4	LOS B	10.6	271.5	0.96	1.03	1.28	32.3
All Vehicles		3195	3.0	0.962	15.6	LOS B	11.2	287.1	0.93	1.08	1.40	31.3

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lanes, Volumes, Timings
12: 67th Avenue NE & 188th Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	6	156	12	4	14	72	537	18	21	526	144
Future Volume (vph)	149	6	156	12	4	14	72	537	18	21	526	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	45		0	35		0	105		0	110		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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97		0.99	0.98			1.00			0.99	
Frt		0.856			0.880			0.995			0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1505	0	1719	1561	0	1719	1798	0	1719	1743	0
Flt Permitted	0.548						0.158			0.324		
Satd. Flow (perm)	992	1505	0	1796	1561	0	286	1798	0	586	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		173			16			2			18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1804			590			5317			5234	
Travel Time (s)		41.0			13.4			120.8			119.0	
Confl. Peds. (#/hr)			3	3			1		4	4		1
Confl. Bikes (#/hr)						2			6			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	166	7	173	13	4	16	80	597	20	23	584	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	180	0	13	20	0	80	617	0	23	744	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)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	15.0	28.0		10.0	23.0		11.0	72.0		10.0	71.0	
Total Split (%)	12.5%	23.3%		8.3%	19.2%		9.2%	60.0%		8.3%	59.2%	
Maximum Green (s)	10.5	23.5		5.5	18.5		6.5	67.5		5.5	66.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
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)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	14.4	13.1		8.5	6.9		43.8	42.0		40.7	36.5	
Actuated g/C Ratio	0.21	0.19		0.12	0.10		0.63	0.60		0.58	0.52	

Lanes, Volumes, Timings
12: 67th Avenue NE & 188th Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.52	0.43		0.06	0.12		0.24	0.57		0.05	0.81	
Control Delay	35.3	10.6		30.2	24.5		6.6	12.3		5.2	22.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.3	10.6		30.2	24.5		6.6	12.3		5.2	22.2	
LOS	D	B		C	C		A	B		A	C	
Approach Delay		22.5			26.7			11.6			21.7	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)	58	2		5	1		8	88		2	214	
Queue Length 95th (ft)	162	68		23	27		30	342		12	481	
Internal Link Dist (ft)		1724			510			5237			5154	
Turn Bay Length (ft)	45			35			105			110		
Base Capacity (vph)	348	692		212	489		334	1584		445	1530	
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	0.48	0.26		0.06	0.04		0.24	0.39		0.05	0.49	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 69.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 18.1 Intersection LOS: B
Intersection Capacity Utilization 66.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 12: 67th Avenue NE & 188th Street NE

2030 Baseline Conditions with Improvements
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

2030 Opening Year Level of Service Calculations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1333	601	0	1976	798	0	0	0	461	1	396
Future Volume (vph)	0	1333	601	0	1976	798	0	0	0	461	1	396
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			0.98			0.96						0.99
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	1552	0	3539	1523	0	0	0	1681	1686	1562
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			626			831						26
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)	8		4	4		8	1					1
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
Adj. Flow (vph)	0	1389	626	0	2058	831	0	0	0	480	1	413
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1389	626	0	2058	831	0	0	0	240	241	413
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)		94.2	94.2		93.9	93.9				28.0	28.0	28.0
Actuated g/C Ratio		0.70	0.70		0.70	0.70				0.21	0.21	0.21
v/c Ratio		0.56	0.49		0.83	0.63				0.68	0.68	1.19
Control Delay		10.7	1.9		18.1	2.8				59.9	60.0	153.2

Lanes, Volumes, Timings
1: I-5 Southbound Ramps & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		1.1	0.6		1.7	0.1				0.0	0.0	0.0
Total Delay		11.8	2.4		19.7	3.0				59.9	60.0	153.2
LOS		B	A		B	A				E	E	F
Approach Delay		8.9			14.9						103.0	
Approach LOS		A			B						F	
Queue Length 50th (ft)		281	0		610	0				204	205	~414
Queue Length 95th (ft)		333	33		722	36				305	306	#623
Internal Link Dist (ft)		529			860			899			1046	
Turn Bay Length (ft)			200							350		435
Base Capacity (vph)		2491	1277		2483	1316				351	352	347
Starvation Cap Reductn		796	296		255	63				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		0.82	0.64		0.92	0.66				0.68	0.68	1.19

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 133.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.19
Intersection Signal Delay: 26.4 Intersection LOS: C
Intersection Capacity Utilization 89.2% ICU Level of Service E
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.

Splits and Phases: 1: I-5 Southbound Ramps & 172nd Street NE

2030 Opening Year Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	446	1409	0	0	2092	999	892	0	1325	0	0	0
Future Volume (vph)	446	1409	0	0	2092	999	892	0	1325	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					0.98			0.99			
Frt						0.850			0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1736	3471	0	0	4988	1553	1649	1649	1553	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1735	3471	0	0	4988	1523	1649	1649	1532	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						535			306			
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)	3		9	9		3			5	5		
Confl. Bikes (#/hr)			1									
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	465	1468	0	0	2179	1041	929	0	1380	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	465	1468	0	0	2179	1041	464	465	1380	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			

Lanes, Volumes, Timings
2: I-5 Northbound Ramps & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.44	0.66			1.05	1.10	1.05	1.05	0.90			
Control Delay	253.0	16.4			73.4	80.4	103.3	103.9	9.7			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	253.0	16.4			73.4	80.4	103.3	103.9	9.7			
LOS	F	B			E	F	F	F	A			
Approach Delay		73.3			75.7			47.5				
Approach LOS		E			E			D				
Queue Length 50th (ft)	~534	380			~739	~720	~451	~453	0			
Queue Length 95th (ft)	#747	453			#832	#981	#675	#677	0			
Internal Link Dist (ft)		860			1006			1014			919	
Turn Bay Length (ft)	600					300	400					
Base Capacity (vph)	323	2226			2066	944	441	441	1532			
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	1.44	0.66			1.05	1.10	1.05	1.05	0.90			

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 130.8
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.44
Intersection Signal Delay: 66.3 Intersection LOS: E
Intersection Capacity Utilization 130.4% ICU Level of Service H
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.

Splits and Phases: 2: I-5 Northbound Ramps & 172nd Street NE

2030 Opening Year Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	78	509	1142	410	280	1496	172	774	572	320	213	309	424
Future Volume (vph)	78	509	1142	410	280	1496	172	774	572	320	213	309	424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		900		0	400		260	200		200	200		170
Storage Lanes		1		1	1		1	2		1	1		1
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00		0.98	1.00		0.98	0.99		0.97	0.99		0.98
Frt				0.850			0.850			0.850			0.850
Flt Protected		0.950			0.950			0.950			0.950		
Satd. Flow (prot)	0	1755	3505	1568	1752	5036	1568	3400	3505	1568	1752	3505	1568
Flt Permitted		0.950			0.950			0.950			0.950		
Satd. Flow (perm)	0	1754	3505	1533	1749	5036	1541	3372	3505	1526	1741	3505	1530
Right Turn on Red				Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				228			116			236			124
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			1086			469			515			2837	
Travel Time (s)			24.7			10.7			11.7			64.5	
Confl. Peds. (#/hr)		4		7	7		4	9		11	11		9
Peak Hour Factor	0.92	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	85	530	1190	427	292	1558	179	806	596	333	222	322	442
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	615	1190	427	292	1558	179	806	596	333	222	322	442
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	5	2		1	6		3	8		7	4	
Permitted Phases				2			6			8			4
Detector Phase	5	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase													
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	10.5	10.5	42.5	42.5	10.5	46.5	46.5	10.5	45.9	45.9	10.5	44.9	44.9
Total Split (s)	35.0	35.0	70.0	70.0	35.0	70.0	70.0	45.0	32.0	32.0	35.0	32.0	32.0
Total Split (%)	19.2%	19.2%	38.5%	38.5%	19.2%	38.5%	38.5%	24.7%	17.6%	17.6%	19.2%	17.6%	17.6%

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Maximum Green (s)	29.5	29.5	63.5	63.5	29.5	63.5	63.5	39.5	26.1	26.1	29.5	26.1	26.1
Yellow Time (s)	3.5	3.5	4.5	4.5	3.5	4.5	4.5	3.5	3.9	3.9	3.5	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	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	0.0	0.0
Total Lost Time (s)		5.5	6.5	6.5	5.5	6.5	6.5	5.5	5.9	5.9	5.5	5.9	5.9
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Max	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)			29.0	29.0		33.0	33.0		33.0	33.0		32.0	32.0
Pedestrian Calls (#/hr)			0	0		0	0		0	0		0	0
Act Effct Green (s)		29.5	63.5	63.5	29.5	63.5	63.5	39.5	51.4	51.4	27.1	39.0	39.0
Actuated g/C Ratio		0.15	0.33	0.33	0.15	0.33	0.33	0.20	0.26	0.26	0.14	0.20	0.20
v/c Ratio		2.32	1.04	0.65	1.10	0.95	0.31	1.17	0.65	0.58	0.91	0.46	1.09
Control Delay		636.1	100.4	30.2	156.8	76.9	18.7	155.4	68.0	22.2	120.1	71.1	120.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		636.1	100.4	30.2	156.8	76.9	18.7	155.4	68.0	22.2	120.1	71.1	120.4
LOS		F	F	C	F	E	B	F	E	C	F	E	F
Approach Delay			234.6			83.3			99.8			104.3	
Approach LOS			F			F			F			F	
Queue Length 50th (ft)		~1279	~864	227	~423	719	57	~630	367	108	281	194	~502
Queue Length 95th (ft)		#1533	#1005	364	#635	#794	130	#767	440	227	#428	250	#743
Internal Link Dist (ft)			1006			389			435			2757	
Turn Bay Length (ft)		900			400		260	200		200	200		170
Base Capacity (vph)		265	1141	653	265	1640	580	689	924	576	265	701	405
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	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	0
Reduced v/c Ratio		2.32	1.04	0.65	1.10	0.95	0.31	1.17	0.65	0.58	0.84	0.46	1.09

Intersection Summary

Area Type: Other
Cycle Length: 182

Actuated Cycle Length: 194.9
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 2.32
Intersection Signal Delay: 138.7
Intersection LOS: F
Intersection Capacity Utilization 136.1%
ICU Level of Service H
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.

Splits and Phases: 3: Smokey Point Boulevard & 172nd Street NE

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	24	26	1156	40	211	1648	24	323	14	272	10	6	19
Future Volume (vph)	24	26	1156	40	211	1648	24	323	14	272	10	6	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		155		0	230		60	225		0	100		0
Storage Lanes		1		1	1		1	2		0	1		0
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00				1.00		1.00				0.99	
Frt				0.850		0.998			0.857			0.885	
Flt Protected		0.950			0.950			0.950			0.950		
Satd. Flow (prot)	0	1761	1845	1568	1752	3496	0	3400	1581	0	1752	1616	0
Flt Permitted		0.950			0.950			0.950			0.950		
Satd. Flow (perm)	0	1759	1845	1568	1752	3496	0	3392	1581	0	1752	1616	0
Right Turn on Red				Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				124		2			256			20	
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			2130			2599			1049			2423	
Travel Time (s)			48.4			59.1			23.8			55.1	
Confl. Peds. (#/hr)		3					3	1					1
Confl. Bikes (#/hr)							1						
Peak Hour Factor	0.92	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	26	28	1230	43	224	1753	26	344	15	289	11	6	20
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	54	1230	43	224	1779	0	344	304	0	11	26	0
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	5	2		1	6		3	8		7	4	
Permitted Phases				2									
Detector Phase	5	5	2	2	1	6		3	8		7	4	
Switch Phase													
Minimum Initial (s)	3.0	3.0	10.0	10.0	3.0	10.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	9.5	9.5	32.9	32.9	9.5	30.9		9.5	32.1		9.5	37.1	
Total Split (s)	15.0	15.0	100.0	100.0	25.0	100.0		15.0	20.0		15.0	20.0	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	9.4%	9.4%	62.5%	62.5%	15.6%	62.5%		9.4%	12.5%		9.4%	12.5%	
Maximum Green (s)	9.5	9.5	94.1	94.1	19.5	94.1		9.9	14.9		9.9	14.9	
Yellow Time (s)	3.5	3.5	3.9	3.9	3.5	3.9		3.1	3.1		3.1	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	
Total Lost Time (s)		5.5	5.9	5.9	5.5	5.9		5.1	5.1		5.1	5.1	
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5	3.0	3.0	2.5	3.0		2.5	3.0		2.5	3.0	
Recall Mode	None	None	C-Max	C-Max	None	C-Max		None	Max		None	Max	
Walk Time (s)			7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)			20.0	20.0		18.0			20.0			25.0	
Pedestrian Calls (#/hr)			0	0		0			0			0	
Act Effct Green (s)		8.5	94.1	94.1	19.5	107.4		9.9	25.0		6.1	14.9	
Actuated g/C Ratio		0.05	0.59	0.59	0.12	0.67		0.06	0.16		0.04	0.09	
v/c Ratio		0.58	1.13	0.04	1.05	0.76		1.64	0.66		0.17	0.15	
Control Delay		97.8	103.6	0.1	140.7	21.1		349.9	20.2		79.5	32.7	
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		97.8	103.6	0.1	140.7	21.1		349.9	20.2		79.5	32.7	
LOS		F	F	A	F	C		F	C		E	C	
Approach Delay			100.0			34.5			195.2			46.6	
Approach LOS			F			C			F			D	
Queue Length 50th (ft)		56	~1490	0	~254	660		~267	43		11	6	
Queue Length 95th (ft)		106	#1759	0	#434	756		#374	163		34	39	
Internal Link Dist (ft)			2050			2519			969			2343	
Turn Bay Length (ft)		155			230			225			100		
Base Capacity (vph)		104	1085	973	213	2346		210	462		108	168	
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	1.13	0.04	1.05	0.76		1.64	0.66		0.10	0.15	

Intersection Summary

Area Type: Other

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 25 (16%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.64
Intersection Signal Delay: 82.2 Intersection LOS: F
Intersection Capacity Utilization 112.9% ICU Level of Service H
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.

Splits and Phases: 4: 43rd Avenue NE & 172nd Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	1051	346	181	1242	39	554	78	331	64	69	98
Future Volume (vph)	46	1051	346	181	1242	39	554	78	331	64	69	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	250		0	180		150	225		0
Storage Lanes	1		0	1		0	1		1	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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00		1.00				0.98	
Frt		0.963			0.995				0.850		0.912	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1765	0	1752	1834	0	1752	1845	1568	1752	1657	0
Flt Permitted	0.043			0.041			0.357			0.676		
Satd. Flow (perm)	79	1765	0	76	1834	0	656	1845	1568	1247	1657	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			3				224		42	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2599			2632			3339			896	
Travel Time (s)		59.1			59.8			75.9			20.4	
Confl. Peds. (#/hr)	1		2	2		1	2					2
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
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	48	1095	360	189	1294	41	577	81	345	67	72	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	1455	0	189	1335	0	577	81	345	67	174	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	10.5	30.9		10.5	33.9		28.1	28.1	28.1	28.3	28.3	
Total Split (s)	15.0	100.0		15.0	100.0		20.0	20.0	20.0	20.0	20.0	
Total Split (%)	11.1%	74.1%		11.1%	74.1%		14.8%	14.8%	14.8%	14.8%	14.8%	
Maximum Green (s)	9.5	94.1		9.5	94.1		14.9	14.9	14.9	13.7	13.7	
Yellow Time (s)	3.5	3.9		3.5	3.9		3.1	3.1	3.1	4.3	4.3	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.9		5.5	5.9		5.1	5.1	5.1	6.3	6.3	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.5	4.0		2.5	4.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		18.0			21.0		16.0	16.0	16.0	15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	100.5	94.1		107.7	99.7		14.9	14.9	14.9	13.7	13.7	
Actuated g/C Ratio	0.74	0.70		0.80	0.74		0.11	0.11	0.11	0.10	0.10	
v/c Ratio	0.36	1.17		1.06	0.99		8.01	0.40	0.93	0.53	0.85	

Lanes, Volumes, Timings
5: 51st Avenue NE & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	16.7	109.3		121.3	39.7		3192.0	62.3	52.4	73.8	78.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	16.7	109.3		121.3	39.7		3192.0	62.3	52.4	73.8	78.3	
LOS	B	F		F	D		F	E	D	E	E	
Approach Delay		106.3			49.8			1859.3			77.1	
Approach LOS		F			D			F			E	
Queue Length 50th (ft)	7	~1518		~130	~1073		~984	67	111	57	116	
Queue Length 95th (ft)	31	#1788		#291	#1515		#1181	121	#301	109	#246	
Internal Link Dist (ft)		2519			2552			3259			816	
Turn Bay Length (ft)	250			250			180		150	225		
Base Capacity (vph)	178	1239		178	1355		72	203	372	126	205	
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	0.27	1.17		1.06	0.99		8.01	0.40	0.93	0.53	0.85	

Intersection Summary

Area Type: Other
Cycle Length: 135
Actuated Cycle Length: 135
Offset: 15 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 8.01
Intersection Signal Delay: 496.2 Intersection LOS: F
Intersection Capacity Utilization 146.5% ICU Level of Service H
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.

Splits and Phases: 5: 51st Avenue NE & 172nd Street NE

2030 Opening Year Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Lanes, Volumes, Timings
6: 59th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	243	1143	50	59	769	40	160	47	108	112	23	584
Future Volume (vph)	243	1143	50	59	769	40	160	47	108	112	23	584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	150		0	250		0	400		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	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.993			0.896			0.856	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1816	0	1736	1814	0	1736	1637	0	1736	1564	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	1816	0	1736	1814	0	1736	1637	0	1736	1564	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			2			59			309	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2632			1402			1370			1561	
Travel Time (s)		59.8			31.9			31.1			35.5	
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 (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	264	1242	54	64	836	43	174	51	117	122	25	635
Shared Lane Traffic (%)												
Lane Group Flow (vph)	264	1296	0	64	879	0	174	168	0	122	660	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0		3.0	5.0		3.0	5.0	
Minimum Split (s)	9.5	34.9		9.5	37.9		9.5	32.9		9.5	32.9	
Total Split (s)	34.0	85.0		14.0	85.0		15.0	26.0		15.0	26.0	
Total Split (%)	21.3%	53.1%		8.8%	53.1%		9.4%	16.3%		9.4%	16.3%	
Maximum Green (s)	28.5	79.1		8.5	79.1		9.5	20.1		9.5	20.1	
Yellow Time (s)	3.5	3.9		3.5	3.9		3.5	3.9		3.5	3.9	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.9		5.5	5.9		5.5	5.9		5.5	5.9	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	C-Max		None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			25.0			20.0			20.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	27.0	99.3		8.3	80.6		9.5	20.1		9.5	20.1	
Actuated g/C Ratio	0.17	0.62		0.05	0.50		0.06	0.13		0.06	0.13	
v/c Ratio	0.90	1.15		0.72	0.96		1.69	0.65		1.18	1.42	
Control Delay	97.4	107.3		106.8	44.7		389.2	56.3		206.7	223.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Lanes, Volumes, Timings
6: 59th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	97.4	107.3		106.8	44.7		389.2	56.3		206.7	223.9	
LOS	F	F		F	D		F	E		F	F	
Approach Delay		105.6			48.9			225.7			221.2	
Approach LOS		F			D			F			F	
Queue Length 50th (ft)	271	~1592		69	789		~268	110		~153	~630	
Queue Length 95th (ft)	#428	#1862		m97	m#891		m#430	m196		#294	#880	
Internal Link Dist (ft)		2552			1322			1290			1481	
Turn Bay Length (ft)	350			150			250			400		
Base Capacity (vph)	309	1128		92	915		103	257		103	466	
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	0.85	1.15		0.70	0.96		1.69	0.65		1.18	1.42	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 34 (21%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.69
Intersection Signal Delay: 127.1 Intersection LOS: F
Intersection Capacity Utilization 131.7% ICU Level of Service H
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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: 59th Avenue NE & 172nd Street NE

2030 Opening Year Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1395	9	0	827	0	37
Future Vol, veh/h	1395	9	0	827	0	37
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	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	1468	9	0	871	0	39

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1473
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	-	-	0	-	0	155
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	155
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	35.8
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	155	-	-	-
HCM Lane V/C Ratio	0.251	-	-	-
HCM Control Delay (s)	35.8	-	-	-
HCM Lane LOS	E	-	-	-
HCM 95th %tile Q(veh)	0.9	-	-	-

Lanes, Volumes, Timings
8: 67th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	379	907	145	62	529	62	72	245	111	136	285	226
Future Volume (vph)	379	907	145	62	529	62	72	245	111	136	285	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		80	125		0	150		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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								0.99		1.00		
Frt			0.850		0.984			0.953			0.934	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1845	1568	1752	1815	0	1752	1745	0	1752	1723	0
Flt Permitted	0.256			0.070			0.125			0.119		
Satd. Flow (perm)	472	1845	1568	129	1815	0	231	1745	0	219	1723	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			88		6			13			22	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1109			3194			1426			2074	
Travel Time (s)		25.2			72.6			32.4			47.1	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	387	926	148	63	540	63	73	250	113	139	291	231
Shared Lane Traffic (%)												
Lane Group Flow (vph)	387	926	148	63	603	0	73	363	0	139	522	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8			4		
Detector Phase	5	2	2	1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	7.0		5.0	7.0	
Minimum Split (s)	10.0	31.9	31.9	10.0	34.9		10.0	33.9		10.0	35.9	
Total Split (s)	16.0	90.0	90.0	16.0	90.0		16.0	38.0		16.0	38.0	
Total Split (%)	10.0%	56.3%	56.3%	10.0%	56.3%		10.0%	23.8%		10.0%	23.8%	
Maximum Green (s)	11.0	84.1	84.1	11.0	84.1		11.0	32.1		11.0	32.1	
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9		3.0	3.9		3.0	3.9	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.9	5.9	5.0	5.9		5.0	5.9		5.0	5.9	
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)	3.0	4.0	4.0	3.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		19.0	19.0		22.0			21.0			23.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	99.0	89.3	89.3	93.0	84.1		42.6	32.1		45.4	33.5	
Actuated g/C Ratio	0.62	0.56	0.56	0.58	0.53		0.27	0.20		0.28	0.21	
v/c Ratio	1.02	0.90	0.16	0.40	0.63		0.48	1.01		0.83	1.38	

Lanes, Volumes, Timings
8: 67th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	52.3	45.9	14.8	19.5	30.3		51.2	109.3		79.9	230.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	52.3	45.9	14.8	19.5	30.3		51.2	109.3		79.9	230.6	
LOS	D	D	B	B	C		D	F		E	F	
Approach Delay		44.5			29.3			99.6			198.9	
Approach LOS		D			C			F			F	
Queue Length 50th (ft)	~287	829	57	24	434		56	~377		110	~714	
Queue Length 95th (ft)	m243	m743	m52	45	569		99	#600		#221	#960	
Internal Link Dist (ft)		1029			3114			1346			1994	
Turn Bay Length (ft)	350		80	125			150			200		
Base Capacity (vph)	379	1029	913	188	956		168	360		167	378	
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	1.02	0.90	0.16	0.34	0.63		0.43	1.01		0.83	1.38	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 9.5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.38
Intersection Signal Delay: 80.4 Intersection LOS: F
Intersection Capacity Utilization 103.7% ICU Level of Service G
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.
m Volume for 95th percentile queue is metered by upstream signal.

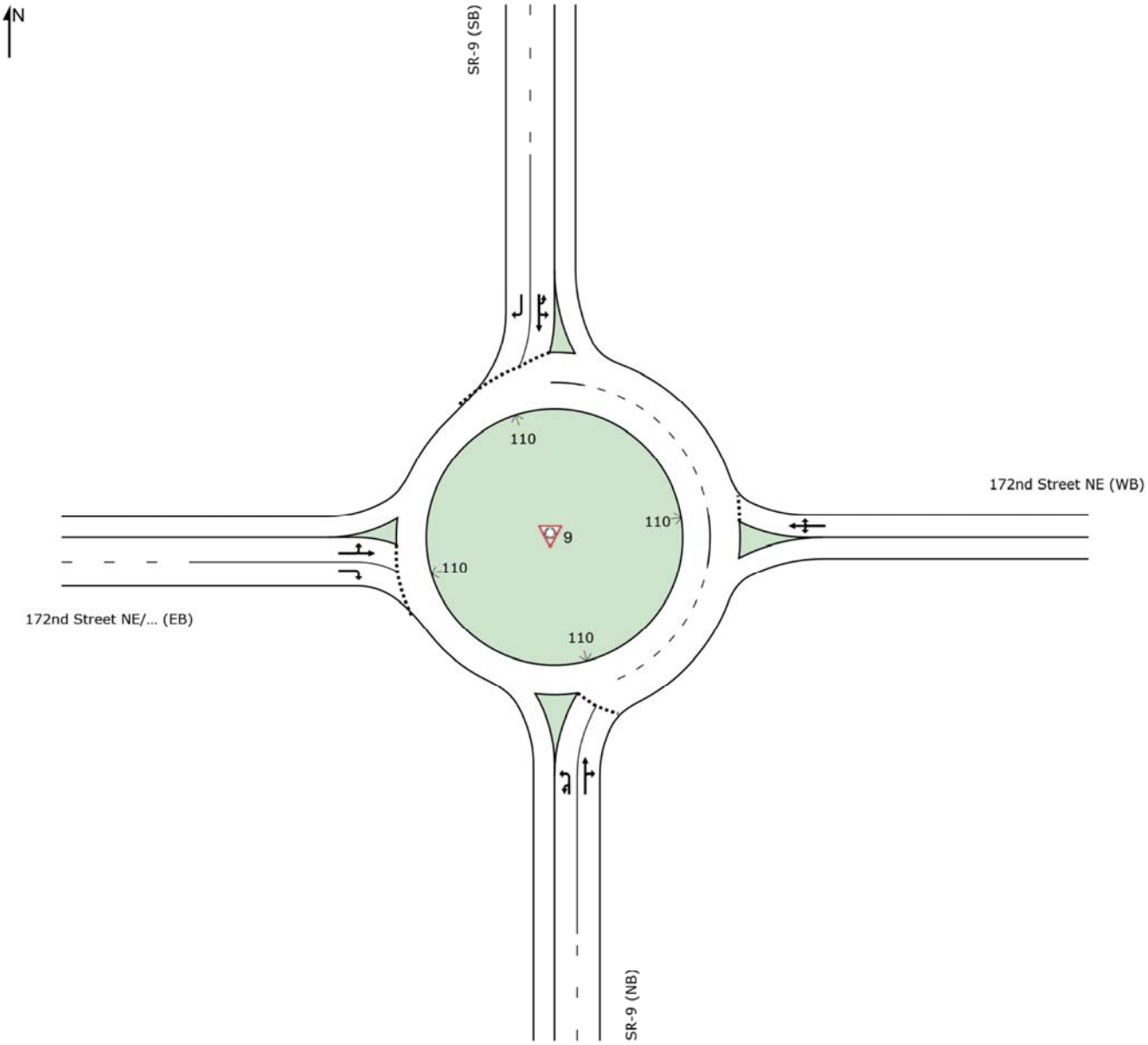
Splits and Phases: 8: 67th Avenue NE & 172nd Street NE

2030 Opening Year Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

SITE LAYOUT

Site: 9 [2030 Future Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout



Organisation: GIBSON TRAFFIC CONSULTANTS | Created: Thursday, July 29, 2021 4:13:49 PM
Project: H:\2020\20-106\Full Analysis\Full BSP\Comments\Arlington\Sidra\#9.sip8

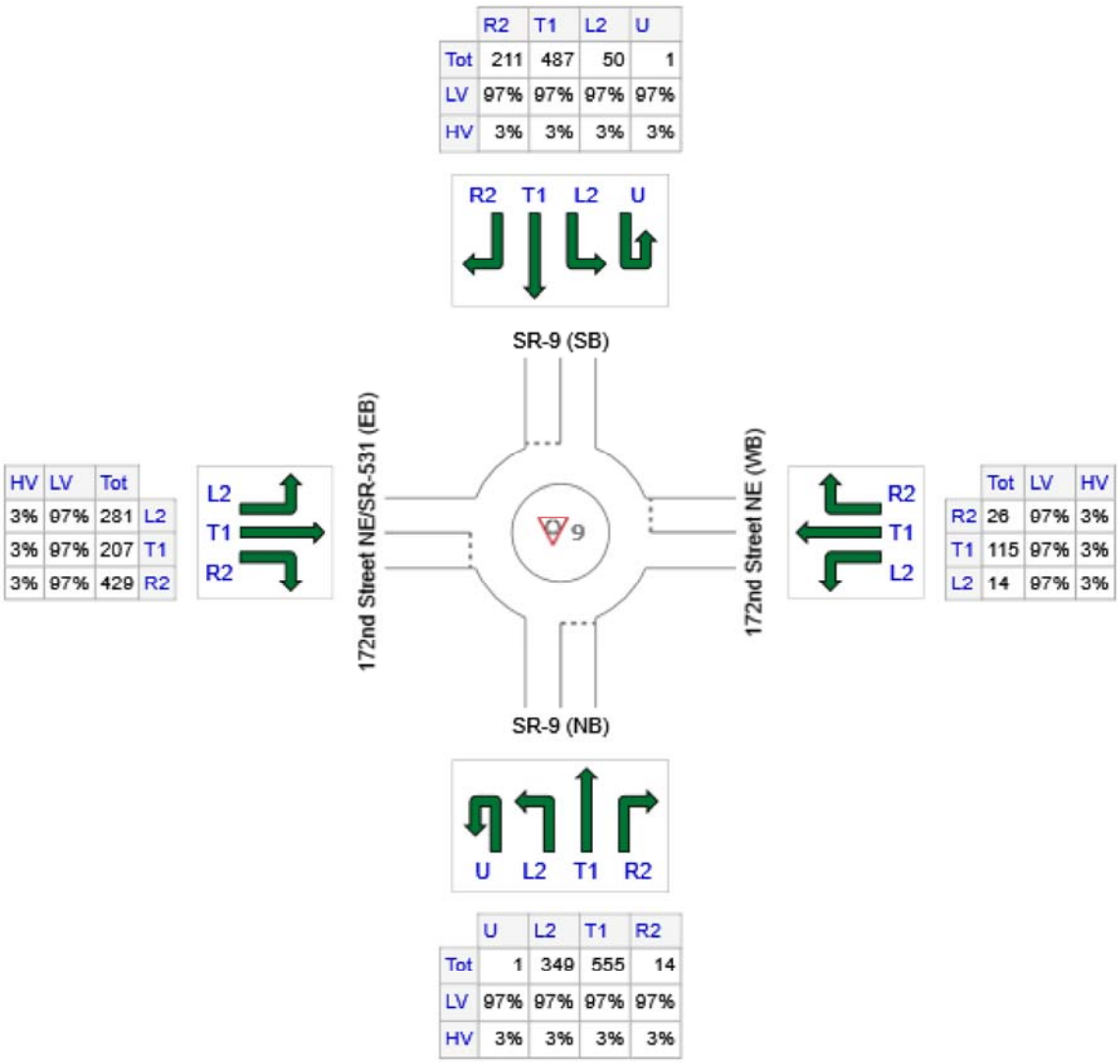
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 9 [2030 Future Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: SR-9 (NB)	919	891	28
E: 172nd Street NE (WB)	155	150	5
N: SR-9 (SB)	749	727	22
W: 172nd Street NE/SR-531 (EB)	917	889	28
Total	2740	2658	82

MOVEMENT SUMMARY

Site: 9 [2030 Future Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: SR-9 (NB)												
3u	U	1	3.0	0.439	16.2	LOS B	3.3	84.1	0.80	0.85	0.82	34.1
3	L2	371	3.0	0.439	13.6	LOS B	3.3	84.1	0.80	0.85	0.82	33.2
8	T1	590	3.0	0.538	7.3	LOS A	5.1	131.5	0.85	0.73	0.91	35.2
18	R2	15	3.0	0.538	7.4	LOS A	5.1	131.5	0.85	0.73	0.91	34.1
Approach		978	3.0	0.538	9.7	LOS A	5.1	131.5	0.83	0.78	0.87	34.4
East: 172nd Street NE (WB)												
1	L2	15	3.0	0.299	14.6	LOS B	1.5	39.3	0.79	0.84	0.79	35.2
6	T1	122	3.0	0.299	8.8	LOS A	1.5	39.3	0.79	0.84	0.79	35.0
16	R2	28	3.0	0.299	8.6	LOS A	1.5	39.3	0.79	0.84	0.79	33.9
Approach		165	3.0	0.299	9.3	LOS A	1.5	39.3	0.79	0.84	0.79	34.8
North: SR-9 (SB)												
7u	U	1	3.0	0.536	15.4	LOS B	4.1	104.4	0.71	0.69	0.77	36.6
7	L2	53	3.0	0.536	12.9	LOS B	4.1	104.4	0.71	0.69	0.77	35.7
4	T1	518	3.0	0.536	6.7	LOS A	4.1	104.4	0.71	0.69	0.77	35.5
14	R2	224	3.0	0.284	6.7	LOS A	1.4	37.0	0.60	0.72	0.60	35.1
Approach		797	3.0	0.536	7.1	LOS A	4.1	104.4	0.68	0.70	0.72	35.4
West: 172nd Street NE/SR-531 (EB)												
5	L2	299	3.0	0.455	12.7	LOS B	3.7	95.1	0.80	0.73	0.80	34.7
2	T1	220	3.0	0.455	6.1	LOS A	3.7	95.1	0.80	0.73	0.80	34.6
12	R2	456	3.0	0.522	8.4	LOS A	4.4	112.7	0.83	0.87	0.92	34.4
Approach		976	3.0	0.522	9.2	LOS A	4.4	112.7	0.81	0.79	0.85	34.5
All Vehicles		2915	3.0	0.538	8.8	LOS A	5.1	131.5	0.78	0.76	0.82	34.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	54	260	23	21	108
Future Vol, veh/h	68	54	260	23	21	108
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	-	-	-	150	-
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	74	59	283	25	23	117

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	459	296	0	0	308	0
Stage 1	296	-	-	-	-	-
Stage 2	163	-	-	-	-	-
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	560	743	-	-	1253	-
Stage 1	755	-	-	-	-	-
Stage 2	866	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	550	743	-	-	1253	-
Mov Cap-2 Maneuver	550	-	-	-	-	-
Stage 1	755	-	-	-	-	-
Stage 2	850	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	1.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	621	1253	-
HCM Lane V/C Ratio	-	-	0.214	0.018	-
HCM Control Delay (s)	-	-	12.4	7.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

Intersection	
Intersection Delay, s/veh	13.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	57	35	263	7	10	8	118	141	10	183	1
Future Vol, veh/h	6	57	35	263	7	10	8	118	141	10	183	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	7	66	41	306	8	12	9	137	164	12	213	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.4	15.4	13.1	12.3
HCM LOS	B	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	6%	94%	5%
Vol Thru, %	44%	58%	3%	94%
Vol Right, %	53%	36%	4%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	267	98	280	194
LT Vol	8	6	263	10
Through Vol	118	57	7	183
RT Vol	141	35	10	1
Lane Flow Rate	310	114	326	226
Geometry Grp	1	1	1	1
Degree of Util (X)	0.465	0.188	0.53	0.366
Departure Headway (Hd)	5.397	5.93	5.86	5.839
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	664	601	612	614
Service Time	3.463	4.012	3.922	3.91
HCM Lane V/C Ratio	0.467	0.19	0.533	0.368
HCM Control Delay	13.1	10.4	15.4	12.3
HCM Lane LOS	B	B	C	B
HCM 95th-tile Q	2.5	0.7	3.1	1.7

Intersection												
Int Delay, s/veh	53.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	149	6	156	12	4	14	72	542	18	21	528	144
Future Vol, veh/h	149	6	156	12	4	14	72	542	18	21	528	144
Conflicting Peds, #/hr	0	0	3	3	0	0	1	0	4	4	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	45	-	-	35	-	-	105	-	-	110	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	166	7	173	13	4	16	80	602	20	23	587	160

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1496	1500	671	1582	1570	616	748	0	0	626	0	0
Stage 1	714	714	-	776	776	-	-	-	-	-	-	-
Stage 2	782	786	-	806	794	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 99	120	451	87	109	485	847	-	-	941	-	-
Stage 1	418	430	-	386	403	-	-	-	-	-	-	-
Stage 2	383	399	-	371	396	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 84	105	449	46	96	483	846	-	-	937	-	-
Mov Cap-2 Maneuver	~ 84	105	-	46	96	-	-	-	-	-	-	-
Stage 1	378	419	-	348	363	-	-	-	-	-	-	-
Stage 2	332	359	-	218	386	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	278.9	57.2	1.1	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	846	-	-	84	400	46	255	937	-	-
HCM Lane V/C Ratio	0.095	-	-	1.971	0.45	0.29	0.078	0.025	-	-
HCM Control Delay (s)	9.7	-	-	$ 559.1	21.2	112.5	20.3	8.9	-	-
HCM Lane LOS	A	-	-	F	C	F	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	14.5	2.3	1	0.3	0.1	-	-

Notes

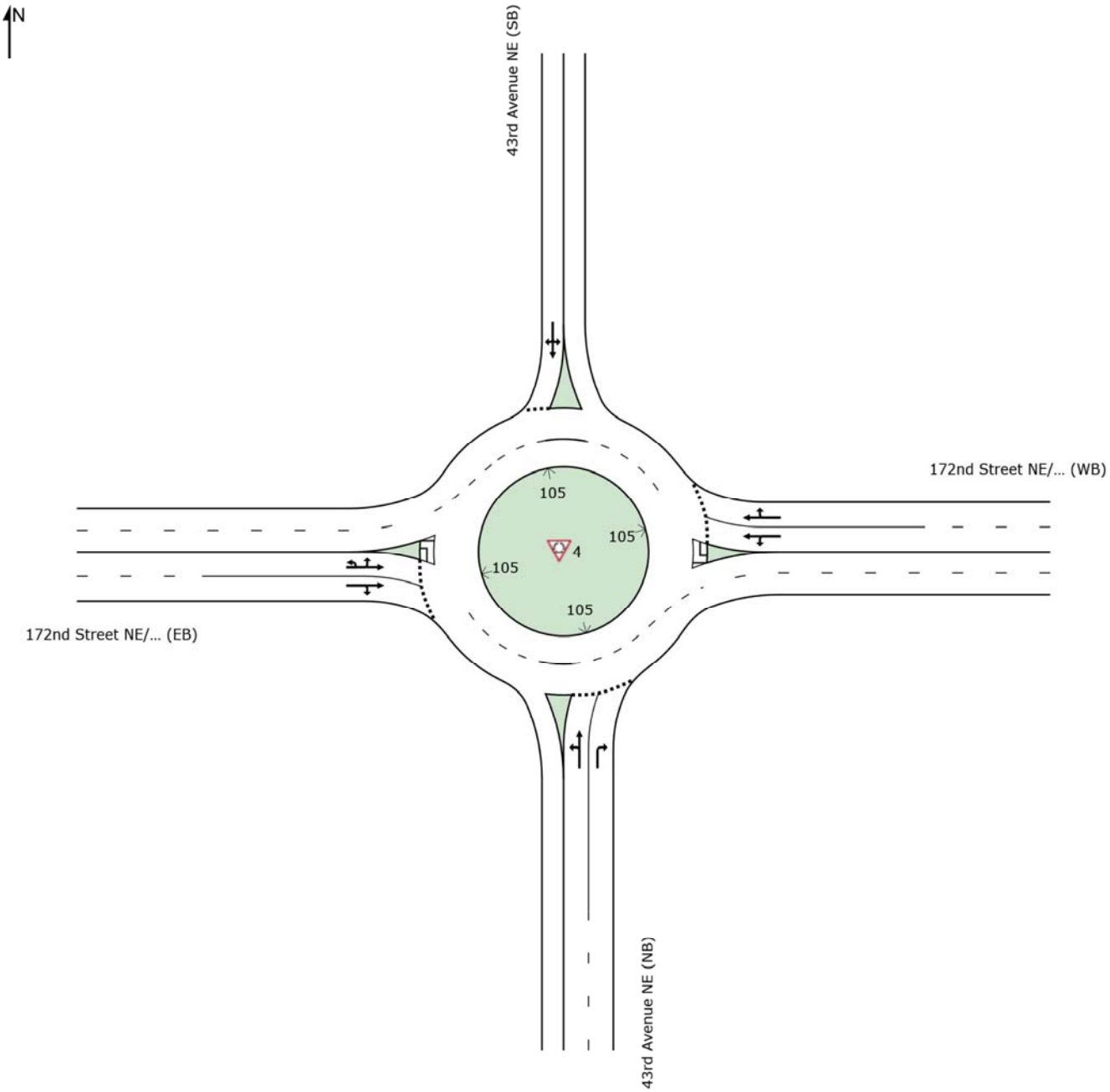
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

2030 Opening Year Level of Service Calculations with Improvements

SITE LAYOUT

Site: 4 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout



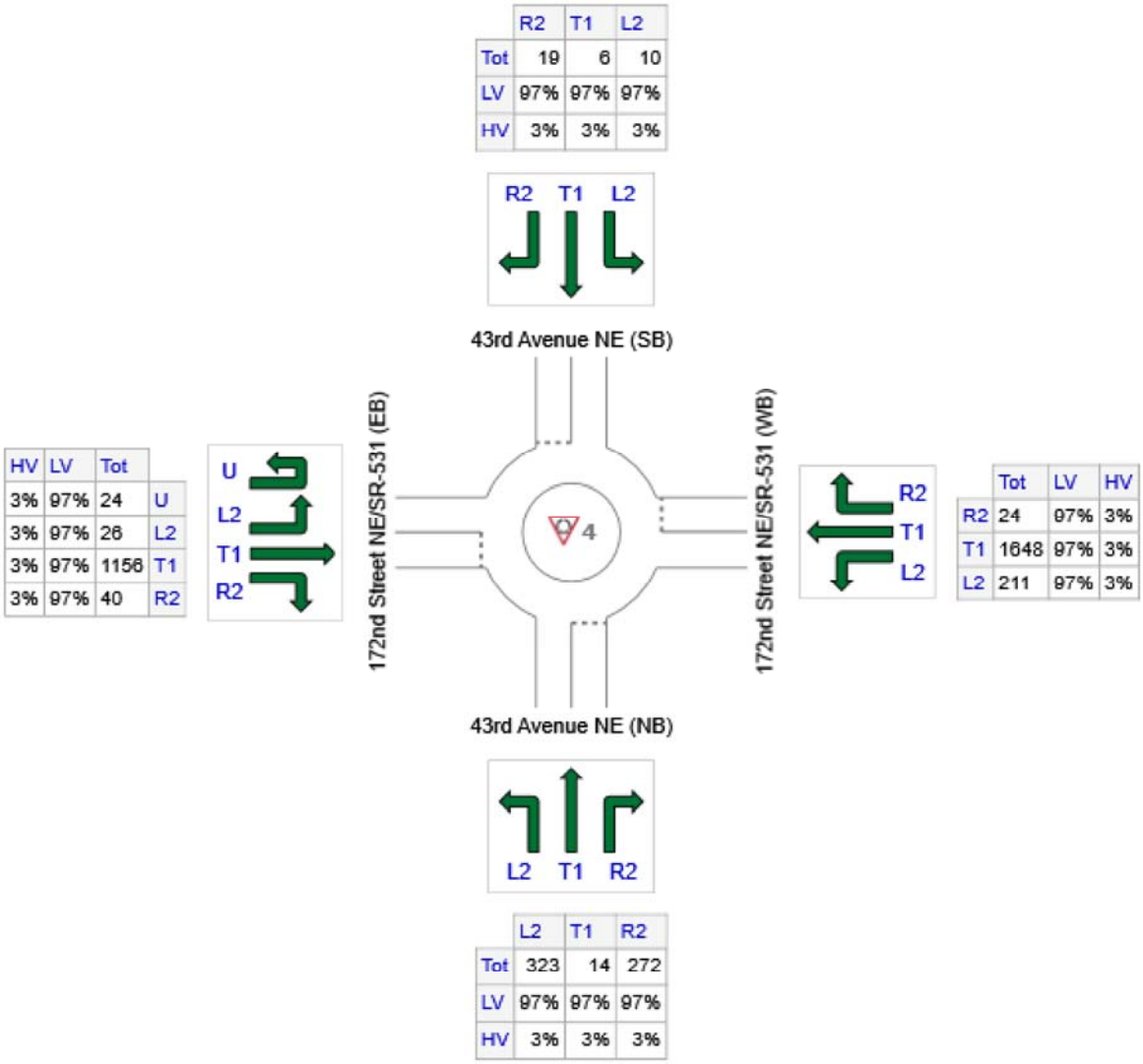
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 4 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 43rd Avenue NE (NB)	609	591	18
E: 172nd Street NE/SR-531 (WB)	1883	1827	56
N: 43rd Avenue NE (SB)	35	34	1
W: 172nd Street NE/SR-531 (EB)	1246	1209	37
Total	3773	3660	113

MOVEMENT SUMMARY

Site: 4 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout

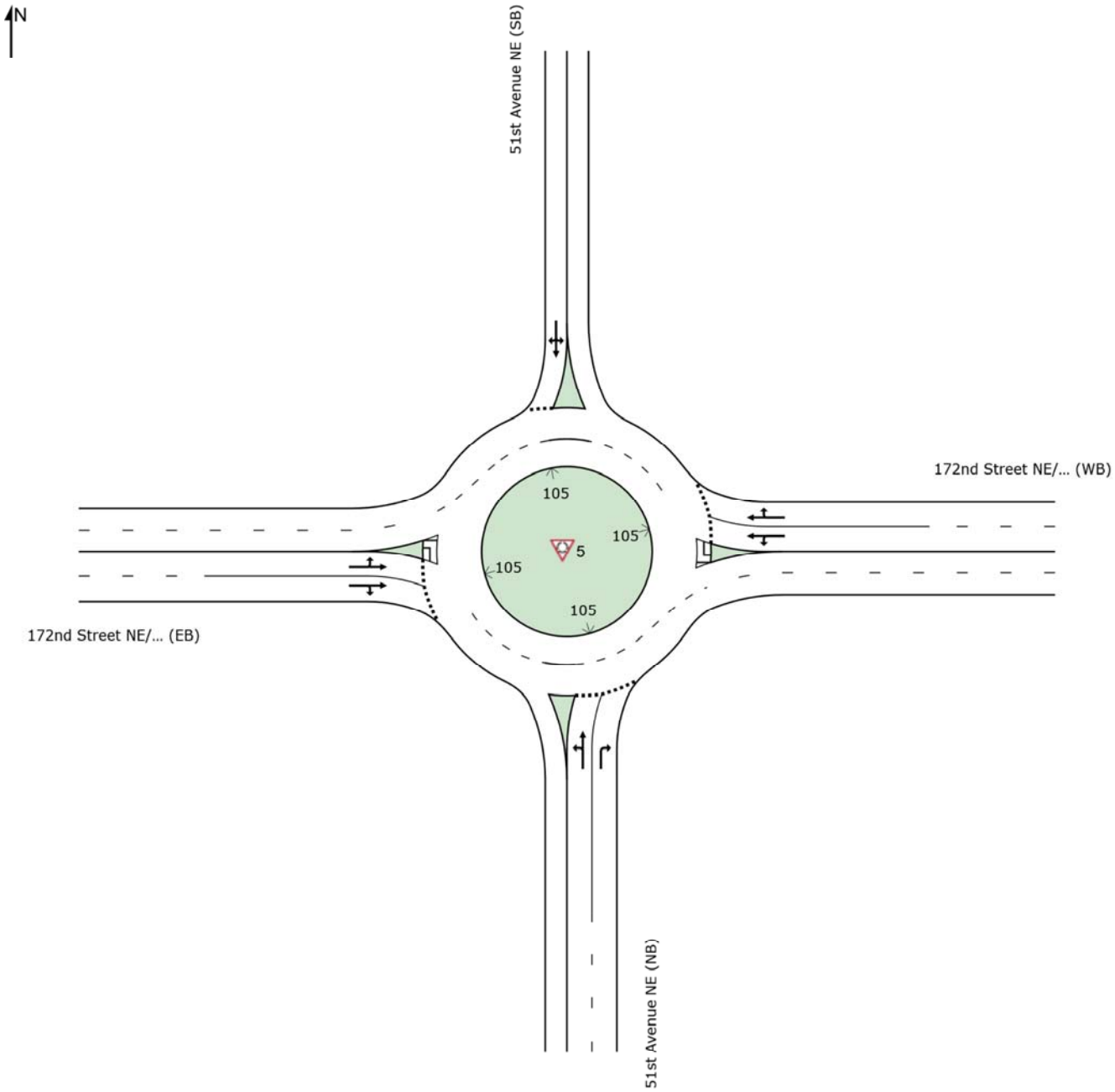
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 43rd Avenue NE (NB)												
3	L2	344	3.0	0.424	12.9	LOS B	2.3	59.4	0.75	0.90	0.83	33.4
8	T1	15	3.0	0.424	6.9	LOS A	2.3	59.4	0.75	0.90	0.83	33.3
18	R2	289	3.0	0.451	8.4	LOS A	2.3	58.8	0.75	0.91	0.87	34.4
Approach		648	3.0	0.451	10.8	LOS B	2.3	59.4	0.75	0.90	0.85	33.8
East: 172nd Street NE/SR-531 (WB)												
1	L2	224	3.0	0.889	21.6	LOS D	17.5	449.1	1.00	1.15	1.58	31.5
6	T1	1753	3.0	0.889	14.1	LOS D	18.5	473.4	1.00	1.10	1.52	32.4
16	R2	26	3.0	0.889	13.5	LOS D	18.5	473.4	1.00	1.07	1.48	32.0
Approach		2003	3.0	0.889	14.9	LOS B	18.5	473.4	1.00	1.10	1.53	32.3
North: 43rd Avenue NE (SB)												
7	L2	11	3.0	0.153	21.5	LOS C	0.8	20.8	0.91	0.96	0.91	31.4
4	T1	6	3.0	0.153	15.4	LOS B	0.8	20.8	0.91	0.96	0.91	31.3
14	R2	20	3.0	0.153	15.4	LOS B	0.8	20.8	0.91	0.96	0.91	30.5
Approach		37	3.0	0.153	17.1	LOS B	0.8	20.8	0.91	0.96	0.91	30.9
West: 172nd Street NE/SR-531 (EB)												
5u	U	26	3.0	0.525	13.8	LOS B	4.2	108.6	0.62	0.54	0.62	36.8
5	L2	28	3.0	0.525	11.3	LOS B	4.2	108.6	0.62	0.54	0.62	35.8
2	T1	1230	3.0	0.525	5.1	LOS A	4.5	114.7	0.61	0.51	0.61	35.9
12	R2	43	3.0	0.525	5.2	LOS A	4.5	114.7	0.60	0.49	0.60	34.8
Approach		1326	3.0	0.525	5.4	LOS A	4.5	114.7	0.61	0.51	0.61	35.9
All Vehicles		4014	3.0	0.889	11.1	LOS B	18.5	473.4	0.83	0.87	1.11	33.7

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 5 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout



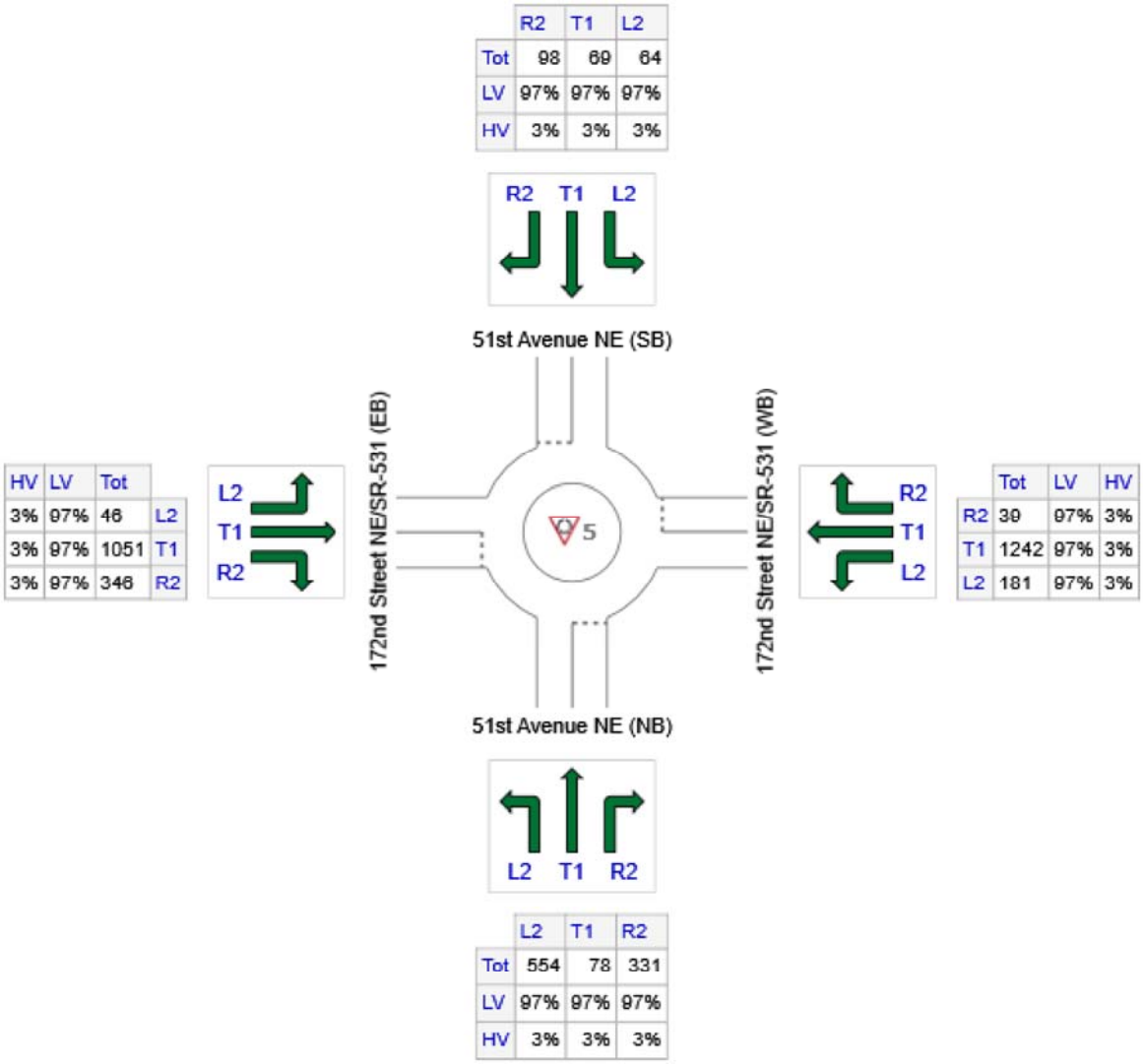
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 5 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 51st Avenue NE (NB)	963	934	29
E: 172nd Street NE/SR-531 (WB)	1462	1418	44
N: 51st Avenue NE (SB)	231	224	7
W: 172nd Street NE/SR-531 (EB)	1443	1400	43
Total	4099	3976	123

MOVEMENT SUMMARY

Site: 5 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout

Movement Performance - Vehicles

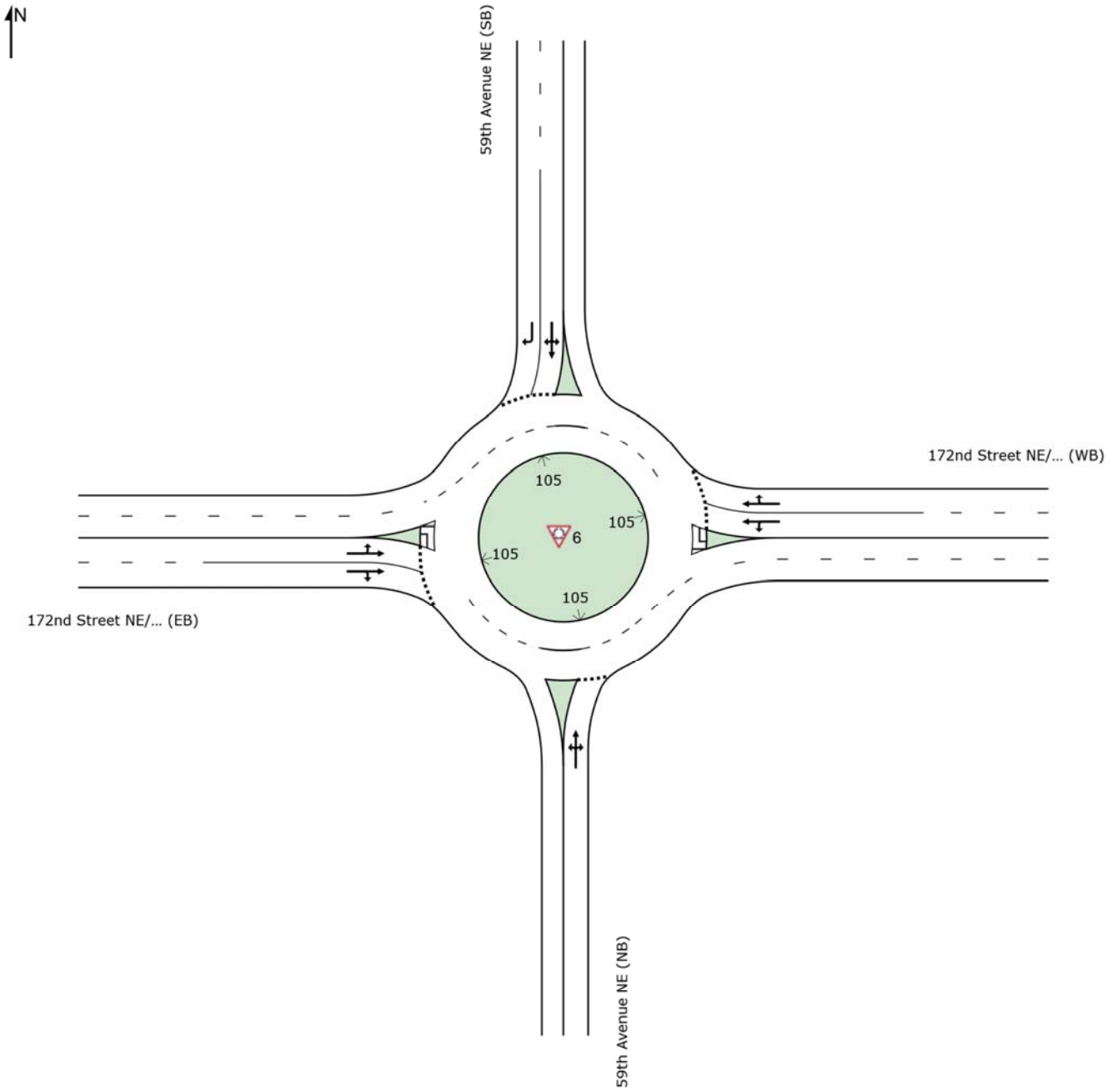
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 51st Avenue NE (NB)												
3	L2	577	3.0	0.807	18.2	LOS B	7.9	201.6	0.93	1.16	1.46	31.5
8	T1	81	3.0	0.807	12.2	LOS B	7.9	201.6	0.93	1.16	1.46	31.4
18	R2	345	3.0	0.568	9.9	LOS A	3.4	87.6	0.81	0.97	1.02	33.6
Approach		1003	3.0	0.807	14.9	LOS B	7.9	201.6	0.89	1.09	1.31	32.2
East: 172nd Street NE/SR-531 (WB)												
1	L2	189	3.0	0.951	39.3	LOS E	21.6	552.0	1.00	1.55	2.40	25.3
6	T1	1294	3.0	0.951	31.0	LOS E	25.6	654.5	1.00	1.54	2.38	26.1
16	R2	41	3.0	0.951	30.0	LOS E	25.6	654.5	1.00	1.53	2.36	26.0
Approach		1523	3.0	0.951	32.0	LOS C	25.6	654.5	1.00	1.54	2.38	26.0
North: 51st Avenue NE (SB)												
7	L2	67	3.0	0.797	41.4	LOS D	6.6	169.2	0.98	1.24	1.81	24.7
4	T1	72	3.0	0.797	35.4	LOS D	6.6	169.2	0.98	1.24	1.81	24.6
14	R2	102	3.0	0.797	35.4	LOS D	6.6	169.2	0.98	1.24	1.81	24.1
Approach		241	3.0	0.797	37.1	LOS D	6.6	169.2	0.98	1.24	1.81	24.4
West: 172nd Street NE/SR-531 (EB)												
5	L2	48	3.0	0.619	12.8	LOS B	5.7	144.9	0.72	0.69	0.77	35.5
2	T1	1095	3.0	0.619	6.4	LOS A	5.7	145.4	0.71	0.67	0.75	35.6
12	R2	360	3.0	0.619	6.1	LOS A	5.7	145.4	0.69	0.63	0.71	34.6
Approach		1503	3.0	0.619	6.5	LOS A	5.7	145.4	0.70	0.66	0.74	35.4
All Vehicles		4270	3.0	0.951	19.3	LOS B	25.6	654.5	0.87	1.11	1.52	30.0

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 6 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout



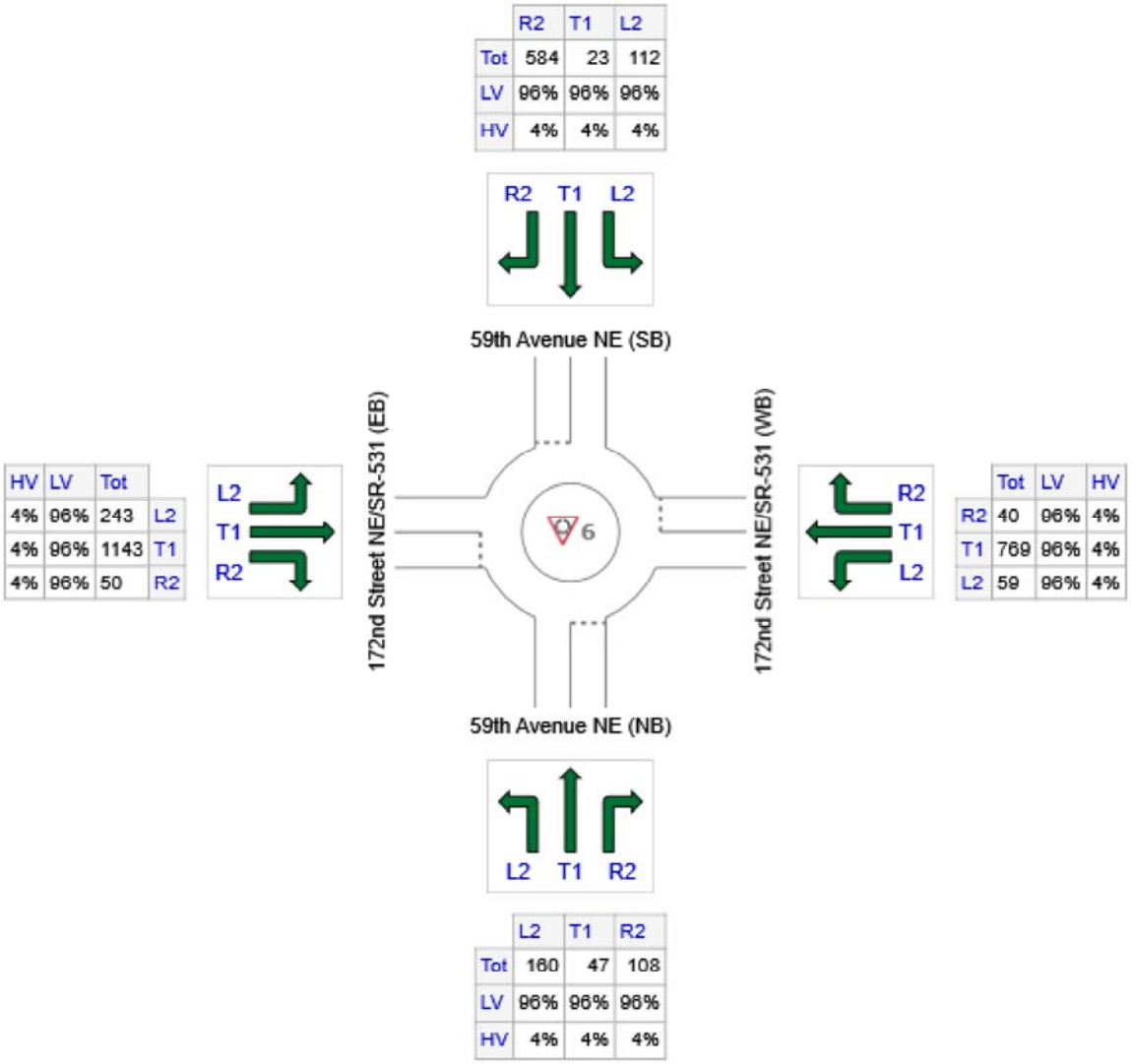
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 6 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 59th Avenue NE (NB)	315	302	13
E: 172nd Street NE/SR-531 (WB)	868	833	35
N: 59th Avenue NE (SB)	719	690	29
W: 172nd Street NE/SR-531 (EB)	1436	1379	57
Total	3338	3204	134

MOVEMENT SUMMARY

Site: 6 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout

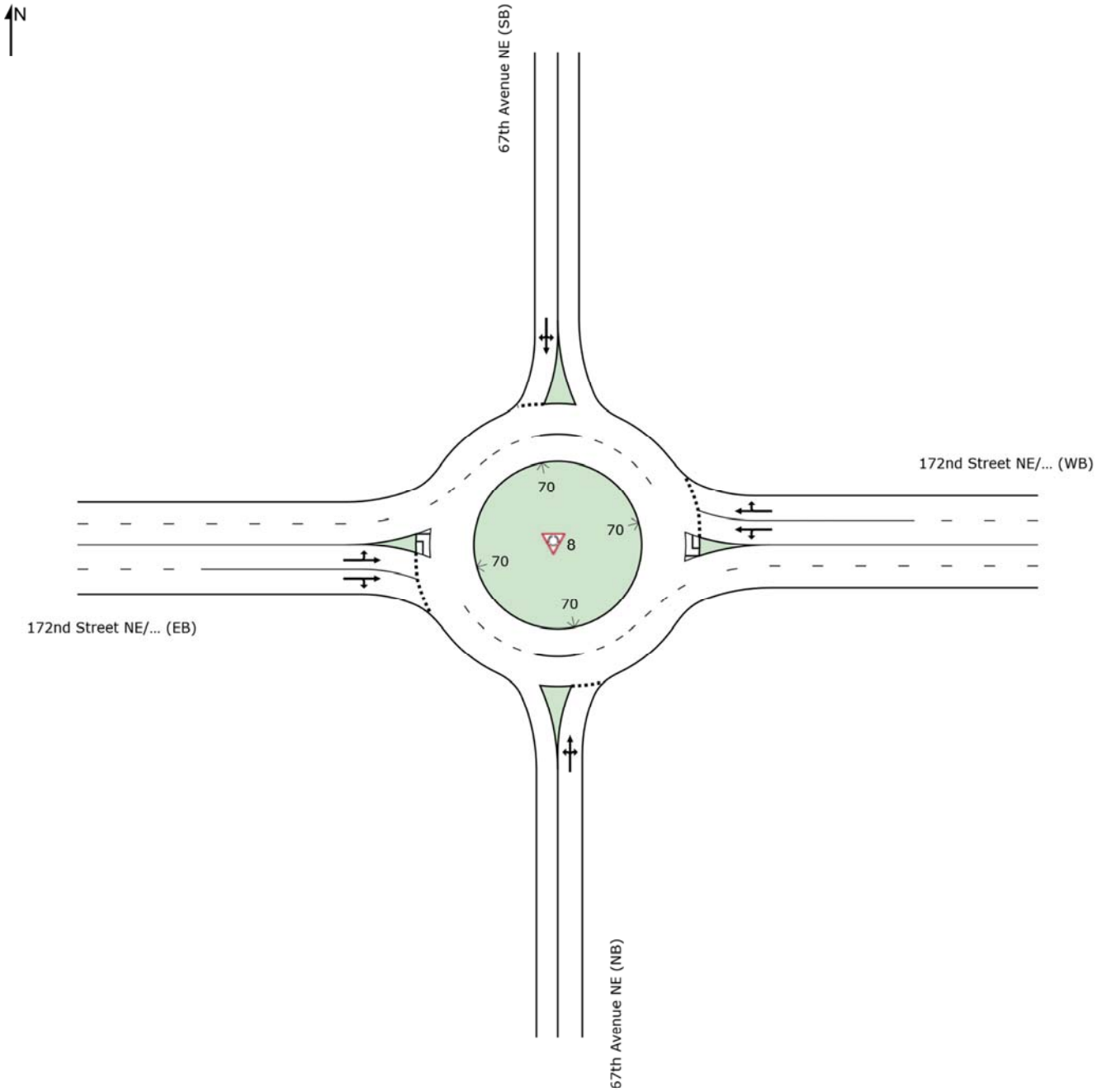
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 59th Avenue NE (NB)												
3	L2	174	4.0	0.622	17.7	LOS B	3.7	95.9	0.84	1.03	1.15	32.6
8	T1	51	4.0	0.622	11.6	LOS B	3.7	95.9	0.84	1.03	1.15	32.5
18	R2	117	4.0	0.622	11.6	LOS B	3.7	95.9	0.84	1.03	1.15	31.6
Approach		342	4.0	0.622	14.7	LOS B	3.7	95.9	0.84	1.03	1.15	32.2
East: 172nd Street NE/SR-531 (WB)												
1	L2	64	4.0	0.443	12.9	LOS B	2.9	75.2	0.69	0.69	0.69	35.4
6	T1	836	4.0	0.443	6.5	LOS A	3.1	80.8	0.68	0.65	0.68	35.6
16	R2	43	4.0	0.443	6.4	LOS A	3.1	80.8	0.68	0.61	0.68	34.5
Approach		943	4.0	0.443	6.9	LOS A	3.1	80.8	0.68	0.65	0.68	35.5
North: 59th Avenue NE (SB)												
7	L2	122	4.0	0.520	14.9	LOS B	3.0	76.6	0.77	0.95	0.94	34.3
4	T1	25	4.0	0.520	8.8	LOS A	3.0	76.6	0.77	0.95	0.94	34.2
14	R2	635	4.0	0.520	8.2	LOS A	3.2	83.0	0.77	0.93	0.92	34.2
Approach		782	4.0	0.520	9.3	LOS A	3.2	83.0	0.77	0.94	0.92	34.2
West: 172nd Street NE/SR-531 (EB)												
5	L2	264	4.0	0.603	11.4	LOS B	5.0	130.0	0.61	0.60	0.61	35.3
2	T1	1242	4.0	0.603	5.2	LOS A	5.2	134.6	0.59	0.53	0.59	35.8
12	R2	54	4.0	0.603	5.3	LOS A	5.2	134.6	0.58	0.50	0.58	34.8
Approach		1561	4.0	0.603	6.2	LOS A	5.2	134.6	0.59	0.54	0.59	35.7
All Vehicles		3628	4.0	0.622	7.9	LOS A	5.2	134.6	0.68	0.70	0.74	35.0

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 8 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout



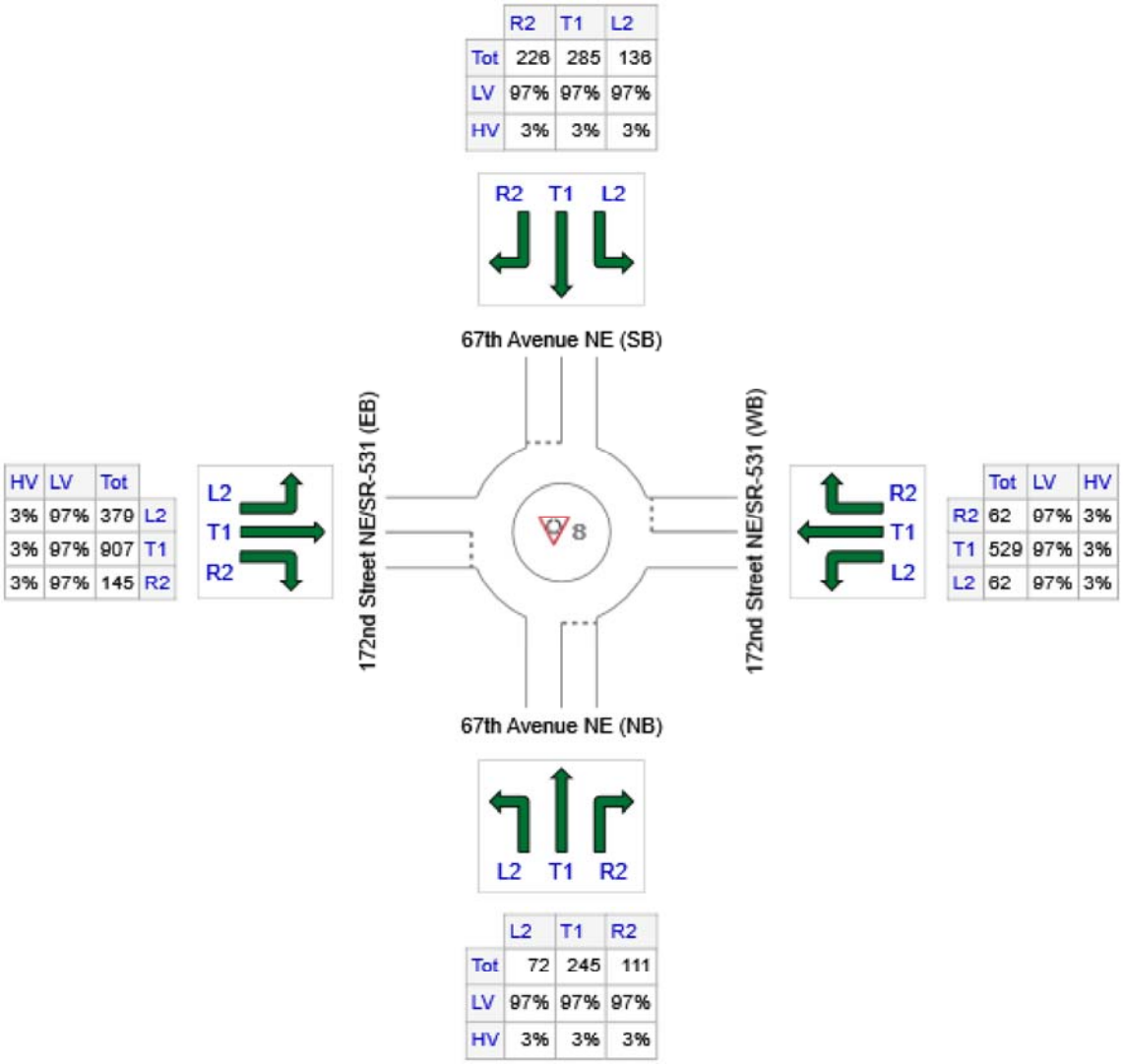
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 8 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 67th Avenue NE (NB)	428	415	13
E: 172nd Street NE/SR-531 (WB)	653	633	20
N: 67th Avenue NE (SB)	647	628	19
W: 172nd Street NE/SR-531 (EB)	1431	1388	43
Total	3159	3064	95

MOVEMENT SUMMARY

Site: 8 [2030 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 67th Avenue NE (NB)												
3	L2	73	3.0	0.982	39.9	LOS E	12.4	318.0	0.99	1.48	2.57	24.5
8	T1	250	3.0	0.982	35.1	LOS E	12.4	318.0	0.99	1.48	2.57	24.5
18	R2	113	3.0	0.982	34.9	LOS E	12.4	318.0	0.99	1.48	2.57	24.1
Approach		437	3.0	0.982	35.8	LOS D	12.4	318.0	0.99	1.48	2.57	24.4
East: 172nd Street NE/SR-531 (WB)												
1	L2	63	3.0	0.419	14.5	LOS B	2.9	75.0	0.82	0.89	0.86	33.6
6	T1	540	3.0	0.419	9.0	LOS A	3.1	79.2	0.82	0.85	0.84	34.2
16	R2	63	3.0	0.419	8.6	LOS A	3.1	79.2	0.82	0.82	0.83	33.4
Approach		666	3.0	0.419	9.5	LOS A	3.1	79.2	0.82	0.85	0.84	34.0
North: 67th Avenue NE (SB)												
7	L2	139	3.0	0.881	20.2	LOS D	10.4	265.7	0.95	1.21	1.62	31.1
4	T1	291	3.0	0.881	15.3	LOS D	10.4	265.7	0.95	1.21	1.62	31.1
14	R2	231	3.0	0.881	15.1	LOS D	10.4	265.7	0.95	1.21	1.62	30.5
Approach		660	3.0	0.881	16.3	LOS B	10.4	265.7	0.95	1.21	1.62	30.9
West: 172nd Street NE/SR-531 (EB)												
5	L2	387	3.0	0.777	18.0	LOS B	10.4	267.0	0.97	1.08	1.34	31.2
2	T1	926	3.0	0.777	12.3	LOS B	11.1	283.8	0.97	1.04	1.31	32.6
12	R2	148	3.0	0.777	11.9	LOS B	11.1	283.8	0.97	1.02	1.30	32.2
Approach		1460	3.0	0.777	13.7	LOS B	11.1	283.8	0.97	1.05	1.32	32.2
All Vehicles		3223	3.0	0.982	16.4	LOS B	12.4	318.0	0.94	1.10	1.45	30.9

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lanes, Volumes, Timings
12: 67th Avenue NE & 188th Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	6	156	12	4	14	72	542	18	21	528	144
Future Volume (vph)	149	6	156	12	4	14	72	542	18	21	528	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	45		0	35		0	105		0	110		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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97		0.99	0.98			1.00			1.00	
Frt		0.856			0.880			0.995			0.968	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1505	0	1719	1561	0	1719	1798	0	1719	1743	0
Flt Permitted	0.548						0.157			0.320		
Satd. Flow (perm)	992	1505	0	1796	1561	0	284	1798	0	579	1743	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		173			16			2			18	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1804			590			5317			5234	
Travel Time (s)		41.0			13.4			120.8			119.0	
Confl. Peds. (#/hr)			3	3			1		4	4		1
Confl. Bikes (#/hr)						2			6			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	166	7	173	13	4	16	80	602	20	23	587	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	166	180	0	13	20	0	80	622	0	23	747	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)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	15.0	28.0		10.0	23.0		11.0	72.0		10.0	71.0	
Total Split (%)	12.5%	23.3%		8.3%	19.2%		9.2%	60.0%		8.3%	59.2%	
Maximum Green (s)	10.5	23.5		5.5	18.5		6.5	67.5		5.5	66.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
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)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	14.4	13.1		8.5	7.0		44.0	42.1		40.9	36.7	
Actuated g/C Ratio	0.21	0.19		0.12	0.10		0.63	0.60		0.59	0.53	

Lanes, Volumes, Timings
12: 67th Avenue NE & 188th Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.52	0.43		0.06	0.12		0.24	0.57		0.05	0.81	
Control Delay	35.5	10.6		30.3	24.6		6.6	12.3		5.2	22.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.5	10.6		30.3	24.6		6.6	12.3		5.2	22.2	
LOS	D	B		C	C		A	B		A	C	
Approach Delay		22.6			26.9			11.6			21.7	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)	58	2		5	1		8	89		2	216	
Queue Length 95th (ft)	163	68		23	27		30	345		12	484	
Internal Link Dist (ft)		1724			510			5237			5154	
Turn Bay Length (ft)	45			35			105			110		
Base Capacity (vph)	348	691		211	488		333	1581		442	1528	
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	0.48	0.26		0.06	0.04		0.24	0.39		0.05	0.49	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 69.9
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 18.2 Intersection LOS: B
Intersection Capacity Utilization 66.9% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 12: 67th Avenue NE & 188th Street NE

2030 Opening Year Conditions with Improvements
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

2036 Baseline Level of Service Calculations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1587	717	0	2344	843	0	0	0	504	2	473
Future Volume (vph)	0	1587	717	0	2344	843	0	0	0	504	2	473
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			0.98			0.96						0.99
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	1552	0	3539	1523	0	0	0	1681	1686	1562
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			747			750						26
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)	8		4	4		8	1					1
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
Adj. Flow (vph)	0	1653	747	0	2442	878	0	0	0	525	2	493
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1653	747	0	2442	878	0	0	0	262	265	493
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)		94.2	94.2		93.9	93.9				28.0	28.0	28.0
Actuated g/C Ratio		0.70	0.70		0.70	0.70				0.21	0.21	0.21
v/c Ratio		0.66	0.57		0.98	0.68				0.75	0.75	1.42
Control Delay		12.6	2.3		34.2	4.3				63.8	64.2	242.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		2.7	0.7		24.4	0.2				0.0	0.0	0.0
Total Delay		15.3	2.9		58.6	4.5				63.8	64.2	242.2
LOS		B	A		E	A				E	E	F
Approach Delay		11.5			44.3						150.1	
Approach LOS		B			D						F	
Queue Length 50th (ft)		381	0		977	33				226	229	~561
Queue Length 95th (ft)		449	35		#1268	97				#349	#355	#782
Internal Link Dist (ft)		529			860			899			1046	
Turn Bay Length (ft)			200							350		435
Base Capacity (vph)		2491	1313		2483	1292				351	352	347
Starvation Cap Reductn		691	252		182	58				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		0.92	0.70		1.06	0.71				0.75	0.75	1.42

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 133.8
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.42
Intersection Signal Delay: 48.6 Intersection LOS: D
Intersection Capacity Utilization 104.1% ICU Level of Service G
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.

Splits and Phases: 1: I-5 Southbound Ramps & 172nd Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	533	1629	0	0	2372	1059	1066	0	1544	0	0	0
Future Volume (vph)	533	1629	0	0	2372	1059	1066	0	1544	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					0.98			0.99			
Frt						0.850			0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1736	3471	0	0	4988	1553	1649	1649	1553	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1735	3471	0	0	4988	1523	1649	1649	1532	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						523			288			
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)	3		9	9		3			5	5		
Confl. Bikes (#/hr)			1									
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	555	1697	0	0	2471	1103	1110	0	1608	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	555	1697	0	0	2471	1103	555	555	1608	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			

Lanes, Volumes, Timings
2: I-5 Northbound Ramps & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.72	0.76			1.20	1.18	1.26	1.26	1.05			
Control Delay	368.6	19.4			128.2	110.8	173.6	173.6	41.6			
Queue Delay	0.0	0.5			0.0	0.0	0.0	0.0	0.0			
Total Delay	368.6	19.8			128.2	110.8	173.6	173.6	41.6			
LOS	F	B			F	F	F	F	D			
Approach Delay		105.8			122.8			95.5				
Approach LOS		F			F			F				
Queue Length 50th (ft)	~693	496			~927	~844	~620	~620	~134			
Queue Length 95th (ft)	#916	592			#1017	#1109	#855	#855	#400			
Internal Link Dist (ft)		860			1006			1014			919	
Turn Bay Length (ft)	600					300	400					
Base Capacity (vph)	323	2226			2066	937	441	441	1532			
Starvation Cap Reductn	0	172			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	1.72	0.83			1.20	1.18	1.26	1.26	1.05			

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 130.8
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.72
Intersection Signal Delay: 109.6 Intersection LOS: F
Intersection Capacity Utilization 139.3% ICU Level of Service H
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.

Splits and Phases: 2: I-5 Northbound Ramps & 172nd Street NE

2036 Baseline Conditions
PM Peak-Hour
Gibson Traffic Consultants, Inc. [BJL #20-106]

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	93	608	1260	498	278	1497	198	952	683	362	252	369	506
Future Volume (vph)	93	608	1260	498	278	1497	198	952	683	362	252	369	506
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		900		0	400		260	200		200	200		170
Storage Lanes		1		1	1		1	2		1	1		1
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00		0.98	1.00		0.98	0.99		0.97	0.99		0.98
Frt				0.850			0.850			0.850			0.850
Flt Protected		0.950			0.950			0.950			0.950		
Satd. Flow (prot)	0	1755	3505	1568	1752	5036	1568	3400	3505	1568	1752	3505	1568
Flt Permitted		0.950			0.950			0.950			0.950		
Satd. Flow (perm)	0	1754	3505	1533	1749	5036	1541	3375	3505	1526	1743	3505	1530
Right Turn on Red				Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				251			125			224			120
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			1086			469			515			2837	
Travel Time (s)			24.7			10.7			11.7			64.5	
Confl. Peds. (#/hr)		4		7	7		4	9		11	11		9
Peak Hour Factor	0.92	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	101	633	1313	519	290	1559	206	992	711	377	263	384	527
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	734	1313	519	290	1559	206	992	711	377	263	384	527
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	5	2		1	6		3	8		7	4	
Permitted Phases				2			6			8			4
Detector Phase	5	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase													
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	10.5	10.5	42.5	42.5	10.5	46.5	46.5	10.5	45.9	45.9	10.5	44.9	44.9
Total Split (s)	35.0	35.0	70.0	70.0	35.0	70.0	70.0	45.0	32.0	32.0	35.0	32.0	32.0
Total Split (%)	19.2%	19.2%	38.5%	38.5%	19.2%	38.5%	38.5%	24.7%	17.6%	17.6%	19.2%	17.6%	17.6%

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Maximum Green (s)	29.5	29.5	63.5	63.5	29.5	63.5	63.5	39.5	26.1	26.1	29.5	26.1	26.1
Yellow Time (s)	3.5	3.5	4.5	4.5	3.5	4.5	4.5	3.5	3.9	3.9	3.5	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	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	0.0	0.0
Total Lost Time (s)		5.5	6.5	6.5	5.5	6.5	6.5	5.5	5.9	5.9	5.5	5.9	5.9
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Max	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)			29.0	29.0		33.0	33.0		33.0	33.0		32.0	32.0
Pedestrian Calls (#/hr)			0	0		0	0		0	0		0	0
Act Effct Green (s)		29.5	63.5	63.5	29.5	63.5	63.5	39.5	49.4	49.4	29.1	39.0	39.0
Actuated g/C Ratio		0.15	0.33	0.33	0.15	0.33	0.33	0.20	0.25	0.25	0.15	0.20	0.20
v/c Ratio		2.77	1.15	0.78	1.09	0.95	0.35	1.44	0.80	0.68	1.00	0.55	1.31
Control Delay		831.5	134.6	38.6	154.8	77.0	20.7	256.3	76.2	32.6	136.4	73.4	199.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		831.5	134.6	38.6	154.8	77.0	20.7	256.3	76.2	32.6	136.4	73.4	199.4
LOS		F	F	D	F	E	C	F	E	C	F	E	F
Approach Delay			314.5			82.3			154.2			144.1	
Approach LOS			F			F			F			F	
Queue Length 50th (ft)		~1594	~1035	337	~417	720	75	~885	456	185	343	236	~738
Queue Length 95th (ft)		#1857	#1173	506	#627	#795	154	#1024	538	320	#550	298	#987
Internal Link Dist (ft)			1006			389			435			2757	
Turn Bay Length (ft)		900			400		260	200		200	200		170
Base Capacity (vph)		265	1141	668	265	1640	586	689	888	554	265	701	402
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	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	0
Reduced v/c Ratio		2.77	1.15	0.78	1.09	0.95	0.35	1.44	0.80	0.68	0.99	0.55	1.31

Intersection Summary

Area Type: Other
Cycle Length: 182

Actuated Cycle Length: 194.9
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 2.77
Intersection Signal Delay: 186.2
Intersection LOS: F
Intersection Capacity Utilization 147.5%
ICU Level of Service H
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.

Splits and Phases: 3: Smokey Point Boulevard & 172nd Street NE

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	28	31	1245	48	244	1580	28	385	17	321	12	7	23
Future Volume (vph)	28	31	1245	48	244	1580	28	385	17	321	12	7	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		155		0	230		60	225		0	100		0
Storage Lanes		1		1	1		1	2		0	1		0
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00				1.00		1.00				0.99	
Frt				0.850		0.997			0.858			0.884	
Flt Protected		0.950			0.950			0.950			0.950		
Satd. Flow (prot)	0	1761	1845	1568	1752	3493	0	3400	1583	0	1752	1614	0
Flt Permitted		0.950			0.950			0.950			0.950		
Satd. Flow (perm)	0	1759	1845	1568	1752	3493	0	3392	1583	0	1752	1614	0
Right Turn on Red				Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				124		2			242			24	
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			2130			2599			1049			2423	
Travel Time (s)			48.4			59.1			23.8			55.1	
Confl. Peds. (#/hr)		3					3	1					1
Confl. Bikes (#/hr)							1						
Peak Hour Factor	0.92	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	30	33	1324	51	260	1681	30	410	18	341	13	7	24
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	63	1324	51	260	1711	0	410	359	0	13	31	0
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	5	2		1	6		3	8		7	4	
Permitted Phases				2									
Detector Phase	5	5	2	2	1	6		3	8		7	4	
Switch Phase													
Minimum Initial (s)	3.0	3.0	10.0	10.0	3.0	10.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	9.5	9.5	32.9	32.9	9.5	30.9		9.5	32.1		9.5	37.1	
Total Split (s)	15.0	15.0	100.0	100.0	25.0	100.0		15.0	20.0		15.0	20.0	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	9.4%	9.4%	62.5%	62.5%	15.6%	62.5%		9.4%	12.5%		9.4%	12.5%	
Maximum Green (s)	9.5	9.5	94.1	94.1	19.5	94.1		9.9	14.9		9.9	14.9	
Yellow Time (s)	3.5	3.5	3.9	3.9	3.5	3.9		3.1	3.1		3.1	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	
Total Lost Time (s)		5.5	5.9	5.9	5.5	5.9		5.1	5.1		5.1	5.1	
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5	3.0	3.0	2.5	3.0		2.5	3.0		2.5	3.0	
Recall Mode	None	None	C-Max	C-Max	None	C-Max		None	Max		None	Max	
Walk Time (s)			7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)			20.0	20.0		18.0			20.0			25.0	
Pedestrian Calls (#/hr)			0	0		0			0			0	
Act Effct Green (s)		8.8	94.1	94.1	19.5	104.8		9.9	24.9		6.3	14.9	
Actuated g/C Ratio		0.06	0.59	0.59	0.12	0.66		0.06	0.16		0.04	0.09	
v/c Ratio		0.66	1.22	0.05	1.22	0.75		1.95	0.80		0.19	0.18	
Control Delay		103.5	138.6	0.1	189.4	21.4		480.1	34.8		80.1	31.6	
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		103.5	138.6	0.1	189.4	21.4		480.1	34.8		80.1	31.6	
LOS		F	F	A	F	C		F	C		F	C	
Approach Delay			132.1			43.6			272.2			45.9	
Approach LOS			F			D			F			D	
Queue Length 50th (ft)		66	~1694	0	~332	611		~340	118		14	7	
Queue Length 95th (ft)		#132	#1960	0	#521	702		#453	#336		38	43	
Internal Link Dist (ft)			2050			2519			969			2343	
Turn Bay Length (ft)		155			230			225			100		
Base Capacity (vph)		104	1085	973	213	2288		210	450		108	172	
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		0.61	1.22	0.05	1.22	0.75		1.95	0.80		0.12	0.18	

Intersection Summary

Area Type: Other

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 25 (16%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.95
Intersection Signal Delay: 115.4 Intersection LOS: F
Intersection Capacity Utilization 119.5% ICU Level of Service H
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.

Splits and Phases: 4: 43rd Avenue NE & 172nd Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	1215	312	152	1431	51	319	203	157	77	122	117
Future Volume (vph)	55	1215	312	152	1431	51	319	203	157	77	122	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	250		0	180		150	225		0
Storage Lanes	1		0	1		0	1		1	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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00		1.00				0.99	
Frt		0.969			0.995				0.850		0.927	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1778	0	1752	1834	0	1752	1845	1568	1752	1688	0
Flt Permitted	0.042			0.041			0.268			0.292		
Satd. Flow (perm)	77	1778	0	76	1834	0	492	1845	1568	539	1688	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			3				163		29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2599			2632			3339			896	
Travel Time (s)		59.1			59.8			75.9			20.4	
Confl. Peds. (#/hr)	1		2	2		1	2					2
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
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	57	1266	325	158	1491	53	332	211	164	80	127	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1591	0	158	1544	0	332	211	164	80	249	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	10.5	30.9		10.5	33.9		28.1	28.1	28.1	28.3	28.3	
Total Split (s)	15.0	100.0		15.0	100.0		20.0	20.0	20.0	20.0	20.0	
Total Split (%)	11.1%	74.1%		11.1%	74.1%		14.8%	14.8%	14.8%	14.8%	14.8%	
Maximum Green (s)	9.5	94.1		9.5	94.1		14.9	14.9	14.9	13.7	13.7	
Yellow Time (s)	3.5	3.9		3.5	3.9		3.1	3.1	3.1	4.3	4.3	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.9		5.5	5.9		5.1	5.1	5.1	6.3	6.3	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.5	4.0		2.5	4.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		18.0			21.0		16.0	16.0	16.0	15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	101.0	94.3		107.4	99.4		14.9	14.9	14.9	13.7	13.7	
Actuated g/C Ratio	0.75	0.70		0.80	0.74		0.11	0.11	0.11	0.10	0.10	
v/c Ratio	0.42	1.27		0.90	1.14		6.15	1.04	0.52	1.48	1.26	

Lanes, Volumes, Timings
5: 51st Avenue NE & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	21.9	152.3		80.3	94.3		2365.6	131.1	14.3	333.2	194.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	21.9	152.3		80.3	94.3		2365.6	131.1	14.3	333.2	194.9	
LOS	C	F		F	F		F	F	B	F	F	
Approach Delay		147.8			93.0			1153.3			228.5	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	8	~1765		87	~1606		~555	~199	1	~96	~251	
Queue Length 95th (ft)	43	#2034		#226	#1913		#748	#363	70	#205	#428	
Internal Link Dist (ft)		2519			2552			3259			816	
Turn Bay Length (ft)	250			250			180		150	225		
Base Capacity (vph)	177	1248		178	1350		54	203	318	54	197	
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	0.32	1.27		0.89	1.14		6.15	1.04	0.52	1.48	1.26	

Intersection Summary

Area Type: Other
Cycle Length: 135
Actuated Cycle Length: 135
Offset: 15 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 6.15
Intersection Signal Delay: 294.7 Intersection LOS: F
Intersection Capacity Utilization 142.0% ICU Level of Service H
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.

Splits and Phases: 5: 51st Avenue NE & 172nd Street NE

2036 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Lanes, Volumes, Timings
6: 59th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	1118	30	36	854	48	145	30	126	134	16	698
Future Volume (vph)	290	1118	30	36	854	48	145	30	126	134	16	698
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	150		0	250		0	400		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	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.992			0.879			0.853	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1820	0	1736	1812	0	1736	1606	0	1736	1558	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	1820	0	1736	1812	0	1736	1606	0	1736	1558	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			107			291	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2632			1402			1370			1561	
Travel Time (s)		59.8			31.9			31.1			35.5	
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 (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	315	1215	33	39	928	52	158	33	137	146	17	759
Shared Lane Traffic (%)												
Lane Group Flow (vph)	315	1248	0	39	980	0	158	170	0	146	776	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0		3.0	5.0		3.0	5.0	
Minimum Split (s)	9.5	34.9		9.5	37.9		9.5	32.9		9.5	32.9	
Total Split (s)	34.0	85.0		14.0	85.0		15.0	26.0		15.0	26.0	
Total Split (%)	21.3%	53.1%		8.8%	53.1%		9.4%	16.3%		9.4%	16.3%	
Maximum Green (s)	28.5	79.1		8.5	79.1		9.5	20.1		9.5	20.1	
Yellow Time (s)	3.5	3.9		3.5	3.9		3.5	3.9		3.5	3.9	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.9		5.5	5.9		5.5	5.9		5.5	5.9	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	C-Max		None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			25.0			20.0			20.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	28.5	102.1		7.7	79.1		9.5	20.1		9.5	20.1	
Actuated g/C Ratio	0.18	0.64		0.05	0.49		0.06	0.13		0.06	0.13	
v/c Ratio	1.02	1.07		0.47	1.09		1.53	0.58		1.42	1.72	
Control Delay	119.3	77.7		92.0	97.1		328.2	33.6		284.6	358.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Lanes, Volumes, Timings
6: 59th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	119.3	77.7		92.0	97.1		328.2	33.6		284.6	358.2	
LOS	F	E		F	F		F	C		F	F	
Approach Delay		86.0			96.9			175.5			346.5	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	~348	~1485		40	~1153		~231	61		~205	~920	
Queue Length 95th (ft)	#549	#1757		84	#1421		#387	146		#357	#1179	
Internal Link Dist (ft)		2552			1322			1290			1481	
Turn Bay Length (ft)	350			150			250			400		
Base Capacity (vph)	309	1162		92	896		103	295		103	450	
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	1.02	1.07		0.42	1.09		1.53	0.58		1.42	1.72	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 34 (21%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.72
Intersection Signal Delay: 159.3 Intersection LOS: F
Intersection Capacity Utilization 135.1% ICU Level of Service H
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.

Splits and Phases: 6: 59th Avenue NE & 172nd Street NE

2036 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Lanes, Volumes, Timings
8: 67th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	386	874	174	74	558	74	86	293	132	162	340	247
Future Volume (vph)	386	874	174	74	558	74	86	293	132	162	340	247
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		80	125		0	150		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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								0.99				
Frt			0.850		0.982			0.953			0.937	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1845	1568	1752	1811	0	1752	1745	0	1752	1728	0
Flt Permitted	0.230			0.082			0.125			0.121		
Satd. Flow (perm)	424	1845	1568	151	1811	0	231	1745	0	223	1728	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			88		6			13			20	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1109			3194			1426			2074	
Travel Time (s)		25.2			72.6			32.4			47.1	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	394	892	178	76	569	76	88	299	135	165	347	252
Shared Lane Traffic (%)												
Lane Group Flow (vph)	394	892	178	76	645	0	88	434	0	165	599	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8			4		
Detector Phase	5	2	2	1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	7.0		5.0	7.0	
Minimum Split (s)	10.0	31.9	31.9	10.0	34.9		10.0	33.9		10.0	35.9	
Total Split (s)	16.0	90.0	90.0	16.0	90.0		16.0	38.0		16.0	38.0	
Total Split (%)	10.0%	56.3%	56.3%	10.0%	56.3%		10.0%	23.8%		10.0%	23.8%	
Maximum Green (s)	11.0	84.1	84.1	11.0	84.1		11.0	32.1		11.0	32.1	
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9		3.0	3.9		3.0	3.9	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.9	5.9	5.0	5.9		5.0	5.9		5.0	5.9	
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)	3.0	4.0	4.0	3.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		19.0	19.0		22.0			21.0			23.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	98.7	86.8	86.8	93.3	84.1		43.0	32.1		45.0	33.1	
Actuated g/C Ratio	0.62	0.54	0.54	0.58	0.53		0.27	0.20		0.28	0.21	
v/c Ratio	1.12	0.89	0.20	0.44	0.68		0.56	1.21		0.99	1.61	

Lanes, Volumes, Timings
8: 67th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	105.1	45.2	10.0	20.1	32.1		54.8	166.4		111.2	323.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	105.1	45.2	10.0	20.1	32.1		54.8	166.4		111.2	323.0	
LOS	F	D	B	C	C		D	F		F	F	
Approach Delay		57.0			30.8			147.6			277.2	
Approach LOS		E			C			F			F	
Queue Length 50th (ft)	~240	804	44	29	481		68	~540		133	~894	
Queue Length 95th (ft)	#460	#1145	92	52	629		115	#767		#289	#1140	
Internal Link Dist (ft)		1029			3114			1346			1994	
Turn Bay Length (ft)	350		80	125			150			200		
Base Capacity (vph)	352	1000	890	200	954		168	360		167	373	
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	1.12	0.89	0.20	0.38	0.68		0.52	1.21		0.99	1.61	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 9.5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.61
Intersection Signal Delay: 113.7 Intersection LOS: F
Intersection Capacity Utilization 111.2% ICU Level of Service H
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.

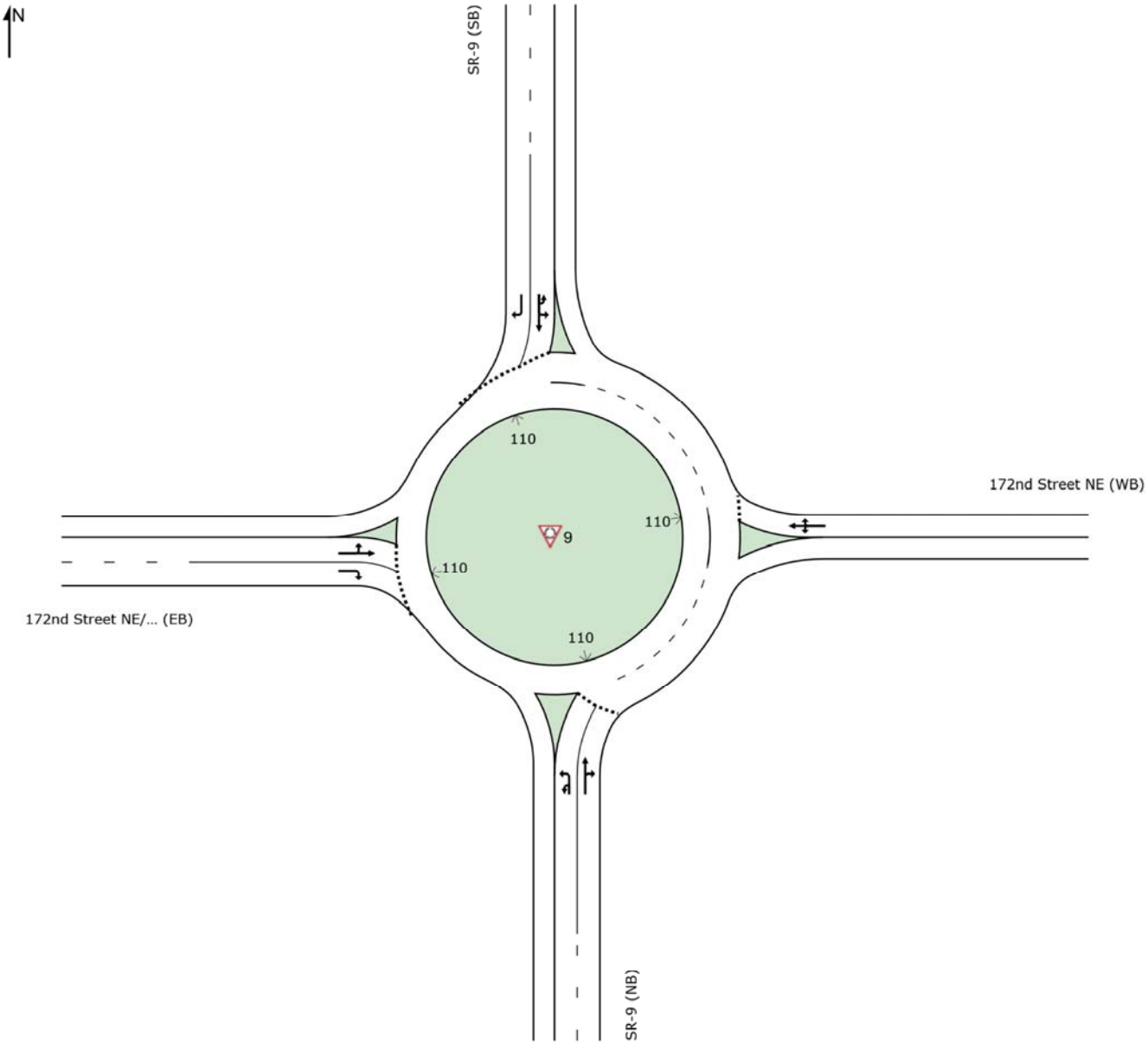
Splits and Phases: 8: 67th Avenue NE & 172nd Street NE

2036 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

SITE LAYOUT

Site: 9 [2036 Baseline Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout



Organisation: GIBSON TRAFFIC CONSULTANTS | Created: Thursday, July 29, 2021 4:14:08 PM
Project: H:\2020\20-106\Full Analysis\Full BSP\Comments\Arlington\Sidra\#9.sip8

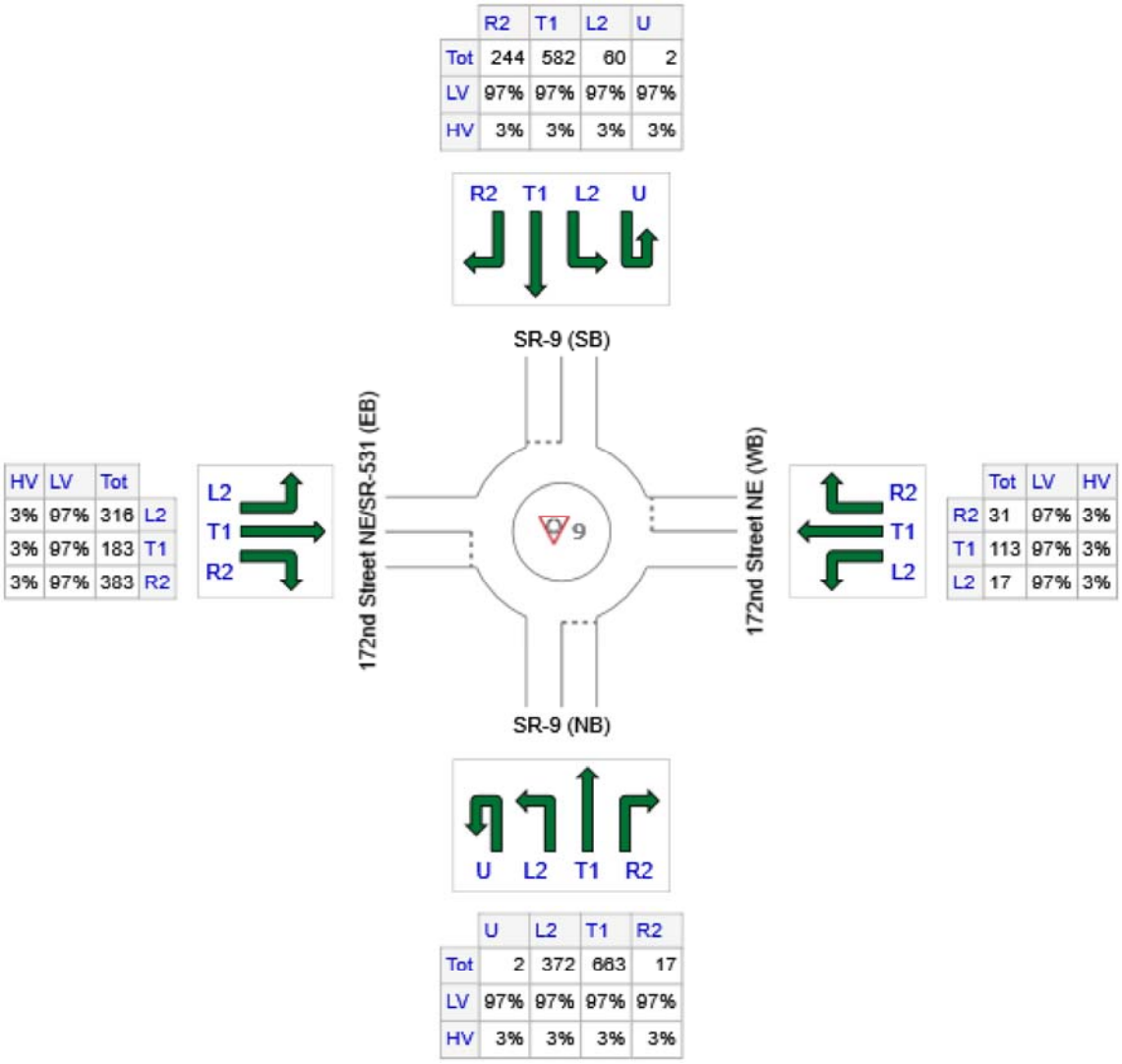
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 9 [2036 Baseline Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: SR-9 (NB)	1054	1022	32
E: 172nd Street NE (WB)	161	156	5
N: SR-9 (SB)	888	861	27
W: 172nd Street NE/SR-531 (EB)	882	856	26
Total	2985	2895	90

MOVEMENT SUMMARY

Site: 9 [2036 Baseline Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: SR-9 (NB)												
3u	U	2	3.0	0.494	17.1	LOS B	4.2	106.3	0.86	0.91	0.93	33.7
3	L2	396	3.0	0.494	14.6	LOS B	4.2	106.3	0.86	0.91	0.93	32.9
8	T1	705	3.0	0.672	9.6	LOS A	8.5	217.0	0.96	0.95	1.18	34.8
18	R2	18	3.0	0.672	9.7	LOS A	8.5	217.0	0.96	0.95	1.18	33.7
Approach		1121	3.0	0.672	11.4	LOS B	8.5	217.0	0.92	0.93	1.09	34.1
East: 172nd Street NE (WB)												
1	L2	18	3.0	0.375	16.9	LOS B	2.2	55.2	0.86	0.95	0.95	34.1
6	T1	120	3.0	0.375	11.1	LOS B	2.2	55.2	0.86	0.95	0.95	33.9
16	R2	33	3.0	0.375	10.9	LOS B	2.2	55.2	0.86	0.95	0.95	32.9
Approach		171	3.0	0.375	11.7	LOS B	2.2	55.2	0.86	0.95	0.95	33.7
North: SR-9 (SB)												
7u	U	2	3.0	0.661	17.0	LOS B	6.5	166.9	0.82	0.88	0.98	36.2
7	L2	64	3.0	0.661	14.5	LOS B	6.5	166.9	0.82	0.88	0.98	35.3
4	T1	619	3.0	0.661	8.3	LOS A	6.5	166.9	0.82	0.88	0.98	35.0
14	R2	260	3.0	0.341	7.1	LOS A	1.8	47.1	0.64	0.76	0.64	35.0
Approach		945	3.0	0.661	8.4	LOS A	6.5	166.9	0.77	0.84	0.89	35.1
West: 172nd Street NE/SR-531 (EB)												
5	L2	336	3.0	0.536	14.5	LOS B	5.4	137.7	0.93	0.88	1.03	33.8
2	T1	195	3.0	0.536	8.0	LOS A	5.4	137.7	0.93	0.88	1.03	33.7
12	R2	407	3.0	0.551	10.3	LOS B	5.1	129.4	0.92	0.98	1.08	33.4
Approach		938	3.0	0.551	11.3	LOS B	5.4	137.7	0.93	0.92	1.05	33.6
All Vehicles		3176	3.0	0.672	10.5	LOS B	8.5	217.0	0.87	0.90	1.01	34.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Intersection Delay, s/veh	17.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	68	41	314	8	12	10	119	169	12	212	2
Future Vol, veh/h	7	68	41	314	8	12	10	119	169	12	212	2
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	8	79	48	365	9	14	12	138	197	14	247	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.9	22.2	16.8	15.2
HCM LOS	B	C	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	6%	94%	5%
Vol Thru, %	40%	59%	2%	94%
Vol Right, %	57%	35%	4%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	298	116	334	226
LT Vol	10	7	314	12
Through Vol	119	68	8	212
RT Vol	169	41	12	2
Lane Flow Rate	347	135	388	263
Geometry Grp	1	1	1	1
Degree of Util (X)	0.575	0.249	0.685	0.471
Departure Headway (Hd)	5.969	6.636	6.354	6.456
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	603	538	567	557
Service Time	4.02	4.706	4.406	4.513
HCM Lane V/C Ratio	0.575	0.251	0.684	0.472
HCM Control Delay	16.8	11.9	22.2	15.2
HCM Lane LOS	C	B	C	C
HCM 95th-tile Q	3.6	1	5.3	2.5

Intersection												
Int Delay, s/veh	123.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	179	7	187	15	5	17	86	581	21	25	608	172
Future Vol, veh/h	179	7	187	15	5	17	86	581	21	25	608	172
Conflicting Peds, #/hr	0	0	3	3	0	0	1	0	4	4	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	45	-	-	35	-	-	105	-	-	110	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	199	8	208	17	6	19	96	646	23	28	676	191

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1691	1694	776	1793	1778	662	868	0	0	673	0	0
Stage 1	829	829	-	854	854	-	-	-	-	-	-	-
Stage 2	862	865	-	939	924	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 73	91	393	61	81	457	763	-	-	904	-	-
Stage 1	361	381	-	349	371	-	-	-	-	-	-	-
Stage 2	346	367	-	313	344	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 58	77	392	23	68	455	762	-	-	901	-	-
Mov Cap-2 Maneuver	~ 58	77	-	23	68	-	-	-	-	-	-	-
Stage 1	315	369	-	304	323	-	-	-	-	-	-	-
Stage 2	285	320	-	139	333	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 612.5	150.6	1.3	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	762	-	-	58	342	23	198	901	-	-
HCM Lane V/C Ratio	0.125	-	-	3.429	0.63	0.725	0.123	0.031	-	-
HCM Control Delay (s)	10.4	-	-	$ 1241.7	31.9	$ 333.8	25.7	9.1	-	-
HCM Lane LOS	B	-	-	F	D	F	D	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	21.1	4.1	2.1	0.4	0.1	-	-

Notes

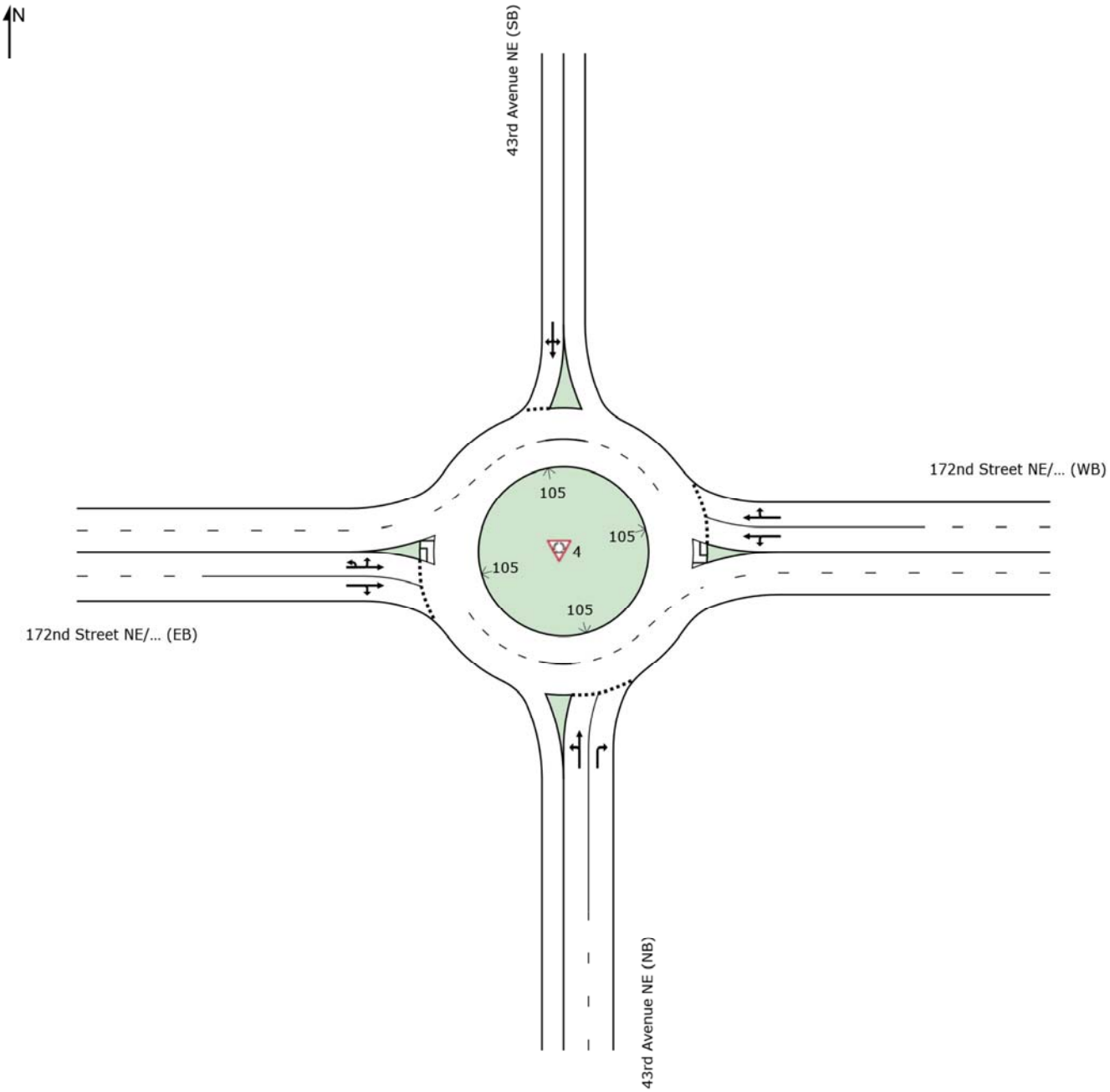
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

2036 Baseline Level of Service Calculations with Improvements

SITE LAYOUT

Site: 4 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout



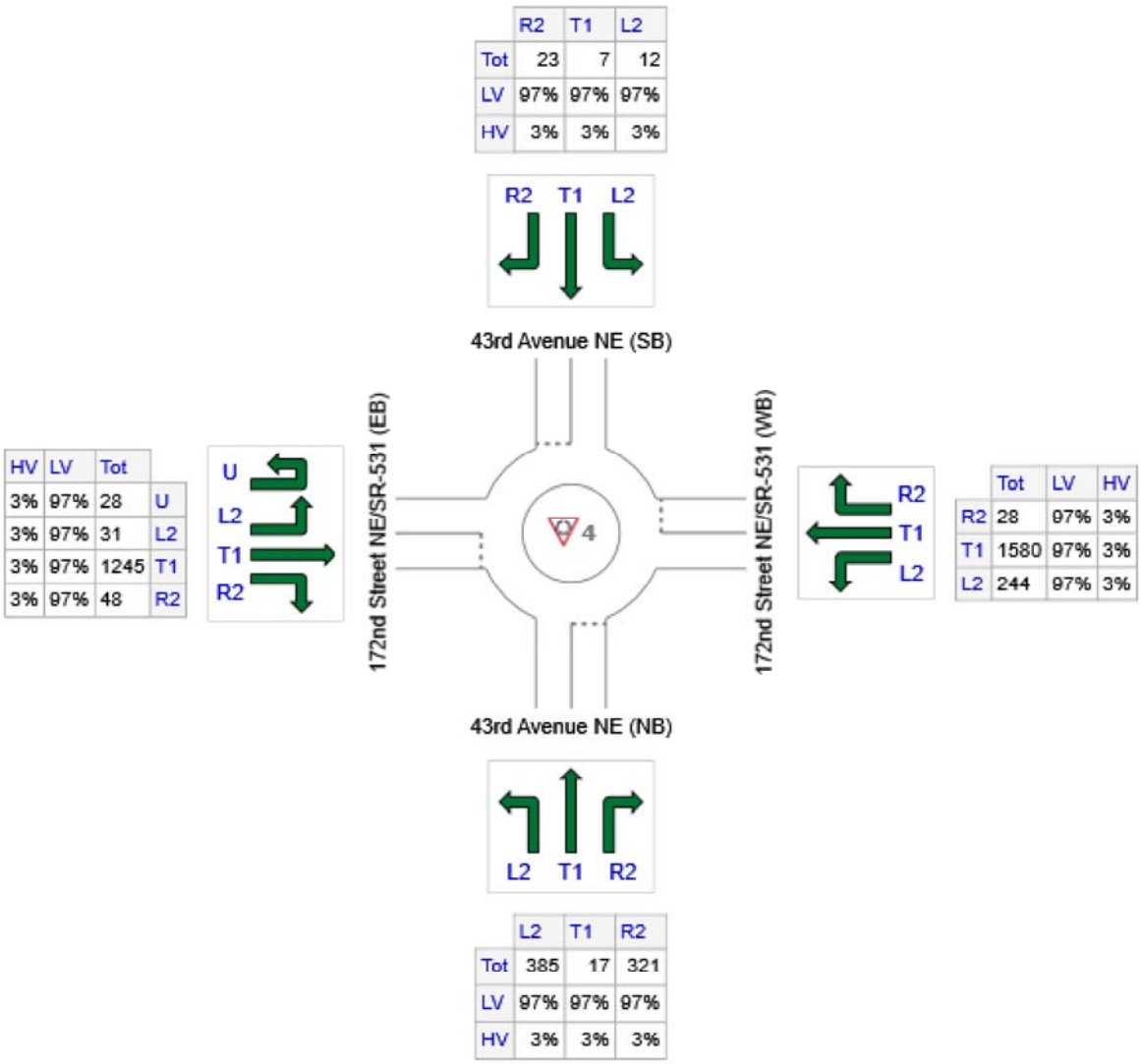
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 4 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 43rd Avenue NE (NB)	723	701	22
E: 172nd Street NE/SR-531 (WB)	1852	1796	56
N: 43rd Avenue NE (SB)	42	41	1
W: 172nd Street NE/SR-531 (EB)	1352	1311	41
Total	3969	3850	119

MOVEMENT SUMMARY

Site: 4 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout

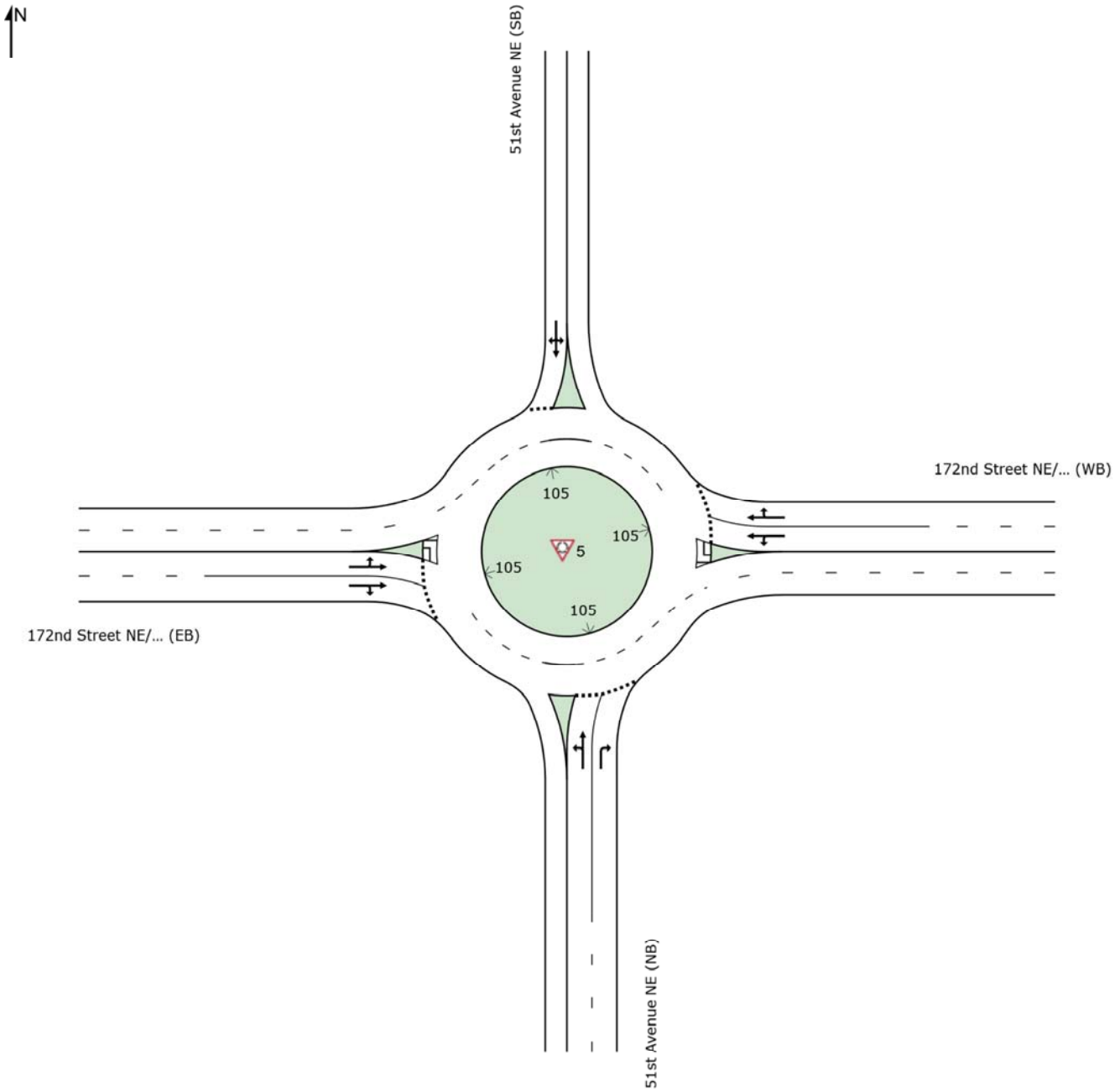
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 43rd Avenue NE (NB)												
3	L2	410	3.0	0.550	14.1	LOS B	3.5	89.9	0.83	1.00	1.00	33.1
8	T1	18	3.0	0.550	8.0	LOS A	3.5	89.9	0.83	1.00	1.00	33.0
18	R2	341	3.0	0.590	10.1	LOS B	3.5	88.6	0.83	0.98	1.05	33.5
Approach		769	3.0	0.590	12.2	LOS B	3.5	89.9	0.83	0.99	1.03	33.3
East: 172nd Street NE/SR-531 (WB)												
1	L2	260	3.0	0.944	29.5	LOS D	23.1	590.3	1.00	1.39	2.05	28.3
6	T1	1681	3.0	0.944	21.5	LOS D	25.4	649.3	1.00	1.34	1.98	29.3
16	R2	30	3.0	0.944	20.6	LOS D	25.4	649.3	1.00	1.31	1.94	29.1
Approach		1970	3.0	0.944	22.5	LOS C	25.4	649.3	1.00	1.35	1.99	29.2
North: 43rd Avenue NE (SB)												
7	L2	13	3.0	0.191	22.6	LOS C	1.0	26.5	0.93	0.96	0.93	30.9
4	T1	7	3.0	0.191	16.5	LOS B	1.0	26.5	0.93	0.96	0.93	30.8
14	R2	24	3.0	0.191	16.5	LOS B	1.0	26.5	0.93	0.96	0.93	30.1
Approach		45	3.0	0.191	18.3	LOS B	1.0	26.5	0.93	0.96	0.93	30.4
West: 172nd Street NE/SR-531 (EB)												
5u	U	30	3.0	0.587	14.4	LOS B	5.2	132.0	0.70	0.59	0.71	36.5
5	L2	33	3.0	0.587	11.8	LOS B	5.2	132.0	0.70	0.59	0.71	35.5
2	T1	1324	3.0	0.587	5.5	LOS A	5.3	136.4	0.69	0.55	0.69	35.6
12	R2	51	3.0	0.587	5.5	LOS A	5.3	136.4	0.68	0.52	0.68	34.5
Approach		1439	3.0	0.587	5.8	LOS A	5.3	136.4	0.69	0.55	0.69	35.6
All Vehicles		4223	3.0	0.944	14.9	LOS B	25.4	649.3	0.86	1.01	1.36	31.9

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 5 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout



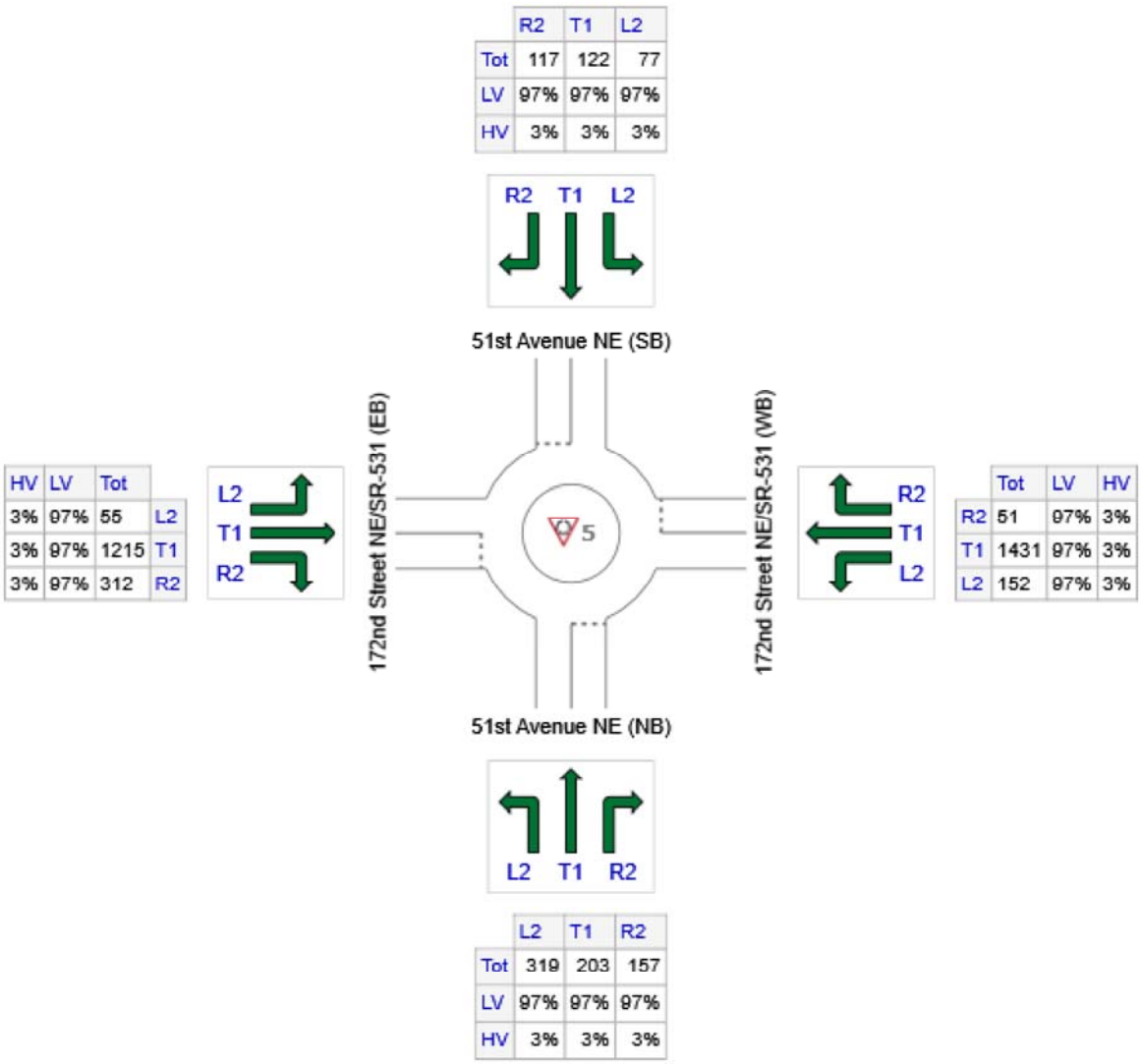
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 5 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 51st Avenue NE (NB)	679	659	20
E: 172nd Street NE/SR-531 (WB)	1634	1585	49
N: 51st Avenue NE (SB)	316	307	9
W: 172nd Street NE/SR-531 (EB)	1582	1535	47
Total	4211	4085	126

MOVEMENT SUMMARY

Site: 5 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout

Movement Performance - Vehicles

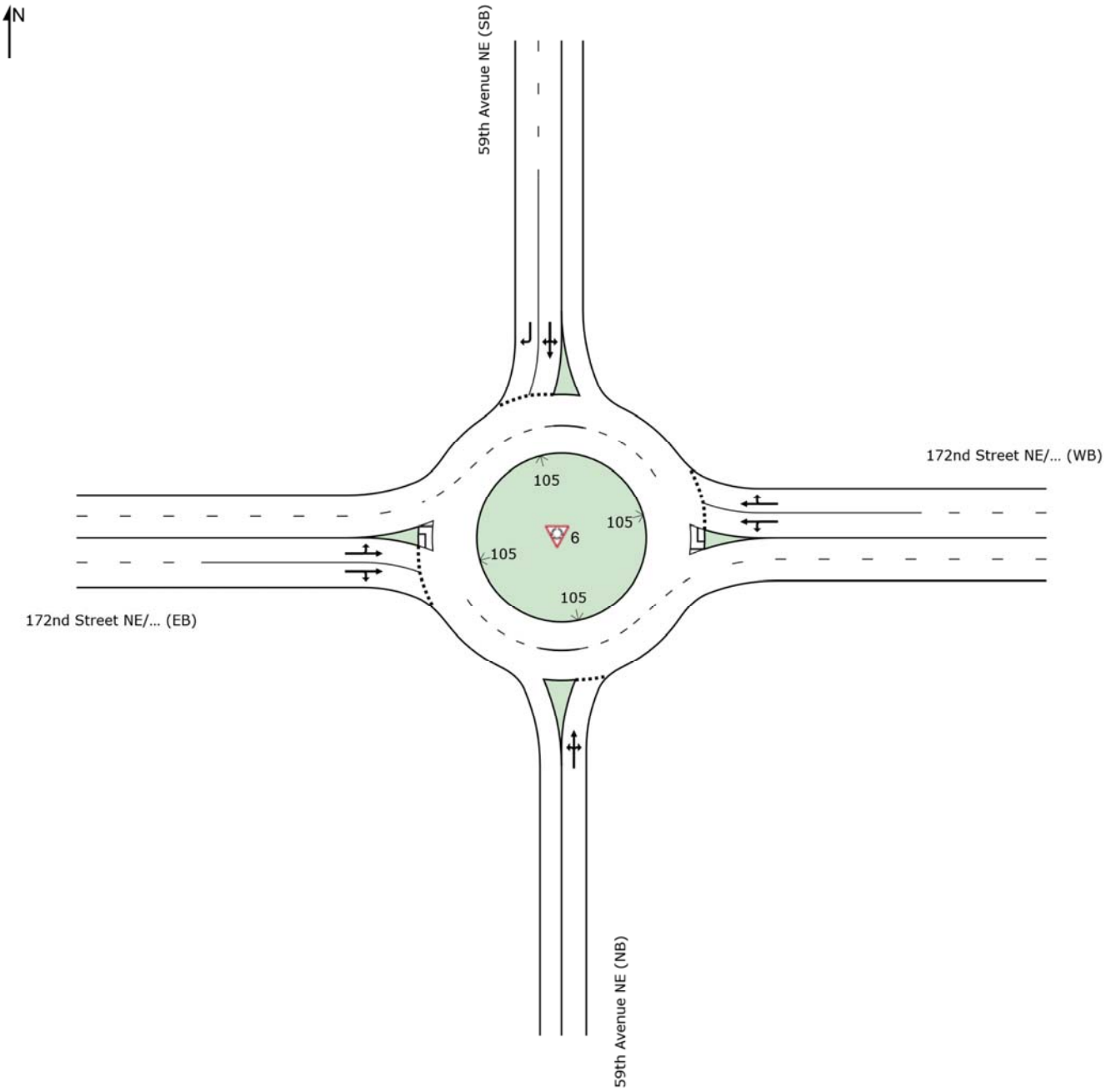
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 51st Avenue NE (NB)												
3	L2	332	3.0	0.764	18.1	LOS B	6.6	169.6	0.94	1.13	1.39	32.2
8	T1	211	3.0	0.764	12.0	LOS B	6.6	169.6	0.94	1.13	1.39	32.1
18	R2	164	3.0	0.328	8.6	LOS A	1.6	40.4	0.78	0.89	0.82	34.3
Approach		707	3.0	0.764	14.1	LOS B	6.6	169.6	0.90	1.07	1.26	32.6
East: 172nd Street NE/SR-531 (WB)												
1	L2	158	3.0	0.935	32.2	LOS D	20.8	531.2	1.00	1.45	2.14	27.6
6	T1	1491	3.0	0.935	24.2	LOS D	23.7	606.7	1.00	1.41	2.09	28.4
16	R2	53	3.0	0.935	23.1	LOS D	23.7	606.7	1.00	1.38	2.06	28.2
Approach		1702	3.0	0.935	24.9	LOS C	23.7	606.7	1.00	1.41	2.10	28.3
North: 51st Avenue NE (SB)												
7	L2	80	3.0	1.023	69.4	LOS F	14.7	375.4	1.00	1.63	3.07	18.9
4	T1	127	3.0	1.023	63.3	LOS F	14.7	375.4	1.00	1.63	3.07	18.9
14	R2	122	3.0	1.023	63.3	LOS F	14.7	375.4	1.00	1.63	3.07	18.6
Approach		329	3.0	1.023	64.8	LOS E	14.7	375.4	1.00	1.63	3.07	18.8
West: 172nd Street NE/SR-531 (EB)												
5	L2	57	3.0	0.697	14.2	LOS B	7.7	196.9	0.80	0.82	0.94	35.1
2	T1	1266	3.0	0.697	7.7	LOS A	7.9	201.3	0.79	0.79	0.91	35.3
12	R2	325	3.0	0.697	7.4	LOS A	7.9	201.3	0.78	0.75	0.87	34.3
Approach		1648	3.0	0.697	7.9	LOS A	7.9	201.3	0.79	0.78	0.91	35.1
All Vehicles		4386	3.0	1.023	19.7	LOS B	23.7	606.7	0.90	1.14	1.59	30.0

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 6 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout



Organisation: GIBSON TRAFFIC CONSULTANTS | Created: Thursday, July 29, 2021 4:38:24 PM
Project: H:\2020\20-106\Full Analysis\Full BSP\Comments\Arlington\Sidra\#6.sip8

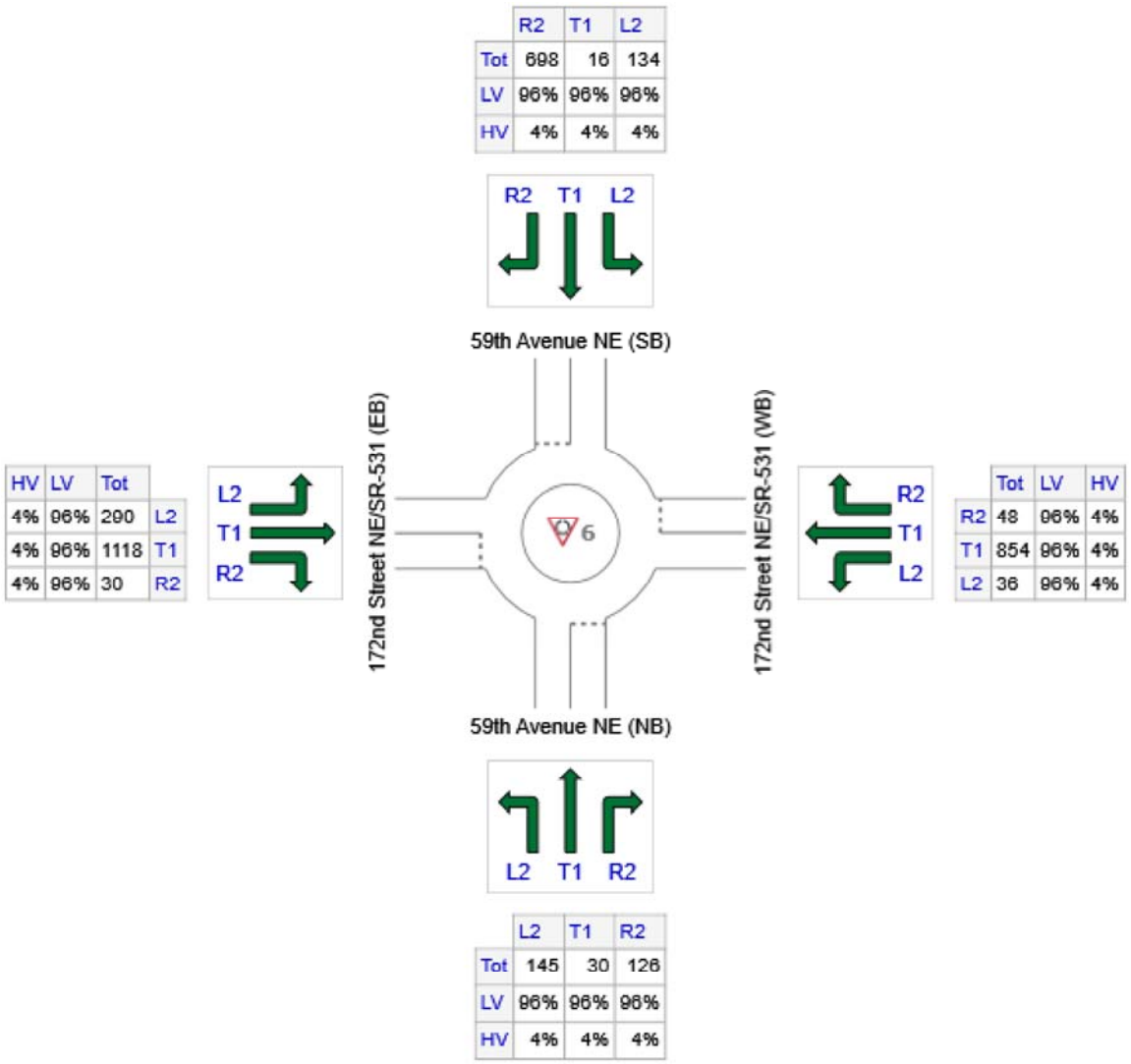
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 6 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 59th Avenue NE (NB)	301	289	12
E: 172nd Street NE/SR-531 (WB)	938	900	38
N: 59th Avenue NE (SB)	848	814	34
W: 172nd Street NE/SR-531 (EB)	1438	1380	58
Total	3525	3384	141

MOVEMENT SUMMARY

Site: 6 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout

Movement Performance - Vehicles

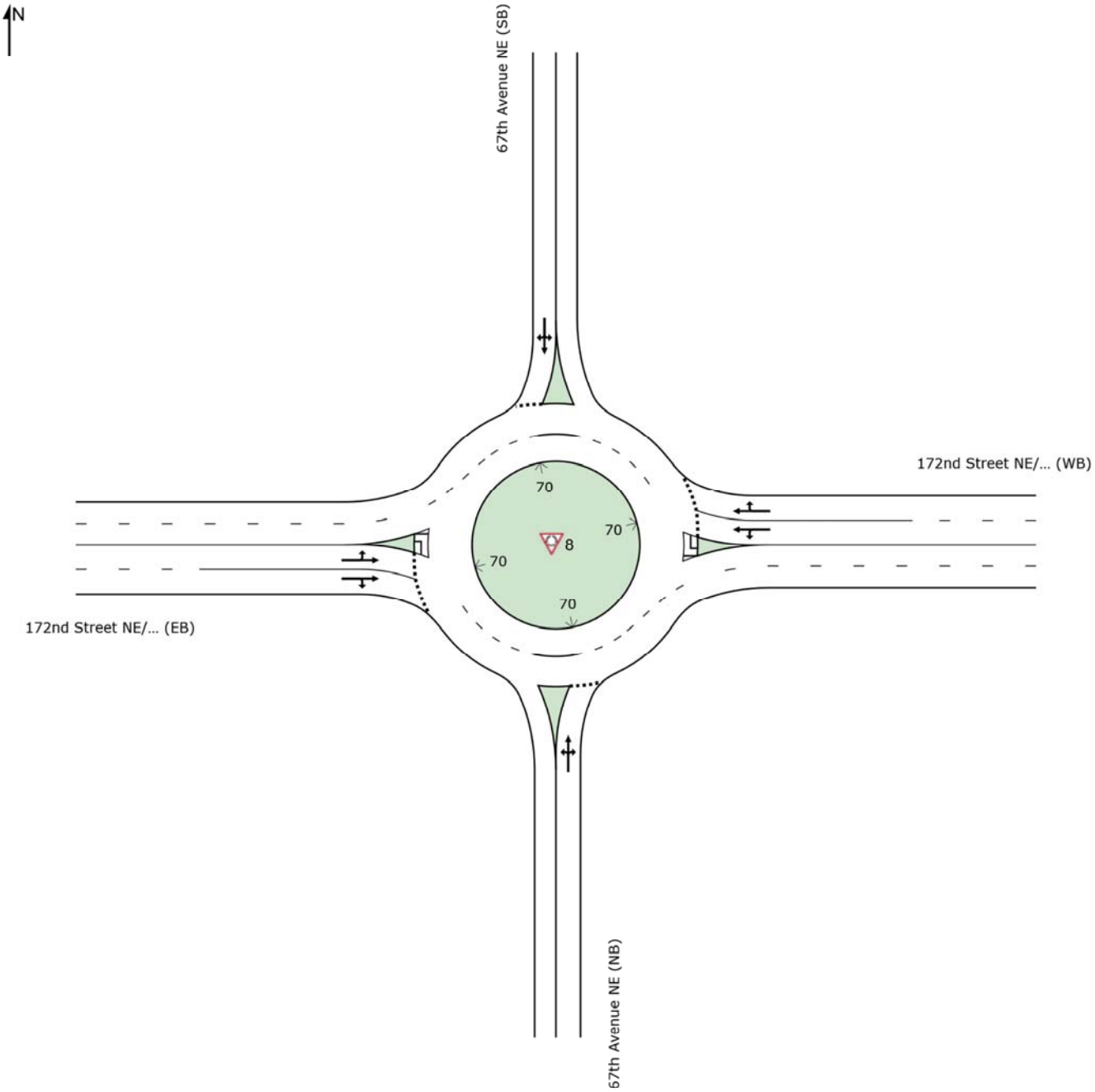
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 59th Avenue NE (NB)												
3	L2	158	4.0	0.608	17.8	LOS B	3.6	92.9	0.84	1.03	1.15	32.6
8	T1	33	4.0	0.608	11.7	LOS B	3.6	92.9	0.84	1.03	1.15	32.5
18	R2	137	4.0	0.608	11.8	LOS B	3.6	92.9	0.84	1.03	1.15	31.6
Approach		327	4.0	0.608	14.7	LOS B	3.6	92.9	0.84	1.03	1.15	32.1
East: 172nd Street NE/SR-531 (WB)												
1	L2	39	4.0	0.485	13.4	LOS B	3.5	90.1	0.72	0.75	0.77	35.4
6	T1	928	4.0	0.485	6.9	LOS A	3.6	92.4	0.71	0.69	0.74	35.5
16	R2	52	4.0	0.485	6.7	LOS A	3.6	92.4	0.71	0.64	0.71	34.4
Approach		1020	4.0	0.485	7.1	LOS A	3.6	92.4	0.71	0.69	0.74	35.5
North: 59th Avenue NE (SB)												
7	L2	146	4.0	0.638	16.3	LOS B	4.1	106.8	0.83	1.01	1.10	33.5
4	T1	17	4.0	0.638	10.2	LOS B	4.1	106.8	0.83	1.01	1.10	33.4
14	R2	759	4.0	0.638	9.5	LOS A	4.5	117.3	0.83	1.00	1.09	33.5
Approach		922	4.0	0.638	10.6	LOS B	4.5	117.3	0.83	1.00	1.09	33.5
West: 172nd Street NE/SR-531 (EB)												
5	L2	315	4.0	0.605	11.3	LOS B	5.2	134.6	0.61	0.61	0.61	35.1
2	T1	1215	4.0	0.605	5.1	LOS A	5.4	139.7	0.59	0.53	0.59	35.7
12	R2	33	4.0	0.605	5.2	LOS A	5.4	139.7	0.58	0.49	0.58	34.8
Approach		1563	4.0	0.605	6.4	LOS A	5.4	139.7	0.60	0.54	0.60	35.6
All Vehicles		3832	4.0	0.638	8.3	LOS A	5.4	139.7	0.71	0.73	0.80	34.7

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 8 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout



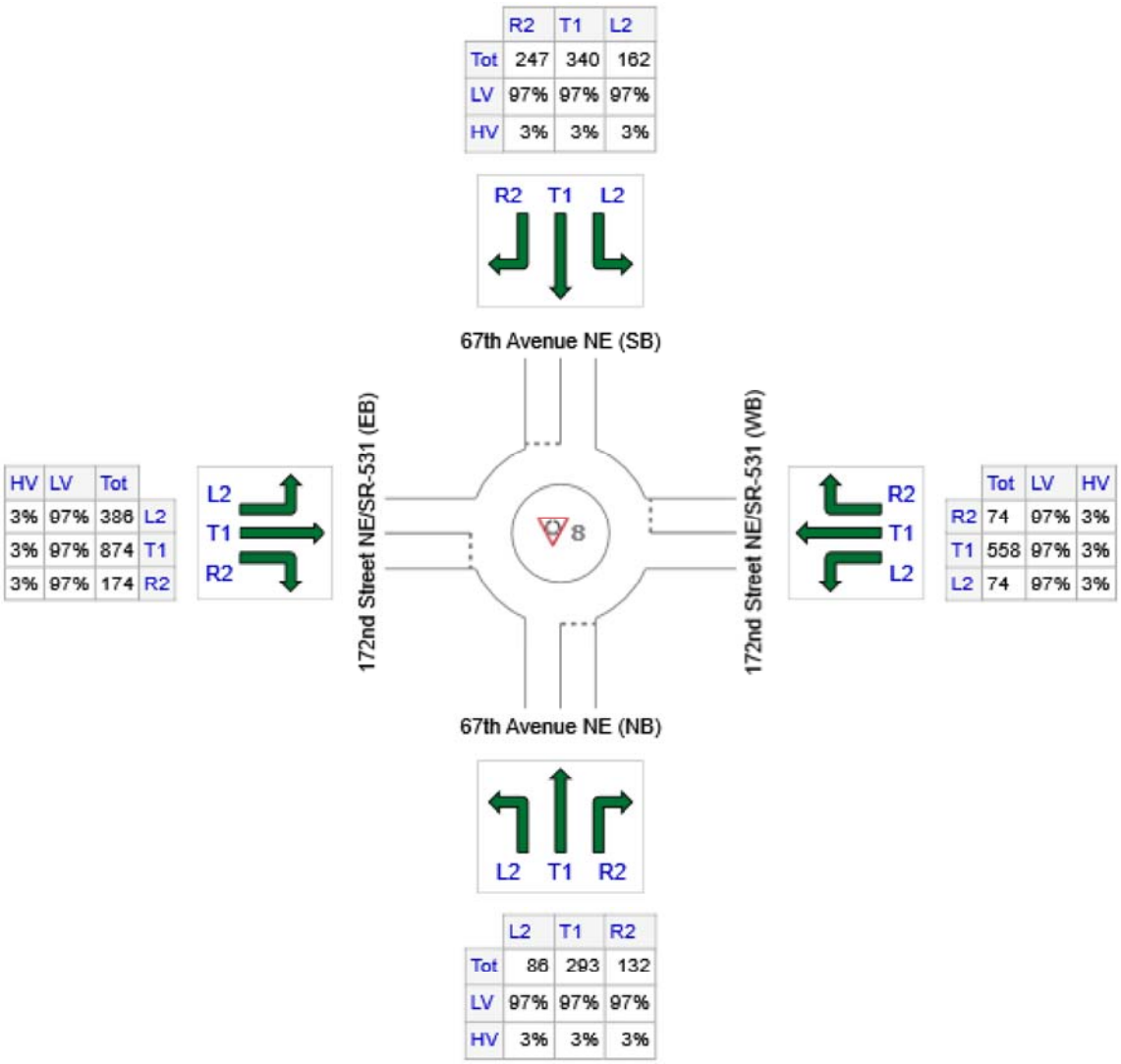
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 8 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 67th Avenue NE (NB)	511	496	15
E: 172nd Street NE/SR-531 (WB)	706	685	21
N: 67th Avenue NE (SB)	749	727	22
W: 172nd Street NE/SR-531 (EB)	1434	1391	43
Total	3400	3298	102

MOVEMENT SUMMARY

Site: 8 [2036 Baseline Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 67th Avenue NE (NB)												
3	L2	88	3.0	1.183	107.3	LOS F	35.1	898.0	1.00	2.45	5.67	14.1
8	T1	299	3.0	1.183	102.4	LOS F	35.1	898.0	1.00	2.45	5.67	14.1
18	R2	135	3.0	1.183	102.3	LOS F	35.1	898.0	1.00	2.45	5.67	13.9
Approach		521	3.0	1.183	103.2	LOS F	35.1	898.0	1.00	2.45	5.67	14.0
East: 172nd Street NE/SR-531 (WB)												
1	L2	76	3.0	0.466	15.3	LOS B	3.5	89.1	0.84	0.93	0.94	33.2
6	T1	569	3.0	0.466	9.8	LOS A	3.7	95.4	0.85	0.90	0.93	33.9
16	R2	76	3.0	0.466	9.4	LOS A	3.7	95.4	0.85	0.87	0.91	33.3
Approach		720	3.0	0.466	10.4	LOS B	3.7	95.4	0.85	0.90	0.93	33.7
North: 67th Avenue NE (SB)												
7	L2	165	3.0	1.055	52.0	LOS F	29.0	741.2	1.00	1.99	3.81	21.5
4	T1	347	3.0	1.055	47.1	LOS F	29.0	741.2	1.00	1.99	3.81	21.6
14	R2	252	3.0	1.055	46.9	LOS F	29.0	741.2	1.00	1.99	3.81	21.3
Approach		764	3.0	1.055	48.1	LOS D	29.0	741.2	1.00	1.99	3.81	21.5
West: 172nd Street NE/SR-531 (EB)												
5	L2	394	3.0	0.847	22.7	LOS C	13.4	343.8	1.00	1.22	1.62	29.3
2	T1	892	3.0	0.847	16.6	LOS B	14.6	373.7	1.00	1.19	1.59	30.7
12	R2	178	3.0	0.847	16.1	LOS B	14.6	373.7	1.00	1.17	1.57	30.4
Approach		1463	3.0	0.847	18.2	LOS B	14.6	373.7	1.00	1.19	1.60	30.2
All Vehicles		3469	3.0	1.183	35.9	LOS D	35.1	898.0	0.97	1.50	2.56	24.4

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lanes, Volumes, Timings
12: 67th Avenue NE & 188th Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	7	187	15	5	17	86	581	21	25	608	172
Future Volume (vph)	179	7	187	15	5	17	86	581	21	25	608	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	45		0	35		0	105		0	110		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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97		0.99	0.98			1.00			0.99	
Frt		0.856			0.886			0.995			0.967	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1505	0	1719	1573	0	1719	1798	0	1719	1741	0
Flt Permitted	0.449			0.909			0.129			0.293		
Satd. Flow (perm)	812	1505	0	1634	1573	0	233	1798	0	530	1741	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		208			19			2			19	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1804			590			5317			5234	
Travel Time (s)		41.0			13.4			120.8			119.0	
Confl. Peds. (#/hr)			3	3			1		4	4		1
Confl. Bikes (#/hr)						2			6			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	199	8	208	17	6	19	96	646	23	28	676	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	199	216	0	17	25	0	96	669	0	28	867	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)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	15.0	28.0		10.0	23.0		11.0	72.0		10.0	71.0	
Total Split (%)	12.5%	23.3%		8.3%	19.2%		9.2%	60.0%		8.3%	59.2%	
Maximum Green (s)	10.5	23.5		5.5	18.5		6.5	67.5		5.5	66.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
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)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.2	14.0		9.7	7.0		57.1	53.9		54.8	50.7	
Actuated g/C Ratio	0.20	0.16		0.11	0.08		0.66	0.63		0.64	0.59	

Lanes, Volumes, Timings
12: 67th Avenue NE & 188th Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.71	0.52		0.09	0.17		0.35	0.59		0.07	0.84	
Control Delay	50.5	12.3		34.9	27.2		8.4	13.7		5.3	24.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	50.5	12.3		34.9	27.2		8.4	13.7		5.3	24.3	
LOS	D	B		C	C		A	B		A	C	
Approach Delay		30.6			30.3			13.0			23.7	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)	107	4		8	3		17	250		5	408	
Queue Length 95th (ft)	#229	78		29	31		36	394		14	663	
Internal Link Dist (ft)		1724			510			5237			5154	
Turn Bay Length (ft)	45			35			105			110		
Base Capacity (vph)	288	600		191	389		279	1413		421	1357	
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	0.69	0.36		0.09	0.06		0.34	0.47		0.07	0.64	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 86
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 21.3 Intersection LOS: C
Intersection Capacity Utilization 75.1% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: 67th Avenue NE & 188th Street NE

2036 Baseline Conditions with Improvements
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

2036 Horizon Year Level of Service Calculations

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1588	717	0	2348	843	0	0	0	506	2	473
Future Volume (vph)	0	1588	717	0	2348	843	0	0	0	506	2	473
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			0.98			0.96						0.99
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	1552	0	3539	1523	0	0	0	1681	1686	1562
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			747			748						26
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)	8		4	4		8	1					1
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
Adj. Flow (vph)	0	1654	747	0	2446	878	0	0	0	527	2	493
Shared Lane Traffic (%)										50%		
Lane Group Flow (vph)	0	1654	747	0	2446	878	0	0	0	263	266	493
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)		94.2	94.2		93.9	93.9				28.0	28.0	28.0
Actuated g/C Ratio		0.70	0.70		0.70	0.70				0.21	0.21	0.21
v/c Ratio		0.66	0.57		0.99	0.68				0.75	0.76	1.42
Control Delay		12.6	2.3		34.5	4.3				64.0	64.4	242.2

Lanes, Volumes, Timings
1: I-5 Southbound Ramps & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		2.7	0.7		24.7	0.2				0.0	0.0	0.0
Total Delay		15.3	2.9		59.2	4.5				64.0	64.4	242.2
LOS		B	A		E	A				E	E	F
Approach Delay		11.5			44.8						150.1	
Approach LOS		B			D						F	
Queue Length 50th (ft)		381	0		982	34				227	230	~561
Queue Length 95th (ft)		450	35		#1271	99				#351	#357	#782
Internal Link Dist (ft)		529			860			899			1046	
Turn Bay Length (ft)			200							350		435
Base Capacity (vph)		2491	1313		2483	1291				351	352	347
Starvation Cap Reductn		691	252		181	58				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		0.92	0.70		1.06	0.71				0.75	0.76	1.42

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 133.8
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.42
Intersection Signal Delay: 48.9 Intersection LOS: D
Intersection Capacity Utilization 104.2% ICU Level of Service G
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.

Splits and Phases: 1: I-5 Southbound Ramps & 172nd Street NE

2036 Horizon Year Conditions
PM Peak-Hour
Gibson Traffic Consultants, Inc. [BJL #20-106]

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

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	533	1633	0	0	2376	1064	1066	0	1544	0	0	0
Future Volume (vph)	533	1633	0	0	2376	1064	1066	0	1544	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					0.98			0.99			
Frt						0.850			0.850			
Flt Protected	0.950						0.950	0.950				
Satd. Flow (prot)	1736	3471	0	0	4988	1553	1649	1649	1553	0	0	0
Flt Permitted	0.950						0.950	0.950				
Satd. Flow (perm)	1735	3471	0	0	4988	1523	1649	1649	1532	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						523			288			
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)	3		9	9		3			5	5		
Confl. Bikes (#/hr)			1									
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
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	555	1701	0	0	2475	1108	1110	0	1608	0	0	0
Shared Lane Traffic (%)							50%					
Lane Group Flow (vph)	555	1701	0	0	2475	1108	555	555	1608	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			

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

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.72	0.76			1.20	1.18	1.26	1.26	1.05			
Control Delay	368.6	19.4			129.0	113.0	173.6	173.6	41.6			
Queue Delay	0.0	0.5			0.0	0.0	0.0	0.0	0.0			
Total Delay	368.6	19.9			129.0	113.0	173.6	173.6	41.6			
LOS	F	B			F	F	F	F	D			
Approach Delay		105.7			124.1			95.5				
Approach LOS		F			F			F				
Queue Length 50th (ft)	~693	498			~930	~853	~620	~620	~134			
Queue Length 95th (ft)	#916	593			#1020	#1118	#855	#855	#400			
Internal Link Dist (ft)		860			1006			1014			919	
Turn Bay Length (ft)	600					300	400					
Base Capacity (vph)	323	2226			2066	937	441	441	1532			
Starvation Cap Reductn	0	171			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	1.72	0.83			1.20	1.18	1.26	1.26	1.05			

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 130.8
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.72
Intersection Signal Delay: 110.1 Intersection LOS: F
Intersection Capacity Utilization 139.6% ICU Level of Service H
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.

Splits and Phases: 2: I-5 Northbound Ramps & 172nd Street NE

2036 Horizon Year Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	93	608	1263	499	278	1504	200	954	683	362	253	369	506
Future Volume (vph)	93	608	1263	499	278	1504	200	954	683	362	253	369	506
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		900		0	400		260	200		200	200		170
Storage Lanes		1		1	1		1	2		1	1		1
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor		1.00		0.98	1.00		0.98	0.99		0.97	0.99		0.98
Frt				0.850			0.850			0.850			0.850
Flt Protected		0.950			0.950			0.950			0.950		
Satd. Flow (prot)	0	1755	3505	1568	1752	5036	1568	3400	3505	1568	1752	3505	1568
Flt Permitted		0.950			0.950			0.950			0.950		
Satd. Flow (perm)	0	1754	3505	1533	1749	5036	1541	3375	3505	1526	1743	3505	1530
Right Turn on Red				Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				251			125			224			120
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			1086			469			515			2837	
Travel Time (s)			24.7			10.7			11.7			64.5	
Confl. Peds. (#/hr)		4		7	7		4	9		11	11		9
Peak Hour Factor	0.92	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	101	633	1316	520	290	1567	208	994	711	377	264	384	527
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	734	1316	520	290	1567	208	994	711	377	264	384	527
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	5	2		1	6		3	8		7	4	
Permitted Phases				2			6			8			4
Detector Phase	5	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase													
Minimum Initial (s)	5.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	10.5	10.5	42.5	42.5	10.5	46.5	46.5	10.5	45.9	45.9	10.5	44.9	44.9
Total Split (s)	35.0	35.0	70.0	70.0	35.0	70.0	70.0	45.0	32.0	32.0	35.0	32.0	32.0
Total Split (%)	19.2%	19.2%	38.5%	38.5%	19.2%	38.5%	38.5%	24.7%	17.6%	17.6%	19.2%	17.6%	17.6%

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Maximum Green (s)	29.5	29.5	63.5	63.5	29.5	63.5	63.5	39.5	26.1	26.1	29.5	26.1	26.1
Yellow Time (s)	3.5	3.5	4.5	4.5	3.5	4.5	4.5	3.5	3.9	3.9	3.5	3.9	3.9
All-Red Time (s)	2.0	2.0	2.0	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	0.0	0.0
Total Lost Time (s)		5.5	6.5	6.5	5.5	6.5	6.5	5.5	5.9	5.9	5.5	5.9	5.9
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0	2.5	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	None	Max	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)			29.0	29.0		33.0	33.0		33.0	33.0		32.0	32.0
Pedestrian Calls (#/hr)			0	0		0	0		0	0		0	0
Act Effct Green (s)		29.5	63.5	63.5	29.5	63.5	63.5	39.5	49.4	49.4	29.1	39.0	39.0
Actuated g/C Ratio		0.15	0.33	0.33	0.15	0.33	0.33	0.20	0.25	0.25	0.15	0.20	0.20
v/c Ratio		2.77	1.15	0.78	1.09	0.96	0.35	1.44	0.80	0.68	1.01	0.55	1.31
Control Delay		831.5	135.5	38.7	154.8	77.7	21.0	257.5	76.2	32.6	136.9	73.4	199.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		831.5	135.5	38.7	154.8	77.7	21.0	257.5	76.2	32.6	136.9	73.4	199.4
LOS		F	F	D	F	E	C	F	E	C	F	E	F
Approach Delay			314.7			82.8			154.8			144.2	
Approach LOS			F			F			F			F	
Queue Length 50th (ft)		~1594	~1040	338	~417	725	78	~887	456	185	344	236	~738
Queue Length 95th (ft)		#1857	#1177	509	#627	#817	157	#1025	538	320	#553	298	#987
Internal Link Dist (ft)			1006			389			435			2757	
Turn Bay Length (ft)		900			400		260	200		200	200		170
Base Capacity (vph)		265	1141	668	265	1640	586	689	887	553	265	701	402
Starvation Cap Reductn		0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn		0	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	0
Reduced v/c Ratio		2.77	1.15	0.78	1.09	0.96	0.35	1.44	0.80	0.68	1.00	0.55	1.31

Intersection Summary

Area Type: Other
Cycle Length: 182

Actuated Cycle Length: 194.9
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 2.77
Intersection Signal Delay: 186.5
Intersection LOS: F
Intersection Capacity Utilization 147.6%
ICU Level of Service H
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.

Splits and Phases: 3: Smokey Point Boulevard & 172nd Street NE

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	28	31	1249	48	246	1589	28	385	17	322	12	7	23
Future Volume (vph)	28	31	1249	48	246	1589	28	385	17	322	12	7	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		155		0	230		60	225		0	100		0
Storage Lanes		1		1	1		1	2		0	1		0
Taper Length (ft)		25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00				1.00		1.00				0.99	
Frt				0.850		0.997			0.857			0.884	
Flt Protected		0.950			0.950			0.950			0.950		
Satd. Flow (prot)	0	1761	1845	1568	1752	3493	0	3400	1581	0	1752	1614	0
Flt Permitted		0.950			0.950			0.950			0.950		
Satd. Flow (perm)	0	1759	1845	1568	1752	3493	0	3392	1581	0	1752	1614	0
Right Turn on Red				Yes			Yes			Yes			Yes
Satd. Flow (RTOR)				124		2			241			24	
Link Speed (mph)			30			30			30			30	
Link Distance (ft)			2130			2599			1049			2423	
Travel Time (s)			48.4			59.1			23.8			55.1	
Confl. Peds. (#/hr)		3					3	1					1
Confl. Bikes (#/hr)							1						
Peak Hour Factor	0.92	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	30	33	1329	51	262	1690	30	410	18	343	13	7	24
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	63	1329	51	262	1720	0	410	361	0	13	31	0
Turn Type	Prot	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	5	2		1	6		3	8		7	4	
Permitted Phases				2									
Detector Phase	5	5	2	2	1	6		3	8		7	4	
Switch Phase													
Minimum Initial (s)	3.0	3.0	10.0	10.0	3.0	10.0		3.0	3.0		3.0	3.0	
Minimum Split (s)	9.5	9.5	32.9	32.9	9.5	30.9		9.5	32.1		9.5	37.1	
Total Split (s)	15.0	15.0	100.0	100.0	25.0	100.0		15.0	20.0		15.0	20.0	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	9.4%	9.4%	62.5%	62.5%	15.6%	62.5%		9.4%	12.5%		9.4%	12.5%	
Maximum Green (s)	9.5	9.5	94.1	94.1	19.5	94.1		9.9	14.9		9.9	14.9	
Yellow Time (s)	3.5	3.5	3.9	3.9	3.5	3.9		3.1	3.1		3.1	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	
Total Lost Time (s)		5.5	5.9	5.9	5.5	5.9		5.1	5.1		5.1	5.1	
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5	3.0	3.0	2.5	3.0		2.5	3.0		2.5	3.0	
Recall Mode	None	None	C-Max	C-Max	None	C-Max		None	Max		None	Max	
Walk Time (s)			7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)			20.0	20.0		18.0			20.0			25.0	
Pedestrian Calls (#/hr)			0	0		0			0			0	
Act Effct Green (s)		8.8	94.1	94.1	19.5	104.8		9.9	24.9		6.3	14.9	
Actuated g/C Ratio		0.06	0.59	0.59	0.12	0.66		0.06	0.16		0.04	0.09	
v/c Ratio		0.66	1.22	0.05	1.23	0.75		1.95	0.80		0.19	0.18	
Control Delay		103.5	140.5	0.1	192.5	21.5		480.1	35.7		80.1	31.6	
Queue Delay		0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		103.5	140.5	0.1	192.5	21.5		480.1	35.7		80.1	31.6	
LOS		F	F	A	F	C		F	D		F	C	
Approach Delay			133.9			44.1			272.0			45.9	
Approach LOS			F			D			F			D	
Queue Length 50th (ft)		66	~1705	0	~336	617		~340	121		14	7	
Queue Length 95th (ft)		#132	#1971	0	#525	708		#453	#342		38	43	
Internal Link Dist (ft)			2050			2519			969			2343	
Turn Bay Length (ft)		155			230			225			100		
Base Capacity (vph)		104	1085	973	213	2288		210	449		108	172	
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		0.61	1.22	0.05	1.23	0.75		1.95	0.80		0.12	0.18	

Intersection Summary

Area Type: Other

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 25 (16%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.95
Intersection Signal Delay: 116.2 Intersection LOS: F
Intersection Capacity Utilization 119.8% ICU Level of Service H
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.

Splits and Phases: 4: 43rd Avenue NE & 172nd Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	1219	312	152	1442	58	319	203	157	80	122	117
Future Volume (vph)	55	1219	312	152	1442	58	319	203	157	80	122	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	250		0	180		150	225		0
Storage Lanes	1		0	1		0	1		1	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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00		1.00				0.99	
Frt		0.969			0.994				0.850		0.927	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1778	0	1752	1832	0	1752	1845	1568	1752	1688	0
Flt Permitted	0.042			0.041			0.268			0.292		
Satd. Flow (perm)	77	1778	0	76	1832	0	493	1845	1568	539	1688	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			4				163		29	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2599			2632			3339			896	
Travel Time (s)		59.1			59.8			75.9			20.4	
Confl. Peds. (#/hr)	1		2	2		1	2					2
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
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	57	1270	325	158	1502	60	332	211	164	83	127	122
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	1595	0	158	1562	0	332	211	164	83	249	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		
Detector Phase	5	2		1	6		8	8	8	4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0		7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	10.5	30.9		10.5	33.9		28.1	28.1	28.1	28.3	28.3	
Total Split (s)	15.0	100.0		15.0	100.0		20.0	20.0	20.0	20.0	20.0	
Total Split (%)	11.1%	74.1%		11.1%	74.1%		14.8%	14.8%	14.8%	14.8%	14.8%	
Maximum Green (s)	9.5	94.1		9.5	94.1		14.9	14.9	14.9	13.7	13.7	
Yellow Time (s)	3.5	3.9		3.5	3.9		3.1	3.1	3.1	4.3	4.3	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.5	5.9		5.5	5.9		5.1	5.1	5.1	6.3	6.3	
Lead/Lag	Lead	Lag		Lead	Lag							
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	2.5	4.0		2.5	4.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		Min	Min	Min	Min	Min	
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)		18.0			21.0		16.0	16.0	16.0	15.0	15.0	
Pedestrian Calls (#/hr)		0			0		0	0	0	0	0	
Act Effct Green (s)	101.0	94.3		107.4	99.4		14.9	14.9	14.9	13.7	13.7	
Actuated g/C Ratio	0.75	0.70		0.80	0.74		0.11	0.11	0.11	0.10	0.10	
v/c Ratio	0.42	1.28		0.90	1.16		6.15	1.04	0.52	1.54	1.26	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	21.9	153.7		80.3	100.2		2365.6	131.1	14.3	354.0	194.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	21.9	153.7		80.3	100.2		2365.6	131.1	14.3	354.0	194.9	
LOS	C	F		F	F		F	F	B	F	F	
Approach Delay		149.1			98.4			1153.3			234.7	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	8	~1772		87	~1640		~555	~199	1	~101	~251	
Queue Length 95th (ft)	43	#2042		#226	#1947		#748	#363	70	#212	#428	
Internal Link Dist (ft)		2519			2552			3259			816	
Turn Bay Length (ft)	250			250			180		150	225		
Base Capacity (vph)	177	1248		178	1349		54	203	318	54	197	
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	0.32	1.28		0.89	1.16		6.15	1.04	0.52	1.54	1.26	

Intersection Summary

Area Type: Other
Cycle Length: 135
Actuated Cycle Length: 135
Offset: 15 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 6.15
Intersection Signal Delay: 296.7 Intersection LOS: F
Intersection Capacity Utilization 142.2% ICU Level of Service H
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.

Splits and Phases: 5: 51st Avenue NE & 172nd Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	290	1122	34	40	863	48	163	32	126	134	17	698
Future Volume (vph)	290	1122	34	40	863	48	163	32	126	134	17	698
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	150		0	250		0	400		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	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.992			0.881			0.853	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1820	0	1736	1812	0	1736	1610	0	1736	1558	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1736	1820	0	1736	1812	0	1736	1610	0	1736	1558	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			2			101			288	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2632			1402			1370			1561	
Travel Time (s)		59.8			31.9			31.1			35.5	
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 (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	315	1220	37	43	938	52	177	35	137	146	18	759
Shared Lane Traffic (%)												
Lane Group Flow (vph)	315	1257	0	43	990	0	177	172	0	146	777	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	3.0	7.0		3.0	7.0		3.0	5.0		3.0	5.0	
Minimum Split (s)	9.5	34.9		9.5	37.9		9.5	32.9		9.5	32.9	
Total Split (s)	34.0	85.0		14.0	85.0		15.0	26.0		15.0	26.0	
Total Split (%)	21.3%	53.1%		8.8%	53.1%		9.4%	16.3%		9.4%	16.3%	
Maximum Green (s)	28.5	79.1		8.5	79.1		9.5	20.1		9.5	20.1	
Yellow Time (s)	3.5	3.9		3.5	3.9		3.5	3.9		3.5	3.9	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.5	5.9		5.5	5.9		5.5	5.9		5.5	5.9	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	C-Max		None	C-Max		None	Min		None	Min	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		22.0			25.0			20.0			20.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	28.5	102.0		7.8	79.1		9.5	20.1		9.5	20.1	
Actuated g/C Ratio	0.18	0.64		0.05	0.49		0.06	0.13		0.06	0.13	
v/c Ratio	1.02	1.08		0.51	1.10		1.72	0.59		1.42	1.74	
Control Delay	119.3	80.8		90.3	87.1		401.0	37.2		284.6	364.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Lanes, Volumes, Timings
6: 59th Avenue NE & 172nd Street NE
Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	119.3	80.8		90.3	87.1		401.0	37.2		284.6	364.3	
LOS	F	F		F	F		F	D		F	F	
Approach Delay		88.5			87.3			221.7			351.7	
Approach LOS		F			F			F			F	
Queue Length 50th (ft)	~348	~1505		45	~1185		~275	70		~205	~928	
Queue Length 95th (ft)	#549	#1777		m62	m#1169		m#435	m155		#357	#1190	
Internal Link Dist (ft)		2552			1322			1290			1481	
Turn Bay Length (ft)	350			150			250			400		
Base Capacity (vph)	309	1161		92	896		103	290		103	447	
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	1.02	1.08		0.47	1.10		1.72	0.59		1.42	1.74	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 34 (21%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.74
Intersection Signal Delay: 162.8 Intersection LOS: F
Intersection Capacity Utilization 136.6% ICU Level of Service H
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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: 59th Avenue NE & 172nd Street NE

2036 Horizon Year Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1426	6	0	894	0	16
Future Vol, veh/h	1426	6	0	894	0	16
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	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	1501	6	0	941	0	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1504
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	-	-	0	-	0	148
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	148
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	32.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	148	-	-	-
HCM Lane V/C Ratio	0.114	-	-	-
HCM Control Delay (s)	32.4	-	-	-
HCM Lane LOS	D	-	-	-
HCM 95th %tile Q(veh)	0.4	-	-	-

Lanes, Volumes, Timings
8: 67th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	389	880	174	74	560	74	86	293	132	162	340	248
Future Volume (vph)	389	880	174	74	560	74	86	293	132	162	340	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		80	125		0	150		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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								0.99				
Frt			0.850		0.982			0.953			0.937	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1845	1568	1752	1811	0	1752	1745	0	1752	1728	0
Flt Permitted	0.229			0.078			0.125			0.121		
Satd. Flow (perm)	422	1845	1568	144	1811	0	231	1745	0	223	1728	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			88		6			13			21	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1109			3194			1426			2074	
Travel Time (s)		25.2			72.6			32.4			47.1	
Confl. Peds. (#/hr)									1	1		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	397	898	178	76	571	76	88	299	135	165	347	253
Shared Lane Traffic (%)												
Lane Group Flow (vph)	397	898	178	76	647	0	88	434	0	165	600	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6			8			4		
Detector Phase	5	2	2	1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0		5.0	7.0		5.0	7.0	
Minimum Split (s)	10.0	31.9	31.9	10.0	34.9		10.0	33.9		10.0	35.9	
Total Split (s)	16.0	90.0	90.0	16.0	90.0		16.0	38.0		16.0	38.0	
Total Split (%)	10.0%	56.3%	56.3%	10.0%	56.3%		10.0%	23.8%		10.0%	23.8%	
Maximum Green (s)	11.0	84.1	84.1	11.0	84.1		11.0	32.1		11.0	32.1	
Yellow Time (s)	3.0	3.9	3.9	3.0	3.9		3.0	3.9		3.0	3.9	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.9	5.9	5.0	5.9		5.0	5.9		5.0	5.9	
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)	3.0	4.0	4.0	3.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	Max		None	Min	
Walk Time (s)		7.0	7.0		7.0			7.0			7.0	
Flash Dont Walk (s)		19.0	19.0		22.0			21.0			23.0	
Pedestrian Calls (#/hr)		0	0		0			0			0	
Act Effct Green (s)	98.7	86.8	86.8	93.3	84.1		43.0	32.1		45.0	33.1	
Actuated g/C Ratio	0.62	0.54	0.54	0.58	0.53		0.27	0.20		0.28	0.21	
v/c Ratio	1.13	0.90	0.20	0.46	0.68		0.56	1.21		0.99	1.61	

Lanes, Volumes, Timings
8: 67th Avenue NE & 172nd Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	93.5	45.4	16.6	20.6	32.2		54.8	166.4		111.2	322.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	93.5	45.4	16.6	20.6	32.2		54.8	166.4		111.2	322.6	
LOS	F	D	B	C	C		D	F		F	F	
Approach Delay		54.9			31.0			147.6			277.0	
Approach LOS		D			C			F			F	
Queue Length 50th (ft)	~334	804	80	29	484		68	~540		133	~894	
Queue Length 95th (ft)	m#294	m746	m75	52	632		115	#767		#289	#1140	
Internal Link Dist (ft)		1029			3114			1346			1994	
Turn Bay Length (ft)	350		80	125			150			200		
Base Capacity (vph)	351	1000	890	196	954		168	360		167	373	
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	1.13	0.90	0.20	0.39	0.68		0.52	1.21		0.99	1.61	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 9.5 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.61
Intersection Signal Delay: 112.6 Intersection LOS: F
Intersection Capacity Utilization 111.5% ICU Level of Service H
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.
m Volume for 95th percentile queue is metered by upstream signal.

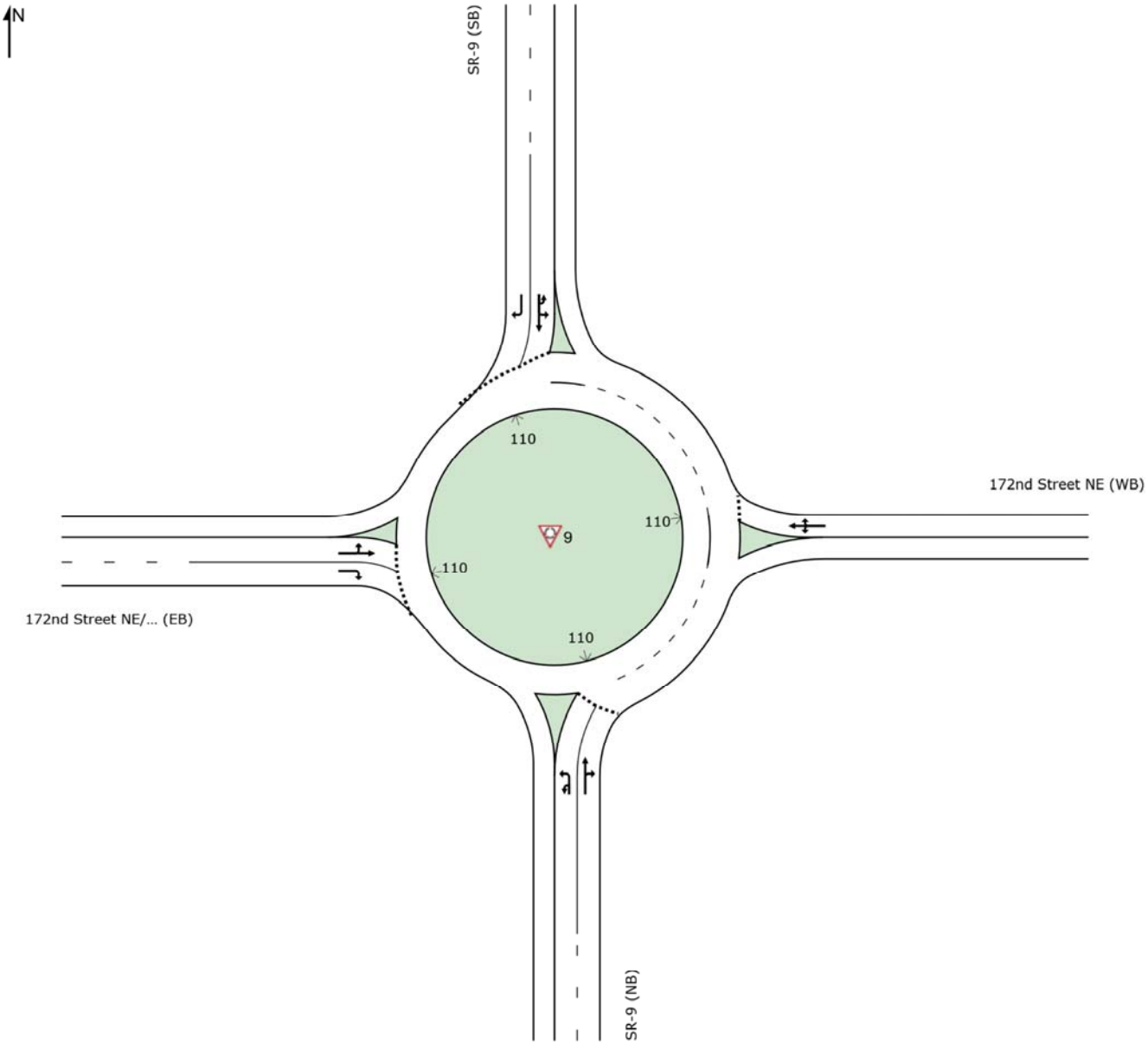
Splits and Phases: 8: 67th Avenue NE & 172nd Street NE

2036 Horizon Year Conditions
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour

SITE LAYOUT

Site: 9 [2036 Future Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout



Organisation: GIBSON TRAFFIC CONSULTANTS | Created: Thursday, July 29, 2021 4:14:33 PM
Project: H:\2020\20-106\Full Analysis\Full BSP\Comments\Arlington\Sidra\#9.sip8

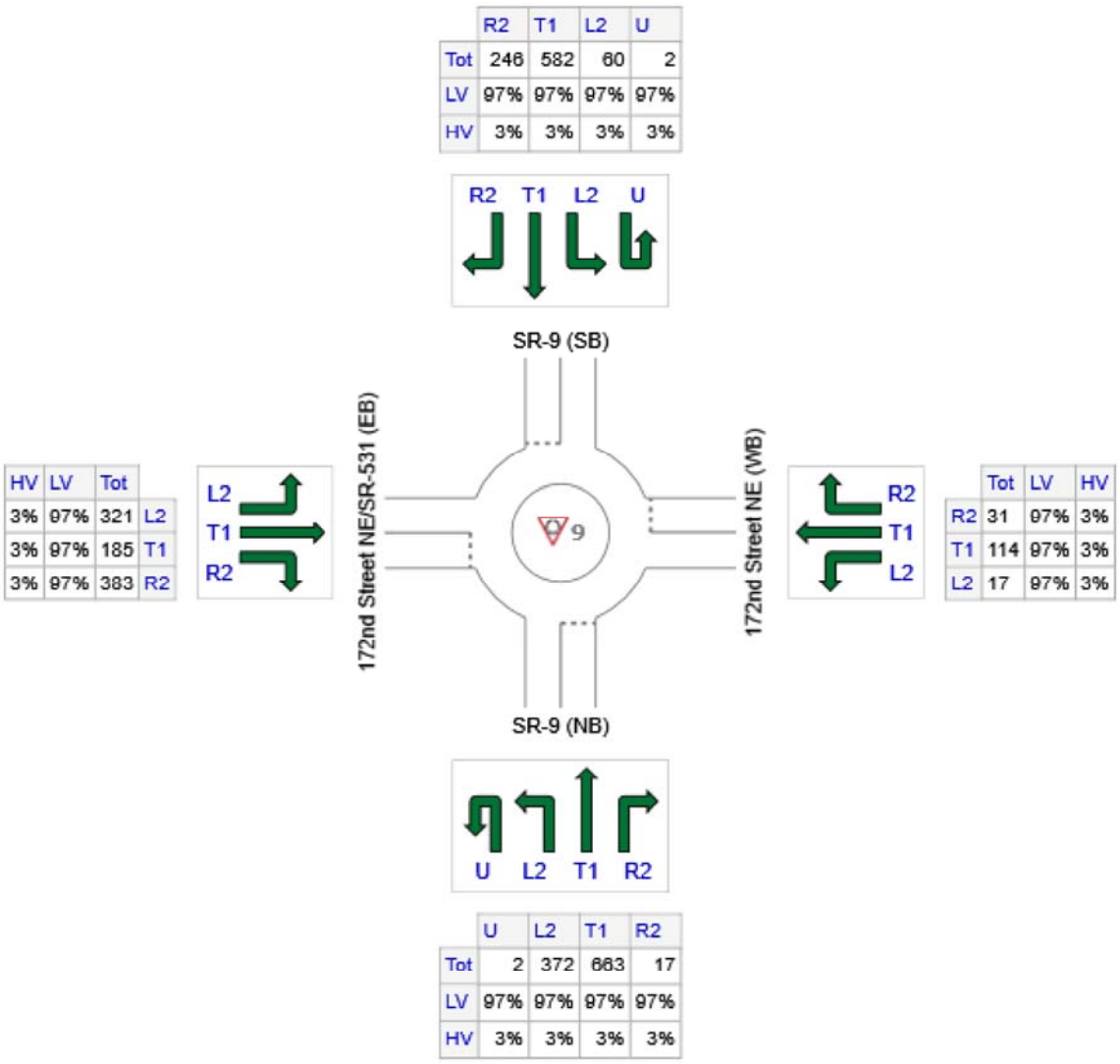
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 9 [2036 Future Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: SR-9 (NB)	1054	1022	32
E: 172nd Street NE (WB)	162	157	5
N: SR-9 (SB)	890	863	27
W: 172nd Street NE/SR-531 (EB)	889	862	27
Total	2995	2905	90

MOVEMENT SUMMARY

Site: 9 [2036 Future Conditions]

172nd Street NE/SR-531 at SR-9
Site Category: PM Peak-Hour
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: SR-9 (NB)												
3u	U	2	3.0	0.499	17.3	LOS B	4.2	108.5	0.87	0.91	0.95	33.6
3	L2	396	3.0	0.499	14.7	LOS B	4.2	108.5	0.87	0.91	0.95	32.8
8	T1	705	3.0	0.678	9.8	LOS A	8.7	222.1	0.97	0.96	1.20	34.8
18	R2	18	3.0	0.678	9.9	LOS A	8.7	222.1	0.97	0.96	1.20	33.7
Approach		1121	3.0	0.678	11.6	LOS B	8.7	222.1	0.93	0.94	1.11	34.0
East: 172nd Street NE (WB)												
1	L2	18	3.0	0.380	17.1	LOS B	2.2	56.3	0.86	0.95	0.96	34.0
6	T1	121	3.0	0.380	11.2	LOS B	2.2	56.3	0.86	0.95	0.96	33.9
16	R2	33	3.0	0.380	11.0	LOS B	2.2	56.3	0.86	0.95	0.96	32.9
Approach		172	3.0	0.380	11.8	LOS B	2.2	56.3	0.86	0.95	0.96	33.7
North: SR-9 (SB)												
7u	U	2	3.0	0.662	17.0	LOS B	6.5	167.7	0.82	0.88	0.99	36.2
7	L2	64	3.0	0.662	14.5	LOS B	6.5	167.7	0.82	0.88	0.99	35.2
4	T1	619	3.0	0.662	8.3	LOS A	6.5	167.7	0.82	0.88	0.99	35.0
14	R2	262	3.0	0.344	7.1	LOS A	1.9	47.6	0.65	0.76	0.65	35.0
Approach		947	3.0	0.662	8.4	LOS A	6.5	167.7	0.77	0.85	0.89	35.0
West: 172nd Street NE/SR-531 (EB)												
5	L2	341	3.0	0.544	14.7	LOS B	5.5	141.6	0.93	0.89	1.04	33.7
2	T1	197	3.0	0.544	8.1	LOS A	5.5	141.6	0.93	0.89	1.04	33.6
12	R2	407	3.0	0.552	10.3	LOS B	5.1	129.6	0.92	0.98	1.08	33.4
Approach		946	3.0	0.552	11.4	LOS B	5.5	141.6	0.93	0.93	1.06	33.6
All Vehicles		3186	3.0	0.678	10.6	LOS B	8.7	222.1	0.88	0.91	1.02	34.2

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	54	271	23	21	115
Future Vol, veh/h	68	54	271	23	21	115
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	-	-	-	150	-
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	74	59	295	25	23	125

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	479	308	0	0	320	0
Stage 1	308	-	-	-	-	-
Stage 2	171	-	-	-	-	-
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	545	732	-	-	1240	-
Stage 1	745	-	-	-	-	-
Stage 2	859	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	535	732	-	-	1240	-
Mov Cap-2 Maneuver	535	-	-	-	-	-
Stage 1	745	-	-	-	-	-
Stage 2	843	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	1.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	607	1240	-
HCM Lane V/C Ratio	-	-	0.218	0.018	-
HCM Control Delay (s)	-	-	12.6	8	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

Intersection	
Intersection Delay, s/veh	17.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	68	41	314	8	12	10	120	169	12	212	2
Future Vol, veh/h	7	68	41	314	8	12	10	120	169	12	212	2
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	8	79	48	365	9	14	12	140	197	14	247	2
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.9	22.3	16.9	15.2
HCM LOS	B	C	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	3%	6%	94%	5%
Vol Thru, %	40%	59%	2%	94%
Vol Right, %	57%	35%	4%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	299	116	334	226
LT Vol	10	7	314	12
Through Vol	120	68	8	212
RT Vol	169	41	12	2
Lane Flow Rate	348	135	388	263
Geometry Grp	1	1	1	1
Degree of Util (X)	0.577	0.249	0.686	0.472
Departure Headway (Hd)	5.974	6.644	6.36	6.461
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	601	538	567	557
Service Time	4.025	4.714	4.411	4.518
HCM Lane V/C Ratio	0.579	0.251	0.684	0.472
HCM Control Delay	16.9	11.9	22.3	15.2
HCM Lane LOS	C	B	C	C
HCM 95th-tile Q	3.7	1	5.3	2.5

Intersection												
Int Delay, s/veh	126.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	179	7	187	15	5	17	86	584	21	25	609	172
Future Vol, veh/h	179	7	187	15	5	17	86	584	21	25	609	172
Conflicting Peds, #/hr	0	0	3	3	0	0	1	0	4	4	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	45	-	-	35	-	-	105	-	-	110	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	199	8	208	17	6	19	96	649	23	28	677	191

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1695	1698	777	1797	1782	665	869	0	0	676	0	0
Stage 1	830	830	-	857	857	-	-	-	-	-	-	-
Stage 2	865	868	-	940	925	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	~ 72	91	392	61	81	455	763	-	-	902	-	-
Stage 1	360	381	-	348	370	-	-	-	-	-	-	-
Stage 2	344	366	-	313	344	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 57	77	391	23	68	453	762	-	-	899	-	-
Mov Cap-2 Maneuver	~ 57	77	-	23	68	-	-	-	-	-	-	-
Stage 1	314	369	-	303	322	-	-	-	-	-	-	-
Stage 2	283	319	-	139	333	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 626.5	150.6	1.3	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	762	-	-	57	341	23	198	899	-	-
HCM Lane V/C Ratio	0.125	-	-	3.489	0.632	0.725	0.123	0.031	-	-
HCM Control Delay (s)	10.4	-	-	$ 1270.8	32.1	$ 333.8	25.7	9.1	-	-
HCM Lane LOS	B	-	-	F	D	F	D	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	21.2	4.1	2.1	0.4	0.1	-	-

Notes

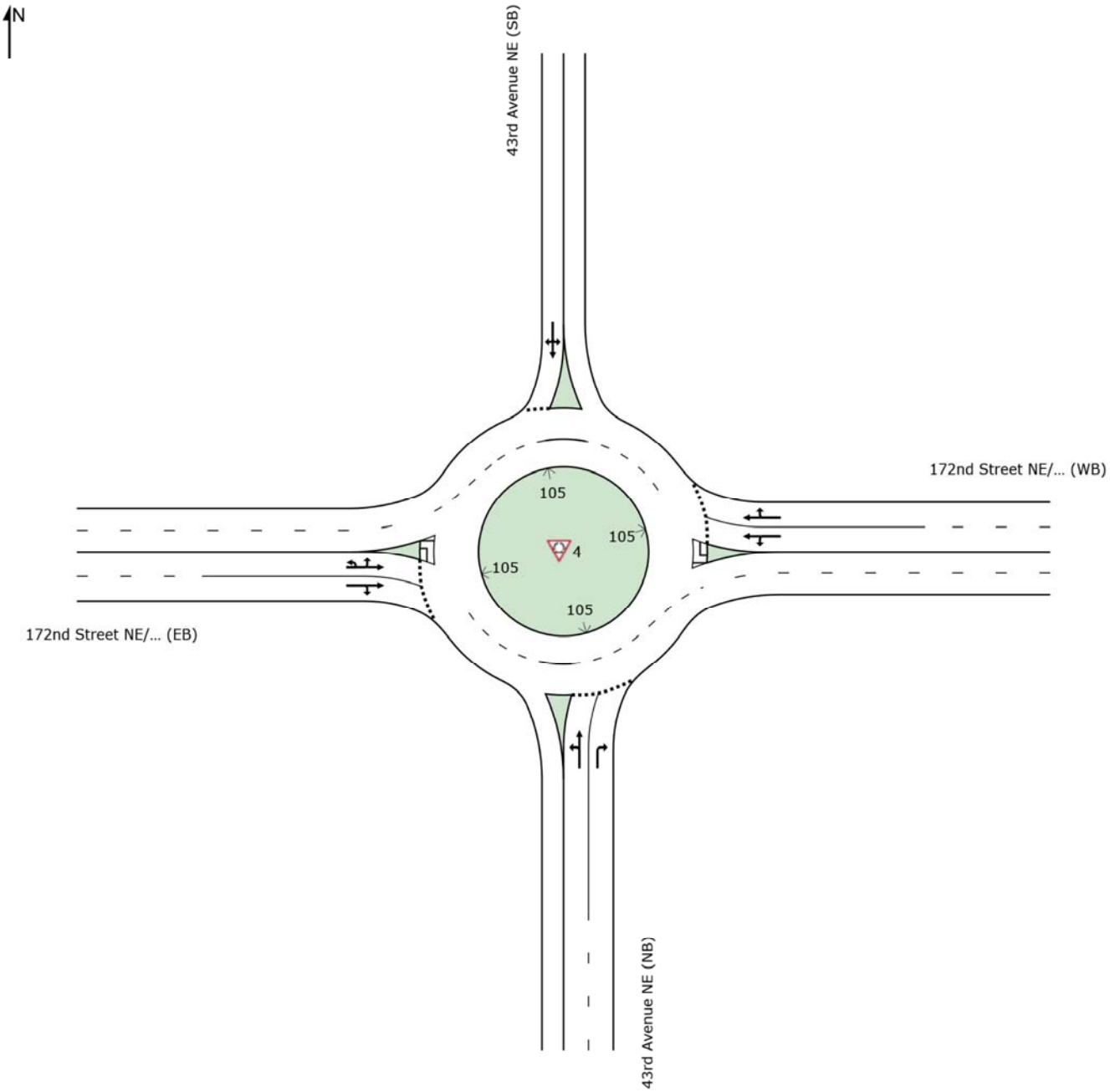
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

2036 Horizon Year Level of Service Calculations with Improvements

SITE LAYOUT

Site: 4 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout



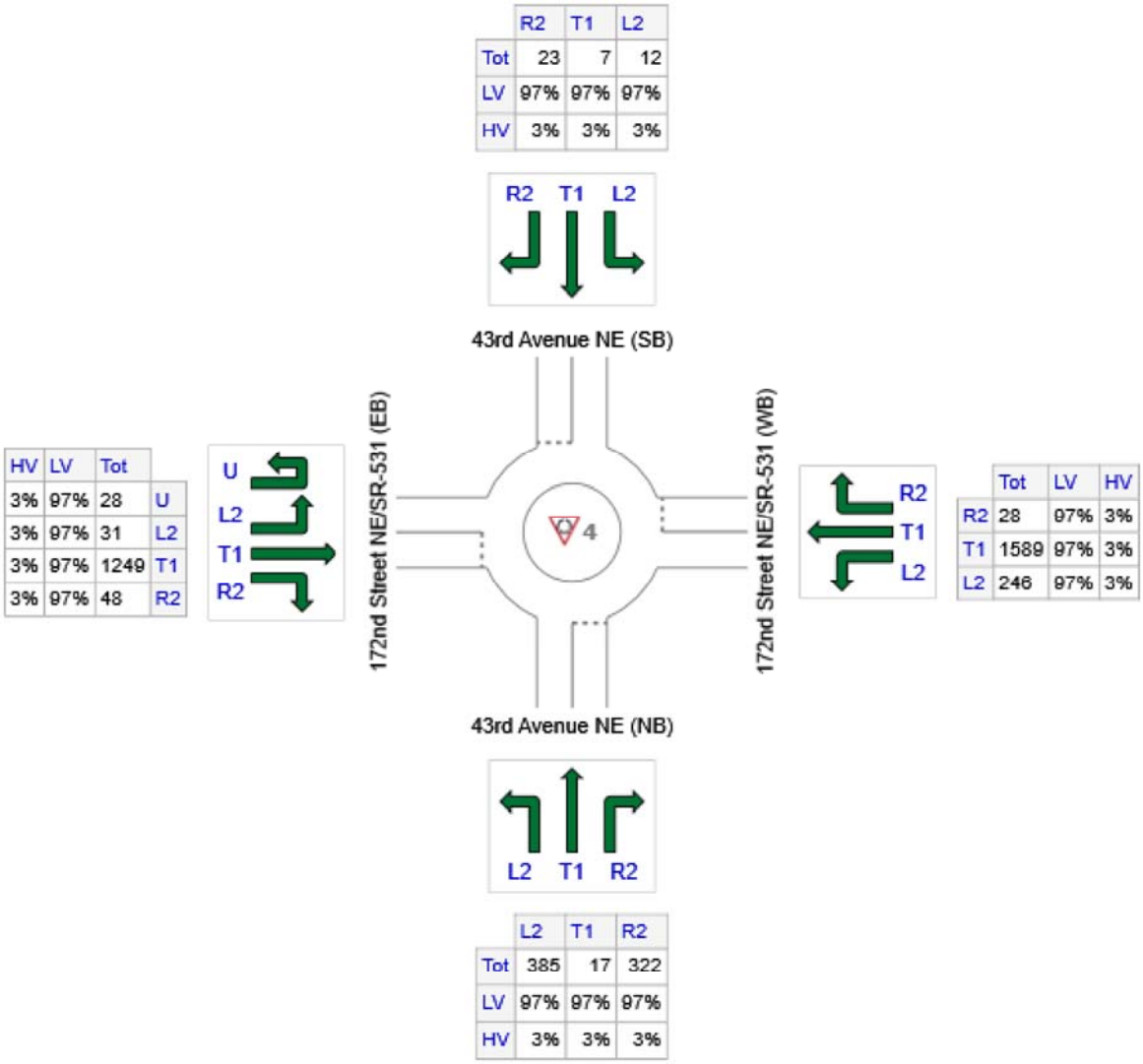
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 4 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 43rd Avenue NE (NB)	724	702	22
E: 172nd Street NE/SR-531 (WB)	1863	1807	56
N: 43rd Avenue NE (SB)	42	41	1
W: 172nd Street NE/SR-531 (EB)	1356	1315	41
Total	3985	3865	120

MOVEMENT SUMMARY

Site: 4 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 43rd Avenue NE
Roundabout

Movement Performance - Vehicles

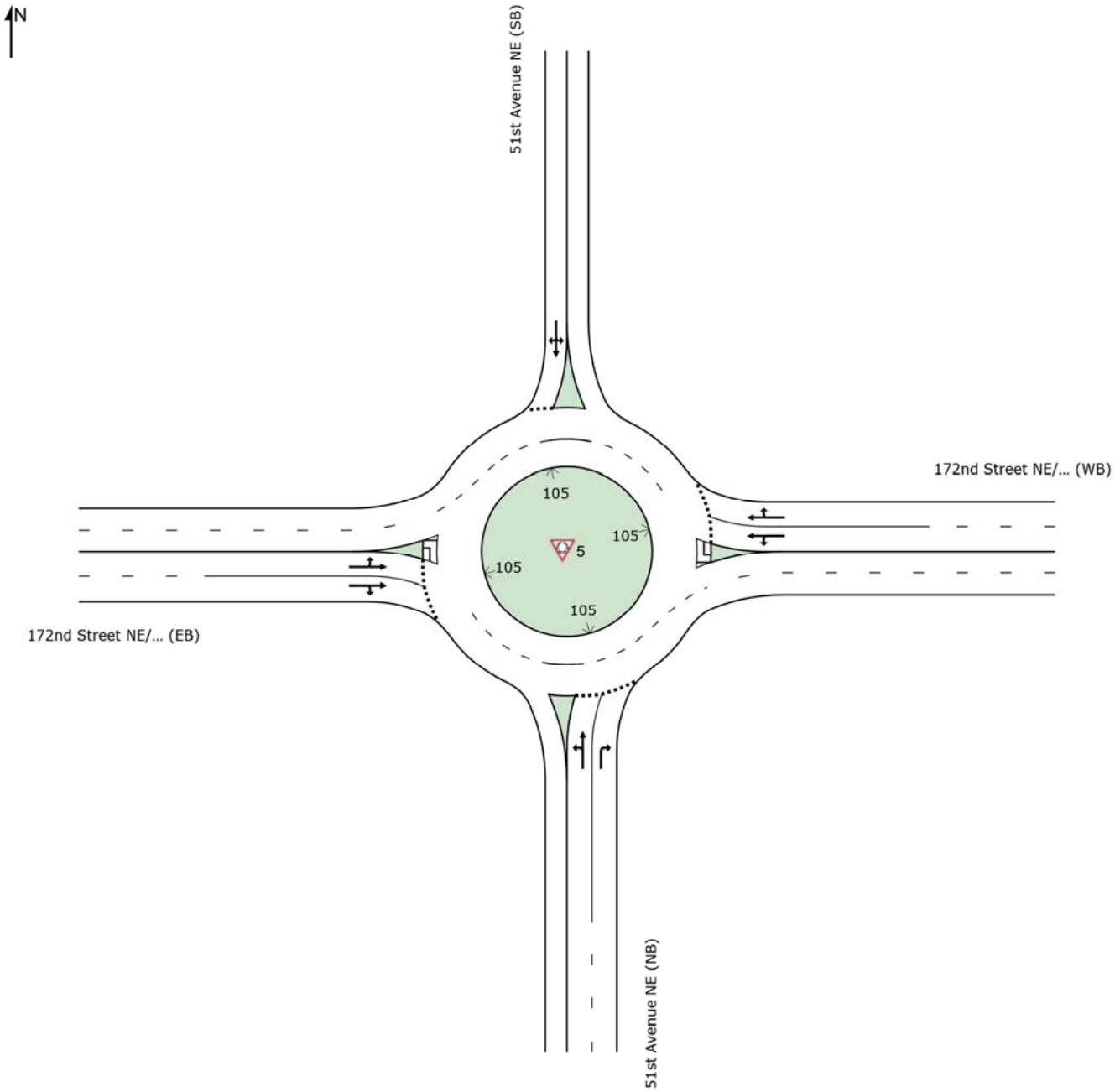
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 43rd Avenue NE (NB)												
3	L2	410	3.0	0.553	14.2	LOS B	3.5	90.6	0.83	1.00	1.01	33.1
8	T1	18	3.0	0.553	8.1	LOS A	3.5	90.6	0.83	1.00	1.01	32.9
18	R2	343	3.0	0.594	10.2	LOS B	3.5	89.7	0.83	0.98	1.06	33.5
Approach		770	3.0	0.594	12.2	LOS B	3.5	90.6	0.83	0.99	1.03	33.2
East: 172nd Street NE/SR-531 (WB)												
1	L2	262	3.0	0.950	30.4	LOS D	23.8	610.4	1.00	1.41	2.10	28.0
6	T1	1690	3.0	0.950	22.3	LOS D	26.3	672.7	1.00	1.36	2.03	29.0
16	R2	30	3.0	0.950	21.4	LOS D	26.3	672.7	1.00	1.33	1.99	28.8
Approach		1982	3.0	0.950	23.4	LOS C	26.3	672.7	1.00	1.37	2.04	28.9
North: 43rd Avenue NE (SB)												
7	L2	13	3.0	0.193	22.8	LOS C	1.0	26.9	0.93	0.96	0.93	30.9
4	T1	7	3.0	0.193	16.7	LOS B	1.0	26.9	0.93	0.96	0.93	30.7
14	R2	24	3.0	0.193	16.7	LOS B	1.0	26.9	0.93	0.96	0.93	30.0
Approach		45	3.0	0.193	18.5	LOS B	1.0	26.9	0.93	0.96	0.93	30.4
West: 172nd Street NE/SR-531 (EB)												
5u	U	30	3.0	0.590	14.4	LOS B	5.2	133.7	0.70	0.60	0.72	36.5
5	L2	33	3.0	0.590	11.9	LOS B	5.2	133.7	0.70	0.60	0.72	35.5
2	T1	1329	3.0	0.590	5.5	LOS A	5.4	137.4	0.69	0.56	0.70	35.6
12	R2	51	3.0	0.590	5.5	LOS A	5.4	137.4	0.68	0.52	0.68	34.5
Approach		1443	3.0	0.590	5.9	LOS A	5.4	137.4	0.69	0.56	0.70	35.6
All Vehicles		4240	3.0	0.950	15.3	LOS B	26.3	672.7	0.86	1.02	1.39	31.7

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 5 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout



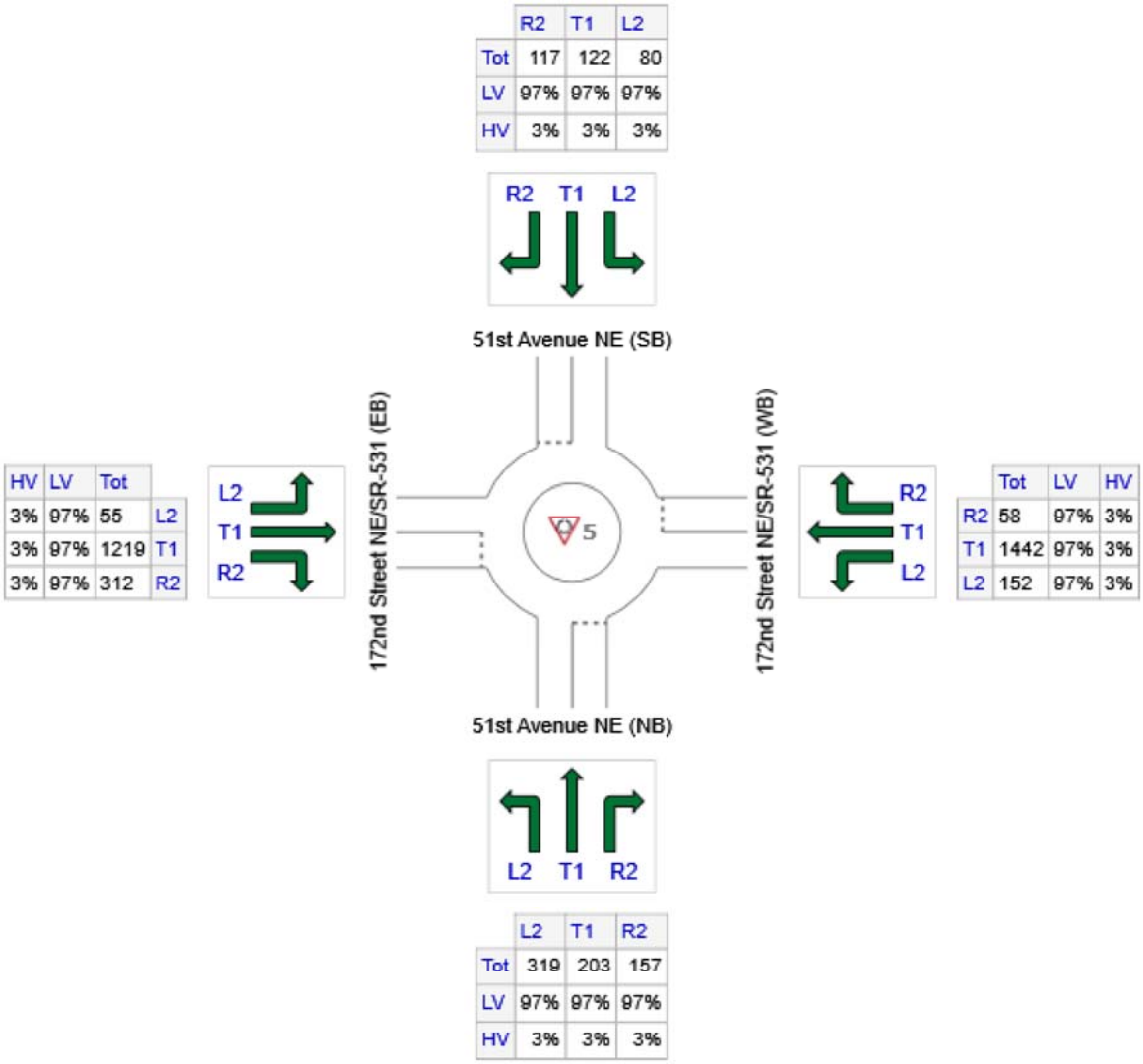
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 5 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 51st Avenue NE (NB)	679	659	20
E: 172nd Street NE/SR-531 (WB)	1652	1602	50
N: 51st Avenue NE (SB)	319	309	10
W: 172nd Street NE/SR-531 (EB)	1586	1538	48
Total	4236	4109	127

MOVEMENT SUMMARY

Site: 5 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 51st Avenue NE
Roundabout

Movement Performance - Vehicles

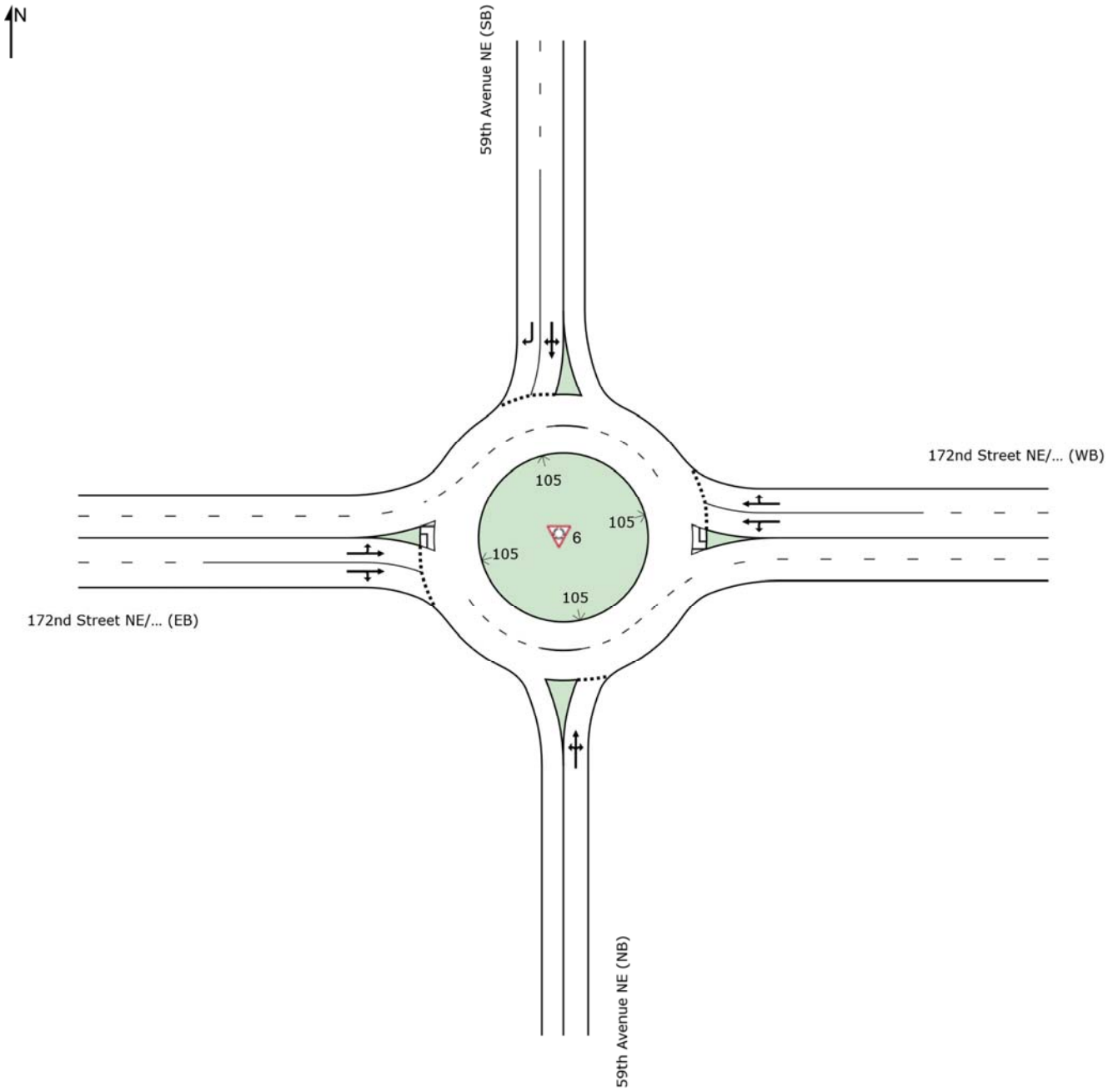
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 51st Avenue NE (NB)												
3	L2	332	3.0	0.768	18.2	LOS B	6.7	171.0	0.94	1.13	1.40	32.1
8	T1	211	3.0	0.768	12.2	LOS B	6.7	171.0	0.94	1.13	1.40	32.0
18	R2	164	3.0	0.329	8.7	LOS A	1.6	40.5	0.78	0.89	0.82	34.3
Approach		707	3.0	0.768	14.2	LOS B	6.7	171.0	0.90	1.08	1.27	32.5
East: 172nd Street NE/SR-531 (WB)												
1	L2	158	3.0	0.945	33.8	LOS D	22.0	562.0	1.00	1.48	2.22	27.0
6	T1	1502	3.0	0.945	25.7	LOS D	25.2	643.9	1.00	1.45	2.18	27.9
16	R2	60	3.0	0.945	24.6	LOS D	25.2	643.9	1.00	1.42	2.15	27.7
Approach		1721	3.0	0.945	26.4	LOS C	25.2	643.9	1.00	1.45	2.18	27.8
North: 51st Avenue NE (SB)												
7	L2	83	3.0	1.044	75.5	LOS F	16.1	411.7	1.00	1.70	3.27	18.0
4	T1	127	3.0	1.044	69.4	LOS F	16.1	411.7	1.00	1.70	3.27	17.9
14	R2	122	3.0	1.044	69.4	LOS F	16.1	411.7	1.00	1.70	3.27	17.7
Approach		332	3.0	1.044	70.9	LOS F	16.1	411.7	1.00	1.70	3.27	17.9
West: 172nd Street NE/SR-531 (EB)												
5	L2	57	3.0	0.699	14.3	LOS B	7.7	197.8	0.80	0.82	0.95	35.1
2	T1	1270	3.0	0.699	7.7	LOS A	7.9	202.3	0.79	0.79	0.91	35.3
12	R2	325	3.0	0.699	7.4	LOS A	7.9	202.3	0.78	0.75	0.87	34.3
Approach		1652	3.0	0.699	7.9	LOS A	7.9	202.3	0.79	0.78	0.91	35.1
All Vehicles		4413	3.0	1.044	20.9	LOS C	25.2	643.9	0.90	1.16	1.64	29.5

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 6 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout



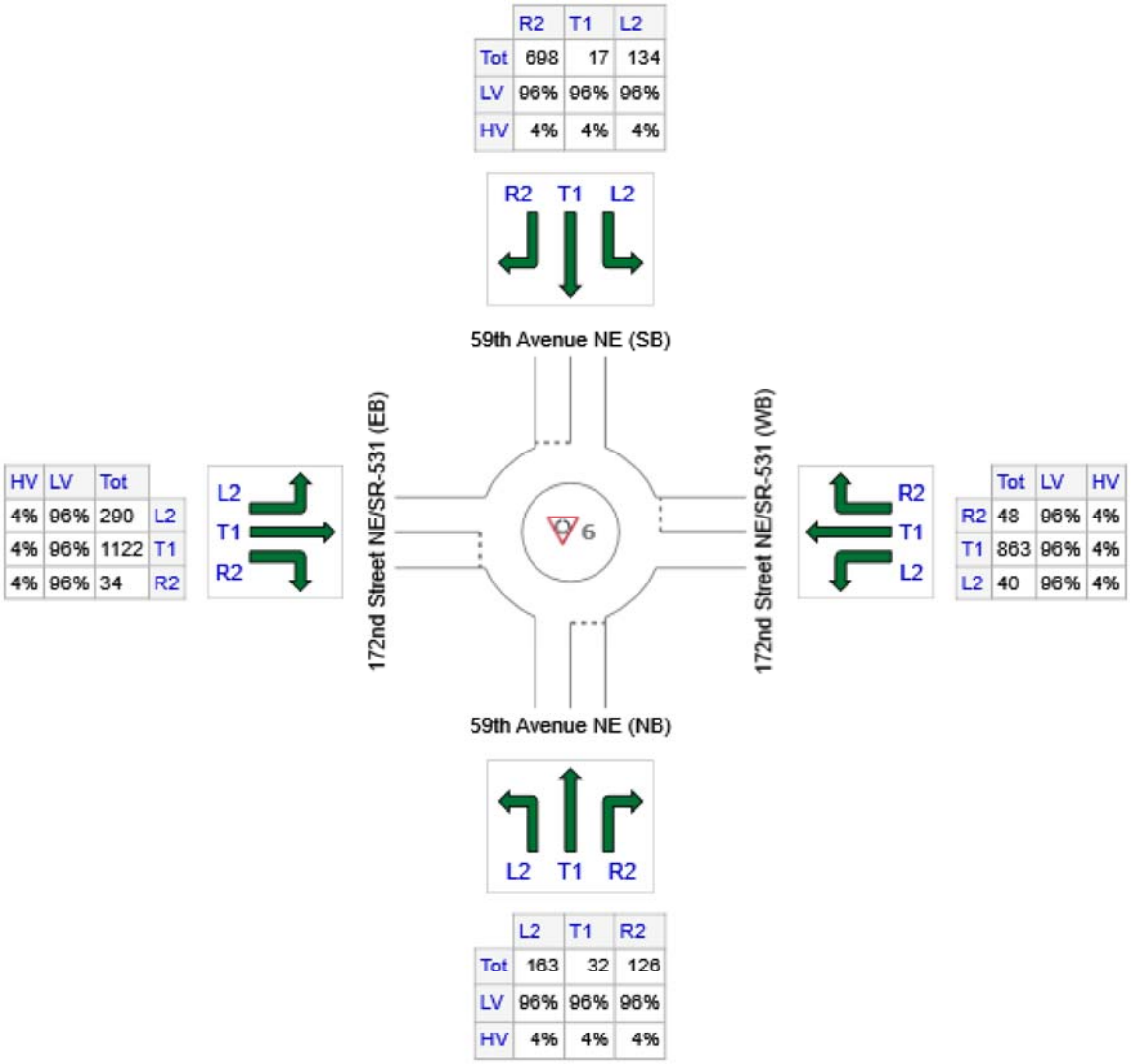
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 6 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 59th Avenue NE (NB)	321	308	13
E: 172nd Street NE/SR-531 (WB)	951	913	38
N: 59th Avenue NE (SB)	849	815	34
W: 172nd Street NE/SR-531 (EB)	1446	1388	58
Total	3567	3424	143

MOVEMENT SUMMARY

Site: 6 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 59th Avenue NE
Roundabout

Movement Performance - Vehicles

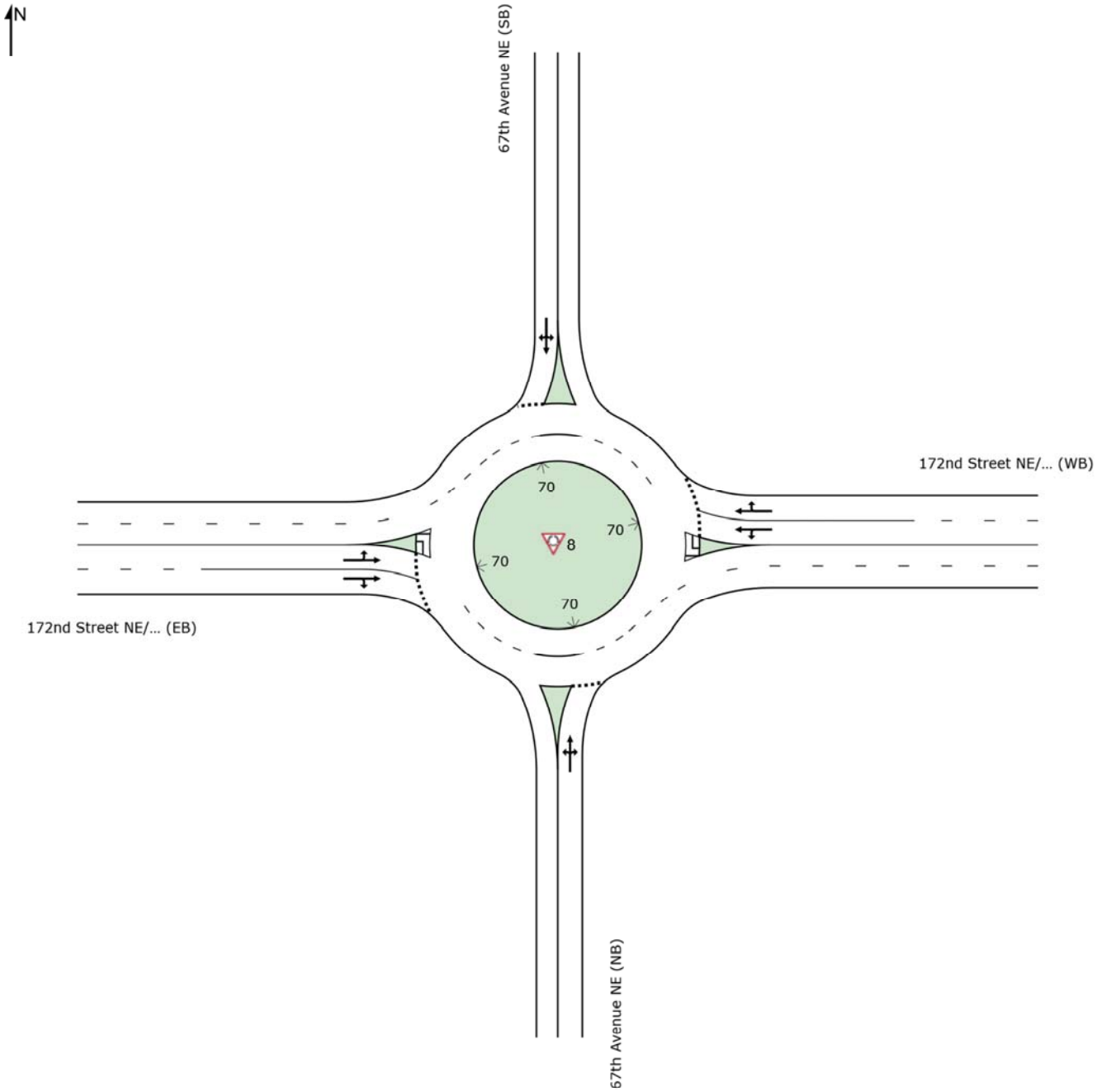
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 59th Avenue NE (NB)												
3	L2	177	4.0	0.654	18.6	LOS B	4.1	105.0	0.86	1.05	1.22	32.1
8	T1	35	4.0	0.654	12.5	LOS B	4.1	105.0	0.86	1.05	1.22	32.0
18	R2	137	4.0	0.654	12.6	LOS B	4.1	105.0	0.86	1.05	1.22	31.2
Approach		349	4.0	0.654	15.6	LOS B	4.1	105.0	0.86	1.05	1.22	31.7
East: 172nd Street NE/SR-531 (WB)												
1	L2	43	4.0	0.500	13.8	LOS B	3.7	96.1	0.74	0.80	0.81	35.3
6	T1	938	4.0	0.500	7.2	LOS A	3.9	99.5	0.73	0.73	0.78	35.4
16	R2	52	4.0	0.500	7.0	LOS A	3.9	99.5	0.73	0.68	0.75	34.3
Approach		1034	4.0	0.500	7.5	LOS A	3.9	99.5	0.73	0.73	0.78	35.4
North: 59th Avenue NE (SB)												
7	L2	146	4.0	0.655	16.8	LOS B	4.3	111.9	0.84	1.03	1.14	33.3
4	T1	18	4.0	0.655	10.7	LOS B	4.3	111.9	0.84	1.03	1.14	33.2
14	R2	759	4.0	0.655	9.9	LOS A	4.8	123.6	0.85	1.02	1.12	33.3
Approach		923	4.0	0.655	11.0	LOS B	4.8	123.6	0.85	1.02	1.13	33.3
West: 172nd Street NE/SR-531 (EB)												
5	L2	315	4.0	0.610	11.4	LOS B	5.3	136.5	0.62	0.61	0.62	35.1
2	T1	1220	4.0	0.610	5.1	LOS A	5.5	141.8	0.60	0.53	0.60	35.7
12	R2	37	4.0	0.610	5.3	LOS A	5.5	141.8	0.59	0.49	0.59	34.7
Approach		1572	4.0	0.610	6.4	LOS A	5.5	141.8	0.61	0.55	0.61	35.6
All Vehicles		3877	4.0	0.655	8.6	LOS A	5.5	141.8	0.72	0.75	0.83	34.6

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 8 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout



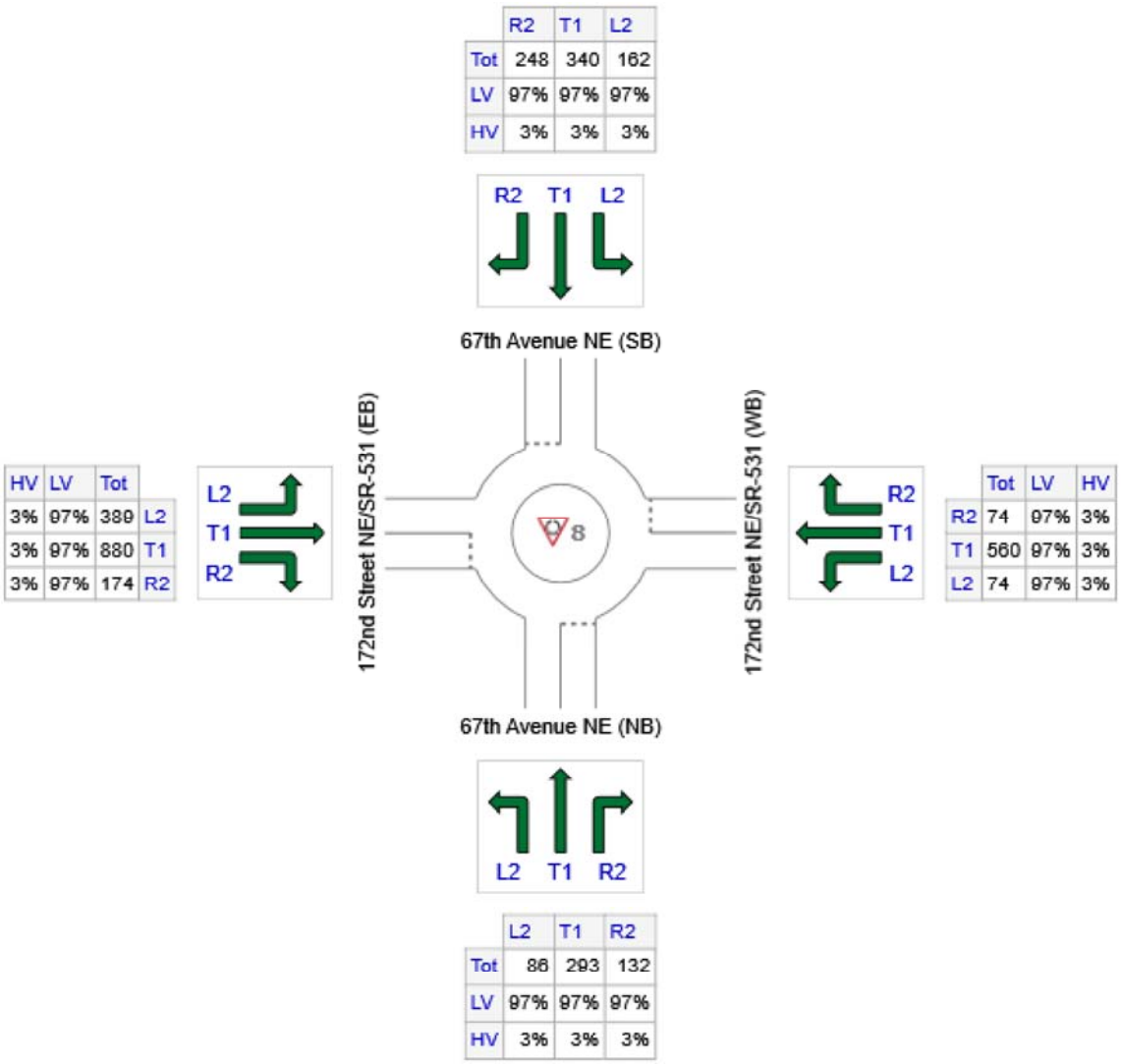
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

Site: 8 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 67th Avenue NE (NB)	511	496	15
E: 172nd Street NE/SR-531 (WB)	708	687	21
N: 67th Avenue NE (SB)	750	728	23
W: 172nd Street NE/SR-531 (EB)	1443	1400	43
Total	3412	3310	102

MOVEMENT SUMMARY

Site: 8 [2036 Future Conditions]

PM Peak-Hour
Site Category: 172nd Street NE/SR-531 at 67th Avenue NE
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 67th Avenue NE (NB)												
3	L2	88	3.0	1.190	110.5	LOS F	35.9	918.7	1.00	2.48	5.78	13.8
8	T1	299	3.0	1.190	105.6	LOS F	35.9	918.7	1.00	2.48	5.78	13.8
18	R2	135	3.0	1.190	105.4	LOS F	35.9	918.7	1.00	2.48	5.78	13.7
Approach		521	3.0	1.190	106.4	LOS F	35.9	918.7	1.00	2.48	5.78	13.8
East: 172nd Street NE/SR-531 (WB)												
1	L2	76	3.0	0.468	15.4	LOS B	3.5	90.0	0.85	0.93	0.95	33.1
6	T1	571	3.0	0.468	9.9	LOS A	3.8	96.4	0.85	0.90	0.93	33.9
16	R2	76	3.0	0.468	9.4	LOS A	3.8	96.4	0.85	0.87	0.92	33.3
Approach		722	3.0	0.468	10.4	LOS B	3.8	96.4	0.85	0.90	0.93	33.7
North: 67th Avenue NE (SB)												
7	L2	165	3.0	1.058	53.0	LOS F	29.4	753.6	1.00	2.01	3.87	21.3
4	T1	347	3.0	1.058	48.2	LOS F	29.4	753.6	1.00	2.01	3.87	21.4
14	R2	253	3.0	1.058	48.0	LOS F	29.4	753.6	1.00	2.01	3.87	21.1
Approach		765	3.0	1.058	49.1	LOS D	29.4	753.6	1.00	2.01	3.87	21.3
West: 172nd Street NE/SR-531 (EB)												
5	L2	397	3.0	0.851	22.9	LOS D	13.7	349.8	1.00	1.23	1.64	29.2
2	T1	898	3.0	0.851	16.8	LOS D	14.9	380.2	1.00	1.19	1.60	30.6
12	R2	178	3.0	0.851	16.3	LOS D	14.9	380.2	1.00	1.18	1.58	30.3
Approach		1472	3.0	0.851	18.4	LOS B	14.9	380.2	1.00	1.20	1.61	30.2
All Vehicles		3482	3.0	1.190	36.7	LOS D	35.9	918.7	0.97	1.51	2.59	24.2

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: SIDRA Roundabout LOS.
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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Lanes, Volumes, Timings
12: 67th Avenue NE & 188th Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	7	187	15	5	17	86	584	21	25	609	172
Future Volume (vph)	179	7	187	15	5	17	86	584	21	25	609	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	45		0	35		0	105		0	110		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	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.97		0.99	0.98			1.00			0.99	
Frt		0.856			0.886			0.995			0.967	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1719	1505	0	1719	1573	0	1719	1798	0	1719	1741	0
Flt Permitted	0.449			0.909			0.129			0.291		
Satd. Flow (perm)	812	1505	0	1634	1573	0	233	1798	0	527	1741	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		208			19			2			19	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1804			590			5317			5234	
Travel Time (s)		41.0			13.4			120.8			119.0	
Confl. Peds. (#/hr)			3	3			1		4	4		1
Confl. Bikes (#/hr)						2			6			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	199	8	208	17	6	19	96	649	23	28	677	191
Shared Lane Traffic (%)												
Lane Group Flow (vph)	199	216	0	17	25	0	96	672	0	28	868	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)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	15.0	28.0		10.0	23.0		11.0	72.0		10.0	71.0	
Total Split (%)	12.5%	23.3%		8.3%	19.2%		9.2%	60.0%		8.3%	59.2%	
Maximum Green (s)	10.5	23.5		5.5	18.5		6.5	67.5		5.5	66.5	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
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)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		0			0			0			0	
Act Effct Green (s)	17.2	14.0		9.7	7.0		57.2	54.0		54.9	50.8	
Actuated g/C Ratio	0.20	0.16		0.11	0.08		0.66	0.63		0.64	0.59	

Lanes, Volumes, Timings
12: 67th Avenue NE & 188th Street NE

Cascade Commerce Center

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.71	0.52		0.09	0.17		0.35	0.60		0.07	0.84	
Control Delay	50.7	12.3		35.0	27.2		8.4	13.7		5.3	24.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	50.7	12.3		35.0	27.2		8.4	13.7		5.3	24.3	
LOS	D	B		C	C		A	B		A	C	
Approach Delay		30.7			30.4			13.1			23.7	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)	107	4		8	3		17	252		5	409	
Queue Length 95th (ft)	#229	78		29	31		36	397		14	664	
Internal Link Dist (ft)		1724			510			5237			5154	
Turn Bay Length (ft)	45			35			105			110		
Base Capacity (vph)	287	599		191	388		279	1412		420	1355	
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	0.69	0.36		0.09	0.06		0.34	0.48		0.07	0.64	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 86.1
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 21.4 Intersection LOS: C
Intersection Capacity Utilization 75.1% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 12: 67th Avenue NE & 188th Street NE

2036 Horizon Year Conditions with Improvements
Gibson Traffic Consultants, Inc. [BJL #20-106]
PM Peak-Hour