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Pioneer Point Traffic Impact Analysis

Jurisdiction: City of Arlington

October 2021

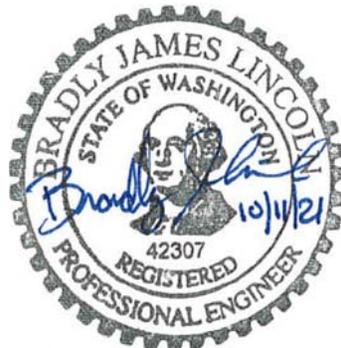


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Counts and Turning Movement Calculations A

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1. INTRODUCTION

Gibson Traffic Consultants, Inc. (GTC) has been retained to analyze the traffic impacts of the proposed Pioneer Point development. The proposed development is located along the 207th Street NE alignment, east of Stillaguamish Avenue. A site vicinity map is included in Figure 1. The development is proposed to consist of 93 multifamily residential units. A 6-year horizon period to the year 2027 has been used for the analysis in this report; however, the development is anticipated to be completed before the year 2027.

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

2. METHODOLOGY

Trip generation for The Pioneer Point development is based on average trip generation rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition (2017)*. Level of service (LOS) at the study intersections is determined using the methodology described in the *Highway Capacity Manual, 6th Edition (HCM)*. The analysis has been performed using the *Synchro 11.1, Build 0* and *Sidra Version 8.07.7.7948* software packages. The intersection level of service analysis has been performed for the 2021 existing conditions, 2027 baseline conditions, and 2027 future with development conditions during the PM peak-hour. The year 2027 has been utilized for the horizon year to represent a conservative 6-year horizon period; even though the development is anticipated to be completed before 2027.

Traffic congestion on roadways is generally measured in terms of level of service at critical intersections. In accordance with the *Highway Capacity Manual, 6th Edition*, roadway facilities and intersections are rated between LOS A and LOS F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. The level of service at signalized, all-way stop-controlled and roundabout intersections are based on the average stopped delay for all entering vehicles. The level of service at two-way stop-controlled intersections is based on stopped delay times for the critical approach. Geometric characteristics and conflicting traffic movements are taken into consideration when determining level of service values. A summary of the level of service criteria has been included in Table 1.

Table 1: Level of Service Criteria for Intersections

Level of ¹ Service	Expected Delay	Intersection Control Delay (Seconds per Vehicle)	
		Unsignalized Intersections	Signalized & Roundabout 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 City of Arlington has established an acceptable level of service of LOS D.

The City of Arlington and Snohomish County have an interlocal agreement that provides for reciprocal mitigation fees. Snohomish County mitigation fees can be calculated based on the default percentage in the interlocal agreement, which is 70%, or based on actual impacts.

3. TRIP GENERATION

Trip generation calculations for the proposed Pioneer Point development are based on national research data for land uses contained in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 10th Edition* (2017). The average trip generation rates for ITE Land Use Code 220, Multifamily Housing (Low-Rise), has been utilized for the trip generation calculations. The trip generation of the Pioneer Point development is summarized in Table 2.

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.

Table 2: Trip Generation Summary

93 New Multifamily Housing Units	Average Daily Trips			AM Peak-Hour Trips			PM Peak-Hour Trips		
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
Generation Rate	7.32 trips per unit			0.46 trips per unit			0.56 trips per unit		
Splits	50%	50%	100%	23%	77%	100%	63%	37%	100%
Trips	341	340	681	10	33	43	33	19	52

The Pioneer Point development is anticipated to generate 681 new average daily trips (ADT) with 43 new AM peak-hour trips and 52 new PM peak-hour trips.

4. TRIP DISTRIBUTION

The trip distribution for The Pioneer Point development is based on previously approved distributions in the site vicinity, surrounding uses and existing traffic volumes. It is anticipated that 40% of the trips generated by the development will travel to and from the north, thirty percent along Stillaguamish Avenue and ten percent along 67th Avenue NE. An estimated 50% of the trips generated by the development will travel to and from the south, fifteen percent along 67th Avenue NE and thirty-five percent along SR-9. The remaining 10% of the trips generated by the development are anticipated to travel to and from local areas in the vicinity of SR-9 at 204th Street NE. Detailed distributions for the AM and PM peak-hours are shown in Figure 2 and Figure 3, respectively.

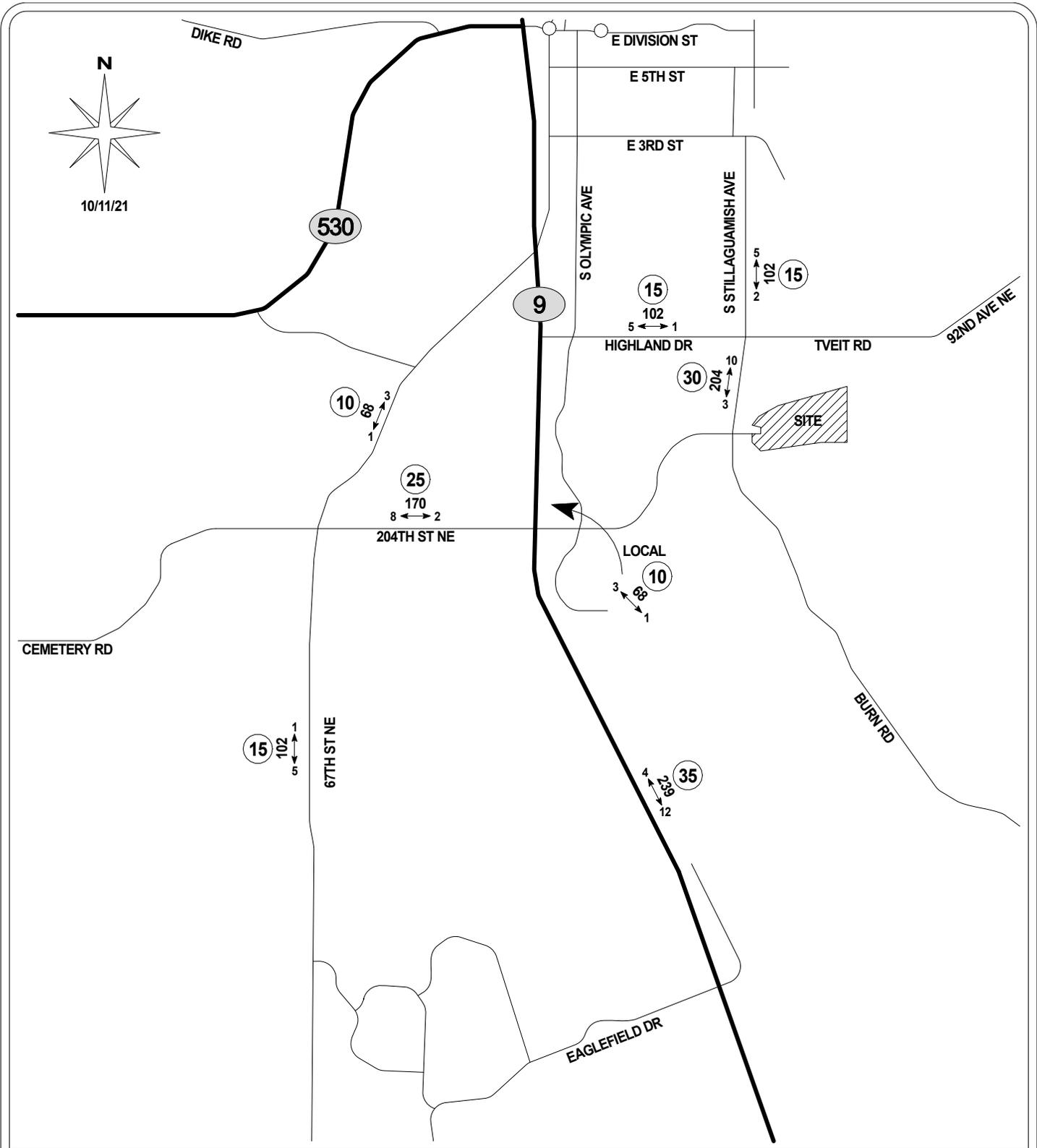
The interlocal agreement between the City of Arlington and Snohomish County requires detailed development trip turning movement data at Snohomish County key intersections. The trips generated by the development are not anticipated to impact any Snohomish County key intersections during the AM and PM peak-hours.

5. LEVEL OF SERVICE ANALYSIS

The following intersections have been analyzed as a part of this report:

1. Stillaguamish Avenue at Highland Drive – All-Way Stop-Control
2. Stillaguamish Avenue at 207th Street NE – All-Way Stop-Control
3. 77th Avenue NE at 204th Street NE – Roundabout
4. SR-9 at 204th Street NE – Signalized
5. 67th Avenue NE at 204th Street NE – Signalized

The intersections have been analyzed for the 2021 existing conditions, 2027 baseline conditions and 2027 future with development conditions.



GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #21-246

PIONEER POINT

LEGEND

AWDT
AM ←→ PEAK

NEW DAILY TRIPS
NEW AM PEAK-HOUR TRIPS



TRIP DISTRIBUTION %

FIGURE 2
DEVELOPMENT TRIP
DISTRIBUTION
AM PEAK-HOUR

CITY OF ARLINGTON

5.1 Intersection Turning Movements

The existing volumes at the study intersections have been collected by the independent count firm Traffic Data Gathering (TDG) in August 2021. The existing turning movements at the study intersections are shown in Figure 4. The 2027 baseline turning movements at the intersections have been calculated utilizing a 2% annually compounding growth rate, which is consistent with previous analysis performed in the City of Arlington. The 2027 baseline turning movements are shown in Figure 5. The 2027 future with development turning movements were calculated by adding the trips generated by the development to the 2027 baseline tuning movements. The 2026 future with development turning movements are shown in Figure 7. The existing turning movement counts and future turning movement calculations are included in the attachments.

5.2 Level of Service Analysis

The level of service analysis has been completed with the existing channelization and intersection control. The level of service analysis shows that the study intersections currently operate at LOS C, or better, and are anticipated to operate at LOS D, or better, under the 2027 baseline and 2027 future with development conditions. The level of service results for the study intersections are summarized in Table 3.

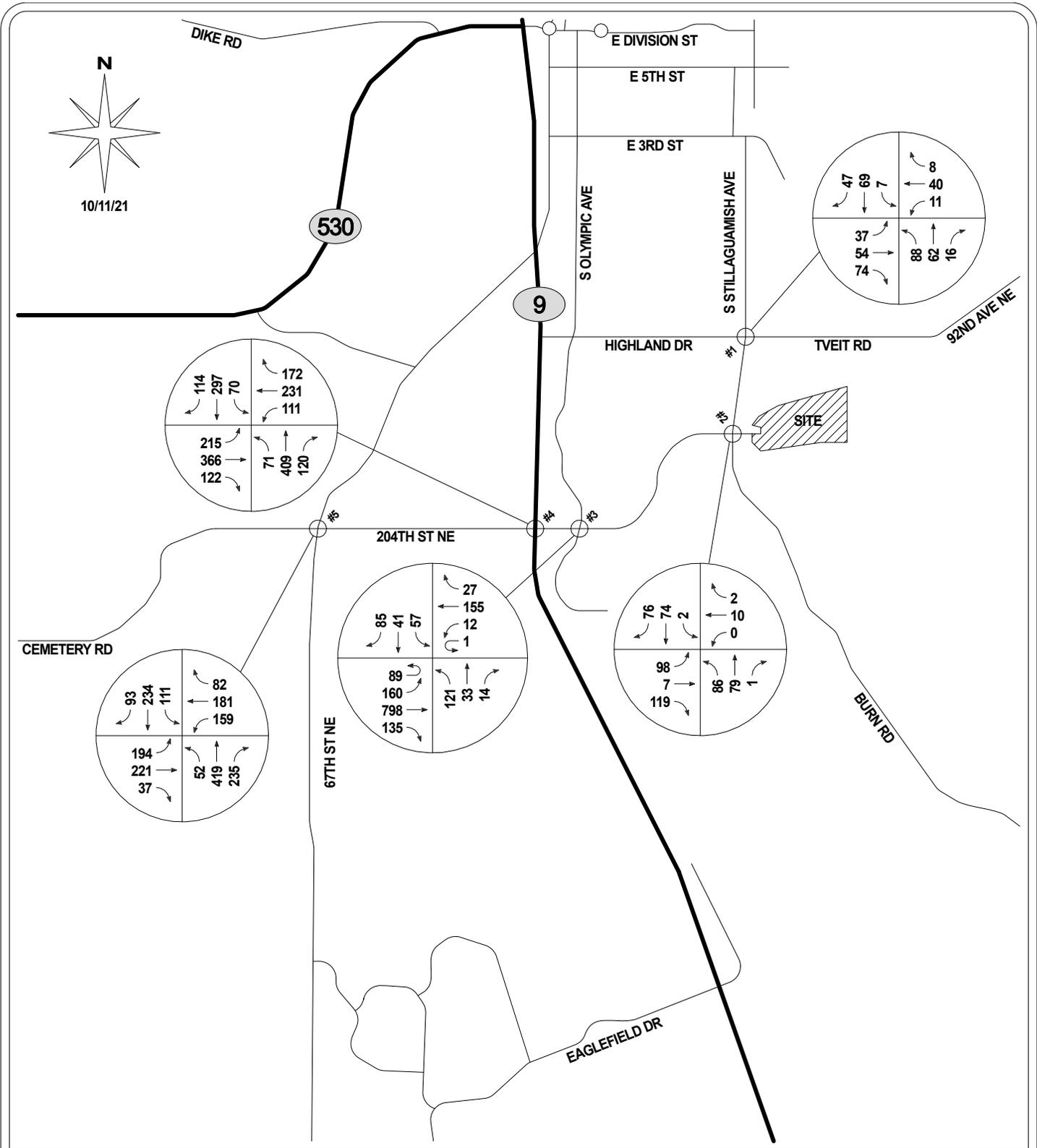
Table 3: Level of Service Summary

Intersection	Control	2021 Existing Conditions		2027 Baseline Conditions		2027 Future w Development Conditions	
		LOS	Delay	LOS	Delay	LOS	Delay
1. Stillaguamish Avenue at Highland Drive	All-Way Stop-Control	A	8.8 sec	A	9.2 sec	A	9.3 sec
2. Stillaguamish Avenue at 207 th Street NE	All-Way Stop-Control	A	9.4 sec	A	9.8 sec	B	10.1 sec
3. 77 th Avenue NE at 204 th Street NE	Roundabout	A	8.1 sec v/c 0.52	A	8.4 sec v/c 0.59	A	8.5 sec v/c 0.61
4. SR-9 at 204 th Street NE	Signal	C	32.8 sec	D	41.2 sec	D	43.5 sec
5. 67 th Avenue NE at 204 th Street NE	Signal	C	33.0 sec	D	36.4 sec	D	36.5 sec

The level of service calculations are included in the attachments.

6. TRAFFIC MITIGATION FEES

The City of Arlington collects traffic mitigation fees based on the number of PM peak-hour trips generated by a development. The City of Arlington also has an interlocal agreement with Snohomish County for traffic mitigation fees.



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PIONEER POINT

LEGEND

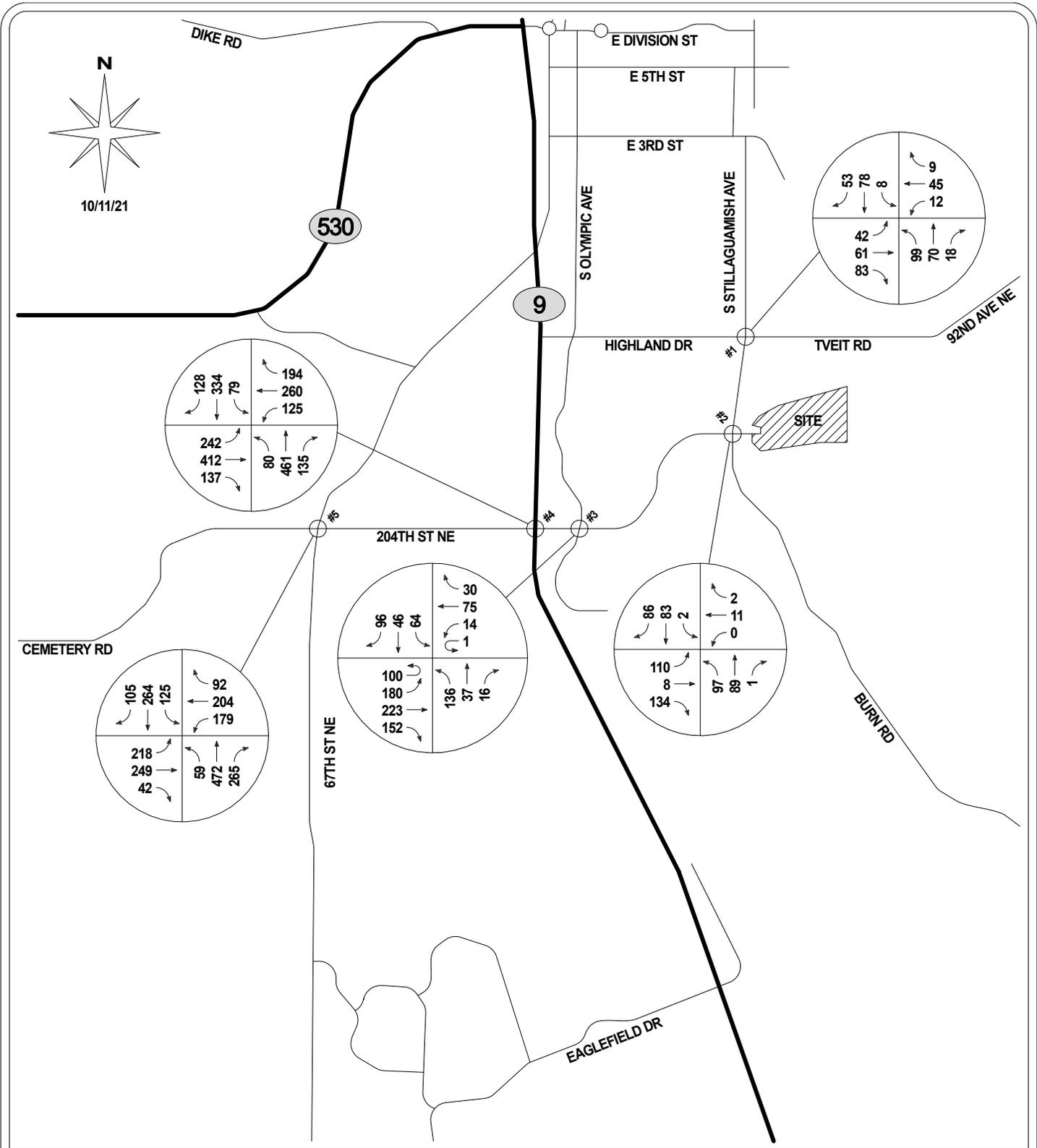
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PEAK-HOUR TURNING
MOVEMENT VOLUMES

FIGURE 4

**2021 EXISTING
TURNING MOVEMENTS**

CITY OF ARLINGTON



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PIONEER POINT

LEGEND

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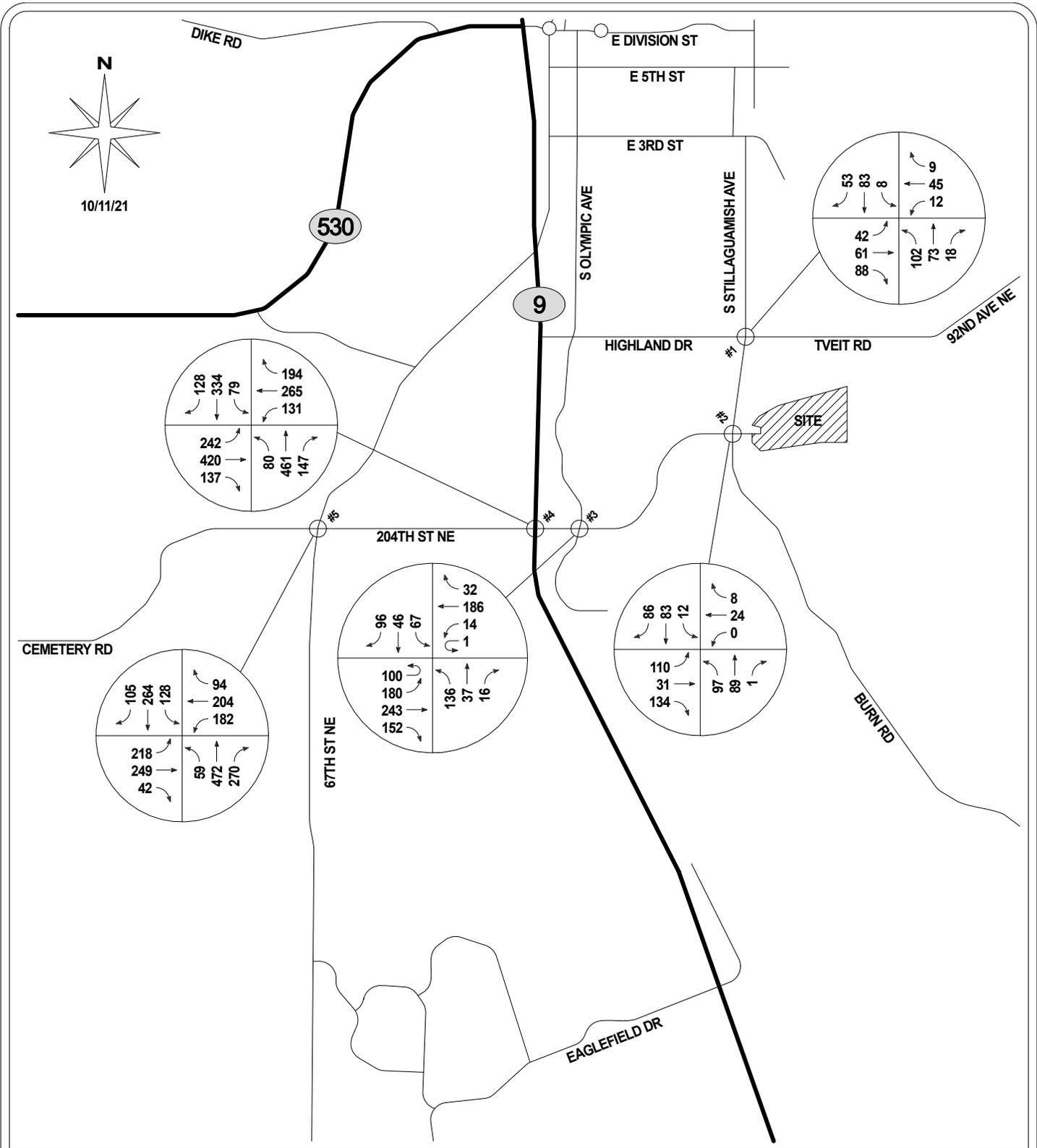
PEAK-HOUR TURNING
MOVEMENT VOLUMES

FIGURE 5

**2027 BASELINE
TURNING MOVEMENTS**

CITY OF ARLINGTON

10/11/21



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GTC #21-246

PIONEER POINT

LEGEND

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PEAK-HOUR TURNING
MOVEMENT VOLUMES

FIGURE 6

**2027 FUTURE
WITH DEVELOPMENT
TURNING MOVEMENTS**

CITY OF ARLINGTON

10/11/21

6.1 City of Arlington

The City of Arlington currently has a traffic mitigation fee of \$3,355 per PM peak-hour trip. The Pioneer Point development is anticipated to generate 52 new PM peak-hour trips. These trips result in City of Arlington traffic mitigation fees of \$174,460.00. The City of Arlington traffic mitigation fee is equivalent to \$1,875.91 for each of the 93 units that are proposed to be constructed.

6.2 Snohomish County

The City of Arlington has an interlocal agreement with Snohomish County that provides for mitigation payments for impacts to Snohomish County arterials. City of Arlington developments that impact road improvement projects with 3 directional PM peak-hour trips identified in Snohomish County's *Transportation Needs Report* (TNR) are required to pay mitigation fees to Snohomish County. There are not any improvement projects identified in Snohomish County's TNR that will be impacted by 3 or more directional PM peak-hour trips generated by the Pioneer Point development. Snohomish County traffic mitigation fees should therefore not be required for the Pioneer Point development.

7. CONCLUSIONS

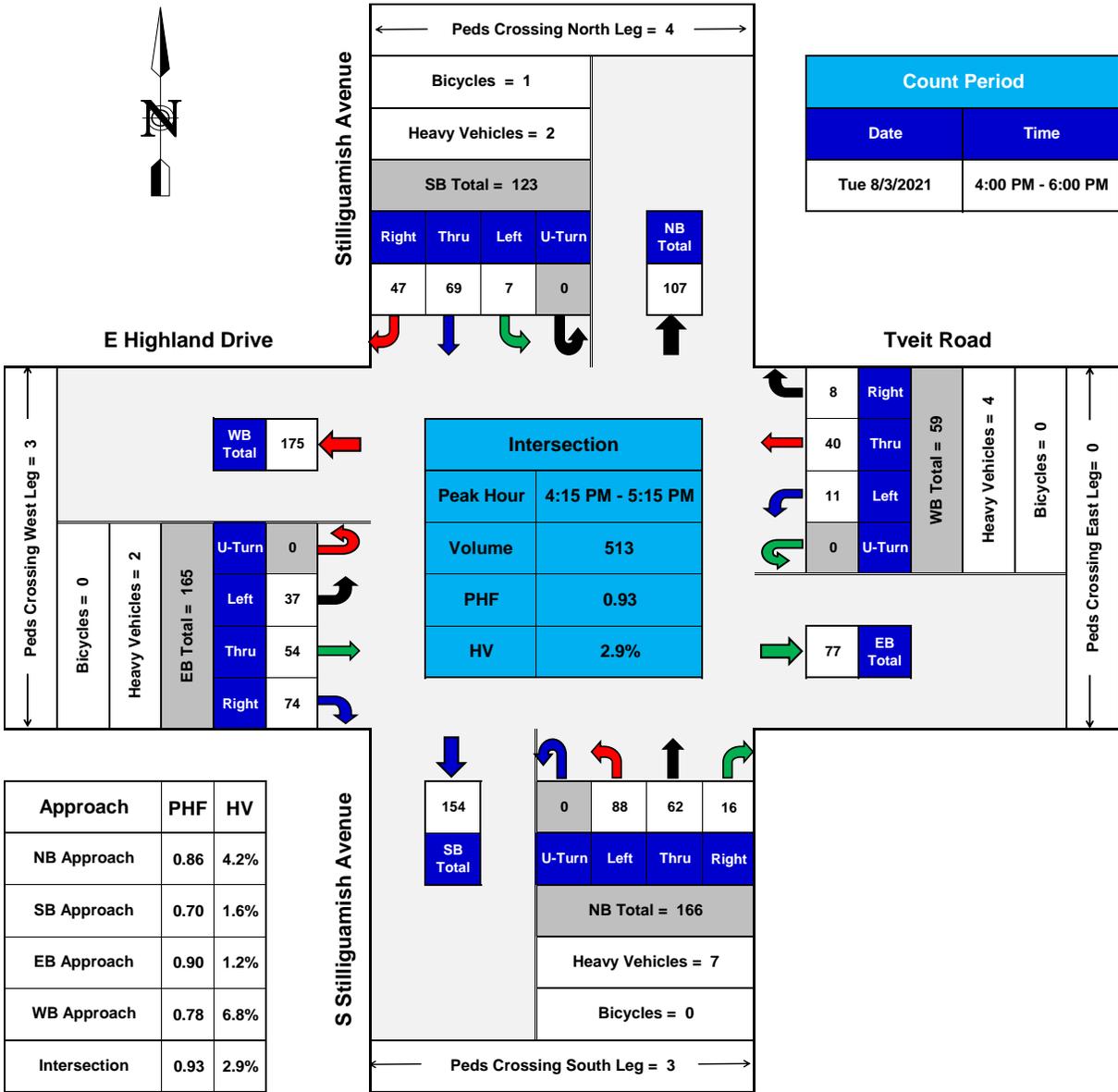
The proposed Pioneer Point development is located along the 207th Street NE alignment, east of Stillaguamish Avenue. The development is proposed to consist of 93 multifamily residential units. The Pioneer Point development is anticipated to generate 681 new daily trips with 43 new AM peak-hour trips and 52 new PM peak-hour trips.

The level of service analysis shows that all of the study intersections are anticipated to operate at acceptable LOS D or better under the 2027 future with development conditions. Improvements at the study intersections should not be a condition of the Pioneer Point development.

The Pioneer Point development will have a total traffic mitigation fee of \$174,460.00 for the impacts to the City of Arlington. The fee is equivalent to \$1,875.91 for each of the 93 units that are proposed to be constructed. Traffic mitigation fees to Snohomish County should not be required. It is important to note that the City of Arlington traffic mitigation fees do not vest and could increase in the future.

Counts and Turning Movement Calculations

Stilliguamish Avenue @ E Highland Drive Arlington, WA

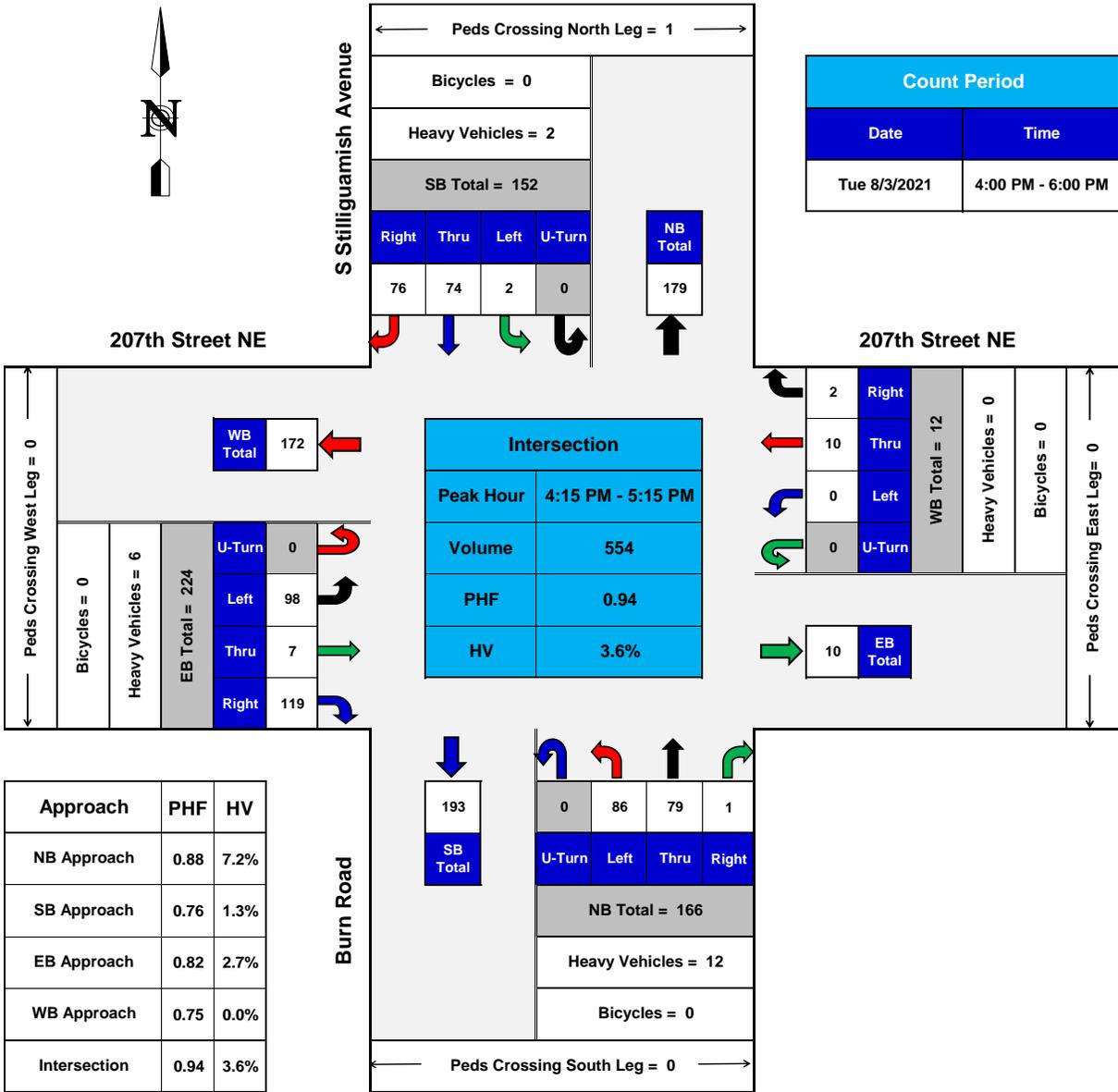


PHF = Peak Hour Factor
HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY



**S Stilliguamish Avenue @ 207th Street NE
Arlington, WA**

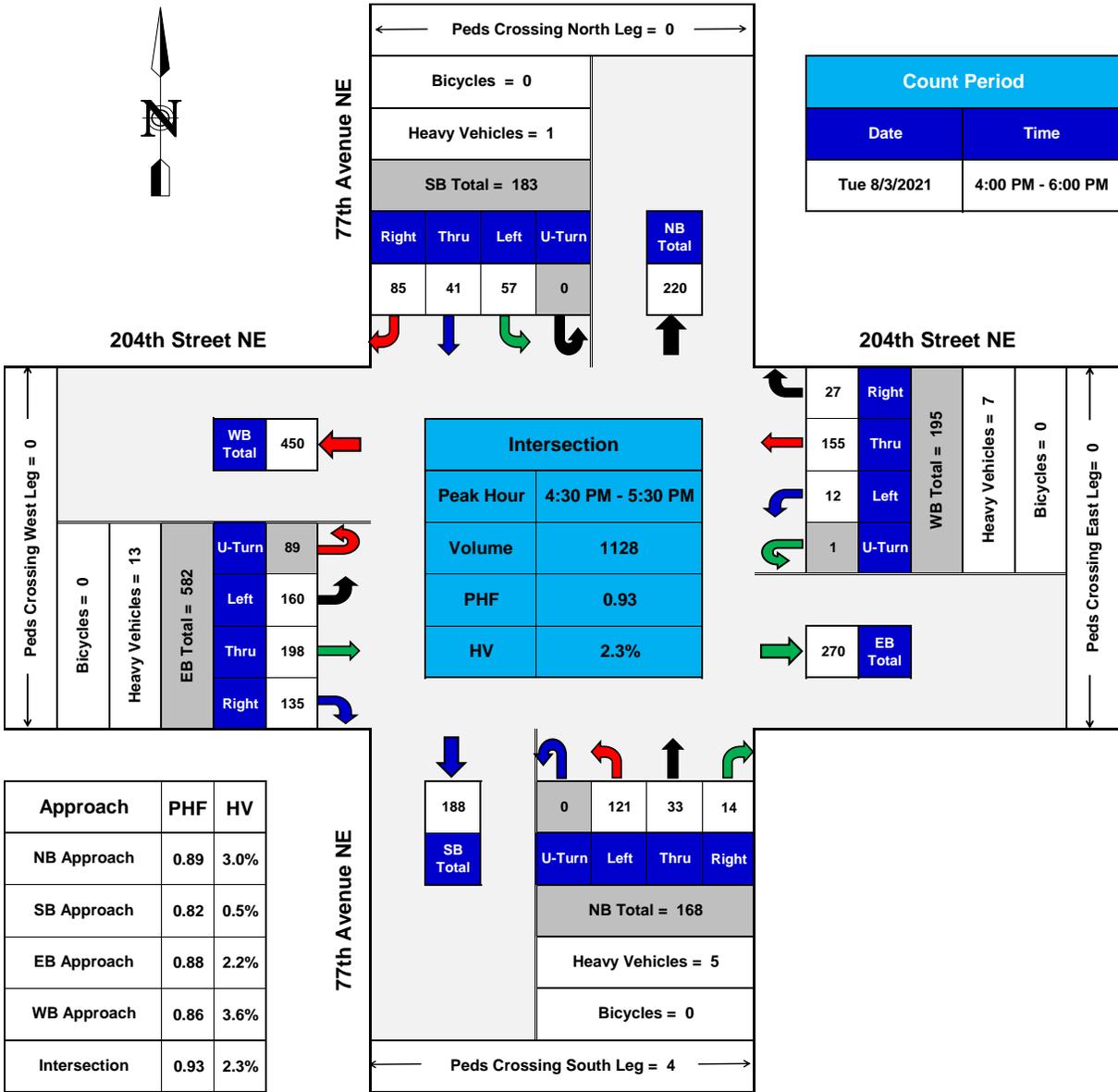


PHF = Peak Hour Factor
HV = Heavy Vehicles

**TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY**



77th Avenue NE @ 204th Street NE
Arlington, WA

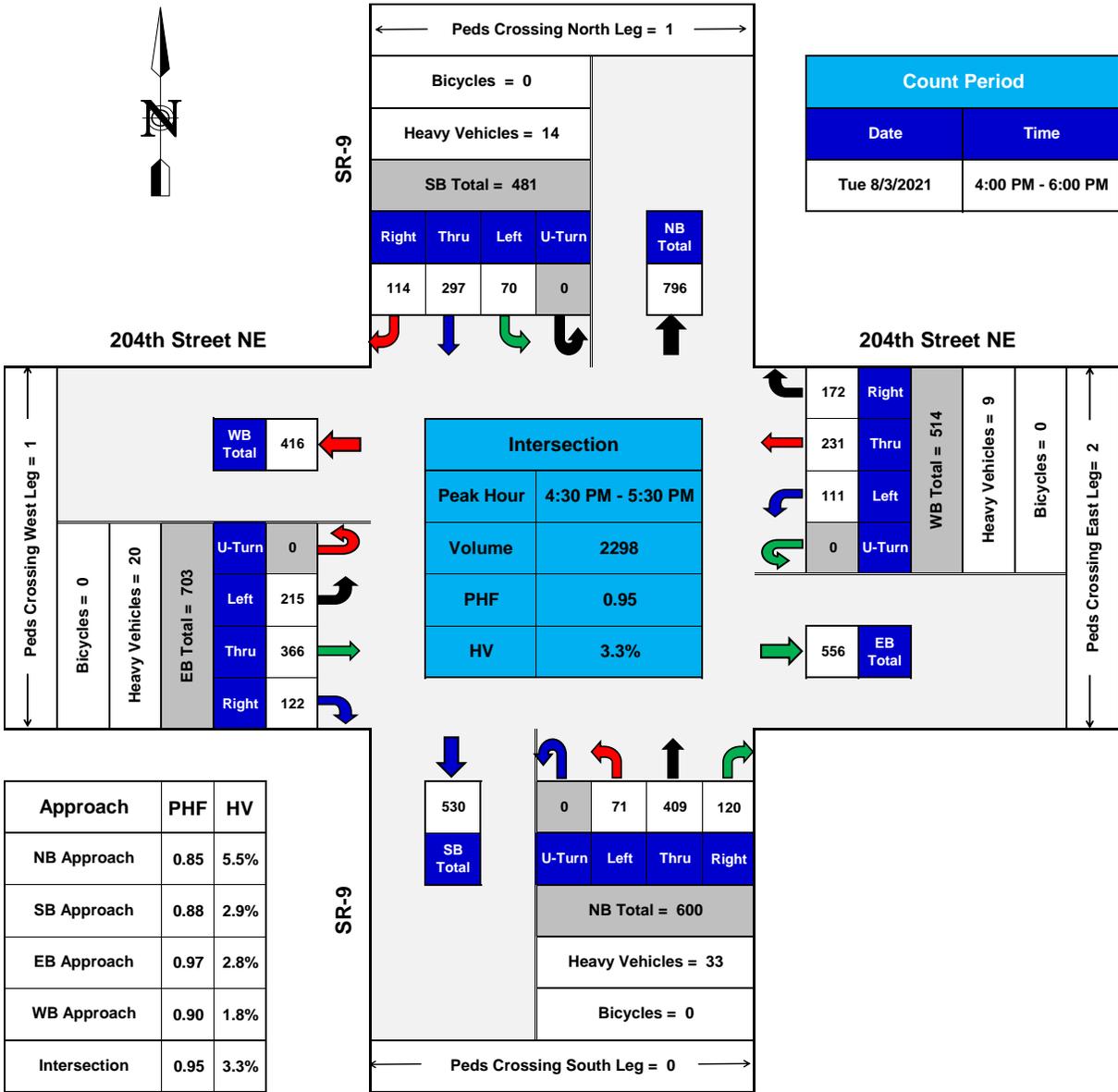


PHF = Peak Hour Factor
 HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY



SR-9 @ 204th Street NE
Arlington, WA

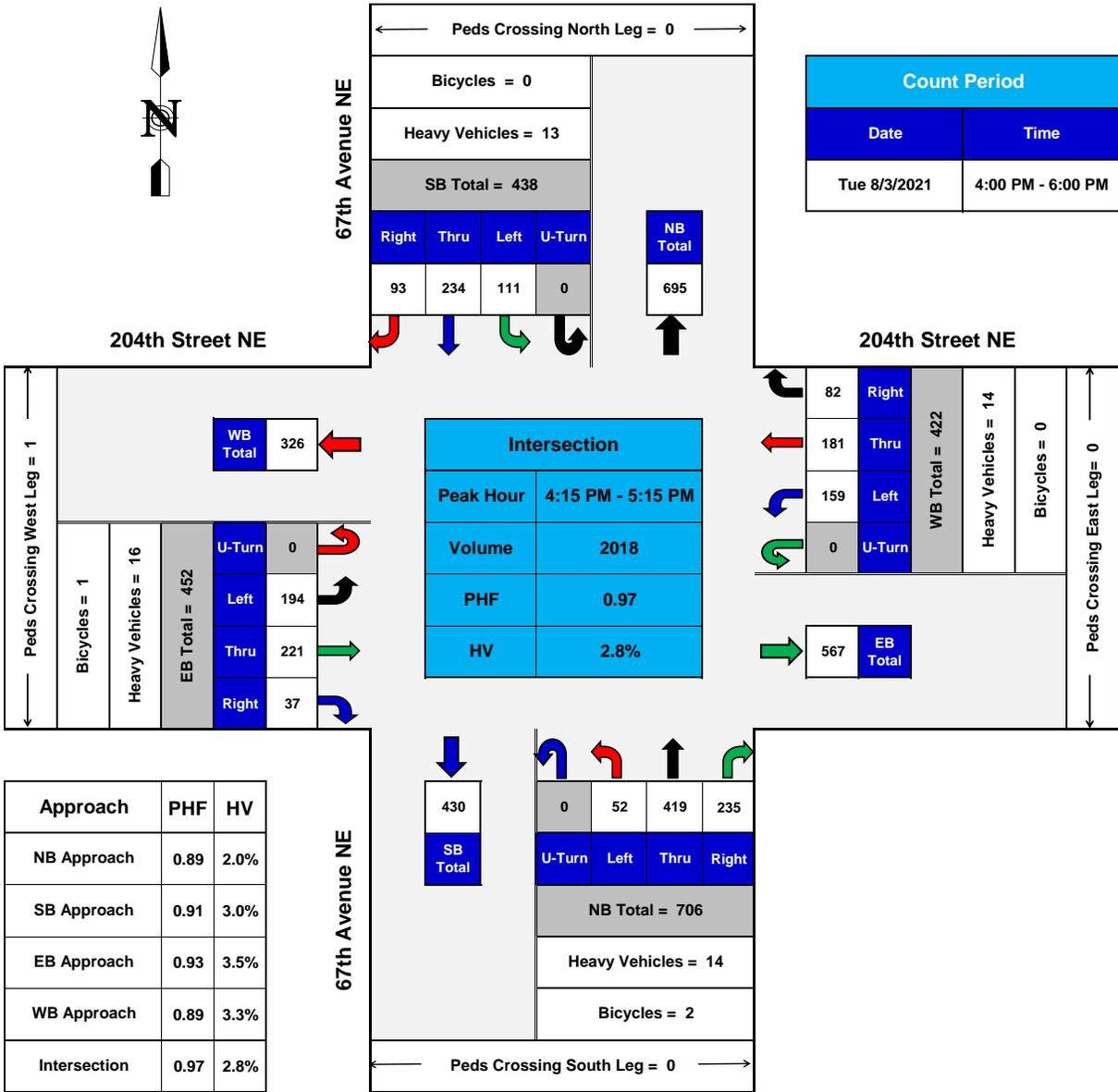


PHF = Peak Hour Factor
 HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY



67th Avenue NE @ 204th Street NE
Arlington, WA



PHF = Peak Hour Factor
 HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY



1 Highland Ave at Stillaguamish

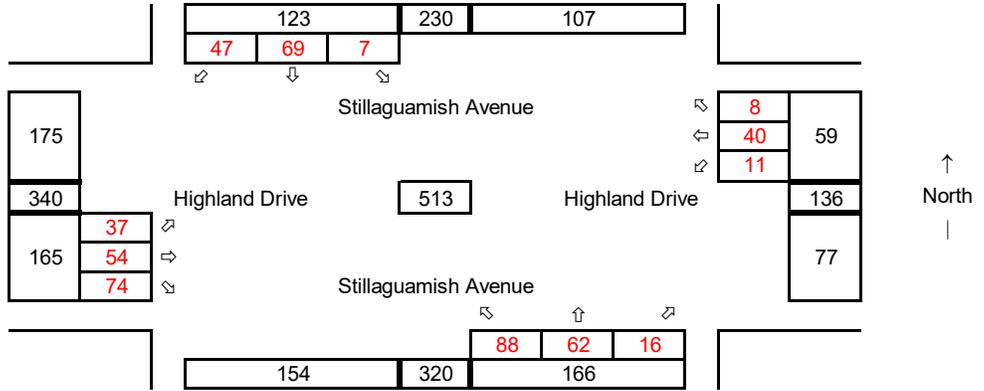
Synchro ID: 1

Existing

Average Weekday
PM Peak-Hour

Year: **8/3/2021**

Data Source: **TDG**



Future without Project

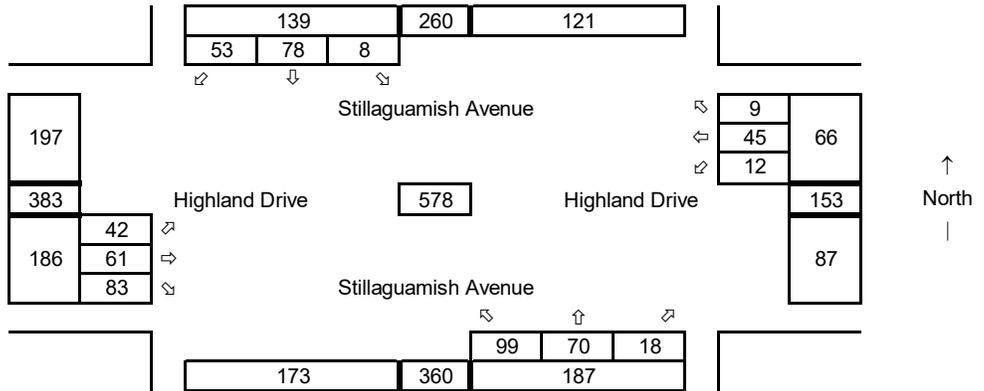
Average Weekday
PM Peak-Hour

Year: **2027**

Growth Rate = **2.0%**

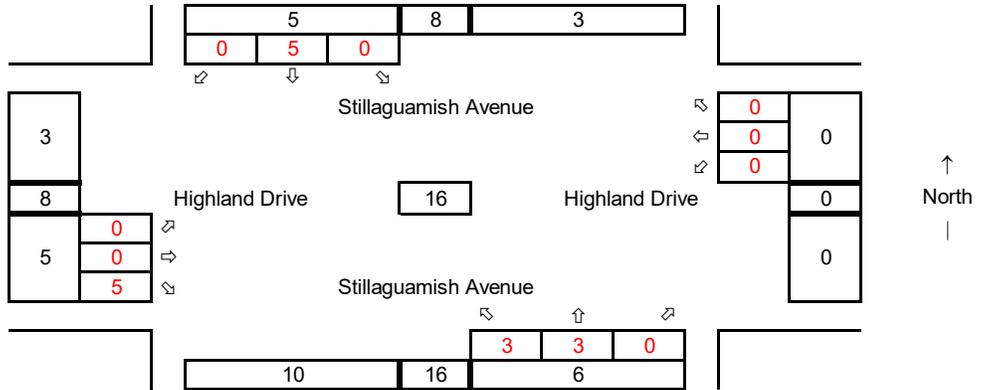
Years of Growth = 6

Total Growth = 1.1262



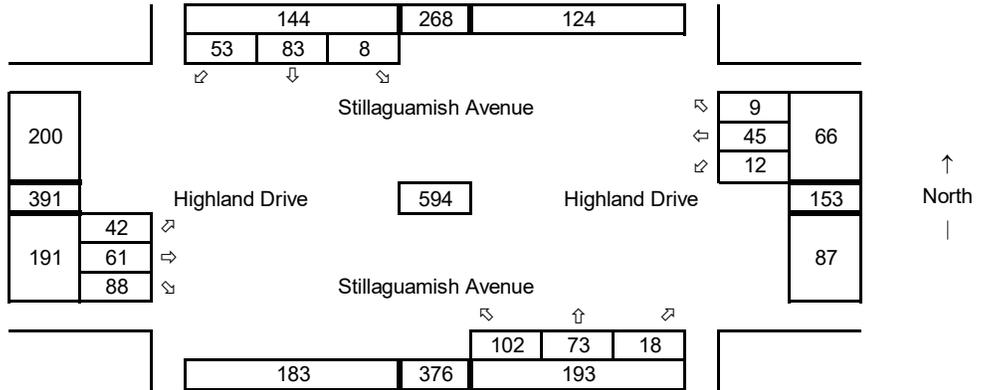
Total Project Trips

Average Weekday
PM Peak-Hour



Future with Project

Average Weekday
PM Peak-Hour



3 204th St NE at 77th Ave NE

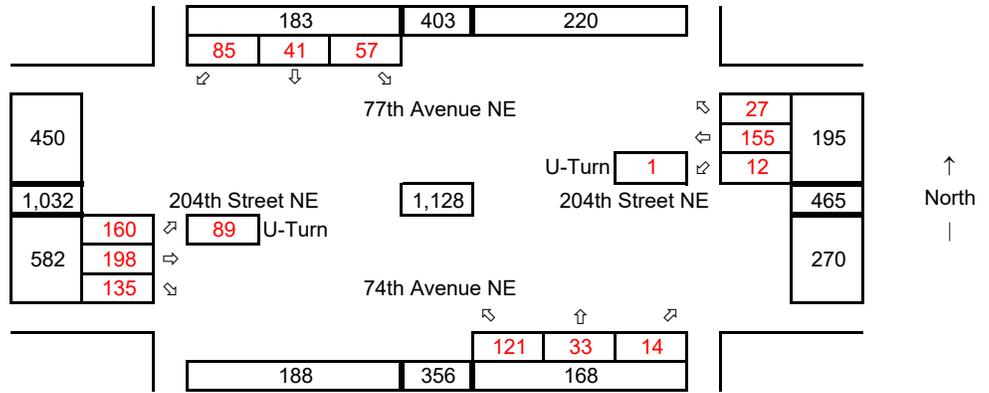
Synchro ID: 3

Existing

Average Weekday
PM Peak-Hour

Year: 8/3/2021

Data Source: TDG



Future without Project

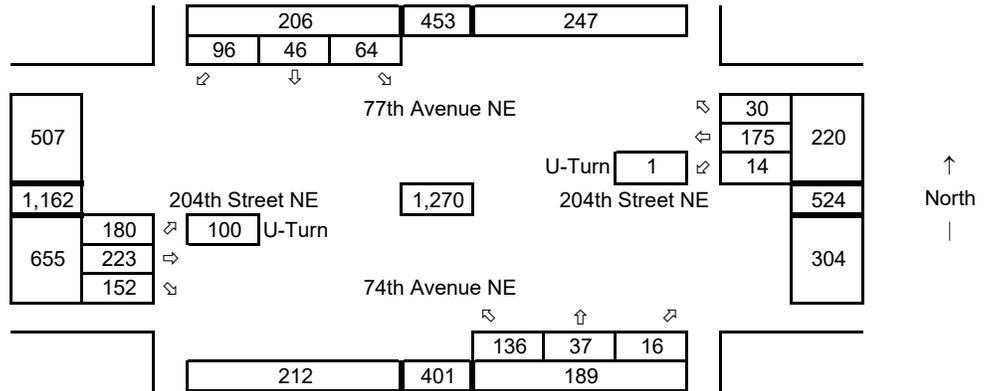
Average Weekday
PM Peak-Hour

Year: 2027

Growth Rate = 2.0%

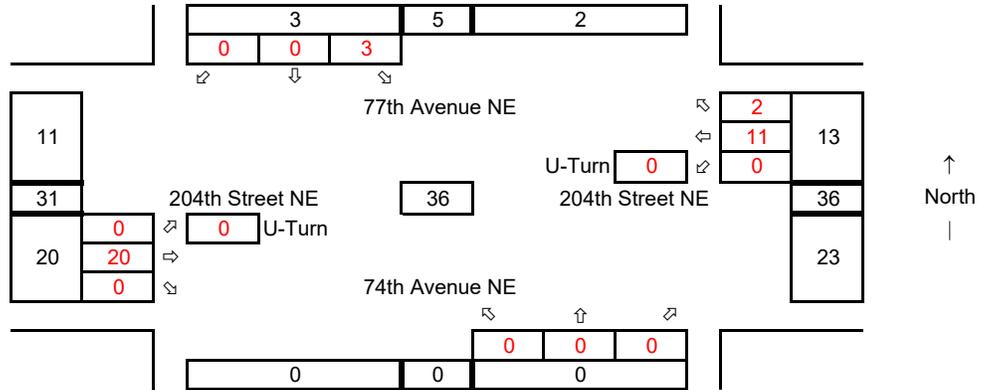
Years of Growth = 6

Total Growth = 1.1262



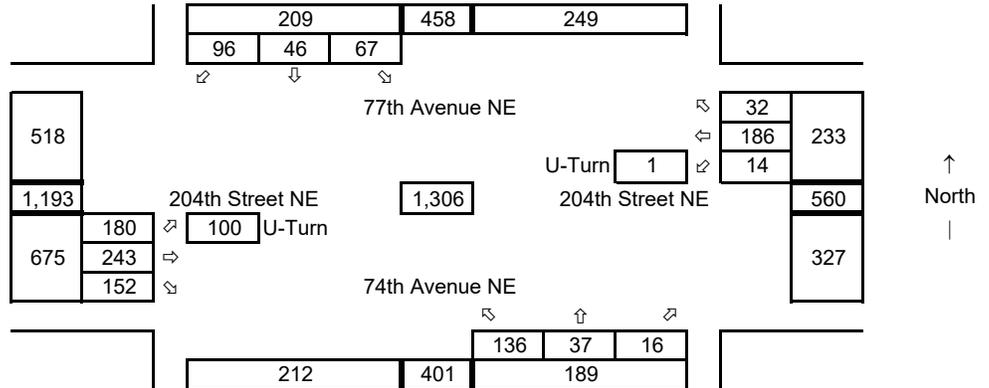
Total Project Trips

Average Weekday
PM Peak-Hour



Future with Project

Average Weekday
PM Peak-Hour



4 204th St NE at SR-9

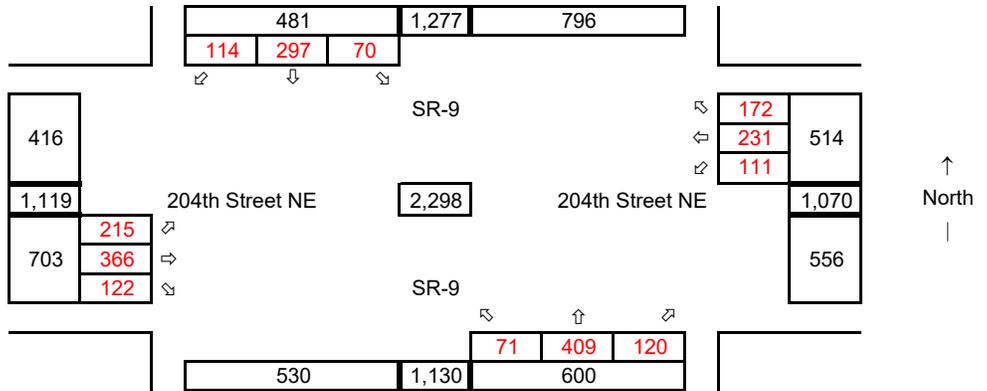
Synchro ID: 4

Existing

Average Weekday
PM Peak-Hour

Year: **8/3/2021**

Data Source: **TDG**



Future without Project

Average Weekday
PM Peak-Hour

Year: 2027

Growth Rate = 2.0%

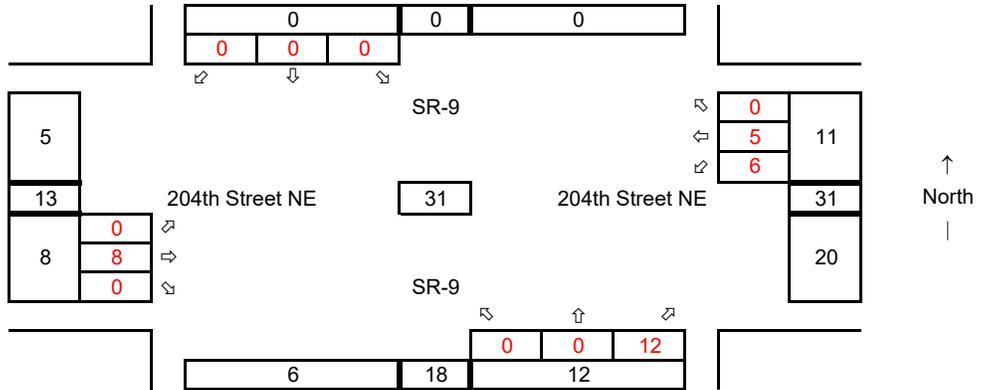
Years of Growth = 6

Total Growth = 1.1262



Total Project Trips

Average Weekday
PM Peak-Hour



Future with Project

Average Weekday
PM Peak-Hour



Level of Service Calculations

HCM 6th AWSC
1: Stillaguamish Avenue & Highland Drive

Pioneer Plaza

Intersection

Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	37	54	74	11	40	8	88	62	16	7	69	47
Future Vol, veh/h	37	54	74	11	40	8	88	62	16	7	69	47
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	40	58	80	12	43	9	95	67	17	8	74	51
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			2		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			2			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	2			1			1			1		
HCM Control Delay	8.9			8.4			9			8.6		
HCM LOS	A			A			A			A		

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	22%	19%	6%
Vol Thru, %	0%	79%	33%	68%	56%
Vol Right, %	0%	21%	45%	14%	38%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	88	78	165	59	123
LT Vol	88	0	37	11	7
Through Vol	0	62	54	40	69
RT Vol	0	16	74	8	47
Lane Flow Rate	95	84	177	63	132
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.151	0.119	0.225	0.086	0.17
Departure Headway (Hd)	5.742	5.094	4.568	4.888	4.634
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	624	702	784	730	771
Service Time	3.485	2.837	2.606	2.936	2.679
HCM Lane V/C Ratio	0.152	0.12	0.226	0.086	0.171
HCM Control Delay	9.5	8.5	8.9	8.4	8.6
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.5	0.4	0.9	0.3	0.6

HCM 6th AWSC
2: Stillaguamish Avenue & 204th Street NE

Pioneer Plaza

Intersection

Intersection Delay, s/veh	9.4
Intersection LOS	A

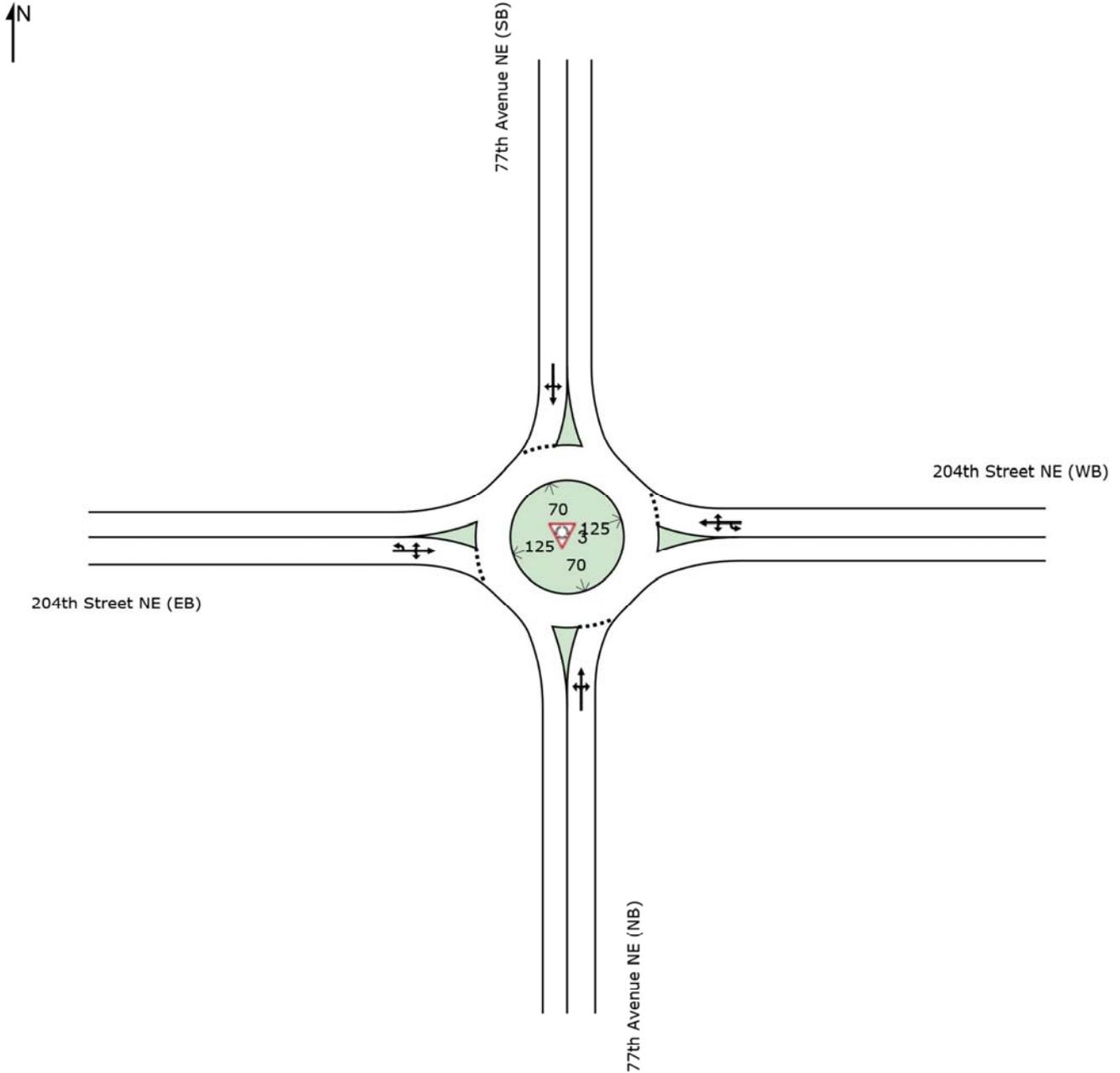
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	98	7	119	0	10	2	86	79	1	2	74	76
Future Vol, veh/h	98	7	119	0	10	2	86	79	1	2	74	76
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	104	7	127	0	11	2	91	84	1	2	79	81
Number of Lanes	1	1	0	0	1	0	1	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			2			1			2		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			2			2			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	2			1			1			2		
HCM Control Delay	9.2			8.9			9.3			9.7		
HCM LOS	A			A			A			A		

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	0%	1%
Vol Thru, %	0%	99%	0%	6%	83%	49%
Vol Right, %	0%	1%	0%	94%	17%	50%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	86	80	98	126	12	152
LT Vol	86	0	98	0	0	2
Through Vol	0	79	0	7	10	74
RT Vol	0	1	0	119	2	76
Lane Flow Rate	91	85	104	134	13	162
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.149	0.127	0.173	0.178	0.02	0.231
Departure Headway (Hd)	5.881	5.369	5.963	4.794	5.667	5.135
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	608	666	601	745	627	697
Service Time	3.633	3.121	3.712	2.543	3.739	3.185
HCM Lane V/C Ratio	0.15	0.128	0.173	0.18	0.021	0.232
HCM Control Delay	9.7	8.9	10	8.6	8.9	9.7
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.5	0.4	0.6	0.6	0.1	0.9

SITE LAYOUT

Site: 3 [2021 Existing]

204th Street NE at 77th Avenue NE
Site Category: PM Peak-Hour
Roundabout



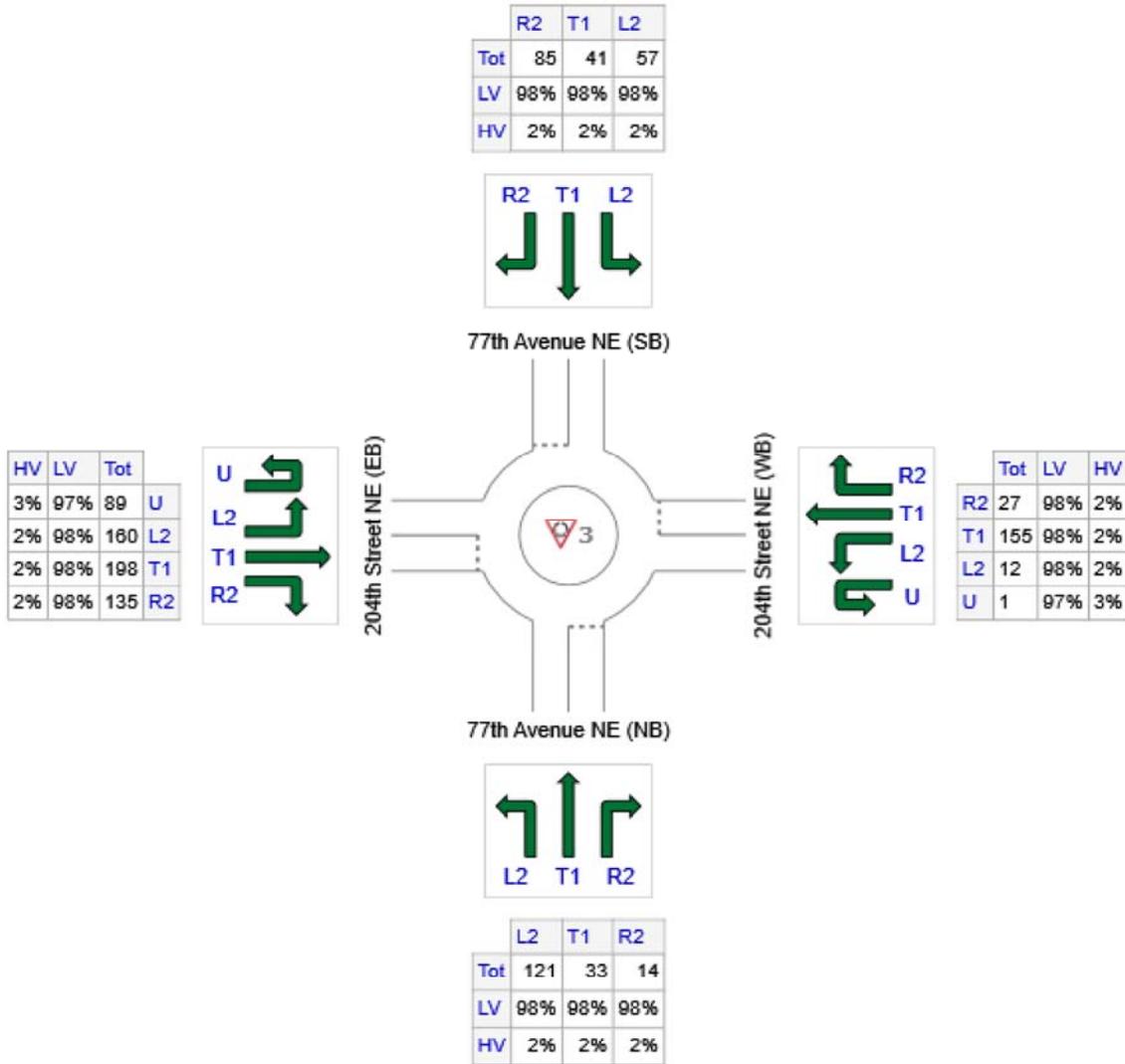
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

 Site: 3 [2021 Existing]

204th Street NE at 77th Avenue NE
 Site Category: PM Peak-Hour
 Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 77th Avenue NE (NB)	168	165	3
E: 204th Street NE (WB)	195	191	4
N: 77th Avenue NE (SB)	183	179	4
W: 204th Street NE (EB)	582	569	13
Total	1128	1105	23

MOVEMENT SUMMARY

Site: 3 [2021 Existing]

204th Street NE at 77th Avenue NE
 Site Category: PM Peak-Hour
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows 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: 77th Avenue NE (NB)												
3	L2	130	2.0	0.233	12.9	LOS B	1.3	32.4	0.64	0.79	0.64	33.8
8	T1	35	2.0	0.233	7.2	LOS A	1.3	32.4	0.64	0.79	0.64	33.9
18	R2	15	2.0	0.233	7.6	LOS A	1.3	32.4	0.64	0.79	0.64	32.7
Approach		181	2.0	0.233	11.4	LOS B	1.3	32.4	0.64	0.79	0.64	33.7
East: 204th Street NE (WB)												
1u	U	1	3.0	0.217	14.4	LOS B	1.1	29.2	0.54	0.62	0.54	36.9
1	L2	13	2.0	0.217	12.0	LOS B	1.1	29.2	0.54	0.62	0.54	36.3
6	T1	167	2.0	0.217	6.1	LOS A	1.1	29.2	0.54	0.62	0.54	36.0
16	R2	29	2.0	0.217	5.8	LOS A	1.1	29.2	0.54	0.62	0.54	35.2
Approach		210	2.0	0.217	6.4	LOS A	1.1	29.2	0.54	0.62	0.54	35.9
North: 77th Avenue NE (SB)												
7	L2	61	2.0	0.224	12.0	LOS B	1.1	29.0	0.54	0.69	0.54	35.3
4	T1	44	2.0	0.224	6.2	LOS A	1.1	29.0	0.54	0.69	0.54	35.4
14	R2	91	2.0	0.224	6.6	LOS A	1.1	29.0	0.54	0.69	0.54	34.1
Approach		197	2.0	0.224	8.2	LOS A	1.1	29.0	0.54	0.69	0.54	34.7
West: 204th Street NE (EB)												
5u	U	97	3.0	0.519	13.1	LOS B	4.0	101.6	0.43	0.57	0.43	36.3
5	L2	172	2.0	0.519	10.7	LOS B	4.0	101.6	0.43	0.57	0.43	35.7
2	T1	213	2.0	0.519	4.7	LOS A	4.0	101.6	0.43	0.57	0.43	35.4
12	R2	145	2.0	0.519	4.5	LOS A	4.0	101.6	0.43	0.57	0.43	34.6
Approach		627	2.2	0.519	7.6	LOS A	4.0	101.6	0.43	0.57	0.43	35.4
All Vehicles		1214	2.1	0.519	8.1	LOS A	4.0	101.6	0.50	0.63	0.50	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: 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.

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Organisation: GIBSON TRAFFIC CONSULTANTS | Processed: Tuesday, August 24, 2021 7:22:10 AM

Project: H:\2021\21-246\Pioneer Point\Sidra\3 - 204th St NE at 77th Ave NE.sip8

Lanes, Volumes, Timings
4: SR-9 & 204th Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	215	366	122	111	231	172	71	409	120	70	297	114
Traffic Volume (vph)	215	366	122	111	231	172	71	409	120	70	297	114
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	150	190	190	190	190	0	200	0	300	0	300	425
Storage Length (ft)	1	1	1	1	1	1	1	1	0	1	1	1
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.97	0.99	0.97	1.00	0.97	1.00	0.99	1.00	1.00	0.98	0.850
Fit	0.950	0.850	0.850	0.950	0.850	0.850	0.950	0.966	0.950	0.950	0.850	0.850
Flt Protected	1752	1845	1752	1845	1752	1752	1772	0	1752	1845	1568	1568
Satd. Flow (prot)	0.322	0.334	0.334	0.322	0.334	0.322	0.334	0.463	0.322	0.334	0.322	0.334
Flt Permitted	593	1845	1518	612	1845	1528	853	1772	0	302	1845	1533
Satd. Flow (perm)	Yes											
Right Turn on Red	110	110	110	110	110	110	110	110	110	110	110	110
Satd. Flow (RTOR)	35	35	35	35	35	35	35	35	35	35	35	35
Link Speed (mph)	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790	2790
Link Distance (ft)	54.4	54.4	54.4	54.4	54.4	54.4	54.4	54.4	54.4	54.4	54.4	54.4
Travel Time (s)	2	2	2	2	2	2	2	2	2	2	2	2
Confl. Peds. (#/ht)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Peak Hour Factor	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Heavy Vehicles (%)	226	385	128	117	243	181	75	557	0	74	313	120
Shared Lane Traffic (%)	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	NA
Lane Group Flow (vph)	5	2	2	6	6	6	8	8	7	4	4	4
Turn Type	5	2	2	6	6	6	8	8	7	4	4	4
Protected Phases	5	2	2	6	6	6	8	8	7	4	4	4
Permitted Phases	5	2	2	6	6	6	8	8	7	4	4	4
Detector Phase	5	2	2	6	6	6	8	8	7	4	4	4
Switch Phase	5	2	2	6	6	6	8	8	7	4	4	4
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	41.9	41.9	9.5	23.5	23.5	9.5	42.3	9.5	40.3	40.3	40.3
Total Split (s)	45.0	45.0	45.0	25.0	30.0	30.0	25.0	42.3	25.0	40.3	40.3	40.3
Total Split (%)	31.6%	31.6%	31.6%	17.6%	21.1%	21.1%	17.6%	29.7%	17.6%	28.3%	28.3%	28.3%
Yellow Time (s)	3.5	3.9	3.9	3.5	3.5	3.5	3.5	4.3	3.5	4.3	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	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	5.9	5.9	5.5	5.5	5.5	6.3	6.3	5.5	6.3	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes											
Recall Mode	None											
Act Effct Green (s)	42.3	27.9	27.9	30.6	21.9	21.9	43.5	36.9	44.7	37.5	37.5	37.5
Act Effct g/C Ratio	0.41	0.27	0.27	0.30	0.21	0.21	0.43	0.36	0.44	0.37	0.37	0.37
v/c Ratio	0.54	0.77	0.26	0.42	0.62	0.39	0.18	0.86	0.30	0.46	0.18	0.18
Control Delay	25.2	45.6	9.2	24.4	44.6	7.7	18.6	48.1	20.8	31.0	3.3	3.3
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	25.2	45.6	9.2	24.4	44.6	7.7	18.6	48.1	20.8	31.0	3.3	3.3
LOS	C	D	A	C	D	A	B	D	C	C	C	A
Approach Delay	33.0	27.9	27.9	33.0	27.9	27.9	33.0	27.9	33.0	27.9	27.9	27.9
Approach LOS	C	C	C	C	C	C	C	D	C	C	C	C

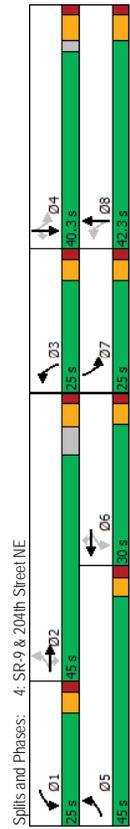
2021 Existing Conditions
Gibson Traffic Consultants, Inc. [BJL GTC#21-246]

2021 Existing Conditions
Gibson Traffic Consultants, Inc. [BJL GTC#21-246]

Lanes, Volumes, Timings
4: SR-9 & 204th Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	99	236	9	48	148	0	26	344	26	160	0	0
Queue Length 95th (ft)	161	367	55	87	246	56	65	#689	64	301	26	26
Internal Link Dist (ft)	150	2710	0	551	551	0	0	981	0	791	0	0
Turn Bay Length (ft)	150	190	190	190	190	200	200	646	300	425	0	0
Base Capacity (vph)	726	816	732	466	481	532	578	646	426	677	656	656
Stallback 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	0.31	0.47	0.17	0.25	0.51	0.34	0.13	0.86	0.17	0.46	0.18	0.18

Intersection Summary
Area Type: Other
Cycle Length: 142.3
Actuated Cycle Length: 102.2
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 32.8
Intersection Capacity Utilization 80.6%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

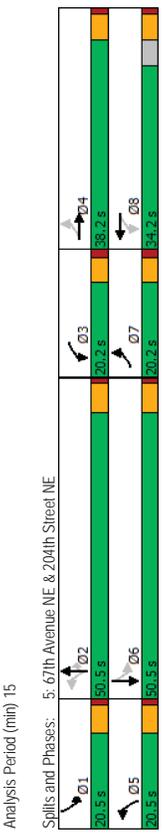


Splits and Phases: 4: SR-9 & 204th Street NE
Phase 1: 25 s
Phase 2: 45 s
Phase 3: 25 s
Phase 4: 25 s
Phase 5: 25 s
Phase 6: 25 s
Phase 7: 25 s
Phase 8: 25 s
Phase 9: 25 s
Phase 10: 25 s
Phase 11: 25 s
Phase 12: 25 s

Lanes, Volumes, Timings
5: 67th Avenue NE & 204th Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Approach LOS	D	D	D	D	D	D	D	D	D	C	C
Queue Length 50th (ft)	103	179	82	179	18	249	35	40	168		
Queue Length 95th (ft)	168	281	139	281	45	424	111	84	295		
Internal Link Dist (ft)	160	573	200	2710	280	958	150	200	1307		
Turn Bay Length (ft)	343	531	353	527	589	737	712	466	790		
Base Capacity (vph)	0	0	0	0	0	0	0	0	0		
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	0.58	0.50	0.46	0.52	0.09	0.59	0.34	0.24	0.43		

Intersection Summary
Area Type: Other
Cycle Length: 129.4
Actuated Cycle Length: 113.5
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Capacity Delay: 33.0
Intersection LOS: C
ICU Level of Service: D
Analysis Period (min): 15



Lanes, Volumes, Timings
5: 67th Avenue NE & 204th Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	194	221	37	159	181	82	52	419	235	111	234
Traffic Volume (vph)	194	221	37	159	181	82	52	419	235	111	234
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	160	200	0	200	0	280	0	200	150	200	0
Storage Length (ft)	1	0	0	1	0	0	1	1	1	1	0
Taper Length (ft)	25	0	0	25	0	25	1.00	1.00	1.00	1.00	1.00
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
Ped Bike Factor	0.979	1.00	1.00	0.953	1.00	0.98	1.00	0.957	0.850	1.00	0.957
Flt Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1752	1799	0	1752	1758	0	1752	1845	1568	1752	1765
Flt Permitted	0.294	0.329	0.489	0.489	0.312	0.312	0.312	0.312	0.312	0.312	0.312
Satd. Flow (perm)	542	1799	0	604	1758	0	902	1845	1532	575	1765
Right Turn on Red	6	Yes	Yes	17	35	35	35	1038	167	17	35
Satd. Flow (RTOR)	35	2790	20.2	54.4	20.2	20.2	20.2	27.0	1	1	6
Link Speed (mph)	653	12.7	4	4	4	4	4	4	1	1	6
Link Distance (ft)	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Travel Time (s)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Confl. Peds. (#/hr)	200	266	0	164	272	0	54	432	242	114	337
Confl. Bikes (#/hr)	pm-plt	INA	pm-plt	INA	INA	pm-plt	5	2	2	6	INA
Peak Hour Factor	7	4	8	8	8	8	8	8	8	8	8
Heavy Vehicles (%)	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Shared Lane Traffic (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Lane Group Flow (vph)	200	266	0	164	272	0	54	432	242	114	337
Turn Type	pm-plt	INA	pm-plt	INA	INA	pm-plt	5	2	2	6	INA
Protected Phases	7	4	8	8	8	8	8	8	8	8	8
Permitted Phases	4	8	8	8	8	8	8	8	8	8	8
Detector Phase	7	4	3	3	3	3	3	3	3	3	3
Switch Phase	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Initial (s)	10.2	38.2	10.2	34.2	10.2	34.2	10.2	34.2	10.2	34.2	10.2
Minimum Split (s)	20.2	38.2	20.2	34.2	20.2	34.2	20.2	34.2	20.2	34.2	20.2
Total Split (s)	15.6%	29.5%	15.6%	26.4%	15.6%	26.4%	15.6%	26.4%	15.6%	26.4%	15.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
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
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	None	None	None	None
Act Effct Green (s)	36.7	23.2	35.7	22.7	36.7	22.7	35.7	22.7	36.7	22.7	35.7
Actuated g/C Ratio	0.32	0.20	0.31	0.20	0.32	0.20	0.31	0.20	0.32	0.20	0.31
v/c Ratio	0.63	0.72	0.51	0.75	0.63	0.72	0.51	0.75	0.63	0.72	0.51
Control Delay	34.9	52.7	31.0	53.4	34.9	52.7	31.0	53.4	34.9	52.7	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	52.7	31.0	53.4	34.9	52.7	31.0	53.4	34.9	52.7	31.0
LOS	C	D	C	D	C	D	C	D	C	D	C
Approach Delay	45.1	24.1	23.3	24.1	45.1	24.1	23.3	24.1	45.1	24.1	23.3

2021 Existing Conditions
Gibson Traffic Consultants, Inc. [BJL GTC#21-246]

2021 Existing Conditions
Gibson Traffic Consultants, Inc. [BJL GTC#21-246]

HCM 6th AWSC
1: Stillaguamish Avenue & Highland Drive

Pioneer Plaza

Intersection

Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔			↔	
Traffic Vol, veh/h	42	61	83	12	45	9	99	70	18	8	78	53
Future Vol, veh/h	42	61	83	12	45	9	99	70	18	8	78	53
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	45	66	89	13	48	10	106	75	19	9	84	57
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			2		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			2			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	2			1			1			1		
HCM Control Delay	9.4			8.7			9.3			9		
HCM LOS	A			A			A			A		

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	23%	18%	6%
Vol Thru, %	0%	80%	33%	68%	56%
Vol Right, %	0%	20%	45%	14%	38%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	99	88	186	66	139
LT Vol	99	0	42	12	8
Through Vol	0	70	61	45	78
RT Vol	0	18	83	9	53
Lane Flow Rate	106	95	200	71	149
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.173	0.137	0.26	0.099	0.197
Departure Headway (Hd)	5.844	5.196	4.685	5.027	4.75
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	611	686	764	708	750
Service Time	3.604	2.956	2.736	3.092	2.812
HCM Lane V/C Ratio	0.173	0.138	0.262	0.1	0.199
HCM Control Delay	9.8	8.8	9.4	8.7	9
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.6	0.5	1	0.3	0.7

HCM 6th AWSC
2: Stillaguamish Avenue & 204th Street NE

Pioneer Plaza

Intersection

Intersection Delay, s/veh	9.8
Intersection LOS	A

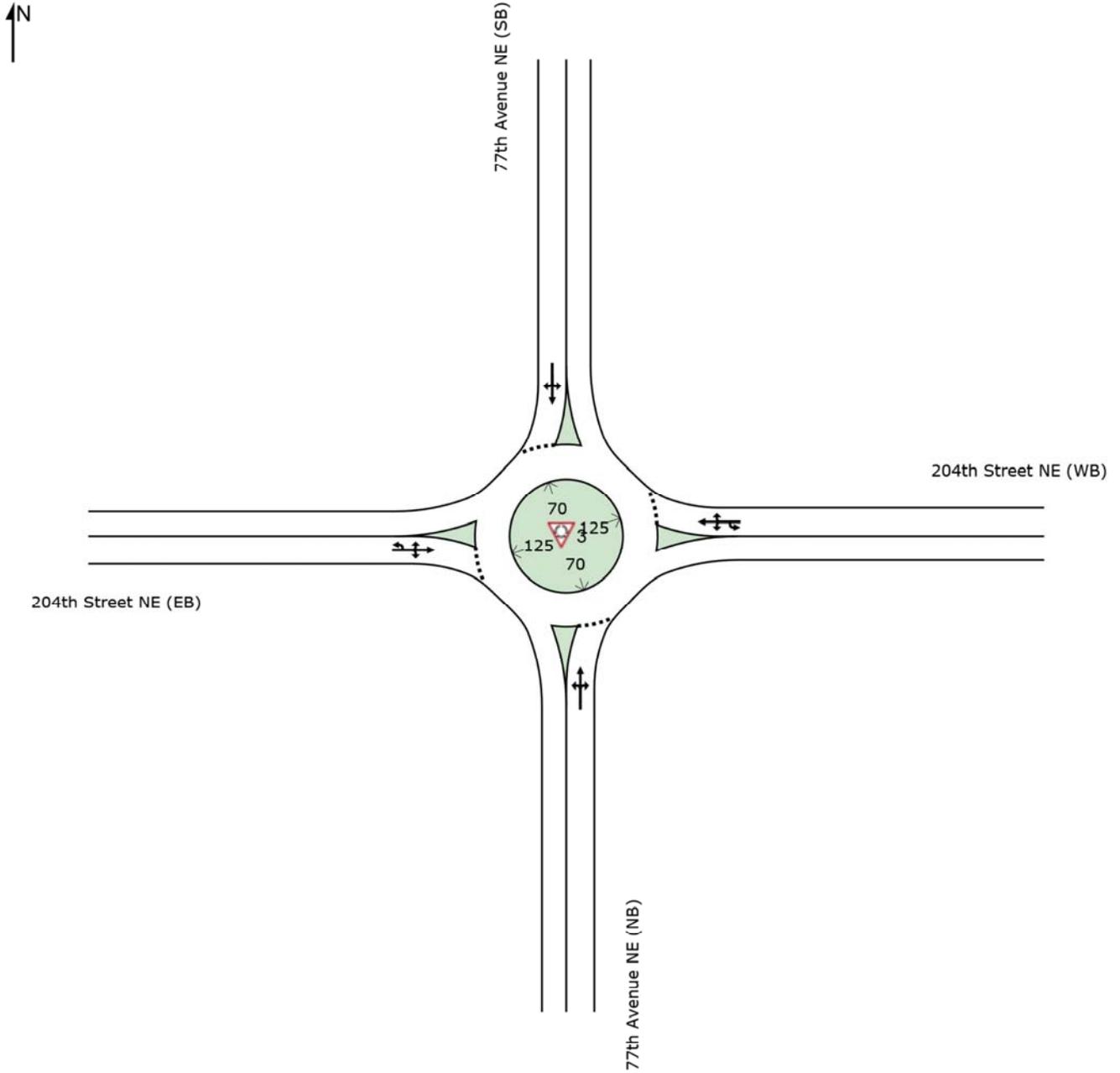
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	110	8	134	0	11	2	97	89	1	2	83	86
Future Vol, veh/h	110	8	134	0	11	2	97	89	1	2	83	86
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	117	9	143	0	12	2	103	95	1	2	88	91
Number of Lanes	1	1	0	0	1	0	1	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			2			1			2		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			2			2			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	2			1			1			2		
HCM Control Delay	9.6			9.1			9.6			10.2		
HCM LOS	A			A			A			B		

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	0%	1%
Vol Thru, %	0%	99%	0%	6%	85%	49%
Vol Right, %	0%	1%	0%	94%	15%	50%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	97	90	110	142	13	171
LT Vol	97	0	110	0	0	2
Through Vol	0	89	0	8	11	83
RT Vol	0	1	0	134	2	86
Lane Flow Rate	103	96	117	151	14	182
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.172	0.146	0.198	0.206	0.022	0.265
Departure Headway (Hd)	5.994	5.482	6.079	4.909	5.843	5.246
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	595	650	587	727	607	680
Service Time	3.762	3.25	3.843	2.673	3.937	3.312
HCM Lane V/C Ratio	0.173	0.148	0.199	0.208	0.023	0.268
HCM Control Delay	10	9.2	10.4	9	9.1	10.2
HCM Lane LOS	A	A	B	A	A	B
HCM 95th-tile Q	0.6	0.5	0.7	0.8	0.1	1.1

SITE LAYOUT

Site: 3 [2027 Baseline]

204th Street NE at 77th Avenue NE
Site Category: PM Peak-Hour
Roundabout



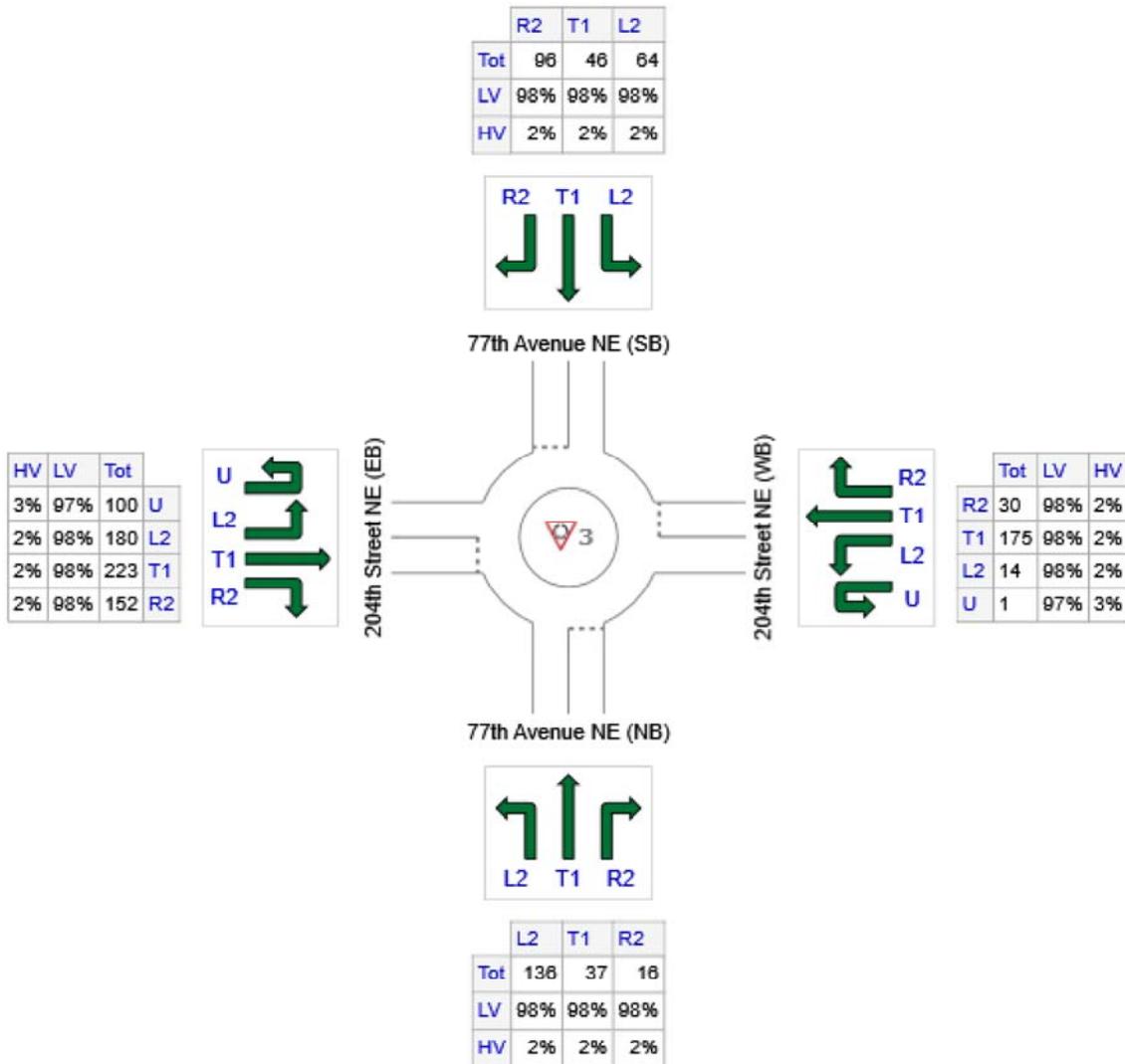
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

 Site: 3 [2027 Baseline]

204th Street NE at 77th Avenue NE
 Site Category: PM Peak-Hour
 Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 77th Avenue NE (NB)	189	185	4
E: 204th Street NE (WB)	220	216	4
N: 77th Avenue NE (SB)	206	202	4
W: 204th Street NE (EB)	655	641	14
Total	1270	1244	26

MOVEMENT SUMMARY

Site: 3 [2027 Baseline]

204th Street NE at 77th Avenue NE
 Site Category: PM Peak-Hour
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows 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: 77th Avenue NE (NB)												
3	L2	146	2.0	0.284	13.6	LOS B	1.6	41.6	0.70	0.83	0.70	33.5
8	T1	40	2.0	0.284	7.9	LOS A	1.6	41.6	0.70	0.83	0.70	33.6
18	R2	17	2.0	0.284	8.3	LOS A	1.6	41.6	0.70	0.83	0.70	32.4
Approach		203	2.0	0.284	12.0	LOS B	1.6	41.6	0.70	0.83	0.70	33.4
East: 204th Street NE (WB)												
1u	U	1	3.0	0.257	14.8	LOS B	1.4	36.3	0.60	0.66	0.60	36.7
1	L2	15	2.0	0.257	12.5	LOS B	1.4	36.3	0.60	0.66	0.60	36.1
6	T1	188	2.0	0.257	6.5	LOS A	1.4	36.3	0.60	0.66	0.60	35.8
16	R2	32	2.0	0.257	6.2	LOS A	1.4	36.3	0.60	0.66	0.60	35.0
Approach		237	2.0	0.257	6.9	LOS A	1.4	36.3	0.60	0.66	0.60	35.7
North: 77th Avenue NE (SB)												
7	L2	69	2.0	0.264	12.4	LOS B	1.4	35.6	0.59	0.73	0.59	35.0
4	T1	49	2.0	0.264	6.7	LOS A	1.4	35.6	0.59	0.73	0.59	35.2
14	R2	103	2.0	0.264	7.1	LOS A	1.4	35.6	0.59	0.73	0.59	33.9
Approach		222	2.0	0.264	8.7	LOS A	1.4	35.6	0.59	0.73	0.59	34.5
West: 204th Street NE (EB)												
5u	U	109	3.0	0.593	13.3	LOS B	5.1	129.3	0.51	0.59	0.51	36.1
5	L2	194	2.0	0.593	11.0	LOS B	5.1	129.3	0.51	0.59	0.51	35.5
2	T1	240	2.0	0.593	5.0	LOS A	5.1	129.3	0.51	0.59	0.51	35.2
12	R2	163	2.0	0.593	4.7	LOS A	5.1	129.3	0.51	0.59	0.51	34.4
Approach		705	2.2	0.593	7.8	LOS A	5.1	129.3	0.51	0.59	0.51	35.2
All Vehicles		1367	2.1	0.593	8.4	LOS A	5.1	129.3	0.56	0.66	0.56	34.9

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: 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.

Lanes, Volumes, Timings
4: SR-9 & 204th Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	242	412	137	125	260	194	80	461	135	79	334	128
Traffic Volume (vph)	242	412	137	125	260	194	80	461	135	79	334	128
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	150	190	190	190	190	190	200	190	0	300	425	425
Storage Length (ft)	1	1	1	1	1	1	1	1	0	1	1	1
Storage Lanes	25	25	25	25	25	25	25	25	0	25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.97	0.99	0.97	1.00	0.99	0.99	0.99	1.00	1.00	0.98	0.98
Frt	0.950	0.850	0.850	0.950	0.850	0.850	0.950	0.850	0.950	0.850	0.850	0.850
Flt Protected	1752	1845	1752	1845	1752	1845	1752	1772	0	1752	1845	1568
Satd. Flow (prot)	0.291	0.284	0.284	0.291	0.284	0.291	0.291	0.291	0.107	0.107	0.107	0.107
Flt Permitted	536	1845	1518	521	1845	1528	732	1772	0	197	1845	1533
Satd. Flow (perm)	Yes											
Right Turn on Red	110	110	110	110	110	110	110	110	0	110	110	149
Satd. Flow (RTOR)	35	35	35	35	35	35	35	35	0	35	35	30
Link Speed (mph)	2790	2790	2790	2790	2790	2790	2790	2790	1061	1061	1061	871
Link Distance (ft)	54.4	54.4	54.4	54.4	54.4	54.4	54.4	54.4	24.1	24.1	24.1	19.8
Travel Time (s)	2	2	2	2	2	2	2	2	2	2	2	2
Confl. Peds. (#/ht)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Peak Hour Factor	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Heavy Vehicles (%)	255	434	144	132	274	204	84	627	0	83	352	135
Shared Lane Traffic (%)	NA											
Lane Group Flow (vph)	pm+pt	2	2	2	2	2	2	2	2	2	2	2
Turn Type	5	2	2	2	2	2	2	2	2	2	2	2
Protected Phases	5	2	2	2	2	2	2	2	2	2	2	2
Permitted Phases	5	2	2	2	2	2	2	2	2	2	2	2
Detector Phase	5	2	2	2	2	2	2	2	2	2	2	2
Switch Phase	5	2	2	2	2	2	2	2	2	2	2	2
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.5	41.9	41.9	9.5	23.5	23.5	9.5	42.3	9.5	40.3	40.3	40.3
Total Split (s)	45.0	45.0	45.0	25.0	30.0	30.0	25.0	42.3	25.0	40.3	40.3	40.3
Total Split (%)	31.6%	31.6%	31.6%	17.6%	21.1%	21.1%	17.6%	29.7%	17.6%	28.3%	28.3%	28.3%
Yellow Time (s)	3.5	3.9	3.9	3.5	3.5	3.5	3.5	4.3	3.5	4.3	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	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	5.9	5.9	5.5	5.5	5.5	5.5	6.3	5.5	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes											
Recall Mode	None											
Act Effct Green (s)	47.0	31.5	31.5	33.9	24.4	43.8	36.8	45.1	37.4	37.4	37.4	37.4
Actuated g/C Ratio	0.44	0.29	0.29	0.32	0.23	0.23	0.41	0.34	0.42	0.35	0.35	0.35
v/c Ratio	0.60	0.80	0.27	0.48	0.65	0.40	0.23	1.02	0.41	0.55	0.21	0.21
Control Delay	26.1	47.6	10.6	25.8	46.6	7.6	20.4	78.0	24.9	35.0	4.9	4.9
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	26.1	47.6	10.6	25.8	46.6	7.6	20.4	78.0	24.9	35.0	4.9	4.9
LOS	C	D	B	C	D	A	C	E	C	D	A	A
Approach Delay	34.6	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
Approach LOS	C	C	C	C	C	C	C	E	C	C	C	C

2027 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL #21-246]

PM Peak-Hour

Lanes, Volumes, Timings
4: SR-9 & 204th Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 500h (ft)	116	280	17	55	175	0	33	490	32	204	0	0
Queue Length 95th (ft)	183	431	68	98	291	61	71	829	71	348	38	38
Internal Link Dist (ft)	150	2710	0	0	551	0	0	981	0	791	0	0
Turn Bay Length (ft)	150	190	190	190	190	200	200	616	300	645	425	425
Base Capacity (vph)	703	778	703	442	471	542	523	616	379	645	633	633
Stallback 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	0.36	0.56	0.20	0.30	0.58	0.38	0.16	1.02	0.22	0.55	0.21	0.21
Intersection Summary	Other											
Area Type:	Other											
Cycle Length:	142.3											
Actuated Cycle Length:	106.9											
Natural Cycle:	105											
Control Type:	Actuated-Uncoordinated											
Maximum v/c Ratio:	1.02											
Intersection Signal Delay:	41.2											
Intersection Capacity Utilization:	86.3%											
Analysis Period (min):	15											
Intersection LOS:	D											
ICU Level of Service:	E											
Volume shown is maximum after two cycles.												
Queue shown is maximum after two cycles.												
95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												
Spills and Phases:	4: SR-9 & 204th Street NE											
Ø1	35 s	45 s	Ø2	25 s	Ø3	25 s	Ø4	40.3 s	Ø5	35 s	Ø6	30 s
Ø7	25 s	Ø8	42.3 s	Ø9	25 s	Ø10	25 s	Ø11	25 s	Ø12	25 s	Ø13

2027 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL #21-246]

PM Peak-Hour

Lanes, Volumes, Timings
5: 67th Avenue NE & 204th Street NE

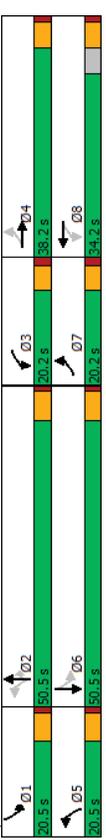
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Traffic Volume (vph)	218	249	42	179	204	92	59	472	265	125	264	105
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	160	1900	0	200	1900	0	280	1900	150	200	0	0
Storage Length (ft)	1	0	0	1	0	0	1	1	1	1	0	0
Storage Lanes	25	1	0	1	0	0	1	1	1	1	0	0
Taper Length (ft)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	0.978	0.978	0.953	0.953	0.953	0.953	0.953	0.953	0.953	0.953	0.957	0.957
Flt Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.957	0.957
Satd. Flow (prot)	1752	1797	0	1752	1758	0	1752	1845	1568	1752	1765	0
Flt Permitted	0.249	0.274	0.274	0.274	0.274	0.274	0.440	0.246	0.246	0.246	0.246	0
Satd. Flow (perm)	459	1797	0	503	1758	0	812	1845	1532	454	1765	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	6	17		17	35		35	167	167	17	35	17
Link Speed (mph)	35	35		35	35		35	1038	1038	35	35	35
Link Distance (ft)	653	653		2790	2790		20.2	20.2	20.2	27.0	27.0	27.0
Travel Time (s)	12.7	12.7	4	4	4		4	4	4	4	4	4
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	225	300	0	185	305	0	61	487	273	129	380	0
Turn Type	pm-pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	NA
Protected Phases	7	4	3	8	8	5	2	2	2	1	6	6
Permitted Phases	4	8	8	8	8	2	2	2	2	6	6	6
Detector Phase	7	4	3	8	8	5	2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.2	38.2	10.2	34.2	34.2	10.5	35.5	35.5	35.5	10.5	28.5	10.0
Total Split (s)	20.2	38.2	20.2	34.2	34.2	20.5	50.5	50.5	50.5	20.5	50.5	50.5
Total Split (%)	15.6%	29.5%	15.6%	26.4%	26.4%	15.8%	39.0%	39.0%	39.0%	15.8%	39.0%	39.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lag	Lag
Lead/Lag Optimize?	Yes											
Recall Mode	None											
Act Effct Green (s)	39.1	25.1	38.2	24.6	24.6	53.9	45.3	45.3	45.3	59.9	50.6	50.6
Actuated g/C Ratio	0.34	0.22	0.33	0.21	0.21	0.46	0.39	0.39	0.39	0.51	0.43	0.43
v/c Ratio	0.73	0.77	0.60	0.79	0.79	0.14	0.68	0.39	0.36	0.36	0.49	0.49
Control Delay	41.0	56.3	33.9	57.0	57.0	16.2	37.4	12.9	18.2	28.0	28.0	28.0
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	41.0	56.3	33.9	57.0	57.0	16.2	37.4	12.9	18.2	28.0	28.0	28.0
LOS	D	E	E	C	E	B	D	B	B	B	C	C
Approach Delay		49.7		48.3			27.6				25.5	

2027 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL #21-246]

Lanes, Volumes, Timings
5: 67th Avenue NE & 204th Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	D	D	D	D	D	D	C	C	C	C	C	C
Queue Length 50th (ft)	119	211	211	95	208	208	22	307	53	49	206	206
Queue Length 95th (ft)	191	323	323	158	322	322	50	496	140	93	341	341
Internal Link Dist (ft)	160	573	573	200	2710	2710	280	958	150	200	1307	1307
Turn Bay Length (ft)	325	516	516	333	513	513	540	717	697	408	776	776
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0	0	0
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	0.69	0.58	0.58	0.56	0.59	0.59	0.11	0.68	0.39	0.32	0.49	0.49

Intersection Summary
Area Type: Other
Cycle Length: 129.4
Actuated Cycle Length: 116.6
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Capacity Delay: 36.4
Intersection LOS: D
ICU Level of Service: D
Analysis Period (min) 15



2027 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL #21-246]

HCM 6th AWSC
1: Stillaguamish Avenue & Highland Drive

Portage Creek Townhomes

Intersection

Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔			↔	
Traffic Vol, veh/h	42	61	88	12	45	9	102	73	18	8	83	53
Future Vol, veh/h	42	61	88	12	45	9	102	73	18	8	83	53
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	45	66	95	13	48	10	110	78	19	9	89	57
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			2		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			2			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	2			1			1			1		
HCM Control Delay	9.5			8.7			9.4			9.1		
HCM LOS	A			A			A			A		

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	22%	18%	6%
Vol Thru, %	0%	80%	32%	68%	58%
Vol Right, %	0%	20%	46%	14%	37%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	102	91	191	66	144
LT Vol	102	0	42	12	8
Through Vol	0	73	61	45	83
RT Vol	0	18	88	9	53
Lane Flow Rate	110	98	205	71	155
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.179	0.142	0.269	0.1	0.206
Departure Headway (Hd)	5.864	5.221	4.707	5.069	4.781
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	609	682	760	702	745
Service Time	3.632	2.988	2.76	3.138	2.849
HCM Lane V/C Ratio	0.181	0.144	0.27	0.101	0.208
HCM Control Delay	9.9	8.9	9.5	8.7	9.1
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.6	0.5	1.1	0.3	0.8

HCM 6th AWSC
 2: Stillaguamish Avenue & 204th Street NE

Portage Creek Townhomes

Intersection

Intersection Delay, s/veh	10.1
Intersection LOS	B

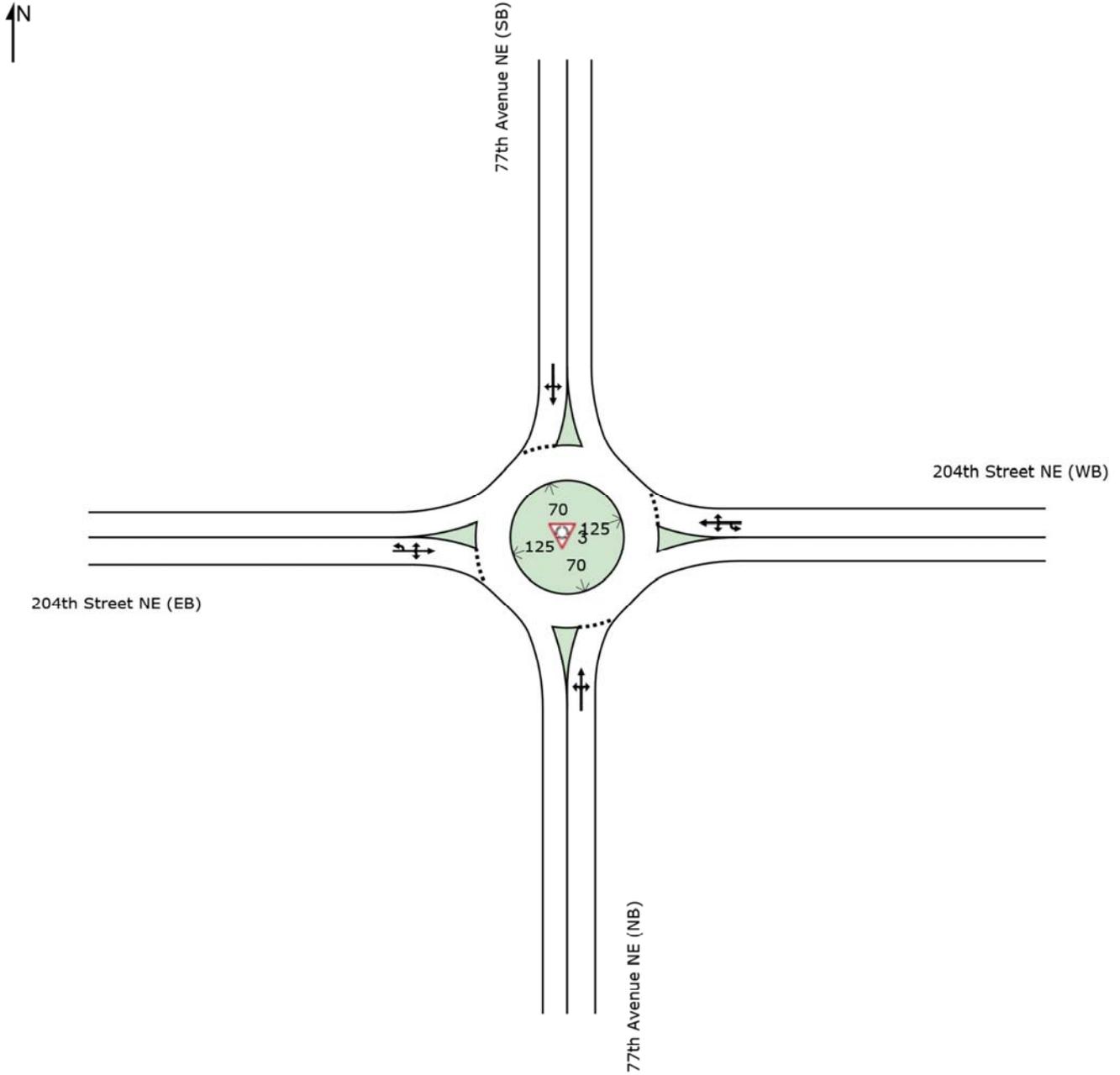
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	110	31	134	0	24	8	97	89	1	12	83	86
Future Vol, veh/h	110	31	134	0	24	8	97	89	1	12	83	86
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	117	33	143	0	26	9	103	95	1	13	88	91
Number of Lanes	1	1	0	0	1	0	1	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			2			1			2		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			2			2			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	2			1			1			2		
HCM Control Delay	9.9			9.3			9.9			10.7		
HCM LOS	A			A			A			B		

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	0%	7%
Vol Thru, %	0%	99%	0%	19%	75%	46%
Vol Right, %	0%	1%	0%	81%	25%	48%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	97	90	110	165	32	181
LT Vol	97	0	110	0	0	12
Through Vol	0	89	0	31	24	83
RT Vol	0	1	0	134	8	86
Lane Flow Rate	103	96	117	176	34	193
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.176	0.15	0.2	0.247	0.057	0.289
Departure Headway (Hd)	6.138	5.626	6.149	5.072	5.982	5.4
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	580	631	579	700	602	659
Service Time	3.928	3.415	3.933	2.855	3.982	3.486
HCM Lane V/C Ratio	0.178	0.152	0.202	0.251	0.056	0.293
HCM Control Delay	10.3	9.4	10.5	9.5	9.3	10.7
HCM Lane LOS	B	A	B	A	A	B
HCM 95th-tile Q	0.6	0.5	0.7	1	0.2	1.2

SITE LAYOUT

Site: 3 [2027 Future w Development]

204th Street NE at 77th Avenue NE
Site Category: PM Peak-Hour
Roundabout



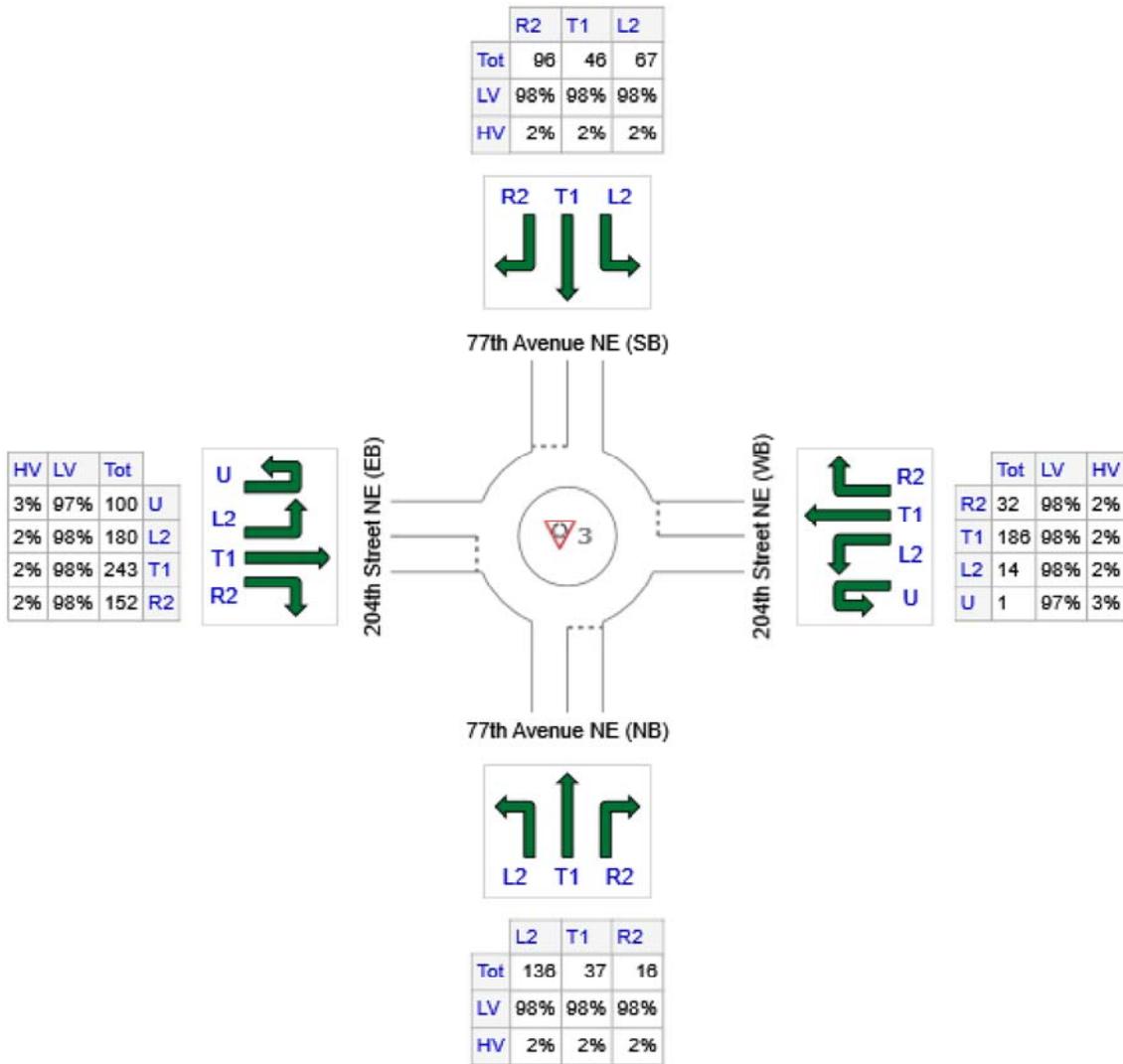
INPUT VOLUMES

Vehicles and pedestrians per 60 minutes

 Site: 3 [2027 Future w Development]

204th Street NE at 77th Avenue NE
 Site Category: PM Peak-Hour
 Roundabout

Volume Display Method: Total and %



	All MCs	Light Vehicles (LV)	Heavy Vehicles (HV)
S: 77th Avenue NE (NB)	189	185	4
E: 204th Street NE (WB)	233	228	5
N: 77th Avenue NE (SB)	209	205	4
W: 204th Street NE (EB)	675	661	15
Total	1306	1279	27

MOVEMENT SUMMARY

Site: 3 [2027 Future w Development]

204th Street NE at 77th Avenue NE
 Site Category: PM Peak-Hour
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows 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: 77th Avenue NE (NB)												
3	L2	146	2.0	0.292	13.9	LOS B	1.7	43.4	0.72	0.84	0.72	33.3
8	T1	40	2.0	0.292	8.1	LOS A	1.7	43.4	0.72	0.84	0.72	33.5
18	R2	17	2.0	0.292	8.5	LOS A	1.7	43.4	0.72	0.84	0.72	32.3
Approach		203	2.0	0.292	12.3	LOS B	1.7	43.4	0.72	0.84	0.72	33.3
East: 204th Street NE (WB)												
1u	U	1	3.0	0.272	14.8	LOS B	1.5	39.0	0.60	0.66	0.60	36.7
1	L2	15	2.0	0.272	12.5	LOS B	1.5	39.0	0.60	0.66	0.60	36.1
6	T1	200	2.0	0.272	6.5	LOS A	1.5	39.0	0.60	0.66	0.60	35.8
16	R2	34	2.0	0.272	6.2	LOS A	1.5	39.0	0.60	0.66	0.60	35.0
Approach		251	2.0	0.272	6.9	LOS A	1.5	39.0	0.60	0.66	0.60	35.7
North: 77th Avenue NE (SB)												
7	L2	72	2.0	0.270	12.5	LOS B	1.4	36.8	0.60	0.74	0.60	35.0
4	T1	49	2.0	0.270	6.8	LOS A	1.4	36.8	0.60	0.74	0.60	35.1
14	R2	103	2.0	0.270	7.2	LOS A	1.4	36.8	0.60	0.74	0.60	33.8
Approach		225	2.0	0.270	8.8	LOS A	1.4	36.8	0.60	0.74	0.60	34.4
West: 204th Street NE (EB)												
5u	U	109	3.0	0.613	13.4	LOS B	5.4	137.9	0.53	0.59	0.53	36.0
5	L2	194	2.0	0.613	11.0	LOS B	5.4	137.9	0.53	0.59	0.53	35.4
2	T1	261	2.0	0.613	5.1	LOS A	5.4	137.9	0.53	0.59	0.53	35.2
12	R2	163	2.0	0.613	4.8	LOS A	5.4	137.9	0.53	0.59	0.53	34.4
Approach		727	2.1	0.613	7.8	LOS A	5.4	137.9	0.53	0.59	0.53	35.2
All Vehicles		1405	2.1	0.613	8.5	LOS A	5.4	137.9	0.58	0.66	0.58	34.9

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: 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.

Lanes, Volumes, Timings
4: SR-9 & 204th Street NE

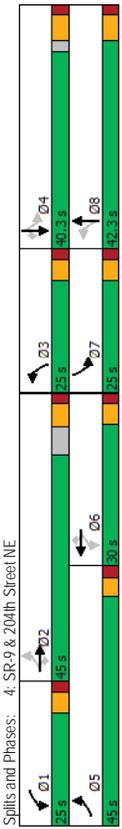
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	242	420	137	131	265	194	80	461	147	79	334	128
Traffic Volume (vph)	242	420	137	131	265	194	80	461	147	79	334	128
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	150	190	190	190	190	190	200	190	0	300	425	425
Storage Length (ft)	1	1	1	1	1	1	1	1	0	0	1	1
Storage Lanes	25	25	25	25	25	25	25	25	0	25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.97	0.97	0.97	0.97	0.97	0.99	0.99	0.964	1.00	0.98	0.850
Fit	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.964	0.950	0.850	0.850
Flt Protected	1752	1845	1568	1752	1845	1568	1752	1768	0	1752	1845	1568
Satd. Flow (prot)	0.291	0.271	0.271	0.271	0.271	0.271	0.393	0.393	0.107	0.107	0.107	0.107
Flt Permitted	536	1845	1518	497	1845	1528	724	1768	0	197	1845	1533
Satd. Flow (perm)	Yes											
Right Turn on Red	110	110	110	204	204	204	11	11	0	197	1845	1533
Satd. Flow (RTOR)	35	35	35	35	35	35	30	30	0	197	1845	1533
Link Speed (mph)	2790	2790	2790	631	631	631	1061	1061	0	197	1845	1533
Link Distance (ft)	54.4	54.4	54.4	12.3	12.3	12.3	24.1	24.1	0	19.8	19.8	19.8
Travel Time (s)	2	2	2	6	6	6	2	2	2	2	2	2
Confl. Peds. (#/hr)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Peak Hour Factor	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Heavy Vehicles (%)	255	442	144	138	279	204	84	640	0	83	352	135
Shared Lane Traffic (%)	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	NA	pm+pt	NA	Perm
Lane Group Flow (vph)	5	2	2	6	6	6	8	8	0	7	4	4
Turn Type	5	2	2	6	6	6	8	8	0	7	4	4
Protected Phases	5	2	2	6	6	6	8	8	0	7	4	4
Permitted Phases	5	2	2	6	6	6	8	8	0	7	4	4
Detector Phase	5	2	2	6	6	6	8	8	0	7	4	4
Switch Phase	5	2	2	6	6	6	8	8	0	7	4	4
Minimum Initial (s)	5.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	0	3.0	5.0	5.0
Minimum Split (s)	10.5	41.9	41.9	9.5	23.5	23.5	9.5	42.3	0	9.5	40.3	40.3
Total Split (s)	45.0	45.0	45.0	25.0	30.0	30.0	25.0	42.3	0	25.0	40.3	40.3
Total Split (%)	31.6%	31.6%	31.6%	17.6%	21.1%	21.1%	17.6%	29.7%	0	17.6%	28.3%	28.3%
Yellow Time (s)	3.5	3.9	3.9	3.5	3.5	3.5	3.5	4.3	0	3.5	4.3	4.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	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
Total Lost Time (s)	5.5	5.9	5.9	5.5	5.5	5.5	5.5	6.3	0	5.5	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes											
Recall Mode	None	Max	Max									
Act Effct Green (s)	47.7	32.0	32.0	34.8	25.1	25.1	43.8	36.8	0	45.0	37.3	37.3
Actuated g/C Ratio	0.44	0.30	0.30	0.32	0.23	0.23	0.41	0.34	0	0.42	0.35	0.35
v/c Ratio	0.59	0.81	0.27	0.50	0.65	0.40	0.23	1.05	0	0.41	0.55	0.21
Control Delay	25.9	48.0	10.6	26.4	46.3	7.5	20.8	86.4	0	25.3	35.6	4.9
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
Total Delay	25.9	48.0	10.6	26.4	46.3	7.5	20.8	86.4	0	25.3	35.6	4.9
LOS	C	D	B	C	D	A	C	F	C	C	D	A
Approach Delay	34.9	34.9	34.9	29.2	29.2	29.2	29.2	29.2	0	29.2	26.8	26.8
Approach LOS	C	C	C	C	C	C	E	E	E	C	C	C

2027 Future Conditions with Development
Gibson Traffic Consultants, Inc. [BJL #21-246]

PM Peak-Hour

Lanes, Volumes, Timings
4: SR-9 & 204th Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 500h (ft)	116	288	17	58	179	0	34	-519	0	33	207	0
Queue Length 95th (ft)	183	442	69	102	298	61	72	#855	0	71	349	38
Internal Link Dist (ft)	2710	2710	2710	551	551	551	981	981	0	981	791	791
Turn Bay Length (ft)	150	190	190	190	190	190	200	200	0	300	425	425
Base Capacity (vph)	701	772	699	437	474	544	517	611	0	376	640	629
Stallback 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	0.36	0.57	0.21	0.32	0.59	0.38	0.16	1.05	0	0.22	0.55	0.21
Intersection Summary	Other											
Area Type:	Other											
Cycle Length:	142.3											
Actuated Cycle Length:	107.6											
Natural Cycle:	105											
Control Type:	Actuated-Uncoordinated											
Maximum v/c Ratio:	1.05											
Intersection Signal Delay:	43.5											
Intersection LOS:	D											
ICU Level of Service E												
Intersection Capacity Utilization:	87.8%											
Analysis Period (min):	15											
Notes:	~ 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.											



Spills and Phases: 4: SR-9 & 204th Street NE
2027 Future Conditions with Development
Gibson Traffic Consultants, Inc. [BJL #21-246]

PM Peak-Hour

Lanes, Volumes, Timings
5: 67th Avenue NE & 204th Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS	D	D	D	D	D	D	D	D	D	D	D	C
Queue Length 50th (ft)	119	212	212	97	211	22	309	54	50	207		
Queue Length 95th (ft)	#193	323	323	160	324	50	496	143	95	341		
Internal Link Dist (ft)	160	573	573	200	2710	280	716	698	408	775		
Turn Bay Length (ft)	323	515	515	333	512	0	0	0	0	0		
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.70	0.58	0.56	0.60	0.11	0.68	0.40	0.32	0.49			

Intersection Summary
Area Type: Other
Cycle Length: 129.4
Actuated Cycle Length: 116.7
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Capacity Delay: 36.5
Analysis Period (min): 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lanes, Volumes, Timings
5: 67th Avenue NE & 204th Street NE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Traffic Volume (vph)	218	249	42	182	204	94	59	472	270	128	264	105
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	160	0	0	200	0	0	280	150	200	0	0	0
Storage Length (ft)	1	0	0	1	0	0	1	1	1	1	1	1
Storage Lanes	25	0	0	25	0	0	25	25	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	0.978	0.978	0.978	0.978	0.978	0.978	0.978	0.978	0.978	0.978	0.978	0.978
Flt Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1752	1797	0	1752	1758	0	1752	1845	1568	1752	1765	0
Flt Permitted	0.245	0.274	0.274	0.274	0.274	0.274	0.274	0.274	0.274	0.274	0.274	0.274
Satd. Flow (perm)	452	1797	0	503	1758	0	810	1845	1532	455	1765	0
Right Turn on Red	6	Yes	Yes	17	35	35	35	1038	20.2	1	1	1
Satd. Flow (RTOR)	35	653	12.7	4	4	4	4	4	4	4	4	4
Link Speed (mph)	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Link Distance (ft)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Travel Time (s)	225	300	0	188	307	0	61	487	278	132	380	0
Confl. Bikes (#/hr)	pm+pt	NA	pm+pt	NA	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA	NA
Peak Hour Factor	7	4	3	8	8	2	2	2	2	6	6	6
Heavy Vehicles (%)	4	8	8	8	8	8	8	8	8	8	8	8
Shared Lane Traffic (%)	7	4	3	8	8	8	8	8	8	8	8	8
Lane Group Flow (vph)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Turn Type	10.2	38.2	10.2	34.2	10.2	34.2	10.2	34.2	10.2	34.2	10.2	34.2
Protected Phases	20.2	38.2	20.2	34.2	20.2	34.2	20.2	34.2	20.2	34.2	20.2	34.2
Permitted Phases	15.6%	29.5%	15.6%	26.4%	15.6%	26.4%	15.6%	26.4%	15.6%	26.4%	15.6%	26.4%
Detector Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Switch Phase	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Minimum Initial (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
Minimum Split (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 Split (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Yellow Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
All-Red Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lost Time Adjust (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag	Lead	Lag										
Lead-Lag Optimize?	Yes											
Recall Mode	None											
Act Effct Green (s)	39.1	25.1	38.3	24.7	39.1	25.1	38.3	24.7	39.1	25.1	38.3	24.7
Actuated g/C Ratio	0.34	0.22	0.33	0.21	0.34	0.22	0.33	0.21	0.34	0.22	0.33	0.21
v/c Ratio	0.73	0.77	0.60	0.80	0.73	0.77	0.60	0.80	0.73	0.77	0.60	0.80
Control Delay	41.4	56.4	34.1	57.3	41.4	56.4	34.1	57.3	41.4	56.4	34.1	57.3
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	41.4	56.4	34.1	57.3	41.4	56.4	34.1	57.3	41.4	56.4	34.1	57.3
LOS	D	E	E	C	D	E	E	C	D	E	E	C
Approach Delay	50.0	48.5	27.6	27.6	50.0	48.5	27.6	27.6	50.0	48.5	27.6	27.6

2027 Future Conditions with Development
Gibson Traffic Consultants, Inc. [BJL #21-246]

2027 Future Conditions with Development
Gibson Traffic Consultants, Inc. [BJL #21-246]