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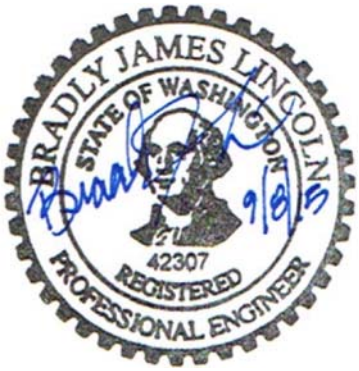
Bergsma Development
Traffic Impact Analysis

Applicant: Windward Real Estate Services
Location: Newport Road, West of SR-900
Jurisdiction: City of Issaquah

September 2015



GTC #15-095

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1. EXECUTIVE SUMMARY

Gibson Traffic Consultants, Inc. (GTC) was hired to provide a traffic analysis of the 78-unit Bergsma Development. The development is located on the west side of Newport Way, west of SR-900. The analysis was scoped with City of Issaquah staff to include the intersections of SR-900 at Newport Way and Newport Way at the site access. The analysis was been performed for the AM and PM peak-hour and also includes an analysis with the reassignment of trips from the Talus Development. The analysis shows that the study intersections will operate at acceptable levels of service during the AM and PM peak-hour with the development and with the reassignment of the Talus Development trips. Frontage improvements and payment of the appropriate traffic impact fee is all that should be required to mitigate the impacts of the development. The current traffic impact fee, $7,904.10 per unit, results in a total traffic mitigation fee of $616,519.80.

2. PROPOSED DEVELOPMENT

The Bergsma Development is located along the west side of Newport Way, west of SR-900. The development is proposed to consist of 78 single-family units on 46 acres that are currently undeveloped and zoned as Residential, SF-E and SF-S. Access is proposed to include a new access to Newport Way and a connection to the Talus Development. The development is anticipated to be constructed in the year 2017. A site vicinity map showing the site is included in Figure 1.

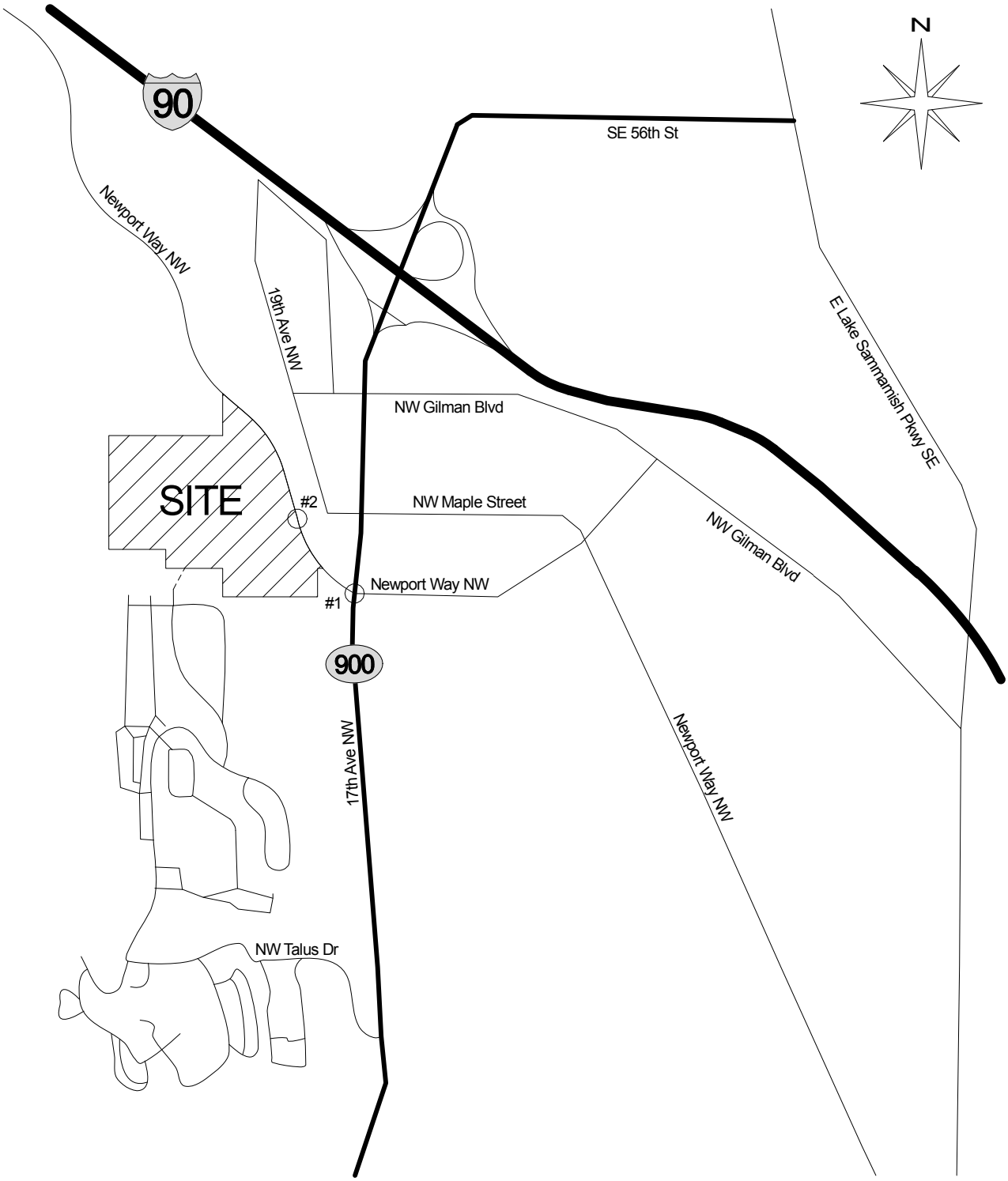
2.1 Methodology

A detailed scoping process was performed with City of Issaquah staff. The scoping process identified the trip generation methodology, trip distribution and scope of the full analysis. The trip generation is based on data from the latest edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual – Volume 2: Data*. The trip distribution is based on count data and previous analysis in the site vicinity. The trip generation and trip distribution were approved as part of the scoping process.

During the scoping process the City of Issaquah staff identified the following intersections for analysis:

1. SR-900 at Newport Way
2. Newport Wat at Site Access

The intersection analysis has been performed for the AM peak-hour, the highest hour between 7:00 AM and 9:00 AM, and the PM peak-hour, the highest hour between 4:00 PM and 6:00 PM. The City of Issaquah staff identified the following developments as pipeline development that are to be included in the intersection analysis:



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BREGSMA DEVELOPMENT
78 SINGLE-FAMILY

CITY OF ISSAQUAH

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DEVELOPMENT SITE

STUDY INTERSECTION

FIGURE 1

SITE VICINITY MAP

- Gateway Apartments – 400 apartments
- Gateway Senior Housing – 136 units
- Riva – 33 condominiums

Additionally, a 2% annually compounding growth rate has been included in the calculations of future vehicles at the study intersections. The development is proposed to include a connection to the Talus Development, which will provide a connection to Newport Way for units within the Talus Development. The City of Issaquah staff asked for analysis without and with this connection. This connection would result in a portion of the trips generated by the Talus Development using the Bergsma Development access.

The intersection analysis has been performed for the following conditions:

- 2015 Existing Conditions
- 2017 Baseline Conditions
- 2017 Future with Development Conditions
- 2017 Future with Development Conditions and Talus

Congestion at intersections and along arterials is generally measured in terms of level of service (LOS). In accordance with *Highway Capacity Manual: 2010 Edition (HCM)* by the Transportation Research Board, road facilities and intersections are rated between LOS A and LOS F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. The level of service at signalized, roundabout and all-way stop-controlled intersections is based on the average delay of all approaches. The level of service for two-way stop-controlled intersections is based on average delays for the critical stopped approach. The City of Auburn uses the average travel speed to determine the level of service for arterial segments. Geometric characteristics and conflicting traffic movements are taken into consideration when determining level of service values. A summary of the intersection level of service criteria is included in Table 1.

Table 1: Level of Service Criteria for Intersections

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	>50	>80

The City of Issaquah utilizes LOS D as the acceptable level of service threshold; however, the WSDOT level of service standards have been applied for the intersection of SR-900 at Newport Way. The WSDOT *Development Services Manual* identifies LOS E as an acceptable level of service for urban non-Highways of Statewide Significance that are within a 3-mile buffer of freeways, such as I-5. These are considered Tier 1 roadways. The WSDOT level of service criteria are included in the attachments.

[1] **Source:** *Highway Capacity Manual* 2010.

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.

3. EXISTING CONDITIONS

3.1 Existing Roadway Conditions

The Bergsma Development is proposed to include one new access to Newport Way. Newport Way currently is a 2-lane roadway with paved shoulders and a paved pedestrian facility with curbing along the east side. The intersection of SR-900 at Newport Way is a signalized intersection with separate turning lanes on all approaches. There are also two northbound and southbound through lanes.

3.2 Existing Traffic Volumes

Existing AM and PM peak-hour turning movements were collected at the intersection of SR-900 at Newport Way for the intersection analysis. Existing AM and PM peak-hour counts were also obtained at the intersection of SR-900 at NW Talus Drive, which have been used to determine the trip distribution and to help estimate the potential reassignment of Talus Development trips with the proposed connection through the Bergsma Development. The existing AM and PM peak-hour turning movements at the intersection of SR-900 at Newport Way are shown in Figure 2 and Figure 3, respectively. The existing turning movement counts are included in the attachments.

4. FUTURE CONDITIONS

4.1 Future Roadway Conditions

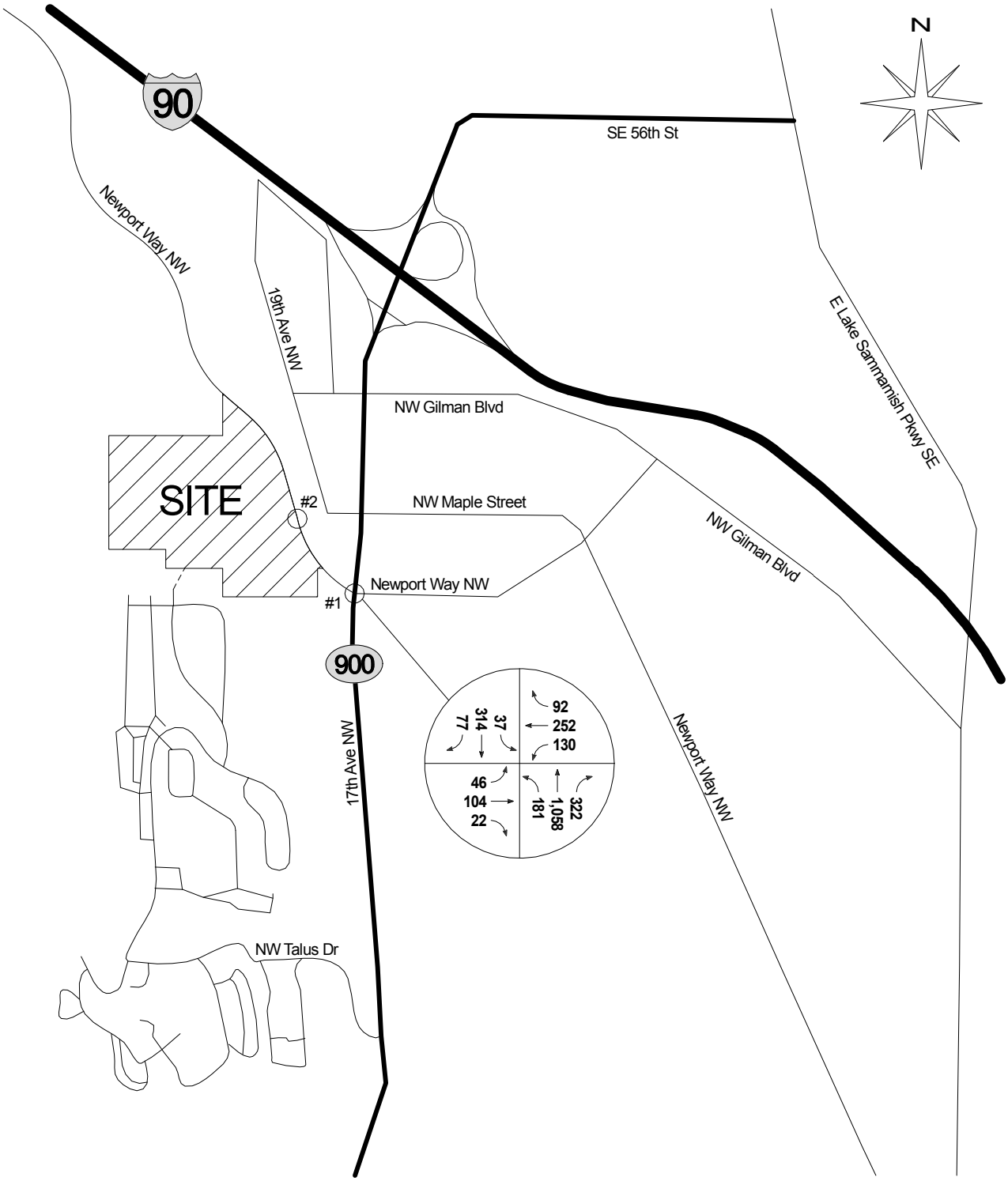
Roadway improvements at the intersection of SR-900 at Newport Way or along Newport Way west of SR-900 have not been included in the analysis. The future conditions are based on the existing channelization and control at the study intersections.

4.2 Baseline Traffic Volumes

The baseline traffic volumes at the study intersections have been calculated by applying a 2% annually compounding growth rate to the 2015 existing turning movements and trips from the following pipeline developments:

- Gateway Apartments – 400 apartments
- Gateway Senior Housing – 136 units
- Riva – 33 condominiums

The pipeline trips have been assigned to the different movements at the study intersections based on data provided by City of Issaquah staff and the trip distribution utilized for the trips generated by the Bergsma Development. The 2017 baseline turning movements are shown in Figure 4 and Figure 5 for the AM and PM peak-hours, respectively. The turning movement calculations are included in the attachments.



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BREGSMA DEVELOPMENT
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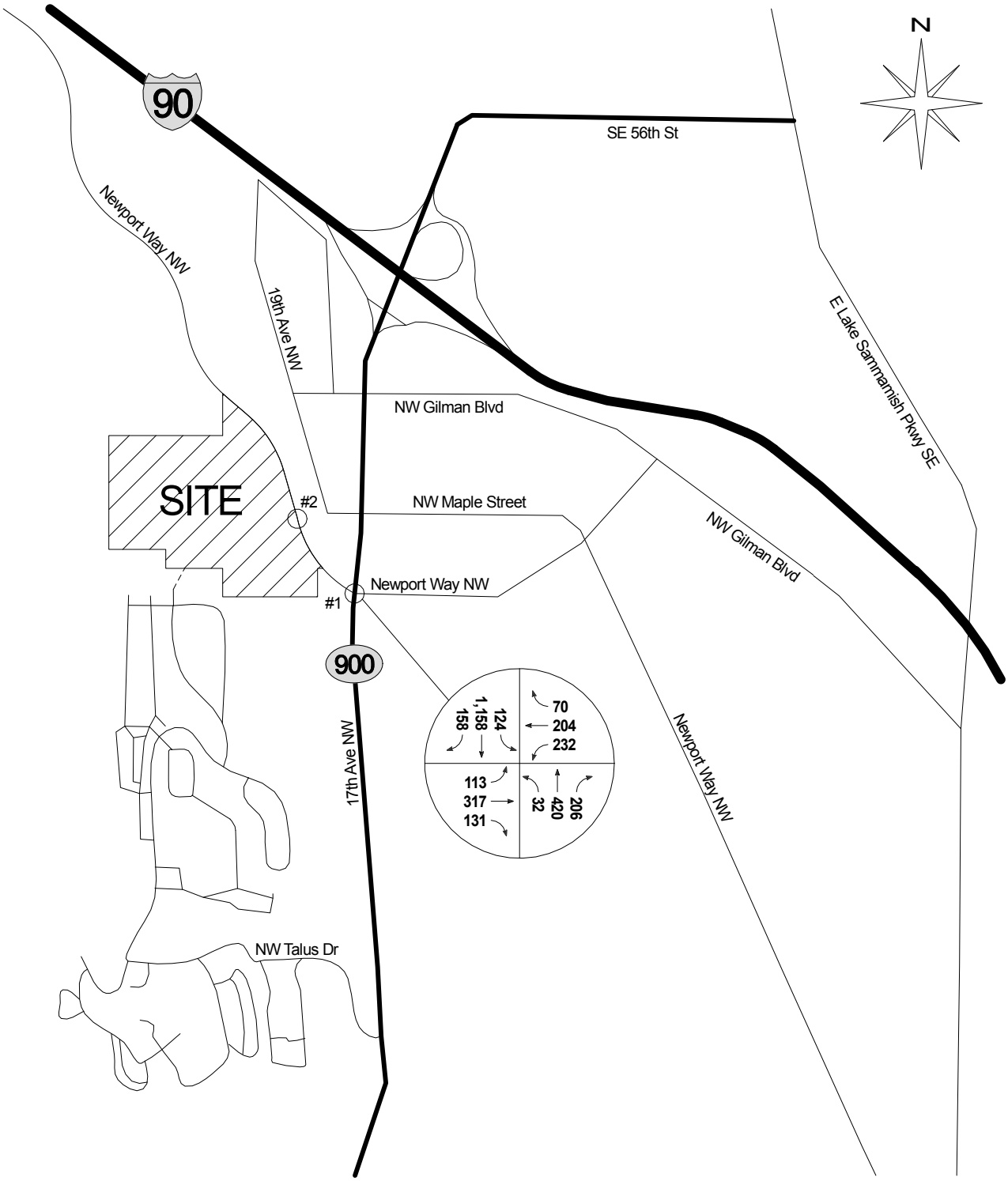
XXX → AM PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 2

2015 EXISTING TRAFFIC VOLUMES
AM PEAK-HOUR



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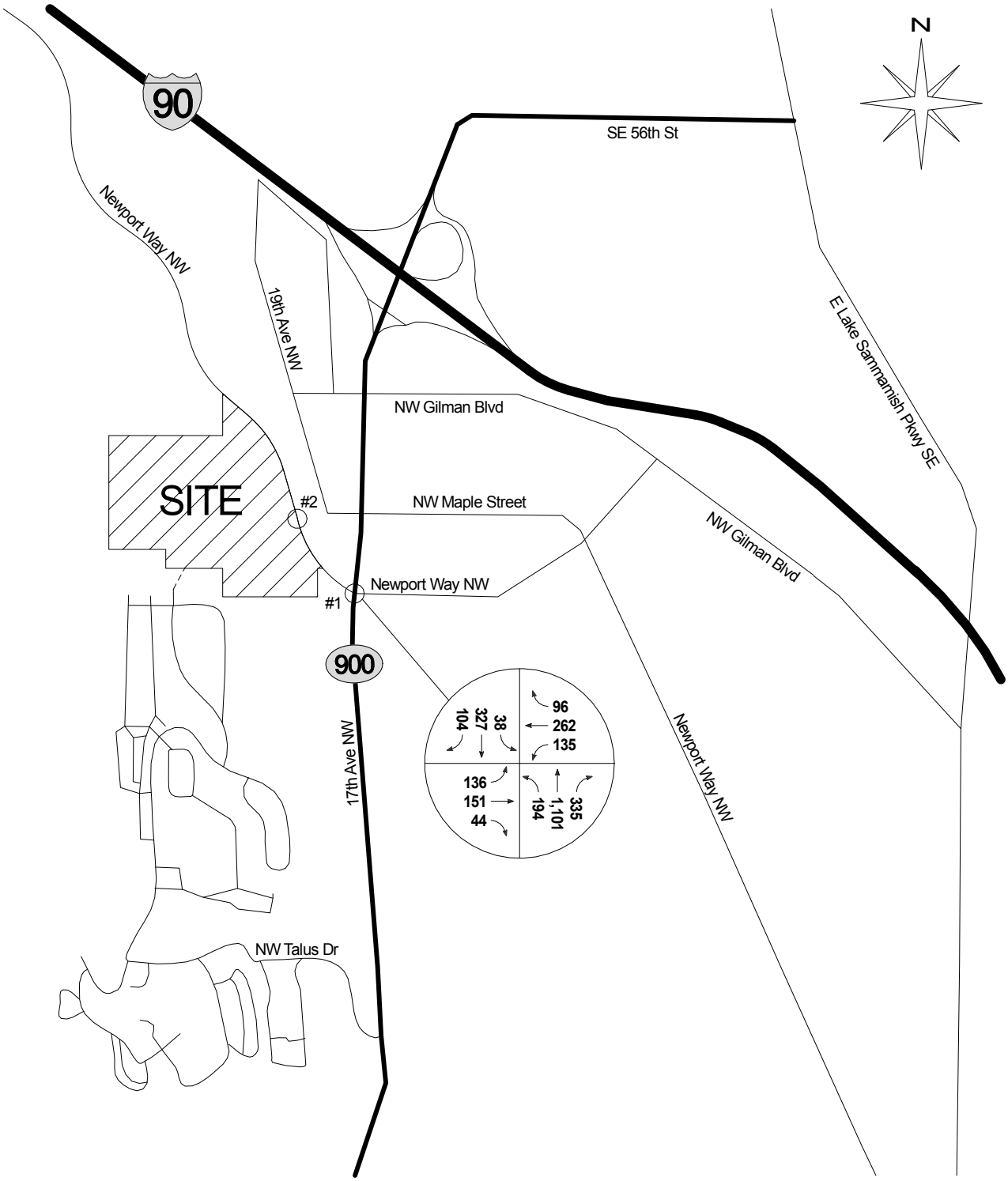
XXX → PM PEAK HOUR TURNING MOVEMENT VOLUMES

FIGURE 3

2017 EXISTING TRAFFIC VOLUMES
PM PEAK-HOUR



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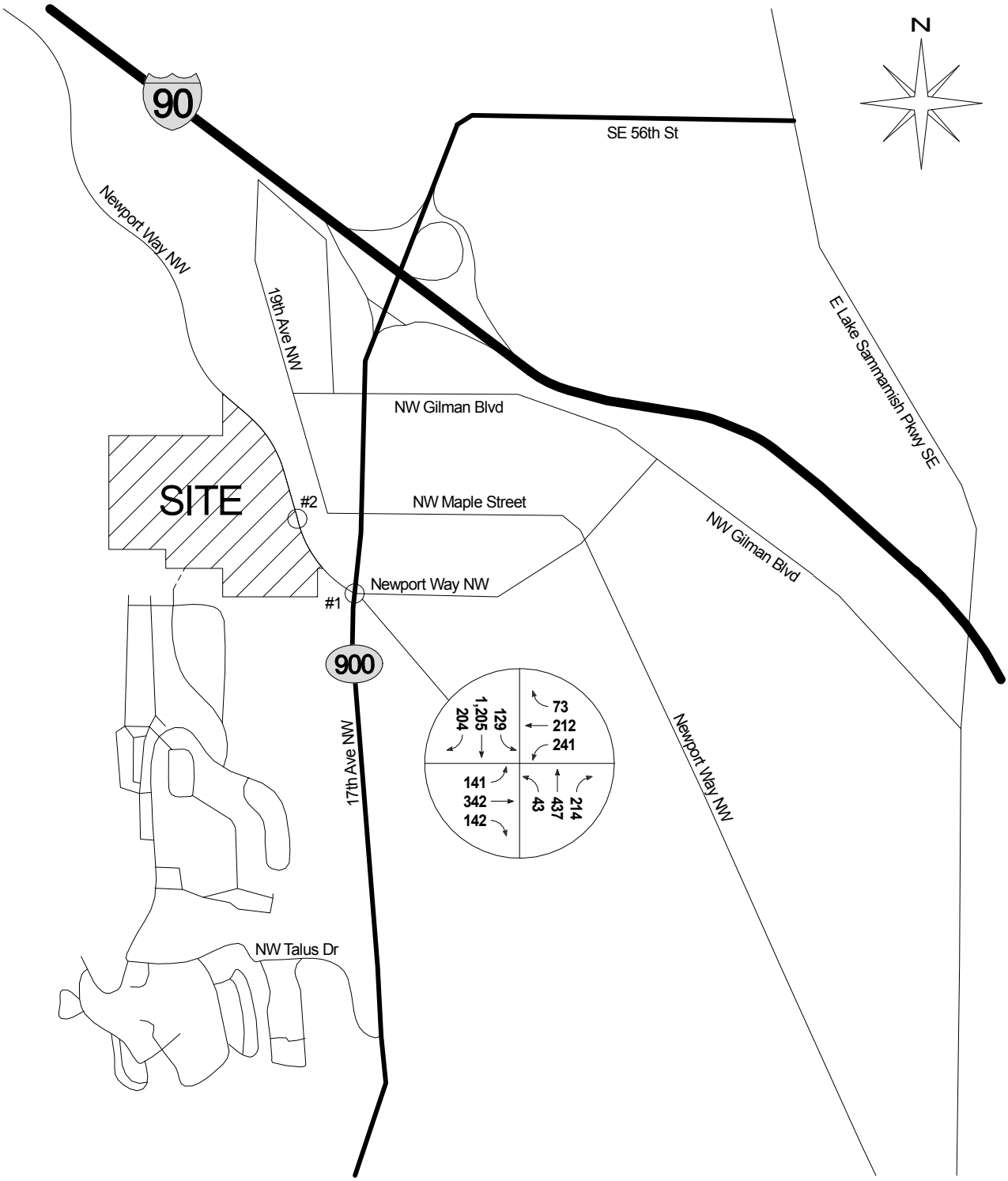
xxx → AM PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 4

2017 BASELINE TRAFFIC VOLUMES
AM PEAK-HOUR



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XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 5

2017 BASELINE TRAFFIC VOLUMES
PM PEAK-HOUR

4.3 Trip Generation

The trip generation methodology and calculations for the Bergsma Development were approved as part of the scoping process with City of Issaquah staff. The trip generation calculations are based on the national data available in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 9th Edition (2012)*. The trip generation calculations have been performed based on the average trip generation rates for ITE Land Use Land Use Code 210, Single-Family Detached Housing. The trip generation of the Bergsma Development is summarized in Table 2.

Table 2: Trip Generation Summary

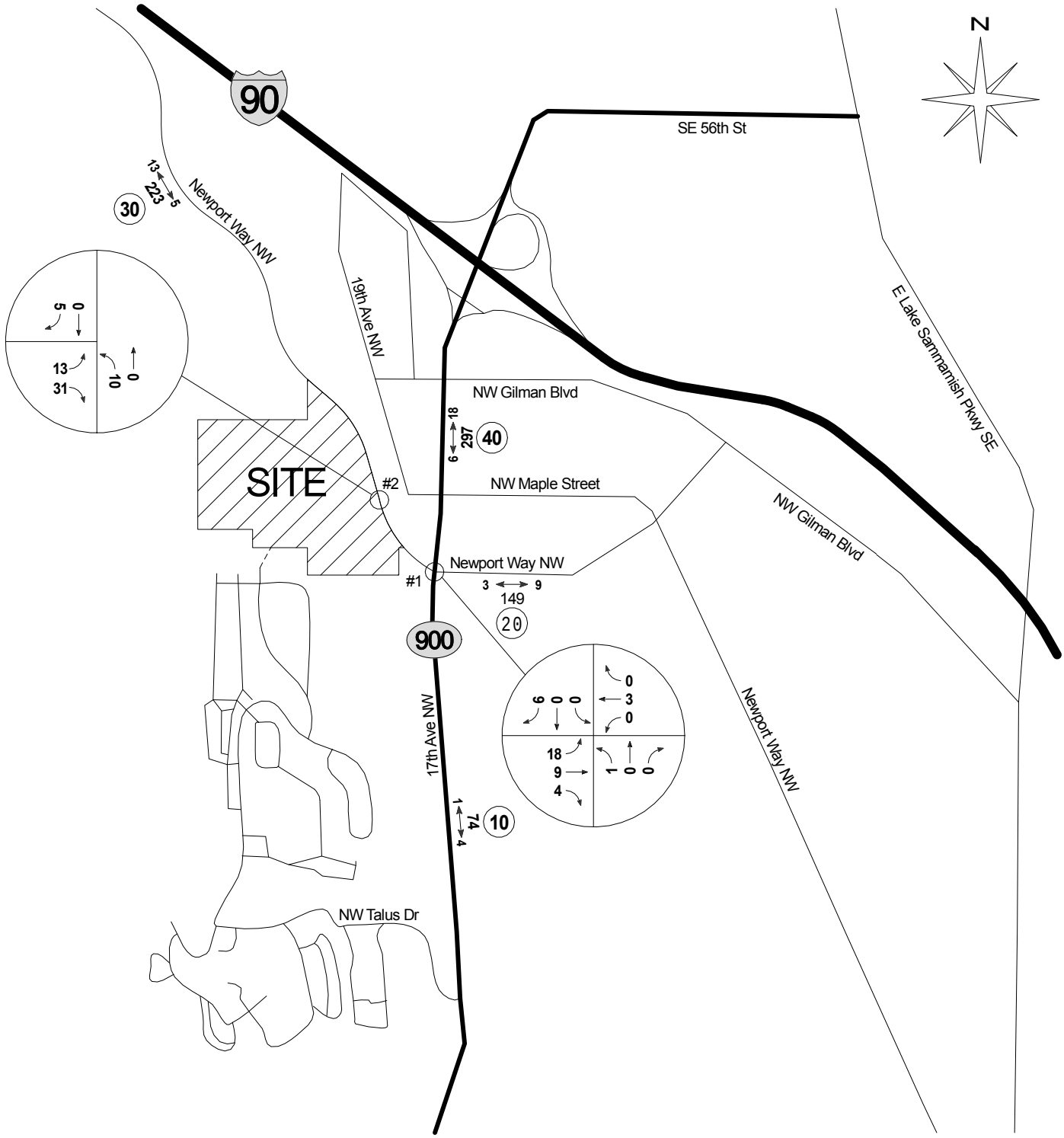
78 New Single-Family Residential Units	Average Daily Trips			AM Peak-Hour Trips			PM Peak-Hour Trips		
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
Generation Rate	9.52 trips per unit			0.75 trips per unit			1.00 trips per unit		
Splits	50%	50%	100%	25%	75%	100%	63%	37%	100%
Trips	372	371	743	15	44	59	49	29	78

The trip generation calculations are included in the attachments.

4.4 Trip Distribution and Assignment

Trip distribution and traffic assignments for the Bergsma Development are based on previous analysis conducted in the site vicinity and count data collected in the site vicinity. The distribution was approved by City of Issaquah staff during the scoping process.

It is anticipated that 50% of the development's trips will travel along SR-900, forty percent to and from the north and ten percent to and from the south. Approximately 30% of the development's trips are expected to travel to and from the west along Newport Way. The remaining 20% of the development's trips will travel to and from the east along Newport Way, east of SR-900. The detailed trip distribution and trip assignments at the study intersections are shown in Figure 6 for the AM peak-hour and Figure 7 for the PM peak-hour.



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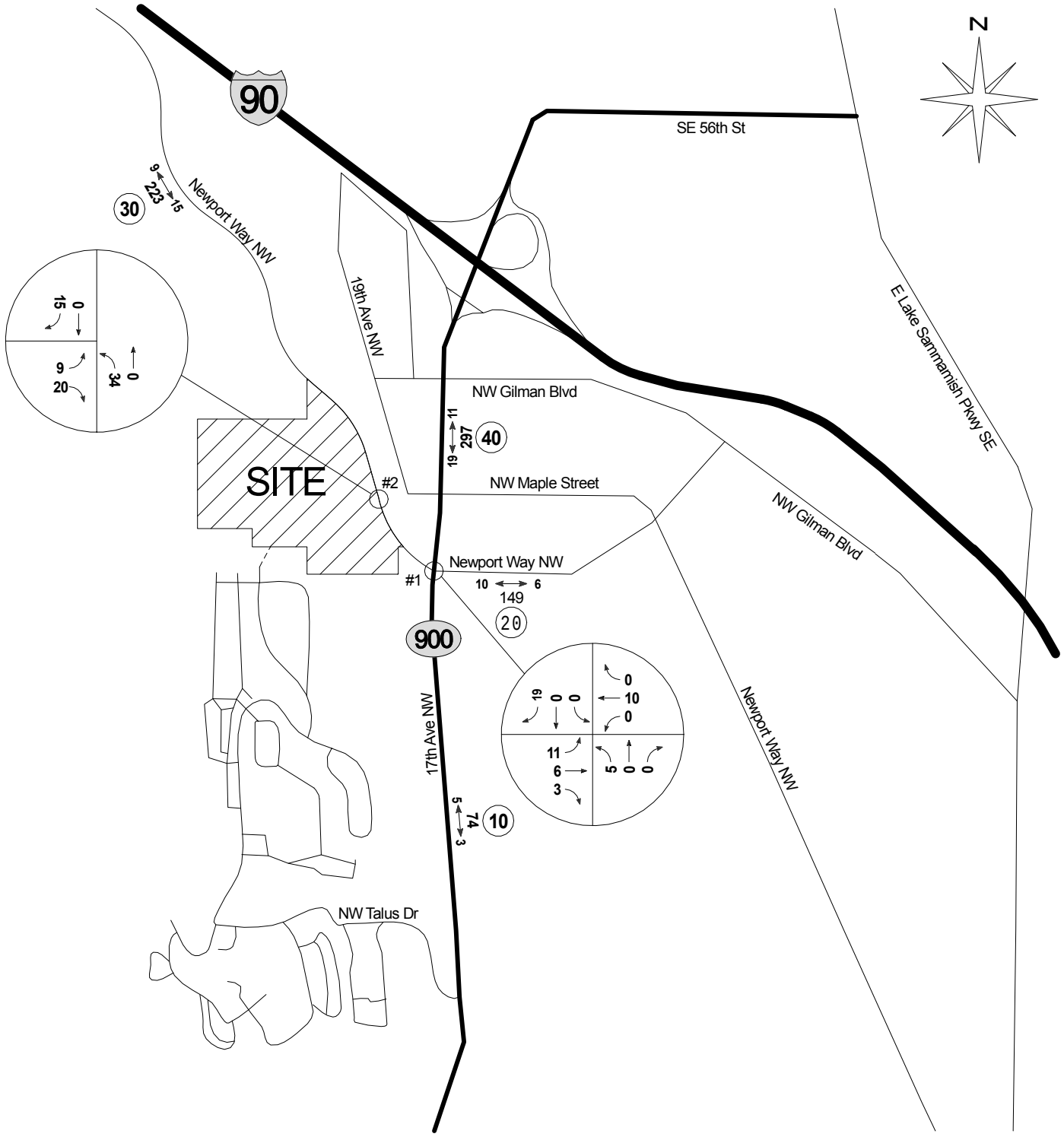
AWDT — NEW DAILY TRAFFIC

AM ⟷ PEAK — NEW PEAK-HOUR TRIPS

XX — TRIP DISTRIBUTION %

FIGURE 6

DEVELOPMENT TRIP DISTRIBUTION AND ASSIGNMENT AM PEAK-HOUR



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AWDT — NEW DAILY TRAFFIC

PM ⟷ PEAK — NEW PEAK-HOUR TRIPS

(XX) — TRIP DISTRIBUTION %

FIGURE 7

DEVELOPMENT TRIP DISTRIBUTION AND ASSIGNMENT PM PEAK-HOUR

4.5 Future with Development Traffic Volumes

The Bergsma Development is anticipated to be fully constructed by the end of 2017. The 2017 future with development traffic volumes have been calculated by adding the development trips to the 2017 baseline traffic volumes. The 2017 future with development traffic volumes at the study intersections are shown in Figure 8 and Figure 9 for the AM and PM peak-hours, respectively.

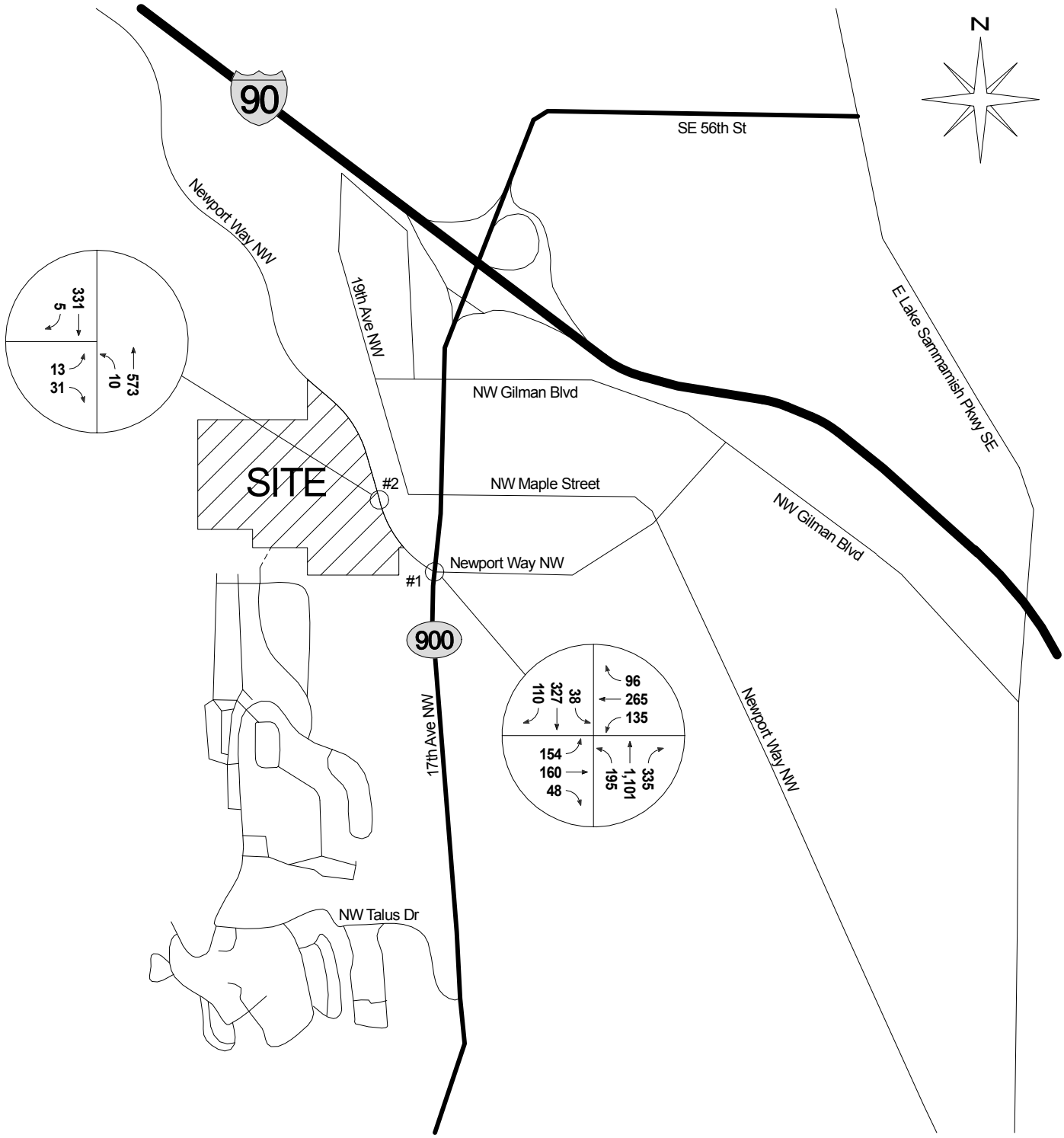
4.5.1. Reassignment of Talus Development Trips

The City of Issaquah staff requested an analysis of the potential impacts of trips from the Talus Development with the proposed connection through the Bergsma Development. The potential trips from the Talus Development that could utilize the access to Newport Way through the Bergsma development were estimated based on count data at the intersection of SR-900 at Talus Drive, the sole access for the Talus Development, and the existing units within the Talus Development.

The inbound and outbound trips at the intersection of SR-900 at Talus Drive that travel to and from the north along SR-900 are trips that could potentially be reassigned to the connection through the Bergsma Development. Using aerial data, it is estimated that half of the units in the Talus Development are between Talus Drive and the Bergsma Development and that half of these units would utilize the connection through the Bergsma Development. It is therefore estimated that 25% of the trips from the Talus Development that travel to and from the north could be reassigned to the connection through the Bergsma Development. This reassignment results in the following trips potentially using the connection through the Bergsma Development:

- AM peak-hour – 21 inbound and 82 outbound trips
- PM peak-hour – 74 inbound and 44 outbound trips

It is important to note that it is anticipated that fewer trips from the Talus Development would likely utilize the connection through the Bergsma Development, but these trips represent the highest anticipated impact to the Bergsma Development access. The traffic volumes at the study intersections with the Bergsma Development and with the Talus reassignment are shown in Figure 10 for the AM peak-hour and Figure 11 for the PM peak-hour.



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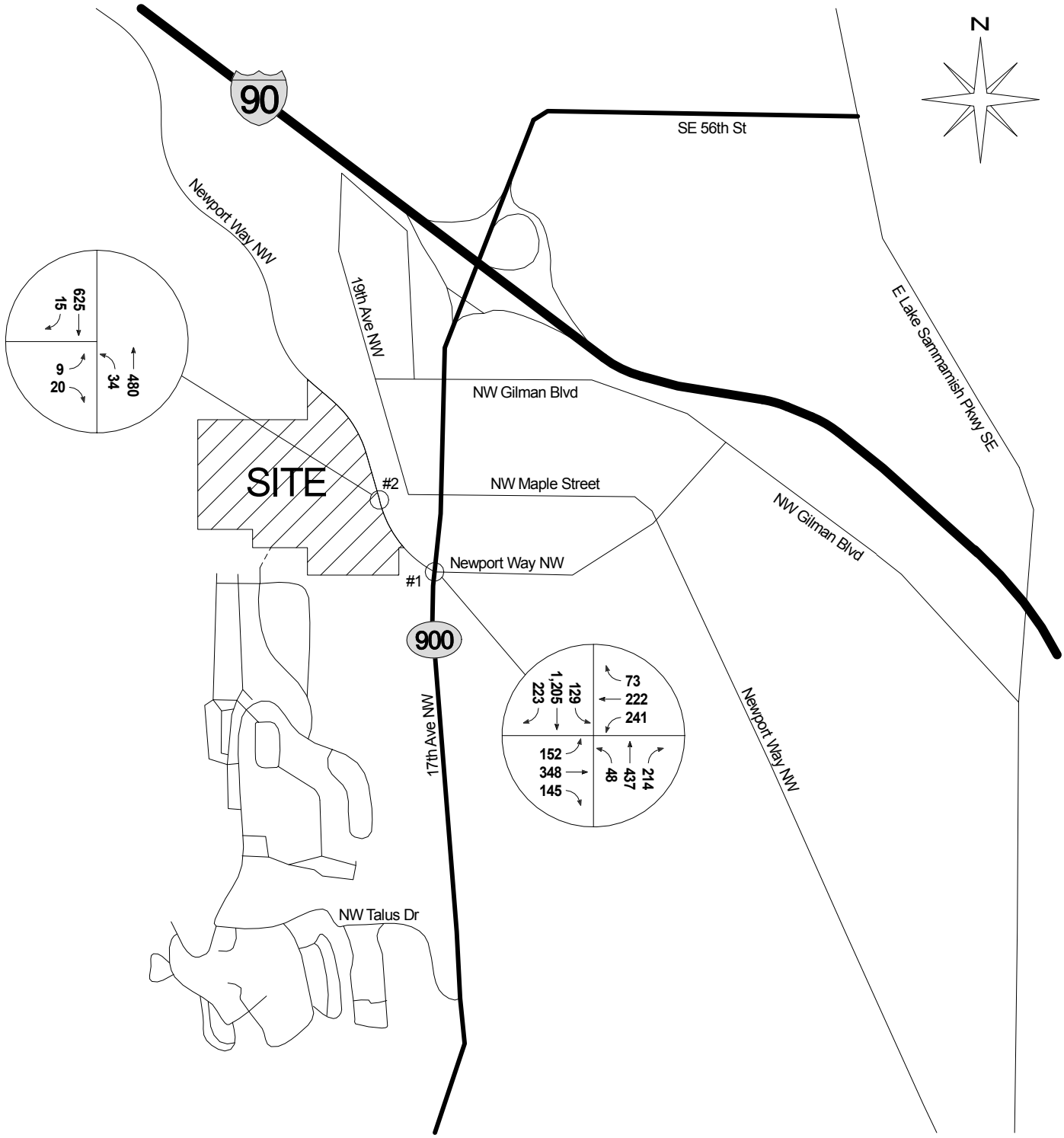
XXX → AM PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 8
2017 FUTURE WITH DEVELOPMENT TRAFFIC VOLUMES AM PEAK HOUR



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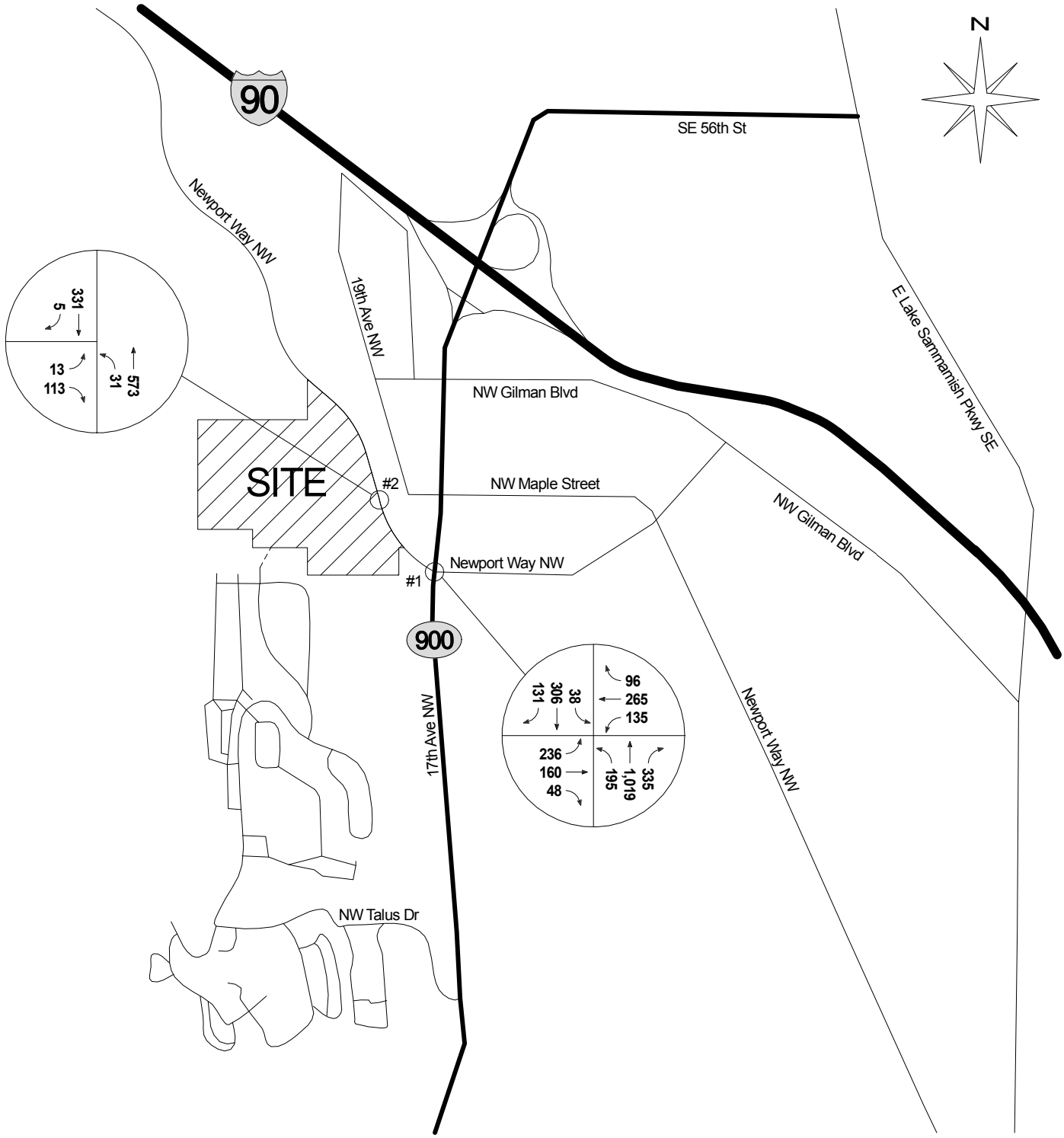
XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 9

2017 FUTURE WITH DEVELOPMENT TRAFFIC VOLUMES PM PEAK-HOUR



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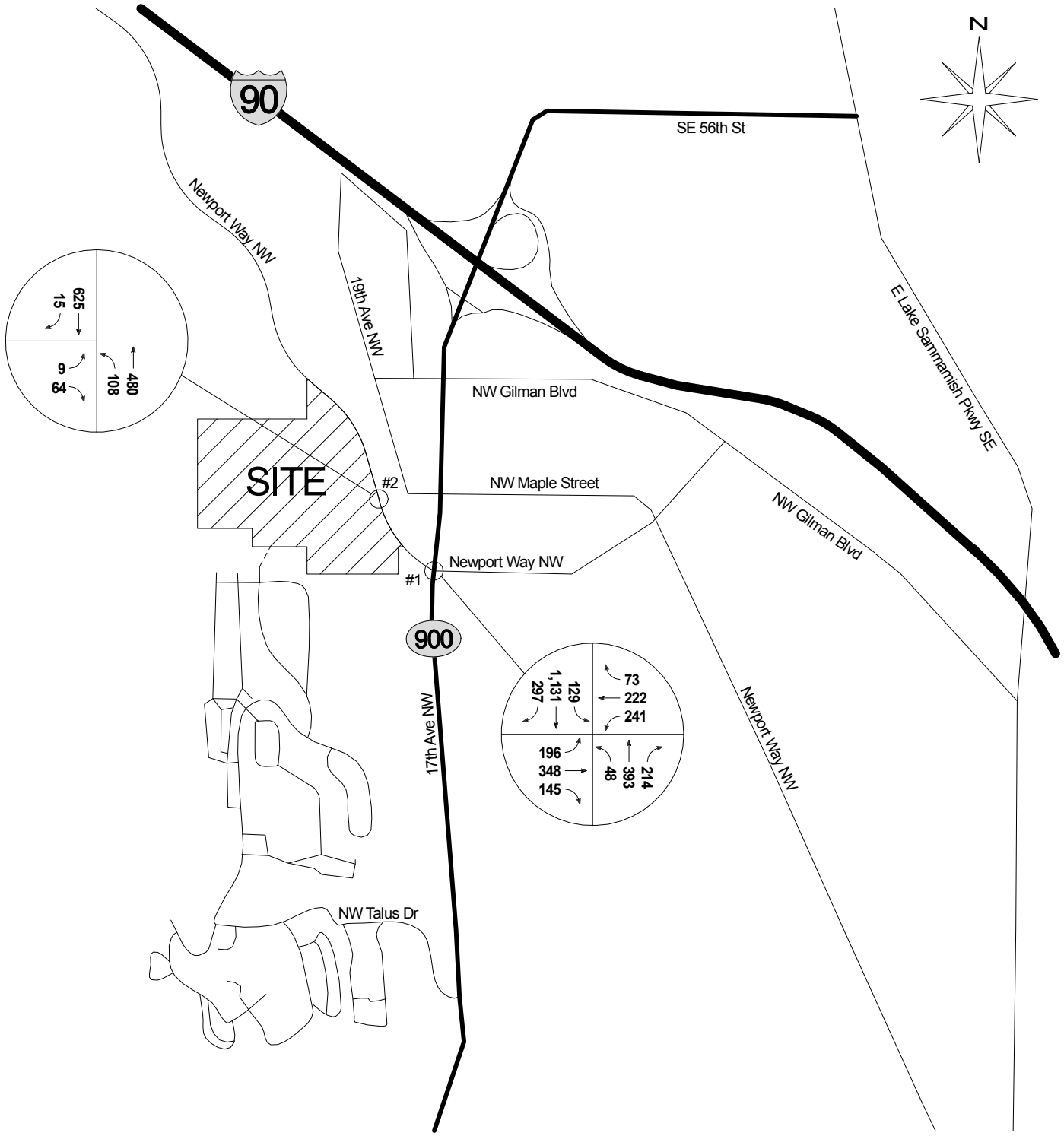
XXX → AM PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 10

2017 FUTURE WITH DEVELOPMENT AND TALUS TRAFFIC VOLUMES AM PEAK-HOUR



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XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUMES

FIGURE 11

2017 FUTURE WITH DEVELOPMENT AND TALUS TRAFFIC VOLUMES PM PEAK-HOUR

5. TRAFFIC ANALYSIS AND IMPACT

The traffic analysis has been performed for the AM and PM peak-hours at the following study intersections:

- SR-900 at Newport Way
- Newport Wat at Site Access

The analysis has been performed for the following conditions:

- 2015 Existing Conditions
- 2017 Baseline Conditions
- 2017 Future with Development Conditions
- 2017 Future with Development Conditions with Talus

The traffic analysis has been performed using the *Synchro 8.0, Build 806* software. The analysis of the signalized intersection of SR-900 at Newport Way has utilized signal timings received from the City of Issaquah for the PM peak-hour. Minor adjustments to the timings have been made for the AM peak-hour due to the change in dominant traffic patterns from the PM peak-hour. The intersection analysis has been performed in accordance with City of Issaquah guidelines.

The operations of the study intersections during the AM peak-hour are summarized in Table 3.

Table 3: Intersection Operations Summary – AM Peak-Hour

Intersection	2015 Existing Conditions			2017 Baseline Conditions			2017 Future with Development Conditions			2017 Future with Development Conditions with Talus		
	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C
1. SR-900 at Newport Way	D	35.9	0.85	D	42.1	0.87	D	42.8	0.87	D	51.6	1.20
2. Newport Way at Site Access	---	---	---	---	---	---	B	13.6	0.10	B	13.2	0.24

The operations of the study intersections during the PM peak-hour are summarized in Table 4.

Table 4: Intersection Operations Summary – PM Peak-Hour

Intersection	2015 Existing Conditions			2017 Baseline Conditions			2017 Future with Development Conditions			2017 Future with Development Conditions with Talus		
	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C
1. SR-900 at Newport Way	D	53.3	1.33	E	56.4	1.39	E	57.2	1.39	E	58.3	1.39
2. Newport Way at Site Access	---	---	---	---	---	---	C	18.4	0.11	C	18.8	0.23

The level of service analysis shows that the intersection of SR-900 at Newport Way will operate at acceptable LOS E or better with the development and with the reassignment of the Talus Development. The site access will operate at acceptable LOS C or better, even with the reassignment of the Talus Development trips. The v/c ratio for the majority of movements at the intersection of SR-900 at Newport Way will be less than 0.85. The majority of movements that do have a v/c ratio above 0.85 are left-turning movements that are not impacted by the development, such as the westbound left-turn and southbound left-turn. During the AM peak-hour, the v/c ratio of the eastbound left-turn will increase above 0.85 with the reassignment of the Talus Development trips. The City of Issaquah can address this increase in a variety of ways, including adjusting the signal timings. The impact of the Talus Development should not be considered an impact of the Bergsma Development since the eastbound left-turn movement will operate with a v/c ratio below 0.85 with just the Bergsma Development.

5.1 Queuing Analysis

A queuing analysis for the intersection of SR-900 at Newport Road has been completed to determine the impact of queue lengths on the west leg (i.e. the eastbound movements). These are the movements that could block the access. The site access is over 600 feet from SR-900. The 50th Percentile and 95th Percentile queue lengths are summarized in Table 5.

Table 5: SR-900 at Newport Way Queue Length Summary

Time	Eastbound Movement	2015 Existing Conditions		2017 Baseline Conditions		2017 Future with Development Conditions		2017 Future with Development Conditions with Talus	
		50th %	95th %	50th %	95th %	50th %	95th %	50th %	95th %
AM Peak-Hour	Left	54 ft	85 ft	154 ft	280 ft	177 ft	327 ft	333 ft	522 ft
	Through	115 ft	138 ft	152 ft	192 ft	162 ft	203 ft	162 ft	203 ft
	Right	0 ft	0 ft	0 ft	0 ft	0 ft	2 ft	0 ft	2 ft
PM Peak-Hour	Left	98 ft	196 ft	122 ft	262 ft	133 ft	290 ft	174 ft	392 ft
	Through	294 ft	397 ft	315 ft	455 ft	320 ft	468 ft	316 ft	468 ft
	Right	21 ft	55 ft	25 ft	62 ft	27 ft	65 ft	26 ft	65 ft

The queueing analysis shows that the Bergsma Development will increase the queue length by one to two vehicles. However, the reassignment of the Talus Development trips will have a larger increase in queue lengths, especially during the AM peak-hour. The queue length is not anticipated to block the site access.

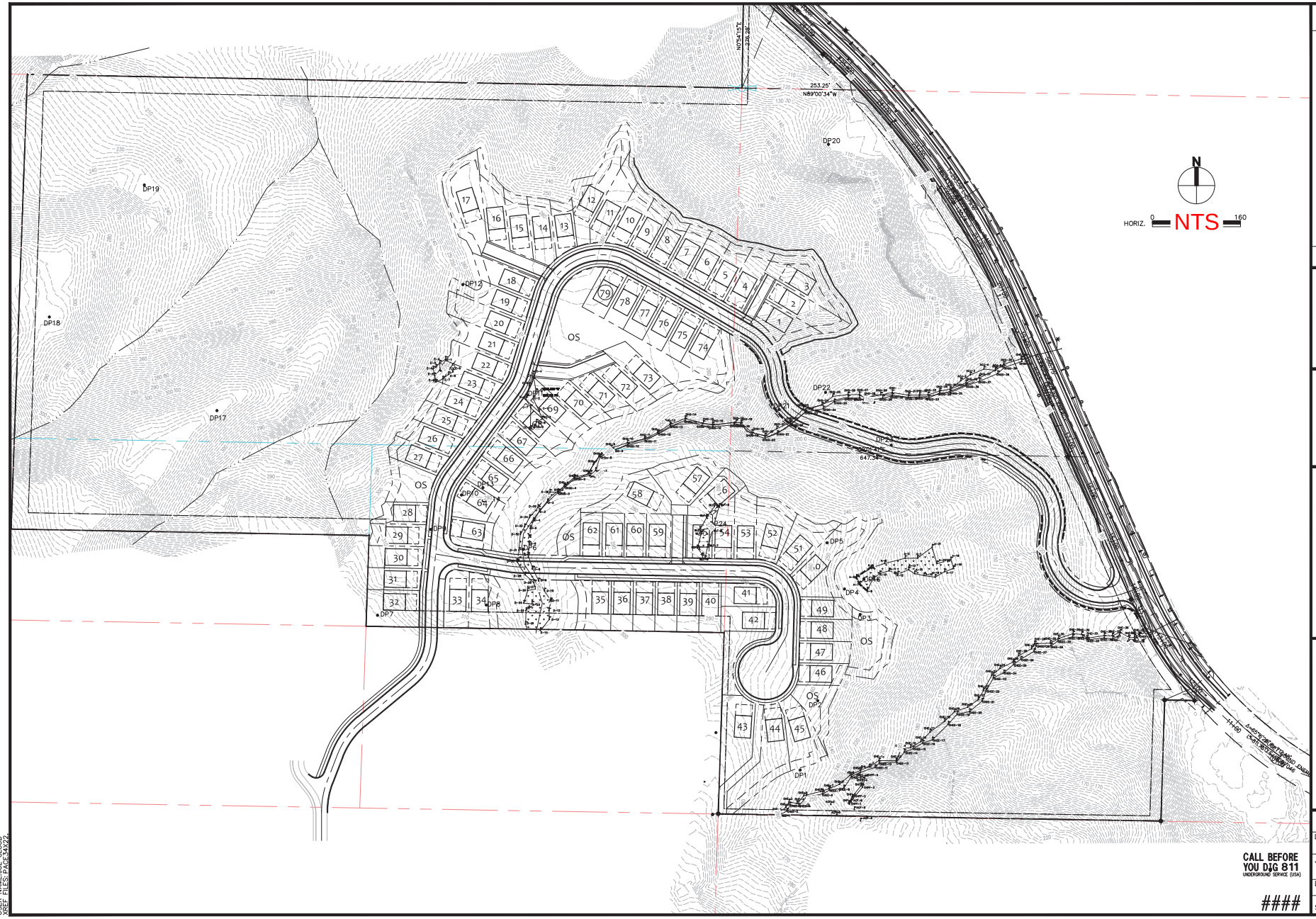
5.2 Access Analysis

The access of the Bergsma Development to Newport Way is proposed to be a stop-controlled intersection. The access is proposed to include a 100-foot northbound left-turn lane for left-turns into the development. The level of service analysis, which includes this left-turn lane, shows that the access is anticipated to operate at acceptable LOS C or better, even with the reassignment of trips from the Talus Development. Additionally, the development's access will have adequate sight distance in both directions based on a posted speed limit of 30 mph.

6. MITIGATION IDENTIFICATION AND RECOMMENDATIONS

The operational analysis shows that the Bergsma Development will not significantly impact the operations of the intersection of SR-900 at Newport Way, which is anticipated to operate at an acceptable level of service with the development. The development should therefore only be required to provide frontage improvements and pay the appropriate traffic impact fee. The current traffic impact fee is $7,904.10 per single-family residential unit. This results in a total traffic impact fee of $616,519.80. It is important to note that the fee is assessed at the time of building permit issuance and may increase from what is identified in this report.

Site Plan



SYM	REVISION	DATE

PACE
Engineering Services Company
11255 Kirkland Way, Suite 300
Kirkland, WA 98033
p. 425.827.2014 | f. 425.827.5043
Civil | Structural | Planning | Survey
pacedesigns.com

PRELIMINARY

SCALE: ####	DATE: XX/XX/XX
DESIGNED BY: XX	CHECKED BY: XX
JOB NUMBER ######.##	
DWG NAME: 14499-SP	
SHEET #### OF ####	

FILE NAME: P:\14499 BERGSMA ISSAQUAH\CAD\ENGINEERING\X-REFS\14499-SP.DWG
SAVE TIME: 6/16/2015 12:53 PM
PLOT TIME: 6/16/2015 12:57 PM
PLOT NAME: JOE LOUD
XREF FILES: PACE-XBASE

Trip Generation Calculations

Bergsma Issaquah
GTC #15-095

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		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Single-Family (new)	78 units	210	9.52	50%	50%	743	0%	0	743	0%	0	0%	0	743	0	0	0	0	372	371
Totals						743		0	743		0		0	743	0	0	0	0	372	371

Bergsma Issaquah
GTC #15-095

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

									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Single-Family (new)	78 units	210	0.75	25%	75%	59	0%	0	59	0%	0	0%	0	59	0	0	0	0	15	44
Totals						59		0	59		0		0	59	0	0	0	0	15	44

Bergsma Issaquah
GTC #15-095

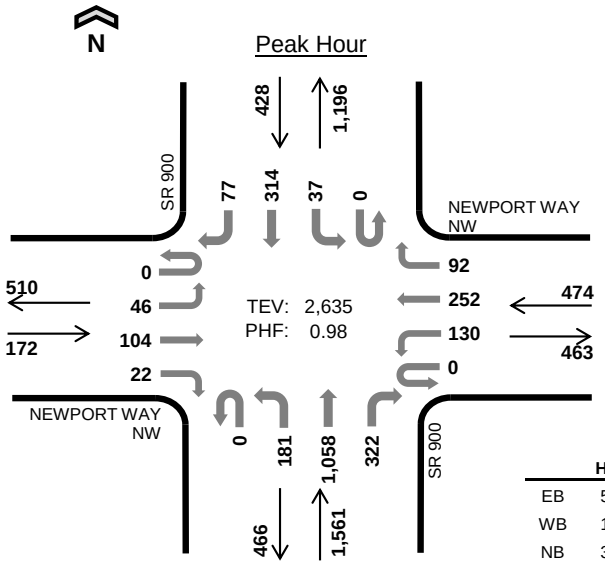
Trip Generation for: **Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 4 and 6 PM**
(a.k.a.): **Weekday PM Peak Hour**

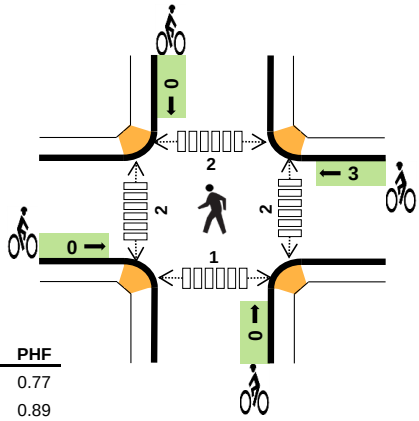
									NET EXTERNAL TRIPS BY TYPE											
									IN BOTH DIRECTIONS						DIRECTIONAL ASSIGNMENTS					
			Gross Trips				Internal Crossover		TOTAL	PASS-BY		DIVERTED LINK		NEW	PASS-BY		DIVERTED LINK		NEW	
LAND USES	VARIABLE	ITE LU code	Trip Rate	% IN	% OUT	In+Out (Total)	% of Gross Trips	Trips In+Out (Total)	In+Out (Total)	% of Ext. Trips	In+Out (Total)	% of Ext. Trips	In+Out (Total)	In+Out (Total)	In	Out	In	Out	In	Out
Single-Family (new)	78 units	210	1.00	63%	37%	78	0%	0	78	0%	0	0%	0	78	0	0	0	0	49	29
Totals						78		0	78		0		0	78	0	0	0	0	49	29

Existing Count Data

SR 900
NEWPORT WAY NW

Date: Tue, Aug 11, 2015
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM





	HV %:	PHF
EB	5.2%	0.77
WB	1.5%	0.89
NB	3.2%	0.95
SB	6.3%	0.91
TOTAL	3.5%	0.98

Two-Hour Count Summaries

Interval Start	NEWPORT WAY NW Eastbound				NEWPORT WAY NW Westbound				SR 900 Northbound				SR 900 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	11	24	2	0	35	35	15	0	40	256	76	0	9	50	14	567	0
7:15 AM	**0**	**11**	**18**	**4**	**0**	**30**	**62**	**24**	**0**	**42**	**286**	**84**	**0**	**7**	**62**	**14**	**644**	0
7:30 AM	**0**	**8**	**26**	**9**	**0**	**35**	**75**	**23**	**0**	**43**	**262**	**70**	**0**	**11**	**80**	**26**	**668**	0
7:45 AM	**0**	**15**	**33**	**8**	**0**	**33**	**52**	**21**	**0**	**51**	**265**	**83**	**0**	**9**	**88**	**16**	**674**	2,553
8:00 AM	**0**	**12**	**27**	**1**	**0**	**32**	**63**	**24**	**0**	**45**	**245**	**85**	**0**	**10**	**84**	**21**	**649**	**2,635**
8:15 AM	0	13	25	6	0	26	44	20	0	53	193	66	0	8	65	15	534	2,525
8:30 AM	0	19	24	5	0	17	62	23	0	43	237	71	0	12	81	29	623	2,480
8:45 AM	0	23	43	5	0	26	48	21	0	31	263	119	0	24	86	20	709	2,515
Count Total	0	112	220	40	0	234	441	171	0	348	2,007	654	0	90	596	155	5,068	0
Peak Hour	**0**	**46**	**104**	**22**	**0**	**130**	**252**	**92**	**0**	**181**	**1,058**	**322**	**0**	**37**	**314**	**77**	**2,635**	**0**

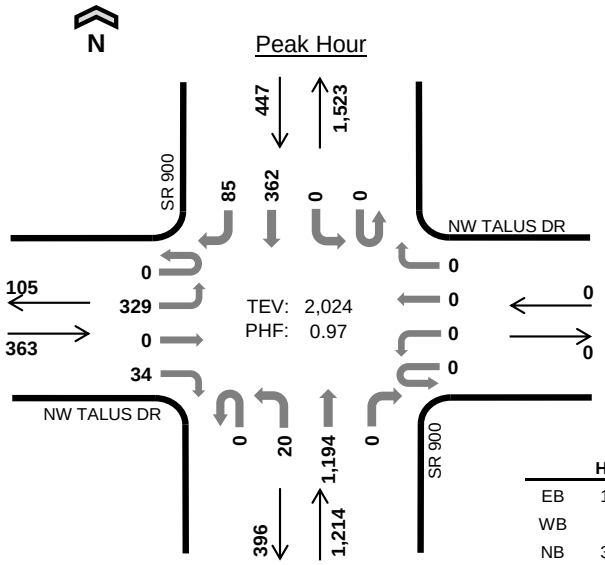
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

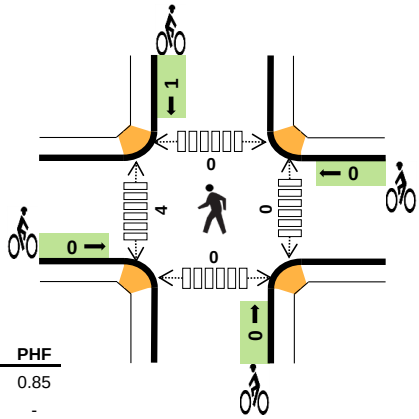
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	9	1	8	6	*24*	1	0	0	1	*2*	0	0	0	0	*0*
7:15 AM	**5**	**1**	**11**	**6**	***23***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**4**	**0**	**13**	**5**	***22***	**0**	**2**	**0**	**0**	***2***	**0**	**2**	**1**	**0**	*3*
7:45 AM	**0**	**3**	**11**	**6**	***20***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**1**	**1**	*4*
8:00 AM	**0**	**3**	**15**	**10**	***28***	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***
8:15 AM	1	4	12	6	*23*	1	0	0	0	*1*	1	0	0	1	*2*
8:30 AM	2	5	12	8	*27*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	3	2	13	9	*27*	0	0	0	0	*0*	0	1	1	0	*2*
Count Total	24	19	95	56	*194*	2	3	0	1	*6*	3	3	3	2	*11*
Peak Hour	**9**	**7**	**50**	**27**	***93***	**0**	**3**	**0**	**0**	***3***	**2**	**2**	**2**	**1**	***7***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

SR 900
NW TALUS DR

Date: Tue, Aug 11, 2015
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM





	HV %:	PHF
EB	1.7%	0.85
WB	-	-
NB	3.5%	0.95
SB	5.8%	0.85
TOTAL	3.7%	0.97

Two-Hour Count Summaries

Interval Start	NW TALUS DR Eastbound				NW TALUS DR Westbound				SR 900 Northbound				SR 900 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	62	0	6	0	0	0	0	0	14	297	0	0	0	54	29	462	0
7:15 AM	**0**	**98**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**6**	**291**	**0**	**0**	**0**	**70**	**18**	**492**	0
7:30 AM	**0**	**66**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**4**	**315**	**0**	**0**	**0**	**107**	**25**	**524**	0
7:45 AM	**0**	**95**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**4**	**283**	**0**	**0**	**0**	**83**	**27**	**501**	1,979
8:00 AM	**0**	**70**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**6**	**305**	**0**	**0**	**0**	**102**	**15**	**507**	**2,024**
8:15 AM	0	70	0	4	0	0	0	0	0	5	246	0	0	0	83	19	427	1,959
8:30 AM	0	82	0	6	0	0	0	0	0	4	280	0	0	0	75	20	467	1,902
8:45 AM	0	95	0	6	0	0	0	0	0	5	309	0	0	0	76	29	520	1,921
Count Total	0	638	0	56	0	0	0	0	0	48	2,326	0	0	0	650	182	3,900	0
Peak Hour	**0**	**329**	**0**	**34**	**0**	**0**	**0**	**0**	**0**	**20**	**1,194**	**0**	**0**	**0**	**362**	**85**	**2,024**	**0**

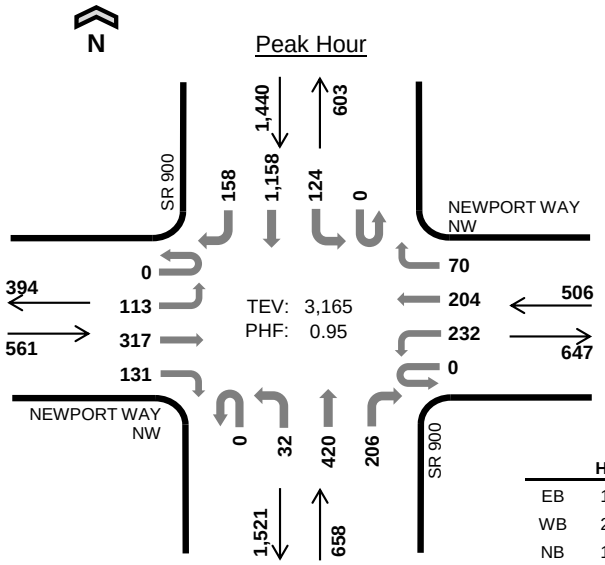
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

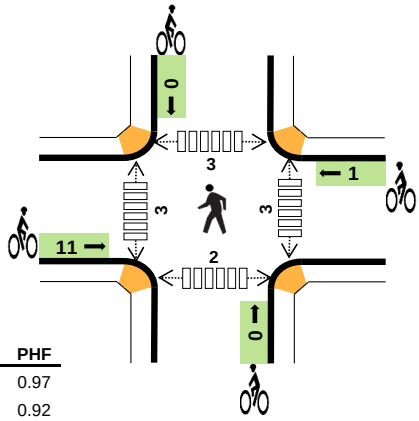
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	0	9	8	*19*	0	0	0	0	*0*	0	1	0	0	*1*
7:15 AM	**3**	**0**	**8**	**2**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
7:30 AM	**0**	**0**	**14**	**8**	***22***	**0**	**0**	**0**	**0**	***0***	**0**	**4**	**0**	**0**	*4*
7:45 AM	**1**	**0**	**7**	**6**	***14***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**2**	**0**	**13**	**10**	***25***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***
8:15 AM	1	0	9	4	*14*	0	0	0	0	*0*	1	0	0	0	*1*
8:30 AM	2	0	7	6	*15*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	4	0	8	9	*21*	1	0	0	0	*1*	0	0	0	0	*0*
Count Total	15	0	75	53	*143*	1	0	0	1	*2*	1	5	0	0	*6*
Peak Hour	**6**	**0**	**42**	**26**	***74***	**0**	**0**	**0**	**1**	***1***	**0**	**4**	**0**	**0**	***4***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

SR 900
NEWPORT WAY NW

Date: Tue, Aug 11, 2015
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM





	HV %:	PHF
EB	1.4%	0.97
WB	2.2%	0.92
NB	1.8%	0.91
SB	1.3%	0.87
TOTAL	1.5%	0.95

Two-Hour Count Summaries

Interval Start	NEWPORT WAY NW Eastbound				NEWPORT WAY NW Westbound				SR 900 Northbound				SR 900 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	18	38	27	0	57	57	20	0	7	109	35	0	32	306	43	749	0
4:15 PM	0	19	77	33	0	62	45	28	0	11	121	43	0	24	291	36	790	0
4:30 PM	0	26	71	27	0	57	34	15	0	10	108	39	0	34	316	44	781	0
4:45 PM	**0**	**38**	**73**	**33**	**0**	**43**	**48**	**22**	**0**	**2**	**110**	**44**	**0**	**18**	**256**	**37**	**724**	3,044
5:00 PM	**0**	**26**	**80**	**29**	**0**	**54**	**57**	**19**	**0**	**7**	**110**	**43**	**0**	**41**	**333**	**38**	**837**	3,132
5:15 PM	**0**	**30**	**75**	**33**	**0**	**74**	**53**	**10**	**0**	**6**	**97**	**59**	**0**	**31**	**271**	**41**	**780**	3,122
5:30 PM	**0**	**19**	**89**	**36**	**0**	**61**	**46**	**19**	**0**	**17**	**103**	**60**	**0**	**34**	**298**	**42**	**824**	**3,165**
5:45 PM	0	26	65	35	0	59	37	11	0	7	90	53	0	28	266	46	723	3,164
Count Total	0	202	568	253	0	467	377	144	0	67	848	376	0	242	2,337	327	6,208	0
Peak Hour	**0**	**113**	**317**	**131**	**0**	**232**	**204**	**70**	**0**	**32**	**420**	**206**	**0**	**124**	**1,158**	**158**	**3,165**	**0**

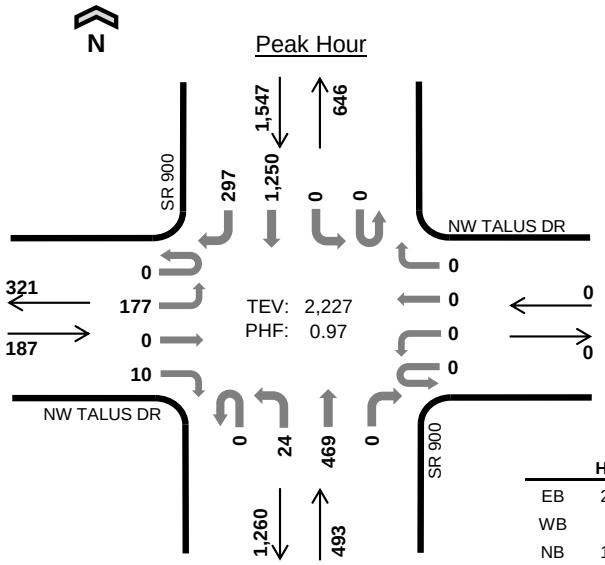
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

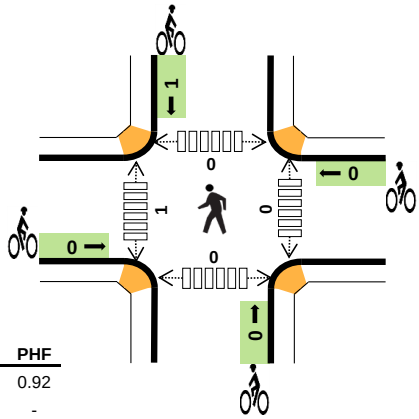
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	0	6	10	*17*	1	0	0	0	*1*	0	0	1	0	*1*
4:15 PM	6	0	5	4	*15*	1	0	0	0	*1*	1	1	3	0	*5*
4:30 PM	0	2	2	5	*9*	0	2	0	0	*2*	0	0	2	1	*3*
4:45 PM	**2**	**2**	**3**	**6**	***13***	**3**	**1**	**0**	**0**	***4***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**2**	**5**	**4**	**1**	***12***	**4**	**0**	**0**	**0**	***4***	**1**	**1**	**2**	**1**	*5*
5:15 PM	**3**	**2**	**1**	**6**	***12***	**1**	**0**	**0**	**0**	***1***	**0**	**2**	**1**	**0**	*3*
5:30 PM	**1**	**2**	**4**	**5**	***12***	**3**	**0**	**0**	**0**	***3***	**2**	**0**	**0**	**1**	***3***
5:45 PM	1	2	3	4	*10*	1	1	0	0	*2*	0	3	0	1	*4*
Count Total	16	15	28	41	*100*	14	4	0	0	*18*	4	7	9	4	*24*
Peak Hour	**8**	**11**	**12**	**18**	***49***	**11**	**1**	**0**	**0**	***12***	**3**	**3**	**3**	**2**	***11***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

SR 900
NW TALUS DR

Date: Tue, Aug 11, 2015
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM





	HV %:	PHF
EB	2.1%	0.92
WB	-	-
NB	1.8%	0.90
SB	2.2%	0.93
TOTAL	2.1%	0.97

Two-Hour Count Summaries

Interval Start	NW TALUS DR Eastbound				NW TALUS DR Westbound				SR 900 Northbound				SR 900 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	51	0	16	0	0	0	0	0	5	122	0	0	0	326	64	584	0
4:15 PM	0	41	0	6	0	0	0	0	0	3	112	0	0	0	327	73	562	0
4:30 PM	0	44	0	8	0	0	0	0	0	7	110	0	0	0	305	61	535	0
4:45 PM	**0**	**41**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**5**	**129**	**0**	**0**	**0**	**273**	**74**	**524**	2,205
5:00 PM	**0**	**43**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**5**	**96**	**0**	**0**	**0**	**343**	**72**	**563**	2,184
5:15 PM	**0**	**50**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**7**	**130**	**0**	**0**	**0**	**310**	**75**	**573**	2,195
5:30 PM	**0**	**43**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**7**	**114**	**0**	**0**	**0**	**324**	**76**	**567**	**2,227**
5:45 PM	0	44	0	2	0	0	0	0	0	3	115	0	0	0	262	90	516	2,219
Count Total	0	357	0	42	0	0	0	0	0	42	928	0	0	0	2,470	585	4,424	0
Peak Hour	**0**	**177**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**24**	**469**	**0**	**0**	**0**	**1,250**	**297**	**2,227**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	3	0	4	8	*15*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	2	0	3	2	*7*	0	0	0	0	*0*	0	1	0	0	*1*
4:30 PM	3	0	0	5	*8*	0	0	0	0	*0*	0	1	0	0	*1*
4:45 PM	**1**	**0**	**4**	**5**	***10***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	*0*
5:00 PM	**2**	**0**	**1**	**8**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**0**	**0**	**1**	**13**	***14***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**0**	**0**	*1*
5:30 PM	**1**	**0**	**3**	**8**	***12***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:45 PM	1	0	1	7	*9*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	13	0	17	56	*86*	0	0	0	1	*1*	0	3	0	0	*3*
Peak Hour	**4**	**0**	**9**	**34**	***47***	**0**	**0**	**0**	**1**	***1***	**0**	**1**	**0**	**0**	***1***

Mark Skaggs: (425) 250-0777 mark.skaggs@idaxdata.com

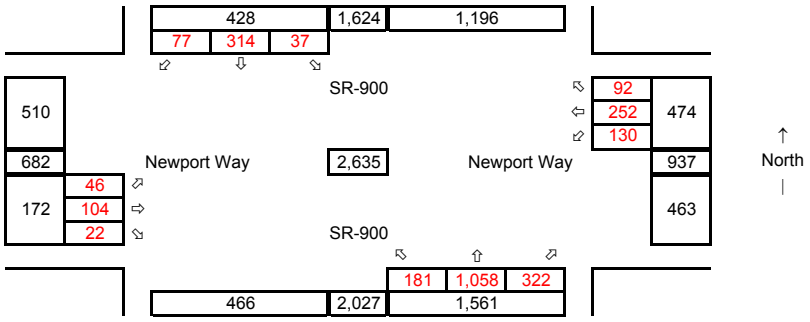
Turning Movement Calculations

Synchro ID: 1

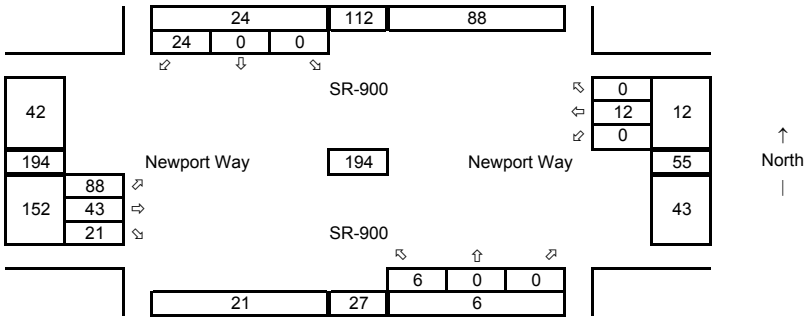
Existing Volumes
Average Weekday
AM Peak-Hour

Year: **8/11/2015**

Data Source: **Idax**

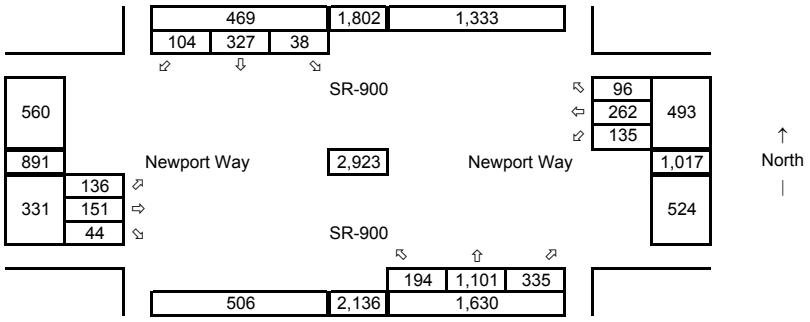


Pipeline Trips
Average Weekday
AM Peak-Hour

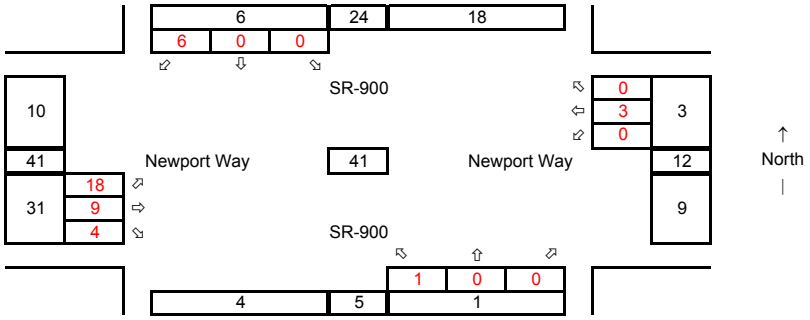


2017 Baseline Volumes
Average Weekday
AM Peak-Hour

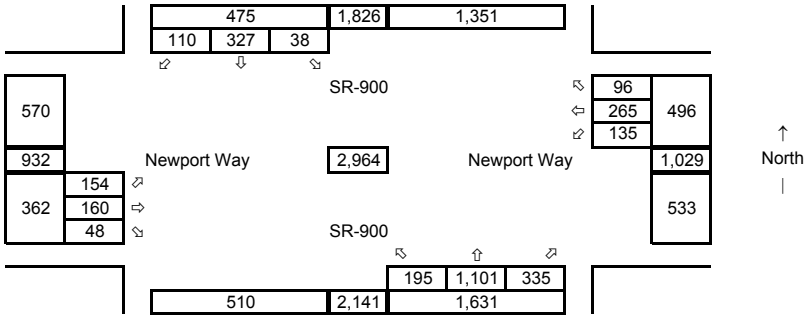
Year: 2017
Growth Rate = 2.0%
Years of Growth = 2
Total Growth = 1.0404

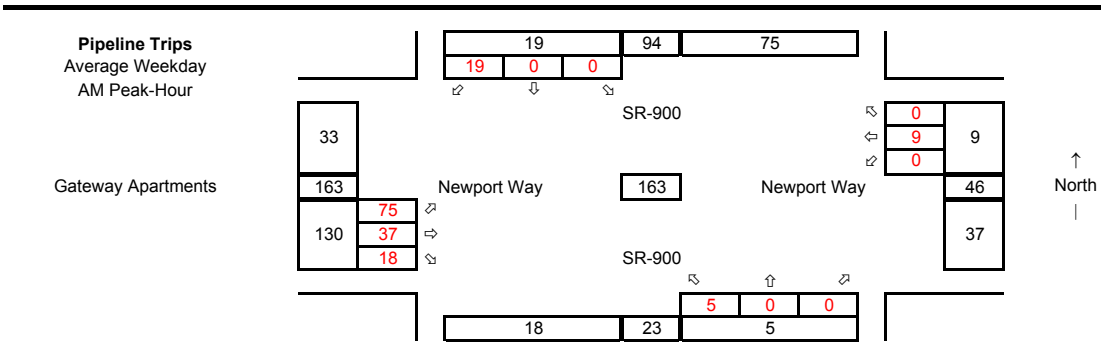


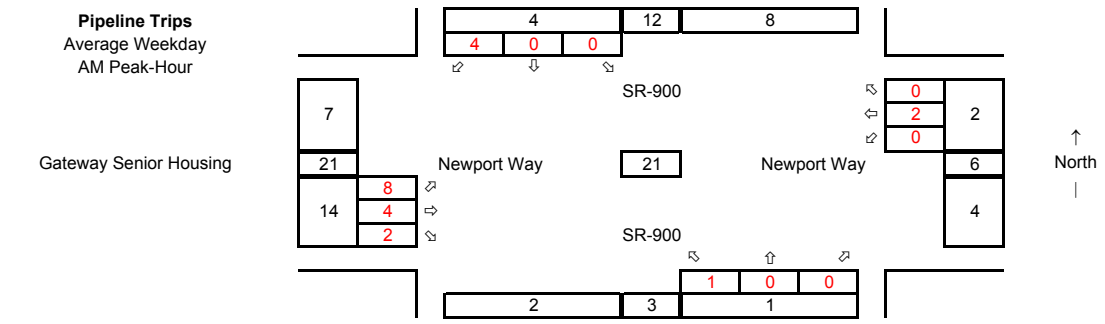
Development Trips
Average Weekday
AM Peak-Hour

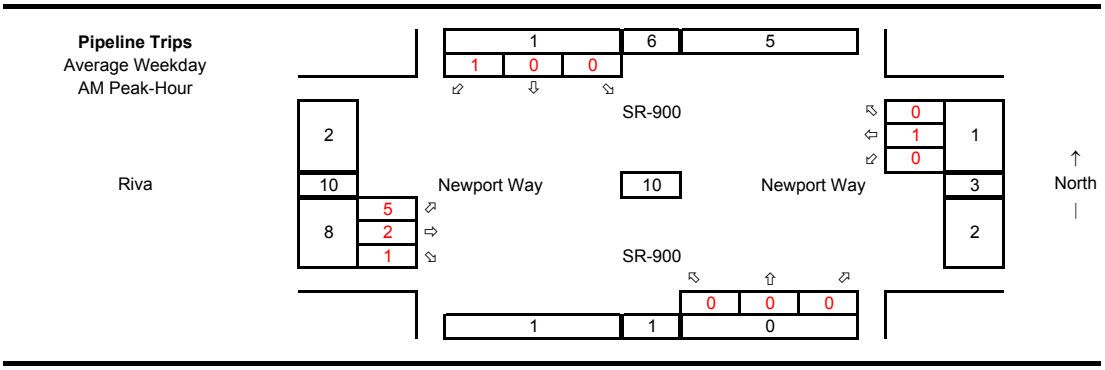


Future with Dev. Volumes
Average Weekday
AM Peak-Hour




Pipeline Trips
Average Weekday
AM Peak-Hour
Gateway Apartments
19
94
75
19
0
0
SR-900
33
0
9
9
0
163
Newport Way
163
Newport Way
46
North
75
130
37
37
18
SR-900
5
0
0
18
23
5


Pipeline Trips
Average Weekday
AM Peak-Hour
Gateway Senior Housing
4
12
8
4
0
0
SR-900
7
0
2
2
0
21
Newport Way
21
Newport Way
6
North
8
14
4
4
2
SR-900
1
0
0
2
3
1

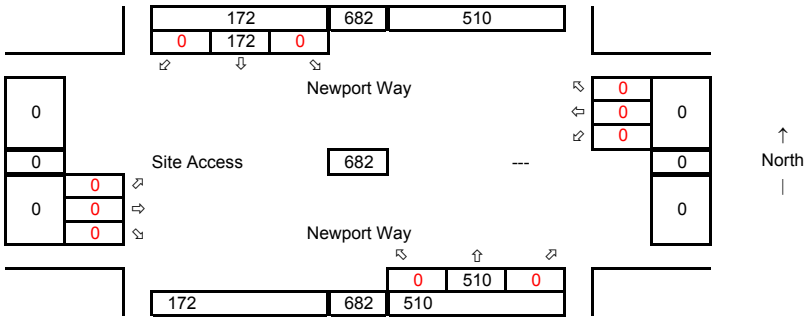

Pipeline Trips
Average Weekday
AM Peak-Hour
Riva
1
6
5
1
0
0
SR-900
2
0
1
1
0
10
Newport Way
10
Newport Way
3
North
5
8
2
2
1
SR-900
0
0
0
1
1
0

Synchro ID: 2

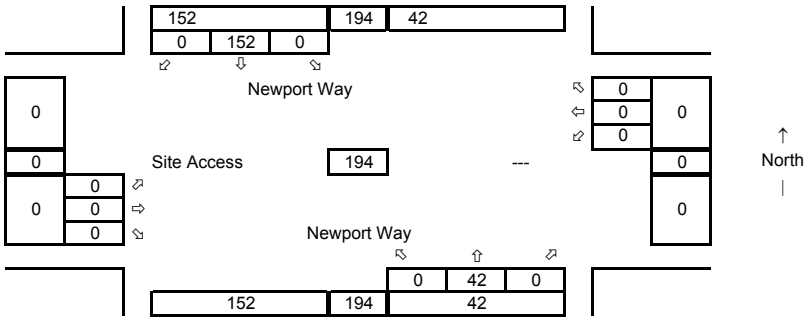
Existing Volumes
Average Weekday
AM Peak-Hour

Year: **8/11/2015**

Data Source: **Idax**

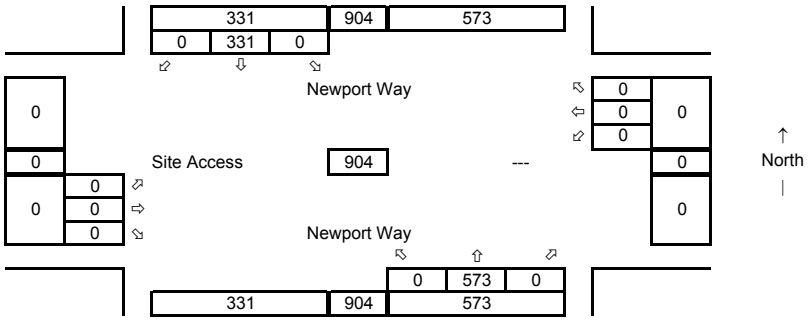


Pipeline Trips
Average Weekday
AM Peak-Hour

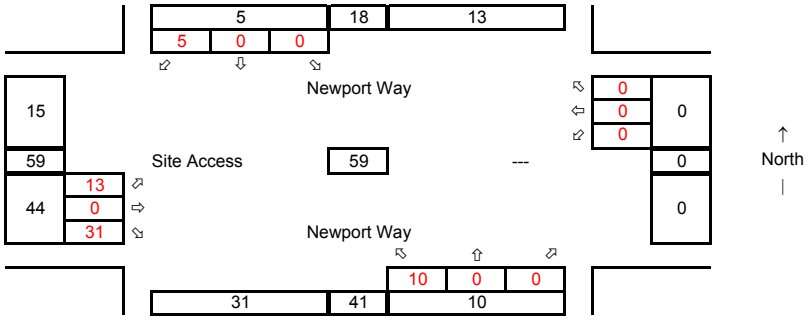


2017 Baseline Volumes
Average Weekday
AM Peak-Hour

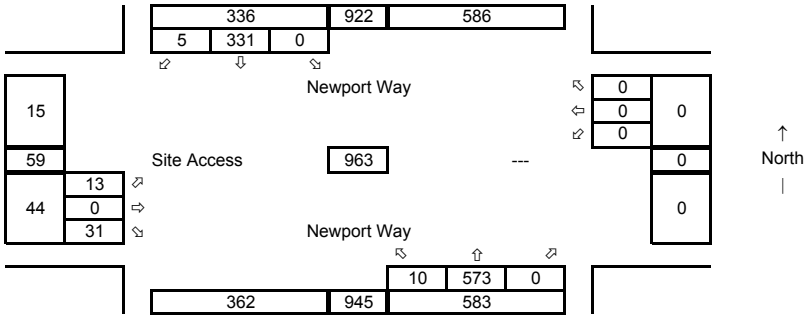
Year: 2017
Growth Rate = 2.00%
Years of Growth = 2
Total Growth = 1.0404



Development Trips
Average Weekday
AM Peak-Hour

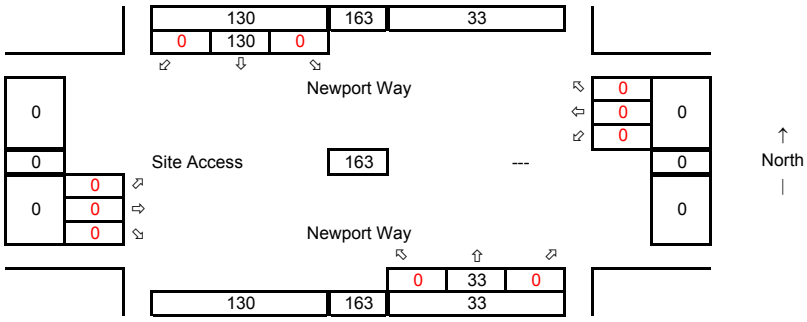


Future with Dev. Volumes
Average Weekday
AM Peak-Hour



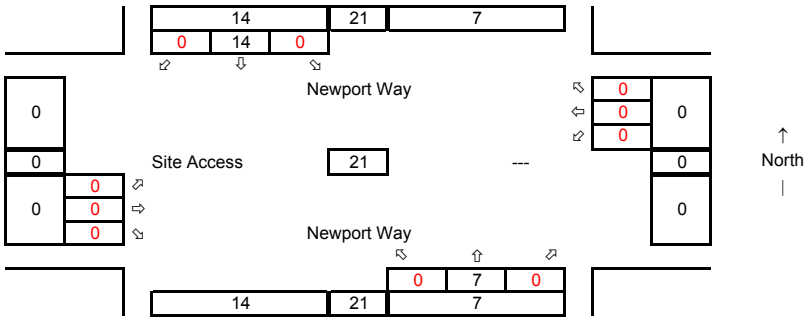
Pipeline Trips
Average Weekday
AM Peak-Hour

Gateway Apartments



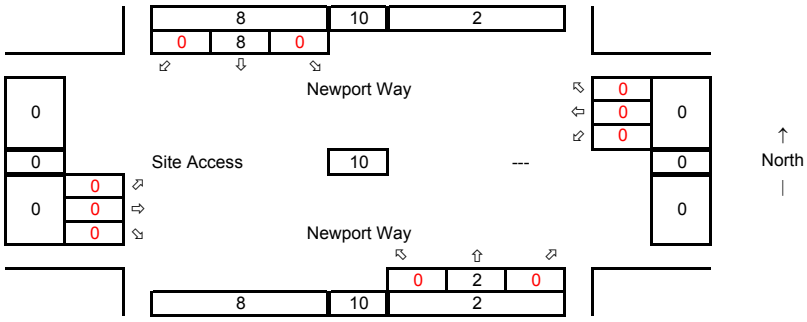
Pipeline Trips
Average Weekday
AM Peak-Hour

Gateway Senior Housing



Pipeline Trips
Average Weekday
AM Peak-Hour

Riva



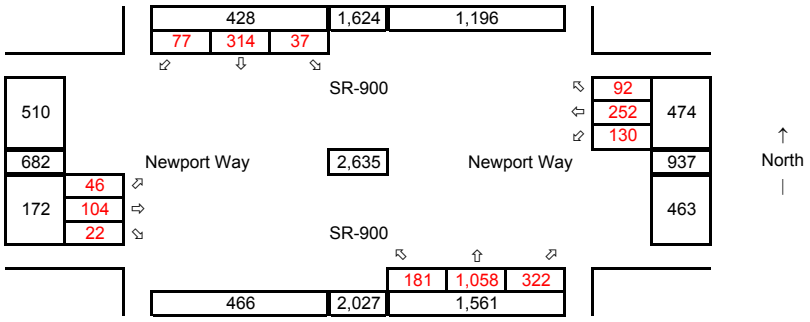
Includes Talus Reassignment

Synchro ID: 1

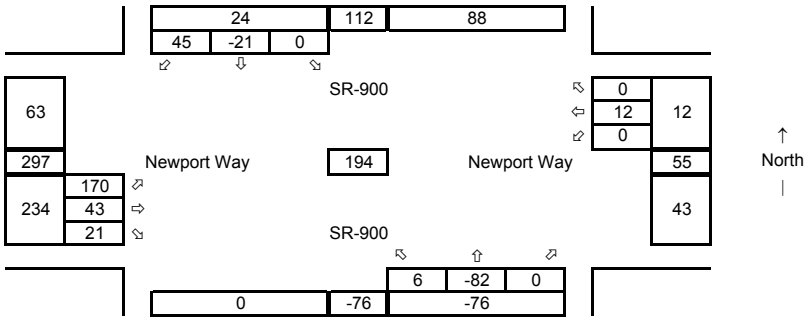
Existing Volumes
Average Weekday
AM Peak-Hour

Year: **8/11/2015**

Data Source: **Idax**

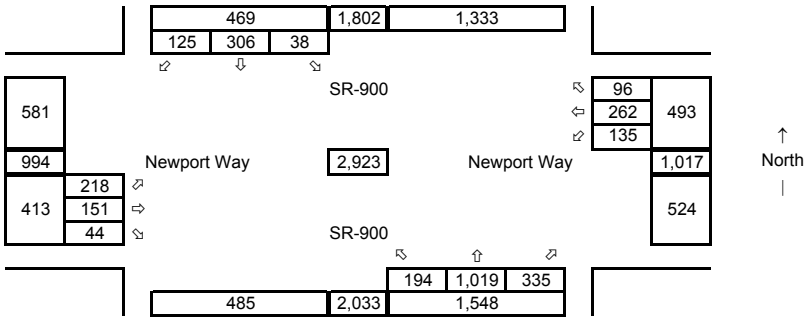


Pipeline Trips
Average Weekday
AM Peak-Hour

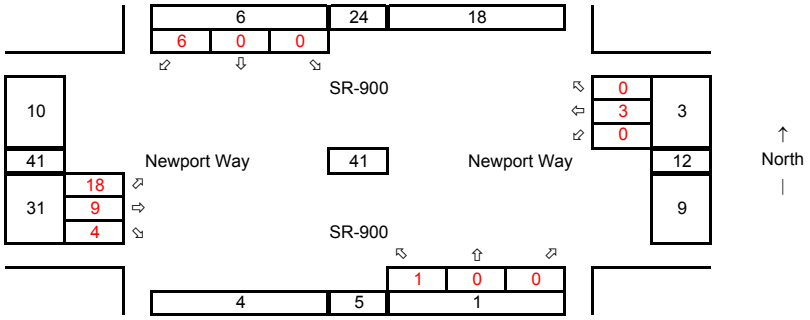


2017 Baseline Volumes
Average Weekday
AM Peak-Hour

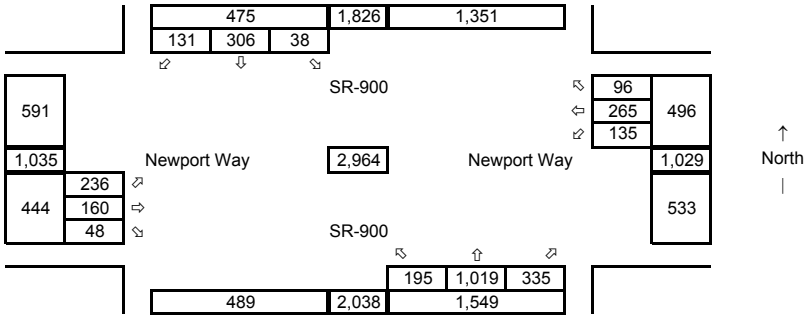
Year: 2017
Growth Rate = 2.0%
Years of Growth = 2
Total Growth = 1.0404



Development Trips
Average Weekday
AM Peak-Hour



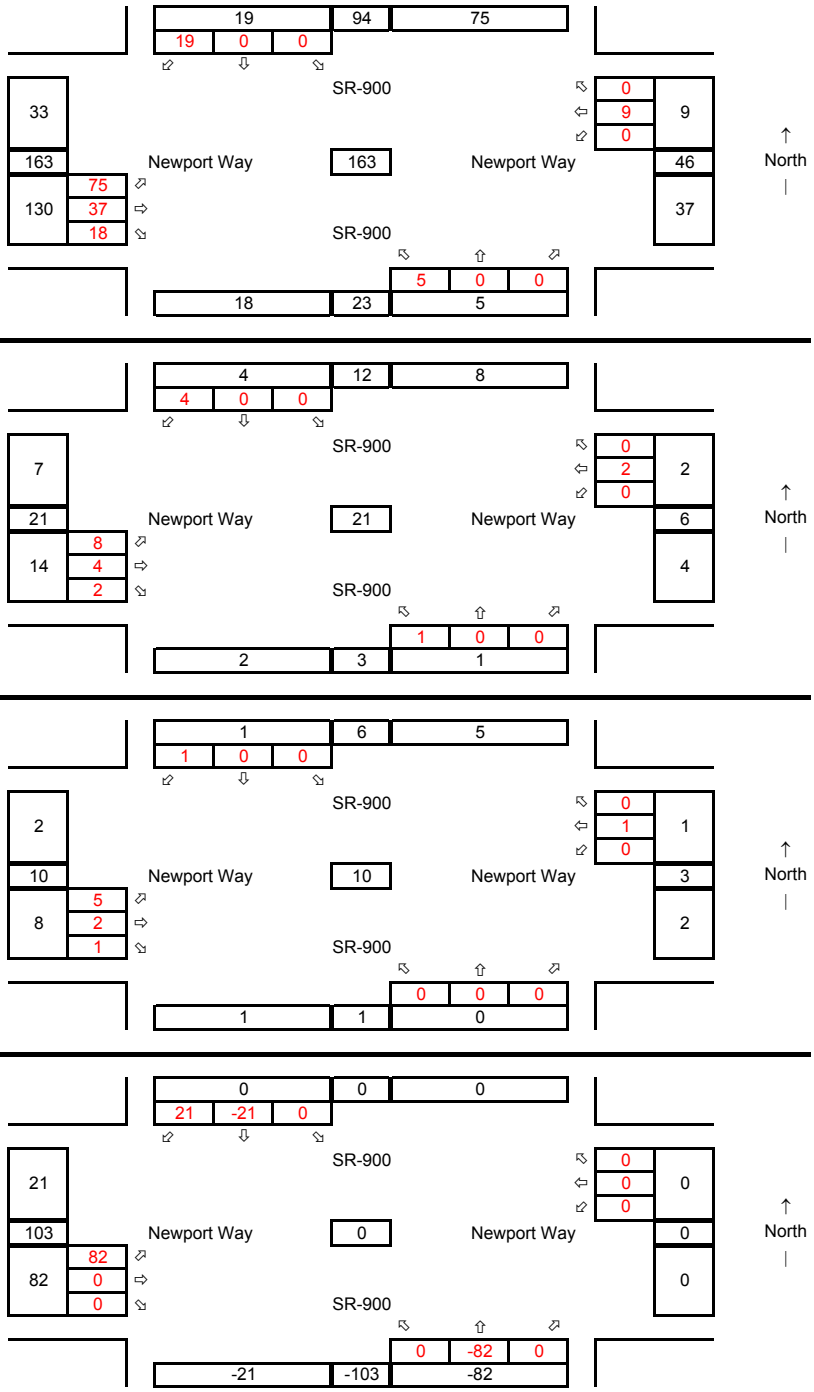
Future with Dev. Volumes
Average Weekday
AM Peak-Hour



Includes Talus Reassignment

Pipeline Trips
Average Weekday
AM Peak-Hour

Gateway Apartments



Pipeline Trips
Average Weekday
AM Peak-Hour

Gateway Senior Housing

Pipeline Trips
Average Weekday
AM Peak-Hour

Riva

Pipeline Trips
Average Weekday
AM Peak-Hour

Talus trips w Connection

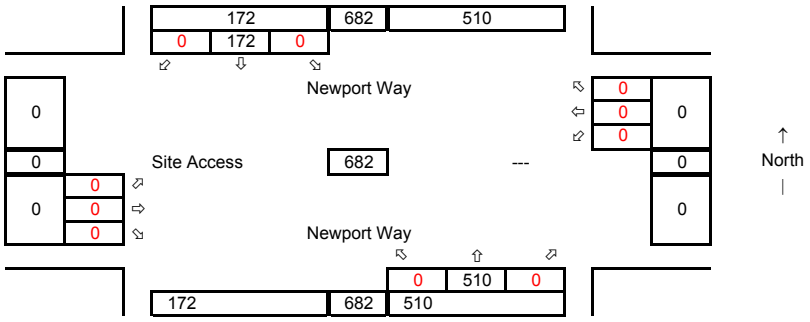
Includes Talus Reassignment

Synchro ID: 2

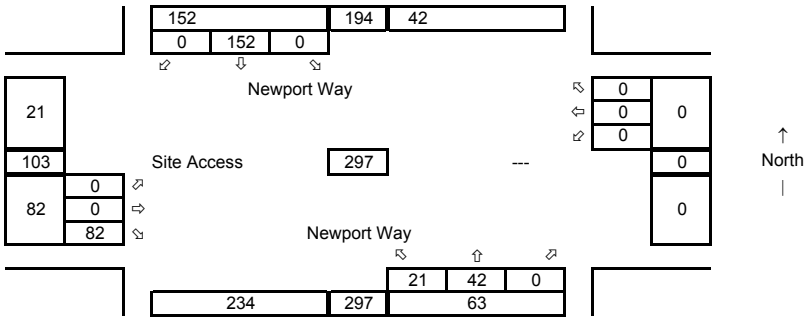
Existing Volumes
Average Weekday
AM Peak-Hour

Year: **8/11/2015**

Data Source: **Idax**

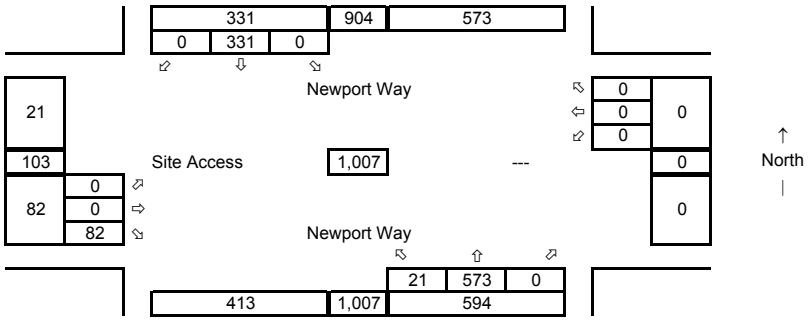


Pipeline Trips
Average Weekday
AM Peak-Hour

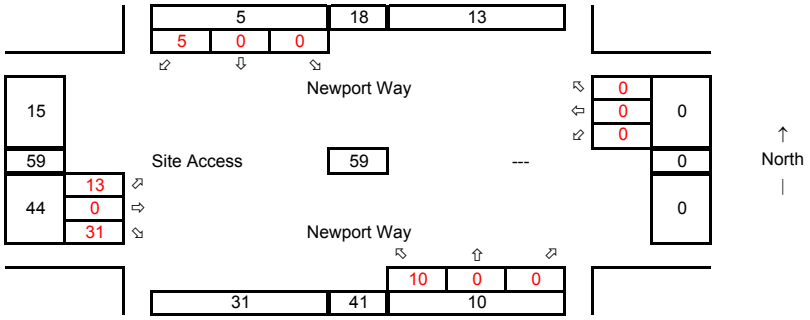


2017 Baseline Volumes
Average Weekday
AM Peak-Hour

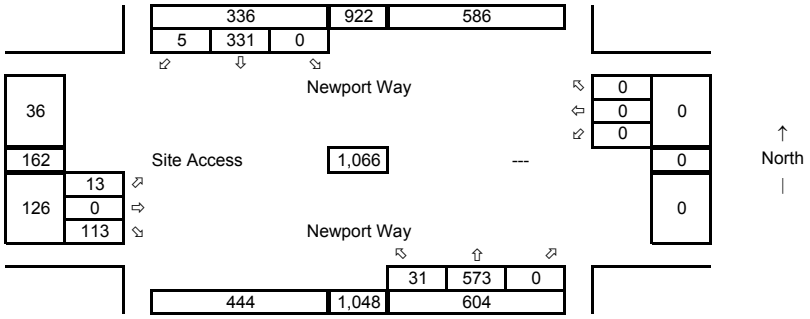
Year: 2017
Growth Rate = 2.00%
Years of Growth = 2
Total Growth = 1.0404



Development Trips
Average Weekday
AM Peak-Hour



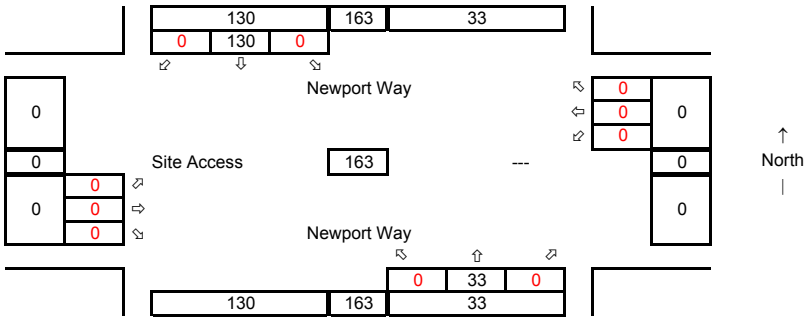
Future with Dev. Volumes
Average Weekday
AM Peak-Hour



Includes Talus Reassignment

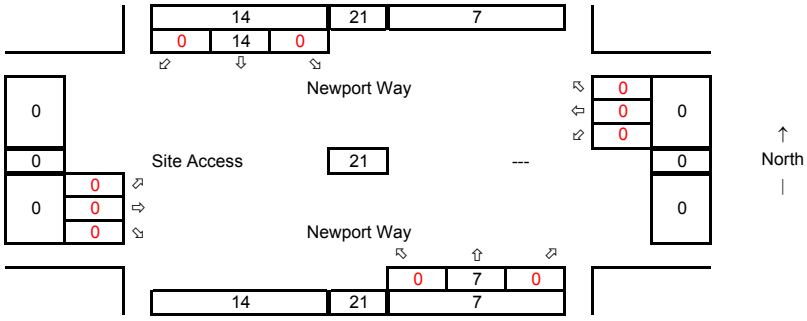
Pipeline Trips
Average Weekday
AM Peak-Hour

Gateway Apartments



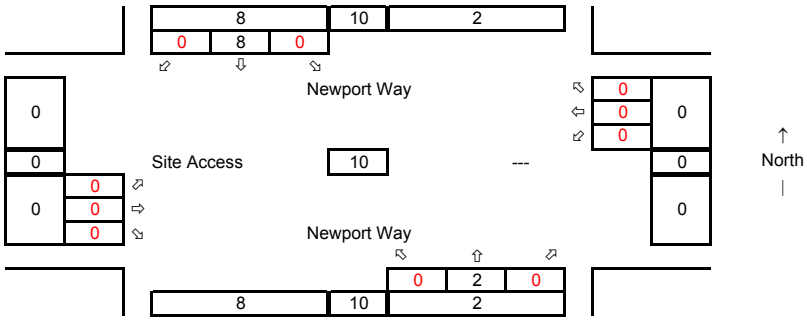
Pipeline Trips
Average Weekday
AM Peak-Hour

Gateway Senior Housing



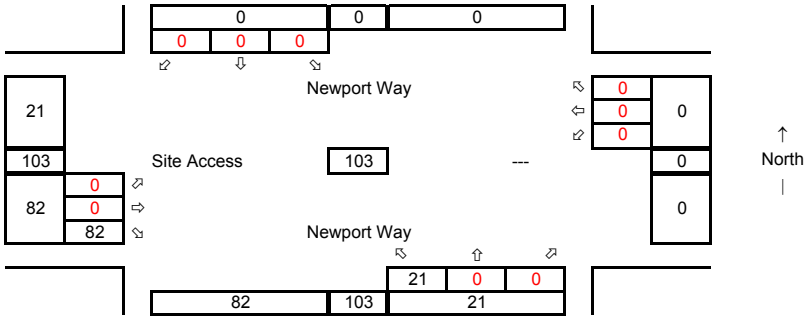
Pipeline Trips
Average Weekday
AM Peak-Hour

Riva



Pipeline Trips
Average Weekday
AM Peak-Hour

Talus trips w Connection

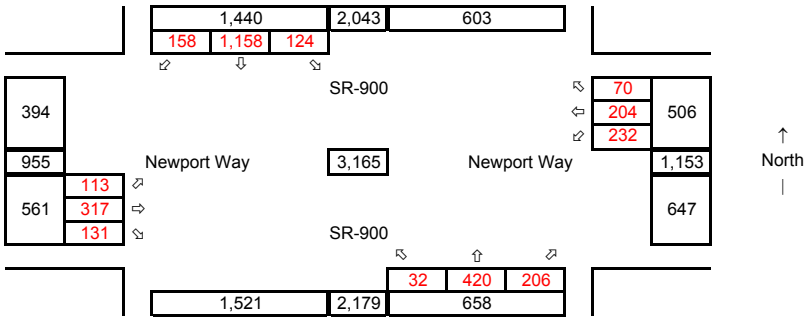


Synchro ID: 1

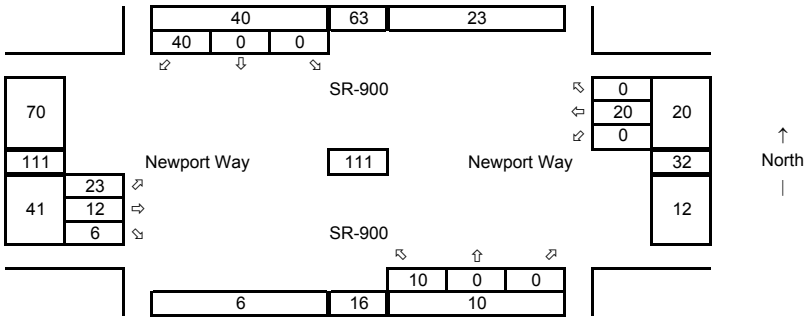
Existing Volumes
Average Weekday
PM Peak-Hour

Year: **8/11/2015**

Data Source: **Idax**

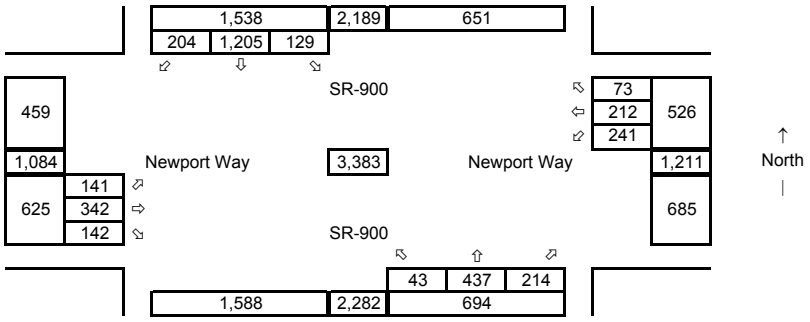


Pipeline Trips
Average Weekday
PM Peak-Hour

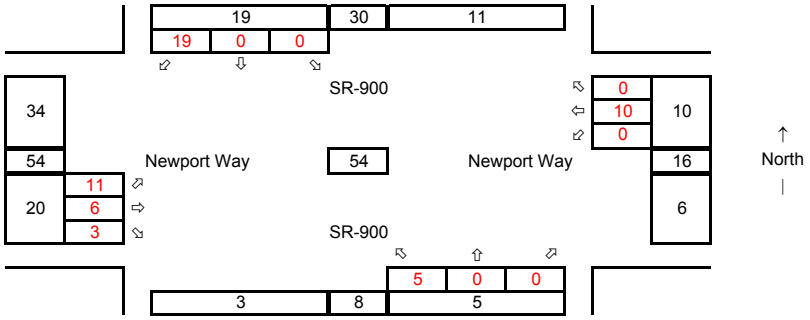


2017 Baseline Volumes
Average Weekday
PM Peak-Hour

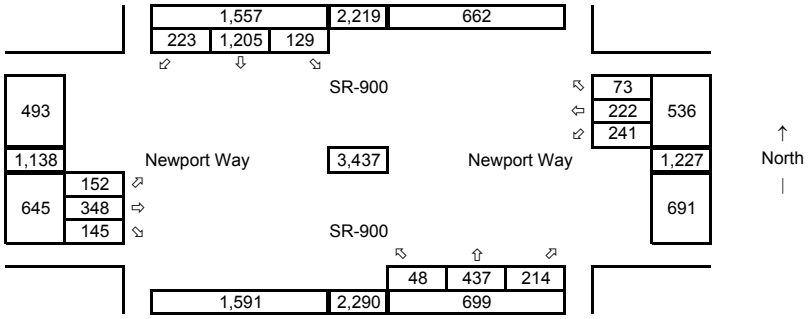
Year: 2017
Growth Rate = 2.0%
Years of Growth = 2
Total Growth = 1.0404



Development Trips
Average Weekday
PM Peak-Hour

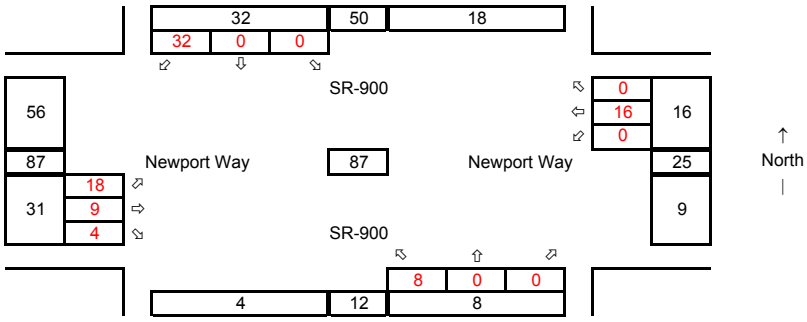


Future with Dev. Volumes
Average Weekday
PM Peak-Hour



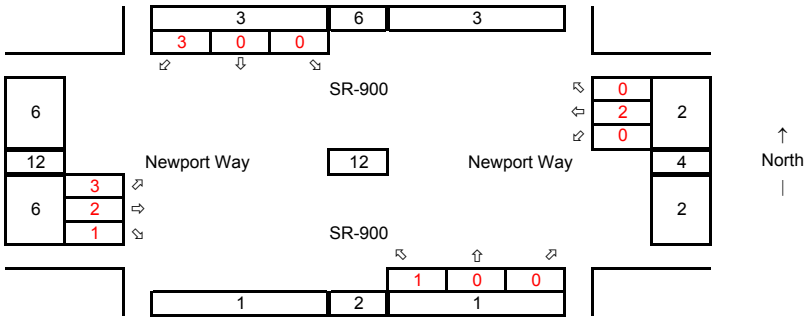
Pipeline Trips
Average Weekday
PM Peak-Hour

Gateway Apartments



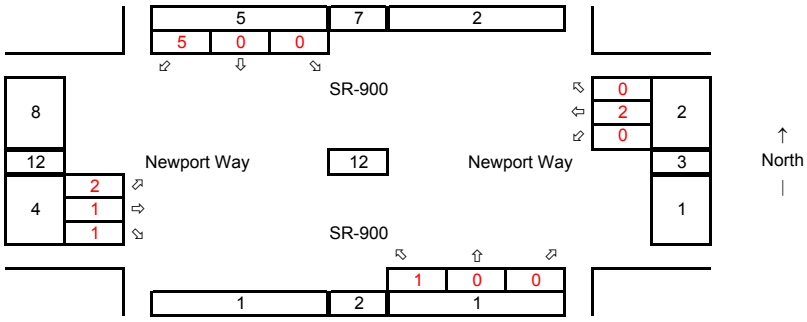
Pipeline Trips
Average Weekday
PM Peak-Hour

Gateway Senior Housing



Pipeline Trips
Average Weekday
PM Peak-Hour

Riva

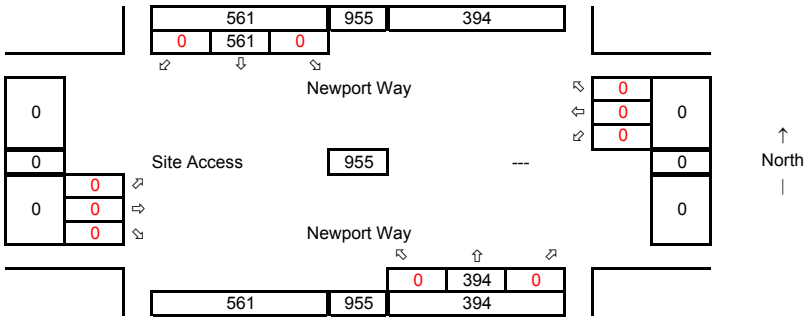


Synchro ID: 2

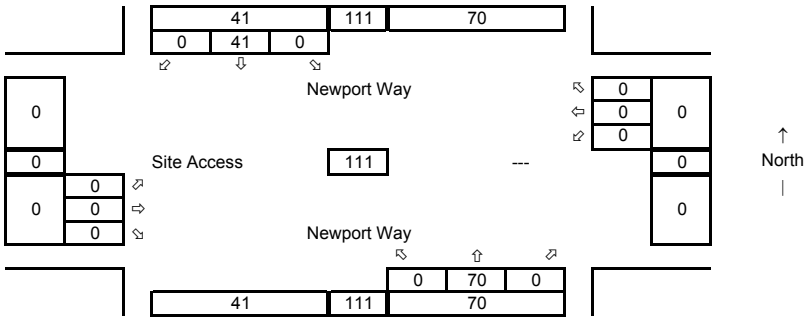
Existing Volumes
Average Weekday
PM Peak-Hour

Year: **8/11/2015**

Data Source: **Idax**

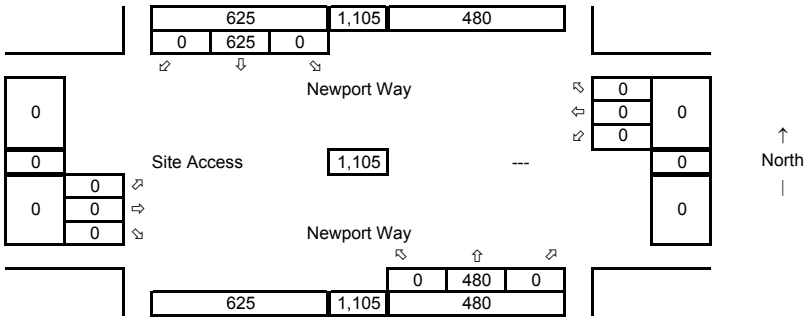


Pipeline Trips
Average Weekday
PM Peak-Hour

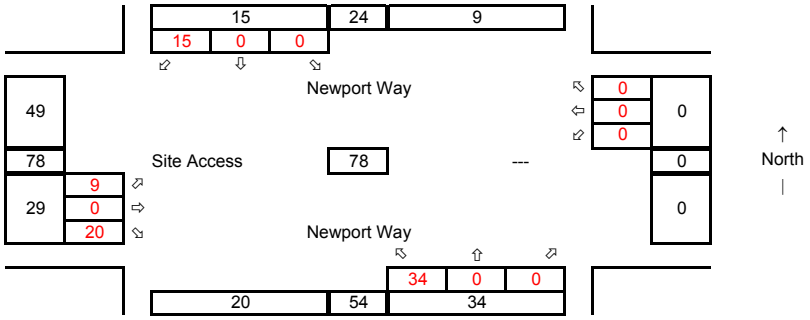


2017 Baseline Volumes
Average Weekday
PM Peak-Hour

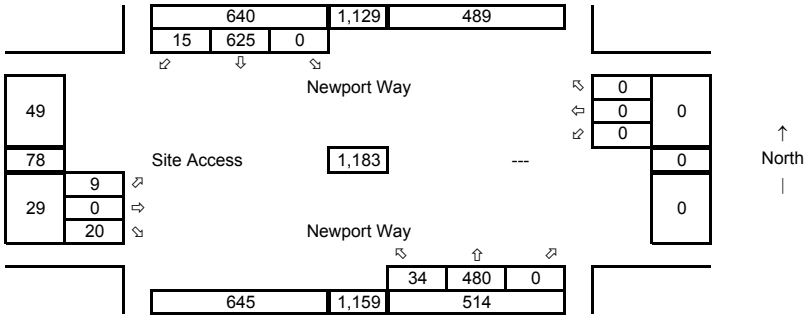
Year: 2017
Growth Rate = 2.0%
Years of Growth = 2
Total Growth = 1.0404



Development Trips
Average Weekday
PM Peak-Hour

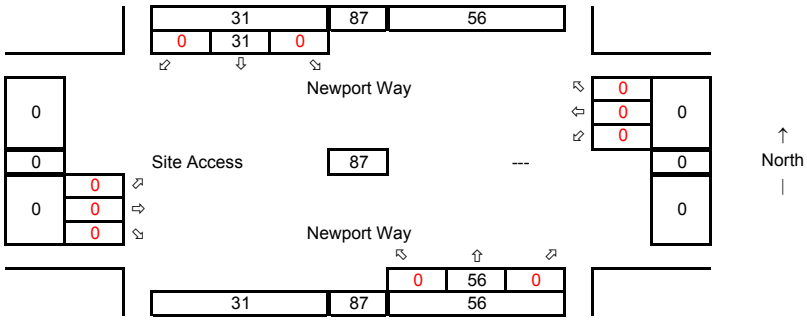


Future with Dev. Volumes
Average Weekday
PM Peak-Hour



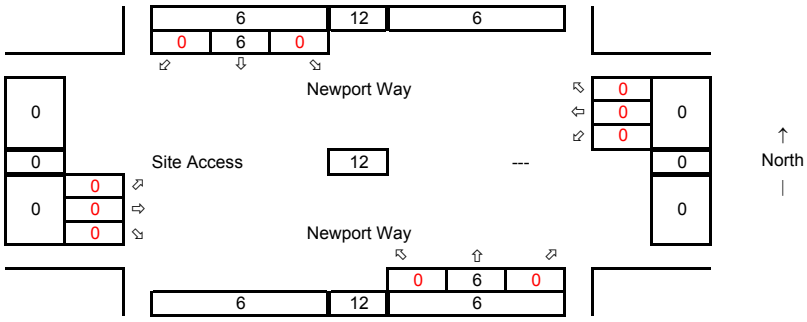
Pipeline Trips
Average Weekday
PM Peak-Hour

Gateway Apartments



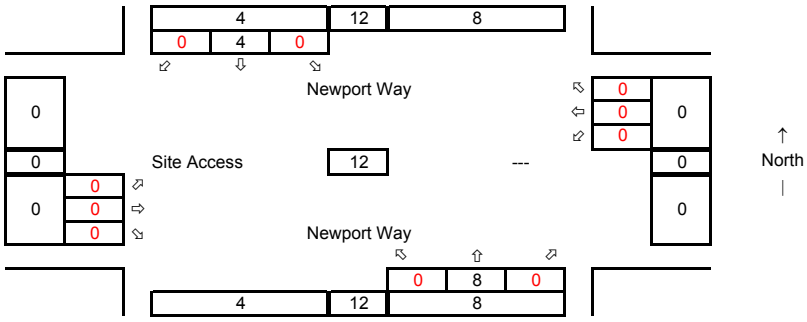
Pipeline Trips
Average Weekday
PM Peak-Hour

Gateway Senior Housing



Pipeline Trips
Average Weekday
PM Peak-Hour

Riva



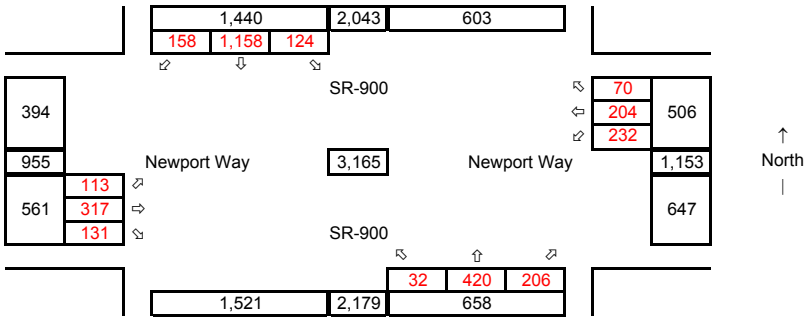
Includes Talus Reassignment

Synchro ID: 1

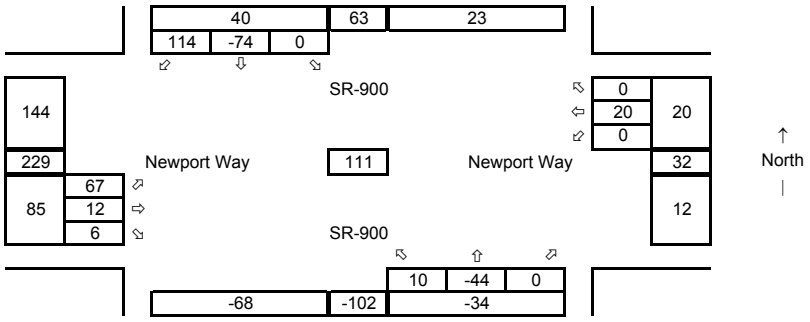
Existing Volumes
Average Weekday
PM Peak-Hour

Year: **8/11/2015**

Data Source: **Idax**

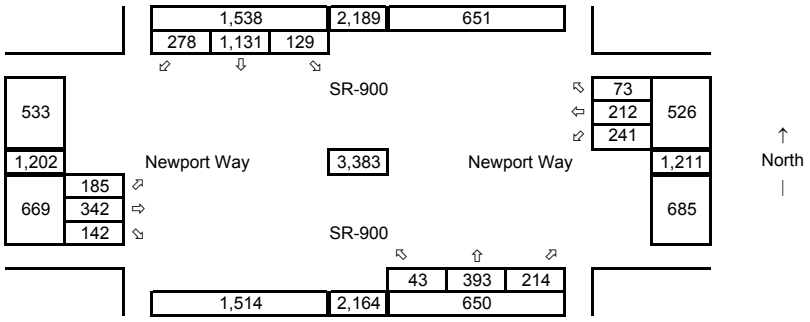


Pipeline Trips
Average Weekday
PM Peak-Hour

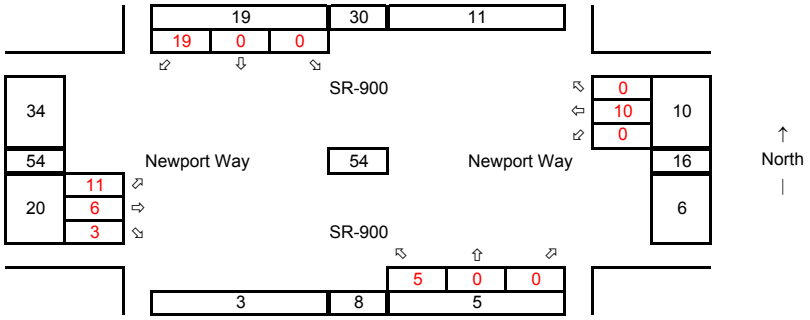


2017 Baseline Volumes
Average Weekday
PM Peak-Hour

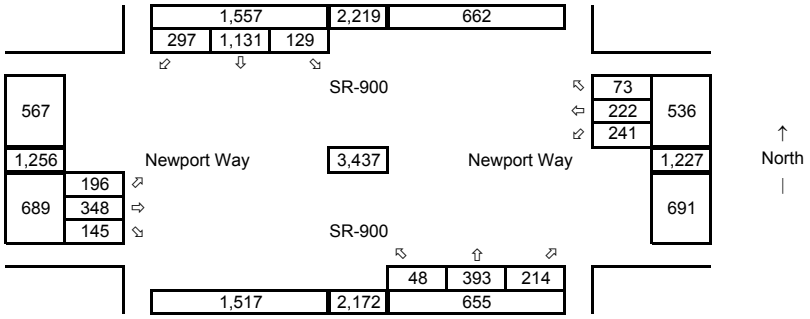
Year: 2017
Growth Rate = 2.0%
Years of Growth = 2
Total Growth = 1.0404



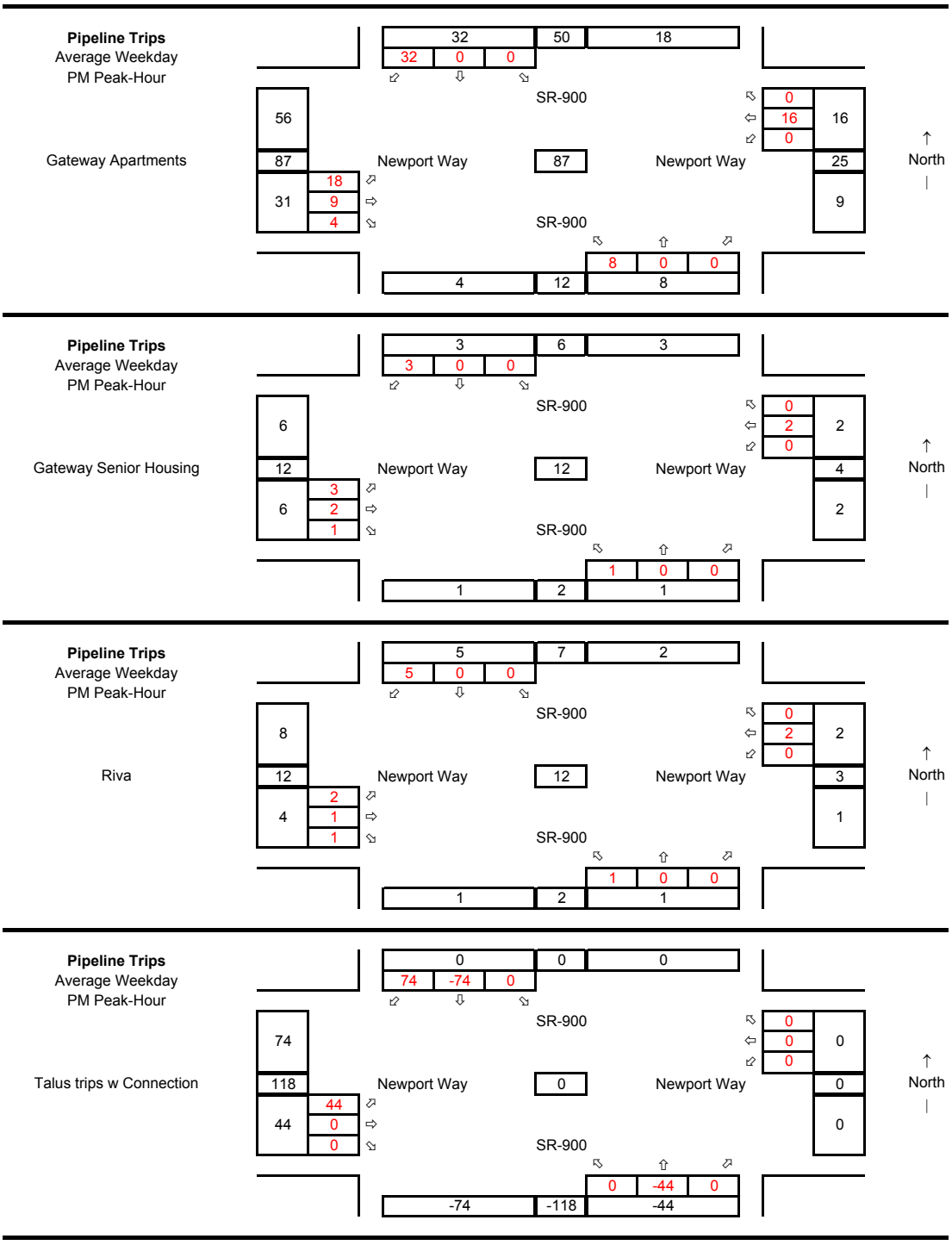
Development Trips
Average Weekday
PM Peak-Hour



Future with Dev. Volumes
Average Weekday
PM Peak-Hour



Includes Talus Reassignment



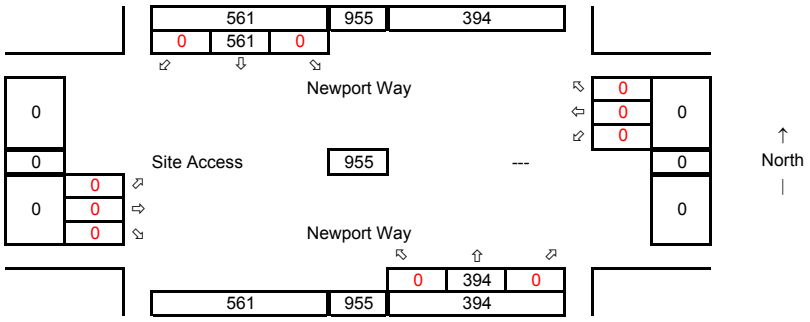
Includes Talus Reassignment

Synchro ID: 2

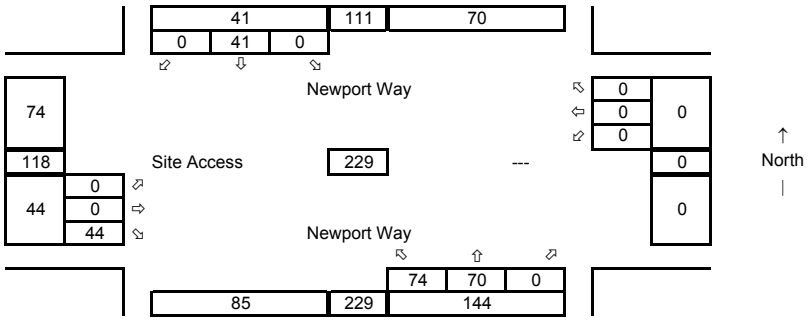
Existing Volumes
Average Weekday
PM Peak-Hour

Year: **8/11/2015**

Data Source: **Idax**

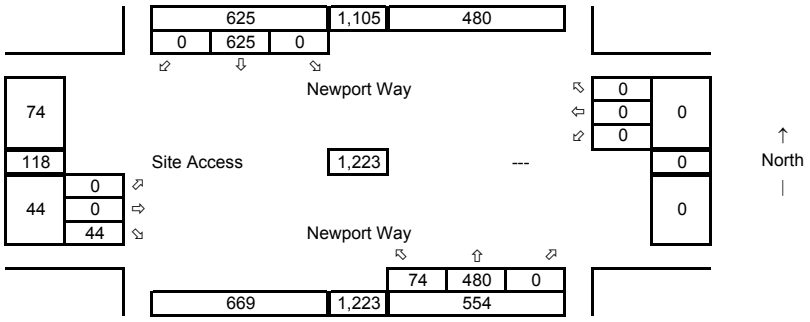


Pipeline Trips
Average Weekday
PM Peak-Hour

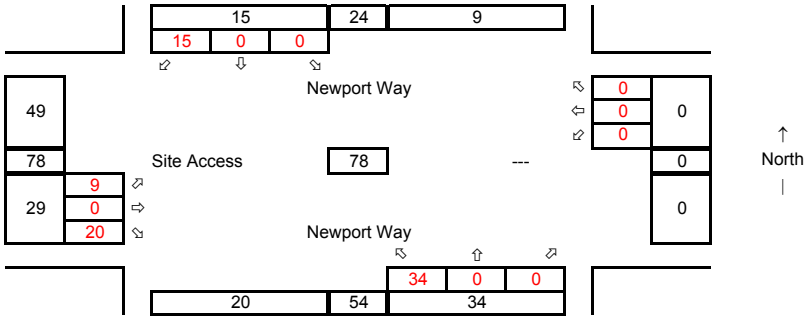


2017 Baseline Volumes
Average Weekday
PM Peak-Hour

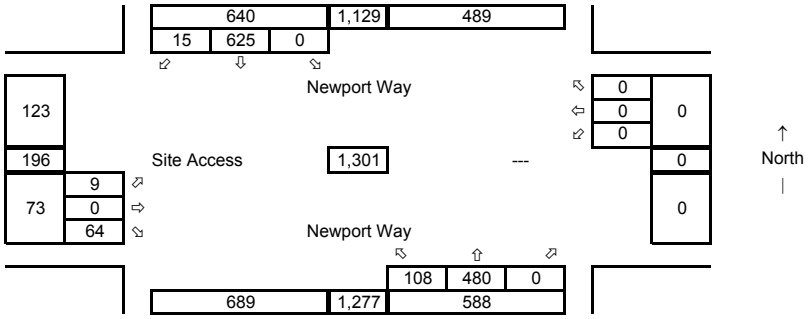
Year: 2017
Growth Rate = 2.0%
Years of Growth = 2
Total Growth = 1.0404



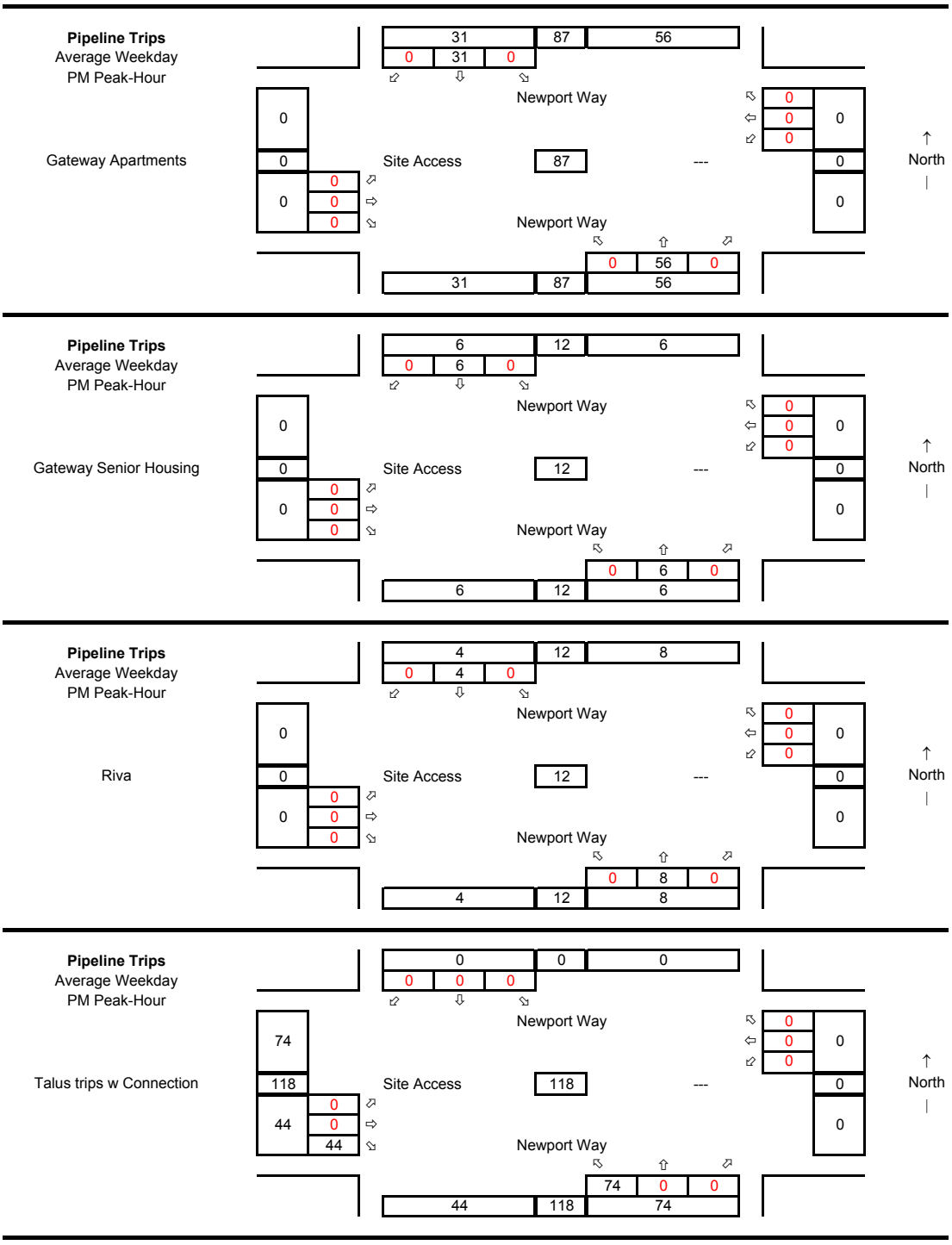
Development Trips
Average Weekday
PM Peak-Hour



Future with Dev. Volumes
Average Weekday
PM Peak-Hour



Includes Talus Reassignment



AM Peak-Hour Level of Service Analysis

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	104	22	130	252	92	181	1058	322	37	314	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	100		150	175		175	140		0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	1749	1487	1711	1801	1531	1694	3388	1516	1646	3292	1473
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1659	1749	1467	1709	1801	1505	1689	3388	1478	1644	3292	1436
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			132			206			132
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		988			1674			1168			1074	
Travel Time (s)		22.5			38.0			19.9			18.3	
Confl. Peds. (#/hr)	2		1	1		2	2		2	2		2
Confl. Bikes (#/hr)						3						
Peak Hour Factor	0.77	0.77	0.77	0.89	0.89	0.89	0.95	0.95	0.95	0.91	0.91	0.91
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	3%	3%	3%	6%	6%	6%
Adj. Flow (vph)	60	135	29	146	283	103	191	1114	339	41	345	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	135	29	146	283	103	191	1114	339	41	345	85
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	13.0	40.0	15.0	15.0	41.0	41.0	15.0	35.0	35.0	15.0	35.0	35.0
Total Split (s)	15.0	40.0	30.0	20.0	45.0	45.0	30.0	65.0	65.0	15.0	50.0	50.0
Total Split (%)	10.7%	28.6%	21.4%	14.3%	32.1%	32.1%	21.4%	46.4%	46.4%	10.7%	35.7%	35.7%
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	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	9.3	21.8	46.8	14.1	28.6	28.6	25.0	78.4	77.4	7.8	59.1	59.1
Actuated g/C Ratio	0.07	0.16	0.33	0.10	0.20	0.20	0.18	0.56	0.55	0.06	0.42	0.42
v/c Ratio	0.55	0.50	0.05	0.85	0.77	0.25	0.63	0.59	0.37	0.45	0.25	0.12
Control Delay	80.3	58.2	0.2	99.7	66.7	4.3	63.7	24.9	9.9	78.8	28.8	1.4
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	80.3	58.2	0.2	99.7	66.7	4.3	63.7	24.9	9.9	78.8	28.8	1.4
LOS	F	E	A	F	E	A	E	C	A	E	C	A
Approach Delay		56.6			63.7			26.3			28.2	

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		E			E			C			C	
Queue Length 50th (ft)	54	115	0	132	250	0	163	352	60	37	105	0
Queue Length 95th (ft)	85	138	0	#243	323	24	249	537	165	77	168	9
Internal Link Dist (ft)		908			1594			1088			994	
Turn Bay Length (ft)	150		200	100		150	175		175	140		
Base Capacity (vph)	129	437	556	183	514	524	302	1896	909	118	1390	682
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	0.47	0.31	0.05	0.80	0.55	0.20	0.63	0.59	0.37	0.35	0.25	0.12

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 28 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Red
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 35.9 — Intersection LOS: D
Intersection Capacity Utilization 69.4% — 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: SR-900 & Newport Way NW

2015 Existing Conditions
Gibson Traffic Consultants, Inc. [BJL 15-095]
AM Peak-Hour

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	136	151	44	135	262	96	194	1101	335	38	327	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	100		150	175		175	140		0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	1749	1487	1711	1801	1531	1694	3388	1516	1646	3292	1473
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1659	1749	1467	1709	1801	1505	1689	3388	1478	1644	3292	1436
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			132			206			132
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		988			1674			1168			1074	
Travel Time (s)		22.5			38.0			19.9			18.3	
Confl. Peds. (#/hr)	2		1	1		2	2		2	2		2
Confl. Bikes (#/hr)						3						
Peak Hour Factor	0.77	0.77	0.77	0.89	0.89	0.89	0.95	0.95	0.95	0.91	0.91	0.91
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	3%	3%	3%	6%	6%	6%
Adj. Flow (vph)	177	196	57	152	294	108	204	1159	353	42	359	114
Shared Lane Traffic (%)												
Lane Group Flow (vph)	177	196	57	152	294	108	204	1159	353	42	359	114
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	13.0	40.0	15.0	15.0	41.0	41.0	15.0	35.0	35.0	15.0	35.0	35.0
Total Split (s)	15.0	40.0	30.0	20.0	45.0	45.0	30.0	65.0	65.0	15.0	50.0	50.0
Total Split (%)	10.7%	28.6%	21.4%	14.3%	32.1%	32.1%	21.4%	46.4%	46.4%	10.7%	35.7%	35.7%
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	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	21.8	35.7	60.7	14.3	28.2	28.2	25.0	64.3	63.3	7.7	45.0	45.0
Actuated g/C Ratio	0.16	0.26	0.43	0.10	0.20	0.20	0.18	0.46	0.45	0.06	0.32	0.32
v/c Ratio	0.68	0.44	0.08	0.87	0.81	0.26	0.68	0.75	0.45	0.47	0.34	0.21
Control Delay	70.7	47.8	0.8	102.3	70.4	5.0	66.0	35.7	13.0	80.0	37.3	4.4
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	70.7	47.8	0.8	102.3	70.4	5.0	66.0	35.7	13.0	80.0	37.3	4.4
LOS	E	D	A	F	E	A	E	D	B	E	D	A
Approach Delay		51.0			66.4			34.6			33.5	

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			E			C			C	
Queue Length 50th (ft)	154	152	0	138	259	0	176	463	87	38	131	0
Queue Length 95th (ft)	#280	192	0	#256	332	29	266	570	179	78	176	33
Internal Link Dist (ft)		908			1594			1088			994	
Turn Bay Length (ft)	150		200	100		150	175		175	140		
Base Capacity (vph)	259	445	693	183	514	524	302	1555	781	117	1058	551
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	0.68	0.44	0.08	0.83	0.57	0.21	0.68	0.75	0.45	0.36	0.34	0.21

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 28 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Red
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 42.1 — Intersection LOS: D
Intersection Capacity Utilization 74.0% — 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: 1: SR-900 & Newport Way NW

2017 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL 15-095]
AM Peak-Hour

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	160	48	135	265	96	195	1101	335	38	327	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	100		150	175		175	140		0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	1749	1487	1711	1801	1531	1694	3388	1516	1646	3292	1473
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1659	1749	1467	1709	1801	1505	1689	3388	1478	1644	3292	1436
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			132			206			132
Link Speed (mph)		40			30			30			30	
Link Distance (ft)		988			1674			1168			1074	
Travel Time (s)		16.8			38.0			26.5			24.4	
Confl. Peds. (#/hr)	2		1	1		2	2		2	2		2
Confl. Bikes (#/hr)						3						
Peak Hour Factor	0.77	0.77	0.77	0.89	0.89	0.89	0.95	0.95	0.95	0.91	0.91	0.91
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	3%	3%	3%	6%	6%	6%
Adj. Flow (vph)	200	208	62	152	298	108	205	1159	353	42	359	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	200	208	62	152	298	108	205	1159	353	42	359	121
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	13.0	40.0	15.0	15.0	41.0	41.0	15.0	35.0	35.0	15.0	35.0	35.0
Total Split (s)	15.0	40.0	30.0	20.0	45.0	45.0	30.0	65.0	65.0	15.0	50.0	50.0
Total Split (%)	10.7%	28.6%	21.4%	14.3%	32.1%	32.1%	21.4%	46.4%	46.4%	10.7%	35.7%	35.7%
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	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	21.6	35.7	60.7	14.3	28.4	28.4	25.0	64.3	63.3	7.7	45.0	45.0
Actuated g/C Ratio	0.15	0.26	0.43	0.10	0.20	0.20	0.18	0.46	0.45	0.06	0.32	0.32
v/c Ratio	0.78	0.47	0.09	0.87	0.82	0.26	0.68	0.75	0.45	0.47	0.34	0.22
Control Delay	78.3	48.5	1.1	102.3	70.3	5.0	66.2	35.7	13.0	80.0	37.3	5.3
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	78.3	48.5	1.1	102.3	70.3	5.0	66.2	35.7	13.0	80.0	37.3	5.3
LOS	E	D	A	F	E	A	E	D	B	E	D	A
Approach Delay		54.9			66.4			34.7			33.3	

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			E			C			C	
Queue Length 50th (ft)	177	162	0	138	263	0	177	463	87	38	131	0
Queue Length 95th (ft)	#327	203	2	#256	335	29	267	570	179	78	176	39
Internal Link Dist (ft)		908			1594			1088			994	
Turn Bay Length (ft)	150		200	100		150	175		175	140		
Base Capacity (vph)	255	445	693	183	514	524	302	1555	781	117	1058	551
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	0.78	0.47	0.09	0.83	0.58	0.21	0.68	0.75	0.45	0.36	0.34	0.22

Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 28 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Red
Natural Cycle: 115
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 42.8 — Intersection LOS: D
Intersection Capacity Utilization 75.2% — 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: 1: SR-900 & Newport Way NW

2017 Future with Development Conditions
Gibson Traffic Consultants, Inc. [BJL 15-095]
AM Peak-Hour

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	13	31	10	573	331	5
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	-	50	-	-	-
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	14	34	11	623	360	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1008	363	365	0	-	0
Stage 1	363	-	-	-	-	-
Stage 2	645	-	-	-	-	-
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	267	682	1194	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	522	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	265	682	1194	-	-	-
Mov Cap-2 Maneuver	265	-	-	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	517	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1194	-	466	-	-
HCM Lane V/C Ratio	0.009	-	0.103	-	-
HCM Control Delay (s)	8	-	13.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	236	160	48	135	265	96	195	1019	335	38	306	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	100		150	175		175	140		0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.98
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1662	1749	1487	1711	1801	1531	1694	3388	1516	1646	3292	1473
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1659	1749	1467	1709	1801	1505	1689	3388	1478	1644	3292	1436
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			132			222			144
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		988			1674			1168			1074	
Travel Time (s)		22.5			38.0			26.5			24.4	
Confl. Peds. (#/hr)	2		1	1		2	2		2	2		2
Confl. Bikes (#/hr)						3						
Peak Hour Factor	0.77	0.77	0.77	0.89	0.89	0.89	0.95	0.95	0.95	0.91	0.91	0.91
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	3%	3%	3%	6%	6%	6%
Adj. Flow (vph)	306	208	62	152	298	108	205	1073	353	42	336	144
Shared Lane Traffic (%)												
Lane Group Flow (vph)	306	208	62	152	298	108	205	1073	353	42	336	144
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	13.0	40.0	15.0	15.0	41.0	41.0	15.0	35.0	35.0	15.0	35.0	35.0
Total Split (s)	15.0	40.0	30.0	20.0	45.0	45.0	30.0	65.0	65.0	15.0	50.0	50.0
Total Split (%)	10.7%	28.6%	21.4%	14.3%	32.1%	32.1%	21.4%	46.4%	46.4%	10.7%	35.7%	35.7%
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	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	21.6	35.7	60.7	14.3	28.4	28.4	25.0	64.3	63.3	7.7	45.0	45.0
Actuated g/C Ratio	0.15	0.26	0.43	0.10	0.20	0.20	0.18	0.46	0.45	0.06	0.32	0.32
v/c Ratio	1.20	0.47	0.09	0.87	0.82	0.26	0.68	0.69	0.45	0.47	0.32	0.26
Control Delay	169.5	48.5	1.1	102.3	70.3	5.0	66.2	33.7	11.8	80.0	36.9	6.3
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	169.5	48.5	1.1	102.3	70.3	5.0	66.2	33.7	11.8	80.0	36.9	6.3
LOS	F	D	A	F	E	A	E	C	B	E	D	A
Approach Delay		107.7			66.4			33.1			31.9	

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		F			E			C			C	
Queue Length 50th (ft)	~333	162	0	138	263	0	177	413	75	38	121	0
Queue Length 95th (ft)	#522	203	2	#256	335	29	267	510	166	78	165	50
Internal Link Dist (ft)		908			1594			1088			994	
Turn Bay Length (ft)	150		200	100		150	175		175	140		
Base Capacity (vph)	255	445	693	183	514	524	302	1555	789	117	1058	559
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	1.20	0.47	0.09	0.83	0.58	0.21	0.68	0.69	0.45	0.36	0.32	0.26

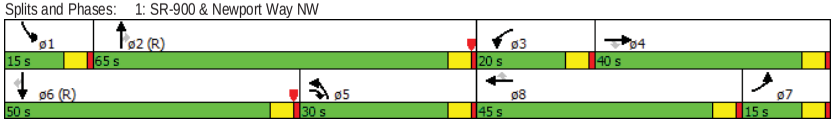
Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 28 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Red
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: 51.6 — Intersection LOS: D
Intersection Capacity Utilization 79.7% — ICU Level of Service D
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: SR-900 & Newport Way NW



2017 Future with Development Conditions with Talus Reassignment
Gibson Traffic Consultants, Inc. [BJL 15-095]
AM Peak-Hour

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	13	113	31	573	331	5
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	-	50	-	-	-
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	14	123	34	623	360	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1053	363	365	0	-	0
Stage 1	363	-	-	-	-	-
Stage 2	690	-	-	-	-	-
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	251	682	1194	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	498	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	244	682	1194	-	-	-
Mov Cap-2 Maneuver	244	-	-	-	-	-
Stage 1	704	-	-	-	-	-
Stage 2	484	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1194	-	575	-	-
HCM Lane V/C Ratio	0.028	-	0.238	-	-
HCM Control Delay (s)	8.1	-	13.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-	-

PM Peak-Hour Level of Service Analysis

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	317	131	232	204	70	32	420	206	124	1158	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	100		150	175		175	140		0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00		0.97	1.00		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1711	1801	1531	1711	1801	1531	1711	3421	1531	1711	3421	1531
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1706	1801	1497	1708	1801	1506	1708	3421	1489	1704	3421	1489
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			132			217			132
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		988			1674			1168			1074	
Travel Time (s)		22.5			38.0			26.5			24.4	
Confl. Peds. (#/hr)	3		2	2		3	3		3	3		3
Confl. Bikes (#/hr)			11			1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	334	138	244	215	74	34	442	217	131	1219	166
Shared Lane Traffic (%)												
Lane Group Flow (vph)	119	334	138	244	215	74	34	442	217	131	1219	166
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	13.0	40.0	15.0	15.0	41.0	41.0	15.0	35.0	35.0	15.0	35.0	35.0
Total Split (s)	15.0	40.0	17.0	20.0	45.0	45.0	17.0	65.0	65.0	15.0	63.0	63.0
Total Split (%)	10.7%	28.6%	12.1%	14.3%	32.1%	32.1%	12.1%	46.4%	46.4%	10.7%	45.0%	45.0%
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	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	19.6	29.9	41.9	15.0	25.3	25.3	12.0	61.1	60.1	14.0	63.1	63.1
Actuated g/C Ratio	0.14	0.21	0.30	0.11	0.18	0.18	0.09	0.44	0.43	0.10	0.45	0.45
v/c Ratio	0.50	0.87	0.27	1.33	0.66	0.19	0.23	0.30	0.28	0.77	0.79	0.22
Control Delay	64.8	75.5	8.8	228.5	61.9	1.1	64.1	26.5	4.0	88.7	38.3	7.4
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	64.8	75.5	8.8	228.5	61.9	1.1	64.1	26.5	4.0	88.7	38.3	7.4
LOS	E	E	A	F	E	A	E	C	A	F	D	A
Approach Delay		57.8			129.8			21.3			39.3	
Approach LOS		E			F			C			D	

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	98	294	21	~288	191	0	29	137	0	118	496	17
Queue Length 95th (ft)	#196	397	55	#464	248	0	66	179	49	#268	626	66
Internal Link Dist (ft)		908			1594			1088			994	
Turn Bay Length (ft)	150		200	100		150	175		175	140		
Base Capacity (vph)	239	450	516	183	514	524	146	1494	763	171	1542	744
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	0.50	0.74	0.27	1.33	0.42	0.14	0.23	0.30	0.28	0.77	0.79	0.22

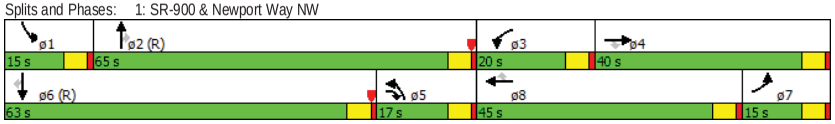
Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 28 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Red
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.33
Intersection Signal Delay: 53.3 — Intersection LOS: D
Intersection Capacity Utilization 83.1% — 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: SR-900 & Newport Way NW



2015 Existing Conditions
Gibson Traffic Consultants, Inc. [BJL 15-095]
PM Peak-Hour

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	342	142	241	212	73	43	437	214	129	1205	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	100		150	175		175	140		0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00		0.97	1.00		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1711	1801	1531	1711	1801	1531	1711	3421	1531	1711	3421	1531
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1706	1801	1497	1708	1801	1506	1708	3421	1489	1704	3421	1489
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			132			225			156
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		988			1674			1168			1074	
Travel Time (s)		22.5			38.0			26.5			24.4	
Confl. Peds. (#/hr)	3		2	2		3	3		3	3		3
Confl. Bikes (#/hr)			11			1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	148	360	149	254	223	77	45	460	225	136	1268	215
Shared Lane Traffic (%)												
Lane Group Flow (vph)	148	360	149	254	223	77	45	460	225	136	1268	215
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	13.0	40.0	15.0	15.0	41.0	41.0	15.0	35.0	35.0	15.0	35.0	35.0
Total Split (s)	15.0	40.0	17.0	20.0	45.0	45.0	17.0	65.0	65.0	15.0	63.0	63.0
Total Split (%)	10.7%	28.6%	12.1%	14.3%	32.1%	32.1%	12.1%	46.4%	46.4%	10.7%	45.0%	45.0%
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	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	20.8	31.4	43.4	15.0	25.6	25.6	12.0	60.1	59.1	13.5	61.6	61.6
Actuated g/C Ratio	0.15	0.22	0.31	0.11	0.18	0.18	0.09	0.43	0.42	0.10	0.44	0.44
v/c Ratio	0.58	0.89	0.28	1.39	0.68	0.20	0.31	0.31	0.30	0.82	0.84	0.29
Control Delay	66.5	76.8	9.5	249.0	62.5	1.4	66.2	27.1	4.1	97.4	41.9	8.9
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	66.5	76.8	9.5	249.0	62.5	1.4	66.2	27.1	4.1	97.4	41.9	8.9
LOS	E	E	A	F	E	A	E	C	A	F	D	A
Approach Delay		59.2			139.5			22.4			42.2	
Approach LOS		E			F			C			D	

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	122	315	25	~307	198	0	39	143	0	125	545	32
Queue Length 95th (ft)	#262	#455	62	#484	258	2	81	186	50	#281	666	89
Internal Link Dist (ft)		908			1594			1088			994	
Turn Bay Length (ft)	150		200	100		150	175		175	140		
Base Capacity (vph)	254	450	531	183	514	524	146	1468	758	165	1505	742
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	0.58	0.80	0.28	1.39	0.43	0.15	0.31	0.31	0.30	0.82	0.84	0.29

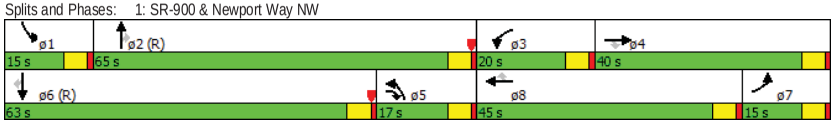
Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 28 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Red
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.39
Intersection Signal Delay: 56.4 — Intersection LOS: E
Intersection Capacity Utilization 86.2% — 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: SR-900 & Newport Way NW



Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	152	348	145	241	222	73	48	437	214	129	1205	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	100		150	175		175	140		0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00		0.97	1.00		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1711	1801	1531	1711	1801	1531	1711	3421	1531	1711	3421	1531
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1706	1801	1497	1708	1801	1506	1708	3421	1489	1704	3421	1489
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			132			225			170
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		988			1674			1168			1074	
Travel Time (s)		22.5			38.0			19.9			18.3	
Confl. Peds. (#/hr)	3		2	2		3	3		3	3		3
Confl. Bikes (#/hr)			11			1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	160	366	153	254	234	77	51	460	225	136	1268	235
Shared Lane Traffic (%)												
Lane Group Flow (vph)	160	366	153	254	234	77	51	460	225	136	1268	235
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	13.0	40.0	15.0	15.0	41.0	41.0	15.0	35.0	35.0	15.0	35.0	35.0
Total Split (s)	15.0	40.0	17.0	20.0	45.0	45.0	17.0	65.0	65.0	15.0	63.0	63.0
Total Split (%)	10.7%	28.6%	12.1%	14.3%	32.1%	32.1%	12.1%	46.4%	46.4%	10.7%	45.0%	45.0%
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	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	21.7	32.7	44.7	15.0	26.1	26.1	12.0	60.0	59.0	12.3	60.3	60.3
Actuated g/C Ratio	0.16	0.23	0.32	0.11	0.19	0.19	0.09	0.43	0.42	0.09	0.43	0.43
v/c Ratio	0.60	0.87	0.28	1.39	0.70	0.20	0.35	0.31	0.30	0.91	0.86	0.32
Control Delay	66.6	72.7	9.8	249.0	63.4	1.3	67.5	27.2	4.1	115.0	43.7	9.1
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	66.6	72.7	9.8	249.0	63.4	1.3	67.5	27.2	4.1	115.0	43.7	9.1
LOS	E	E	A	F	E	A	E	C	A	F	D	A
Approach Delay		57.1			138.3			22.9			44.6	
Approach LOS		E			F			C			D	

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	133	320	27	~307	207	0	45	143	0	126	550	35
Queue Length 95th (ft)	#290	#468	65	#484	271	2	90	186	50	#281	666	97
Internal Link Dist (ft)		908			1594			1088			994	
Turn Bay Length (ft)	150		200	100		150	175		175	140		
Base Capacity (vph)	265	450	544	183	514	524	146	1466	757	150	1472	737
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	0.60	0.81	0.28	1.39	0.46	0.15	0.35	0.31	0.30	0.91	0.86	0.32

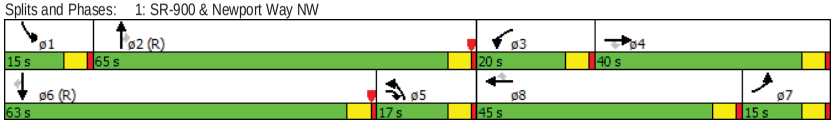
Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 28 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Red
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.39
Intersection Signal Delay: 57.2 — Intersection LOS: E
Intersection Capacity Utilization 86.5% — 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: SR-900 & Newport Way NW



2017 Future with Development Conditions
Gibson Traffic Consultants, Inc. [BJL 15-095]
PM Peak-Hour

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	9	20	34	480	625	15
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	-	50	-	-	-
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	10	22	37	522	679	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1284	688	696	0	-	0
Stage 1	688	-	-	-	-	-
Stage 2	596	-	-	-	-	-
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	182	446	900	-	-	-
Stage 1	499	-	-	-	-	-
Stage 2	550	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	175	446	900	-	-	-
Mov Cap-2 Maneuver	175	-	-	-	-	-
Stage 1	499	-	-	-	-	-
Stage 2	527	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.4	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	900	-	301	-	-
HCM Lane V/C Ratio	0.041	-	0.105	-	-
HCM Control Delay (s)	9.2	-	18.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	196	348	145	241	222	73	48	393	214	129	1131	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		200	100		150	175		175	140		0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor	1.00		0.98	1.00		0.98	1.00		0.97	1.00		0.97
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1711	1801	1531	1711	1801	1531	1711	3421	1531	1711	3421	1531
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1706	1801	1497	1708	1801	1506	1708	3421	1489	1704	3421	1489
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			94			132			225			241
Link Speed (mph)		30			30			40			40	
Link Distance (ft)		988			1674			1168			1074	
Travel Time (s)		22.5			38.0			19.9			18.3	
Confl. Peds. (#/hr)	3		2	2		3	3		3	3		3
Confl. Bikes (#/hr)			11			1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	206	366	153	254	234	77	51	414	225	136	1191	313
Shared Lane Traffic (%)												
Lane Group Flow (vph)	206	366	153	254	234	77	51	414	225	136	1191	313
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	13.0	40.0	15.0	15.0	41.0	41.0	15.0	35.0	35.0	15.0	35.0	35.0
Total Split (s)	15.0	40.0	17.0	20.0	45.0	45.0	17.0	65.0	65.0	15.0	63.0	63.0
Total Split (%)	10.7%	28.6%	12.1%	14.3%	32.1%	32.1%	12.1%	46.4%	46.4%	10.7%	45.0%	45.0%
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	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	23.9	35.0	47.0	15.0	26.1	26.1	12.0	60.0	59.0	10.0	58.0	58.0
Actuated g/C Ratio	0.17	0.25	0.34	0.11	0.19	0.19	0.09	0.43	0.42	0.07	0.41	0.41
v/c Ratio	0.71	0.81	0.27	1.39	0.70	0.20	0.35	0.28	0.30	1.11	0.84	0.41
Control Delay	68.8	64.8	9.5	249.0	63.4	1.3	67.5	26.7	4.1	172.6	43.5	8.6
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	68.8	64.8	9.5	249.0	63.4	1.3	67.5	26.7	4.1	172.6	43.5	8.6
LOS	E	E	A	F	E	A	E	C	A	F	D	A
Approach Delay		54.3			138.3			22.3			47.5	
Approach LOS		D			F			C			D	

Lanes, Volumes, Timings
1: SR-900 & Newport Way NW

Bergsma Development

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	174	316	26	~307	207	0	45	127	0	~142	507	40
Queue Length 95th (ft)	#392	#468	65	#484	271	2	90	167	50	#281	605	113
Internal Link Dist (ft)		908			1594			1088			994	
Turn Bay Length (ft)	150		200	100		150	175		175	140		
Base Capacity (vph)	292	450	567	183	514	524	146	1466	757	122	1417	758
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	0.71	0.81	0.27	1.39	0.46	0.15	0.35	0.28	0.30	1.11	0.84	0.41

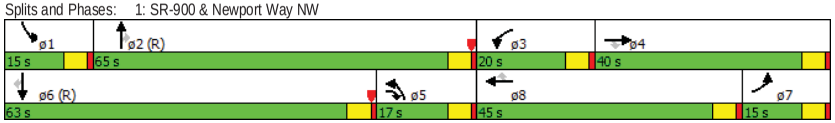
Intersection Summary

Area Type: Other
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 28 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Red
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.39
Intersection Signal Delay: 58.3 — Intersection LOS: E
Intersection Capacity Utilization 84.4% — 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: SR-900 & Newport Way NW



Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	9	64	108	480	625	15
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	-	50	-	-	-
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	10	70	117	522	679	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1445	688	696	0	-	0
Stage 1	688	-	-	-	-	-
Stage 2	757	-	-	-	-	-
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	145	446	900	-	-	-
Stage 1	499	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	126	446	900	-	-	-
Mov Cap-2 Maneuver	126	-	-	-	-	-
Stage 1	499	-	-	-	-	-
Stage 2	403	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.8	1.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	900	-	340	-	-
HCM Lane V/C Ratio	0.13	-	0.233	-	-
HCM Control Delay (s)	9.6	-	18.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.4	-	0.9	-	-

WSDOT Level of Service Thresholds

Appendix 29

LOS Standards Set By MPOs/ RTPOs for RegionallySignificant (non-HSS) State Highways

Level Of Service Thresholds for State Highways Set by RTPOs

February 20, 2004

	LOS for Non-HSS[1]		LOS for HSS[2]	
	Urban	Rural	Urban	Rural
(PSRC) Puget Sound Regional Council - TMA/MPO/RTPO				
King County	Tier 1 is Mitigated E_4 Tier 2 is D_4 Tier 3 is C_4		D	C
Pierce County			D	C
Snohomish County			D	C
Kitsap County[3]			D	C
(SRTC) Spokane Regional Transportation Council - TMA/MPO/RTPO				
Spokane County	D	C	D	C
(RTC) Southwest Washington Regional Transportation Council - TMA/MPO/RTPO				
Clark County	E	C	D	C
Skamania County	E	C	D	C
Klickitat County	E	C	D	C
(TRPC) Thurston Regional Planning Council - MPO/RTPO				
Thurston County	High density corridors/core areas E_5 Elsewhere in Urban Growth Area D_5 Outside Urban Growth Area C_5		D	C
(WCCOG) Whatcom Council of Governments - MPO/RTPO				
Whatcom County	D	C	D	C
(YVCOG) Yakima Valley Conference of Governments - MPO/RTPO				
Yakima County	D	C	D	C
(BFCG) Benton-Franklin Council of Governments - MPO/RTPO				
Benton County	D	C	D	C
Franklin County	D	C	D	C
Walla Walla County	D	C	D	C
(CWCOG/SWRTPO) Cowlitz-Wahkiakum Council of Governments - MPO/RTPO				
Cowlitz County	D	C	D	C
Wahkiakum County	D	C	D	C
Lewis County	D	C	D	C
Pacific County	D	C	D	C
Grays Harbor County	D	C	D	C
(NCRTPO) North Central - RTPO				
Chelan County	D	C	D	C
Douglas County	D	C	D	C
Okanogan County	D	C	D	C
(N.E.W. RTPO) North East Washington - RTPO				
Ferry County	D	C	D	C
Stevens County	D	C	D	C
Pend Oreille County	D	C	D	C
(Pal RTPO) Palouse - RTPO				
Columbia County	D	C	D	C
Garfield County	D	C	D	C
Whitman County	D	C	D	C
Asotin County	D	C	D	C
(PRTPO) Peninsula - RTPO				
Mason County	D	C	D	C
Jefferson County	D	C	D	C
Clallam County	D	C	D	C
Kitsap County[3]	See PSRC above	See PSRC above	D	C
(QUADCO) Quad County - RTPO				
Kittitas County	D	C	D	C
Grant County	D	C	D	C
Lincoln County	D	C	D	C
Adams County	D	C	D	C
(S/I RTPO) Skagit/Island - RTPO				
Skagit County	D	C	D	C
Island County	E	D	E	D

Notes:

1. RTPOs have authority to set LOS Thresholds for Non HSS. LOS is based on Peak-Hour except where noted [4, 5]

2. LOS is based on Congestion Index 6 is approximately equal to LOS "C", 10~LOS "D", 12~LOS "E"

3. Kitsap County belongs to both PSRC and PRTPO

4. LOS will be measured consistent with the latest edition (preferred) of the Highway Capacity Manual and based on a one-hour p.m. peak period.
Tier 1 : For this process, the "inner" urban area is generally defined as a 3-mile buffer around the most heavily traveled freeways (I-5, I-405, SR 167, SR 520, and I-90), plus all designated urban centers (most are located in the freeway buffer already). The proposed standard for Tier 1 routes is LOS "E/mitigated," meaning that congestion should be mitigated (such as transit) when p.m. peak hour LOS falls below LOS "E."
Tier 2 : These routes serve the "outer" urban area - those outside the 3-mile buffer - and connect the "main" urban growth area (UGA) to the first set of "satellite" UGA's (e.g., SR 410 to Enumclaw). These urban and rural areas are generally farther from transit alternatives, have fewer alternative roadway routes, and locally adopted LOS standards in these areas are generally LOS "D" or better. The proposed standard for Tier 2 routes is LOS "D."
Tier 3: Rural routes are regionally significant state routes in rural areas that are not in Tier 2. The proposed standard for rural routes is LOS "C," consistent with the rural standard in effect for those routes once they leave the four counties in the PSRC region, such as SR 530 entering Skagit County.
The LOS standards do not change within a city. For example, the change from Tier 1 to Tier 2 on SR 516 occurs at the Kent/Covington city limit boundary.
http://www.psrc.org/projects/mtp/los/los.htm

5. TRPC regional goals are based on a two-hour PM peak. Urban Growth Areas are based on the Growth Management Act.