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Transportation Impact Analysis

WOODS CREEK HIGHLANDS

Prepared for:

Woods Creek Development, Inc.

November 2018

Prepared by:

transpogroup
WHAT TRANSPORTATION CAN BE.

11 – 7 – 18

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Introduction

The purpose of this transportation impact analysis (TIA) is to identify potential transportation-related impacts associated with the proposed Woods Creek Highlands residential development located in the City of Monroe. As necessary, mitigation measures are identified that would offset or reduce significant transportation-related impacts that the project may have on the surrounding transportation system.

Project Description

The proposed project would construct up to 26 single-family homes, located northeast of the Chain Lake Road/134th Street SE intersection. Access to the site will be provided via 134th Street SE. The project site and site vicinity are shown in Figure 1. One existing single-family home would be removed with the construction of the project.

A preliminary site plan for the development is shown in Figure 2. As required by the City, a 2028 horizon year was utilized.

Methodology

Vehicle trip generation for the Woods Creek Highlands development was estimated using trip generation data from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 10th Edition (2017*). The trip distribution for the development was based on approved development in the site vicinity.

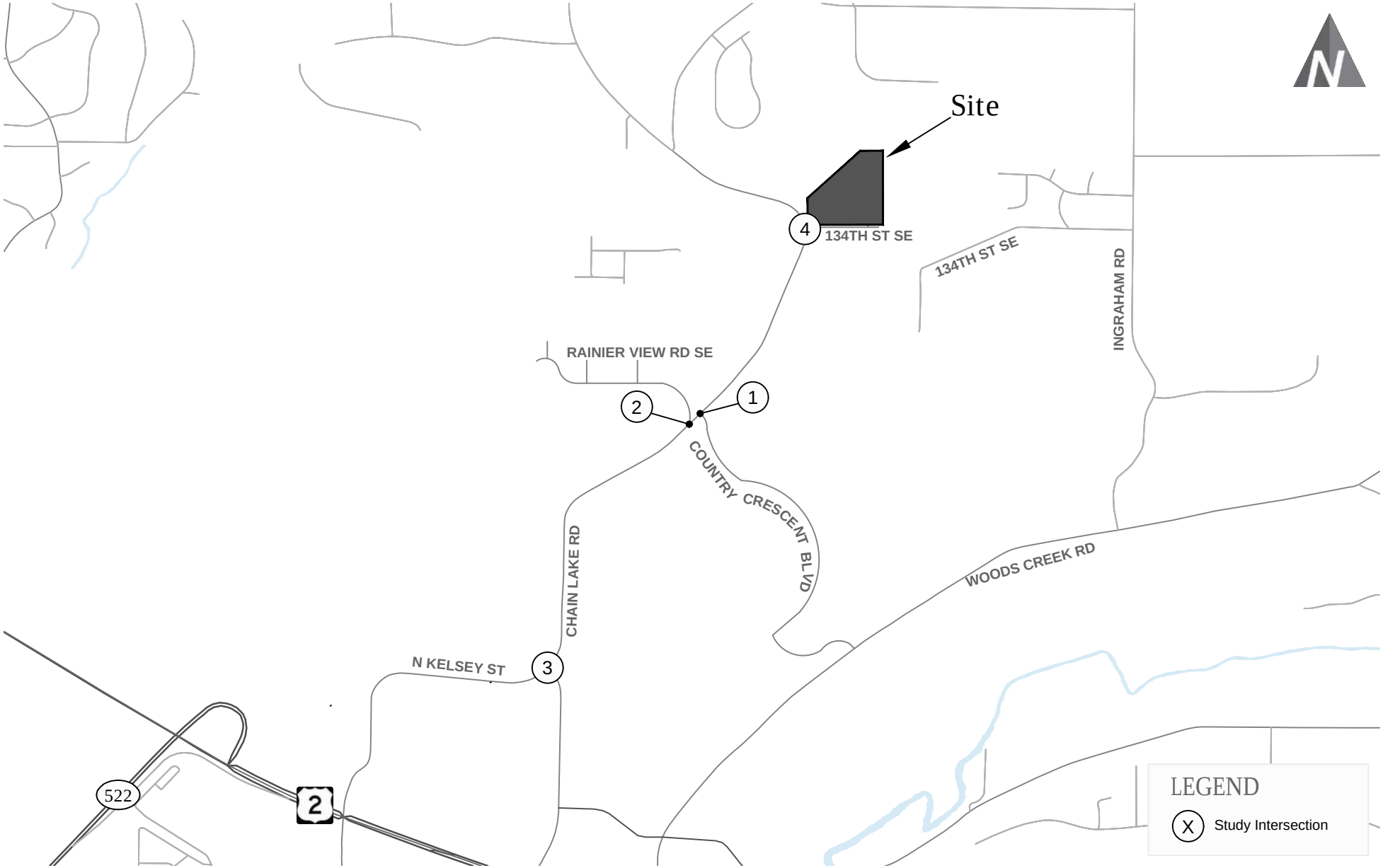
The scope of this analysis is based on coordination with City of Monroe staff. Based on anticipated vehicular impacts of the proposed project, the following off-site intersections were selected for analysis:

1. Chain Lake Road/Country Crescent Boulevard (one-way stop sign-controlled)
2. Chain Lake Road/Rainier View Road SE (one-way stop sign-controlled)
3. Chain Lake Road/N Kelsey Street (single-lane roundabout)
4. Chain Lake Road/134th Street SE (one-way stop sign-controlled)

The proposed project would take access via 134th Street SE, which currently provides access to a residential development under construction. Given a lack of occupancy of the development along 134th Street SE, existing traffic counts would not be representative of typical conditions at this intersection. Based on this, the Chain Lake Road/134th Street SE intersection was analyzed under future (2028) without- and with-project conditions. The study intersections are depicted on Figure 1.

The operational characteristics of an intersection are determined by calculating the intersection level of service (LOS). At roundabout intersections, LOS is measured in average control delay per vehicle and is typically reported using the intersection delay. At unsignalized side-street, stop-controlled intersections, LOS is measured by the average delay on the worst-movement of the intersection. Traffic operations and average vehicle delay for an intersection can be described qualitatively with a range of levels of service (LOS A through LOS F), with LOS A indicating free-flowing traffic and LOS F indicating extreme congestion and long vehicle delays. Appendix A contains a detailed explanation of LOS criteria and definitions. The City of Monroe has a level of service threshold of LOS D for arterial road intersections, which includes the study intersections.

Weekday PM peak hour traffic operations for existing, future without-, and with-project conditions were evaluated at the study intersections based on the procedures identified in the *Highway Capacity Manual* (2010) and were evaluated using *Synchro 9*. *Synchro 9* is a software program that uses *HCM* methodologies to evaluate intersection LOS and average vehicle delays. The roundabout at Chain Lake Road/N Kelsey Street was evaluated using the *Sidra 7* software program.



Site Vicinity & Study Intersections

Woods Creek Highlands

FIGURE

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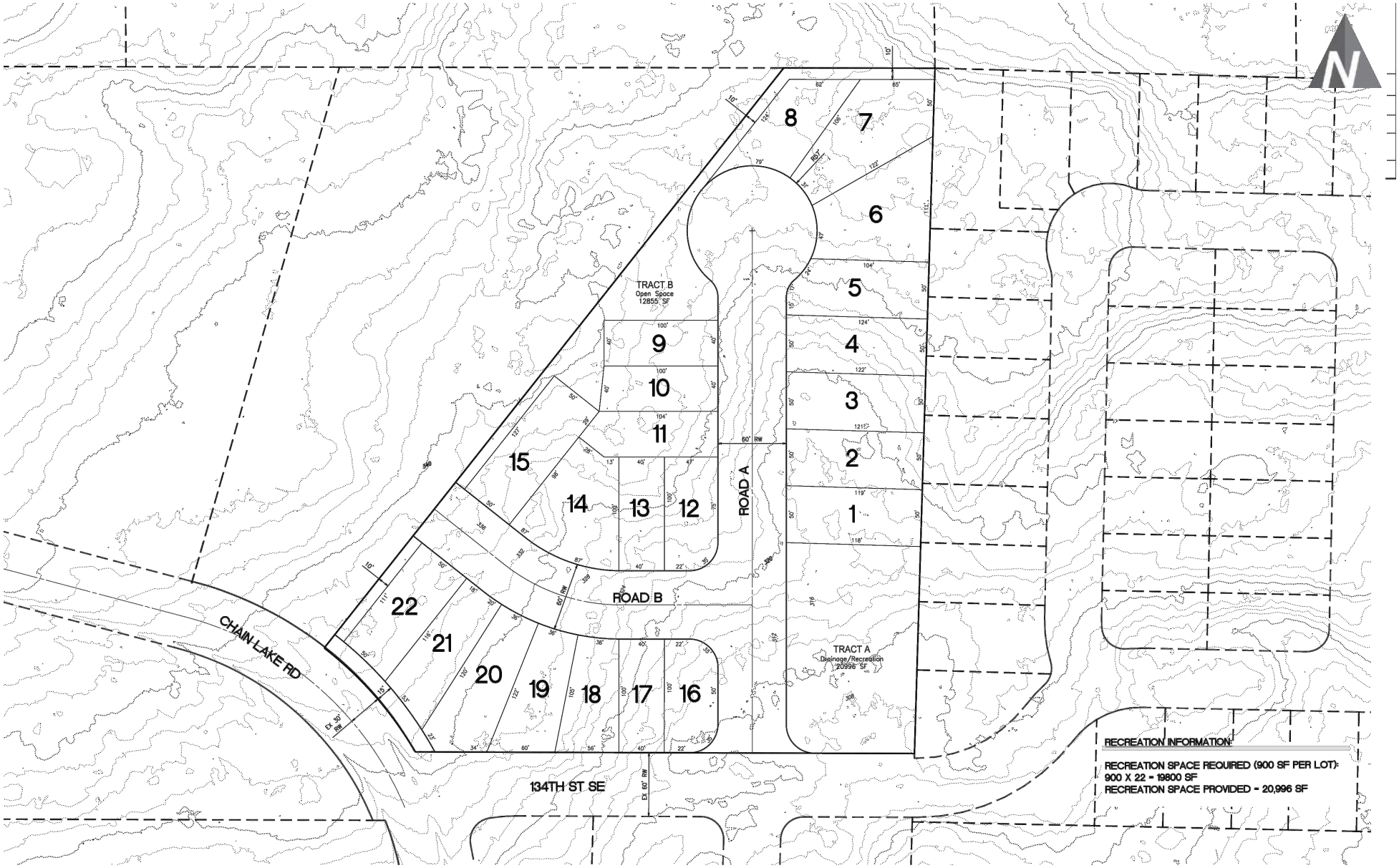

Preliminary Site Plan

Woods Creek Highlands

FIGURE

2

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Oct 04, 2018 - 1:16pm jonathans M:\18\1.18295.00 - Woods Creek Highlands\Graphics\DWG\18295_Graphics.dwg Layout: Site Plan

Vehicle Trip Generation

Table 1 summarizes the resulting net new weekday daily, AM and PM peak hour vehicle trip generation including credit for the existing use being removed with the project. Detailed trip generation calculations for the proposed development are provided in Appendix B.

Table 1. Estimated Weekday Vehicle Trip Generation

Land Use	Size	Daily Trips[1]	AM Peak Hour Trips			PM Peak Hour Trips		
			In	Out	Total	In	Out	Total
Proposed Use								
Single-Family Detached Housing	26 DU	245	5	14	19	16	10	26
Existing Use								
Single-Family Detached Housing	1 DU	9	0	1	1	1	0	1
Net New Vehicle Trips		**236**	**5**	**13**	**18**	**15**	**10**	**25**

Notes: GFA = Gross Floor Area
1. Trip generation based on number of units and average trip rates published in the ITE *Trip Generation Manual* (10th Edition, 2017).

As shown in Table 1, the development is forecast to generate 236 net new vehicular weekday daily trips with 18 trips occurring during the weekday AM peak hour and 25 occurring during the weekday PM peak hour.

Vehicle Trip Distribution

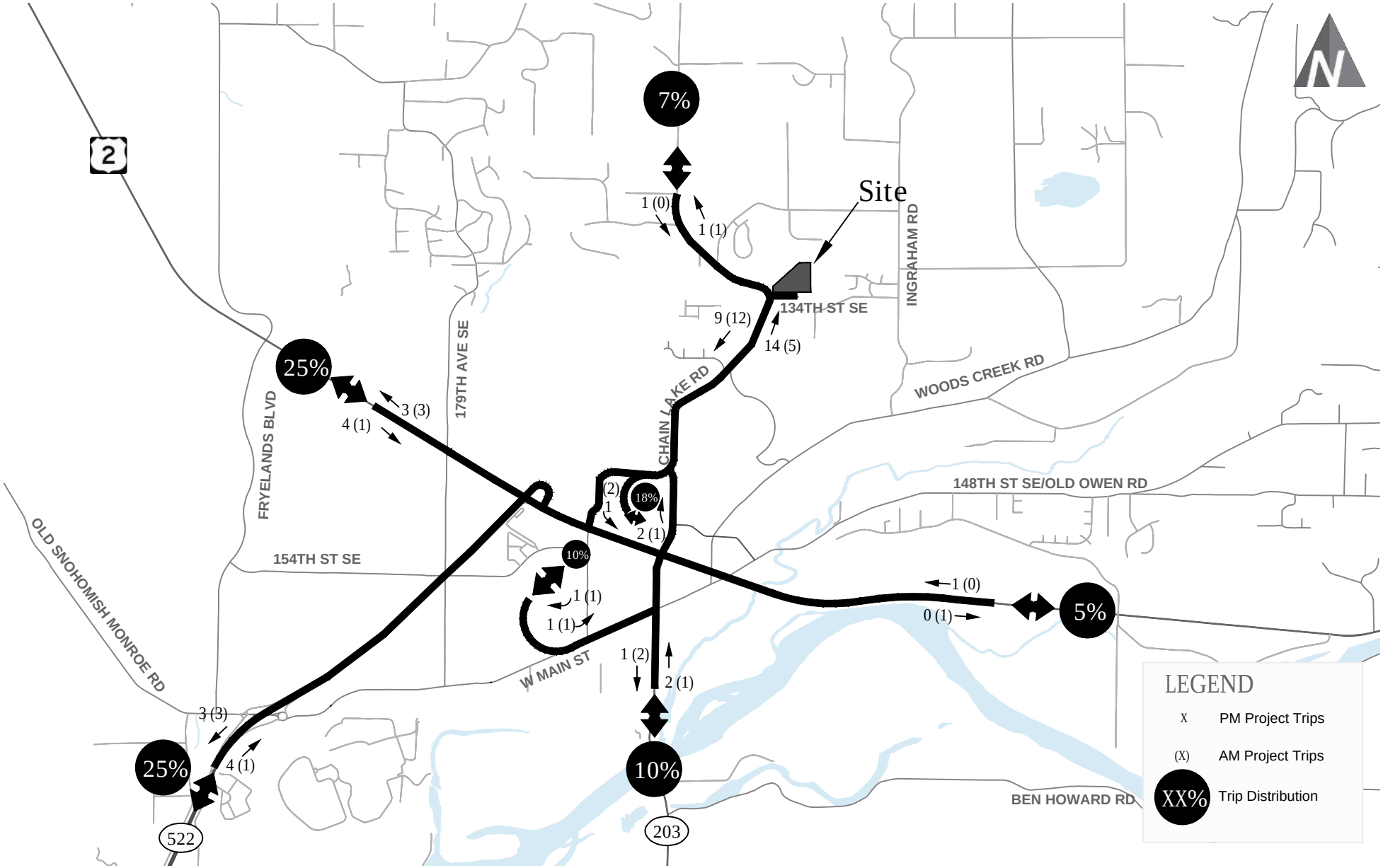
Trip distribution patterns for the proposed project was based on similar approved projects near the site. The trips are distributed as follows:

- 25 percent to/from the west on SR 2
- 25 percent to/from the south on SR 522
- 10 percent to/from the south on SR 203
- 7 percent to/from the north on Chain Lake Road
- 5 percent to/from the east on SR 2
- Remaining 28 percent local to downtown Monroe

The project trip distribution and assignment are shown in Figure 3.

Based on the distribution and interlocal agreements with the Washington State Department of Transportation (WSDOT), the Woods Creek Highlands development will not impact any WSDOT intersections by 25 or more PM peak hour trips and therefore, impacts to WSDOT intersections have not been analyzed.

Additionally, based on the interlocal agreement, Snohomish County requires key intersections impacted by 3 or more directional project generated trips be shown for the AM and PM peak hours. As shown in Appendix E, the proposed Woods Creek Highlands is anticipated to impact 3 key intersections during the AM and PM Peak hours. Trips traveling to/from the south along SR 522 and SR 203 are anticipated to travel to and from King County. Per Snohomish County's distribution policy, trips along SR 2 do not need to be distributed west of 88th Street SE near the City of Snohomish.



Vehicle Trip Distribution & Assignment

Woods Creek Highlands

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Intersection Level of Service

Intersections analyzed were based on the anticipated trip generation and distribution and through coordination with City of Monroe Staff. The following intersections were analyzed during the weekday PM peak hour:

1. Chain Lake Road/Country Crescent Boulevard
2. Chain Lake Road/Rainier View Road SE
3. Chain Lake Road/N Kelsey Street

Additionally, the Chain Lake Road/134th Street SE intersection was studied under future without- and with-project conditions.

Existing Traffic Volumes

Existing turning movement volumes were counted at study intersections in September 2018 during the weekday PM peak period (4:00 to 6:00 p.m.). The detailed intersection turning movement traffic volumes are provided in Appendix C. Existing weekday PM peak hour traffic volumes used to establish existing traffic conditions are summarized in Figure 4.

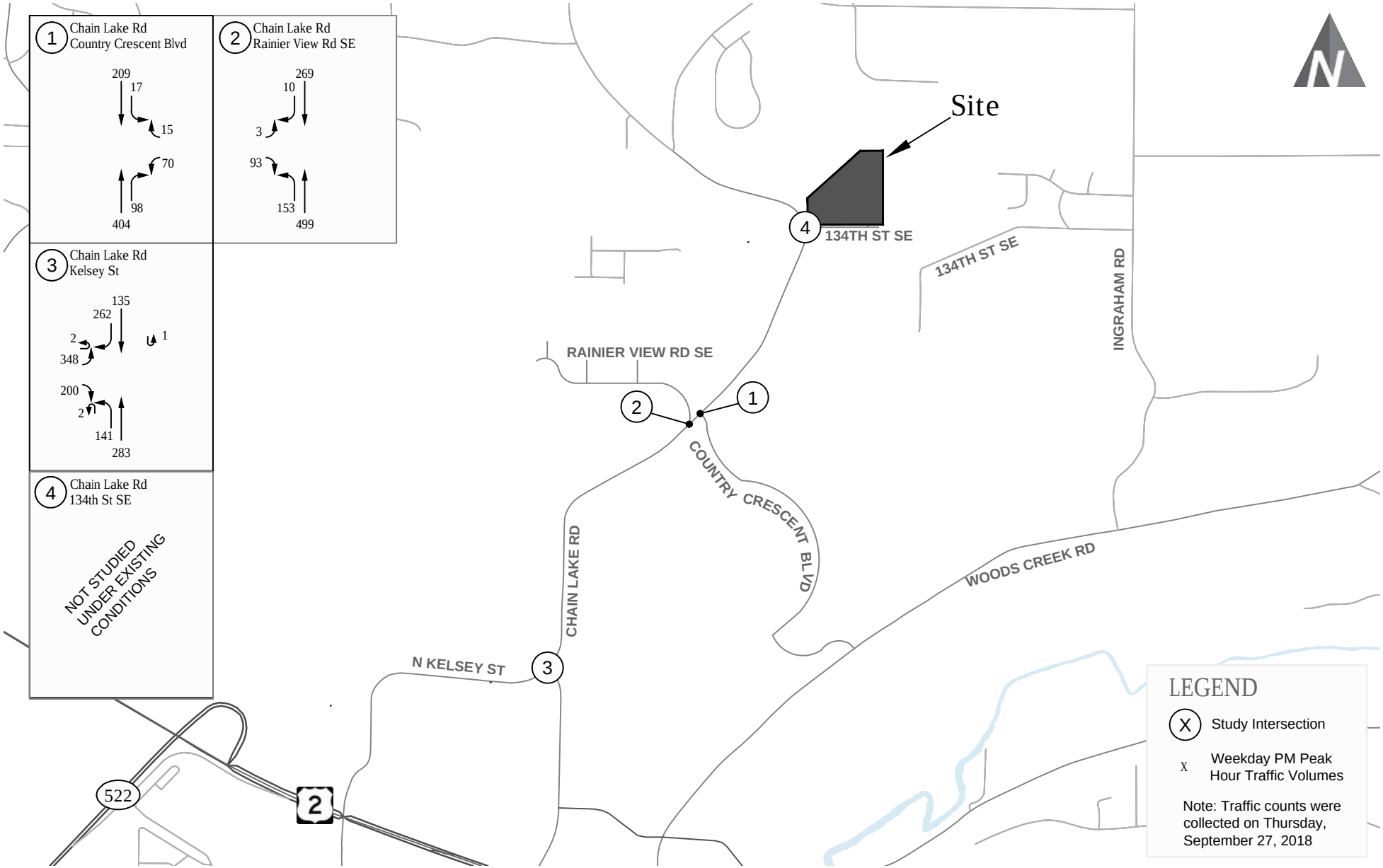
Future Volumes

Future (2028) without-project traffic volumes were forecasted by applying an average annual growth rate to existing traffic volumes and adding traffic from “pipeline” development projects that would also increase traffic at study intersections. Consistent with City of Monroe requirements, an annual growth rate of 2 percent was applied to the existing PM peak hour traffic volumes at study intersections. Traffic from 11 pipeline projects were also included in the future without-project volume forecasts. The pipeline projects include:

- Eaglemont I-III (f.k.a. Eaglemont) – 15 unconstructed new single-family units
- Eaglemont IV (f.k.a. Eaglemont IV-VIII) – 117 new single-family units
- Eaglemont V – 15 new single-family units
- Eaglemont VI (f.k.a. Sky View Ridge) – 44 new single-family units
- Eaglemont VII – 41 new single-family units
- Easton Cove (f.k.a. Klier Property) – 88 new single-family units
- Worthington Heights – 100 new single-family units
- Raspberry Hill – 25 new single-family units
- Clothier Short Plat – 6 new single-family units
- 2 Short Plats north of Easton Cove – 10 new single-family units
- Kestrel Ridge – 31 new single-family homes

Future without-project through traffic volumes at the Chain Lake Road/134th Street SE intersection were estimated based on anticipated traffic at the Chain Lake Road/Country Crescent Boulevard traveling to/from the north. Additionally, pipeline project traffic accessing 134th Street SE or increasing northbound or southbound through traffic were included in estimating future traffic volumes at this intersection. Future (2028) without-project weekday PM peak hour traffic volumes are shown in Figure 5.

Future (2028) with-project volumes were forecast by adding project generated trips to the future (2028) without-project trips. Future (2028) with-project traffic volumes are shown in Figure 6.



Existing Weekday PM Peak Hour Traffic Volumes

Woods Creek Highlands

FIGURE

4

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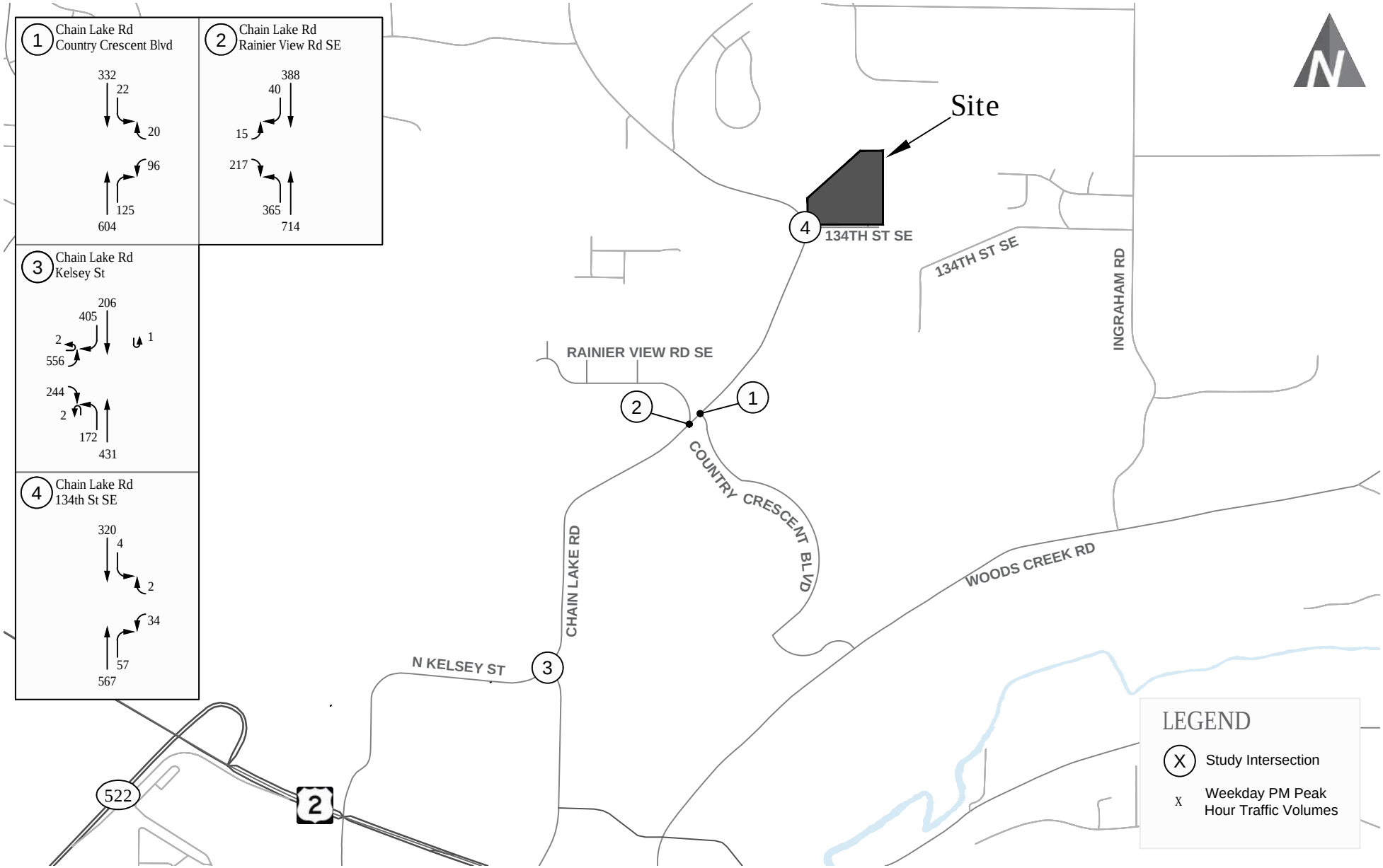

Future (2028) Without-Project Weekday PM Peak Hour Traffic Volumes

FIGURE **5**

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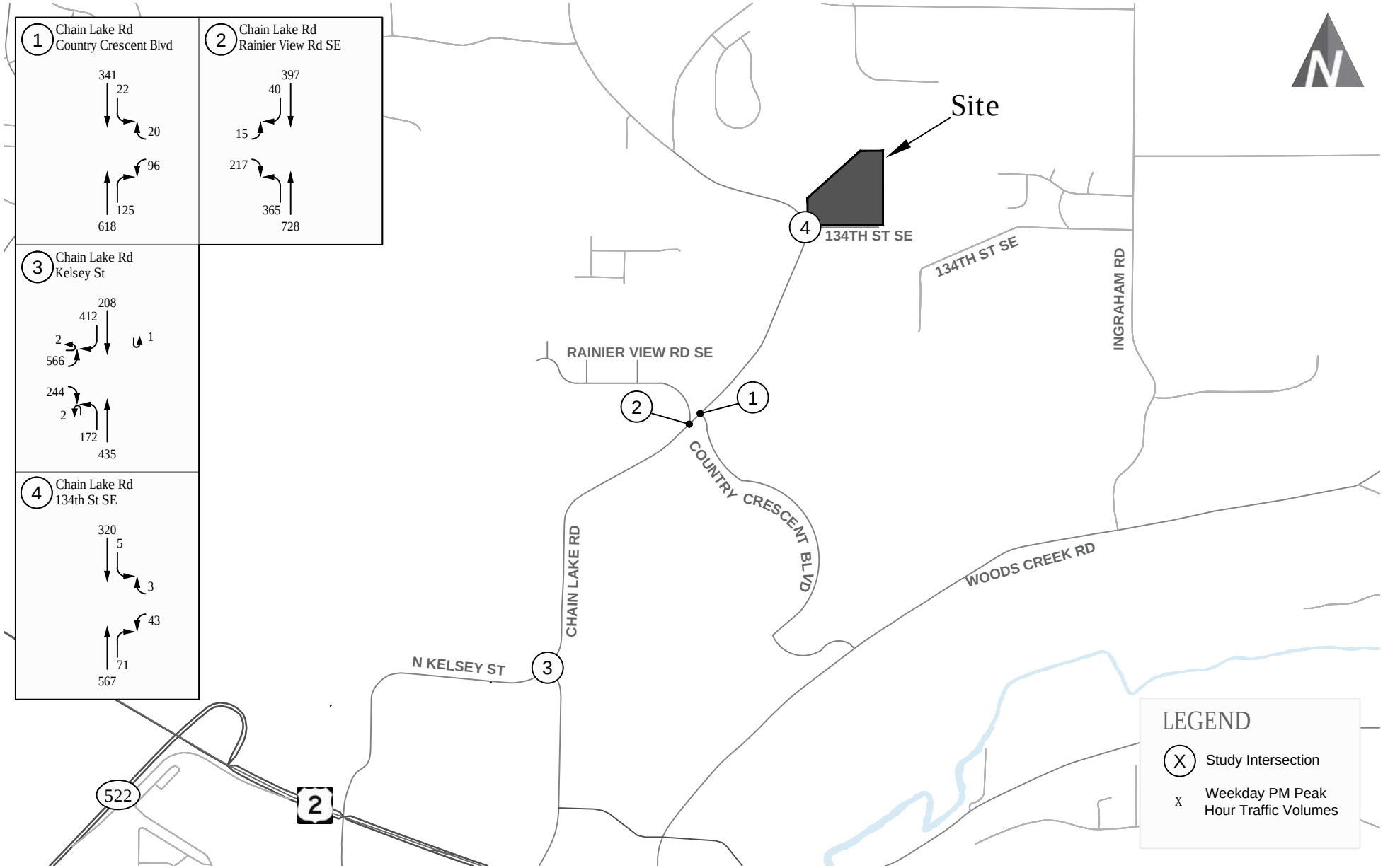
Oct 30, 2018 - 2:05pm jonathans M:\18\1.18295.00 - Woods Creek Highlands\Graphics\DWG\18295_Graphics.dwg Layout: Baseline Vols



Future (2028) With-Project Weekday PM Peak Hour Traffic Volumes

FIGURE **6**

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Oct 30, 2018 - 2:06pm jonathans M:\18\1.18295.00 - Woods Creek Highlands\Graphics\DWG\18295_Graphics.dwg Layout: Future Vols

Traffic Operations

The LOS operations analysis was conducted for the weekday PM peak hour. The LOS operation analysis is based on existing intersection parameters such as channelization and intersection control. The same parameters were utilized in the evaluation of future without- and with-project conditions. A review of the City of Monroe 2018-2023 Transportation Improvement Plan indicated one project in the area that would affect the project distribution: E/W Connector – 191st to Chain Lake Road or Galaxy Way. However, the project is currently unfunded and thus was not included in future analysis.

A comparison of existing, future without-project and future with-project weekday PM peak hour traffic operations are summarized in Table 2. Detailed LOS worksheets are provided in Appendix D.

Table 2. Existing and Future (2028) PM Peak Hour LOS Summary

	Existing			2028 Without-Project			2028 With-Project		
Intersection	**LOS[1]**	**Delay[2]**	**WM[3] or V/C[4]**	**LOS[1]**	**Delay[2]**	**WM[3] or V/C[4]**	**LOS**	**Delay**	**WM[3] or V/C[4]**
1. Chain Lake Rd/Country Crescent Blvd	C	16	WBL	D	29	WBL	D	30	WBL
2. Chain Lake Rd/Rainier View Rd SE	B	11	EB	D	30	EB	D	31	EB
3. Chain Lake Rd/N Kelsey St	A	7	0.45	A	9	0.67	A	9	0.68
4. Chain Lake Rd/134th St SE	-	-	-	C	18	WB	C	19	WB

1. Level of Service (A – F) as defined by the *Highway Capacity Manual* (TRB, 2010)
2. Average delay per vehicle in seconds
3. Worst movement or approach reported for side-street stop-controlled intersections; EB = eastbound approach; WB = westbound approach; WBL = westbound left
4. Volume-to-capacity ratio reported for roundabout intersections

With the addition of project-generated traffic during the weekday PM peak hour study period, all study intersections would continue to operate at the same LOS as without-project conditions with increases in delay of 1 second or less and would likely go unnoticed by drivers. All study intersections operate at LOS D or better, and therefore meet the City of Monroe Level of Service standard.

As discussed previously, the proposed project would take access along 134th Street SE, which currently provides access to a residential development under construction. Traffic operations at the Chain Lake Road/134th Street SE intersection were analyzed for the future (2028) without- and with-project conditions. This intersection is anticipated to operate at LOS C under both future (2028) without- and with-project weekday PM peak hour conditions.

Traffic Mitigation Fees

Mitigation for the proposed project is being collected in the form of Monroe traffic impact fees. In addition, per the interlocal agreements with Snohomish County and WSDOT, fees are paid to offset project impacts to Snohomish County and WSDOT facilities, if applicable.

The following provides an estimate of the impact fees to be paid to the City of Monroe, Snohomish County, and WSDOT. As described below, no impacts are anticipated at Snohomish County or WSDOT facilities; therefore, no impact fees are required.

City of Monroe collects impact fees based on the number of dwelling units in the proposed development. The impact fee rate for a single-family home is $3,475 per home. The project is proposing to construct up to 25 net new homes, this equates to an anticipated impact fee of **$86,875** (25 net new homes x $3,475). Final fees will be determined by the City.

Snohomish County fees are based on an interlocal agreement between the City of Monroe and Snohomish County. Traffic mitigation fees are based on the impacts to the project's transportation service area (TSA) or impacts to improvement projects. Based on the preceding analysis and in coordination with County staff, the proposed development will not impact any Snohomish County capital improvement projects[1] with three or more directional peak hour trips. Therefore, no mitigation or fee offer is required to Snohomish County for the proposed development.

WSDOT and the City of Monroe have an interlocal agreement that provides for the payment of traffic mitigation fees. The interlocal agreement defines 25 or more peak hour trips through a state intersection that has LOS C or greater as "Significant Impact." The proposed development is not anticipated to impact any WSDOT intersections with 25 or more PM peak-hour trips and therefore WSDOT traffic mitigation fees should not be assessed for the proposed development.

Findings and Conclusions

This analysis summarizes the project traffic impacts of the proposed Woods Creek Highlands development in the City of Monroe. The development is anticipated to construct up to 25 net new single-family homes. General findings and recommendations include:

- The development is estimated to generate approximately 236 net new vehicular weekday daily trips with 18 trips occurring during the weekday AM peak hour and 25 occurring during the weekday PM peak hour.
- Vehicular access to the project site will be provided via a connection on 134th Street SE.
- With the addition of project traffic, all study intersections would continue to operate at LOS D or better, meeting the City of Monroe LOS standard.
- The proposed project is not anticipated to impact any County or State facilities; therefore, no impact fees are proposed to Snohomish County or WSDOT. The traffic mitigation fee to the City of Monroe is estimated to be $86,875.

[1] Based on a review of projects listed in *Snohomish County Transportation Needs Report* for the project's TSA (TSA C).

Appendix A: LOS Definitions

Highway Capacity Manual, 2000

Signalized intersection level of service (LOS) is defined in terms of the average total vehicle delay of all movements through an intersection. Vehicle delay is a method of quantifying several intangible factors, including driver discomfort, frustration, and lost travel time. Specifically, LOS criteria are stated in terms of average delay per vehicle during a specified time period (for example, the PM peak hour). Vehicle delay is a complex measure based on many variables, including signal phasing (i.e., progression of movements through the intersection), signal cycle length, and traffic volumes with respect to intersection capacity. Table 1 shows LOS criteria for signalized intersections, as described in the *Highway Capacity Manual* (Transportation Research Board, Special Report 209, 2000).

Table 1. Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (sec/veh)	General Description (Signalized Intersections)
A	≤10	Free Flow
B	>10 - 20	Stable Flow (slight delays)
C	>20 - 35	Stable flow (acceptable delays)
D	>35 - 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 - 80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report 209, 2000.

Unsignalized intersection LOS criteria can be further reduced into two intersection types: all-way stop-controlled and two-way stop-controlled. All-way, stop-controlled intersection LOS is expressed in terms of the average vehicle delay of all of the movements, much like that of a signalized intersection. Two-way, stop-controlled intersection LOS is defined in terms of the average vehicle delay of an individual movement(s). This is because the performance of a two-way, stop-controlled intersection is more closely reflected in terms of its individual movements, rather than its performance overall. For this reason, LOS for a two-way, stop-controlled intersection is defined in terms of its individual movements. With this in mind, total average vehicle delay (i.e., average delay of all movements) for a two-way, stop-controlled intersection should be viewed with discretion. Table 2 shows LOS criteria for unsignalized intersections (both all-way and two-way, stop-controlled).

Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (sec/veh)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50

Source: *Highway Capacity Manual*, Transportation Research Board, Special Report 209, 2000.

Highway Capacity Manual 2010

Signalized intersection level of service (LOS) is defined in terms of a weighted average control delay for the entire intersection. Control delay quantifies the increase in travel time that a vehicle experiences due to the traffic signal control as well as provides a surrogate measure for driver discomfort and fuel consumption. Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period (e.g., weekday PM peak hour). Control delay is a complex measure based on many variables, including signal phasing and coordination (i.e., progression of movements through the intersection and along the corridor), signal cycle length, and traffic volumes with respect to intersection capacity and resulting queues. Table 1 summarizes the LOS criteria for signalized intersections, as described in the *Highway Capacity Manual 2010* (Transportation Research Board, 2010).

Table 1. Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F[1]	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0 LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

Unsignalized intersection LOS criteria can be further reduced into two intersection types: all-way stop and two-way stop control. All-way stop control intersection LOS is expressed in terms of the weighted average control delay of the overall intersection or by approach. Two-way stop-controlled intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This approach is because major-street through vehicles are assumed to experience zero delay, a weighted average of all movements results in very low overall average delay, and this calculated low delay could mask deficiencies of minor movements. Table 2 shows LOS criteria for unsignalized intersections.

Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F[1]	>50

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

1. If the volume-to-capacity (v/c) ratio exceeds 1.0, LOS F is assigned an individual lane group for all unsignalized intersections, or minor street approach at two-way stop-controlled intersections. Overall intersection LOS is determined solely by control delay.

Appendix B: Trip Generation

Appendix B

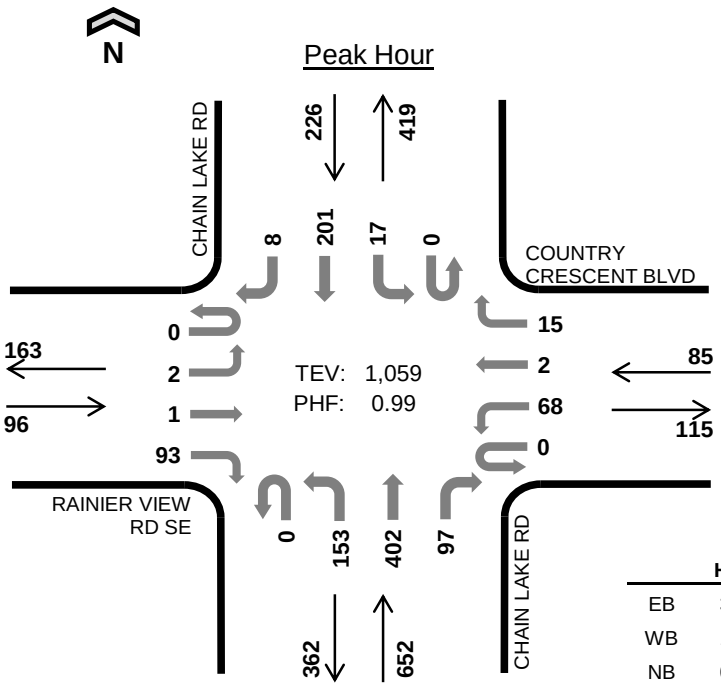
Trip Generation														
			Weekday Daily		Weekday AM Peak Hour					Weekday PM Peak Hour				
Land Use	Intensity	Units	Rate[1]	Total	Rate	% Inbound	Inbound	Outbound	Total	Rate	% Inbound	Inbound	Outbound	Total
Proposed														
Single Family Detached Housing (LU #210)	26	DU	9.44	245	0.74	25%	5	14	19	0.99	63%	16	10	26
Existing														
Single Family Detached Housing (LU #210)	1	DU	9.44	9	0.74	25%	0	1	1	0.99	63%	1	0	1
Net New				**236**			**5**	**13**	**18**			**15**	**10**	**25**

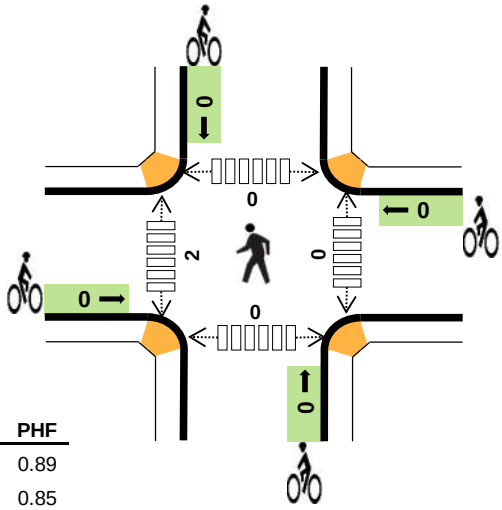
1. Trip generation rate from ITE Tip Generation Manual 10th Edition

Appendix C: Traffic Counts

CHAIN LAKE RD
COUNTRY CRESCENT BLVD

Date: Thu, Sep 27, 2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM





	HV %:	PHF
EB	3.1%	0.89
WB	1.2%	0.85
NB	0.5%	0.92
SB	0.4%	0.91
TOTAL	0.8%	0.99

Two-Hour Count Summaries

Interval Start	RAINIER VIEW RD SE				COUNTRY CRESCENT BLVD				CHAIN LAKE RD				CHAIN LAKE RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	3	3	23	0	11	0	1	0	39	87	15	0	4	36	4	226	0
4:15 PM	0	1	1	24	1	14	2	5	0	35	95	22	0	2	55	2	259	0
4:30 PM	0	4	1	29	0	16	0	3	0	31	86	17	0	1	63	1	252	0
4:45 PM	0	1	0	22	0	18	2	2	0	35	68	23	0	5	48	1	225	962
5:00 PM	**0**	**0**	**0**	**19**	**0**	**13**	**1**	**3**	**0**	**40**	**106**	**32**	**0**	**2**	**47**	**2**	**265**	1,001
5:15 PM	**0**	**1**	**0**	**23**	**0**	**21**	**1**	**3**	**0**	**35**	**104**	**20**	**0**	**5**	**53**	**2**	**268**	1,010
5:30 PM	**0**	**0**	**1**	**25**	**0**	**15**	**0**	**4**	**0**	**38**	**100**	**24**	**0**	**6**	**45**	**2**	**260**	1,018
5:45 PM	**0**	**1**	**0**	**26**	**0**	**19**	**0**	**5**	**0**	**40**	**92**	**21**	**0**	**4**	**56**	**2**	**266**	**1,059**
Count Total	0	11	6	191	1	127	6	26	0	293	738	174	0	29	403	16	2,021	0
Peak Hour	**0**	**2**	**1**	**93**	**0**	**68**	**2**	**15**	**0**	**153**	**402**	**97**	**0**	**17**	**201**	**8**	**1,059**	**0**

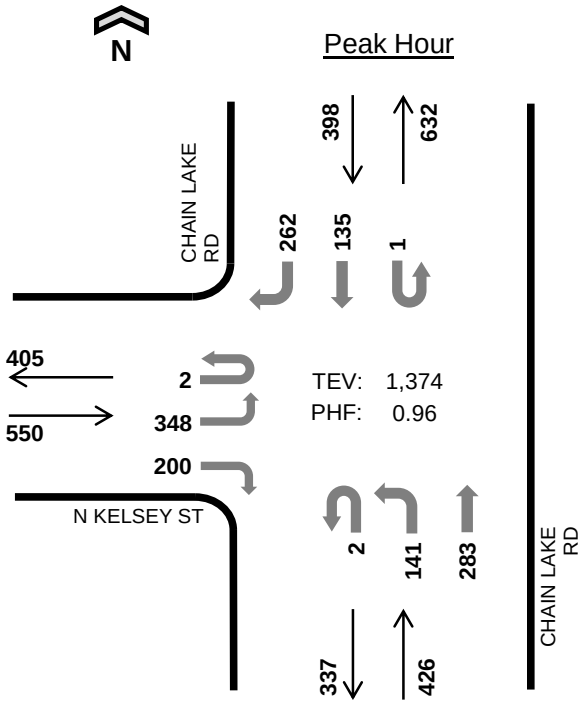
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

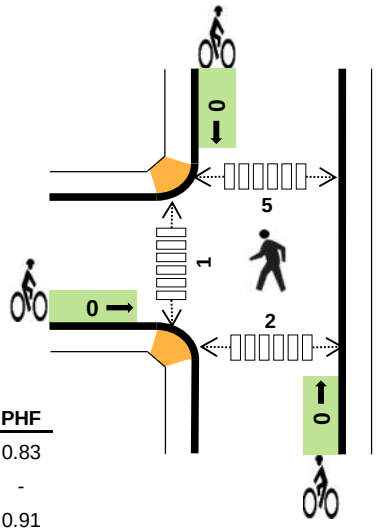
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	5	1	*6*	0	0	0	0	*0*	0	0	0	0	*0*
4:15 PM	3	0	3	0	*6*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	1	0	2	3	*6*	0	0	0	0	*0*	0	2	0	0	*2*
4:45 PM	0	0	1	0	*1*	0	0	0	0	*0*	0	4	0	0	*4*
5:00 PM	**1**	**0**	**1**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:30 PM	**0**	**1**	**1**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**0**	*2*
5:45 PM	**1**	**0**	**1**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
Count Total	7	1	14	5	*27*	0	0	0	0	*0*	0	8	0	0	*8*
Peak Hour	**3**	**1**	**3**	**1**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**0**	***2***

CHAIN LAKE RD
N KELSEY ST

Date: Thu, Sep 27, 2018
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM

Peak Hour





	HV %:	PHF
EB	0.9%	0.83
WB	-	-
NB	1.2%	0.91
SB	2.5%	0.93
TOTAL	1.5%	0.96

Two-Hour Count Summaries

Interval Start	N KELSEY ST				0				CHAIN LAKE RD				CHAIN LAKE RD				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	1	81	0	37	0	0	0	0	0	28	68	0	0	0	37	46	298	0
4:15 PM	**1**	**79**	**0**	**48**	**0**	**0**	**0**	**0**	**0**	**34**	**83**	**0**	**0**	**0**	**36**	**71**	**352**	0
4:30 PM	**0**	**79**	**0**	**61**	**0**	**0**	**0**	**0**	**1**	**38**	**64**	**0**	**0**	**0**	**41**	**63**	**347**	0
4:45 PM	**1**	**77**	**0**	**39**	**0**	**0**	**0**	**0**	**1**	**36**	**57**	**0**	**1**	**0**	**36**	**69**	**317**	1,314
5:00 PM	**0**	**113**	**0**	**52**	**0**	**0**	**0**	**0**	**0**	**33**	**79**	**0**	**0**	**0**	**22**	**59**	**358**	**1,374**
5:15 PM	0	93	0	43	0	0	0	0	0	36	70	0	0	0	34	70	346	1,368
5:30 PM	0	103	0	48	0	0	0	0	0	20	69	0	0	0	26	58	324	1,345
5:45 PM	1	98	0	38	0	0	0	0	0	27	66	0	0	0	37	71	338	1,366
Count Total	4	723	0	366	0	0	0	0	2	252	556	0	1	0	269	507	2,680	0
Peak Hour	**2**	**348**	**0**	**200**	**0**	**0**	**0**	**0**	**2**	**141**	**283**	**0**	**1**	**0**	**135**	**262**	**1,374**	**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	1	*8*	0	0	0	0	*0*	0	4	1	4	*9*
4:15 PM	**1**	**0**	**3**	**2**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**1**	**2**	*4*
4:30 PM	**2**	**0**	**1**	**5**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**3**	**0**	*3*
4:45 PM	**2**	**0**	**0**	**1**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**0**	*1*
5:00 PM	**0**	**0**	**1**	**2**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	0	0	1	1	*2*	0	0	0	0	*0*	0	0	0	1	*1*
5:30 PM	0	0	3	0	*3*	0	0	0	0	*0*	0	3	1	0	*4*
5:45 PM	1	0	2	0	*3*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	7	0	17	12	*36*	0	0	0	0	*0*	0	8	7	7	*22*
Peak Hr	**5**	**0**	**5**	**10**	***20***	**0**	**0**	**0**	**0**	***0***	**0**	**1**	**5**	**2**	***8***

Appendix D: LOS Worksheets

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	70	15	404	98	17	209
Future Vol, veh/h	70	15	404	98	17	209
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	1	1	0	0	0	0
Mvmt Flow	71	15	408	99	17	211

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	703	458	0	0	507	0
Stage 1	458	-	-	-	-	-
Stage 2	245	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	405	605	-	-	1068	-
Stage 1	639	-	-	-	-	-
Stage 2	798	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	399	605	-	-	1068	-
Mov Cap-2 Maneuver	399	-	-	-	-	-
Stage 1	639	-	-	-	-	-
Stage 2	785	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	399	605	1068	-
HCM Lane V/C Ratio	-	-	0.177	0.025	0.016	-
HCM Control Delay (s)	-	-	16	11.1	8.4	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0.1	0	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	93	153	499	269	10
Future Vol, veh/h	3	93	153	499	269	10
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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	3	3	0	0	0	0
Mvmt Flow	3	94	155	504	272	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1090	277	282	0	-	0
Stage 1	277	-	-	-	-	-
Stage 2	813	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.1	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.2	-	-	-
Pot Cap-1 Maneuver	237	759	1292	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	209	759	1292	-	-	-
Mov Cap-2 Maneuver	209	-	-	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	382	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11	1.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1292	-	701	-	-
HCM Lane V/C Ratio	0.12	-	0.138	-	-
HCM Control Delay (s)	8.2	-	11	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.5	-	-

MOVEMENT SUMMARY

Site: 3 [Existing (2018) PM Peak Hour]

Chain Lake Rd/N Kelsey Street
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: RoadName											
3u	U	2	1.0	0.446	14.5	LOS B	2.8	71.4	0.61	0.67	36.1
3	L2	147	1.0	0.446	12.1	LOS B	2.8	71.4	0.61	0.67	35.3
8	T1	295	1.0	0.446	6.1	LOS A	2.8	71.4	0.61	0.67	35.2
Approach		444	1.0	0.446	8.1	LOS A	2.8	71.4	0.61	0.67	35.2
North: RoadName											
7u	U	1	3.0	0.367	13.1	LOS B	2.3	59.8	0.41	0.51	37.9
4	T1	141	3.0	0.367	4.7	LOS A	2.3	59.8	0.41	0.51	36.9
14	R2	273	3.0	0.367	4.8	LOS A	2.3	59.8	0.41	0.51	35.7
Approach		415	3.0	0.367	4.8	LOS A	2.3	59.8	0.41	0.51	36.1
West: RoadName											
5u	U	2	1.0	0.262	12.8	LOS B	1.6	39.6	0.34	0.63	34.9
5	L2	363	1.0	0.262	10.4	LOS B	1.6	39.6	0.34	0.63	34.2
12	R2	208	1.0	0.126	3.6	LOS A	0.0	0.0	0.00	0.45	37.2
Approach		573	1.0	0.262	7.9	LOS A	1.6	39.6	0.22	0.56	35.2
All Vehicles		1431	1.6	0.446	7.1	LOS A	2.8	71.4	0.40	0.58	35.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	96	20	604	125	22	332
Future Vol, veh/h	96	20	604	125	22	332
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	1	1	0	0	0	0
Mvmt Flow	97	20	610	126	22	335

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1053	673	0	0	736	0
Stage 1	673	-	-	-	-	-
Stage 2	380	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	252	457	-	-	879	-
Stage 1	509	-	-	-	-	-
Stage 2	694	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	246	457	-	-	879	-
Mov Cap-2 Maneuver	246	-	-	-	-	-
Stage 1	509	-	-	-	-	-
Stage 2	677	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.1	0	0.6
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	246	457	879	-
HCM Lane V/C Ratio	-	-	0.394	0.044	0.025	-
HCM Control Delay (s)	-	-	28.8	13.2	9.2	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	1.8	0.1	0.1	-

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	217	365	714	388	40
Future Vol, veh/h	15	217	365	714	388	40
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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	3	3	0	0	0	0
Mvmt Flow	15	219	369	721	392	40

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1871	412	432	0	-	0
Stage 1	412	-	-	-	-	-
Stage 2	1459	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.1	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.2	-	-	-
Pot Cap-1 Maneuver	79	638	1138	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	212	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	53	638	1138	-	-	-
Mov Cap-2 Maneuver	53	-	-	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	143	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	29.8	3.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1138	-	372	-	-
HCM Lane V/C Ratio	0.324	-	0.63	-	-
HCM Control Delay (s)	9.7	-	29.8	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	1.4	-	4.1	-	-

MOVEMENT SUMMARY

Site: 3 [Future (2028) Without- Project PM Peak Hour]

Chain Lake Rd/N Kelsey Street
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: RoadName											
3u	U	2	1.0	0.671	18.8	LOS B	7.3	183.1	0.88	0.97	34.5
3	L2	179	1.0	0.671	16.3	LOS B	7.3	183.1	0.88	0.97	33.7
8	T1	449	1.0	0.671	10.4	LOS B	7.3	183.1	0.88	0.97	33.6
Approach		630	1.0	0.671	12.1	LOS B	7.3	183.1	0.88	0.97	33.6
North: RoadName											
7u	U	1	3.0	0.526	13.4	LOS B	4.3	110.5	0.55	0.54	37.5
4	T1	215	3.0	0.526	5.0	LOS A	4.3	110.5	0.55	0.54	36.4
14	R2	422	3.0	0.526	5.0	LOS A	4.3	110.5	0.55	0.54	35.3
Approach		638	3.0	0.526	5.0	LOS A	4.3	110.5	0.55	0.54	35.7
West: RoadName											
5u	U	2	1.0	0.396	13.1	LOS B	2.9	72.0	0.48	0.65	34.6
5	L2	579	1.0	0.396	10.7	LOS B	2.9	72.0	0.48	0.65	33.8
12	R2	254	1.0	0.153	3.6	LOS A	0.0	0.0	0.00	0.45	37.2
Approach		835	1.0	0.396	8.5	LOS A	2.9	72.0	0.33	0.59	34.8
All Vehicles		2103	1.6	0.671	8.5	LOS A	7.3	183.1	0.56	0.69	34.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	2	567	57	4	320
Future Vol, veh/h	34	2	567	57	4	320
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	34	2	573	58	4	323

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	933	602	0	0	630	0
Stage 1	602	-	-	-	-	-
Stage 2	331	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	298	503	-	-	962	-
Stage 1	551	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	297	503	-	-	962	-
Mov Cap-2 Maneuver	297	-	-	-	-	-
Stage 1	551	-	-	-	-	-
Stage 2	728	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	304	962	-
HCM Lane V/C Ratio	-	-	0.12	0.004	-
HCM Control Delay (s)	-	-	18.4	8.8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	96	20	618	125	22	341
Future Vol, veh/h	96	20	618	125	22	341
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	1	1	0	0	0	0
Mvmt Flow	97	20	624	126	22	344

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1076	687	0	0	751	0
Stage 1	687	-	-	-	-	-
Stage 2	389	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	244	449	-	-	868	-
Stage 1	501	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	238	449	-	-	868	-
Mov Cap-2 Maneuver	238	-	-	-	-	-
Stage 1	501	-	-	-	-	-
Stage 2	670	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.3	0	0.6
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	238	449	868	-
HCM Lane V/C Ratio	-	-	0.407	0.045	0.026	-
HCM Control Delay (s)	-	-	30.2	13.4	9.3	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	1.9	0.1	0.1	-

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	217	365	728	397	40
Future Vol, veh/h	15	217	365	728	397	40
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	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	3	3	0	0	0	0
Mvmt Flow	15	219	369	735	401	40

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1894	421	441	0	-	0
Stage 1	421	-	-	-	-	-
Stage 2	1473	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.1	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.2	-	-	-
Pot Cap-1 Maneuver	76	630	1130	-	-	-
Stage 1	660	-	-	-	-	-
Stage 2	209	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	51	630	1130	-	-	-
Mov Cap-2 Maneuver	51	-	-	-	-	-
Stage 1	660	-	-	-	-	-
Stage 2	141	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.3	3.2	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1130	-	363	-	-
HCM Lane V/C Ratio	0.326	-	0.646	-	-
HCM Control Delay (s)	9.7	-	31.3	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	1.4	-	4.3	-	-

MOVEMENT SUMMARY

Site: 3 [Future (2028) Without- Project PM Peak Hour]

Chain Lake Rd/N Kelsey Street
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: RoadName											
3u	U	2	1.0	0.671	18.8	LOS B	7.3	183.1	0.88	0.97	34.5
3	L2	179	1.0	0.671	16.3	LOS B	7.3	183.1	0.88	0.97	33.7
8	T1	449	1.0	0.671	10.4	LOS B	7.3	183.1	0.88	0.97	33.6
Approach		630	1.0	0.671	12.1	LOS B	7.3	183.1	0.88	0.97	33.6
North: RoadName											
7u	U	1	3.0	0.526	13.4	LOS B	4.3	110.5	0.55	0.54	37.5
4	T1	215	3.0	0.526	5.0	LOS A	4.3	110.5	0.55	0.54	36.4
14	R2	422	3.0	0.526	5.0	LOS A	4.3	110.5	0.55	0.54	35.3
Approach		638	3.0	0.526	5.0	LOS A	4.3	110.5	0.55	0.54	35.7
West: RoadName											
5u	U	2	1.0	0.396	13.1	LOS B	2.9	72.0	0.48	0.65	34.6
5	L2	579	1.0	0.396	10.7	LOS B	2.9	72.0	0.48	0.65	33.8
12	R2	254	1.0	0.153	3.6	LOS A	0.0	0.0	0.00	0.45	37.2
Approach		835	1.0	0.396	8.5	LOS A	2.9	72.0	0.33	0.59	34.8
All Vehicles		2103	1.6	0.671	8.5	LOS A	7.3	183.1	0.56	0.69	34.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	0.9

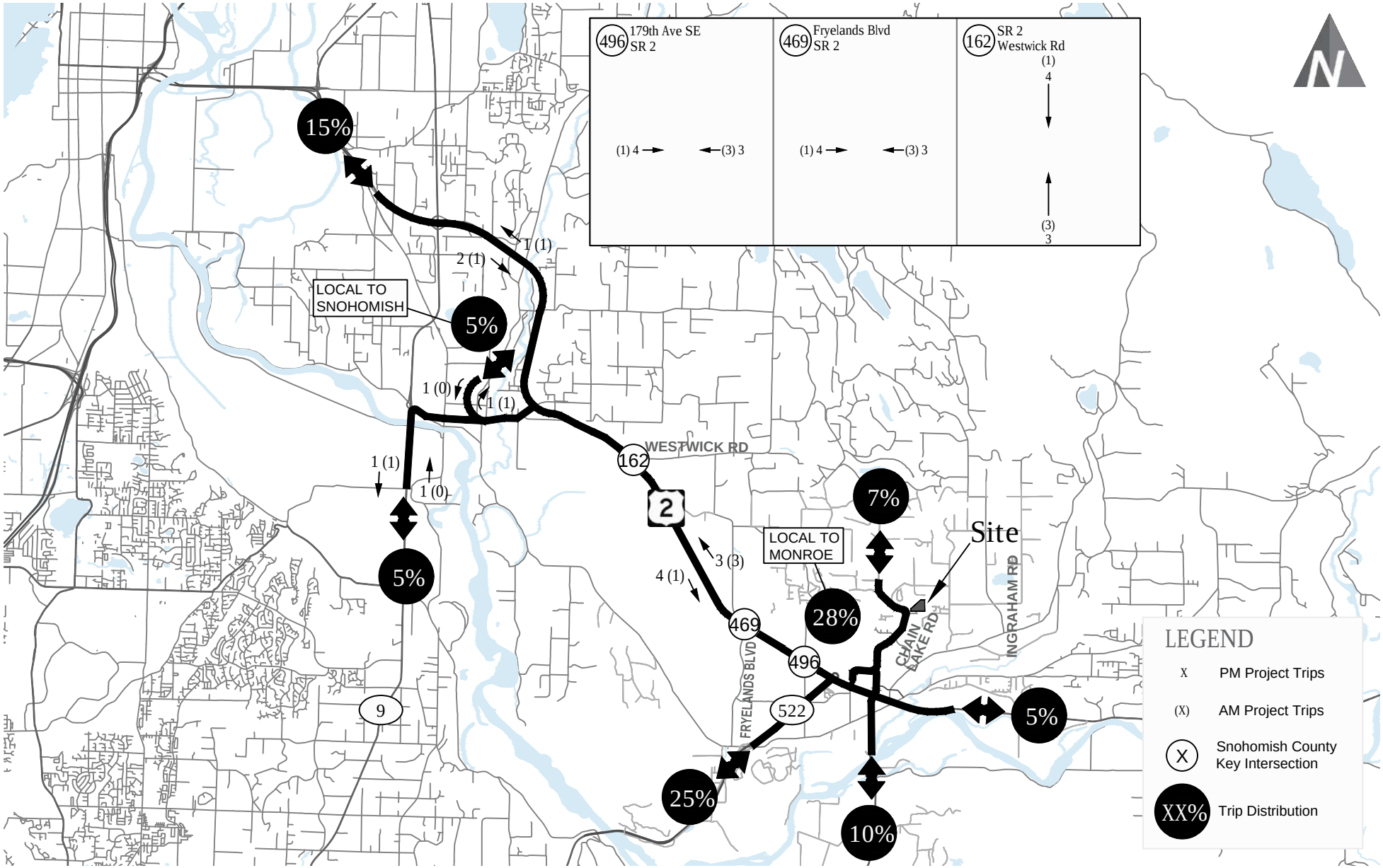
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	3	567	71	5	320
Future Vol, veh/h	43	3	567	71	5	320
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	43	3	573	72	5	323

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	942	609	0	0	644	0
Stage 1	609	-	-	-	-	-
Stage 2	333	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	294	499	-	-	951	-
Stage 1	547	-	-	-	-	-
Stage 2	731	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	292	499	-	-	951	-
Mov Cap-2 Maneuver	292	-	-	-	-	-
Stage 1	547	-	-	-	-	-
Stage 2	727	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.2	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	300	951	-
HCM Lane V/C Ratio	-	-	0.155	0.005	-
HCM Control Delay (s)	-	-	19.2	8.8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Appendix E: Snohomish County Intersections



Snohomish County Intersections

Woods Creek Highlands

APPENDIX

E

transpogroup
WHAT TRANSPORTATION CAN BE.

Oct 04, 2018 - 2:53pm jonathans M:\18\1.18295.00 - Woods Creek Highlands\Graphics\DWG\18295_Graphics.dwg Layout: Sno Co ints

Appendix E

Weekday PM Peak Hour														
Intersection ID #	Street Name 1	Street Name 2	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
496	179th Ave SE	SR 2		4			3							
469	Fryelands Blvd	SR 2		4			3							
162	SR 2	Westwick Rd								3			4	

Weekday AM Peak Hour														
Intersection ID #	Street Name 1	Street Name 2	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
496	179th Ave SE	SR 2		1			3							
469	Fryelands Blvd	SR 2		1			3							
162	SR 2	Westwick Rd								3			1	