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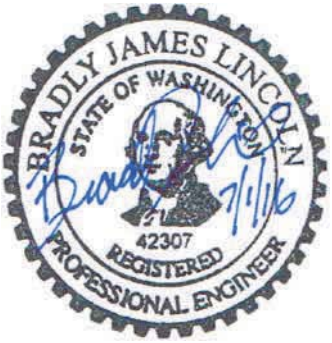
Currie Farms Development
Traffic Impact Analysis

Jurisdiction: City of Monroe

June 2016



GTC #16-148

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1. DEVELOPMENT IDENTIFICATION

Gibson Traffic Consultants, Inc. (GTC) has been retained to provide a traffic impact analysis for the proposed Currie Farms development to address the City of Monroe, Snohomish County and Washington State Department of Transportation (WSDOT) traffic impacts. Brad Lincoln, responsible for this report and traffic analysis, is a licensed professional engineer (Civil) in the State of Washington and member of the Washington State section of ITE.

The Currie Farms development is proposed to consist of a total of 28 single-family residential units. There is one existing single-family residential that will be removed and credited towards the development. The analysis in this report has therefore been performed for 27 new single-family residential units. The development site is located on the east side of 171st Avenue, south of Mountain View Road. The development is proposed to have two access points, one onto 171st Avenue NE that will align with 158th Place NE and an access to Mountain View Road via an existing stub-road. site vicinity map has been included in Figure 1.

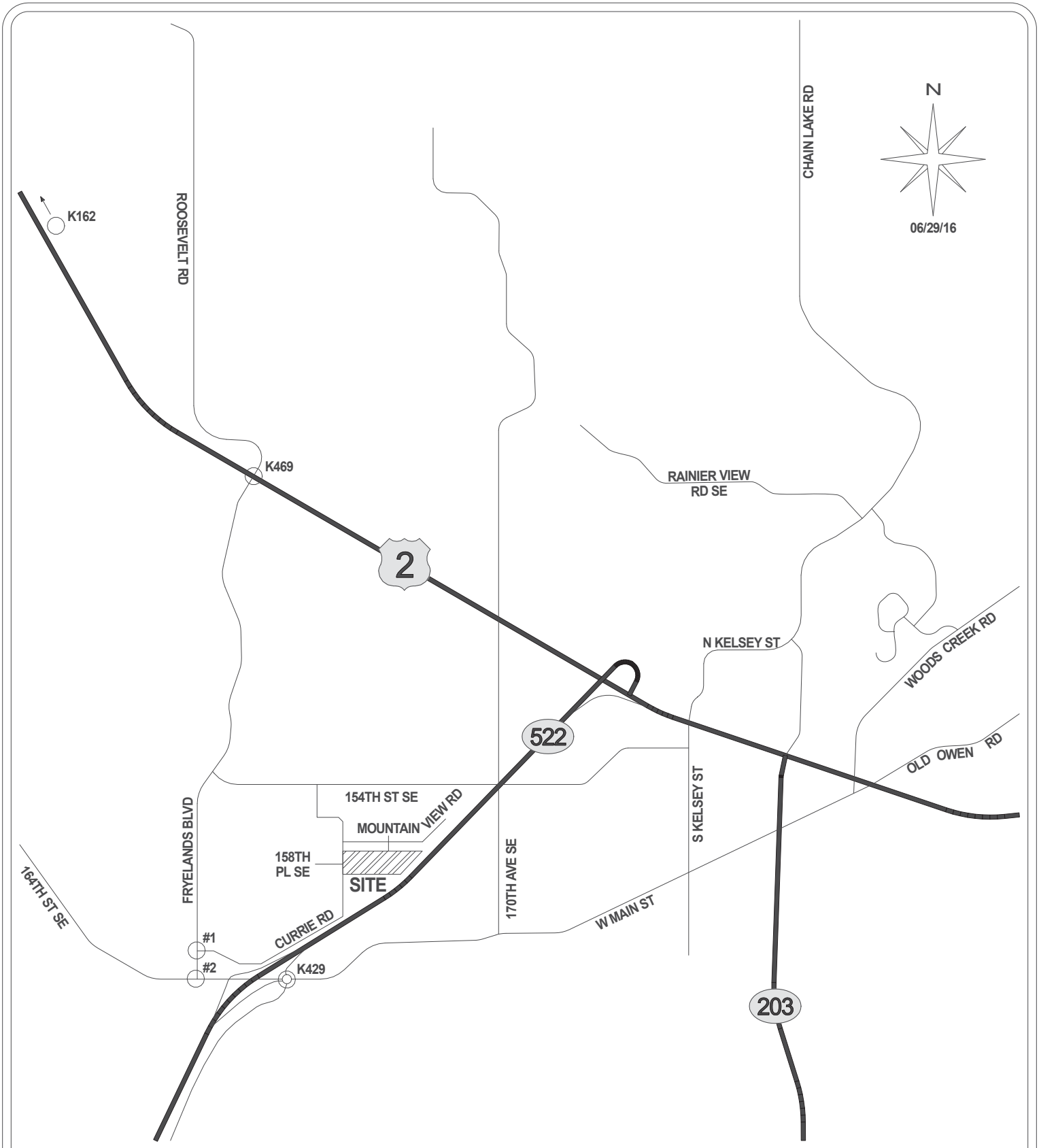
2. METHODOLOGY

Trip generation calculations for the Currie Farms development have been performed utilizing average trip generation data contained in the Institute of Transportation Engineers' (ITE) *Trip Generation, 9th Edition (2012)*. The distribution of trips generated by the site is based on approved distributions for similar developments in the site vicinity.

Intersection level of service analysis has been performed based on typical analysis requirements of the City of Monroe and analysis performed for similar developments in the site vicinity. Level of service analysis has been performed for the following intersections:

1. Fryelands Boulevard at Currie Road
2. Fryelands Boulevard at 164th Street SE

Congestion at intersections 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 stopped approach with the highest delay. 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.



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TRAFFIC IMPACT STUDY
GTC #16-148

CURRIE FARMS
27 NEW SINGLE-FAMILY UNITS

CITY OF MONROE

LEGEND

DEVELOPMENT SITE

KXXX SNOHOMISH COUNTY KEY INTERSECTION

#X STUDY INTERSECTION

FIGURE 1

SITE VICINITY MAP

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[2]	>50	>80

The City of Monroe has a level of service threshold of LOS C for collector road intersections and LOS D for arterial road intersections. The City of Monroe also has an interlocal agreement with WSDOT for intersections along US-2, SR-203 and SR-522. The interlocal agreement states that the level of service needs to remain at LOS D for intersections operating at LOS D before development and LOS E for intersections that operate at LOS E before developments. Intersections operating at LOS F before development will require mitigation. The level of service analysis has been performed utilizing the *Synchro 9.1, Build 907* software.

The City of Monroe also has an interlocal agreement with Snohomish County to provide turning movements at Snohomish County key intersections impacted with 3 or more directional peak-hour trips on an approach or departure and for traffic mitigation fees.

[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.

[2] When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection.

3. TRIP GENERATION

The trip generation calculations for the Currie Farms development are based on the average trip generation rates for ITE Land Use Code 210, Single-Family Detached Housing. The development will have a total of 28 single-family units with a credit of 1 single-family unit for the existing unit on the site. The trip generation of 27 new units for the Currie Farms development is summarized in Table 2.

Table 2: Trip Generation Summary

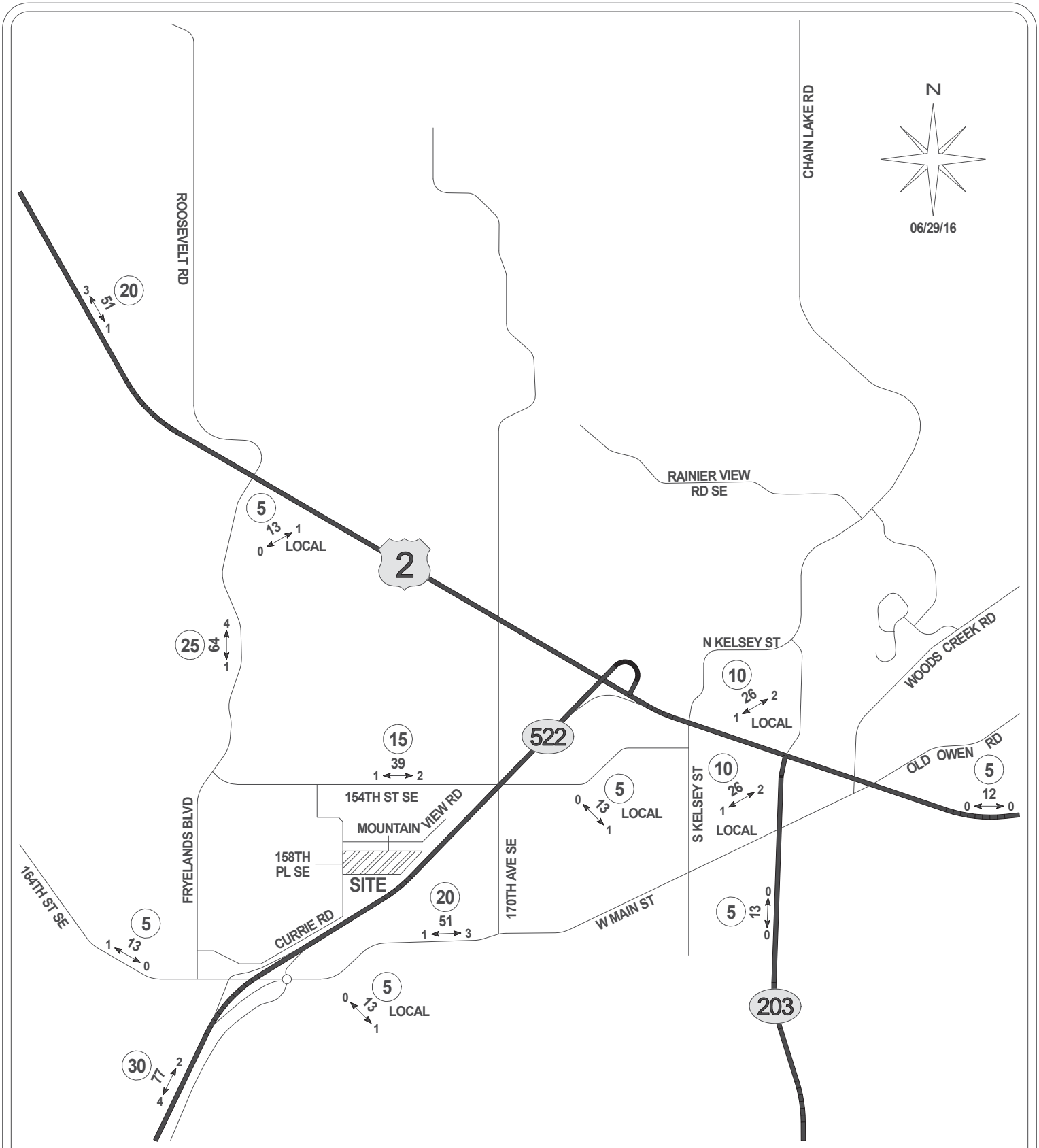
27 New Single-Family Residential Units	Average Daily Trips			AM Peak-Hour Trips			PM Peak-Hour Trips		
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
Generation Rate	9.52 trips per unit			0.75 trips per unit			1.00 trips per unit		
Splits	50%	50%	100%	25%	75%	100%	63%	37%	100%
Trips	129	128	257	5	15	20	17	10	27

The 27 new units are anticipated to generate 257 average daily trips with 20 AM peak-hour trips and 27 PM peak-hour trips.

4. TRIP DISTRIBUTION

The distribution of trips generated by the Currie Farms development is based on previously approved traffic studies for residential developments conducted in the site vicinity. It is anticipated that 25% of the development's trips will travel to and from the north along Fryelands Boulevard. Approximately 35% of the development's trips will travel to and from the east, fifteen percent along 154th Street SE and twenty-percent along W. Main Street. It is estimated that 30% of the development's trips will travel to and from the south along SR-522. The remaining 10% of the development's trips will be split between trips traveling to and from the west along 164th Street SE, five percent, and trips traveling to and from local areas, five percent. Detailed distributions are included in Figure 2 for the AM peak-hour and Figure 3 for the PM peak-hour.

The interlocal agreement with Snohomish County requires key intersections impacted with 3 or more directional peak-hour trips on any approach or departure to be shown. The Currie Farms development will impact 3 Snohomish County key intersections during the AM and PM peak-hours. The key intersection impacts are shown in detail in the attachments of this report. Snohomish County's trip distribution policies state that trips along US-2 do not need to be distributed west of 88th Street SE. Development trips on US-2 are expected to be through-trips at 88th Street SE. Development rips traveling to and from the south along SR-522 are anticipated to travel to and from King County.



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TRAFFIC IMPACT STUDY
GTC #16-148

CURRIE FARMS
27 NEW SINGLE-FAMILY UNITS

CITY OF MONROE

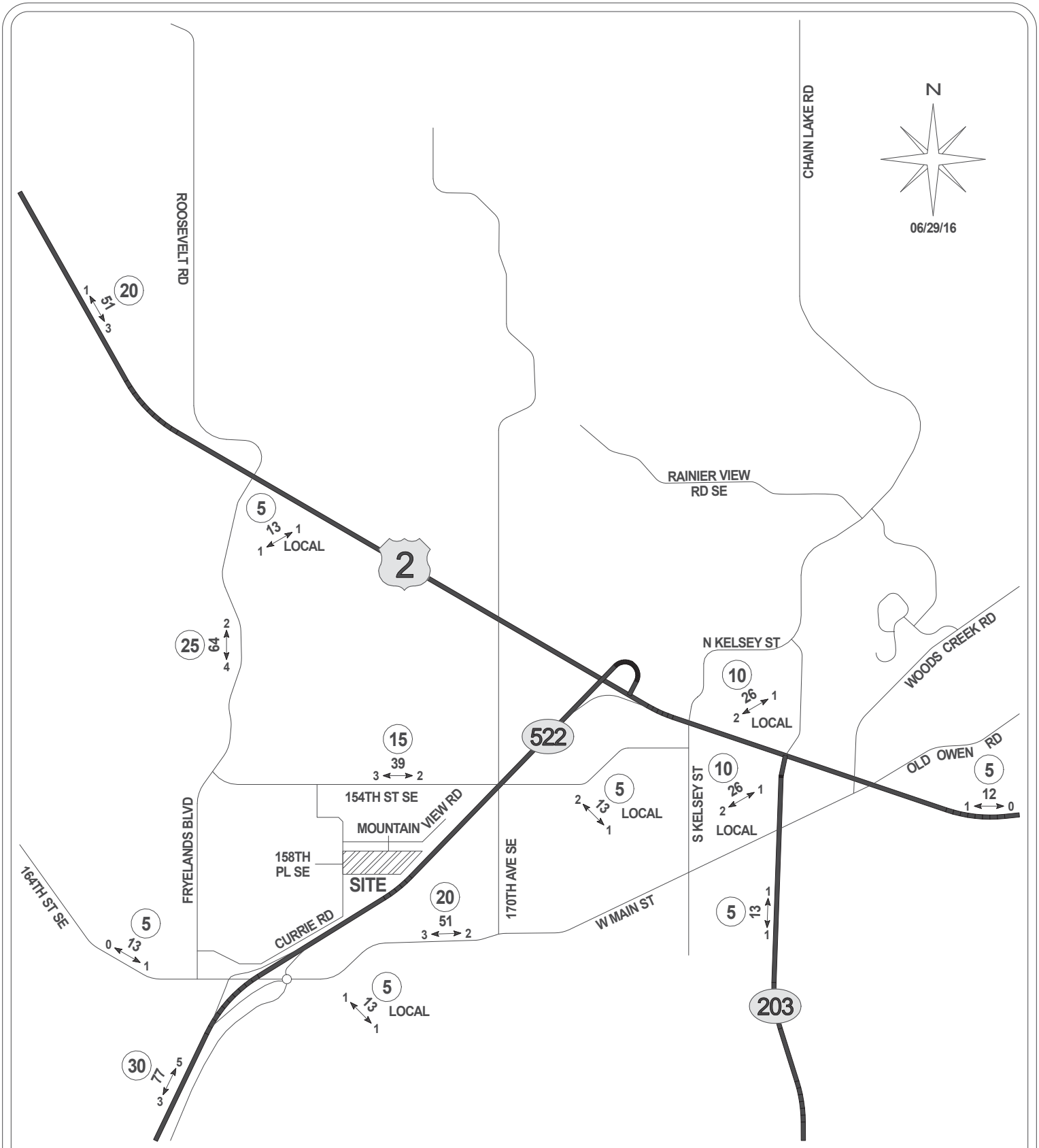
LEGEND

AWDT
AM ⟷ PEAK — NEW SITE TRAFFIC (DAILY/PEAK-HOUR)

XX — TRIP DISTRIBUTION %

FIGURE 2

DEVELOPMENT TRIP DISTRIBUTION AM PEAK-HOUR



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CURRIE FARMS
27 NEW SINGLE-FAMILY UNITS

CITY OF MONROE

LEGEND

AWDT
PM ⟷ PEAK — NEW SITE TRAFFIC (DAILY/PEAK-HOUR)

XX — TRIP DISTRIBUTION %

FIGURE 3

DEVELOPMENT
TRIP DISTRIBUTION
PM PEAK-HOUR

5. INTERSECTION LEVEL OF SERVICE ANALYSIS

The intersections that have been analyzed as part of this report are based on typical requirements of the City of Monroe. Level of service analysis has been performed for the following intersections for the weekday PM peak-hour:

1. Fryelands Boulevard at Currie Road
2. Fryelands Boulevard at 164th Street SE

These are the only two major intersections impacted with 10 or more development PM peak-hour trips. There are not any WSDOT intersections that are anticipated to be impacted with 25 PM peak-hour trips, which is the WSDOT threshold for intersections that do not have fee-based improvements.

5.1 Turning Movement Volumes

The existing turning movements at the study intersections were counted by the independent count firm of Traffic Data Gathering (TDG). The counts were performed between 4:00 PM and 6:00 PM, the typical PM peak-period. The turning movement counts were collected in February of 2015. The existing turning movements at the study intersections are shown in Figure 4.

The future volumes have been calculated for the year 2026, a 10-year horizon period. The 2026 baseline turning movements have been calculated by applying a 2% annually compounding growth rate and pipeline trips from the Hagar development, located in the vicinity of the Currie Farms development. The 2026 baseline turning movements at the study intersections are shown in Figure 5.

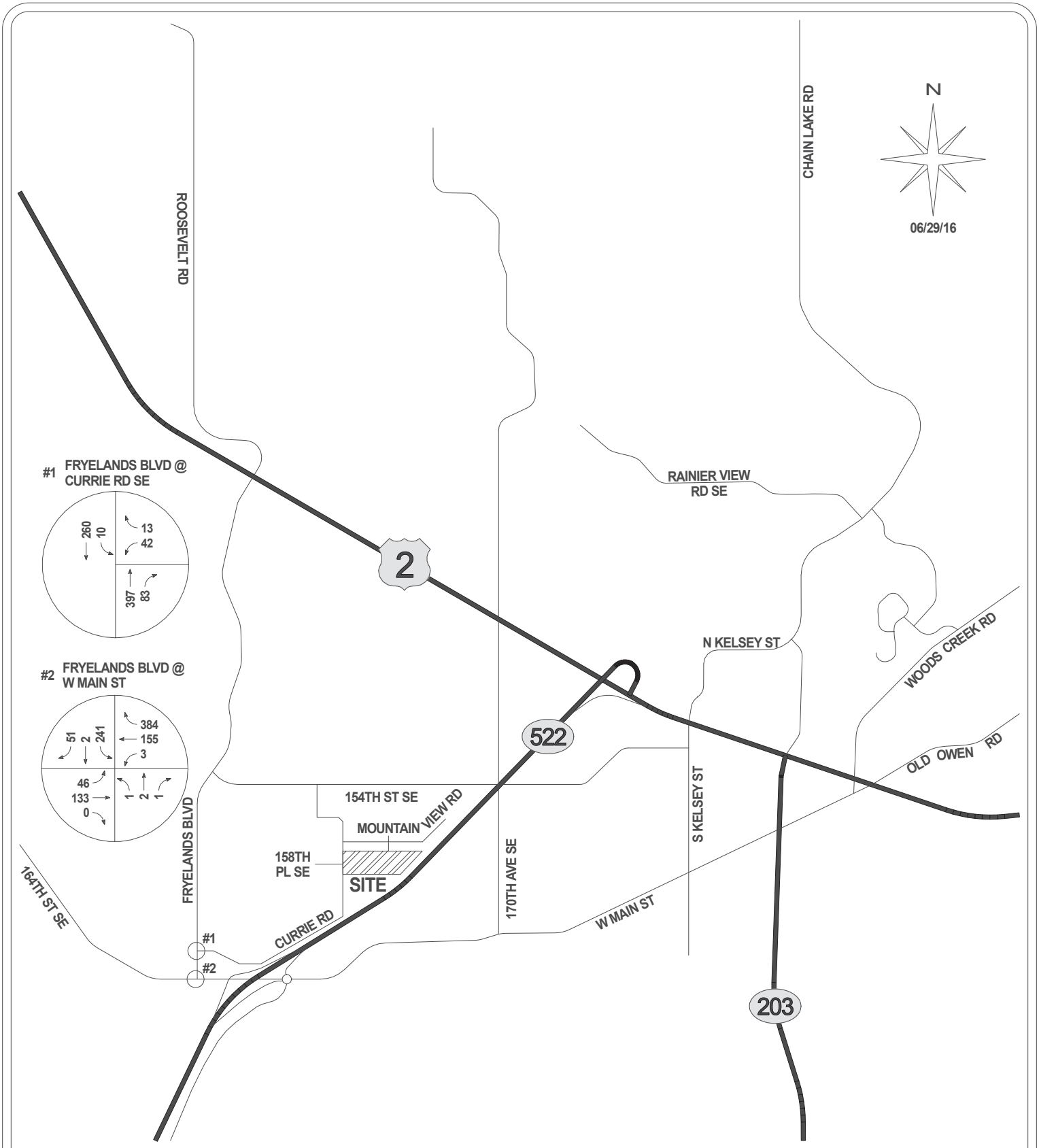
The 2026 future with development turning movements were calculated by adding the development's turning movements to the 2026 baseline turning movements. The 2026 future with development turning movements are shown in Figure 6.

The existing turning movement counts and turning movement calculations are included in the attachments.

5.2 Intersection Level of Service Results

The level of service analysis has been performed utilizing the existing control, channelization, peak-hour factors and heavy-vehicle factors. Both study intersections are along Fryelands Boulevard which is classified as a minor arterial and therefore have a level of service threshold of LOS D.

The level of service analysis shows that the study intersections operate at acceptable LOS C or better under the existing conditions and the 2026 baseline conditions; and will remain at acceptable LOS C or better with the addition of the Currie Farms Development. The level of service results for the study intersections are summarized in Table 3.



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GTC #16-148

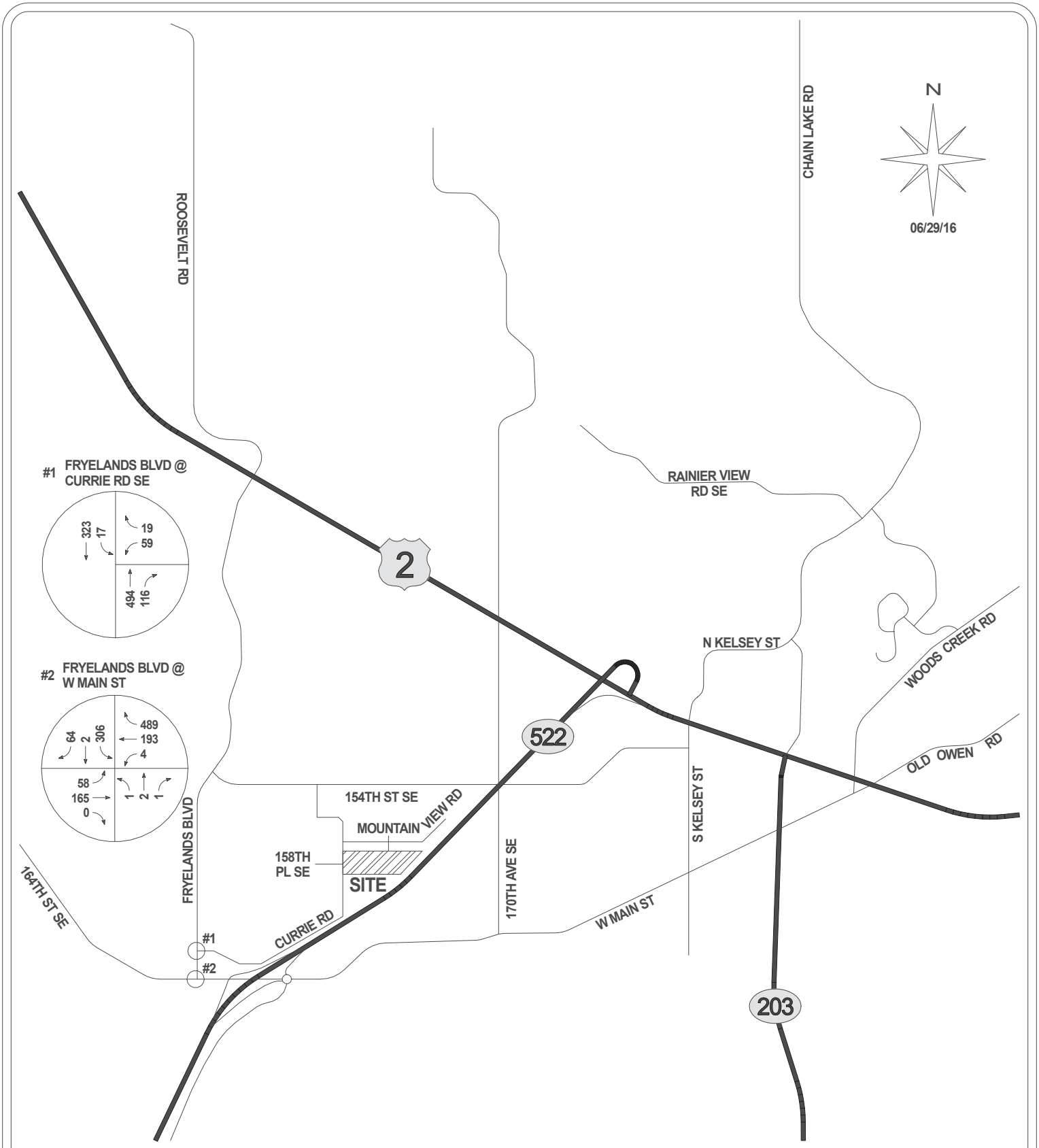
CURRIE FARMS
27 NEW SINGLE-FAMILY UNITS

CITY OF MONROE

LEGEND

XXX → TURNING MOVEMENT VOLUMES

FIGURE 4
EXISTING
TURNING MOVEMENTS



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CURRIE FARMS
27 NEW SINGLE-FAMILY UNITS

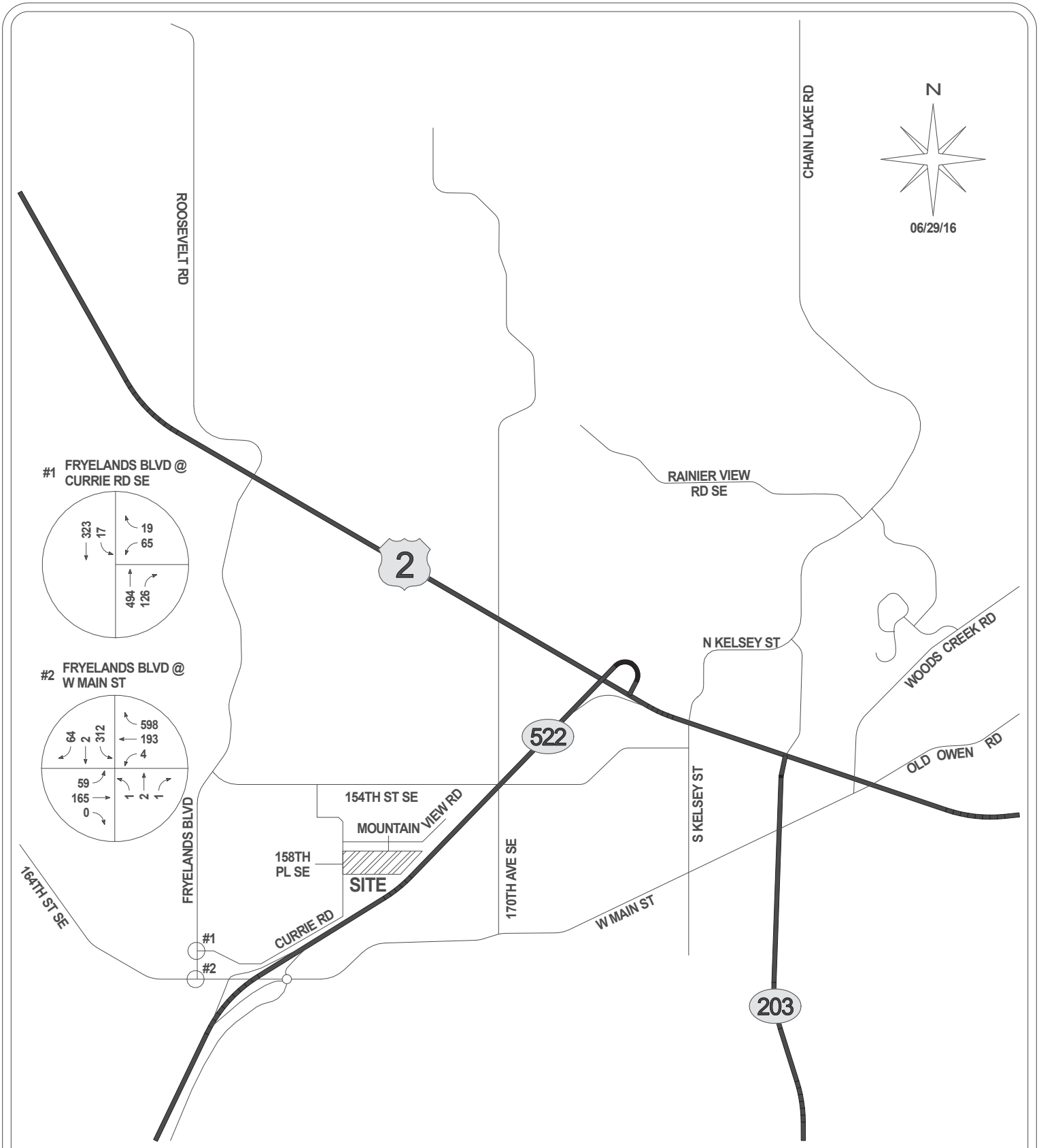
CITY OF MONROE

LEGEND

XXX → TURNING MOVEMENT VOLUMES

FIGURE 5

2026 BASELINE
TURNING MOVEMENTS



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CURRIE FARMS
27 NEW SINGLE-FAMILY UNITS

CITY OF MONROE

LEGEND

XXX → TURNING MOVEMENT VOLUMES

FIGURE 6

2026 FUTURE
WITH DEVELOPMENT
TURNING MOVEMENTS

Table 3: Intersection Level of Service Summary

Intersection	Approach	Existing Conditions		2026 Baseline Conditions		2026 Future Conditions with Development	
		LOS	Delay	LOS	Delay	LOS	Delay
1. Fryelands Blvd. at Currie Rd.	Westbound	B	14.6 sec	C	19.4 sec	C	20.2 sec
2. Fryelands Blvd. at W. Main St.	Intersection	B	13.4 sec	C	21.3 sec	C	22.4 sec

The level of service calculations are included in the attachments.

6. TRAFFIC MITIGATION FEES

The Washington Growth Management Act and Revised Code of Washington 82.02.050(2) authorize local jurisdictions to establish proportionate share traffic mitigation fees in order to fund capital facilities, such as roads and intersections. The Currie Farms development is located within the City of Monroe, which has established traffic mitigation fees. The City of Monroe also has interlocal agreements with Snohomish County and WSDOT for traffic mitigation fees.

6.1 City of Monroe

The City of Monroe has established a traffic mitigation fee schedule. The fee for single-family residential units is $2,815.79 per unit. The 27 new units of the Currie Farms development will have City of Monroe traffic mitigation fees of $76,026.33. It should be noted that these fees may not vest and may be higher when the building applications are pulled.

6.2 Snohomish County

The City of Monroe and Snohomish County have an interlocal agreement that provides for the payment of traffic mitigation for impacts to Snohomish County roadways by City of Monroe developments. Traffic mitigation fees are based on predetermined area impacts or impacts to actual improvement projects. The trip distribution shows that the Currie Farms development will not impact any Snohomish County improvement projects in the Transportation Needs Report with three directional PM peak-hour trips. According to Section 3(a)2 of the S*nohomish County Traffic Worksheet and Traffic Study Requirements for Developments in the City of Monroe*, City of Monroe developments are only required to pay traffic mitigation fees for improvements in the Transportation Needs Report impacted with three directional peak-hour trips. The Currie Farms development is therefore not required to pay traffic mitigation fees to Snohomish County.

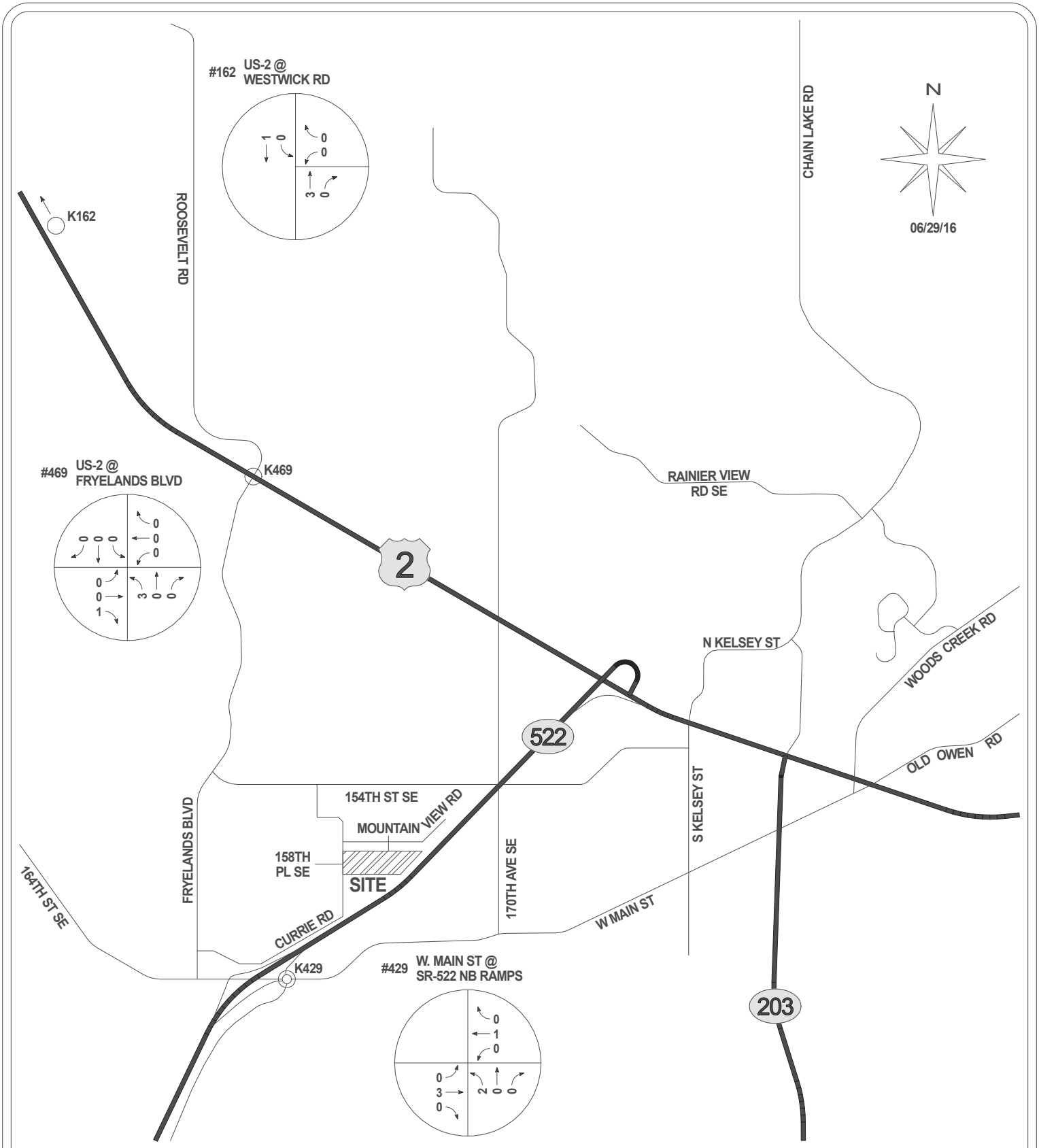
6.3 WSDOT

The City of Monroe and WSDOT have an interlocal agreement that provides for the payment of traffic mitigation fees. The interlocal agreement states that development only has a "significant adverse impact" if the development contributes 25 or more trips to a WSDOT intersection. The Currie Farms development will not impact any WSDOT intersections with 25 peak-hour trips during the AM or PM peak-hours. The Currie Farms development is therefore not required to pay traffic mitigation fees to WSDOT.

7. CONCLUSIONS

The Currie Farms development is proposed to consist of 27 new single-family residential units. The development is anticipated to generate 257 new average daily trips with 20 new AM peak-hour trips and 27 new PM peak-hour trips. The level of service analysis shows that all of the study intersections are anticipated to operate at acceptable levels of service. The Currie Farms development will have City of Monroe traffic mitigation fees of $76,026.33. The development will not meet the thresholds for paying traffic mitigation fees to Snohomish County or WSDOT.

Snohomish County Key Intersection Impacts



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TRAFFIC IMPACT STUDY
GTC #16-148

CURRIE FARMS
27 NEW SINGLE-FAMILY UNITS

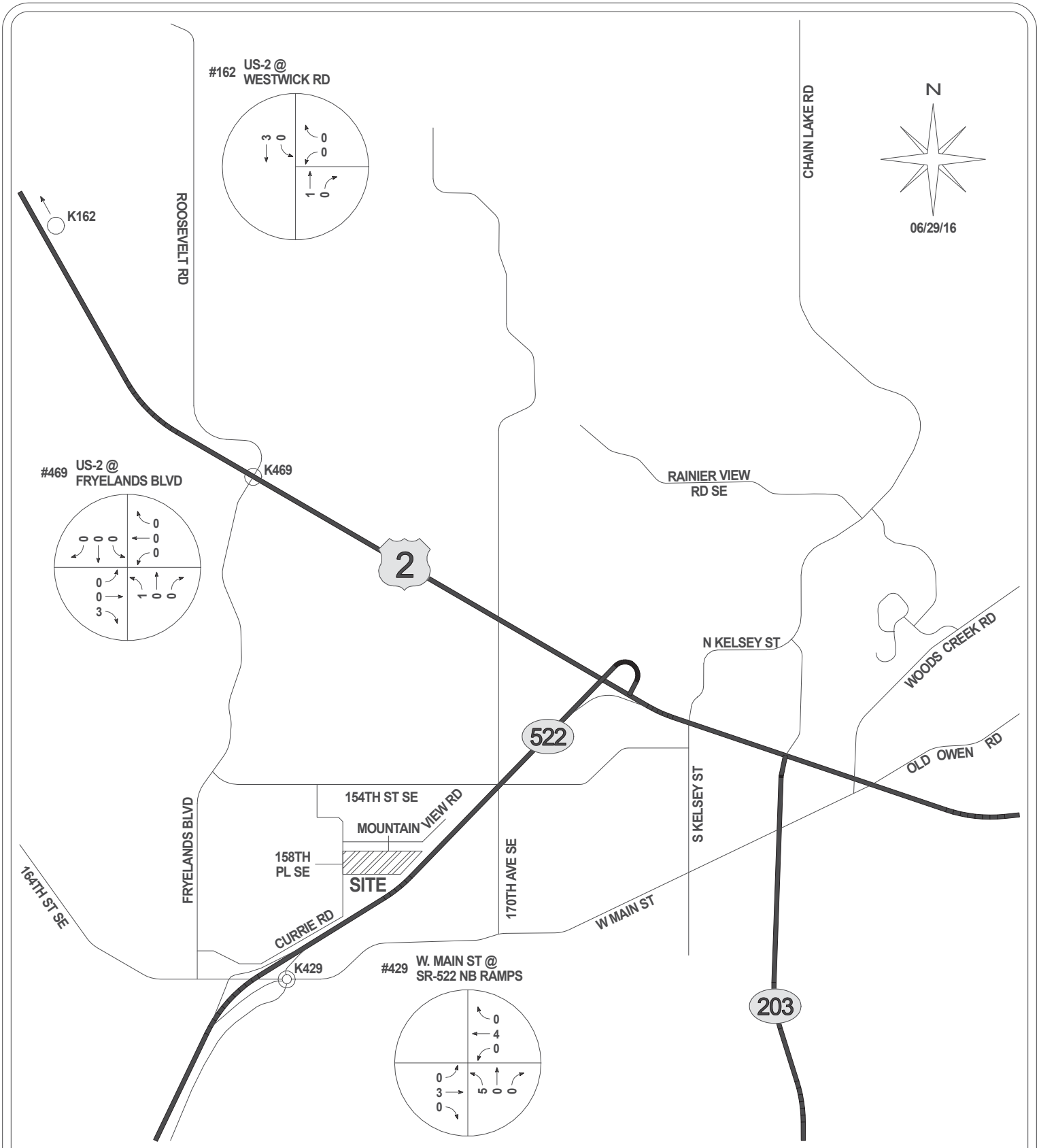
CITY OF MONROE

LEGEND

XXX → DEVELOPMENT TURNING MOVEMENT VOLUMES

FIGURE A

SNOHOMISH COUNTY KEY INTERSECTION AM VOLUMES



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GTC #16-148

CURRIE FARMS
27 NEW SINGLE-FAMILY UNITS

CITY OF MONROE

LEGEND

XXX → DEVELOPMENT TURNING MOVEMENT VOLUMES

FIGURE B

SNOHOMISH COUNTY KEY INTERSECTION PM VOLUMES

AM Peak-Hour Key Intersection Volumes

Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#162: US-2 at Westwick Rd	NA	NA	NA	0	NA	0	NA	3	0	0	1	N/A
#429: W. Main St at SR-522 NB Ramps	0	3	0	0	1	0	2	0	0	N/A	N/A	N/A
#469: US-2 at Fryelands Blvd	0	0	1	0	0	0	3	0	0	0	0	0

PM Peak-Hour Key Intersection Volumes

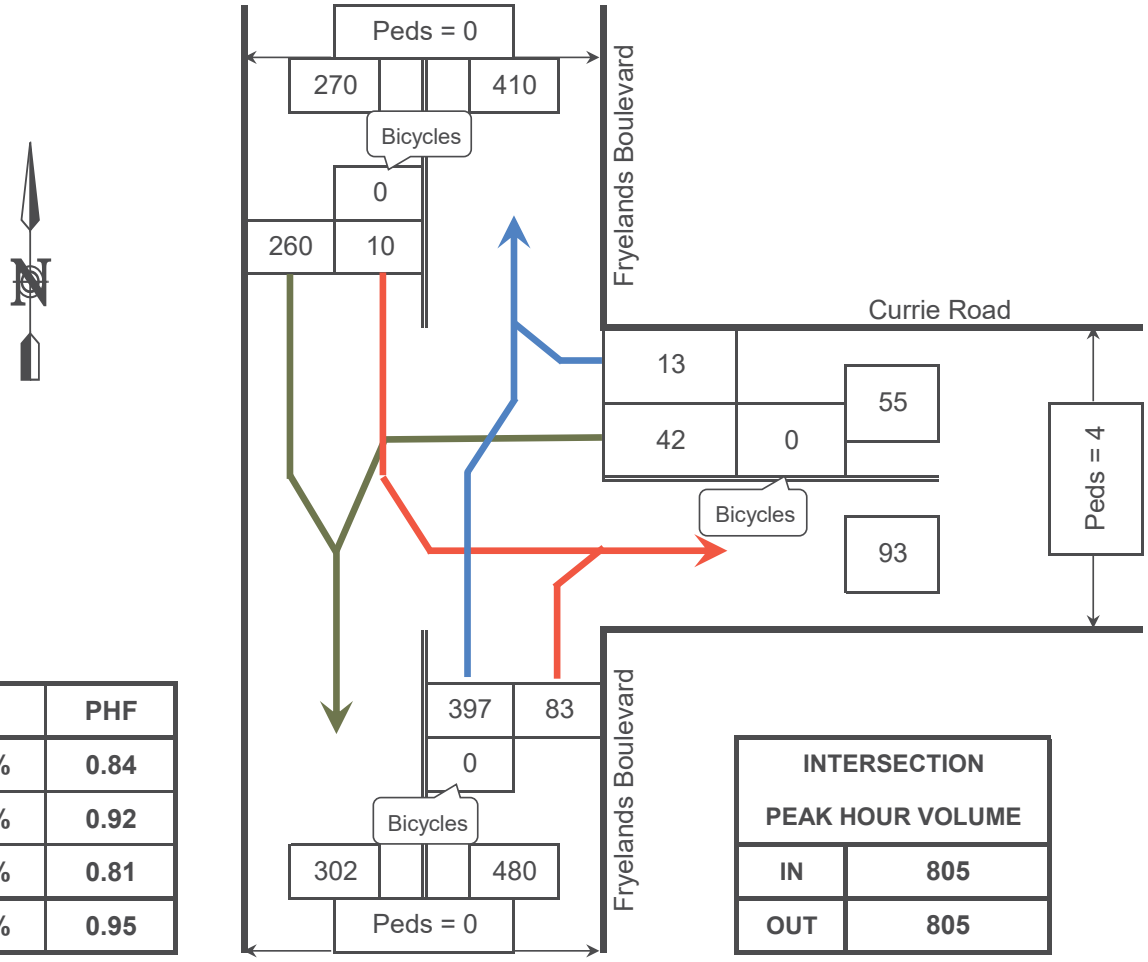
Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
#162: US-2 at Westwick Rd	NA	NA	NA	0	NA	0	NA	1	0	0	3	N/A
#429: W. Main St at SR-522 NB Ramps	0	3	0	0	4	0	5	0	0	N/A	N/A	N/A
#469: US-2 at Fryelands Blvd	0	0	3	0	0	0	1	0	0	0	0	0

Counts and Turning Movement Volumes

TRAFFIC DATA GATHERING

TURNING MOVEMENTS DIAGRAM

4:00 PM - 6:00 PM PEAK HOUR: 4:15 PM TO 5:15 PM



	HV	PHF
SB	3.0%	0.84
NB	3.8%	0.92
WB	0.0%	0.81
INTRS.	3.2%	0.95

INTERSECTION PEAK HOUR VOLUME	
IN	805
OUT	805

HV = Heavy Vehicles
PHF = Peak Hour Factor

Fryelands Boulevard @ Currie Road

Monroe, WA

COUNTED BY: JH

DATE OF COUNT: Tue. 2/10/15

REDUCED BY: CN

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

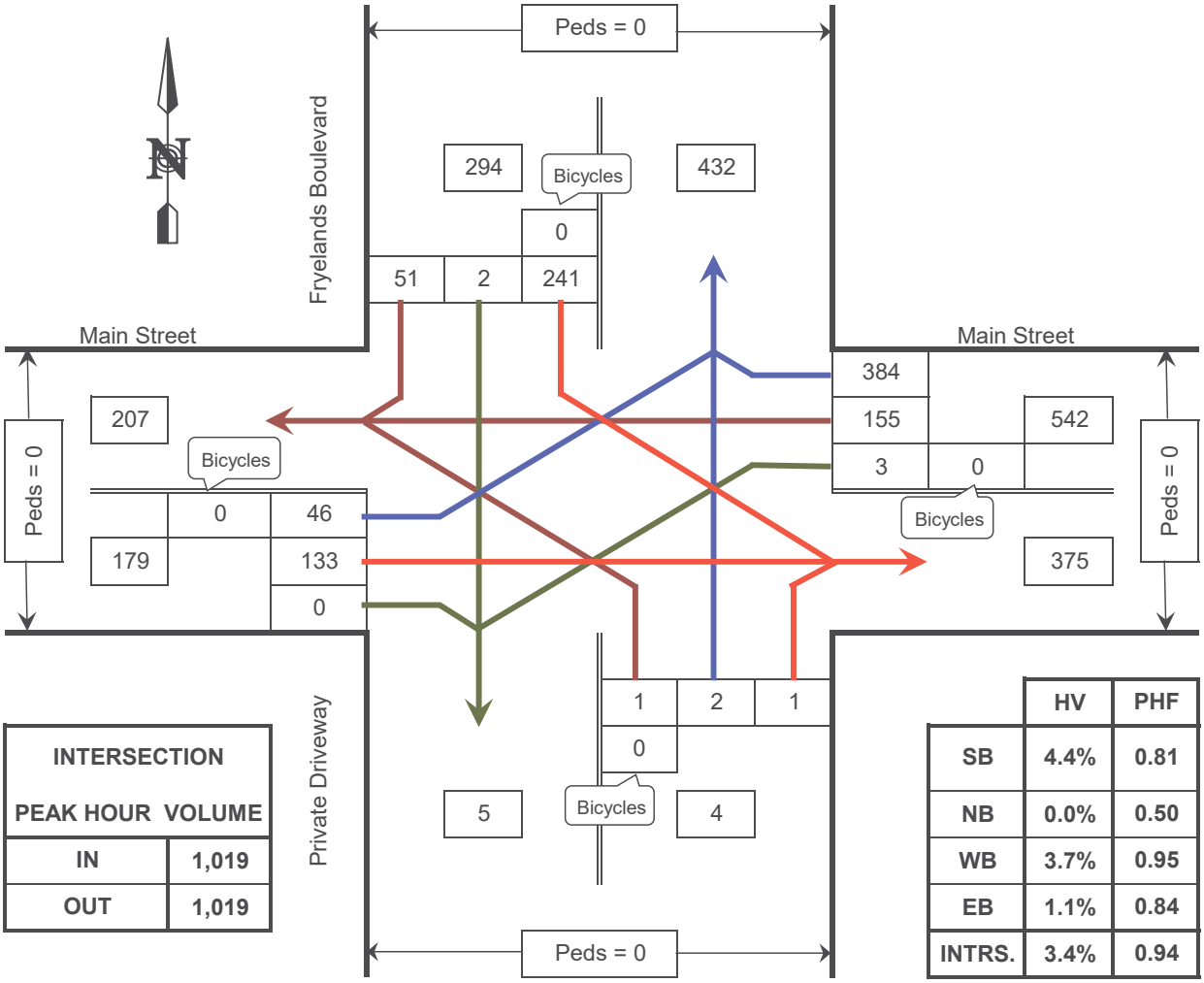
REDUCTION DATE: Tue. 2/10/15

WEATHER: Overcast

TRAFFIC DATA GATHERING

TURNING MOVEMENTS DIAGRAM

4:00 PM - 6:00 PM PEAK HOUR: 4:15 PM TO 5:15 PM



INTERSECTION PEAK HOUR VOLUME	
IN	1,019
OUT	1,019

	HV	PHF
SB	4.4%	0.81
NB	0.0%	0.50
WB	3.7%	0.95
EB	1.1%	0.84
INTRS.	3.4%	0.94

PHF = Peak Hour Factor
HV = Heavy Vehicles

Fryelands Boulevard @ Main Street

Monroe, WA

COUNTED BY: CN

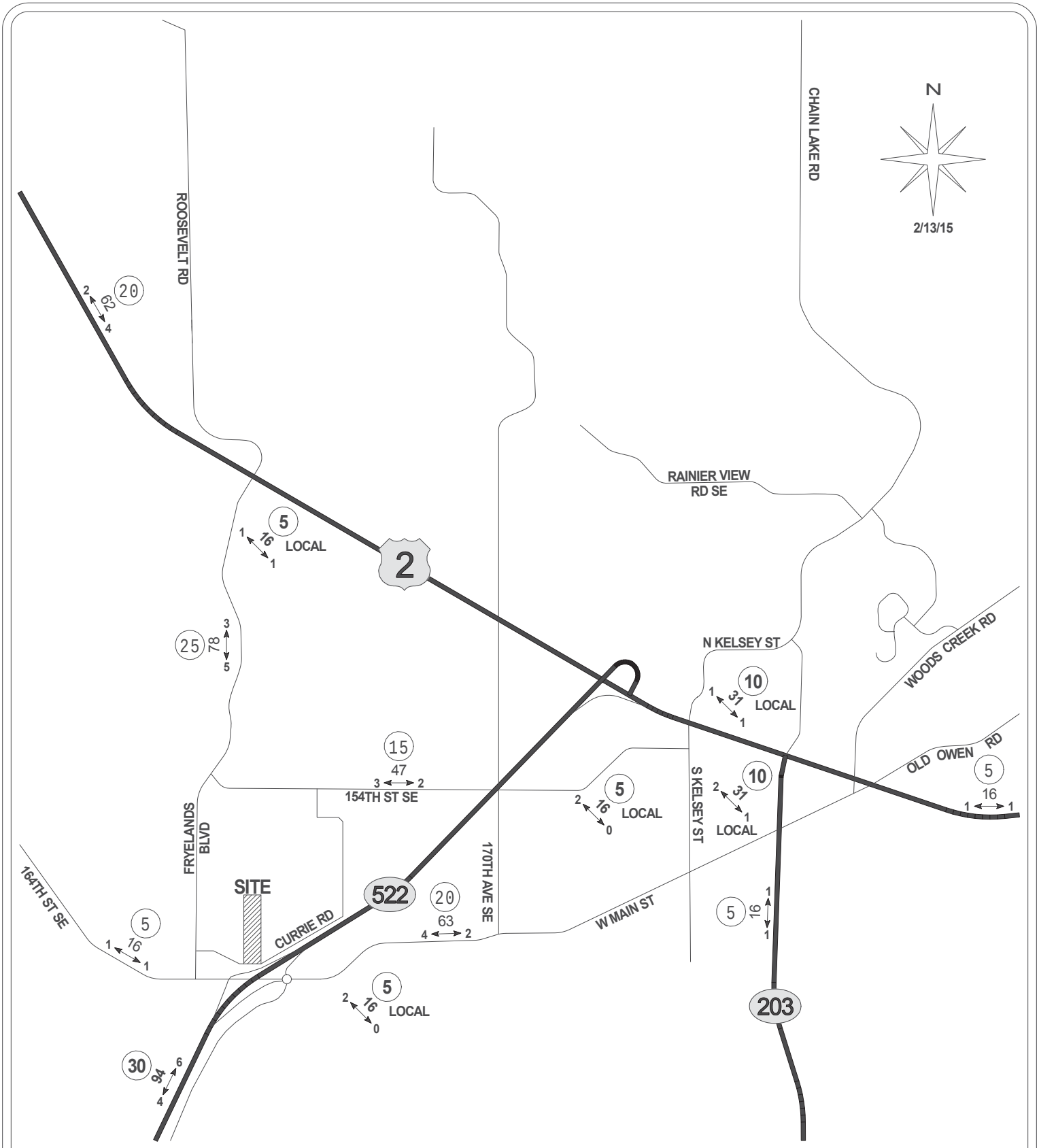
REDUCED BY: CN

REDUCTION DATE: Tue. 2/10/15

DATE OF COUNT: Tue. 2/10/15

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

WEATHER: Overcast



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GTC #14-211

HAGAR DEVELOPMENT
33 NEW SINGLE-FAMILY UNITS

CITY OF MONROE

LEGEND

AWDT
PM ⟷ PEAK — NEW SITE TRAFFIC (DAILY/PEAK-HOUR)

XX — TRIP DISTRIBUTION %

FIGURE 3

DEVELOPMENT
TRIP DISTRIBUTION
PM PEAK-HOUR

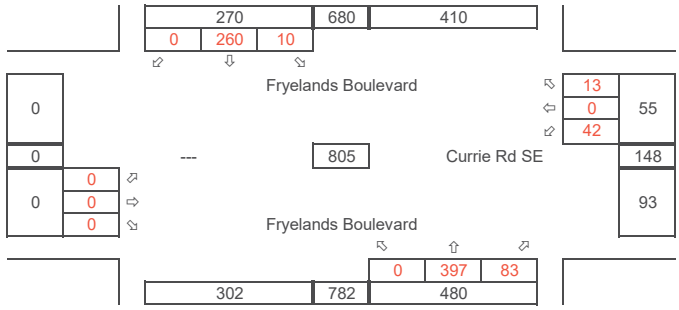
#1 Fryelands Blvd @ Currie Rd

Synchro ID: 1

Existing
Average Weekday
PM Peak Hour

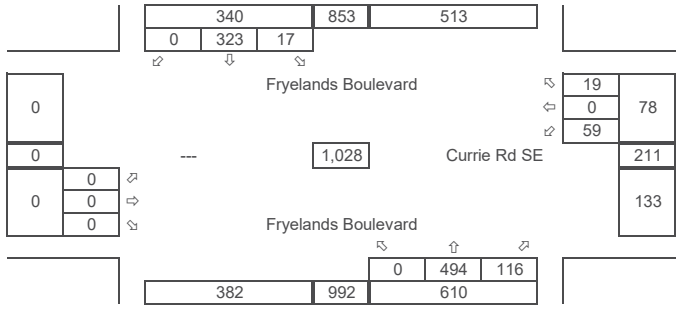
Date **2/10/2015**

Data Source: **TDG**

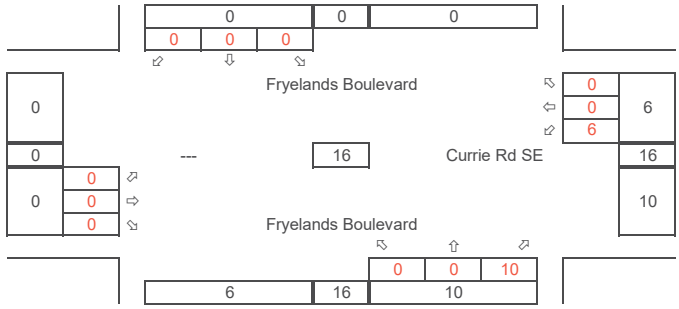


Future w/o Development
Average Weekday
PM Peak Hour

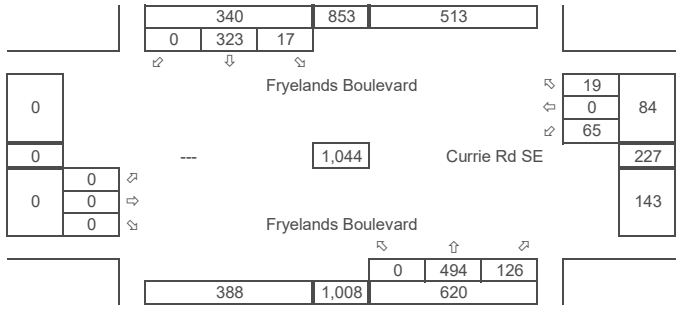
Year: 2026
Growth Rate = 2.0%
Years of Growth = 11
Total Growth = 1.2434



Total Development Trips
Average Weekday
PM Peak Hour

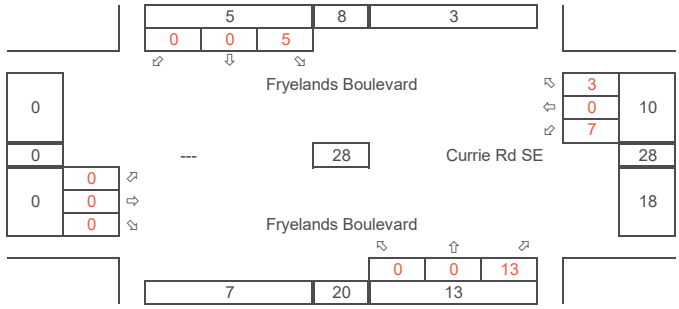


Future with Project
Average Weekday
PM Peak Hour



Pipeline Projects
Average Weekday
PM Peak Hour

Hagar Development



#2 Fryelands Blvd @ W. Main St.

Synchro ID: 2

Existing
Average Weekday
PM Peak Hour

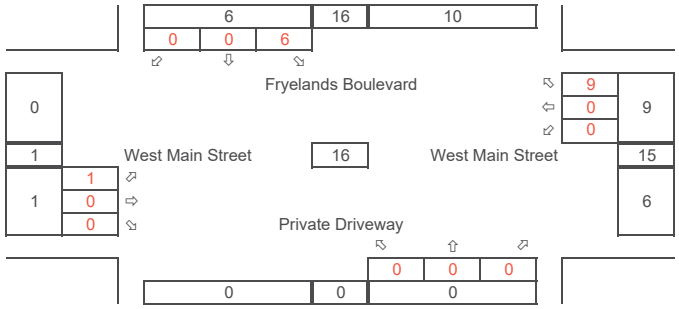
Date **2/10/2015**

Data Source: **TDG**

Future w/o Development
Average Weekday
PM Peak Hour

Year: 2026
Growth Rate = 2.0%
Years of Growth = 11
Total Growth = 1.2434

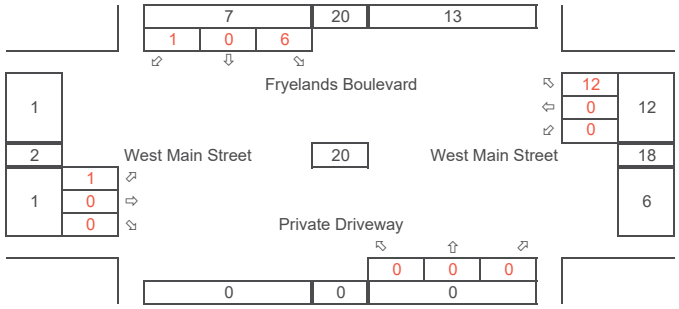
Total Development Trips
Average Weekday
PM Peak Hour



Future with Project
Average Weekday
PM Peak Hour

Pipeline Projects
Average Weekday
PM Peak Hour

Hagar Development



Level of Service Calculations

Intersection						
Int Delay, s/veh	1.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	42	13	397	83	10	260
Future Vol, veh/h	42	13	397	83	10	260
Conflicting Peds, #/hr	0	0	0	4	4	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	81	81	92	92	84	84
Heavy Vehicles, %	0	0	4	4	3	3
Mvmt Flow	52	16	432	90	12	310

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	660	265	0	0	526	0
Stage 1	481	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.16	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.23	-
Pot Cap-1 Maneuver	401	739	-	-	1030	-
Stage 1	593	-	-	-	-	-
Stage 2	840	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	394	737	-	-	1030	-
Mov Cap-2 Maneuver	394	-	-	-	-	-
Stage 1	591	-	-	-	-	-
Stage 2	828	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.6	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	443	1030	-
HCM Lane V/C Ratio	-	-	0.153	0.012	-
HCM Control Delay (s)	-	-	14.6	8.5	0.1
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Intersection Delay, s/veh	13.4
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	46	133	0	0	3	155	384	0	1	2	1
Future Vol, veh/h	0	46	133	0	0	3	155	384	0	1	2	1
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	3	3	3	2	3	3	3	2	3	3	3
Mvmt Flow	0	49	141	0	0	3	165	409	0	1	2	1
Number of Lanes	0	0	1	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	11.4	13.5	9.4
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	25%	26%	2%	0%	82%
Vol Thru, %	50%	74%	98%	0%	1%
Vol Right, %	25%	0%	0%	100%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	179	158	384	294
LT Vol	1	46	3	0	241
Through Vol	2	133	155	0	2
RT Vol	1	0	0	384	51
Lane Flow Rate	4	190	168	409	313
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.007	0.307	0.271	0.578	0.503
Departure Headway (Hd)	6.337	5.8	5.811	5.093	5.788
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	563	619	619	707	622
Service Time	4.396	3.839	3.545	2.826	3.82
HCM Lane V/C Ratio	0.007	0.307	0.271	0.579	0.503
HCM Control Delay	9.4	11.4	10.7	14.6	14.6
HCM Lane LOS	A	B	B	B	B
HCM 95th-tile Q	0	1.3	1.1	3.7	2.8

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	241	2	51
Future Vol, veh/h	0	241	2	51
Peak Hour Factor	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	3	3	3
Mvmt Flow	0	256	2	54
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	14.6
HCM LOS	B

Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	59	19	494	116	17	323
Future Vol, veh/h	59	19	494	116	17	323
Conflicting Peds, #/hr	0	0	0	4	4	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	81	81	92	92	84	84
Heavy Vehicles, %	0	0	4	4	3	3
Mvmt Flow	73	23	537	126	20	385

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	837	336	0	0	667	0
Stage 1	604	-	-	-	-	-
Stage 2	233	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.16	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.23	-
Pot Cap-1 Maneuver	309	666	-	-	912	-
Stage 1	514	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	299	664	-	-	912	-
Mov Cap-2 Maneuver	299	-	-	-	-	-
Stage 1	512	-	-	-	-	-
Stage 2	768	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.4	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	345	912	-
HCM Lane V/C Ratio	-	-	0.279	0.022	-
HCM Control Delay (s)	-	-	19.4	9	0.1
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

Intersection	
Intersection Delay, s/veh	21.3
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	58	165	0	0	4	193	489	0	1	2	1
Future Vol, veh/h	0	58	165	0	0	4	193	489	0	1	2	1
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	3	3	3	2	3	3	3	2	3	3	3
Mvmt Flow	0	62	176	0	0	4	205	520	0	1	2	1
Number of Lanes	0	0	1	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	14.1	23.3	10.4
HCM LOS	B	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	25%	26%	2%	0%	82%
Vol Thru, %	50%	74%	98%	0%	1%
Vol Right, %	25%	0%	0%	100%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	223	197	489	372
LT Vol	1	58	4	0	306
Through Vol	2	165	193	0	2
RT Vol	1	0	0	489	64
Lane Flow Rate	4	237	210	520	396
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.009	0.422	0.367	0.806	0.687
Departure Headway (Hd)	7.343	6.397	6.303	5.581	6.247
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	490	560	568	645	578
Service Time	5.343	4.478	4.074	3.351	4.306
HCM Lane V/C Ratio	0.008	0.423	0.37	0.806	0.685
HCM Control Delay	10.4	14.1	12.7	27.6	22
HCM Lane LOS	B	B	B	D	C
HCM 95th-tile Q	0	2.1	1.7	8.2	5.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	306	2	64
Future Vol, veh/h	0	306	2	64
Peak Hour Factor	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	3	3	3
Mvmt Flow	0	326	2	68
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	22
HCM LOS	C

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	65	19	494	126	17	323
Future Vol, veh/h	65	19	494	126	17	323
Conflicting Peds, #/hr	0	0	0	4	4	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	81	81	92	92	84	84
Heavy Vehicles, %	0	0	4	4	3	3
Mvmt Flow	80	23	537	137	20	385

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	842	341	0	0	678	0
Stage 1	609	-	-	-	-	-
Stage 2	233	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.16	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.23	-
Pot Cap-1 Maneuver	307	661	-	-	903	-
Stage 1	511	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	297	659	-	-	903	-
Mov Cap-2 Maneuver	297	-	-	-	-	-
Stage 1	509	-	-	-	-	-
Stage 2	768	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.2	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	339	903	-
HCM Lane V/C Ratio	-	-	0.306	0.022	-
HCM Control Delay (s)	-	-	20.2	9.1	0.1
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0.1	-

Intersection	
Intersection Delay, s/veh	22.4
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	59	165	0	0	4	193	498	0	1	2	1
Future Vol, veh/h	0	59	165	0	0	4	193	498	0	1	2	1
Peak Hour Factor	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	3	3	3	2	3	3	3	2	3	3	3
Mvmt Flow	0	63	176	0	0	4	205	530	0	1	2	1
Number of Lanes	0	0	1	0	0	0	1	1	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	2
HCM Control Delay	14.3	24.9	10.5
HCM LOS	B	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1
Vol Left, %	25%	26%	2%	0%	83%
Vol Thru, %	50%	74%	98%	0%	1%
Vol Right, %	25%	0%	0%	100%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	224	197	498	378
LT Vol	1	59	4	0	312
Through Vol	2	165	193	0	2
RT Vol	1	0	0	498	64
Lane Flow Rate	4	238	210	530	402
Geometry Grp	2	5	7	7	2
Degree of Util (X)	0.009	0.427	0.369	0.827	0.701
Departure Headway (Hd)	7.41	6.445	6.339	5.617	6.276
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	486	555	564	641	575
Service Time	5.41	4.527	4.111	3.388	4.338
HCM Lane V/C Ratio	0.008	0.429	0.372	0.827	0.699
HCM Control Delay	10.5	14.3	12.8	29.7	22.8
HCM Lane LOS	B	B	B	D	C
HCM 95th-tile Q	0	2.1	1.7	8.7	5.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	312	2	64
Future Vol, veh/h	0	312	2	64
Peak Hour Factor	0.92	0.94	0.94	0.94
Heavy Vehicles, %	2	3	3	3
Mvmt Flow	0	332	2	68
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	22.8
HCM LOS	C