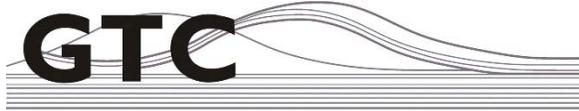


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03/28/2019  
CITY OF MONROE

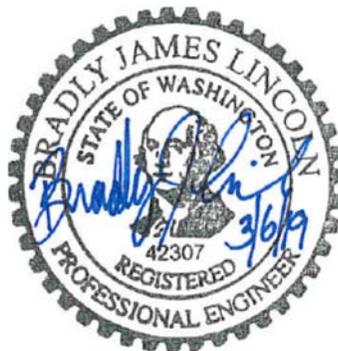


Gibson Traffic Consultants, Inc.  
2813 Rockefeller Avenue  
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Everett, WA 98201  
425.339.8266

# Eaglemont 7 Traffic Impact Analysis

Jurisdiction: City of Monroe

March 2019



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## 1. DEVELOPMENT IDENTIFICATION

Gibson Traffic Consultants, Inc. (GTC) has been retained to provide a traffic impact analysis for the proposed Eaglemont 7 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 Eaglemont 7 development is proposed to consist of a total of 46 single-family residential units that will be constructed in one phase. There are two existing single-family residential units that will be removed and will be credited to the development. The analysis in this report has therefore been performed for 44 new single-family residential units. The development site is located along the south side of Chain Lake Road at the intersection with Brown Road. A site vicinity map has been included in Figure 1.

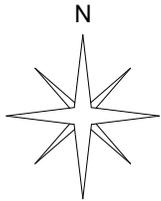
## 2. METHODOLOGY

Trip generation calculations for the Eaglemont 7 development have been performed utilizing average trip generation data contained in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual, 10<sup>th</sup> Edition (2017)*. The distribution of trips generated by the site is based on approved distributions for developments in the site vicinity.

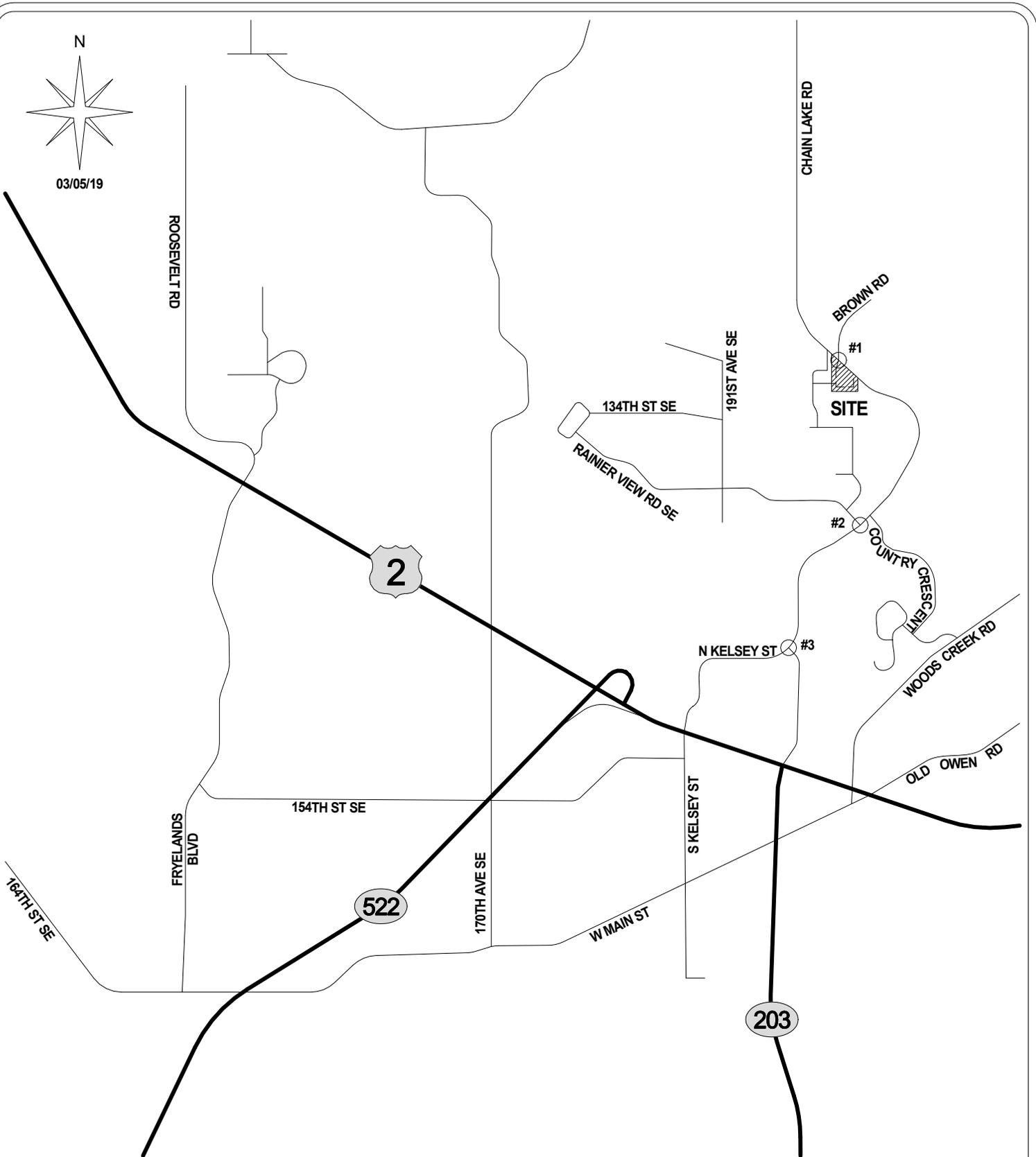
Intersection level of service analysis has been performed based on typical City of Monroe requirements and previous scoping conversations with City of Monroe staff. Level of service analysis has been performed for the following City of Monroe intersections:

1. Chain Lake Road at Brown Road
2. Chain Lake Road at Rainier View Road SE
3. Chain Lake Road at Kelsey Street

Congestion at intersections is generally measured in terms of level of service (LOS). In accordance with *Highway Capacity Manual: 6<sup>th</sup> 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 #18-042**

**EAGLEMONT 7  
44 NEW SINGLE FAMILY  
DWELLINGS**

**CITY OF MONROE**

**LEGEND**



DEVELOPMENT SITE



STUDY INTERSECTION

**FIGURE 1  
SITE VICINITY  
MAP**

**Table 1: Level of Service Criteria for Intersections**

Level of <sup>1</sup> Service	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 <sup>2</sup>	>50	>80

The City of Monroe has a level of service threshold of LOS D for arterial road intersections, which includes all of the City of Monroe study intersections. The level of service analysis has been performed utilizing the *Synchro 10.2 Build 0* software for the stop-controlled intersections (intersection 1 and 2). The *Sidra 8.0* software has been utilized for the intersection of Chain Lake Road at Kelsey Street (intersection 3), which is a roundabout.

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 any approach or departure and for traffic mitigation fees.

<sup>1</sup> **Source:** *Highway Capacity Manual 6<sup>th</sup> Edition*.

LOS A: Free-flow traffic conditions, with minimal delay to stopped vehicles (no vehicle is delayed longer than one cycle at signalized intersection).

LOS B: Generally stable traffic flow conditions.

LOS C: Occasional back-ups may develop, but delay to vehicles is short term and still tolerable.

LOS D: During short periods of the peak hour, delays to approaching vehicles may be substantial but are tolerable during times of less demand (i.e. vehicles delayed one cycle or less at signal).

LOS E: Intersections operate at or near capacity, with long queues developing on all approaches and long delays.

LOS F: Jammed conditions on all approaches with excessively long delays and vehicles unable to move at times.

<sup>2</sup> 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 Eaglemont 7 development are based on the average trip generation rates for ITE Land Use Code 210, Single-Family Detached Housing. The trip generation calculations are based on the 44 new units of the Eaglemont 7 development, which includes credit for the existing units on the site and are summarized in Table 2.

**Table 2: Trip Generation Summary**

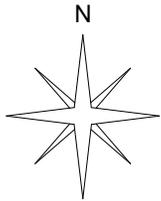
44 Net New Single-Family Residential Units	Average Daily Trips			AM Peak-Hour Trips			PM Peak-Hour Trips		
	Inbound	Outbound	Total	Inbound	Outbound	Total	Inbound	Outbound	Total
Generation Rate	9.44 trips per unit			0.74 trips per unit			0.99 trips per unit		
Splits	50%	50%	100%	25%	75%	100%	63%	37%	100%
Trips	207.68	207.68	415.36	8.14	24.42	32.56	27.44	16.12	43.56

The 44 new units are anticipated to generate approximately 415.36 average daily trips with approximately 24.42 AM peak-hour trips and 43.56 PM peak-hour trips.

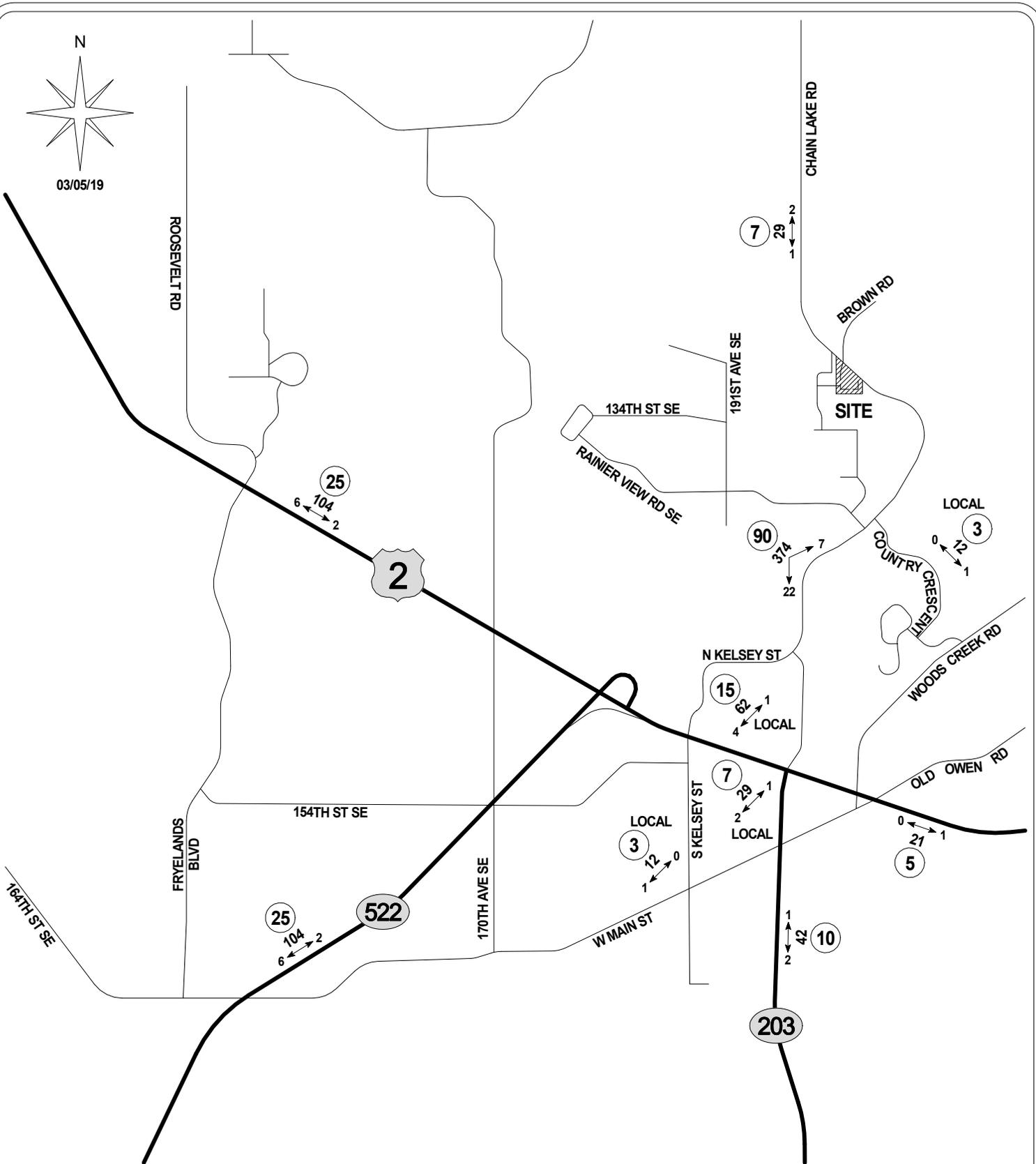
### 4. TRIP DISTRIBUTION

The distribution of trips generated by the Eaglemont 7 development is based on approved distributions for developments in the site vicinity. It is anticipated that 25% of the development's trips will travel to and from the west along US-2. Approximately 35% of the development's trips will travel to and from the south, twenty-five percent along SR-522 and ten percent along SR-203. It is estimated that 28% of the development's trips will travel to and from local areas in the vicinity of the development, ten percent south of US-2, fifteen percent north of US-2, and three percent to the east. The remaining 12% of the development's trips are anticipated to travel to and from the north and east, seven percent to and from the north along Chain Lake Road and five percent to and from the east along US-2. 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 Eaglemont 7 development will impact 3 key intersections during the AM peak-hour and 4 key intersections during the PM peak-hour. The key intersection impacts are shown in detail in the attachments of this report. Snohomish County's trip distribution policy states that trips along US-2 do not need to be distributed west of 88<sup>th</sup> Street SE. Trips traveling to and from the south along SR-522 and SR-203 are anticipated to travel to and from King County.



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**EAGLEMONT 7**  
44 NEW SINGLE FAMILY DWELLINGS

LEGEND

AWDT  
AM ↔ PEAK

NEW SITE TRAFFIC  
(DAILY/PEAK-HOUR)



TRIP DISTRIBUTION %

**FIGURE 2**  
**DEVELOPMENT**  
**TRIP DISTRIBUTION**  
**AM PEAK-HOUR**

**CITY OF MONROE**



## 5. INTERSECTION LEVEL OF SERVICE ANALYSIS

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

1. Chain Lake Road at Brown Road
2. Chain Lake Road at Rainier View Road SE
3. Chain Lake Road at Kelsey Street

The analysis has been completed for the existing, 2029 baseline and 2029 future with development conditions.

### 5.1 Turning Movement Volumes

The existing turning movements at the study intersections are based on data collected by the independent count firm, Traffic Data Gathering (TDG), in January 2018. The existing turning movements at the study intersections are shown in Figure 4.

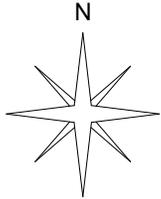
The 2029 baseline volumes have been calculated using a 10-year horizon period and applying a 2% annually compounding growth rate with the following pipeline developments:

- Eaglemont I-III (F.K.A. Eaglemont) – 15 unconstructed 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
- 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
- Kestrel Ridge – 30 new single-family units
- 2 Short Plats north of Easton Cove – 10 new single-family units
- Garibaldi – 59 new single-family units

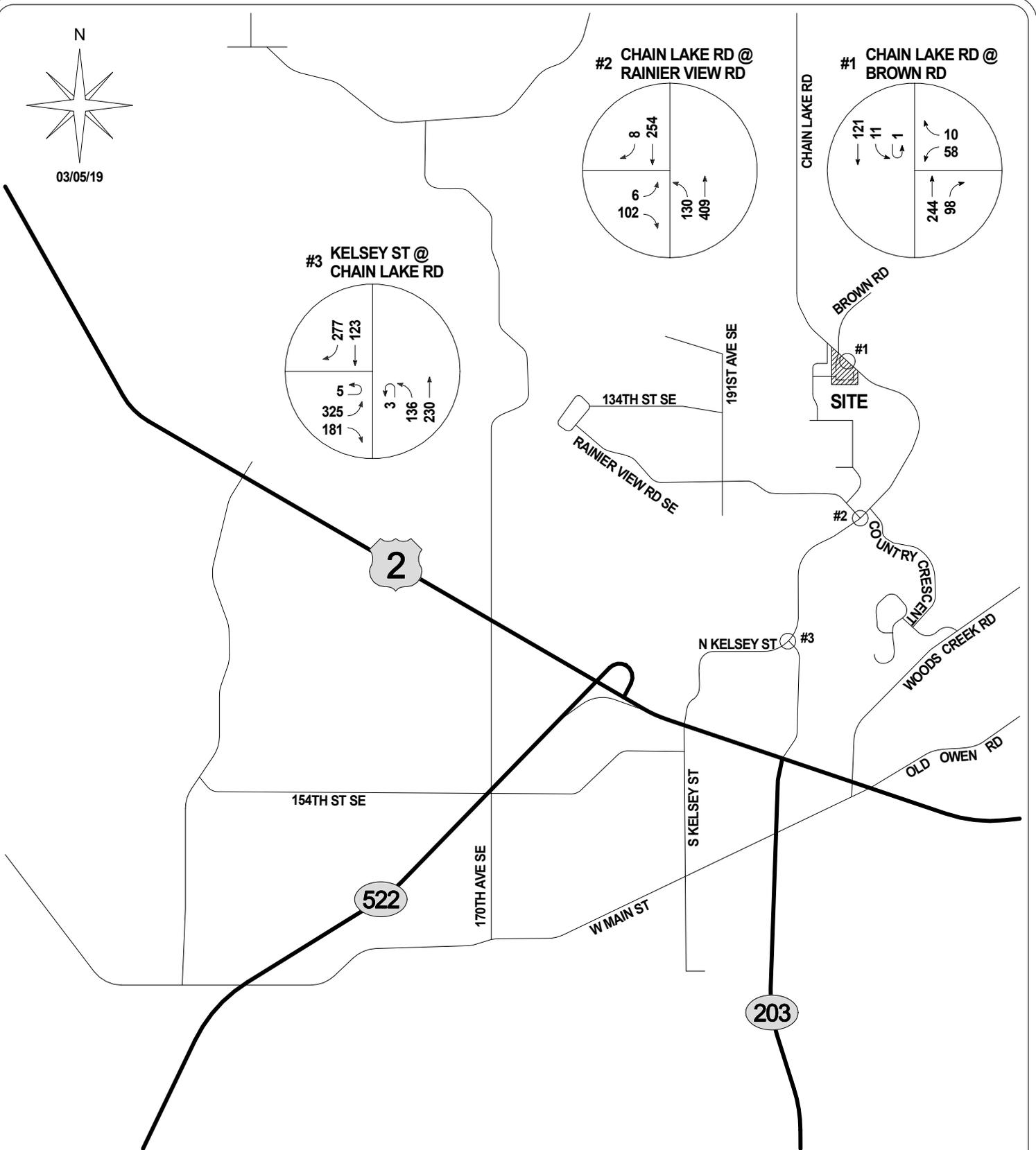
The approved PM peak-hour trip distributions for the pipeline developments are included in the attachments. For the pipeline projects where a trip distribution was not available, the pipeline's trips were distributed in accordance with the Eaglemont 7 distribution. The Eaglemont I-III development is anticipated to have a total of 149 units, however, GTC staff surveyed the area and found 134 completed and occupied houses, resulting in 15 unconstructed houses for the Eaglemont I-III development. The 2029 baseline turning movements at the study intersections are shown in Figure 5.

The 2029 future with development turning movements were calculated by adding the development's turning movements to the 2029 baseline turning movements. The 2029 future with development turning movements are shown in Figure 6.

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



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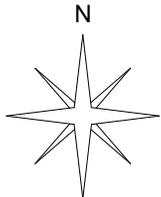
**EAGLEMONT 7  
44 NEW SINGLE FAMILY  
DWELLINGS**

**LEGEND**

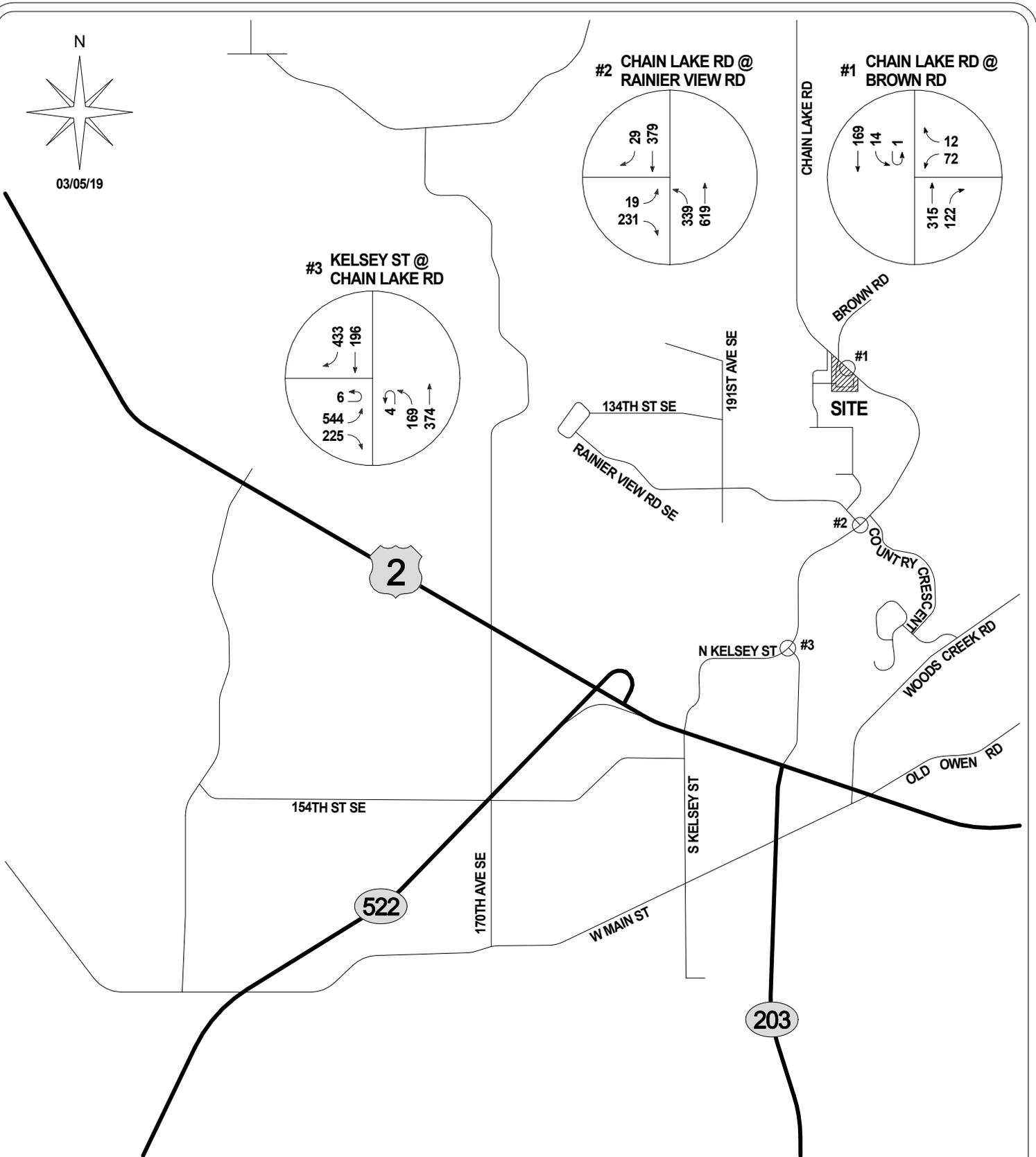
XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUMES

**FIGURE 4  
EXISTING  
TURNING MOVEMENTS**

**CITY OF MONROE**



03/05/19



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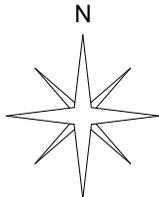
**EAGLEMONT 7  
44 NEW SINGLE FAMILY  
DWELLINGS**

**LEGEND**

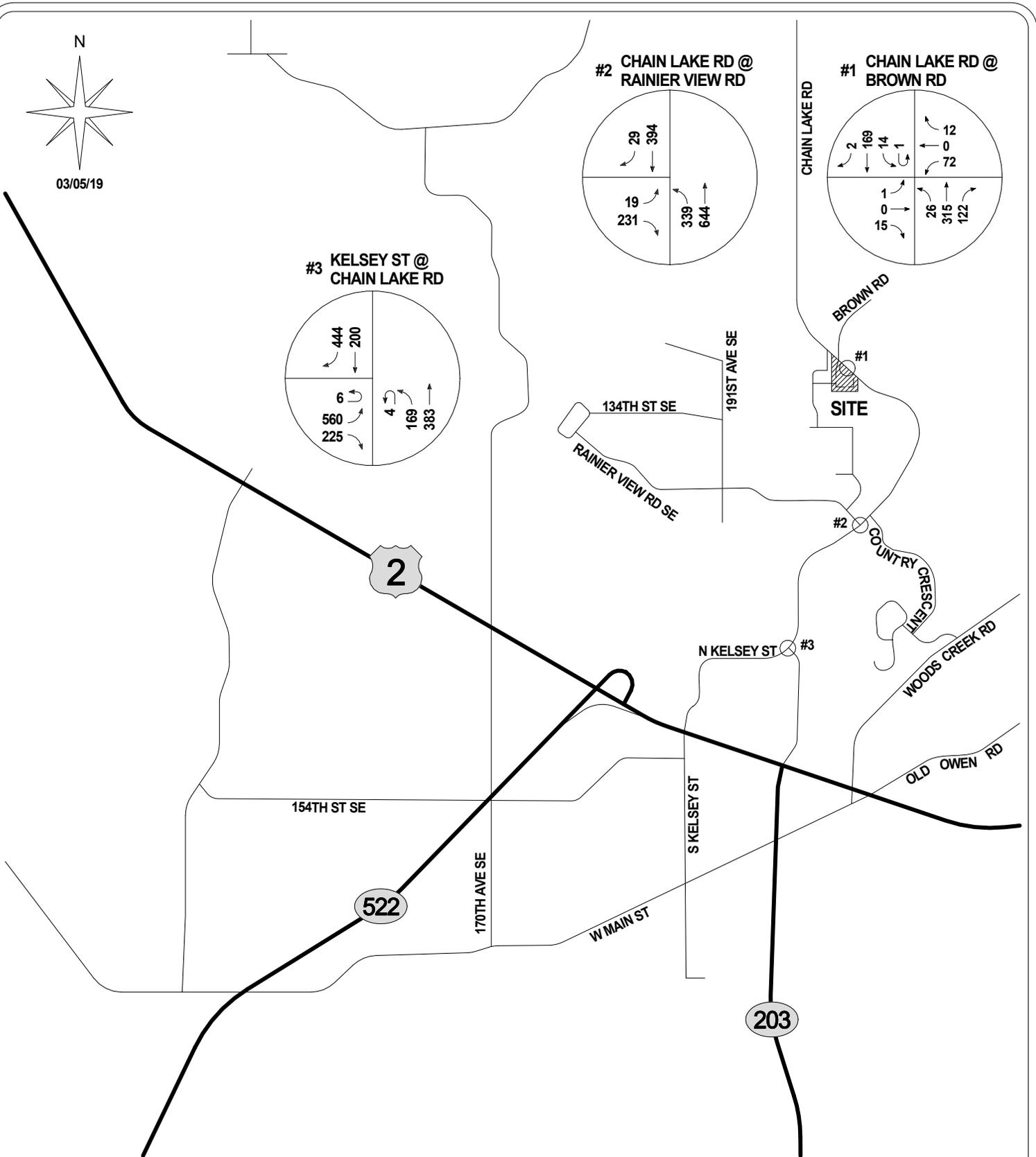
XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUMES

**FIGURE 5  
2028 BASELINE  
TURNING MOVEMENTS**

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03/05/19



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**TRAFFIC IMPACT STUDY  
GTC #18-042**

**EAGLEMONT 7  
44 NEW SINGLE FAMILY  
DWELLINGS**

LEGEND

XXX → PM PEAK-HOUR TURNING MOVEMENT VOLUMES

**FIGURE 6  
2028 FUTURE  
WITH DEVELOPMENT  
TURNING MOVEMENTS**

**CITY OF MONROE**

## 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 from the 2018 counts.

The level of service analysis shows that the development will not cause any intersection to operate at LOS F and will not cause the level of service to change from the 2029 baseline conditions. However, the intersection of Chain Lake Road at Rainier View Road SW is anticipated to operate at LOS F under the 2029 baseline and 2029 future with development conditions. The level of service results for the study intersections are summarized in Table 3.

**Table 3: Intersection Level of Service Summary**

Intersection	Intersection Type	Existing Conditions		2029 Baseline Conditions		2029 Future Conditions with Development	
		LOS	Delay	LOS	Delay	LOS	Delay
1. Chain Lake Road at Brown Road	Two-Way Stop-Control	B	13.2 sec	C	16.9 sec	C	22.0 sec
2. Chain Lake Road at Rainier View Road SW	Two-Way Stop-Control	B	11.6 sec	F	53.3 sec	F	60.4 sec
3. Chain Lake Road at Kelsey Street	Roundabout	A	7.3 sec	B	10.3 sec	B	10.8 sec

The level of service calculations are included in the attachments.

### 5.2.1. Chain Lake Road at Rainier View Road

Improvements to the Chain Lake Road corridor have been analyzed as part of the updated City of Monroe Comprehensive Plan. Improvements to Chain Lake Road to increase vehicle capacity are included in the Comprehensive Plan and show the intersection of Chain Lake Road at Rainier View Road operating at LOS C. The City of Monroe traffic mitigation fees, which are discussed later in this report, will help fund these improvements.

## 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 Eaglemont 7 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 \$3,475 per unit. The 44 new units of the Eaglemont 7 development will result in City of Monroe traffic mitigation fees of \$152,900.00. 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 Eaglemont 7 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 *Snohomish 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. Snohomish County traffic mitigation fees should therefore not be required for the Eaglemont 7 development.

### **6.3 WSDOT**

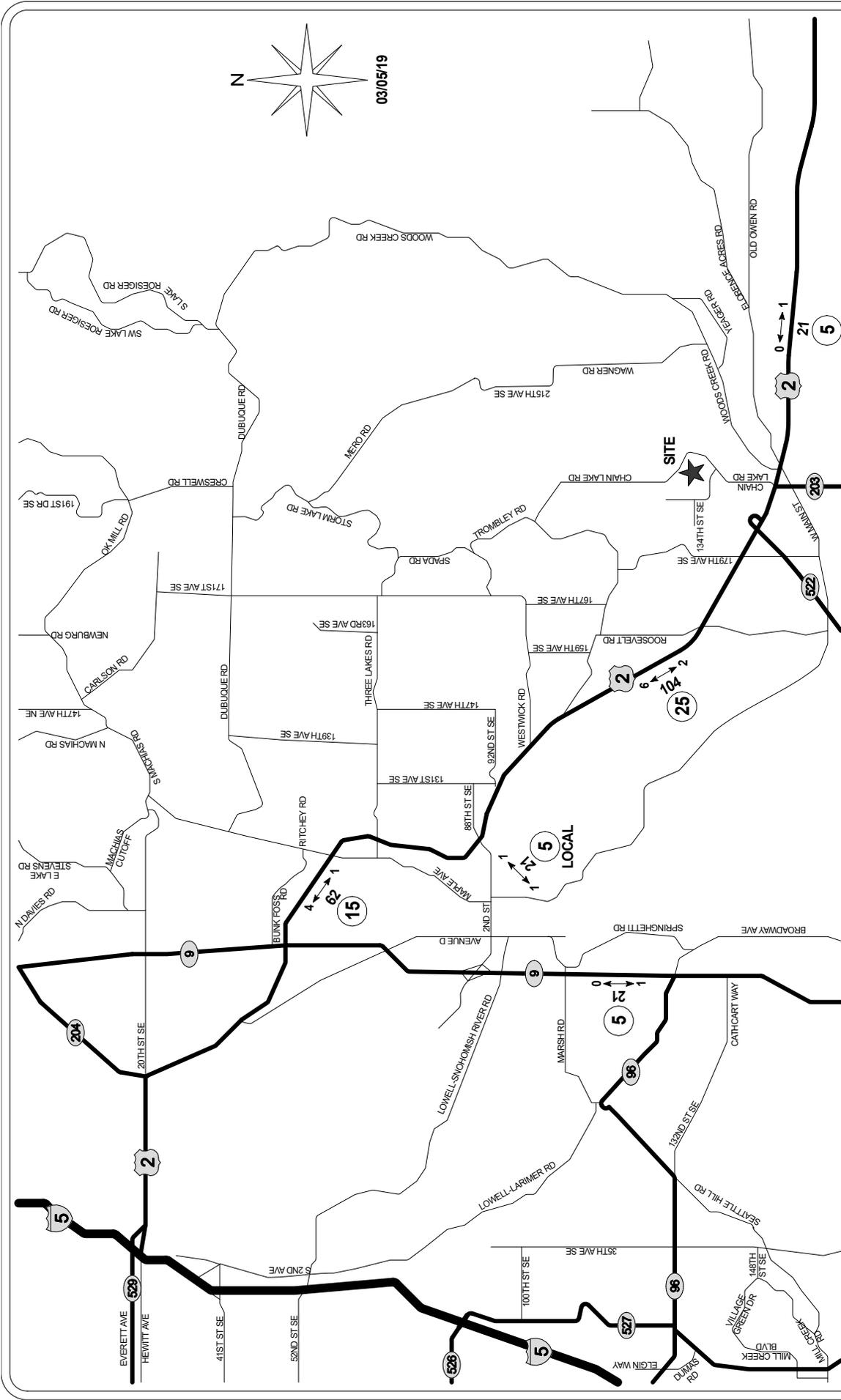
The City of Monroe and WSDOT have an interlocal agreement that provides for the payment of traffic mitigation fees. The interlocal agreement states that a development only has a “significant adverse impact” if the development contributes 25 or more trips to a WSDOT intersection. The Eaglemont 7 development is not anticipated to impact any WSDOT intersections with 25 PM peak-hour trips and is therefore not anticipated to have a “significant adverse impact” on WSDOT intersections. WSDOT does not have a collection project for any of the intersections near the Eaglemont 7 development and therefore WSDOT traffic mitigation fees should not be assessed for the Eaglemont 7 development.

## **7. CONCLUSIONS**

The Eaglemont 7 development is proposed to consist of 46 single-family residential units with 2 existing units being removed. The 44 new units of the Eaglemont 7 development are anticipated to generate approximately 415.36 average daily trips with approximately 32.56 AM peak-hour trips and 43.56 PM peak-hour trips. The level of service analysis shows that all the study intersections are anticipated to operate at acceptable levels of service except for Chain Lake Road at Rainier View Road SW, which will operate at LOS F in the 2029 baseline and future with development conditions. The intersection is planned for capacity improvements identified in the latest Comprehensive Plan. The Eaglemont 7 development will have City of Monroe traffic mitigation fees of \$152,900.00. The development’s impacts will not meet the thresholds for paying traffic mitigation fees to Snohomish County or WSDOT.

# **Snohomish County Key Intersection Impacts**





**TRAFFIC IMPACT STUDY**  
GTC #18-042

**FIGURE A2**  
**DEVELOPMENT**  
**TRIP DISTRIBUTION**  
**AM PEAK-HOUR**

**GIBSON TRAFFIC CONSULTANTS**

**EAGLEMONT 7**  
**44 NEW SINGLE FAMILY**  
**DWELLINGS**

**CITY OF MONROE**

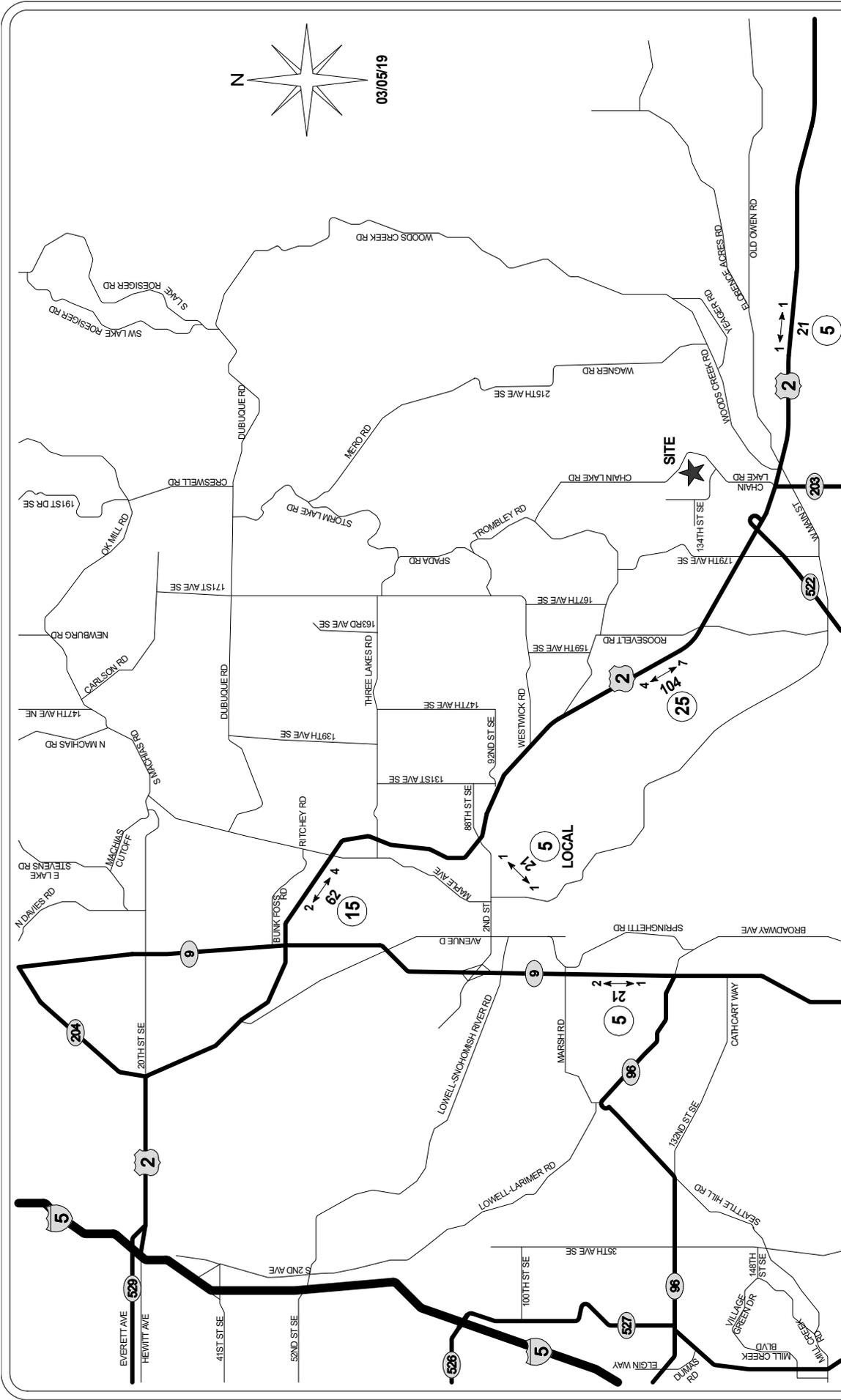
**LEGEND**

AWM/T → PEAK  
← A/M

NEW SITE TRAFFIC  
DAILY AND AM PEAK-HOUR

TRIP DISTRIBUTION %

(XX)



**TRAFFIC IMPACT STUDY**  
**GTC #18-042**

**FIGURE A3**  
**DEVELOPMENT**  
**TRIP DISTRIBUTION**  
**PM PEAK-HOUR**

**GIBSON TRAFFIC CONSULTANTS**

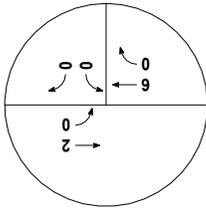
**EAGLEMONT 7**  
**44 NEW SINGLE FAMILY DWELLINGS**

**CITY OF MONROE**

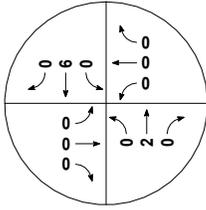
**LEGEND**  
 AWD T → PEAK  
 PM ←  
 NEW SITE TRAFFIC DAILY AND PM PEAK-HOUR  
 TRIP DISTRIBUTION %  
 (XX)

**AM  
PEAK-HOUR**

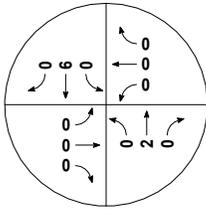
#162 SR-2 @  
WESTWICK RD



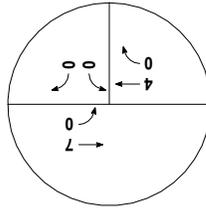
#469 SR-2 @  
ROOSEVELT RD



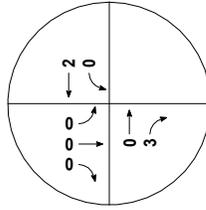
#496 SR-2 @  
179TH AVE SE



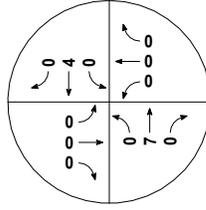
#162 SR-2 @  
WESTWICK RD



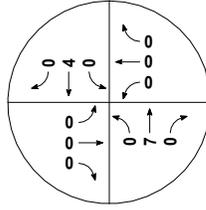
#287 SR-2 EB RAMPS @  
88TH ST SE



#469 SR-2 @  
ROOSEVELT RD



#496 SR-2 @  
179TH AVE SE



**PM  
PEAK-HOUR**

**GIBSON TRAFFIC CONSULTANTS**

**TRAFFIC IMPACT STUDY  
GTC #18-042**

**EAGLEMONT 7  
44 NEW SINGLE FAMILY  
DWELLINGS**

**LEGEND**

XXX →

PEAK HOUR  
TURNING MOVEMENT VOLUME

**FIGURE A4**

**DEVELOPMENT  
KEY INTERSECTION VOLUMES  
AM & PM PEAK-HOURS**

### Key AM Peak-Hour Key Intersection Volumes

<b>Intersection</b>	<b>EBL</b>	<b>EBT</b>	<b>EBR</b>	<b>WBL</b>	<b>WBT</b>	<b>WBR</b>	<b>NBL</b>	<b>NBT</b>	<b>NBR</b>	<b>SBL</b>	<b>SBT</b>	<b>SBR</b>
#162: SR-2 at Westwick Rd	N/A	N/A	N/A	0	N/A	0	N/A	6	0	0	2	N/A
#469: SR-2 at Roosevelt Rd	0	2	0	0	6	0	0	0	0	0	0	0
#496: SR-2 at 179 <sup>th</sup> Ave SE	0	2	0	0	6	0	0	0	0	0	0	0

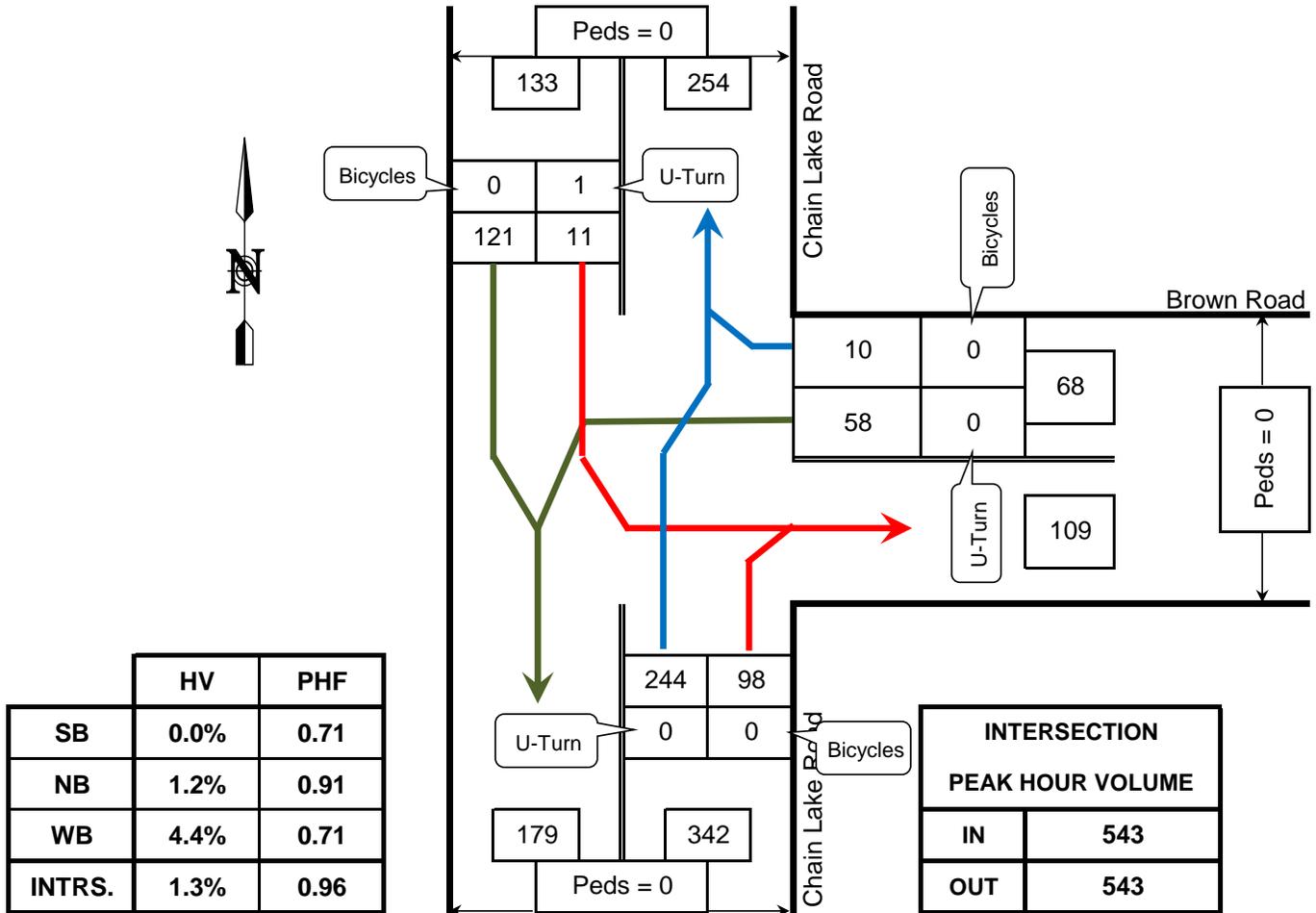
### PM Peak-Hour Key Intersection Volumes

<b>Intersection</b>	<b>EBL</b>	<b>EBT</b>	<b>EBR</b>	<b>WBL</b>	<b>WBT</b>	<b>WBR</b>	<b>NBL</b>	<b>NBT</b>	<b>NBR</b>	<b>SBL</b>	<b>SBT</b>	<b>SBR</b>
#162: SR-2 at Westwick Rd	N/A	N/A	N/A	0	N/A	0	N/A	4	0	0	7	N/A
#287: SR-2 EB Ramps at 88 <sup>th</sup> St SE	N/A	0	3	0	2	N/A	N/A	N/A	N/A	0	0	0
#469: SR-2 at Roosevelt Rd	0	7	0	0	4	0	0	0	0	0	0	0
#496: SR-2 at 179 <sup>th</sup> Ave SE	0	7	0	0	4	0	0	0	0	0	0	0

# **Turning Movement Calculations and Counts**

**TURNING MOVEMENTS DIAGRAM**

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



HV = Heavy Vehicles  
PHF = Peak Hour Factor

**Chain Lake Road @ Brown Road**

**Monroe, WA**

COUNTED BY: VT/CN

DATE OF COUNT: Wed. 1/31/18

REDUCED BY: CN

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

REDUCTION DATE: Tue. 2/6/18

WEATHER: Rainy



INTERSECTION TURNING MOVEMENTS REDUCTION SHEET

LOCATION: Chain Lake Road @ Brown Road  
 DATE OF COUNT: Wed. 1/31/18  
 TIME OF COUNT: 4:00 PM - 6:00 PM  
 COUNTED BY: VT/CN  
 WEATHER: Rainy

TIME INTERVAL ENDING AT	FROM NORTH ON Chain Lake Road						FROM SOUTH ON Chain Lake Road						FROM EAST ON Brown Road						FROM WEST ON						INTERVAL TOTALS					
	Peds		Bicycle		HV		U-Turn		Left		Thru		Right		Peds		Bicycle		HV		U-Turn		Left			Thru		Right		
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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04:30 PM	0	0	0	0	3	28	0	0	0	0	59	19	0	0	2	0	21	0	3	0	0	0	0	0	0	0	0	0	133	
04:45 PM	0	0	0	0	0	2	45	0	0	1	0	55	26	0	0	0	10	0	3	0	0	0	0	0	0	0	0	0	141	
05:00 PM	0	0	0	1	3	24	0	0	2	0	0	62	32	0	0	1	0	13	0	4	0	0	0	0	0	0	0	0	139	
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05:30 PM	0	0	0	0	0	7	21	0	0	1	0	60	24	0	0	0	15	0	1	0	0	0	0	0	0	0	0	0	128	
05:45 PM	0	0	0	0	0	3	31	0	0	1	0	69	18	0	0	0	16	0	1	0	0	0	0	0	0	0	0	0	138	
06:00 PM	0	0	0	0	1	23	0	0	1	0	0	63	28	0	0	0	10	0	2	0	0	0	0	0	0	0	0	0	127	
PEAK HOUR TOTALS	0	0	0	1	11	121	0	0	4	0	0	244	98	0	0	3	0	58	0	10	0	0	0	0	0	0	0	0	INTERSECTION	
ALL MOVEMENTS	133						342						68						0						543					
% HV	0.0%						1.2%						4.4%						#N/A						1.3%					
PEAK HOUR FACTOR	0.71						0.91						0.71						#N/A						0.96					

HV = Heavy Vehicle  
 PHF = Peak Hour Factor

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

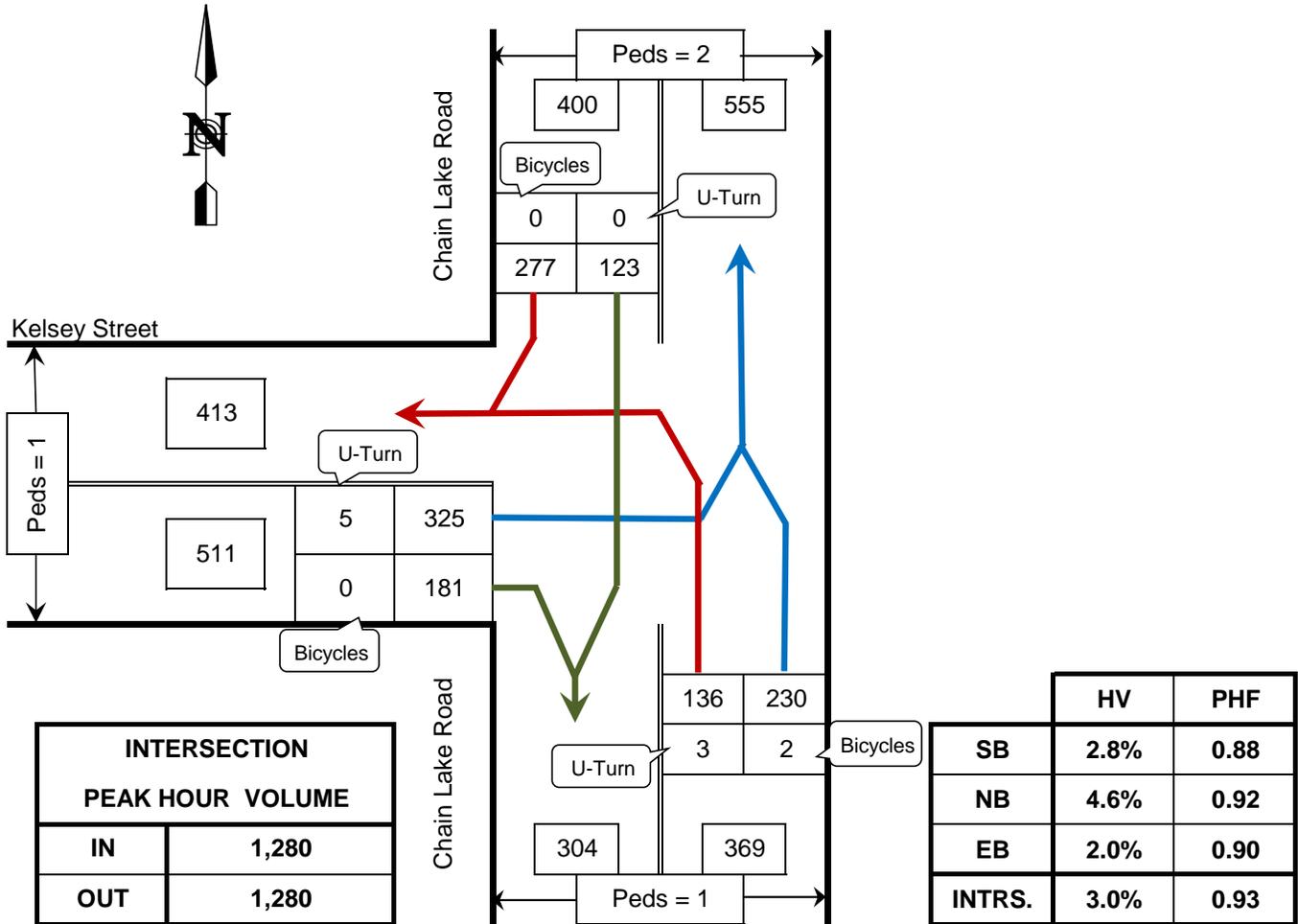
REDUCED BY: CN DATE OF REDUCTION: 2/6/2018

ROLLING HOUR COUNT

TIME INTERVAL	FROM NORTH ON Chain Lake Road						FROM SOUTH ON Chain Lake Road						FROM EAST ON Brown Road						FROM WEST ON						INTERVAL TOTALS					
	Peds		Bicycle		HV		U-Turn		Left		Thru		Right		Peds		Bicycle		HV		U-Turn		Left			Thru		Right		
2:00 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:15 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 5:00 PM	0	0	4	1	10	135	0	0	6	0	0	222	99	0	0	5	0	56	0	12	0	0	0	0	0	0	0	0	556	
4:15 PM - 5:15 PM	0	0	0	1	11	121	0	0	4	0	0	244	99	0	0	3	0	58	0	10	0	0	0	0	0	0	0	543		
4:30 PM - 5:30 PM	0	0	0	1	15	114	0	0	5	0	0	245	103	0	0	1	0	52	0	8	0	0	0	0	0	0	0	0	538	
4:45 PM - 5:45 PM	0	0	0	1	16	100	0	0	5	0	0	259	95	0	0	1	0	58	0	6	0	0	0	0	0	0	0	0	536	
5:00 PM - 6:00 PM	0	0	0	0	14	99	0	0	4	0	0	260	91	0	0	0	0	55	0	4	0	0	0	0	0	0	0	0	523	
4:00 PM - 6:00 PM Total:	0	0	4	1	24	234	0	0	10	0	0	482	190	0	0	5	0	111	0	16	0	0	0	0	0	0	0	0	1058	

**TURNING MOVEMENTS DIAGRAM**

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



HV = Heavy Vehicles  
PHF = Peak Hour Factor

**Chain Lake Road @ Kelsey Street**

**Monroe, WA**

COUNTED BY: VT

DATE OF COUNT: Wed. 3/7/18

REDUCED BY: CN

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

REDUCTION DATE: Fri. 3/9/18

WEATHER: Overcast



TRAFFIC DATA GATHERING

INTERSECTION TURNING MOVEMENTS REDUCTION SHEET

LOCATION: Chain Lake Road @ Kelsey Street, Monroe, WA DATE OF COUNT: Wed. 3/7/18 TIME OF COUNT: 4:00 PM - 6:00 PM COUNTED BY: VT WEATHER: Overcast

Table with columns for Time Interval, From North On (Chain Lake Road), From South On (Chain Lake Road), From East On, From West On (Kelsey Street), and Interval Totals. Rows include various time intervals from 02:15 PM to 06:00 PM, and summary rows for Peak Hour Totals, All Movements, and Peak Hour Factor.

HV = Heavy Vehicle PHF = Peak Hour Factor

REDUCED BY: CN DATE OF REDUCTION: 3/9/2018

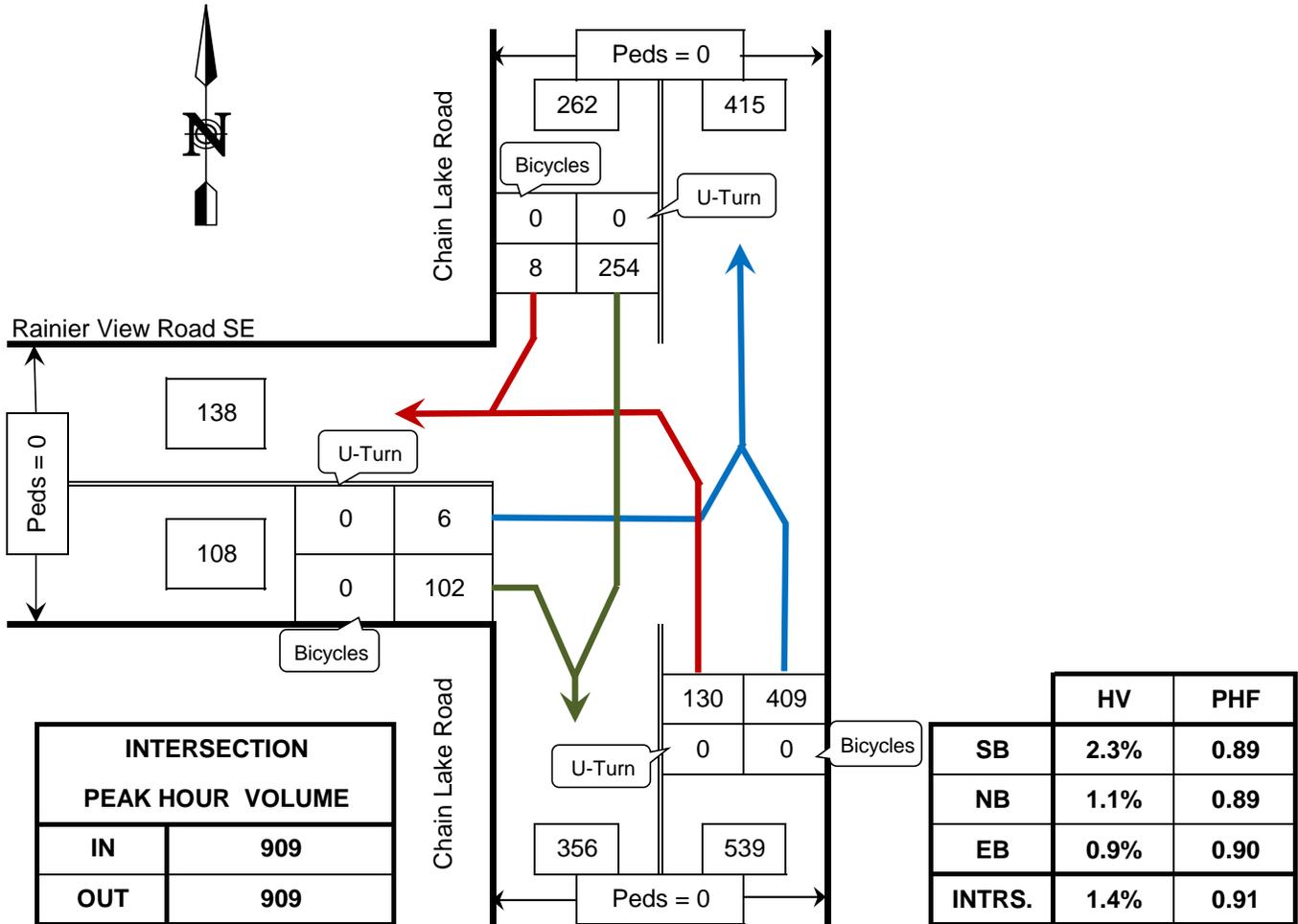
4:00 PM - 6:00 PM PEAK HOUR: 4:00 PM TO 5:00 PM

ROLLING HOUR COUNT

Table with columns for Time Interval, From North On (Chain Lake Road), From South On (Chain Lake Road), From East On, From West On (Kelsey Street), and Interval Totals. Rows include rolling hour intervals from 2:00 PM - 3:00 PM to 5:00 PM - 6:00 PM, and a Total row.

**TURNING MOVEMENTS DIAGRAM**

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



HV = Heavy Vehicles  
PHF = Peak Hour Factor

**Chain Lake Road @ Rainier View Road SE**

**Monroe, WA**

COUNTED BY: VT/CN

DATE OF COUNT: Wed. 1/31/18

REDUCED BY: CN

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

REDUCTION DATE: Tue. 2/6/18

WEATHER: Rainy

INTERSECTION TURNING MOVEMENTS REDUCTION SHEET

LOCATION: Chain Lake Road @ Rainier View Road SE  
 DATE OF COUNT: Wed. 1/31/18  
 TIME OF COUNT: 4:00 PM - 6:00 PM  
 COUNTED BY: VT/CN  
 WEATHER: Rainy

TIME INTERVAL ENDING AT	FROM NORTH ON Chain Lake Road						FROM SOUTH ON Chain Lake Road						FROM EAST ON Rainier View Road SE						INTERVAL TOTALS			
	Peds		Bicycle		HV		Peds		Bicycle		HV		Peds		Bicycle		HV					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left		Thru	Right	
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HOUR TOTALS	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALL MOVEMENTS	2.3%						1.1%						0						108			
PEAK HOUR FACTOR	0.89						0.89						#N/A						0.90			

HV = Heavy Vehicle  
 PHF = Peak Hour Factor  
 REDUCED BY: CN  
 DATE OF REDUCTION: 2/6/2018  
 4:00 PM - 6:00 PM PEAK HOUR: 4:00 PM TO 5:00 PM

ROLLING HOUR COUNT

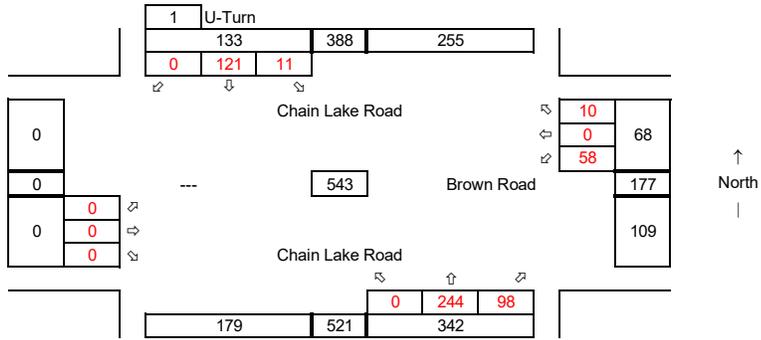
TIME INTERVAL	FROM NORTH ON Chain Lake Road						FROM SOUTH ON Chain Lake Road						FROM EAST ON Rainier View Road SE						INTERVAL TOTALS			
	Peds		Bicycle		HV		Peds		Bicycle		HV		Peds		Bicycle		HV					
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left		Thru	Right	
2:00 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 5:00 PM	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 5:15 PM	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 5:30 PM	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 6:00 PM	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 6:00 PM Total:	0	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1 Chain Lake Rd @ Brown Rd

Synchro ID: 1  
**Existing**  
 Average Weekday  
 PM Peak Hour

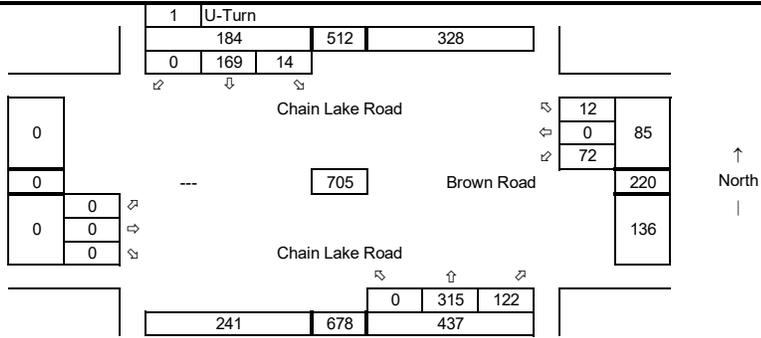
Year: 1/31/18

Data Source: TDG

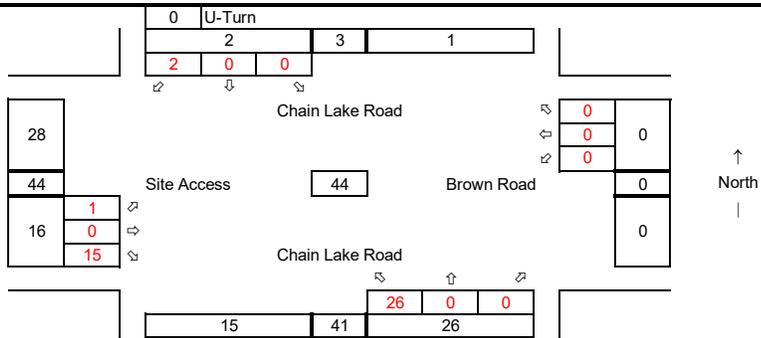


**Future without Project**  
 Average Weekday  
 PM Peak Hour

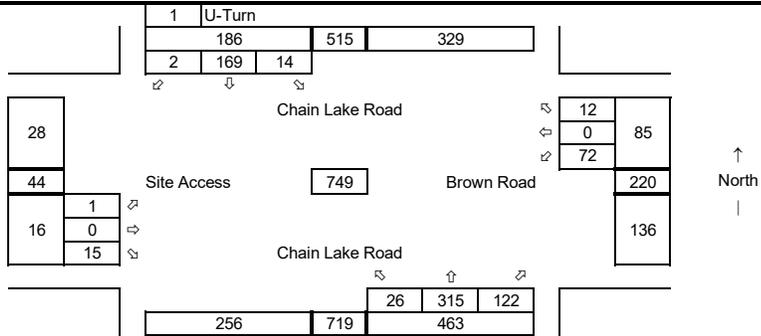
Year: 2029  
 Growth Rate = 2.0%  
 Years of Growth = 11  
 Total Growth = 1.2434



**Total Project Trips**  
 Average Weekday  
 PM Peak Hour

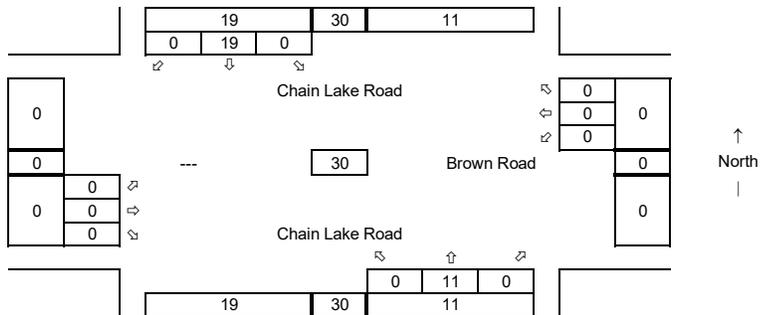


**Future with Project**  
 Average Weekday  
 PM Peak Hour



**Pipeline Trips**  
 Average Weekday  
 PM Peak Hour

Eaglemont 1-6  
 Easton Cove  
 Worthington Heights  
 Raspberry Hill  
 Clothier Short Plat  
 Kestrel Ridge  
 2 Short Plats  
 Garibaldi



2 Rainier View @ Chain Lake Rd

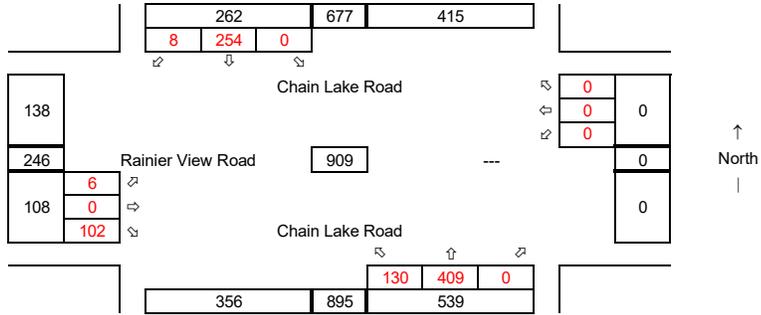
Synchro ID: 2

**Existing**

Average Weekday  
PM Peak Hour

Year: 1/31/18

Data Source: TDG



**Future without Project**

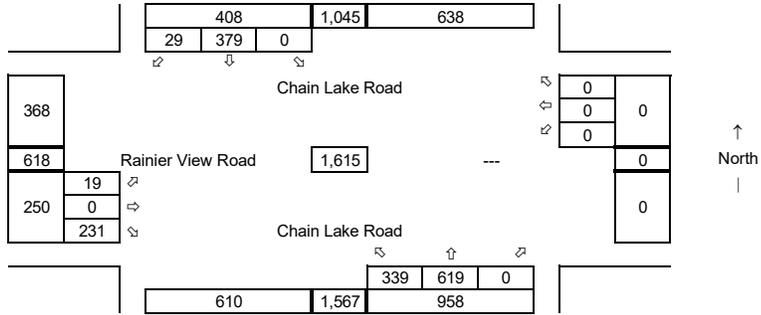
Average Weekday  
PM Peak Hour

Year: 2029

Growth Rate = 2.0%

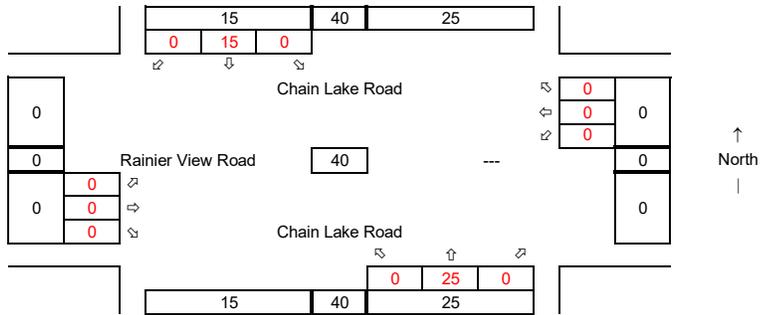
Years of Growth = 11

Total Growth = 1.2434



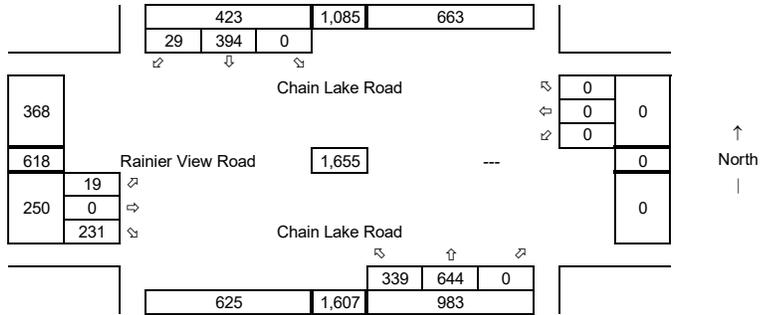
**Total Project Trips**

Average Weekday  
PM Peak Hour



**Future with Project**

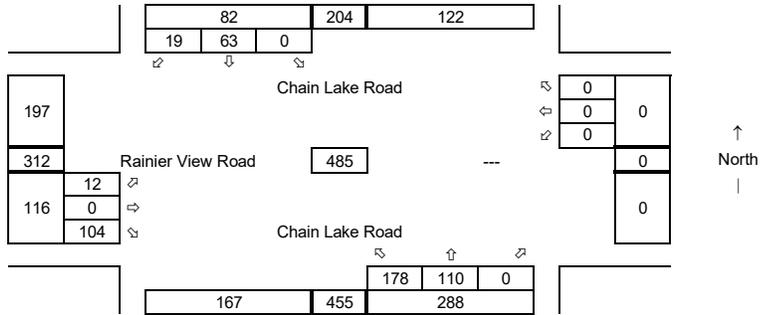
Average Weekday  
PM Peak Hour



**Pipeline Trips**

Average Weekday  
PM Peak Hour

- Eaglemont 1-6
- Easton Cove
- Worthington Heights
- Raspberry Hill
- Clothier Short Plat
- Kestrel Ridge
- 2 Short Plats
- Garibaldi



3 Kelsey St @ Chain Lake Rd

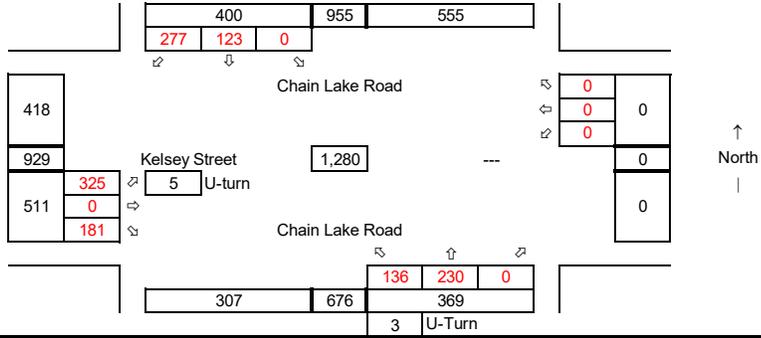
Synchro ID: 3

**Existing**

Average Weekday  
PM Peak Hour

Year: 1/31/18

Data Source: TDG

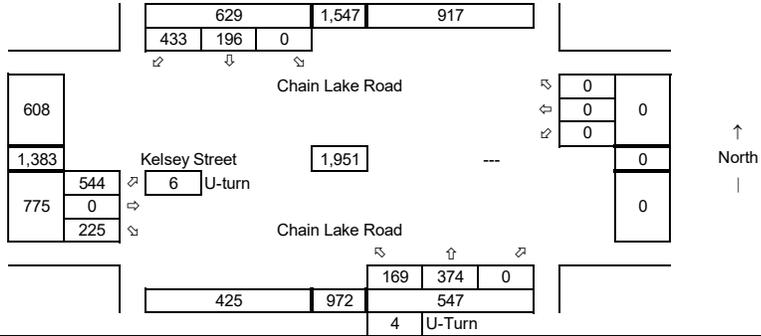


**Future without Project**

Average Weekday  
PM Peak Hour

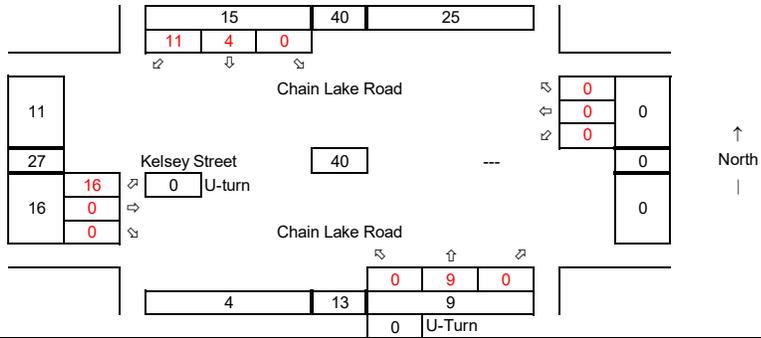
Year: 2029

Growth Rate = 2.0%  
Years of Growth = 11  
Total Growth = 1.2434



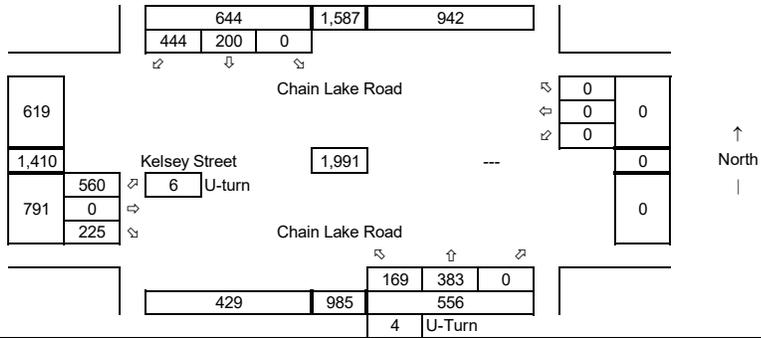
**Total Project Trips**

Average Weekday  
PM Peak Hour



**Future with Project**

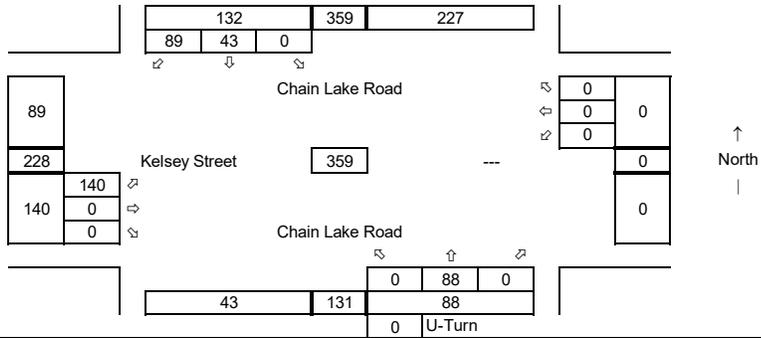
Average Weekday  
PM Peak Hour



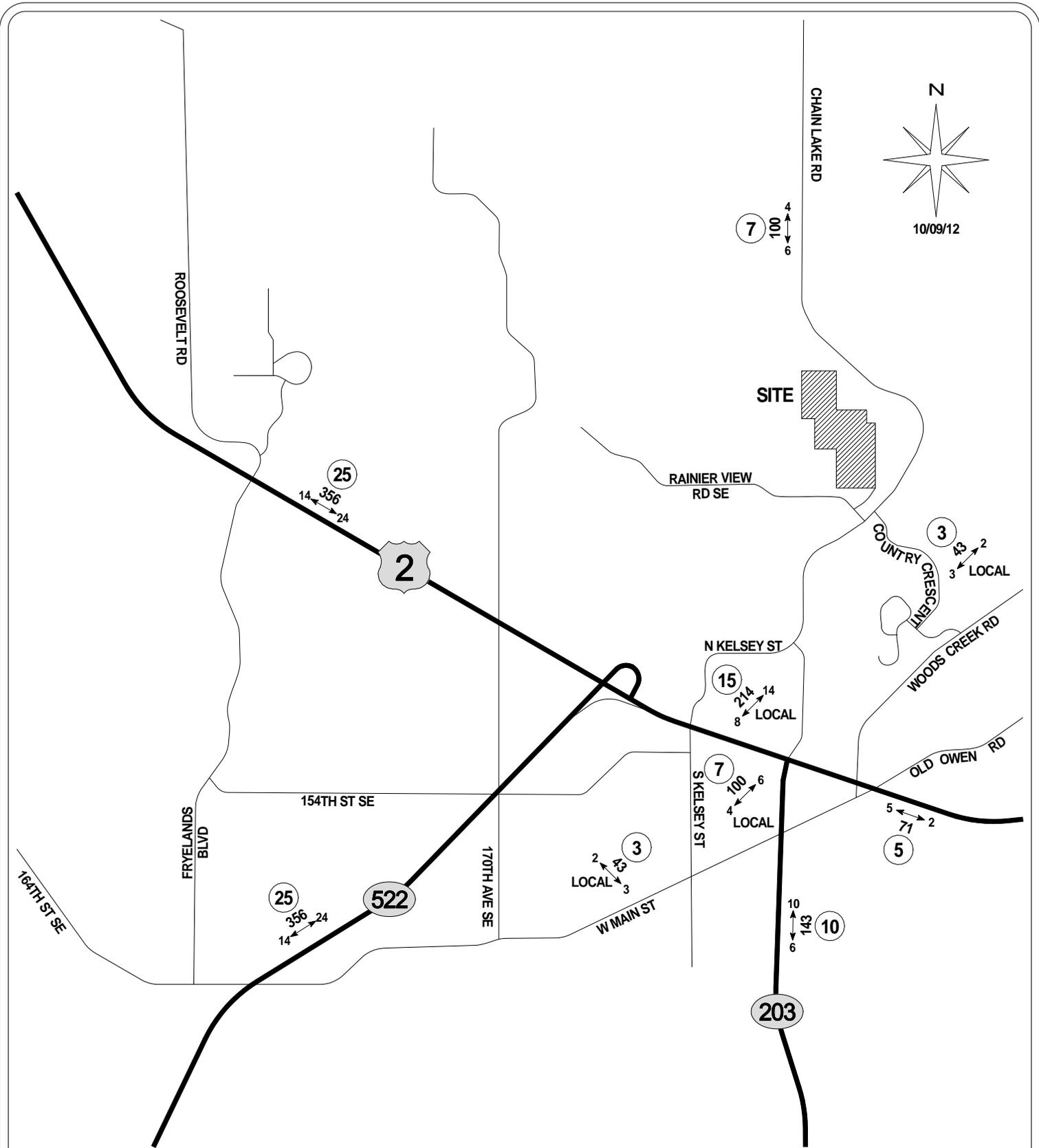
**Pipeline Trips**

Average Weekday  
PM Peak Hour

Eaglemont 1-6  
Easton Cove  
Worthington Heights  
Raspberry Hill  
Clothier Short Plat  
Kestrel Ridge  
2 Short Plats  
Garibaldi



# **Pipeline Information**



**GIBSON TRAFFIC CONSULTANTS**

**TRAFFIC IMPACT STUDY  
GTC #12-087**

**EAGLEMONT  
149 SINGLE-FAMILY UNITS**

**LEGEND**  
AWDT  
PM ↔ PEAK

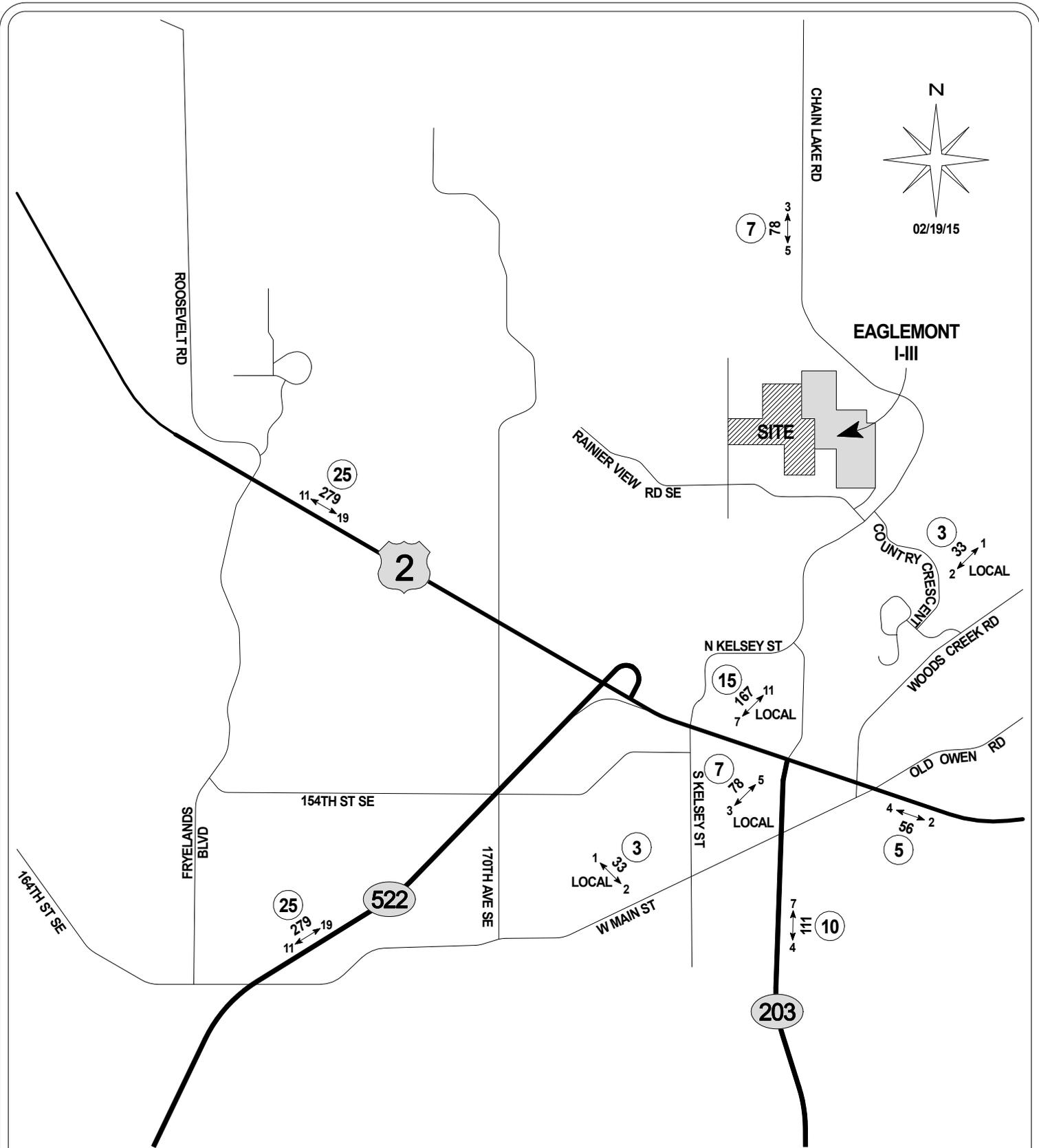
NEW SITE TRAFFIC  
(DAILY/PEAK-HOUR)

**CITY OF MONROE**

**25**

TRIP DISTRIBUTION %

**FIGURE 3  
DEVELOPMENT  
TRIP DISTRIBUTION  
PM PEAK-HOUR**



**GIBSON TRAFFIC CONSULTANTS**

**TRAFFIC IMPACT STUDY  
GTC #15-045**

**EAGLEMONT IV-VIII  
117 NEW SINGLE-FAMILY UNITS**

**LEGEND**

AWDT  
PM ↔ PEAK

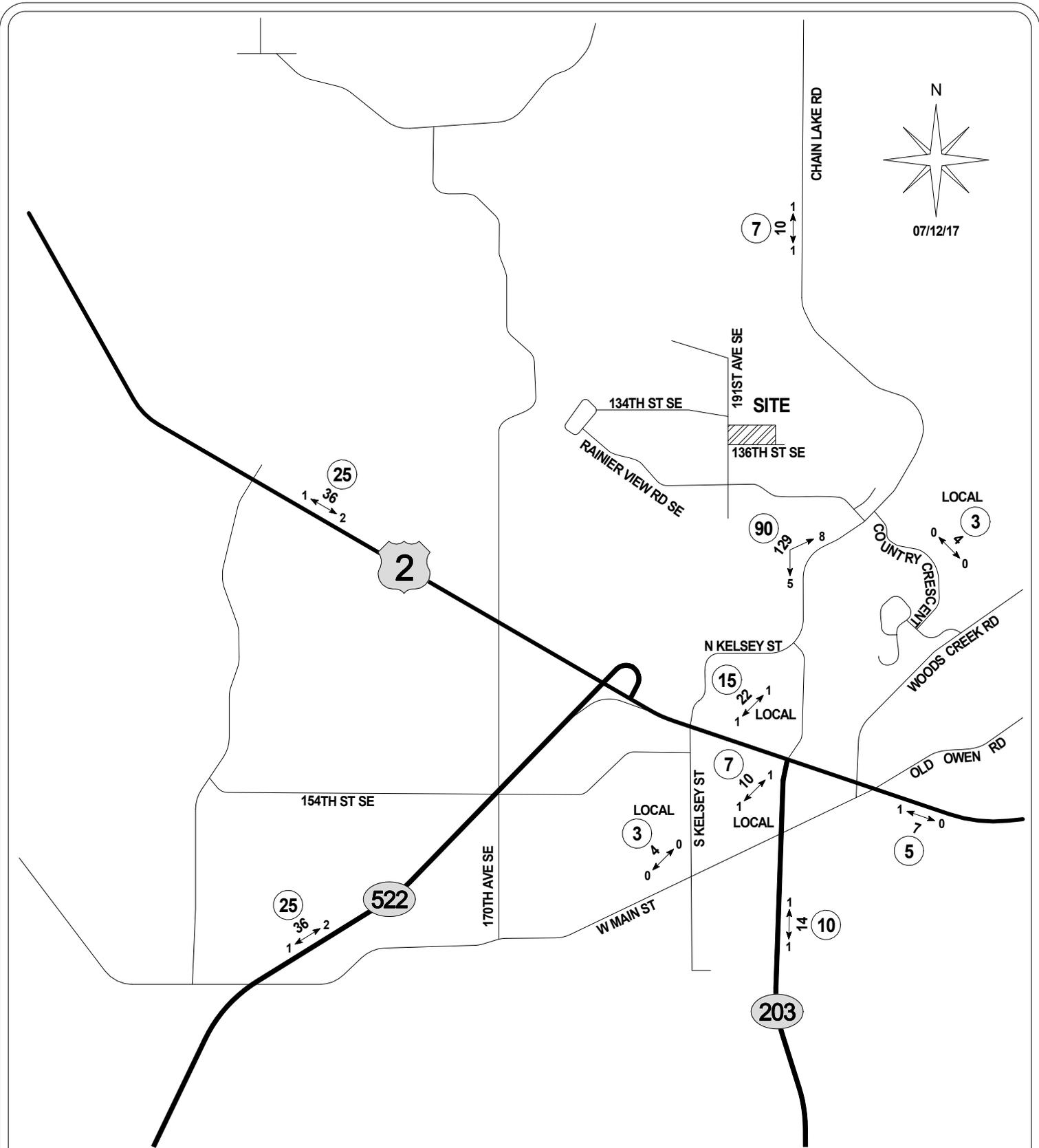
NEW SITE TRAFFIC  
(DAILY/PEAK-HOUR)

XX

TRIP DISTRIBUTION %

**CITY OF MONROE**

**FIGURE 3  
DEVELOPMENT  
TRIP DISTRIBUTION  
PM PEAK-HOUR**



**GIBSON TRAFFIC CONSULTANTS**

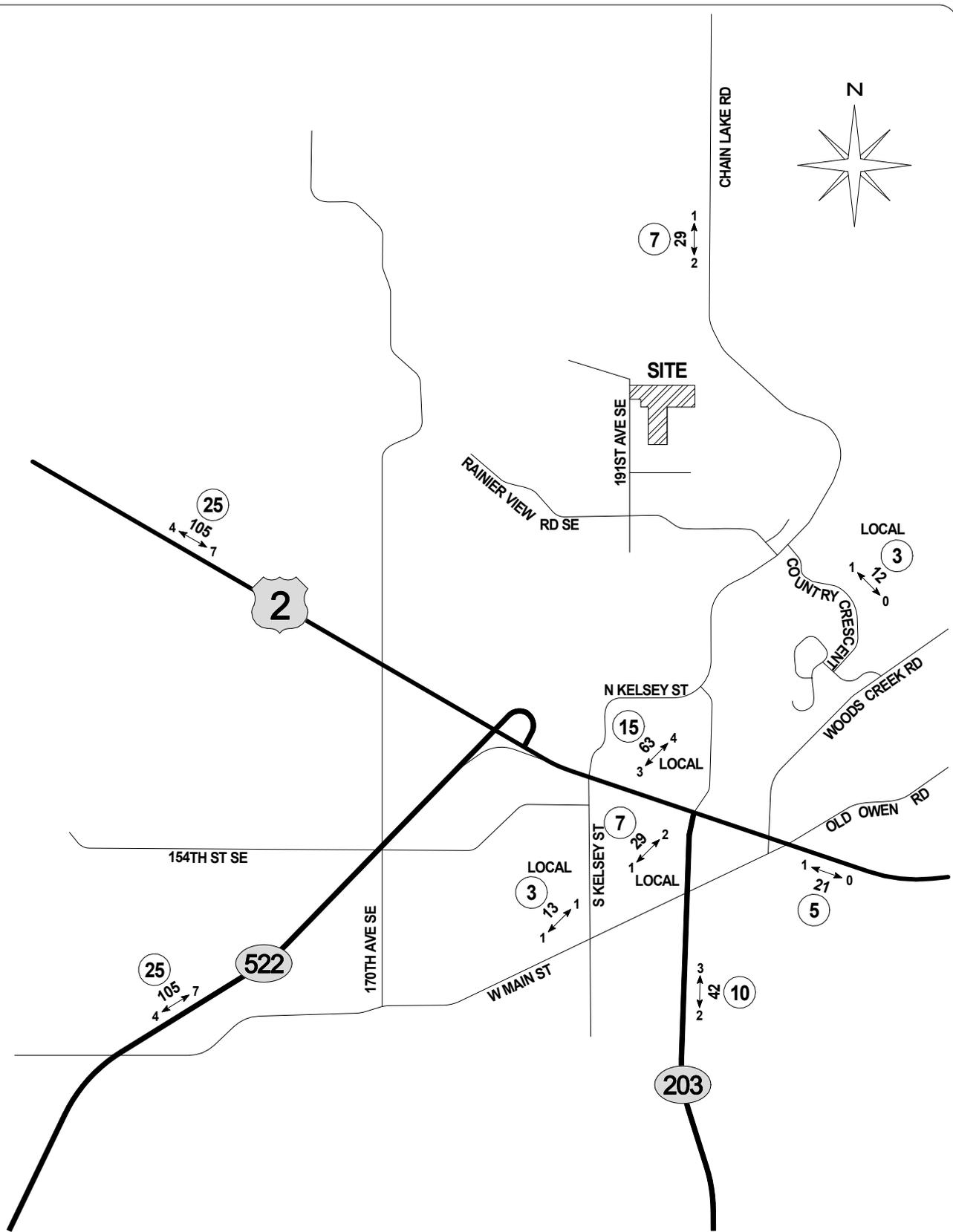
**TRAFFIC IMPACT STUDY  
GTC #17-130**

**EAGLEMONT 5  
15 NEW SINGLE FAMILY  
DWELLINGS**

**LEGEND**  
 AWDT  
 PM ↔ PEAK  
 NEW SITE TRAFFIC  
 (DAILY/PEAK-HOUR)  
 (XX)  
 TRIP DISTRIBUTION %

**FIGURE 3  
DEVELOPMENT  
TRIP DISTRIBUTION  
PM PEAK-HOUR**

**CITY OF MONROE**



**GIBSON TRAFFIC CONSULTANTS**

**TRAFFIC IMPACT STUDY  
GTC #15-244**

**SKY VIEW RIDGE  
44 NEW SINGLE-FAMILY UNITS**

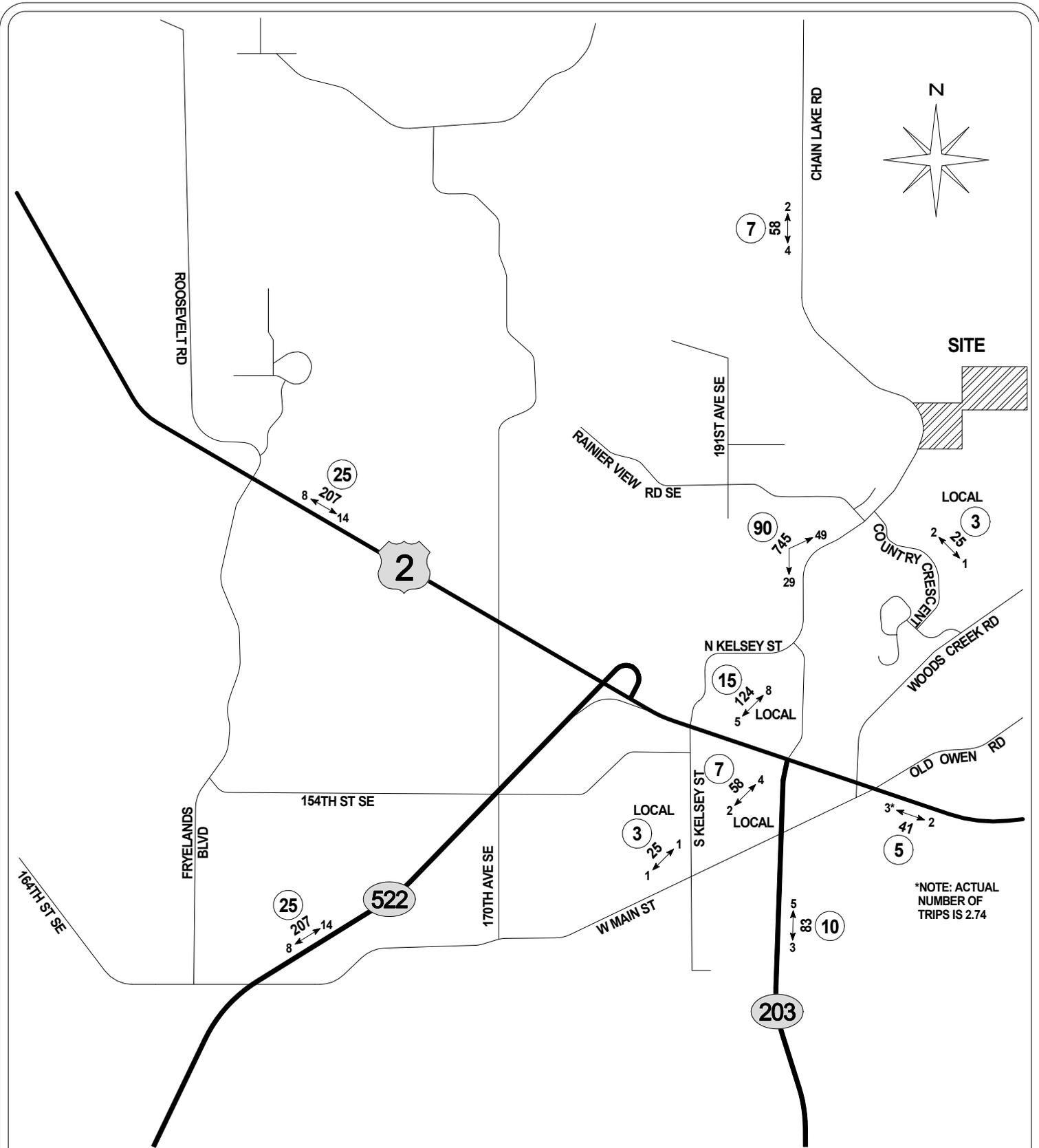
**LEGEND**  
AWDT  
PM ↔ PEAK  
**XX**

NEW SITE TRAFFIC  
(DAILY/PEAK-HOUR)

TRIP DISTRIBUTION %

**FIGURE 2  
DEVELOPMENT  
TRIP DISTRIBUTION  
PM PEAK-HOUR**

**CITY OF MONROE**



**GIBSON TRAFFIC CONSULTANTS**

**TRAFFIC IMPACT STUDY  
GTC #16-030**

**KLIER DEVELOPMENT  
87 NEW SINGLE FAMILY  
DWELLINGS**

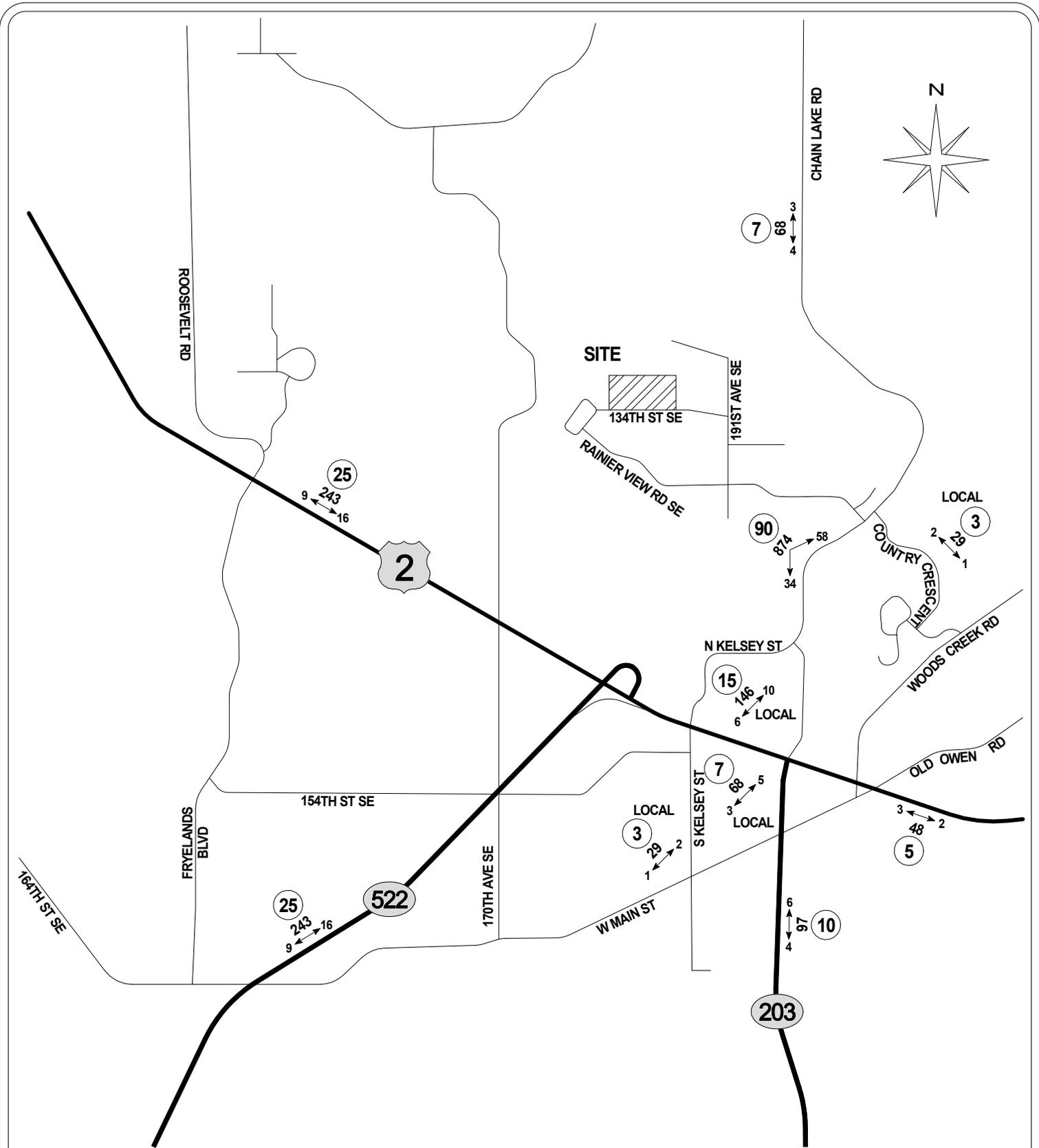
**LEGEND**  
AWDT  
PM ↔ PEAK  
**XX**

NEW SITE TRAFFIC  
(DAILY/PEAK-HOUR)

TRIP DISTRIBUTION %

**FIGURE 3  
DEVELOPMENT  
TRIP DISTRIBUTION  
PM PEAK-HOUR**

**CITY OF MONROE**



**GIBSON TRAFFIC CONSULTANTS**

**TRAFFIC IMPACT STUDY  
GTC #16-171**

**WORTHINGTON HEIGHTS  
106 SINGLE FAMILY  
DWELLINGS**

**LEGEND**  
AWDT  
PM ↔ PEAK

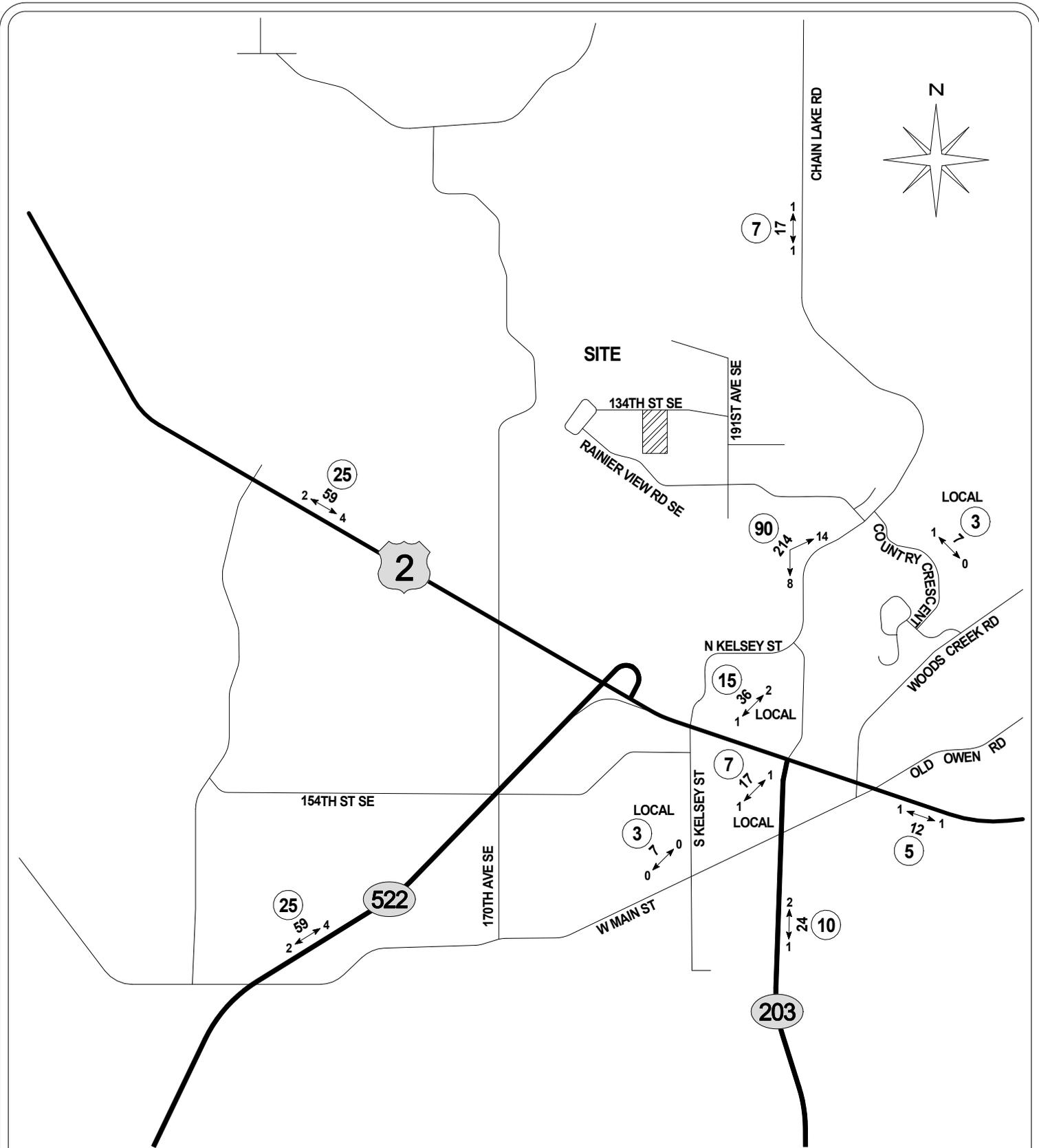
NEW SITE TRAFFIC  
(DAILY/PEAK-HOUR)

XX

TRIP DISTRIBUTION %

**FIGURE 3  
DEVELOPMENT  
TRIP DISTRIBUTION  
PM PEAK-HOUR**

**CITY OF MONROE**



**GIBSON TRAFFIC CONSULTANTS**

**TRAFFIC IMPACT STUDY**  
GTC #16-165

**RASPBERRY HILL**  
**25 NEW SINGLE FAMILY**  
**DWELLINGS**

**LEGEND**

AWDT  
PM ↔ PEAK

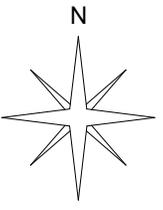
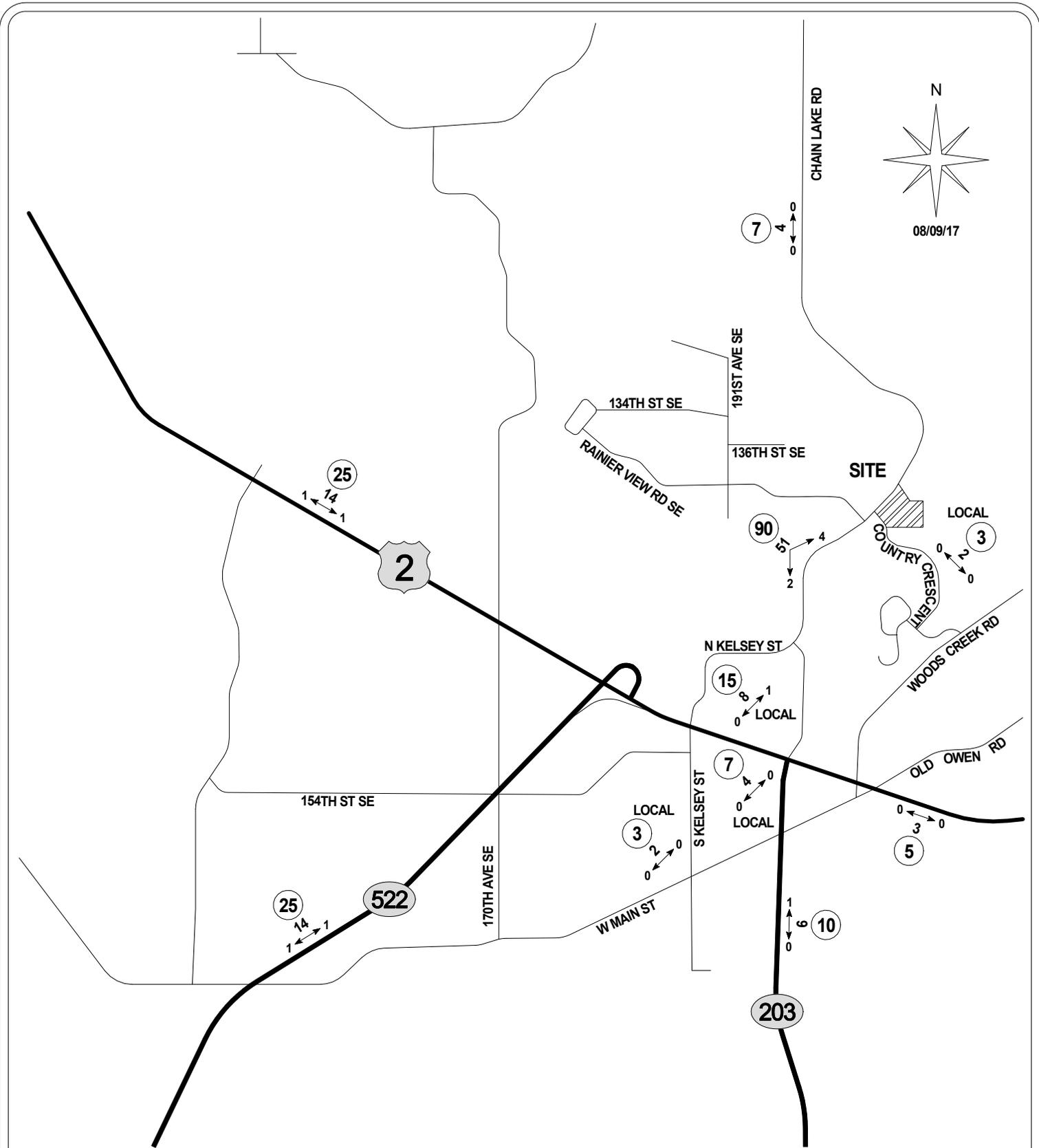
NEW SITE TRAFFIC  
(DAILY/PEAK-HOUR)



TRIP DISTRIBUTION %

**FIGURE 3**  
**DEVELOPMENT**  
**TRIP DISTRIBUTION**  
**PM PEAK-HOUR**

**CITY OF MONROE**



08/09/17

**GIBSON TRAFFIC CONSULTANTS**

**TRAFFIC IMPACT STUDY  
GTC #17-167**

**CLOTHIER SHORT PLAT  
6 NEW SINGLE FAMILY  
DWELLINGS**

**LEGEND**

AWDT  
PM ↔ PEAK

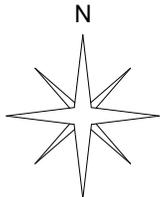
NEW SITE TRAFFIC  
(DAILY/PEAK-HOUR)



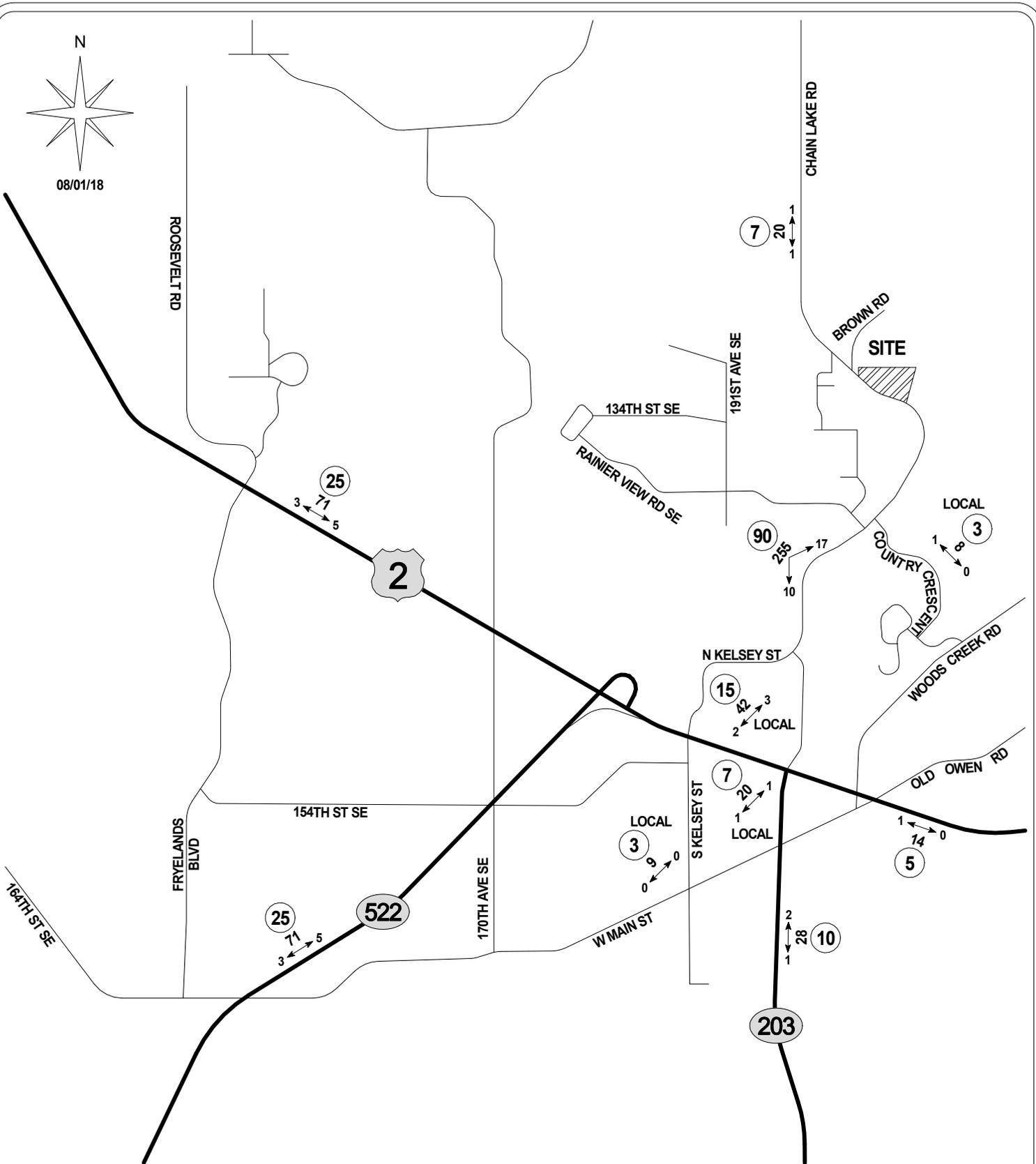
TRIP DISTRIBUTION %

**FIGURE 3  
DEVELOPMENT  
TRIP DISTRIBUTION  
PM PEAK-HOUR**

**CITY OF MONROE**



08/01/18



**GIBSON TRAFFIC CONSULTANTS**

**TRAFFIC IMPACT STUDY**  
GTC #18-042

**KESTREL RIDGE**  
30 NEW SINGLE FAMILY DWELLINGS

**LEGEND**  
AWDT  
PM ↔ PEAK  
**XX**

NEW SITE TRAFFIC  
(DAILY/PEAK-HOUR)

TRIP DISTRIBUTION %

**FIGURE 3**  
**DEVELOPMENT**  
**TRIP DISTRIBUTION**  
**PM PEAK-HOUR**

**CITY OF MONROE**

2 Short Plats North of Easton  
Cove Trip Generation

Eaglemont 7  
GTC #18-042

PM Peak-Hour

%	New ADT	New PM Peak Hour Trips		
		In	Out	Total
100%	94	6	4	9.90
1%	0.94	0.06	0.04	0.10
2%	1.89	0.12	0.07	0.20
3%	2.83	0.19	0.11	0.30
4%	3.78	0.25	0.15	0.40
<b>5%</b>	<b>4.72</b>	<b>0.31</b>	<b>0.18</b>	<b>0.50</b>
6%	5.66	0.37	0.22	0.59
7%	6.61	0.44	0.26	0.69
8%	7.55	0.50	0.29	0.79
9%	8.50	0.56	0.33	0.89
<b>10%</b>	<b>9.44</b>	<b>0.62</b>	<b>0.37</b>	<b>0.99</b>
11%	10.38	0.69	0.40	1.09
12%	11.33	0.75	0.44	1.19
13%	12.27	0.81	0.48	1.29
14%	13.22	0.87	0.51	1.39
<b>15%</b>	<b>14.16</b>	<b>0.94</b>	<b>0.55</b>	<b>1.49</b>
16%	15.10	1.00	0.59	1.58
17%	16.05	1.06	0.62	1.68
18%	16.99	1.12	0.66	1.78
19%	17.94	1.19	0.70	1.88
<b>20%</b>	<b>18.88</b>	<b>1.25</b>	<b>0.73</b>	<b>1.98</b>
21%	19.82	1.31	0.77	2.08
22%	20.77	1.37	0.81	2.18
23%	21.71	1.44	0.84	2.28
24%	22.66	1.50	0.88	2.38
<b>25%</b>	<b>23.60</b>	<b>1.56</b>	<b>0.92</b>	<b>2.48</b>
26%	24.54	1.62	0.95	2.57
27%	25.49	1.68	0.99	2.67
28%	26.43	1.75	1.02	2.77
29%	27.38	1.81	1.06	2.87
<b>30%</b>	<b>28.32</b>	<b>1.87</b>	<b>1.10</b>	<b>2.97</b>
31%	29.26	1.93	1.13	3.07
32%	30.21	2.00	1.17	3.17
33%	31.15	2.06	1.21	3.27
34%	32.10	2.12	1.24	3.37
<b>35%</b>	<b>33.04</b>	<b>2.18</b>	<b>1.28</b>	<b>3.47</b>
36%	33.98	2.25	1.32	3.56
37%	34.93	2.31	1.35	3.66
38%	35.87	2.37	1.39	3.76
39%	36.82	2.43	1.43	3.86
<b>40%</b>	<b>37.76</b>	<b>2.50</b>	<b>1.46</b>	<b>3.96</b>
41%	38.70	2.56	1.50	4.06
42%	39.65	2.62	1.54	4.16
43%	40.59	2.68	1.57	4.26
44%	41.54	2.75	1.61	4.36
<b>45%</b>	<b>42.48</b>	<b>2.81</b>	<b>1.65</b>	<b>4.46</b>
46%	43.42	2.87	1.68	4.55
47%	44.37	2.93	1.72	4.65
48%	45.31	3.00	1.76	4.75
49%	46.26	3.06	1.79	4.85
<b>50%</b>	<b>47.20</b>	<b>3.12</b>	<b>1.83</b>	<b>4.95</b>
51%	48.14	3.18	1.87	5.05
52%	49.09	3.24	1.90	5.15
53%	50.03	3.31	1.94	5.25
54%	50.98	3.37	1.98	5.35
<b>55%</b>	<b>51.92</b>	<b>3.43</b>	<b>2.01</b>	<b>5.45</b>
56%	52.86	3.49	2.05	5.54
57%	53.81	3.56	2.09	5.64
58%	54.75	3.62	2.12	5.74
59%	55.70	3.68	2.16	5.84
<b>60%</b>	<b>56.64</b>	<b>3.74</b>	<b>2.20</b>	<b>5.94</b>
61%	57.58	3.81	2.23	6.04
62%	58.53	3.87	2.27	6.14
63%	59.47	3.93	2.31	6.24
64%	60.42	3.99	2.34	6.34
<b>65%</b>	<b>61.36</b>	<b>4.06</b>	<b>2.38</b>	<b>6.44</b>
66%	62.30	4.12	2.42	6.53
67%	63.25	4.18	2.45	6.63
68%	64.19	4.24	2.49	6.73
69%	65.14	4.31	2.53	6.83
<b>70%</b>	<b>66.08</b>	<b>4.37</b>	<b>2.56</b>	<b>6.93</b>
71%	67.02	4.43	2.60	7.03
72%	67.97	4.49	2.64	7.13
73%	68.91	4.56	2.67	7.23
74%	69.86	4.62	2.71	7.33
<b>75%</b>	<b>70.80</b>	<b>4.68</b>	<b>2.75</b>	<b>7.43</b>
76%	71.74	4.74	2.78	7.52
77%	72.69	4.80	2.82	7.62
78%	73.63	4.87	2.85	7.72
79%	74.58	4.93	2.89	7.82
<b>80%</b>	<b>75.52</b>	<b>4.99</b>	<b>2.93</b>	<b>7.92</b>
81%	76.46	5.05	2.96	8.02
82%	77.41	5.12	3.00	8.12
83%	78.35	5.18	3.04	8.22
84%	79.30	5.24	3.07	8.32
<b>85%</b>	<b>80.24</b>	<b>5.30</b>	<b>3.11</b>	<b>8.42</b>
86%	81.18	5.37	3.15	8.51
87%	82.13	5.43	3.18	8.61
88%	83.07	5.49	3.22	8.71
89%	84.02	5.55	3.26	8.81
<b>90%</b>	<b>84.96</b>	<b>5.62</b>	<b>3.29</b>	<b>8.91</b>
91%	85.90	5.68	3.33	9.01
92%	86.85	5.74	3.37	9.11
93%	87.79	5.80	3.40	9.21
94%	88.74	5.87	3.44	9.31
<b>95%</b>	<b>89.68</b>	<b>5.93</b>	<b>3.48</b>	<b>9.41</b>
96%	90.62	5.99	3.51	9.50
97%	91.57	6.05	3.55	9.60
98%	92.51	6.12	3.59	9.70
99%	93.46	6.18	3.62	9.80
<b>100%</b>	<b>94.40</b>	<b>6.24</b>	<b>3.66</b>	<b>9.90</b>



# **Level of Service Calculations**

Eaglemont 7 (18-042)  
 1: Chain Lake Road & Brown Road

Existing Conditions  
 PM Peak-Hour

Intersection

Int Delay, s/veh	1.9						
Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations	Y		T				4
Traffic Vol, veh/h	58	10	244	98	1	11	121
Future Vol, veh/h	58	10	244	98	1	11	121
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	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	71	71	91	91	92	71	71
Heavy Vehicles, %	4	4	1	1	2	0	0
Mvmt Flow	82	14	268	108	1	15	170

Major/Minor	Minor1	Major1	Major2				
Conflicting Flow All	522	322	0	0	-	376	0
Stage 1	322	-	-	-	-	-	-
Stage 2	200	-	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	-	4.1	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	-	2.2	-
Pot Cap-1 Maneuver	511	714	-	-	-	1194	-
Stage 1	730	-	-	-	-	-	-
Stage 2	829	-	-	-	-	-	-
Platoon blocked, %			-	-	-	-	-
Mov Cap-1 Maneuver	511	714	-	-	~-15	~-15	-
Mov Cap-2 Maneuver	511	-	-	-	-	-	-
Stage 1	730	-	-	-	-	-	-
Stage 2	829	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	533	+
HCM Lane V/C Ratio	-	-	0.18	-
HCM Control Delay (s)	-	-	13.2	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.6	-

Notes

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

Eaglemont 7 (18-042)  
2: Chain Lake Road & Rainier View Road SE

Existing Conditions  
PM Peak-Hour

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	102	130	409	254	8
Future Vol, veh/h	6	102	130	409	254	8
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	-	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	89	89	89	89
Heavy Vehicles, %	1	1	1	1	2	2
Mvmt Flow	7	113	146	460	285	9

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1042	290	294	0	-	0
Stage 1	290	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	256	752	1273	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	227	752	1273	-	-	-
Mov Cap-2 Maneuver	227	-	-	-	-	-
Stage 1	674	-	-	-	-	-
Stage 2	468	-	-	-	-	-

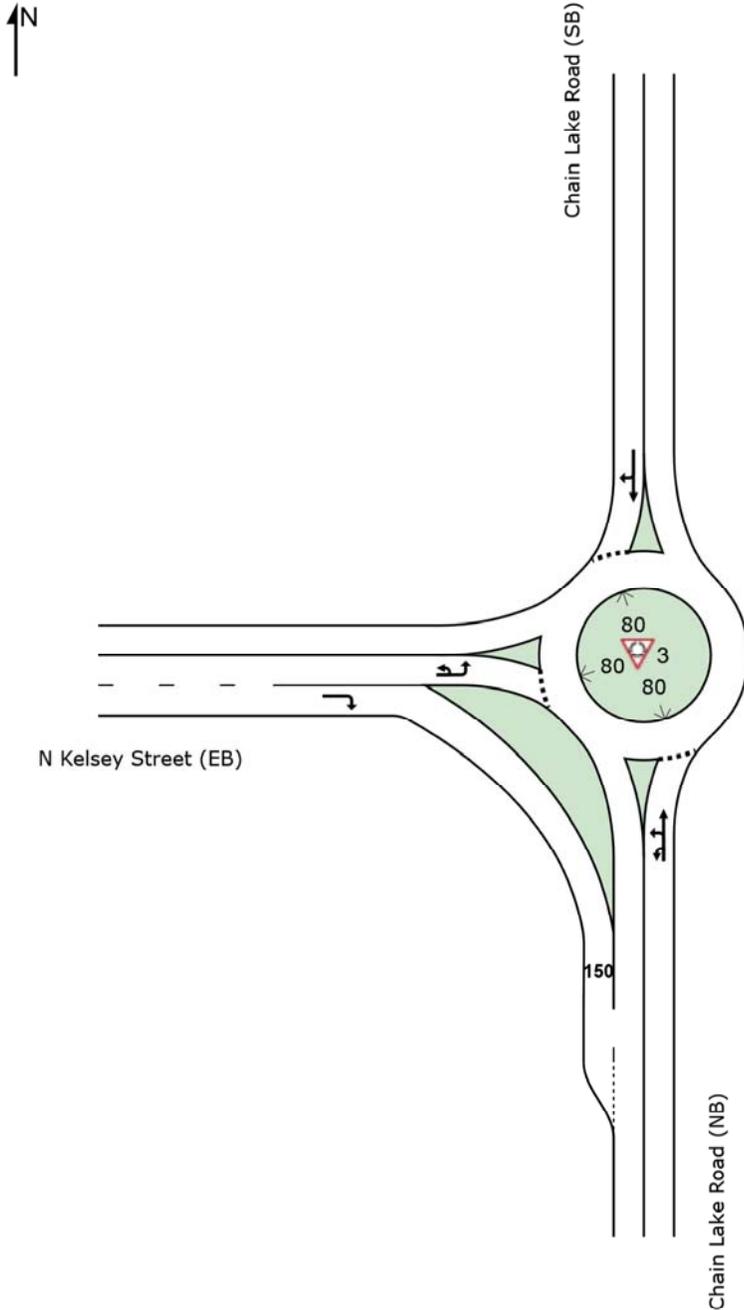
Approach	EB	NB	SB
HCM Control Delay, s	11.6	2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1273	-	666	-	-
HCM Lane V/C Ratio	0.115	-	0.18	-	-
HCM Control Delay (s)	8.2	-	11.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.7	-	-

# SITE LAYOUT

## Site: 3 [2018 Existing Conditions]

Chain Lake Road at N Kelsey Street  
Site Category: (None)  
Roundabout



# MOVEMENT SUMMARY

## Site: 3 [2018 Existing Conditions]

Chain Lake Road at N Kelsey Street  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Chain Lake Road (NB)												
3u	U	3	3.0	0.397	14.2	LOS B	2.7	68.8	0.63	0.71	0.63	35.2
3	L2	146	3.0	0.397	12.0	LOS B	2.7	68.8	0.63	0.71	0.63	34.5
8	T1	247	3.0	0.397	6.7	LOS A	2.7	68.8	0.63	0.71	0.63	34.6
Approach		397	3.0	0.397	8.7	LOS A	2.7	68.8	0.63	0.71	0.63	34.5
North: Chain Lake Road (SB)												
4	T1	132	3.0	0.369	5.3	LOS A	2.7	68.1	0.46	0.54	0.46	36.2
14	R2	298	3.0	0.369	5.2	LOS A	2.7	68.1	0.46	0.54	0.46	35.2
Approach		430	3.0	0.369	5.2	LOS A	2.7	68.1	0.46	0.54	0.46	35.5
West: N Kelsey Street (EB)												
5u	U	5	3.0	0.248	12.3	LOS B	1.6	40.7	0.35	0.62	0.35	34.4
5	L2	349	3.0	0.248	10.1	LOS B	1.6	40.7	0.35	0.62	0.35	33.8
12	R2	195	3.0	0.120	3.8	LOS A	0.0	0.0	0.00	0.47	0.00	36.8
Approach		549	3.0	0.248	7.9	LOS A	1.6	40.7	0.23	0.57	0.23	34.8
All Vehicles		1376	3.0	0.397	7.3	LOS A	2.7	68.8	0.42	0.60	0.42	34.9

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.

**SIDRA INTERSECTION 8.0 | Copyright © 2000-2018 Akcelik and Associates Pty Ltd | sidrasolutions.com**

Organisation: GIBSON TRAFFIC CONSULTANTS | Processed: Wednesday, March 6, 2019 1:20:34 PM

Project: H:\2018\18-042\46-Unit Update March 2019\Sidra\Chain Lake Rd at Kelsey St - 46-Unit Analysis.sip8

Eaglemont 7 (18-042)  
 1: Chain Lake Road & Brown Road

2029 Baseline Conditions  
 PM Peak-Hour

Intersection

Int Delay, s/veh	2.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	72	12	315	122	14	169
Future Vol, veh/h	72	12	315	122	14	169
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	71	71	91	91	71	71
Heavy Vehicles, %	4	4	1	1	0	0
Mvmt Flow	101	17	346	134	20	238

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	691	413	0	0	480
Stage 1	413	-	-	-	-
Stage 2	278	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.1
Critical Hdwy Stg 1	5.44	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.2
Pot Cap-1 Maneuver	407	635	-	-	1093
Stage 1	664	-	-	-	-
Stage 2	764	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	398	635	-	-	1093
Mov Cap-2 Maneuver	398	-	-	-	-
Stage 1	650	-	-	-	-
Stage 2	764	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	420	1093
HCM Lane V/C Ratio	-	-	0.282	0.018
HCM Control Delay (s)	-	-	16.9	8.4
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1

Eaglemont 7 (18-042)  
 2: Chain Lake Road & Rainier View Road SE

2029 Baseline Conditions  
 PM Peak-Hour

Intersection

Int Delay, s/veh	10.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	WT		WT	↑	↑	
Traffic Vol, veh/h	19	231	339	619	379	29
Future Vol, veh/h	19	231	339	619	379	29
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	-	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	89	89	89	89
Heavy Vehicles, %	1	1	1	1	2	2
Mvmt Flow	21	257	381	696	426	33

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1901	443	459	0	0
Stage 1	443	-	-	-	-
Stage 2	1458	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-
Pot Cap-1 Maneuver	76	617	1107	-	-
Stage 1	649	-	-	-	-
Stage 2	215	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	50	617	1107	-	-
Mov Cap-2 Maneuver	50	-	-	-	-
Stage 1	426	-	-	-	-
Stage 2	215	-	-	-	-

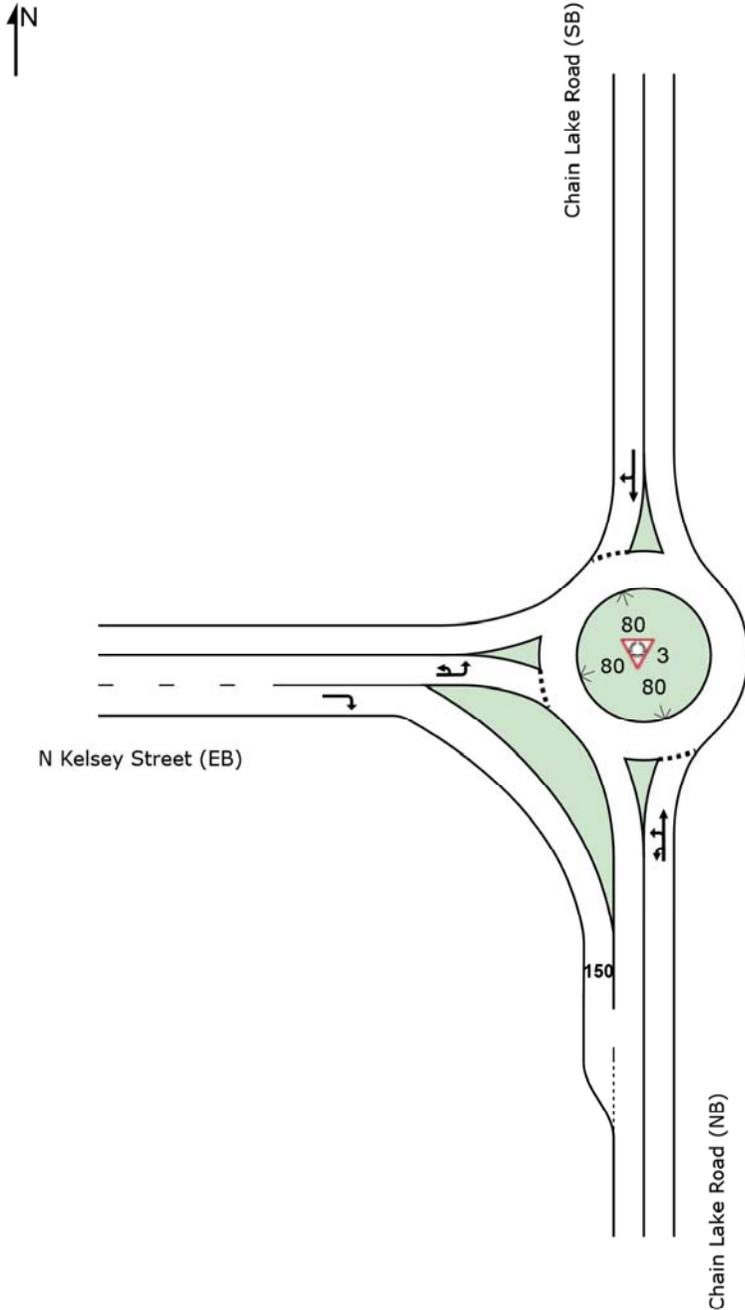
Approach	EB	NB	SB
HCM Control Delay, s	53.3	3.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1107	-	331	-	-
HCM Lane V/C Ratio	0.344	-	0.839	-	-
HCM Control Delay (s)	9.9	-	53.3	-	-
HCM Lane LOS	A	-	F	-	-
HCM 95th %tile Q(veh)	1.5	-	7.4	-	-

# SITE LAYOUT

## Site: 3 [2029 Baseline Conditions]

Chain Lake Road at N Kelsey Street  
Site Category: (None)  
Roundabout



# MOVEMENT SUMMARY

 **Site: 3 [2029 Baseline Conditions]**

Chain Lake Road at N Kelsey Street  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Chain Lake Road (NB)												
3u	U	4	3.0	0.752	23.3	LOS C	10.1	257.6	0.99	1.15	1.46	31.3
3	L2	182	3.0	0.752	21.0	LOS C	10.1	257.6	0.99	1.15	1.46	30.8
8	T1	402	3.0	0.752	15.8	LOS B	10.1	257.6	0.99	1.15	1.46	30.8
Approach		588	3.0	0.752	17.4	LOS B	10.1	257.6	0.99	1.15	1.46	30.8
North: Chain Lake Road (SB)												
4	T1	211	3.0	0.614	6.1	LOS A	6.1	156.6	0.70	0.62	0.70	35.6
14	R2	466	3.0	0.614	5.9	LOS A	6.1	156.6	0.70	0.62	0.70	34.6
Approach		676	3.0	0.614	6.0	LOS A	6.1	156.6	0.70	0.62	0.70	34.9
West: N Kelsey Street (EB)												
5u	U	6	3.0	0.447	13.0	LOS B	3.6	92.5	0.55	0.66	0.55	33.9
5	L2	585	3.0	0.447	10.7	LOS B	3.6	92.5	0.55	0.66	0.55	33.3
12	R2	242	3.0	0.149	3.8	LOS A	0.0	0.0	0.00	0.47	0.00	36.8
Approach		833	3.0	0.447	8.7	LOS A	3.6	92.5	0.39	0.61	0.39	34.2
All Vehicles		2098	3.0	0.752	10.3	LOS B	10.1	257.6	0.66	0.77	0.79	33.4

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.

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Eaglemont 7 (18-042)  
1: Chain Lake Road & Site Access/Brown Road

2029 Future with Development Conditions  
PM Peak-Hour

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	1	0	15	72	0	12	26	315	122	14	169	2
Future Vol, veh/h	1	0	15	72	0	12	26	315	122	14	169	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	71	92	71	92	91	91	71	71	92
Heavy Vehicles, %	2	2	2	4	2	4	2	1	1	0	0	2
Mvmt Flow	1	0	16	101	0	17	28	346	134	20	238	2
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	757	815	239	756	749	413	240	0	0	480	0	0
Stage 1	279	279	-	469	469	-	-	-	-	-	-	-
Stage 2	478	536	-	287	280	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.14	6.52	6.24	4.12	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.536	4.018	3.336	2.218	-	-	2.2	-	-
Pot Cap-1 Maneuver	324	312	800	322	341	635	1327	-	-	1093	-	-
Stage 1	728	680	-	571	561	-	-	-	-	-	-	-
Stage 2	568	523	-	716	679	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	304	297	800	304	324	635	1327	-	-	1093	-	-
Mov Cap-2 Maneuver	304	297	-	304	324	-	-	-	-	-	-	-
Stage 1	707	666	-	554	545	-	-	-	-	-	-	-
Stage 2	537	508	-	687	665	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	10.1			22			0.4			0.6		
HCM LOS	B			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1327	-	-	726	328	1093	-	-				
HCM Lane V/C Ratio	0.021	-	-	0.024	0.361	0.018	-	-				
HCM Control Delay (s)	7.8	0	-	10.1	22	8.4	0	-				
HCM Lane LOS	A	A	-	B	C	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.1	1.6	0.1	-	-				

Eaglemont 7 (18-042)  
 2: Chain Lake Road & Rainier View Road SE

2029 Future with Development Conditions  
 PM Peak-Hour

Intersection

Int Delay, s/veh	11.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	231	339	644	394	29
Future Vol, veh/h	19	231	339	644	394	29
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	-	200	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	89	89	89	89
Heavy Vehicles, %	1	1	1	1	2	2
Mvmt Flow	21	257	381	724	443	33

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	1946	460	476	0	0
Stage 1	460	-	-	-	-
Stage 2	1486	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-
Pot Cap-1 Maneuver	72	603	1091	-	-
Stage 1	638	-	-	-	-
Stage 2	208	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	47	603	1091	-	-
Mov Cap-2 Maneuver	47	-	-	-	-
Stage 1	415	-	-	-	-
Stage 2	208	-	-	-	-

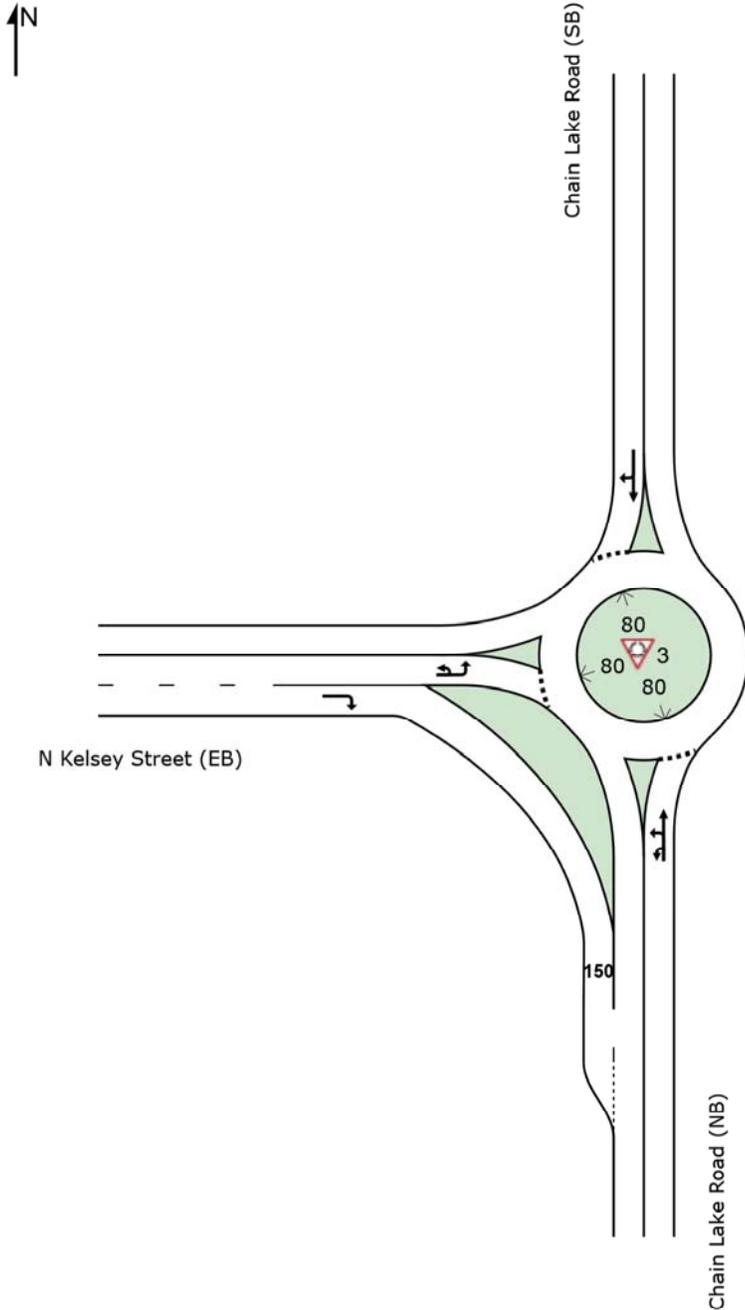
Approach	EB	NB	SB
HCM Control Delay, s	60.4	3.5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1091	-	318	-	-
HCM Lane V/C Ratio	0.349	-	0.874	-	-
HCM Control Delay (s)	10.1	-	60.4	-	-
HCM Lane LOS	B	-	F	-	-
HCM 95th %tile Q(veh)	1.6	-	8	-	-

# SITE LAYOUT

## Site: 3 [2029 Future Conditions w Development]

Chain Lake Road at N Kelsey Street  
Site Category: (None)  
Roundabout



# MOVEMENT SUMMARY

## Site: 3 [2029 Future Conditions w Development]

Chain Lake Road at N Kelsey Street  
 Site Category: (None)  
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: Chain Lake Road (NB)												
3u	U	4	3.0	0.780	24.9	LOS C	11.1	285.4	1.00	1.20	1.55	30.7
3	L2	182	3.0	0.780	22.6	LOS C	11.1	285.4	1.00	1.20	1.55	30.1
8	T1	412	3.0	0.780	17.4	LOS B	11.1	285.4	1.00	1.20	1.55	30.2
Approach		598	3.0	0.780	19.0	LOS B	11.1	285.4	1.00	1.20	1.55	30.2
North: Chain Lake Road (SB)												
4	T1	215	3.0	0.629	6.1	LOS A	6.4	163.9	0.72	0.63	0.72	35.5
14	R2	477	3.0	0.629	6.0	LOS A	6.4	163.9	0.72	0.63	0.72	34.6
Approach		692	3.0	0.629	6.0	LOS A	6.4	163.9	0.72	0.63	0.72	34.9
West: N Kelsey Street (EB)												
5u	U	6	3.0	0.462	13.0	LOS B	3.8	97.3	0.57	0.67	0.57	33.9
5	L2	602	3.0	0.462	10.7	LOS B	3.8	97.3	0.57	0.67	0.57	33.3
12	R2	242	3.0	0.149	3.8	LOS A	0.0	0.0	0.00	0.47	0.00	36.8
Approach		851	3.0	0.462	8.8	LOS A	3.8	97.3	0.41	0.61	0.41	34.2
All Vehicles		2141	3.0	0.780	10.8	LOS B	11.1	285.4	0.67	0.78	0.83	33.2

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.

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