

Gibson Traffic Consultants
2813 Rockefeller Avenue
Suite B
Everett, WA 98201
425.339.8266

Nubgaard Development Traffic Impact Analysis

Jurisdiction: City of Ferndale

August 2020



TABLE OF CONTENTS

1.	DEVELOPMENT IDENTIFICATION	1
2.	TRIP GENERATION.....	1
3.	TRIP DISTRIBUTION	1
4.	METHODOLOGY	4
5.	INTERSECTION ANALYSIS.....	5
5.1	Turning Movement Calculations.....	5
5.2	Intersection Level of Service Analysis.....	9
6.	SIEVERS WAY SPEED DATA.....	9
7.	TRANSPORTATION IMPACT FEES.....	10
8.	CONCLUSIONS	10

LIST OF FIGURES

Figure 1: Site Vicinity Map		2
Figure 2: Trip Distribution.....		3
Figure 3: 2020 Existing Turning Movements.....		6
Figure 4: 2026 Baseline Turning Movements		7
Figure 5: 2026 Future with Development Turning Movements		8

LIST OF TABLES

Table 1: Trip Generation Summary		1
Table 2: Level of Service Criteria for Intersections.....		4
Table 3: Intersection Level of Service Summary		9

ATTACHMENTS

Turning Movement Counts and Calculations		A
Level of Service Calculations		B

1. DEVELOPMENT IDENTIFICATION

Gibson Traffic Consultants, Inc. (GTC) completed the scoping analysis for the Nubgaard development in May 2020. The Nubgaard development is located between the east terminus of Chloe Lane and the west terminus of Sievers Way, south of Thornton Road and west of Church Road. A site vicinity map is included in Figure 1. This report addresses the intersection analysis and comments from City of Ferndale staff requesting analysis of local intersections in the vicinity of the development and the potential cut-through trips from the adjacent Meadows development. The trip generation and trip distribution is based on the May 2020 scoping analysis and is summarized in this report. 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.

2. TRIP GENERATION

The Nubgaard development is proposed to consist of 92 single-family detached units. The site is currently undeveloped. The trip generation calculations have been performed using data published by the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition* (2017). The average trip generation rates for ITE LUC 210, Single-Family Detached Housing, have been utilized. The trip generation of Nubgaard development is summarized in Table 1.

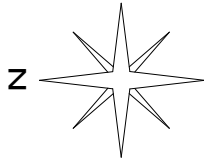
Table 1: Trip Generation Summary

92 Single-Family Detached	Average Daily Trips			PM Peak-Hour Trips		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Generation Rate	9.44 trips per unit			0.99 trips per unit		
Splits	50%	50%	100%	63%	37%	100%
Trips	434	434	868	57	34	91

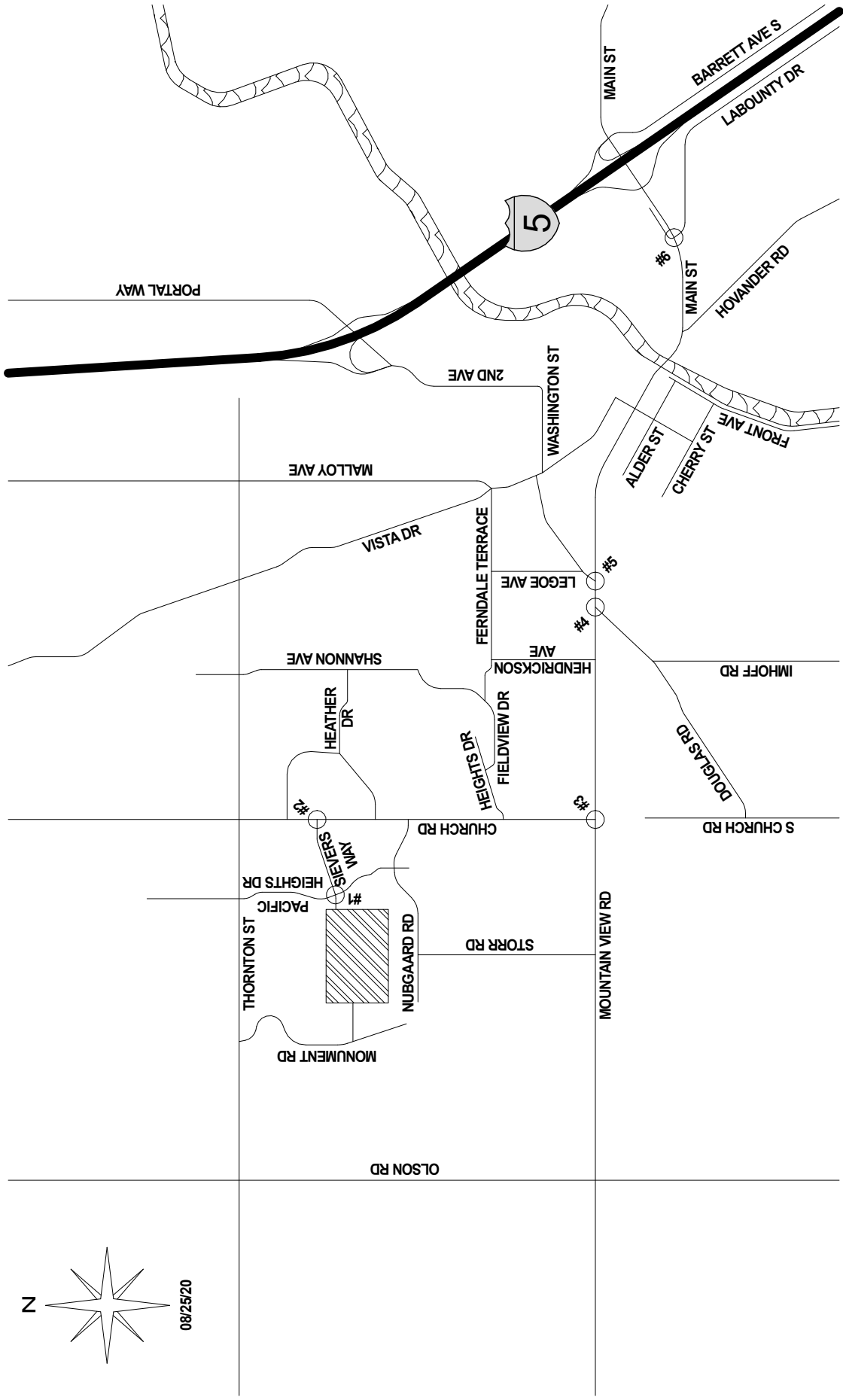
Nubgaard development is anticipated to generate 868 new average daily trips with 91 new PM peak-hour trips.

3. TRIP DISTRIBUTION

The trip distribution for the Nubgaard development is based on the surrounding commercial uses and previously approved distributions for developments in the site vicinity. It is estimated that 15% of the trips generated by the development will travel to and from the north along Church Road. It is anticipated that 10% of the trips generated by the development will travel to and from the west along Thornton Street. Approximately 50% of the trips generated by the development will travel to and from the south, five percent along Imhoff Road, thirty-five percent along I-5 and ten percent along Barrett Avenue S. The remaining 20% of the trips generated by the development are anticipated to travel to and from local areas. A detailed trip distribution is included in Figure 2.



08/25/20



GIBSON TRAFFIC CONSULTANTS

TRAFFIC IMPACT STUDY
GTC #20-092

NUBGAARD
92 NEW SFD

LEGEND



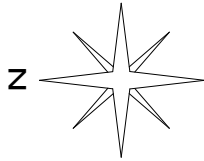
DEVELOPMENT SITE



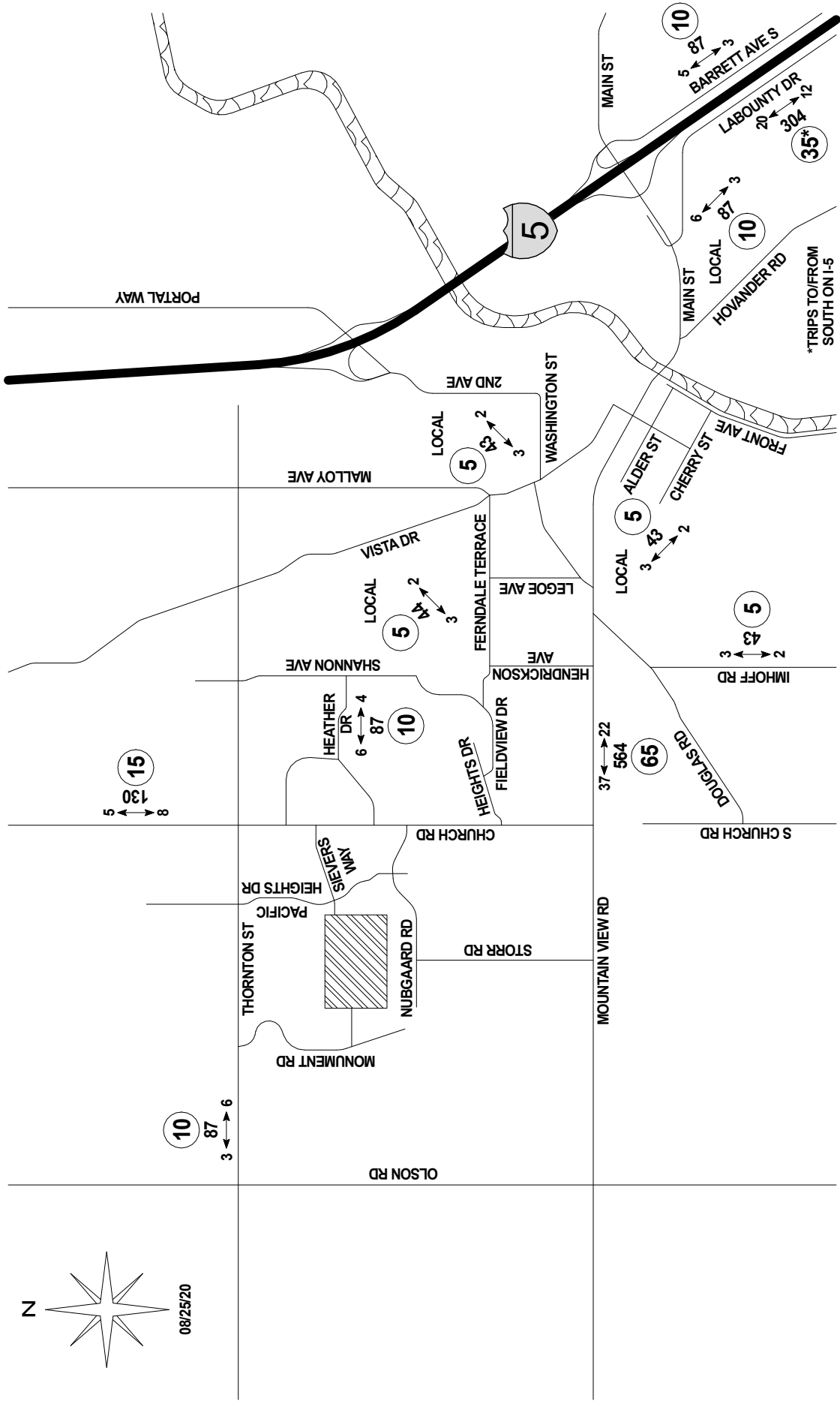
STUDY INTERSECTION

FIGURE 1
SITE VICINITY
MAP

CITY OF FERDALE



08/25/20



*TRIPS TO/FROM SOUTH ON I-5

GIBSON TRAFFIC CONSULTANTS

NUBGAARD
92 NEW SFD

CITY OF FERNDALE

TRAFFIC IMPACT STUDY
GTC #20-092

FIGURE 2
DEVELOPMENT
TRIP DISTRIBUTION

LEGEND
AWDT
PM ← → PEAK
NEW DAILY TRIPS
NEW PM PEAK-HOUR TRIPS
TRIP DISTRIBUTION %



4. METHODOLOGY

Congestion at intersections and along arterials is generally measured in terms of level of service (LOS). In accordance with *Highway Capacity Manual (HCM), 6th Edition* by the Transportation Research Board, road facilities and intersections are rated between LOS A and LOS F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. The level of service at signalized, roundabout, and all-way stop-controlled intersections is based on the average delay of all approaches. The level of service for two-way stop-controlled intersections is based on average delays for the critical stopped approach. The City of Auburn uses the average travel speed to determine the level of service for arterial segments. Geometric characteristics and conflicting traffic movements are taken into consideration when determining level of service values. A summary of the intersection level of service criteria is included in Table 2.

Table 2: Level of Service Criteria for Intersections

Level of ¹ 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	>50	>80

The City of Ferndale utilizes LOS D as the acceptable level of service threshold.

¹ **Source:** *Highway Capacity Manual 6th Edition*.

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

LOS B: Generally stable traffic flow conditions.

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

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

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

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

5. INTERSECTION ANALYSIS

The following intersections have been analyzed based on scoping discussions with City of Ferndale staff:

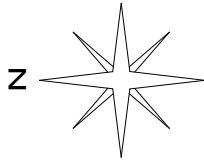
1. Sievers Way at Pacific Heights Drive
2. Sievers Way at Church Road
3. Mountain View Road at Church Road
4. Mountain View Road at Douglas Road
5. Main Street at Washington Street
6. Main Street at Labounty Drive

The intersections have been analyzed for the 2020 existing conditions, 2026 baseline conditions and 2026 future with development conditions.

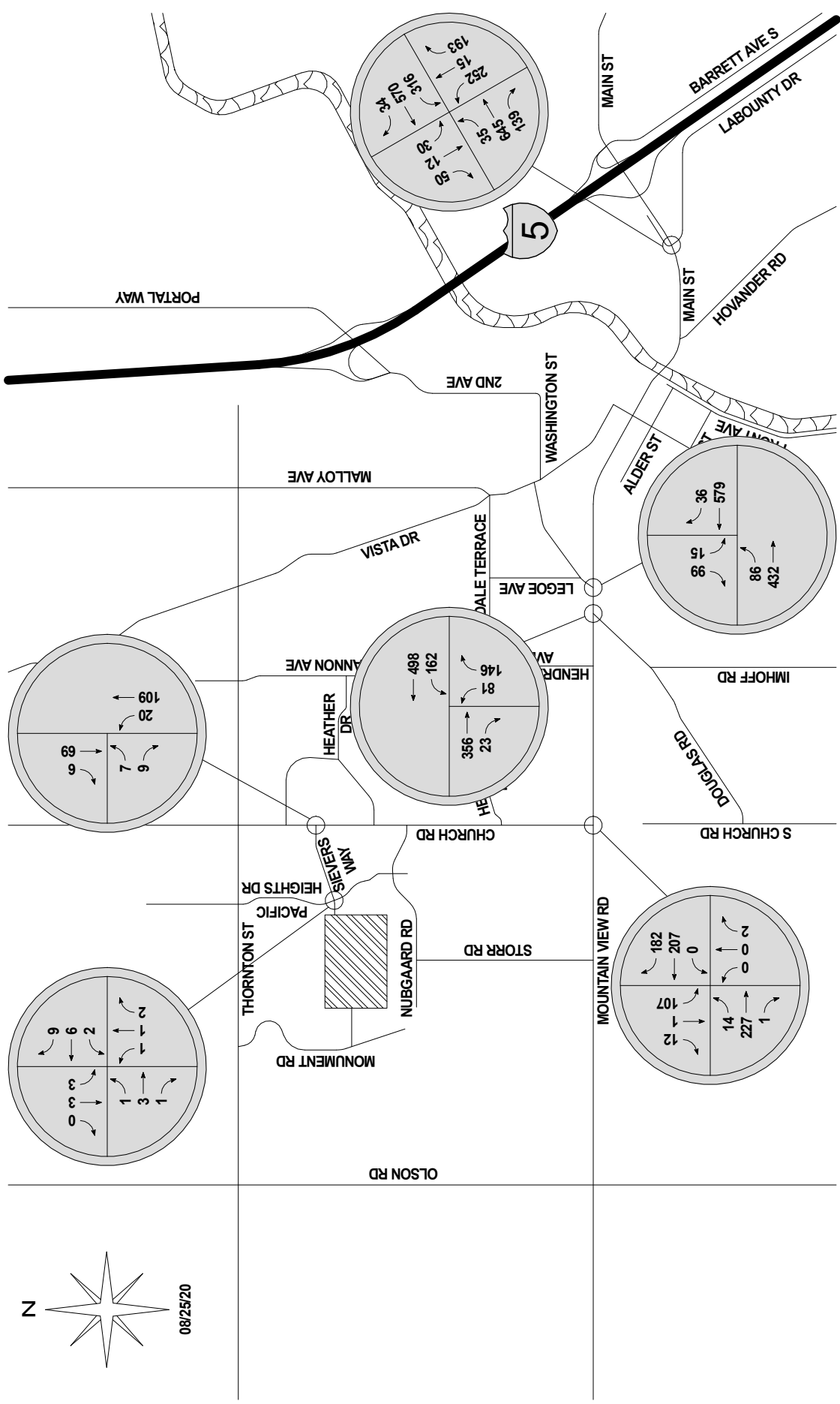
5.1 Turning Movement Calculations

The counts for the study intersections were collected during the weekday PM peak period (4:00 PM to 6:00PM) in August 2020 by the independent count firm Traffic Data Gathering (TDG). A 10% increase to the counts was applied to account for Covid-19 related traffic reductions. This increase is based on data for the Puget Sound region. The existing turning movement volumes at the study intersections are shown in Figure 3. The 2026 baseline volumes have been calculated using a 3% annually compounding growth rate. The 2026 baseline turning movements at the study intersections are shown in Figure 4.

The 2026 future with development turning movements are calculated by adding the trips generated by the Nubgaard development and adding trips generated by the Meadows development. It has been assumed that all of the trips that are anticipated to be generated by the 157 residential units of the Meadows development will travel through the Nubgaard development and impact the study intersections with the same percentage of trips as the Nubgaard development. The trips generated by the Meadows development have been added in this manner since the Nubgaard development will provide a connection between Pacific Heights Drive (and Church Road to the east) and the Meadows development. Adding the trips generated by the Meadows development and applying a growth rate will result in a double-counting of some trips generated by the Meadows development. per the existing zoning and the proposed zoning to the 2025 baseline turning movements. The 2026 future with development turning movements are shown in Figure 5. The turning movement calculations are included in the attachments.



08/25/20



GIBSON TRAFFIC CONSULTANTS

**NUBGAARD
92 NEW SFD**

CITY OF FERDALE

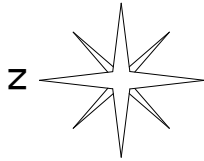
**TRAFFIC IMPACT STUDY
GTC #20-092**

**FIGURE 3
2020 EXISTING
TURNING MOVEMENTS**

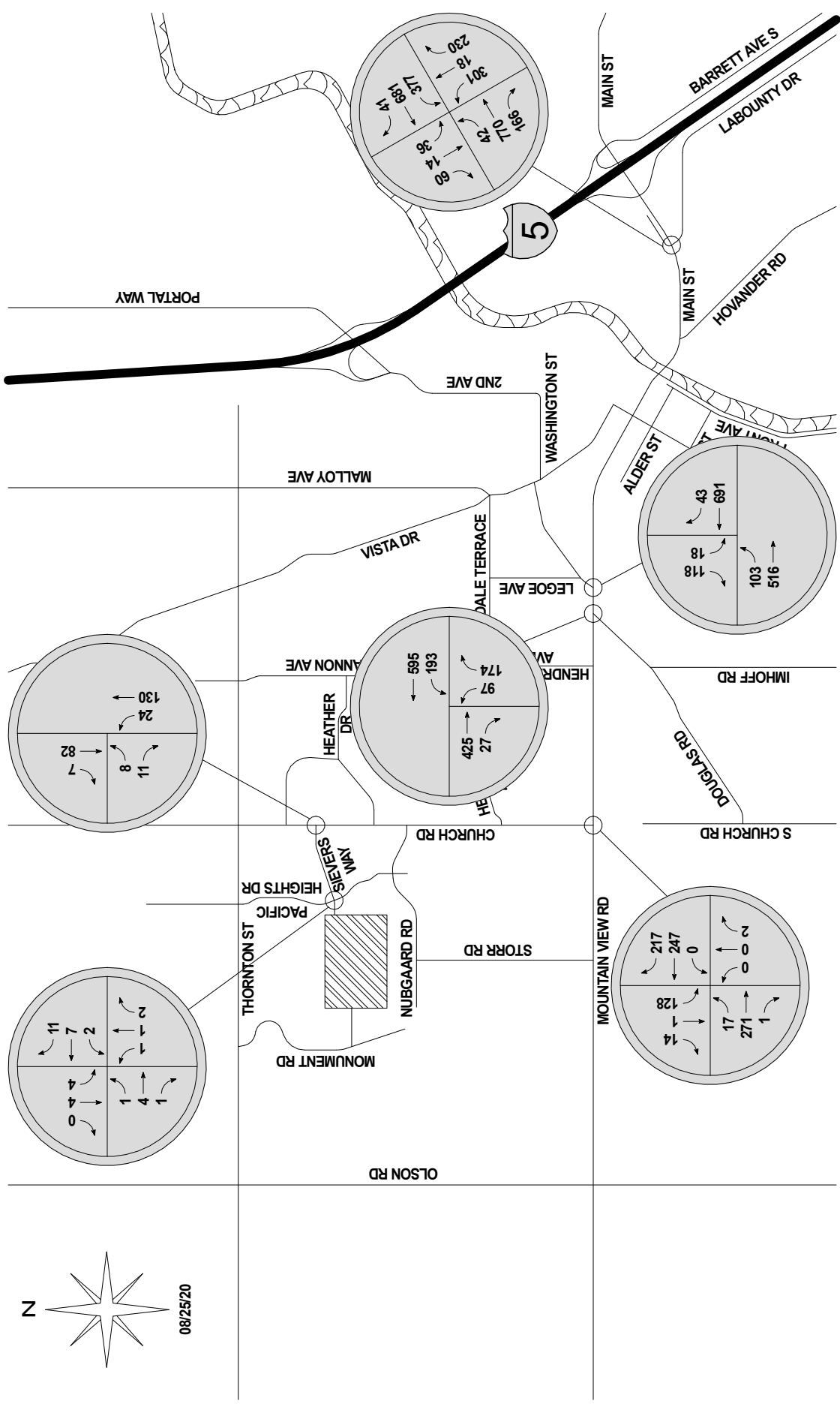
LEGEND

PM PEAK-HOUR
TURNING MOVEMENT VOLUMES

XXX →



08/25/20



GIBSON TRAFFIC CONSULTANTS

**NUBGAARD
92 NEW SFD**

CITY OF FERDALE

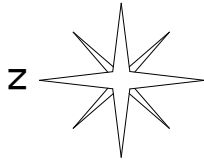
**TRAFFIC IMPACT STUDY
GTC #20-092**

**FIGURE 4
2026 BASELINE
TURNING MOVEMENTS**

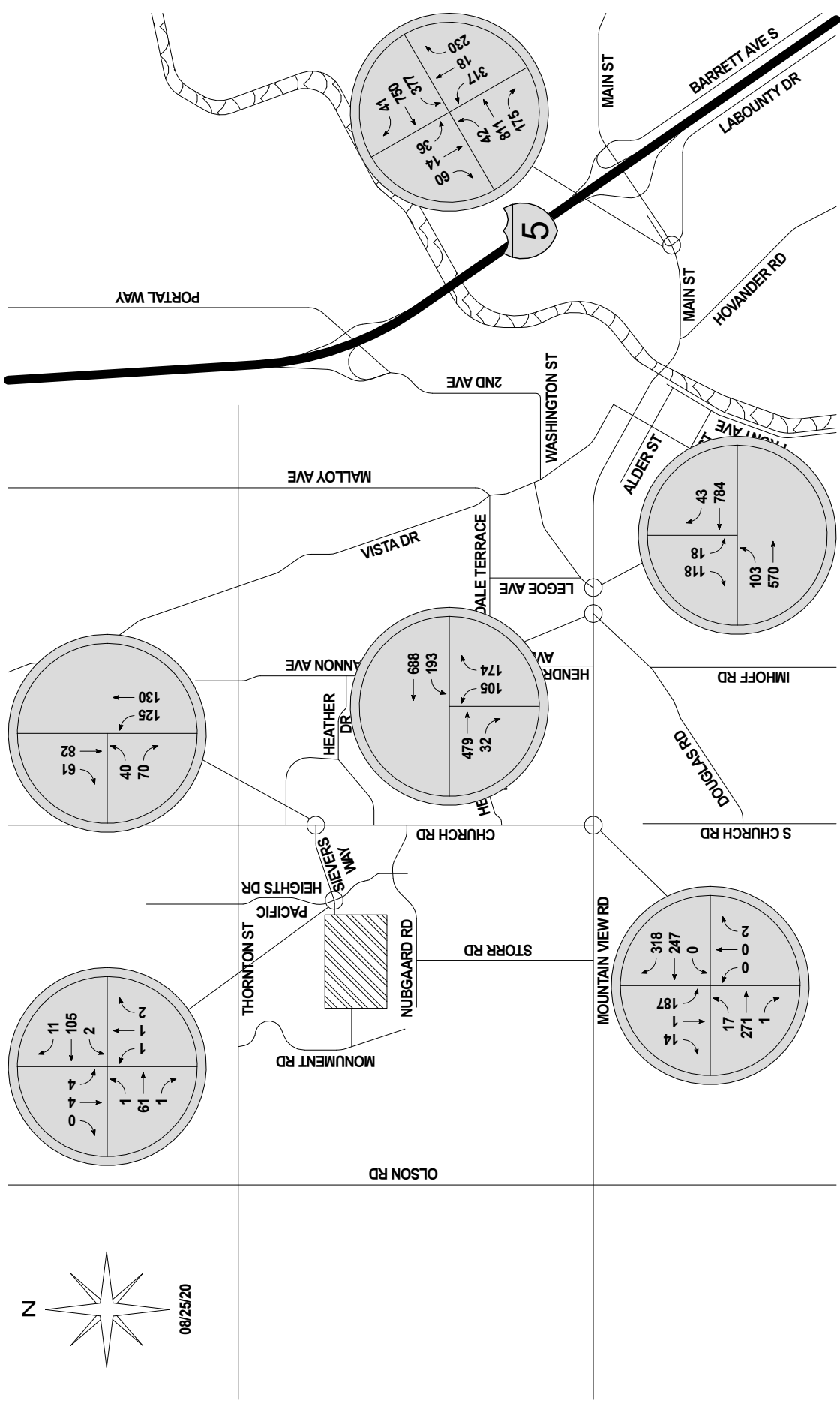
LEGEND

PM PEAK-HOUR
TURNING MOVEMENT VOLUMES

XXX →



08/25/20



GIBSON TRAFFIC CONSULTANTS

**NUBGAARD
92 NEW SFD**

CITY OF FERDALE

**TRAFFIC IMPACT STUDY
GTC #20-092**

LEGEND

PM PEAK-HOUR
TURNING MOVEMENT VOLUMES

xxx →

**FIGURE 5
2026 FUTURE
WITH DEVELOPMENT
TURNING MOVEMENTS**

5.2 Intersection Level of Service Analysis

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

Table 3: Intersection Level of Service Summary

Intersection	Control	Existing Conditions		2026 Baseline Conditions		2026 Future w Development Conditions	
		LOS	Delay	LOS	Delay	LOS	Delay
1. Sievers Way at Pacific Heights Drive	All-Way Stop-Control	A	7.0 sec	A	7.0 sec	A	7.9 sec
2. Sievers Way at Church Road	Two-Way Stop-Control	A	9.3 sec	A	9.4 sec	B	11.3 sec
3. Mountain View Road at Church Road	Two-Way Stop-Control	C	15.3 sec	C	17.1 sec	C	20.6 sec
4. Mountain View Road at Douglas Road	Signal	A	9.3 sec	A	9.9 sec	B	10.6 sec
5. Main Street at Washington Street	Two-Way Stop-Control	C	17.5 sec	C	20.0 sec	C	23.4 sec
6. Main Street at Labounty Drive	Signal	D	45.0 sec	D	36.4 sec	D	39.5 sec

The level of service analysis shows the study intersections currently operate at LOS D or better and are all anticipated to continue to operate at LOS D or better under the 2026 future with development conditions. It is important to note that the signal splits for the intersection of Main Street at Labounty Drive have been optimized for the 2026 baseline conditions. This has been done to simulate the periodic signal timing updates that jurisdictions perform over time. The intersection level of service calculations are included in the attachments.

6. SIEVERS WAY SPEED DATA

During the scoping discussions with City of Ferndale staff it was identified that neighbors have identified that speeding may be an issue along Sievers Way between Pacific Heights Drive and Church Road. A 24-hour speed study was performed on the section of Sievers Way between Honeycutt Court and Louis Court. This section would represent the typical speeds since it is far enough away from the stop-controlled intersections with Pacific Heights Drive and Church Road. The speed data was collected by the independent count firm TDG at the same time as the PM peak-hour turning movement counts.

The speed data shows that the 85th Percentile speed, which is typically utilized for design parameters, is 22.4 mph. This is below the design speed of 25 mph. Even the 90th Percentile speed (23.6 mph) is below the design speed of 25 mph. This data would identify that speeding is not an issue along Sievers Way. Additionally, the connection through the Nubgaard development is not anticipated to change these speeds since there is stop-control at the Pacific Heights Drive and Church Road intersections.

7. TRANSPORTATION IMPACT FEES

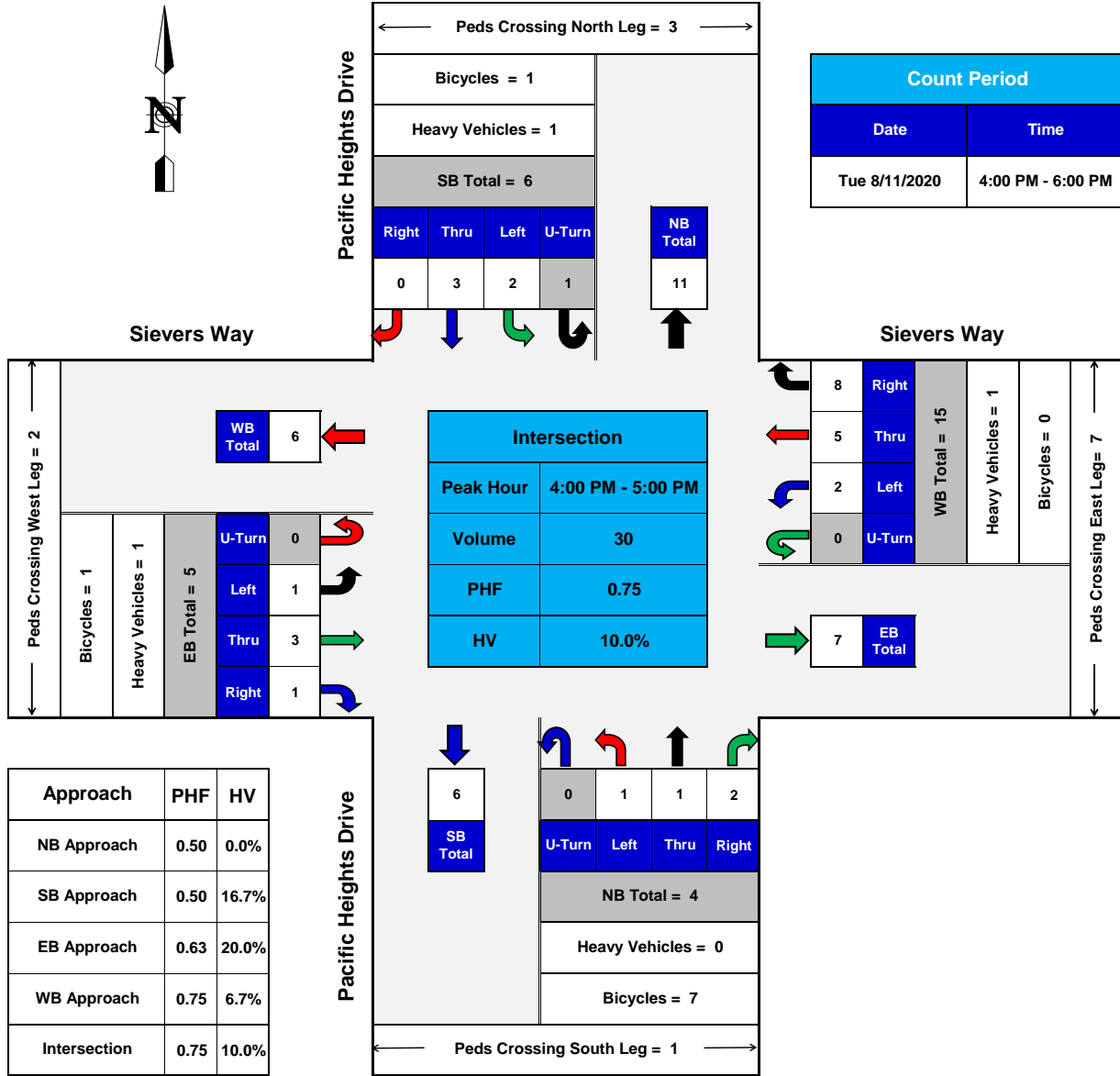
The City of Ferndale currently has a transportation impact fee of \$3,223 per unit for single-family detached units. The Nubgaard development is proposing to construct 92 single-family detached units, resulting in a total transportation mitigation fee of \$296,516.00.

8. CONCLUSIONS

The level of service analysis shows that the study intersections currently operate at LOS D and are anticipated to remain at LOS D with the Nubgaard development. The traffic mitigation fees should adequately mitigate the impact of the Nubgaard development.

Turning Movement Counts and Calculations

Pacific Heights Drive @ Sievers Way Ferndale, WA



PHF = Peak Hour Factor
HV = Heavy Vehicles

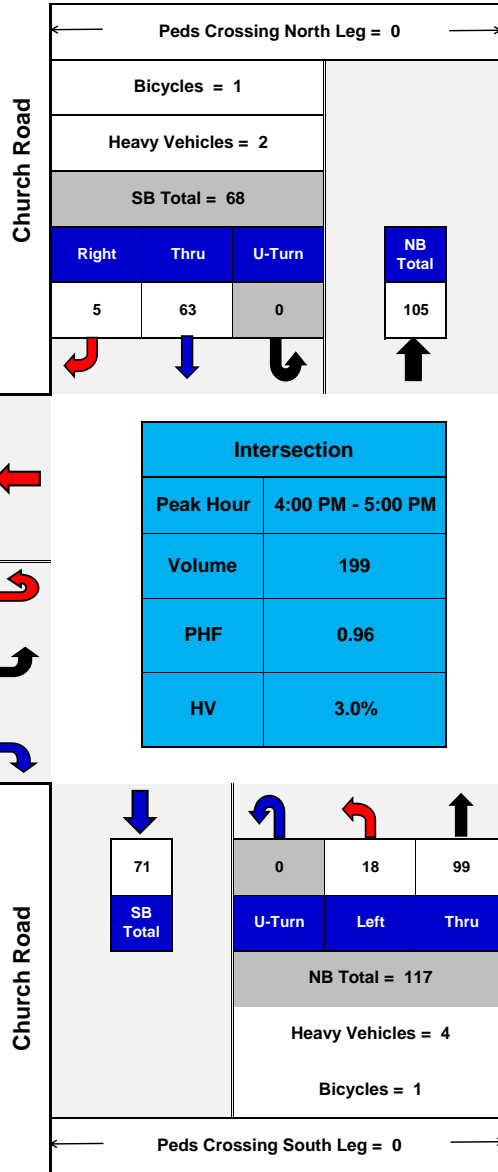
TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY



Church Road @ Sievers Way
Ferndale, WA



Count Period	
Date	Time
Tue 8/11/2020	4:00 PM - 6:00 PM



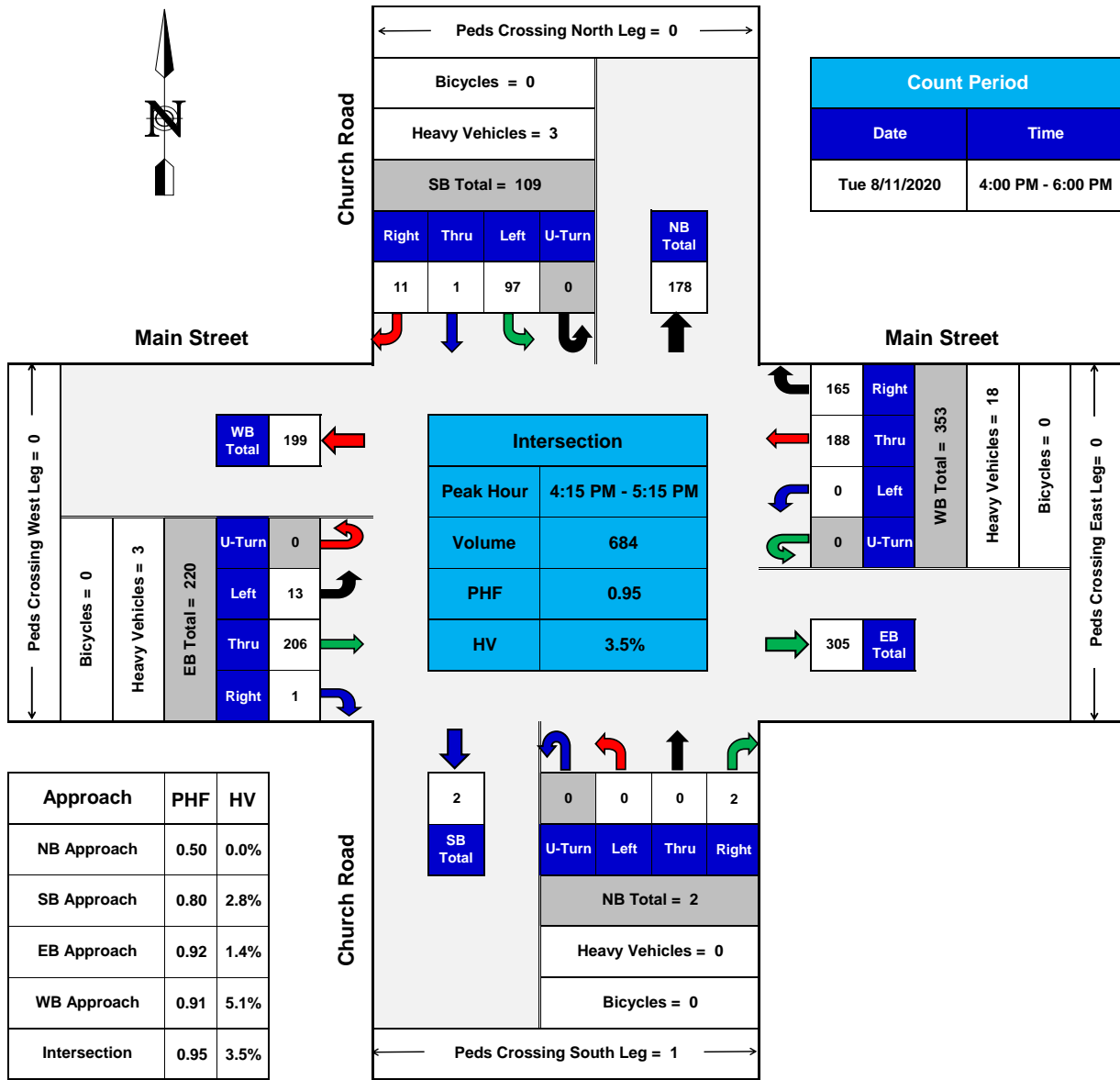
PHF = Peak Hour Factor
 HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY



Church Road @ Main Street

Ferndale, WA



Approach	PHF	HV
NB Approach	0.50	0.0%
SB Approach	0.80	2.8%
EB Approach	0.92	1.4%
WB Approach	0.91	5.1%
Intersection	0.95	3.5%

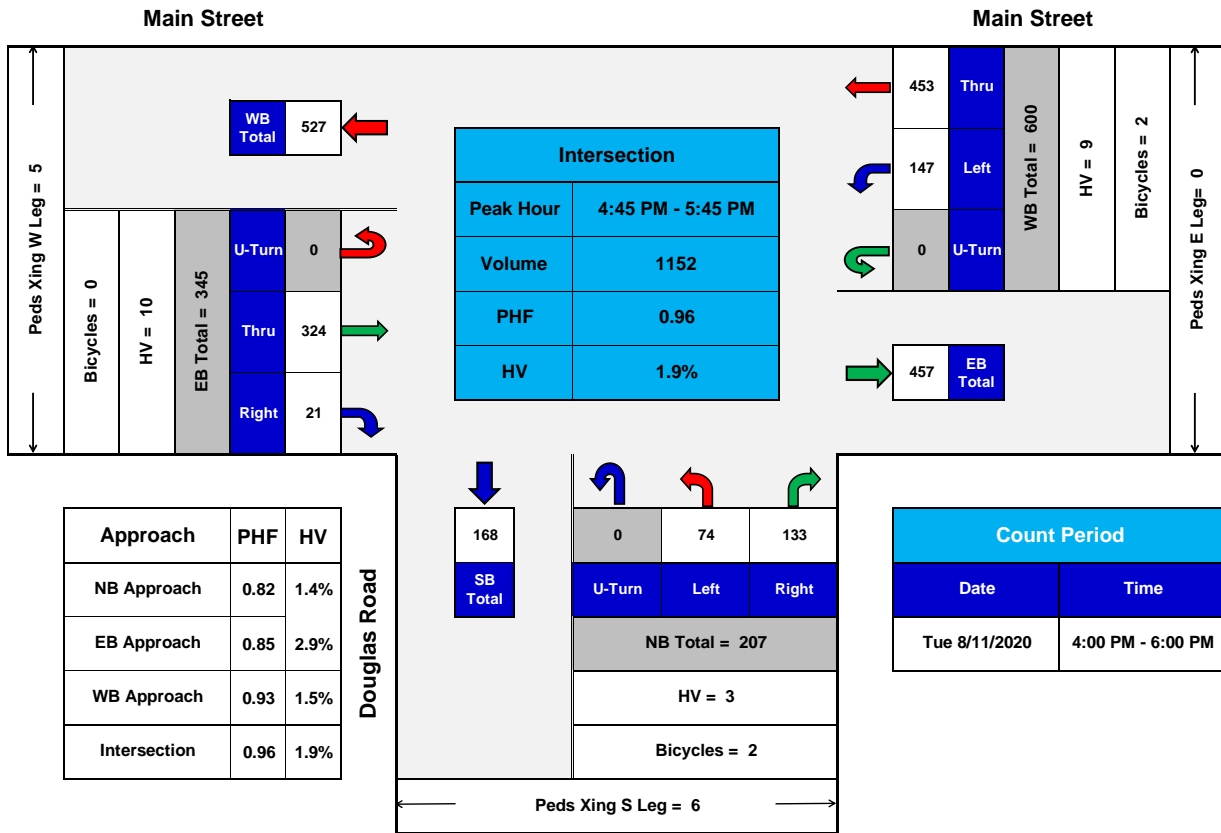
PHF = Peak Hour Factor
 HV = Heavy Vehicles

TURNING MOVEMENTS DIAGRAM PEAK HOUR SUMMARY





**Douglas Road @ Main Street
Ferndale, WA**

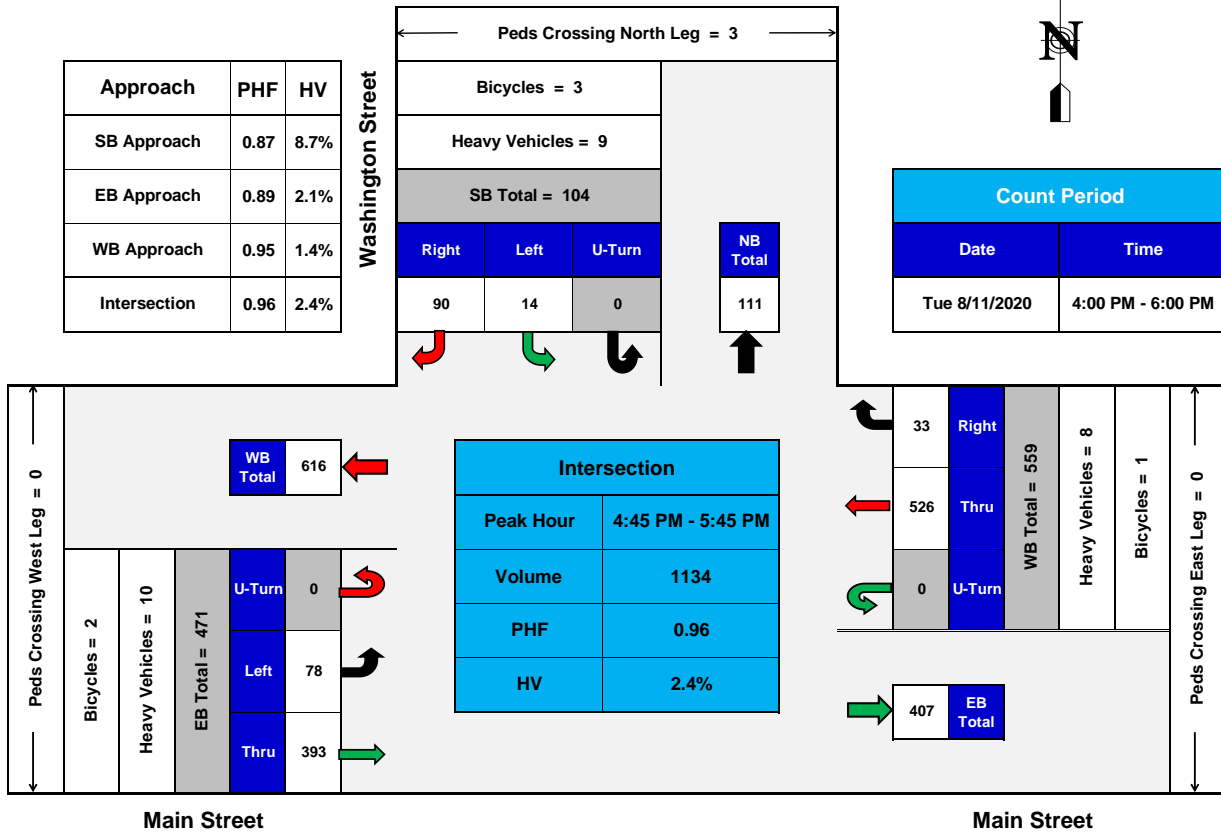


PHF = Peak Hour Factor
 HV = Heavy Vehicles

**TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY**



**Washington Street @ Main Street
Ferndale, WA**

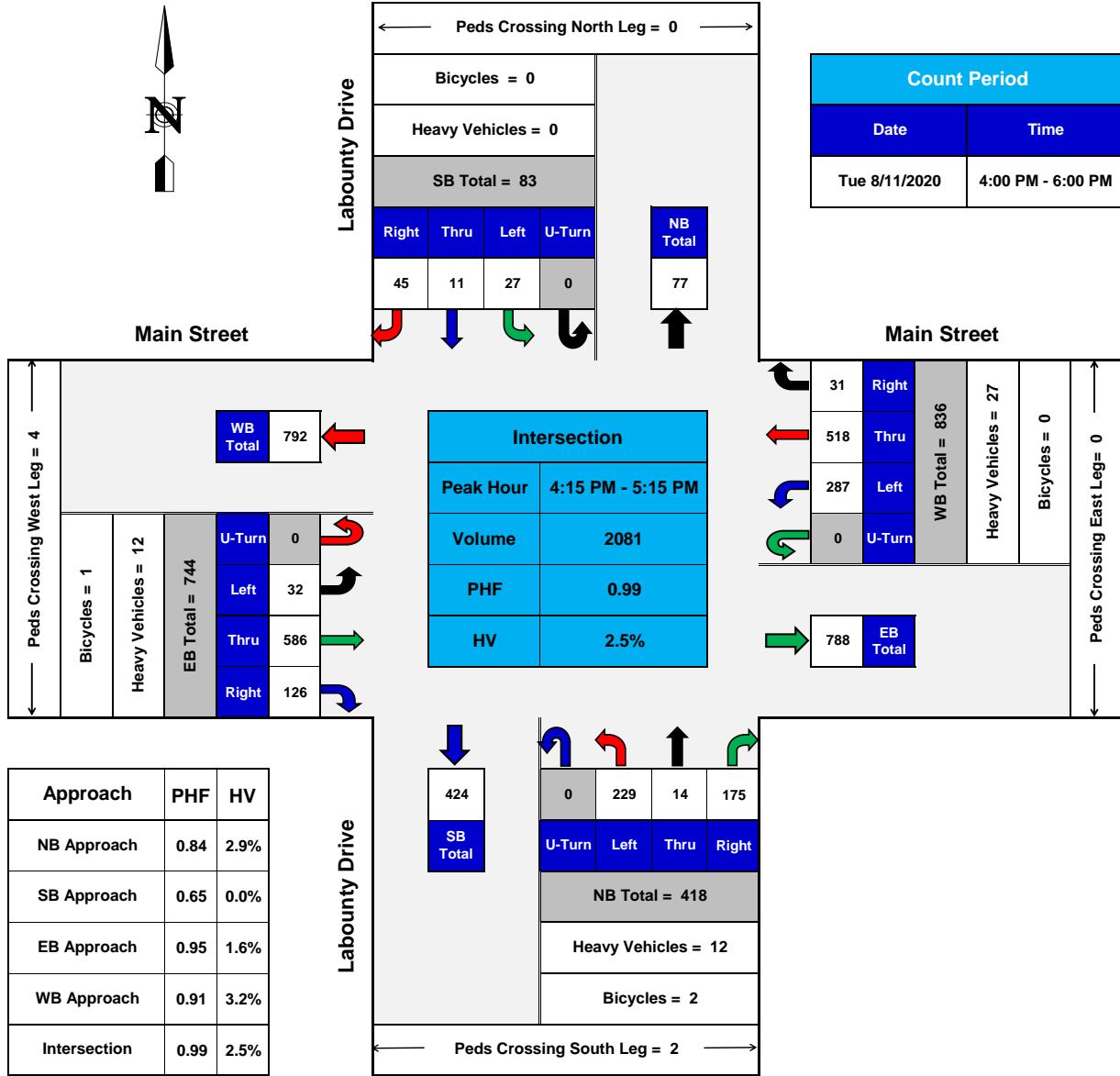


PHF = Peak Hour Factor
HV = Heavy Vehicles

**TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY**



Labounty Drive @ Main Street Ferndale, WA



**TURNING MOVEMENTS DIAGRAM
PEAK HOUR SUMMARY**

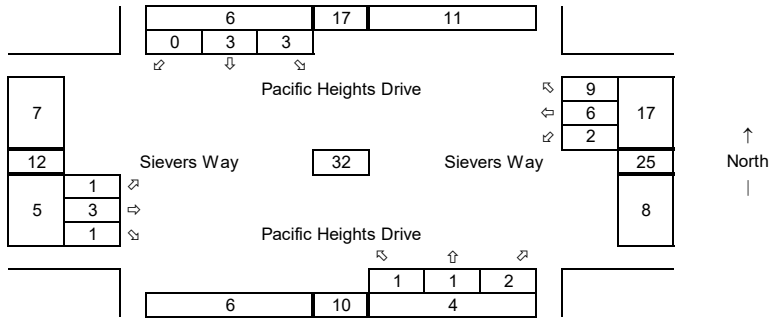


1 Sievers Way at Pac Heights Dr

Synchro ID: 1
Existing Volumes
 Average Weekday
 PM Peak-Hour

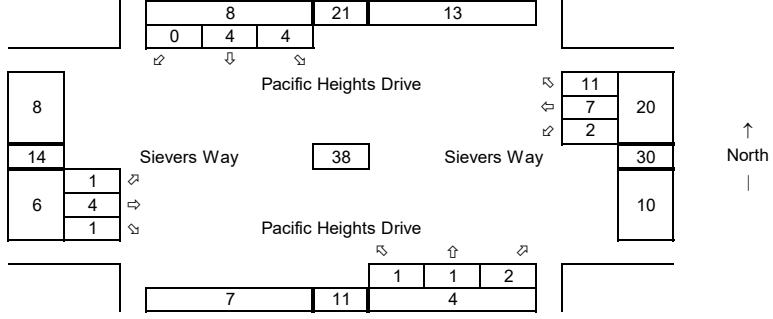
 Year: **8/11/2020**

 Data Source: **TDG**

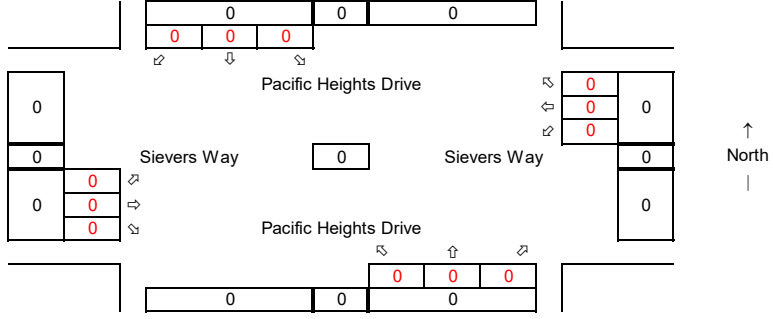


Baseline Volumes
 Average Weekday
 PM Peak-Hour

 Year: **2026**
 Growth Rate = **3.0%**
 Years of Growth = 6
 Total Growth = 1.1941



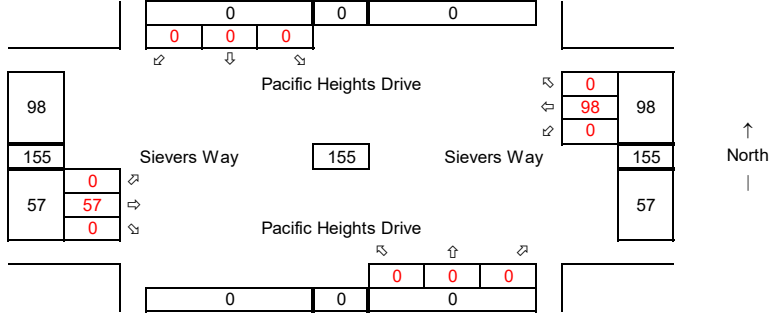
Development Volumes
 Average Weekday
 PM Peak-Hour



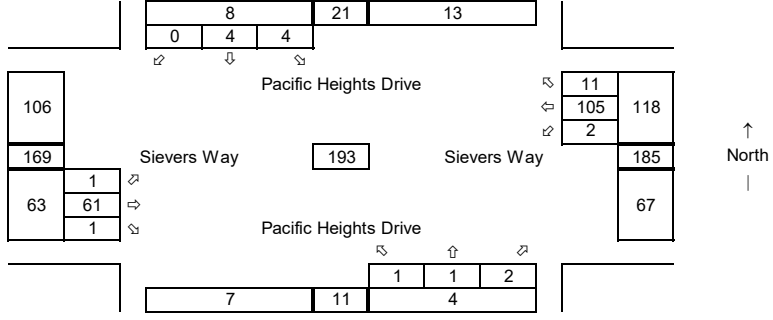
Development Volumes
 Average Weekday
 PM Peak-Hour

Meadows Development
 157 Units

 Total: 155
 Inbound: 98
 Outbound: 57

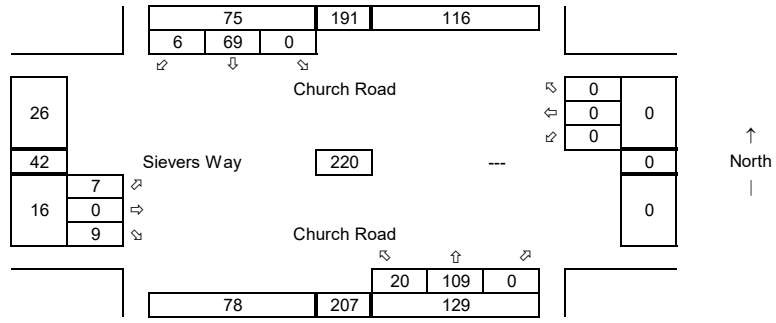


Future w Dev Volumes
 Average Weekday
 PM Peak-Hour

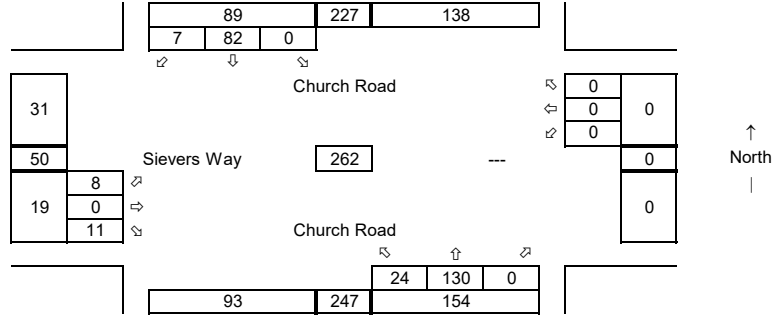


2 Sievers Way at Church Rd

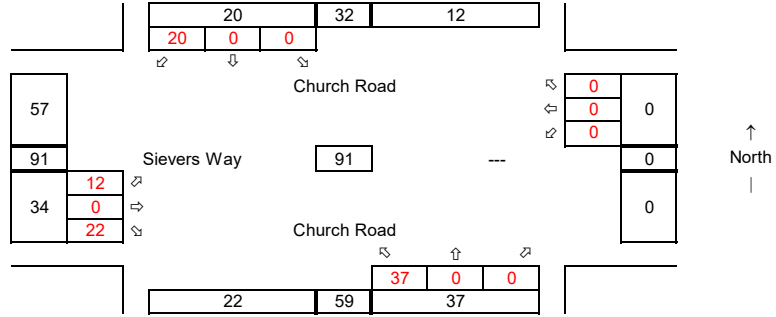
Synchro ID: 2
Existing Volumes
 Average Weekday
 PM Peak-Hour
 Year: 8/11/2020
 Data Source: TDG



Baseline Volumes
 Average Weekday
 PM Peak-Hour
 Year: 2026
 Growth Rate = 3.0%
 Years of Growth = 6
 Total Growth = 1.1941

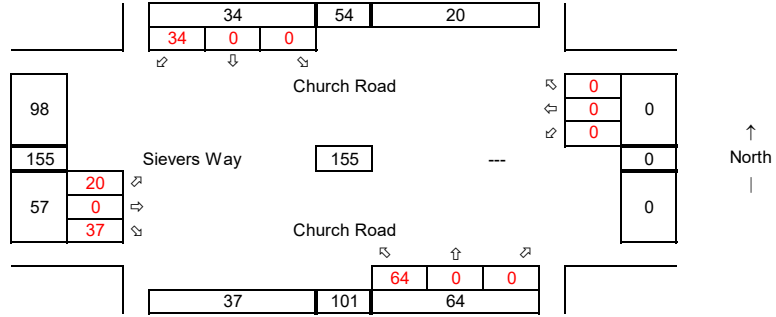


Development Volumes
 Average Weekday
 PM Peak-Hour

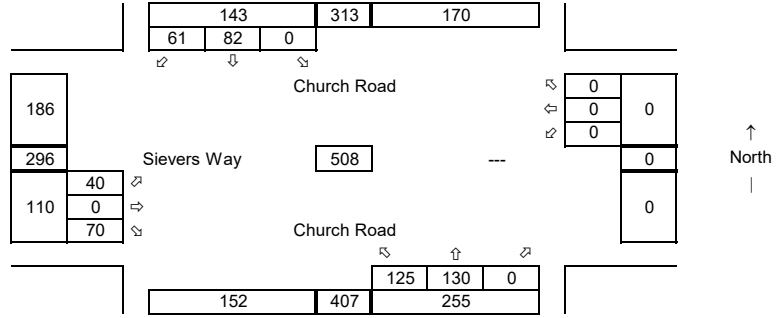


Development Volumes
 Average Weekday
 PM Peak-Hour

Meadows Development
 157 Units
 Total: 155
 Inbound: 98
 Outbound: 57



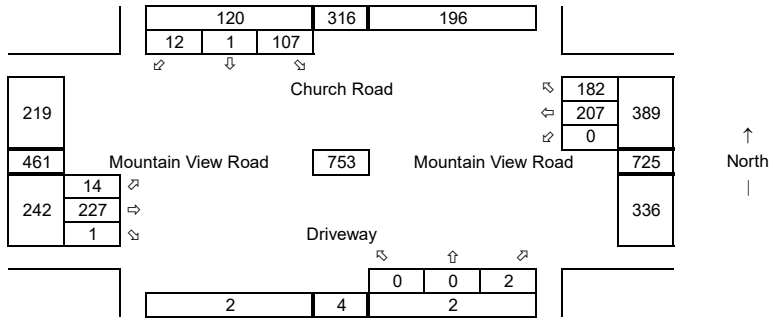
Future w Dev Volumes
 Average Weekday
 PM Peak-Hour



3 Mtn View Rd at Church Rd

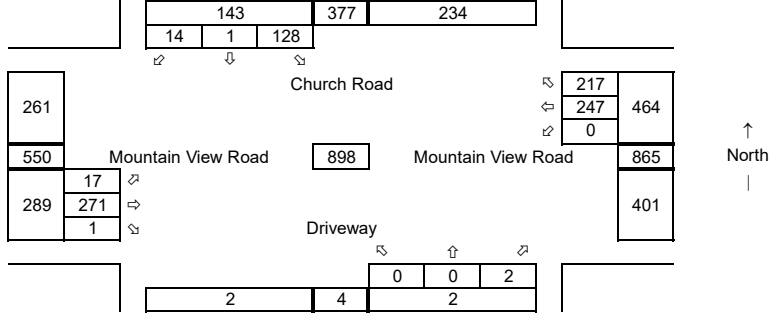
Synchro ID: 3
Existing Volumes
 Average Weekday
 PM Peak-Hour

 Year: **8/11/2020**
 Data Source: **TDG**

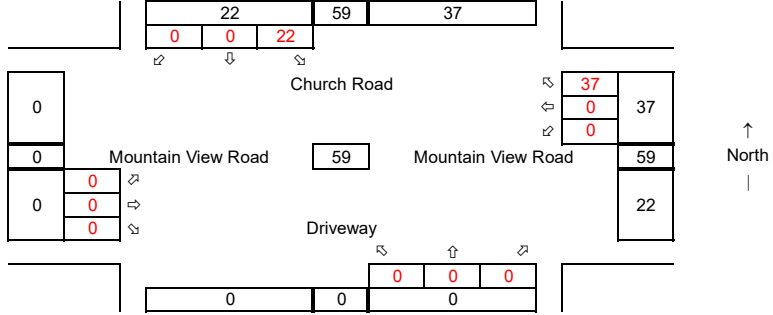


Baseline Volumes
 Average Weekday
 PM Peak-Hour

 Year: 2026
 Growth Rate = 3.0%
 Years of Growth = 6
 Total Growth = 1.1941



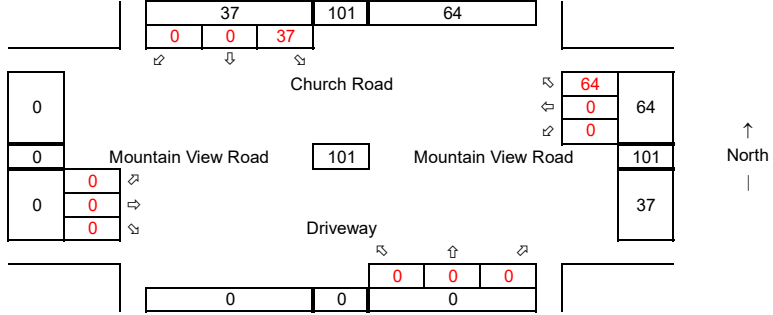
Development Volumes
 Average Weekday
 PM Peak-Hour



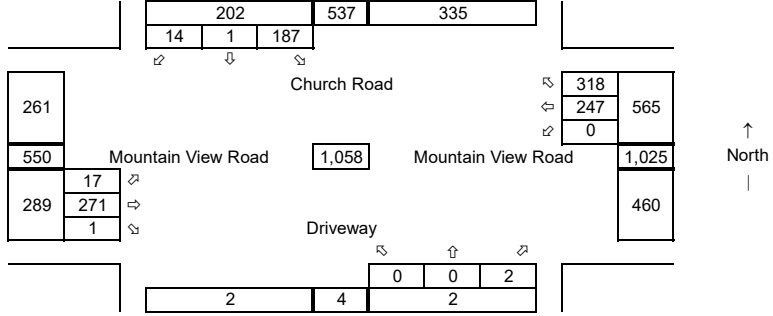
Development Volumes
 Average Weekday
 PM Peak-Hour

Meadows Development
 157 Units

 Total: 155
 Inbound: 98
 Outbound: 57

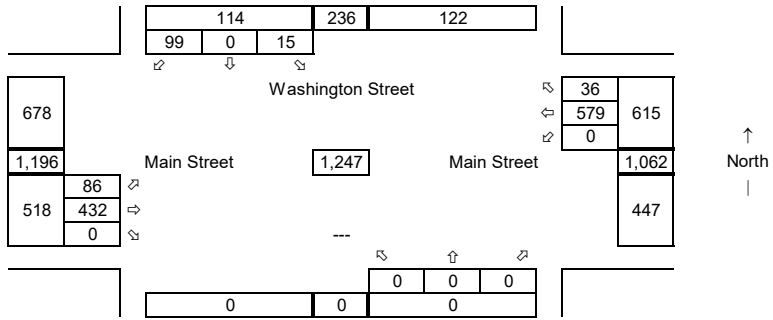


Future w Dev Volumes
 Average Weekday
 PM Peak-Hour

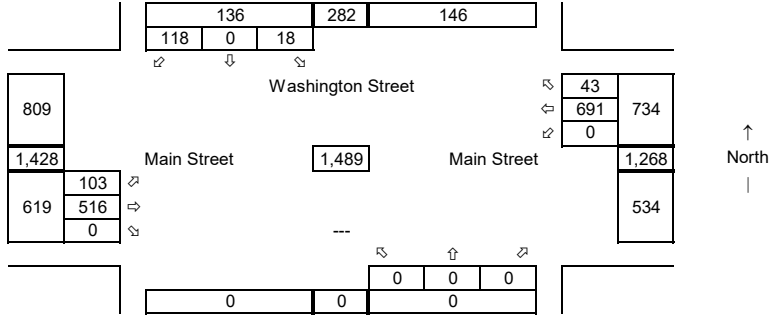


5 Main St at Washington St

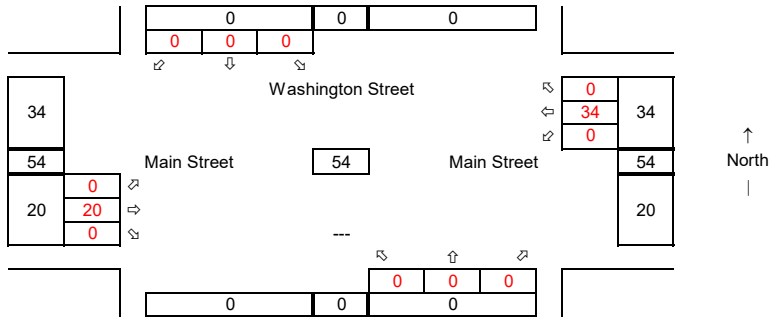
Synchro ID: 5
Existing Volumes
 Average Weekday
 PM Peak-Hour
 Year: 8/11/2020
 Data Source: TDG



Baseline Volumes
 Average Weekday
 PM Peak-Hour
 Year: 2026
 Growth Rate = 3.0%
 Years of Growth = 6
 Total Growth = 1.1941

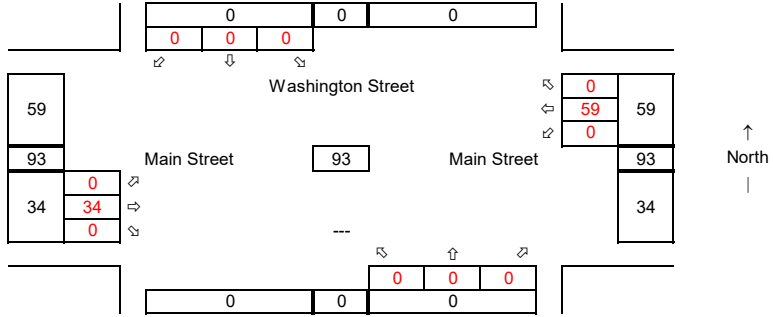


Development Volumes
 Average Weekday
 PM Peak-Hour

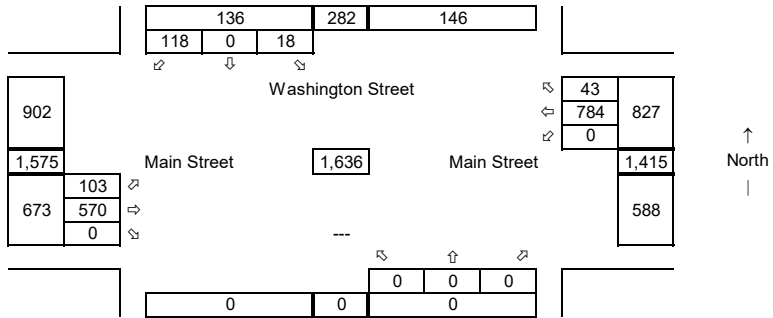


Development Volumes
 Average Weekday
 PM Peak-Hour

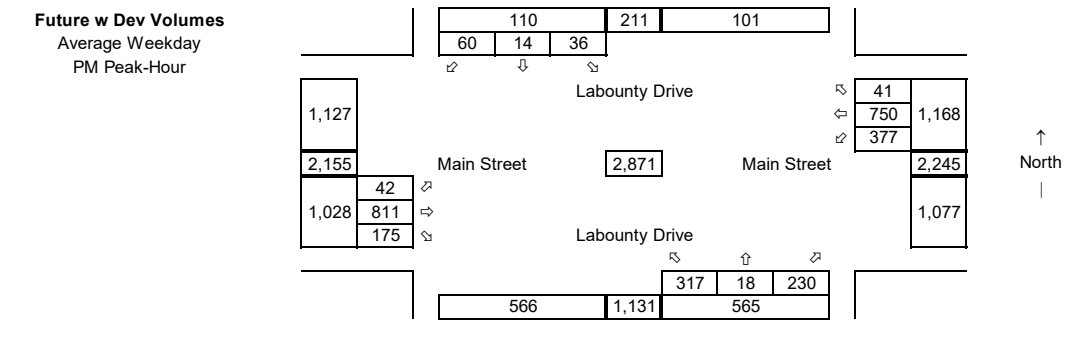
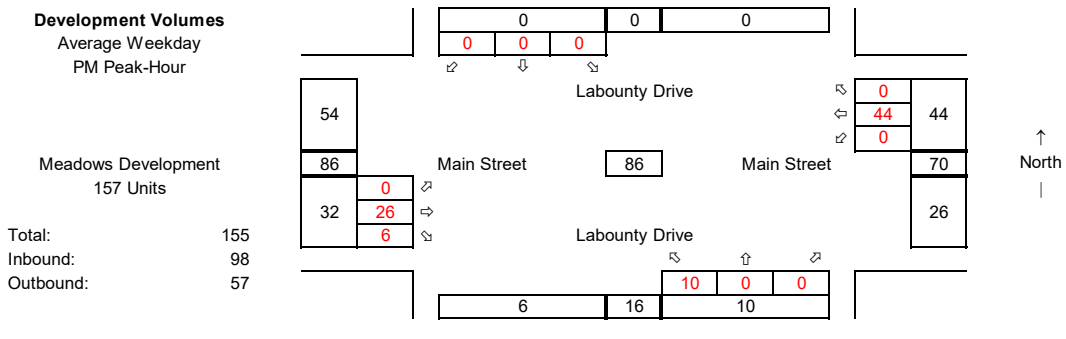
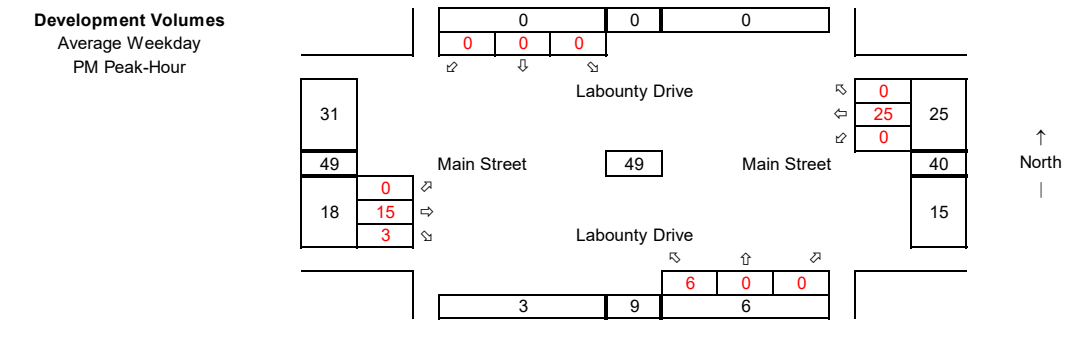
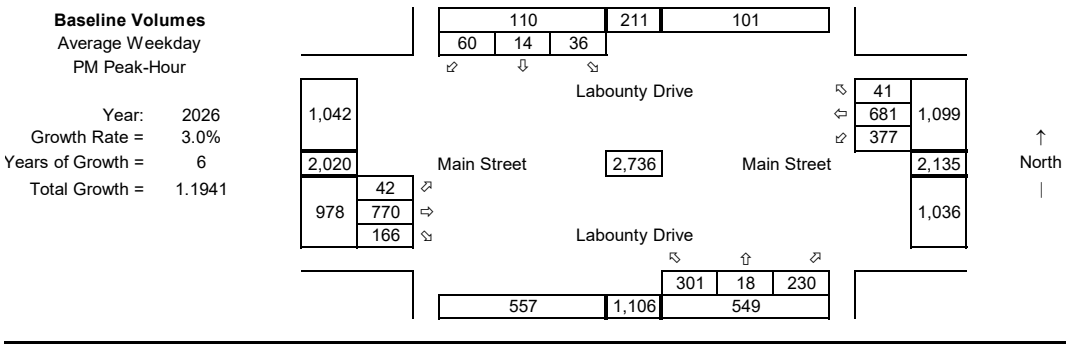
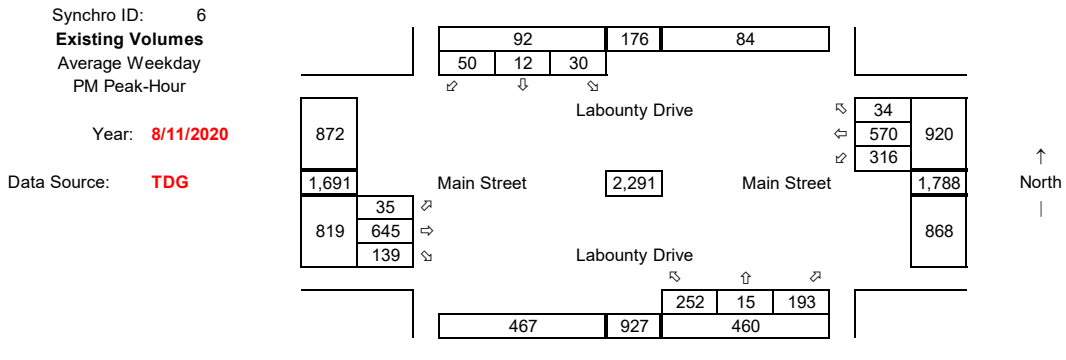
Meadows Development
 157 Units
 Total: 155
 Inbound: 98
 Outbound: 57



Future w Dev Volumes
 Average Weekday
 PM Peak-Hour



6 Main St at Labounty Dr



TRAFFIC DATA GATHERING
LAKE STEVENS, WA 98258 (425) 334-3348
EMAIL: Carlan@Trafficdatagathering.com

Location : Sievers Way w/o Sievers Court
 City, State : Ferndale, WA
 Counter # : NT-2808

Site: Loc 01
 8/11/2020
 Tuesday

24 Hour Speed

EB

mph	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
12:00 PM	3	1	1	0	0	0	0	0	0	0	0	0	0	17.4
1:00 PM	4	1	0	1	0	0	0	0	0	0	0	0	0	19.4
2:00 PM	7	1	3	2	1	0	0	0	0	0	0	0	0	20.8
3:00 PM	7	2	3	2	0	0	0	0	0	0	0	0	0	17.4
4:00 PM	11	0	8	3	0	0	0	0	0	0	0	0	0	19.0
5:00 PM	11	4	4	3	0	0	0	0	0	0	0	0	0	17.1
6:00 PM	15	1	10	4	0	0	0	0	0	0	0	0	0	17.7
7:00 PM	6	1	3	1	1	0	0	0	0	0	0	0	0	19.4
8:00 PM	3	0	0	0	0	0	0	0	0	0	0	0	0	14.4
9:00 PM	4	0	2	2	0	0	0	0	0	0	0	0	0	19.8
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	-
11:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	-
8/12/2020														
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	-
1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	-
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	-
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	-
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	-
5:00 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	19.3
6:00 AM	9	2	3	3	1	0	0	0	0	0	0	0	0	19.6
7:00 AM	13	1	6	5	1	0	0	0	0	0	0	0	0	19.6
8:00 AM	8	1	5	2	0	0	0	0	0	0	0	0	0	18.4
9:00 AM	7	1	4	1	0	1	0	0	0	0	0	0	0	20.3
10:00 AM	8	3	5	0	0	0	0	0	0	0	0	0	0	16.0
11:00 AM	12	1	9	1	1	0	0	0	0	0	0	0	0	18.4
Total	129	23	69	30	6	1	0	0	0	0	0	0	0	18.5
%	17.8	53.5	23.3	4.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average (Mean) 18.5 mph **Minimum** 10.8 mph **Maximum** 32.7 mph **Pace Range** 12.9 - 22.9 mph 111 vehicles (86.0%)

Percentile Speeds (mph) **10%** 13.9 **15%** 14.4 **50%** 18.2 **85%** 21.9 **90%** 23.1 **95%** 24.9

Speeds Exceeded **25 mph** 5.4% (7) **35 mph** 0% (0) **45 mph** 0% (0) **55 mph** 0% (0) **65 mph** 0% (0) **75 mph** 0% (0)

TRAFFIC DATA GATHERING
LAKE STEVENS, WA 98258 (425) 334-3348
EMAIL: Carlan@Trafficdatagathering.com

Location : Sievers Way w/o Sievers Court
 City, State : Ferndale, WA
 Counter # : NT-2808

Site: Loc 01
 8/11/2020
 Tuesday

24 Hour Speed

WB

mph	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
12:00 PM	9	2	4	2	1	0	0	0	0	0	0	0	0	23.1
1:00 PM	9	2	2	1	1	0	0	0	0	0	0	0	0	19.8
2:00 PM	6	4	1	0	0	0	0	0	0	0	0	0	0	17.6
3:00 PM	13	3	7	1	0	0	0	0	0	0	0	0	0	20.8
4:00 PM	20	8	6	3	0	0	0	0	0	0	0	0	0	19.4
5:00 PM	17	10	2	0	0	0	0	0	0	0	0	0	0	17.0
6:00 PM	26	3	19	1	0	0	0	0	0	0	0	0	0	17.7
7:00 PM	11	2	5	4	0	0	0	0	0	0	0	0	0	17.8
8:00 PM	11	3	5	2	1	0	0	0	0	0	0	0	0	17.7
9:00 PM	2	0	2	0	0	0	0	0	0	0	0	0	0	19.0
10:00 PM	3	2	0	1	0	0	0	0	0	0	0	0	0	15.7
11:00 PM	3	0	2	1	0	0	0	0	0	0	0	0	0	19.3
8/12/2020														
12:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	14.9
1:00 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	26.0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	-
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	-
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	-
5:00 AM	2	0	1	1	0	0	0	0	0	0	0	0	0	19.8
6:00 AM	1	0	1	0	0	0	0	0	0	0	0	0	0	15.6
7:00 AM	5	3	0	1	1	0	0	0	0	0	0	0	0	18.9
8:00 AM	6	1	3	2	0	0	0	0	0	0	0	0	0	18.0
9:00 AM	4	0	3	0	1	0	0	0	0	0	0	0	0	20.2
10:00 AM	8	4	4	0	0	0	0	0	0	0	0	0	0	15.1
11:00 AM	7	1	5	1	0	0	0	0	0	0	0	0	0	17.9
Total	165	79	38	11	3	0	0	0	0	0	0	0	0	18.5
%	20.6	47.9	23.0	6.7	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Average (Mean) 18.5 mph **Minimum** 10.4 mph **Maximum** 30.9 mph **Pace Range** 12.9 - 22.9 mph 134 vehicles (81.2%)

Percentile Speeds (mph) **10%** 13.4 **15%** 13.8 **50%** 18.0 **85%** 22.4 **90%** 23.6 **95%** 27.4

Speeds Exceeded **25 mph** 8.5% (14) **35 mph** 0% (0) **45 mph** 0% (0) **55 mph** 0% (0) **65 mph** 0% (0) **75 mph** 0% (0)

Level of Service Calculations

HCM 6th AWSC
 1: Pacific Heights Drive & Sievers Way

Nubgaard Development

Intersection

Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	1	4	1	2	6	10	1	1	2	4	4	0
Future Vol, veh/h	1	4	1	2	6	10	1	1	2	4	4	0
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	1	5	1	3	8	13	1	1	3	5	5	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	7.1			6.9			6.9			7.3		
HCM LOS	A			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	17%	11%	50%
Vol Thru, %	25%	67%	33%	50%
Vol Right, %	50%	17%	56%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	6	18	8
LT Vol	1	1	2	4
Through Vol	1	4	6	4
RT Vol	2	1	10	0
Lane Flow Rate	5	8	24	11
Geometry Grp	1	1	1	1
Degree of Util (X)	0.006	0.009	0.025	0.013
Departure Headway (Hd)	3.882	4.048	3.792	4.229
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	924	886	947	849
Service Time	1.897	2.062	1.804	2.242
HCM Lane V/C Ratio	0.005	0.009	0.025	0.013
HCM Control Delay	6.9	7.1	6.9	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0

HCM 6th TWSC
2: Church Road & Sievers Way

Nubgaard Development

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
----------	-----	-----	-----	-----	-----	-----

Lane Configurations						
Traffic Vol, veh/h	7	10	21	118	75	6
Future Vol, veh/h	7	10	21	118	75	6
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	7	10	22	123	78	6

Major/Minor	Minor2	Major1	Major2
-------------	--------	--------	--------

Conflicting Flow All	249	82	85	0	-	0
Stage 1	82	-	-	-	-	-
Stage 2	167	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-	-
Pot Cap-1 Maneuver	737	975	1505	-	-	-
Stage 1	939	-	-	-	-	-
Stage 2	860	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	724	974	1504	-	-	-
Mov Cap-2 Maneuver	724	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	859	-	-	-	-	-

Approach	EB	NB	SB
----------	----	----	----

HCM Control Delay, s	9.3	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
-----------------------	-----	-----	-------	-----	-----

Capacity (veh/h)	1504	-	853	-	-
HCM Lane V/C Ratio	0.015	-	0.021	-	-
HCM Control Delay (s)	7.4	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 6th TWSC
 3: Church Road & Mountain View Road

Nubgaard Development

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔		↔	↔	↔
Traffic Vol, veh/h	16	246	1	0	224	197	0	0	2	116	1	13
Future Vol, veh/h	16	246	1	0	224	197	0	0	2	116	1	13
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	300	-	-	-	200	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	17	259	1	0	236	207	0	0	2	122	1	14
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	443	0	0	261	0	0	642	738	261	531	531	236
Stage 1	-	-	-	-	-	-	295	295	-	236	236	-
Stage 2	-	-	-	-	-	-	347	443	-	295	295	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1107	-	-	1292	-	-	384	343	773	456	451	798
Stage 1	-	-	-	-	-	-	709	665	-	763	706	-
Stage 2	-	-	-	-	-	-	665	572	-	709	665	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1107	-	-	1291	-	-	371	336	772	449	442	798
Mov Cap-2 Maneuver	-	-	-	-	-	-	371	336	-	449	442	-
Stage 1	-	-	-	-	-	-	696	652	-	749	706	-
Stage 2	-	-	-	-	-	-	653	572	-	694	652	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0			9.7			15.3		
HCM LOS							A			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3		
Capacity (veh/h)	772	1107	-	-	1291	-	-	449	442	798		
HCM Lane V/C Ratio	0.003	0.015	-	-	-	-	-	0.272	0.002	0.017		
HCM Control Delay (s)	9.7	8.3	0	-	0	-	-	16	13.2	9.6		
HCM Lane LOS	A	A	A	-	A	-	-	C	B	A		
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	1.1	0	0.1		

Lanes, Volumes, Timings
4: Douglas Road & Mountain View Road/Main Street

Nubgaard Development

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	387	176	541	88	159	159
Traffic Volume (vph)	387	25	176	541	88	159
Future Volume (vph)	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	0	125	100	0	0	0
Storage Length (ft)	0	1	1	1	1	1
Taper Length (ft)	0	25	25	25	25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.992	1.00	0.99	0.99	0.850
Flt Protected	1845	0	1770	1863	1770	1583
Satd. Flow (prot)	1845	0	1770	1863	1770	1583
Flt Permitted	1845	0	1770	1863	1770	1583
Satd. Flow (perm)	1845	0	1770	1863	1770	1583
Right Turn on Red	6	Yes	6	6	6	166
Satd. Flow (RTOR)	35	35	35	35	35	166
Link Speed (mph)	3176	3176	3176	3176	3176	3176
Link Distance (ft)	61.9	61.9	61.9	61.9	61.9	61.9
Travel Time (s)	0.96	0.96	0.96	0.96	0.96	0.96
Confl. Peds. (#/hr)	403	26	183	564	92	166
Peak Hour Factor	NA	NA	NA	NA	NA	NA
Adj. Flow (vph)	429	0	183	564	92	166
Shared Lane Traffic (%)	2	2	2	2	2	2
Lane Group Flow (vph)	2	2	2	2	2	2
Turn Type	Protected Phases	Permitted Phases	Detector Phase	Switch Phase	Minimum Initial (s)	Minimum Split (s)
Protected Phases	2	2	2	2	2	2
Permitted Phases	2	2	2	2	2	2
Detector Phase	2	2	2	2	2	2
Switch Phase	6.0	33.0	11.0	23.0	27.0	27.0
Minimum Initial (s)	54.0	18.0	36.0	18.0	18.0	18.0
Minimum Split (s)	60.0%	20.0%	40.0%	20.0%	20.0%	20.0%
Total Split (%)	49.0	13.0	31.0	13.0	13.0	13.0
Maximum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Yellow Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	Lag	Lead	Lead	Lead	Lead	Lead
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	Max	None	Max	None	None	None
Recall Mode	8.0	8.0	8.0	8.0	8.0	8.0
Walk Time (s)	20.0	10.0	14.0	14.0	14.0	14.0
Flash Don't Walk (s)	0	0	0	0	0	0
Pedestrian Calls (#/hr)	0.60	0.76	0.76	0.12	0.12	0.12
Act Effect Green (s)	0.38	0.27	0.40	0.45	0.50	0.50
Actuated g/C Ratio	10.1	3.9	4.6	4.6	4.10	4.10
v/c Ratio						
Control Delay						

2020 Existing Conditions
Gibson Traffic Consultants, Inc. [BJL 20-092]

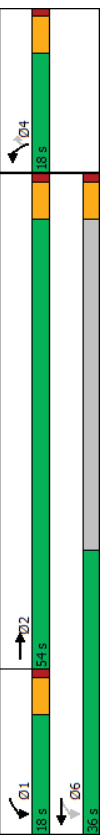
PM Peak-Hour

Lanes, Volumes, Timings
4: Douglas Road & Mountain View Road/Main Street

Nubgaard Development

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	3.9	4.6	4.6	41.0	11.6
LOS	B	A	A	A	D	B
Approach Delay	10.1	4.4	4.4	4.4	22.0	
Approach LOS	B	A	A	A	C	
Queue Length 50th (ft)	100	19	76	44	0	0
Queue Length 95th (ft)	187	41	143	91	54	54
Internal Link Dist (ft)	3096	338	3232			
Turn Bay Length (ft)	1115	748	1536	283	392	
Base Capacity (vph)	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.24	0.37	0.33	0.42	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 81.4
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.50
Intersection Signal Delay: 9.3
Intersection LOS: A
Analysis Period (min): 15
Intersection Capacity Utilization: 50.6%



Spills and Phases: 4: Douglas Road & Mountain View Road/Main Street

2020 Existing Conditions
Gibson Traffic Consultants, Inc. [BJL 20-092]

PM Peak-Hour

HCM 6th TWSC
 5: Main Street & Washington Street

Nubgaard Development

Intersection

Int Delay, s/veh	2.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	93	469	628	39	17	107
Future Vol, veh/h	93	469	628	39	17	107
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	489	654	41	18	111

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	698	0	-	0	1361 678
Stage 1	-	-	-	-	678 -
Stage 2	-	-	-	-	683 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	898	-	-	-	163 452
Stage 1	-	-	-	-	504 -
Stage 2	-	-	-	-	502 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	895	-	-	-	145 451
Mov Cap-2 Maneuver	-	-	-	-	282 -
Stage 1	-	-	-	-	448 -
Stage 2	-	-	-	-	500 -

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	17.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	895	-	-	-	417
HCM Lane V/C Ratio	0.108	-	-	-	0.31
HCM Control Delay (s)	9.5	-	-	-	17.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	1.3

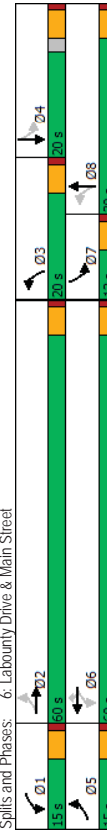
Lanes, Volumes, Timings
6: Labounty Drive & Main Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	14.7	30.8	152.3	34.5	0.1	29.2	7.5	24.5	15.5			
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Delay	14.7	30.8	152.3	34.5	0.1	29.2	7.5	24.5	15.5			
LOS	B	C	F	C	A	C	A	C	B			
Approach Delay		30.1	73.7			19.4			18.4			
Approach LOS		C	E			B			B			
Queue Length 50th (ft)	13	25.5	-218	39.2	0	13.4	8	13	7			
Queue Length 95th (ft)	29	319	#428	556	0	246	75	39	49			
Internal Link Dist (ft)		5400	1894			1414			785			
Turn Bay Length (ft)			300			600			50			
Base Capacity (vph)		288	281	967	897	536	681		377			
Starvation Cap Reductn		0	0	0	0	0	0		0			
Spillback Cap Reductn		0	0	0	0	0	0		0			
Storage Cap Reductn		0	0	0	0	0	0		0			
Reduced v/c Ratio	0.13	0.48	1.23	0.65	0.04	0.51	0.33		0.08			

Intersection Summary

Area Type: Other
 Cycle Length: 117
 Actuated Cycle Length: 106.5
 Natural Cycle: 85
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.23
 Intersection Signal Delay: 45.0
 Intersection Capacity Utilization: 82.3%
 Analysis Period (min): 15
 Intersection LOS: D
 ICU Level of Service: E

- Volume exceeds capacity, queue is theoretically infinite.
 - Queue shown is maximum after two cycles.
 - # 95th percentile volume exceeds capacity, queue may be longer.
 - Queue shown is maximum after two cycles.



Lanes, Volumes, Timings
6: Labounty Drive & Main Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	38	700	150	343	619	37	273	17	209	32	13	54
Traffic Volume (vph)	38	700	150	343	619	37	273	17	209	32	13	54
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	0	1000	300	300	600	300	300	0	50	0	0	0
Storage Length (ft)	1	2	1	1	1	1	1	1	1	1	1	1
Storage Lanes	25	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Taper Length (ft)	1.00	0.973	0.950	1.752	1845	1752	1588	0	1752	1583	0	0
Lane Util. Factor	0.950	0.183	0.158	0.158	0.158	0.158	0.158	0	0.616	0.616	0	0
Ped Bike Factor	0.973	338	3395	0	291	1845	1588	0	1136	1583	0	0
Flt Protected		29	35			159	211		55			
Satd. Flow (prot)	1752	3395	0	1752	1845	1568	1752	1588	0	1752	1583	0
Flt Permitted	0.183	338	3395	0	291	1845	1588	0	1136	1583	0	0
Satd. Flow (perm)		29	35			159	211		55			
Right Turn on Red		0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Satd. Flow (RTOR)		38	707	152	346	625	37	276	211	32	13	55
Link Speed (mph)		38	859	0	346	625	37	276	228	0	32	68
Link Distance (ft)		pm-plt	NA	pm-plt	NA	Perm	pm-plt	NA	pm-plt	NA	pm-plt	NA
Travel Time (s)		5	2	1	6	6	8	8	4	7	4	4
Confl. Peds. (#/hr)		5	2	1	6	6	8	8	4	7	4	4
Peak Hour Factor		0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)		3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)		38	707	152	346	625	37	276	211	32	13	55
Shared Lane Traffic (%)		38	859	0	346	625	37	276	228	0	32	68
Lane Group Flow (vph)		pm-plt	NA	pm-plt	NA	Perm	pm-plt	NA	pm-plt	NA	pm-plt	NA
Turn Type		5	2	1	6	6	8	8	4	7	4	4
Protected Phases		5	2	1	6	6	8	8	4	7	4	4
Permitted Phases		5	2	1	6	6	8	8	4	7	4	4
Detector Phase		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Switch Phase		11.0	31.0	11.0	23.0	11.0	23.0	11.0	29.0	11.0	29.0	11.0
Minimum Initial (s)		15.0	60.0	15.0	60.0	20.0	30.0	12.0	20.0	12.0	20.0	12.0
Minimum Split (s)		12.8%	51.3%	12.8%	51.3%	17.1%	25.6%	10.3%	17.1%	10.3%	17.1%	10.3%
Total Split (%)		10.0	55.0	10.0	55.0	15.0	25.0	7.0	15.0	7.0	15.0	7.0
Maximum Green (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Yellow Time (s)		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
All-Red Time (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)		Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead/Lag		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?		3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0
Vehicle Extension (s)		None	None	None	None	None	None	None	None	None	None	None
Recall Mode		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Walk Time (s)		19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Flash Dont Walk (s)		0	0	0	0	0	0	0	0	0	0	0
Pedestrian Calls (#/hr)		45.1	38.2	52.0	46.5	46.5	42.9	36.4	30.9	24.4	24.4	24.4
Act Effct Green (s)		0.42	0.36	0.49	0.44	0.44	0.40	0.34	0.29	0.23	0.23	0.23
Actuated G/C Ratio		0.16	0.70	1.23	0.78	0.78	0.65	0.53	0.49	0.33	0.33	0.33
v/c Ratio												

Intersection Summary

Area Type: Other
 Cycle Length: 117
 Actuated Cycle Length: 106.5
 Natural Cycle: 85
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.23
 Intersection Signal Delay: 45.0
 Intersection Capacity Utilization: 82.3%
 Analysis Period (min): 15
 Intersection LOS: D
 ICU Level of Service: E

- Volume exceeds capacity, queue is theoretically infinite.
 - Queue shown is maximum after two cycles.
 - # 95th percentile volume exceeds capacity, queue may be longer.
 - Queue shown is maximum after two cycles.



2020 Existing Conditions

Gibson Traffic Consultants, Inc. [B.U.L. 20-092]

2020 Existing Conditions

Gibson Traffic Consultants, Inc. [B.U.L. 20-092]

HCM 6th AWSC
 1: Pacific Heights Drive & Sievers Way

Nubgaard Development

Intersection

Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	1	4	1	2	7	11	1	1	2	4	4	0
Future Vol, veh/h	1	4	1	2	7	11	1	1	2	4	4	0
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	1	5	1	3	9	15	1	1	3	5	5	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	7.1			6.9			6.9			7.3		
HCM LOS	A			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	17%	10%	50%
Vol Thru, %	25%	67%	35%	50%
Vol Right, %	50%	17%	55%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	6	20	8
LT Vol	1	1	2	4
Through Vol	1	4	7	4
RT Vol	2	1	11	0
Lane Flow Rate	5	8	27	11
Geometry Grp	1	1	1	1
Degree of Util (X)	0.006	0.009	0.028	0.013
Departure Headway (Hd)	3.888	4.051	3.793	4.235
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	922	886	946	848
Service Time	1.903	2.064	1.805	2.248
HCM Lane V/C Ratio	0.005	0.009	0.029	0.013
HCM Control Delay	6.9	7.1	6.9	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0	0.1	0

HCM 6th TWSC
2: Church Road & Sievers Way

Nubgaard Development

Intersection

Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	11	24	130	82	7
Future Vol, veh/h	8	11	24	130	82	7
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	8	11	25	135	85	7

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	275	90	93	0	0
Stage 1	90	-	-	-	-
Stage 2	185	-	-	-	-
Critical Hdwy	6.43	6.23	4.13	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-
Pot Cap-1 Maneuver	712	965	1495	-	-
Stage 1	931	-	-	-	-
Stage 2	844	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	698	964	1494	-	-
Mov Cap-2 Maneuver	698	-	-	-	-
Stage 1	914	-	-	-	-
Stage 2	843	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1494	-	831	-	-
HCM Lane V/C Ratio	0.017	-	0.024	-	-
HCM Control Delay (s)	7.5	-	9.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

HCM 6th TWSC
 3: Church Road & Mountain View Road

Nubgaard Development

Intersection

Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔		↔	↔	↔
Traffic Vol, veh/h	17	271	1	0	247	217	0	0	2	128	1	14
Future Vol, veh/h	17	271	1	0	247	217	0	0	2	128	1	14
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	300	-	-	-	200	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	18	285	1	0	260	228	0	0	2	135	1	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	488	0	0	287	0	0	705	811	287	583	583	260
Stage 1	-	-	-	-	-	-	323	323	-	260	260	-
Stage 2	-	-	-	-	-	-	382	488	-	323	323	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1065	-	-	1264	-	-	349	311	747	421	421	774
Stage 1	-	-	-	-	-	-	685	647	-	740	689	-
Stage 2	-	-	-	-	-	-	636	547	-	685	647	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1065	-	-	1263	-	-	336	304	746	413	412	774
Mov Cap-2 Maneuver	-	-	-	-	-	-	336	304	-	413	412	-
Stage 1	-	-	-	-	-	-	671	633	-	725	689	-
Stage 2	-	-	-	-	-	-	623	547	-	669	633	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0	9.8	17.1
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	746	1065	-	-	1263	-	-	413	412	774
HCM Lane V/C Ratio	0.003	0.017	-	-	-	-	-	0.326	0.003	0.019
HCM Control Delay (s)	9.8	8.4	0	-	0	-	-	17.9	13.8	9.7
HCM Lane LOS	A	A	A	-	A	-	-	C	B	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	1.4	0	0.1

Lanes, Volumes, Timings
4: Douglas Road & Mountain View Road/Main Street

Nubgaard Development

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	425	27	193	595	97	174
Traffic Volume (vph)	425	27	193	595	97	174
Future Volume (vph)	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	0	125	0	100	0	0
Storage Length (ft)	0	1	1	1	1	1
Storage Lanes	1	0	25	25	0	0
Taper Length (ft)	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	0.99	0.850
Ped Bike Factor	0.992					
Flt Protected	1845	0	1770	1863	1770	1583
Satd. Flow (prot)	1845	0	1770	1863	1770	1583
Flt Permitted	1845	0	1770	1863	1770	1583
Satd. Flow (perm)	5	Yes	702	1863	1752	1583
Right Turn on Red	35					181
Satd. Flow (RTOR)	3176					181
Link Speed (mph)	61.9					181
Link Distance (ft)	0.96					0.96
Travel Time (s)	443	28	201	620	101	181
Confl. Peds. (#/hr)	NA	0	201	620	101	181
Peak Hour Factor	2	pm-pt	6	6	4	4
Adj. Flow (vph)	2	6	6	6	4	4
Shared Lane Traffic (%)	2	6	6	6	4	4
Lane Group Flow (vph)	2	6	6	6	4	4
Turn Type	2	6	6	6	4	4
Protected Phases	2	6	6	6	4	4
Permitted Phases	2	6	6	6	4	4
Detector Phase	2	6	6	6	4	4
Switch Phase	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Initial (s)	33.0	11.0	23.0	27.0	27.0	27.0
Vehicle Split (s)	47.0	16.0	63.0	27.0	27.0	27.0
Total Split (s)	52.2%	17.8%	70.0%	30.0%	30.0%	30.0%
Total Split (%)	42.0	11.0	58.0	22.0	22.0	22.0
Maximum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0
Yellow Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	Lag	Lead	Lead	Lead	Lead	Lead
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	Max	None	Max	None	None	None
Recall Mode	8.0	8.0	8.0	8.0	8.0	8.0
Walk Time (s)	20.0	10.0	14.0	14.0	14.0	14.0
Flash Don't Walk (s)	0	0	0	0	0	0
Pedestrian Calls (#/hr)	44.9	58.1	9.7	9.7	9.7	9.7
Act Effct Green (s)	0.58	0.75	0.12	0.12	0.12	0.12
Actuated g/C Ratio	0.44	0.32	0.45	0.46	0.51	0.51
v/c Ratio	1.17	4.5	5.3	38.3	10.7	10.7
Control Delay						

2026 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL 20-092]

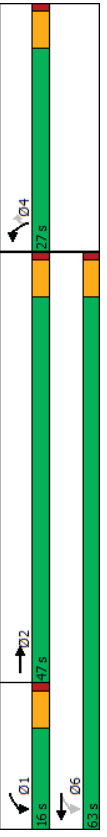
PM Peak-Hour

Lanes, Volumes, Timings
4: Douglas Road & Mountain View Road/Main Street

Nubgaard Development

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	4.5	5.3	38.3	10.7	10.7
LOS	B	A	A	D	B	B
Approach Delay	11.7	5.1	20.6			
Approach LOS	B	A	C			
Queue Length 50th (ft)	116	22	89	46	0	0
Queue Length 95th (ft)	222	47	172	92	53	53
Internal Link Dist (ft)	3096	338	3232			
Turn Bay Length (ft)	1066	125	675	1390	501	577
Base Capacity (vph)	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.30	0.45	0.20	0.31	0.31

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 77.8
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 9.9
Intersection LOS: A
Analysis Period (min): 15
ICU Level of Service: A



Spills and Phases: 4: Douglas Road & Mountain View Road/Main Street

2026 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL 20-092]

PM Peak-Hour

HCM 6th TWSC
 5: Main Street & Washington Street

Nubgaard Development

Intersection

Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	103	516	691	43	18	118
Future Vol, veh/h	103	516	691	43	18	118
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	107	538	720	45	19	123

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	768	0	-	0	1498
Stage 1	-	-	-	-	746
Stage 2	-	-	-	-	752
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	846	-	-	-	135
Stage 1	-	-	-	-	469
Stage 2	-	-	-	-	466
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	844	-	-	-	117
Mov Cap-2 Maneuver	-	-	-	-	251
Stage 1	-	-	-	-	408
Stage 2	-	-	-	-	465

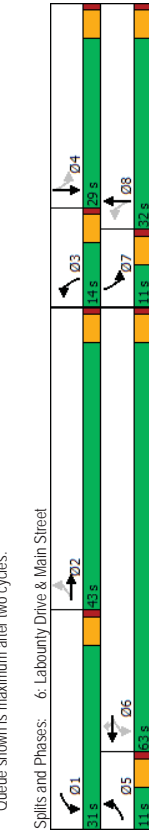
Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	20
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	844	-	-	-	380
HCM Lane V/C Ratio	0.127	-	-	-	0.373
HCM Control Delay (s)	9.9	-	-	-	20
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	1.7

Lanes, Volumes, Timings
6: Labounty Drive & Main Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	14.6	44.5	0.0	55.3	27.5	0.1	45.2	8.4	0.0	0.0	28.4	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	44.5	0.0	55.3	27.5	0.1	45.2	8.4	0.0	0.0	28.4	14.5
LOS	B	D	D	E	C	A	D	A	A	C	C	B
Approach Delay												
Approach LOS	D	D	D	D	D	D	C	C	C	B	B	B
Queue Length 50th (ft)	13	340	0	222	404	0	187	11	0	19	9	9
Queue Length 95th (ft)	28	426	0	385	560	0	308	80	0	44	50	50
Internal Link Dist (ft)		5400		1894			1414					785
Turn Bay Length (ft)				300			600					50
Base Capacity (vph)	258	1169	0	465	977	883	412	616	0	304	387	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.81	0.82	0.70	0.05	0.74	0.41	0.12	0.19	0.12	0.19	0.19

Intersection Summary
Area Type: Other
Cycle Length: 117
Actuated Cycle Length: 112.3
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 36.4
Intersection Capacity Utilization: 89.9%
Analysis Period (min): 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



2026 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL 20-092]

Lanes, Volumes, Timings
6: Labounty Drive & Main Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Traffic Volume (vph)	42	770	166	377	681	41	301	18	230	36	14	60
Future Volume (vph)	42	770	166	377	681	41	301	18	230	36	14	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	1000	300	600	600	300	0	50	0	50	0	0
Storage Lanes	1	2	1	1	1	1	1	1	1	1	1	1
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	25
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.973	0.973	0.950	0.950	0.950	0.99	0.861	0.950	0.98	0.878	0.950
Flt Protected	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Satd. Flow (prot)	1752	3395	0	1752	1845	1568	1752	1588	0	1752	1581	0
Flt Permitted	0.279	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093
Satd. Flow (perm)	515	3395	0	172	1845	1568	1089	1588	0	980	1581	0
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)	23	35	35	35	35	35	35	35	35	35	35	35
Link Speed (mph)	35	35	35	35	35	35	35	35	35	35	35	35
Link Distance (ft)	5480	5480	5480	5480	5480	5480	5480	5480	5480	5480	5480	5480
Travel Time (s)	106.8	106.8	106.8	106.8	106.8	106.8	106.8	106.8	106.8	106.8	106.8	106.8
Confl. Peds. (#/hr)	2	2	2	2	2	2	2	2	2	2	2	2
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	42	778	168	381	688	41	304	18	232	36	14	61
Shared Lane Traffic (%)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	42	946	0	381	688	41	304	250	0	36	75	0
Turn Type	pm-pt	NA	NA	pm-pt	NA	Perm	pm-pt	NA	0	pm-pt	NA	NA
Protected Phases	5	2	2	1	6	6	8	8	7	4	4	4
Permitted Phases	2	2	2	6	6	6	8	8	4	4	4	4
Detector Phase	5	2	2	1	6	6	3	8	7	4	4	4
Switch Phase	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Initial (s)	11.0	31.0	11.0	23.0	23.0	11.0	23.0	11.0	23.0	11.0	29.0	29.0
Minimum Split (s)	11.0	43.0	11.0	63.0	63.0	14.0	32.0	11.0	29.0	11.0	29.0	29.0
Total Split (s)	9.4%	36.8%	9.4%	53.8%	53.8%	12.0%	27.4%	9.4%	24.8%	9.4%	24.8%	24.8%
Total Split (%)	6.0	38.0	6.0	58.0	58.0	9.0	27.0	6.0	24.0	6.0	24.0	24.0
Maximum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Yellow Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	3.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	None	None	None	None	None	None	None	None	None	None	None	None
Recall Mode	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Walk Time (s)	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Flash Dont Walk (s)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Calls (#/hr)	41.9	35.8	64.1	57.7	57.7	37.0	31.8	31.8	30.1	24.1	24.1	24.1
Act Effct Green (s)	0.37	0.32	0.57	0.51	0.51	0.33	0.28	0.28	0.27	0.21	0.21	0.21
Actuated G/C Ratio	0.16	0.86	0.90	0.73	0.73	0.05	0.74	0.41	0.12	0.12	0.12	0.12
v/c Ratio												

2026 Baseline Conditions
Gibson Traffic Consultants, Inc. [BJL 20-092]

HCM 6th AWSC
1: Pacific Heights Drive & Sievers Way

Nubgaard Development

Intersection

Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	1	61	1	2	105	11	1	1	2	4	4	0
Future Vol, veh/h	1	61	1	2	105	11	1	1	2	4	4	0
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	1	81	1	3	140	15	1	1	3	5	5	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	7.7			8			7.4			7.8		
HCM LOS	A			A			A			A		

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	2%	2%	50%
Vol Thru, %	25%	97%	89%	50%
Vol Right, %	50%	2%	9%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	63	118	8
LT Vol	1	1	2	4
Through Vol	1	61	105	4
RT Vol	2	1	11	0
Lane Flow Rate	5	84	157	11
Geometry Grp	1	1	1	1
Degree of Util (X)	0.006	0.098	0.18	0.014
Departure Headway (Hd)	4.366	4.209	4.108	4.71
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	825	848	872	764
Service Time	2.366	2.255	2.139	2.71
HCM Lane V/C Ratio	0.006	0.099	0.18	0.014
HCM Control Delay	7.4	7.7	8	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.3	0.7	0

HCM 6th TWSC
2: Church Road & Sievers Way

Nubgaard Development

Intersection

Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	70	125	130	82	61
Future Vol, veh/h	40	70	125	130	82	61
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	42	73	130	135	85	64

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	513	118	150	0	0
Stage 1	118	-	-	-	-
Stage 2	395	-	-	-	-
Critical Hdwy	6.43	6.23	4.13	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-
Pot Cap-1 Maneuver	519	931	1425	-	-
Stage 1	905	-	-	-	-
Stage 2	678	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	471	930	1424	-	-
Mov Cap-2 Maneuver	471	-	-	-	-
Stage 1	822	-	-	-	-
Stage 2	677	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	3.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1424	-	687	-	-
HCM Lane V/C Ratio	0.091	-	0.167	-	-
HCM Control Delay (s)	7.8	-	11.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.6	-	-

HCM 6th TWSC
 3: Church Road & Mountain View Road

Nubgaard Development

Intersection

Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔		↔		↔	↔	↔
Traffic Vol, veh/h	17	271	1	0	247	318	0	0	2	187	1	14
Future Vol, veh/h	17	271	1	0	247	318	0	0	2	187	1	14
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	300	-	-	-	200	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	18	285	1	0	260	335	0	0	2	197	1	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	595	0	0	287	0	0	759	918	287	583	583	260
Stage 1	-	-	-	-	-	-	323	323	-	260	260	-
Stage 2	-	-	-	-	-	-	436	595	-	323	323	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	972	-	-	1264	-	-	321	270	747	421	421	774
Stage 1	-	-	-	-	-	-	685	647	-	740	689	-
Stage 2	-	-	-	-	-	-	595	489	-	685	647	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	972	-	-	1263	-	-	309	264	746	413	411	774
Mov Cap-2 Maneuver	-	-	-	-	-	-	309	264	-	413	411	-
Stage 1	-	-	-	-	-	-	669	632	-	724	689	-
Stage 2	-	-	-	-	-	-	583	489	-	668	632	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0			9.8			20.6		
HCM LOS							A			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	746	972	-	-	1263	-	-	413	411	774
HCM Lane V/C Ratio	0.003	0.018	-	-	-	-	-	0.477	0.003	0.019
HCM Control Delay (s)	9.8	8.8	0	-	0	-	-	21.4	13.8	9.7
HCM Lane LOS	A	A	A	-	A	-	-	C	B	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	2.5	0	0.1

Lanes, Volumes, Timings
4: Douglas Road & Mountain View Road/Main Street

Nubgaard Development

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	479	193	688	105	174	174
Future Volume (vph)	479	32	688	105	174	174
Ideal Flow (vphft)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	125	100	0	0	0
Storage Lanes	0	1	1	1	1	1
Taper Length (ft)	0	25	25	0	0	0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00	1.00	0.99	0.99	0.850
Fit	0.992					
Flt Protected		0.950		0.950		
Satd. Flow (prot)	1844	0	1770	1770	1583	1583
Flt Permitted		0.336		0.950		
Satd. Flow (perm)	1844	0	624	1863	1752	1583
Right Turn on Red		Yes			Yes	Yes
Satd. Flow (RTOR)	5					181
Link Speed (mph)	35		35		30	
Link Distance (ft)	3176		418		3312	
Travel Time (s)	61.9		8.1		75.3	
Confl. Peds. (#/hr)		6	6		5	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	499	33	201	717	109	181
Shared Lane Traffic (%)						
Lane Group Flow (vph)	532	0	201	717	109	181
Turn Type	NA	pm-pt	NA	Prot	Perm	Perm
Protected Phases	2		6		4	
Permitted Phases	2		6		4	
Detector Phase						
Switch Phase			1		4	
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Split (s)	33.0	11.0	23.0	27.0	27.0	27.0
Total Split (s)	47.0	16.0	63.0	27.0	27.0	27.0
Total Split (%)	52.2%	17.8%	70.0%	30.0%	30.0%	30.0%
Maximum Green (s)	42.0	11.0	58.0	22.0	22.0	22.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes				
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Max	None	Max	None	None	None
Walk Time (s)	8.0	8.0	8.0	8.0	8.0	8.0
Flash Don't Walk (s)	20.0	10.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Act Effct Green (s)	44.9	58.1	10.1	10.1	10.1	10.1
Actuated g/C Ratio	0.57	0.74	0.13	0.13	0.13	0.13
v/c Ratio	0.50	0.34	0.52	0.48	0.50	0.50
Control Delay	12.8	5.0	6.2	38.6	10.4	10.4

2026 Future Conditions with Development
Gibson Traffic Consultants, Inc. [BJL 20-092]

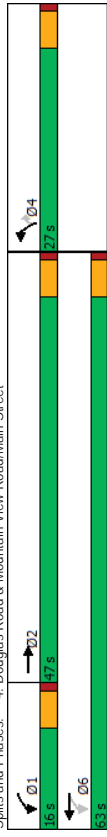
PM Peak-Hour

Lanes, Volumes, Timings
4: Douglas Road & Mountain View Road/Main Street

Nubgaard Development

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	5.0	6.2	38.6	10.4	10.4
LOS	B	A	A	D	B	B
Approach Delay	12.8		5.9	21.0		
Approach LOS	B	A	A	C		
Queue Length 50th (ft)	139	22	114	50	0	0
Queue Length 95th (ft)	266	49	224	98	53	53
Internal Link Dist (ft)	3096		338	3232		
Turn Bay Length (ft)		125		100		
Base Capacity (vph)	1060	624	1384	498	576	576
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.32	0.52	0.22	0.31	0.31

Intersection Summary



Spills and Phases: 4: Douglas Road & Mountain View Road/Main Street

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 78.2

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 10.6

Intersection LOS: B

Analysis Capacity Utilization: 56.2%

ICU Level of Service: B

Analysis Period (min): 15

2026 Future Conditions with Development
Gibson Traffic Consultants, Inc. [BJL 20-092]

PM Peak-Hour

HCM 6th TWSC
 5: Main Street & Washington Street

Nubgaard Development

Intersection

Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	103	570	784	43	18	118
Future Vol, veh/h	103	570	784	43	18	118
Conflicting Peds, #/hr	3	0	0	3	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	107	594	817	45	19	123

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	865	0	-	0	1651
Stage 1	-	-	-	-	843
Stage 2	-	-	-	-	808
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	778	-	-	-	109
Stage 1	-	-	-	-	422
Stage 2	-	-	-	-	438
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	776	-	-	-	93
Mov Cap-2 Maneuver	-	-	-	-	223
Stage 1	-	-	-	-	362
Stage 2	-	-	-	-	437

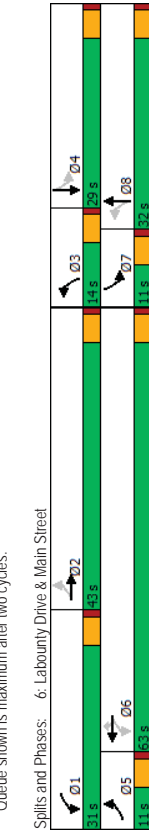
Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	23.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	776	-	-	-	335
HCM Lane V/C Ratio	0.138	-	-	-	0.423
HCM Control Delay (s)	10.4	-	-	-	23.4
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.5	-	-	-	2

Lanes, Volumes, Timings
6: Labounty Drive & Main Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	15.9	47.3	55.6	33.9	0.1	48.7	8.4	28.5	14.5	14.5	14.5	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	47.3	55.6	33.9	0.1	48.7	8.4	28.5	14.5	14.5	14.5	14.5
LOS	B	D	E	C	A	D	A	C	B	C	C	B
Approach Delay	46.0	39.8	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1
Approach LOS	D	D	D	D	D	D	C	C	B	B	B	B
Queue Length 50th (ft)	13	366	222	474	0	199	11	19	9	9	9	9
Queue Length 95th (ft)	28	#487	#385	659	0	#342	80	44	50	50	50	50
Internal Link Dist (ft)	5400	1894	300	600	300	1414	1414	1414	1414	1414	1414	1414
Turn Bay Length (ft)	199	1160	463	949	861	409	612	302	384	302	384	384
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.86	0.82	0.80	0.05	0.78	0.41	0.12	0.20	0.12	0.20	0.20

Intersection Summary
Area Type: Other
Cycle Length: 117
Actuated Cycle Length: 113.1
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 39.5
Intersection Capacity Utilization 91.3%
Analysis Period (min): 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



2026 Future Conditions with Development
Gibson Traffic Consultants, Inc. [BJL 20-092]

Lanes, Volumes, Timings
6: Labounty Drive & Main Street

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Traffic Volume (vph)	42	811	175	377	750	41	317	18	230	36	14	60
Future Volume (vph)	42	811	175	377	750	41	317	18	230	36	14	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	1000	300	600	600	300	0	50	0	50	0	0
Storage Lanes	1	2	1	1	1	1	1	1	1	1	1	1
Taper Length (ft)	25	25	25	25	25	25	25	25	25	25	25	25
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	0.973	0.973	0.973	0.973	0.973	0.973	0.973	0.973	0.973	0.973	0.973
FRT	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950	0.950
Flt Protected	1752	3395	0	1752	1845	1568	1752	1588	0	1752	1581	0
Satd. Flow (prot)	0.178	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093	0.093
Satd. Flow (perm)	328	3395	0	172	1845	1568	1089	1588	0	981	1581	0
Right Turn on Red	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Satd. Flow (RTOR)	23	35	112	35	35	112	232	30	61	30	61	61
Link Speed (mph)	35	35	35	35	35	35	35	35	35	35	35	35
Link Distance (ft)	5480	1974	1494	1974	1494	1974	1494	1974	1494	1974	1494	1494
Travel Time (s)	106.8	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5
Confl. Peds. (#/hr)	2	2	2	2	2	2	2	2	2	2	2	2
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Adj. Flow (vph)	42	819	177	381	758	41	320	18	232	36	14	61
Shared Lane Traffic (%)	42	996	0	381	758	41	320	250	0	36	75	0
Lane Group Flow (vph)	pm-plt	NA	pm-plt	NA	pm-plt	NA	pm-plt	NA	pm-plt	NA	pm-plt	NA
Turn Type	5	2	1	6	6	8	3	8	7	4	4	4
Protected Phases	5	2	1	6	6	8	3	8	7	4	4	4
Permitted Phases	5	2	1	6	6	8	3	8	7	4	4	4
Detector Phase	5	2	1	6	6	8	3	8	7	4	4	4
Switch Phase	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Minimum Initial (s)	11.0	31.0	11.0	23.0	23.0	11.0	23.0	11.0	29.0	11.0	29.0	29.0
Minimum Split (s)	11.0	43.0	31.0	63.0	63.0	14.0	32.0	11.0	29.0	11.0	29.0	29.0
Total Split (s)	9.4%	36.8%	26.5%	53.8%	53.8%	12.0%	27.4%	9.4%	24.8%	9.4%	24.8%	24.8%
Total Split (%)	6.0	38.0	26.0	58.0	58.0	9.0	27.0	6.0	24.0	6.0	24.0	24.0
Maximum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Yellow Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	3.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	None	None	None	None	None	None	None	None	None	None	None	None
Recall Mode	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Walk Time (s)	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Flash Dont Walk (s)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Calls (#/hr)	42.6	36.6	64.9	56.4	56.4	37.0	31.8	30.1	24.1	30.1	24.1	24.1
Act Effct Green (s)	0.38	0.32	0.57	0.50	0.50	0.33	0.28	0.27	0.21	0.27	0.21	0.21
Actuated G/C Ratio	0.21	0.89	0.90	0.82	0.82	0.05	0.78	0.41	0.12	0.20	0.20	0.20
v/c Ratio												

2026 Future Conditions with Development
Gibson Traffic Consultants, Inc. [BJL 20-092]