

REPORT

Union Self Storage Traffic Impact Study

March 3, 2017

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UNION SELF STORAGE TRAFFIC IMPACT STUDY



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SECTION I STUDY SUMMARY

INTRODUCTION

This traffic impact analysis has been prepared to assess transportation impacts related to the proposed Union Self Storage development. The project site is comprised of tax lot 176190-000 and is located at 6250 NW Friberg-Strunk Street in Camas, Washington. Figure 1 shows the project vicinity.

Project Description

The proposed project is the development of a 55,000 square foot storage facility and 15 RV storage spaces. Access will be provided by creating an east leg at the NW Friberg-Strunk Street/Union High School Driveway (Middle) intersection, as well as constructing a new “outbound only” driveway onto NW Friberg-Strunk Street south of the primary project access. Figure 2 shows the project site plan.

Scope of Traffic Impact Study

The scope of the traffic impact study was developed from known City of Camas traffic study requirements. From these requirements, the following intersections were analyzed:

- NW Friberg-Strunk Street/Union High School Driveway (North)
- NW Friberg-Strunk Street/Union High School Driveway (Middle)/ North Project Access
- NW Friberg-Strunk Street/South Project Access
- NW Friberg-Strunk Street/Union High School Driveway (South)

The remainder of this report presents the following analysis:

- Existing traffic conditions in the project study area.
- 2022 “Without Project” condition to establish the baseline condition by which the project impacts are determined.
- Trip generation estimates for the proposed development.
- 2022 “With Project” condition to determine project traffic impacts.

SUMMARY OF FINDINGS

The following are the findings and recommendations from the traffic analysis:

Findings

The following are the findings from the traffic analysis:

- The proposed development is expected to generate 141 net new daily, 8 net new A.M. peak hour (4 in, 4 out), and 14 net new P.M. peak hour (7 in, 7 out) trips.
- All of the study area intersections are projected to meet the City of Camas' level of service standards in the 2022 "Without Project" and 2022 "With Project" condition with the exception of the two movements at the following two intersections:
 - o NW Friberg-Strunk St/UHS (Middle)/Project Access (North) – Eastbound Left LOS E in the 2022 "With Project" A.M. peak hour.
 - o NW Friberg-Strunk St/UHS Driveway (South) – Eastbound Left LOS E in both the 2022 "Without Project" and 2022 "With Project" A.M. peak hour.
- Turn lane warrants at the project access intersections were not conducted due to low traffic volumes, acceptable levels of service, and acceptable accident rates in the 2022 "With Project" conditions.
- Based on field measurements conducted by H. Lee & Associates, PLLC, the project access intersections should be able to meet the sight distance requirements as long as any vegetation within the sight distance triangles are properly maintained after construction and no obstructions are placed within the sight distance triangles that could impede a driver's vision. Because the accesses into the project site are not built, the corner sight distances should be re-verified in the final engineering/construction stages of development.

Recommendations

- The LOS E conditions in the 2022 "With Project" A.M. peak hour are caused primarily by the Union High School inbound and outbound traffic crossing and conflicting with each other. By eliminating these conflicts through managing the three high school driveway movements, the LOS E conditions can be mitigated to LOS D or better. The following high school access changes are recommended:
 - o South UHS Driveway – Restrict eastbound left out movement

- o Middle UHS Driveway – No eastbound movements; only allow inbound movements
 - o North UHS Driveway – Restrict northbound left movement
- The northbound left turn pocket to the north Union High School driveway should be restriped as a center left turn lane so the lane can serve both the high school and proposed project.

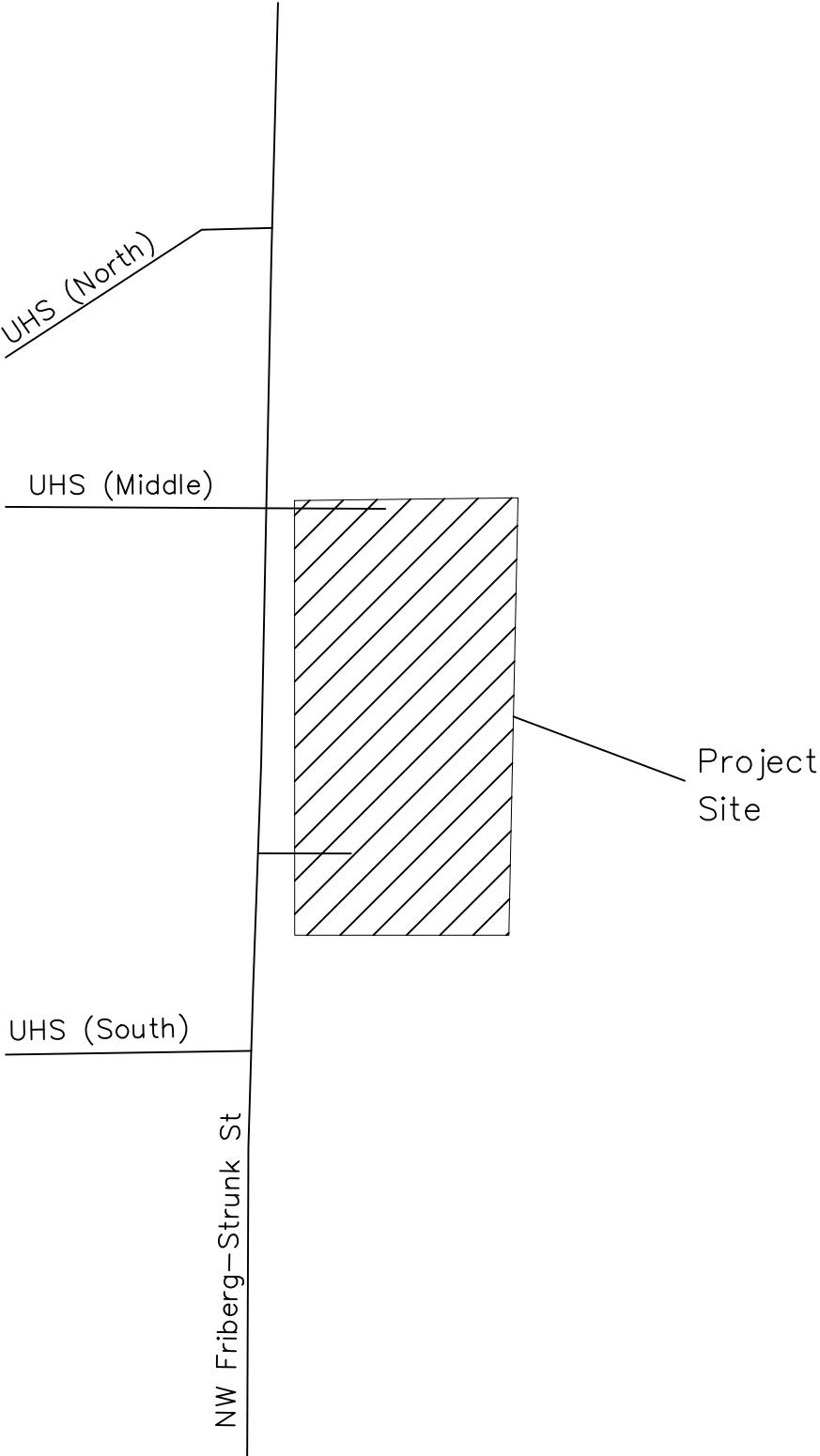


FIGURE 1
Site Vicinity Map

ENGINEERING, INC.

EXISTING SLOPE EASEMENT
EXISTING 37' HALF-WIDTH RIGHT-OF-WAY

EXISTING 50' CPU EASEMENT

T.L. 19
176165-000

NW. FRIBERG-STRUNK ST.

STREET "B"

END OF PROPOSED
IMPROVEMENTS

TRACT "A" OPEN SPACE/WETLANDS

PARCEL #176190-000

T.L.
17618

56'4"

43'

FIGURE 2
Site Plan

SECTION II EXISTING CONDITIONS

SITE CONDITION AND ADJACENT LAND USE

The project site is vacant. Vacant land exists to the north and east. To the west lies Union High School. To the south lies a Clark County sub-station.

TRANSPORTATION FACILITIES

The following provides a description of the existing street system in the study area.

NW Friberg-Strunk Street: NW Friberg-Strunk Street is a two-to-three lane minor arterial roadway with an intermittent center median and additional turn pockets at major intersections. Sidewalks and bike lanes exist along both sides of the roadway. The posted speed limit is 40 mph.

As part of this study, levels of service analysis was performed for the following intersections:

- NW Friberg-Strunk Street/Union High School Driveway (North)
- NW Friberg-Strunk Street/Union High School Driveway (Middle)/Project Access (North)
- NW Friberg-Strunk Street/Project Access (South)
- NW Friberg-Strunk Street/Union High School Driveway (South)

All of the study area intersections are unsignalized and stop sign controlled. Figure 3 shows the existing lane configurations and traffic control at these intersections.

EXISTING TRAFFIC VOLUMES

A.M. and P.M. peak hour traffic counts were obtained at the study area intersections by HLA in September 2016. Per the 2010 HCM¹, peak 15-minute traffic volumes were multiplied by four (4) to arrive at the peak hour traffic volumes. With this methodology of developing peak hour traffic volumes, the peak hour factor (PHF) is set to 1.00 because the peaking has already occurred by multiplying the peak 15-minute traffic volume by four (4). The existing condition traffic volumes are presented in Figure 4. The existing traffic counts can be referenced in Appendix A.

¹ 2010 Highway Capacity Manual (HCM), Volume 3, Transportation Research Board, 2010, page 18-2 and 18-3.

EXISTING LEVEL OF SERVICE

Based on the traffic volumes presented in Figure 4, peak hour traffic operations were analyzed at the intersections identified above using the methodologies outlined in the 2010 Highway Capacity Manual (HCM). According to the HCM, there are six levels of service (LOS) by which the operational performance of an intersection may be described. These levels of service range between LOS "A" which indicates a relatively free-flowing condition and LOS "F" which indicates operational breakdown. LOS D or better is the City of Camas' adopted level of service standard on collector/arterial streets. On minor or local streets, LOS C or better is the adopted level of service standard. It should be noted that all of the study area intersections are on an arterial, so the level of service standard that needs to be met is LOS D or better. Figure 4 shows the existing traffic volumes for all of the study intersections.

Levels of service were calculated at the study area intersections with the existing traffic volumes shown in Figure 4 and the existing lane configurations shown earlier in Figure 3. The results of the analysis are shown in Table 1. As shown in Table 1, all of the study area intersections are currently operating at acceptable levels of service of LOS D or better in the existing conditions with the exception of the eastbound left turn movement at the NW Friberg-Strunk Street/Union High School Driveway (South) intersection, which is operating at LOS E in the A.M. peak hour. The A.M. peak hour LOS E condition is a result of outbound student drop-off traffic from Union High School conflicting with northbound student traffic utilizing the driveways to the north. Appendix B contains the level of service worksheets for the existing condition.

Table 1. Existing Levels of Service

	A.M. Peak Hour			P.M. Peak Hour		
	L O S	Average Delay (sec)	V/C Ratio	L O S	Average Delay (sec)	V/C Ratio
Unsignalized Intersection						
NW Friberg-Strunk Street/UHS Driveway (North)						
Eastbound Left	D	27.9	0.09	B	12.2	0.07
Eastbound Right	B	10.8	0.09	A	9.1	0.02
Northbound Left	B	10.6	0.31	A	7.7	0.03
NW Friberg-Strunk St/UHS (Middle)/North Project Access						
Eastbound Left	C	23.5	0.30	B	11.8	0.09
Eastbound Right	B	11.0	0.14	A	9.5	0.06
Northbound Left	A	8.1	0.06	A	7.6	0.00
NW Friberg-Strunk Street/UHS Driveway (South)						
Eastbound Left	E	37.0	0.20	B	13.1	0.14
Eastbound Right	B	12.4	0.33	A	9.7	0.07
Northbound Left	A	8.9	0.22	A	7.8	0.05

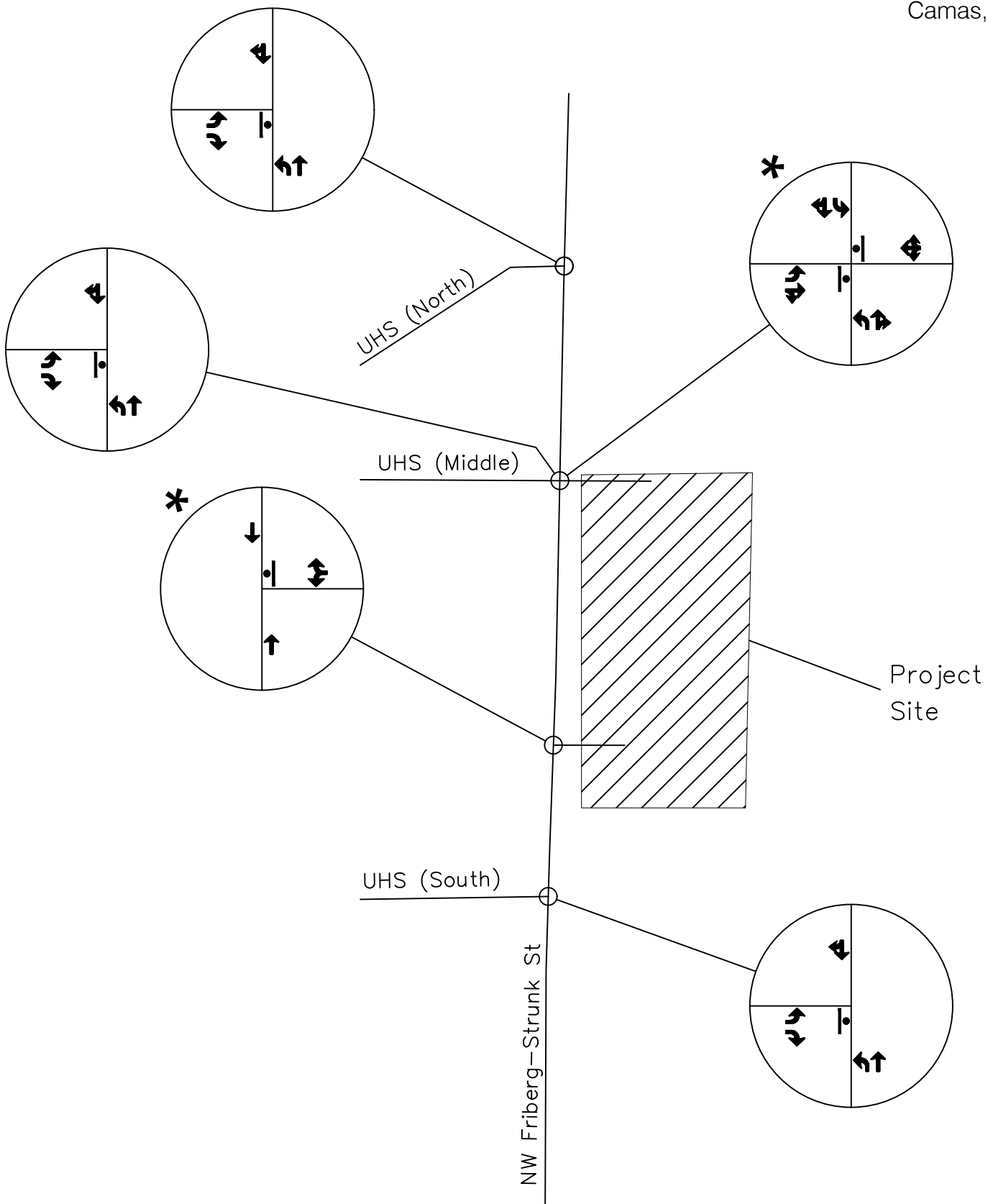
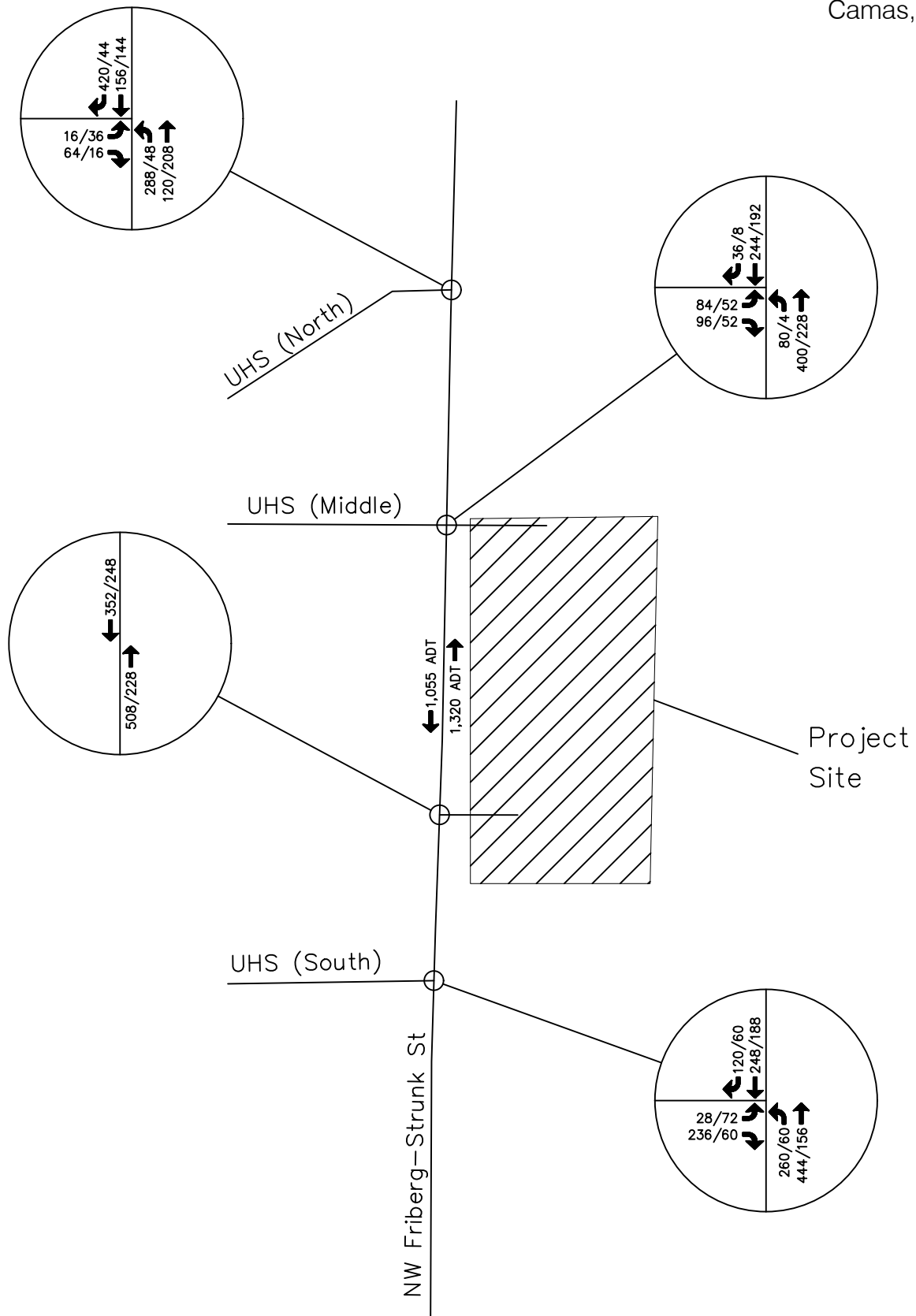


FIGURE 3
Existing Lane Configuration and Traffic Control



LEGEND

128/200

A.M./P.M. Peak Hour
Traffic Volume

←#### ADT

Average Daily Trips

ADT →

FIGURE 4
Existing A.M. and P.M.
Peak Hour Traffic Volumes

ACCIDENT HISTORY

Accident data was obtained from the Washington State Department of Transportation (WSDOT) for the five year and nine month period between January 1, 2011 and September 30, 2016. The data includes total accidents and accidents by severity (i.e. fatal, injury or property damage only). This accident data is summarized in Table 2. Appendix C contains the accident data.

As shown in Table 2, none of the study area intersections have accident rates above 1.00 accidents per million entering vehicles. Accident rates above 1.00 accident per million entering vehicles do not necessarily indicate there is a safety problem, but it is an indicator that further analysis should be conducted. Intersections with accident rates of less than 1.00 accidents per million entering vehicles are considered acceptable and therefore no further analysis is required.

Table 2. Summary of Traffic Accident History in Study Area

Intersection	Average Annual Accidents				acc/mev ²
	PDO ¹	Injury	Fatal	Total	
NW Friberg-Strunk Street/UHS Driveway (North)	0.0	0.0	0.0	0.0	0.00
NW Friberg-Strunk St/UHS (Middle)/North Project Access	0.0	0.0	0.0	0.0	0.00
NW Friberg-Strunk Street/South Project Access	0.2	0.0	0.0	0.2	0.09
NW Friberg-Strunk Street/UHS Driveway (South)	0.3	0.0	0.0	0.3	0.11

¹ PDO = property damage only

² acc/mev = accidents per million entering vehicles

EXISTING PUBLIC TRANSIT SERVICE

C-Tran provides public transit service in the City of Camas. Currently there are no routes that provide service adjacent to the project site.

NON-MOTORIZED TRANSPORTATION

Sidewalks and bike lanes exist along both sides of NW Friberg-Strunk Street directly adjacent to the project site.

PLANNED TRANSPORTATION IMPROVEMENTS

There is one known transportation improvement project in the project vicinity based on the City of Camas' 2016-2021 Six Year Transportation Program. This project is described below:

#24 – North Dwyer Creek Master Plan Street “B” – NW Friberg-Strunk St to NW Larkspur St

This improvement project is the construction of a new roadway connecting NW Friberg-Strunk Street and NW Larkspur Street. The estimated project budget for preliminary engineering is \$5,000. No other project costs have been developed. The preliminary engineering is scheduled to start in 2021.

SECTION III TRAFFIC IMPACT ANALYSIS

ANALYSIS METHODOLOGY

The A.M. and P.M. peak hour traffic impacts generated by the proposed Union Self Storage development were analyzed as follows:

- The 2022 “Without Project” traffic volumes were established as the future baseline condition for the traffic analysis and to define a baseline by which project impacts are determined. The 2022 “Without Project” condition traffic volumes were derived by adding “in-process” traffic volumes from previously approved but not yet built developments in the project site vicinity. The “in-process” traffic volumes were obtained from the City of Camas staff.
- A.M., P.M., and daily trip generation were estimated for the proposed development using the rates in "Trip Generation, 9th Edition," (Institute of Transportation Engineers, 2012).
- Trip distribution of site-generated traffic was developed from existing count information, previous traffic studies, location of residential areas, and logical travel paths to and from major travel corridors.
- Predicted A.M. and P.M. peak hour site-generated traffic from the proposed development was assigned to the roadway network and added to the 2022 “Without Project” traffic volumes to develop the 2022 “With Project” traffic volumes.

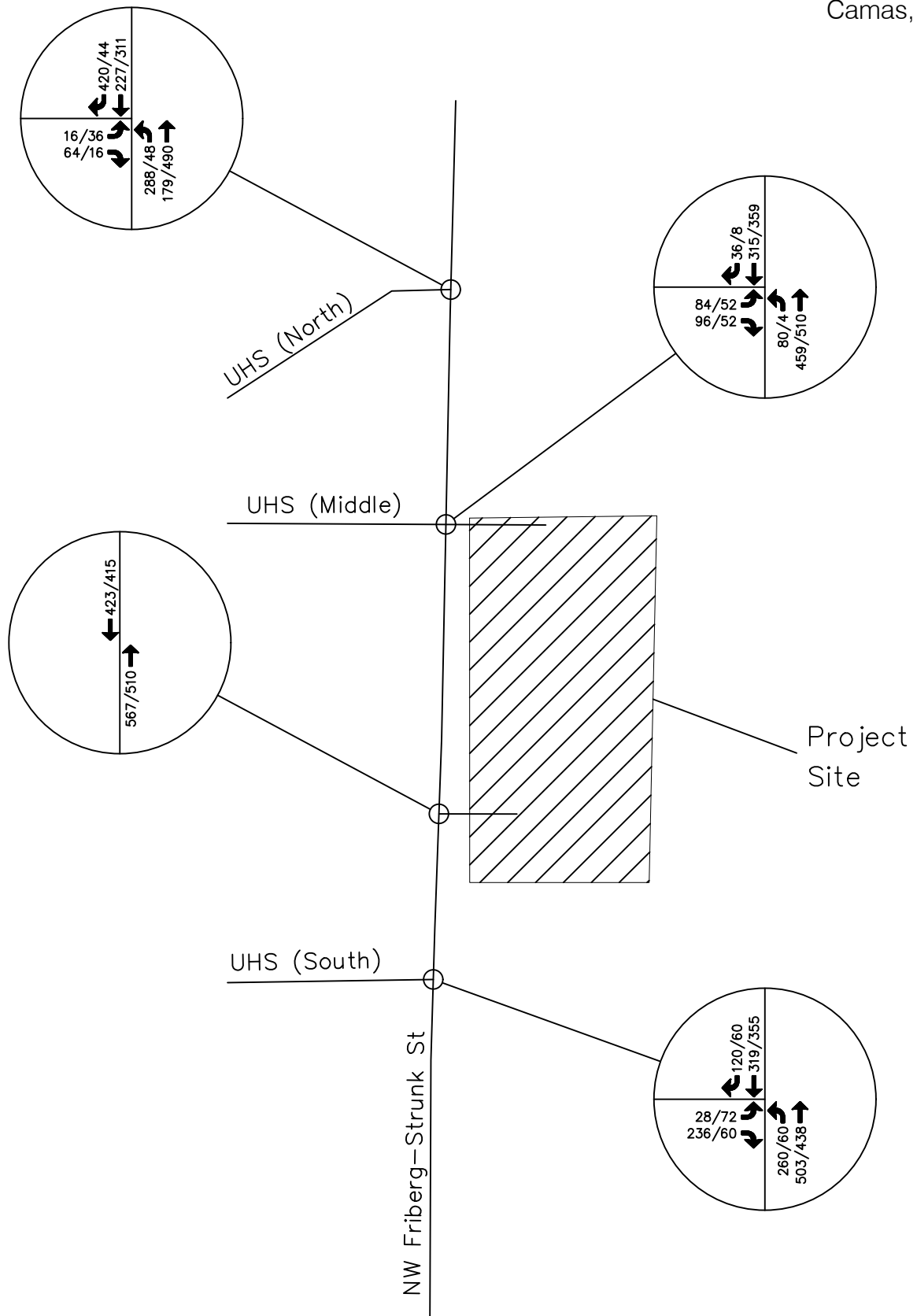
A detailed discussion of the methodology summarized above and the analysis results are contained in the remainder of this section.

2022 “WITHOUT PROJECT” TRAFFIC VOLUMES AND LEVELS OF SERVICE

The 2022 “Without Project” traffic volumes were established as the future baseline condition for the traffic analysis and to define a baseline by which project impacts are determined. The 2022 “Without Project” condition traffic volumes were derived by adding “in-process” traffic volumes from three previously approved but not yet built developments in the project site vicinity to the existing traffic volumes. The “in-process” traffic volumes were obtained from the City of Camas staff and can be referenced in Appendix D. The three “in-process” developments are as follows:

- Parklands at Camas Meadows
- Green Mountain Estates
- Green Mountain Master Plan

Figure 5 shows the 2022 “Without Project” traffic volumes for the study intersections.



LEGEND

128/200

A.M./P.M. Peak Hour
Traffic Volume

FIGURE 5
2022 "Without Project"
A.M. and P.M. Peak Hour Traffic Volumes



NOT TO SCALE

Levels of service were calculated at the study area intersections with the 2022 “Without Project” traffic volumes shown in Figure 5 and the existing lane configurations shown earlier in Figure 3. The results of the analysis are shown in Table 3. Appendix E contains the levels of service worksheets for the 2022 “Without Project” condition.

As shown in Table 3, all of the study area intersections are projected to operate at acceptable levels of service of LOS D or better in the 2022 “Without Project” condition with the exception of the eastbound left turn movement at the NW Friberg-Strunk Street/Union High School Driveway (South) intersection, which is projected to operate at LOS E in the 2022 “Without Project” A.M. peak hour. The A.M. peak hour LOS E condition is a result of outbound student drop-off traffic from Union High School conflicting with northbound student traffic utilizing the driveways to the north.

Table 3. 2022 “Without Project” Levels of Service

	A.M. Peak Hour			P.M. Peak Hour		
	L O S	Average Delay (sec)	V/C Ratio	L O S	Average Delay (sec)	V/C Ratio
Unsignalized Intersection						
NW Friberg-Strunk Street/UHS Driveway (North)						
Eastbound Left	D	34.0	0.11	C	19.1	0.12
Eastbound Right	B	11.4	0.10	B	10.2	0.02
Northbound Left	B	11.1	0.33	A	8.1	0.04
NW Friberg-Strunk St/UHS (Middle)/North Project Access						
Eastbound Left	D	29.6	0.37	C	18.5	0.16
Eastbound Right	B	11.7	0.15	B	10.7	0.08
Northbound Left	A	8.3	0.07	A	8.0	0.00
NW Friberg-Strunk Street/UHS Driveway (South)						
Eastbound Left	E	46.1	0.24	C	22.3	0.26
Eastbound Right	B	13.6	0.36	B	10.9	0.09
Northbound Left	A	9.3	0.24	A	8.3	0.05

DEVELOPMENT PLANS

As previously stated, the proposed project is the development of a 55,000 square foot storage facility and 15 RV storage spaces. Access will be provided by creating an east leg at the NW Friberg-Strunk Street/Union High School Driveway (Middle) intersection, as well as constructing a new “outbound only” driveway onto NW Friberg-Strunk Street south of the primary project access. As previously shown, Figure 2 shows the project site plan.

TRIP GENERATION

Estimates of daily, A.M. peak hour, and P.M. peak hour trips generated by the proposed project for mini warehouse (ITE Code 151) use were developed from rates published in “Trip Generation, 9th Edition” (Institute of Transportation Engineers, 2012). Estimates of daily, A.M. peak hour, and P.M. peak hour trips generated by the proposed project for RV storage use were developed from a previous survey conducted by HLA. Appendix F contains the RV storage survey and supporting documentation.

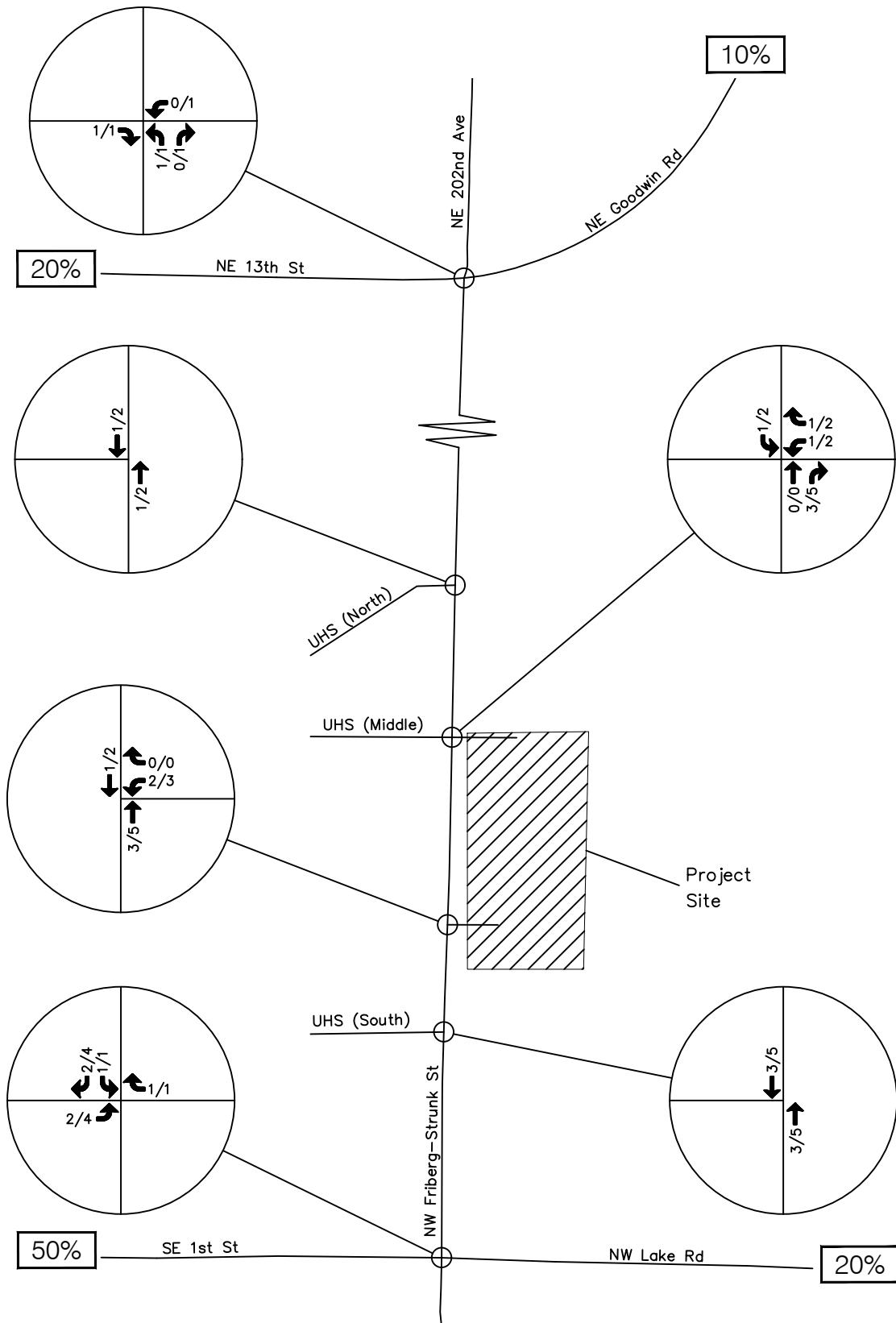
The proposed development is expected to generate 141 net new daily trips, 8 net new A.M. peak hour trips (4 in, 4 out), and 14 net new P.M. peak hour trips (7 in, 7 out). The trip generation is summarized in Table 4.

Table 4. Trip Generation Summary for Union Self Storage

	Amount	Average Daily	A.M. Peak			P.M. Peak		
			In	Out	Total	In	Out	Total
Mini Warehouse (ITE Code 151)								
Rate per 1,000 square feet (ksf)		2.50	0.08	0.06	0.14	0.13	0.13	0.26
Trips	55.000 ksf	138	4	4	8	7	7	14
RV Storage								
Rate per storage unit		0.178	0.006	0.006	0.012	0.008	0.007	0.015
Trips	15 units	3	-	-	-	-	-	-
Net Total		141	4	4	8	7	7	14

TRIP DISTRIBUTION AND ASSIGNMENT

A generalized trip distribution for the A.M. and P.M. peak hour was developed from the existing traffic counts, previous traffic studies, location of residential areas, and logical travel paths to and from major travel corridors. Figure 6 shows the resulting trip distribution pattern and assignment of project-generated trips.



LEGEND

100/128

A.M./P.M. Peak Hour
Traffic Volumes

10%

Peak Hour Trip Distribution

FIGURE 6
Trip Distribution and Assignment
Traffic Volumes

2022 “WITH PROJECT” TRAFFIC VOLUMES AND LEVELS OF SERVICE

The traffic volumes shown in Figures 5 and 6 were combined to arrive at the 2022 “With Project” A.M. and P.M. peak hour traffic volumes. Figure 7 shows these traffic volumes. Levels of service were calculated for the 2022 “With Project” condition based on the traffic volumes shown in Figure 7 and the existing lane configurations previously shown in Figure 3, as well as the striping modification shown in Figure 8. Figure 8 shows the proposal of restriping the northbound left turn pocket to the north Union High School driveway as a center left turn lane so it can serve both the high school and the proposed project. The results of the 2022 “With Project” levels of service analysis are shown in Table 5. Appendix G contains the level of service worksheets for the 2022 “With Project” condition.

As shown in Table 5, all of the study area intersections are projected to operate at acceptable levels of service of LOS D or better in the 2022 “With Project” condition with the exception of the two movements at the following two intersections:

- NW Friberg-Strunk St/UHS (Middle)/Project Access (North) – Eastbound Left LOS E in the A.M. peak hour.
- NW Friberg-Strunk St/UHS Driveway (South) – Eastbound Left LOS E in the A.M. peak hour.

The LOS E conditions in the 2022 “With Project” A.M. peak hour are caused primarily by the Union High School inbound and outbound traffic crossing and conflicting with each other. By eliminating these conflicts through managing the three high school driveway movements, the LOS E conditions can be mitigated to LOS D or better. The following high school access changes are recommended:

- South UHS Driveway – Restrict eastbound left out movement
- Middle UHS Driveway – No eastbound movements; only allow inbound movements
- North UHS Driveway – Restrict northbound left movement

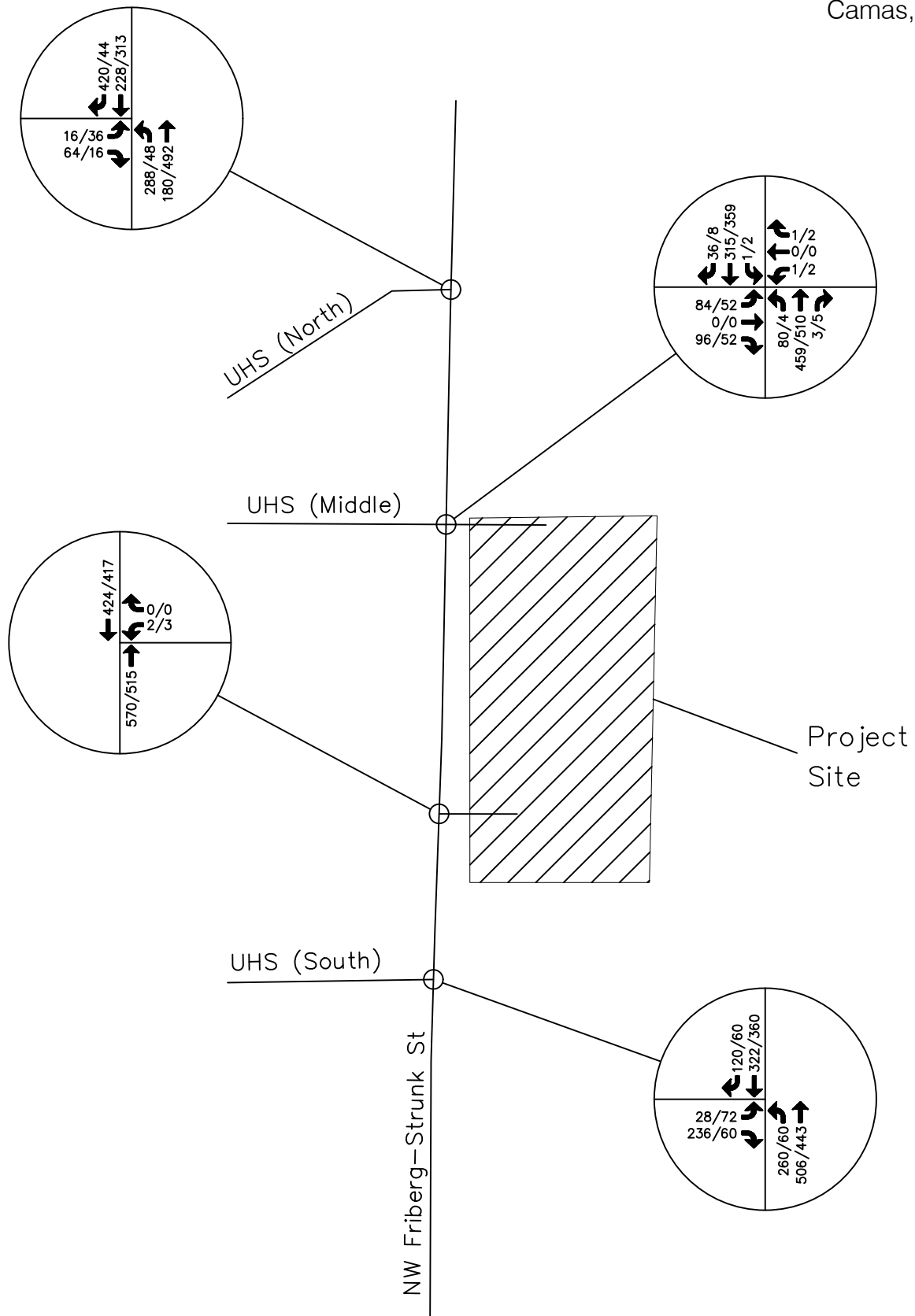
Figure 9 shows the 2022 “With Project” mitigated A.M. peak hour traffic volumes. Table 6 shows the mitigated levels of service for the 2022 “With Project” A.M. peak hour conditions based on the recommended Union High School access changes. Appendix H contains the level of service worksheets for the 2022 “With Project” mitigated condition.

Table 5. 2022 “With Project” Levels of Service

	A.M. Peak Hour			P.M. Peak Hour		
	L O S	Average Delay (sec)	V/C Ratio	L O S	Average Delay (sec)	V/C Ratio
Unsignalized Intersection						
NW Friberg-Strunk Street/UHS Driveway (North)						
Eastbound Left	D	34.2	0.12	C	19.2	0.12
Eastbound Right	B	11.4	0.10	B	10.2	0.02
Northbound Left	B	11.1	0.33	A	8.1	0.04
NW Friberg-Strunk St/UHS (Middle)/North Project Access						
Eastbound Left	E	37.6	0.44	C	22.0	0.20
Eastbound Through/Right	B	11.7	0.15	B	10.7	0.08
Westbound Approach	C	18.2	0.01	C	15.9	0.01
Northbound Left	A	8.3	0.07	A	8.0	0.00
Southbound Left	A	8.4	0.00	A	8.4	0.00
NW Friberg-Strunk Street/South Project Access						
Eastbound Approach	C	18.2	0.01	C	17.2	0.01
NW Friberg-Strunk Street/UHS Driveway (South)						
Eastbound Left	E	47.0	0.25	C	22.7	0.26
Eastbound Right	B	13.6	0.36	B	11.0	0.09
Northbound Left	A	9.3	0.24	A	8.3	0.05

Table 6. 2022 “With Project” Mitigated Levels of Service

	A.M. Peak Hour		
	LOS	Average Delay (sec)	V/C Ratio
Unsignalized Intersection			
NW Friberg-Strunk Street/UHS Driveway (North)			
Eastbound Left	C	15.1	0.27
Eastbound Right	B	12.6	0.25
Northbound Left	A	0.0	0.00
NW Friberg-Strunk St/UHS (Middle)/North Project Access			
Eastbound Left	A	0.0	0.00
Eastbound Through/Right	A	0.0	0.00
Westbound Approach	C	24.1	0.01
Northbound Left	A	9.8	0.33
Southbound Left	A	7.6	0.00
NW Friberg-Strunk Street/UHS Driveway (South)			
Eastbound Left	A	0.0	0.00
Eastbound Right	B	13.4	0.36
Northbound Left	A	9.1	0.23



LEGEND

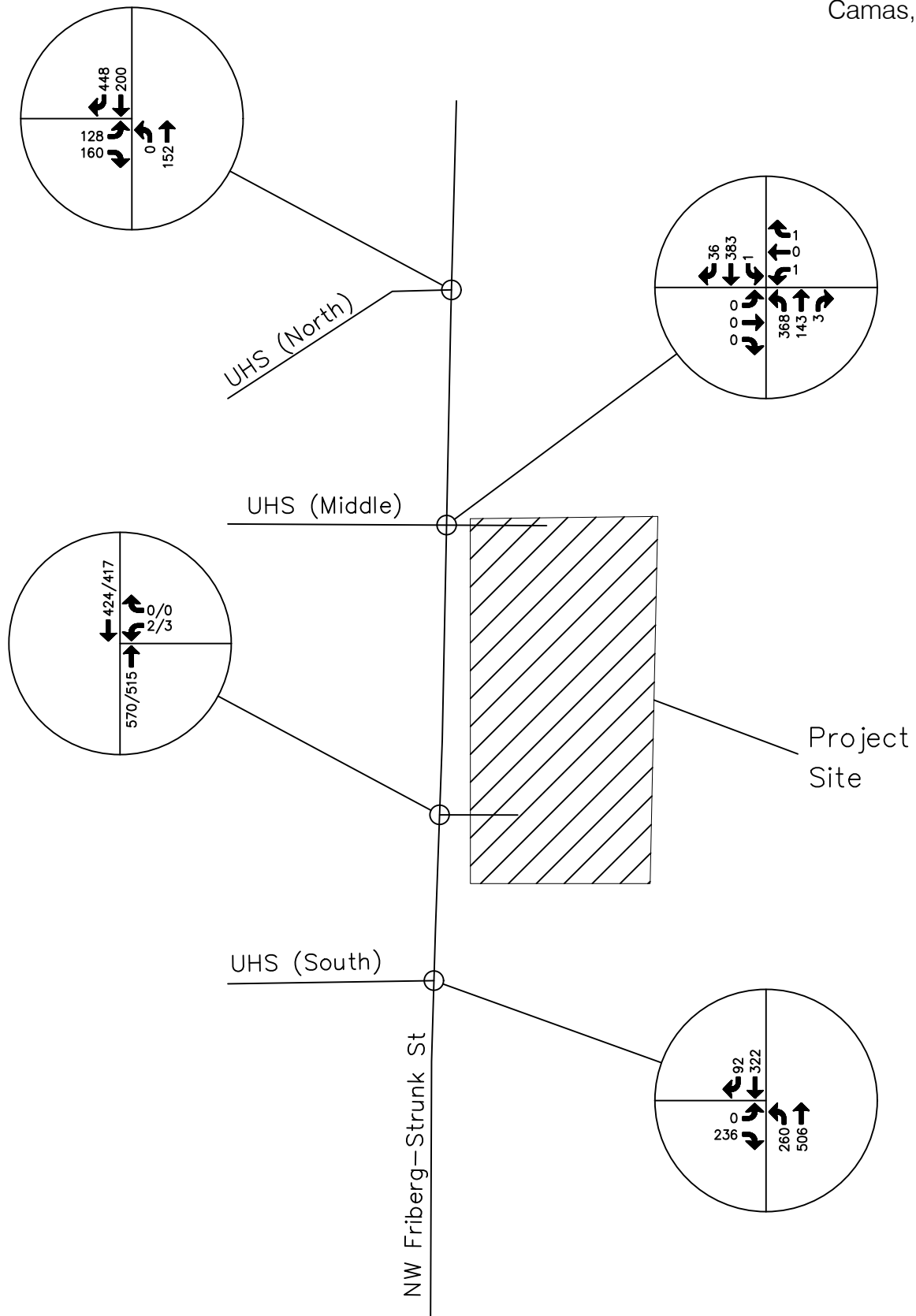
128/200

A.M./P.M. Peak Hour
Traffic Volume

FIGURE 7
2022 "With Project"
A.M. and P.M. Peak Hour Traffic Volumes



FIGURE 8
Proposed Restriping



LEGEND

128/200

A.M. Peak Hour
Traffic Volumes Only

FIGURE 9
2022 "With Project" Mitigated
A.M. Peak Hour Traffic Volumes

CORNER SIGHT DISTANCE

The minimum corner sight distance was analyzed for the proposed Union Self Storage development. The minimum corner sight distance required for the proposed Union Self Storage accesses at the proposed NW Friberg-Strunk Street/Union High School Driveway (Middle)/North Project Access and NW Friberg-Strunk Street/South Project Access intersections are based on the City of Camas' Design Standard Manual. Per the City of Camas' Design Standard Manual, public and private streets must comply with the sight distance requirements contained in the current "A Policy on Geometric Design on Highways and Streets," published by AASHTO (American Association of State Highway and Transportation Officials)." The most recent edition of this reference is the 2011 – 6th Edition.

From AASHTO, the following intersection sight distances are relevant to the project's site access intersection:

- Case B1 – left turn from minor road
- Case B2 – right turn from minor road
- Case F – left from major road

The required sight distance for Case B1 based on a posted speed limit of 40 mph along NW Friberg-Strunk Street is 445 feet. This requirement can be found in Table 9-6 of the "A Policy on Geometric Design on Highways and Streets," page 9-38.

The required sight distance for Case B2 based on a posted speed limit of 40 mph along NW Friberg-Strunk Street is 385 feet. This requirement can be found in Table 9-8 of the "A Policy on Geometric Design on Highways and Streets," page 9-41.

The required sight distance for Case F based on a posted speed limit of 40 mph along the NW Friberg-Strunk Street is 325 feet. This requirement can be found in Table 9-14 of the "A Policy on Geometric Design on Highways and Streets," page 9-52.

The corner sight distance at the proposed NW Friberg-Strunk Street/Union High School Driveway (Middle)/North Project Access and NW Friberg-Strunk Street/South Project Access intersections were field measured and compared to the minimum acceptable AASHTO standards described above. Based on field measurements conducted by HLA, all of the AASHTO sight distance requirements can be met at the proposed NW Friberg-Strunk Street/Union High School Driveway (Middle)/North Project Access and NW Friberg-Strunk Street/South Project Access intersections as long as any vegetation within the sight distance triangles is properly maintained and no obstructions that obscure the driver's sight distance are located within the sight distance triangles. Since the intersection is not yet built, the intersection corner sight distance should be re-verified at the final engineering stage of the project.

LANE WARRANT ANALYSIS

Turn lane warrants at the project access intersections were not conducted due to low traffic volumes, good levels of service, and acceptable accident rates in the 2022 “With Project” conditions.

CONCLUSIONS

The following are the findings and recommendations from the traffic analysis:

Findings

The following are the findings from the traffic analysis:

- The proposed development is expected to generate 141 net new daily, 8 net new A.M. peak hour (4 in, 4 out), and 14 net new P.M. peak hour (7 in, 7 out) trips.
- All of the study area intersections are projected to meet the City of Camas' level of service standards in the 2022 "Without Project" and 2022 "With Project" condition with the exception of the two movements at the following two intersections:
 - o NW Friberg-Strunk St/UHS (Middle)/Project Access (North) – Eastbound Left LOS E in the 2022 "With Project" A.M. peak hour.
 - o NW Friberg-Strunk St/UHS Driveway (South) – Eastbound Left LOS E in both the 2022 "Without Project" and 2022 "With Project" A.M. peak hour.
- Turn lane warrants at the project access intersections were not conducted due to low traffic volumes, acceptable levels of service, and acceptable accident rates in the 2022 "With Project" conditions.
- Based on field measurements conducted by H. Lee & Associates, PLLC, the project access intersections should be able to meet the sight distance requirements as long as any vegetation within the sight distance triangles are properly maintained after construction and no obstructions are placed within the sight distance triangles that could impede a driver's vision. Because the accesses into the project site are not built, the corner sight distances should be re-verified in the final engineering/construction stages of development.

Recommendations

- The LOS E conditions in the 2022 "With Project" A.M. peak hour are caused primarily by the Union High School inbound and outbound traffic crossing and conflicting with each other. By eliminating these conflicts through managing the three high school driveway movements, the LOS E conditions can be mitigated to LOS D or better. The following high school access changes are recommended:
 - o South UHS Driveway – Restrict eastbound left out movement

- o Middle UHS Driveway – No eastbound movements; only allow inbound movements
 - o North UHS Driveway – Restrict northbound left movement
- The northbound left turn pocket to the north Union High School driveway should be restriped as a center left turn lane so the lane can serve both the high school and proposed project.

APPENDIX A

EXISTING TRAFFIC COUNTS

Intersection: NW Friberg-Strunk Street/Union High School Driveway (North)
 AM Peak Hour Turning Movement Volumes

Date: 09/08/16

Time	<u>SB</u>				<u>WB</u>				<u>NB</u>				<u>EB</u>				Total
	SBR	SBT	SBL	Trucks	WBR	WBT	WBL	Trucks	NBR	NBT	NBL	Trucks	EBR	EBT	EBL	Trucks	
<u>15 Minute Totals</u>																	
7:00 - 7:15 AM	9	9	0	1	0	0	0	0	0	17	4	1	3	0	1	0	43
7:15 - 7:30 AM	18	19	0	1	0	0	0	0	0	21	10	1	2	0	0	0	70
7:30 - 7:45 AM	6	23	0	0	0	0	0	0	0	18	4	0	0	0	0	0	51
7:45 - 8:00 AM	7	20	0	3	0	0	0	0	0	19	6	0	0	0	1	0	53
8:00 - 8:15 AM	34	42	0	2	0	0	0	0	0	14	22	1	4	0	3	0	119
8:15 - 8:30 AM	105	39	0	18	0	0	0	0	0	30	72	16	16	0	4	0	266
8:30 - 8:45 AM	77	44	0	4	0	0	0	0	0	48	65	8	14	0	4	0	252
8:45 - 9:00 AM	3	25	0	1	0	0	0	0	0	20	3	1	1	0	4	0	56
<u>Hourly Total by 15 minutes</u>																	
7:00 - 8:00 AM	40	71	0	5	0	0	0	0	0	75	24	2	5	0	2	0	217
7:15 - 8:15 AM	65	104	0	6	0	0	0	0	0	72	42	2	6	0	4	0	293
7:30 - 8:30 AM	152	124	0	23	0	0	0	0	0	81	104	17	20	0	8	0	489
7:45 - 8:45 AM	223	145	0	27	0	0	0	0	0	111	165	25	34	0	12	0	690
8:00 - 9:00 AM	219	150	0	25	0	0	0	0	0	112	162	26	35	0	15	0	693
Peak Hour 8:00 - 9:00 AM	219	150	0	25	0	0	0	0	0	112	162	26	35	0	15	0	693
Peak Hour Factor	0.64				0.00				0.61				0.63				0.65
Peak Hour - % Trucks	7%				0%				9%				0%				
Peak 15 Minute - % Trucks	13%				0%				16%				0%				

Intersection: NW Friberg-Strunk Street/Union High School Driveway (North)
 PM Peak Hour Turning Movement Volumes

Date: 09/08/16

Time	<u>SB</u>				<u>WB</u>				<u>NB</u>				<u>EB</u>				Total
	SBR	SBT	SBL	Trucks	WBR	WBT	WBL	Trucks	NBR	NBT	NBL	Trucks	EBR	EBT	EBL	Trucks	
<u>15 Minute Totals</u>																	
4:00 - 4:15 PM	3	17	0	0	0	0	0	0	0	30	1	0	1	0	1	0	53
4:15 - 4:30 PM	4	15	0	3	0	0	0	0	0	37	4	1	2	0	2	0	64
4:30 - 4:45 PM	3	18	0	0	0	0	0	0	0	35	6	1	5	0	9	0	76
4:45 - 5:00 PM	10	29	0	2	0	0	0	0	0	44	8	2	6	0	12	1	109
5:00 - 5:15 PM	11	36	0	0	0	0	0	0	0	52	12	0	4	0	9	0	124
5:15 - 5:30 PM	7	35	0	0	0	0	0	0	0	52	7	1	4	0	6	0	111
5:30 - 5:45 PM	5	20	0	0	0	0	0	0	0	34	11	1	1	0	3	0	74
5:45 - 6:00 PM	18	24	0	0	0	0	0	0	0	42	14	0	2	0	1	0	101
<u>Hourly Total by 15 minutes</u>																	
4:00 - 5:00 PM	20	79	0	5	0	0	0	0	0	146	19	4	14	0	24	1	302
4:15 - 5:15 PM	28	98	0	5	0	0	0	0	0	168	30	4	17	0	32	1	373
4:30 - 5:30 PM	31	118	0	2	0	0	0	0	0	183	33	4	19	0	36	1	420
4:45 - 5:45 PM	33	120	0	2	0	0	0	0	0	182	38	4	15	0	30	1	418
5:00 - 6:00 PM	41	115	0	0	0	0	0	0	0	180	44	2	11	0	19	0	410
Peak Hour 4:30 - 5:30 PM	31	118	0	2	0	0	0	0	0	183	33	4	19	0	36	1	420
Peak Hour Factor	0.79		0.00						0.84				0.76				0.85
Peak Hour - % Trucks	1%		0%						2%				2%				
Peak 15 Minute - % Trucks	0%		0%						0%				0%				

Intersection: NW Friberg-Strunk Street/Union High School Driveway (Middle)/Project Access (North)

Date: 09/08/16

AM Peak Hour Turning Movement Volumes

Time	<u>SB</u>				<u>WB</u>				<u>NB</u>				<u>EB</u>				Total
	SBR	SBT	SBL	Trucks	WBR	WBT	WBL	Trucks	NBR	NBT	NBL	Trucks	EBR	EBT	EBL	Trucks	
<u>15 Minute Totals</u>																	
7:00 - 7:15 AM	1	11	0	0	0	0	0	0	0	16	3	0	2	0	2	0	35
7:15 - 7:30 AM	4	16	0	1	0	0	0	0	0	25	2	0	8	0	8	1	63
7:30 - 7:45 AM	1	24	0	1	0	0	0	0	0	15	3	0	2	0	3	0	48
7:45 - 8:00 AM	2	2	0	2	0	0	0	0	0	33	3	2	6	0	3	0	49
8:00 - 8:15 AM	11	43	0	1	0	0	0	0	0	33	13	3	16	0	2	1	118
8:15 - 8:30 AM	9	61	0	5	0	0	0	0	0	100	20	9	24	0	21	18	235
8:30 - 8:45 AM	8	34	0	1	0	0	0	0	0	64	8	3	21	0	17	9	152
8:45 - 9:00 AM	3	22	0	1	0	0	0	0	0	25	0	1	4	0	1	1	55
<u>Hourly Total by 15 minutes</u>																	
7:00 - 8:00 AM	8	53	0	4	0	0	0	0	0	89	11	2	18	0	16	1	195
7:15 - 8:15 AM	18	85	0	5	0	0	0	0	0	106	21	5	32	0	16	2	278
7:30 - 8:30 AM	23	130	0	9	0	0	0	0	0	181	39	14	48	0	29	19	450
7:45 - 8:45 AM	30	140	0	9	0	0	0	0	0	230	44	17	67	0	43	28	554
8:00 - 9:00 AM	31	160	0	8	0	0	0	0	0	222	41	16	65	0	41	29	560
Peak Hour 8:00 - 9:00 AM	31	160	0	8	0	0	0	0	0	222	41	16	65	0	41	29	560
Peak Hour Factor	0.68				0.00				0.55				0.59				0.60
Peak Hour - % Trucks	4%				0%				6%				27%				
Peak 15 Minute - % Trucks	7%				0%				8%				40%				

Intersection: NW Friberg-Strunk Street/Union High School Driveway (Middle)/Project Access (North)
 PM Peak Hour Turning Movement Volumes

Date: 09/08/16

Time	<u>SB</u>				<u>WB</u>				<u>NB</u>				<u>EB</u>				Total
	SBR	SBT	SBL	Trucks	WBR	WBT	WBL	Trucks	NBR	NBT	NBL	Trucks	EBR	EBT	EBL	Trucks	
<u>15 Minute Totals</u>																	
4:00 - 4:15 PM	2	12	0	1	0	0	0	0	0	32	1	0	2	0	1	0	50
4:15 - 4:30 PM	1	20	0	1	0	0	0	0	0	34	0	1	4	0	4	0	63
4:30 - 4:45 PM	1	21	0	0	0	0	0	0	0	37	4	0	8	0	2	1	73
4:45 - 5:00 PM	3	36	0	0	0	0	0	0	0	45	1	1	7	0	8	2	100
5:00 - 5:15 PM	2	48	0	0	0	0	0	0	0	57	1	0	13	0	13	0	134
5:15 - 5:30 PM	1	27	0	0	0	0	0	0	0	48	2	0	5	0	4	0	87
5:30 - 5:45 PM	0	29	0	0	0	0	0	0	0	41	2	1	9	0	5	0	86
5:45 - 6:00 PM	1	14	0	0	0	0	0	0	0	48	1	0	2	0	3	0	69
<u>Hourly Total by 15 minutes</u>																	
4:00 - 5:00 PM	7	89	0	2	0	0	0	0	0	148	6	2	21	0	15	3	286
4:15 - 5:15 PM	7	125	0	1	0	0	0	0	0	173	6	2	32	0	27	3	370
4:30 - 5:30 PM	7	132	0	0	0	0	0	0	0	187	8	1	33	0	27	3	394
4:45 - 5:45 PM	6	140	0	0	0	0	0	0	0	191	6	2	34	0	30	2	407
5:00 - 6:00 PM	4	118	0	0	0	0	0	0	0	194	6	1	29	0	25	0	376
Peak Hour 4:45 - 5:45 PM	6	140	0	0	0	0	0	0	0	191	6	2	34	0	30	2	407
Peak Hour Factor	0.73				0.00				0.85				0.62				0.76
Peak Hour - % Trucks	0%				0%				1%				3%				
Peak 15 Minute - % Trucks	0%				0%				0%				0%				

Intersection: NW Friberg-Strunk Street/Project Access (South)
 AM Peak Hour Turning Movement Volumes

Date: 09/08/16

Time	<u>SB</u>				<u>WB</u>				<u>NB</u>				<u>EB</u>				Total
	SBR	SBT	SBL	Trucks	WBR	WBT	WBL	Trucks	NBR	NBT	NBL	Trucks	EBR	EBT	EBL	Trucks	
<u>15 Minute Totals</u>																	
7:00 - 7:15 AM	0	13	0	0	0	0	0	0	0	19	0	0	0	0	0	0	32
7:15 - 7:30 AM	0	25	0	1	0	0	0	0	0	28	0	1	0	0	0	0	53
7:30 - 7:45 AM	0	25	0	1	0	0	0	0	0	20	0	1	0	0	0	0	45
7:45 - 8:00 AM	0	29	0	1	0	0	0	0	0	37	0	2	0	0	0	0	66
8:00 - 8:15 AM	0	55	0	2	0	0	0	0	0	47	0	3	0	0	0	0	102
8:15 - 8:30 AM	0	88	0	11	0	0	0	0	0	127	0	11	0	0	0	0	215
8:30 - 8:45 AM	0	54	0	6	0	0	0	0	0	66	0	4	0	0	0	0	120
8:45 - 9:00 AM	0	27	0	1	0	0	0	0	0	24	0	1	0	0	0	0	51
<u>Hourly Total by 15 minutes</u>																	
7:00 - 8:00 AM	0	92	0	3	0	0	0	0	0	104	0	3	0	0	0	0	196
7:15 - 8:15 AM	0	134	0	5	0	0	0	0	0	132	0	6	0	0	0	0	266
7:30 - 8:30 AM	0	197	0	15	0	0	0	0	0	231	0	15	0	0	0	0	428
7:45 - 8:45 AM	0	226	0	20	0	0	0	0	0	277	0	19	0	0	0	0	503
8:00 - 9:00 AM	0	224	0	20	0	0	0	0	0	264	0	18	0	0	0	0	488
Peak Hour 7:45 - 8:45 AM	0	226	0	20	0	0	0	0	0	277	0	18.5	0	0	0	0	503
Peak Hour Factor	0.64				0.00				0.55				0.00				0.58
Peak Hour - % Trucks	9%				0%				7%				0%				
Peak 15 Minute - % Trucks	13%				0%				8%				0%				

Intersection: NW Friberg-Strunk Street/Project Access (South)
 PM Peak Hour Turning Movement Volumes

Date: 09/08/16

Time	<u>SB</u>				<u>WB</u>				<u>NB</u>				<u>EB</u>				Total
	SBR	SBT	SBL	Trucks	WBR	WBT	WBL	Trucks	NBR	NBT	NBL	Trucks	EBR	EBT	EBL	Trucks	
<u>15 Minute Totals</u>																	
4:00 - 4:15 PM	0	14	0	1	0	0	0	0	0	33	0	1	0	0	0	0	47
4:15 - 4:30 PM	0	24	0	0	0	0	0	0	0	36	0	1	0	0	0	0	60
4:30 - 4:45 PM	0	29	0	1	0	0	0	0	0	42	0	1	0	0	0	0	71
4:45 - 5:00 PM	0	40	0	1	0	0	0	0	0	51	0	1	0	0	0	0	91
5:00 - 5:15 PM	0	62	0	0	0	0	0	0	0	57	0	0	0	0	0	0	119
5:15 - 5:30 PM	0	31	0	0	0	0	0	0	0	51	0	0	0	0	0	0	82
5:30 - 5:45 PM	0	37	0	0	0	0	0	0	0	44	0	1	0	0	0	0	81
5:45 - 6:00 PM	0	18	0	0	0	0	0	0	0	46	0	0	0	0	0	0	64
<u>Hourly Total by 15 minutes</u>																	
4:00 - 5:00 PM	0	107	0	3	0	0	0	0	0	162	0	2	0	0	0	0	269
4:15 - 5:15 PM	0	155	0	2	0	0	0	0	0	186	0	2	0	0	0	0	341
4:30 - 5:30 PM	0	162	0	2	0	0	0	0	0	201	0	1	0	0	0	0	363
4:45 - 5:45 PM	0	170	0	1	0	0	0	0	0	203	0	1	0	0	0	0	373
5:00 - 6:00 PM	0	148	0	0	0	0	0	0	0	198	0	1	0	0	0	0	346
Peak Hour 4:45 - 5:45 PM	0	170	0	1	0	0	0	0	0	203	0	1	0	0	0	0	373
Peak Hour Factor	0.69				0.00				0.89				0.00				0.78
Peak Hour - % Trucks	1%				0%				0%				0%				
Peak 15 Minute - % Trucks	0%				0%				0%				0%				

Intersection: NW Friberg-Strunk Street/Union High School Driveway (South)
 AM Peak Hour Turning Movement Volumes

Date: 09/08/16

Time	<u>SB</u>				<u>WB</u>				<u>NB</u>				<u>EB</u>				Total
	SBR	SBT	SBL	Trucks	WBR	WBT	WBL	Trucks	NBR	NBT	NBL	Trucks	EBR	EBT	EBL	Trucks	
<u>15 Minute Totals</u>																	
7:00 - 7:15 AM	1	12	0	0	0	0	0	0	0	19	3	0	1	0	0	0	36
7:15 - 7:30 AM	5	20	0	1	0	0	0	0	0	28	5	1	5	0	0	1	63
7:30 - 7:45 AM	7	18	0	1	0	0	0	0	0	19	11	0	7	0	1	1	63
7:45 - 8:00 AM	5	24	0	1	0	0	0	0	0	34	13	2	5	0	3	1	84
8:00 - 8:15 AM	20	35	0	2	0	0	0	0	0	42	40	3	20	0	5	2	162
8:15 - 8:30 AM	30	62	0	10	0	0	0	0	0	111	65	8	59	0	7	5	334
8:30 - 8:45 AM	15	39	0	6	0	0	0	0	0	55	32	2	15	0	11	6	167
8:45 - 9:00 AM	9	18	0	1	0	0	0	0	0	18	12	0	19	0	6	1	82
<u>Hourly Total by 15 minutes</u>																	
7:00 - 8:00 AM	18	74	0	3	0	0	0	0	0	100	32	3	18	0	4	3	246
7:15 - 8:15 AM	37	97	0	5	0	0	0	0	0	123	69	6	37	0	9	5	372
7:30 - 8:30 AM	62	139	0	14	0	0	0	0	0	206	129	13	91	0	16	9	643
7:45 - 8:45 AM	70	160	0	19	0	0	0	0	0	242	150	15	99	0	26	14	747
8:00 - 9:00 AM	74	154	0	19	0	0	0	0	0	226	149	13	113	0	29	14	745
Peak Hour 7:45 - 8:45 AM	70	160	0	19	0	0	0	0	0	242	150	15	99	0	26	14	747
Peak Hour Factor	0.63				0.00				0.56				0.47				0.56
Peak Hour - % Trucks	8%				0%				4%				11%				
Peak 15 Minute - % Trucks	11%				0%				5%				8%				

Intersection: NW Friberg-Strunk Street/Union High School Driveway (South)
 PM Peak Hour Turning Movement Volumes

Date: 09/08/16

Time	<u>SB</u>				<u>WB</u>				<u>NB</u>				<u>EB</u>				Total
	SBR	SBT	SBL	Trucks	WBR	WBT	WBL	Trucks	NBR	NBT	NBL	Trucks	EBR	EBT	EBL	Trucks	
<u>15 Minute Totals</u>																	
4:00 - 4:15 PM	3	11	0	1	0	0	0	0	0	30	8	0	3	0	3	1	58
4:15 - 4:30 PM	4	20	0	0	0	0	0	0	0	32	2	1	4	0	4	0	66
4:30 - 4:45 PM	1	28	0	1	0	0	0	0	0	40	10	0	1	0	2	1	82
4:45 - 5:00 PM	8	32	0	1	0	0	0	0	0	49	11	0	8	0	2	1	110
5:00 - 5:15 PM	15	47	0	0	0	0	0	0	0	39	15	0	15	0	18	0	149
5:15 - 5:30 PM	3	28	0	0	0	0	0	0	0	41	8	0	3	0	10	0	93
5:30 - 5:45 PM	6	31	0	0	0	0	0	0	0	41	13	1	6	0	3	0	100
5:45 - 6:00 PM	4	14	0	0	0	0	0	0	0	44	12	0	4	0	2	0	80
<u>Hourly Total by 15 minutes</u>																	
4:00 - 5:00 PM	16	91	0	3	0	0	0	0	0	151	31	1	16	0	11	3	316
4:15 - 5:15 PM	28	127	0	2	0	0	0	0	0	160	38	1	28	0	26	2	407
4:30 - 5:30 PM	27	135	0	2	0	0	0	0	0	169	44	0	27	0	32	2	434
4:45 - 5:45 PM	32	138	0	1	0	0	0	0	0	170	47	1	32	0	33	1	452
5:00 - 6:00 PM	28	120	0	0	0	0	0	0	0	165	48	1	28	0	33	0	422
Peak Hour 4:45 - 5:45 PM	32	138	0	1	0	0	0	0	0	170	47	1	32	0	33	1	452
Peak Hour Factor		0.69				0.00				0.90				0.49			0.76
Peak Hour - % Trucks		1%				0%				0%				2%			
Peak 15 Minute - % Trucks		0%				0%				0%				0%			

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Speed Study

Site Code: 000000000000

Station ID:

NW Friberg-Strunk St between Union

South Access & Union Central Access

Latitude: 0' 0.0000 Undefined

Northbound

Start	0	16	21	26	31	36	41	46	51	56	61	66	71	76		85th	95th
Time	15	20	25	30	35	40	45	50	55	60	65	70	75	9999	Total	Percent	Percent
09/19/16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	2	10	31	45	45	36	12	0	1	0	0	0	0	1	183	38	41
16:00	2	2	15	17	43	49	19	1	0	0	1	0	0	0	149	39	43
17:00	0	0	6	25	56	68	27	4	1	0	0	0	0	0	187	40	44
18:00	0	0	11	10	55	45	24	5	1	0	0	0	0	0	151	41	44
19:00	2	0	3	8	15	31	9	0	0	0	0	0	0	4	72	39	43
20:00	0	0	0	4	16	16	11	3	0	0	0	0	0	0	50	42	45
21:00	0	0	2	2	7	6	6	1	0	0	1	0	0	0	25	43	48
22:00	0	0	0	1	5	5	2	3	1	0	0	0	0	0	17	47	50
23:00	0	0	0	0	2	3	1	0	0	0	0	0	0	0	6	40	43
Total	6	12	68	112	244	259	111	17	4	0	2	0	0	5	840		
Percent	0.7%	1.4%	8.1%	13.3%	29.0%	30.8%	13.2%	2.0%	0.5%	0.0%	0.2%	0.0%	0.0%	0.6%			

AM Peak

Vol.

PM Peak

Vol.

15:00	15:00	15:00	15:00	17:00	17:00	17:00	18:00	15:00		16:00		19:00	17:00
2	10	31	45	56	68	27	5	1		1		4	187

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Speed Study

Page 2

Site Code: 000000000000

Station ID:

NW Friberg-Strunk St between Union

South Access & Union Central Access

Latitude: 0' 0.0000 Undefined

Northbound

Start	0	16	21	26	31	36	41	46	51	56	61	66	71	76		85th	95th
Time	15	20	25	30	35	40	45	50	55	60	65	70	75	9999	Total	Percent	Percent
09/20/16	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	69	69
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	34	34
02:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	39	39
03:00	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	39	39
04:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	34	34
05:00	0	0	0	2	1	3	1	0	0	0	0	0	0	0	7	39	43
06:00	0	0	1	2	11	10	5	2	0	0	0	0	0	0	31	42	46
07:00	0	0	1	8	31	37	5	2	1	0	0	0	0	0	85	39	43
08:00	0	9	35	69	67	45	13	0	2	0	0	0	0	0	240	37	41
09:00	0	1	7	14	25	13	8	1	1	0	0	0	0	0	70	39	44
10:00	0	3	10	11	11	11	5	2	0	0	0	0	0	0	53	39	44
11:00	0	1	8	7	19	18	3	0	2	0	0	0	0	0	58	38	43
12 PM	0	0	5	17	27	45	6	0	0	0	0	0	0	0	100	38	40
13:00	0	1	10	20	38	45	13	2	2	0	0	0	0	0	131	39	44
14:00	1	0	9	17	29	31	11	2	0	0	0	0	0	0	100	39	43
15:00	0	4	30	28	36	33	16	1	2	0	0	0	0	0	150	39	43
16:00	1	0	9	25	34	49	21	2	0	0	0	0	0	0	141	40	43
17:00	0	0	22	19	68	68	34	4	0	0	0	0	0	0	215	40	44
18:00	0	3	6	14	34	58	29	7	0	0	0	0	0	0	151	42	44
19:00	0	2	15	36	44	42	12	2	0	0	0	0	0	0	153	38	42
20:00	0	1	5	6	16	27	11	1	1	0	0	0	0	0	68	41	44
21:00	0	0	0	4	8	14	1	2	0	0	1	0	0	0	30	39	48
22:00	0	0	0	2	1	3	2	1	0	0	0	0	0	0	9	44	47
23:00	0	0	0	0	1	5	1	0	0	0	0	0	0	0	7	39	43
Total	2	25	173	301	503	560	197	31	11	0	1	1	0	0	1805		
Percent	0.1%	1.4%	9.6%	16.7%	27.9%	31.0%	10.9%	1.7%	0.6%	0.0%	0.1%	0.1%	0.0%	0.0%			
AM Peak		08:00	08:00	08:00	08:00	08:00	08:00	06:00	08:00			00:00			08:00		
Vol.		9	35	69	67	45	13	2	2			1			240		
PM Peak	14:00	15:00	15:00	19:00	17:00	17:00	17:00	18:00	13:00		21:00				17:00		
Vol.	1	4	30	36	68	68	34	7	2		1				215		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Speed Study

Site Code: 000000000000

Station ID:

NW Friberg-Strunk St between Union

South Access & Union Central Access

Latitude: 0' 0.0000 Undefined

Northbound

Start	0	16	21	26	31	36	41	46	51	56	61	66	71	76		85th	95th
Time	15	20	25	30	35	40	45	50	55	60	65	70	75	9999	Total	Percent	Percent
09/21/16	0	0	1	1	0	2	0	0	0	0	0	0	0	0	4	38	39
01:00	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	44	44
02:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	39	39
03:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	54	54
04:00	0	0	0	0	0	4	2	0	0	0	0	0	0	0	6	42	44
05:00	0	0	1	0	2	2	1	0	0	0	0	0	0	0	6	40	43
06:00	0	0	0	1	7	11	7	2	0	0	0	0	0	0	28	43	46
07:00	0	1	2	8	25	27	13	3	0	0	0	0	0	0	79	41	44
08:00	0	8	40	80	71	37	6	1	1	0	0	0	0	0	244	36	39
09:00	0	2	8	12	17	18	6	1	0	0	0	0	0	0	64	39	43
10:00	0	1	5	11	20	9	6	1	0	0	0	0	0	0	53	39	43
11:00	0	0	7	10	25	20	8	2	0	1	0	0	0	0	73	40	44
12 PM	1	6	33	38	42	22	6	1	0	0	0	0	0	0	149	36	39
13:00	2	1	11	16	33	40	13	3	0	0	0	0	0	5	124	39	43
14:00	0	2	9	23	52	36	13	1	0	0	0	0	0	0	136	39	42
15:00	0	0	10	14	32	60	15	1	0	0	0	0	0	0	132	39	43
16:00	0	0	7	19	50	56	38	5	1	0	0	0	0	0	176	42	44
17:00	0	1	11	31	52	89	31	10	0	1	0	0	0	0	226	41	44
18:00	0	0	0	5	42	73	23	3	1	0	0	0	0	0	147	41	44
19:00	0	3	12	17	38	53	9	3	0	1	1	0	0	0	137	39	43
20:00	0	1	1	1	20	13	6	1	0	0	0	0	0	0	43	40	44
21:00	0	0	0	0	9	18	3	0	1	0	0	0	0	0	31	39	44
22:00	0	0	0	1	3	6	5	0	1	0	0	0	0	0	16	43	50
23:00	0	0	0	1	2	2	2	0	0	0	0	0	0	1	8	42	44
Total	3	26	158	289	542	599	215	38	6	3	1	0	0	6	1886		
Percent	0.2%	1.4%	8.4%	15.3%	28.7%	31.8%	11.4%	2.0%	0.3%	0.2%	0.1%	0.0%	0.0%	0.3%			
AM Peak		08:00	08:00	08:00	08:00	08:00	07:00	07:00	03:00	11:00					08:00		
Vol.		8	40	80	71	37	13	3	1	1					244		
PM Peak	13:00	12:00	12:00	12:00	14:00	17:00	16:00	17:00	16:00	17:00	19:00			13:00	17:00		
Vol.	2	6	33	38	52	89	38	10	1	1	1			5	226		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Speed Study

Page 4

Site Code: 000000000000

Station ID:

NW Friberg-Strunk St between Union

South Access & Union Central Access

Latitude: 0' 0.0000 Undefined

Northbound

Start	0	16	21	26	31	36	41	46	51	56	61	66	71	76		85th	95th
Time	15	20	25	30	35	40	45	50	55	60	65	70	75	9999	Total	Percent	Percent
09/22/16	0	0	0	0	2	1	0	1	0	0	0	0	0	0	4	47	48
01:00	0	0	0	0	2	3	1	0	0	0	0	0	0	0	6	40	43
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	34	34
03:00	0	0	0	0	1	0	1	1	0	0	0	0	0	0	3	47	49
04:00	0	0	0	0	1	1	1	0	0	0	0	0	0	0	3	42	44
05:00	0	0	0	0	3	1	2	0	0	0	0	0	0	0	6	42	44
06:00	0	0	0	4	12	15	5	0	0	0	0	0	0	0	36	39	43
07:00	0	0	1	15	37	21	11	1	1	0	0	0	0	0	87	39	43
08:00	0	12	34	60	93	35	7	2	0	0	0	0	0	0	243	36	39
09:00	1	0	6	9	21	8	8	0	0	0	0	0	0	0	53	40	43
10:00	0	2	7	9	14	15	5	2	0	0	0	0	0	0	54	39	44
11:00	0	2	3	11	20	15	8	1	0	0	0	0	0	0	60	39	43
12 PM	0	0	5	19	47	41	12	2	1	1	0	0	0	0	128	39	43
13:00	0	0	9	21	37	35	13	2	0	0	0	0	0	0	117	39	43
14:00	0	0	6	29	29	25	9	2	0	0	0	0	0	0	100	39	43
15:00	2	4	22	48	50	36	6	0	0	0	0	0	0	0	168	37	39
16:00	0	0	12	24	55	73	29	4	0	0	0	0	0	0	197	40	43
17:00	0	1	17	49	71	89	37	8	1	1	0	0	0	0	274	40	44
18:00	0	2	11	21	61	78	22	6	0	0	0	0	0	0	201	39	44
19:00	0	1	10	17	27	36	14	4	0	0	0	0	0	0	109	40	44
20:00	0	0	0	5	8	16	4	2	1	0	0	0	0	0	36	42	48
21:00	0	0	1	1	8	10	7	1	0	0	1	0	0	0	29	43	47
22:00	0	0	0	3	0	1	3	0	0	0	0	0	1	0	8	44	72
23:00	0	0	0	0	2	7	2	1	1	1	0	0	0	0	14	49	56
Total	3	24	144	345	602	562	207	40	5	3	1	0	1	0	1937		
Percent	0.2%	1.2%	7.4%	17.8%	31.1%	29.0%	10.7%	2.1%	0.3%	0.2%	0.1%	0.0%	0.1%	0.0%			
AM Peak	09:00	08:00	08:00	08:00	08:00	08:00	07:00	08:00	07:00						08:00		
Vol.	1	12	34	60	93	35	11	2	1						243		
PM Peak	15:00	15:00	15:00	17:00	17:00	17:00	17:00	17:00	12:00	12:00	21:00		22:00		17:00		
Vol.	2	4	22	49	71	89	37	8	1	1	1		1		274		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668
Speed Study

Page 5

Site Code: 000000000000

Station ID:

NW Friberg-Strunk St between Union

South Access & Union Central Access

Latitude: 0' 0.0000 Undefined

Northbound

Start	0	16	21	26	31	36	41	46	51	56	61	66	71	76		85th	95th
Time	15	20	25	30	35	40	45	50	55	60	65	70	75	9999	Total	Percent	Percent
09/23/16	0	0	1	0	2	1	1	0	0	0	0	0	0	0	5	41	43
01:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	33	34
02:00	0	0	0	0	0	1	2	0	0	0	0	0	0	0	3	43	44
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	1	0	0	3	1	0	0	0	0	0	0	0	5	41	43
05:00	0	0	0	0	3	4	3	0	0	0	0	0	0	0	10	42	44
06:00	0	0	1	4	8	13	9	2	0	0	0	0	0	0	37	43	45
07:00	0	0	5	6	32	36	6	4	0	0	0	0	0	0	89	39	44
08:00	0	11	36	76	80	33	4	2	0	0	0	0	0	0	242	35	39
09:00	0	0	6	16	17	12	6	1	0	0	0	0	0	0	58	39	43
10:00	0	4	11	14	14	23	5	0	0	0	0	0	0	0	71	38	41
11:00	0	0	5	11	19	26	10	2	0	0	0	0	0	0	73	40	44
12 PM	0	0	14	18	52	40	15	2	1	0	0	0	0	0	142	39	43
13:00	0	2	12	19	32	30	7	3	1	0	0	0	0	0	106	39	44
14:00	0	0	12	29	31	30	7	1	0	0	0	0	0	0	110	38	41
15:00	1	11	32	46	54	33	9	1	0	0	0	0	0	0	187	37	40
16:00	0	0	7	10	33	81	19	1	0	0	0	0	0	0	151	39	43
17:00	0	0	5	5	28	54	26	8	0	0	0	0	0	0	126	42	46
18:00	0	0	0	8	17	37	24	0	1	0	0	0	0	0	87	42	44
19:00	0	0	0	4	20	27	6	2	0	0	0	0	0	0	59	39	44
20:00	0	0	0	6	9	18	8	2	0	0	0	0	0	0	43	42	44
21:00	0	0	0	6	12	10	4	0	0	0	0	0	0	0	32	39	42
22:00	0	0	0	1	5	7	6	3	0	0	0	0	0	0	22	44	48
23:00	2	0	2	7	3	6	1	1	0	0	0	0	0	0	22	38	44
Total	3	28	150	287	472	525	179	35	3	0	0	0	0	0	1682		
Percent	0.2%	1.7%	8.9%	17.1%	28.1%	31.2%	10.6%	2.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		08:00	08:00	08:00	08:00	07:00	11:00	07:00							08:00		
Vol.		11	36	76	80	36	10	4							242		
PM Peak	23:00	15:00	15:00	15:00	15:00	16:00	17:00	17:00	12:00						15:00		
Vol.	2	11	32	46	54	81	26	8	1						187		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Speed Study

Site Code: 000000000000

Station ID:

NW Friberg-Strunk St between Union

South Access & Union Central Access

Latitude: 0' 0.0000 Undefined

Northbound

Start	0	16	21	26	31	36	41	46	51	56	61	66	71	76		85th	95th
Time	15	20	25	30	35	40	45	50	55	60	65	70	75	9999	Total	Percent	Percent
09/24/16	0	0	2	6	3	3	3	0	0	0	0	0	0	0	17	40	43
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	34	34
02:00	0	0	0	0	0	2	1	0	0	0	0	0	0	0	3	42	44
03:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2	38	39
04:00	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	43	44
05:00	0	0	0	0	1	2	2	0	0	0	0	0	0	0	5	43	44
06:00	0	0	0	0	7	2	3	0	0	0	0	0	0	0	12	42	44
07:00	0	0	3	7	15	14	4	0	0	0	0	0	0	0	43	39	42
08:00	0	0	5	4	22	18	9	2	1	0	0	0	0	0	61	41	44
09:00	0	0	1	6	9	15	11	1	0	1	0	0	0	0	44	42	44
10:00	0	2	4	7	19	37	13	1	0	0	0	0	0	0	83	40	43
11:00	0	0	4	5	19	32	17	1	0	0	0	0	0	0	78	41	44
12 PM	0	0	5	5	21	34	20	1	1	0	0	0	0	0	87	42	44
13:00	0	0	0	3	12	35	16	4	0	0	0	0	0	0	70	42	45
14:00	0	0	2	4	18	39	23	5	0	0	0	0	0	0	91	43	45
15:00	0	0	1	1	11	37	21	7	0	1	0	0	0	0	79	44	47
16:00	0	0	2	3	14	29	16	4	0	0	0	0	0	0	68	43	45
17:00	0	0	0	4	9	38	18	2	0	0	0	0	0	0	71	42	44
18:00	0	0	0	4	23	30	14	0	0	0	0	0	0	0	71	41	43
19:00	0	0	0	2	12	23	10	3	0	0	0	0	0	0	50	42	45
20:00	0	0	0	2	14	21	3	1	1	1	0	0	0	0	43	39	49
21:00	0	0	2	3	6	14	3	0	0	1	0	0	0	0	29	39	44
22:00	0	0	0	0	5	13	3	0	0	0	0	0	0	0	21	39	43
23:00	0	0	1	0	5	6	6	0	0	0	0	0	0	0	18	42	44
Total	0	2	32	67	246	446	217	32	3	4	0	0	0	0	1049		
Percent	0.0%	0.2%	3.1%	6.4%	23.5%	42.5%	20.7%	3.1%	0.3%	0.4%	0.0%	0.0%	0.0%	0.0%			
AM Peak		10:00	08:00	07:00	08:00	10:00	11:00	08:00	08:00	09:00					10:00		
Vol.		2	5	7	22	37	17	2	1	1					83		
PM Peak			12:00	12:00	18:00	14:00	14:00	15:00	12:00	15:00					14:00		
Vol.			5	5	23	39	23	7	1	1					91		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668
Speed Study

Page 7

Site Code: 000000000000

Station ID:

NW Friberg-Strunk St between Union

South Access & Union Central Access

Latitude: 0' 0.0000 Undefined

Northbound

Start	0	16	21	26	31	36	41	46	51	56	61	66	71	76		85th	95th
Time	15	20	25	30	35	40	45	50	55	60	65	70	75	9999	Total	Percent	Percent
09/25/16	0	0	1	0	1	3	0	1	0	0	0	0	0	0	6	45	48
01:00	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3	37	39
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	34	34
03:00	0	0	0	0	1	1	1	0	0	0	0	0	0	0	3	42	44
04:00	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3	38	39
05:00	0	0	0	0	1	3	4	0	0	0	0	0	0	0	8	43	44
06:00	0	0	0	1	4	5	2	0	0	0	0	0	0	0	12	40	43
07:00	0	0	0	0	3	5	5	2	0	0	0	0	0	0	15	44	48
08:00	0	0	1	3	7	14	6	4	0	1	0	0	0	0	36	44	49
09:00	0	0	0	5	10	16	10	1	0	0	0	0	0	0	42	42	44
10:00	0	0	0	3	5	25	9	3	1	0	1	0	0	0	47	43	49
11:00	0	0	4	4	25	36	14	2	0	0	0	0	0	0	85	41	44
12 PM	0	0	1	5	22	47	27	5	0	1	1	0	0	0	109	43	46
13:00	0	0	2	5	21	41	19	3	0	0	0	0	0	0	91	42	44
14:00	0	1	3	8	24	31	17	3	0	0	0	0	0	0	87	42	44
15:00	0	0	2	5	16	29	19	2	0	0	0	0	0	0	73	42	44
16:00	0	0	2	7	17	26	17	4	0	0	0	0	0	0	73	42	45
17:00	0	1	0	4	20	23	15	5	2	0	0	0	0	0	70	43	48
18:00	0	0	3	6	21	35	17	3	1	0	0	0	0	0	86	42	44
19:00	0	0	1	5	9	21	11	2	1	0	1	0	0	0	51	43	48
20:00	0	0	0	2	6	9	5	1	0	0	0	0	0	0	23	42	44
21:00	0	0	0	1	8	9	6	2	0	0	0	1	0	0	27	44	49
22:00	0	0	0	0	1	3	3	1	0	0	0	0	0	0	8	44	47
23:00	0	0	0	1	3	2	1	0	0	0	0	0	0	0	7	39	43
Total	0	2	20	65	229	387	208	44	5	2	3	1	0	0	966		
Percent	0.0%	0.2%	2.1%	6.7%	23.7%	40.1%	21.5%	4.6%	0.5%	0.2%	0.3%	0.1%	0.0%	0.0%			
AM Peak			11:00	09:00	11:00	11:00	11:00	08:00	10:00	08:00	10:00				11:00		
Vol.			4	5	25	36	14	4	1	1	1				85		
PM Peak		14:00	14:00	14:00	14:00	12:00	12:00	12:00	17:00	12:00	12:00	21:00			12:00		
Vol.		1	3	8	24	47	27	5	2	1	1	1			109		

H. LEE & ASSOCIATES, PLLC

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Speed Study

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Site Code: 000000000000

Station ID:

NW Friberg-Strunk St between Union

South Access & Union Central Access

Latitude: 0' 0.0000 Undefined

Northbound

Start	0	16	21	26	31	36	41	46	51	56	61	66	71	76		85th	95th
Time	15	20	25	30	35	40	45	50	55	60	65	70	75	9999	Total	Percent	Percent
09/26/16	0	0	0	0	1	3	1	0	0	0	0	0	0	0	5	41	43
01:00	0	0	0	0	3	1	0	0	0	0	0	0	0	0	4	37	38
02:00	0	0	0	0	1	1	0	0	1	0	0	0	0	0	3	52	54
03:00	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	43	44
04:00	0	0	0	0	1	1	0	1	0	0	0	0	0	0	3	47	49
05:00	0	0	0	0	2	2	1	0	0	0	0	0	0	0	5	41	43
06:00	0	0	1	3	6	16	4	1	0	0	0	0	0	0	31	40	44
07:00	0	0	1	12	27	23	10	1	0	0	0	0	0	0	74	39	43
08:00	0	7	21	55	109	47	7	1	0	0	0	0	0	0	247	36	39
09:00	0	1	7	11	24	13	9	1	0	1	0	0	0	0	67	40	44
10:00	0	0	7	6	13	15	7	0	0	0	0	0	0	0	48	39	43
11:00	0	1	6	11	22	27	7	2	0	0	0	0	0	0	76	39	43
12 PM	0	1	8	15	61	37	12	2	1	0	0	0	0	0	137	39	43
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	0	10	51	113	270	187	59	9	2	1	0	0	0	0	702		
Percent	0.0%	1.4%	7.3%	16.1%	38.5%	26.6%	8.4%	1.3%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak		08:00	08:00	08:00	08:00	08:00	07:00	11:00	02:00	09:00					08:00		
Vol.		7	21	55	109	47	10	2	1	1					247		
PM Peak		12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00						12:00		
Vol.		1	8	15	61	37	12	2	1						137		
Grand Total	17	129	796	1579	3108	3525	1393	246	39	13	8	2	1	11	10867		
Percent	0.2%	1.2%	7.3%	14.5%	28.6%	32.4%	12.8%	2.3%	0.4%	0.1%	0.1%	0.0%	0.0%	0.1%			

15th Percentile : 27 MPH
50th Percentile : 34 MPH
85th Percentile : 40 MPH
95th Percentile : 44 MPH

Statistics
10 MPH Pace Speed : 31-40 MPH
Number in Pace : 6634
Percent in Pace : 61.0%
Number of Vehicles > 55 MPH : 35
Percent of Vehicles > 55 MPH : 0.3%
Mean Speed(Average) : 35 MPH

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668
Traffic Volumes

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NW Friberg-Strunk St NB Between Union
South Access & Union Central Access

Start Time	20-Sep-16 Tue	Northbound		Hour Totals	
		Morning	Afternoon	Morning	Afternoon
12:00		0	19		
12:15		1	16		
12:30		0	21		
12:45		0	44	1	100
01:00		0	64		
01:15		1	12		
01:30		0	28		
01:45		0	27	1	131
02:00		0	24		
02:15		0	18		
02:30		0	27		
02:45		1	31	1	100
03:00		0	55		
03:15		0	41		
03:30		1	23		
03:45		1	31	2	150
04:00		0	30		
04:15		0	36		
04:30		1	31		
04:45		0	44	1	141
05:00		1	63		
05:15		1	52		
05:30		3	56		
05:45		2	44	7	215
06:00		4	50		
06:15		9	33		
06:30		6	40		
06:45		12	28	31	151
07:00		15	35		
07:15		24	38		
07:30		17	58		
07:45		29	22	85	153
08:00		52	20		
08:15		112	20		
08:30		64	19		
08:45		12	9	240	68
09:00		24	15		
09:15		18	9		
09:30		16	1		
09:45		12	5	70	30
10:00		8	4		
10:15		12	3		
10:30		19	1		
10:45		14	1	53	9
11:00		12	1		
11:15		11	3		
11:30		18	0		
11:45		17	3	58	7
Total		550	1255		
Percent		30.5%	69.5%		

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P.O. Box 1849
Vancouver, WA 98668
Traffic Volumes

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NW Friberg-Strunk St NB Between Union
South Access & Union Central Access

Start Time	21-Sep-16 Wed	Northbound		Hour Totals	
		Morning	Afternoon	Morning	Afternoon
12:00		1	25		
12:15		3	23		
12:30		0	60		
12:45		0	41	4	149
01:00		0	34		
01:15		2	30		
01:30		0	31		
01:45		0	29	2	124
02:00		0	30		
02:15		1	19		
02:30		0	46		
02:45		0	41	1	136
03:00		0	36		
03:15		0	30		
03:30		1	36		
03:45		0	30	1	132
04:00		3	27		
04:15		1	38		
04:30		1	51		
04:45		1	60	6	176
05:00		0	61		
05:15		0	61		
05:30		3	49		
05:45		3	55	6	226
06:00		5	49		
06:15		6	33		
06:30		7	37		
06:45		10	28	28	147
07:00		19	31		
07:15		18	32		
07:30		13	46		
07:45		29	28	79	137
08:00		66	19		
08:15		120	7		
08:30		41	9		
08:45		17	8	244	43
09:00		22	8		
09:15		20	5		
09:30		12	13		
09:45		10	5	64	31
10:00		11	2		
10:15		14	5		
10:30		15	5		
10:45		13	4	53	16
11:00		19	1		
11:15		12	3		
11:30		19	2		
11:45		23	2	73	8
Total		561	1325		
Percent		29.7%	70.3%		

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Traffic Volumes

NW Friberg-Strunk St NB Between Union
South Access & Union Central Access

Start Time	22-Sep-16 Thu	Northbound		Hour Totals	
		Morning	Afternoon	Morning	Afternoon
12:00		2	14		
12:15		1	28		
12:30		0	38		
12:45		1	48	4	128
01:00		1	55		
01:15		0	22		
01:30		2	19		
01:45		3	21	6	117
02:00		0	21		
02:15		1	22		
02:30		0	27		
02:45		0	30	1	100
03:00		0	59		
03:15		1	35		
03:30		1	31		
03:45		1	43	3	168
04:00		1	39		
04:15		2	33		
04:30		0	62		
04:45		0	63	3	197
05:00		2	89		
05:15		1	67		
05:30		0	64		
05:45		3	54	6	274
06:00		3	64		
06:15		7	44		
06:30		9	59		
06:45		17	34	36	201
07:00		17	36		
07:15		23	26		
07:30		15	26		
07:45		32	21	87	109
08:00		56	17		
08:15		120	4		
08:30		52	7		
08:45		15	8	243	36
09:00		11	7		
09:15		18	8		
09:30		14	9		
09:45		10	5	53	29
10:00		8	3		
10:15		20	2		
10:30		10	1		
10:45		16	2	54	8
11:00		11	6		
11:15		20	5		
11:30		13	1		
11:45		16	2	60	14
Total		556	1381		
Percent		28.7%	71.3%		
Grand Total		1667	3961		
Percent		29.6%	70.4%		
ADT		ADT 1,876		AADT 1,876	

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Speed Study

NW Friberg-Strunk St SB between Union
South Access & Union Central Access

Southbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	85th Percent	95th Percent
09/19/16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	67	12	10	24	42	37	10	2	1	1	0	1	0	2	209	37	42
16:00	1	0	2	18	27	38	13	2	0	0	0	0	0	0	101	39	43
17:00	0	0	1	5	22	51	19	5	2	0	0	0	0	0	105	42	46
18:00	0	0	0	17	33	35	19	8	0	0	0	0	0	0	112	42	46
19:00	2	0	0	5	11	25	12	3	0	1	0	0	0	0	59	42	46
20:00	0	0	1	4	6	18	8	0	0	0	0	0	0	0	37	41	43
21:00	0	0	0	1	2	11	5	3	0	0	0	0	0	0	22	44	48
22:00	0	0	0	1	0	4	0	0	0	0	0	0	0	0	5	39	39
23:00	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	43	44
Total	70	12	14	75	143	220	87	23	3	2	0	1	0	2	652		
Percent	10.7%	1.8%	2.1%	11.5%	21.9%	33.7%	13.3%	3.5%	0.5%	0.3%	0.0%	0.2%	0.0%	0.3%			
AM Peak Vol.																	
PM Peak Vol.	15:00 67	15:00 12	15:00 10	15:00 24	15:00 42	17:00 51	17:00 19	18:00 8	17:00 2	15:00 1		15:00 1		15:00 2	15:00 209		

H. LEE & ASSOCIATES, PLLC

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Speed Study

NW Friberg-Strunk St SB between Union
South Access & Union Central Access

Southbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	85th Percent	95th Percent
09/20/16	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	49	49
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	48	49
04:00	0	0	0	0	0	3	2	1	0	0	0	0	0	0	6	45	48
05:00	0	0	0	0	1	10	17	10	1	0	0	0	0	0	39	47	49
06:00	0	0	0	3	7	10	10	2	0	0	0	0	0	0	32	43	45
07:00	0	1	2	21	21	31	17	2	1	0	0	0	0	0	96	41	44
08:00	0	6	21	67	58	27	7	0	0	0	0	0	0	0	186	36	39
09:00	0	0	2	14	23	15	9	1	0	0	0	0	0	0	64	40	43
10:00	1	0	0	10	10	13	5	1	0	0	0	0	0	0	40	40	44
11:00	0	0	0	11	9	24	7	2	2	0	0	0	0	0	55	41	48
12 PM	4	2	13	26	37	27	13	1	2	0	0	0	0	0	125	39	43
13:00	0	0	2	10	16	21	8	2	0	1	0	0	0	0	60	41	45
14:00	0	0	2	10	19	36	15	3	0	0	0	0	0	0	85	41	44
15:00	63	8	9	16	38	40	17	3	1	0	0	0	0	0	195	39	43
16:00	1	0	2	10	23	42	11	5	0	0	0	0	0	0	94	40	45
17:00	0	0	0	17	63	50	22	4	1	0	0	0	0	0	157	40	44
18:00	1	0	2	10	38	41	15	4	0	1	0	0	0	0	112	41	44
19:00	0	0	5	8	30	24	10	0	1	0	0	0	0	0	78	39	43
20:00	0	0	2	3	16	19	7	1	1	0	0	0	0	0	49	41	44
21:00	0	0	0	1	12	11	0	1	0	0	0	0	0	0	25	38	39
22:00	0	0	0	0	2	4	4	0	0	0	0	1	0	0	11	44	67
23:00	0	0	0	0	0	2	1	0	1	0	0	0	0	0	4	52	53
Total	70	17	62	237	423	450	198	46	11	2	0	1	0	0	1517		
Percent	4.6%	1.1%	4.1%	15.6%	27.9%	29.7%	13.1%	3.0%	0.7%	0.1%	0.0%	0.1%	0.0%	0.0%			
AM Peak	10:00	08:00	08:00	08:00	08:00	07:00	05:00	05:00	11:00						08:00		
Vol.	1	6	21	67	58	31	17	10	2						186		
PM Peak	15:00	15:00	12:00	12:00	17:00	17:00	17:00	16:00	12:00	13:00		22:00			15:00		
Vol.	63	8	13	26	63	50	22	5	2	1		1			195		

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Speed Study

NW Friberg-Strunk St SB between Union
South Access & Union Central Access

Southbound	0	16	21	26	31	36	41	46	51	56	61	66	71	76		85th	95th
Start Time	15	20	25	30	35	40	45	50	55	60	65	70	75	9999	Total	Percent	Percent
09/21/16	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	39	39
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	39	39
03:00	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	49	49
04:00	0	0	0	0	1	3	3	3	0	0	0	0	0	0	10	47	49
05:00	0	0	0	0	3	15	12	6	1	1	1	0	0	0	39	47	55
06:00	0	0	1	1	7	13	12	5	1	0	0	0	0	0	40	45	49
07:00	0	0	1	24	26	28	11	3	2	0	0	0	0	0	95	40	45
08:00	0	5	31	71	53	22	4	0	0	0	0	0	0	0	186	34	38
09:00	0	0	2	12	18	19	14	4	0	0	0	0	0	0	69	42	45
10:00	0	0	2	7	12	28	7	4	0	0	0	0	0	0	60	41	46
11:00	0	0	3	9	15	28	20	1	0	0	0	0	0	0	76	42	44
12 PM	103	18	7	27	35	23	4	2	1	0	0	1	0	3	224	34	39
13:00	3	0	1	6	30	29	20	2	2	0	0	0	0	0	93	42	44
14:00	0	0	2	21	54	45	17	6	1	0	0	0	0	0	146	40	44
15:00	0	0	1	6	22	37	18	5	0	0	0	0	0	0	89	42	45
16:00	0	0	1	4	11	27	26	5	1	0	0	0	0	0	75	43	47
17:00	0	0	0	23	40	48	34	8	2	1	0	0	0	0	156	43	46
18:00	1	0	0	11	23	51	23	4	1	0	0	0	0	0	114	42	44
19:00	0	0	4	16	24	23	12	1	0	0	0	0	0	0	80	40	43
20:00	0	0	0	1	10	24	6	2	0	0	0	0	0	0	43	41	44
21:00	0	0	0	2	7	16	7	1	1	0	0	0	0	0	34	42	46
22:00	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	49	49
23:00	0	0	0	0	1	0	2	0	0	0	0	0	0	0	3	43	44
Total	107	23	56	241	392	481	252	67	13	2	1	1	0	3	1639		
Percent	6.5%	1.4%	3.4%	14.7%	23.9%	29.3%	15.4%	4.1%	0.8%	0.1%	0.1%	0.1%	0.0%	0.2%			
AM Peak		08:00	08:00	08:00	08:00	07:00	11:00	05:00	07:00	05:00	05:00				08:00		
Vol.		5	31	71	53	28	20	6	2	1	1				186		
PM Peak	12:00	12:00	12:00	12:00	14:00	18:00	17:00	17:00	13:00	17:00		12:00		12:00	12:00		
Vol.	103	18	7	27	54	51	34	8	2	1		1		3	224		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668
Speed Study

NW Friberg-Strunk St SB between Union
South Access & Union Central Access

Southbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	85th Percent	95th Percent
09/22/16	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	43	44
01:00	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3	38	39
02:00	0	0	0	0	1	1	0	1	0	0	0	0	0	0	3	47	49
03:00	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	39	39
04:00	0	0	0	0	0	1	6	0	0	0	0	0	0	0	7	44	44
05:00	0	1	0	0	0	18	12	5	1	0	0	0	0	0	37	45	49
06:00	0	0	0	5	4	7	10	2	0	0	0	0	0	0	28	43	46
07:00	0	0	9	21	30	32	9	4	1	0	0	0	0	0	106	39	44
08:00	1	8	40	52	55	25	7	1	1	0	0	0	0	0	190	36	39
09:00	0	0	2	15	13	16	4	3	1	0	0	0	0	0	54	39	47
10:00	1	0	4	13	13	13	7	0	1	0	0	0	0	0	52	40	43
11:00	0	0	1	10	11	25	11	3	0	0	0	0	0	0	61	42	44
12 PM	0	2	3	21	38	34	23	6	1	0	0	0	0	0	128	42	45
13:00	0	0	3	5	14	15	14	2	0	0	0	0	0	0	53	42	44
14:00	0	2	3	14	23	35	9	4	0	0	0	0	0	0	90	39	44
15:00	87	3	8	33	45	30	10	3	1	0	1	1	1	2	225	37	43
16:00	0	0	3	10	29	43	22	4	0	0	0	0	0	0	111	42	44
17:00	0	0	3	28	65	57	34	6	0	0	0	0	0	0	193	41	44
18:00	0	1	2	24	50	50	21	6	1	0	0	0	0	0	155	41	44
19:00	0	0	5	19	33	25	13	2	1	0	0	0	0	0	98	40	44
20:00	0	0	0	0	6	8	9	2	0	0	0	0	0	0	25	44	46
21:00	0	0	0	0	3	10	8	2	0	0	0	0	0	0	23	44	47
22:00	0	0	0	0	0	2	0	2	0	0	1	0	0	0	5	61	63
23:00	0	0	0	0	3	0	1	0	0	0	0	0	0	0	4	42	43
Total	89	17	86	270	438	451	231	58	9	0	2	1	1	2	1655		
Percent	5.4%	1.0%	5.2%	16.3%	26.5%	27.3%	14.0%	3.5%	0.5%	0.0%	0.1%	0.1%	0.1%	0.1%			
AM Peak	08:00	08:00	08:00	08:00	08:00	07:00	05:00	05:00	05:00						08:00		
Vol.	1	8	40	52	55	32	12	5	1						190		
PM Peak	15:00	15:00	15:00	15:00	17:00	17:00	17:00	12:00	12:00		15:00	15:00	15:00	15:00	15:00		
Vol.	87	3	8	33	65	57	34	6	1		1	1	1	2	225		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668
Speed Study

NW Friberg-Strunk St SB between Union
South Access & Union Central Access

Southbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	85th Percent	95th Percent
09/23/16	0	0	0	0	1	1	2	0	0	0	0	0	0	0	4	43	44
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2	48	49
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	3	1	1	1	0	0	0	0	0	6	50	53
05:00	0	0	0	0	1	18	10	4	1	1	0	0	0	0	35	45	51
06:00	0	0	0	2	11	8	13	4	0	0	0	0	0	0	38	44	47
07:00	1	0	4	16	25	28	16	2	1	0	0	0	0	0	93	41	44
08:00	0	16	35	89	51	24	5	1	0	0	0	0	0	0	221	34	38
09:00	1	0	3	10	20	20	7	1	1	0	0	0	0	0	63	39	44
10:00	0	0	4	8	15	20	4	2	0	0	0	0	0	0	53	39	44
11:00	0	2	2	5	14	22	14	2	1	0	0	0	0	0	62	42	44
12 PM	0	0	1	23	49	48	15	3	0	0	0	0	0	0	139	39	43
13:00	0	0	5	17	27	24	10	2	0	1	0	0	0	0	86	40	44
14:00	0	2	5	14	29	32	13	4	0	0	0	0	0	0	99	40	44
15:00	86	11	12	32	31	20	10	3	0	0	0	1	0	4	210	35	41
16:00	0	0	0	11	27	34	24	1	2	0	0	0	0	0	99	42	44
17:00	0	0	0	4	22	29	22	5	0	0	0	0	0	0	82	43	45
18:00	0	0	0	1	13	22	16	6	0	0	0	0	0	0	58	44	47
19:00	0	0	0	0	7	12	6	1	2	1	1	0	0	0	30	47	57
20:00	0	0	1	2	3	9	7	2	2	0	0	0	0	0	26	45	51
21:00	0	0	1	3	9	10	7	1	2	0	0	1	0	0	34	44	53
22:00	0	0	1	0	0	2	5	2	2	0	0	0	0	0	12	50	53
23:00	0	0	0	1	4	3	2	0	0	0	0	0	0	0	10	41	43
Total	88	31	74	238	360	389	209	48	15	3	1	2	0	4	1462		
Percent	6.0%	2.1%	5.1%	16.3%	24.6%	26.6%	14.3%	3.3%	1.0%	0.2%	0.1%	0.1%	0.0%	0.3%			
AM Peak	07:00	08:00	08:00	08:00	08:00	07:00	07:00	05:00	04:00	05:00					08:00		
Vol.	1	16	35	89	51	28	16	4	1	1					221		
PM Peak	15:00	15:00	15:00	15:00	12:00	12:00	16:00	18:00	16:00	13:00	19:00	15:00		15:00	15:00		
Vol.	86	11	12	32	49	48	24	6	2	1	1	1		4	210		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668
Speed Study

NW Friberg-Strunk St SB between Union
South Access & Union Central Access

Southbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	85th Percent	95th Percent
09/24/16	0	0	1	5	9	8	4	0	0	0	0	0	0	0	27	39	43
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	39	39
04:00	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2	73	74
05:00	0	0	0	0	0	1	9	5	0	0	0	0	0	0	15	47	49
06:00	0	0	0	2	1	2	3	3	1	0	0	0	0	0	12	48	51
07:00	0	0	3	10	6	4	4	2	0	0	0	0	0	0	29	42	46
08:00	0	0	2	7	16	23	15	1	0	0	0	0	0	0	64	42	44
09:00	0	0	1	9	7	19	19	2	0	0	0	1	0	0	58	43	45
10:00	0	0	0	4	14	32	16	2	0	0	0	0	0	0	68	42	44
11:00	0	0	0	6	11	26	28	5	1	0	0	0	0	0	77	44	47
12 PM	0	0	0	1	6	22	28	7	0	0	0	0	0	0	64	44	47
13:00	0	0	0	0	9	23	21	3	3	0	0	0	0	0	59	44	50
14:00	0	0	0	3	6	25	27	2	1	0	1	0	0	0	65	43	46
15:00	0	0	0	2	11	14	16	9	2	0	0	0	0	0	54	46	49
16:00	0	0	0	1	8	27	12	4	2	0	0	0	0	0	54	44	49
17:00	0	0	0	1	5	23	21	5	2	1	0	0	0	0	58	44	50
18:00	0	0	0	5	6	22	12	1	1	0	0	0	0	0	47	42	44
19:00	0	0	0	2	1	14	6	0	1	1	0	0	0	0	25	43	53
20:00	0	0	0	0	7	6	3	0	1	0	0	0	0	0	17	42	50
21:00	0	0	0	0	1	6	2	0	0	0	0	0	0	0	9	41	43
22:00	0	0	0	0	3	1	4	1	1	0	0	0	0	0	10	47	52
23:00	0	0	0	1	0	4	3	1	0	0	0	0	0	0	9	44	47
Total	0	0	7	59	127	303	254	53	16	2	1	1	1	0	824		
Percent	0.0%	0.0%	0.8%	7.2%	15.4%	36.8%	30.8%	6.4%	1.9%	0.2%	0.1%	0.1%	0.1%	0.0%			
AM Peak			07:00	07:00	08:00	10:00	11:00	05:00	06:00			09:00	04:00		11:00		
Vol.			3	10	16	32	28	5	1			1	1		77		
PM Peak				18:00	15:00	16:00	12:00	15:00	13:00	17:00	14:00				14:00		
Vol.				5	11	27	28	9	3	1	1				65		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Speed Study

NW Friberg-Strunk St SB between Union
South Access & Union Central Access

Southbound

Start Time	015	1620	2125	2630	3135	3640	4145	4650	5155	5660	6165	6670	7175	769999	Total	85th Percent	95th Percent
09/25/16	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	44	44
01:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	49	49
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	34	34
03:00	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	39	39
04:00	0	0	0	0	1	0	1	1	0	0	0	0	0	0	3	47	49
05:00	0	0	0	0	3	4	9	4	3	2	0	0	0	0	25	52	56
06:00	0	0	0	0	0	1	0	2	0	0	0	0	0	0	3	48	49
07:00	0	0	0	1	0	5	3	2	0	0	0	0	0	0	11	45	48
08:00	0	0	0	2	5	11	11	4	0	0	0	0	0	0	33	44	47
09:00	0	0	0	3	12	16	18	4	1	0	0	0	0	0	54	44	47
10:00	0	0	2	4	15	32	23	1	1	0	0	0	0	0	78	42	44
11:00	0	0	2	4	16	25	20	3	1	1	0	0	0	0	72	43	47
12 PM	0	0	0	7	22	40	29	8	0	0	0	0	0	0	106	43	46
13:00	0	0	0	1	17	17	12	4	1	0	0	0	0	0	52	43	48
14:00	1	0	0	1	16	40	20	4	0	2	0	0	0	0	84	43	47
15:00	0	0	1	4	10	18	14	8	1	1	0	1	0	0	58	46	50
16:00	0	0	0	3	8	19	19	5	0	0	0	0	0	0	54	44	47
17:00	0	0	1	1	7	21	11	3	0	0	0	0	0	0	44	43	46
18:00	0	0	1	3	8	21	9	0	0	0	0	0	0	0	42	41	43
19:00	0	0	0	4	7	16	10	0	0	0	0	0	0	0	37	42	44
20:00	0	0	0	0	4	9	7	1	0	0	0	0	0	0	21	43	44
21:00	0	0	0	0	0	5	4	0	1	0	0	0	0	0	10	44	52
22:00	0	0	0	0	0	0	2	2	0	0	0	0	0	0	4	48	49
23:00	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	38	39
Total	1	0	8	38	152	303	224	57	9	6	0	1	0	0	799		
Percent	0.1%	0.0%	1.0%	4.8%	19.0%	37.9%	28.0%	7.1%	1.1%	0.8%	0.0%	0.1%	0.0%	0.0%			
AM Peak			10:00	10:00	11:00	10:00	10:00	05:00	05:00	05:00					10:00		
Vol.			2	4	16	32	23	4	3	2					78		
PM Peak	14:00		15:00	12:00	12:00	12:00	12:00	12:00	13:00	14:00		15:00			12:00		
Vol.	1		1	7	22	40	29	8	1	2		1			106		

Speed Study

Southbound

[illegible]

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668
Traffic Volumes

Page 1

NW Friberg-Strunk St SB between Union
South Access & Union Central Access

Start Time	20-Sep-16 Tue	Southbound		Hour Totals	
		Morning	Afternoon	Morning	Afternoon
12:00		0	13		
12:15		2	12		
12:30		0	82		
12:45		0	18	2	125
01:00		0	19		
01:15		0	18		
01:30		0	12		
01:45		0	11	0	60
02:00		0	24		
02:15		0	20		
02:30		0	17		
02:45		0	24	0	85
03:00		2	73		
03:15		0	72		
03:30		0	26		
03:45		0	24	2	195
04:00		0	29		
04:15		1	17		
04:30		0	14		
04:45		5	34	6	94
05:00		2	34		
05:15		10	41		
05:30		19	41		
05:45		8	41	39	157
06:00		6	35		
06:15		6	26		
06:30		5	26		
06:45		15	25	32	112
07:00		12	12		
07:15		28	22		
07:30		21	31		
07:45		35	13	96	78
08:00		40	26		
08:15		72	11		
08:30		48	10		
08:45		26	2	186	49
09:00		16	4		
09:15		10	13		
09:30		22	3		
09:45		16	5	64	25
10:00		8	4		
10:15		10	3		
10:30		14	2		
10:45		8	2	40	11
11:00		9	0		
11:15		12	2		
11:30		23	1		
11:45		11	1	55	4
Total		522	995		
Percent		34.4%	65.6%		

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P.O. Box 1849
Vancouver, WA 98668
Traffic Volumes

Page 2

NW Friberg-Strunk St SB between Union
South Access & Union Central Access

Start Time	21-Sep-16 Wed	Southbound		Hour Totals	
		Morning	Afternoon	Morning	Afternoon
12:00		0	14		
12:15		0	17		
12:30		1	97		
12:45		0	96	1	224
01:00		0	19		
01:15		0	30		
01:30		0	21		
01:45		0	23	0	93
02:00		1	30		
02:15		0	39		
02:30		0	46		
02:45		0	31	1	146
03:00		2	22		
03:15		0	23		
03:30		0	27		
03:45		0	17	2	89
04:00		2	21		
04:15		2	15		
04:30		2	22		
04:45		4	17	10	75
05:00		3	41		
05:15		10	47		
05:30		22	30		
05:45		4	38	39	156
06:00		4	39		
06:15		6	19		
06:30		13	27		
06:45		17	29	40	114
07:00		9	21		
07:15		23	22		
07:30		26	26		
07:45		37	11	95	80
08:00		36	18		
08:15		80	10		
08:30		53	8		
08:45		17	7	186	43
09:00		24	8		
09:15		12	1		
09:30		16	13		
09:45		17	12	69	34
10:00		23	1		
10:15		7	1		
10:30		17	0		
10:45		13	1	60	3
11:00		13	0		
11:15		16	1		
11:30		14	1		
11:45		33	1	76	3
Total		579	1060		
Percent		35.3%	64.7%		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668
Traffic Volumes

NW Friberg-Strunk St SB between Union
South Access & Union Central Access

Start Time	22-Sep-16 Thu	Southbound		Hour Totals	
		Morning	Afternoon	Morning	Afternoon
12:00		2	16		
12:15		0	16		
12:30		0	78		
12:45		0	18	2	128
01:00		1	20		
01:15		0	17		
01:30		1	11		
01:45		1	5	3	53
02:00		0	23		
02:15		0	17		
02:30		2	23		
02:45		1	27	3	90
03:00		1	94		
03:15		1	75		
03:30		0	32		
03:45		0	24	2	225
04:00		0	28		
04:15		1	22		
04:30		3	26		
04:45		3	35	7	111
05:00		3	53		
05:15		10	60		
05:30		16	42		
05:45		8	38	37	193
06:00		4	39		
06:15		7	38		
06:30		7	26		
06:45		10	52	28	155
07:00		13	50		
07:15		34	15		
07:30		26	24		
07:45		33	9	106	98
08:00		48	9		
08:15		73	7		
08:30		49	3		
08:45		20	6	190	25
09:00		16	6		
09:15		10	1		
09:30		18	9		
09:45		10	7	54	23
10:00		14	0		
10:15		10	2		
10:30		14	3		
10:45		14	0	52	5
11:00		8	1		
11:15		10	2		
11:30		21	1		
11:45		22	0	61	4
Total		545	1110		
Percent		32.9%	67.1%		
Grand Total		1646	3165		
Percent		34.2%	65.8%		

ADT

ADT 1,604

AADT 1,604

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P.O. Box 1849
Vancouver, WA 98668
Speed Study

NW Friberg-Strunk St North of
Union North Access

Northbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/19/16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	2	2	1	3	3	4	3	2	2	1	3	3	10	46	85	42	43
15:00	9	3	7	19	32	24	25	9	21	14	17	9	12	79	280	38	42
16:00	0	3	3	4	6	4	1	0	2	7	9	7	6	118	170	41	43
17:00	2	1	2	2	6	3	1	0	1	2	2	10	16	136	184	43	43
18:00	4	1	5	9	11	6	4	2	2	3	4	8	14	119	192	42	43
19:00	2	0	2	0	2	5	0	0	0	0	6	5	6	48	76	42	43
20:00	0	0	2	0	3	1	1	0	0	1	1	2	4	43	58	42	43
21:00	1	1	0	3	4	0	0	1	0	1	1	1	0	21	34	38	40
22:00	0	0	0	0	0	0	0	0	0	1	0	3	0	15	19	41	41
23:00	0	0	1	0	0	0	0	0	0	0	1	1	1	4	8	42	43
Total	20	11	23	40	67	47	35	14	28	30	44	49	69	629	1106		
Percent	1.8%	1.0%	2.1%	3.6%	6.1%	4.2%	3.2%	1.3%	2.5%	2.7%	4.0%	4.4%	6.2%	56.9%			
AM Peak Vol.																	
PM Peak Vol.	15:00 9	15:00 3	15:00 7	15:00 19	15:00 32	15:00 24	15:00 25	15:00 9	15:00 21	15:00 14	15:00 17	17:00 10	17:00 16	17:00 136	15:00 280		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668
Speed Study

NW Friberg-Strunk St North of
Union North Access

Northbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/20/16	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	*	*
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	23	23
03:00	0	0	0	0	0	0	0	0	0	0	0	1	0	2	3	41	41
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	*	*
06:00	0	1	0	1	0	0	0	0	0	2	1	1	5	16	27	43	43
07:00	2	0	0	0	1	0	1	2	0	1	4	2	7	40	60	43	43
08:00	11	0	2	4	11	4	4	4	9	3	8	11	11	46	128	41	43
09:00	1	0	1	1	0	0	1	0	2	5	1	2	7	42	63	43	43
10:00	3	0	1	0	1	2	2	2	1	1	3	2	4	23	45	42	43
11:00	0	1	1	0	1	2	1	0	0	5	5	5	7	32	60	42	43
12 PM	2	1	0	4	0	2	0	0	2	6	4	4	6	42	73	42	43
13:00	1	0	1	0	0	0	2	2	0	4	1	6	2	54	73	41	43
14:00	1	1	4	3	2	4	4	2	3	5	4	8	10	56	107	42	43
15:00	6	5	12	20	28	32	18	12	8	11	10	7	14	90	273	38	42
16:00	2	0	3	2	3	3	1	2	2	2	4	10	6	104	144	42	43
17:00	6	0	2	0	6	9	4	0	3	3	4	5	17	164	223	42	43
18:00	3	0	3	1	2	0	2	1	0	1	5	5	9	138	170	42	43
19:00	0	2	2	10	8	3	4	2	0	6	1	7	15	113	173	42	43
20:00	0	1	2	2	4	2	0	0	1	0	0	0	5	58	75	42	43
21:00	0	0	1	3	0	0	1	1	1	0	1	2	2	21	33	42	43
22:00	0	0	0	0	0	0	0	0	1	0	0	0	1	7	9	43	43
23:00	0	0	0	0	0	0	0	0	0	0	0	1	0	5	6	41	41
Total	38	12	36	51	67	63	45	30	33	55	56	79	128	1059	1752		
Percent	2.2%	0.7%	2.1%	2.9%	3.8%	3.6%	2.6%	1.7%	1.9%	3.1%	3.2%	4.5%	7.3%	60.4%			
AM Peak	08:00	06:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	09:00	08:00	08:00	08:00	08:00	08:00		
Vol.	11	1	2	4	11	4	4	4	9	5	8	11	11	46	128		
PM Peak	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	16:00	17:00	17:00	15:00		
Vol.	6	5	12	20	28	32	18	12	8	11	10	10	17	164	273		

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Speed Study

NW Friberg-Strunk St North of
Union North Access

Northbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/21/16	0	0	0	0	0	0	0	0	0	0	0	1	0	5	6	41	41
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	*	*
02:00	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	23	23
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	*	*
06:00	0	0	0	0	0	0	0	0	1	0	0	1	2	17	21	43	43
07:00	2	0	0	1	1	0	1	1	0	2	1	4	4	49	66	42	43
08:00	19	1	6	6	6	5	4	2	5	11	9	10	5	36	125	40	42
09:00	0	0	0	0	0	0	0	3	4	4	1	2	4	33	51	42	43
10:00	1	0	0	1	0	0	1	1	3	1	6	3	1	36	54	40	42
11:00	0	0	0	4	1	2	1	3	0	0	5	5	7	40	68	42	43
12 PM	1	3	9	12	19	22	21	8	4	9	10	17	16	55	206	41	43
13:00	5	0	5	9	10	12	2	6	5	5	4	4	9	67	143	40	43
14:00	1	1	2	6	14	9	9	4	2	2	5	8	10	78	151	41	43
15:00	0	1	4	0	2	1	2	0	1	2	1	10	8	113	145	42	43
16:00	1	1	0	0	1	1	3	1	1	2	7	6	10	131	165	42	43
17:00	6	0	2	4	7	6	5	4	0	3	6	6	15	159	223	42	43
18:00	2	0	3	3	5	1	2	2	2	0	5	6	16	122	169	43	43
19:00	0	1	0	6	5	3	3	0	1	2	6	8	7	107	149	42	43
20:00	1	1	1	10	5	3	4	0	0	1	1	6	5	37	75	41	43
21:00	0	1	0	2	1	1	1	1	0	0	1	2	3	26	39	42	43
22:00	0	0	0	0	0	0	0	0	0	0	1	1	0	14	16	41	41
23:00	0	0	0	0	0	0	0	0	0	1	1	0	0	9	11	39	39
Total	39	10	33	64	77	66	59	36	29	45	70	100	122	1148	1898		
Percent	2.1%	0.5%	1.7%	3.4%	4.1%	3.5%	3.1%	1.9%	1.5%	2.4%	3.7%	5.3%	6.4%	60.5%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	08:00	09:00	08:00	08:00	08:00	08:00	11:00	07:00	08:00		
Vol.	19	1	6	6	6	5	4	3	5	11	9	10	7	49	125		
PM Peak	17:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	13:00	12:00	12:00	12:00	12:00	17:00	17:00		
Vol.	6	3	9	12	19	22	21	8	5	9	10	17	16	159	223		

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Speed Study

NW Friberg-Strunk St North of
Union North Access

Northbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/22/16	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	*	*
02:00	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2	43	43
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	2	3	19	24	43	43
07:00	1	0	0	0	1	1	2	1	1	1	2	4	3	38	55	42	43
08:00	11	1	2	5	7	1	5	3	5	6	7	13	12	38	116	42	43
09:00	0	0	1	2	2	2	0	1	1	1	1	0	6	29	46	43	43
10:00	1	4	2	2	1	2	0	1	4	6	3	4	2	21	53	40	42
11:00	0	0	2	0	0	2	2	2	1	2	4	1	9	33	58	43	43
12 PM	2	1	1	7	3	2	0	1	2	2	2	5	10	55	93	42	43
13:00	1	0	1	1	0	3	0	1	0	2	4	2	7	58	80	43	43
14:00	1	2	3	2	5	4	1	2	5	3	6	5	7	56	102	42	43
15:00	8	5	11	10	32	22	21	9	13	14	16	11	13	92	277	39	42
16:00	2	0	3	7	8	8	3	3	3	1	3	11	7	141	200	41	43
17:00	7	0	2	6	5	8	4	1	1	3	3	6	8	169	223	41	43
18:00	3	0	4	5	8	11	5	7	1	0	4	14	11	160	233	42	43
19:00	1	1	9	9	21	8	7	1	1	3	3	4	8	93	169	40	43
20:00	0	0	0	0	2	1	0	0	0	0	0	0	2	37	42	43	43
21:00	0	0	0	0	0	0	0	0	1	0	0	1	3	21	26	43	43
22:00	1	0	0	0	0	0	0	0	0	0	0	1	1	8	11	43	43
23:00	0	0	0	0	0	0	0	0	0	0	0	3	0	13	16	41	41
Total	39	14	42	56	95	75	50	33	39	44	58	87	113	1098	1843		
Percent	2.1%	0.8%	2.3%	3.0%	5.2%	4.1%	2.7%	1.8%	2.1%	2.4%	3.1%	4.7%	6.1%	59.6%			
AM Peak	08:00	10:00	08:00	08:00	08:00	09:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	07:00	08:00		
Vol.	11	4	2	5	7	2	5	3	5	6	7	13	12	38	116		
PM Peak	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	18:00	15:00	17:00	15:00		
Vol.	8	5	11	10	32	22	21	9	13	14	16	14	13	169	277		

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Speed Study

NW Friberg-Strunk St North of
Union North Access

Northbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/23/16	0	0	0	0	0	0	0	1	1	0	0	1	0	2	5	41	41
01:00	0	0	0	0	0	0	0	0	0	1	0	0	1	1	3	43	43
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	*	*
05:00	0	0	0	0	0	1	0	0	0	0	0	0	0	5	6	29	29
06:00	0	0	0	0	0	0	0	0	0	0	3	0	1	26	30	42	43
07:00	1	0	1	0	0	1	0	0	0	1	2	5	5	51	67	43	43
08:00	9	1	2	3	7	6	8	2	5	5	6	8	7	45	114	41	43
09:00	0	1	0	1	0	1	1	2	1	4	2	1	9	28	51	43	43
10:00	1	0	0	1	0	2	1	1	3	1	3	4	5	44	66	42	43
11:00	0	1	1	1	0	1	1	0	1	4	1	3	5	49	68	42	43
12 PM	1	0	3	2	1	6	1	1	2	3	4	6	3	65	98	41	42
13:00	0	0	0	0	4	0	1	1	3	1	2	2	6	44	64	43	43
14:00	0	2	3	5	4	4	2	1	2	6	2	6	9	67	113	42	43
15:00	7	5	11	22	26	32	22	20	19	9	13	11	16	92	305	39	42
16:00	4	0	0	7	4	3	1	2	0	0	8	10	5	138	182	41	43
17:00	2	0	4	3	1	2	1	0	0	1	5	3	4	111	137	42	43
18:00	0	0	0	0	1	1	0	3	0	0	2	5	2	86	100	41	43
19:00	0	1	1	0	0	0	0	1	1	2	1	2	7	49	65	43	43
20:00	1	0	0	0	0	0	0	1	1	1	2	2	1	32	41	41	43
21:00	0	1	5	1	3	1	1	0	1	2	2	2	3	19	41	41	43
22:00	0	0	0	0	0	0	0	0	0	0	0	0	3	19	22	43	43
23:00	0	0	1	1	1	0	1	0	1	0	1	1	1	8	16	41	43
Total	26	12	32	47	52	61	41	36	41	41	59	72	93	988	1601		
Percent	1.6%	0.7%	2.0%	2.9%	3.2%	3.8%	2.6%	2.2%	2.6%	2.6%	3.7%	4.5%	5.8%	61.7%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	09:00	07:00	08:00		
Vol.	9	1	2	3	7	6	8	2	5	5	6	8	9	51	114		
PM Peak	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	15:00	16:00	15:00		
Vol.	7	5	11	22	26	32	22	20	19	9	13	11	16	138	305		

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NW Friberg-Strunk St North of
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Northbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/24/16	1	2	4	10	3	3	3	3	1	2	2	4	3	7	48	40	42
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	*	*
03:00	0	0	0	0	0	0	0	1	0	0	0	0	0	2	3	33	33
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	*	*
06:00	0	0	0	0	0	0	0	0	0	2	0	0	0	12	14	37	37
07:00	0	0	1	0	0	0	0	0	0	0	0	1	4	15	21	43	43
08:00	1	0	0	2	0	2	0	0	1	2	4	4	3	49	68	42	43
09:00	0	2	2	2	0	4	1	0	0	0	1	0	2	34	48	39	43
10:00	0	0	0	3	2	0	0	0	0	3	2	3	2	64	79	41	43
11:00	2	0	1	5	3	2	2	1	0	0	5	0	5	64	90	42	43
12 PM	0	0	0	1	1	0	2	0	1	1	1	4	3	79	93	42	43
13:00	1	0	0	0	0	0	0	0	0	0	0	1	2	69	73	43	43
14:00	1	0	0	0	2	0	0	0	0	1	1	0	1	76	82	42	43
15:00	1	0	0	0	0	0	0	0	0	0	1	2	4	77	85	43	43
16:00	1	0	0	0	0	0	0	0	0	1	0	2	2	63	69	43	43
17:00	0	0	0	2	0	0	0	0	0	0	0	3	4	58	67	43	43
18:00	0	0	0	1	0	0	0	0	0	0	2	3	1	72	79	41	43
19:00	0	0	0	0	0	1	0	1	0	1	1	2	2	45	53	42	43
20:00	0	0	0	1	0	0	0	0	2	0	1	3	2	35	44	42	43
21:00	0	0	0	0	0	0	0	0	2	1	0	1	2	23	29	43	43
22:00	0	0	0	0	0	0	0	0	0	0	1	0	0	21	22	39	39
23:00	0	0	0	0	0	0	0	0	0	0	0	1	0	16	17	41	41
Total	8	4	8	27	11	12	8	6	7	14	22	34	42	889	1092		
Percent	0.7%	0.4%	0.7%	2.5%	1.0%	1.1%	0.7%	0.5%	0.6%	1.3%	2.0%	3.1%	3.8%	81.4%			
AM Peak	11:00	00:00	00:00	00:00	00:00	09:00	00:00	00:00	00:00	10:00	11:00	00:00	11:00	10:00	11:00		
Vol.	2	2	4	10	3	4	3	3	1	3	5	4	5	64	90		
PM Peak	13:00			17:00	14:00	19:00	12:00	19:00	20:00	12:00	18:00	12:00	15:00	12:00	12:00		
Vol.	1			2	2	1	2	1	2	1	2	4	4	79	93		

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Northbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/25/16	0	0	0	0	0	0	0	0	0	0	0	1	0	5	6	41	41
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	4	5	27	27
02:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	37	37
03:00	0	0	0	0	0	0	0	0	0	0	1	0	0	2	3	39	39
04:00	0	0	0	0	0	0	0	0	0	0	1	0	0	2	3	39	39
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	*	*
06:00	0	0	0	0	0	0	0	0	0	0	1	0	0	11	12	39	39
07:00	0	1	0	0	0	0	0	0	1	0	1	1	0	14	18	40	41
08:00	0	0	0	0	0	0	0	0	0	0	0	1	3	24	28	43	43
09:00	0	0	0	0	0	0	0	0	0	1	0	0	0	38	39	37	37
10:00	1	0	0	0	0	0	0	0	0	1	0	0	0	40	42	37	37
11:00	0	0	0	0	0	0	1	0	1	1	0	5	3	67	78	42	43
12 PM	0	0	1	0	5	0	0	0	1	0	1	0	2	74	84	42	43
13:00	1	0	0	0	0	0	0	0	0	0	2	2	3	69	77	43	43
14:00	1	1	2	1	2	2	1	1	0	1	3	5	5	71	96	42	43
15:00	1	0	0	1	1	2	0	0	0	0	2	1	2	68	78	42	43
16:00	0	0	0	0	0	0	0	0	0	1	2	1	2	51	57	43	43
17:00	0	0	1	0	0	0	0	0	0	2	1	2	3	64	73	43	43
18:00	0	0	0	0	0	0	0	0	1	0	3	2	2	76	84	42	43
19:00	0	1	0	0	1	2	1	1	0	1	0	1	3	55	66	42	43
20:00	0	0	2	0	0	0	0	0	0	0	1	1	1	19	24	42	43
21:00	0	0	0	0	0	0	0	0	0	0	1	1	1	20	23	43	43
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12	*	*
23:00	0	0	0	1	0	0	0	0	0	0	1	0	0	7	9	39	39
Total	4	3	6	3	10	6	3	2	4	9	21	24	30	798	923		
Percent	0.4%	0.3%	0.7%	0.3%	1.1%	0.7%	0.3%	0.2%	0.4%	1.0%	2.3%	2.6%	3.3%	86.5%			
AM Peak	10:00	07:00			01:00		11:00		07:00	02:00	03:00	11:00	08:00	11:00	11:00		
Vol.	1	1			1		1		1	1	1	5	3	67	78		
PM Peak	13:00	14:00	14:00	14:00	12:00	14:00	14:00	14:00	12:00	17:00	14:00	14:00	14:00	18:00	14:00		
Vol.	1	1	2	1	5	2	1	1	1	2	3	5	5	76	96		

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Speed Study

NW Friberg-Strunk St North of
Union North Access

Northbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/26/16	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	*	*
01:00	0	0	0	0	0	0	0	0	0	0	1	0	1	2	4	43	43
02:00	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	43	43
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	*	*
06:00	0	0	0	0	0	0	0	0	0	1	1	0	0	21	23	39	39
07:00	0	0	0	0	0	0	0	1	0	0	0	1	6	37	45	43	43
08:00	12	1	2	4	3	8	4	6	3	1	8	8	5	48	113	40	42
09:00	0	1	0	1	0	1	1	0	0	6	1	2	5	32	50	42	43
10:00	0	0	0	1	2	1	0	1	1	2	0	6	1	35	50	41	42
11:00	1	1	0	1	1	2	0	1	3	2	5	5	4	40	66	42	43
12 PM	3	0	2	5	1	2	3	2	6	4	5	11	4	46	94	41	42
13:00	6	0	0	0	0	0	0	0	0	0	0	0	0	0	6	17	19
14:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	17	19
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	24	3	4	12	7	14	8	11	13	16	21	33	27	276	469		
Percent	5.1%	0.6%	0.9%	2.6%	1.5%	3.0%	1.7%	2.3%	2.8%	3.4%	4.5%	7.0%	5.8%	58.8%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	09:00	08:00	08:00	07:00	08:00	08:00		
Vol.	12	1	2	4	3	8	4	6	3	6	8	8	6	48	113		
PM Peak	13:00		12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00		
Vol.	6		2	5	1	2	3	2	6	4	5	11	4	46	94		

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Northbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/27/16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
06:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
12 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Percent	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%			

AM Peak
Vol.

PM Peak
Vol.

Grand Total	198	69	184	300	386	344	249	168	194	254	351	478	624	6885	10684		
Percent	1.9%	0.6%	1.7%	2.8%	3.6%	3.2%	2.3%	1.6%	1.8%	2.4%	3.3%	4.5%	5.8%	64.4%			

15th Percentile : 24 MPH
50th Percentile : 34 MPH
85th Percentile : 42 MPH
95th Percentile : 43 MPH

Statistics

10 MPH Pace Speed : 35-44 MPH
Number in Pace : 1901
Percent in Pace : 17.8%
Number of Vehicles > 55 MPH : 0
Percent of Vehicles > 55 MPH : 0.0%
Mean Speed(Average) : 33 MPH

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NW Friberg-Strunk St North of
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Southbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/19/16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	15	1	3	4	1	2	4	6	7	9	9	7	6	2	76	40	42
15:00	48	6	4	5	1	1	6	3	8	11	10	10	6	1	120	39	42
16:00	13	4	5	7	2	0	1	3	7	14	6	7	4	9	82	40	42
17:00	6	13	12	9	0	2	2	3	5	12	15	11	8	12	110	40	42
18:00	7	15	22	7	6	2	3	4	5	3	4	9	5	10	102	40	42
19:00	5	4	6	3	0	1	1	4	3	4	7	7	8	3	56	42	43
20:00	1	5	4	1	1	3	2	1	3	5	8	4	0	5	43	39	41
21:00	0	0	0	0	0	1	0	0	0	1	3	3	1	1	10	41	43
22:00	0	0	0	0	0	0	0	0	1	1	1	2	0	0	5	41	41
23:00	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	43	43
Total	95	48	56	36	11	12	19	24	39	60	63	61	39	43	606		
Percent	15.7%	7.9%	9.2%	5.9%	1.8%	2.0%	3.1%	4.0%	6.4%	9.9%	10.4%	10.1%	6.4%	7.1%			
AM Peak Vol.																	
PM Peak Vol.	15:00 48	18:00 15	18:00 22	17:00 9	18:00 6	20:00 3	15:00 6	14:00 6	15:00 8	16:00 14	17:00 15	17:00 11	17:00 8	17:00 12	15:00 120		

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Southbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/20/16	0	1	0	0	0	0	0	0	0	0	0	0	0	2	3	21	21
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	39	39
04:00	0	0	0	0	0	0	0	0	0	0	1	1	2	2	6	43	43
05:00	0	0	1	0	0	0	0	1	2	5	5	3	8	14	39	43	43
06:00	1	3	2	1	1	0	1	1	4	5	5	5	1	4	34	40	41
07:00	7	11	13	5	6	3	8	8	14	13	10	16	9	6	129	40	42
08:00	117	42	38	36	13	16	16	17	10	12	10	7	2	1	337	32	38
09:00	3	2	5	3	4	4	5	4	9	10	5	7	6	4	71	40	42
10:00	4	2	4	6	1	1	2	0	5	9	5	4	1	3	47	39	41
11:00	0	1	5	3	1	0	1	3	3	1	7	8	10	6	49	42	43
12 PM	3	2	5	4	2	1	2	2	2	8	13	5	4	7	60	40	42
13:00	1	0	5	3	2	1	0	4	5	6	10	12	4	3	56	41	42
14:00	16	5	4	3	2	1	5	7	7	8	8	9	8	7	90	41	42
15:00	32	5	6	6	2	3	3	8	7	8	11	8	3	7	109	39	41
16:00	7	5	2	6	0	1	1	3	1	6	11	17	11	7	78	42	43
17:00	9	7	18	10	5	6	11	8	7	23	17	19	12	15	167	40	42
18:00	3	5	7	6	1	1	1	8	8	10	25	13	10	9	107	41	43
19:00	4	9	9	8	5	0	2	2	7	7	13	6	3	4	79	39	41
20:00	1	1	1	2	0	0	1	5	3	8	5	5	5	2	39	41	43
21:00	3	0	1	2	0	0	0	2	6	4	1	2	0	1	22	37	40
22:00	1	0	0	0	0	1	0	0	0	2	1	0	0	2	7	38	39
23:00	0	0	0	0	0	0	0	1	0	1	1	0	1	1	5	42	43
Total	212	101	126	104	45	39	59	84	100	146	165	147	100	108	1536		
Percent	13.8%	6.6%	8.2%	6.8%	2.9%	2.5%	3.8%	5.5%	6.5%	9.5%	10.7%	9.6%	6.5%	7.0%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	07:00	07:00	07:00	07:00	11:00	05:00	08:00		
Vol.	117	42	38	36	13	16	16	17	14	13	10	16	10	14	337		
PM Peak	15:00	19:00	17:00	17:00	17:00	17:00	17:00	15:00	18:00	17:00	18:00	17:00	17:00	17:00	17:00		
Vol.	32	9	18	10	5	6	11	8	8	23	25	19	12	15	167		

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Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/21/16	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	39	39
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	37	37
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	*	*
04:00	0	0	0	0	0	0	0	0	1	2	1	2	2	2	10	42	43
05:00	0	0	0	0	0	0	0	0	1	2	6	10	10	9	38	43	43
06:00	2	3	0	0	0	1	1	2	3	6	11	5	3	7	44	40	42
07:00	9	8	16	10	4	4	8	4	12	12	9	16	5	5	122	40	41
08:00	112	57	47	23	15	9	8	17	11	17	6	3	3	4	332	32	37
09:00	1	3	3	6	4	1	6	6	5	12	9	9	8	4	77	41	43
10:00	1	5	2	5	2	2	4	4	4	8	5	5	7	5	59	41	43
11:00	1	1	4	3	1	0	4	4	6	8	6	14	4	6	62	41	42
12 PM	41	7	7	1	3	1	4	8	10	10	10	10	4	5	121	39	41
13:00	4	8	21	6	5	2	4	4	4	9	13	6	4	11	101	39	41
14:00	4	8	14	15	3	2	6	5	7	11	7	12	12	8	114	41	43
15:00	6	3	6	7	2	6	3	0	6	9	12	12	6	12	90	41	42
16:00	1	1	6	1	1	2	2	0	2	6	7	14	12	18	73	42	43
17:00	11	6	9	16	8	3	2	6	7	12	15	23	19	17	154	41	43
18:00	11	13	14	19	5	0	5	4	5	9	19	12	9	6	131	40	42
19:00	7	5	6	7	4	1	1	4	9	12	8	5	6	3	78	39	42
20:00	3	0	3	1	1	0	1	1	2	8	6	7	2	1	36	41	42
21:00	1	1	0	0	0	0	0	0	4	2	3	5	0	3	19	41	41
22:00	0	0	0	0	0	0	0	0	0	1	0	1	0	3	5	41	41
23:00	0	0	0	0	0	0	1	0	0	0	0	1	0	1	3	41	41
Total	215	129	158	120	58	34	60	69	99	157	154	172	116	132	1673		
Percent	12.9%	7.7%	9.4%	7.2%	3.5%	2.0%	3.6%	4.1%	5.9%	9.4%	9.2%	10.3%	6.9%	7.9%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	07:00	08:00	07:00	08:00	06:00	07:00	05:00	05:00	08:00		
Vol.	112	57	47	23	15	9	8	17	12	17	11	16	10	9	332		
PM Peak	12:00	18:00	13:00	18:00	17:00	15:00	14:00	12:00	12:00	17:00	18:00	17:00	17:00	16:00	17:00		
Vol.	41	13	21	19	8	6	6	8	10	12	19	23	19	18	154		

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Southbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/22/16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
01:00	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	39	39
02:00	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	39	39
03:00	0	0	0	0	0	0	0	0	0	0	2	0	0	1	3	39	39
04:00	0	0	0	0	0	0	0	0	0	0	3	2	2	0	7	42	43
05:00	0	0	0	0	0	0	0	0	1	3	11	10	2	8	35	41	42
06:00	3	2	2	2	0	0	0	1	3	7	5	5	2	2	34	40	42
07:00	4	13	11	8	5	2	8	12	13	17	12	6	3	5	119	38	41
08:00	126	51	51	19	7	9	15	16	10	11	7	6	1	2	331	32	37
09:00	3	6	3	4	2	1	3	3	7	15	8	3	2	4	64	39	41
10:00	7	4	3	2	2	5	2	5	4	9	7	3	1	0	54	38	40
11:00	2	3	4	3	2	2	2	2	2	9	9	6	5	5	56	41	42
12 PM	4	6	2	1	1	3	3	4	6	10	8	5	2	7	62	39	41
13:00	2	1	4	0	0	1	4	3	7	8	8	6	9	5	58	42	43
14:00	12	5	3	6	2	1	6	5	5	5	16	9	7	5	87	40	42
15:00	39	11	9	9	8	1	1	7	12	9	15	11	6	6	144	39	41
16:00	5	2	19	10	2	3	3	1	1	6	6	16	10	12	96	41	43
17:00	6	10	18	28	7	7	5	8	12	15	16	25	24	10	191	41	43
18:00	13	9	15	15	9	3	2	4	11	7	15	13	6	12	134	40	41
19:00	0	4	4	5	4	1	0	1	6	11	9	5	7	3	60	41	43
20:00	0	1	0	0	0	0	1	0	4	4	3	2	5	4	24	42	43
21:00	1	0	0	1	0	1	0	1	1	4	3	3	4	5	24	42	43
22:00	0	0	0	0	0	0	0	0	0	0	1	0	1	3	5	43	43
23:00	0	0	0	0	0	0	0	1	1	1	0	0	1	0	4	42	43
Total	227	128	148	113	51	40	55	74	107	151	166	136	100	100	1596		
Percent	14.2%	8.0%	9.3%	7.1%	3.2%	2.5%	3.4%	4.6%	6.7%	9.5%	10.4%	8.5%	6.3%	6.3%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	07:00	07:00	07:00	05:00	11:00	05:00	08:00		
Vol.	126	51	51	19	7	9	15	16	13	17	12	10	5	8	331		
PM Peak	15:00	15:00	16:00	17:00	18:00	17:00	14:00	17:00	15:00	17:00	14:00	17:00	17:00	16:00	17:00		
Vol.	39	11	19	28	9	7	6	8	12	15	16	25	24	12	191		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Speed Study

NW Friberg-Strunk St North of
Union North Access

Southbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/23/16	0	0	0	1	0	0	1	0	0	0	0	1	0	0	3	41	41
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	*	*
04:00	0	0	0	0	0	0	0	0	0	0	2	2	1	1	6	42	43
05:00	0	0	0	0	0	0	0	0	0	5	12	7	5	5	34	42	43
06:00	1	2	1	1	1	0	0	0	3	2	7	6	4	8	36	41	43
07:00	10	9	14	7	7	1	5	9	12	10	12	4	6	10	116	39	42
08:00	129	57	43	24	10	19	16	15	15	18	10	5	3	2	366	33	37
09:00	3	3	4	4	1	2	2	7	8	7	7	11	5	6	70	41	42
10:00	1	1	5	3	1	1	3	5	3	9	9	7	1	2	51	40	41
11:00	4	2	0	3	2	2	4	4	6	4	5	8	4	5	53	41	42
12 PM	4	5	7	3	0	0	1	1	7	15	9	5	9	3	69	41	43
13:00	5	2	6	6	3	2	3	5	11	12	10	7	5	1	78	40	42
14:00	13	2	5	6	2	1	3	14	7	8	12	9	9	5	96	40	42
15:00	35	4	2	5	1	3	5	11	9	17	7	10	5	4	118	39	41
16:00	8	4	8	5	3	1	3	6	9	11	10	11	7	9	95	40	42
17:00	2	5	10	3	4	1	0	1	9	9	15	15	1	6	81	40	41
18:00	1	1	1	1	0	0	0	2	6	12	10	6	11	10	61	42	43
19:00	0	0	0	0	0	0	0	2	2	3	10	3	4	4	28	42	43
20:00	0	1	1	0	0	1	0	2	2	3	7	4	1	3	25	40	41
21:00	5	4	2	1	0	0	1	1	1	2	3	3	2	5	30	40	42
22:00	0	0	0	0	0	0	0	0	2	0	1	4	2	3	12	42	43
23:00	1	2	1	0	0	0	0	0	0	2	2	1	1	2	12	41	43
Total	222	104	110	73	35	34	47	85	112	149	160	129	86	96	1442		
Percent	15.4%	7.2%	7.6%	5.1%	2.4%	2.4%	3.3%	5.9%	7.8%	10.3%	11.1%	8.9%	6.0%	6.7%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	05:00	09:00	07:00	07:00	08:00		
Vol.	129	57	43	24	10	19	16	15	15	18	12	11	6	10	366		
PM Peak	15:00	12:00	17:00	13:00	17:00	15:00	15:00	14:00	13:00	15:00	17:00	17:00	18:00	18:00	15:00		
Vol.	35	5	10	6	4	3	5	14	11	17	15	15	11	10	118		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Speed Study

NW Friberg-Strunk St North of
Union North Access

Southbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/24/16	6	3	5	2	2	0	0	1	0	1	1	2	0	0	23	37	40
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	39	39
04:00	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	41	41
05:00	0	0	0	0	0	0	0	0	0	0	3	4	0	8	15	41	41
06:00	0	0	1	0	0	0	1	0	0	1	1	1	1	5	11	42	43
07:00	0	7	7	5	2	0	0	6	5	4	6	2	1	3	48	38	40
08:00	3	14	12	9	7	1	2	4	6	3	7	8	8	5	89	40	42
09:00	2	0	4	4	0	0	1	3	6	7	6	7	4	9	53	41	42
10:00	2	1	2	3	0	1	0	4	3	9	17	8	8	9	67	41	43
11:00	3	1	1	6	3	3	0	3	4	8	9	10	8	14	73	41	43
12 PM	0	0	0	0	0	1	0	0	0	6	11	11	13	19	61	43	43
13:00	0	0	1	0	0	0	0	3	2	9	7	13	14	14	63	42	43
14:00	0	0	0	0	1	1	1	0	1	5	12	12	9	18	60	42	43
15:00	4	0	0	1	0	0	3	1	2	6	5	10	7	12	51	42	43
16:00	0	0	0	0	2	1	0	0	4	6	10	5	15	17	60	43	43
17:00	0	0	0	0	0	0	1	0	1	4	10	14	8	21	59	42	43
18:00	1	0	0	2	0	0	1	1	1	8	10	10	6	8	48	42	43
19:00	1	1	0	0	0	0	2	1	3	4	7	6	2	1	28	41	42
20:00	0	1	0	0	0	0	1	0	3	6	0	2	1	2	16	40	42
21:00	0	0	0	0	0	0	1	1	0	2	1	1	0	1	7	40	41
22:00	0	0	0	0	0	0	0	2	1	0	2	3	1	4	13	41	43
23:00	0	0	0	0	0	0	0	0	0	3	0	1	1	1	6	42	43
Total	22	28	33	32	17	8	14	30	42	92	126	131	107	172	854		
Percent	2.6%	3.3%	3.9%	3.7%	2.0%	0.9%	1.6%	3.5%	4.9%	10.8%	14.8%	15.3%	12.5%	20.1%			
AM Peak	00:00	08:00	08:00	08:00	08:00	11:00	08:00	07:00	08:00	10:00	10:00	11:00	08:00	11:00	08:00		
Vol.	6	14	12	9	7	3	2	6	6	9	17	10	8	14	89		
PM Peak	15:00	19:00	13:00	18:00	16:00	12:00	15:00	13:00	16:00	13:00	14:00	17:00	16:00	17:00	13:00		
Vol.	4	1	1	2	2	1	3	3	4	9	12	14	15	21	63		

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
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Speed Study

NW Friberg-Strunk St North of
Union North Access

Southbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/25/16	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2	41	41
01:00	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	41	41
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	1	0	0	1	1	0	0	3	41	41
04:00	0	0	0	0	0	0	0	0	1	0	0	0	1	1	3	43	43
05:00	0	0	0	0	0	0	0	1	1	4	2	1	6	10	25	43	43
06:00	0	0	0	0	0	0	0	0	0	0	1	0	0	2	3	39	39
07:00	0	0	1	0	0	0	1	0	0	1	2	2	1	4	12	41	43
08:00	0	0	1	0	0	0	2	0	2	2	3	3	3	9	25	42	43
09:00	0	0	0	0	0	0	0	2	4	5	8	11	13	12	55	43	43
10:00	1	1	0	0	0	0	0	2	7	10	14	16	12	16	79	42	43
11:00	2	1	3	0	0	1	1	1	9	3	8	11	8	20	68	42	43
12 PM	0	0	2	4	2	1	0	5	3	10	15	12	8	23	85	41	43
13:00	2	0	1	3	2	2	1	2	7	5	9	12	7	10	63	41	43
14:00	2	0	2	1	0	0	0	0	2	7	11	9	13	16	63	42	43
15:00	1	0	1	1	1	0	1	2	2	8	8	7	5	20	57	41	43
16:00	0	0	2	0	3	1	0	2	5	3	7	7	9	16	55	42	43
17:00	1	0	0	0	1	1	0	1	5	3	8	8	8	8	44	42	43
18:00	0	0	0	1	0	0	0	5	1	8	5	11	2	4	37	41	42
19:00	1	0	1	0	0	0	2	1	5	8	7	7	7	2	41	42	43
20:00	0	1	0	0	0	0	0	0	1	4	3	4	4	2	19	42	43
21:00	0	0	0	0	0	0	0	0	1	1	5	2	0	3	12	40	41
22:00	0	0	0	0	0	0	0	0	0	2	2	1	0	0	5	40	41
23:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	35	35
Total	10	3	14	10	9	6	9	25	57	84	119	127	107	179	759		
Percent	1.3%	0.4%	1.8%	1.3%	1.2%	0.8%	1.2%	3.3%	7.5%	11.1%	15.7%	16.7%	14.1%	23.6%			
AM Peak	11:00	10:00	11:00			11:00	08:00	09:00	11:00	10:00	10:00	10:00	09:00	11:00	10:00		
Vol.	2	1	3			1	2	2	9	10	14	16	13	20	79		
PM Peak	13:00	20:00	12:00	12:00	16:00	13:00	19:00	12:00	13:00	12:00	12:00	12:00	14:00	12:00	12:00		
Vol.	2	1	2	4	3	2	2	5	7	10	15	12	13	23	85		

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P.O. Box 1849
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Speed Study

NW Friberg-Strunk St North of
Union North Access

Southbound

Start Time	1 20	21 22	23 24	25 26	27 28	29 30	31 32	33 34	35 36	37 38	39 40	41 42	43 44	45 999	Total	85th Percent	95th Percent
09/26/16	0	0	0	0	0	0	1	0	0	0	0	0	1	1	3	43	43
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	41	41
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	0	0	0	1	0	2	0	0	0	3	39	39
05:00	0	0	0	0	0	0	0	0	1	6	7	5	8	11	38	42	43
06:00	1	0	4	0	1	1	0	2	5	8	4	5	3	6	40	41	42
07:00	4	7	11	6	2	3	4	6	12	7	17	13	8	8	108	40	42
08:00	104	45	56	31	16	19	16	18	13	11	17	5	7	1	359	33	39
09:00	1	3	3	4	2	2	2	2	4	8	7	5	6	10	59	41	43
10:00	1	1	6	4	4	0	2	0	8	6	3	3	4	6	48	40	42
11:00	2	1	3	1	1	2	0	1	4	6	19	11	6	5	62	41	43
12 PM	5	4	2	7	1	1	4	0	4	7	11	5	9	11	71	42	43
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
14:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	17	19
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
Total	119	61	85	53	27	28	29	29	52	59	87	53	52	61	795		
Percent	15.0%	7.7%	10.7%	6.7%	3.4%	3.5%	3.6%	3.6%	6.5%	7.4%	10.9%	6.7%	6.5%	7.7%			
AM Peak	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	11:00	07:00	05:00	05:00	08:00		
Vol.	104	45	56	31	16	19	16	18	13	11	19	13	8	11	359		
PM Peak	12:00	12:00	12:00	12:00	12:00	12:00	12:00		12:00	12:00	12:00	12:00	12:00	12:00	12:00		
Vol.	5	4	2	7	1	1	4		4	7	11	5	9	11	71		

Speed Study

Southbound

AM Peak Vol.															
PM Peak Vol.	13:00 1														13:00 1
Grand Total	1123	602	730	541	253	201	292	420	608	898	1040	956	707	891	9262
Percent	12.1%	6.5%	7.9%	5.8%	2.7%	2.2%	3.2%	4.5%	6.6%	9.7%	11.2%	10.3%	7.6%	9.6%	

Statistics	10 MPH Pace Speed :	35-44 MPH
	Number in Pace :	4209
	Percent in Pace :	45.4%
	Number of Vehicles > 55 MPH :	0
	Percent of Vehicles > 55 MPH :	0.0%
	Mean Speed(Average) :	31 MPH

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
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Traffic Volume

NW Friberg-Strunk St North of
Union North Access

Start Time	19-Sep-16 Mon	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		*	*			*	*				
12:15		*	*			*	*				
12:30		*	*			*	*				
12:45		*	*	0	0	*	*	0	0	0	0
01:00		*	*			*	*				
01:15		*	*			*	*				
01:30		*	23			*	17				
01:45		*	19	0	42	*	13	0	30	0	72
02:00		*	22			*	21				
02:15		*	24			*	7				
02:30		*	21			*	21				
02:45		*	18	0	85	*	27	0	76	0	161
03:00		*	60			*	51				
03:15		*	139			*	26				
03:30		*	38			*	28				
03:45		*	43	0	280	*	15	0	120	0	400
04:00		*	39			*	19				
04:15		*	33			*	25				
04:30		*	32			*	16				
04:45		*	66	0	170	*	22	0	82	0	252
05:00		*	58			*	22				
05:15		*	46			*	37				
05:30		*	45			*	20				
05:45		*	35	0	184	*	31	0	110	0	294
06:00		*	50			*	31				
06:15		*	55			*	15				
06:30		*	57			*	26				
06:45		*	30	0	192	*	30	0	102	0	294
07:00		*	29			*	15				
07:15		*	14			*	14				
07:30		*	15			*	11				
07:45		*	18	0	76	*	16	0	56	0	132
08:00		*	22			*	17				
08:15		*	19			*	14				
08:30		*	9			*	6				
08:45		*	8	0	58	*	6	0	43	0	101
09:00		*	12			*	0				
09:15		*	8			*	3				
09:30		*	7			*	6				
09:45		*	7	0	34	*	1	0	10	0	44
10:00		*	9			*	2				
10:15		*	7			*	2				
10:30		*	2			*	1				
10:45		*	1	0	19	*	0	0	5	0	24
11:00		*	2			*	1				
11:15		*	3			*	1				
11:30		*	2			*	0				
11:45		*	1	0	8	*	0	0	2	0	10
Total		0	1148			0	636			0	1784
Percent		0.0%	100.0%			0.0%	100.0%			0.0%	100.0%

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P.O. Box 1849
Vancouver, WA 98668
Traffic Volume

Page 2

NW Friberg-Strunk St North of
Union North Access

Start Time	20-Sep-16 Tue	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	18			0	10				
12:15		1	15			1	15				
12:30		0	22			2	19				
12:45		0	18	1	73	0	16	3	60	4	133
01:00		0	17			0	20				
01:15		1	13			0	13				
01:30		0	16			0	15				
01:45		0	27	1	73	0	8	0	56	1	129
02:00		0	30			0	21				
02:15		0	31			0	15				
02:30		0	24			0	14				
02:45		1	22	1	107	0	40	0	90	1	197
03:00		1	62			2	40				
03:15		0	144			0	29				
03:30		1	30			0	26				
03:45		1	37	3	273	0	14	2	109	5	382
04:00		0	26			0	18				
04:15		0	44			0	22				
04:30		1	35			1	13				
04:45		0	39	1	144	5	25	6	78	7	222
05:00		0	70			2	37				
05:15		1	59			6	37				
05:30		2	55			18	53				
05:45		0	39	3	223	13	40	39	167	42	390
06:00		4	54			7	37				
06:15		8	42			4	29				
06:30		10	40			6	24				
06:45		5	34	27	170	17	17	34	107	61	277
07:00		10	32			21	20				
07:15		19	37			37	24				
07:30		10	71			27	25				
07:45		21	33	60	173	44	10	129	79	189	252
08:00		22	27			70	17				
08:15		25	13			146	13				
08:30		62	19			95	8				
08:45		19	16	128	75	26	1	337	39	465	114
09:00		14	12			19	4				
09:15		22	10			13	10				
09:30		14	8			21	2				
09:45		13	3	63	33	18	6	71	22	134	55
10:00		5	3			8	1				
10:15		9	4			8	2				
10:30		16	1			22	3				
10:45		15	1	45	9	9	1	47	7	92	16
11:00		15	1			10	1				
11:15		12	1			16	2				
11:30		12	3			12	1				
11:45		21	1	60	6	11	1	49	5	109	11
Total		393	1359			717	819			1110	2178
Percent		22.4%	77.6%			46.7%	53.3%			33.8%	66.2%

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Traffic Volume

NW Friberg-Strunk St North of
Union North Access

Start Time	21-Sep-16 Wed	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		3	34			0	14				
12:15		2	16			0	26				
12:30		1	73			1	41				
12:45		0	83	6	206	0	40	1	121	7	327
01:00		0	59			0	24				
01:15		2	35			0	25				
01:30		0	17			0	18				
01:45		0	32	2	143	0	34	0	101	2	244
02:00		1	27			1	26				
02:15		1	31			0	27				
02:30		0	61			0	24				
02:45		0	32	2	151	0	37	1	114	3	265
03:00		0	40			1	19				
03:15		0	42			1	27				
03:30		0	23			0	29				
03:45		1	40	1	145	0	15	2	90	3	235
04:00		3	24			2	16				
04:15		0	34			1	14				
04:30		2	45			3	18				
04:45		1	62	6	165	4	25	10	73	16	238
05:00		0	54			1	42				
05:15		0	71			7	52				
05:30		2	33			17	33				
05:45		2	65	4	223	13	27	38	154	42	377
06:00		5	70			6	38				
06:15		3	50			7	21				
06:30		7	27			9	26				
06:45		6	22	21	169	22	46	44	131	65	300
07:00		14	28			17	24				
07:15		18	25			36	21				
07:30		11	60			31	21				
07:45		23	36	66	149	38	12	122	78	188	227
08:00		19	29			73	13				
08:15		37	24			151	4				
08:30		52	14			84	9				
08:45		17	8	125	75	24	10	332	36	457	111
09:00		14	10			29	2				
09:15		18	9			16	3				
09:30		10	13			13	6				
09:45		9	7	51	39	19	8	77	19	128	58
10:00		11	3			23	3				
10:15		13	4			10	1				
10:30		15	7			11	0				
10:45		15	2	54	16	15	1	59	5	113	21
11:00		19	3			21	0				
11:15		17	2			13	1				
11:30		15	3			14	1				
11:45		17	3	68	11	14	1	62	3	130	14
Total		406	1492			748	925			1154	2417
Percent		21.4%	78.6%			44.7%	55.3%			32.3%	67.7%

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P.O. Box 1849
Vancouver, WA 98668

Traffic Volume

NW Friberg-Strunk St North of
Union North Access

Start Time	22-Sep-16 Thu	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		1	19			0	9				
12:15		2	17			0	18				
12:30		0	35			0	19				
12:45		1	22	4	93	0	16	0	62	4	155
01:00		0	19			0	15				
01:15		1	21			1	19				
01:30		2	21			0	15				
01:45		1	19	4	80	1	9	2	58	6	138
02:00		0	17			0	13				
02:15		1	39			0	24				
02:30		0	23			0	14				
02:45		1	23	2	102	2	36	2	87	4	189
03:00		0	55			1	58				
03:15		1	142			2	39				
03:30		1	43			0	27				
03:45		1	37	3	277	0	20	3	144	6	421
04:00		1	40			0	20				
04:15		1	42			1	27				
04:30		1	47			3	25				
04:45		0	71	3	200	3	24	7	96	10	296
05:00		0	67			3	53				
05:15		2	51			9	60				
05:30		1	54			12	40				
05:45		0	51	3	223	11	38	35	191	38	414
06:00		5	69			5	44				
06:15		5	59			7	37				
06:30		7	53			7	31				
06:45		7	52	24	233	15	22	34	134	58	367
07:00		14	61			24	17				
07:15		16	30			39	27				
07:30		9	46			25	7				
07:45		16	32	55	169	31	9	119	60	174	229
08:00		20	19			78	9				
08:15		38	9			138	8				
08:30		47	4			95	4				
08:45		11	10	116	42	20	3	331	24	447	66
09:00		13	7			18	5				
09:15		8	8			18	5				
09:30		16	5			13	8				
09:45		9	6	46	26	15	6	64	24	110	50
10:00		7	6			12	0				
10:15		16	2			13	1				
10:30		18	2			17	4				
10:45		12	1	53	11	12	0	54	5	107	16
11:00		13	3			11	1				
11:15		15	7			12	2				
11:30		17	4			13	1				
11:45		13	2	58	16	20	0	56	4	114	20
Total		371	1472			707	889			1078	2361
Percent		20.1%	79.9%			44.3%	55.7%			31.3%	68.7%

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Traffic Volume

NW Friberg-Strunk St North of
Union North Access

Start Time	23-Sep-16 Fri	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		1	21			0	12				
12:15		2	19			1	12				
12:30		0	31			0	17				
12:45		2	27	5	98	2	28	3	69	8	167
01:00		1	17			1	22				
01:15		0	18			0	27				
01:30		1	14			0	12				
01:45		1	15	3	64	0	17	1	78	4	142
02:00		1	28			0	30				
02:15		1	37			0	12				
02:30		0	24			0	16				
02:45		0	24	2	113	0	38	0	96	2	209
03:00		1	57			1	48				
03:15		0	166			0	30				
03:30		0	47			0	29				
03:45		0	35	1	305	0	11	1	118	2	423
04:00		0	38			0	21				
04:15		0	36			1	19				
04:30		2	43			1	24				
04:45		2	65	4	182	4	31	6	95	10	277
05:00		2	35			3	27				
05:15		0	41			7	19				
05:30		1	32			12	16				
05:45		3	29	6	137	12	19	34	81	40	218
06:00		6	43			2	21				
06:15		9	29			10	16				
06:30		5	18			8	10				
06:45		10	10	30	100	16	14	36	61	66	161
07:00		11	12			27	9				
07:15		23	25			23	5				
07:30		13	17			20	6				
07:45		20	11	67	65	46	8	116	28	183	93
08:00		20	7			82	6				
08:15		34	14			133	7				
08:30		48	10			125	6				
08:45		12	10	114	41	26	6	366	25	480	66
09:00		11	4			16	8				
09:15		11	25			19	10				
09:30		16	9			20	7				
09:45		13	3	51	41	15	5	70	30	121	71
10:00		18	4			7	5				
10:15		8	8			16	4				
10:30		21	5			17	2				
10:45		19	5	66	22	11	1	51	12	117	34
11:00		19	2			11	3				
11:15		19	5			11	2				
11:30		12	4			17	3				
11:45		18	5	68	16	14	4	53	12	121	28
Total		417	1184			737	705			1154	1889
Percent		26.0%	74.0%			51.1%	48.9%			37.9%	62.1%

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Traffic Volume

NW Friberg-Strunk St North of
Union North Access

Start Time	24-Sep-16 Sat	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		12	24			15	21				
12:15		28	31			5	16				
12:30		5	26			1	17				
12:45		3	12	48	93	2	7	23	61	71	154
01:00		1	17			0	17				
01:15		0	12			0	20				
01:30		0	26			0	12				
01:45		0	18	1	73	0	14	0	63	1	136
02:00		1	18			0	20				
02:15		0	24			0	14				
02:30		1	18			0	13				
02:45		0	22	2	82	0	13	0	60	2	142
03:00		2	27			1	18				
03:15		0	18			0	13				
03:30		0	14			0	8				
03:45		1	26	3	85	0	12	1	51	4	136
04:00		1	15			0	17				
04:15		0	20			0	17				
04:30		0	18			1	13				
04:45		1	16	2	69	1	13	2	60	4	129
05:00		0	13			0	16				
05:15		1	21			5	16				
05:30		2	20			7	21				
05:45		0	13	3	67	3	6	15	59	18	126
06:00		4	26			1	7				
06:15		6	19			3	10				
06:30		4	21			0	17				
06:45		0	13	14	79	7	14	11	48	25	127
07:00		3	13			3	10				
07:15		4	14			13	6				
07:30		5	14			9	4				
07:45		9	12	21	53	23	8	48	28	69	81
08:00		21	6			13	4				
08:15		21	12			35	5				
08:30		19	9			20	2				
08:45		7	17	68	44	21	5	89	16	157	60
09:00		13	11			9	2				
09:15		9	8			13	1				
09:30		12	4			16	1				
09:45		14	6	48	29	15	3	53	7	101	36
10:00		18	5			18	3				
10:15		23	7			14	4				
10:30		22	4			19	1				
10:45		16	6	79	22	16	5	67	13	146	35
11:00		21	1			21	3				
11:15		17	5			15	2				
11:30		25	5			22	0				
11:45		27	6	90	17	15	1	73	6	163	23
Total		379	713			382	472			761	1185
Percent		34.7%	65.3%			44.7%	55.3%			39.1%	60.9%

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668
Traffic Volume

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NW Friberg-Strunk St North of
Union North Access

Start Time	25-Sep-16 Sun	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		2	16			1	26				
12:15		3	15			0	26				
12:30		0	23			0	18				
12:45		1	30	6	84	1	15	2	85	8	169
01:00		3	22			1	20				
01:15		1	16			0	12				
01:30		1	13			0	16				
01:45		0	26	5	77	1	15	2	63	7	140
02:00		0	20			0	20				
02:15		0	27			0	15				
02:30		1	15			0	16				
02:45		0	34	1	96	0	12	0	63	1	159
03:00		0	16			3	6				
03:15		2	15			0	14				
03:30		0	27			0	20				
03:45		1	20	3	78	0	17	3	57	6	135
04:00		0	13			0	11				
04:15		0	12			1	13				
04:30		2	15			1	13				
04:45		1	17	3	57	1	18	3	55	6	112
05:00		0	22			2	14				
05:15		4	15			7	8				
05:30		0	17			7	16				
05:45		1	19	5	73	9	6	25	44	30	117
06:00		6	25			1	10				
06:15		1	16			1	6				
06:30		4	20			0	7				
06:45		1	23	12	84	1	14	3	37	15	121
07:00		5	26			1	11				
07:15		2	18			2	8				
07:30		8	12			3	13				
07:45		3	10	18	66	6	9	12	41	30	107
08:00		6	6			2	8				
08:15		6	8			9	5				
08:30		4	5			4	3				
08:45		12	5	28	24	10	3	25	19	53	43
09:00		13	6			16	5				
09:15		10	3			7	3				
09:30		8	4			16	2				
09:45		8	10	39	23	16	2	55	12	94	35
10:00		7	6			10	2				
10:15		10	5			12	0				
10:30		11	0			28	0				
10:45		14	1	42	12	29	3	79	5	121	17
11:00		16	3			24	0				
11:15		20	3			16	0				
11:30		21	2			10	0				
11:45		21	1	78	9	18	1	68	1	146	10
Total		240	683			277	482			517	1165
Percent		26.0%	74.0%			36.5%	63.5%			30.7%	69.3%

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668
Traffic Volume

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NW Friberg-Strunk St North of
Union North Access

Start Time	26-Sep-16 Mon	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		1	20			1	16				
12:15		2	24			1	16				
12:30		0	19			0	21				
12:45		1	31	4	94	1	18	3	71	7	165
01:00		3	3			0	0				
01:15		0	3			1	0				
01:30		1	0			0	0				
01:45		0	0	4	6	0	0	1	0	5	6
02:00		1	1			0	1				
02:15		0	1			0	0				
02:30		2	0			1	0				
02:45		0	0	3	2	1	0	2	1	5	3
03:00		0	0			0	0				
03:15		0	0			0	0				
03:30		0	0			0	0				
03:45		0	0	0	0	0	0	0	0	0	0
04:00		2	0			0	0				
04:15		0	0			0	0				
04:30		3	0			0	0				
04:45		0	0	5	0	3	0	3	0	8	0
05:00		1	0			4	0				
05:15		0	0			8	0				
05:30		2	0			16	0				
05:45		1	0	4	0	10	0	38	0	42	0
06:00		2	0			4	0				
06:15		6	0			6	0				
06:30		7	0			10	0				
06:45		8	0	23	0	20	0	40	0	63	0
07:00		13	0			20	0				
07:15		9	0			24	0				
07:30		10	0			24	0				
07:45		13	0	45	0	40	0	108	0	153	0
08:00		17	0			80	0				
08:15		39	0			144	0				
08:30		39	0			106	0				
08:45		18	0	113	0	29	0	359	0	472	0
09:00		11	0			13	0				
09:15		12	0			8	0				
09:30		13	0			21	0				
09:45		14	0	50	0	17	0	59	0	109	0
10:00		15	0			8	0				
10:15		8	0			18	0				
10:30		10	0			15	0				
10:45		17	0	50	0	7	0	48	0	98	0
11:00		9	0			10	0				
11:15		17	0			11	0				
11:30		22	0			15	0				
11:45		18	0	66	0	26	0	62	0	128	0
Total		367	102			723	72			1090	174
Percent		78.3%	21.7%			90.9%	9.1%			86.2%	13.8%

H. LEE & ASSOCIATES, PLLC

P.O. Box 1849
Vancouver, WA 98668

Traffic Volume

NW Friberg-Strunk St North of
Union North Access

Start Time	27-Sep-16 Tue	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	0			0	0				
12:15		0	0			0	0				
12:30		0	0			0	0				
12:45		0	0	0	0	0	0	0	0	0	0
01:00		0	0			0	0				
01:15		0	0			0	0				
01:30		0	0			0	1				
01:45		0	0	0	0	0	0	0	1	0	1
02:00		0	0			0	0				
02:15		0	*			0	*				
02:30		0	*			0	*				
02:45		0	*	0	0	0	*	0	0	0	0
03:00		0	*			0	*				
03:15		0	*			0	*				
03:30		0	*			0	*				
03:45		0	*	0	0	0	*	0	0	0	0
04:00		0	*			0	*				
04:15		0	*			0	*				
04:30		0	*			0	*				
04:45		0	*	0	0	0	*	0	0	0	0
05:00		0	*			0	*				
05:15		0	*			0	*				
05:30		0	*			0	*				
05:45		0	*	0	0	0	*	0	0	0	0
06:00		0	*			0	*				
06:15		0	*			0	*				
06:30		0	*			0	*				
06:45		0	*	0	0	0	*	0	0	0	0
07:00		0	*			0	*				
07:15		0	*			0	*				
07:30		0	*			0	*				
07:45		0	*	0	0	0	*	0	0	0	0
08:00		0	*			0	*				
08:15		0	*			0	*				
08:30		0	*			0	*				
08:45		0	*	0	0	0	*	0	0	0	0
09:00		0	*			0	*				
09:15		0	*			0	*				
09:30		0	*			0	*				
09:45		0	*	0	0	0	*	0	0	0	0
10:00		0	*			0	*				
10:15		0	*			0	*				
10:30		0	*			0	*				
10:45		0	*	0	0	0	*	0	0	0	0
11:00		0	*			0	*				
11:15		0	*			0	*				
11:30		0	*			0	*				
11:45		0	*	0	0	0	*	0	0	0	0
Total		0	0			0	1			0	1
Percent		0.0%	0.0%			0.0%	100.0%			0.0%	100.0%
Grand Total		2573	8153			4291	5001			6864	13154
Percent		24.0%	76.0%			46.2%	53.8%			34.3%	65.7%
ADT		ADT 2,491		AADT 2,491							

APPENDIX B

EXISTING LEVEL OF SERVICE

Lanes, Volumes, Timings

1: NW Friberg-Strunk Street & Union High School Driveway (North)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	64	288	120	156	420
Future Volume (vph)	16	64	288	120	156	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	260			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.902	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1556	1638	1517	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1556	1638	1517	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	806			370	359	
Travel Time (s)	22.0			6.3	6.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	16%	16%	13%	13%
Adj. Flow (vph)	16	64	288	120	156	420
Shared Lane Traffic (%)						
Lane Group Flow (vph)	16	64	288	120	576	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 63.3% ICU Level of Service B

Analysis Period (min) 15

Intersection

Int Delay, s/veh 3.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	64	288	120	156	420
Future Vol, veh/h	16	64	288	120	156	420
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	0	260	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	16	16	13	13
Mvmt Flow	16	64	288	120	156	420

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1062	366	576	0	-	0
Stage 1	366	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.26	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.344	-	-	-
Pot Cap-1 Maneuver	250	684	932	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	498	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	173	684	932	-	-	-
Mov Cap-2 Maneuver	173	-	-	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	344	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.2	7.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	932	-	173	684	-	-
HCM Lane V/C Ratio	0.309	-	0.092	0.094	-	-
HCM Control Delay (s)	10.6	-	27.9	10.8	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	1.3	-	0.3	0.3	-	-

Lanes, Volumes, Timings

2: NW Friberg-Strunk Street & Union High School Driveway (Middle)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	84	96	80	400	244	36
Future Volume (vph)	84	96	80	400	244	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	415			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.983	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1289	1154	1671	1759	1746	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1289	1154	1671	1759	1746	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	801			730	370	
Travel Time (s)	21.8			12.4	6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	40%	40%	8%	8%	7%	7%
Adj. Flow (vph)	84	96	80	400	244	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	84	96	80	400	280	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 34.1% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	84	96	80	400	244	36
Future Vol, veh/h	84	96	80	400	244	36
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	0	415	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	40	40	8	8	7	7
Mvmt Flow	84	96	80	400	244	36
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	822	262	280	0	-	0
Stage 1	262	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Critical Hdwy	6.8	6.6	4.18	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.86	3.66	2.272	-	-	-
Pot Cap-1 Maneuver	297	693	1249	-	-	-
Stage 1	701	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	278	693	1249	-	-	-
Mov Cap-2 Maneuver	278	-	-	-	-	-
Stage 1	701	-	-	-	-	-
Stage 2	471	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.8	1.3		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1249	-	278	693	-	-
HCM Lane V/C Ratio	0.064	-	0.302	0.139	-	-
HCM Control Delay (s)	8.1	-	23.5	11	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.2	0.5	-	-

Lanes, Volumes, Timings

4: NW Friberg-Strunk Street & Union High School Driveway (South)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	28	236	260	444	248	120
Future Volume (vph)	28	236	260	444	248	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	385			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.956	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1671	1495	1719	1810	1636	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1671	1495	1719	1810	1636	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	804			608	730	
Travel Time (s)	21.9			10.4	12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	5%	5%	11%	11%
Adj. Flow (vph)	28	236	260	444	248	120
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	236	260	444	368	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 48.1% ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh 4.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	236	260	444	248	120
Future Vol, veh/h	28	236	260	444	248	120
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	0	385	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	8	8	5	5	11	11
Mvmt Flow	28	236	260	444	248	120

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1272	308	368	0	-	0
Stage 1	308	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Critical Hdwy	6.48	6.28	4.15	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	2.245	-	-	-
Pot Cap-1 Maneuver	180	718	1174	-	-	-
Stage 1	732	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	140	718	1174	-	-	-
Mov Cap-2 Maneuver	140	-	-	-	-	-
Stage 1	732	-	-	-	-	-
Stage 2	281	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15	3.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1174	-	140	718	-	-
HCM Lane V/C Ratio	0.221	-	0.2	0.329	-	-
HCM Control Delay (s)	8.9	-	37	12.4	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q(veh)	0.8	-	0.7	1.4	-	-

Lanes, Volumes, Timings

1: NW Friberg-Strunk Street & Union High School Driveway (North)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	36	16	48	208	144	44
Future Volume (vph)	36	16	48	208	144	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	260			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.968	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1900	1839	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1900	1839	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	806			370	359	
Travel Time (s)	22.0			6.3	6.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	36	16	48	208	144	44
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	16	48	208	188	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 26.9% ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh 1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	16	48	208	144	44
Future Vol, veh/h	36	16	48	208	144	44
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	0	260	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	36	16	48	208	144	44

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	470	166	188	0	-	0
Stage 1	166	-	-	-	-	-
Stage 2	304	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	556	884	1398	-	-	-
Stage 1	868	-	-	-	-	-
Stage 2	753	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	537	884	1398	-	-	-
Mov Cap-2 Maneuver	537	-	-	-	-	-
Stage 1	868	-	-	-	-	-
Stage 2	727	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1398	-	537	884	-	-
HCM Lane V/C Ratio	0.034	-	0.067	0.018	-	-
HCM Control Delay (s)	7.7	-	12.2	9.1	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	0.1	-	-

Lanes, Volumes, Timings

2: NW Friberg-Strunk Street & Union High School Driveway (Middle)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	52	52	4	228	192	8
Future Volume (vph)	52	52	4	228	192	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	415			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.995	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1900	1890	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1900	1890	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	801			730	370	
Travel Time (s)	21.8			12.4	6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	52	52	4	228	192	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	52	4	228	200	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 22.0% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	52	52	4	228	192	8
Future Vol, veh/h	52	52	4	228	192	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	0	415	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	52	52	4	228	192	8
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	432	196	200	0	-	0
Stage 1	196	-	-	-	-	-
Stage 2	236	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	584	850	1384	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	582	850	1384	-	-	-
Mov Cap-2 Maneuver	582	-	-	-	-	-
Stage 1	842	-	-	-	-	-
Stage 2	806	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.6	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1384	-	582	850	-	-
HCM Lane V/C Ratio	0.003	-	0.089	0.061	-	-
HCM Control Delay (s)	7.6	-	11.8	9.5	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	0.2	-	-

Lanes, Volumes, Timings

4: NW Friberg-Strunk Street & Union High School Driveway (South)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	72	60	60	156	188	60
Future Volume (vph)	72	60	60	156	188	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	385			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.967	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1900	1837	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1900	1837	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	804			608	730	
Travel Time (s)	21.9			10.4	12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	72	60	60	156	188	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	60	60	156	248	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 30.9% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	72	60	60	156	188	60
Future Vol, veh/h	72	60	60	156	188	60
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	0	385	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	72	60	60	156	188	60
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	494	218	248	0	-	0
Stage 1	218	-	-	-	-	-
Stage 2	276	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	538	827	1330	-	-	-
Stage 1	823	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	514	827	1330	-	-	-
Mov Cap-2 Maneuver	514	-	-	-	-	-
Stage 1	823	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.6	2.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1330	-	514	827	-	-
HCM Lane V/C Ratio	0.045	-	0.14	0.073	-	-
HCM Control Delay (s)	7.8	-	13.1	9.7	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	0.2	-	-

APPENDIX C
ACCIDENT DATA



**Washington State
Department of Transportation**

Transportation Data and GIS Office
7345 Linderson Way Sw, Fl 1
Tumwater, WA 98501

360-570-2464 / Fax 360-570-2449
TTY: 1-800-833-6388
www.wsdot.wa.gov

September 26, 2016

Grant Stonex
H. Lee & Associates, PLLC
PO Box 1849
Vancouver WA 98668

Dear Mr. Stonex:

In accordance with the Public Records Act, RCW 42.56, this letter acknowledges receipt of your request for records dated September 20, 2016 (Request Number PDR-16-2843).

We have prepared a history of officer reported crashes that occurred *at or in the vicinity of* the following intersections and road segment in the Cities of Camas and Vancouver for the period of 1/1/2011 – *available 2016*.

- 13th St / Goodwin Rd @ 202nd Ave / Friberg-Strunk St – *City of Camas*
- 1st St / Lake Rd @ Friberg-Strunk St / 202nd Ave – *City of Vancouver*
- Friberg-Strunk St / 202nd Ave from 13th St / Goodwind Rd to 1st St / Lake Rd - *Cities of Camas & Vancouver*

Federal law 23 United States Code Section 409 governs use of the data you requested. Under this law, data maintained for purposes of evaluating potential highway safety enhancements:

“ . . . shall not be subject to discovery or admitted into evidence in a federal or state court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.” [Emphasis added.]

Public Disclosure Request PDR-16-2843

September 26, 2016

Page 2

The Washington State Department of Transportation (WSDOT) is releasing this data to you with the understanding that you will not use this data contrary to the restrictions in Section 409, which means you will not use this data in discovery or as evidence at trial in any action for damages against the WSDOT, the State of Washington, or any other jurisdiction involved in the locations mentioned in the data. If you should attempt to use this data in an action for damages against WSDOT, the State of Washington, or any other jurisdiction involved in the locations mentioned in the data, these entities expressly reserve the right, under Section 409, to object to the use of the data, including any opinions drawn from the data.

With this package, your request for records is complete and closed.

If you have any further questions you may contact me at 360-570-2464.

Sincerely,

A handwritten signature in blue ink that reads "Julie Brown". The signature is written in a cursive, flowing style.

Julie Brown

Transportation Planning Technician 3

Transportation Data and GIS Office

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of THE FOLLOWING INTERSECTIONS & ROAD SEGMENT IN THE CITIES OF CAMAS & VANCOUVER

13th ST / GOODWIN RD @ 202nd AVE / FRIBERG-STRUNK ST - *City of Camas*

1st ST / LAKE RD @ FRIBERG-STRUNK ST / 202nd AVE - *City of Vancouver*

FRIBERG-STRUNK ST / 202nd AVE FROM 13th ST / GOODWIN RD TO 1st ST / LAKE RD -*Cities of Camas & Vancouver*

1/1/2011 - available 2016

Under 23 U.S. Code § 409 and 23 U.S. Code § 148, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

JURISDICTION	CITY	PRIMARY TRAFFICWAY	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	MILE POST	A / B	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# I N J	# F A T	# V E D	# P E D A L	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	ROADWAY SURFACE CONDITIONS	LIGHTING CONDITIONS	FIRST COLLISION TYPE / OBJECT STRUCK	VEH 1 ACTION	VEH 2 ACTION	MV DRIVER CONT CIRC 1 (UNIT 1)	MV DRIVER CONT CIRC 1 (UNIT 2)	VEH 1 COMP DIR FROM	VEH 1 COMP DIR TO	VEH 2 COMP DIR FROM	VEH 2 COMP DIR TO	IMPACT LOCATION (Effective for City, County & Misc 1/1/2010; SR's indefinite)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
City Street	Camas	NE 13TH ST	20100	NW FRIBERG STRUNK ST							E547400	5/8/2016	10:29	No Injury	0	0	2	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Dry	Daylight	From opposite direction - one left turn - one straight	Going Straight Ahead	Making Left Turn	None	Did Not Grant RW to Vehicle	West	East	East	South	Lane of Primary Trafficway	1,137,588.40	115,291.87
City Street	Camas	NE 13TH ST	20100		122	F	W	NE GOODWIN RD			E465764	9/22/2015	7:50	No Injury	0	0	4	0	Passenger Car	Passenger Car	Not at Intersection and Not Related	Dry	Daylight	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Going Straight Ahead	Follow Too Closely	None	West	East	West	East	Lane of Primary Trafficway	1,137,466.60	115,293.57
City Street	Camas	NE 202ND AVE	7000		85	F	S	NE 13TH ST			E302840	1/15/2014	14:34	No Injury	0	0	2	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	Intersection Related but Not at Intersection	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Follow Too Closely	None	South	North	Vehicle Stopped	Vehicle Stopped	Lane of Primary Trafficway	1,137,582.14	115,206.80
City Street	Camas	NE GOODWIN RD	7800	NW FRIBERG STRUNK ST							3673280	2/22/2013	9:35	No Injury	0	0	1	0	Pickup,Panel Truck or Vanette under 10,000 lb		At Intersection and Related	Wet	Unknown	Street Light Pole or Base	Going Straight Ahead		Operating Defective Equipment		East	West			Past the Outside Shoulder of Primary Trafficway	1,137,588.40	115,291.86
City Street	Camas	NE GOODWIN RD	7800	NW FRIBERG STRUNK ST							3720273	4/27/2016	14:47	No Injury	0	0	2	0	Passenger Car	Passenger Car	At Intersection and Related	Dry	Daylight	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	Did Not Grant RW to Vehicle	None	South	West	North	South	Lane of Primary Trafficway	1,137,588.40	115,291.87
City Street	Camas	NW FRIBERG STRUNK ST	7000		223	F	S	NE 202ND AVE			2984254	3/9/2011	12:23	No Injury	0	0	1	0	Pickup,Panel Truck or Vanette under 10,000 lb		Not at Intersection and Not Related	Wet	Daylight	Fire Hydrant	Going Straight Ahead		Inattention		South	North			Past the Outside Shoulder of Primary Trafficway	1,137,563.93	115,069.88
City Street	Camas	NW FRIBERG STRUNK ST	6400		208	F	N	NE 8TH ST			3241865	12/13/2013	7:40	Possible Injury	1	0	1	1	Passenger Car		Not at Intersection and Not Related	Wet	Dawn	Vehicle going straight hits pedestrian	Going Straight Ahead		Driver Operating Other Electronic Devices (compute		North	South			Past the Outside Shoulder of Primary Trafficway	1,137,536.32	113,827.26
City Street	Camas	NW FRIBERG STRUNK ST	6200		0.21	M	S	NE 8TH ST			3614040	3/28/2013	14:29	No Injury	0	0	4	0	Passenger Car	Passenger Car	Not at Intersection and Not Related	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Follow Too Closely	None	North	South	North	Vehicle Stopped	Lane of Primary Trafficway	1,137,499.23	112,533.39
City Street	Camas	NW FRIBERG STRUNK ST	6200		0.11	M	N	NW LAKE RD			3610134	8/10/2015	19:10	No Injury	0	0	2	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Driveway	Dry	Daylight	Entering at angle	Making Left Turn	Going Straight Ahead	Other	None	West	North	North	South	Lane of Primary Trafficway	1,137,474.71	111,909.05
City Street	Camas	NW FRIBERG STRUNK ST	6200		500	F	N	SE 1ST ST			3327557	11/4/2013	7:45	No Injury	0	0	3	0	Passenger Car	Passenger Car	Driveway Related but Not at Driveway	Wet	Daylight	From same direction - both going straight - both moving - sideswipe	Changing Lanes	Going Straight Ahead	Inattention	None	South	Northeast	South	North	Lane of Primary Trafficway	1,137,486.53	111,831.59
City Street	Camas	NW FRIBERG STRUNK ST	6200		170.4	F	N	SE 1ST ST			E158720	3/9/2012	14:34	No Injury	0	0	2	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	Not at Intersection and Not Related	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Inattention	None	North	South	North	Vehicle Stopped	Lane of Primary Trafficway	1,137,503.57	111,502.14
City Street	Camas	NW FRIBERG STRUNK ST	6200		184	F	N	SE 1ST ST			E552642	6/10/2016	14:22	Possible Injury	1	0	2	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	Not at Intersection and Not Related	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Other Driver Distractions Inside Vehicle	None	North	South	Vehicle Backing	Vehicle Stopped	Lane of Primary Trafficway	1,137,496.27	111,516.08
City Street	Camas	NW LAKE RD	4800		423	F	E	NW FRIBERG STRUNK ST			3711812	2/2/2016	6:05	Evident Injury	1	0	1	0	Pickup,Panel Truck or Vanette under 10,000 lb		Not at Intersection and Not Related	Ice	Dark-Street Lights On	Linear Curb	Changing Lanes		Exceeding Reas. Safe Speed		East	West			Outside Shoulder of Primary Trafficway	1,137,920.37	111,320.63
City Street	Camas	NW LAKE RD	4600		0.25	M	E	SE 202ND AVE			3673257	6/18/2013	22:45	No Injury	0	0	1	0	Pickup,Panel Truck or Vanette under 10,000 lb		Not at Intersection and Not Related	Wet	Dark-Street Lights On	Tree or Stump (stationary)	Going Straight Ahead		Apparently Asleep		East	West			Past the Outside Shoulder of Primary Trafficway	1,138,823.61	111,300.68
City Street	Camas	NW LAKE RD	4800		0.22	M	E	SE 202ND AVE			E518655	2/7/2016	21:40	Dead at Scene	0	1	1	0	Motorcycle		Not at Intersection and Not Related	Dry	Dark-Street Lights On	Concrete Barrier/Jersey Barrier - Face	Going Straight Ahead		Unknown Driver Distraction		East	West			Median Shoulder of Primary Trafficway	1,138,651.38	111,290.30
City Street	Vancouver	NW FRIBERG STRUNK ST		SE 1ST ST							E474172	10/23/2015	11:56	No Injury	0	0	2	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Dry	Daylight	Entering at angle	Making Right Turn	Going Straight Ahead	Exceeding Reas. Safe Speed	None	North	West	West	East	Intersecting Trafficway	1,137,496.62	111,331.93

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of THE FOLLOWING INTERSECTIONS & ROAD SEGMENT IN THE CITIES OF CAMAS & VANCOUVER

13th ST / GOODWIN RD @ 202nd AVE / FRIBERG-STRUNK ST - *City of Camas*

1st ST / LAKE RD @ FRIBERG-STRUNK ST / 202nd AVE - *City of Vancouver*

FRIBERG-STRUNK ST / 202nd AVE FROM 13th ST / GOODWIN RD TO 1st ST / LAKE RD -*Cities of Camas & Vancouver*

1/1/2011 - available 2016

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JURISDICTION	CITY	PRIMARY TRAFFICWAY	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	MILE POST	A / B	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJURY	# FATAL	# VERBALLY	# PEDESTAL	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	ROADWAY SURFACE CONDITIONS	LIGHTING CONDITIONS	FIRST COLLISION TYPE / OBJECT STRUCK	VEH 1 ACTION	VEH 2 ACTION	MV DRIVER CONT CIRC 1 (UNIT 1)	MV DRIVER CONT CIRC 1 (UNIT 2)	VEH 1 COMP DIR FROM	VEH 1 COMP DIR TO	VEH 2 COMP DIR FROM	VEH 2 COMP DIR TO	IMPACT LOCATION (Effective for City, County & Misc 1/1/2010; SR's indefinite)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
City Street	Vancouver	NW LAKE RD		NW FRIBERG STRUNK ST							3252960	5/12/2012	12:09	Possible Injury	1	0	2	0	Pickup,Panel Truck or Vanette under 10,000 lb	Passenger Car	At Intersection and Related	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	Under Influence of Alcohol	None	East	West	East	Vehicle Stopped	Lane of Primary Trafficway	1,137,496.72	111,285.24
City Street	Vancouver	NW LAKE RD	9900	NW FRIBERG STRUNK ST							3691264	4/17/2014	19:23	Possible Injury	1	0	2	0	Passenger Car	Passenger Car	At Intersection and Related	Wet	Dark-Street Lights On	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	Inattention	None	East	West	East	Vehicle Stopped	Lane of Primary Trafficway	1,137,496.60	111,331.92

APPENDIX D
“IN-PROCESS”

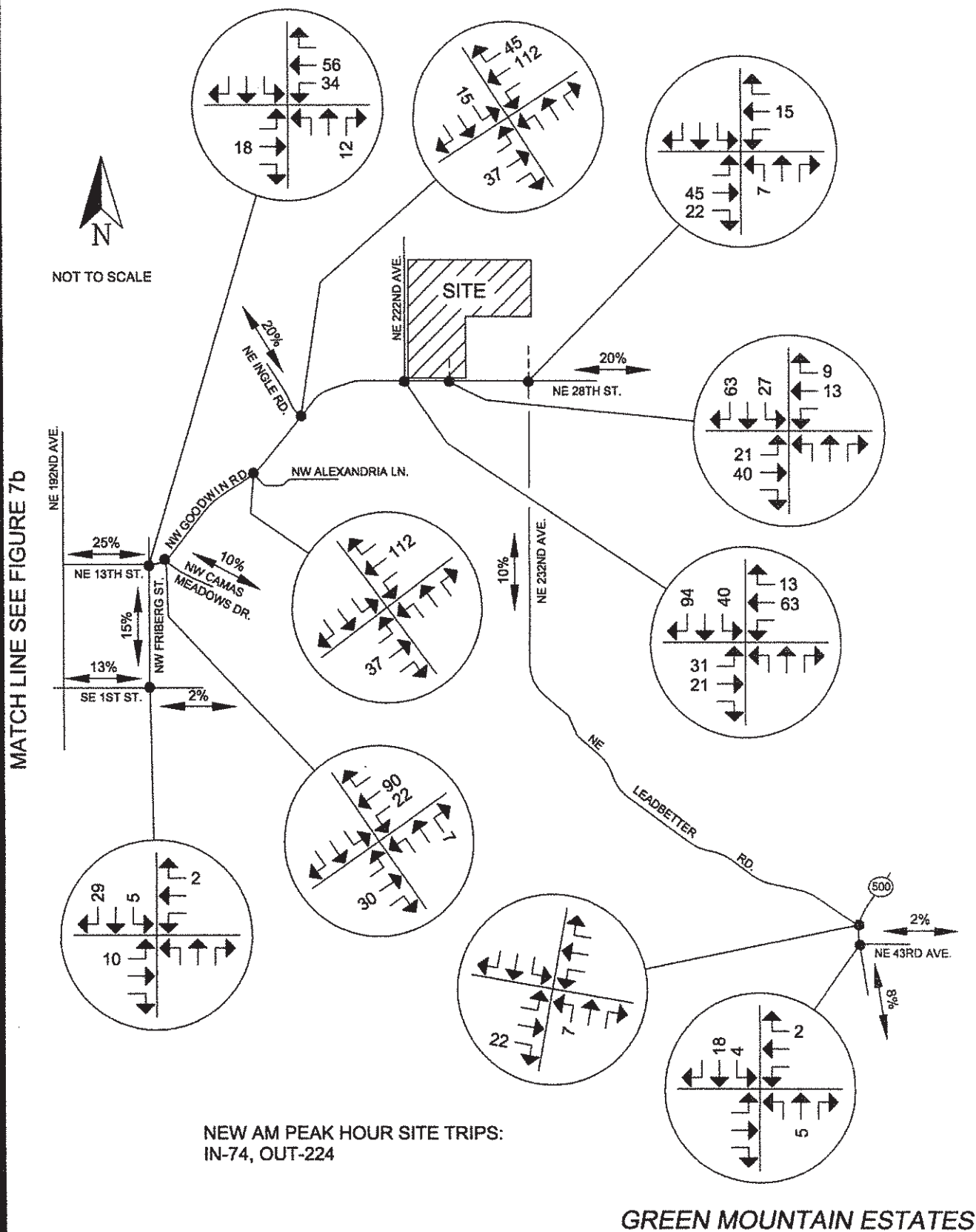


FIGURE 7a
**SITE TRAFFIC DISTRIBUTION/
 ASSIGNMENT, AM PEAK HOUR**

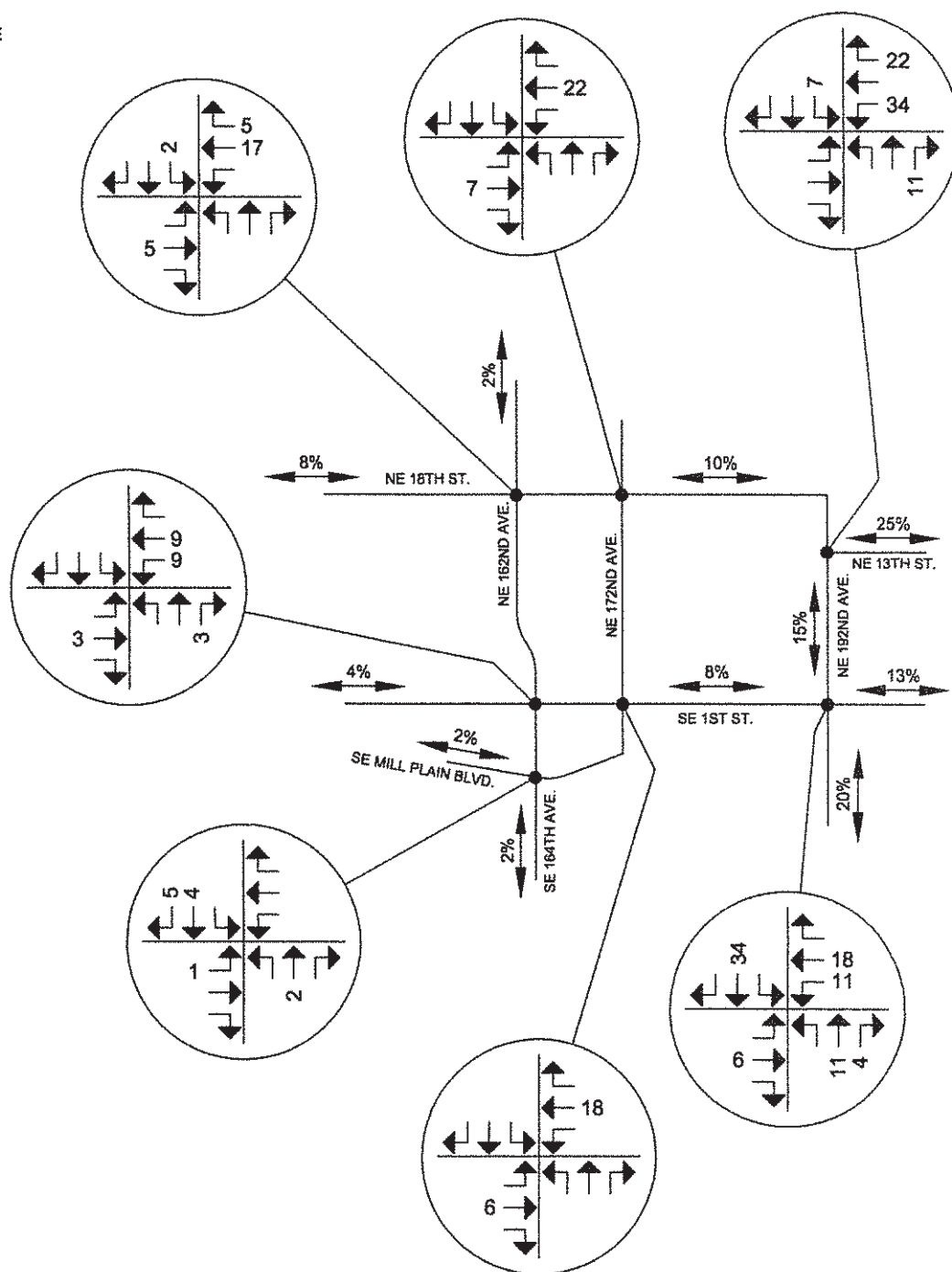
KELLY ENGINEERING

316 E. Fourth Plain, A-2, Vancouver, WA 98663

Phone: 360-433-7530



NOT TO SCALE



MATCH LINE SEE FIGURE 7a

GREEN MOUNTAIN ESTATES

FIGURE 7b
SITE TRAFFIC DISTRIBUTION/
ASSIGNMENT, AM PEAK HOUR

KELLY ENGINEERING

316 E. Fourth Plain, A-2, Vancouver, WA 98663

Phone: 360-433-7530

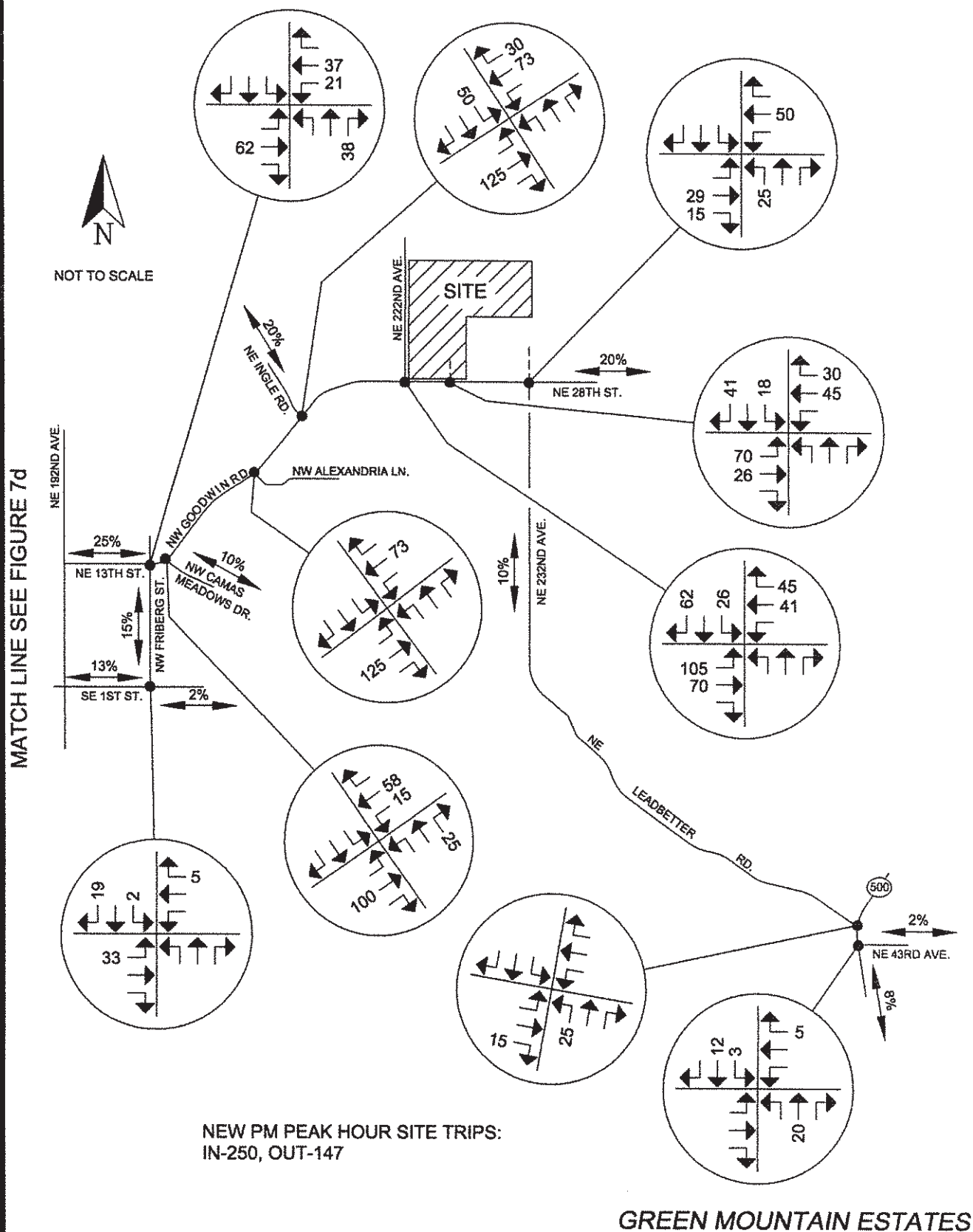


FIGURE 7c
**SITE TRAFFIC DISTRIBUTION/
ASSIGNMENT, PM PEAK HOUR**

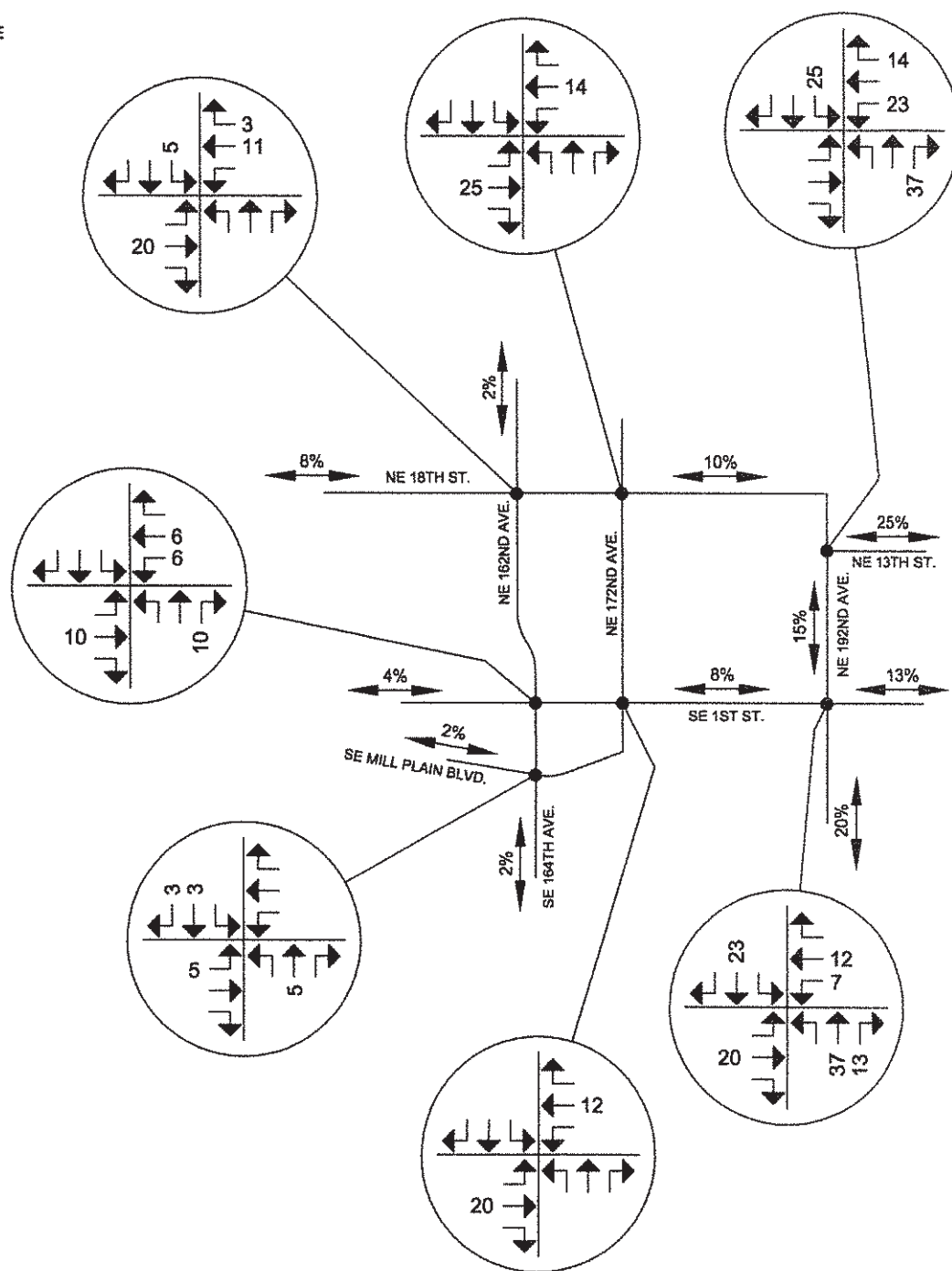
KELLY ENGINEERING

316 E. Fourth Plain, A-2, Vancouver, WA 98663

Phone: 360-433-7530



NOT TO SCALE



MATCH LINE SEE FIGURE 7c

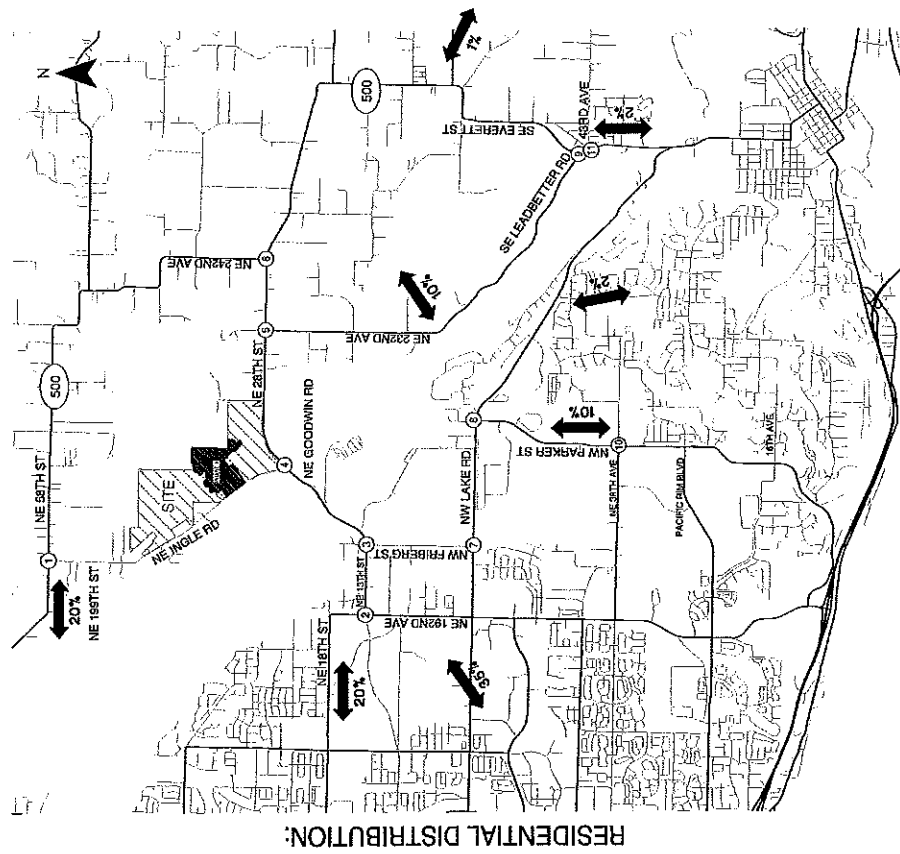
GREEN MOUNTAIN ESTATES

FIGURE 7d
SITE TRAFFIC DISTRIBUTION/
ASSIGNMENT, PM PEAK HOUR

KELLY ENGINEERING

316 E. Fourth Plain, A-2, Vancouver, WA 98663

Phone: 360-433-7530



Estimated Trip Distribution Pattern
Camas, Washington

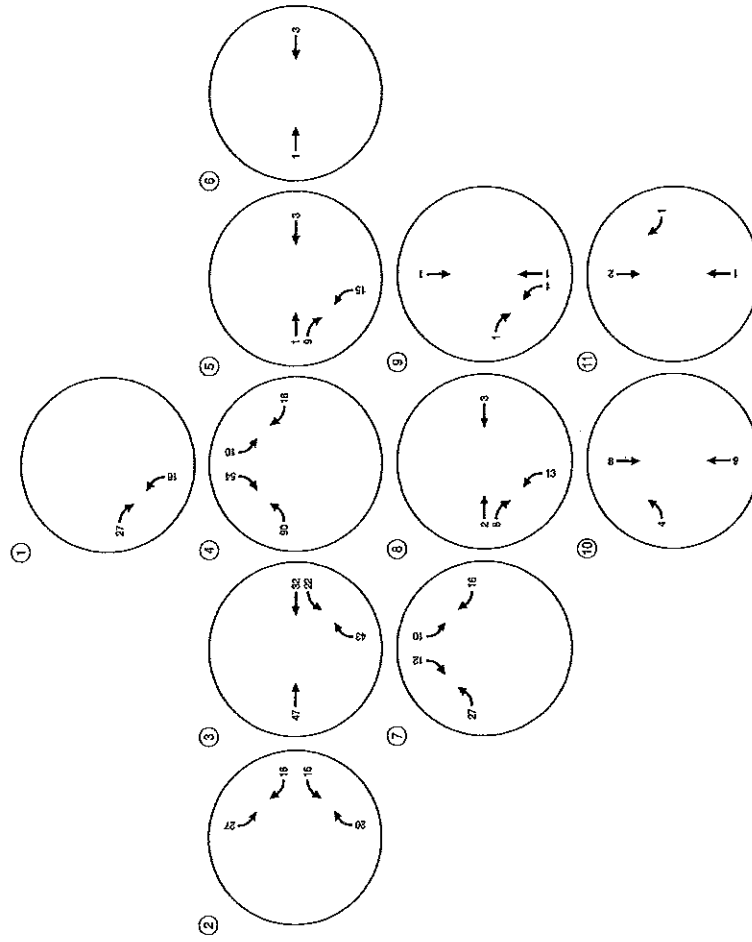
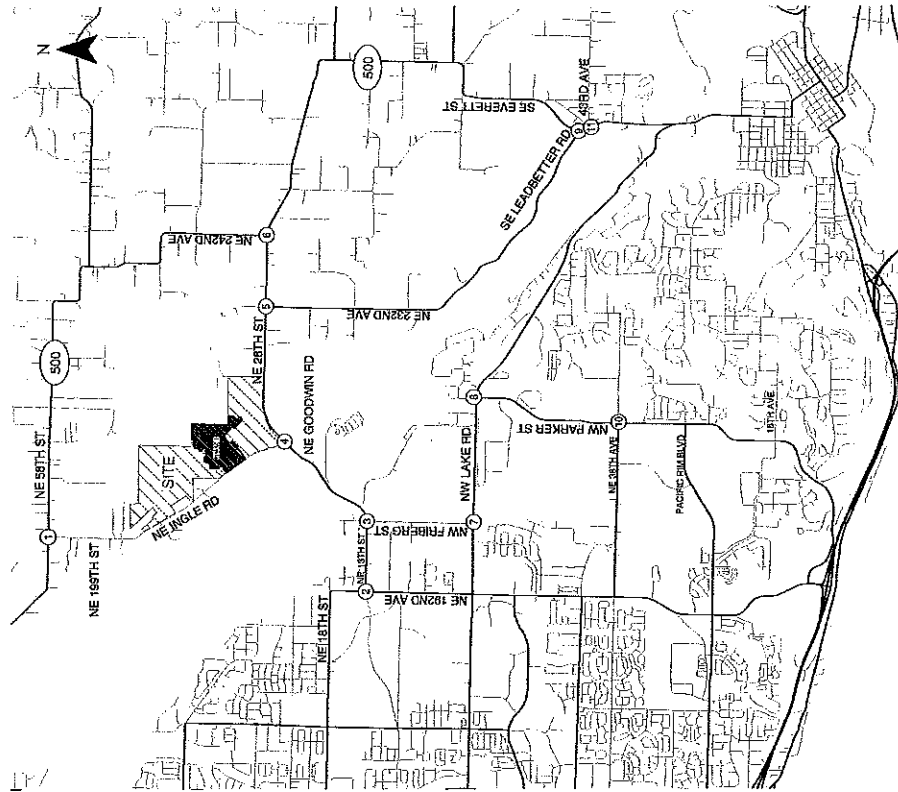
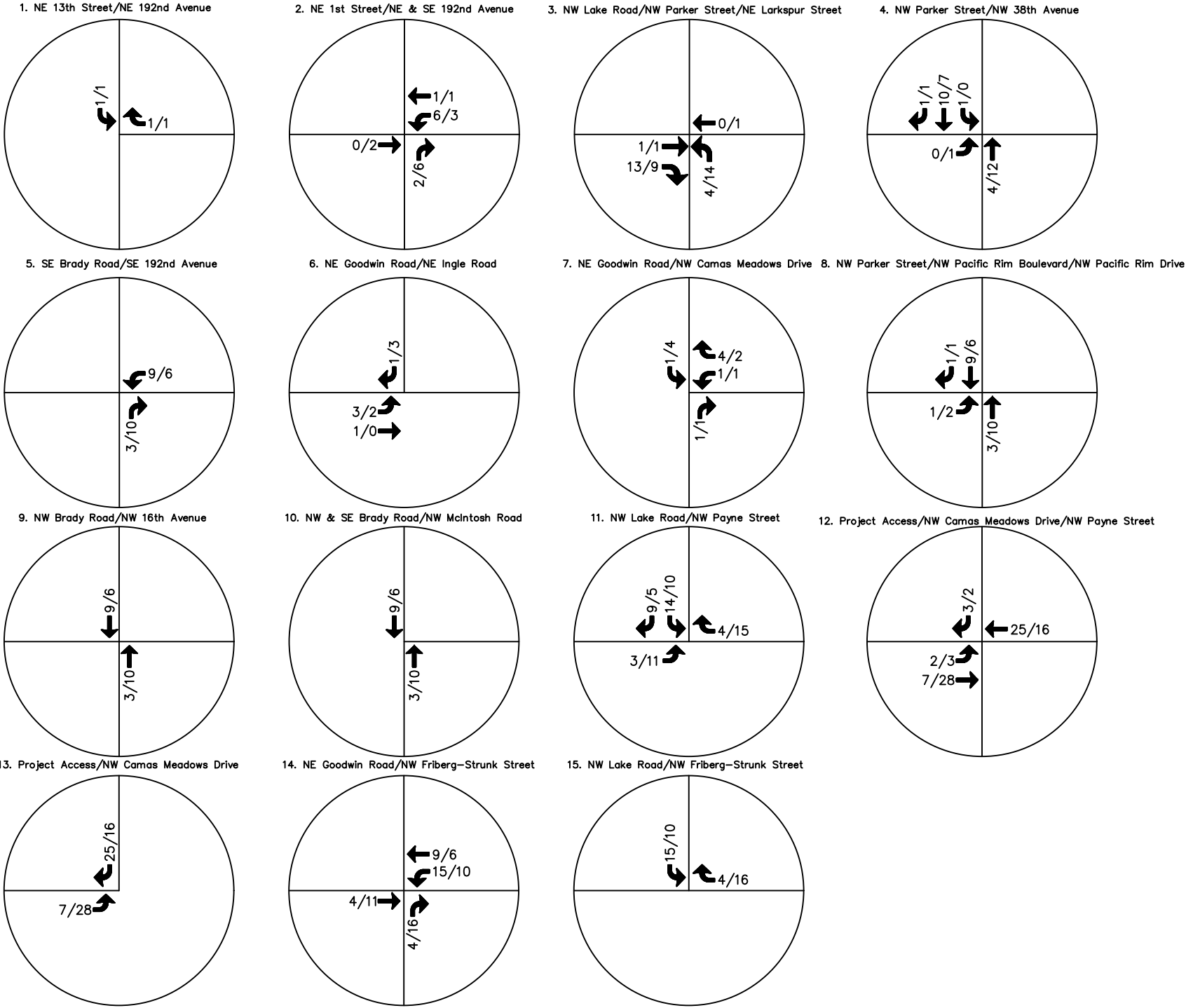
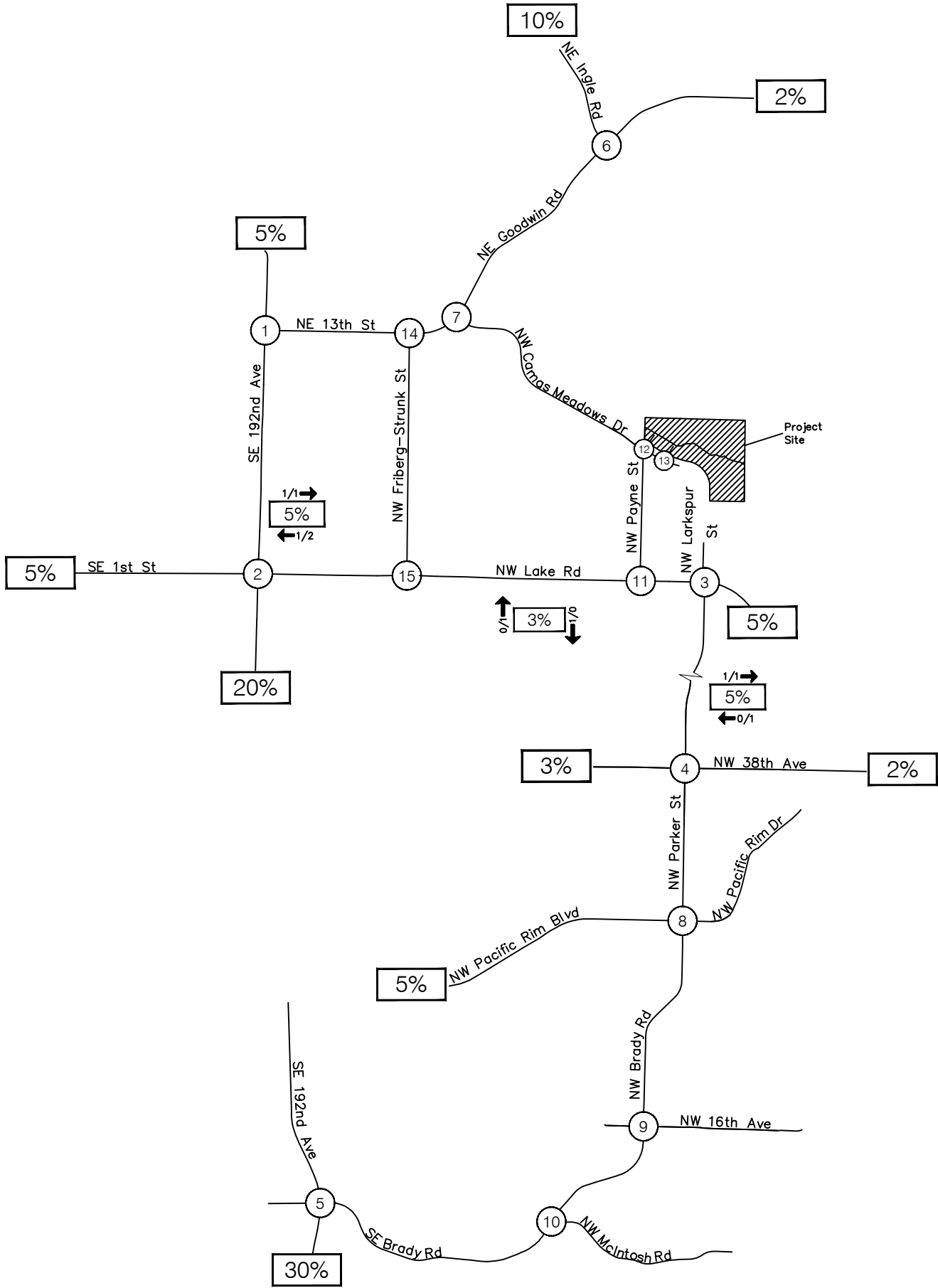


Figure 8



**Total Estimated Trip Assignment - Full Build-Out
Weekday PM Peak Hour
Camas, Washington**



LEGEND

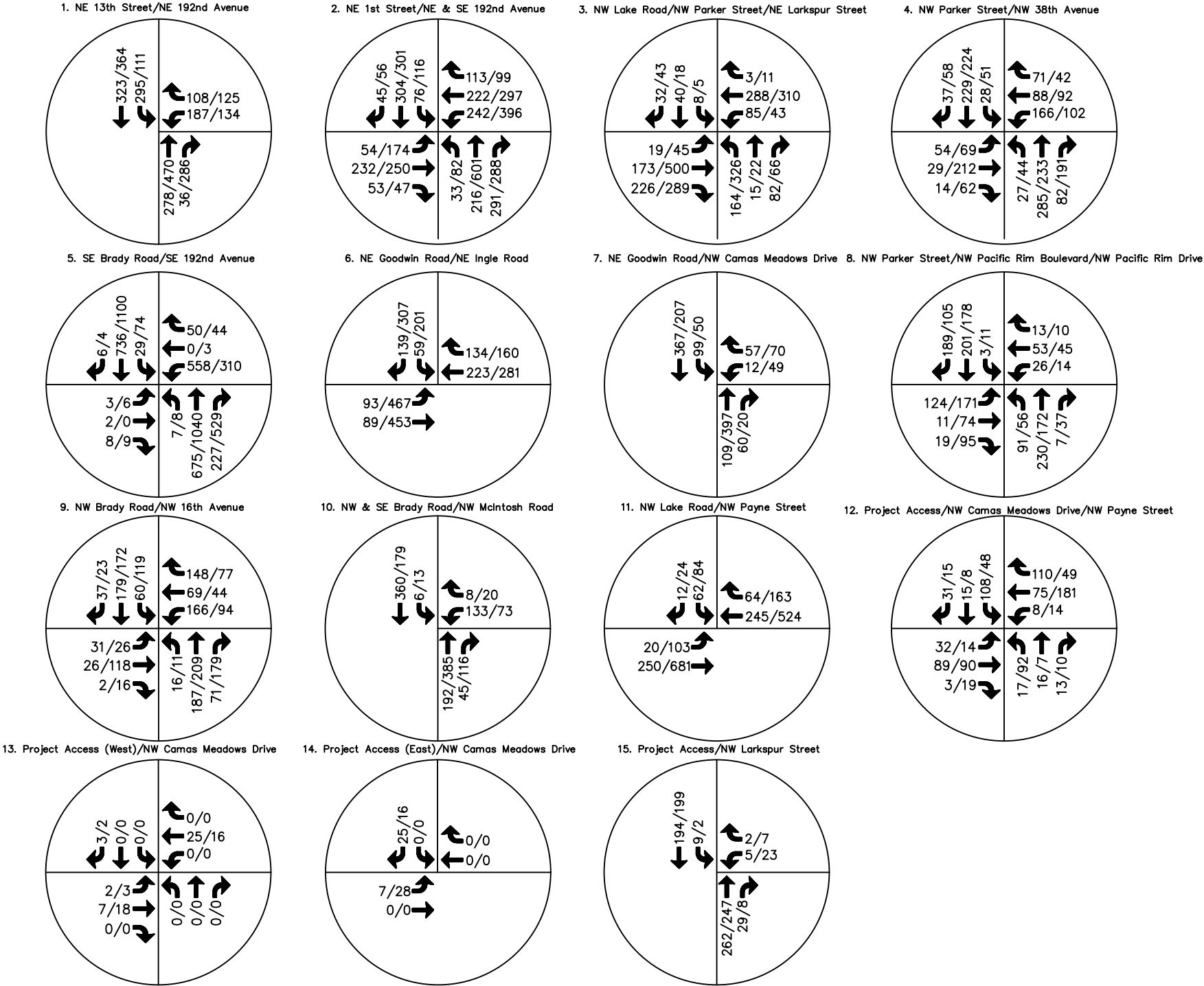
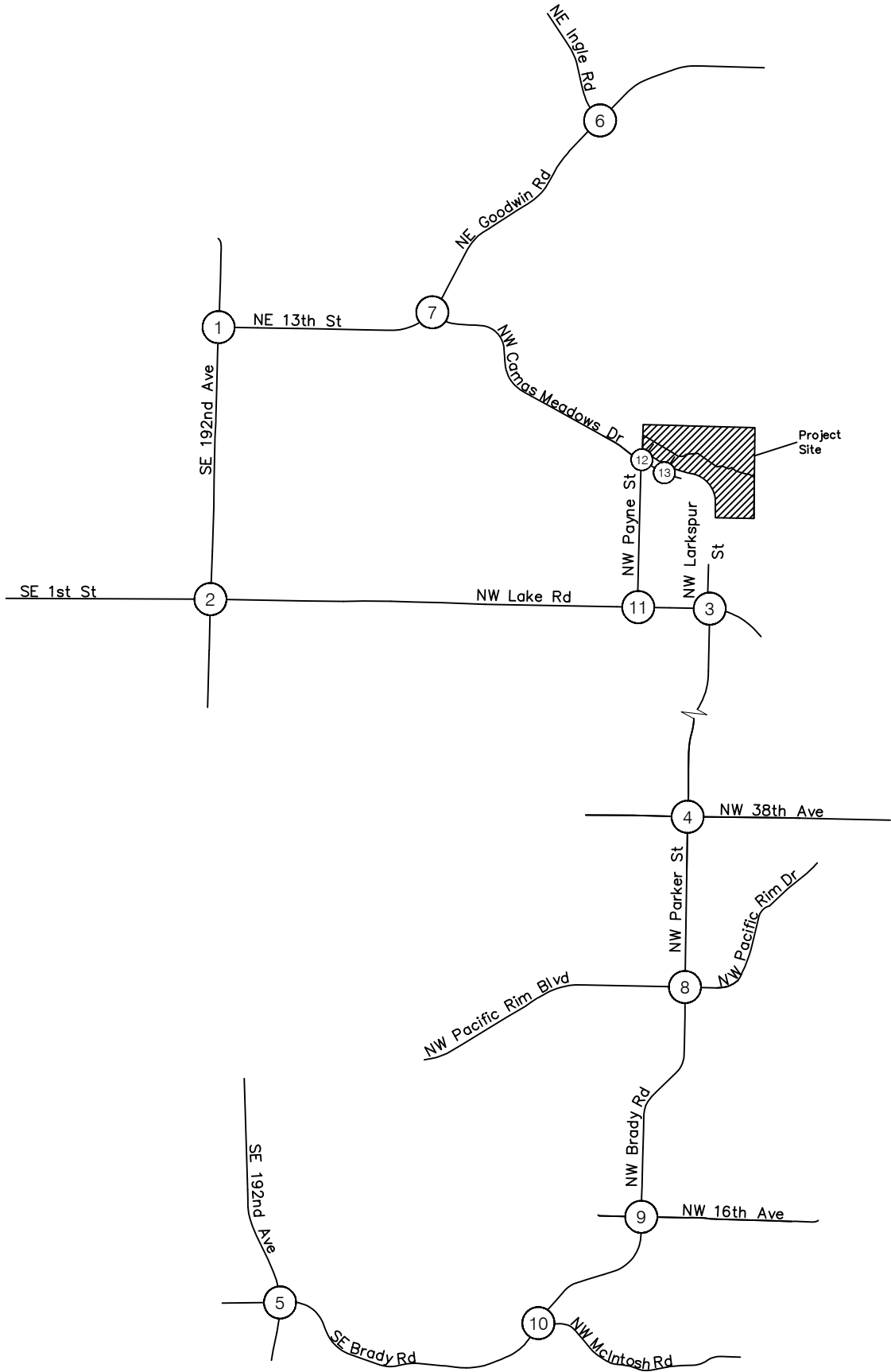
128/200

A.M./P.M. Peak Hour
Traffic Volume

10%

A.M. and P.M. Peak Hour Trip Distribution

FIGURE 1
Trip Distribution and Assignment
Traffic Volumes



LEGEND

128/200

AM/PM Peak Hour
Traffic Volume

FIGURE 2
2020 "With Project"
A.M. and P.M. Peak Hour Traffic Volumes

APPENDIX E

2022 “WITHOUT PROJECT” LEVEL OF SERVICE

Lanes, Volumes, Timings

1: NW Friberg-Strunk Street & Union High School Driveway (North)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	64	288	179	227	420
Future Volume (vph)	16	64	288	179	227	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	260			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.912	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1556	1638	1533	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1556	1638	1533	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	806			370	359	
Travel Time (s)	22.0			6.3	6.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	16%	16%	13%	13%
Adj. Flow (vph)	16	64	288	179	227	420
Shared Lane Traffic (%)						
Lane Group Flow (vph)	16	64	288	179	647	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 67.0% ICU Level of Service C

Analysis Period (min) 15

Intersection

Int Delay, s/veh 3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	64	288	179	227	420
Future Vol, veh/h	16	64	288	179	227	420
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	0	260	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	16	16	13	13
Mvmt Flow	16	64	288	179	227	420

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1192	437	647	0	-	0
Stage 1	437	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.26	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.344	-	-	-
Pot Cap-1 Maneuver	209	624	875	-	-	-
Stage 1	655	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	140	624	875	-	-	-
Mov Cap-2 Maneuver	140	-	-	-	-	-
Stage 1	655	-	-	-	-	-
Stage 2	314	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.9	6.9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	875	-	140	624	-	-
HCM Lane V/C Ratio	0.329	-	0.114	0.103	-	-
HCM Control Delay (s)	11.1	-	34	11.4	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	1.4	-	0.4	0.3	-	-

Lanes, Volumes, Timings

2: NW Friberg-Strunk Street & Union High School Driveway (Middle)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	84	96	80	459	315	36
Future Volume (vph)	84	96	80	459	315	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	415			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.986	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1289	1154	1671	1759	1751	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1289	1154	1671	1759	1751	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	801			730	370	
Travel Time (s)	21.8			12.4	6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	40%	40%	8%	8%	7%	7%
Adj. Flow (vph)	84	96	80	459	315	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	84	96	80	459	351	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 37.8% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	84	96	80	459	315	36
Future Vol, veh/h	84	96	80	459	315	36
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	0	415	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	40	40	8	8	7	7
Mvmt Flow	84	96	80	459	315	36
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	952	333	351	0	-	0
Stage 1	333	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Critical Hdwy	6.8	6.6	4.18	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.86	3.66	2.272	-	-	-
Pot Cap-1 Maneuver	246	630	1175	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	471	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	229	630	1175	-	-	-
Mov Cap-2 Maneuver	229	-	-	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	439	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	20.1	1.2		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1175	-	229	630	-	-
HCM Lane V/C Ratio	0.068	-	0.367	0.152	-	-
HCM Control Delay (s)	8.3	-	29.6	11.7	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.6	0.5	-	-

Lanes, Volumes, Timings

4: NW Friberg-Strunk Street & Union High School Driveway (South)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	28	236	260	503	319	120
Future Volume (vph)	28	236	260	503	319	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	385			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.963	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1671	1495	1719	1810	1648	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1671	1495	1719	1810	1648	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	804			608	730	
Travel Time (s)	21.9			10.4	12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	5%	5%	11%	11%
Adj. Flow (vph)	28	236	260	503	319	120
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	236	260	503	439	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 51.8% ICU Level of Service A

Analysis Period (min) 15

Intersection							
Int Delay, s/veh	4.7						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	28	236	260	503	319	120	
Future Vol, veh/h	28	236	260	503	319	120	
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	0	385	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	100	100	100	100	100	100	
Heavy Vehicles, %	8	8	5	5	11	11	
Mvmt Flow	28	236	260	503	319	120	
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1402	379	439	0	-	0	
Stage 1	379	-	-	-	-	-	
Stage 2	1023	-	-	-	-	-	
Critical Hdwy	6.48	6.28	4.15	-	-	-	
Critical Hdwy Stg 1	5.48	-	-	-	-	-	
Critical Hdwy Stg 2	5.48	-	-	-	-	-	
Follow-up Hdwy	3.572	3.372	2.245	-	-	-	
Pot Cap-1 Maneuver	150	655	1105	-	-	-	
Stage 1	679	-	-	-	-	-	
Stage 2	338	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	115	655	1105	-	-	-	
Mov Cap-2 Maneuver	115	-	-	-	-	-	
Stage 1	679	-	-	-	-	-	
Stage 2	258	-	-	-	-	-	
Approach	EB	NB		SB			
HCM Control Delay, s	17	3.2		0			
HCM LOS	C						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR	
Capacity (veh/h)	1105	-	115	655	-	-	
HCM Lane V/C Ratio	0.235	-	0.243	0.36	-	-	
HCM Control Delay (s)	9.3	-	46.1	13.6	-	-	
HCM Lane LOS	A	-	E	B	-	-	
HCM 95th %tile Q(veh)	0.9	-	0.9	1.6	-	-	

Lanes, Volumes, Timings

1: NW Friberg-Strunk Street & Union High School Driveway (North)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	36	16	48	490	311	44
Future Volume (vph)	36	16	48	490	311	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	260			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.983	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1900	1868	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1900	1868	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	806			370	359	
Travel Time (s)	22.0			6.3	6.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	36	16	48	490	311	44
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	16	48	490	355	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 35.8% ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh 1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	16	48	490	311	44
Future Vol, veh/h	36	16	48	490	311	44
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	0	260	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	36	16	48	490	311	44

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	919	333	355	0	-	0
Stage 1	333	-	-	-	-	-
Stage 2	586	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	304	713	1215	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	292	713	1215	-	-	-
Mov Cap-2 Maneuver	292	-	-	-	-	-
Stage 1	731	-	-	-	-	-
Stage 2	538	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1215	-	292	713	-	-
HCM Lane V/C Ratio	0.04	-	0.123	0.022	-	-
HCM Control Delay (s)	8.1	-	19.1	10.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	0.1	-	-

Lanes, Volumes, Timings

2: NW Friberg-Strunk Street & Union High School Driveway (Middle)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	52	52	4	510	359	8
Future Volume (vph)	52	52	4	510	359	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	415			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.997	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1900	1894	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1900	1894	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	801			730	370	
Travel Time (s)	21.8			12.4	6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	52	52	4	510	359	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	52	4	510	367	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 36.8% ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	52	52	4	510	359	8
Future Vol, veh/h	52	52	4	510	359	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	0	415	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	52	52	4	510	359	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	881	363	367	0	-	0
Stage 1	363	-	-	-	-	-
Stage 2	518	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	320	686	1203	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	602	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	319	686	1203	-	-	-
Mov Cap-2 Maneuver	319	-	-	-	-	-
Stage 1	708	-	-	-	-	-
Stage 2	600	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1203	-	319	686	-	-
HCM Lane V/C Ratio	0.003	-	0.163	0.076	-	-
HCM Control Delay (s)	8	-	18.5	10.7	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.6	0.2	-	-

Lanes, Volumes, Timings

4: NW Friberg-Strunk Street & Union High School Driveway (South)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	72	60	60	438	355	60
Future Volume (vph)	72	60	60	438	355	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	385			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.980	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1900	1862	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1900	1862	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	804			608	730	
Travel Time (s)	21.9			10.4	12.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	72	60	60	438	355	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	60	60	438	415	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 39.6% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	72	60	60	438	355	60
Future Vol, veh/h	72	60	60	438	355	60
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	0	385	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	72	60	60	438	355	60
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	943	385	415	0	-	0
Stage 1	385	-	-	-	-	-
Stage 2	558	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	294	667	1155	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	279	667	1155	-	-	-
Mov Cap-2 Maneuver	279	-	-	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.1	1		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1155	-	279	667	-	-
HCM Lane V/C Ratio	0.052	-	0.258	0.09	-	-
HCM Control Delay (s)	8.3	-	22.3	10.9	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1	0.3	-	-

APPENDIX F
RV STORAGE SURVEY



H. Lee & Associates

Traffic Engineering, Transportation Planning, and Planning

MEMORANDUM

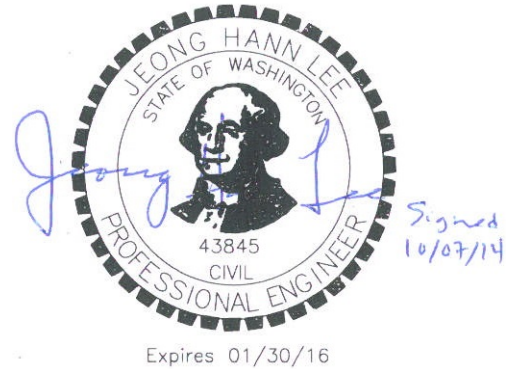
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To: City of Vancouver Staff

From: Hann Lee, P.E.

Date: October 7, 2014

Subject: Garrison Heights Boat & RV Storage Trip Generation
Page 1 of 4



INTRODUCTION

The Garrison Heights Boat & RV Storage project is located on Parcels 1100787-000, 110794-004, and 110785-000 which is located west of NE 87th Avenue, north of E. 5th Street and south of E. 7th Street. A single driveway is proposed onto E. 5th Street. The proposed project is comprised of 146 storage spaces for boats and RVs. The site plan is attached as reference.

The threshold to require a full traffic study for a proposed development in the City of Vancouver is 20 or more net new P.M. peak hour trips. The threshold for requiring a trip generation and distribution analysis for the proposed project is five (5) or more net new P.M. peak hour trips. The ITE Trip Generation Manual does not have a specific rate or equation to estimate trips for the proposed use (boat & RV storage). To estimate the trip generation of the proposed use, identical uses within Clark County and the City of Vancouver were surveyed. Based on the results of the trip generation survey, the appropriate level of traffic study will be determined.

TRIP GENERATION SURVEY METHODOLOGY

The trip generation survey methodology was based on the *Trip Generation Handbook, 2nd Edition*, Chapter 4 (Institute of Transportation Engineers (ITE), June 2004). As stated above, the reason for conducting the trip generation survey is that the description of the site is not covered by the land use classifications presented in ITE's *Trip Generation*. Therefore, the collection of local data is needed to establish a local rate for boat and RV park storage.

The *Trip Generation Handbook* calls for at least three sites to be studied and five preferred. There are a limited number of similar facilities in the City of Vancouver and surrounding unincorporated Clark County. The following four facilities were found to be similar to the proposed Garrison Heights Boat & RV Storage project.

- East Vancouver RV & Boat Storage – 1306 NE 172nd Avenue, unincorporated Clark County, WA

- Pedron's Auto Boat & RV Storage – 6002 NE 152nd Avenue, Vancouver, WA 98682
- Specialty Recreational Vehicle Storage – 11026 NE St. Johns Road, unincorporated Clark County
- Brush Prairie RV Storage – 11111 NE 117th Avenue, unincorporated Clark County

The East Vancouver RV & Boat Storage has 277 total storage spaces. Only 140 storage spaces are covered and encompass 54,205 square feet of covered storage areas.

Pedron's Auto Boat & RV Storage has 85 covered storage spaces for RVs and boats which encompasses 47,888 square feet of covered storage area. The remaining 35,840 square feet of covered storage space is for storing up to 136 automobiles.

The Specialty Recreational Vehicle Storage facility has 99 covered storage spaces encompassing 33,176 square feet of covered storage area.

The Brush Prairie RV Storage facility has 171 covered storage spaces encompassing 55,292 square feet of covered storage area.

The site plans of the survey sites can be referenced in Attachment A.

Forty-eight (48) hour trip generation surveys were conducted at the survey sites. The days each facility was counted are summarized below:

- East Vancouver RV & Boat Storage - 6/11/14 and 6/17/14
- Pedron's Auto Boat & RV Storage - 6/12/14 and 6/17/14
- Specialty Recreational Vehicle Storage - 6/17/14 and 6/18/14
- Brush Prairie RV Storage – 6/17/14 and 6/18/14

The trip generation rates for weekday daily; peak hour of adjacent street one hour between 7:00 and 9:00 A.M.; and peak hour of adjacent street one hour between 4:00 and 6:00 P.M. were derived from the data collected based on a weighted average of all the sites. The independent variable chosen was the number of storage spaces. The area of covered storage area varied widely among the sites and was deemed too inconsistent to be the independent variable.

DERIVED TRIP GENERATION RATES

The daily trip generation rate is derived in Table 1. The daily rate was derived using a weighted average. The daily trip generation rate derived for the RV, Boat, & Auto storage use is 0.178 daily trips per storage space. The standard deviation is 0.081 which is less than 110% of the weighted average so the ITE *Trip Generation Handbook* indicates that the weighted average is good to use.

The A.M. peak hour trip generation rate is derived in Table 2. The A.M. peak hour rate was derived using a weighted average. The A.M. peak hour trip generation rate derived for the RV,

Boat, & Auto storage use is 0.012 A.M. peak hour trips per storage space. The standard deviation is 0.011 which is less than 110% of the weighted average so the ITE *Trip Generation Handbook* indicates that the weighted average is good to use.

The P.M. peak hour trip generation rate is derived in Table 3. The P.M. peak hour rate was derived using a weighted average. The P.M. peak hour trip generation rate derived for the RV, Boat, & Auto storage use is 0.015 P.M. peak hour trips per storage space. The standard deviation is 0.015 which is less than 110% of the weighted average so the ITE *Trip Generation Handbook* indicates that the weighted average is good to use.

The trip generation survey and the summary by hour are provided in Attachment B for reference.

Table 1. Derived Daily Trip Generation Rate

Location/Date of Survey	Daily Trips	Total Spaces	Daily Rate
Specialty RV Storage			
6/17/14	24	99	0.242
6/18/14	24	99	0.242
Brush Prairie RV Storage			
6/17/14	25	171	0.146
6/18/14	37	171	0.216
East Vancouver RV & Boat Storage			
6/11/14	68	277	0.245
6/17/14	15	277	0.054
Pedron's Auto Boat & RV Storage			
6/12/14	25	181	0.138
6/17/14	56	181	0.309
Total	274	728	0.178 ¹
Standard Deviation			0.081

¹Weighted Average

Table 2. Derived A.M. Peak Hour Trip Generation Rate

Location/Date of Survey	A.M. Peak Hour Trips ²	Total Spaces	A.M. Peak Hour Rate
Specialty RV Storage			
6/17/14 – 7:00 to 8:00 A.M.	3	99	0.030
6/18/14 – 7:00 to 8:00 A.M.	0	99	0.000
Brush Prairie RV Storage			
6/17/14 – 8:00 – 9:00 A.M.	0	171	0.000
6/18/14 – 8:00 – 9:00 A.M.	2	171	0.012
East Vancouver RV & Boat Storage			
6/11/14 – 7:45 to 8:45 A.M.	5	277	0.018
6/17/14 – 8:00 to 9:00 A.M.	5	277	0.018
Pedron's Auto Boat & RV Storage			
6/12/14 – 8:00 to 9:00 A.M.	2	181	0.011
6/17/14 – 8:00 to 9:00 A.M.	0	181	0.000
Total	17	728	0.012 ¹
Standard Deviation			0.011

¹Weighted Average

²Inbound = 53% of trips, Outbound = 47% of trips

Table 3. Derived P.M. Peak Hour Trip Generation Rate

Location/Date of Survey	A.M. Peak Hour Trips ²	Total Spaces	A.M. Peak Hour Rate
Specialty RV Storage			
6/17/14 – 5:00 to 6:00 P.M.	1	99	0.010
6/18/14 – 5:00 to 6:00 P.M.	0	99	0.000
Brush Prairie RV Storage			
6/17/14 – 5:00 – 6:00 P.M.	1	171	0.006
6/18/14 – 4:45 – 5:45 P.M.	3	171	0.012
East Vancouver RV & Boat Storage			
6/11/14 – 4:30 to 5:30 P.M.	5	277	0.018
6/17/14 – 4:30 to 5:30 P.M.	0	277	0.018
Pedron's Auto Boat & RV Storage			
6/12/14 – 5:00 to 6:00 P.M.	3	181	0.017
6/17/14 – 5:00 to 6:00 P.M.	9	181	0.050
Total	22	728	0.015¹
Standard Deviation			0.015

¹Weighted Average

²Inbound = 55% of trips, Outbound = 45% of trips

TRIP GENERATION BASED ON DERIVED RATES

Estimates of daily, A.M. peak hour, and P.M. peak hour trips generated by the proposed project were developed from rates derived by the trip generation described above that was conducted by H. Lee & Associates. The proposed project is expected to generate 26 net daily, 2 net A.M. peak hour (1 in, 1 out), and 2 net P.M. peak hour (1 in, 1 out) trip which is summarized in Table 4.

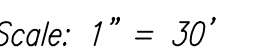
Table 4. Trip Generation

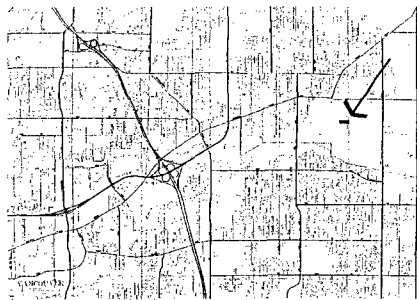
Land Use	Amount	Average Daily	A.M. Peak			P.M. Peak		
			In	Out	Total	In	Out	Total
RV, Boat & Automobile Storage								
Rate per Storage Unit		0.178	0.006	0.006	0.012	0.008	0.007	0.015
Trips	146 units	26	1	1	2	1	1	2

TRIP DISTRIBUTION AND ASSIGNMENT

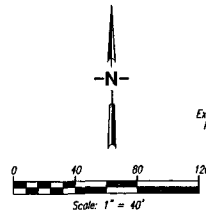
Because the proposed project is estimated to generate fewer than 5 peak hour trips, a trip distribution and assignment of project-generated trips is not required by the City of Vancouver.

ATTACHMENT A





VICINITY MAP
NO SCALE



W 1/2 GOVERNMENT LOT 1

T.L. 26
Vacant (ML zone)

NOTES:

APPLICANT / OWNER

JOE AND ROBIN PEDRON
6002 NE 152ND AVENUE
VANDOVER, WA 98662
(360) 256 4312

ENGINEERS, SURVEYORS, & PLANNERS

MACKEY & SPOSITO, INC.
1325 SE TECH CENTER DRIVE, SUITE 140
VANDOVER, WA 98663
ATTN: ERIN TOMAN OR HENRY DIAZ
(360) 695 3411 FAX 695 0833

PRESENT USE

THE SITE IS OCCUPIED BY TWO METAL SIDED BUILDINGS
ON CONCRETE SLABS WITH COVERED STORAGE AREAS ON BOTH SIDES.

EXISTING ZONING PROPOSED USE

ML
THE APPLICANTS ARE PROPOSING CONTINUED USE AS AN
R.V. STORAGE FACILITY WITH FIVE ADDITIONAL R.V. PARKING/STORAGE
AREAS, AN R.V. DUMP AREA, AND SIX PARKING SPACES (1 ACCESSIBLE SPACE)

SANITARY SEWER SERVICE

PUBLIC CITY OF VANDOVER

WATER SERVICE

PUBLIC CLARK PUBLIC UTILITIES

STORM DRAINAGE

PER CLARK COUNTY STANDARDS

ELECTRICAL SERVICE

PUBLIC CLARK PUBLIC UTILITIES

CONTOURS

PER CITY OF VANDOVER AERIAL TOPOGRAPHY

ACREAGE WITHIN BOUNDARY

± 4.8 ACRES

LIGHTING

SECURITY LIGHTING ALREADY EXISTS ON SITE.
DETAILED LOCATIONS NOT SHOWN.
NO NEW LIGHTING IS PROPOSED.

TRANSIT STOPS

NOT APPLICABLE

FIRE HYDRANTS

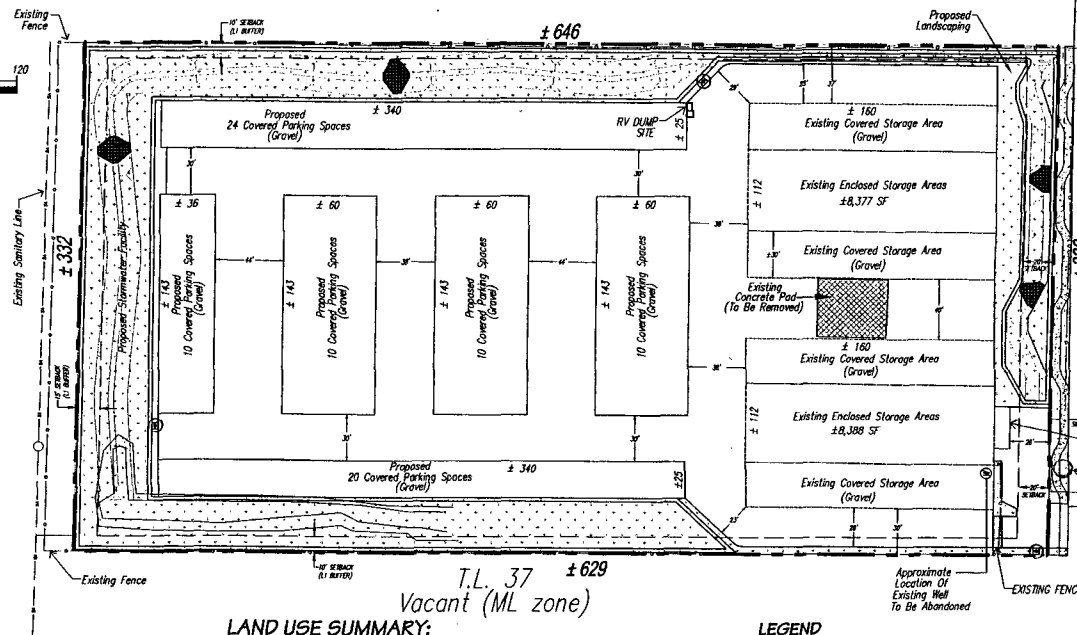
THERE ARE THREE FIRE HYDRANTS SHOWN.
THE FIRST FIRE HYDRANT IS LOCATED IN THE SW CORNER, THE SECOND IS LOCATED
IN THE NORTH DIRECTLY ABOVE THE R.V. DUMP SITE, AND THE THIRD
IS LOCATED IN THE SE CORNER OF THE SITE.

SETBACKS

PER CCC 40.220.080 2
FRONT: 20 FEET
REAR: 15 FEET
SIDE: 10 FEET

LANDSCAPE BUFFER

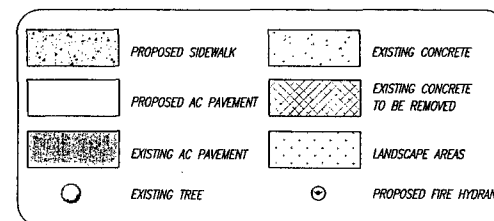
L1 BUFFER
PER CCC 40.220.010 1



LAND USE SUMMARY:

LAND USE	SQ. FT.	ACREAGE	%
EXISTING STORAGE AREAS (COVERED GRAVEL AREAS)	± 19,109 SF	± 0.44 ACRES	9%
EXISTING STORAGE AREAS (ENCLOSED AREAS)	± 16,765 SF	± 0.38 ACRES	8%
PROPOSED STORAGE AREAS (COVERED GRAVEL AREAS)	± 47,888 SF	± 1.10 ACRES	23%
STORMWATER AREA/ LANDSCAPE AREA	± 55,498 SF	± 1.27 ACRES	26%
ASPHALT AREA	± 70,229 SF	± 1.61 ACRES	34%
TOTAL	± 209,489 SF	± 4.8 ACRES	100%

LEGEND



T.L. 22
Vacant
(ML zone)

EXISTING EAST R/W LINE
(20' EAST OF SECTION LINE
AS PER ESTABLISHMENT)
EXISTING AWNING
EXISTING TREE
TO REMAIN



REVISIONS

REVISIONS

Mackey & Sposito, Inc.

ENGINEERS SURVEYORS PLANNERS
1325 SE TECH CENTER DRIVE, SUITE 140 VANDOVER, WA 98663
(360) 695-3411 (360) 256-8725 (360) 695-3411 FAX (360) 695-0833



Date March, 2005

Scale 1"=40'

Designed By RM

Drawn By LG

Checked By ET/H.Y.D.

FINAL SITE PLAN FOR POST DECISION REVIEW
PEDRON ENTERPRISES' R.V. STORAGE

Clark County

Washington

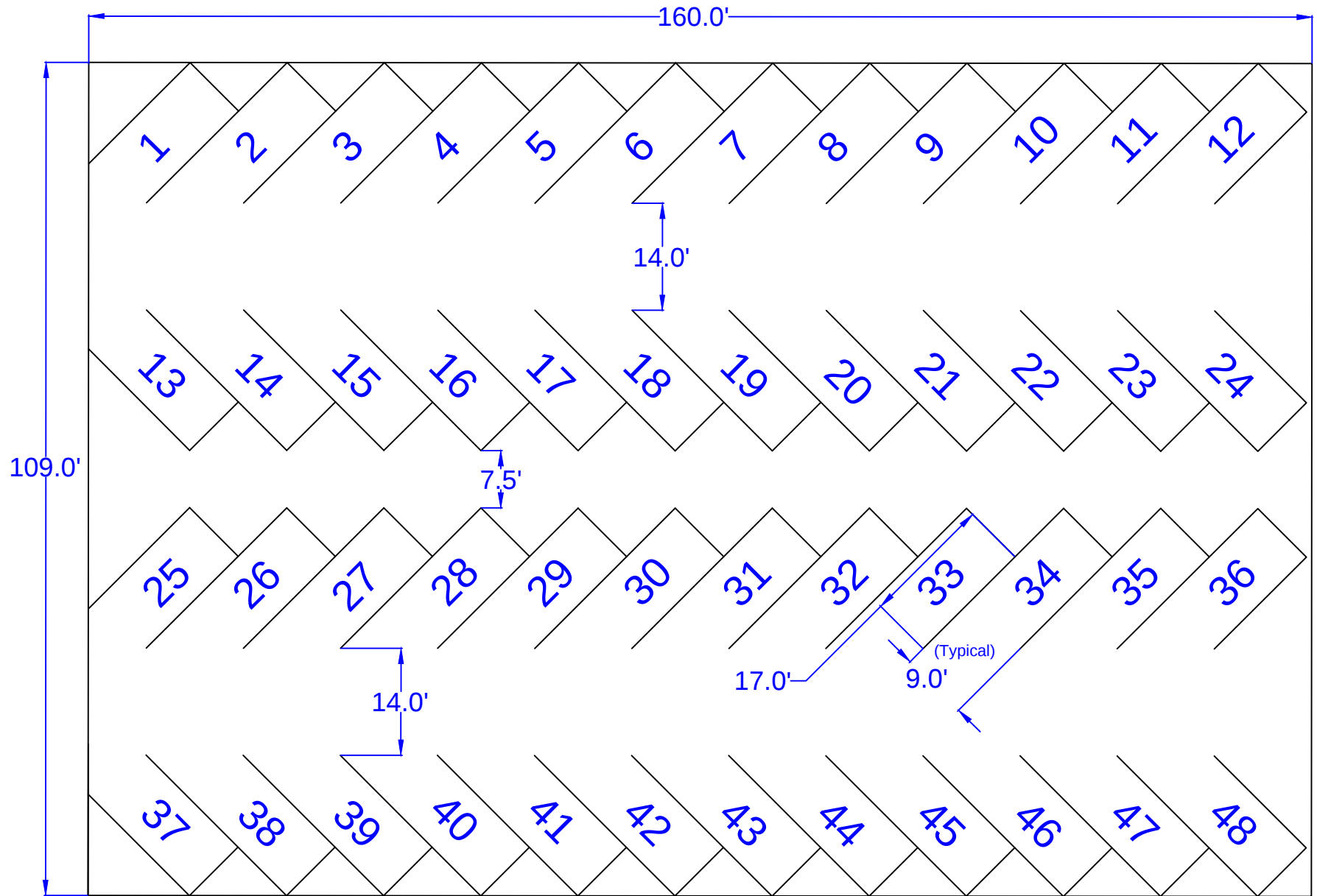
Job Number

11989

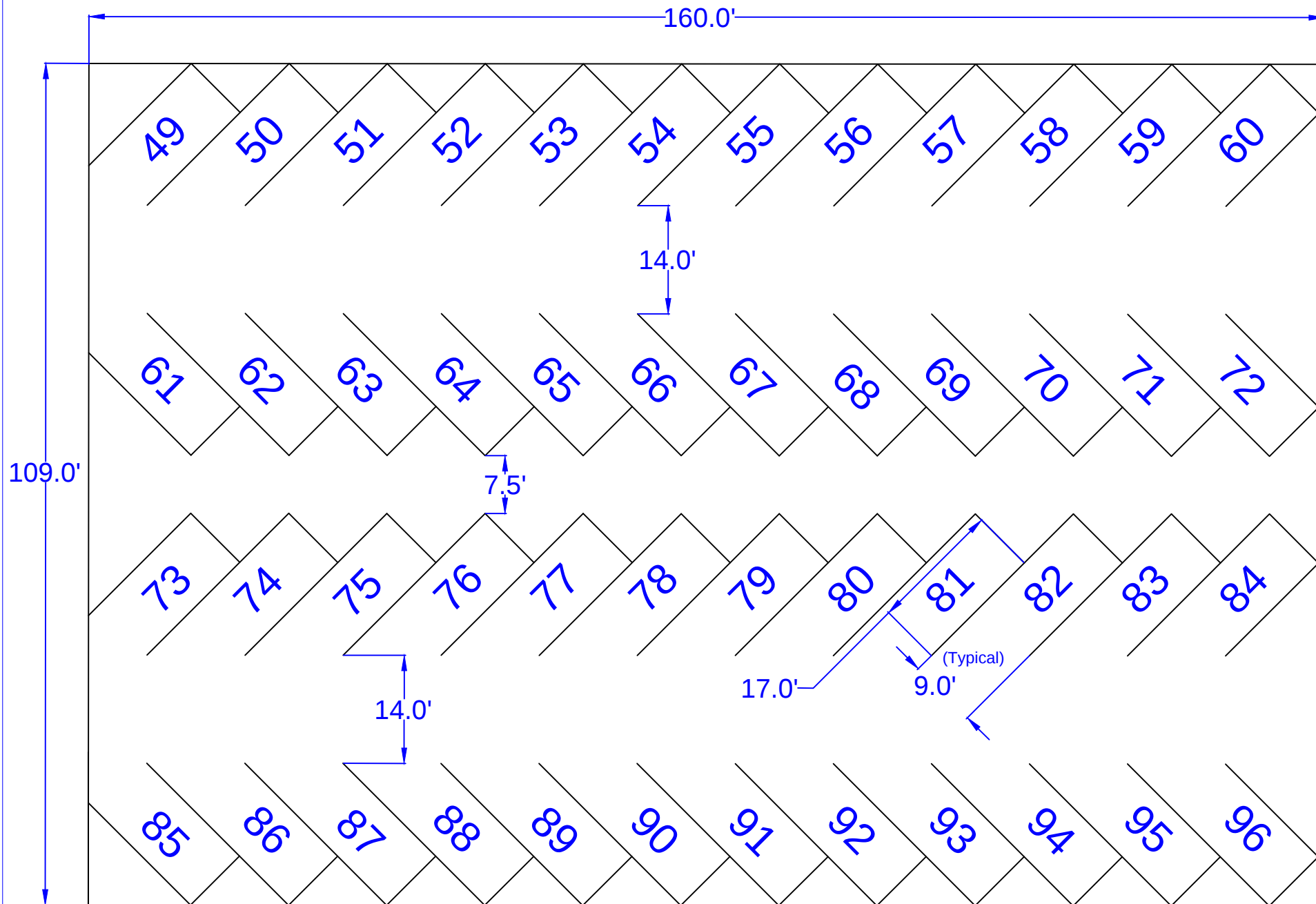
Sheet

1 of 1





Pedron's Auto Boat and RV Storage Area Study of Auto Storage Building 1

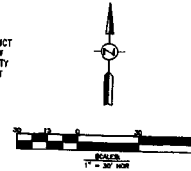
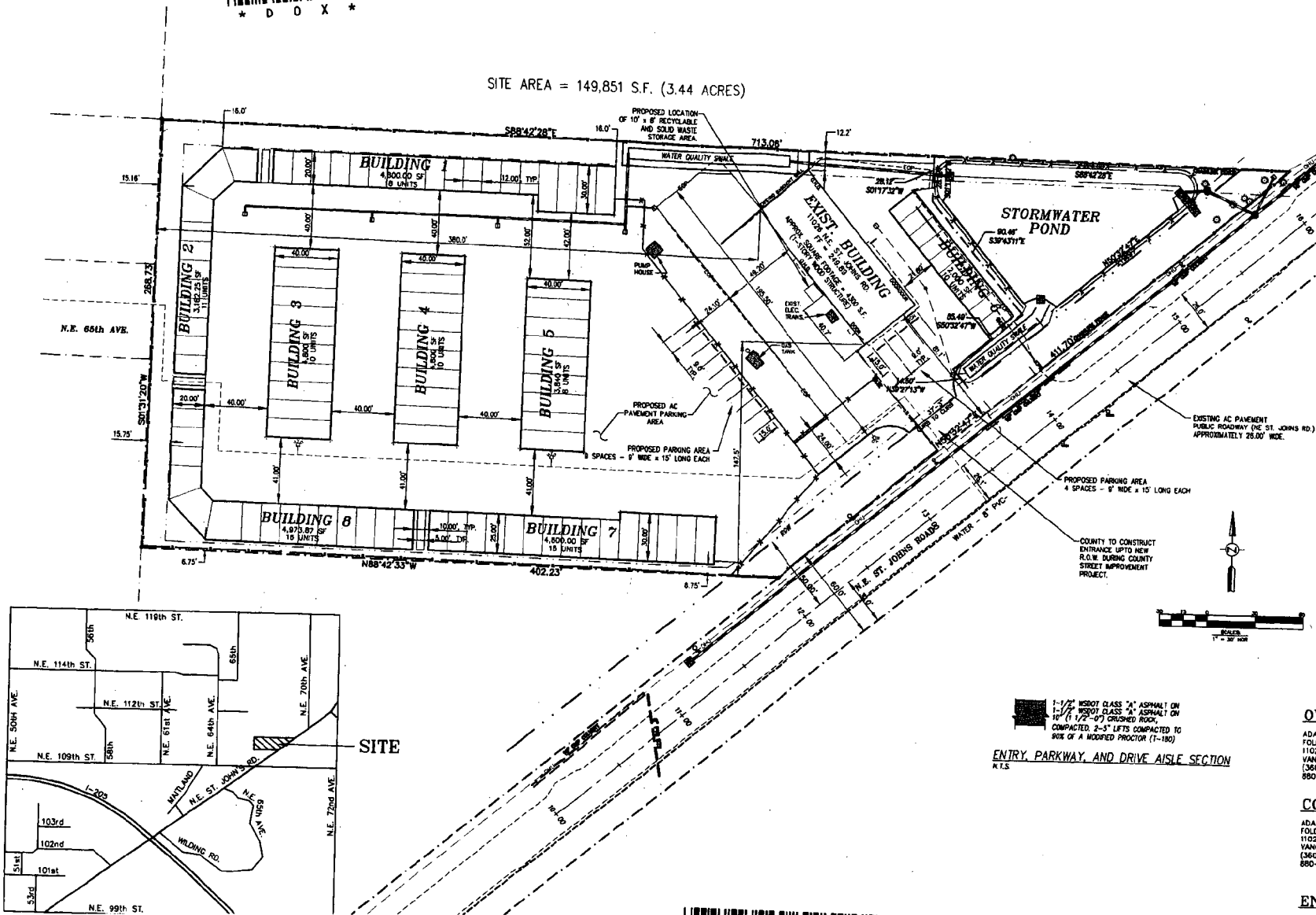


Pedron's Auto Boat and RV Storage Area Study of Auto Storage Building 2



* D O X *

SITE AREA = 149,851 S.F. (3.44 ACRES)



1-1/2" WSDOT CLASS "A" ASPHALT ON 1-1/2" WSDOT CLASS "A" ASPHALT ON 1-1/2" (1-1/2" - 2") CRUSHED ROCK, COMPACTED, 2-3" LFTS COMPACTED TO 90% OF A MODIFIED PROCTOR (1-180) ENTRY, PARKWAY, AND DRIVE AISLE SECTION N.T.S.

OWNER/APPLICANT

ADAM FOLDEN
FOLDEN CONSTRUCTION
11025 N.E. ST. JOHN'S RD.
VANDOLIVER, WA 98686
(360) 546-2291
880-4388 (CELLULAR)

CONTACT

ADAM FOLDEN
FOLDEN CONSTRUCTION
11025 N.E. ST. JOHN'S RD.
VANDOLIVER, WA 98686
(360) 546-2291
880-4388 (CELLULAR)

ENGINEER

DATE: 8/4/03		SHEET: 39	
DESIGNED: PRE		CHECKED: JLS	
DRAWN: PRE		APPROVED: JLS	
SCALE: 1" = 30'	FILE: 000302	LEGAL: 000302	CADDWRT: 122778
PROJECT NAME: SPECIALTY RV			
SITE PLAN			
CSA Consulting Engineers 321 SW 4th Ave. Portland, OR 97204 (503) 228-3846			



* 1 1 6 4 0 2 *

EXHIBIT # A

ATTACHMENT B

RV Storage 24 Hour Traffic Data by Hour

Hourly Total by 15 minutes	Specialty Recreational Vehicle Storage						Brush Praire RV Storage						East Vancouver RV & Boat Storage						Pedron's Auto Boat & RV Storage					
Time	6/17/2014			6/18/2014			6/17/2014			6/18/2014			6/11/2014			6/17/2014			6/12/2014			6/17/2014		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
12:00 - 1:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 - 1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 - 1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 - 1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 - 2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 - 2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 - 2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 - 2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 - 3:00 AM	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 - 3:15 AM	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 - 3:30 AM	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 - 3:45 AM	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 - 4:00 AM	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 - 4:15 AM	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 - 4:30 AM	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 - 4:45 AM	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 - 5:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0
4:15 - 5:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2	0	0	0
4:30 - 5:30 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2	0	0	0
4:45 - 5:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	2	0	0	0
5:00 - 6:00 AM	0	0	0	0	0	0	0	1	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0
5:15 - 6:15 AM	0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:30 - 6:30 AM	0	0	0	0	0	0	0	2	2	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0
5:45 - 6:45 AM	0	0	0	0	0	0	1	3	4	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0
6:00 - 7:00 AM	1	0	1	0	0	0	1	2	3	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
6:15 - 7:15 AM	1	1	2	0	0	0	1	2	3	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0
6:30 - 7:30 AM	1	1	2	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 - 7:45 AM	1	1	2	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0
7:00 - 8:00 AM	1	2	3	0	0	0	0	0	0	0	1	1	2	0	2	1	0	1	0	0	0	0	0	0
7:15 - 8:15 AM	1	1	2	0	0	0	0	0	0	0	1	1	2	0	2	1	0	1	1	0	1	0	0	0
7:30 - 8:30 AM	1	1	2	0	0	0	0	0	0	0	0	1	1	2	0	2	1	4	1	0	1	0	0	0
7:45 - 8:45 AM	1	1	2	0	0	0	0	0	0	0	0	0	3	2	5	3	1	4	1	1	2	0	0	0
8:00 - 9:00 AM	0	0	0	0	0	0	0	0	0	1	1	2	1	3	4	3	2	5	1	1	2	0	0	0
8:15 - 9:15 AM	0	0	0	0	0	0	0	0	0	2	2	4	1	3	4	3	3	6	0	1	1	0	0	0
8:30 - 9:30 AM	0	0	0	0	0	0	0	0	0	0	3	3	6	1	3	4	2	4	0	1	1	1	0	1
8:45 - 9:45 AM	0	0	0	0	0	0	1	0	1	3	3	6	0	1	1	2	2	4	0	0	0	1	1	2
9:00 - 10:00 AM	0	0	0	0	0	0	2	0	2	3	2	5	0	0	0	3	3	6	0	0	0	1	1	2
9:15 - 10:15 AM	0	0	0	1	0	1	2	1	3	2	1	3	1	0	1	4	4	8	0	0	0	1	1	2
9:30 - 10:30 AM	0	0	0	2	0	2	2	1	3	2	0	2	1	1	2	3	4	7	0	0	0	0	0	1
9:45 - 10:45 AM	0	0	0	3	0	3	1	1	2	2	1	3	1	1	2	2	4	6	0	0	0	0	0	0
10:00 - 11:00 AM	0	0	0	3	0	3	0	1	1	1	1	2	4	1	5	1	2	3	1	1	2	1	1	2
10:15 - 11:15 AM	0	0	0	2	0	2	1	1	2	1	1	2	3	3	6	0	0	0	1	1	2	1	1	2
10:30 - 11:30 AM	1	0	1	1	0	1	1	1	2	1	2	3	4	3	7	0	0	0	2	2	4	1	1	2
10:45 - 11:45 AM	1	1	2	0	0	0	1	1	2	1	1	2	5	3	8	0	0	0	3	2	5	1	1	2
11:00 - 12:00 PM	2	1	3	1	2	3	1	1	2	3	2	5	3	4	7	0	0	0	2	1	3	1	1	2
11:15 - 12:15 PM	2	1	3	1	3	4	0	0	0	3	2	5	4	2	6	0	0	0	2	1	3	1	2	3
11:30 - 12:30 PM	1	1	2	1	4	5	0	0	0	2	1	3	3	3	6	0	0	0	1	0	1	2	2	4
11:45 - 12:45 PM	2	1	3	1	4	5	0	0	0	3	1	4	2	4	6	0	0	0	0	1	1	4	3	7
12:00 - 1:00 PM	1	1	2	0	2	2	0	0	0	1	0	1	2	4	6	0	0	0	0	1	1	3	2	5
12:15 - 1:15 PM	2	1	3	1	2	3	0	0	0	1	0	1	1	4	5	0	0	0	0					

RV Storage 24 Hour Traffic Data

[illegible]

APPENDIX G

2022 “WITH PROJECT” LEVEL OF SERVICE

Lanes, Volumes, Timings

1: NW Friberg-Strunk Street & Union High School Driveway (North)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	64	288	180	228	420
Future Volume (vph)	16	64	288	180	228	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	260			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.912	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1556	1638	1533	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1556	1638	1533	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	806			370	359	
Travel Time (s)	22.0			6.3	6.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	16%	16%	13%	13%
Adj. Flow (vph)	16	64	288	180	228	420
Shared Lane Traffic (%)						
Lane Group Flow (vph)	16	64	288	180	648	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 67.1% ICU Level of Service C

Analysis Period (min) 15

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	64	288	180	228	420
Future Vol, veh/h	16	64	288	180	228	420
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	0	260	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	16	16	13	13
Mvmt Flow	16	64	288	180	228	420

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1194	438	648	0	-	0
Stage 1	438	-	-	-	-	-
Stage 2	756	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.26	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.344	-	-	-
Pot Cap-1 Maneuver	208	623	874	-	-	-
Stage 1	655	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	139	623	874	-	-	-
Mov Cap-2 Maneuver	139	-	-	-	-	-
Stage 1	655	-	-	-	-	-
Stage 2	313	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16	6.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	874	-	139	623	-	-
HCM Lane V/C Ratio	0.33	-	0.115	0.103	-	-
HCM Control Delay (s)	11.1	-	34.2	11.4	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	1.4	-	0.4	0.3	-	-

Lanes, Volumes, Timings

2: NW Friberg-Strunk Street & Union High School Driveway (Middle)/Project Access (North)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	0	96	1	0	1	80	459	3	1	315	36
Future Volume (vph)	84	0	96	1	0	1	80	459	3	1	315	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	415		0	0		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.932			0.999			0.985	
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1289	1154	0	0	1728	0	1671	1758	0	1687	1749	0
Flt Permitted	0.950				0.976		0.950			0.950		
Satd. Flow (perm)	1289	1154	0	0	1728	0	1671	1758	0	1687	1749	0
Link Speed (mph)		25			30			40			40	
Link Distance (ft)		801			736			540			370	
Travel Time (s)		21.8			16.7			9.2			6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	40%	40%	40%	0%	0%	0%	8%	8%	8%	7%	7%	7%
Adj. Flow (vph)	84	0	96	1	0	1	80	459	3	1	315	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	84	96	0	0	2	0	80	462	0	1	351	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	45.9%											
Analysis Period (min)	15											
	ICU Level of Service A											

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	84	0	96	1	0	1	80	459	3	1	315	36
Future Vol, veh/h	84	0	96	1	0	1	80	459	3	1	315	36
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	0	-	-	-	-	-	415	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	40	40	40	0	0	0	8	8	8	7	7	7
Mvmt Flow	84	0	96	1	0	1	80	459	3	1	315	36
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	956	957	333	1004	974	461	351	0	0	462	0	0
Stage 1	335	335	-	621	621	-	-	-	-	-	-	-
Stage 2	621	622	-	383	353	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.9	6.6	7.1	6.5	6.2	4.18	-	-	4.17	-	-
Critical Hdwy Stg 1	6.5	5.9	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.9	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.86	4.36	3.66	3.5	4	3.3	2.272	-	-	2.263	-	-
Pot Cap-1 Maneuver	203	223	630	222	254	605	1175	-	-	1073	-	-
Stage 1	606	580	-	478	482	-	-	-	-	-	-	-
Stage 2	416	424	-	644	634	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	192	208	630	178	236	605	1175	-	-	1073	-	-
Mov Cap-2 Maneuver	192	208	-	178	236	-	-	-	-	-	-	-
Stage 1	565	579	-	445	449	-	-	-	-	-	-	-
Stage 2	387	395	-	545	633	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	23.8			18.2			1.2			0		
HCM LOS	C			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	1175	-	-	192	630	275	1073	-	-			
HCM Lane V/C Ratio	0.068	-	-	0.438	0.152	0.007	0.001	-	-			
HCM Control Delay (s)	8.3	-	-	37.6	11.7	18.2	8.4	-	-			
HCM Lane LOS	A	-	-	E	B	C	A	-	-			
HCM 95th %tile Q(veh)	0.2	-	-	2	0.5	0	0	-	-			

Lanes, Volumes, Timings

3: NW Friberg-Strunk Street & Project Access (South)

03/01/2017

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	0	570	0	0	424
Future Volume (vph)	2	0	570	0	0	424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1805	0	1759	0	0	1681
Flt Permitted	0.950					
Satd. Flow (perm)	1805	0	1759	0	0	1681
Link Speed (mph)	30		40			40
Link Distance (ft)	703		190			540
Travel Time (s)	16.0		3.2			9.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	8%	8%	13%	13%
Adj. Flow (vph)	2	0	570	0	0	424
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	570	0	0	424
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	40.0%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	0	570	0	0	424
Future Vol, veh/h	2	0	570	0	0	424
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	100	100	100	100	100	100
Heavy Vehicles, %	0	0	8	8	13	13
Mvmt Flow	2	0	570	0	0	424
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	994	570	0	-	-	-
Stage 1	570	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	274	525	-	0	0	-
Stage 1	570	-	-	0	0	-
Stage 2	664	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	274	525	-	-	-	-
Mov Cap-2 Maneuver	274	-	-	-	-	-
Stage 1	570	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	18.2		0		0	
HCM LOS	C					
Minor Lane/Major Mvmt	NBTWBLn1	SBT				
Capacity (veh/h)	- 274	-				
HCM Lane V/C Ratio	- 0.007	-				
HCM Control Delay (s)	- 18.2	-				
HCM Lane LOS	- C	-				
HCM 95th %tile Q(veh)	- 0	-				

Lanes, Volumes, Timings

4: NW Friberg-Strunk Street & Union High School Driveway (South)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	28	236	260	506	322	120
Future Volume (vph)	28	236	260	506	322	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	385			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.963	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1671	1495	1719	1810	1648	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1671	1495	1719	1810	1648	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	804			608	190	
Travel Time (s)	21.9			10.4	3.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	5%	5%	11%	11%
Adj. Flow (vph)	28	236	260	506	322	120
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	236	260	506	442	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 52.0% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	4.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	236	260	506	322	120
Future Vol, veh/h	28	236	260	506	322	120
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	0	385	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	8	8	5	5	11	11
Mvmt Flow	28	236	260	506	322	120
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1408	382	442	0	-	0
Stage 1	382	-	-	-	-	-
Stage 2	1026	-	-	-	-	-
Critical Hdwy	6.48	6.28	4.15	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	2.245	-	-	-
Pot Cap-1 Maneuver	148	652	1102	-	-	-
Stage 1	677	-	-	-	-	-
Stage 2	337	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	113	652	1102	-	-	-
Mov Cap-2 Maneuver	113	-	-	-	-	-
Stage 1	677	-	-	-	-	-
Stage 2	257	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.1	3.1		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1102	-	113	652	-	-
HCM Lane V/C Ratio	0.236	-	0.248	0.362	-	-
HCM Control Delay (s)	9.3	-	47	13.6	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q(veh)	0.9	-	0.9	1.6	-	-

Lanes, Volumes, Timings

1: NW Friberg-Strunk Street & Union High School Driveway (North)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	36	16	48	492	313	44
Future Volume (vph)	36	16	48	492	313	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	260			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.983	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1900	1868	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1900	1868	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	806			370	359	
Travel Time (s)	22.0			6.3	6.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	36	16	48	492	313	44
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	16	48	492	357	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 35.9% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	16	48	492	313	44
Future Vol, veh/h	36	16	48	492	313	44
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	0	260	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	36	16	48	492	313	44
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	923	335	357	0	-	0
Stage 1	335	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	302	712	1213	-	-	-
Stage 1	729	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	290	712	1213	-	-	-
Mov Cap-2 Maneuver	290	-	-	-	-	-
Stage 1	729	-	-	-	-	-
Stage 2	537	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.4	0.7		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1213	-	290	712	-	-
HCM Lane V/C Ratio	0.04	-	0.124	0.022	-	-
HCM Control Delay (s)	8.1	-	19.2	10.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	0.1	-	-

Lanes, Volumes, Timings

2: NW Friberg-Strunk Street & Union High School Driveway (Middle)/Project Access (North)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	0	52	2	0	2	4	510	5	2	359	8
Future Volume (vph)	52	0	52	2	0	2	4	510	5	2	359	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	415		0	0		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.932			0.999			0.997	
Flt Protected	0.950				0.976		0.950			0.950		
Satd. Flow (prot)	1805	1615	0	0	1728	0	1805	1898	0	1805	1894	0
Flt Permitted	0.950				0.976		0.950			0.950		
Satd. Flow (perm)	1805	1615	0	0	1728	0	1805	1898	0	1805	1894	0
Link Speed (mph)		25			30			40			40	
Link Distance (ft)		801			736			540			370	
Travel Time (s)		21.8			16.7			9.2			6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	52	0	52	2	0	2	4	510	5	2	359	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	52	0	0	4	0	4	515	0	2	367	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type: Other												
Control Type: Unsignalized												
Intersection Capacity Utilization 38.9%												
ICU Level of Service A												
Analysis Period (min) 15												

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	52	0	52	2	0	2	4	510	5	2	359	8
Future Vol, veh/h	52	0	52	2	0	2	4	510	5	2	359	8
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	0	-	-	-	-	-	415	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	52	0	52	2	0	2	4	510	5	2	359	8
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	889	890	363	914	892	513	367	0	0	515	0	0
Stage 1	367	367	-	521	521	-	-	-	-	-	-	-
Stage 2	522	523	-	393	371	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	266	284	686	256	283	565	1203	-	-	1061	-	-
Stage 1	657	626	-	542	535	-	-	-	-	-	-	-
Stage 2	542	534	-	636	623	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	264	283	686	236	282	565	1203	-	-	1061	-	-
Mov Cap-2 Maneuver	264	283	-	236	282	-	-	-	-	-	-	-
Stage 1	655	625	-	540	533	-	-	-	-	-	-	-
Stage 2	538	532	-	587	622	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	16.4			15.9			0.1			0		
HCM LOS	C			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	1203	-	-	264	686	333	1061	-	-			
HCM Lane V/C Ratio	0.003	-	-	0.197	0.076	0.012	0.002	-	-			
HCM Control Delay (s)	8	-	-	22	10.7	15.9	8.4	-	-			
HCM Lane LOS	A	-	-	C	B	C	A	-	-			
HCM 95th %tile Q(veh)	0	-	-	0.7	0.2	0	0	-	-			

Lanes, Volumes, Timings

3: NW Friberg-Strunk Street & Project Access (South)

03/01/2017

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	3	0	515	0	0	417
Future Volume (vph)	3	0	515	0	0	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	1805	0	1900	0	0	1900
Flt Permitted	0.950					
Satd. Flow (perm)	1805	0	1900	0	0	1900
Link Speed (mph)	30		40			40
Link Distance (ft)	703		190			540
Travel Time (s)	16.0		3.2			9.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	3	0	515	0	0	417
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3	0	515	0	0	417
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	37.1%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	0	515	0	0	417
Future Vol, veh/h	3	0	515	0	0	417
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	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	3	0	515	0	0	417
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	932	515	0	-	-	-
Stage 1	515	-	-	-	-	-
Stage 2	417	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	298	564	-	0	0	-
Stage 1	604	-	-	0	0	-
Stage 2	669	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	298	564	-	-	-	-
Mov Cap-2 Maneuver	298	-	-	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	669	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	17.2		0		0	
HCM LOS	C					
Minor Lane/Major Mvmt	NBTWBLn1	SBT				
Capacity (veh/h)	- 298	-				
HCM Lane V/C Ratio	- 0.01	-				
HCM Control Delay (s)	- 17.2	-				
HCM Lane LOS	- C	-				
HCM 95th %tile Q(veh)	- 0	-				

Lanes, Volumes, Timings

4: NW Friberg-Strunk Street & Union High School Driveway (South)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	72	60	60	443	360	60
Future Volume (vph)	72	60	60	443	360	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	385			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.981	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1615	1805	1900	1864	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1615	1805	1900	1864	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	804			608	190	
Travel Time (s)	21.9			10.4	3.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	72	60	60	443	360	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	60	60	443	420	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 39.9% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	72	60	60	443	360	60
Future Vol, veh/h	72	60	60	443	360	60
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	0	385	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	72	60	60	443	360	60
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	953	390	420	0	-	0
Stage 1	390	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	290	663	1150	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	275	663	1150	-	-	-
Mov Cap-2 Maneuver	275	-	-	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	544	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.4	1		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1150	-	275	663	-	-
HCM Lane V/C Ratio	0.052	-	0.262	0.09	-	-
HCM Control Delay (s)	8.3	-	22.7	11	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1	0.3	-	-

APPENDIX H

2022 “WITH PROJECT” MITIGATED LEVEL OF SERVICE

Lanes, Volumes, Timings

1: NW Friberg-Strunk Street & Union High School Driveway (North)

03/01/2017



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	128	160	0	152	200	448
Future Volume (vph)	128	160	0	152	200	448
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	260			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.907	
Flt Protected	0.950					
Satd. Flow (prot)	1805	1615	1638	1638	1525	0
Flt Permitted	0.950					
Satd. Flow (perm)	1805	1615	1638	1638	1525	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	806			370	359	
Travel Time (s)	22.0			6.3	6.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	16%	16%	13%	13%
Adj. Flow (vph)	128	160	0	152	200	448
Shared Lane Traffic (%)						
Lane Group Flow (vph)	128	160	0	152	648	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 54.6% ICU Level of Service A

Analysis Period (min) 15

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	128	160	0	152	200	448
Future Vol, veh/h	128	160	0	152	200	448
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	0	260	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	16	16	13	13
Mvmt Flow	128	160	0	152	200	448

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	576	424	648	0	-	0
Stage 1	424	-	-	-	-	-
Stage 2	152	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.26	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.344	-	-	-
Pot Cap-1 Maneuver	482	634	874	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	482	634	874	-	-	-
Mov Cap-2 Maneuver	482	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	881	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	874	-	482	634	-	-
HCM Lane V/C Ratio	-	-	0.266	0.252	-	-
HCM Control Delay (s)	0	-	15.1	12.6	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	1.1	1	-	-

Lanes, Volumes, Timings

2: NW Friberg-Strunk Street & Union High School Driveway (Middle)/Project Access (North)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	1	0	1	368	143	3	1	383	36
Future Volume (vph)	0	0	0	1	0	1	368	143	3	1	383	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	415		0	0		0
Storage Lanes	1		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.932			0.997				0.987
Flt Protected					0.976		0.950			0.950		
Satd. Flow (prot)	1357	1357	0	0	1728	0	1671	1754	0	1687	1753	0
Flt Permitted					0.976		0.950			0.950		
Satd. Flow (perm)	1357	1357	0	0	1728	0	1671	1754	0	1687	1753	0
Link Speed (mph)		25			30			40			40	
Link Distance (ft)		801			736			540			370	
Travel Time (s)		21.8			16.7			9.2			6.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	40%	40%	40%	0%	0%	0%	8%	8%	8%	7%	7%	7%
Adj. Flow (vph)	0	0	0	1	0	1	368	143	3	1	383	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	2	0	368	146	0	1	419	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type: Other												
Control Type: Unsignalized												
Intersection Capacity Utilization 56.1%												
ICU Level of Service B												
Analysis Period (min) 15												

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	1	368	143	3	1	383	36
Future Vol, veh/h	0	0	0	1	0	1	368	143	3	1	383	36
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	0	-	-	-	-	-	415	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	40	40	40	0	0	0	8	8	8	7	7	7
Mvmt Flow	0	0	0	1	0	1	368	143	3	1	383	36
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1284	1285	401	1284	1302	145	419	0	0	146	0	0
Stage 1	403	403	-	881	881	-	-	-	-	-	-	-
Stage 2	881	882	-	403	421	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.9	6.6	7.1	6.5	6.2	4.18	-	-	4.17	-	-
Critical Hdwy Stg 1	6.5	5.9	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.9	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.86	4.36	3.66	3.5	4	3.3	2.272	-	-	2.263	-	-
Pot Cap-1 Maneuver	118	139	574	143	162	908	1109	-	-	1406	-	-
Stage 1	555	539	-	344	367	-	-	-	-	-	-	-
Stage 2	294	317	-	628	592	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	87	93	574	106	108	908	1109	-	-	1406	-	-
Mov Cap-2 Maneuver	87	93	-	106	108	-	-	-	-	-	-	-
Stage 1	371	539	-	230	245	-	-	-	-	-	-	-
Stage 2	196	212	-	628	592	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			24.1			7.1			0		
HCM LOS	A			C								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR			
Capacity (veh/h)	1109	-	-	-	-	190	1406	-	-			
HCM Lane V/C Ratio	0.332	-	-	-	-	0.011	0.001	-	-			
HCM Control Delay (s)	9.8	-	-	0	0	24.1	7.6	-	-			
HCM Lane LOS	A	-	-	A	A	C	A	-	-			
HCM 95th %tile Q(veh)	1.5	-	-	-	-	0	0	-	-			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	236	260	506	322	92
Future Volume (vph)	0	236	260	506	322	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	385			0
Storage Lanes	1	1	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.970	
Flt Protected			0.950			
Satd. Flow (prot)	1759	1495	1719	1810	1660	0
Flt Permitted			0.950			
Satd. Flow (perm)	1759	1495	1719	1810	1660	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	804			608	190	
Travel Time (s)	21.9			10.4	3.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	8%	8%	5%	5%	11%	11%
Adj. Flow (vph)	0	236	260	506	322	92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	236	260	506	414	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 43.8% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	236	260	506	322	92
Future Vol, veh/h	0	236	260	506	322	92
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	0	385	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	8	8	5	5	11	11
Mvmt Flow	0	236	260	506	322	92
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1394	368	414	0	-	0
Stage 1	368	-	-	-	-	-
Stage 2	1026	-	-	-	-	-
Critical Hdwy	6.48	6.28	4.15	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	2.245	-	-	-
Pot Cap-1 Maneuver	151	664	1129	-	-	-
Stage 1	687	-	-	-	-	-
Stage 2	337	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	116	664	1129	-	-	-
Mov Cap-2 Maneuver	116	-	-	-	-	-
Stage 1	687	-	-	-	-	-
Stage 2	259	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.4	3.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1129	-	-	664	-	-
HCM Lane V/C Ratio	0.23	-	-	0.355	-	-
HCM Control Delay (s)	9.1	-	0	13.4	-	-
HCM Lane LOS	A	-	A	B	-	-
HCM 95th %tile Q(veh)	0.9	-	-	1.6	-	-