lancaster mobley

Avery I and II

Transportation Impact Analysis

Tualatin, Oregon

Date:
February 24, 2022

Prepared for:
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Prepared by:
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Executive Summary

1. The proposed development at 10500/10700 SW Tualatin-Sherwood Road includes the construction of two industrial buildings totaling approximately 112,500 square feet. Construction is expected to be completed with occupancy beginning in the year 2023.
2. The proposed development is estimated to generate 83 morning peak hour, 73 evening peak hour, and 548 average weekday trips.
3. Based on a review of the available crash data and crash rates, patterns are consistent with the geometry and traffic control provided at the study intersection. The proposed project is not expected to change or worsen crash rates. Accordingly, no safety mitigation is recommended per the crash data analysis.
4. Preliminary traffic signal warrants are not met at any of the unsignalized study area intersections under buildout conditions.
5. The study intersection is currently operating acceptably per Washington County standards and is projected to continue operating acceptably through the 2023 buildout year of the site. No operational mitigation is required or recommended.
6. The construction of the planned five lane cross-section on SW Tualatin-Sherwood Road will not adversely affect future operations at the study intersection.

Introduction

The proposed development at 10500/10700 SW Tualatin-Sherwood Road includes the construction of two industrial buildings totaling approximately 112,500 square feet. Construction is expected to be completed with occupancy beginning in the year 2023.

Based on correspondence with the City of Tualatin staff, the study area includes one intersection:

- Site Access at SW Tualatin-Sherwood Road

This report examines the impacts of the proposed development on the transportation system in the vicinity of the project site. The purpose of this study is to analyze potential traffic impacts and recommend any required transportation mitigation measures to ensure safe and efficient performance of the transportation facilities that will be impacted by the proposed development. In addition to the operational analysis, the report includes a safety analysis at the study intersection.

Detailed information on traffic counts, trip generation calculations, safety analyses, and operations are included in the appendices to this report.

Location Description

The project site is located south of SW Tualatin-Sherwood Road, north of SW Avery Street, and west of SW Teton Avenue in Tualatin, Oregon. The proposed development includes the construction of two warehouse buildings totaling approximately 112,525 square feet on two tax lots (tax lots 2S126B00105 and 2S127AA02100). Both parcels are zoned General Manufacturing (MG) and are centrally located within Tualatin's industrially zoned lands.

The Avery I site is located at 10700 SW Tualatin-Sherwood Road and will house an 81,075 square-foot warehouse. The Avery II site is located at 10500 SW Tualatin-Sherwood Road and will house a 31,050 square-foot warehouse. Both sites will take access from SW Tualatin-Sherwood Road via an existing shared driveway.

An aerial view of the proposed site and the nearby vicinity is displayed in Figure 1, with the subject sites outlined in yellow. A site plan is included in Appendix A.

Figure 1: Project Location (image from Google Maps)

Vicinity Roadways

The proposed development is expected to impact two major roadways near the site. Table 1 provides a description of each of the vicinity roadways.

Table 1: Vicinity Roadway Descriptions

Roadway	Classification	Jurisdiction	Travel Lanes	Speed (mph)	Curbs	Sidewalks	Bicycle Lanes	On-Street Parking
SW Tualatin-Sherwood Road	Major Arterial	Washington County	3-5	45 (Posted)	Both Sides	Both Sides	Both Sides	Not Permitted
SW Teton Avenue	Minor Arterial	City of Tualatin	3	35 (Posted)	Both Sides	Both Sides w/ Exceptions[1]	None	Not Permitted

Notes:
1. Sidewalk is missing on west side of SW Teton Avenue where adjacent land is undeveloped between SW Tualatin-Sherwood Road and SW Manhasset Drive.

Study Intersections

Through coordination with the City of Tualatin and Washington County, one study intersection was identified for analysis. A summarized description of the study intersection is provided in Table 2.

Table 2: Study Intersection Descriptions

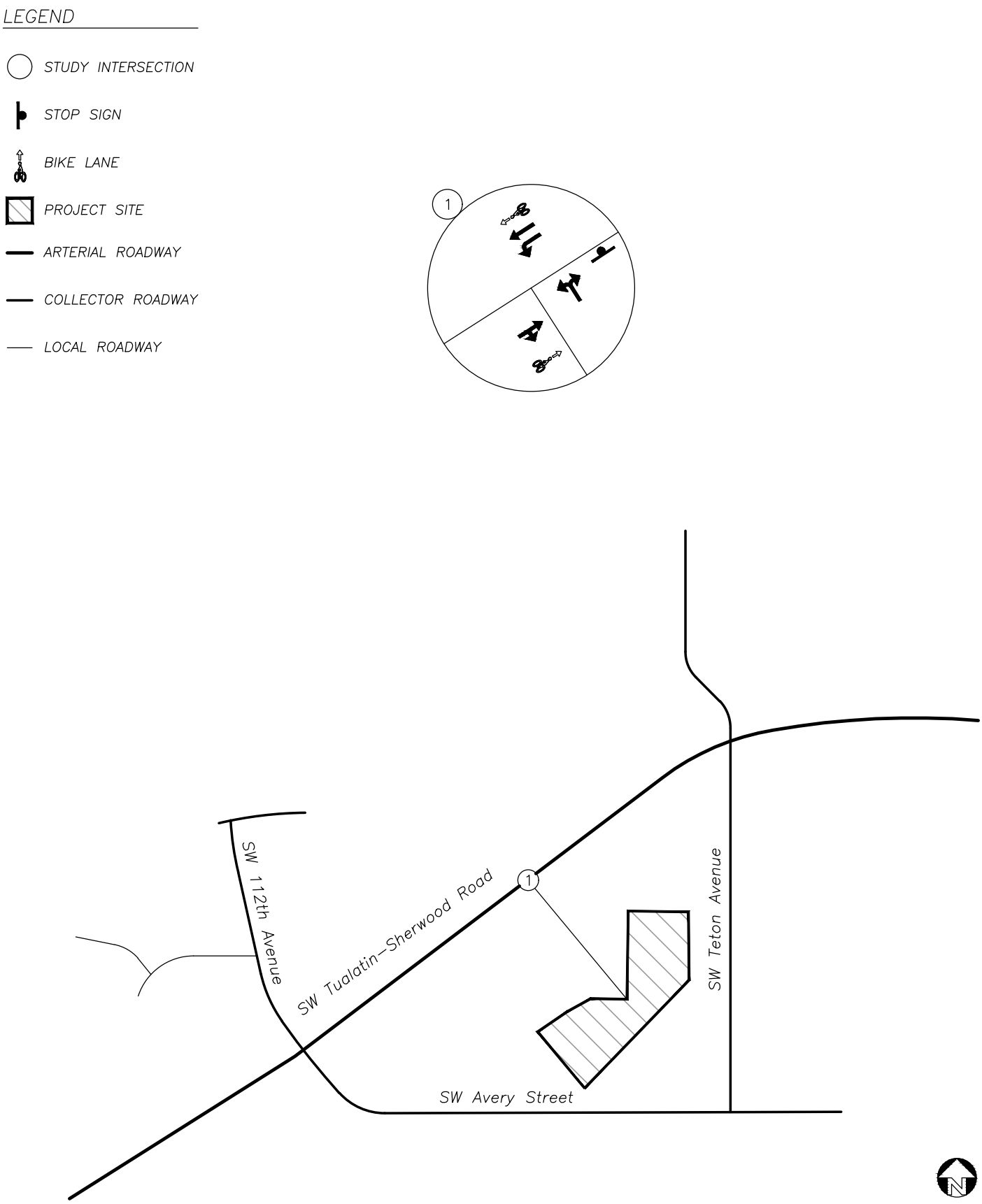
Intersection		Geometry	Traffic Control	Phasing/Stopped Approaches
1	Site Access (Existing) at SW Tualatin-Sherwood Road	Three-Legged	Stop-Controlled	NB Stop-Controlled

Public Transit

The project is located near one transit line that has stops within an approximate one-half mile walking/biking distance from the site.

Bus Line # 97 – *Tualatin-Sherwood Road* provides weekday rush-hour service between W Langer Drive/Sherwood Plaza and the Tualatin WES Station. The nearest bus stops to the site are located at the intersection of SW Teton Avenue and SW Tualatin-Sherwood Road. Weekday service is scheduled with four westbound and three eastbound trips in the morning at approximately 60-minute headways. Afternoon service is scheduled with four eastbound and three westbound trips at approximately 60-minute headways. There is currently no weekend or holiday service.

A vicinity map showing the project site, vicinity streets, and study intersection configuration is shown in Figure 2.



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VICINITY MAP

Figure 2

Avery I & II

2/8/2022

Site Trips

Trip Generation

To estimate trips that will be generated by the proposed development, trip rates from the *Trip Generation Manual*[1] were used. Based on direction from City of Tualatin staff, data from land-use code 110 (*General Light Industrial*) was used to estimate the proposed development's trip generation based on square footage of gross floor area. The client has indicated that both buildings in the proposed development will be used for the storage and distribution of materials.

The trip generation calculations show that the proposed development is projected to generate 83 trips during the morning peak hour, 73 trips during the evening peak hour, and 548 trips during the average weekday. The trip generation estimates are summarized in Table 3. Detailed trip generation calculations are included in Appendix A.

Table 3: Trip Generation Summary

Land Use	ITE Code	Size/Rate	Morning Peak Hour			Evening Peak Hour			Weekday Total
			In	Out	Total	In	Out	Total	
General Light Industrial	110	112,525	73	10	83	10	63	73	548

Given that the surrounding site vicinity is primarily industrial in character, the nearby transportation system was constructed to serve the needs of existing and future industrial development. As such, it is expected that a majority of trips would utilize the transportation corridors of SW Tualatin-Sherwood Road and SW Teton Avenue. From SW Tualatin-Sherwood Road and SW Teton Avenue, access to regional transportation facilities, such as SW Pacific Highway, SW Boones Ferry Road (OR-141), Interstate 5, and Interstate 205, are available.

Trip Distribution

The following trip distribution was estimated based on existing traffic volumes, the locations of likely trip destinations, and locations of major transportation facilities in the site vicinity:

- Approximately 45 percent of site trips will travel to/from the east along SW Tualatin-Sherwood Road;
- Approximately 35 percent of site trips will travel to/from the west along SW Tualatin-Sherwood Road;
- Approximately 10 percent of site trips will travel to/from the north along SW Teton Avenue; and
- Approximately 10 percent of site trips will travel to/from the south along SW Teton Avenue.

Staff provided a general guideline of 60 peak hour trips and 500 daily trips through an intersection during the scoping phase for a previous project (*Tualatin Logistics Traffic Study Scoping Memorandum – Revised*, June 18,

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

2021). Washington County (Resolution & Order 86-95) defines the impact area for developments as "those road links where site-generated traffic equals or exceeds 10% of existing average daily traffic" (ADT).

Table 4 summarizes the estimated number of additional trips through nearby intersections based on the trip distribution described above. No intersections are expected to have more additional trips than the 60 peak hour trip threshold or be over the 500 daily trip threshold.

Table 4: Additional Peak Hour and Weekday Trips Summary

Intersection	Site Trip Distribution	Net Site Trips	
		Peak Hour	Daily
SW 124th Avenue & SW Tualatin-Sherwood Road	35%	29	192
SW 112th Avenue/SW Avery Street & SW Tualatin-Sherwood Road	35%	29	192
SW Teton Avenue & SW Tualatin-Sherwood Road	65%	54	356
SW Boones Ferry Road at SW Tualatin-Sherwood Road	45%	37	247

Traffic data from the Oregon Department of Transportation's (ODOT) TransGIS website was reviewed to determine where daily site trips are anticipated to exceed ten percent of the existing ADT and identify intersections to be analyzed in the TIA. Table 5 summarizes the ADT on roadways within the site vicinity and the estimated site trips on the subject roadways.

Table 5: Weekday Site Trips and Existing ADT Summary

Roadway	Point	Site Trip Distribution	Site Trips	Existing ADT	Ratio of Site Trips to Existing ADT (%)
SW Tualatin-Sherwood Road	East of SW 124th Avenue, west of SW 120th Avenue	35%	192	29,900	0.6%
SW Tualatin-Sherwood Road	0.01 mile west of SW Boones Ferry Road	45%	247	34,300	0.7%

Note: Existing ADT based on ODOT TransGIS Traffic Data

Considering the net increase in traffic on area roadways, none of the nearby intersections or roadways are anticipated to sustain a significant increase in traffic volume or meet the volume threshold guidelines provided by Staff. Therefore, no off-site intersections are proposed for analysis as part of this report.

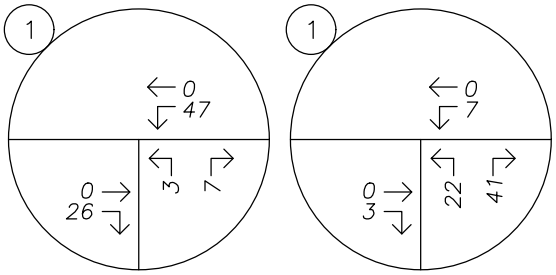
The trip distribution and assignment for the total site trips generated during the morning and evening peak hours is shown in Figure 3.

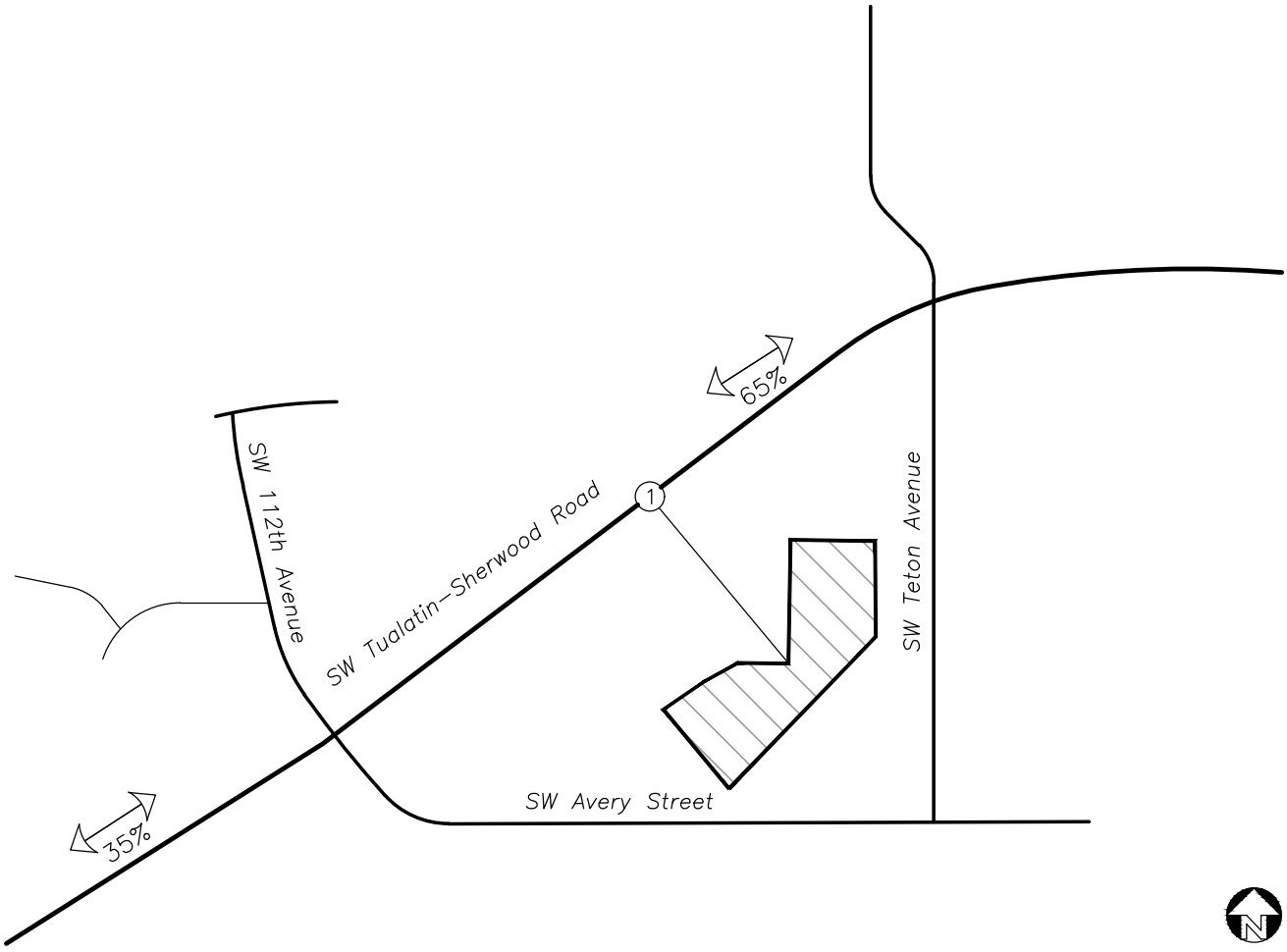
LEGEND

XX% PERCENT OF PROJECT TRIPS

TRIP GENERATION			
	IN	OUT	TOTAL
AM	73	10	83
PM	10	63	73

AM PEAK HOUR PM PEAK HOUR





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SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Plan - Site Trips
AM & PM Peak Hours

Figure 3
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2/8/2022

Traffic Volumes

Existing Conditions

Traffic counts were conducted at the study intersection on Thursday, February 10, 2022, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. Data was used from the intersection's respective morning and evening peak hours. Raw count data is included in Appendix B.

The ongoing COVID-19 viral pandemic, which began in March 2020, has initiated a significant decrease in traffic due to policies on social distancing that have closed or limited business operations and reduced commuting as many people work from home. A comparison of the Portland State University (PSU) Portal data for the I-5 interchange on-ramps near the project site shows that most volumes are at most about 1 percent lower at the end of October 2021 as compared with the same period in 2019. As a result, new traffic data collected for this project was not adjusted for "normal" conditions, as current traffic volumes are close to pre-COVID volumes.

Figure 4 shows the existing traffic volumes at the study intersection for the morning and evening peak hours.

Background Conditions

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. A compounded growth rate of two percent per year for an assumed buildout condition of one year was applied to the measured existing traffic volumes to approximate general growth for year 2023 background conditions.

In addition to the traffic volume growth described above, trips associated with two in-process developments within the site vicinity[2], that are currently approved but not yet fully constructed or occupied, were added to the existing volumes in addition to the calculated volume growth. The following projects were assumed to be completed and occupied prior to year 2023:

- PGE Integrated Operations Center;
- Sherwood Industrial Park;
- Manhasset Industrial (10500 SW Manhasset Drive); and
- Tualatin Industrial Park (11045 SW Tualatin-Sherwood Road)

Figures depicting trip assignment associated with the in-process developments are included in Appendix B.

Figure 5 shows the projected year 2023 background volumes at the study intersection for the morning and evening peak hours.

[2] https://www.tualatinoregon.gov/projects

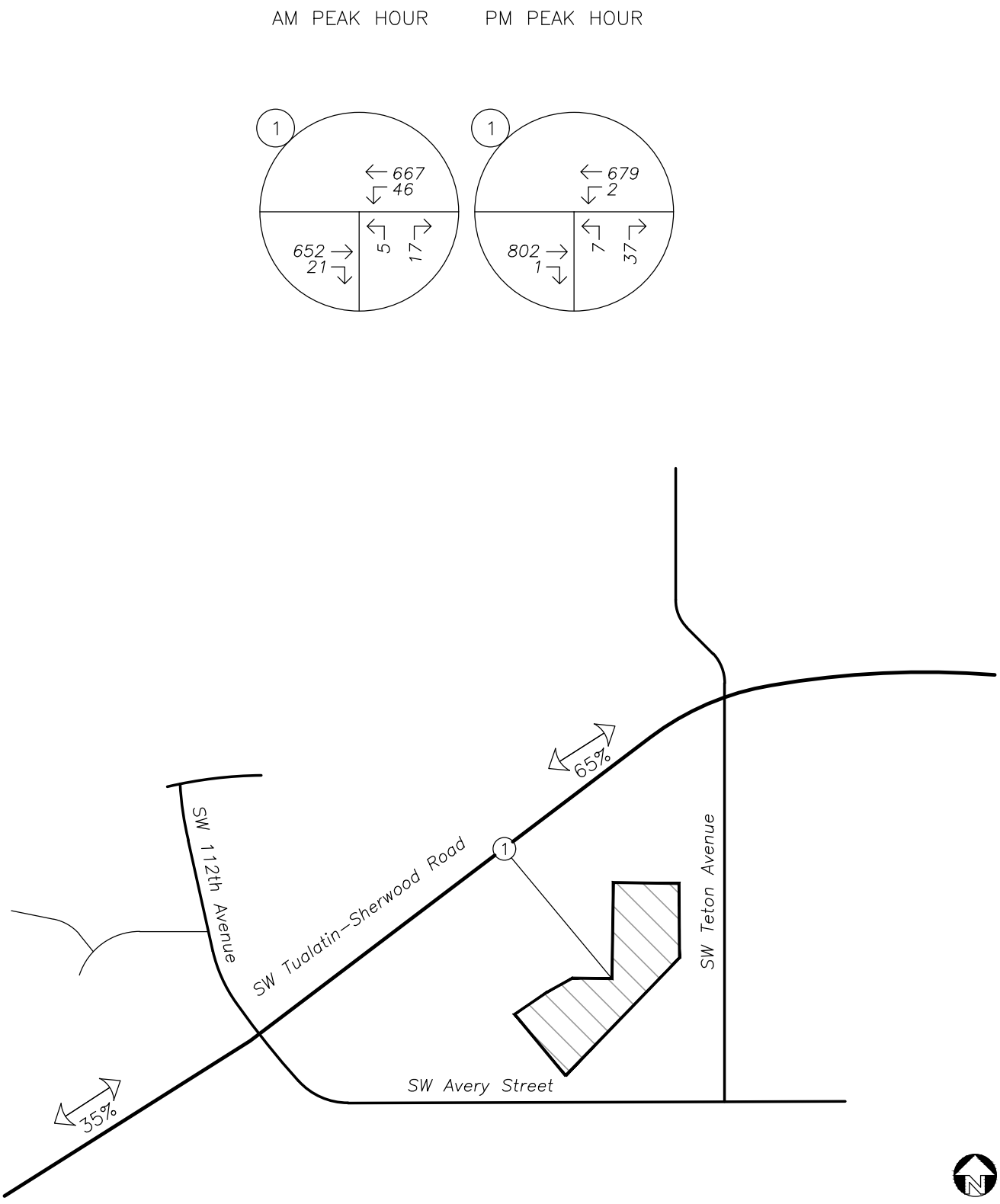
Buildout Conditions

The trips estimated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the year 2023 background traffic volumes to estimate traffic volumes under the year 2023 buildout conditions.

Figure 6 shows the projected year 2023 buildout volumes at the study intersection for the morning and evening peak hours.

Future Roadway Improvements

Improvements along Tualatin-Sherwood Road (between Teton Avenue and Langer Farms Parkway) are planned to begin in 2022 and finish by 2025. As part of this project, the roadway will be widened to five travel lanes (two travel lanes in each direction and a center-turn lane) and bicycle and pedestrian facilities will be included along both sides of the roadway.



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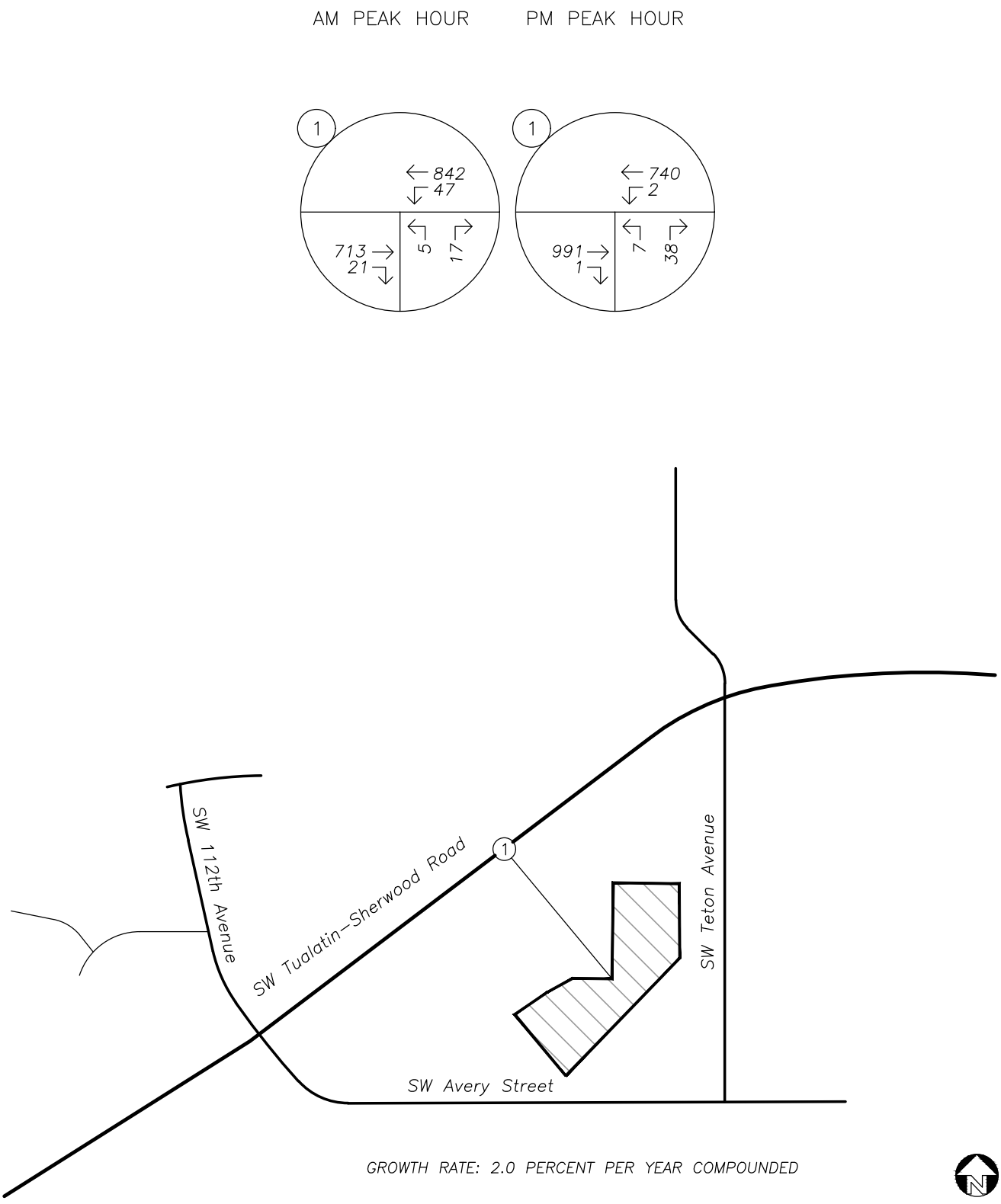
TRAFFIC VOLUMES
Year 2022 Existing Conditions
AM & PM Peak Hours

Figure 4
Avery I & II
2/15/2022



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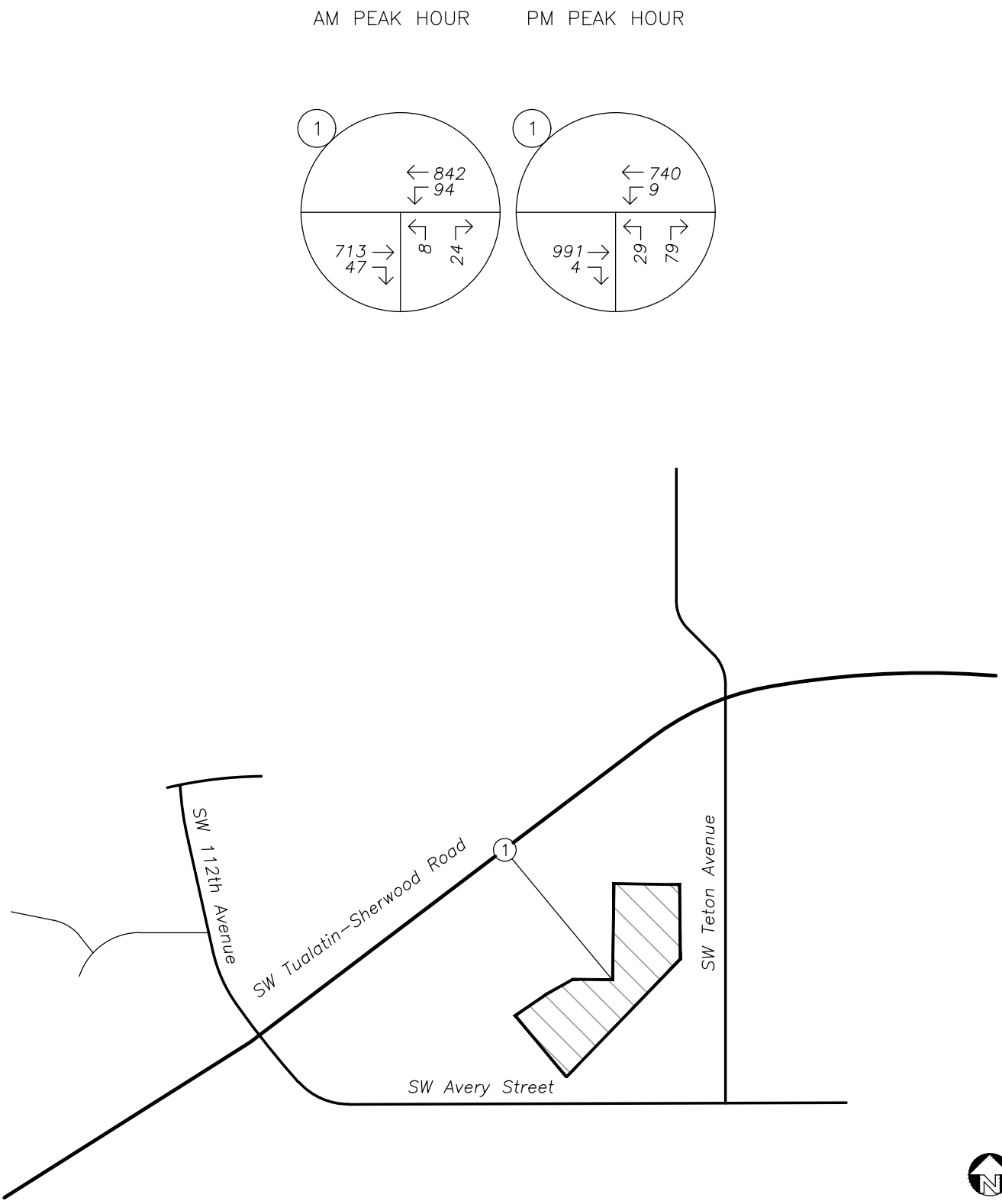
TRAFFIC VOLUMES
Year 2023 Background Conditions
AM & PM Peak Hours

Figure 5
Avery I & II
2/15/2022



TRAFFIC VOLUMES
Year 2023 Buildout Conditions
AM & PM Peak Hours

Figure 6
Avery I & II
2/15/2022

Safety Analysis

Crash History Review

Using data obtained from the ODOT's Crash Data System, the most recent available five years of crash history (January 2015 to December 2019) at the study intersection was reviewed. The crash data were evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection.

Crash severity is based on injuries sustained by people involved in the crash. ODOT classifies crash severity into the following five categories:

- Property Damage Only (*PDO*)
- Possible Injury (*Injury C*)
- Non-Incapacitating Injury (*Injury B*)
- Incapacitating Injury (*Injury A*)
- Fatality or Fatal Injury

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak period represents approximately 10 percent of the annual average daily traffic (AADT) at the intersection.

Table 6 provides a summary of collision types, crash severities, and the calculated crash rate for the study intersection. Detailed ODOT crash reports are included in Appendix C.

Table 6: Crash Type Summary

Intersection		Collision Type		Crash Severity					Total Crashes	AADT	Crash Rate
		Turn	Other	PDO	C	B	A	Fatal			
1	Site Access at SW Tualatin-Sherwood Road	1	0	1	0	0	0	0	1	15,280	0.036

Based on a review of the available crash data and crash rates, patterns are consistent with the geometry and traffic control provided at the study intersection. The proposed project is not expected to change or worsen crash rates. Accordingly, no safety mitigation is recommended per the crash data analysis.

Warrant Analysis

Left-turn lane warrants and preliminary traffic signal warrants were examined for the study intersection where such treatments would be applicable.

Left-Turn Lane Warrants

Left-turn lane warrants were not examined for the westbound approach from SW Tualatin-Sherwood Road into the site as the roadway has an existing two-way left-turn lane as part of the roadway cross-section.

Preliminary Traffic Signal Warrants

Preliminary traffic signal warrants were examined at the site access intersection to determine whether the installation of a new traffic signal will be warranted at this intersection upon completion of the proposed development.

Traffic signal warrants are not met this intersection under buildout conditions. Detailed information on the warrant analysis is included in Appendix C.

Sight Distance

Sight distance was not measured and evaluated, as the proposed development will be using an existing access

Operational Analysis

A capacity and delay analysis was conducted for the study intersection per the unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM) 6th Edition[3]. Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

Intersections along SW Tualatin-Sherwood Road are under the jurisdiction of Washington County, where the County requires intersections to operate with a v/c ratio of 0.99 or less.

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 7. Detailed calculations as well as tables showing the relationship between delay and LOS are included in Appendix D.

[3] Transportation Research Board, *Highway Capacity Manual*, 6th Edition, 2016.

Table 7: Intersection Capacity Analysis Summary

Condition	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1. Site Access (Existing) at SW Tualatin-Sherwood Road						
2021 Existing Condition	C	16	0.07	C	17	0.13
2023 Background Condition	C	17	0.08	C	21	0.18
2023 Buildout Condition	C	19	0.13	D	30	0.44

The study intersection is currently operating acceptably per Washington County standards and is projected to continue operating acceptably through the 2023 buildout year of the site. No operational mitigation is required or recommended.

This project will be completed prior to the construction of the planned five lane cross-section on SW Tualatin-Sherwood Road. However, a review of operations with the future configuration shows that operations are not adversely impacted at the site driveway when the widening of SW Tualatin-Sherwood Road is completed.

Conclusions

Key findings of this study include:

- The proposed development is estimated to generate 83 morning peak hour, 73 evening peak hour, and 548 average weekday trips.
- Based on a review of the available crash data and crash rates, patterns are consistent with the geometry and traffic control provided at the study intersection. The proposed project is not expected to change or worsen crash rates. Accordingly, no safety mitigation is recommended per the crash data analysis.
- Preliminary traffic signal warrants are not met at the unsignalized study area intersection under buildout conditions.
- The study intersection is currently operating acceptably per Washington County standards and is projected to continue operating acceptably through the 2023 buildout year of the site. No operational mitigation is required or recommended.
- The construction of the planned five lane cross-section on SW Tualatin-Sherwood Road will not adversely affect future operations at the study intersection.

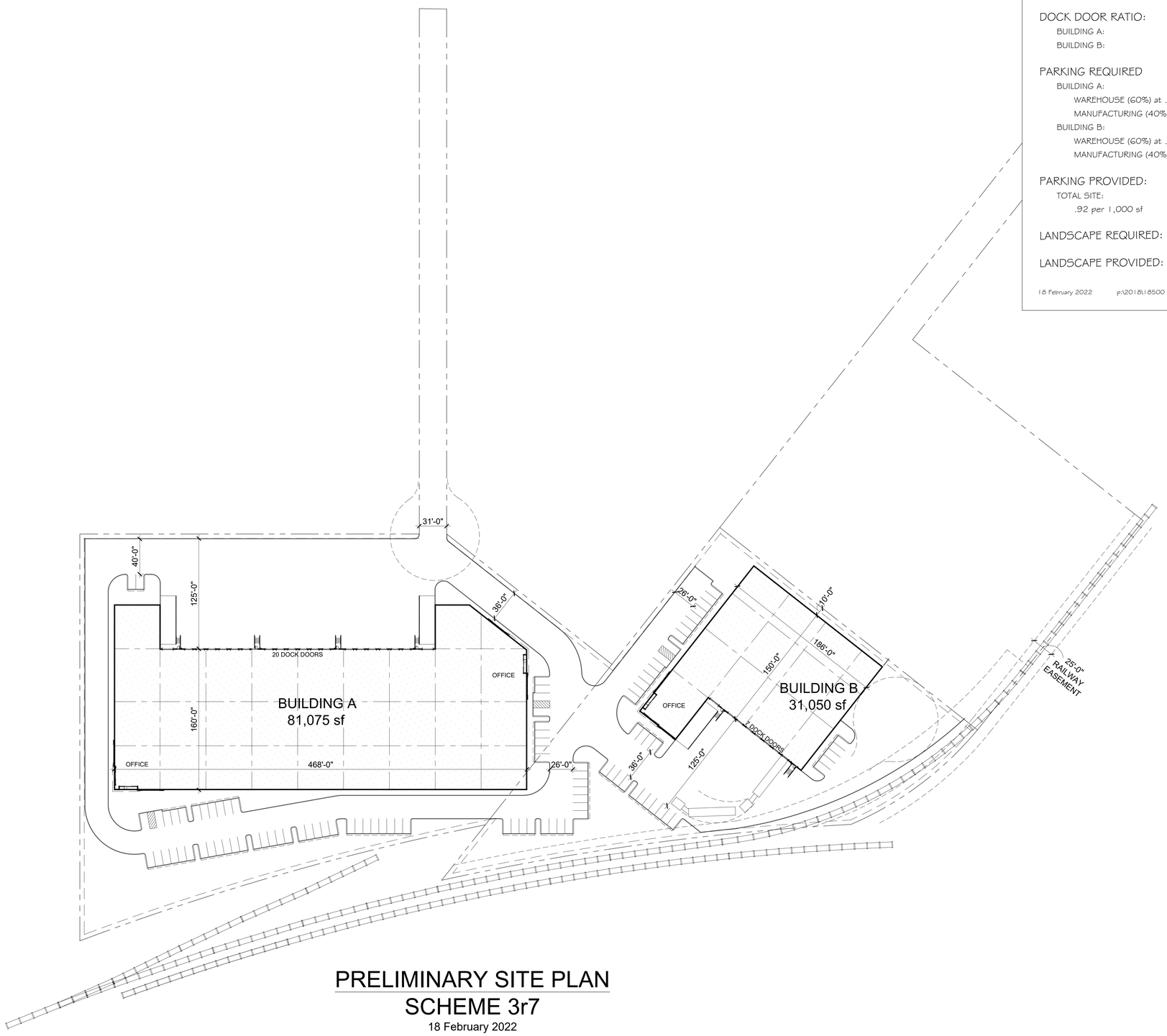
Appendix A – Site Information

Site Plan

Trip Generation Calculations

GROSS LOT AREA:	330,847 sf 7.60 acres
NET LOT AREA:	323,090 sf 7.42 acres
TOTAL BUILDING AREA:	112,525 sf
BUILDING A:	81,075 sf
BUILDING B:	31,050 sf
SITE COVERAGE (on NET):	34.8%
DOCK DOOR RATIO:	
BUILDING A:	1 / 4,054 sf
BUILDING B:	1 / 4,436 sf
PARKING REQUIRED	93 spaces
BUILDING A:	67 spaces
WAREHOUSE (60%) at .3 per 1,000:	15 spaces
MANUFACTURING (40%) at 1.6 per 1,000:	52 spaces
BUILDING B:	26 spaces
WAREHOUSE (60%) at .3 per 1,000:	6 spaces
MANUFACTURING (40%) at 1.6 per 1,000:	20 spaces
PARKING PROVIDED:	103 spaces
TOTAL SITE:	103 spaces
.92 per 1,000 sf	
LANDSCAPE REQUIRED:	48,547 sf (15%)
LANDSCAPE PROVIDED:	TBD

18 February 2022 p:\2018\18500 phelan development\18500.52 pd-avery 1\18500.52 scheme 3r7.dwg



PRELIMINARY SITE PLAN
SCHEME 3r7
18 February 2022

Avery
Tualatin, Oregon

0' 25' 50' 100'
SCALE: 1" = 50'

Calvin J. Coatsworth Architects, PC
1574 Gulf Road PMB 212 - Point Roberts, WA 98281 - Phone: (949) 833-1930

PHELAN
DEVELOPMENT
450 Newport Center Drive, Suite 405
Newport Beach, CA 92660

TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use:	General Light Industrial
Land Use Code:	110
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	1000 SF GFA
Trip Type:	Vehicle
Variable Quantity:	112.6

AM PEAK HOUR

Trip Rate: 0.74

	Enter	Exit	Total
Directional Split	88%	12%	
Trip Ends	73	10	83

PM PEAK HOUR

Trip Rate: 0.65

	Enter	Exit	Total
Directional Split	14%	86%	
Trip Ends	10	63	73

WEEKDAY

Trip Rate: 4.87

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	274	274	548

SATURDAY

Trip Rate: 0.69

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	39	39	78

Appendix B – Traffic Data

Turning Movement Counts

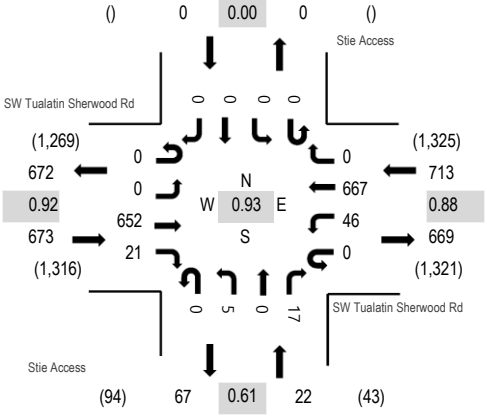
In-Process Traffic Data

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

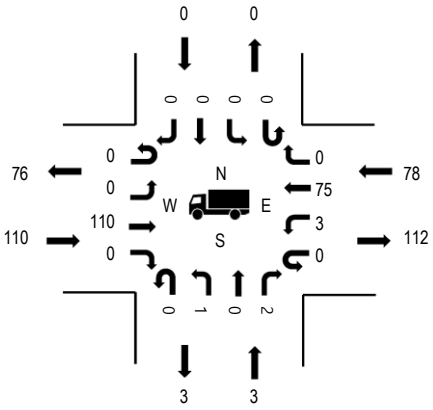
Location: 1 Stie Access & SW Tualatin Sherwood Rd AM
Date: Thursday, February 10, 2022
Study Peak Hour: 07:25 AM - 08:25 AM
Peak 15-Minutes in Study Peak Hour: 07:40 AM - 07:55 AM

Study Peak Hour (for all study intersections)

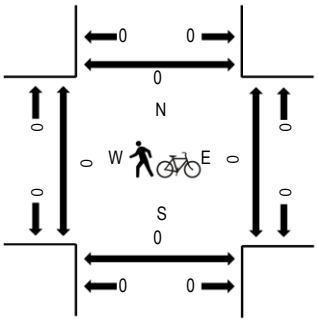
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	16.3%	0.92
WB	10.9%	0.88
NB	13.6%	0.61
SB	0.0%	0.00
All	13.6%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	SW Tualatin Sherwood Rd Eastbound				SW Tualatin Sherwood Rd Westbound				Stie Access Northbound				Stie Access Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	47	1	0	0	54	0	0	0	0	0	0	0	0	0	102	1,368
7:05 AM	0	0	54	0	0	2	50	0	0	0	0	3	0	0	0	0	109	1,384
7:10 AM	0	0	56	0	0	2	55	0	0	0	0	2	0	0	0	0	115	1,364
7:15 AM	0	0	62	0	0	1	39	0	0	0	0	0	0	0	0	0	102	1,380
7:20 AM	0	0	44	0	0	2	46	0	0	0	0	3	0	0	0	0	95	1,391
7:25 AM	0	0	50	2	0	3	69	0	0	0	0	0	0	0	0	0	124	1,408
7:30 AM	0	0	54	1	0	4	62	0	0	0	0	3	0	0	0	0	124	1,402
7:35 AM	0	0	56	4	0	5	60	0	0	0	0	1	0	0	0	0	126	1,389
7:40 AM	0	0	62	1	0	0	37	0	0	0	0	0	0	0	0	0	100	1,371
7:45 AM	0	0	55	1	0	5	79	0	0	0	0	1	0	0	0	0	141	1,365
7:50 AM	0	0	53	2	0	7	71	0	0	1	0	2	0	0	0	0	136	1,318
7:55 AM	0	0	52	4	0	5	32	0	0	0	0	1	0	0	0	0	94	1,288
8:00 AM	0	0	45	1	0	4	65	0	0	0	0	3	0	0	0	0	118	1,316
8:05 AM	0	0	46	1	0	2	39	0	0	1	0	0	0	0	0	0	89	
8:10 AM	0	0	58	1	0	7	62	0	0	1	0	2	0	0	0	0	131	
8:15 AM	0	0	54	1	0	1	55	0	0	1	0	1	0	0	0	0	113	
8:20 AM	0	0	67	2	0	3	36	0	0	1	0	3	0	0	0	0	112	
8:25 AM	0	0	58	2	0	2	53	0	0	1	0	2	0	0	0	0	118	
8:30 AM	0	0	62	0	0	1	48	0	0	0	0	0	0	0	0	0	111	
8:35 AM	0	0	47	0	0	3	57	0	0	1	0	0	0	0	0	0	108	
8:40 AM	0	0	53	0	0	0	38	0	0	0	0	3	0	0	0	0	94	
8:45 AM	0	0	43	0	0	1	50	0	0	0	0	0	0	0	0	0	94	
8:50 AM	0	0	56	3	0	5	38	0	0	2	0	2	0	0	0	0	106	
8:55 AM	0	0	54	1	0	1	64	0	0	1	0	1	0	0	0	0	122	
Count Total	0	0	1,288	28	0	66	1,259	0	0	10	0	33	0	0	0	0	2,684	
Peak Hour	0	0	652	21	0	46	667	0	0	5	0	17	0	0	0	0	1,408	

Location: 1 Stie Access & SW Tualatin Sherwood Rd AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

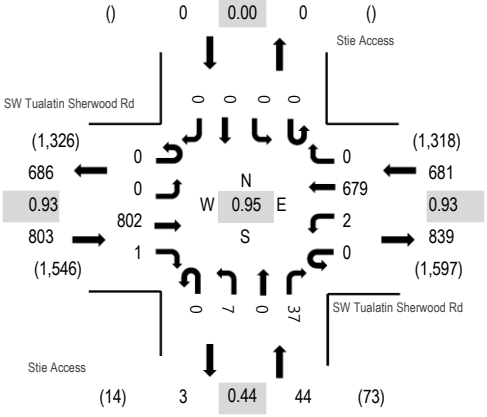
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	12	0	7	0	19	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	9	0	3	0	12	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	9	1	6	0	16	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	12	0	8	0	20	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	7	0	4	0	11	7:20 AM	0	0	2	0	2	7:20 AM	0	0	0	0	0
7:25 AM	17	0	7	0	24	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	9	1	3	0	13	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	11	1	5	0	17	7:35 AM	0	0	1	0	1	7:35 AM	0	0	0	0	0
7:40 AM	9	0	5	0	14	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	9	0	9	0	18	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	7	0	8	0	15	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	5	0	4	0	9	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	8	0	9	0	17	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	5	0	4	0	9	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	10	0	10	0	20	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	10	0	6	0	16	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	10	1	8	0	19	8:20 AM	1	0	0	0	1	8:20 AM	0	0	0	0	0
8:25 AM	7	1	4	0	12	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	8	0	9	0	17	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	4	0	10	0	14	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	7	0	5	0	12	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	10	0	8	0	18	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	10	0	5	0	15	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	8	0	5	0	13	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	213	5	152	0	370	Count Total	1	0	3	0	4	Count Total	0	0	0	0	0
Peak Hour	110	3	78	0	191	Peak Hour	1	0	1	0	2	Peak Hour	0	0	0	0	0

ALL TRAFFIC DATA SERVICES
(303) 216-2439
www.alltrafficdata.net

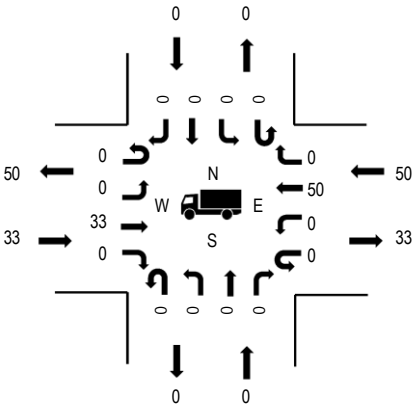
Location: 1 Stie Access & SW Tualatin Sherwood Rd PM
Date: Thursday, February 10, 2022
Study Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes in Study Peak Hour: 05:30 PM - 05:45 PM

Study Peak Hour (for all study intersections)

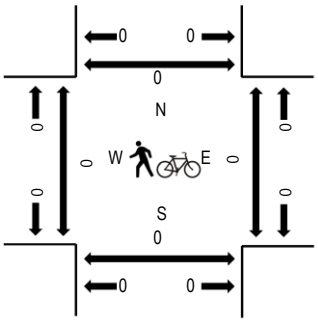
Motorized Vehicles



Heavy Vehicles



Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	4.1%	0.93
WB	7.3%	0.93
NB	0.0%	0.44
SB	0.0%	0.00
All	5.4%	0.95

Traffic Counts - Motorized Vehicles

Interval Start Time	SW Tualatin Sherwood Rd Eastbound				SW Tualatin Sherwood Rd Westbound				Stie Access Northbound				Stie Access Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
4:00 PM	0	0	74	0	0	0	44	0	0	0	0	4	0	0	0	0	122	1,455
4:05 PM	0	0	64	0	0	0	56	0	0	0	0	3	0	0	0	0	123	1,476
4:10 PM	0	0	69	1	0	0	69	0	0	1	0	2	0	0	0	0	142	1,470
4:15 PM	0	0	47	1	0	0	59	0	0	0	0	1	0	0	0	0	108	1,452
4:20 PM	0	0	61	0	0	1	52	0	0	0	0	1	0	0	0	0	115	1,484
4:25 PM	0	0	69	0	0	5	55	0	0	1	0	3	0	0	0	0	133	1,504
4:30 PM	0	0	63	0	0	0	67	0	0	3	0	1	0	0	0	0	134	1,483
4:35 PM	0	0	56	1	0	1	38	0	0	2	0	0	0	0	0	0	98	1,479
4:40 PM	0	0	64	0	0	0	54	0	0	2	0	4	0	0	0	0	124	1,507
4:45 PM	0	0	58	0	0	0	66	0	0	0	0	1	0	0	0	0	125	1,528
4:50 PM	0	0	64	0	0	1	50	0	0	2	0	5	0	0	0	0	122	1,515
4:55 PM	0	0	58	0	0	0	45	0	0	2	0	4	0	0	0	0	109	1,497
5:00 PM	0	0	78	0	0	0	53	0	0	1	0	11	0	0	0	0	143	1,482
5:05 PM	0	0	54	0	0	0	59	0	0	0	0	4	0	0	0	0	117	
5:10 PM	0	0	73	0	0	0	44	0	0	2	0	5	0	0	0	0	124	
5:15 PM	0	0	59	0	0	0	78	0	0	0	0	3	0	0	0	0	140	
5:20 PM	0	0	78	0	0	0	56	0	0	0	0	1	0	0	0	0	135	
5:25 PM	0	0	66	0	0	1	45	0	0	0	0	0	0	0	0	0	112	
5:30 PM	0	0	58	1	0	0	70	0	0	0	0	1	0	0	0	0	130	
5:35 PM	0	0	74	0	0	0	50	0	0	0	0	2	0	0	0	0	126	
5:40 PM	0	0	82	0	0	0	63	0	0	0	0	0	0	0	0	0	145	
5:45 PM	0	0	67	0	0	0	45	0	0	0	0	0	0	0	0	0	112	
5:50 PM	0	0	59	0	0	0	45	0	0	0	0	0	0	0	0	0	104	
5:55 PM	0	0	46	1	0	0	46	0	0	1	0	0	0	0	0	0	94	
Count Total	0	0	1,541	5	0	9	1,309	0	0	17	0	56	0	0	0	0	2,937	
Peak Hour	0	0	802	1	0	2	679	0	0	7	0	37	0	0	0	0	1,528	

Location: 1 Stie Access & SW Tualatin Sherwood Rd PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

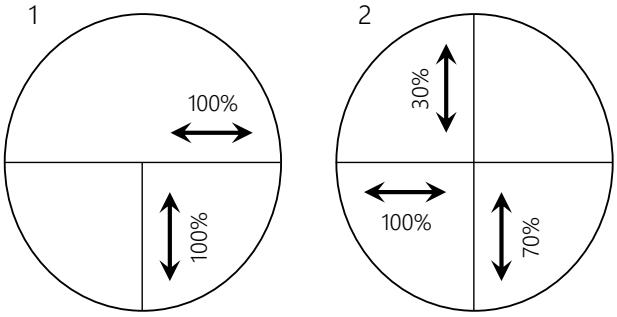
Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	4	0	3	0	7	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	1	0	8	0	9	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	3	0	4	0	7	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	2	0	1	0	3	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	2	0	3	0	5	4:20 PM	0	0	0	0	0	4:20 PM	0	1	0	0	1
4:25 PM	3	0	7	0	10	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	5	0	3	0	8	4:30 PM	0	0	0	0	0	4:30 PM	0	1	0	0	1
4:35 PM	5	0	3	0	8	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	4	1	7	0	12	4:40 PM	1	0	0	0	1	4:40 PM	0	1	0	0	1
4:45 PM	0	0	3	0	3	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	2	0	3	0	5	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	3	0	1	0	4	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	4	0	4	0	8	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	4	0	1	0	5	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	2	0	5	0	7	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	4	0	4	0	8	5:15 PM	0	0	1	0	1	5:15 PM	0	0	0	0	0
5:20 PM	2	0	5	0	7	5:20 PM	0	0	1	0	1	5:20 PM	0	0	0	0	0
5:25 PM	5	0	4	0	9	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	3	0	9	0	12	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	4	0	4	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	4	0	7	0	11	5:40 PM	0	0	1	0	1	5:40 PM	0	0	0	0	0
5:45 PM	3	0	3	0	6	5:45 PM	0	0	1	0	1	5:45 PM	0	0	0	0	0
5:50 PM	2	0	3	0	5	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	4	0	7	0	11	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	71	1	102	0	174	Count Total	1	0	4	0	5	Count Total	0	3	0	0	3
Peak Hour	33	0	50	0	83	Peak Hour	0	0	3	0	3	Peak Hour	0	0	0	0	0

no scale

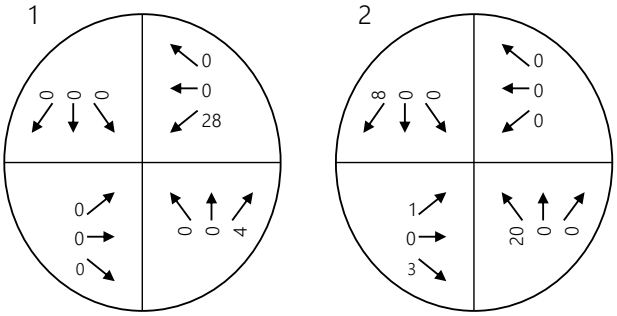
Trip Generation

Period	In	Out	Total
AM	28	4	32
PM	4	24	28
DAILY	118	118	236

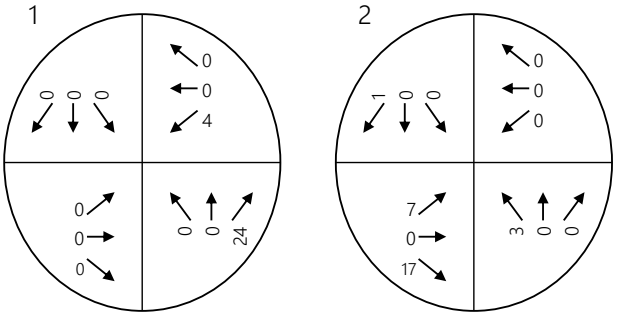
Trip Distribution



Site Trip Assignment - AM Peak Hour



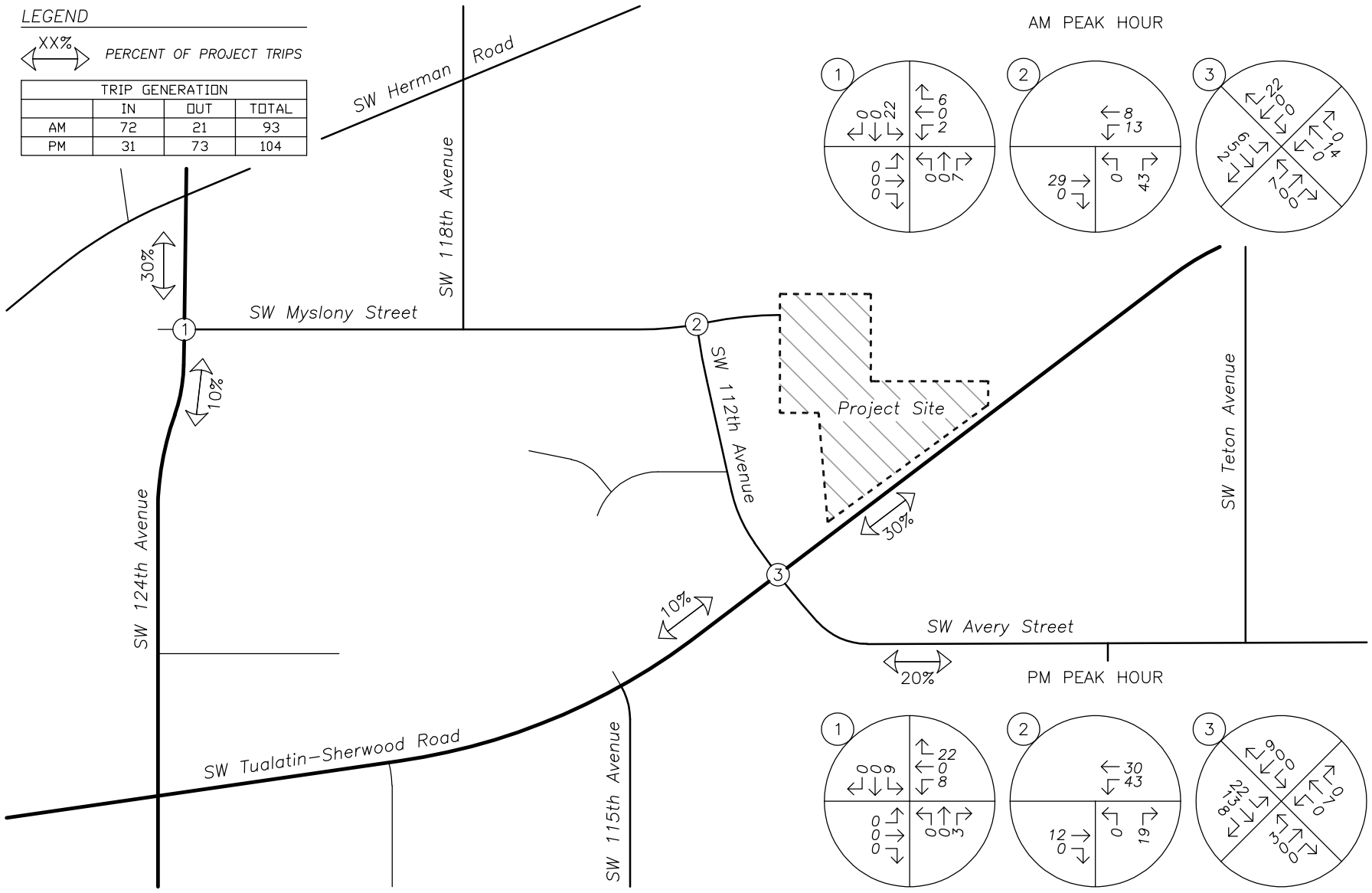
Site Trip Assignment - PM Peak Hour



lancaster mobley

SITE DISTRIBUTION & ASSIGNMENT

Figure 2
10500 SW Manhasset
Tualatin

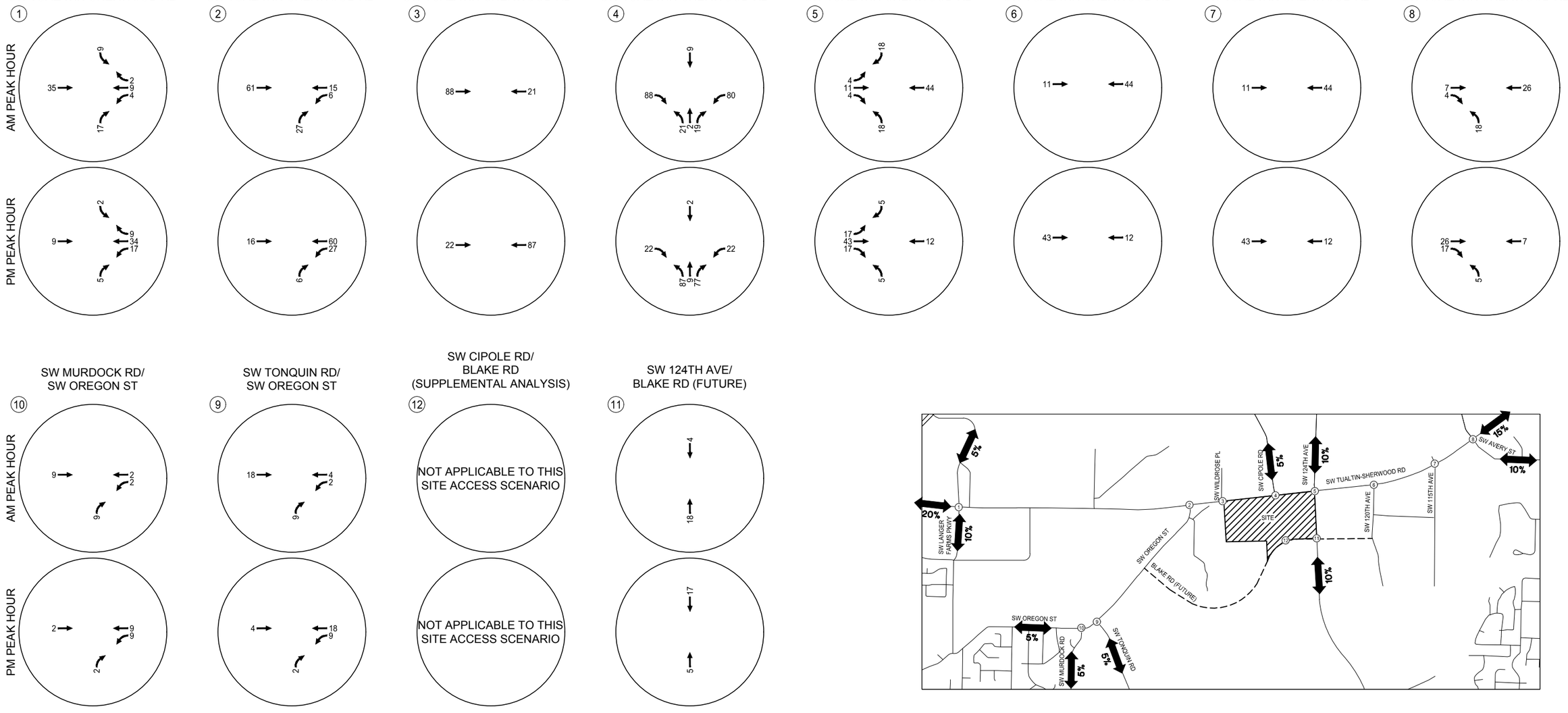


SITE TRIP DISTRIBUTION & ASSIGNMENT
Proposed Development Plan – Site Trips
AM & PM Peak Hours

no scale

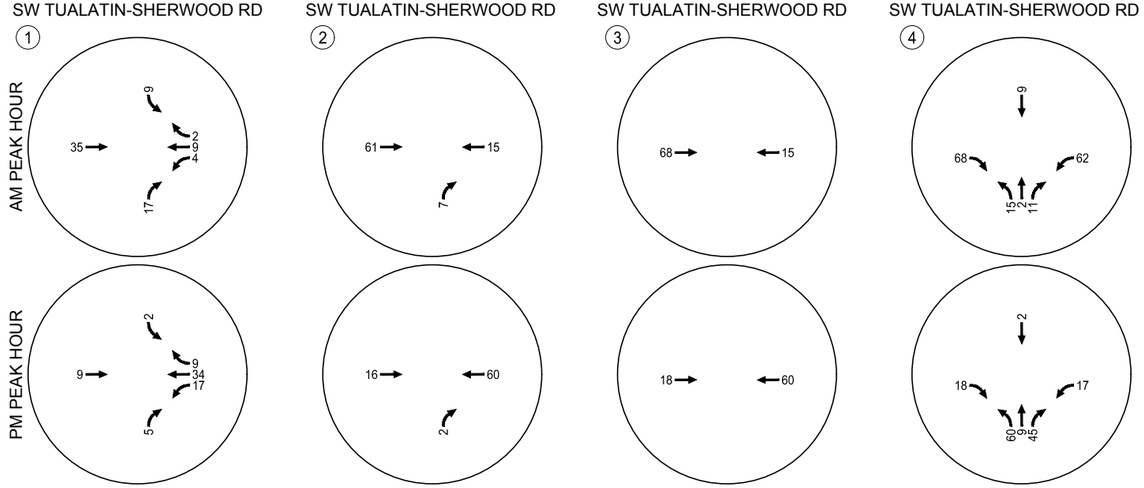
FIGURE 2

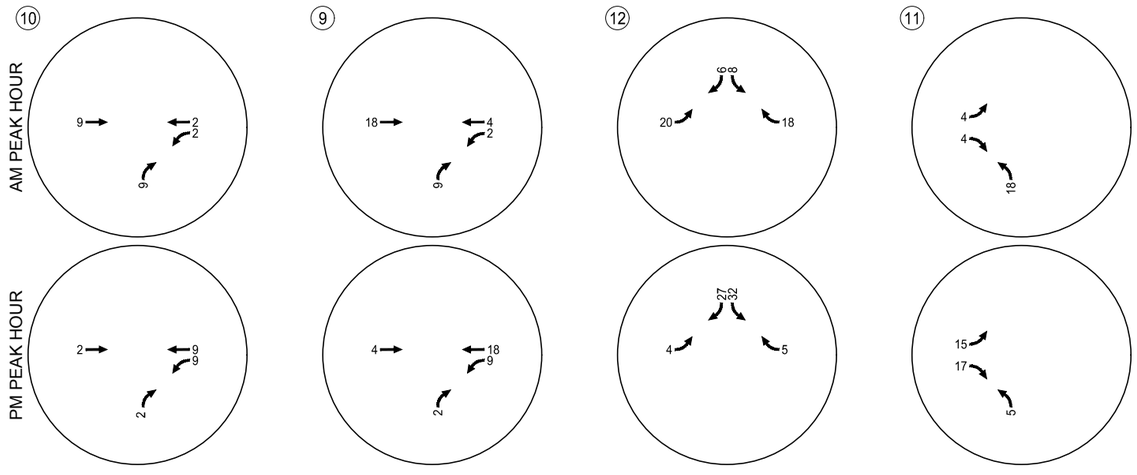
PAGE 11

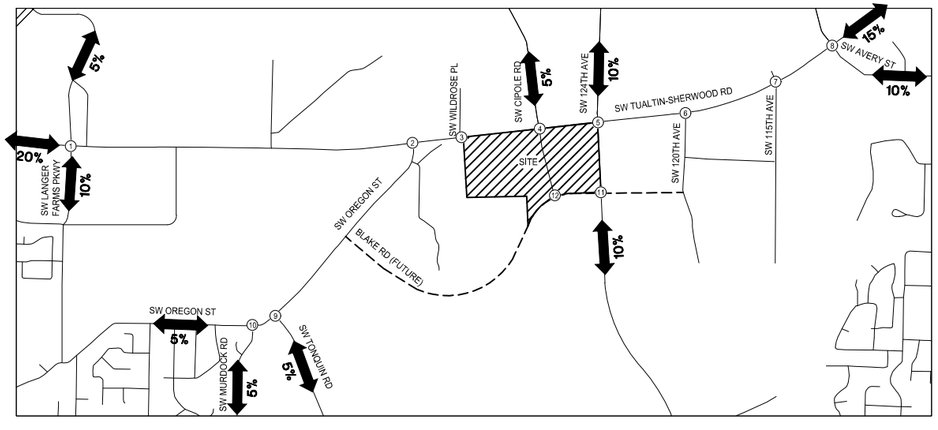


Site Trip Distribution
Weekday AM and PM Peak Hours
Sherwood, Oregon

Figure
6

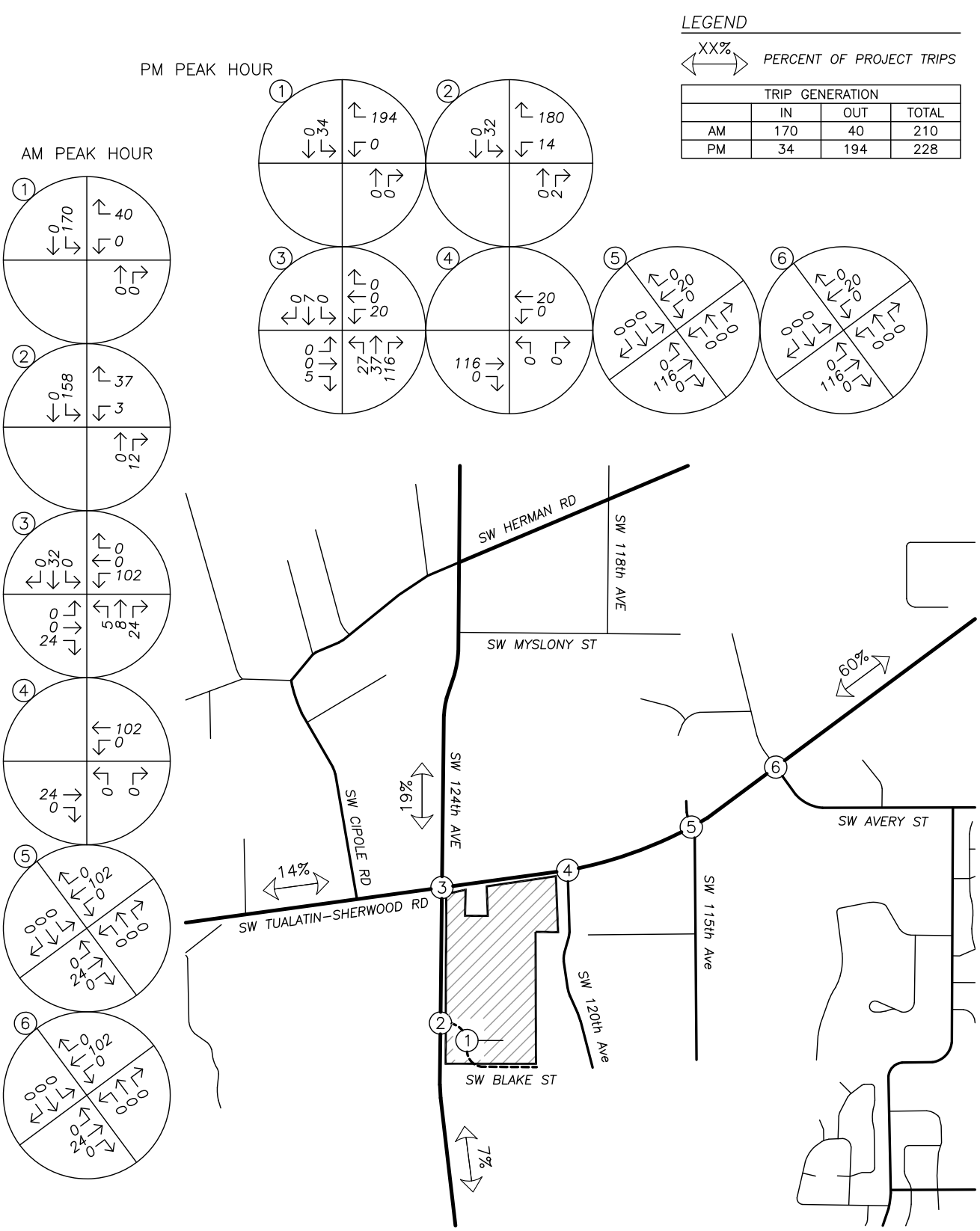






Site Trip Distribution - Alternative Access Scenario
Weekday AM and PM Peak Hours
Sherwood, Oregon

Figure
11



TRIP DISTRIBUTION & ASSIGNMENT
Proposed Development Plan – Site Trips
AM & PM Peak Hours

no scale

FIGURE 4

Appendix C – Safety

Crash Reports

Traffic Signal Warrant Analysis

CITY OF TUALATIN, WASHINGTON COUNTY

TUALATIN-SHERWOOD and Intersectional Crashes at TUALATIN-SHERWOOD, City of Tualatin, Washington County, 01/01/2015 to 12/31/2019

38 - 41 of 605 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G	J I N	S C H	W O R K	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	02	PSNG	INJC	80	F			000	011 013 000		00 00
																03	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	NONE	68	M	OR-Y OR<25		000	022 000		00 00
03248	N	N N	N	N N	06/24/2019	14	SW TUALATIN-SHERWOOD	STRGHT		N	N	CLD	S-1STOP	01	NONE 0	STRGHT												07
CITY			MO		1300	SW AVERY ST	NE	(NONE)	NONE	N	DRY	REAR			PRVTE	NE-SW										000		00
N N			5P 45 22 29.92		-122 47 17.25		08	(02)		N	DAY	INJ			PSNGR CAR		01	DRVR	NONE	16	M	OR-Y OR<25		043	000		07
																02	NONE 0 PRVTE PSNGR CAR	STOP NE-SW	01	DRVR	INJC	22	F	OR-Y OR<25		000	011 000		00 00
04853	N	N N			09/14/2018	14	SW TUALATIN-SHERWOOD	STRGHT		N	N	CLR	S-1TURN	01	NONE 9	U-TURN												08
NONE			FR		1500	SW AVERY ST	NE	(NONE)	UNKNOWN	N	DRY	TURN			N/A	SW-SW										000		00
N N			5P 45 22 31.14		-122 47 15.03		07	(02)		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
05848	N	N N			09/20/2017	14	SW TUALATIN-SHERWOOD	STRGHT		Y	N	RAIN	S-STRGHT	01	NONE 9	STRGHT												13
NONE			WE		40	SW AVERY ST	SW	(NONE)	UNKNOWN	N	WET	SS-O			N/A	SW-NE										000		00
N N			4P 45 22 21.49		-122 47 32.7		06	(03)		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	00	Unk	UNK UNK		000	000		00
																02	NONE 9 N/A PSNGR CAR	STRGHT SW-NE	01	DRVR	NONE	00	Unk	UNK UNK		000	000		00 00
00849	N	N N			02/14/2015	14	SW TUALATIN-SHERWOOD	STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT												29
NONE			SA		50	SW AVERY ST	SW	(NONE)	UNKNOWN	N	DRY	REAR			PRVTE	NE-SW										000		00
N N			10A 45 22 21.43		-122 47 32.82		07	(02)		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	46	M	OR-Y OR>25		042	000		29
																02	NONE 0 PRVTE PSNGR CAR	STRGHT NE-SW	01	DRVR	NONE	34	F	OR-Y OR<25		000	006 000		00 00

Traffic Signal Warrant Analysis

Project: 21175 - Avery I & II
Date: 2/24/2022
Scenario: Year 2023 Buildout Conditions

	Major Street:	Minor Street:
	SW Tualatin-Sherwood Road	Site Access
Number of Lanes:	1	1
PM Peak Hour Volumes:	1744	89

Warrant Used:

X — 100 percent of standard warrants used

_____ — 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
WARRANT 1, CONDITION A		100%	70%	100%	70%
Major St.	Minor St.	Warrants	Warrants	Warrants	Warrants
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
WARRANT 1, CONDITION B					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	17,440	8,850	
Minor Street*	890	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	17,440	13,300	
Minor Street*	890	1,350	**No**
Combination Warrant			
Major Street	17,440	10,640	
Minor Street*	890	2,120	**No**

* Minor street right-turning traffic volumes reduced by 25%

Appendix D – Operations Analysis

LOS Data Sheets

Synchro Reports

Level of Service Definitions

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

- *Level of service A:* Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.
- *Level of service B:* Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.
- *Level of service C:* Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.
- *Level of service D:* Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.
- *Level of service E:* Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.
- *Level of service F:* Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.

Level of Service Criteria
For Signalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

Level of Service Criteria
For Unsignalized Intersections

Level of Service (LOS)	Control Delay per Vehicle (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

Intersection	
Int Delay, s/veh	0.6

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	5	17	652	21	46	667
Future Vol, veh/h	5	17	652	21	46	667
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	14	14	16	16	11	11
Mvmt Flow	5	18	701	23	49	717

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1528	713	0	0	724	0
Stage 1	713	-	-	-	-	-
Stage 2	815	-	-	-	-	-
Critical Hdwy	6.54	6.34	-	-	4.21	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.426	-	-	2.299	-
Pot Cap-1 Maneuver	121	412	-	-	839	-
Stage 1	465	-	-	-	-	-
Stage 2	415	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	114	412	-	-	839	-
Mov Cap-2 Maneuver	245	-	-	-	-	-
Stage 1	465	-	-	-	-	-
Stage 2	391	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	15.8	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	357	839	-
HCM Lane V/C Ratio	-	-	0.066	0.059	-
HCM Control Delay (s)	-	-	15.8	9.6	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.2	-

Intersection	
Int Delay, s/veh	0.5

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	7	37	802	1	2	679
Future Vol, veh/h	7	37	802	1	2	679
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	4	4	7	7
Mvmt Flow	7	39	844	1	2	715

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1564	845	0	0	845	0
Stage 1	845	-	-	-	-	-
Stage 2	719	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.17	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.263	-
Pot Cap-1 Maneuver	124	366	-	-	771	-
Stage 1	425	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	124	366	-	-	771	-
Mov Cap-2 Maneuver	263	-	-	-	-	-
Stage 1	425	-	-	-	-	-
Stage 2	485	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	17	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	345	771	-
HCM Lane V/C Ratio	-	-	0.134	0.003	-
HCM Control Delay (s)	-	-	17	9.7	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	5	17	713	21	47	842
Future Vol, veh/h	5	17	713	21	47	842
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	14	14	16	16	11	11
Mvmt Flow	5	18	767	23	51	905

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1786	779	0	0	790	0
Stage 1	779	-	-	-	-	-
Stage 2	1007	-	-	-	-	-
Critical Hdwy	6.54	6.34	-	-	4.21	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.426	-	-	2.299	-
Pot Cap-1 Maneuver	83	377	-	-	792	-
Stage 1	432	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	78	377	-	-	792	-
Mov Cap-2 Maneuver	200	-	-	-	-	-
Stage 1	432	-	-	-	-	-
Stage 2	314	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	17.4	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	314	792	-
HCM Lane V/C Ratio	-	-	0.075	0.064	-
HCM Control Delay (s)	-	-	17.4	9.9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.2	-

Intersection	
Int Delay, s/veh	0.5

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	7	38	991	1	2	740
Future Vol, veh/h	7	38	991	1	2	740
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	4	4	7	7
Mvmt Flow	7	40	1043	1	2	779

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1827	1044	0	0	1044	0
Stage 1	1044	-	-	-	-	-
Stage 2	783	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.17	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.263	-
Pot Cap-1 Maneuver	85	281	-	-	647	-
Stage 1	342	-	-	-	-	-
Stage 2	454	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	85	281	-	-	647	-
Mov Cap-2 Maneuver	216	-	-	-	-	-
Stage 1	342	-	-	-	-	-
Stage 2	453	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	21.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	268	647	-
HCM Lane V/C Ratio	-	-	0.177	0.003	-
HCM Control Delay (s)	-	-	21.3	10.6	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.6	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	8	24	713	47	94	842
Future Vol, veh/h	8	24	713	47	94	842
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	14	14	16	16	11	11
Mvmt Flow	9	26	767	51	101	905

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1900	793	0	0	818	0
Stage 1	793	-	-	-	-	-
Stage 2	1107	-	-	-	-	-
Critical Hdwy	6.54	6.34	-	-	4.21	-
Critical Hdwy Stg 1	5.54	-	-	-	-	-
Critical Hdwy Stg 2	5.54	-	-	-	-	-
Follow-up Hdwy	3.626	3.426	-	-	2.299	-
Pot Cap-1 Maneuver	71	370	-	-	772	-
Stage 1	425	-	-	-	-	-
Stage 2	300	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	62	370	-	-	772	-
Mov Cap-2 Maneuver	174	-	-	-	-	-
Stage 1	425	-	-	-	-	-
Stage 2	261	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	19.1	0	1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	289	772	-
HCM Lane V/C Ratio	-	-	0.119	0.131	-
HCM Control Delay (s)	-	-	19.1	10.4	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.4	0.5	-

Intersection	
Int Delay, s/veh	1.8

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	29	79	991	4	9	740
Future Vol, veh/h	29	79	991	4	9	740
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	4	4	7	7
Mvmt Flow	31	83	1043	4	9	779

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1842	1045	0	0	1047	0
Stage 1	1045	-	-	-	-	-
Stage 2	797	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.17	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.263	-
Pot Cap-1 Maneuver	84	280	-	-	646	-
Stage 1	342	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	83	280	-	-	646	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	342	-	-	-	-	-
Stage 2	441	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	29.5	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	258	646	-
HCM Lane V/C Ratio	-	-	0.441	0.015	-
HCM Control Delay (s)	-	-	29.5	10.7	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	2.1	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	8	24	713	47	94	842
Future Vol, veh/h	8	24	713	47	94	842
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	14	14	16	16	11	11
Mvmt Flow	9	26	767	51	101	905

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1448	409	0	0	818	0
Stage 1	793	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Critical Hdwy	7.08	7.18	-	-	4.32	-
Critical Hdwy Stg 1	6.08	-	-	-	-	-
Critical Hdwy Stg 2	6.08	-	-	-	-	-
Follow-up Hdwy	3.64	3.44	-	-	2.31	-
Pot Cap-1 Maneuver	109	559	-	-	751	-
Stage 1	377	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	94	559	-	-	751	-
Mov Cap-2 Maneuver	217	-	-	-	-	-
Stage 1	377	-	-	-	-	-
Stage 2	387	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	14.8	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	401	751	-
HCM Lane V/C Ratio	-	-	0.086	0.135	-
HCM Control Delay (s)	-	-	14.8	10.5	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.5	-

Intersection	
Int Delay, s/veh	1.1

Movement	NWL	NWR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	29	79	991	4	9	740
Future Vol, veh/h	29	79	991	4	9	740
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	200	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	4	4	7	7
Mvmt Flow	31	83	1043	4	9	779

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1453	524	0	0	1047	0
Stage 1	1045	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.24	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.27	-
Pot Cap-1 Maneuver	123	503	-	-	631	-
Stage 1	304	-	-	-	-	-
Stage 2	646	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	121	503	-	-	631	-
Mov Cap-2 Maneuver	234	-	-	-	-	-
Stage 1	304	-	-	-	-	-
Stage 2	637	-	-	-	-	-

Approach	NW	NE	SW
HCM Control Delay, s	18.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NWLn1	SWL	SWT
Capacity (veh/h)	-	-	384	631	-
HCM Lane V/C Ratio	-	-	0.296	0.015	-
HCM Control Delay (s)	-	-	18.3	10.8	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	1.2	0	-