Norwood Townhomes

Transportation Impact Analysis

Tualatin, OR

Date:
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RENEWS: 12/31/2025

Table of Contents

List of Appendicies

List of Figures

List of Tables

Executive Summary

1. The proposed Norwood Townhomes project includes 95 townhomes on a site located south of SW Norwood Road and east of SW Boones Ferry Road in Tualatin, Oregon. The site will take access from SW Norwood Road.
2. After deducting the existing site uses, the net new trips are estimated at 45 trips during the morning peak hour, 52 trips during the evening peak hour, and 666 trips during the average weekday.
3. Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified. Accordingly, no safety mitigation is recommended per the crash data analysis.
4. Sight distance requirements are met to the east and west of the proposed site access.
5. The site proposal will meet the Washington County access spacing of 100 feet for SW Norwood Road.
6. Left-turn lane warrants are not projected to be met at the proposed site access intersection for either peak hour under the 2028 buildout scenario.
7. The preliminary signal warrant analysis shows that the intersection of SW Boones Ferry Road & SW Norwood Road does not meet signal warrants with the existing lane configurations under any analysis scenario. Accordingly, no signalization of any of the study intersections is necessary or recommended as part of this application.
8. All study intersections are expected to operate within jurisdictional standards under all analysis scenarios with a two-lane cross-section on SW Norwood Road.
9. Queuing analysis results show that the 95th percentile queues at both of the study intersections are anticipated to provide adequate vehicle storage space that does not inhibit safe and expeditious travel under all scenarios.

Project Description

Introduction

The proposed Norwood Townhomes project includes the development of 95 townhomes on a site located south of SW Norwood Road and east of SW Boones Ferry Road in Tualatin, Oregon. Construction of the project is expected to be completed by the year 2028.

Based on prior scoping coordination with the City of Tualatin and Washington County, the report includes safety and capacity analyses at 2 intersections:

1. SW Boones Ferry Road & SW Norwood Road
2. Site Access & SW Norwood Road (future intersection)

The purpose of this study is to provide an analysis of potential traffic impacts of the proposed project on the surrounding transportation system and to recommend any required mitigative measures. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations are included in the appendices to this report.

Location Description

The project site includes the 1.0-acre parcel located at 9300 SW Norwood Road (Tax Lot 2S135D 000108) and an 8.3-acre portion of the parcel located at 23370 SW Boones Ferry Road (Tax Lot 2S135D 000106) which is part of the Horizon Christian School property. Lot 108 was annexed into the City of Tualatin on March 31, 2023, and is zoned Medium Low Density Residential (RML), and is currently occupied by one single-family home. The portion of Lot 106 to be redeveloped is zoned RML and is currently occupied by one single-family home. It is also developed with parking lots with approximately 212 striped spaces.

The Norwood Townhomes project includes 95 townhomes, as shown in the attached site plan. One access onto SW Norwood Road is proposed with the project. The centerline of the access is planned approximately 450 feet east of the centerline of SW Boones Ferry Road. The edge-to-edge spacing is approximately 170 feet east of the driveway serving the church property located on the southeast corner of the SW Boones Ferry Road & SW Norwood Road intersection, and approximately 500 feet west of the driveway serving the Horizon Christian School. The site will also have a gated access on the Horizon Christian School road network that will be available for emergency use only.

Figure 1 presents an aerial image the project location with the subject site outlined in yellow.

Figure 1: Project Location (City of Tualatin Interactive Zoning Map)

Transportation Facilities

Vicinity Streets

The proposed project is expected to impact two roadways near the site. Table 1 provides a description of each of the vicinity roadways. A vicinity map showing the project site, vicinity streets, and study intersection configurations is shown in Figure 2.

Table 1: Vicinity Roadway Descriptions

Street Name	Jurisdiction	Functional Classification	Cross-Section	Speed	Curbs & Sidewalks	On-Street Parking	Bicycle Facilities
SW Boones Ferry Road[1]	City of Tualatin	Major Arterial	3 Lanes	35 mph	Both Sides	None	Bike Lanes
	Washington Co.	Arterial (Major Arterial[2])		45 mph	Partial Both Sides		
SW Norwood Road	Washington Co.	Collector (Major Collector[2])	2 Lanes	45 mph	Partial Both Sides	None	Partial South

Notes:

1. *SW Boones Ferry Road is under City jurisdiction north of SW Norwood Road and County jurisdiction south of SW Norwood Road.*
2. *City of Tualatin classification of road under County jurisdiction.*

Study Intersections

Based on coordination with City of Tualatin and Washington County staff, two intersections were identified for analysis. A summarized description of the study intersections is provided in Table 2. Figure 2 shows lane configurations at the study intersections.

Table 2: Study Intersection Descriptions

Intersection		Geometry	Traffic Control	Phasing/Stopped Approaches
1	SW Boones Ferry Road & SW Norwood Road	Three-Legged	Stop-Controlled	WB Stop-Controlled
2	Site Access & SW Norwood Road (future intersection)	Three-Legged	Stop-Controlled	NB Stop-Controlled

Pedestrian Facilities

SW Norwood Road currently has a continuous sidewalk along the north side of the street extending westward from SW 84th Avenue to the eastern edge of the corner lot at SW Boones Ferry Road. A gap of 160 feet is present, requiring pedestrians to use the shoulder to walk to the sidewalks on SW Boones Ferry Road.

On the south side of SW Norwood Road, a 12-foot public sidewalk was constructed with the Autumn Sunrise subdivision east of the subject site. The 12-foot sidewalk is planned to be extended across the roadway frontage of the subject site. The frontage improvements are being coordinated and designed with the required frontage improvements associated with the Horizon Church project. A narrow gap in the sidewalk will remain on the adjacent property to the west.

Continuous sidewalks extend along SW Boones Ferry Road north of SW Norwood Road. Upon completion of adjacent developments, continuous sidewalk will extend along the east side of SW Boones Ferry Road from SW Norwood Road to SW Greenhill Lane.

Bicycle Facilities

A bike lane on the south side of SW Norwood Road was added with the Autumn Sunrise subdivision east of the subject site. This bike lane will be extended westward with the proposed development.

Bike lanes are present on both sides of SW Boones Ferry Road.

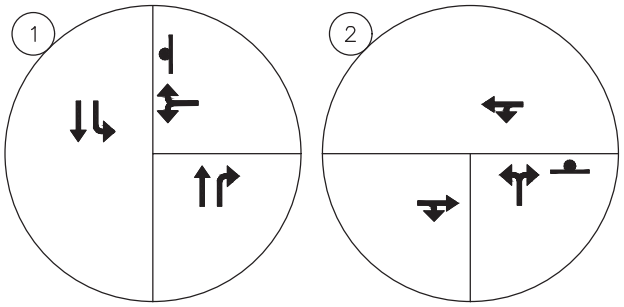
Transit Service

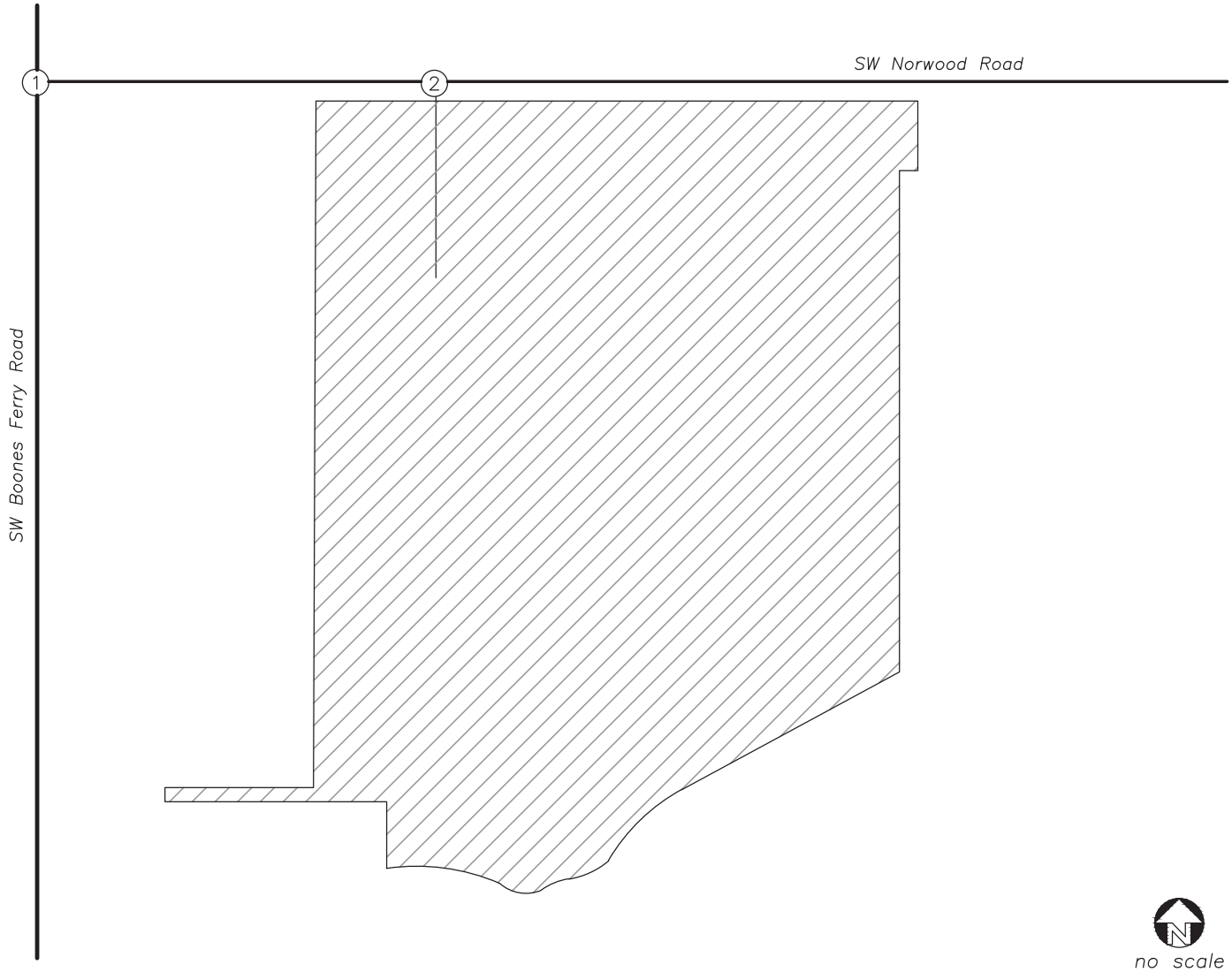
The project is located near one transit line that has stops within less than a one-quarter mile walking/biking distance of the site.

Route 96 – Tualatin/I-5 provides weekday rush-hour service between Commerce Circle and the Mohawk Park & Ride in Tualatin, and regular service between Mohawk Park & Ride and Portland City Center. Weekday service is scheduled from approximately 5:15 AM to 9:10 PM with headways of approximately 30 to 60 minutes. There is currently no weekend or holiday service. The nearest bus stops to the site are currently located just south of the intersection of SW Boones Ferry Road at SW Norwood Road.

LEGEND

- STUDY INTERSECTION
- STOP SIGN
- PROJECT SITE
- COLLECTOR
- ARTERIAL





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VICINITY MAP

Figure 2

Norwood Townhomes TIA

7/8/2025

Site Trips

Trip Generation

To estimate the trips that will be generated by the Norwood Townhomes project, data from the *Trip Generation Manual*[1] were used based on the number of dwelling units (DU). Average trip rates for Land Use 210 – *Single-Family Detached Housing* were applied to the two existing homes on the site. Equations for Land Use 215 – *Single-Family Attached* were applied to the proposed 95 townhomes. Table 3 summarizes the site trip generation.

Table 3: Trip Generation – Norwood Townhomes

ITE Code	Intensity	Morning Peak Hour			Evening Peak Hour			Daily Trips
		In	Out	Total	In	Out	Total	
EXISTING								
210 - Single-Family Detached Housing	2 DU	0	1	1	1	1	2	18
PROPOSED								
215 - Single-Family Attached Housing	95 DU	14	32	46	31	23	54	684
Net Increase		14	31	45	30	22	52	666

As shown in Table 3, after deducting the existing site uses, the net new trips are estimated at 45 trips during the morning peak hour, 52 trips during the evening peak hour, and 666 trips during the average weekday.

Trip Distribution

The directional distribution of site trips to/from the project site was assumed to be the same as the distribution used for the Autumn Sunrise Project to the south/east. That trip distribution was estimated based on the locations of likely trip destinations, locations of major transportation facilities in the site vicinity, and a select zone analysis using Metro's Regional Travel Demand Forecasting Model. An additional consideration was Google Maps estimated travel times along various routes to/from the site.

The distribution nis summarized below:

- Approximately 40 percent of site trips will travel to/from the north on SW Boones Ferry Road
- Approximately 45 percent of site trips will travel to/from the south on SW Boones Ferry Road
- Approximately 15 percent of site trips will travel to/from the east on SW Norwood Road

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

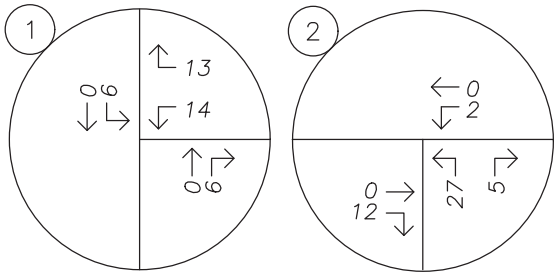
[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021.

LEGEND

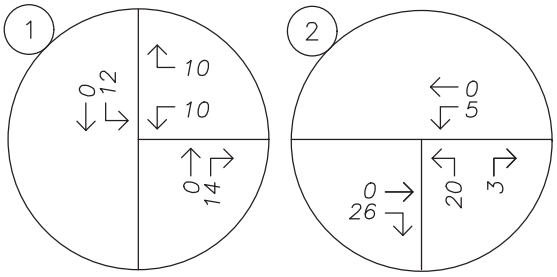
IN%/OUT% PERCENT OF PROJECT TRIPS

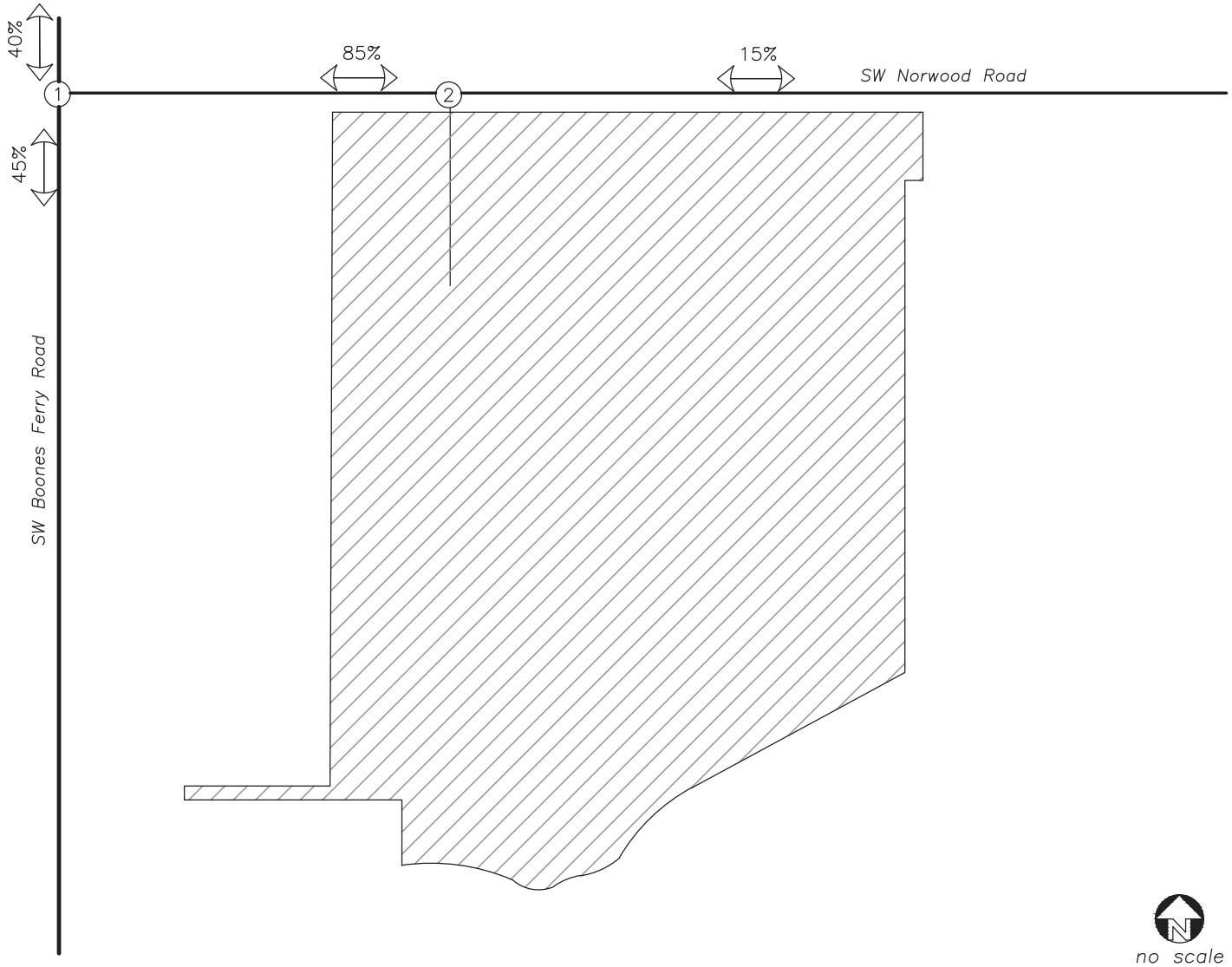
TRIP GENERATION			
	IN	OUT	TOTAL
AM	14	32	46
PM	31	23	54

AM PEAK HOUR



PM PEAK HOUR





no scale

SITE TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development
AM & PM Peak Hours

Figure 3

Norwood Townhomes TIA
7/8/2025

Traffic Volumes

Existing Conditions

Traffic counts were conducted at the study intersections on Wednesday, May 29, 2024, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. Counts were collected while school was in session. Based on correspondence from the City of Tualatin and Washington County, a two percent per year growth rate was applied to the year 2024 counts to obtain the year 2025 existing volumes.

Figure 4 shows the existing traffic volumes at the study intersections during the morning and evening peak hours.

Background Conditions

To provide an analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required. For the general background growth, the annual growth rate of 2.0 percent per year over three years was applied to the year 2025 existing traffic volumes. In addition to the general growth, the following nearby developments are approved but were not yet constructed at the time of the traffic counts are included as in-process traffic:

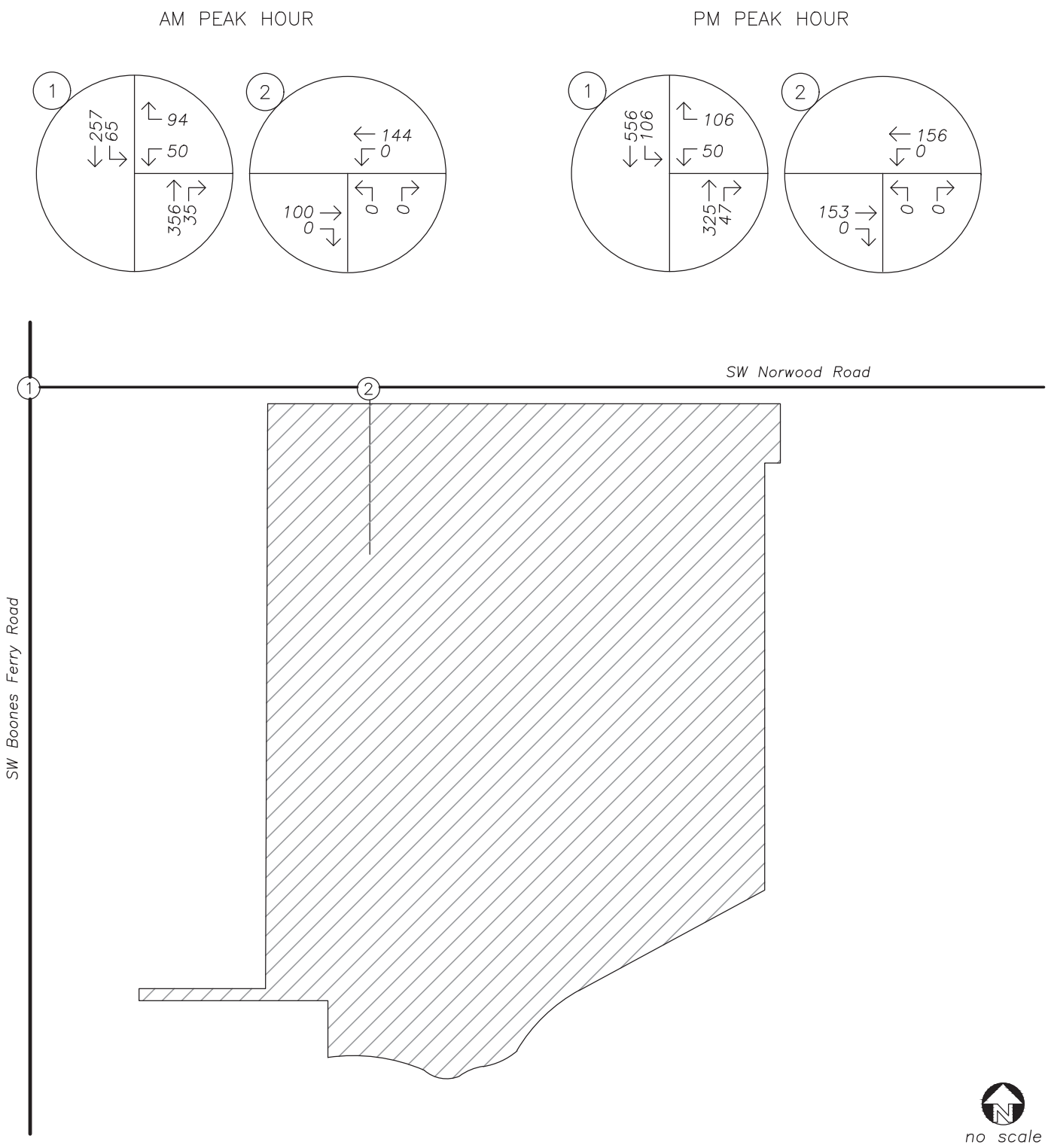
- Autumn Sunrise
- Plambeck Gardens

Figure 5 shows the projected year 2028 background traffic volumes at the study intersections during the morning and evening peak hours.

Buildout Conditions

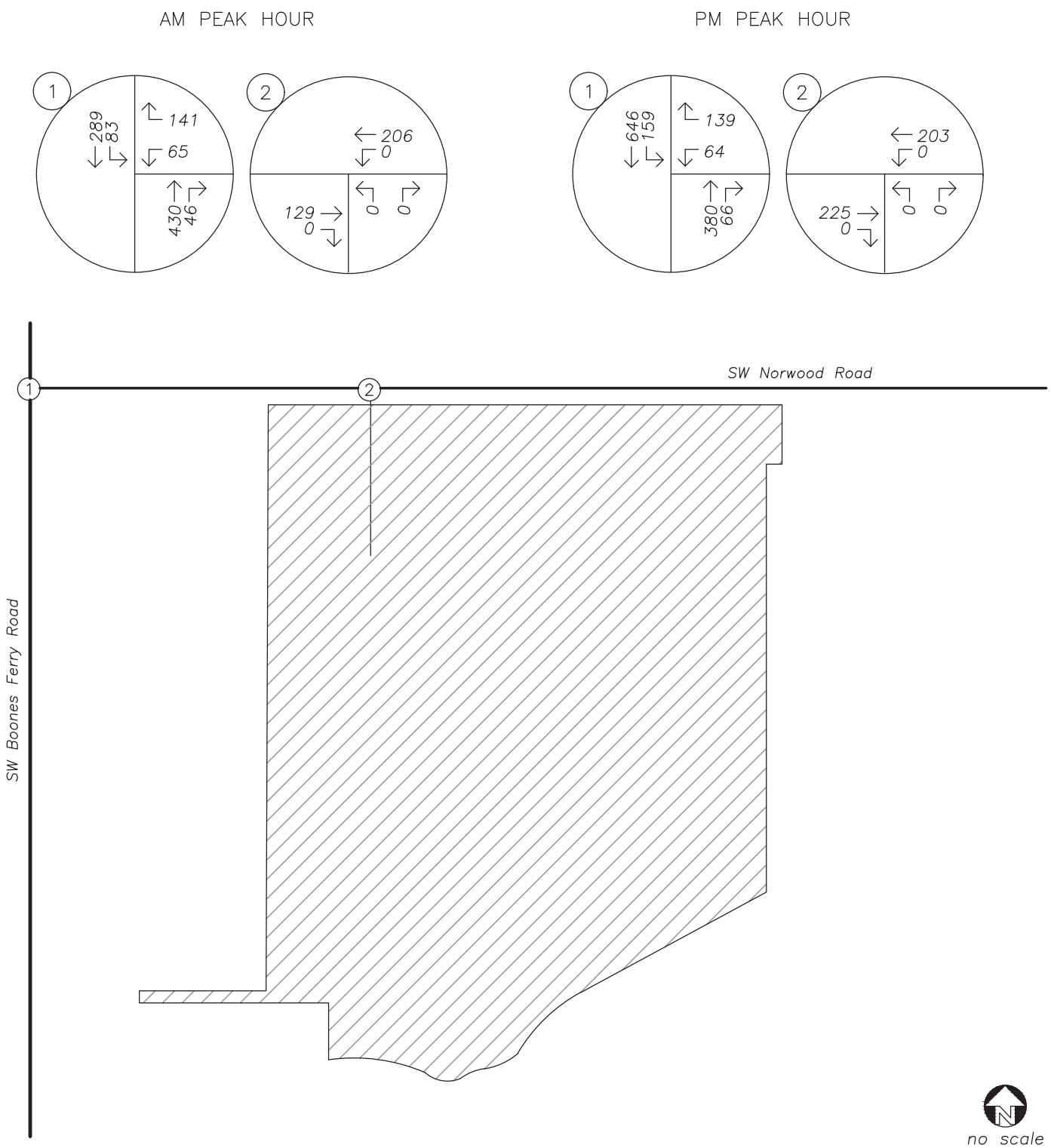
The net increase in morning and evening peak hour trips described in the *Site Trips* section were added to the year 2028 background volumes to obtain the expected year 2028 buildout conditions.

Figure 6 shows year 2028 buildout traffic volumes at the study intersections during the morning and evening peak house.



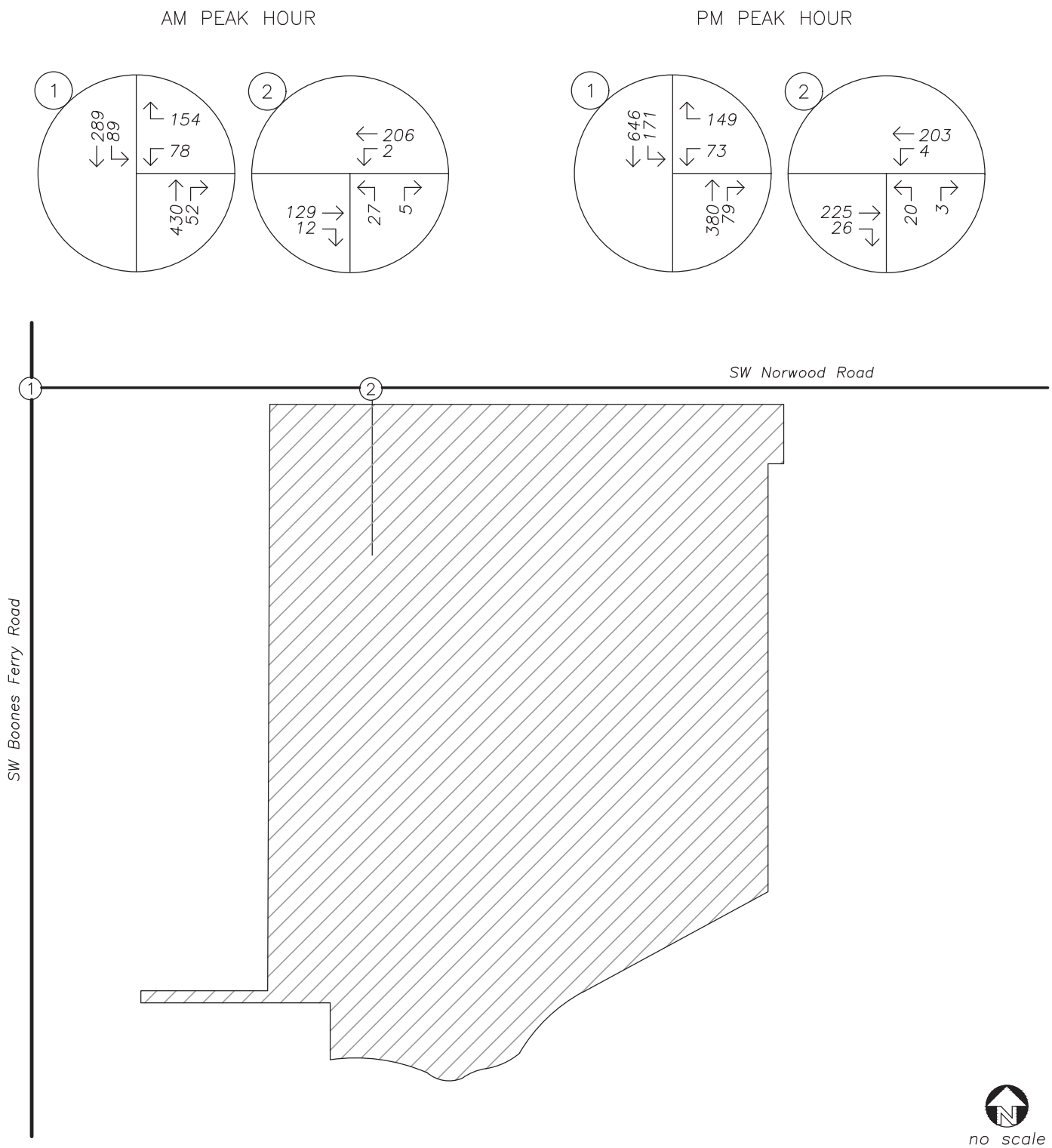
TRAFFIC VOLUMES
Year 2025 Existing Conditions
AM & PM Peak Hours

Figure 4
Norwood Townhomes TIA
7/8/2025



TRAFFIC VOLUMES
Year 2028 Background Conditions
AM & PM Peak Hours

Figure 5
Norwood Townhomes TIA
7/8/2025



TRAFFIC VOLUMES
Year 2028 Buildout Conditions
AM & PM Peak Hours

Figure 6
Norwood Townhomes TIA
7/8/2025

Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Data System, a review of approximately five years of the most recent available crash history (January 2019 through December 2023) was performed at the study intersections. The crash data was evaluated based on the number of crashes, the type of collisions, and the severity of the collisions. Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

- Property Damage Only (PDO)
- Possible Injury (Injury C)
- Suspected Minor Injury (Injury B)
- Suspected Serious Injury (Injury A)
- 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 (ADT) at the intersection.

Table 4 provides a summary of crash types, crash severities, and crash rates for each of the study intersections. Detailed crash data is provided in the appendix to this report.

Table 4: Crash Type Summary

Location		Crash Type				Total Crashes
		Turn	Rear End	Fixed Object	Ped/Bike	
2	SW Boones Ferry Rd & SW Norwood Rd	2	1	1	0	3
SW Norwood Rd Segment		0	0	1	1	2

Table 5: Crash Severity and Rate Summary

Location		Severity					Total Crashes	PHV	Crash Rate	90th % Rate
		PDO	C	B	A	Fatal				
2	SW Boones Ferry Rd & SW Norwood Rd	3	0	0	0	0	3	1,190	0.086	0.293
SW Norwood Rd Segment		0	0	1	1	0	2	-	-	-

PHV = Peak Hour Volume

Vulnerable Users

There were no crashes reported at the intersection involving vulnerable road uses but there was a collision involving a pedestrian using a "pedestrian conveyance" in the roadway on SW Norwood Road that was reported approximately 300 feet east of SW Boones Ferry Road. Both the vehicle and pedestrian were traveling

westbound in the roadway. The type of conveyance is not specified. The pedestrian was reported to have sustained type B injuries. The crash occurred under dark conditions and the pedestrian was indicated to be at fault for being in the roadway and not wearing visible, reflective clothing.

Crash Severity

All of the crashes at the intersection of SW Boone Ferry Road & SW Norwood Road were reported as property damage only.

The fixed object crash on SW Norwood Road was reported to result in type A and type B injuries. The crash occurred 50 feet west of SW 89th Avenue. The cause of the crash was reported as distracted driving. Conditions were daytime and rainy.

ODOT 90th Percentile Crash Rates

Intersection crash rates were compared to the published statewide 90th percentile crash rates within ODOT's Analysis Procedures Manual (APM). According to Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control in the APM, intersections which experience crash rates in excess of 90th percentile crash rates should be "flagged for further analysis".

None of the intersections in the study area were calculated to have crash rates that exceed the 90th percentile crash rates for the intersection type.

ODOT Safety Priority Index System

According to the ODOT TransGIS website, none of the study area intersections were listed in the worst 15 percent of ODOT's 2019 Safety Priority Index System (SPIS) list.

Conclusion

Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified. Accordingly, no safety mitigation is recommended per the crash data analysis.

Sight Distance Evaluation

SW Norwood Road is under Washington County jurisdiction, so intersection sight distance (ISD) was measured and evaluated in accordance with Washington County Community Development Code (CDC) Section 501-8.5.F. Sight distance measurements were made from an entering driver's eye height of 3.5 feet above the roadway surface 15 feet behind the curb line/edge of pavement of the intersecting street to the position of an oncoming vehicle in the major-street traffic lane 4.25 feet above the roadway.

At the proposed site access on SW Norwood Road, the posted speed is 45 mph. Therefore, the intersection sight distance recommendation is 450 feet, and the stopping sight distance requirement is 360 feet.

To the west of the site access, the available sight distance reaches the SW Norwood Road & SW Boones Ferry Road intersection. Therefore, the intersection sight distance recommendation is met. To the east of the proposed site access, sight distance was measured to exceed the intersection sight distance recommendation of 500 feet.

Access Spacing

Site access will be taken from SW Norwood Road, which is under Washington County jurisdiction. The County access requirements are shown in CDC Section 501-8.5B. For SW Norwood Road with a collector classification, the access spacing standard is 100 feet measured between the edge of travel lanes or easements on both sides of the roadway.

One access on SW Norwood Road is proposed with the project. The centerline of the access is planned approximately 400 feet east of the centerline of SW Boones Ferry Road. The edge-to-edge spacing is approximately 170 feet east of the driveway serving the church property on the corner and approximately 500 feet west of the driveway serving the Horizon Christian School. The north side of SW Norwood Road has no accesses between SW Boones Ferry Road and SW 89th Avenue; therefore, the site proposal will meet the Washington County access spacing of 100 feet in the Community Development Code (CDC) Section 501-8.5.B.

Warrant Analysis

Left-Turn Lane Warrants

Left-turn lanes are not present on SW Norwood Road; therefore, left-turn lane warrants were examined at the proposed site access on SW Norwood Road using the methodology outlined in the National Cooperative Highway Research Program Report (NCHRP) 457, published by the Transportation Research Board in 2001. These turn-lane warrants are evaluated based on the number of left-turning vehicles, the number of advancing and opposing vehicles, and the roadway travel speed.

Left-turn lane warrants are not projected to be met at the proposed site access intersection for either peak hour under the 2028 buildout scenario.

Preliminary Traffic Signal Warrants

Preliminary traffic signal warrants were examined for the intersection of SW Boones Ferry Road & SW Norwood Road to determine whether the installation of a new traffic signal will be warranted upon site buildout. The ODOT Preliminary Traffic Signal Warrant Analysis Calculator was used for the evaluation. The calculator is based on the *Manual on Uniform Traffic Control Devices*[2] (MUTCD) Warrant 1, Eight-Hour Vehicular Volumes. The calculator relies on the common assumption that traffic counted during the evening peak hour represents approximately 10 percent of the average daily traffic (ADT) and that the 8th highest hour is 5.65 percent of the daily volume.

For minor streets with a single lane approach, the right turn volumes are discounted by 85 percent of the shared lane capacity for the approach. The discount is applied because making a right-turn movement from a minor street is easier with far less delay than making a left-turn movement. Signals are generally not installed at intersections on the basis of high right-turn volumes.

The posted speed on SW Boones Ferry Road changes from 45 mph south of the intersection with SW Norwood Road to 35 mph north of the intersection. According to the Washington County 2024 Interactive Traffic Counts Map, the 85th percentile speed on SW Boones Ferry Road south of SW Norwood Road was 44 mph. While

[2] Federal Highway Administration, *Manual on Uniform Traffic Control Devices*, 11th Edition, 2023

drivers may be traveling slower north of the intersection, they are still likely to be traveling at a speed near 40 mph as they approach SW Norwood Road. Therefore, the 70 percent warrant thresholds for speeds of 40 mph or greater is appropriate.

The preliminary signal warrant analysis shows that the intersection of SW Boones Ferry Road & SW Norwood Road does not meet signal warrants with the existing lane configurations under any analysis scenario. Accordingly, no signalization of any of the study intersections is necessary or recommended as part of this development application.

Operational Analysis

Intersection Capacity Analysis

A capacity and delay analysis were conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM)[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

Washington County has a mobility target of 0.90 but a v/c ratio of 0.99 or less is acceptable.

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 6 for the morning and evening peak hours.

Table 6: Capacity Analysis Summary

Intersection & Condition	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. SW Boones Ferry Road & SW Norwood Road						
2025 Existing Conditions	B	15	0.31	C	17	0.36
2028 Background Conditions	C	20	0.50	C	25	0.55
2028 Buildout Conditions	C	22	0.57	D	30	0.65
2. Site Access & SW Norwood Road						
2028 Buildout Conditions	B	11	0.06	B	12	0.05

As shown, all study intersections are expected to operate within jurisdictional standards under all analysis scenarios with a two-lane cross-section on SW Norwood Road.

Queuing Analysis

An analysis of projected queuing was conducted for the study intersections. The 95th percentile queue lengths were estimated based on the same Synchro/SimTraffic simulations used for the delay calculations. The 95th percentile queue is a statistical measurement which indicates there is a 5 percent chance that the queue may

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

exceed this length during the analysis period; however, given this is a probability, the 95th percentile queue length may theoretically never be met or observed in the field.

The 95th percentile queue lengths reported in the simulation are presented in Table 7 for the morning and evening peak hours. Reported queue lengths were rounded up to the nearest 25 feet, equivalent to an average vehicle length. Detailed queuing analysis reports are included in the appendix.

Table 7: 95th Percentile Queueing Analysis Summary

Intersection/Movement	Available Storage (ft)	2027 Background Queue (ft)		2027 Buildout Queue (ft)	
		Morning	Evening	Morning	Evening
1. SW Boones Ferry Road & SW Norwood Road					
WB Approach	225	125	150	125	175
SB Left-Turn Lane	325	50	75	50	75
2. Site Access & SW Norwood Road					
WB Approach	325	-	-	0	25
NB Approach	75	-	-	50	50

Queuing analysis results show that the 95th percentile queues at both of the study intersections are anticipated to provide adequate vehicle storage space that does not inhibit safe and expeditious travel under all scenarios.

Conclusions

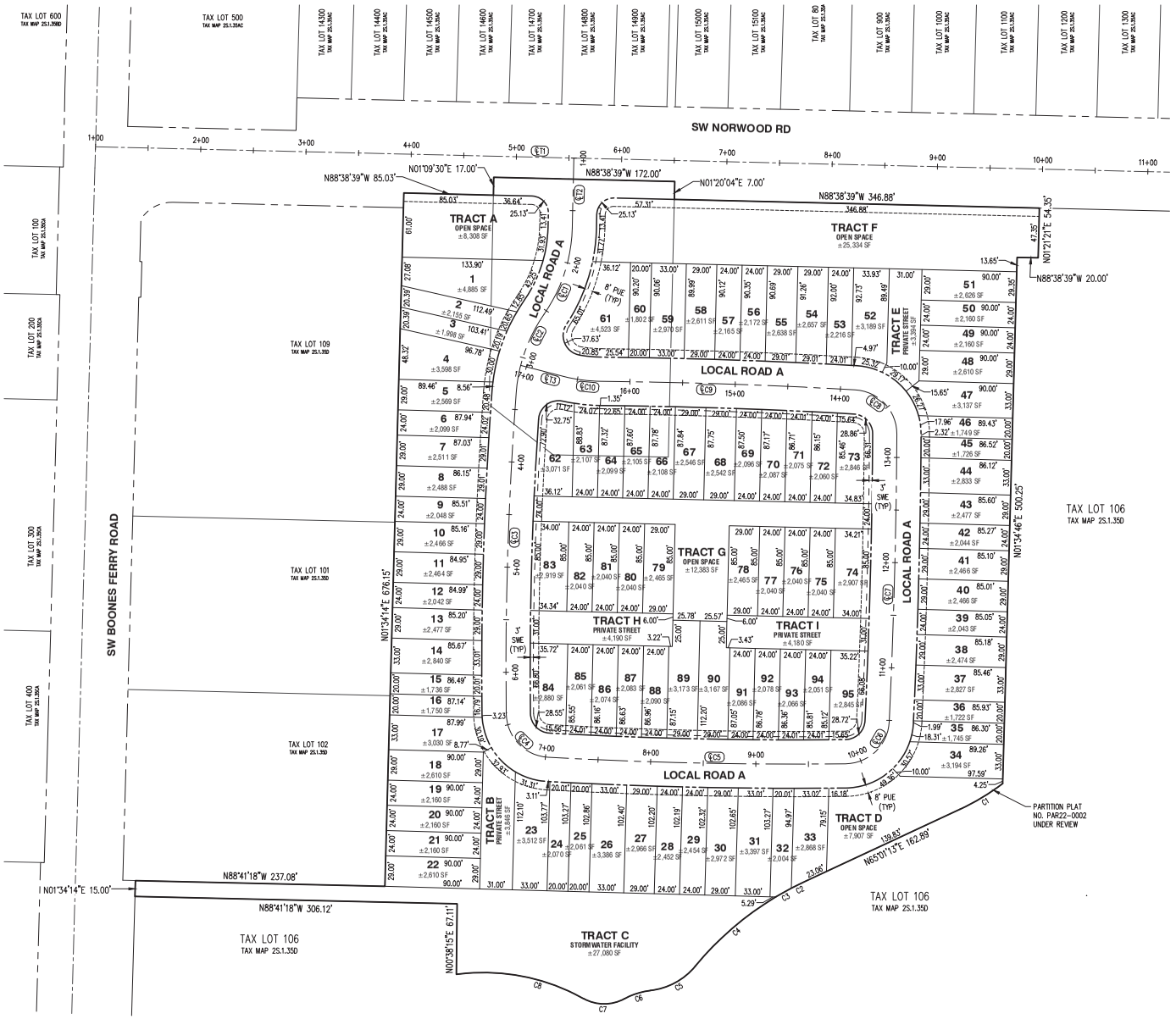
Key findings of this study include:

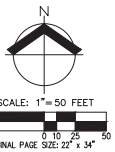
- Based on a review of the most recent five years of available crash data, no significant trends or crash patterns were identified. Accordingly, no safety mitigation is recommended per the crash data analysis.
- Sight distance requirements are met to the east and west of the proposed site access.
- The site proposal will meet the Washington County access spacing of 100 feet for SW Norwood Road.
- Left-turn lane warrants are not projected to be met at the proposed site access intersection for either peak hour under the 2028 buildout scenario.
- The preliminary signal warrant analysis shows that the intersection of SW Boones Ferry Road & SW Norwood Road does not meet signal warrants with the existing lane configurations under any analysis scenario. Accordingly, no signalization of any of the study intersections is necessary or recommended as part of this application.
- All study intersections are expected to operate within jurisdictional standards under all analysis scenarios with a two-lane cross-section on SW Norwood Road.
- Queuing analysis results show that the 95th percentile queues at both of the study intersections are anticipated to provide adequate vehicle storage space that does not inhibit safe and expeditious travel under all scenarios.

Appendix A – Site Information

Site Plan

Trip Generation Calculations





SW NORWOOD ROAD ALIGNMENT TABLE						
CURVE/ TANGENT	STATION	RADIUS	LENGTH	DELTA	CHORD	TANGENT/CHORD BEARING
℄T1	1+00.00		2892.61'			S88°38'39"E

LOCAL RD A ALIGNMENT TABLE						
CURVE/ TANGENT	STATION	RADIUS	LENGTH	DELTA	CHORD	TANGENT/CHORD BEARING
℄T2	1+00.00		66.41'			S01°21'21"W
℄C1	1+66.41	150.00'	87.62'	33°28'01"	86.38	S18°05'22"W
℄C2	2+54.02	150.00'	79.99'	30°33'14"	79.05	S19°32'45"W
℄C3	3+34.01	3500.00'	305.33'	4°59'54"	305.23	S01°46'11"W
℄C4	6+39.34	42.00'	63.10'	86°05'03"	57.33	S43°46'17"E
℄C5	7+02.44	4200.00'	282.79'	3°51'28"	282.74	S88°44'33"E
℄C6	9+85.24	42.00'	63.48'	86°35'38"	57.61	N46°01'54"E
℄C7	10+48.71	6500.00'	273.36'	2°24'35"	273.34	N01°31'48"E
℄C8	13+22.08	42.00'	63.79'	87°01'12"	57.83	N43°11'05"W
℄C9	13+85.87	5000.00'	241.43'	2°46'00"	241.40	N88°04'41"W
℄C10	16+27.29	150.00'	36.04'	13°45'55"	35.95	N82°34'43"W
℄T3	16+63.33		42.24'			N75°41'45"W

TRACT NOTES:

TRACT A: OPEN SPACE AREA TO BE OWNED AND MAINTAINED BY THE NORWOOD HOA.

TRACT B: PRIVATE STREET TO THE BENEFIT OF THE LOTS 18-22.

TRACT C: STORMWATER FACILITY TO BE OWNED AND MAINTAINED BY THE CITY OF TUALATIN.

TRACT D: OPEN SPACE AREA TO BE OWNED AND MAINTAINED BY THE NORWOOD HOA.

TRACT E: PRIVATE STREET TO THE BENEFIT OF LOTS 48-51.

TRACT F: OPEN SPACE AREA TO BE OWNED AND MAINTAINED BY THE NORWOOD HOA.

TRACT G: OPEN SPACE AREA TO BE OWNED AND MAINTAINED BY THE NORWOOD HOA.

TRACT H: PRIVATE STREET TO THE BENEFIT OF LOTS 79-89.

TRACT I: PRIVATE STREET TO THE BENEFIT OF LOTS 74-78, 90-95.

ABBREVIATIONS:

PUE: PUBLIC UTILITY EASEMENT

SWE: SIDEWALK EASEMENT

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
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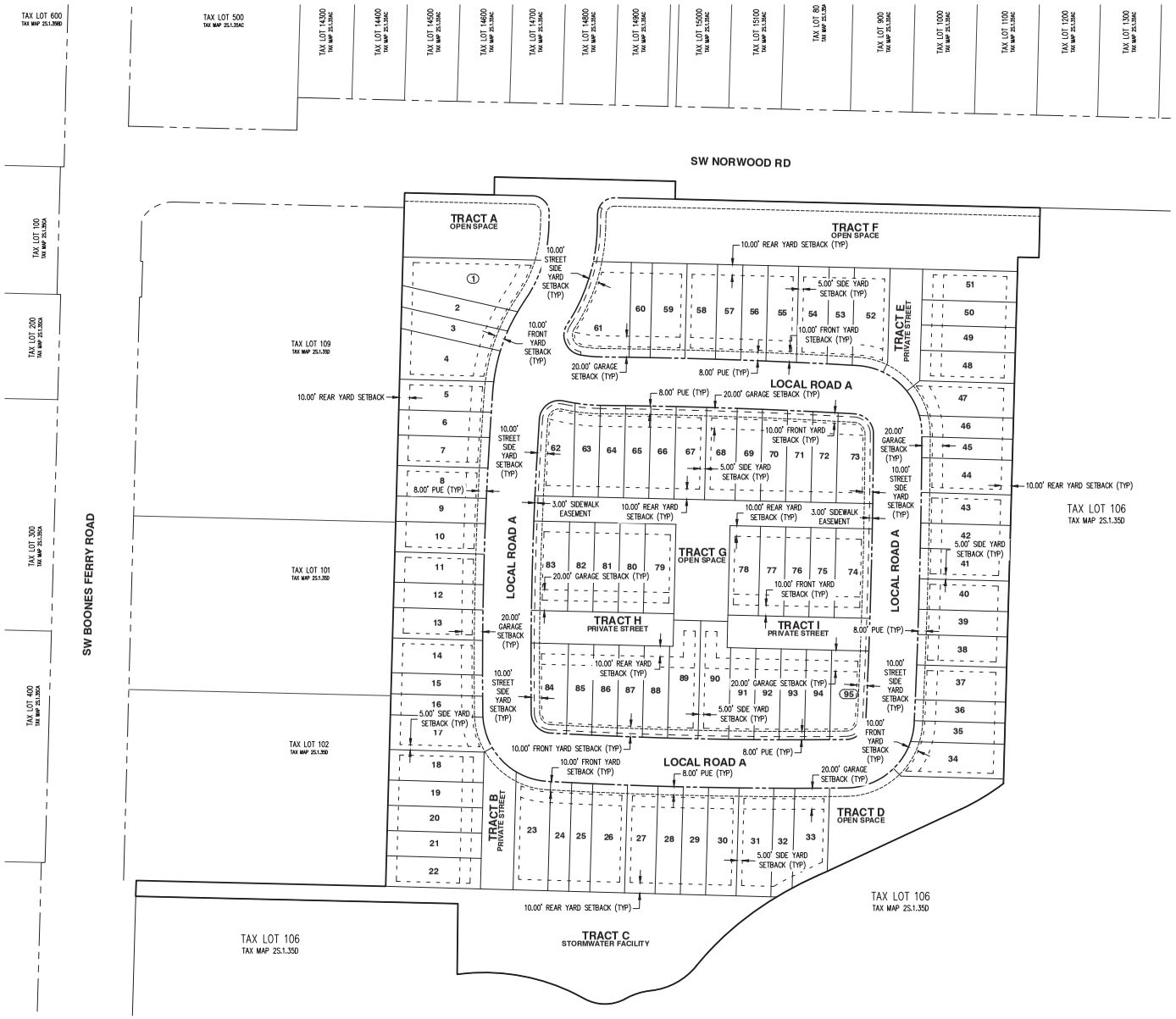
PRELIMINARY PLAT
NORWOOD TOWNHOMES
HEITMAN ALLEN GROUP
OREGON

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 12, 2016
MARKO SIMIC
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/26

JOB NUMBER:	8723-04
DATE:	05/15/2025
DESIGNED BY:	JSM
DRAWN BY:	LKI
CHECKED BY:	DS

PP-01

AKS DRAWING FILE: 8723-04 PRELIM PLAT.DWG | LAYOUT: PP-01



SCALE: 1" = 50 FEET
50 0 10 25 50
ORIGINAL PAGE SIZE: 22" x 34"

SINGLE FAMILY ATTACHED TOWNHOME SETBACKS

FRONT YARD:	10FT
GARAGE:	20FT
SIDE YARD:	5FT
STREET SIDE YARD:	10FT
REAR YARD:	10FT

ATTACHED UNIT SETBACKS TO BE DETERMINED THROUGH SUBSEQUENT ARCHITECTURAL REVIEW APPLICATION.

AKS ENGINEERING & FORESTRY, LLC
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PRELIMINARY SETBACK PLAN
NORWOOD TOWNHOMES
HEITMAN ALLEN GROUP
OREGON

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 12, 2010
CHARLES D. SIMS
PRELIMINARY NOT FOR CONSTRUCTION
RENEWAL DATE: 6/30/26

JOB NUMBER:	8723-04
DATE:	05/15/2025
DESIGNED BY:	JSM
DRAWN BY:	LKI
CHECKED BY:	DS

SB-01

AKS DRAWING FILE: 8723-04 PRELIM SETBACK.DWG | LAYOUT: LAYOUT1

PRELIMINARY STREET PLAN
NORWOOD TOWNHOMES
HEITMAN ALLEN GROUP
OREGON

JOB NUMBER:	8723-04
DATE:	05/15/2025
DESIGNED BY:	JSM
DRAWN BY:	LKI
CHECKED BY:	DS

SP-01

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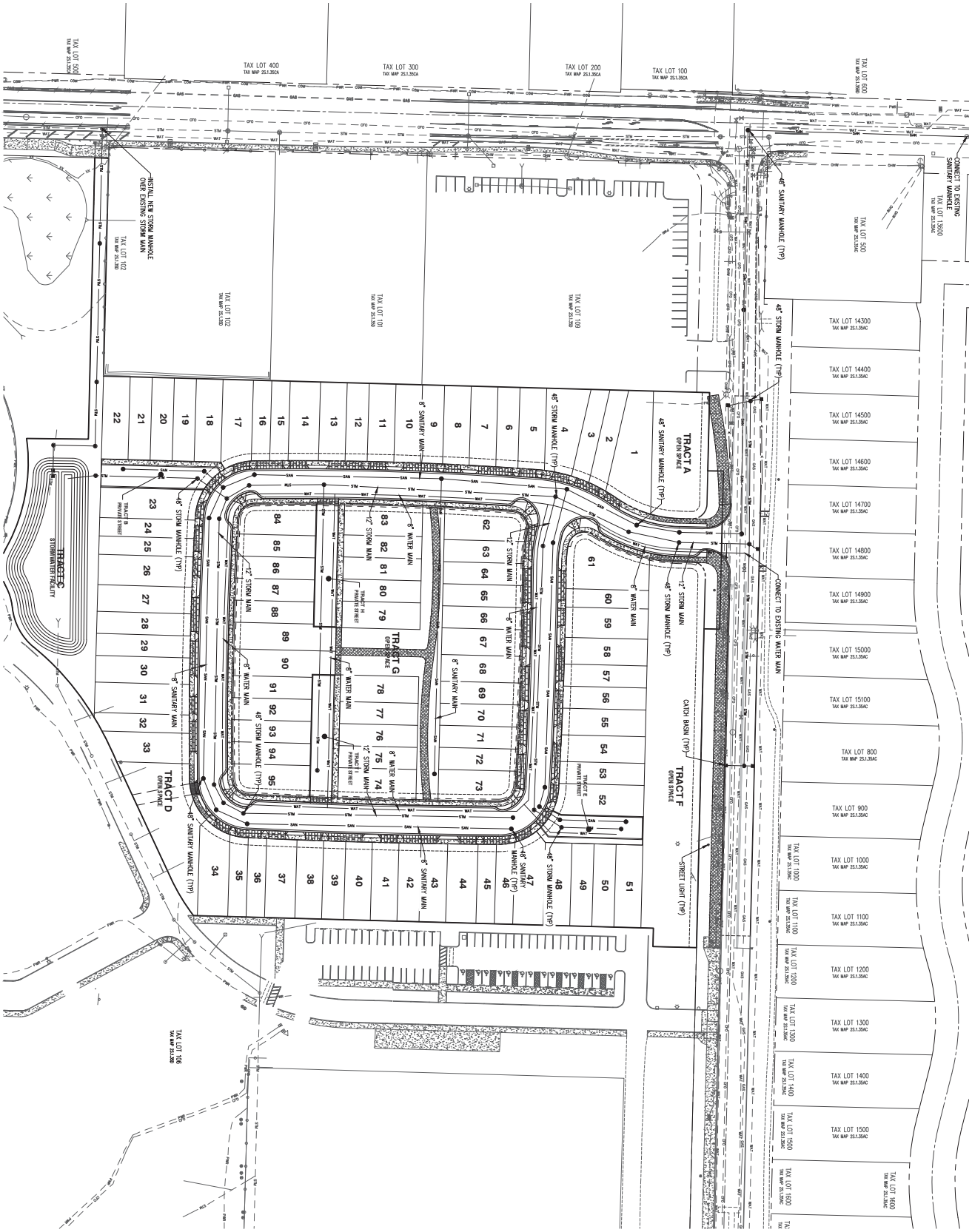

PRELIMINARY COMPOSITE UTILITY PLAN
NORWOOD TOWNHOMES
HEITMAN ALLEN GROUP
OREGON

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FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

CU-01

JOB NUMBER:	8723-04
DATE:	06/15/2025
DESIGNED BY:	GSM
DRAWN BY:	LMI
CHECKED BY:	DS

RENEWAL DATE: 6/30/26

REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY
NOT FOR CONSTRUCTION
OREGON JULY 12, 2011
CHRISTOPHER D. SIMAC

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

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	2

WARNING: Variable Quantity is less than Minimum Survey Size for Peak Hours

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	26%	74%	
Trip Ends	0	1	1

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	1	1	2

WEEKDAY

Trip Rate: 9.43

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	9	9	18

SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	9	9	18

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

Land Use:	Single-Family Attached Housing
Land Use Code:	215
Land Use Subcategory:	All Sites
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Trip Type:	Vehicle
Formula Type:	Rate
Variable Quantity:	95

AM PEAK HOUR

Trip Rate: 0.48

	Enter	Exit	Total
Directional Split	31%	69%	
Trip Ends	14	32	46

PM PEAK HOUR

Trip Rate: 0.57

	Enter	Exit	Total
Directional Split	57%	43%	
Trip Ends	31	23	54

WEEKDAY

Trip Rate: 7.2

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	342	342	684

SATURDAY

Trip Rate: 8.76

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	416	416	832

Appendix B – Volumes

Traffic Counts

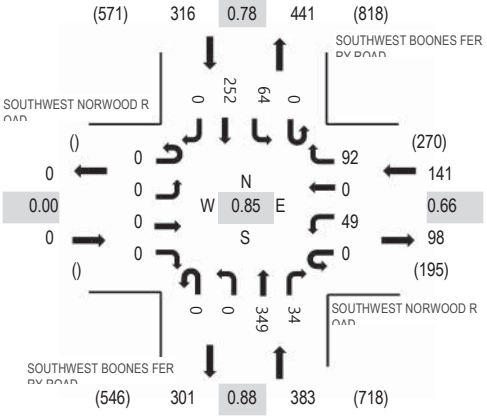
In-Process Trips

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

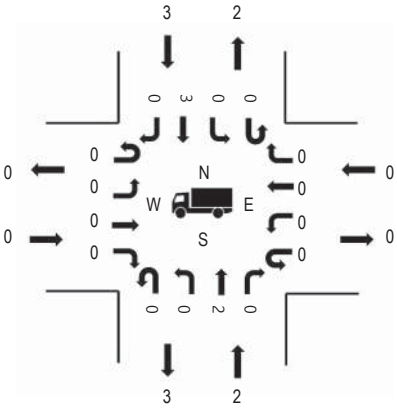
Location: 1 SOUTHWEST BOONES FERRY ROAD & SOUTHWEST NORWOOD ROAD AM
Date: Wednesday, May 29, 2024
Peak Hour: 07:45 AM - 08:45 AM
Peak 15-Minutes: 07:50 AM - 08:05 AM

Peak Hour

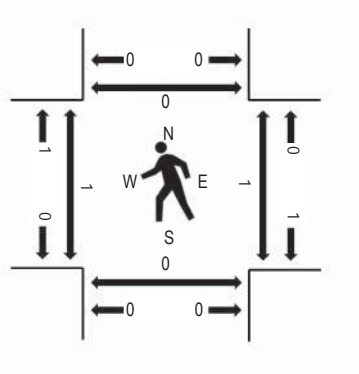
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	0.0%	0.66
NB	0.5%	0.88
SB	0.9%	0.78
All	0.6%	0.85

Traffic Counts - Motorized Vehicles

Interval Start Time	SOUTHWEST NORWOOD ROAD Eastbound				SOUTHWEST NORWOOD ROAD Westbound				SOUTHWEST BOONES FERRY ROAD Northbound				SOUTHWEST BOONES FERRY ROAD Southbound					Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total	
7:00 AM	0	0	0	0	0	6	0	6	0	0	23	4	0	3	14	0	56	761
7:05 AM	0	0	0	0	0	2	0	0	0	0	25	4	0	7	15	0	53	775
7:10 AM	0	0	0	0	0	5	0	4	0	0	16	6	0	6	16	0	53	790
7:15 AM	0	0	0	0	0	0	0	3	0	0	29	3	0	4	17	0	56	799
7:20 AM	0	0	0	0	0	2	0	4	0	0	23	5	0	7	16	0	57	809
7:25 AM	0	0	0	0	0	3	0	7	0	0	25	4	0	4	22	0	65	819
7:30 AM	0	0	0	0	0	5	0	6	0	0	36	1	0	9	13	0	70	814
7:35 AM	0	0	0	0	0	4	0	4	0	0	28	2	0	2	14	0	54	810
7:40 AM	0	0	0	0	0	0	0	7	0	0	23	1	0	4	22	0	57	837
7:45 AM	0	0	0	0	0	2	0	6	0	0	28	0	0	4	24	0	64	840
7:50 AM	0	0	0	0	0	7	0	7	0	0	30	1	0	7	32	0	84	836
7:55 AM	0	0	0	0	0	8	0	12	0	0	36	2	0	7	27	0	92	819
8:00 AM	0	0	0	0	0	3	0	6	0	0	35	5	0	5	16	0	70	798
8:05 AM	0	0	0	0	0	4	0	5	0	0	24	3	0	7	25	0	68	
8:10 AM	0	0	0	0	0	6	0	4	0	0	25	5	0	3	19	0	62	
8:15 AM	0	0	0	0	0	2	0	11	0	0	28	0	0	6	19	0	66	
8:20 AM	0	0	0	0	0	6	0	9	0	0	31	4	0	5	12	0	67	
8:25 AM	0	0	0	0	0	6	0	6	0	0	26	4	0	6	12	0	60	
8:30 AM	0	0	0	0	0	2	0	8	0	0	33	2	0	3	18	0	66	
8:35 AM	0	0	0	0	0	3	0	10	0	0	33	5	0	7	23	0	81	
8:40 AM	0	0	0	0	0	0	0	8	0	0	20	3	0	4	25	0	60	
8:45 AM	0	0	0	0	0	5	0	16	0	0	21	6	0	1	11	0	60	
8:50 AM	0	0	0	0	0	6	0	11	0	0	25	3	0	3	19	0	67	
8:55 AM	0	0	0	0	0	7	0	16	0	0	19	3	0	5	21	0	71	
Count Total	0	0	0	0	0	94	0	176	0	0	642	76	0	119	452	0	1,559	
Peak Hour	0	0	0	0	0	49	0	92	0	0	349	34	0	64	252	0	840	

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	0	0	0	0	0	7:00 AM	0	0	0	1	1	7:00 AM	0	0	0	0	0
7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	1	1	7:30 AM	0	0	0	0	0
7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	1	1	7:35 AM	0	1	0	0	1
7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	0	0	1	1	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	2	0	0	2	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0	8:00 AM	1	0	0	0	1
8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	1	1	8:05 AM	0	0	0	0	0
8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0	8:10 AM	0	0	1	0	1
8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	2	2	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	1	0	0	1	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	1	1	8:55 AM	0	0	0	0	0
Count Total	0	3	0	3	6	Count Total	0	0	0	5	5	Count Total	1	1	1	0	3
Peak Hour	0	2	0	3	5	Peak Hour	0	0	0	1	1	Peak Hour	1	0	1	0	2

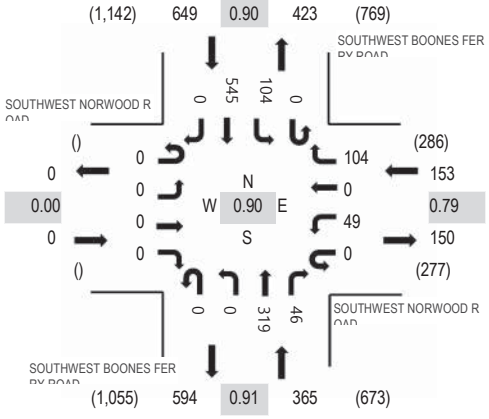
ALL TRAFFIC DATA SERVICES

(303) 216-2439
www.alltrafficdata.net

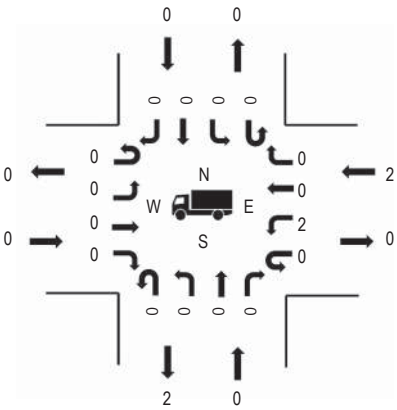
Location: 1 SOUTHWEST BOONES FERRY ROAD & SOUTHWEST NORWOOD ROAD PM
Date: Wednesday, May 29, 2024
Peak Hour: 04:05 PM - 05:05 PM
Peak 15-Minutes: 04:35 PM - 04:50 PM

Peak Hour

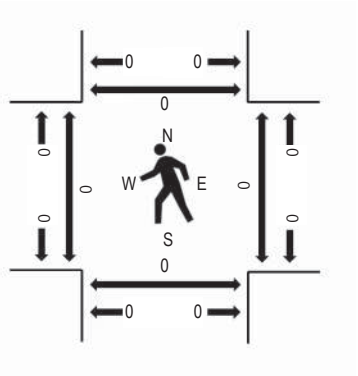
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	1.3%	0.79
NB	0.0%	0.91
SB	0.0%	0.90
All	0.2%	0.90

Traffic Counts - Motorized Vehicles

Interval Start Time	SOUTHWEST NORWOOD ROAD Eastbound				SOUTHWEST NORWOOD ROAD Westbound				SOUTHWEST BOONES FERRY ROAD Northbound				SOUTHWEST BOONES FERRY ROAD 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	0	0	0	3	0	3	0	0	11	5	0	11	51	0	84	1,154
4:05 PM	0	0	0	0	0	4	0	8	0	0	18	4	0	14	55	0	103	1,167
4:10 PM	0	0	0	0	0	6	0	5	0	0	28	8	0	9	44	0	100	1,153
4:15 PM	0	0	0	0	0	5	0	10	0	0	21	5	0	5	44	0	90	1,156
4:20 PM	0	0	0	0	0	3	0	10	0	0	24	1	0	11	57	0	106	1,145
4:25 PM	0	0	0	0	0	5	0	5	0	0	21	6	0	13	35	0	85	1,128
4:30 PM	0	0	0	0	0	4	0	13	0	0	29	1	0	5	47	0	99	1,117
4:35 PM	0	0	0	0	0	5	0	11	0	0	29	4	0	6	52	0	107	1,081
4:40 PM	0	0	0	0	0	6	0	11	0	0	30	2	0	10	55	0	114	1,052
4:45 PM	0	0	0	0	0	2	0	10	0	0	31	5	0	10	45	0	103	1,007
4:50 PM	0	0	0	0	0	1	0	7	0	0	25	5	0	5	37	0	80	973
4:55 PM	0	0	0	0	0	6	0	6	0	0	28	4	0	6	33	0	83	964
5:00 PM	0	0	0	0	0	2	0	8	0	0	35	1	0	10	41	0	97	947
5:05 PM	0	0	0	0	0	1	0	14	0	0	23	5	0	3	43	0	89	
5:10 PM	0	0	0	0	0	2	0	11	0	0	35	7	0	8	40	0	103	
5:15 PM	0	0	0	0	0	4	0	3	0	0	28	7	0	4	33	0	79	
5:20 PM	0	0	0	0	0	6	0	12	0	0	20	4	0	5	42	0	89	
5:25 PM	0	0	0	0	0	2	0	5	0	0	22	4	0	9	32	0	74	
5:30 PM	0	0	0	0	0	4	0	7	0	0	14	6	0	7	25	0	63	
5:35 PM	0	0	0	0	0	3	0	5	0	0	23	2	0	6	39	0	78	
5:40 PM	0	0	0	0	0	4	0	5	0	0	21	0	0	8	31	0	69	
5:45 PM	0	0	0	0	0	2	0	10	0	0	16	5	0	5	31	0	69	
5:50 PM	0	0	0	0	0	7	0	5	0	0	25	3	0	4	27	0	71	
5:55 PM	0	0	0	0	0	6	0	9	0	0	19	3	0	6	23	0	66	
Count Total	0	0	0	0	0	93	0	193	0	0	576	97	0	180	962	0	2,101	
Peak Hour	0	0	0	0	0	49	0	104	0	0	319	46	0	104	545	0	1,167	

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	0	0	0	0	0	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	1	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	1	0	1	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	1	0	0	1	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	1	1	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0	5:00 PM	0	0	2	0	2	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	1	0	0	1	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	2	0	0	2	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	2	2	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	2	0	0	0	2
5:45 PM	0	0	0	0	0	5:45 PM	0	1	0	0	1	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	1	0	1	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	0	0	2	0	2	Count Total	0	5	3	3	11	Count Total	2	0	0	0	2
Peak Hour	0	0	2	0	2	Peak Hour	0	1	2	1	4	Peak Hour	0	0	0	0	0

Site Trips

The proposed development includes the construction of 320 detached home lots and 80 attached home lots. A supplemental memorandum addressing potential development of the commercial parcels abutting SW Boones Ferry Road is included in Appendix E. This memorandum includes trip generation for several potential commercial development scenarios of different intensities.

Trip Generation

To estimate trips that will be generated by the redevelopment, trip equations from the *Trip Generation Manual*[1] were used based on the number of dwelling units (DU). Land Use 210 – *Single-Family Detach Housing* was applied to the 320 detached units in the site while Land Use 220 – *Multifamily Housing (Low-Rise)* was applied to the 80 attached units.

As shown in Table 3, the trip generation calculations show that the proposed Autumn Sunrise Subdivision is estimated to generate 271 trips during the morning peak hour, 358 trips during the evening peak hour, and 3,596 daily trips during the average weekday.

Table 3: Trip Generation Summary

ITE Code	Intensity (DU)	Morning Peak Hour			Evening Peak Hour			Daily Trips
		In	Out	Total	In	Out	Total	
Single-Family Detached Housing	320	58	174	232	195	115	310	3,032
Multifamily Housing (Low-Rise)	80	9	30	39	30	18	48	564
Total	400	67	204	271	225	133	358	3,596

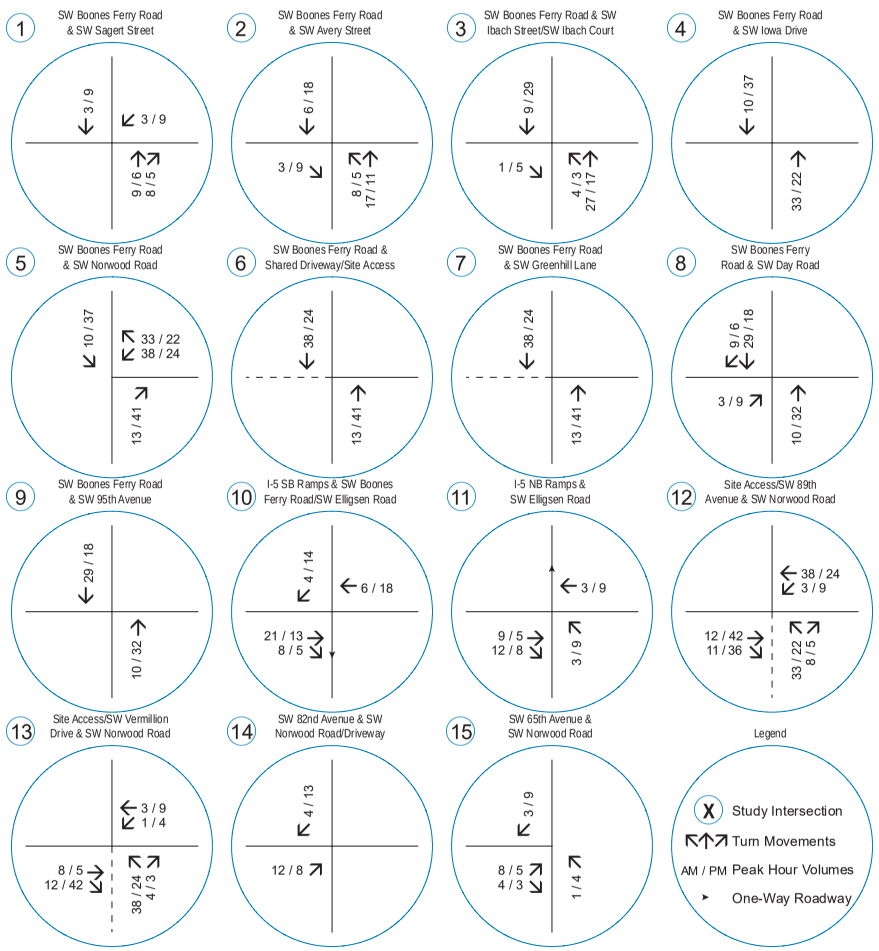
Note: Trip equations were applied for these land uses.

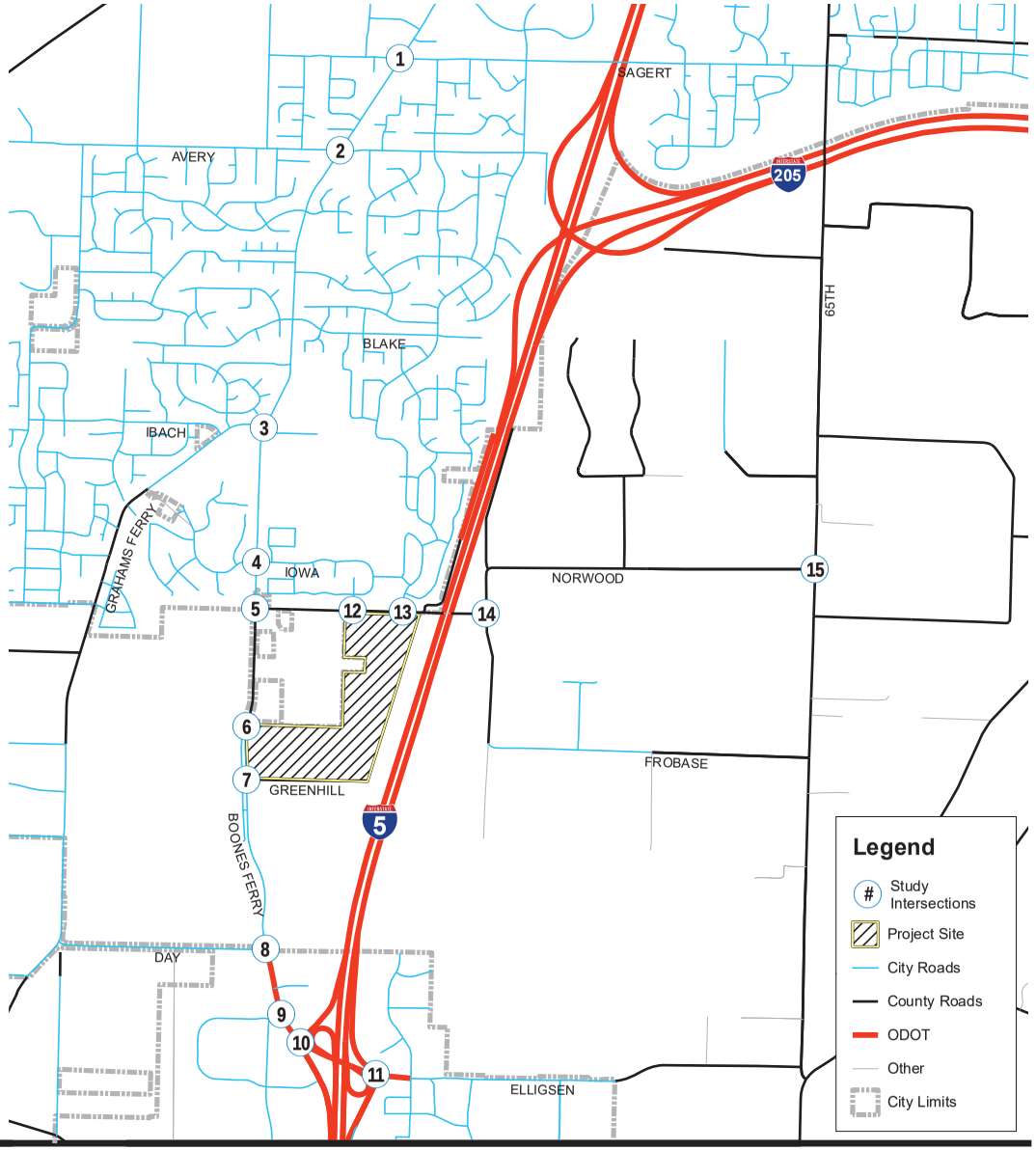
Table 4 presents the number and type of housing units and the trip generation by phase of development. With Phases 1 and 2, all site access will be taken from SW Norwood Road. The site access to SW Boones Ferry Road will be constructed with the completion of Phase 3. Phase 1 is expected to be constructed in year 2023 with each phase completed the subsequent year. Full buildout would occur in year 2026.

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10th Edition, 2017.

Table 4: Trip Generation by Phase

Phase	Intensity (DU)			Morning Peak Hour			Evening Peak Hour			Daily Trips
	Single	Multi	Total	In	Out	Total	In	Out	Total	
1	85	24	109 (27%)	18	55	73	61	36	97	975
2	41	14	55 (14%)	9	28	37	30	18	48	487
3	91	42	133 (33%)	21	65	86	71	42	113	1,158
4	103	0	103 (26%)	19	56	75	63	37	100	976
Subtotal (1-2)	*126*	*38*	*164 (41%)*	*27*	*83*	*110*	*91*	*54*	*145*	*1,462*
Subtotal (1-3)	*217*	*80*	*297 (74%)*	*48*	*148*	*196*	*162*	*96*	*258*	*2,620*
Total (1-4)	320	80	400	67	204	271	225	133	358	3,596





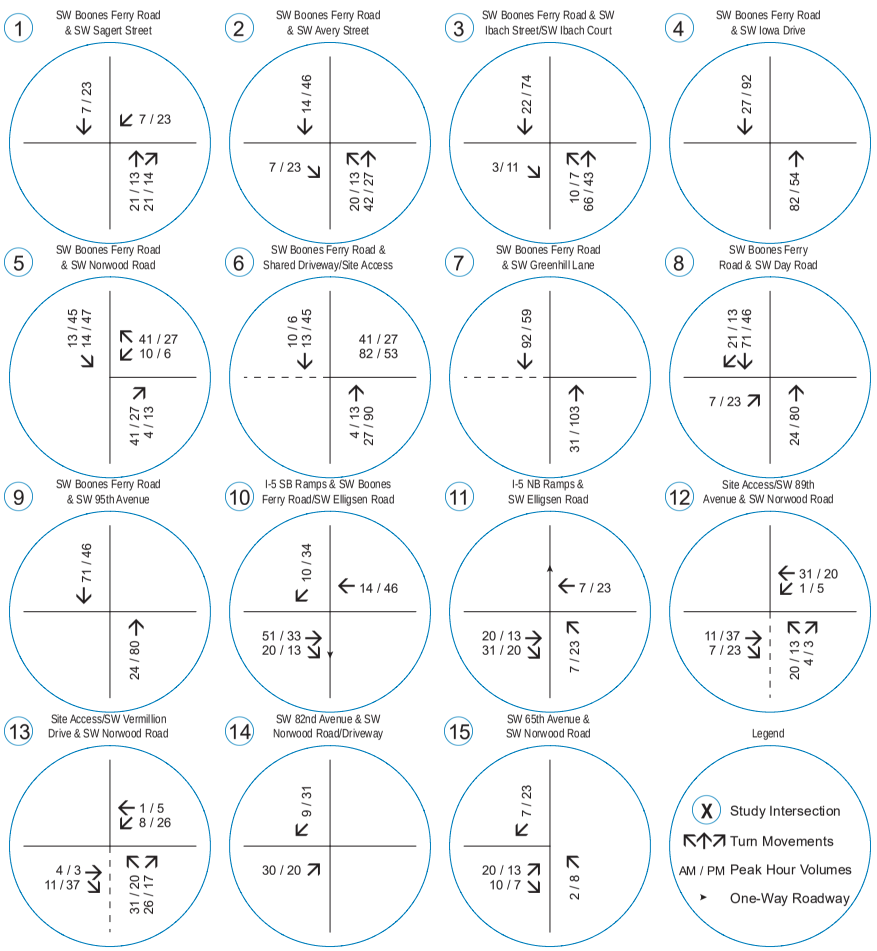
lancaster mobley

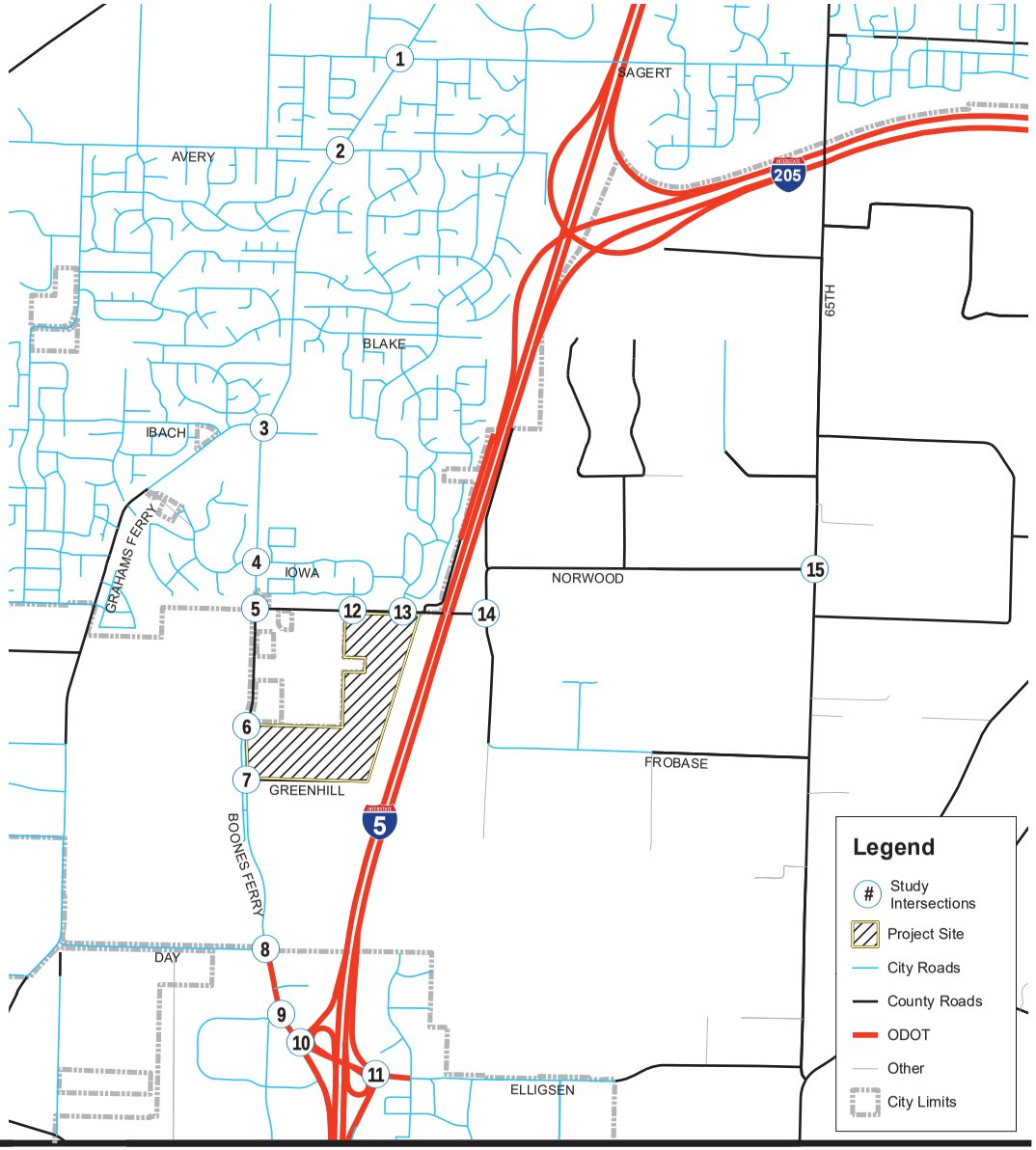
TRAFFIC VOLUMES

Trip Assignment - Phases 1-2

NOT TO SCALE

Figure 3A
Autumn Sunrise Subdivision TIS
6/24/2021





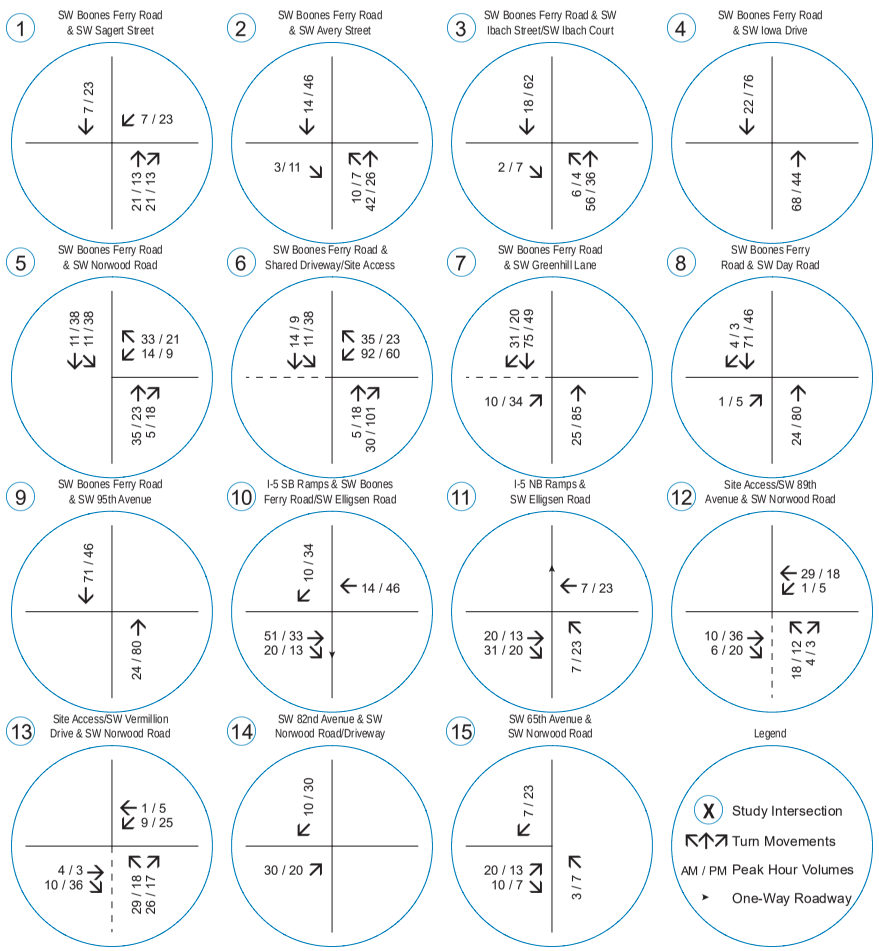
lancaster mobley

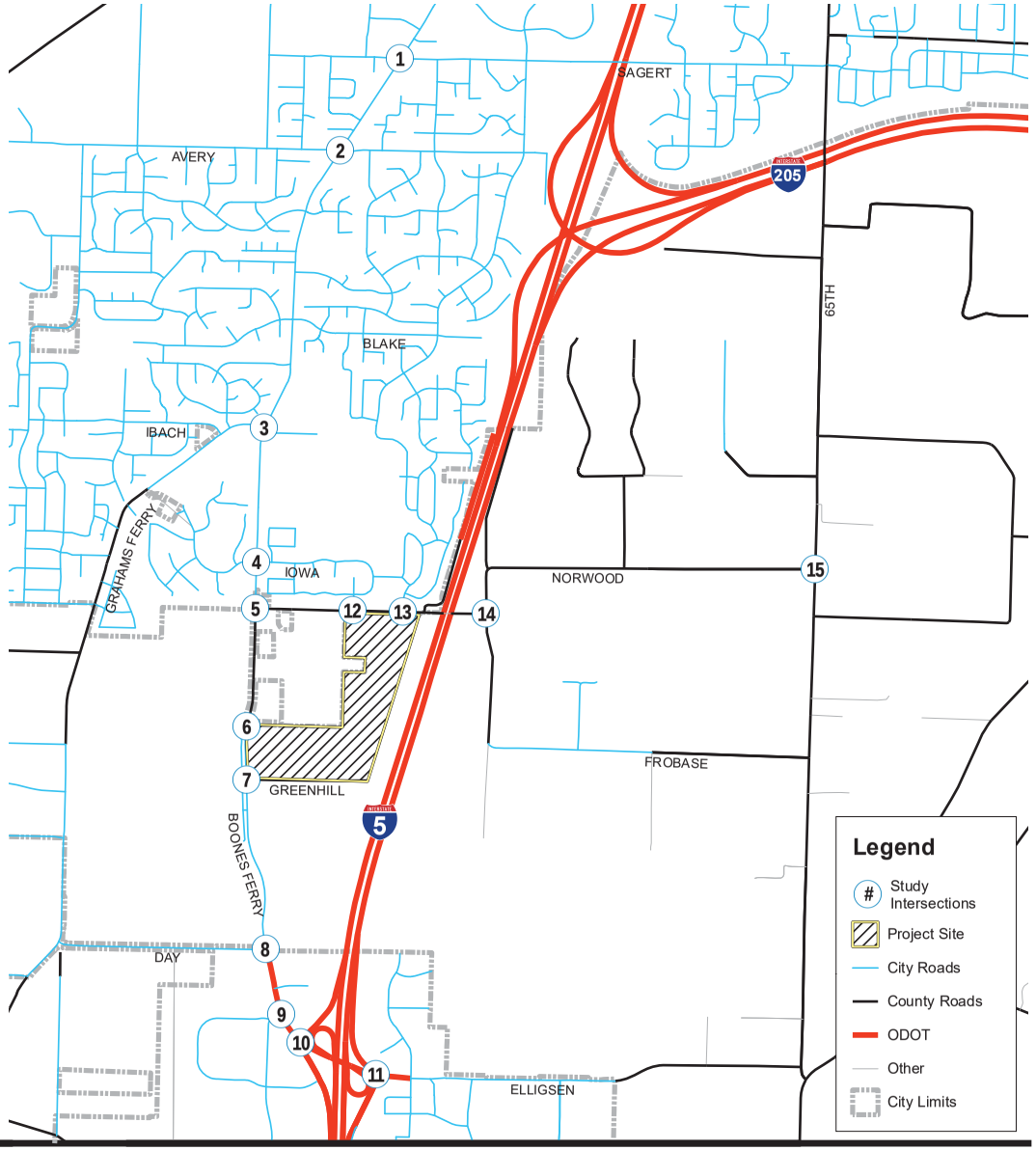
TRAFFIC VOLUMES

Trip Assignment - Phases 1-4

NOT TO SCALE

Figure 3B
Autumn Sunrise Subdivision TIS
6/24/2021





TRAFFIC VOLUMES

Trip Assignment - Phases 1-4 with Basalt Creek Extension

NOT TO SCALE

Figure 3C
Autumn Sunrise Subdivision TIS
6/24/2021

Table 1 Trip Generation Summary

ITE Land Use	Dwelling Units (#)	Weekday						
		ADT	AM Peak Hour			PM Peak Hour		
			Total	Enter	Exit	Total	Enter	Exit
Mid-Rise Housing (#221)	116							
Generation Rate [1]		5.44	0.36	26%	74%	0.44	61%	39%
Site Trips		**631**	**42**	11	31	**51**	31	20

[1] Source: *Trip Generation*, 10th Edition, ITE, 2017, average rates.

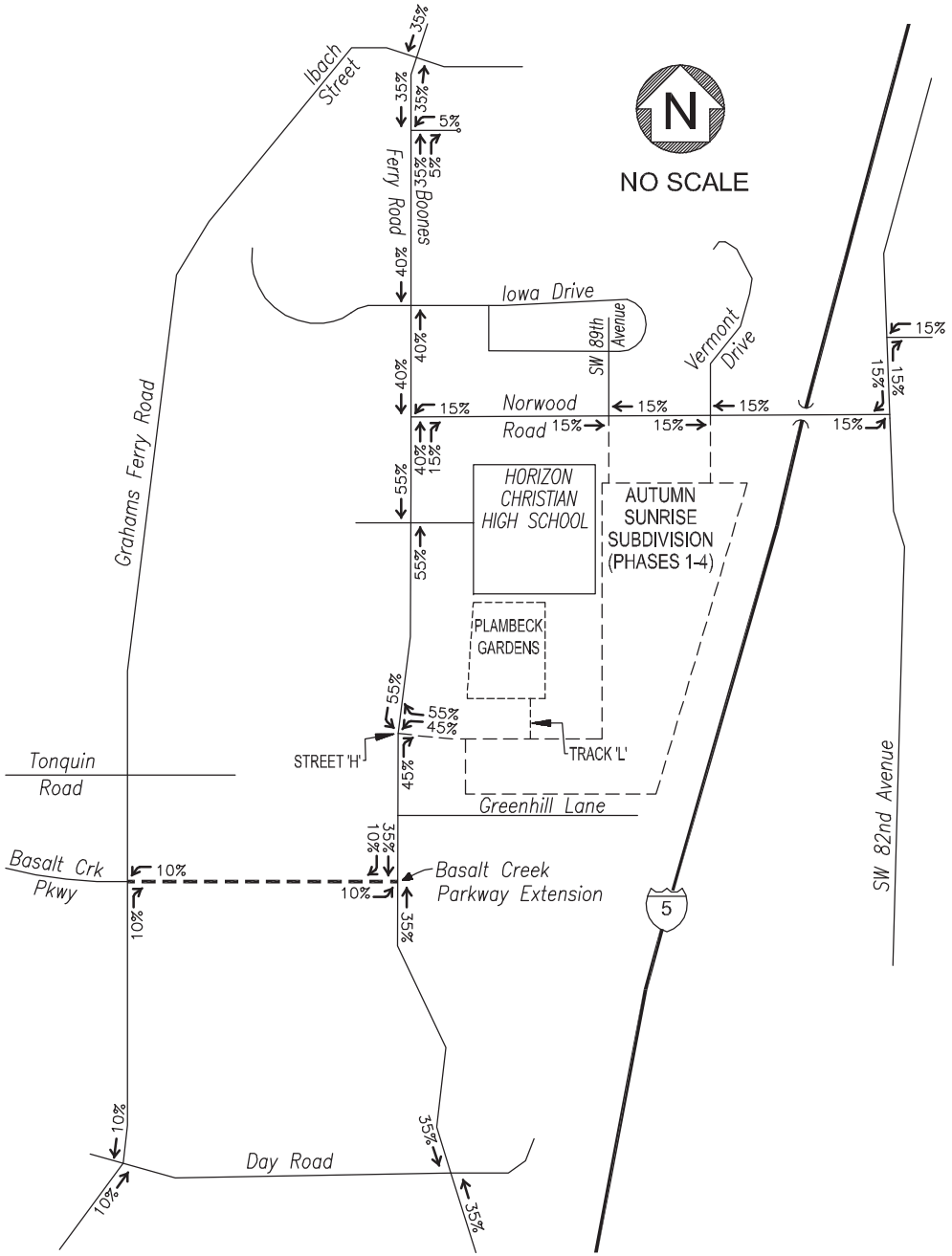
Two existing homes are located on the property site and will be demolished in conjunction with the proposed development. Trip credits totaling 19 daily trips, one AM trip, and two PM trips will result in a net trip generation of 612 daily trips, 41 AM peak hour trips, and 49 PM peak hour trips for Plambeck Gardens.

The Plambeck Gardens trip distribution was based on the existing count data and engineering judgment. This information is presented on Figure 4. The corresponding trip assignments are presented on Figure 5 for the AM & PM peak hours.

CAPACITY ANALYSIS

Capacity analyses were performed to determine the levels of service for the weekday peak hours. Synchro v11.1 software was used to determine the approach delays and level of service for the study intersections. The program is based on the Highway Capacity Manual (6^{th} edition) methodology. Table 2 summarizes the analysis results for the year 2021 existing traffic and for the year 2026 background and total traffic scenarios. Copies of the capacity analysis summaries are included in the appendix.

PLOT DATE: 01.25.22 FILE: 2114flow3.dwg



CHARBONNEAU ENGINEERING LLC

PROJECT: 21-14

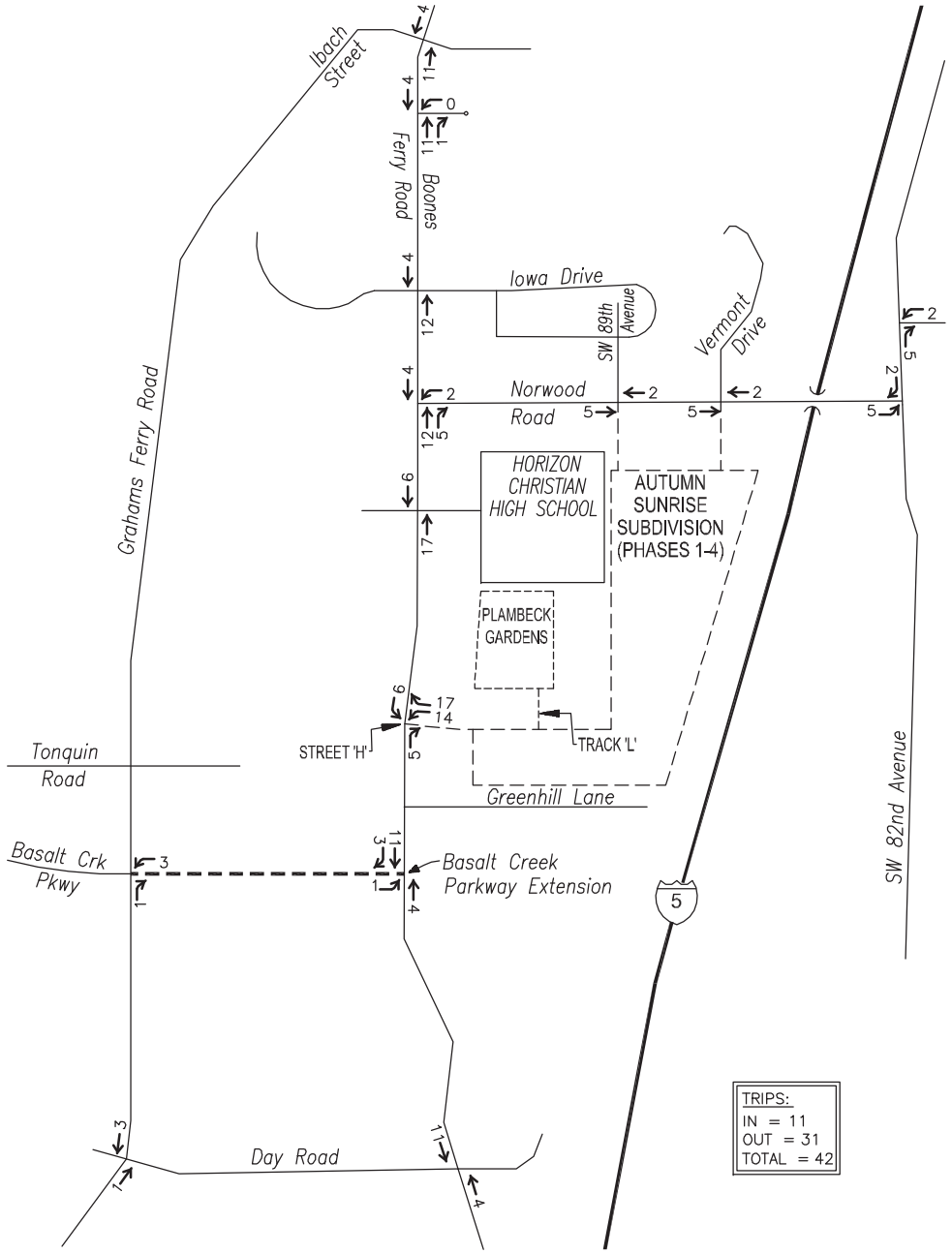
NOTES: The Plambeck Gardens site will take its access from the Autumn Sunrise access to Boones Ferry Road. Trip distribution for Plambeck Gardens is based on engineering judgment.

--- Basalt Creek Pkwy Ext. estimated completion is in Fall 2014.

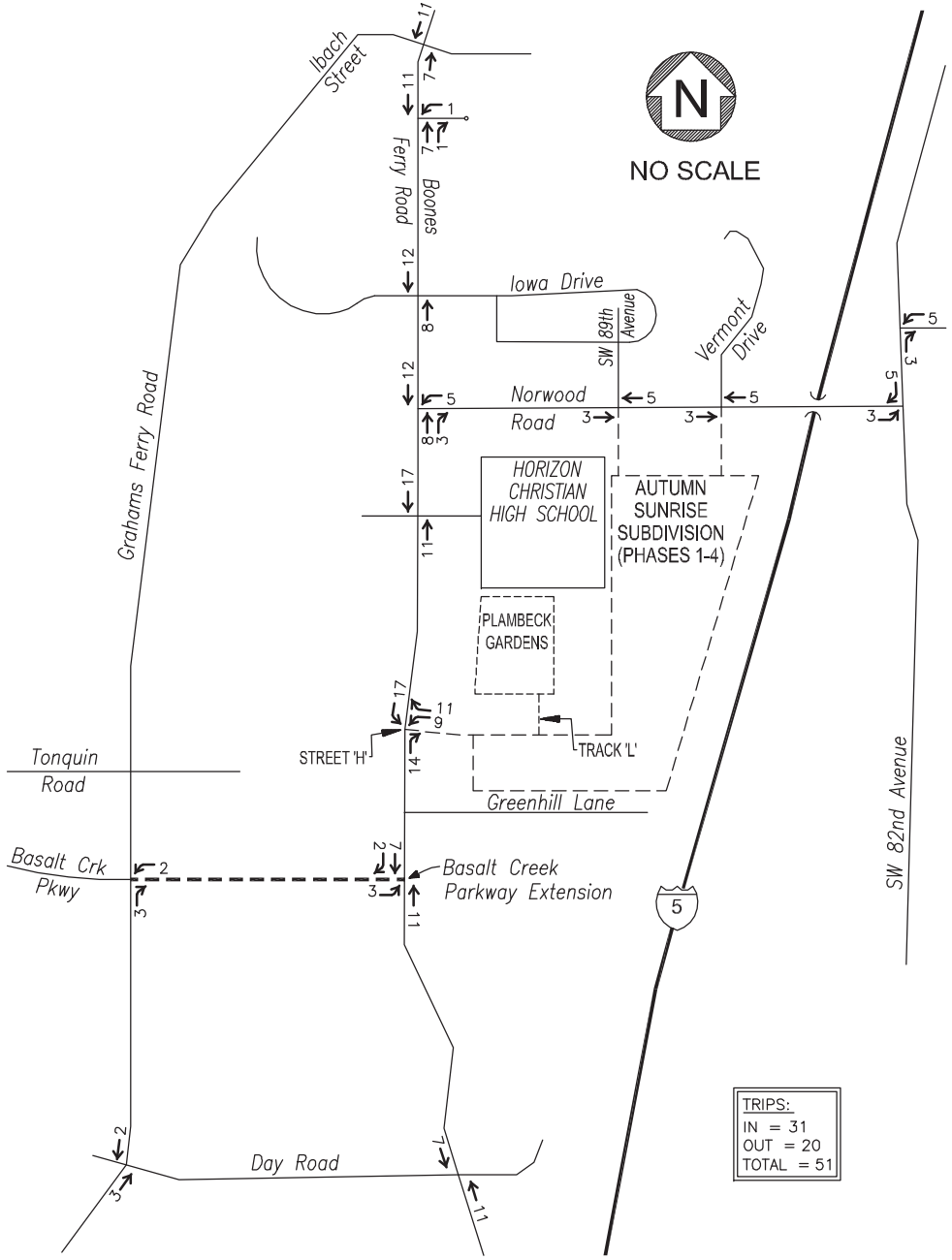
TRIP DISTRIBUTION
AM PEAK HOUR & PM PEAK HOUR
PLAMBECK GARDENS - CPAH

FIGURE 4

PLOT DATE: 01.25.22 FILE: 2114flow3.dwg



AM PEAK HOUR



PM PEAK HOUR

CHARBONNEAU ENGINEERING LLC

PROJECT: 21-14

NOTES: Plambeck Gardens' trip generation was calculated with Mid-Rise Housing (ITE 221) trip rates.

--- Basalt Creek Pkwy Extension estimated completion is in Fall 2014.

TRIP ASSIGNMENT

PLAMBECK GARDENS - CPAH

FIGURE 5

Appendix C - Safety

Crash History Data

Left-Turn Lane Warrant Analysis

Preliminary Signal Warrant Analysis

CITY OF TUALATIN, WASHINGTON COUNTY **BOONES FERRY RD and NORWOOD RD, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023**

1 - 5 of 8 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L C	M J U G S	S I N V	W C H L	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
04147	Y	Y	N	N	N	N	11/11/2020	16	SW BOONES FERRY RD	INTER	3-LEG	N	N	CLR	ANGL-STP	01	NONE 9	TURN-R											30,08
CITY							WE	0	SW NORWOOD RD	E		UNKNOWN	N	DRY	TURN		N/A	S -E									000		00
N							1P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 13.25	-122 46 29.07																UNK					
																02	NONE 9	STOP											
																	N/A	E -W									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
04164	N	N	N	N			11/13/2020	16	SW BOONES FERRY RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											02,03
NONE							FR	0	SW NORWOOD RD	CN		STOP SIGN	N	WET	TURN		N/A	S -N									000		00
N							6A			02	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 13.25	-122 46 29.07																UNK					
																02	NONE 9	TURN-L											
																	N/A	E -S									000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
~~04196~~	~~N~~	~~N~~	~~N~~	~~N~~	~~N~~	~~N~~	~~10/06/2021~~	~~16~~	~~SW BOONES FERRY RD~~	~~ALLEY~~		~~N~~	~~N~~	~~CLD~~	~~ANGL-OTH~~	~~01~~	~~NONE 9~~	~~TURN-L~~											~~02~~
~~STATE~~							~~WE~~	~~565~~	~~SW NORWOOD RD~~	~~S~~	~~(NONE)~~	~~UNKNOWN~~	~~N~~	~~WET~~	~~TURN~~		~~N/A~~	~~E -S~~									~~018~~		~~00~~
~~N~~							~~4P~~			~~08~~			~~N~~	~~DAY~~	~~PDO~~		~~PSNGR CAR~~		~~01~~	~~DRVR~~	~~NONE~~	~~00~~	~~Unk~~	~~UNK~~		~~000~~	~~000~~		~~00~~
~~N~~							~~45 21 3.95~~	~~-122 46 29.05~~			~~(02)~~													~~UNK~~					
																~~02~~	~~NONE 9~~	~~STRGHT~~											
																	~~N/A~~	~~S -N~~									~~000~~		~~00~~
																	~~PSNGR CAR~~		~~01~~	~~DRVR~~	~~NONE~~	~~00~~	~~Unk~~	~~UNK~~		~~000~~	~~000~~		~~00~~
																								~~UNK~~					
~~03359~~	~~N~~	~~N~~	~~N~~	~~N~~			~~07/07/2023~~	~~16~~	~~SW BOONES FERRY RD~~	~~ALLEY~~		~~N~~	~~N~~	~~CLR~~	~~ANGL-OTH~~	~~01~~	~~NONE 9~~	~~BACK~~										~~129,130~~	~~06,02~~
~~NONE~~							~~FR~~	~~1609~~	~~SW NORWOOD RD~~	~~S~~	~~(NONE)~~	~~UNKNOWN~~	~~N~~	~~DRY~~	~~BACK~~		~~N/A~~	~~E -W~~									~~018~~		~~00~~
~~N~~							~~3P~~			~~07~~			~~N~~	~~DAY~~	~~PDO~~		~~PSNGR CAR~~		~~01~~	~~DRVR~~	~~NONE~~	~~00~~	~~Unk~~	~~UNK~~		~~000~~	~~000~~		~~00~~
~~N~~							~~45 20 57.13~~	~~-122 46 30.03~~			~~(02)~~													~~UNK~~					
																~~02~~	~~NONE 9~~	~~STRGHT~~											
																	~~N/A~~	~~S -N~~									~~000~~		~~00~~
																	~~PSNGR CAR~~		~~01~~	~~DRVR~~	~~NONE~~	~~00~~	~~Unk~~	~~UNK~~		~~000~~	~~000~~		~~00~~
																								UNK					
~~06174~~	~~N~~	~~N~~	~~N~~	~~N~~	~~N~~	~~N~~	~~11/29/2023~~	~~17~~	~~SW NORWOOD RD~~	~~STRGHT~~		~~N~~	~~N~~	~~CLR~~	~~PED~~	~~01~~	~~NONE 0~~	~~STRGHT~~											~~18,19~~
~~CITY~~							~~WE~~	~~300~~	~~SW BOONES FERRY RD~~	~~E~~	~~(NONE)~~	~~NONE~~	~~N~~	~~DRY~~	~~PED~~		~~PRVTE~~	~~E -W~~									~~000~~		~~00~~
~~N~~							~~5P~~			~~08~~			~~N~~	~~DARK~~	~~INJ~~		~~PSNGR CAR~~		~~01~~	~~DRVR~~	~~NONE~~	~~47~~	~~M~~	~~OR-Y~~		~~000~~	~~000~~		~~00~~
~~N~~							~~45 21 13.26~~	~~-122 46 24.5~~			~~(02)~~													~~OR<25~~					
																		~~STRGHT~~	~~01~~	~~CONV~~	~~INJB~~	~~24~~	~~M~~		~~ROAD~~	~~071~~	~~046~~		~~18,19~~
																		~~E W~~											

Not at intersection

Not at intersection

Not at intersection

CITY OF TUALATIN, WASHINGTON COUNTY **BOONES FERRY RD and NORWOOD RD, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023**

6 - 8 of 8 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R E C	M J A S	S U L V	W I G L	C N H K	O R	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
02675	N	N	N	N				07/09/2021	16	SW BOONES FERRY RD	STRGHT		Y	N	CLR	S-1STOP	01	NONE 9											29
NONE								FR	25	SW NORWOOD RD	S	(NONE)	UNKNOWN	N	DRY	REAR		N/A		S -N							000		00
N								4P			06			N	DAY	PDO		PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000		00
N								45 21 12.77	-122 46 29.06			(02)												UNK					
																	02	NONE 9		STOP									
																		N/A		S -N							011		00
																		PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					
~~00560~~	~~N~~	~~Y~~	~~N~~	~~N~~				~~01/27/2020~~	~~16~~	~~SW BOONES FERRY RD~~	~~STRGHT~~		~~N~~	~~Y~~	~~CLR~~	~~FIX OBJ~~	~~01~~	~~NONE 0~~		~~STRGHT~~								~~053,121~~	~~10~~
~~NO RPT~~								~~MO~~	~~410~~	~~SW NORWOOD RD~~	~~S~~	~~(NONE)~~	~~UNKNOWN~~	~~N~~	~~WET~~	~~FIX~~		~~PRVTE~~		~~S -N~~							~~000~~	~~053,121~~	~~00~~
~~Y~~								~~2A~~			~~00~~			~~N~~	~~DLIT~~	~~INJ~~		~~PSNGR CAR~~		~~01 DRVR~~	~~INJC~~	~~48~~	~~M~~	~~OR-Y~~		~~081~~	~~000~~		~~10~~
~~N~~								~~45 21 9.07~~	~~-122 46 29.02~~			~~(02)~~												~~OR<25~~					
~~04640~~	~~N~~	~~N~~	~~N~~	~~N~~				~~09/16/2023~~	~~16~~	~~SW BOONES FERRY RD~~	~~STRGHT~~		~~N~~	~~N~~	~~CLR~~	~~S-STRGHT~~	~~01~~	~~NONE 9~~		~~STRGHT~~									~~06~~
~~CITY~~								~~SA~~	~~2325~~	~~SW NORWOOD RD~~	~~S~~	~~(NONE)~~	~~L-TURN REF~~	~~N~~	~~DRY~~	~~SS-O~~		~~N/A~~		~~N -S~~							~~000~~		~~00~~
~~N~~								~~1P~~			~~07~~			~~N~~	~~DAY~~	~~PDO~~		~~PSNGR CAR~~		~~01 DRVR~~	~~NONE~~	~~00~~	~~Unk~~	~~UNK~~		~~000~~	~~000~~		~~00~~
~~N~~								~~45 20 50.23~~	~~-122 46 29.99~~			~~(03)~~												~~UNK~~					
																	~~02~~	~~NONE 9~~		~~STRGHT~~									
																		~~N/A~~		~~N -S~~							~~000~~		~~00~~
																		~~PSNGR CAR~~		~~01 DRVR~~	~~NONE~~	~~00~~	~~Unk~~	~~UNK~~		~~000~~	~~000~~		~~00~~
																								~~UNK~~					

CITY OF TUALATIN, WASHINGTON COUNTY **NORWOOD RD and Intersectional Crashes at NORWOOD RD, City of Tualatin, Washington County, ALL Crashes Severity, ALL Crashes Circumstance, 01/01/2019 to 12/31/2023**

1 - 4 of 4 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	D R A L	M J U G	S I N S	W C H V	O R L 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 / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04147	Y	Y	N	N	N	N	11/11/2020	16	SW BOONES FERRY RD	INTER	3-LEG	N	N	CLR	ANGL-STP	01	NONE 9	TURN-R										30,08
CITY							WE	0	SW NORWOOD RD	E		UNKNOWN	N	DRY	TURN		N/A	S -E									000		00
N							1P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 13.25	-122 46 29.07																UNK				
																02	NONE 9	STOP										
At Intersection																	N/A	E -W									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK				
04164	N	N	N	N			11/13/2020	16	SW BOONES FERRY RD	INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											02,03
NONE							FR	0	SW NORWOOD RD	CN		STOP SIGN	N	WET	TURN		N/A	S -N									000		00
N							6A			02	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N							45 21 13.25	-122 46 29.07																UNK				
																02	NONE 9	TURN-L										
At Intersection																	N/A	E -S									000		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK				
06174	N	N	N	N	N	N	11/29/2023	17	SW NORWOOD RD	STRGHT		N	N	CLR	PED	01	NONE 0	STRGHT											18,19
CITY							WE	300	SW BOONES FERRY RD	E	(NONE)	NONE	N	DRY	PED		PRVTE	E -W									000		00
N							5P			08			N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	47	M	OR-Y		000	000		00
N							45 21 13.26	-122 46 24.5			(02)													OR<25				
																		- STRGHT E W	01	CONV	INJB	24	M		ROAD	071	046		18,19
03705	N	N	N	N			10/11/2020	17	SW NORWOOD RD	STRGHT		N	Y	RAIN	FIX OBJ	01	NONE 0	STRGHT										079,002	27
CITY							SU	50	SW 89TH AVE	W	(NONE)	UNKNOWN	N	WET	FIX		PRVTE	E -W									000	079	00
Y							11A			05			N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	55	F	OR-Y		016,081	038		27
N							45 21 13.31	-122 46 10.63			(02)													OR<25				
																01	NONE 0	STRGHT										
																	PRVTE	E -W									000	079	00
																	PSNGR CAR		02	PSNG	INJA	59	M			000	000	002	00

Left-Turn Lane Warrant Analysis

Project: Norwood Development TIA
Intersection: SW Norwood Road & Site Access
Date: 8/4/2025
Scenario: 2027 Buildout Conditions AM Peak Hour

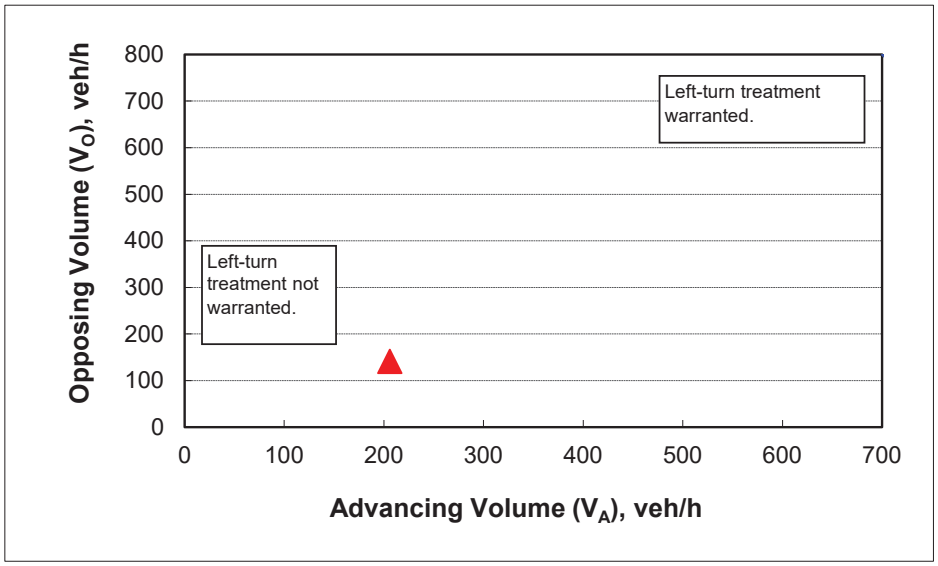
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	1%
Left turns in advancing volume (V_A), veh/h:	2
Advancing volume (V_A), veh/h:	206
Opposing volume (V_O), veh/h:	141

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1402
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis

Project: Norwood Development TIA
Intersection: SW Norwood Road & Site Access
Date: 8/4/2025
Scenario: 2027 Buildout Conditions PM Peak Hour

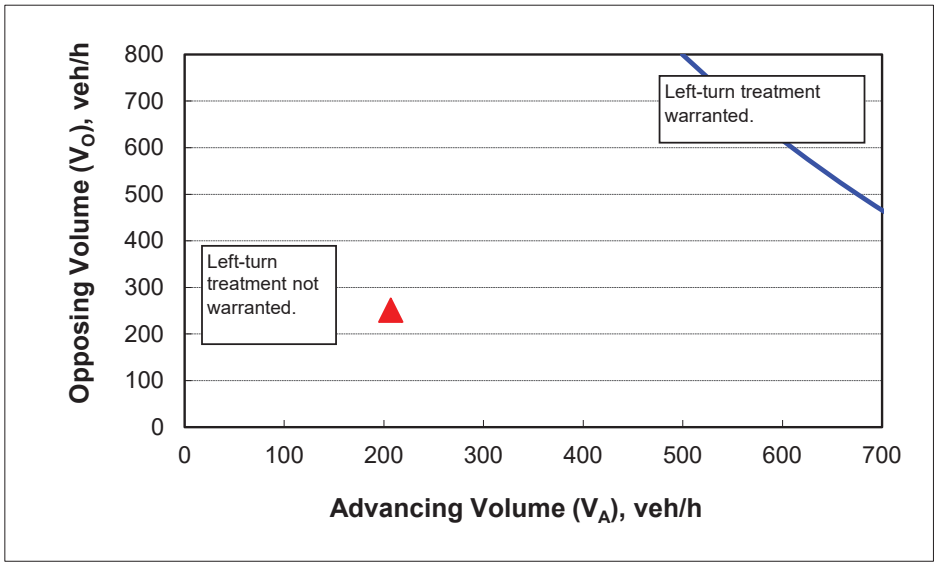
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	45
Percent of left-turns in advancing volume (V_A), %:	2%
Left turns in advancing volume (V_A), veh/h:	4
Advancing volume (V_A), veh/h:	207
Opposing volume (V_O), veh/h:	251

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	881
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Preliminary Traffic Signal Warrant Analysis

Project: Norwood Development TIA
Date: 8/4/2025
Scenario: 2025 Existing Condition - AM Peak Hour - One-Lane Approach on Norwood

Major Street:	SW Boones Ferry Road		Minor Street:	SW Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	713		PM Peak Hour Volumes:	144	Total
				94	Rights
				542	Shared Lane Capacity
				461	RT Discount Volume
				100%	RT Discount %

Warrant Used:

	100 percent of standard warrants used
X	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	7,130	6,200	
Minor Street*	500	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	7,130	9,300	
Minor Street*	500	950	**No**
Combination Warrant			
Major Street	7,130	7,440	
Minor Street*	500	1,480	**No**

* Minor street right-turning traffic volumes reduced by 100%.

Preliminary Traffic Signal Warrant Analysis

Project: Norwood Development TIA
Date: 8/4/2025
Scenario: 2025 Existing Condition - PM Peak Hour - One-Lane Approach on Norwood

Major Street:	SW Boones Ferry Road	Minor Street:	SW Norwood Road	
Number of Lanes:	1	Number of Lanes:	1	
PM Peak Hour Volumes:	1034	PM Peak Hour Volumes:	156	Total
			106	Rights
			482	Shared Lane Capacity
			410	RT Discount Volume
			100%	RT Discount %

Warrant Used:

	100 percent of standard warrants used
X	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	10,340	6,200	
Minor Street*	500	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	10,340	9,300	
Minor Street*	500	950	**No**
Combination Warrant			
Major Street	10,340	7,440	
Minor Street*	500	1,480	**No**

* Minor street right-turning traffic volumes reduced by 100%.

Preliminary Traffic Signal Warrant Analysis

Project: Norwood Development TIA
Date: 8/4/2025
Scenario: 2028 Background Condition - AM Peak Hour - One-Lane Approach on Norwood

Major Street:	SW Boones Ferry Road		Minor Street:	SW Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	848		PM Peak Hour Volumes:	206	Total
				141	Rights
				484	Shared Lane Capacity
				411	RT Discount Volume
				100%	RT Discount %

Warrant Used:

	100 percent of standard warrants used
X	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	8,480	6,200	
Minor Street*	650	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	8,480	9,300	
Minor Street*	650	950	**No**
Combination Warrant			
Major Street	8,480	7,440	
Minor Street*	650	1,480	**No**

* Minor street right-turning traffic volumes reduced by 100%.

Preliminary Traffic Signal Warrant Analysis

Project: Norwood Development TIA
Date: 8/4/2025
Scenario: 2028 Background Condition - PM Peak Hour - One-Lane Approach on Norwood

Major Street:	SW Boones Ferry Road		Minor Street:	SW Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	1251		PM Peak Hour Volumes:	203	Total
				139	Rights
				401	Shared Lane Capacity
				341	RT Discount Volume
				100%	RT Discount %

Warrant Used:

	100 percent of standard warrants used
X	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	12,510	6,200	
Minor Street*	640	1,850	No
Condition B: Interruption of Continuous Traffic			
Major Street	12,510	9,300	
Minor Street*	640	950	No
Combination Warrant			
Major Street	12,510	7,440	
Minor Street*	640	1,480	No

* Minor street right-turning traffic volumes reduced by 100%.

Preliminary Traffic Signal Warrant Analysis

Project: Norwood Development TIA
Date: 8/4/2025
Scenario: 2028 Buildout Condition - AM Peak Hour - One-Lane Approach on Norwood

Major Street:	SW Boones Ferry Road		Minor Street:	SW Norwood Road	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	860		PM Peak Hour Volumes:	232	Total
				154	Rights
				475	Shared Lane Capacity
				404	RT Discount Volume
				100%	RT Discount %

Warrant Used:

	100 percent of standard warrants used
X	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	8,600	6,200	
Minor Street*	780	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	8,600	9,300	
Minor Street*	780	950	**No**
Combination Warrant			
Major Street	8,600	7,440	
Minor Street*	780	1,480	**No**

* Minor street right-turning traffic volumes reduced by 100%.

Preliminary Traffic Signal Warrant Analysis

Project: Norwood Development TIA
Date: 8/4/2025
Scenario: 2028 Buildout Condition - PM Peak Hour - One-Lane Approach on Norwood

Major Street:	SW Boones Ferry Road	Minor Street:	SW Norwood Road		
Number of Lanes:	1	Number of Lanes:	1		
PM Peak Hour Volumes:	1276	PM Peak Hour Volumes:	222	Total	
			149	Rights	
			381	Shared Lane Capacity	
			324	RT Discount Volume	
			100%	RT Discount %	

Warrant Used:

	100 percent of standard warrants used
X	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	12,760	6,200	
Minor Street*	730	1,850	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	12,760	9,300	
Minor Street*	730	950	**No**
Combination Warrant			
Major Street	12,760	7,440	
Minor Street*	730	1,480	**No**

* Minor street right-turning traffic volumes reduced by 100%.

Appendix D - Operations

Definitions

Synchro Reports

Queuing 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	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	94	356	35	65	257
Future Vol, veh/h	50	94	356	35	65	257
Conflicting Peds, #/hr	0	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	350	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	59	111	419	41	76	302

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	875	420	0	0	461	0
Stage 1	420	-	-	-	-	-
Stage 2	455	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	322	638	-	-	1105	-
Stage 1	667	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	300	637	-	-	1104	-
Mov Cap-2 Maneuver	424	-	-	-	-	-
Stage 1	667	-	-	-	-	-
Stage 2	598	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	14.62	0	1.72
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	542	1104	-
HCM Lane V/C Ratio	-	-	0.312	0.069	-
HCM Control Delay (s/veh)	-	-	14.6	8.5	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	1.3	0.2	-

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	106	325	47	106	556
Future Vol, veh/h	50	106	325	47	106	556
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	-	-	150	350	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	0	0	0	0
Mvmt Flow	56	118	361	52	118	618

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1214	361	0	0	413	0
Stage 1	361	-	-	-	-	-
Stage 2	853	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	201	686	-	-	1156	-
Stage 1	707	-	-	-	-	-
Stage 2	419	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	181	686	-	-	1156	-
Mov Cap-2 Maneuver	295	-	-	-	-	-
Stage 1	707	-	-	-	-	-
Stage 2	376	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	16.62	0	1.36
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	482	1156	-
HCM Lane V/C Ratio	-	-	0.36	0.102	-
HCM Control Delay (s/veh)	-	-	16.6	8.5	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.6	0.3	-

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	65	141	430	46	83	289
Future Vol, veh/h	65	141	430	46	83	289
Conflicting Peds, #/hr	0	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	350	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	76	166	506	54	98	340

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1042	507	0	0	561	0
Stage 1	507	-	-	-	-	-
Stage 2	535	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	257	570	-	-	1015	-
Stage 1	609	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	232	569	-	-	1014	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	534	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	19.69	0	1.99
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	484	1014	-
HCM Lane V/C Ratio	-	-	0.501	0.096	-
HCM Control Delay (s/veh)	-	-	19.7	8.9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	2.8	0.3	-

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	61	139	380	66	159	646
Future Vol, veh/h	61	139	380	66	159	646
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	-	-	150	350	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	0	0	0	0
Mvmt Flow	68	154	422	73	177	718

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1493	422	0	0	496	0
Stage 1	422	-	-	-	-	-
Stage 2	1071	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	136	634	-	-	1079	-
Stage 1	664	-	-	-	-	-
Stage 2	331	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	114	634	-	-	1079	-
Mov Cap-2 Maneuver	218	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	276	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	24.56	0	1.78
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	401	1079	-
HCM Lane V/C Ratio	-	-	0.554	0.164	-
HCM Control Delay (s/veh)	-	-	24.6	9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	3.3	0.6	-

Intersection	
Int Delay, s/veh	5.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	78	154	430	52	89	289
Future Vol, veh/h	78	154	430	52	89	289
Conflicting Peds, #/hr	0	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	150	350	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	92	181	506	61	105	340

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1056	507	0	0	568	0
Stage 1	507	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.11	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.209	-
Pot Cap-1 Maneuver	252	570	-	-	1009	-
Stage 1	609	-	-	-	-	-
Stage 2	582	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	225	569	-	-	1008	-
Mov Cap-2 Maneuver	358	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	522	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	22.31	0	2.12
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	475	1008	-
HCM Lane V/C Ratio	-	-	0.574	0.104	-
HCM Ctrl Dly (s/v)	-	-	22.3	9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	3.6	0.3	-

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	129	12	2	206	27	5
Future Vol, veh/h	129	12	2	206	27	5
Conflicting Peds, #/hr	0	0	0	0	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	152	14	2	242	32	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	166	0	407	160
Stage 1	-	-	-	-	159	-
Stage 2	-	-	-	-	248	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1424	-	604	891
Stage 1	-	-	-	-	875	-
Stage 2	-	-	-	-	798	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1424	-	602	890
Mov Cap-2 Maneuver	-	-	-	-	602	-
Stage 1	-	-	-	-	875	-
Stage 2	-	-	-	-	796	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.07	11.03
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	634	-	-	17	-
HCM Lane V/C Ratio	0.059	-	-	0.002	-
HCM Ctrl Dly (s/v)	11	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	5.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	73	149	380	79	171	646
Future Vol, veh/h	73	149	380	79	171	646
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	-	-	150	350	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	0	0	0	0
Mvmt Flow	81	166	422	88	190	718

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1520	422	0	0	510	0
Stage 1	422	-	-	-	-	-
Stage 2	1098	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	131	634	-	-	1065	-
Stage 1	664	-	-	-	-	-
Stage 2	321	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	108	634	-	-	1065	-
Mov Cap-2 Maneuver	210	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	264	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	30.31	0	1.91
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	381	1065	-
HCM Lane V/C Ratio	-	-	0.648	0.178	-
HCM Ctrl Dly (s/v)	-	-	30.3	9.1	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	4.4	0.6	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	225	26	5	203	20	3
Future Vol, veh/h	225	26	5	203	20	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	250	29	6	226	22	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	279	0	501	264
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	237	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1290	-	533	779
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	807	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1290	-	531	779
Mov Cap-2 Maneuver	-	-	-	-	531	-
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	803	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0.19	11.82
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	554	-	-	43	-
HCM Lane V/C Ratio	0.046	-	-	0.004	-
HCM Ctrl Dly (s/v)	11.8	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection: 1: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	NB	SB
Directions Served	LR	T	R	L
Maximum Queue (ft)	166	4	4	53
Average Queue (ft)	56	0	0	24
95th Queue (ft)	121	3	3	51
Link Distance (ft)	482	978		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			150	350
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Site Access & SW Norwood Road

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	SB
Directions Served	LR	R	L
Maximum Queue (ft)	198	13	70
Average Queue (ft)	67	1	34
95th Queue (ft)	141	6	61
Link Distance (ft)	482		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		150	350
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Site Access & SW Norwood Road

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	SB
Directions Served	LR	R	L
Maximum Queue (ft)	178	8	65
Average Queue (ft)	63	0	23
95th Queue (ft)	123	4	51
Link Distance (ft)	482		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		150	350
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Site Access & SW Norwood Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	6	44
Average Queue (ft)	0	20
95th Queue (ft)	5	45
Link Distance (ft)	604	579
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Intersection: 1: SW Boones Ferry Road & SW Norwood Road

Movement	WB	NB	SB
Directions Served	LR	R	L
Maximum Queue (ft)	205	27	72
Average Queue (ft)	85	2	37
95th Queue (ft)	171	14	63
Link Distance (ft)	482		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		150	350
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Site Access & SW Norwood Road

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	24	44
Average Queue (ft)	1	17
95th Queue (ft)	10	44
Link Distance (ft)	604	579
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0