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Memorandum

To: Mike McCarthy, City of Tualatin

Copy: David Force, Lennar Northwest
Mimi Doukas, AKS Engineering & Forestry, LLC

From: Jennifer Danziger, PE,

Date: September 20, 2021

Subject: Supplement to Autumn Subdivision TIS – Evaluation of Potential Commercial

RENEWS: 12·31·21

Introduction

This memorandum supplements the proposed Autumn Sunrise Subdivision Transportation Impact Study (TIS) with three development alternatives on the commercially-zoned parcels abutting SW Boones Ferry Road. These parcels are not part of the subdivision; the specific timing and type of development that could occur on these parcels is unknown.

Commercial Development Concepts

The Neighborhood Commercial (CN) zoning abutting SW Boones Ferry Road will be divided into two parcels to accommodate the proposed Autumn Sunrise site access at SW Boones Ferry Road. The attached site plan shows how the area could potentially be developed. In addition to the proposed stormwater facility, the parcel could accommodate a 3,600-square-foot (SF) building with parking north of the site access and a 10,000-SF building with parking to the south. Both parking lots would take access from the proposed site access approximately 100 feet east of SW Boones Ferry Road.

Tualatin Development Code (TDC) Chapter 51 establishes the standards for the CN zone. According to the TDC, "the primary uses are intended to include professional offices, services, and retail oriented to the day-to-day needs of adjacent neighborhoods." Commercial uses in the CN zone are extremely limited. With that in mind, and considering community feedback a public meetings, two potential concepts were developed for the two buildings:

1. 13,600 SF of general retail in the two buildings
2. 5,000 SF of day care center in one building plus 8,600 of general retail in the remaining space

Trip Generation

To estimate trips generated by the three potential development concepts, trip rates from the *Trip Generation Manual*[1] were used. Within the general retail, permitted uses under TDC Chapter 51 are limited to general

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

merchandise or variety stores such as small food stores (<4,000 SF), drug stores, laundry and dry cleaning, beauty and barber shops, and shoe repair. Trip generation rates for many of these uses are non-existent or very limited; therefore, Land Use 820 – *Shopping Center* was applied for the general retail components of the concepts. Land Use 565 – *Day Care Center* was applied for the other concept. All trip generation is based on gross floor area. Table 1 presents a comparison of trip generation for the three development concepts.

Table 1: Trip Generation Summary

Description (ITE Code)	Intensity (DU)	Morning Peak Hour			Evening Peak Hour			Daily Trips
		In	Out	Total	In	Out	Total	
Concept 1								
Shopping Center (820)	13.6 KSF	8	5	13	25	27	52	514
Internal with Autumn Sunrise		*-1*	*-1*	*-2*	*-3*	*-7*	*-10*	*NA*
Total External		7	4	11	22	20	42	NA
Concept 2								
Day Care Center (565)	5 KSF	29	26	55	26	30	56	119
Shopping Center (820)	8.6 KSF	5	3	8	16	17	33	324
Subtotal		34	29	63	42	47	89	443
Internal with Autumn Sunrise		*-2*	*-1*	*-3*	*-4*	*-12*	*-16*	*NA*
Total External		32	28	60	38	35	73	NA

Although some of the uses may attract pass-by trips, the analysis was performed assuming all trips associated with the commercial development would pass through the site access intersection with SW Boones Ferry Road. However, trips that could be internal with the proposed Autumn Sunrise subdivision were accounted for based on the Transportation Research Board report, *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*.[2]

Trip Distribution

The directional distribution of potential commercial trips was assumed to be:

- Approximately 50 percent of traveling to/from the north on SW Boones Ferry Road
- Approximately 50 percent of traveling to/from the south on SW Boones Ferry Road

Trip Assignment

The resulting trip assignment is shown in Figure 1 for the site access intersection with SW Boones Ferry. Note, the intersection is shown as having four legs to account for the future configuration with a frontage road connection that will be opened with construction of the Basalt Creek Parkway Extension (BCPE).

[2] Transportation Research Board, National Cooperative Highway Research Program Report 684, *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*, 2006.

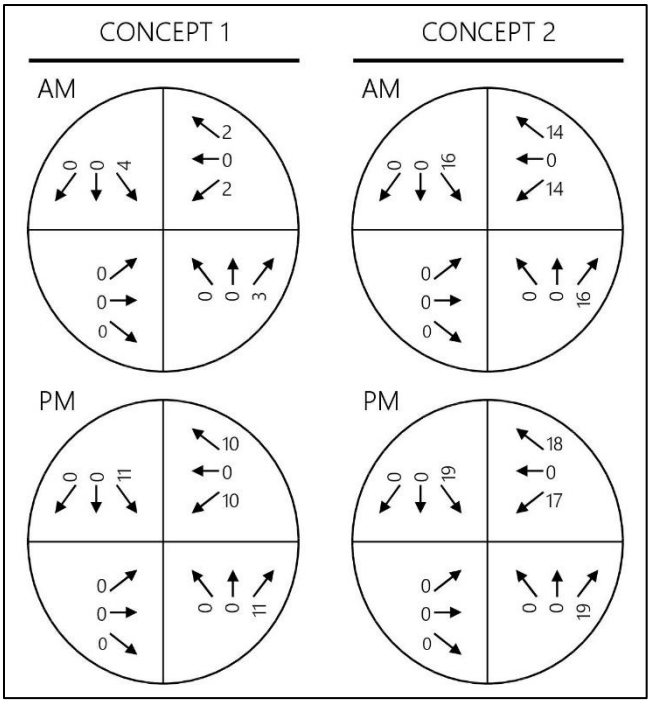


Figure 1: Potential Commercial Development Trip Assignment

Total Traffic – 2026 Buildout with BCPE

The potential commercial traffic for each concept was added to the year 2026 buildout forecast with the BSCE that was shown for Intersection 6 in Figure 6C of the Autumn Sunrise Subdivision TIS. The resulting volumes are shown in Figure 2.

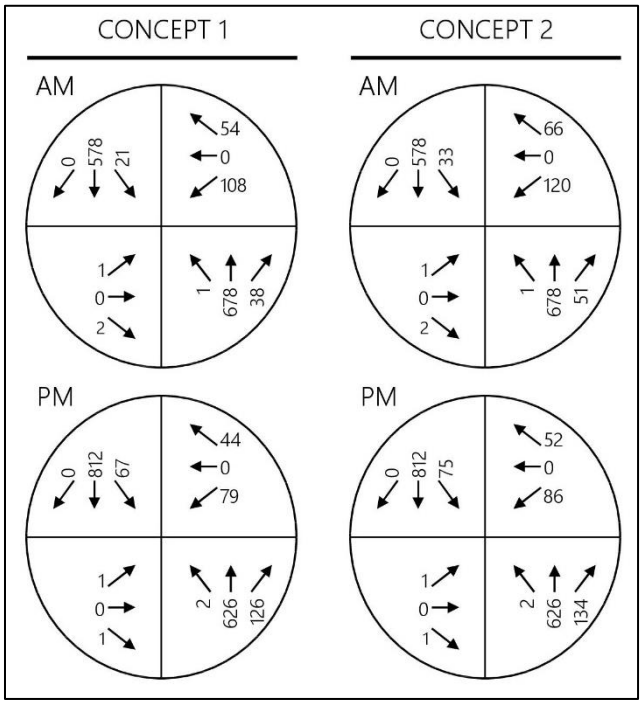


Figure 2: 2026 Buildout with BCPE and Potential Commercial Development

Warrant Analysis

Turn lane warrants and preliminary traffic signal warrants were examined for the study intersections where such treatments would be applicable.

Left-Turn Lane Warrants

SW Boones Ferry Road already has a center refuge lane that would be serve as a left-turn lane for the site access at that location; warrants were not evaluated.

Right-Turn Lane Warrants

Right-turn lane warrants were examined at the SW Boones Ferry Road site access under the Year 2026 buildout conditions. Table 9 of the TIS shows that northbound right-turn lane warrants are met at the proposed site access on SW Boones Ferry Road under the 2026 buildout scenario for both analysis periods. Given the 45-mph posted speed and higher traffic volumes, a northbound turn lane is recommended at this access.

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 with any of the potential commercial development concepts. The preliminary warrants are typically calculated based on the evening peak hour volumes assuming the daily demand is 10 times the evening peak hour. Because the volumes were higher in the morning under some of the scenarios, the warrants were also evaluated considering a daily demand that is 10 times the morning peak hour., which is a less likely scenario. The results are summarized in Table 2 for Year 2026 conditions with full buildout of the proposed development and the BCPE plus the two commercial concepts. A two-lane (left-through and right) approach for the site access is assumed. Detailed information on the warrant analysis is attached.

Table 2: Preliminary Traffic Signal Warrants at the Site Access on SW Boones Ferry Road with BCPE

Scenario	Warrant Met?	
	Based on Morning Peak	Based on Evening Peak
Year 2026 Conditions	No	No
Year 2026 Conditions + Commercial Concept 1	No	No
Year 2026 Conditions + Commercial Concept 2	No	No

As shown in Table 2, preliminary traffic signal warrants are not met with the commercial concepts.

Operations Analysis

An operations analysis was conducted for site access intersection with SW Boones Ferry Road 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.

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

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

The following agency performance standards are applicable to the intersection:

- The City of Tualatin requires intersections to operate at a minimum D and E for signalized and unsignalized intersections, respectively.
- Washington 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 3 for Year 2026 conditions with full buildout of the proposed development and the BCPE plus the two commercial concepts. A two-lane (left-through and right) approach for the site access is assumed. The northbound left is assumed to be striped as a two-way, left-turn lane for the unsignalized scenarios to allow for a two-stage left-turn movement from the site access. Detailed calculations are attached.

Table 3: Capacity Analysis Summary at the Site Access on SW Boones Ferry Road with BCPE

Intersection & Scenario	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
Year 2026 Conditions with BCPE*	D	25	0.40	D	27	0.31
Year 2026 Conditions + Commercial Concept 1	D	26	0.41	D	30	0.37
Year 2026 Conditions + Commercial Concept 2	D	28	0.47	D	32	0.41

** The results of the analysis without the concepts differs slightly from those presented in the TIS because the evaluation in this table does not account for the influence of upstream traffic signals.*

As shown in Table 3, the intersection would meet performance standards with both commercial concepts with a two-lane approach for the site access.

Queuing

An analysis of queuing was conducted for the site access to identify how development of the commercial land could affect storage requirements for the site access intersection at SW Boones Ferry Road. The analysis was conducted based on the results of a SimTraffic simulation. Five (5) simulations were conducted, averaged, and the 95th percentile queue estimates were rounded up to the nearest 25 feet, or the approximate length of one vehicle to estimate the queue lengths.

Table 4 reports the 95th percentile queue estimates for the southbound left-turn, northbound left-turn, and the westbound left-through lanes. The northbound left is assumed to be striped as a two-way, left-turn lane to allow for a two-stage left-turn movement from the site access. However, SimTraffic cannot simulate this two-stage movement; therefore, the westbound left-turn queue estimates are conservatively long.

Table 4: Queue Lengths at the Site Access on SW Boones Ferry Road with BCPE

Intersection & Scenario	Morning Peak Hour			Evening Peak Hour		
	SB Left	NB Left	WB Left	SB Left	NB Left	WB Left
Year 2026 Conditions with BCPE	50 ft	<25 ft	150 ft	50 ft	<25 ft	100 ft
Year 2026 Conditions + Commercial Concept 2	50 ft	<25 ft	125 ft	50 ft	<25 ft	150 ft
Year 2026 Conditions + Commercial Concept 3	50 ft	<25 ft	200 ft	50 ft	<25 ft	175 ft

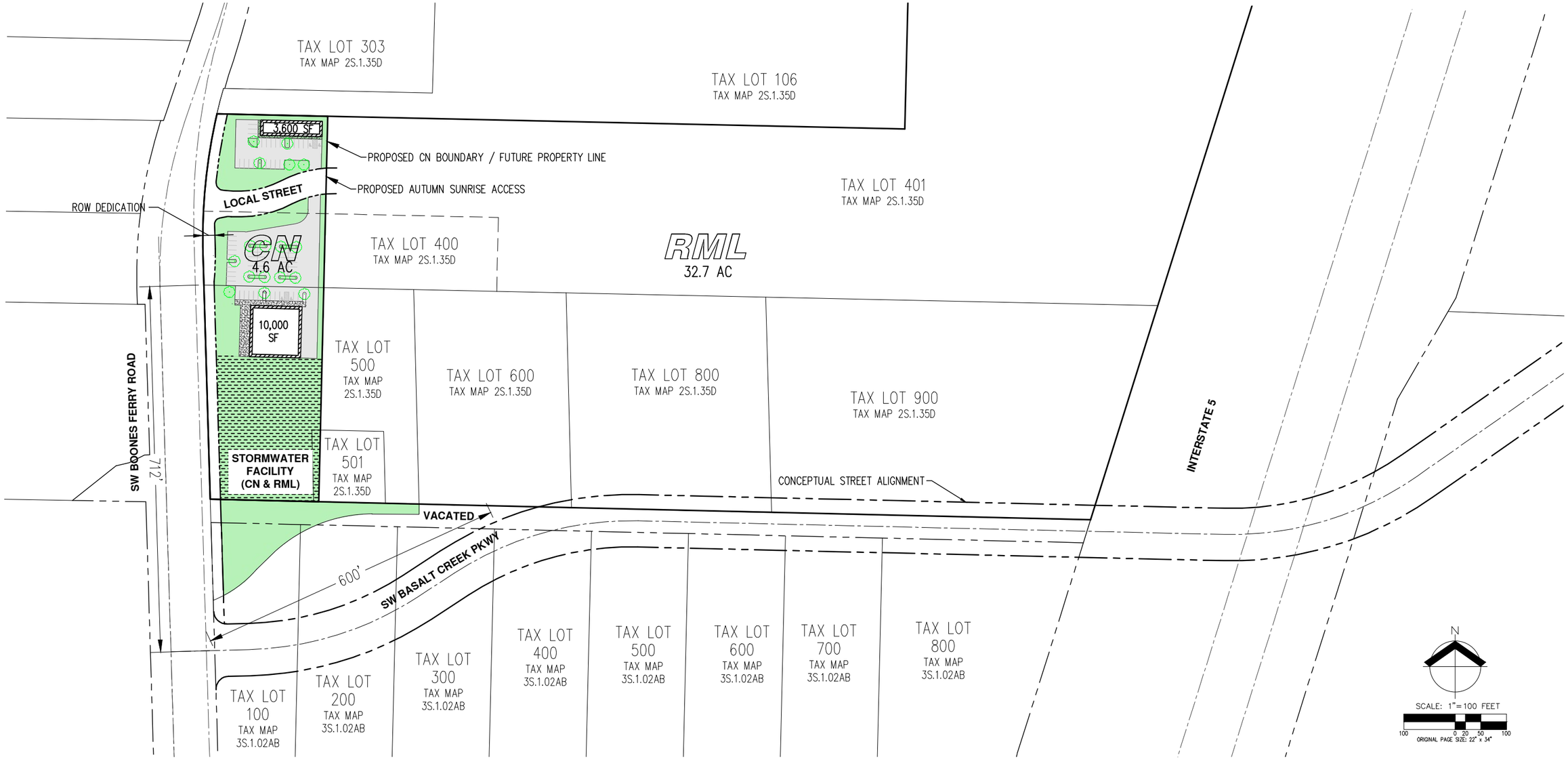
As shown in Table 4, under the most intensive concept, the maximum southbound storage requirement was estimated at:

- Two vehicles or 50 feet for the southbound left, which can easily be accommodated in the existing center refuge lane
- An occasional single vehicle or 25 feet for the northbound left, which can easily be accommodated in the existing center refuge lane
- Eight vehicles or 200 feet for the westbound left, which could be accommodated on the site access road without affecting the closest public street connection ("M" Street) to the east.

Conclusions

The conclusions below were developed as an exercise to understand how development of the commercially-zoned parcels abutting SW Boones Ferry Road could affect the configuration and traffic control at the site access ("H" Street) intersection. These parcels are not part of the subdivision; the specific timing and type of development that could occur on these parcels is unknown. Findings include:

- SW Boones Ferry Road already has a center refuge lane that would be serve as a left-turn lane for the site access at that location; warrants were not evaluated.
- The TIS recommends a northbound right-turn lane on SW Boones Ferry Road at the site access, no other conditions were evaluated.
- Preliminary traffic signal warrants would not be met with the commercial concepts and the two-lane (left-through and right) approach planned for the site access.
- The intersection at SW Boones Ferry Road would meet performance standards with both commercial concepts with a two-lane approach for the site access.
- Maximum queues were estimated at two vehicles or 50 feet for the southbound left, which can easily be accommodated in the existing center refuge lane
- Maximum queues were estimated at one vehicle or 25 feet for the northbound left, which can easily be accommodated in the existing center refuge lane
- Maximum queues were estimated at eight vehicles or 200 feet for a separate westbound left, which could be accommodated on the site access road without affecting the closest public street connection ("M" Street) to the east.



DATE: 08/30/2021 AKS JOB: 7454

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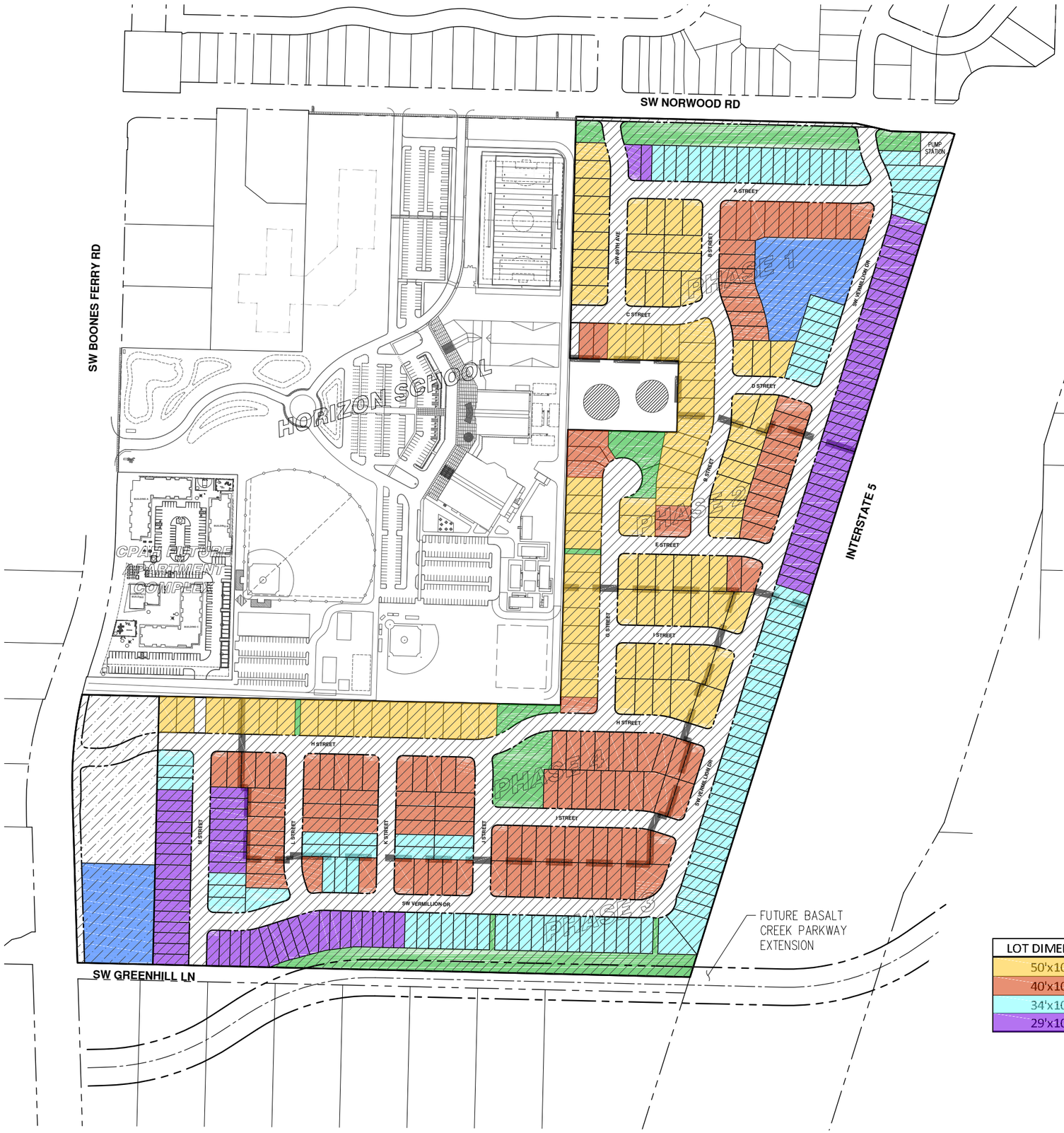
CONCEPTUAL COMMERCIAL LAYOUT

AUTUMN SUNRISE



SCALE: 1"=150 FEET

150 0 30 75 150

– CH ZONING

– RML ZONING

DENSITY CALCULATIONS

RML ZONE	SQ. FT.	ACRES
GROSS SITE AREA:	± 2,688,206	± 61.71
PUBLIC R.O.W. DEDICATION AREA:	± 629,282	± 14.45
CITY RESERVIOR DEDICATION OPEN SPACE AREA:	± 12,879	± 0.30
PRIVATE STREET/ACCESS AREA:	± 5,718	± 0.13
STORMWATER FACILITY AREA:	± 155,691	± 3.57
COMMERCIAL AREA:	± 87,960	± 2.02
PUMP STATION DEDICATION AREA:	± 7,709	± 0.18
NET DEVELOPABLE:	± 1,788,967	± 41.07
AUTUMN SUNRISE SUBDIVISION		
MAXIMUM DENSITY (10 DU PER ACRE)	411	LOTS
MINIMUM DENSITY (7 DU PER ACRE)	287	LOTS

REQUIRED OPEN SPACE AREA (5% GROSS):	± 134,410	SQ. FT.
OPEN SPACE PROVIDED:	± 168,629	SQ. FT.

PLANNED DENSITY:	400	LOTS
AVERAGE LOT AREA (ALL DU):	± 4,151	SQ. FT.
AVERAGE LOT AREA FOR SF DETACHED DU	± 4,411	SQ. FT.
AVERAGE LOT AREA FOR SF ATTACHED DU	± 3,109	SQ. FT.

MAXIMUM LOT SIZE	± 7,731	SQ. FT.
MINIMUM LOT SIZE	± 2,546	SQ. FT.

LOT DIMENSION	HOUSE TYPE	PH-1	PH-2	PH-3	PH-4	TOTAL UNITS
50'x100'	Detached	35	25	7	35	102
40'x100'	Detached	21	15	25	60	121
34'x100'	Detached	29	1	59	8	97
29'x100'	Attached	24	14	42	-	80

TOTAL UNITS	109	55	133	103	400

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LENNAR

PRODUCT DISTRIBUTION PLAN
AUTUMN SUNRISE SUBDIVISION
LENNAR NORTHWEST, INC.
TUALATIN, OREGON

REGISTERED PROFESSIONAL ENGINEER
84800
OREGON
JULY 12, 2016
MARKO SIMIC
PRELIMINARY
RENEWAL DATE: 6/30/22

JOB NUMBER:	7454
DATE:	06/23/2021
DESIGNED BY:	JSM
DRAWN BY:	JSM
CHECKED BY:	DS

PO-04

AKS DRAWING FILE: 7454 PRODUCT DIST.DWG | LAYOUT: PP-00

Shopping Center	820	13.6 KSF	8	5	13	25	27	52	514

Day Care Center	565	5 KSF	29	26	55	26	30	56	119
Shopping Center	820	8.6 KSF	5	3	8	16	17	33	324
Total Primary Trips			34	29	63	42	47	89	443

Option 1 - Basic Shopping Center (13.6 KSF)

	AM Peak			Internal % Initial		Internal Initial		Internal Balanced		External	
	In	Out	Total	In	Out	In	Out	In	Out	In	Out
Residential	67	204	271	2%	1%	1	2	1	1	66	203
Commercial 1	8	5	13	17%	14%	1	1	1	1	7	4

Option 2 - Day Care (5 KSF) + Basic Shopping Center (8.6 KSF)

	AM Peak			Internal % Initial		Internal Initial		Internal Balanced		External	
	In	Out	Total	In	Out	In	Out	In	Out	In	Out
Residential	67	207	274	2%	1%	1	2	1	2	66	205
Commercial 1	34	29	63	17%	14%	6	4	2	1	32	28

Option 1 - Basic Shopping Center (13.6 KSF)

	PM Peak			Internal % Initial		Internal Initial		Internal Balanced		External	
	In	Out	Total	In	Out	In	Out	In	Out	In	Out
Residential	225	133	358	46%	42%	104	56	7	3	218	130
Commercial 1	25	27	52	10%	26%	3	7	3	7	22	20

Option 2 - Day Care (5 KSF) + Basic Shopping Center (8.6 KSF)

	PM Peak			Internal % Initial		Internal Initial		Internal Balanced		External	
	In	Out	Total	In	Out	In	Out	In	Out	In	Out
Residential	225	133	358	46%	42%	104	56	12	4	213	129
Commercial 1	42	47	89	10%	26%	4	12	4	12	38	35

TRIP GENERATION CALCULATIONS

Land Use: Day Care Center
Land Use Code: 565
Setting/Location: General Urban/Suburban
Variable: 1,000 Sq Ft Gross Floor Area
Variable Value: 5

AM PEAK HOUR

Trip Rate: 11.00

	Enter	Exit	Total
Directional Distribution	53%	47%	
Trip Ends	29	26	55

PM PEAK HOUR

Trip Rate: 11.12

	Enter	Exit	Total
Directional Distribution	47%	53%	
Trip Ends	26	30	56

WEEKDAY

Trip Rate: 47.62

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	119	119	238

SATURDAY

Trip Rate: 6.22

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	16	16	32

Source: TRIP GENERATION, Tenth Edition

TRIP GENERATION CALCULATIONS

Land Use: Shopping Center
Land Use Code: 820
Setting/Location General Urban/Suburban
Variable: 1,000 Sq. Ft. GFA
Variable Value: 13.6

AM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Distribution	62%	38%	
Trip Ends	8	5	13

PM PEAK HOUR

Trip Rate: 3.81

	Enter	Exit	Total
Directional Distribution	48%	52%	
Trip Ends	25	27	52

WEEKDAY

Trip Rate: 37.75

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	257	257	514

SATURDAY

Trip Rate: 46.12

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	314	314	628

Source: Trip Generation Manual, Tenth Edition

TRIP GENERATION CALCULATIONS

Land Use: Shopping Center
Land Use Code: 820
Setting/Location General Urban/Suburban
Variable: 1,000 Sq. Ft. GFA
Variable Value: 8.6

AM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Distribution	62%	38%	
Trip Ends	5	3	8

PM PEAK HOUR

Trip Rate: 3.81

	Enter	Exit	Total
Directional Distribution	48%	52%	
Trip Ends	16	17	33

WEEKDAY

Trip Rate: 37.75

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	162	162	324

SATURDAY

Trip Rate: 46.12

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	198	198	396

Source: Trip Generation Manual, Tenth Edition

Preliminary Traffic Signal Warrant Summary

Intersection	Warrant Met?
Site Access at SW Boones Ferry Road	
Year 2026 Conditions (Based on AM) w/ 2-lane Exit	No
Year 2026 Conditions (Based on PM) w/ 2-lane Exit	No
Year 2026 Conditions (Based on AM) + Basic Shopping Center (13.6 KSF) w/ 2-lane Exit	No
Year 2026 Conditions (Based on PM) + Basic Shopping Center (13.6 KSF) w/ 2-lane Exit	No
Year 2026 Conditions (Based on AM) + Day Care (5 KSF) + Basic Shopping Center (8.6 KSF) w/ 2-lane Exit	No
Year 2026 Conditions (Based on PM) + Day Care (5 KSF) + Basic Shopping Center (8.6 KSF) w/ 2-lane Exit	No

Preliminary Traffic Signal Warrant Analysis

Project: 21029 - Autumn Sunrise
Date: 9/20/2021
Scenario: Year 2026 Conditions (Based on AM) w/ 2-lane Exit

Major Street:	SW Boones Ferry Road		Minor Street:	Site Access	
Number of Lanes:	1		Number of Lanes:	1	
AM Peak Hour Volumes:	1302		AM Peak Hour Volumes:	154	Total
				58	Rights
				100%	RT Discount

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	13,020	8,850	
Minor Street*	960	2,650	**No**
Condition B: Interruption of Continuous Traffic			
Major Street	13,020	13,300	
Minor Street*	960	1,350	**No**
Combination Warrant			
Major Street	13,020	10,640	
Minor Street*	960	2,120	**No**

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

Preliminary Traffic Signal Warrant Analysis

Project: 21029 - Autumn Sunrise
Date: 9/20/2021
Scenario: Year 2026 Conditions (Based on PM) w/ 2-lane Exit

Major Street:	SW Boones Ferry Road		Minor Street:	Site Access	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	1596		PM Peak Hour Volumes:	100	Total
				38	Rights
				100%	RT Discount

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	15,960	8,850	
Minor Street*	620	2,650	No
Condition B: Interruption of Continuous Traffic			
Major Street	15,960	13,300	
Minor Street*	620	1,350	No
Combination Warrant			
Major Street	15,960	10,640	
Minor Street*	620	2,120	No

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

Preliminary Traffic Signal Warrant Analysis

Project: 21029 - Autumn Sunrise
Date: 9/20/2021
Scenario: Year 2026 Conditions (Based on AM) + Basic Shopping Center (13.6 KSF) w/ 2-lane Exit

Major Street:	SW Boones Ferry Road		Minor Street:	Site Access	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	1309		PM Peak Hour Volumes:	158	Total
				60	Rights
				100%	RT Discount

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	13,090	8,850	
Minor Street*	980	2,650	No
Condition B: Interruption of Continuous Traffic			
Major Street	13,090	13,300	
Minor Street*	980	1,350	No
Combination Warrant			
Major Street	13,090	10,640	
Minor Street*	980	2,120	No

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

Preliminary Traffic Signal Warrant Analysis

Project: 21029 - Autumn Sunrise
Date: 9/20/2021
Scenario: Year 2026 Conditions (Based on PM) + Basic Shopping Center (13.6 KSF) w/ 2-lane Exit

Major Street:	SW Boones Ferry Road		Minor Street:	Site Access	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	1618		PM Peak Hour Volumes:	120	Total
				48	Rights
				100%	RT Discount

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	16,180	8,850	
Minor Street*	720	2,650	No
Condition B: Interruption of Continuous Traffic			
Major Street	16,180	13,300	
Minor Street*	720	1,350	No
Combination Warrant			
Major Street	16,180	10,640	
Minor Street*	720	2,120	No

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

Preliminary Traffic Signal Warrant Analysis

Project: 21029 - Autumn Sunrise
Date: 9/20/2021
Scenario: Year 2026 Conditions (Based on AM) + Day Care (5 KSF) + Basic Shopping Center (8.6 KSF) w/ 2-lane

Major Street:	SW Boones Ferry Road		Minor Street:	Site Access	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	1334		PM Peak Hour Volumes:	182	Total
				72	Rights
				100%	RT Discount

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	13,340	8,850	
Minor Street*	1,100	2,650	No
Condition B: Interruption of Continuous Traffic			
Major Street	13,340	13,300	
Minor Street*	1,100	1,350	No
Combination Warrant			
Major Street	13,340	10,640	
Minor Street*	1,100	2,120	No

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

Preliminary Traffic Signal Warrant Analysis

Project: 21029 - Autumn Sunrise
Date: 9/20/2021
Scenario: Year 2026 Conditions (Based on PM) + Day Care (5 KSF) + Basic Shopping Center (8.6 KSF) w/ 2-lane

Major Street:	SW Boones Ferry Road		Minor Street:	Site Access	
Number of Lanes:	1		Number of Lanes:	1	
PM Peak Hour Volumes:	1634		PM Peak Hour Volumes:	135	Total
				56	Rights
				100%	RT Discount

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

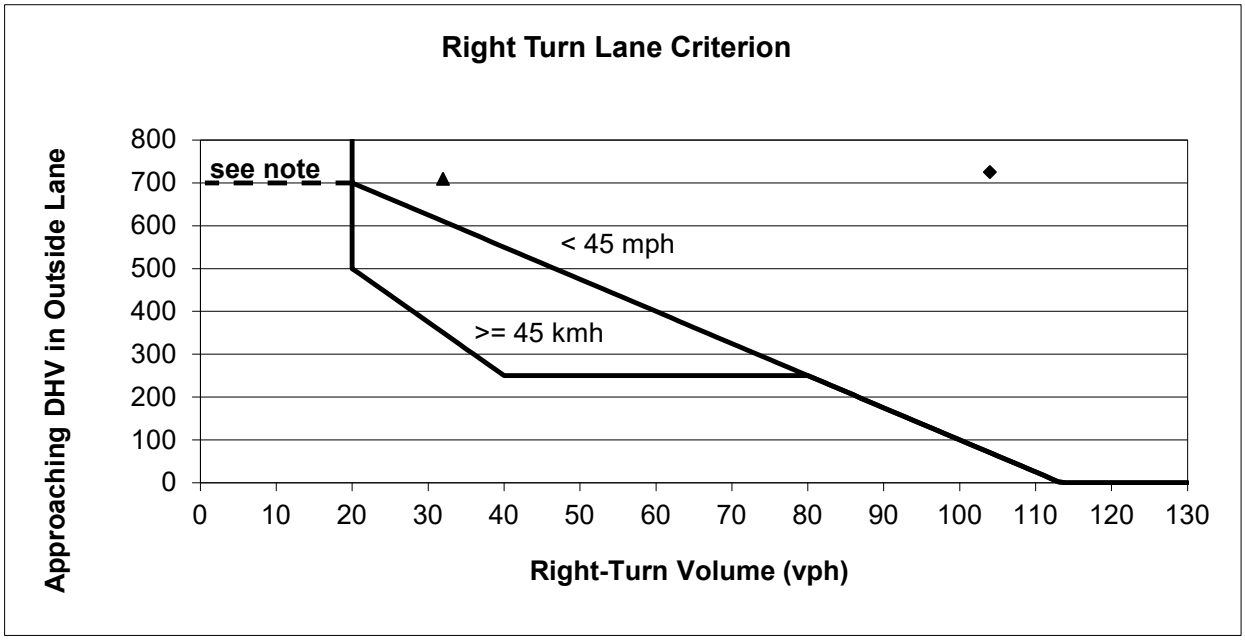
	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
Warrant 1			
Condition A: Minimum Vehicular Volume			
Major Street	16,340	8,850	
Minor Street*	790	2,650	No
Condition B: Interruption of Continuous Traffic			
Major Street	16,340	13,300	
Minor Street*	790	1,350	No
Combination Warrant			
Major Street	16,340	10,640	
Minor Street*	790	2,120	No

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

Project: 21029 - Autumn Sunrise
Intersection: SW Boones Ferry Road/Site Access - Northbound
Date: 6/30/2021
Scenario: 2026 Buildout - Phases 1-4

Speed? 45 mph 72 kmh

AM Peak Hour		PM Peak Hour	
Right-Turn Volume	32	Right-Turn Volume	104
Approaching DHV	709	Approaching DHV	725
Lane Needed?	Yes	Lane Needed?	Yes



Note: If there is no right turn lane, a shoulder needs to be provided.
If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	2	106	0	52	1	678	35	17	578	0
Future Vol, veh/h	1	0	2	106	0	52	1	678	35	17	578	0
Conflicting Peds, #/hr	0	0	0	4	0	4	0	0	4	4	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	150	-	150	150	-	-
Veh in Median Storage, #	-	0	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	2	0	2	6	6	5	5	2
Mvmt Flow	1	0	2	118	0	58	1	753	39	19	642	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1488	1478	646	1444	1439	761	642	0	0	796	0	0
Stage 1	680	680	-	759	759	-	-	-	-	-	-	-
Stage 2	808	798	-	685	680	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.15	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.245	-	-
Pot Cap-1 Maneuver	102	126	472	~ 111	133	409	943	-	-	813	-	-
Stage 1	441	451	-	402	415	-	-	-	-	-	-	-
Stage 2	375	398	-	441	451	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	85	122	470	~ 108	129	406	943	-	-	810	-	-
Mov Cap-2 Maneuver	85	122	-	295	310	-	-	-	-	-	-	-
Stage 1	441	441	-	400	413	-	-	-	-	-	-	-
Stage 2	320	396	-	427	441	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.6	21.9	0	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	943	-	-	187	295	406	810	-	-
HCM Lane V/C Ratio	0.001	-	-	0.018	0.399	0.142	0.023	-	-
HCM Control Delay (s)	8.8	-	-	24.6	25.1	15.3	9.6	-	-
HCM Lane LOS	A	-	-	C	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.8	0.5	0.1	-	-

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

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	1	69	0	34	2	626	115	56	812	0
Future Vol, veh/h	1	0	1	69	0	34	2	626	115	56	812	0
Conflicting Peds, #/hr	0	0	0	2	0	2	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	150	-	150	150	-	-
Veh in Median Storage, #	-	0	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	95	92	95	92	95	95	95	95	92
Heavy Vehicles, %	2	2	2	0	2	0	2	3	3	2	2	2
Mvmt Flow	1	0	1	73	0	36	2	659	121	59	855	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1717	1759	857	1641	1638	663	855	0	0	782	0	0
Stage 1	973	973	-	665	665	-	-	-	-	-	-	-
Stage 2	744	786	-	976	973	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	71	85	357	81	100	465	785	-	-	836	-	-
Stage 1	303	330	-	453	458	-	-	-	-	-	-	-
Stage 2	407	403	-	305	330	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	62	79	356	76	92	463	785	-	-	834	-	-
Mov Cap-2 Maneuver	62	79	-	235	254	-	-	-	-	-	-	-
Stage 1	302	307	-	451	456	-	-	-	-	-	-	-
Stage 2	374	401	-	282	307	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	39.7	22.5	0	0.6
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	785	-	-	106	235	463	834	-	-
HCM Lane V/C Ratio	0.003	-	-	0.021	0.309	0.077	0.071	-	-
HCM Control Delay (s)	9.6	-	-	39.7	27	13.4	9.6	-	-
HCM Lane LOS	A	-	-	E	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.3	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	2	108	0	54	1	678	38	21	578	0
Future Vol, veh/h	1	0	2	108	0	54	1	678	38	21	578	0
Conflicting Peds, #/hr	0	0	0	4	0	4	0	0	4	4	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	150	-	150	150	-	-
Veh in Median Storage, #	-	0	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	2	0	2	6	6	5	5	2
Mvmt Flow	1	0	2	120	0	60	1	753	42	23	642	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1498	1489	646	1452	1447	761	642	0	0	799	0	0
Stage 1	688	688	-	759	759	-	-	-	-	-	-	-
Stage 2	810	801	-	693	688	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.15	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.245	-	-
Pot Cap-1 Maneuver	101	124	472	~ 110	131	409	943	-	-	811	-	-
Stage 1	436	447	-	402	415	-	-	-	-	-	-	-
Stage 2	374	397	-	437	447	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	84	120	470	~ 106	127	406	943	-	-	808	-	-
Mov Cap-2 Maneuver	84	120	-	293	308	-	-	-	-	-	-	-
Stage 1	436	434	-	400	413	-	-	-	-	-	-	-
Stage 2	317	395	-	421	434	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.7	22.2	0	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	943	-	-	186	293	406	808	-	-
HCM Lane V/C Ratio	0.001	-	-	0.018	0.41	0.148	0.029	-	-
HCM Control Delay (s)	8.8	-	-	24.7	25.6	15.4	9.6	-	-
HCM Lane LOS	A	-	-	C	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.9	0.5	0.1	-	-

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

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	1	79	0	44	2	626	126	67	812	0
Future Vol, veh/h	1	0	1	79	0	44	2	626	126	67	812	0
Conflicting Peds, #/hr	0	0	0	2	0	2	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	150	-	150	150	-	-
Veh in Median Storage, #	-	0	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	95	92	95	92	95	95	95	95	92
Heavy Vehicles, %	2	2	2	0	2	0	2	3	3	2	2	2
Mvmt Flow	1	0	1	83	0	46	2	659	133	71	855	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1752	1795	857	1665	1662	663	855	0	0	794	0	0
Stage 1	997	997	-	665	665	-	-	-	-	-	-	-
Stage 2	755	798	-	1000	997	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	67	80	357	~ 78	97	465	785	-	-	827	-	-
Stage 1	294	322	-	453	458	-	-	-	-	-	-	-
Stage 2	401	398	-	295	322	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	56	73	356	~ 72	88	463	785	-	-	825	-	-
Mov Cap-2 Maneuver	56	73	-	225	245	-	-	-	-	-	-	-
Stage 1	293	294	-	451	456	-	-	-	-	-	-	-
Stage 2	359	396	-	268	294	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	43	24.2	0	0.7
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	785	-	-	97	225	463	825	-	-
HCM Lane V/C Ratio	0.003	-	-	0.022	0.37	0.1	0.085	-	-
HCM Control Delay (s)	9.6	-	-	43	30.1	13.6	9.8	-	-
HCM Lane LOS	A	-	-	E	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.6	0.3	0.3	-	-

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

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	2	120	0	66	1	678	51	33	578	0
Future Vol, veh/h	1	0	2	120	0	66	1	678	51	33	578	0
Conflicting Peds, #/hr	0	0	0	4	0	4	0	0	4	4	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	150	-	150	150	-	-
Veh in Median Storage, #	-	0	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	2	0	2	6	6	5	5	2
Mvmt Flow	1	0	2	133	0	73	1	753	57	37	642	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1540	1532	646	1480	1475	761	642	0	0	814	0	0
Stage 1	716	716	-	759	759	-	-	-	-	-	-	-
Stage 2	824	816	-	721	716	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.15	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.245	-	-
Pot Cap-1 Maneuver	94	117	472	~ 105	126	409	943	-	-	800	-	-
Stage 1	421	434	-	402	415	-	-	-	-	-	-	-
Stage 2	367	391	-	422	434	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	74	111	470	~ 100	120	406	943	-	-	797	-	-
Mov Cap-2 Maneuver	74	111	-	284	299	-	-	-	-	-	-	-
Stage 1	421	414	-	400	413	-	-	-	-	-	-	-
Stage 2	299	389	-	399	414	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.7	23.9	0	0.5
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	943	-	-	169	284	406	797	-	-
HCM Lane V/C Ratio	0.001	-	-	0.02	0.469	0.181	0.046	-	-
HCM Control Delay (s)	8.8	-	-	26.7	28.4	15.8	9.7	-	-
HCM Lane LOS	A	-	-	D	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	2.4	0.7	0.1	-	-

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

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	1	86	0	52	2	626	134	75	812	0
Future Vol, veh/h	1	0	1	86	0	52	2	626	134	75	812	0
Conflicting Peds, #/hr	0	0	0	2	0	2	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	150	150	-	150	150	-	-
Veh in Median Storage, #	-	0	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	95	92	95	92	95	95	95	95	92
Heavy Vehicles, %	2	2	2	0	2	0	2	3	3	2	2	2
Mvmt Flow	1	0	1	91	0	55	2	659	141	79	855	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1776	1819	857	1681	1678	663	855	0	0	802	0	0
Stage 1	1013	1013	-	665	665	-	-	-	-	-	-	-
Stage 2	763	806	-	1016	1013	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.1	6.52	6.2	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.1	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.5	4.018	3.3	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	64	78	357	~ 76	95	465	785	-	-	822	-	-
Stage 1	288	316	-	453	458	-	-	-	-	-	-	-
Stage 2	397	395	-	289	316	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	52	70	356	~ 70	85	463	785	-	-	820	-	-
Mov Cap-2 Maneuver	52	70	-	220	240	-	-	-	-	-	-	-
Stage 1	287	286	-	451	456	-	-	-	-	-	-	-
Stage 2	349	393	-	260	286	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	45.5	25.3	0	0.8
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	785	-	-	91	220	463	820	-	-
HCM Lane V/C Ratio	0.003	-	-	0.024	0.411	0.118	0.096	-	-
HCM Control Delay (s)	9.6	-	-	45.5	32.3	13.8	9.9	-	-
HCM Lane LOS	A	-	-	E	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.9	0.4	0.3	-	-

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

Intersection: 6: SW Boones Ferry Road & Site Access

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	31	187	128	6	72	10	44	32
Average Queue (ft)	4	65	24	0	6	0	9	2
95th Queue (ft)	19	136	60	4	35	6	32	15
Link Distance (ft)	318	1445			601			1805
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			150	150		150	150	
Storage Blk Time (%)		4						
Queuing Penalty (veh)		2						

Network Summary

Network wide Queuing Penalty: 2

Intersection: 6: SW Boones Ferry Road & Site Access

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	18	109	29	30	22	26	55	38
Average Queue (ft)	2	40	13	1	1	1	19	2
95th Queue (ft)	13	84	29	10	10	13	44	17
Link Distance (ft)	318	1810			670			1804
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			150	150		150	150	
Storage Blk Time (%)		0						
Queuing Penalty (veh)		0						

Intersection: 6: SW Boones Ferry Road & Site Access

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	30	140	48	12	88	10	32	28
Average Queue (ft)	3	59	22	0	5	0	8	2
95th Queue (ft)	17	124	42	6	42	5	28	13
Link Distance (ft)	318	1445			601			1805
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			150	150		150	150	
Storage Blk Time (%)		2			0			
Queuing Penalty (veh)		1			0			

Network Summary

Network wide Queuing Penalty: 1

Intersection: 6: SW Boones Ferry Road & Site Access

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	30	163	47	29	33	27	61	9
Average Queue (ft)	3	65	18	1	2	2	25	0
95th Queue (ft)	17	131	38	10	16	11	51	5
Link Distance (ft)	318	1810			670			1804
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			150	150		150	150	
Storage Blk Time (%)		2						
Queuing Penalty (veh)		1						

Intersection: 6: SW Boones Ferry Road & Site Access

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	35	224	171	5	76	32	54	46
Average Queue (ft)	3	85	33	0	6	2	16	3
95th Queue (ft)	17	185	99	3	37	13	42	21
Link Distance (ft)	318	1445			601			1805
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			150	150		150	150	
Storage Blk Time (%)		8						
Queuing Penalty (veh)		5						

Network Summary

Network wide Queuing Penalty: 5

Intersection: 6: SW Boones Ferry Road & Site Access

Movement	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	T	R	L	TR
Maximum Queue (ft)	35	193	130	6	46	41	65	59
Average Queue (ft)	3	82	22	0	2	3	25	3
95th Queue (ft)	19	174	72	6	19	20	51	26
Link Distance (ft)	318	1810			670			1804
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			150	150		150	150	
Storage Blk Time (%)		7						0
Queuing Penalty (veh)		4						0