

 **TRAFFIC IMPACT ANALYSIS**


DELOREAN

**JURISDICTION: CITY OF MILLERSBURG, OR
LOCATION: OLD SALEM RD NE, SOUTH OF CONSER RD NE**

Prepared by:

Kimley»»Horn

January 2024
090147000
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TRAFFIC IMPACT ANALYSIS

FOR

DELOREAN

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EXPIRES: December 31, 2024

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1. DEVELOPMENT IDENTIFICATION

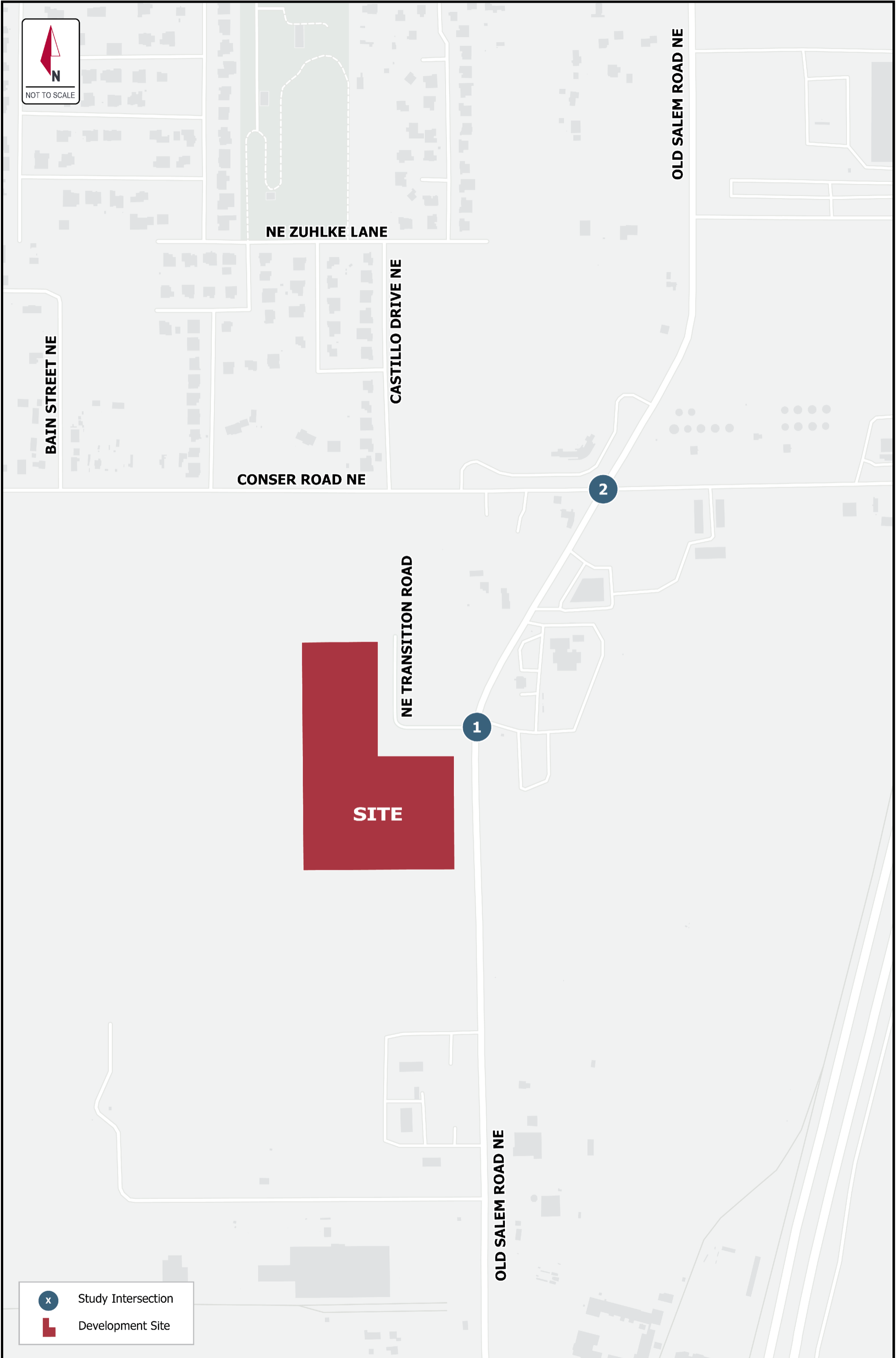
Kimley-Horn and Associates, Inc. (Kimley-Horn) has been retained to analyze the traffic impacts of the proposed Delorean Development (Development). This report is intended to provide the City of Millersburg (City) and Oregon Department of Transportation (ODOT) with the necessary traffic generation, trip distribution, and level of service analysis to facilitate their review of the Development. Brad Lincoln, responsible for this report and traffic analysis, is a licensed professional engineer (Civil) in the State of Oregon.

The Development is proposed to include a 500,000 square foot (SF) manufacturing warehouse. The Development is located west of Old Salem Road NE and south of Conser Road NE. A site vicinity map is included in **Figure 1**. The site will access the City street network via two proposed access drives, one near the north side of the building that will connect with a new roadway that currently provides access to the fire station and one access to the south of the site to connect directly to Old Salem Road NE.

1.1. Scoping of Analysis

The analysis has been performed for the 2023 existing, 2025 baseline, and 2025 future with development conditions to account for full build-out of the site. The level of service analysis has been performed at the following intersections during the PM peak-hour:

- Old Salem Road NE at NE Transition Parkway
- Old Salem Road NE at Conser Road NE



	Study Intersection
	Development Site

FIGURE 1: SITE VICINITY MAP

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1. METHODOLOGY

Trip generation for the Development is based on national data contained in *Trip Generation Manual, 11th Edition (2021)* by the Institute of Transportation Engineers (ITE). The average rates for Land Use Code (LUC) 140, Manufacturing, have been used in the trip generation calculations. The distribution of trips generated by the site is based on existing traffic volumes and surrounding land uses.

Congestion at intersections and along roadway is generally measured in terms of level of service (LOS). In accordance with *Highway Capacity Manual (HCM), 6th Edition* by the Transportation Research Board, road facilities and intersections are rated between LOS A and LOS F, with LOS A being free flow and LOS F being forced flow or over-capacity conditions. The LOS at signalized, roundabout, and all-way stop-controlled intersections is based on the average delay of all approaches. The LOS for two-way stop-controlled intersections is based on average delays for the critical stopped approach. Geometric characteristics and conflicting traffic movements are taken into consideration when determining LOS values. A summary of the intersection LOS criteria is included in **Table 1**.

Table 1: Level of Service Criteria

Level of Service ¹	Expected Delay	Intersection Control Delay (Seconds per Vehicle)	
		Unsignalized Intersections	Signalized Intersections
A	Little/No Delay	≤10	≤10
B	Short Delays	>10 and ≤15	>10 and ≤20
C	Average Delays	>15 and ≤25	>20 and ≤35
D	Long Delays	>25 and ≤35	>35 and ≤55
E	Very Long Delays	>35 and ≤50	>55 and ≤80
F	Extreme Delays ²	>50	>80

The City of Millersburg’s Transportation System Plan (TSP) states mobility targets would be applicable to roads owned by the City and are based on LOS D or better for signalized intersections and unsignalized intersections. County facilities within the City of Millersburg will be required to meet Linn County mobility targets, which are currently under review as part of the Linn County TSP update process. At the time the Millersburg TSP was updated in April 2023, Linn County had established a goal of maintaining LOS D or better throughout the county-owned arterial and collector system for the planning horizon.

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

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

LOS B: Generally stable traffic flow conditions.

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

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

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

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

² When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection.

2. TRIP GENERATION

Trip generation calculations for the proposed Development have been performed using the ITE *Trip Generation Manual, 11th Edition (2021)*. The average rates for ITE Land Use Code 140, Manufacturing, have been used for the trip generation calculations. The trips generated by the Development are summarized in **Table 2**.

Table 2: Trip Generation Summary

Manufacturing 500,000 SF	Average Daily Trips (ADTs)			AM Peak-Hour Trips			PM Peak-Hour Trips		
	In	Out	Total	In	Out	Total	In	Out	Total
Generation Rate	4.75 trips per 1,000 SF			0.68 trips per 1,000 SF			0.74 trips per 1,000 SF		
Splits	50%	50%	100%	76%	24%	100%	31%	69%	100%
Trips	1,188	1,187	2,375	258	82	340	115	255	370

The Development is anticipated to generate approximately 2,375 ADTs with approximately 340 AM peak-hour trips and approximately 370 PM peak-hour trips. The trip generation calculations are provided in **Appendix A**.

3. TRIP DISTRIBUTION

The distribution of trips generated by the Development is primarily based on following existing traffic patterns and surrounding land uses. The trip distribution is:

- 75% to and from the south along Old Salem Road NE
- 25% to and from the north along Old Salem Road NE

A detailed trip distribution for the AM peak-hour and PM peak-hours is displayed in **Figure 2** and **Figure 3**, respectively.



FIGURE 2: DEVELOPMENT TRIP DISTRIBUTION - AM PEAK HOUR
 DELOREAN - CITY OF MILLERSBURG, OR 090147000

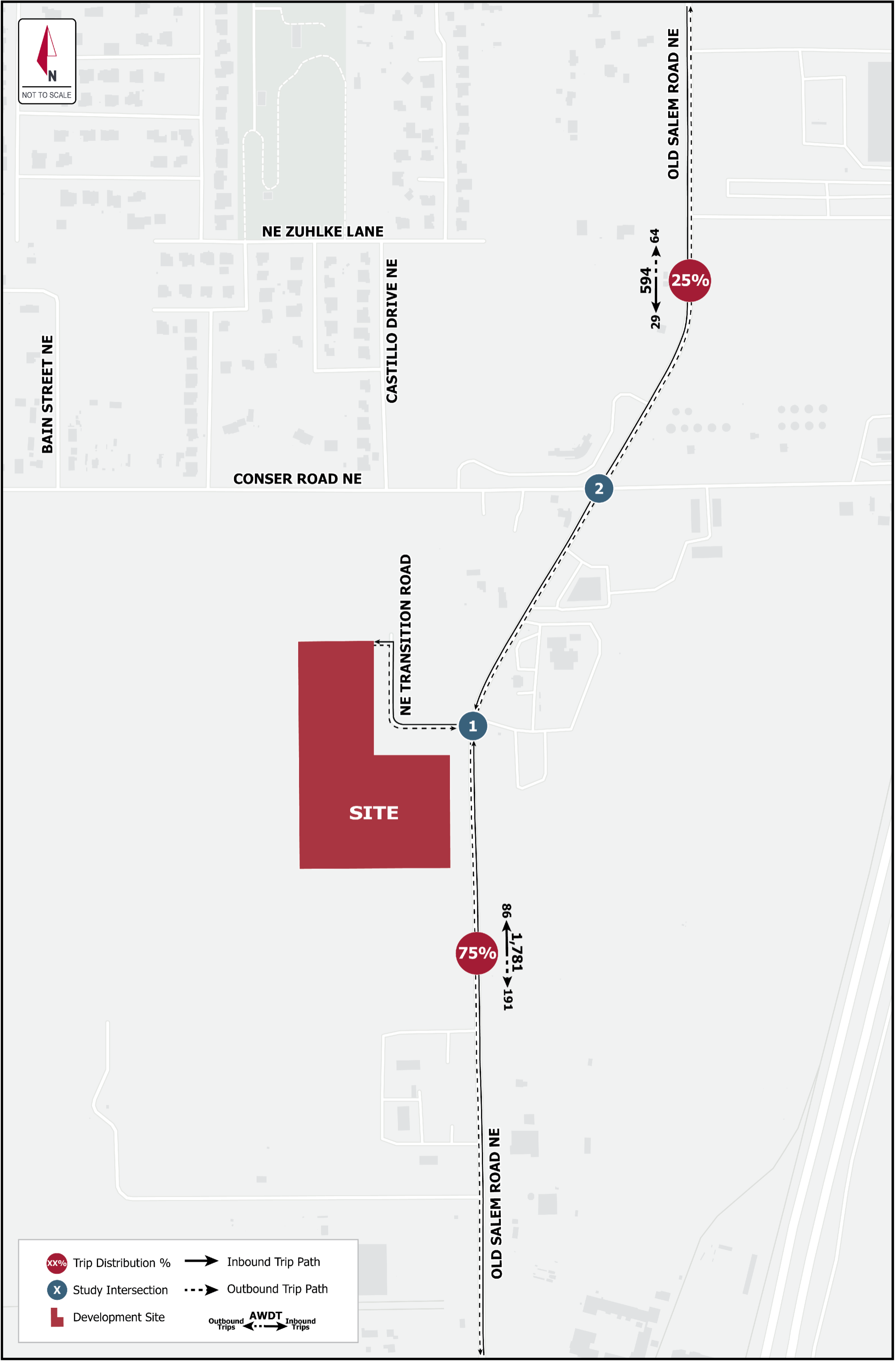


FIGURE 3: DEVELOPMENT TRIP DISTRIBUTION - PM PEAK HOUR
 DELOREAN - CITY OF MILLERSBURG, OR 090147000

4. INTERSECTION LEVEL OF SERVICE ANALYSIS

The following intersections have been analyzed as part of this report:

- Old Salem Road NE at NE Transition Parkway
- Old Salem Road NE at Conser Road NE

The intersections have been analyzed for the weekday PM peak-hours.

4.1. Seasonal Adjustment Factor

The 2023 existing traffic counts were modified to current 30th highest hourly volume (30HV) conditions by applying a seasonal adjustment factor consistent with ODOT’s Analysis Procedures Manual (APM). The seasonal adjustment factor was calculated using data collect at Automatic Tracking Recorder (ATR) #22-005, North Albany. ATR #22-005 is located along I-5, 0.41 miles north of Albany-Junction City Highway No. 58.

Historical data at ATR #22-005 was analyzed to determine the peak-month beginning in 2018 through 2022. Within this five-year span, the ADT values were consistently higher than average weekday traffic (AWT). ADT was therefore used to determine the seasonal factors for ATR #22-005. The month of August had the highest ADT for four of five years of data. The month of August was therefore used when calculating seasonal adjustment factors for ATR #22-005. Following the APM process, the highest and lowest monthly percentages, highlighted in gray in **Table 3** below, were eliminated from the five-year historical data when calculating the average. The remaining three years of data were used to calculate the peak-month average for the five-year time period.

Counts were collected on November 8, 2023, and ATR data is reported for the 15th of each month. Therefore, the ADT values are near the mid-month data usually reported and thus no interpolation was used to calculate the ADT for November. The monthly percent of annual average daily traffic (AADT) for the peak-month of August and count month of November are shown in **Table 3**.

Table 3: Seasonal Adjustment Factor (ATR #22-005, North Albany)

Year	2018	2019	2020	2021	2022	Average
Peak-Month (August)	110	110	114	111	109	110.33
Count Month (November)	98	98	98	102	97	98.00

For ATR #22-005, the average peak-month volume was 110.33 and the average count month volume was 98.00. This results in a seasonal factor of 1.13, calculated by dividing the peak-month average by the count month average.

The seasonal factor of 1.13 from ATR #33-005 was applied to all existing peak-hour turning movement volumes to maintain the most conservative adjustment at the study intersections.

4.2. Turning Movement Calculations

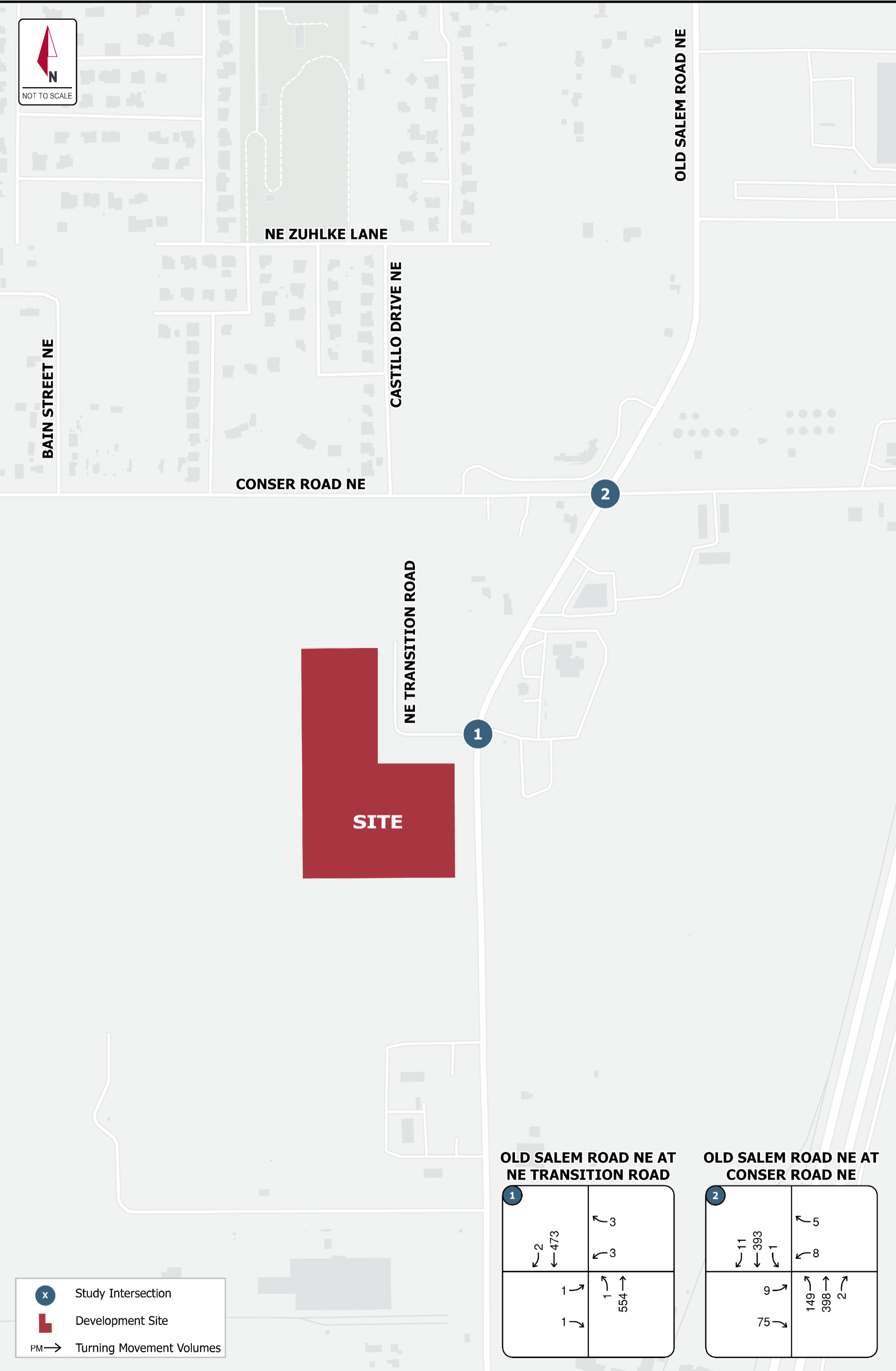
The existing PM peak-hour turning movements at the study intersections were collected by the independent count firm IDAX in November 2023. The seasonal factor of 1.13 from ATR #22-005 was applied to all existing peak-hour turning movement volumes to maintain the most conservative adjustment at the study intersections. The 2023 existing turning movements at the study intersections after the seasonal adjustment factors have been applied are shown in **Figure 4**. The existing count data is included in **Appendix B**.

The year 2025 was used to forecast future volume projections based on the anticipated completion of the Development. The 2025 baseline turning movements have been calculated by applying a 1.5% annually compounding growth rate to the 2023 existing turning movements. This 1.5% growth rate is based on the annual average daily trips (AADT) collected from existing permanent counters within the Oregon Traffic Monitoring System along Old Salem Road NE, Conser Road NE, and Alexander Lane NE. Additionally, pipeline data from the following pipeline developments:

- Agribusiness Millersburg Site
- Gordon Truck Center

The permanent counter data is included with the existing count data in **Appendix B**. The pipeline projects peak-hour data are provided in **Appendix C**. The 2025 baseline turning movements at the study intersections are shown in **Figure 5**.

The 2025 future with development turning movements at the study intersections have been calculated by adding the trips generated by the Development to the 2025 baseline turning movements. The 2025 future with development turning movements are shown in **Figure 6**. The turning movement calculations are included in **Appendix D**. It is important to note that the trips generated by the Development during the PM peak-hour are primarily anticipated to travel to and from the north access. The south access to Old Salem Road is proposed to only be used by trucks and there are only anticipated to be 50 truck trips during the day shift. There is not anticipated to be a significant volume of truck trips at the southern access during the PM peak-hour.



- Study Intersection
- Development Site
- PM → Turning Movement Volumes

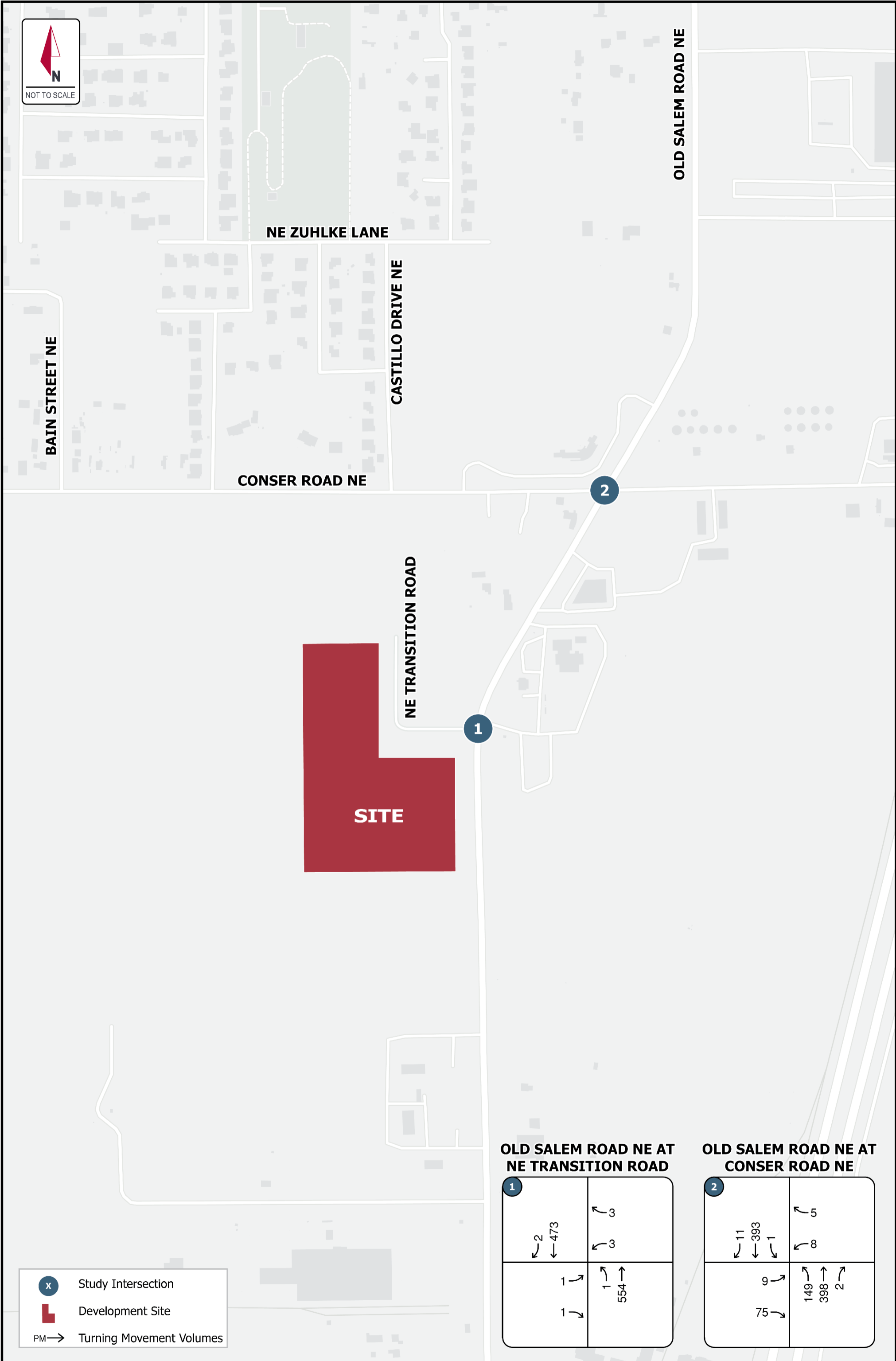
OLD SALEM ROAD NE AT NE TRANSITION ROAD

<p>1</p> <p>← 2 ← 473</p> <p>1 ↘ 1 ↘</p>	<p>↖ 3 ↖ 3</p> <p>1 ↗ 554 →</p>
---	---

OLD SALEM ROAD NE AT CONSER ROAD NE

<p>2</p> <p>← 11 ← 393</p> <p>9 ↘ 75 ↘</p>	<p>↖ 5 ↖ 8</p> <p>149 ↗ 398 → 2 ↗</p>
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FIGURE 4: 2023 EXISTING TURNING MOVEMENTS - PM PEAK HOUR
DELOREAN - CITY OF MILLERSBURG, OR 090147000



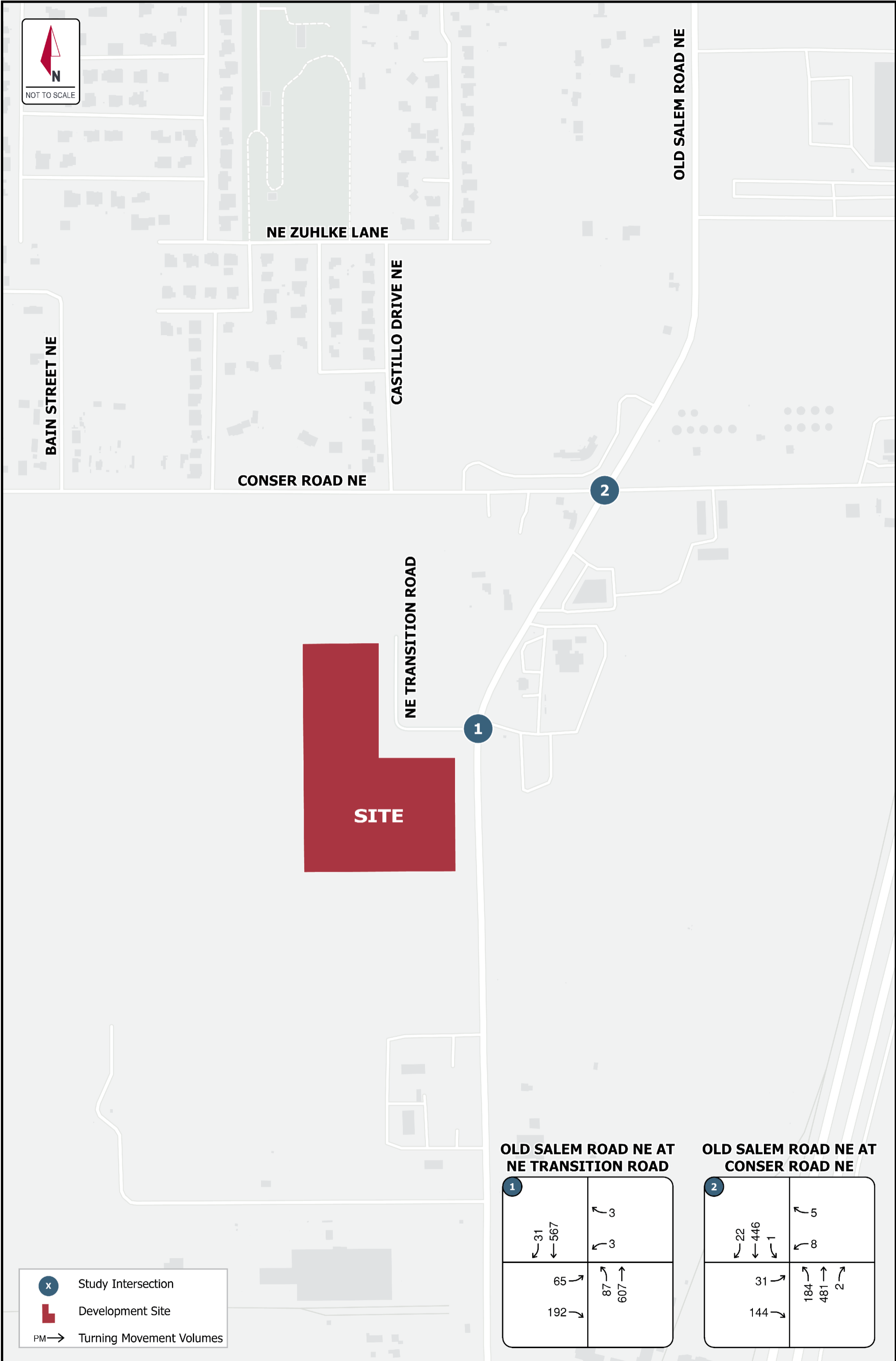
- x Study Intersection
- Development Site
- PM → Turning Movement Volumes

OLD SALEM ROAD NE AT NE TRANSITION ROAD

<p>1</p> <p>← 2 ← 473</p> <p>1 ↘ 1 ↙</p>	<p>↖ 3 ↖ 3</p> <p>1 ↗ 554 →</p>
---	---

OLD SALEM ROAD NE AT CONSER ROAD NE

<p>2</p> <p>← 11 ← 393 ← 1</p> <p>9 ↘ 75 ↙</p>	<p>↖ 5 ↖ 8</p> <p>149 ↗ 398 → 2 ↘</p>
---	---



- Study Intersection
- Development Site
- PM → Turning Movement Volumes

OLD SALEM ROAD NE AT NE TRANSITION ROAD

<p>1</p> <p>← 31 ← 567</p>	<p>↖ 3 ↖ 3</p>
<p>65 → 192 →</p>	<p>↗ 87 ↗ 607</p>

OLD SALEM ROAD NE AT CONSER ROAD NE

<p>2</p> <p>← 22 ← 446 ← 1</p>	<p>↖ 5 ↖ 8</p>
<p>31 → 144 →</p>	<p>↗ 184 ↗ 481 ↗ 2</p>

FIGURE 6: 2025 FUTURE WITH DEVELOPMENT TURNING MOVEMENTS - PM PEAK HOUR
DELOREAN - CITY OF MILLERSBURG, OR 090147000

4.3. Level of Service Calculations

The 2023 existing LOS calculations have been performed using the existing channelization, existing intersection control, and peak-hour factors and heavy vehicle factors from the 2023 turning movement counts. These parameters have been used for the 2023 existing, 2025 baseline, and 2025 future with development conditions. The LOS summary for the PM peak-hour is included in **Table 4**.

Table 4: Level of Service Summary – PM Peak Hour

Intersection	Control	2023 Existing Conditions		2025 Baseline Conditions		2025 Future w. Development Conditions	
		LOS	Delay Approach	LOS	Delay Approach	LOS	Delay Approach
1. Old Salem Road NE at NE Transition Parkway	Two-Way Stop Control	B	14.5 sec WB	C	15.6 sec WB	D	27.0 sec WB
2. Old Salem Road NE at Conser Road NE	Two-Way Stop Control	B	13.6 sec EB	C	18.9 sec EB	C	21.1 sec EB

The analysis shows all study intersections currently operate at acceptable levels of service and are anticipated to continue operating at acceptable level of service standards under the baseline and future with development conditions. It should be noted that the eastbound movement for the intersection of Old Salem Road NE at Conser Road NE has been used to evaluate the operations of the intersection. The westbound approach technically has a higher delay, but there are a limited number of trips that use that dead-end section and there are not anticipated to be any trips generated by the Development that will travel along Conser Road NE east of Old Salem Road. The intersection LOS calculations are provided in the **Appendix E**.

5. CONCLUSIONS

The Development is proposed to include a 500,000 SF manufacturing warehouse. The Development is located west of Old Salem Road NE, south of Conser Road NE. The Development is anticipated to generate approximately 2,375 ADTs with approximately 340 AM peak-hour trips and approximately 370 PM peak-hour trips. The study intersections currently operate acceptably and are anticipated to operate at acceptable levels of service under the 2025 future with development conditions. Additional fees beyond standard System Development Charges (SDC) for future improvements should not be a condition of payment for the Development.

APPENDIX A
TRIP GENERATION

Project Delorean
090147000

**Trip Generation for: Weekday, Peak Hour of Adjacent Street Traffic, One Hour between 7 and 9 AM
(a.k.a.): Weekday AM Peak Hour**

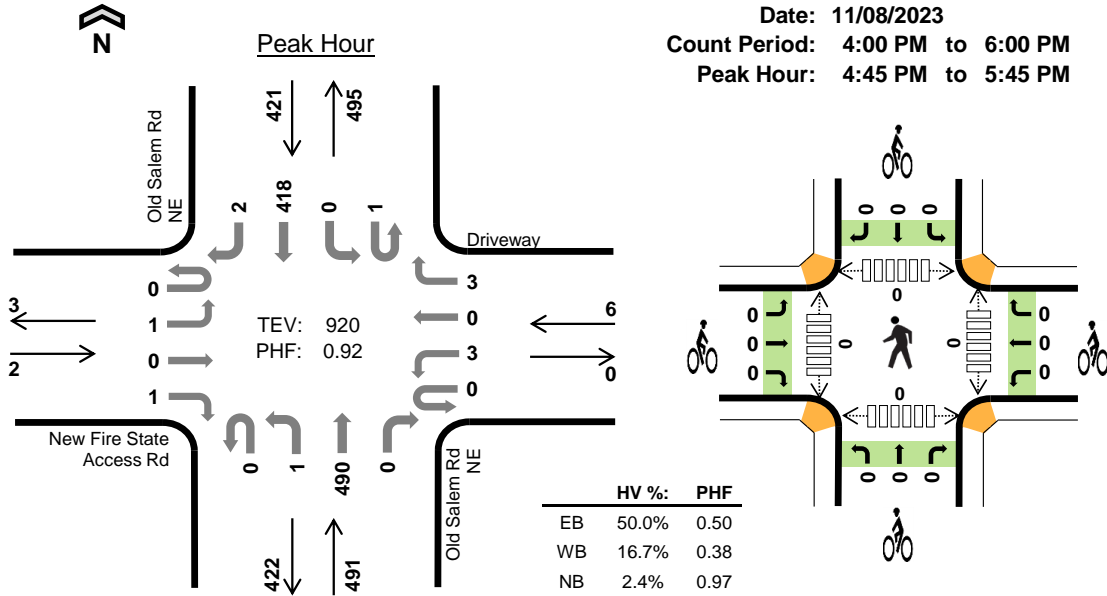
LAND USES	ITE LU code	VARIABLE	Trip Rate	Gross Trips			Internal Crossover			NET EXTERNAL TRIPS BY TYPE												
				% IN	% OUT	In+Out (Total)	% of Gross Trips	In+Out (Total)	IN BOTH DIRECTIONS		DIRECTIONAL ASSIGNMENTS											
									TOTAL In+Out (Total)	PASS-BY % of Ext. Trips	In+Out (Total)	% of Ext. Trips	DIVERTED LINK	NEW In+Out (Total)	PASS-BY In	PASS-BY Out	DIVERTED LINK In	DIVERTED LINK Out	NEW In	NEW Out		
Manufacturing	500.000 K SF		0.68	76%	24%	340	0%	0	0	0	0%	0	0	0	0	0	0	0	0	0	258	82
Total						340		0	0	340		0	0	0	0	0	0	0	0	0	258	82

APPENDIX B
EXISTING COUNT DATA AND GROWTH DATA

Old Salem Rd NE New Fire State Access Rd



Date: 11/08/2023
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM



	HV %:	PHF
EB	50.0%	0.50
WB	16.7%	0.38
NB	2.4%	0.97
SB	1.9%	0.86
TOTAL	2.4%	0.92

Two-Hour Count Summaries

Interval Start	New Fire State Access Rd				Driveway				Old Salem Rd NE				Old Salem Rd NE				15-min Total	Rolling One Hour	
	Eastbound		Westbound		Northbound		Southbound		UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	0	0	1	0	0	0	2	0	0	107	0	0	0	123	0	233	0	
4:15 PM	0	0	0	0	0	1	0	1	0	0	118	0	0	0	96	0	216	0	
4:30 PM	0	0	0	0	0	3	0	2	0	0	110	0	0	0	107	0	222	0	
4:45 PM	0	1	0	0	0	0	0	0	0	0	126	0	1	0	97	1	226	897	
5:00 PM	0	0	0	1	0	1	0	3	0	0	122	0	0	0	123	0	250	914	
5:15 PM	0	0	0	0	0	2	0	0	0	1	122	0	0	0	96	0	221	919	
5:30 PM	0	0	0	0	0	0	0	0	0	0	120	0	0	0	102	1	223	920	
5:45 PM	0	0	0	0	0	0	0	0	0	0	105	0	0	0	71	0	176	870	
Count Total	0	1	0	2	0	7	0	8	0	1	930	0	1	0	815	2	1,767	0	
Peak Hour	All	0	1	0	1	0	3	0	3	0	1	490	0	1	0	418	2	920	0
	HV	0	1	0	0	0	0	0	1	0	1	11	0	0	0	8	0	22	0
	HV%	-	100%	-	0%	-	0%	-	33%	-	100%	2%	-	0%	-	2%	0%	2%	0

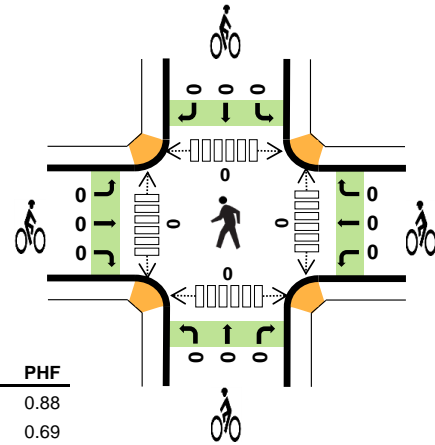
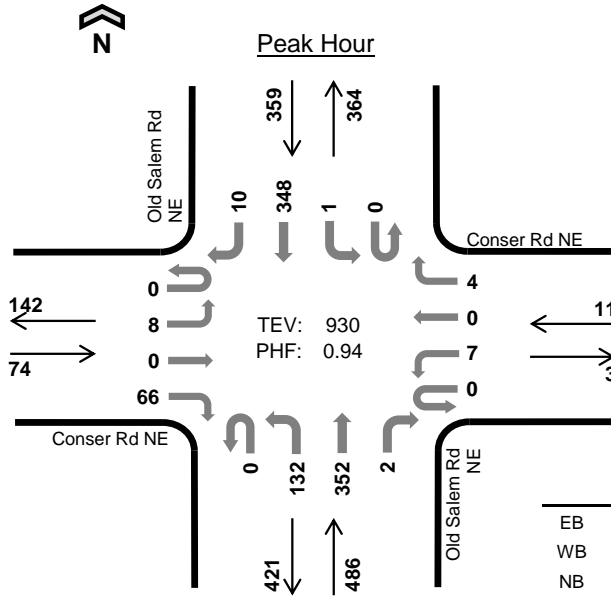
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	5	4	9	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	2	3	5	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	4	1	6	0	0	0	0	0	0	0	0	0	0
4:45 PM	1	0	1	2	4	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	5	1	7	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	3	4	7	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	3	1	4	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	3	2	5	0	0	0	0	0	0	0	0	0	0
Count Total	1	2	26	18	47	0	0	0	0	0	0	0	0	0	0
Peak Hour	1	1	12	8	22	0	0	0	0	0	0	0	0	0	0

Old Salem Rd NE Conser Rd NE



Date: 11/08/2023
 Count Period: 4:00 PM to 6:00 PM
 Peak Hour: 4:15 PM to 5:15 PM



	HV %:	PHF
EB	1.4%	0.88
WB	18.2%	0.69
NB	3.1%	0.93
SB	3.1%	0.87
TOTAL	3.1%	0.94

Two-Hour Count Summaries

Interval Start	Conser Rd NE				Conser Rd NE				Old Salem Rd NE				Old Salem Rd NE				15-min Total	Rolling One Hour	
	Eastbound		Westbound		Northbound		Southbound		UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	2	0	17	0	1	0	0	0	34	74	1	0	0	108	4	241	0	
4:15 PM	0	3	0	13	0	3	0	1	0	32	88	1	0	0	80	3	224	0	
4:30 PM	0	0	0	17	0	0	0	1	0	35	77	1	0	0	91	2	224	0	
4:45 PM	0	4	0	17	0	2	0	1	0	33	98	0	0	0	78	2	235	924	
5:00 PM	0	1	0	19	0	2	0	1	0	32	89	0	0	1	99	3	247	930	
5:15 PM	0	1	0	23	0	0	0	0	0	28	92	0	0	1	69	4	218	924	
5:30 PM	0	2	0	21	0	2	0	0	0	21	95	2	0	0	80	4	227	927	
5:45 PM	0	2	0	16	0	1	0	0	0	36	67	0	0	0	51	2	175	867	
Count Total	0	15	0	143	0	11	0	4	0	251	680	5	0	2	656	24	1,791	0	
Peak Hour	All	0	8	0	66	0	7	0	4	0	132	352	2	0	1	348	10	930	0
	HV	0	0	0	1	0	1	0	1	0	3	11	1	0	0	11	0	29	0
	HV%	-	0%	-	2%	-	14%	-	25%	-	2%	3%	50%	-	0%	3%	0%	3%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	5	8	13	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	2	3	6	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	5	4	10	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	0	6	0	7	0	0	0	0	0	0	0	0	0	0
5:15 PM	1	0	2	2	5	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	3	2	6	0	0	0	0	0	0	0	0	0	0
Count Total	3	2	27	25	57	0	0	0	0	0	0	0	0	0	0
Peak Hour	1	2	15	11	29	0	0	0	0	0	0	0	0	0	0

Project: Delorean
 Subject: ODOT Growth Rate Calculations
 Designed By: KH analyst

Project Number: 090147000
 Date: 12/9/2023
 Page: 1 of 1

Existing Growth Rate Calculations

Ref: Oregon Department of Transportation - Transportation Data Management System 2022

Number of Count Stations Analyzed = 4

Average Annual Growth Rate in the Vicinity of the Proposed Project = 1.42%

ODOT COUNT STATION:	17806	
ROADWAY:	Old Salem Road NE	
LOCATION:	South of Arnold Lane NE / 0.01 mile west Nygren Rd	
Year	ADT	Annual Growth Rate
2019	10507	-9.41%
2022	7810	
YEARS =	3	
PROJECTED TRAFFIC VOLUMES		
Year	ADT	
2023	7075	
2024	6409	
2025	5805	

ODOT COUNT STATION:	27049	
ROADWAY:	Conser Road NE	
LOCATION:	0.02 miles east of Castillo Drive NE	
Year	ADT	Annual Growth Rate
2019	1784	6.32%
2022	2144	
YEARS =	3	
PROJECTED TRAFFIC VOLUMES		
Year	ADT	
2023	2279	
2024	2424	
2025	2577	

ODOT COUNT STATION:	19889	
ROADWAY:	Old Salem Road NE	
LOCATION:	0.03 miles south of Morningstar Road NE	
Year	ADT	Annual Growth Rate
2019	4043	-0.31%
2022	4005	
YEARS =	3	
PROJECTED TRAFFIC VOLUMES		
Year	ADT	
2023	3628	
2024	3286	
2025	2977	

ODOT COUNT STATION:	49128	
ROADWAY:	Alexander Lane NE	
LOCATION:	0.07 miles west of Umpqua Lane NE	
Year	ADT	Annual Growth Rate
2019	677	9.09%
2022	879	
YEARS =	3	
PROJECTED TRAFFIC VOLUMES		
Year	ADT	
2023	935	
2024	994	
2025	1056	

APPENDIX C
PIPELINE PROJECT DATA



AGRIBUSINESS MILLERSBURG SITE

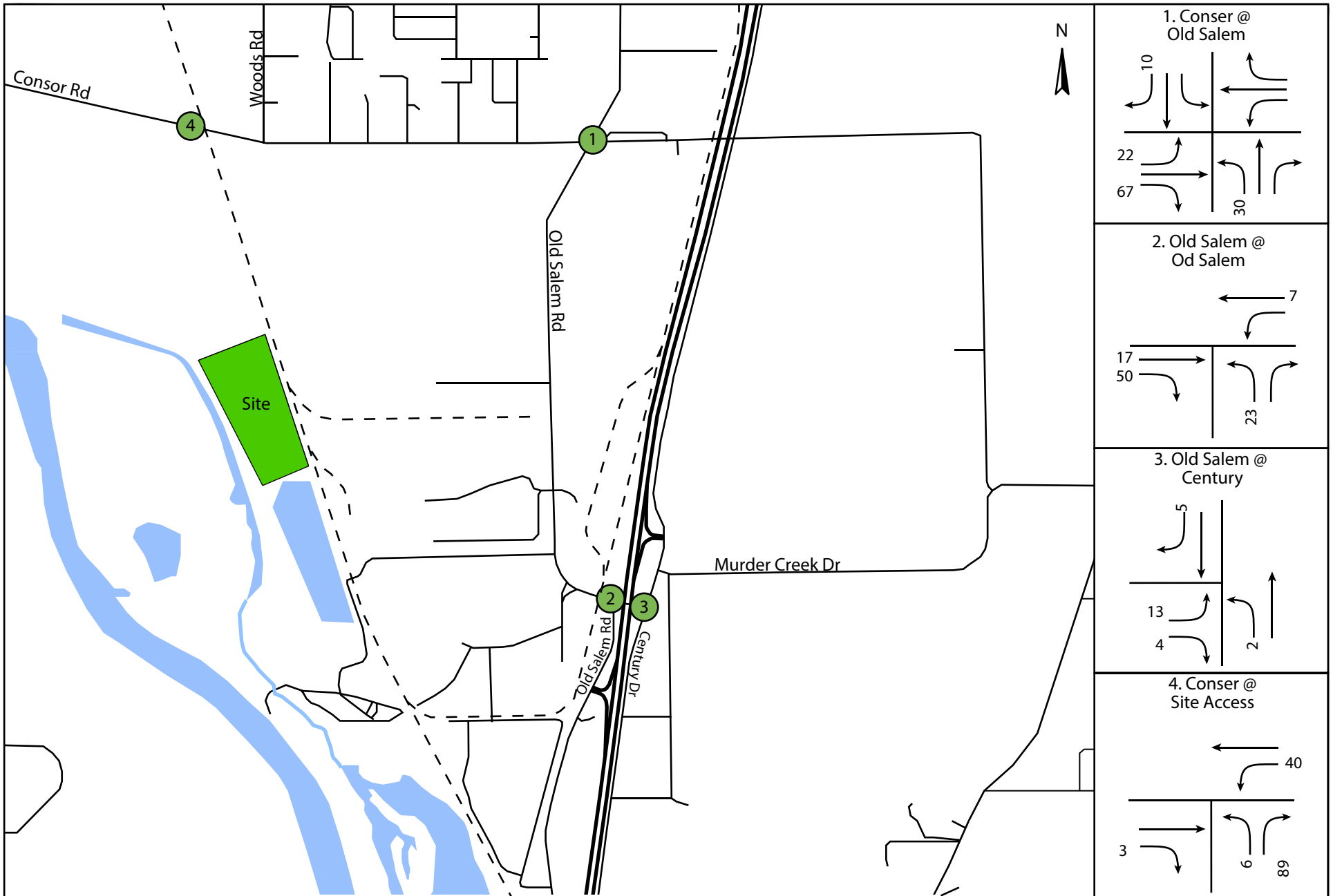
TRAFFIC IMPACT ANALYSIS



September 30, 2022

160 Madison St, Suite A
Eugene, OR 97402

SANDOW
ENGINEERING



Agribusiness Millersburg, Oregon

Figure 10: PM Peak Hour Development Trips



lancaster
moble



EXPIRES: 06/30/2025

Gordon Truck Center Transportation Impact Study Millersburg, Oregon

Date:
May 24, 2023

Prepared for:
Dominic Nicandri
Gordon Truck Center, Inc

Prepared by:
Daniel Stumpf, PE
Ken Kim, PE

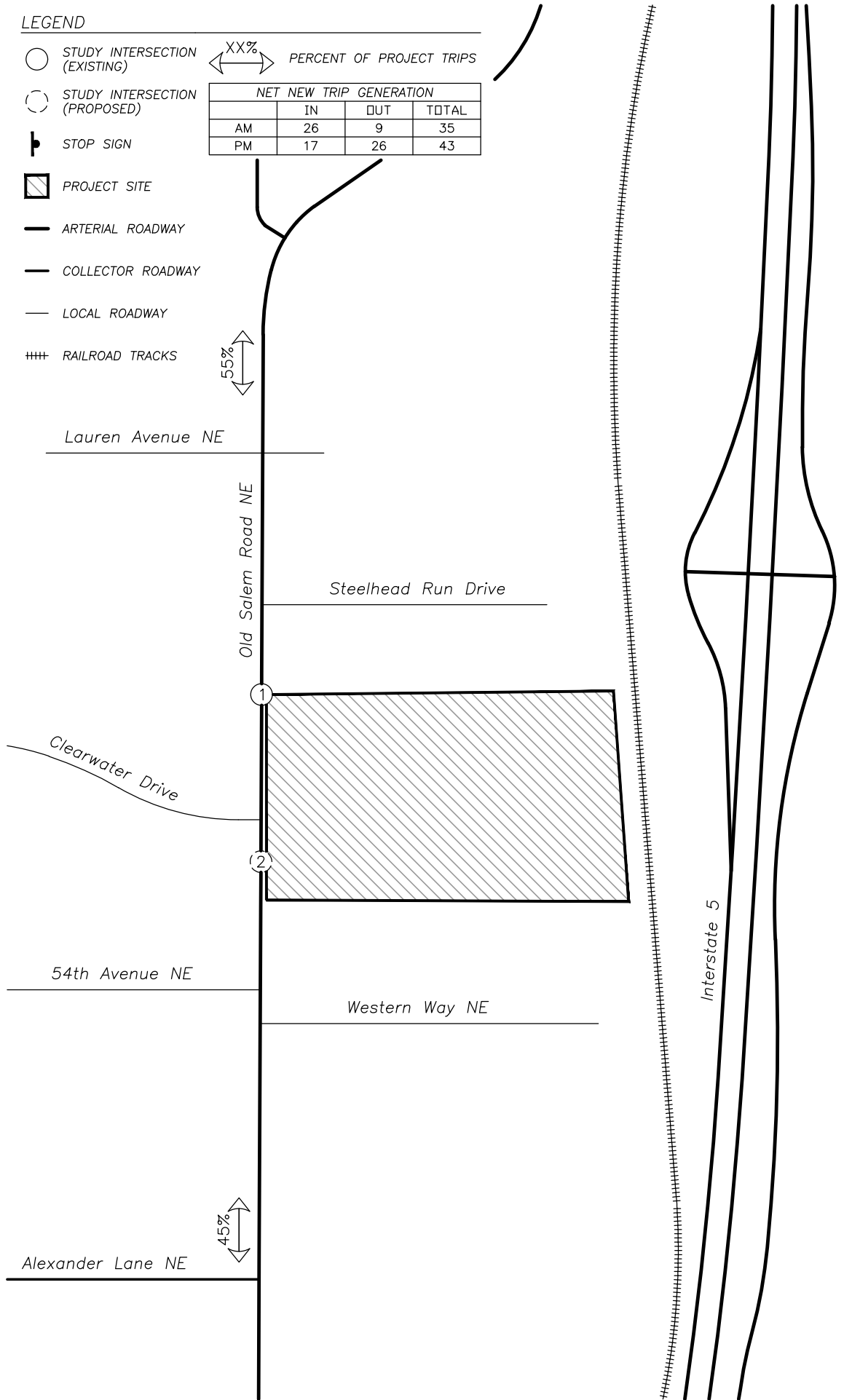
LEGEND

- STUDY INTERSECTION (EXISTING) XX% PERCENT OF PROJECT TRIPS
- STUDY INTERSECTION (PROPOSED)
- ⊥ STOP SIGN
- ▨ PROJECT SITE
- ARTERIAL ROADWAY
- COLLECTOR ROADWAY
- LOCAL ROADWAY
- ⊎ RAILROAD TRACKS

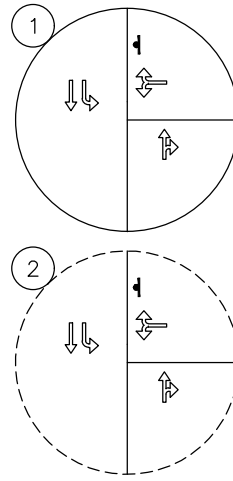
NET NEW TRIP GENERATION			
	IN	OUT	TOTAL
AM	26	9	35
PM	17	26	43

55%

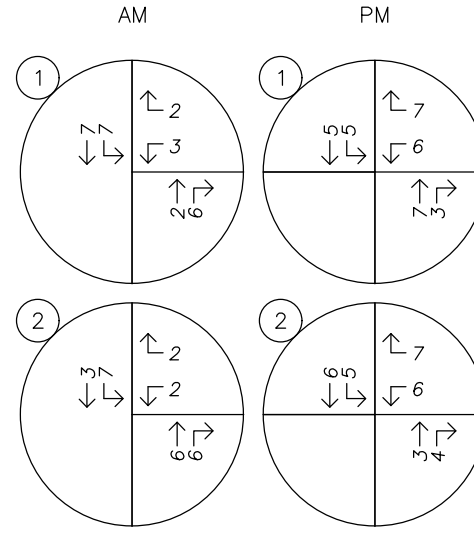
45%



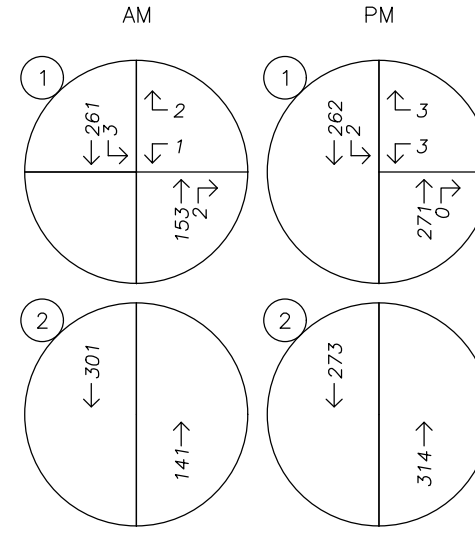
INTERSECTION CONFIGURATION



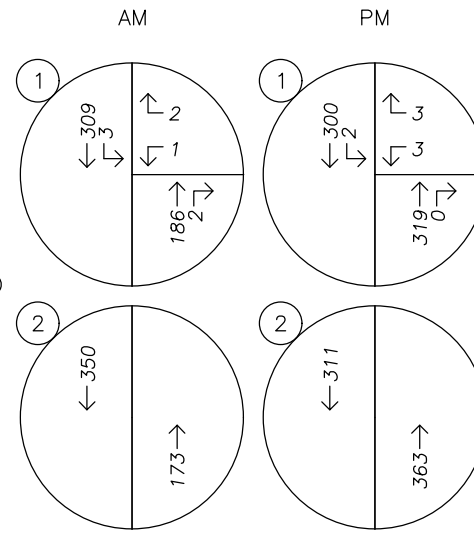
SITE TRIP



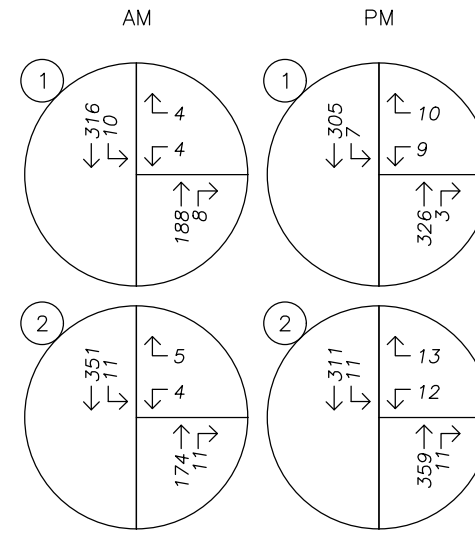
EXISTING CONDITION



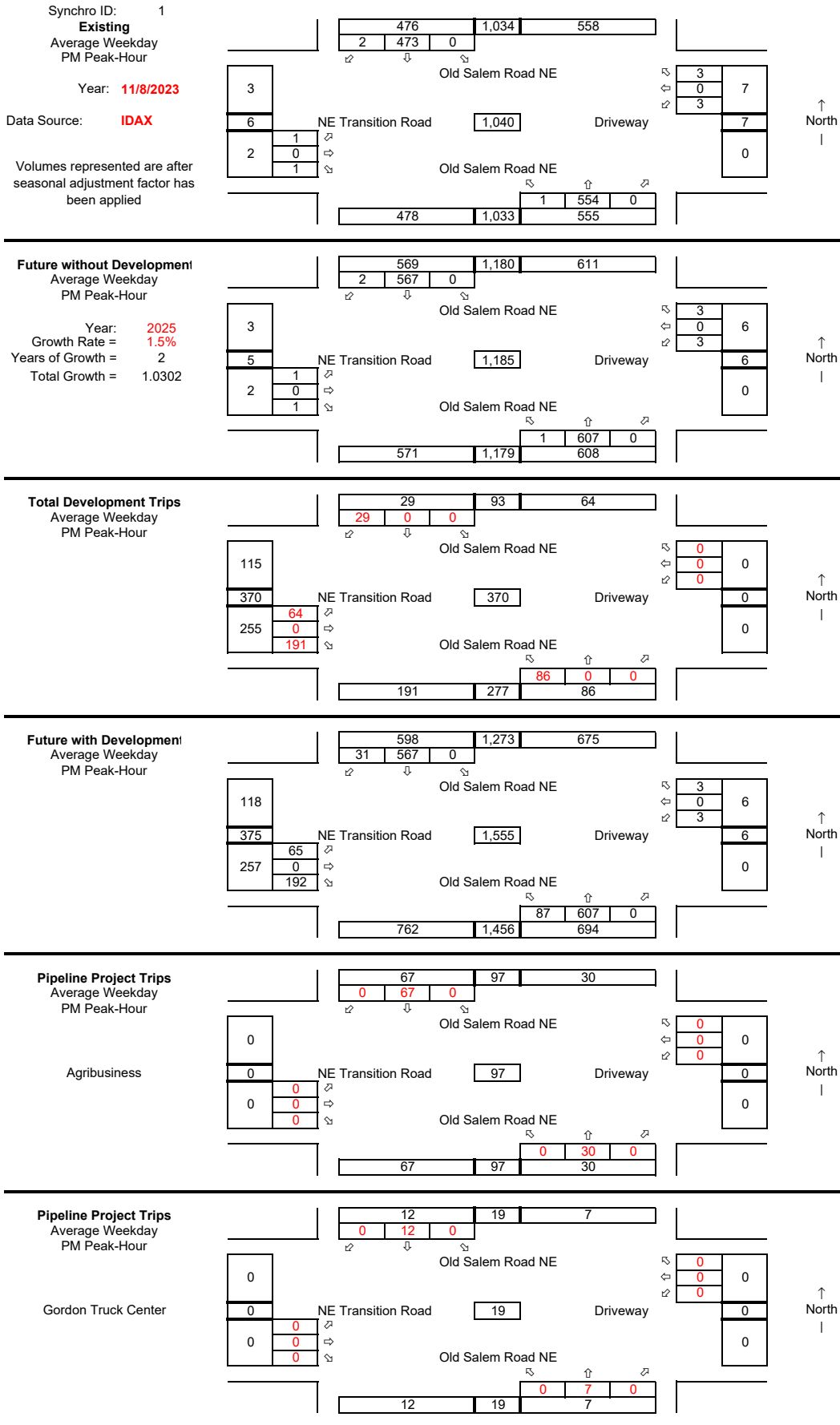
BACKGROUND CONDITION



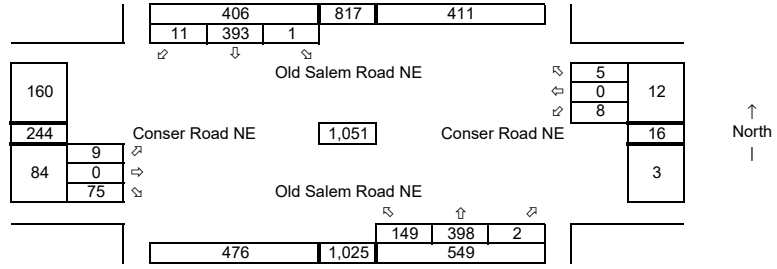
BUILDOUT CONDITION



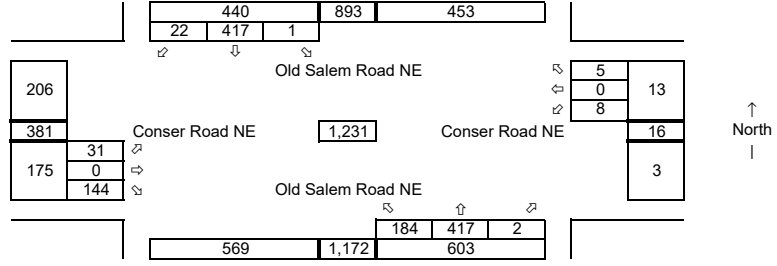
APPENDIX D
TURNING MOVEMENTS



Synchro ID: 2
Existing
 Average Weekday
 PM Peak-Hour
 Year: 11/8/2023
 Data Source: IDAX
 Volumes represented are after
 seasonal adjustment factor has
 been applied



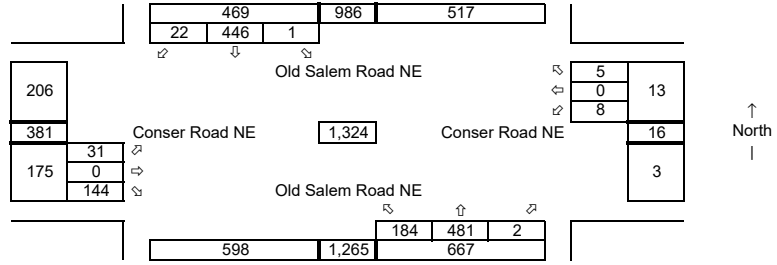
Future without Development
 Average Weekday
 PM Peak-Hour
 Year: 2025
 Growth Rate = 1.5%
 Years of Growth = 2
 Total Growth = 1.0302



Total Development Trips
 Average Weekday
 PM Peak-Hour



Future with Development
 Average Weekday
 PM Peak-Hour



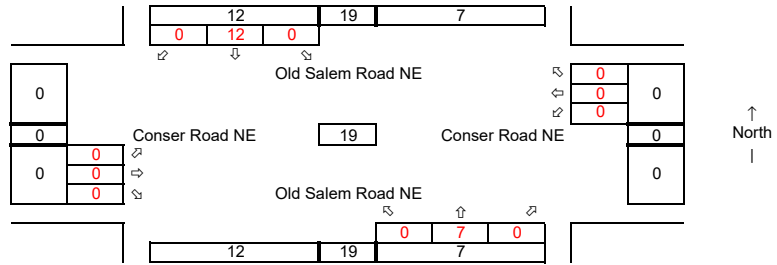
Pipeline Project Trips
 Average Weekday
 PM Peak-Hour

Agribusiness



Pipeline Project Trips
 Average Weekday
 PM Peak-Hour

Gordon Truck Center



APPENDIX E
LEVEL OF SERVICE CALCULATIONS

HCM 6th TWSC

1: Old Salem Road NE & NE Transition Road/Driveway

DELOREAN

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↕		↖	↗		↖	↗	
Traffic Vol, veh/h	1	0	1	3	0	3	1	554	0	0	473	2
Future Vol, veh/h	1	0	1	3	0	3	1	554	0	0	473	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	3	0	3	1	602	0	0	514	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1121	1119	515	1120	1120	602	516	0	0	602	0	0
Stage 1	515	515	-	604	604	-	-	-	-	-	-	-
Stage 2	606	604	-	516	516	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	183	207	560	184	206	500	1050	-	-	975	-	-
Stage 1	543	535	-	485	488	-	-	-	-	-	-	-
Stage 2	484	488	-	542	534	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	182	207	560	183	206	500	1050	-	-	975	-	-
Mov Cap-2 Maneuver	315	327	-	316	326	-	-	-	-	-	-	-
Stage 1	542	535	-	485	488	-	-	-	-	-	-	-
Stage 2	480	488	-	541	534	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14	14.5	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1050	-	-	315	560	387	975	-	-
HCM Lane V/C Ratio	0.001	-	-	0.003	0.002	0.017	-	-	-
HCM Control Delay (s)	8.4	-	-	16.5	11.4	14.5	0	-	-
HCM Lane LOS	A	-	-	C	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.1	0	-	-

HCM 6th TWSC
2: Old Salem Road NE & Conser Road NE

DELOREAN

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖		↗	↖		↗	↖	↗	↖	↗	↖	↗
Traffic Vol, veh/h	9	0	75	8	0	5	149	398	2	1	393	11
Future Vol, veh/h	9	0	75	8	0	5	149	398	2	1	393	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Stop	-	-	None	-	-	None
Storage Length	50	-	0	0	-	25	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	10	0	80	9	0	5	159	423	2	1	418	12

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1168	-	424	1168	-	424	430	0	0	425	0	0
Stage 1	426	-	-	742	-	-	-	-	-	-	-	-
Stage 2	742	-	-	426	-	-	-	-	-	-	-	-
Critical Hdwy	7.13	-	6.23	7.13	-	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	-	-	6.13	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	-	-	6.13	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	-	3.327	3.527	-	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	170	0	628	170	0	628	1124	-	-	1129	-	-
Stage 1	604	0	-	406	0	-	-	-	-	-	-	-
Stage 2	406	0	-	604	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	150	-	628	132	-	628	1124	-	-	1129	-	-
Mov Cap-2 Maneuver	150	-	-	132	-	-	-	-	-	-	-	-
Stage 1	519	-	-	349	-	-	-	-	-	-	-	-
Stage 2	346	-	-	527	-	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	13.6		25.1		2.4			0		
HCM LOS	B		D							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1124	-	-	150	628	132	628	1129	-	-
HCM Lane V/C Ratio	0.141	-	-	0.064	0.127	0.064	0.008	0.001	-	-
HCM Control Delay (s)	8.7	-	-	30.6	11.6	34.1	10.8	8.2	-	-
HCM Lane LOS	A	-	-	D	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	0.2	0.4	0.2	0	0	-	-

HCM 6th TWSC

1: Old Salem Road NE & NE Transition Road/Driveway

DELOREAN

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↕		↖	↗		↖	↗	
Traffic Vol, veh/h	1	0	1	3	0	3	1	607	0	0	567	2
Future Vol, veh/h	1	0	1	3	0	3	1	607	0	0	567	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	3	0	3	1	660	0	0	616	2

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1281	1279	617	1280	1280	660	618	0	0	660	0	0
Stage 1	617	617	-	662	662	-	-	-	-	-	-	-
Stage 2	664	662	-	618	618	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	142	166	490	143	166	463	962	-	-	928	-	-
Stage 1	477	481	-	451	459	-	-	-	-	-	-	-
Stage 2	450	459	-	477	481	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	141	166	490	143	166	463	962	-	-	928	-	-
Mov Cap-2 Maneuver	275	290	-	276	290	-	-	-	-	-	-	-
Stage 1	477	481	-	451	459	-	-	-	-	-	-	-
Stage 2	446	459	-	476	481	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.3		15.6		0		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	962	-	-	275	490	346	928	-	-
HCM Lane V/C Ratio	0.001	-	-	0.004	0.002	0.019	-	-	-
HCM Control Delay (s)	8.7	-	-	18.1	12.4	15.6	0	-	-
HCM Lane LOS	A	-	-	C	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0.1	0	-	-

HCM 6th TWSC
2: Old Salem Road NE & Conser Road NE

DELOREAN

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	0	144	8	0	5	184	417	2	1	417	22
Future Vol, veh/h	31	0	144	8	0	5	184	417	2	1	417	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Stop	-	-	None	-	-	None
Storage Length	50	-	0	0	-	25	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	33	0	153	9	0	5	196	444	2	1	444	23

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1295	-	456	1295	-	445	467	0	0	446	0	0
Stage 1	458	-	-	837	-	-	-	-	-	-	-	-
Stage 2	837	-	-	458	-	-	-	-	-	-	-	-
Critical Hdwy	7.13	-	6.23	7.13	-	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	-	-	6.13	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	-	-	6.13	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	-	3.327	3.527	-	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	139	0	602	139	0	611	1089	-	-	1109	-	-
Stage 1	581	0	-	360	0	-	-	-	-	-	-	-
Stage 2	360	0	-	581	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	119	-	602	89	-	611	1089	-	-	1109	-	-
Mov Cap-2 Maneuver	119	-	-	89	-	-	-	-	-	-	-	-
Stage 1	476	-	-	295	-	-	-	-	-	-	-	-
Stage 2	293	-	-	433	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	18.9		34.8		2.8		0	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1089	-	-	119	602	89	611	1109	-	-
HCM Lane V/C Ratio	0.18	-	-	0.277	0.254	0.096	0.009	0.001	-	-
HCM Control Delay (s)	9	-	-	46.5	13	49.7	10.9	8.2	-	-
HCM Lane LOS	A	-	-	E	B	E	B	A	-	-
HCM 95th %tile Q(veh)	0.7	-	-	1	1	0.3	0	0	-	-

HCM 6th TWSC

1: Old Salem Road NE & NE Transition Road/Driveway

DELOREAN

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	0	192	3	0	3	87	607	0	0	567	31
Future Vol, veh/h	65	0	192	3	0	3	87	607	0	0	567	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	71	0	209	3	0	3	95	660	0	0	616	34

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1485	1483	633	1588	1500	660	650	0	0	660	0	0
Stage 1	633	633	-	850	850	-	-	-	-	-	-	-
Stage 2	852	850	-	738	650	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	103	125	480	87	122	463	936	-	-	928	-	-
Stage 1	468	473	-	355	377	-	-	-	-	-	-	-
Stage 2	354	377	-	410	465	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	94	112	480	45	110	463	936	-	-	928	-	-
Mov Cap-2 Maneuver	206	229	-	104	212	-	-	-	-	-	-	-
Stage 1	421	473	-	319	339	-	-	-	-	-	-	-
Stage 2	316	339	-	232	465	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	21.4		27		1.2		0	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	936	-	-	206	480	170	928	-	-
HCM Lane V/C Ratio	0.101	-	-	0.343	0.435	0.038	-	-	-
HCM Control Delay (s)	9.3	-	-	31.3	18.1	27	0	-	-
HCM Lane LOS	A	-	-	D	C	D	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.4	2.2	0.1	0	-	-

HCM 6th TWSC
2: Old Salem Road NE & Conser Road NE

DELOREAN

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔		↔	↔	↔		↔	↔	
Traffic Vol, veh/h	31	0	144	8	0	5	184	481	2	1	446	22
Future Vol, veh/h	31	0	144	8	0	5	184	481	2	1	446	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Stop	-	-	None	-	-	None
Storage Length	50	-	0	0	-	25	100	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	33	0	153	9	0	5	196	512	2	1	474	23

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1393	-	486	1393	-	513	497	0	0	514	0	0
Stage 1	488	-	-	905	-	-	-	-	-	-	-	-
Stage 2	905	-	-	488	-	-	-	-	-	-	-	-
Critical Hdwy	7.13	-	6.23	7.13	-	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	-	-	6.13	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	-	-	6.13	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	-	3.327	3.527	-	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	119	0	579	119	0	559	1062	-	-	1046	-	-
Stage 1	559	0	-	330	0	-	-	-	-	-	-	-
Stage 2	330	0	-	559	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	101	-	579	75	-	559	1062	-	-	1046	-	-
Mov Cap-2 Maneuver	101	-	-	75	-	-	-	-	-	-	-	-
Stage 1	456	-	-	269	-	-	-	-	-	-	-	-
Stage 2	267	-	-	411	-	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	21.1		40.8		2.5			0		
HCM LOS	C		E							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1062	-	-	101	579	75	559	1046	-	-
HCM Lane V/C Ratio	0.184	-	-	0.327	0.265	0.113	0.01	0.001	-	-
HCM Control Delay (s)	9.2	-	-	57	13.4	59.1	11.5	8.4	-	-
HCM Lane LOS	A	-	-	F	B	F	B	A	-	-
HCM 95th %tile Q(veh)	0.7	-	-	1.3	1.1	0.4	0	0	-	-