

F i s c h b a c h
Transportation Group, LLC
Traffic Engineering and Planning

Traffic Impact Study

Trotwood Avenue Property
Trotwood Avenue at Old Zion Road Ext.
Mt. Pleasant, TN

Prepared April 2025
For SEC, Inc.

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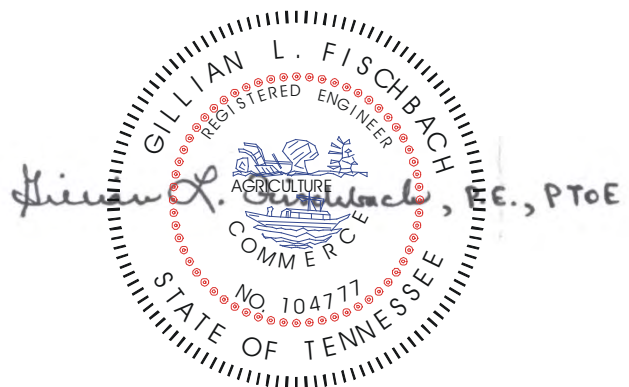


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1. INTRODUCTION

This traffic study has been prepared in order to identify the traffic impacts of a residential development that is proposed to be constructed on the north side of Trotwood Avenue, between Zion Road and Old Zion Road / Old Zion Road Extension, in Mt. Pleasant, Tennessee.

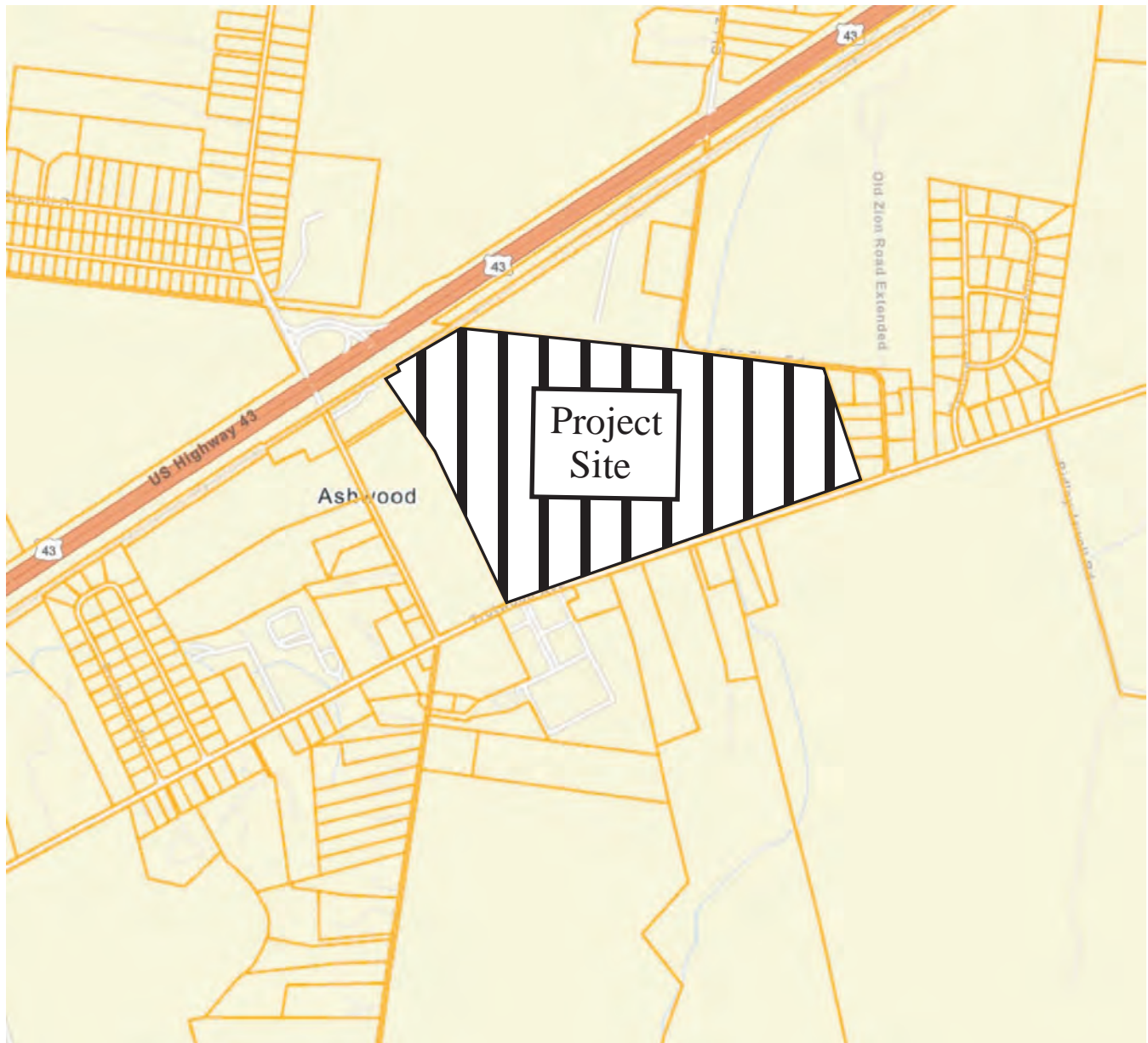
For the purposes of this study, existing and background traffic volumes were established, and capacity analyses were conducted for these conditions. Also, trip generation calculations were performed, and the trips which are expected to be generated by the proposed project were distributed to the roadway system and added to the background traffic volumes. The roadways and intersections which provide access to the site were then re-evaluated to determine the traffic impacts of the proposed project. Access needs for the project were evaluated, and the necessary roadway and/or traffic control improvements were identified. This report presents the results of these analyses and the subsequent recommendations.

2. PROJECT DESCRIPTION

The location of the proposed project is shown in [Figure 1](#). As shown, the project site is located on the north side of Trotwood Avenue, between Zion Road and Old Zion Road / Old Zion Road Extension, in Mt. Pleasant, Tennessee. The developer of the proposed project plans to construct 247 single-family homes, and access to the project will be provided at one location on Zion Road and two locations on Old Zion Road Extension.

The current site plan for the proposed project is shown in [Figure 2](#). In large part, economic and market considerations will dictate the pace and timing with which the proposed project is actually completed. For the purposes of this study, it was assumed that the proposed project will be completed by Year 2030.

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No Scale

Figure 1.
Location of the Proposed Project Site

3. YEAR 2025 EXISTING CONDITIONS

3.1 EXISTING LANEAGE AND TRAFFIC CONTROL

A field visit was completed on April 5, 2025 in order to confirm the laneage and traffic control noted during the collection of turning movement data at the intersections within the study area. The existing laneage and traffic control at the intersections within the study area are shown in [Figure 3](#).

Southbound Zion Road at Project Access



Photo credit: Google Earth (3/2025)

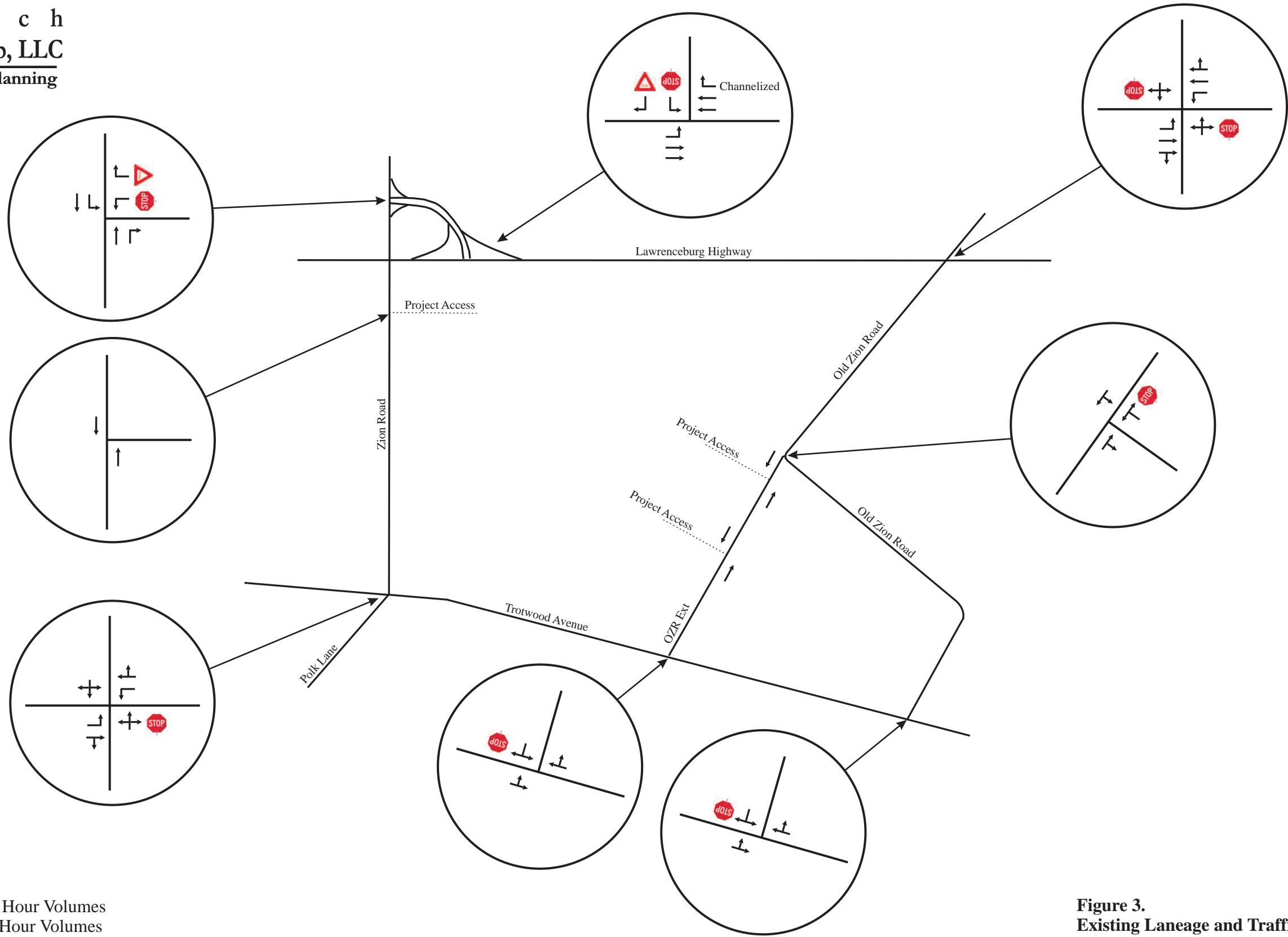
In the vicinity of the project site, between Trotwood Avenue and the ramps for Lawrenceburg Highway, Zion Road includes one 10-foot travel lane in each direction and no shoulders. A 35 mph speed limit is posted on this roadway segment.

Southbound Old Zion Road Extension at Project Access



Photo credit: Google Earth (6/2023)

In the vicinity of the project site, between Trotwood Avenue and Lawrenceburg Highway, Old Zion Road Extension includes one 10-foot travel lane in each direction and no shoulders. A 35 mph speed limit is posted on this roadway segment.



No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 3.
Existing Laneage and Traffic Control

3.2 YEAR 2025 EXISTING TRAFFIC VOLUMES

In order to provide data for the traffic impact analysis, traffic volumes were counted in 15-minute increments at the following intersections:

- Trotwood Avenue and Zion Road / Polk Lane
- Trotwood Avenue and Old Zion Road Extension
- Trotwood Avenue and Old Zion Road
- Old Zion Road and Old Zion Road Extension
- Zion Road and the Ramps for Lawrenceburg Highway
- Lawrenceburg Highway and the Ramps for Zion Road
- Lawrenceburg Highway and Old Zion Road

This data was collected from 6:00 AM – 7:00 PM on typical weekdays in March 2025 when schools were in session. The raw traffic volumes are included in [Appendix A](#) and are shown in [Figure 4](#).

Using the existing peak hour traffic volumes shown in [Figure 4](#), capacity analyses were conducted for the intersections studied. Specifically, in order to identify current peak hour levels of operation within the study area, the capacity calculations were performed according to the methods outlined in the [Highway Capacity Manual 7](#) (HCM 7). These analyses result in the determination of a Level of Service (LOS), which is a measure of evaluation is used to describe how well an intersection or roadway operates. LOS A represents free flow traffic operations, and LOS F suggests that the traffic demand exceeds the available capacity. In an urbanized area, LOS D is typically considered to be the minimum acceptable LOS. [Table 1](#) presents the descriptions of LOS for signalized intersections, and [Table 2](#) presents the descriptions of LOS for unsignalized intersections.

The results of the capacity analyses for the existing peak hour traffic volumes are shown in [Table 3](#), and [Appendix B](#) includes the capacity analyses worksheets. These analyses indicate the following:

Trotwood Avenue and Zion Road / Polk Lane

At this unsignalized intersection, most of the critical turning movements currently operate at LOS C or better during both peak hours. However, the southbound turning movements operate at LOS F during both peak hours, and the typical vehicle delays and queues are moderate.

Trotwood Avenue and Old Zion Road Extension

At this unsignalized intersection, the southbound turning movements operate at LOS E during the AM peak hour and LOS F during the PM peak hour, and the typical vehicle delays and queues are moderate.

Trotwood Avenue and Old Zion Road

At this unsignalized intersection, all of the critical turning movements currently operate at LOS D or better during both peak hours.

Old Zion Road and Old Zion Road Extension

At this unsignalized intersection, all of the critical turning movements currently operate at LOS A during both peak hours.

Zion Road and the Ramps for Lawrenceburg Highway

At this unsignalized intersection, all of the critical turning movements currently operate at LOS B or better during both peak hours.

Lawrenceburg Highway and the Ramps for Zion Road

At this unsignalized intersection, most of the critical turning movements currently operate at LOS C or better during both peak hours. However, the southbound turning movements operate at LOS E during the AM peak hour and LOS F during the PM peak hour.

Lawrenceburg Highway and Old Zion Road

At this unsignalized intersection, most of the critical turning movements currently operate at LOS B or better during both peak hours. However, the northbound turning movements operate at LOS D during the AM peak hour and LOS F during the PM peak hour, and the southbound turning movements operate at LOS F during both peak hours.

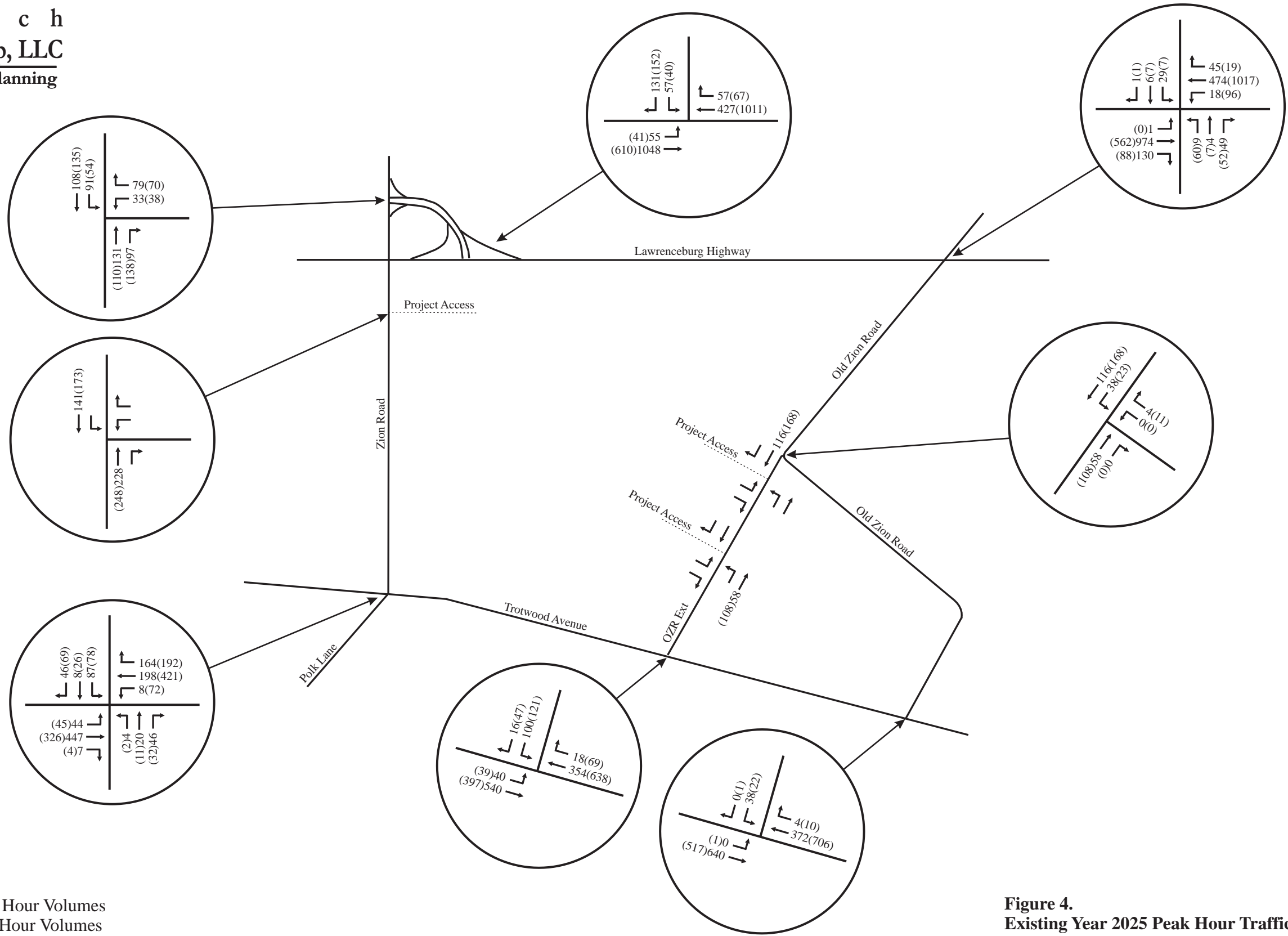


Figure 4.
Existing Year 2025 Peak Hour Traffic Volumes

TABLE 1. DESCRIPTIONS OF LOS FOR SIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay per Vehicle (sec)
A	Operations with very low control delay. Progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	Operations with stable flows. This generally occurs with good progression, short cycle lengths, or both. More vehicles stop than for LOS A, causing higher levels of average delay.	> 10 and ≤ 20
C	Operations with stable flow. Occurs with fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	> 20 and ≤ 35
D	Approaching unstable flow. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop.	> 35 and ≤ 55
E	Unstable flow. In many cases, this is considered to be the limit for acceptable delay. These high delays generally indicate poor progression, long cycle lengths, and high v/c ratios.	> 55 and ≤ 80
F	Unacceptable delay. This condition often occurs with oversaturation or with high v/c ratios. Poor progression and long cycle lengths may also cause such delay levels.	> 80

Source: Highway Capacity Manual 7 (HCM 7)

TABLE 2. DESCRIPTIONS OF LOS FOR UNSIGNALIZED INTERSECTIONS

Level of Service	Description	Average Control Delay (sec/veh)
A	Minimal delay	≤ 10
B	Brief delay	> 10 and ≤ 15
C	Average delay	> 15 and ≤ 25
D	Significant delay	> 25 and ≤ 35
E	Long delay	> 35 and ≤ 50
F	Extreme delay	> 50

Source: Highway Capacity Manual 7 (HCM 7)

TABLE 3. YEAR 2025 EXISTING PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95 TH %-ILE QUEUE	LEVEL OF SERVICE	95 TH %-ILE QUEUE
Trotwood Avenue and Polk Lane / Zion Road	Eastbound Left Turns	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (9 sec/veh)
	Westbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS A	1 veh (8 sec/veh)
	Northbound Turning Movements	LOS C	1 veh (19 sec/veh)	LOS C	1 veh (19 sec/veh)
	Southbound Turning Movements	LOS F	5 veh (55 sec/veh)	LOS F	8 veh (116 sec/veh)
Trotwood Avenue and Old Zion Road Ext.	Eastbound Left Turns / Thrus	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (9 sec/veh)
	Southbound Left / Right Turns	LOS E	3 veh (37 sec/veh)	LOS F	7 veh (74 sec/veh)
Trotwood Avenue and Old Zion Road	Eastbound Left Turns / Thrus	LOS A	0 veh (8 sec/veh)	LOS A	0 veh (9 sec/veh)
	Southbound Left / Right Turns	LOS D	1 veh (26 sec/veh)	LOS D	1 veh (28 sec/veh)
Old Zion Road and Old Zion Road Ext.	Westbound Left / Right Turns	LOS A	0 veh (9 sec/veh)	LOS A	0 veh (9 sec/veh)
	Southbound Left Turns / Thrus	LOS A	1 veh (7 sec/veh)	LOS A	1 veh (8 sec/veh)
Zion Road and Ramps for Lawrenceburg Highway	Westbound Left Turns	LOS B	1 veh (14 sec/veh)	LOS B	1 veh (11 sec/veh)
	Westbound Right Turns	LOS A	1 veh (10 sec/veh)	LOS A	1 veh (9 sec/veh)
	Southbound Left Turns	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Lawrenceburg Highway and Ramps for Zion Road	Eastbound Left Turns	LOS A	1 veh (9 sec/veh)	LOS B	1 veh (11 sec/veh)
	Southbound Left Turns	LOS E	2 veh (40 sec/veh)	LOS F	2 veh (66 sec/veh)
	Southbound Right Turns	LOS B	1 veh (11 sec/veh)	LOS C	2 veh (16 sec/veh)
Lawrenceburg Highway and Old Zion Road	Eastbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS B	0 veh (11 sec/veh)
	Westbound Left Turns	LOS B	1 veh (11 sec/veh)	LOS A	1 veh (9 sec/veh)
	Northbound Turning Movements	LOS D	1 veh (27 sec/veh)	LOS F	7 veh (156 sec/veh)
	Southbound Turning Movements	LOS F	2 veh (55 sec/veh)	LOS F	1 veh (97 sec/veh)

3.3 TRAFFIC SIGNAL WARRANT ANALYSES

Based on the results of the capacity analyses, traffic signal warrant analyses were conducted for the following intersections:

- Trotwood Avenue and Zion Road / Polk Lane
- Trotwood Avenue and Old Zion Road Extension

The Federal Highway Administration has published the Manual on Uniform Traffic Control Devices (MUTCD), which includes traffic signal warrants that help traffic engineering professionals to identify when a traffic signal installation is justified at a particular location. The warrants include minimum conditions that are compared to existing or projected traffic conditions, and typically, traffic signals should not be installed unless at least one of the MUTCD warrants, as described in [Appendix C](#), is met.

The Manual on Uniform Traffic Control Devices (MUTCD) stipulates that the signal warrant thresholds may be reduced by 30% "...if the posted or statutory speed limit or the 85th percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000..." The speed limit on Trotwood Avenue is 45 mph west of Zion Road / Polk Lane and 55 mph east of Zion Road / Polk Lane. Also, Mt. Pleasant has a population of approximately 5,000 people in a built-up part of Maury County, TN. Therefore, reduced traffic signal warrant thresholds were considered appropriate for the intersections studied.

The hourly data collected at the intersection of Trotwood Avenue and Zion Road / Polk Lane was compared to the reduced signal warrant thresholds, and the results of these analyses are included in [Table 4A](#). Specifically, these analyses are based on the following parameters:

- a one-lane approach on each leg of the intersection,
- 100% of the northbound turning movements, and
- 100% of the southbound turning movements.

These results indicate that the existing traffic volumes satisfy Warrant 1B – Interruption of Continuous Traffic and Warrant 2 – Four Hour Volume.

The hourly data collected at the intersection of Trotwood Avenue and Old Zion Road Ext. was compared to the reduced signal warrant thresholds, and the results of these analyses are included in [Table 4B](#). Specifically, these analyses are based on the following parameters:

- a one-lane approach on each leg of the intersection,
- 100% of the southbound turning movements.

These results indicate that the existing traffic volumes satisfy Warrant 1B – Interruption of Continuous Traffic and Warrant 2 – Four Hour Volume.

**TABLE 4A. TRAFFIC SIGNAL WARRANT ANALYSIS
INTERSECTION OF TROTWOOD AVENUE AND ZION ROAD / POLK LANE**

HOUR	TOTAL VEHICLES ON TROTWOOD AVENUE	SOUTHBOUND VEHICLES ON ZION ROAD	NORTHBOUND VEHICLES ON POLK LANE	SATISFY REDUCED WARRANTS?		
				Warrant 1 Condition A	Warrant 1 Condition B	Warrant 2
6:00-7:00 AM	482	89	68	--	--	--
7:00 - 8:00 AM	833	141	67	Yes	Yes	Yes
8:00 - 9:00 AM	590	84	40	--	Yes	--
9:00 - 10:00 AM	558	86	36	--	Yes	--
10:00 - 11:00 AM	524	79	43	--	--	--
11:00 - 12:00	599	67	31	--	Yes	--
12:00 - 1:00 PM	667	78	37	--	Yes	--
1:00 - 2:00 PM	726	60	50	--	Yes	--
2:00 - 3:00 PM	800	99	46	--	Yes	Yes
3:00 - 4:00 PM	987	147	38	Yes	Yes	Yes
4:00 - 5:00 PM	1,003	146	39	Yes	Yes	Yes
5:00 - 6:00 PM	879	131	52	Yes	Yes	Yes
6:00 - 7:00 PM	620	74	31	--	Yes	--

**TABLE 4B. TRAFFIC SIGNAL WARRANT ANALYSIS
INTERSECTION OF TROTWOOD AVENUE AND OLD ZION ROAD EXT.**

HOUR	TOTAL VEHICLES ON TROTWOOD AVENUE	SOUTHBOUND VEHICLES ON OLD ZION ROAD EXT.	SATISFY REDUCED WARRANTS?		
			Warrant 1 Condition A	Warrant 1 Condition B	Warrant 2
6:00-7:00 AM	464	79	--	--	--
7:00 - 8:00 AM	884	116	Yes	Yes	Yes
8:00 - 9:00 AM	618	94	--	Yes	Yes
9:00 - 10:00 AM	570	86	--	Yes	--
10:00 - 11:00 AM	538	90	--	Yes	--
11:00 - 12:00	651	59	--	Yes	--
12:00 - 1:00 PM	658	77	--	Yes	--
1:00 - 2:00 PM	684	70	--	Yes	--
2:00 - 3:00 PM	909	107	Yes	Yes	Yes
3:00 - 4:00 PM	935	120	Yes	Yes	Yes
4:00 - 5:00 PM	918	163	Yes	Yes	Yes
5:00 - 6:00 PM	732	110	Yes	Yes	Yes
6:00 - 7:00 PM	671	76	--	Yes	--

4. YEAR 2030 BACKGROUND TRAFFIC VOLUMES (SCENARIO 1)

In order to account for the traffic growth which will occur within the study area because of typical growth, background traffic volumes were established for the intersections within the study area. Specifically, in order to account for typical growth within the study area, consideration was given to the historical traffic volumes near the project site. The Tennessee Department of Transportation (TDOT) conducts an annual count program throughout the state. This count program includes the annual collection of average daily traffic (ADT) counts at numerous fixed locations.

As shown in [Table 5](#), the daily traffic volumes within the study area have increased steadily since 2015. Based on this data, the existing traffic volumes were increased 2% per year, or a total of 10%, in order to establish the initial Year 2030 background traffic volumes shown in [Figure 5A](#).

TABLE 5. HISTORICAL TRAFFIC VOLUMES IN THE STUDY AREA

Year	Station 167 Trotwood Ave ADT	Annual Growth	Overall Growth
2015	7,702		
2016	7,514	-2.44%	
2017	8,069	7.39%	
2018	8,133	0.79%	
2019	7,841	-3.59%	
2020	7,222	-7.89%	
2021	6,557	-9.21%	
2022	8,335	27.12%	
2023	8,493	1.90%	
2024	8,095	-4.69%	0.57%
Year	Station 58 Zion Road ADT	Annual Growth	Overall Growth
2015	3,123		
2016	2,980	-4.58%	
2017	3,034	1.81%	
2018	3,357	10.65%	
2019	3,060	-8.85%	
2020	2,818	-7.91%	
2021	3,175	12.67%	
2022	3,317	4.47%	
2023	3,991	20.32%	
2024	3,768	-5.59%	2.29%

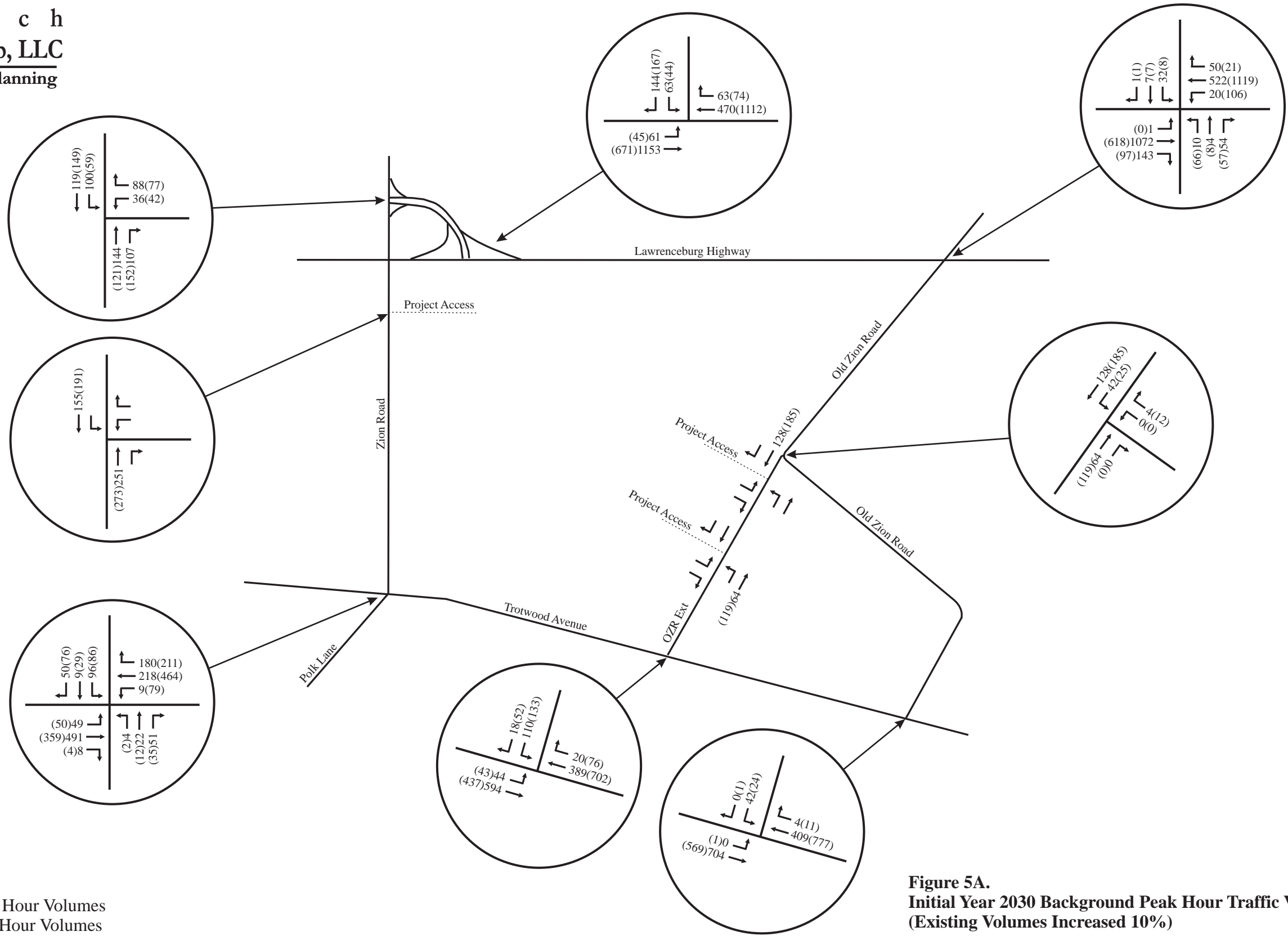


Figure 5A.
Initial Year 2030 Background Peak Hour Traffic Volumes
(Existing Volumes Increased 10%)

It is important to note that another residential project is planned for construction on the east side of Old Zion Road, in the immediate vicinity of the proposed project site. The peak hour traffic volumes generated by this project are identified in the Traffic Impact Study prepared by Ragan Smith Associates, Inc. in February 2023, and these volumes are shown in [Figure 5B](#). Information about this project is included in [Appendix A](#).

The traffic volumes shown in [Figures 5A and 5B](#) were added together in order to identify background traffic volumes, as shown in [Figure 5C](#). Capacity analyses were conducted for the background conditions at the intersections within the study area. The results of these analyses are shown in [Table 6](#), and [Appendix B](#) includes the capacity analyses worksheets. These analyses indicate the following:

Trotwood Avenue and Zion Road / Polk Lane

At this unsignalized intersection, most of the critical turning movements will continue to operate at LOS C or better during both peak hours. However, the southbound turning movements will continue to operate at LOS F during both peak hours, and the typical vehicle delays and queues will be significant. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate with signalized conditions, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with background conditions and signalization, the intersection of Trotwood Avenue and Zion Road / Polk Lane will operate at LOS C during both peak hours.

Trotwood Avenue and Old Zion Road Extension

At this unsignalized intersection, the southbound turning movements will operate at LOS F during both peak hours, and the typical vehicle delays and queues will be significant. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate with signalized conditions, as well as a dedicated eastbound left turn lane and a dedicated westbound right turn lane on Trotwood Avenue, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with background conditions and these laneage and traffic control improvements, the intersection of Trotwood Avenue and Old Zion Road Extension will operate at LOS B during the AM peak hour and LOS C during the PM peak hour.

Trotwood Avenue and Old Zion Road

For this unsignalized intersection, it was assumed that a dedicated eastbound left turn lane and a dedicated westbound right turn lane will be provided on Trotwood Avenue, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with background conditions and these laneage improvements, the southbound turning movements will operate at LOS E during both peak hours, and the typical vehicle delays and queues will be moderate.

Old Zion Road and Old Zion Road Extension

For this unsignalized intersection, it was assumed that a dedicated southbound left turn lane will be provided on Old Zion Road, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with

background conditions and these laneage improvements, all of the critical turning movements will operate at LOS B or better during both peak hours.

Zion Road and the Ramps for Lawrenceburg Highway

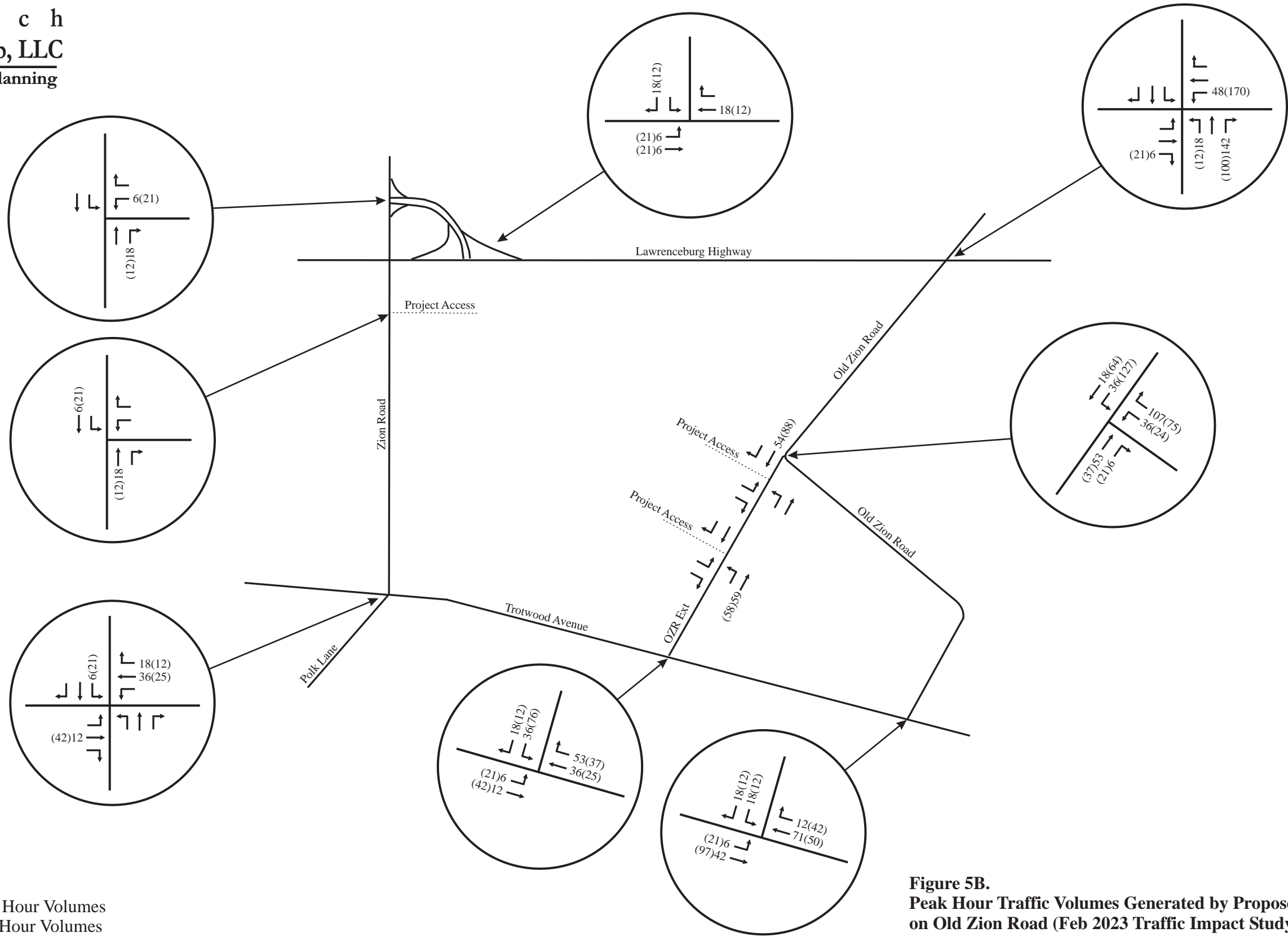
At this unsignalized intersection, all of the critical turning movements will continue to operate at LOS B or better during both peak hours.

Lawrenceburg Highway and the Ramps for Zion Road

At this unsignalized intersection, most of the critical turning movements will continue to operate at LOS C or better during both peak hours. However, the southbound turning movements will operate at LOS F during both peak hours, and the typical vehicle delays and queues will be moderate.

Lawrenceburg Highway and Old Zion Road

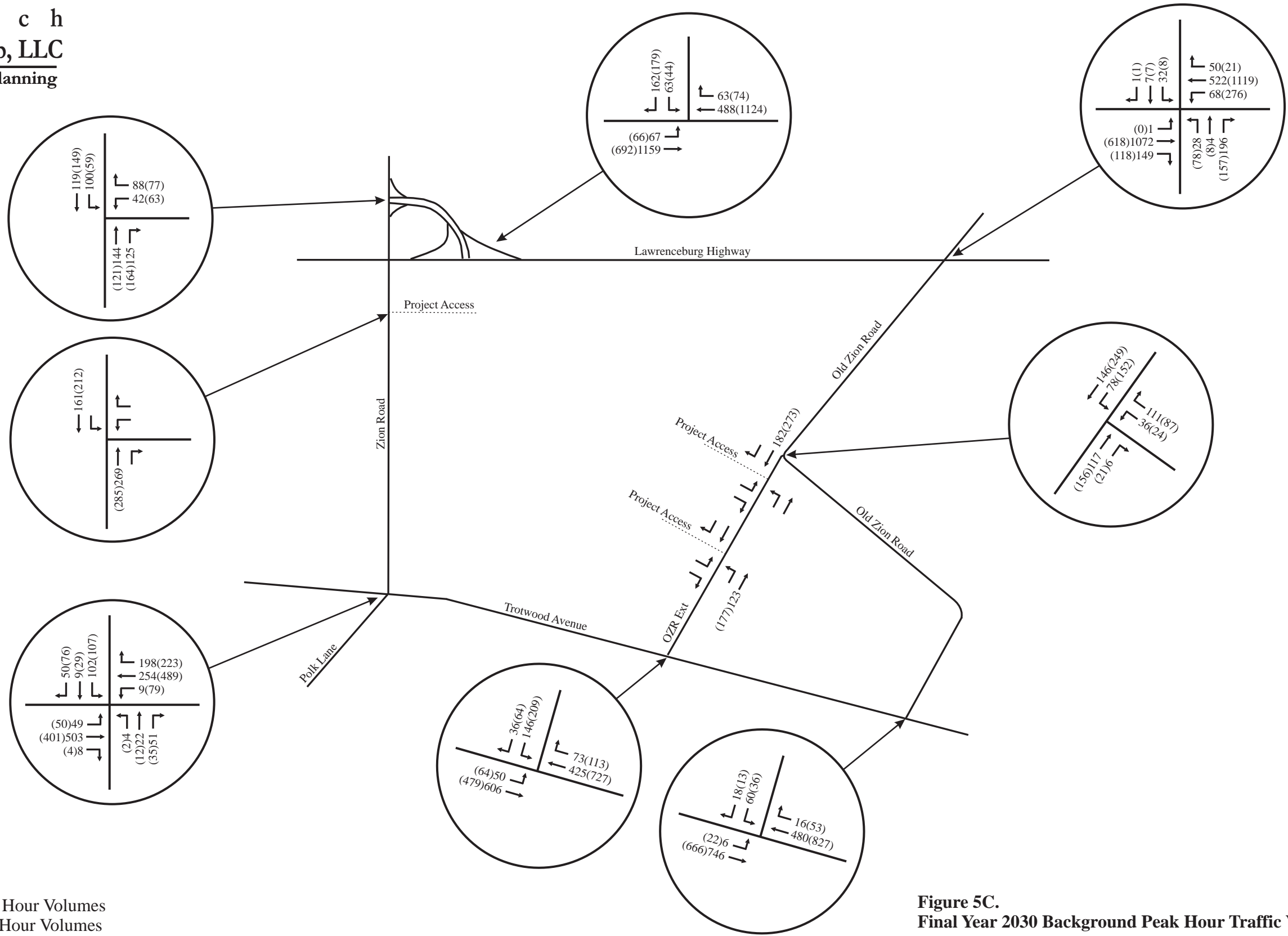
At this unsignalized intersection, the northbound and southbound turning movements will operate at LOS F during both peak hours, with significant vehicle delays and queues. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate if the northbound and southbound left turns and through movements were prohibited, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with these modifications, all of the remaining critical turning movements will operate at LOS D or better during both peak hours.



No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 5B.
Peak Hour Traffic Volumes Generated by Proposed Project
on Old Zion Road (Feb 2023 Traffic Impact Study)



No Scale

XX - AM Peak Hour Volumes
(XX) - PM Peak Hour Volumes

Figure 5C.
Final Year 2030 Background Peak Hour Traffic Volumes

TABLE 6. YEAR 2030 BACKGROUND PEAK HOUR LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95 TH %-ILE QUEUE	LEVEL OF SERVICE	95 TH %-ILE QUEUE
Trotwood Avenue and Polk Lane / Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	1 veh (9 sec/veh)	LOS A	1 veh (10 sec/veh)
	Westbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS A	1 veh (9 sec/veh)
	Northbound Turning Movements	LOS C	1 veh (23 sec/veh)	LOS C	1 veh (24 sec/veh)
	Southbound Turning Movements	LOS F	11 veh (187 sec/veh)	LOS F	18 veh (463 sec/veh)
Trotwood Avenue and Polk Lane / Zion Road (with signalization)	Eastbound Left Turns	LOS B	1 veh (12 sec/veh)	LOS B	1 veh (18 sec/veh)
	Eastbound Thrus / Right Turns	LOS B	14 veh (16 sec/veh)	LOS B	11 veh (16 sec/veh)
	Westbound Left Turns	LOS B	1 veh (13 sec/veh)	LOS B	2 veh (11 sec/veh)
	Westbound Thrus / Right Turns	LOS B	14 veh (18 sec/veh)	LOS C	23 veh (26 sec/veh)
	Northbound Turning Movements	LOS E	5 veh (60 sec/veh)	LOS E	3 veh (63 sec/veh)
	Southbound Turning Movements	LOS E	10 veh (59 sec/veh)	LOS E	11 veh (56 sec/veh)
	OVERALL INTERSECTION	LOS C (25 sec/veh)		LOS C (28 sec/veh)	
Trotwood Avenue and Old Zion Road Ext. (with existing laneage and traffic control)	Eastbound Left Turns / Thrus	LOS A	1 veh (9 sec/veh)	LOS B	1 veh (10 sec/veh)
	Southbound Left / Right Turns	LOS F	9 veh (120 sec/veh)	LOS F	23 veh (474 sec/veh)
Trotwood Avenue and Old Zion Road Ext. (with eastbound and westbound turn lanes and signalization)	Eastbound Left Turns	LOS A	1 veh (6 sec/veh)	LOS B	1 veh (14 sec/veh)
	Eastbound Thrus	LOS A	9 veh (6 sec/veh)	LOS A	9 veh (8 sec/veh)
	Westbound Thrus	LOS A	9 veh (9 sec/veh)	LOS B	21 veh (20 sec/veh)
	Westbound Right Turns	LOS A	1 veh (7 sec/veh)	LOS B	3 veh (10 sec/veh)
	Southbound Left / Right Turns	LOS D	10 veh (55 sec/veh)	LOS D	14 veh (51 sec/veh)
	OVERALL INTERSECTION	LOS B (14 sec/veh)		LOS C (21 sec/veh)	

Trotwood Avenue and Old Zion Road (with turn lanes on Trotwood Avenue)	Eastbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS B	1 veh (10 sec/veh)
	Southbound Left / Right Turns	LOS E	2 veh (43 sec/veh)	LOS E	2 veh (49 sec/veh)
Old Zion Road and Old Zion Road Ext. (with southbound left turn lane)	Westbound Left / Right Turns	LOS B	1 veh (11 sec/veh)	LOS B	1 veh (12 sec/veh)
	Southbound Left Turns	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Zion Road and Ramps for Lawrenceburg Highway (with existing conditions)	Westbound Left Turns	LOS B	1 veh (15 sec/veh)	LOS B	1 veh (12 sec/veh)
	Westbound Right Turns	LOS A	1 veh (10 sec/veh)	LOS A	1 veh (9 sec/veh)
	Southbound Left Turns	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Lawrenceburg Highway and Ramps for Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	1 veh (9 sec/veh)	LOS B	1 veh (12 sec/veh)
	Southbound Left Turns	LOS F	3 veh (65 sec/veh)	LOS F	3 veh (141 sec/veh)
	Southbound Right Turns	LOS B	1 veh (12 sec/veh)	LOS C	2 veh (20 sec/veh)
Lawrenceburg Highway and Old Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS B	0 veh (11 sec/veh)
	Westbound Left Turns	LOS B	1 veh (13 sec/veh)	LOS B	2 veh (12 sec/veh)
	Northbound Turning Movements	LOS F	15 veh (240 sec/veh)	LOS F	30 veh (999+ sec/veh)
	Southbound Turning Movements	LOS F	4 veh (357 sec/veh)	LOS F	3 veh (914 sec/veh)
Lawrenceburg Highway and Old Zion Road (with J-intersection, which would eliminate northbound and southbound left turns and throughs)	Eastbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS B	0 veh (11 sec/veh)
	Westbound Left Turns	LOS B	1 veh (13 sec/veh)	LOS B	2 veh (12 sec/veh)
	Northbound Right Turns	LOS D	4 veh (27 sec/veh)	LOS C	2 veh (15 sec/veh)
	Southbound Right Turns	LOS B	1 veh (11 sec/veh)	LOS B	1 veh (13 sec/veh)

5. IMPACTS OF PROPOSED DEVELOPMENT

5.1 TRIP GENERATION

Trip generation calculations were conducted in order to identify how much traffic will be generated by the proposed project. Trip generation data for daily and peak hour trips were identified from Trip Generation, 11th Edition, which was published by the Institute of Transportation Engineers (ITE) in 2021. [Table 7](#) presents the daily and peak hour trip generations for proposed project, and these calculations are included in [Appendix D](#).

TABLE 7. TRIP GENERATION

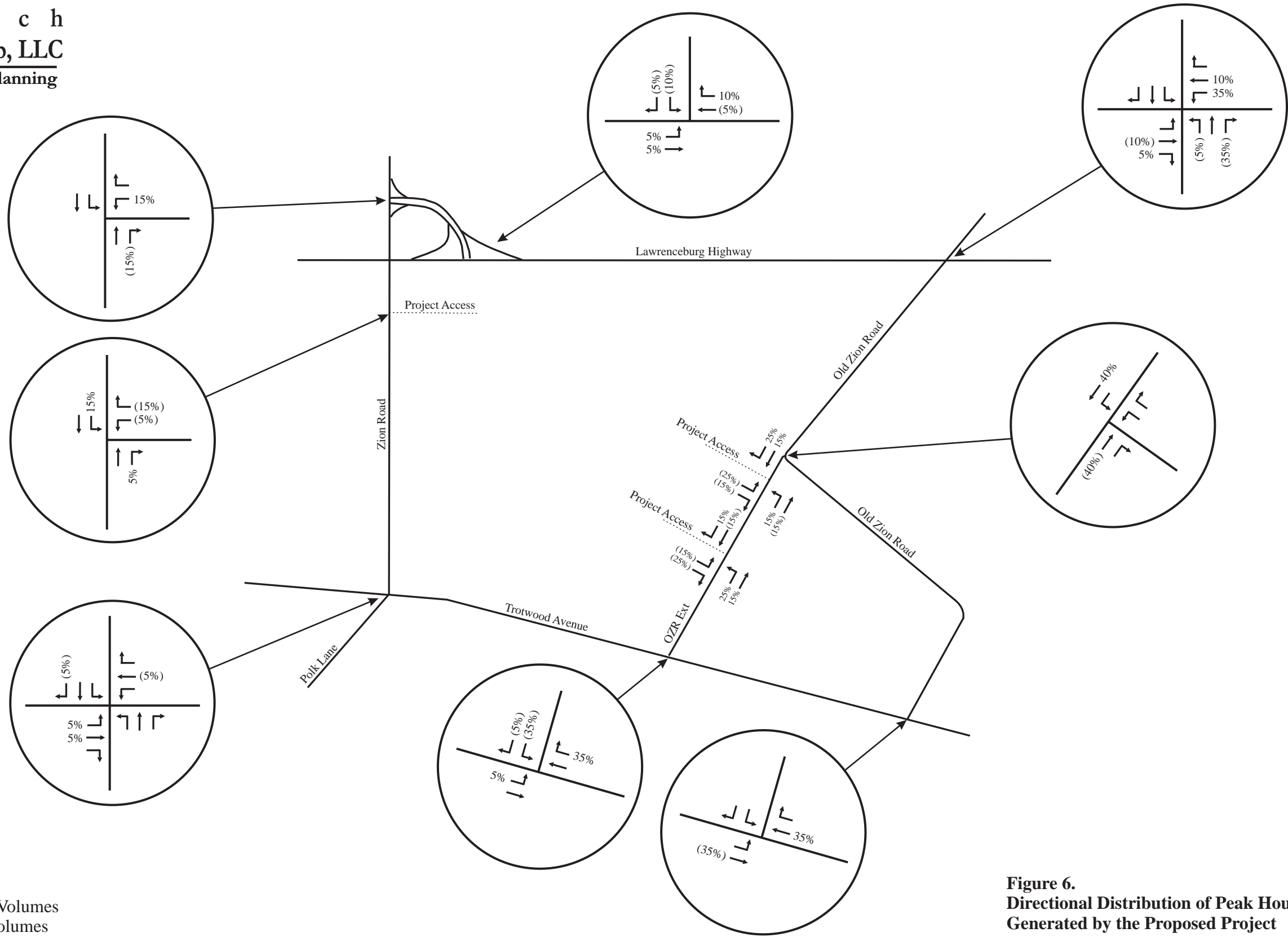
LAND USE	SIZE	DAILY TRAFFIC	GENERATED TRAFFIC			
			AM PEAK HOUR		PM PEAK HOUR	
			ENTER	EXIT	ENTER	EXIT
Single-Family Detached (LUC 210)	247 homes	2,318	42	128	146	86

5.2 TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

For the purposes of this study, it was estimated that the trips generated by the proposed development will access the project site according to the directional distribution shown in [Figure 6](#). The development of this distribution was based on the following factors:

- existing land use characteristics,
- the directions of approach of the existing traffic,
- the access proposed for the project, and
- the locations of population centers in the area.

The peak hour trip generations and directional distribution were used to add the site-generated trips to the roadway system. [Figure 7](#) includes the peak hour traffic volumes that are expected to be generated by the proposed project.



No Scale

XX - Entering Volumes
(XX) - Exiting Volumes

Figure 6.
Directional Distribution of Peak Hour Traffic
Generated by the Proposed Project

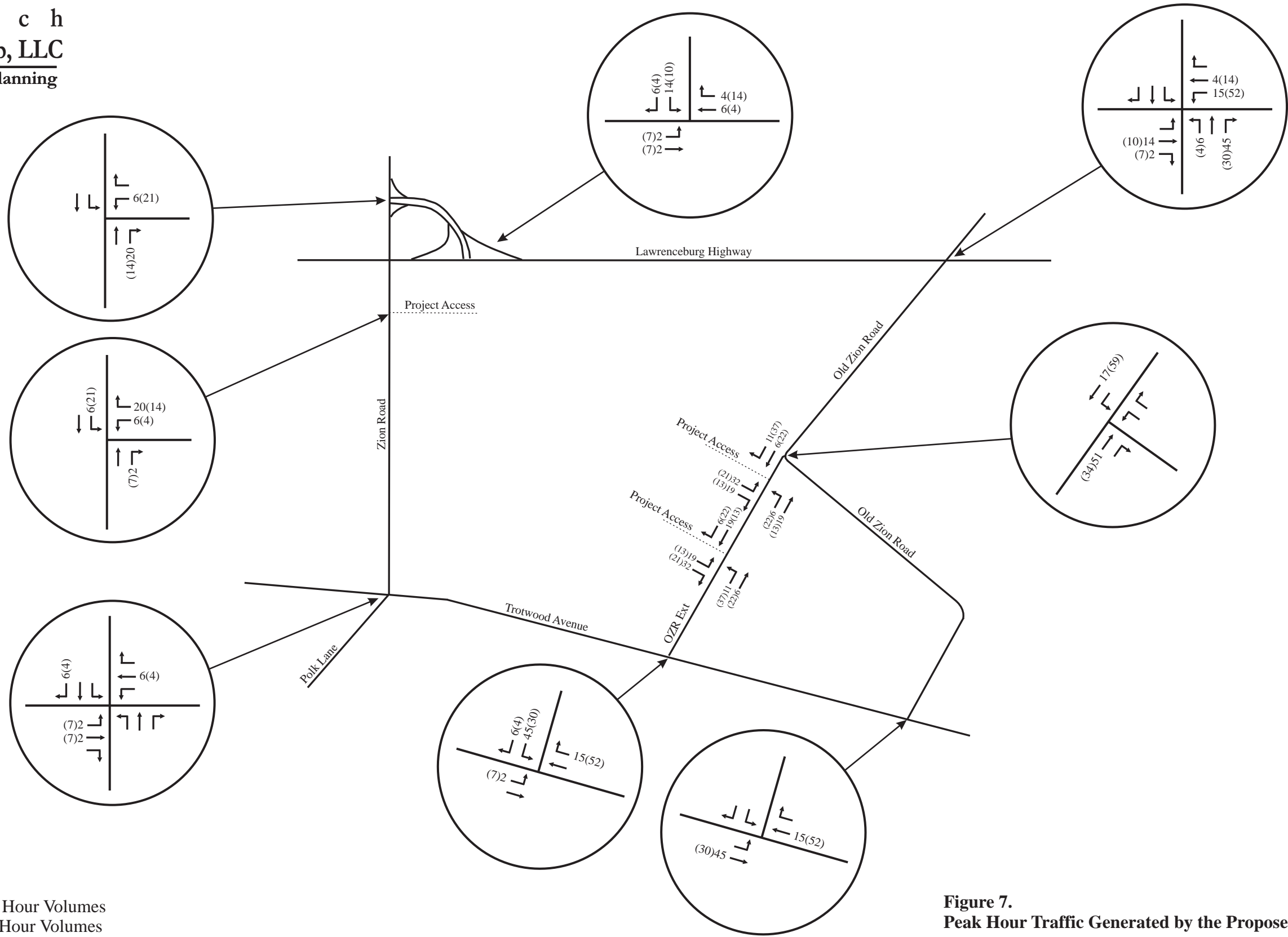


Figure 7.
Peak Hour Traffic Generated by the Proposed Project

5.3 CAPACITY ANALYSES

In order to identify the projected peak hour traffic volumes at the completion of the proposed project, the trips generated by the proposed development were added to the background peak hour traffic volumes within the study area. The resulting peak hour volumes are shown in [Figure 8](#).

Using the total projected peak hour traffic volumes, capacity analyses were conducted in order to determine the impact of the proposed project on the roadway system. Specifically, these capacity analyses were used to evaluate the need for roadway and traffic control improvements within the study area. For these analyses, it was assumed that each of the project accesses will be constructed to include one entering lane and one exiting lane.

The results of the capacity analyses for the total projected peak hour traffic volumes are shown in [Table 8](#), and [Appendix B](#) includes the capacity analyses worksheets. These analyses indicate the following:

Trotwood Avenue and Zion Road / Polk Lane

At this unsignalized intersection, most of the critical turning movements will continue to operate at LOS C or better during both peak hours. However, the southbound turning movements will continue to operate at LOS F during both peak hours, and the typical vehicle delays and queues will be significant. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate with signalized conditions, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with total projected conditions and signalization, the intersection of Trotwood Avenue and Zion Road / Polk Lane will operate at LOS C during both peak hours.

Trotwood Avenue and Old Zion Road Extension

At this unsignalized intersection, the southbound turning movements will operate at LOS F during both peak hours, and the typical vehicle delays and queues will be significant. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate with signalized conditions, as well as a dedicated eastbound left turn lane and a dedicated westbound right turn lane on Trotwood Avenue, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with total projected conditions and these laneage and traffic control improvements, the intersection of Trotwood Avenue and Old Zion Road Extension will operate at LOS B during the AM peak hour and LOS C during the PM peak hour.

Trotwood Avenue and Old Zion Road

For this unsignalized intersection, it was assumed that a dedicated eastbound left turn lane and a dedicated westbound right turn lane will be provided on Trotwood Avenue, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with total projected conditions and these laneage improvements, the southbound turning movements will operate at LOS F during both peak hours, and the typical vehicle delays and queues will be moderate.

Old Zion Road and Old Zion Road Extension

For this unsignalized intersection, it was assumed that a dedicated southbound left turn lane will be provided on Old Zion Road, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with total projected conditions and these laneage improvements, all of the critical turning movements will operate at LOS B or better during both peak hours.

Zion Road and the Ramps for Lawrenceburg Highway

At this unsignalized intersection, all of the critical turning movements will operate at LOS C or better during both peak hours.

Lawrenceburg Highway and the Ramps for Zion Road

At this unsignalized intersection, most of the critical turning movements will continue to operate at LOS C or better during both peak hours. However, the southbound turning movements will operate at LOS F during both peak hours, and the typical vehicle delays and queues will be moderate.

Lawrenceburg Highway and Old Zion Road

At this unsignalized intersection, the northbound turning movements will operate at LOS F during both peak hours, with significant vehicle delays and queues. Also, the southbound turning movements will operate at LOS F during both peak hours, with moderate vehicle delays and queues. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate if the northbound and southbound left turns and through movements were prohibited, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with these modifications, all of the remaining critical turning movements will operate at LOS E or better during both peak hours.

Old Zion Road Ext. and the North Project Access

At this unsignalized intersection, all of the critical turning movements will operate at LOS B or better during both peak hours.

Old Zion Road Ext. and the South Project Access

At this unsignalized intersection, all of the critical turning movements will operate at LOS B or better during both peak hours.

Zion Road and the Project Access

At this unsignalized intersection, all of the critical turning movements will operate at LOS B or better during both peak hours.

Using the total projected peak hour traffic volumes, analyses were conducted to determine whether or not the following turn lanes are warranted in conjunction with the proposed project:

- A northbound left turn lane and/or a southbound right turn lane on Old Zion Road Ext. at the north project access.
- A northbound left turn lane and/or a southbound right turn lane on Old Zion Road Ext. at the south project access.
- A southbound left turn lane and/or a northbound right turn lane on Zion Road at the project access.

For these analyses, consideration was given to the *TDOT Highway System Access Manual*, Volume 3 Geometric Design Criteria, as included in [Appendix E](#). The total projected traffic volumes shown in [Figure 8](#) warrant the following dedicated turn lanes:

- A northbound left turn lane on Old Zion Road Ext. at the north project access.
- A northbound left turn lane on Old Zion Road Ext. at the south project access.
- A southbound left turn lane on Zion Road at the project access.

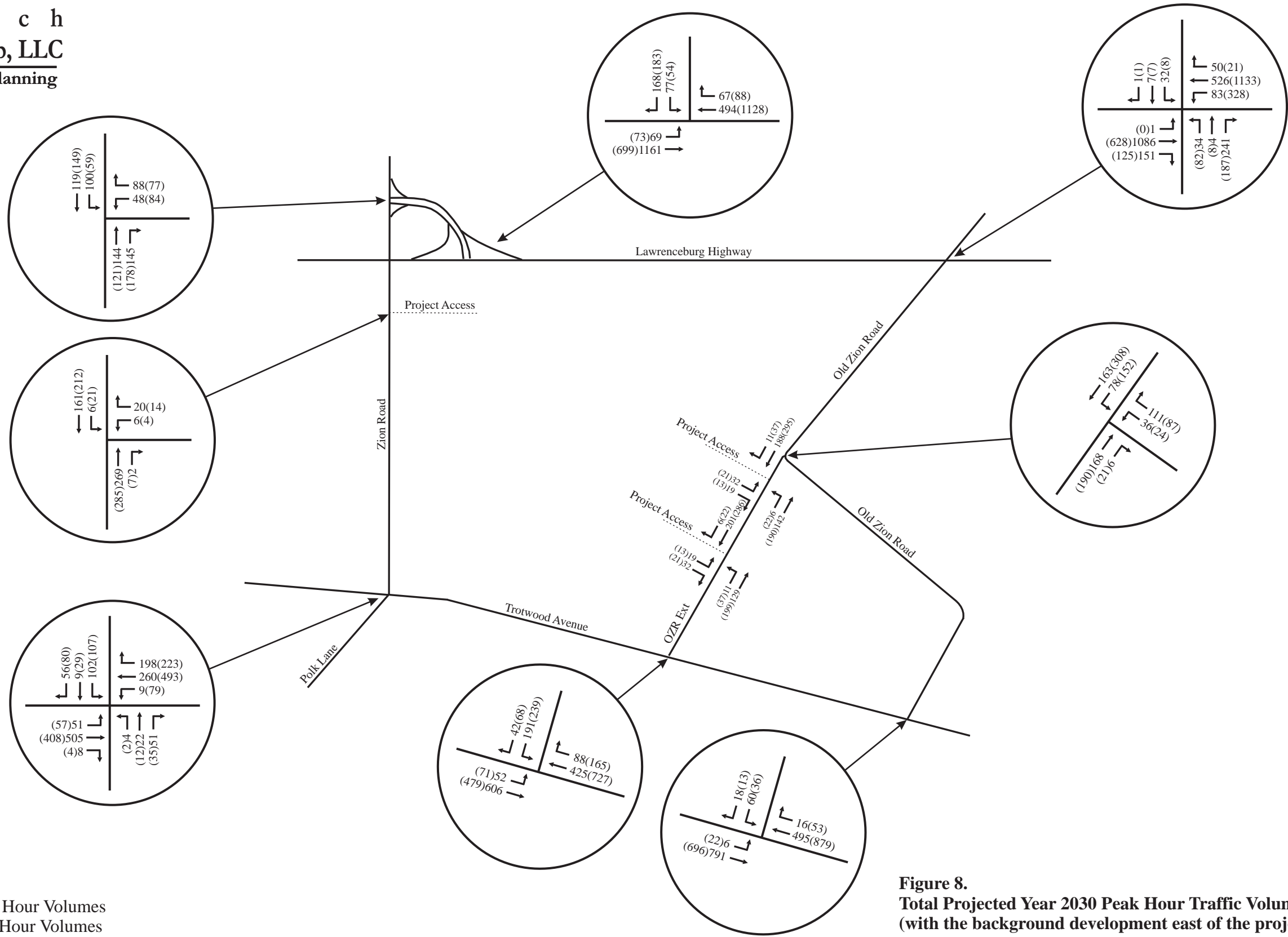


Figure 8.
Total Projected Year 2030 Peak Hour Traffic Volumes
(with the background development east of the project site)



No Scale

XX - AM Peak Hour Volumes
 (XX) - PM Peak Hour Volumes

TABLE 8. YEAR 2030 TOTAL LEVELS OF SERVICE

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95 TH %-ILE QUEUE	LEVEL OF SERVICE	95 TH %-ILE QUEUE
Trotwood Avenue and Polk Lane / Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	1 veh (9 sec/veh)	LOS A	1 veh (10 sec/veh)
	Westbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS A	1 veh (9 sec/veh)
	Northbound Turning Movements	LOS C	1 veh (24 sec/veh)	LOS D	1 veh (25 sec/veh)
	Southbound Turning Movements	LOS F	11 veh (202 sec/veh)	LOS F	19 veh (513 sec/veh)
Trotwood Avenue and Polk Lane / Zion Road (with signalization)	Eastbound Left Turns	LOS B	1 veh (12 sec/veh)	LOS B	1 veh (18 sec/veh)
	Eastbound Thrus / Right Turns	LOS B	15 veh (17 sec/veh)	LOS B	11 veh (17 sec/veh)
	Westbound Left Turns	LOS B	1 veh (13 sec/veh)	LOS B	2 veh (11 sec/veh)
	Westbound Thrus / Right Turns	LOS B	14 veh (19 sec/veh)	LOS C	24 veh (27 sec/veh)
	Northbound Turning Movements	LOS E	5 veh (60 sec/veh)	LOS E	3 veh (63 sec/veh)
	Southbound Turning Movements	LOS E	10 veh (61 sec/veh)	LOS E	12 veh (56 sec/veh)
	OVERALL INTERSECTION	LOS C (26 sec/veh)		LOS C (28 sec/veh)	
Trotwood Avenue and Old Zion Road Ext. (with existing laneage and traffic control)	Eastbound Left Turns / Thrus	LOS A	1 veh (9 sec/veh)	LOS B	1 veh (11 sec/veh)
	Southbound Left / Right Turns	LOS F	15 veh (233 sec/veh)	LOS F	28 veh (623 sec/veh)
Trotwood Avenue and Old Zion Road Ext. (with eastbound and westbound turn lanes and signalization)	Eastbound Left Turns	LOS A	1 veh (7 sec/veh)	LOS B	1 veh (15 sec/veh)
	Eastbound Thrus	LOS A	10 veh (8 sec/veh)	LOS A	10 veh (9 sec/veh)
	Westbound Thrus	LOS B	10 veh (11 sec/veh)	LOS C	23 veh (23 sec/veh)
	Westbound Right Turns	LOS A	2 veh (9 sec/veh)	LOS B	4 veh (12 sec/veh)
	Southbound Left / Right Turns	LOS D	13 veh (53 sec/veh)	LOS D	16 veh (50 sec/veh)
	OVERALL INTERSECTION	LOS B (16 sec/veh)		LOS C (22 sec/veh)	
Trotwood Avenue and Old Zion Road	Eastbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS B	1 veh (10 sec/veh)

(with turn lanes on Trotwood Avenue)	Southbound Left / Right Turns	LOS F	3 veh (50 sec/veh)	LOS F	2 veh (58 sec/veh)
Old Zion Road and Old Zion Road Ext. (with southbound left turn lane)	Westbound Left / Right Turns	LOS B	1 veh (12 sec/veh)	LOS B	1 veh (13 sec/veh)
	Southbound Left Turns	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Zion Road and Ramps for Lawrenceburg Highway (with existing conditions)	Westbound Left Turns	LOS C	1 veh (15 sec/veh)	LOS B	1 veh (12 sec/veh)
	Westbound Right Turns	LOS A	1 veh (10 sec/veh)	LOS A	1 veh (9 sec/veh)
	Southbound Left Turns	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Lawrenceburg Highway and Ramps for Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	1 veh (9 sec/veh)	LOS B	1 veh (12 sec/veh)
	Southbound Left Turns	LOS F	4 veh (85 sec/veh)	LOS F	4 veh (199 sec/veh)
	Southbound Right Turns	LOS B	1 veh (12 sec/veh)	LOS C	2 veh (20 sec/veh)
Lawrenceburg Highway and Old Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS B	0 veh (11 sec/veh)
	Westbound Left Turns	LOS B	1 veh (14 sec/veh)	LOS B	2 veh (12 sec/veh)
	Northbound Turning Movements	LOS F	22 veh (426 sec/veh)	LOS F	36 veh (999+ sec/veh)
	Southbound Turning Movements	LOS F	5 veh (689 sec/veh)	LOS F	3 veh (999+ sec/veh)
Lawrenceburg Highway and Old Zion Road (with J-intersection, which would eliminate northbound and southbound left turns and throughs)	Eastbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS B	0 veh (11 sec/veh)
	Westbound Left Turns	LOS B	1 veh (14 sec/veh)	LOS B	2 veh (12 sec/veh)
	Northbound Right Turns	LOS E	6 veh (39 sec/veh)	LOS C	3 veh (17 sec/veh)
	Southbound Right Turns	LOS B	1 veh (11 sec/veh)	LOS B	1 veh (14 sec/veh)
Old Zion Road Ext. and North Project Access	Eastbound Left / Right Turns	LOS B	1 veh (11 sec/veh)	LOS B	1 veh (12 sec/veh)
	Northbound Left Turns / Thrus	LOS A	0 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Old Zion Road Ext. and South Project Access	Eastbound Left / Right Turns	LOS B	1 veh (10 sec/veh)	LOS B	1 veh (12 sec/veh)
	Northbound Left Turns / Thrus	LOS A	0 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Zion Road and Project Access	Westbound Left / Right Turns	LOS B	1 veh (11 sec/veh)	LOS B	1 veh (11 sec/veh)
	Southbound Left Turns / Thrus	LOS A	0 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)

6. YEAR 2030 BACKGROUND TRAFFIC VOLUMES (SCENARIO 2)

For the purposes of this study, additional analyses were conducted in order to identify Year 2030 background and total projected conditions in the event that the approved project immediately east of the proposed project site is not completed. For this scenario, the traffic volumes shown in [Figure 5A](#) were considered final Year 2030 background traffic volumes.

Capacity analyses were conducted for the background conditions at the intersections within the study area. The results of these analyses are shown in [Table 9](#), and [Appendix B](#) includes the capacity analyses worksheets. These analyses indicate the following:

Trotwood Avenue and Zion Road / Polk Lane

At this unsignalized intersection, most of the critical turning movements will continue to operate at LOS C or better during both peak hours. However, the southbound turning movements will continue to operate at LOS F during both peak hours, and the typical vehicle delays and queues will be significant. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate with signalized conditions. These analyses indicate that, with background conditions and signalization, the intersection of Trotwood Avenue and Zion Road / Polk Lane will operate at LOS C during both peak hours.

Trotwood Avenue and Old Zion Road Extension

At this unsignalized intersection, the southbound turning movements will operate at LOS F during both peak hours, and the typical vehicle delays and queues will be moderate.

Trotwood Avenue and Old Zion Road

At this unsignalized intersection, the southbound turning movements will operate at LOS D during both peak hours.

Old Zion Road and Old Zion Road Extension

At this unsignalized intersection, all of the critical turning movements will operate at LOS A during both peak hours.

Zion Road and the Ramps for Lawrenceburg Highway

At this unsignalized intersection, all of the critical turning movements will operate at LOS B or better during both peak hours.

Lawrenceburg Highway and the Ramps for Zion Road

At this unsignalized intersection, most of the critical turning movements will continue to operate at LOS C or better during both peak hours. However, the southbound turning movements will operate at LOS F during both peak hours, and the typical vehicle delays and queues will be moderate.

Lawrenceburg Highway and Old Zion Road

At this unsignalized intersection, the northbound turning movements will operate at LOS E during the AM peak hour and LOS F during the PM peak hour, with significant vehicle delays and queues during the PM peak hour. Also, the southbound turning movements will operate at LOS F during

both peak hours, with moderate vehicle delays and queues. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate if the northbound and southbound left turns and through movements were prohibited, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with these modifications, all of the remaining critical turning movements will operate at LOS C or better during both peak hours.

**TABLE 9. YEAR 2030 BACKGROUND PEAK HOUR LEVELS OF SERVICE
(WITHOUT APPROVED PROJECT IMMEDIATELY WEST OF THE PROJECT SITE)**

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95 TH %-ILE QUEUE	LEVEL OF SERVICE	95 TH %-ILE QUEUE
Trotwood Avenue and Polk Lane / Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (9 sec/veh)
	Westbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS A	1 veh (8 sec/veh)
	Northbound Turning Movements	LOS C	1 veh (21 sec/veh)	LOS C	1 veh (22 sec/veh)
	Southbound Turning Movements	LOS F	8 veh (117 sec/veh)	LOS F	13 veh (256 sec/veh)
Trotwood Avenue and Polk Lane / Zion Road (with signalization)	Eastbound Left Turns	LOS B	1 veh (11 sec/veh)	LOS B	1 veh (15 sec/veh)
	Eastbound Thrus / Right Turns	LOS B	15 veh (17 sec/veh)	LOS B	10 veh (15 sec/veh)
	Westbound Left Turns	LOS B	1 veh (13 sec/veh)	LOS A	2 veh (10 sec/veh)
	Westbound Thrus / Right Turns	LOS B	12 veh (17 sec/veh)	LOS C	21 veh (22 sec/veh)
	Northbound Turning Movements	LOS E	5 veh (60 sec/veh)	LOS E	3 veh (63 sec/veh)
	Southbound Turning Movements	LOS E	10 veh (58 sec/veh)	LOS D	10 veh (55 sec/veh)
	OVERALL INTERSECTION	LOS C (25 sec/veh)		LOS C (25 sec/veh)	
Trotwood Avenue and Old Zion Road Ext. (with existing conditions)	Eastbound Left Turns / Thrus	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (10 sec/veh)
	Southbound Left / Right Turns	LOS F	5 veh (57 sec/veh)	LOS F	10 veh (154 sec/veh)
Trotwood Avenue and Old Zion Road (with existing conditions)	Eastbound Left Turns / Thrus	LOS A	0 veh (8 sec/veh)	LOS A	0 veh (10 sec/veh)
	Southbound Left / Right Turns	LOS D	1 veh (31 sec/veh)	LOS D	1 veh (34 sec/veh)
Old Zion Road and Old Zion Road Ext. (with existing conditions)	Westbound Left / Right Turns	LOS A	0 veh (9 sec/veh)	LOS A	0 veh (9 sec/veh)
	Southbound Left Turns / Thrus	LOS A	1 veh (7 sec/veh)	LOS A	1 veh (8 sec/veh)
Zion Road and Ramps for Lawrenceburg Highway (with existing conditions)	Westbound Left Turns	LOS B	1 veh (15 sec/veh)	LOS B	1 veh (12 sec/veh)
	Westbound Right Turns	LOS A	1 veh (10 sec/veh)	LOS A	1 veh (9 sec/veh)

	Southbound Left Turns	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Lawrenceburg Highway and Ramps for Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	1 veh (9 sec/veh)	LOS B	1 veh (12 sec/veh)
	Southbound Left Turns	LOS F	3 veh (58 sec/veh)	LOS F	3 veh (106 sec/veh)
	Southbound Right Turns	LOS B	1 veh (11 sec/veh)	LOS C	2 veh (19 sec/veh)
Lawrenceburg Highway and Old Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS B	0 veh (11 sec/veh)
	Westbound Left Turns	LOS B	1 veh (12 sec/veh)	LOS A	1 veh (10 sec/veh)
	Northbound Turning Movements	LOS E	2 veh (37 sec/veh)	LOS F	11 veh (361 sec/veh)
	Southbound Turning Movements	LOS F	2 veh (88 sec/veh)	LOS F	2 veh (163 sec/veh)
Lawrenceburg Highway and Old Zion Road (with J-intersection, which would eliminate northbound and southbound left turns and throughs)	Eastbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS B	0 veh (11 sec/veh)
	Westbound Left Turns	LOS B	1 veh (12 sec/veh)	LOS A	1 veh (10 sec/veh)
	Northbound Right Turns	LOS C	1 veh (16 sec/veh)	LOS B	1 veh (12 sec/veh)
	Southbound Right Turns	LOS B	1 veh (11 sec/veh)	LOS B	1 veh (13 sec/veh)

7. CAPACITY ANALYSES (SCENARIO 2)

In order to identify the projected peak hour traffic volumes at the completion of the proposed project, the trips generated by the proposed development were added to the background peak hour traffic volumes within the study area. The resulting peak hour volumes are shown in [Figure 9](#).

Using the total projected peak hour traffic volumes, capacity analyses were conducted in order to determine the impact of the proposed project on the roadway system. Specifically, these capacity analyses were used to evaluate the need for roadway and traffic control improvements within the study area. For these analyses, it was assumed that each of the project accesses will be constructed to include one entering lane and one exiting lane.

The results of the capacity analyses for the total projected peak hour traffic volumes are shown in [Table 10](#), and [Appendix B](#) includes the capacity analyses worksheets. These analyses indicate the following:

Trotwood Avenue and Zion Road / Polk Lane

At this unsignalized intersection, most of the critical turning movements will operate at LOS C or better during both peak hours. However, the southbound turning movements will operate at LOS F during both peak hours, and the typical vehicle delays and queues will be significant. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate with signalized conditions. These analyses indicate that, with background conditions and signalization, the intersection of Trotwood Avenue and Zion Road / Polk Lane will operate at LOS C during both peak hours.

Trotwood Avenue and Old Zion Road Extension

At this unsignalized intersection, the southbound turning movements will operate at LOS F during both peak hours. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate with signalized conditions, as well as a dedicated eastbound left turn lane and a dedicated westbound right turn lane on Trotwood Avenue. These analyses indicate that, with total projected conditions and these laneage and traffic control improvements, the intersection of Trotwood Avenue and Old Zion Road Extension will operate at LOS B during both peak hours.

Trotwood Avenue and Old Zion Road

At this unsignalized intersection, the southbound will operate at LOS D during the AM peak hour and LOS E during the PM peak hour.

Old Zion Road and Old Zion Road Extension

At this unsignalized intersection, all of the critical turning movements will operate at LOS A during both peak hours.

Zion Road and the Ramps for Lawrenceburg Highway

At this unsignalized intersection, all of the critical turning movements will operate at LOS B or better during both peak hours.

Lawrenceburg Highway and the Ramps for Zion Road

At this unsignalized intersection, most of the critical turning movements will operate at LOS C or better during both peak hours. However, the southbound turning movements will operate at LOS F during both peak hours, although the typical vehicle delays and queues will be moderate.

Lawrenceburg Highway and Old Zion Road

At this unsignalized intersection, the northbound turning movements will operate at LOS F during both peak hours, with significant vehicle delays and queues. Also, the southbound turning movements will operate at LOS F during both peak hours, with moderate vehicle delays and queues. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate if the northbound and southbound left turns and through movements were prohibited, as recommended in the Traffic Impact Study for the approved project immediately east of the proposed project site. These analyses indicate that, with these modifications, all of the remaining critical turning movements will operate at LOS C or better during both peak hours.

Old Zion Road Ext. and the North Project Access

At this unsignalized intersection, all of the critical turning movements will operate at LOS B or better during both peak hours.

Old Zion Road Ext. and the South Project Access

At this unsignalized intersection, all of the critical turning movements will operate at LOS B or better during both peak hours.

Zion Road and the Project Access

At this unsignalized intersection, all of the critical turning movements will operate at LOS B or better during both peak hours.

Using the total projected peak hour traffic volumes, analyses were conducted to determine whether or not the following turn lanes are warranted in conjunction with the proposed project:

- A northbound left turn lane and/or a southbound right turn lane on Old Zion Road Ext. at the north project access.
- A northbound left turn lane and/or a southbound right turn lane on Old Zion Road Ext. at the south project access.
- A southbound left turn lane and/or a northbound right turn lane on Zion Road at the project access.

For these analyses, consideration was given to the *TDOT Highway System Access Manual*, Volume 3 Geometric Design Criteria, as included in [Appendix E](#). The total projected traffic volumes shown in [Figure 9](#) warrant the following dedicated turn lanes:

- A northbound left turn lane on Old Zion Road Ext. at the south project access.
- A southbound left turn lane on Zion Road at the project access.

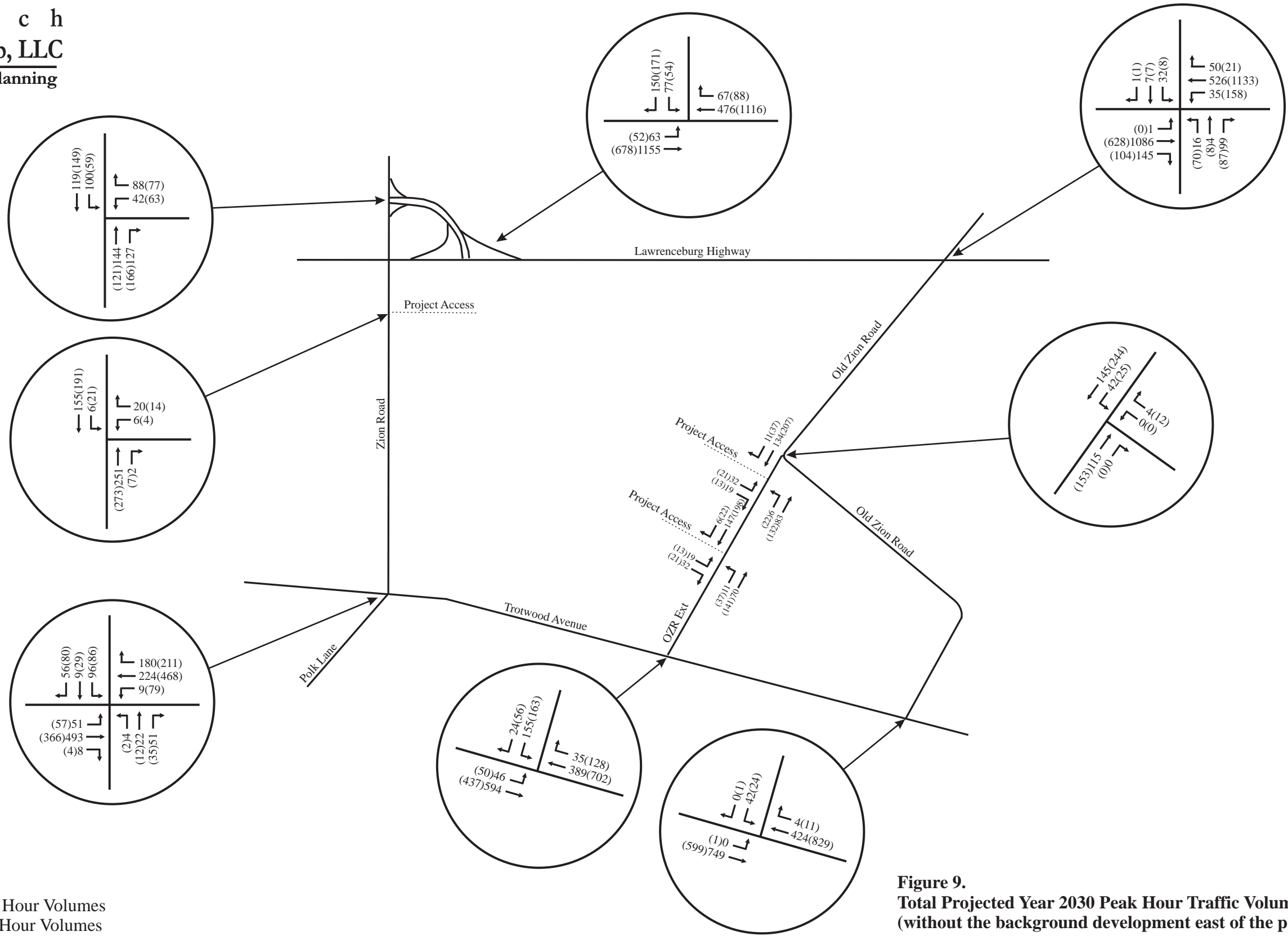


Figure 9.
Total Projected Year 2030 Peak Hour Traffic Volumes
(without the background development east of the project site)

**TABLE 10. YEAR 2030 TOTAL LEVELS OF SERVICE (SCENARIO 2)
(WITHOUT APPROVED PROJECT IMMEDIATELY WEST OF THE PROJECT SITE)**

INTERSECTION	TURNING MOVEMENT	AM PEAK HOUR		PM PEAK HOUR	
		LEVEL OF SERVICE	95 TH %-ILE QUEUE	LEVEL OF SERVICE	95 TH %-ILE QUEUE
Trotwood Avenue and Polk Lane / Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	1 veh (9 sec/veh)	LOS A	1 veh (10 sec/veh)
	Westbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS A	1 veh (8 sec/veh)
	Northbound Turning Movements	LOS C	1 veh (22 sec/veh)	LOS C	1 veh (23 sec/veh)
	Southbound Turning Movements	LOS F	9 veh (126 sec/veh)	LOS F	14 veh (290 sec/veh)
Trotwood Avenue and Polk Lane / Zion Road (with signalization)	Eastbound Left Turns	LOS B	1 veh (11 sec/veh)	LOS B	1 veh (19 sec/veh)
	Eastbound Thrus / Right Turns	LOS B	15 veh (18 sec/veh)	LOS B	10 veh (15 sec/veh)
	Westbound Left Turns	LOS B	1 veh (13 sec/veh)	LOS B	2 veh (10 sec/veh)
	Westbound Thrus / Right Turns	LOS B	12 veh (17 sec/veh)	LOS C	23 veh (28 sec/veh)
	Northbound Turning Movements	LOS E	5 veh (60 sec/veh)	LOS E	3 veh (63 sec/veh)
	Southbound Turning Movements	LOS E	10 veh (59 sec/veh)	LOS D	11 veh (55 sec/veh)
	OVERALL INTERSECTION	LOS C (26 sec/veh)		LOS C (28 sec/veh)	
Trotwood Avenue and Old Zion Road Ext. (with existing conditions)	Eastbound Left Turns / Thrus	LOS A	1 veh (9 sec/veh)	LOS A	1 veh (10 sec/veh)
	Southbound Left / Right Turns	LOS F	9 veh (120 sec/veh)	LOS F	15 veh (284 sec/veh)
Trotwood Avenue and Old Zion Road Ext. (with eastbound and westbound turn lanes and signalization)	Eastbound Left Turns	LOS A	1 veh (5 sec/veh)	LOS B	1 veh (10 sec/veh)
	Eastbound Thrus	LOS A	8 veh (6 sec/veh)	LOS A	7 veh (6 sec/veh)
	Westbound Thrus	LOS A	8 veh (9 sec/veh)	LOS B	18 veh (15 sec/veh)
	Westbound Right Turns	LOS A	1 veh (7 sec/veh)	LOS A	3 veh (8 sec/veh)
	Southbound Left / Right Turns	LOS D	10 veh (55 sec/veh)	LOS D	12 veh (53 sec/veh)
	OVERALL INTERSECTION	LOS B (14 sec/veh)		LOS B (17 sec/veh)	
Trotwood Avenue and Old Zion Road	Eastbound Left Turns / Thrus	LOS A	0 veh (8 sec/veh)	LOS A	0 veh (10 sec/veh)

(with existing conditions)	Southbound Left / Right Turns	LOS D	1 veh (35 sec/veh)	LOS E	1 veh (39 sec/veh)
Old Zion Road and Old Zion Road Ext. (with existing conditions)	Westbound Left / Right Turns	LOS A	0 veh (9 sec/veh)	LOS A	0 veh (9 sec/veh)
	Southbound Left Turns / Thrus	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Zion Road and Ramps for Lawrenceburg Highway (with existing conditions)	Westbound Left Turns	LOS B	1 veh (15 sec/veh)	LOS B	1 veh (12 sec/veh)
	Westbound Right Turns	LOS A	1 veh (10 sec/veh)	LOS A	1 veh (9 sec/veh)
	Southbound Left Turns	LOS A	1 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Lawrenceburg Highway and Ramps for Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	1 veh (9 sec/veh)	LOS B	1 veh (12 sec/veh)
	Southbound Left Turns	LOS F	4 veh (74 sec/veh)	LOS F	4 veh (146 sec/veh)
	Southbound Right Turns	LOS B	1 veh (11 sec/veh)	LOS C	2 veh (19 sec/veh)
Lawrenceburg Highway and Old Zion Road (with existing conditions)	Eastbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS B	0 veh (11 sec/veh)
	Westbound Left Turns	LOS B	1 veh (13 sec/veh)	LOS A	1 veh (10 sec/veh)
	Northbound Turning Movements	LOS F	4 veh (59 sec/veh)	LOS F	16 veh (699 sec/veh)
	Southbound Turning Movements	LOS F	3 veh (132 sec/veh)	LOS F	2 veh (283 sec/veh)
Lawrenceburg Highway and Old Zion Road (with J-intersection, which would eliminate northbound and southbound left turns and throughs)	Eastbound Left Turns	LOS A	0 veh (9 sec/veh)	LOS B	0 veh (11 sec/veh)
	Westbound Left Turns	LOS B	1 veh (13 sec/veh)	LOS B	1 veh (10 sec/veh)
	Northbound Right Turns	LOS C	1 veh (18 sec/veh)	LOS B	1 veh (13 sec/veh)
	Southbound Right Turns	LOS B	1 veh (11 sec/veh)	LOS B	1 veh (14 sec/veh)
Old Zion Road Ext. and North Project Access	Eastbound Left / Right Turns	LOS B	1 veh (10 sec/veh)	LOS B	1 veh (11 sec/veh)
	Northbound Left Turns / Thrus	LOS A	0 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Old Zion Road Ext. and South Project Access	Eastbound Left / Right Turns	LOS A	1 veh (10 sec/veh)	LOS B	1 veh (11 sec/veh)
	Northbound Left Turns / Thrus	LOS A	0 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)
Zion Road and Project Access	Westbound Left / Right Turns	LOS B	1 veh (10 sec/veh)	LOS B	1 veh (11 sec/veh)
	Southbound Left Turns / Thrus	LOS A	0 veh (8 sec/veh)	LOS A	1 veh (8 sec/veh)

8. HISTORICAL CRASH EVALUATION

On behalf of the City of Mt. Pleasant, KCI Technologies, Inc. provided historical crash data for the study area. For the purposes of this study, data was collected for the five-year period from January 1, 2020 to December 31, 2024. [Table 11](#) summarizes the crashes by severity, and [Table 12](#) summarizes the crashes by location and type.

TABLE 11. CRASH SEVERITY SUMMARY

YEAR	TOTAL NUMBER OF CRASHES	CRASH SEVERITY			
		Fatal	Serious Injury	Minor Injury	Property Damage Only
2020	22	0	2	8	12
2021	26	0	3	6	17
2022	37	0	0	9	28
2023	31	1	1	8	21
2024	24	0	2	6	16
TOTAL	140	1	8	37	94
PERCENTAGE OF TOTAL		0.7%	5.7%	26.4%	67.2%

TABLE 12. CRASH LOCATION AND TYPE SUMMARY

Year	Total Crashes	Crash Location		Crash Type				
		At an Inter- section	Along Roadway	Head- On	Rear- End	Angle	Side- swipe	Other / Unknown
2020	22	7	15	1	6	3	4	8
2021	26	10	16	2	11	6	4	3
2022	37	14	23	0	13	8	3	13
2023	31	17	14	3	5	18	1	4
2024	24	11	13	3	6	7	2	6
TOTAL	140	59	81	9	41	42	14	34
		42.1%	57.9%	6.4%	29.3%	30.0%	10.0%	24.3%
		% OF TOTAL		% OF SUBTOTAL				

A crash analysis was conducted for several of the intersections within the study area, based on the crash data provided by KCI Technologies, Inc. and the peak hour traffic counts collected for the purposes of this study. The purpose of these analyses is to understand the crash risk at this location and identify the potential need for safety improvements. As shown in [Table 13](#), the analysis reveals that the intersection of Trotwood Avenue and Zion Road / Polk Lane has a crash rate significantly higher than the other intersections. This information suggests that a traffic signal installation, as recommended, is likely an appropriate mitigation.

TABLE 12. INTERSECTION CRASH ANALYSIS

Intersection	Total Crashes	Peak Hour Entering Volume	K Factor	Daily Volume	Total Entering Volume 2020-2024	Crashes per million Entering Vehicles
Trotwood Avenue and Zion Road / Polk Lane	25	1,278	9	14,200	25,943,400	0.96
Trotwood Avenue and Old Zion Road Ext.	12	1,311	9	14,567	26,613,909	0.45
Lawrenceburg Highway and Ramps for Zion Road	3	1,921	9	21,344	38,995,488	0.08
Lawrenceburg Highway and Old Zion Road	12	1,916	9	21,289	38,895,003	0.31

9. CONCLUSIONS AND RECOMMENDATIONS

The analyses conducted for the purposes of this study indicate that the following considerations should be made in order to accommodate the traffic volumes that will be generated by the proposed project:

Trotwood Avenue and Zion Road / Polk Lane

With the existing laneage and traffic control at this unsignalized intersection, most of the critical turning movements operate acceptably during both peak hours under existing, background, and total projected conditions with build-out of the proposed project. However, the southbound turning movements operate at LOS F during both peak hours in all conditions, and the typical vehicle delays and queues will be significant with background and total projected conditions.

Based on these results, traffic signal analyses were conducted for the intersection of Trotwood Avenue and Zion Road / Polk Lane. These results indicate that the Year 2025 existing traffic volumes warrant a traffic signal at this intersection. With signalization, the intersection of Trotwood Avenue and Zion Road / Polk Lane will operate at LOS C during both peak hours under existing, background, and total projected conditions with build-out of the proposed project.

It is important to note that this improvement is identified in the February 2023 Traffic Impact Study that was prepared for the Old Zion Road residential development that is planned for construction immediately east of the proposed project. Because the signal is warranted by existing traffic volumes, this improvement should be provided even if the Old Zion Road project and the proposed project are not constructed.

Trotwood Avenue and Old Zion Road Extension

With the existing laneage and traffic control at this unsignalized intersection, the southbound turning movements operate at LOS F during both peak hours under existing, background, and total projected conditions with build-out of the proposed project, and the typical vehicle delays and queues will be significant with background and total projected conditions.

Based on these results, traffic signal analyses were conducted for the intersection of Trotwood Avenue and Old Zion Road Ext. These results indicate that the Year 2025 existing traffic volumes warrant a traffic signal at this intersection. With signalization, the intersection of Trotwood Avenue and Old Zion Road Ext. will operate at LOS C or better during both peak hours under existing, background, and total projected conditions with build-out of the proposed project.

It is important to note that this improvement, along with the construction of a dedicated eastbound left turn lane and a dedicated westbound right turn lane on Trotwood Avenue at this intersection, are identified in the February 2023 Traffic Impact Study that was prepared for the Old Zion Road residential development that is planned for construction immediately east of the proposed project. Because the signal is warranted by existing traffic volumes, these

improvements should be provided even if the Old Zion Road project and the proposed project are not constructed.

Trotwood Avenue and Old Zion Road

The February 2023 Traffic Impact Study that was prepared for the Old Zion Road residential development identifies the need for a dedicated eastbound left turn lane and a dedicated westbound right turn lane on Trotwood Avenue at this intersection. Also, that Traffic Impact Study suggests that a traffic signal may be warranted in conjunction with the Old Zion Road residential development that is planned for construction immediately east of the proposed project.

Because the proposed project will not generate traffic volumes on this segment of Old Zion Road, no additional laneage or traffic control modifications are recommended at this intersection.

Old Zion Road and Old Zion Road Extension

The February 2023 Traffic Impact Study that was prepared for the Old Zion Road residential development identifies the need for a dedicated southbound left turn lane on Old Zion Road at this intersection.

No additional laneage or traffic control modifications are recommended at this intersection in conjunction with the proposed project.

Zion Road and the Ramps for Lawrenceburg Highway

At this unsignalized intersection, all of the critical turning movements will operate acceptably during both peak hours under existing, background, and total projected conditions with build-out of the proposed project.

Therefore, no laneage or traffic control modifications are recommended at this intersection in conjunction with the proposed project.

Lawrenceburg Highway and the Ramps for Zion Road

The analyses conducted for the purposes of this study indicate that the southbound turning movements operate poorly during both peak hours under existing, background, and total projected conditions with build-out of the proposed project.

However, no laneage or traffic control modifications are recommended at this intersection in conjunction with the proposed project.

Lawrenceburg Highway and Old Zion Road

The analyses conducted for the purposes of this study indicate that the northbound turning movements will operate at LOS F during both peak hours, with significant vehicle delays and queues, and the southbound turning movements will operate at LOS F during both peak hours with moderate vehicle delays and queues. Based on these results, additional analyses were conducted in order to identify how well this intersection would operate if the northbound and southbound left turns and through movements were prohibited. These analyses indicate that, with these modifications, all of the remaining critical turning movements will operate with significantly lower delays and queues during both peak hours.

It is important to note that this improvement is identified in the February 2023 Traffic Impact Study that was prepared for the Old Zion Road residential development that is planned for construction immediately east of the proposed project.

No additional laneage or traffic control modifications are recommended at this intersection in conjunction with the proposed project.

Old Zion Road Ext. and the North Project Access**Old Zion Road Ext. and the South Project Access**

Each of the project accesses should be constructed to include one entering lane and one exiting lane, and stop signs should be installed for the eastbound approaches on the project accesses.

Also, in conjunction with the proposed project, Old Zion Road Ext. should be widened and improved to a three-lane cross-section from Trotwood Avenue to Old Zion Road.

Because the project accesses have not been constructed, accurate sight distance measurements cannot be collected to adequately represent the future conditions. Therefore, sight triangles should be provided for the intersections of Old Zion Road Ext. and the project accesses in conjunction with construction documents for the proposed project. These sight triangles should be developed based on guidelines that are included in *A Policy on Geometric Design of Highways and Streets, 7th Edition*, which was published by the American Association of State Highway and Transportation Officials (AASHTO) in 2018 and is commonly known as *The Green Book*. Specifically, *The Green Book* indicates that for a speed of 35 mph, the minimum stopping sight distance is 250 feet. This is the distance that a motorist on Old Zion Road Ext. will need to come to a stop if a vehicle turning from the project creates a conflict. Also, based on *The Green Book*, the minimum intersection sight distance is 390 feet. This is the distance that a motorist on a project access will need to safely complete a turn onto Old Zion Road Ext.

Zion Road and the Project Access

The project access should be constructed to include one entering lane and one exiting lane, and a stop sign should be installed on the westbound approach of the project access.

Also, in conjunction with the proposed project, a southbound left turn lane with at least 100 feet of storage should be provided on Zion Road at the project access.

Because the project access has not been constructed, accurate sight distance measurements cannot be collected to adequately represent the future conditions. Therefore, sight triangles should be provided for the intersection of Zion Road and the project access in conjunction with construction documents for the proposed project. These sight triangles should be developed based on guidelines that are included in *A Policy on Geometric Design of Highways and Streets, 7th Edition*, which was published by the American Association of State Highway and Transportation Officials (AASHTO) in 2018 and is commonly known as *The Green Book*. Specifically, *The Green Book* indicates that for a speed of 35 mph, the minimum stopping sight distance is 250 feet. This is the distance that a motorist on Zion Road will need to come to a stop if a vehicle turning from the project creates a conflict. Also, based on *The Green Book*, the minimum intersection sight distance is 390 feet. This is the distance that a motorist on a project access will need to safely complete a turn onto Zion Road.

Trotwood Avenue Corridor

In conjunction with the proposed project, adequate right-of-way should be reserved to accommodate a future widening of Trotwood Avenue to a three-lane cross-section.

Also, the speed limit on Trotwood Avenue should be reduced to no more than 45 mph along the frontage of the project site.

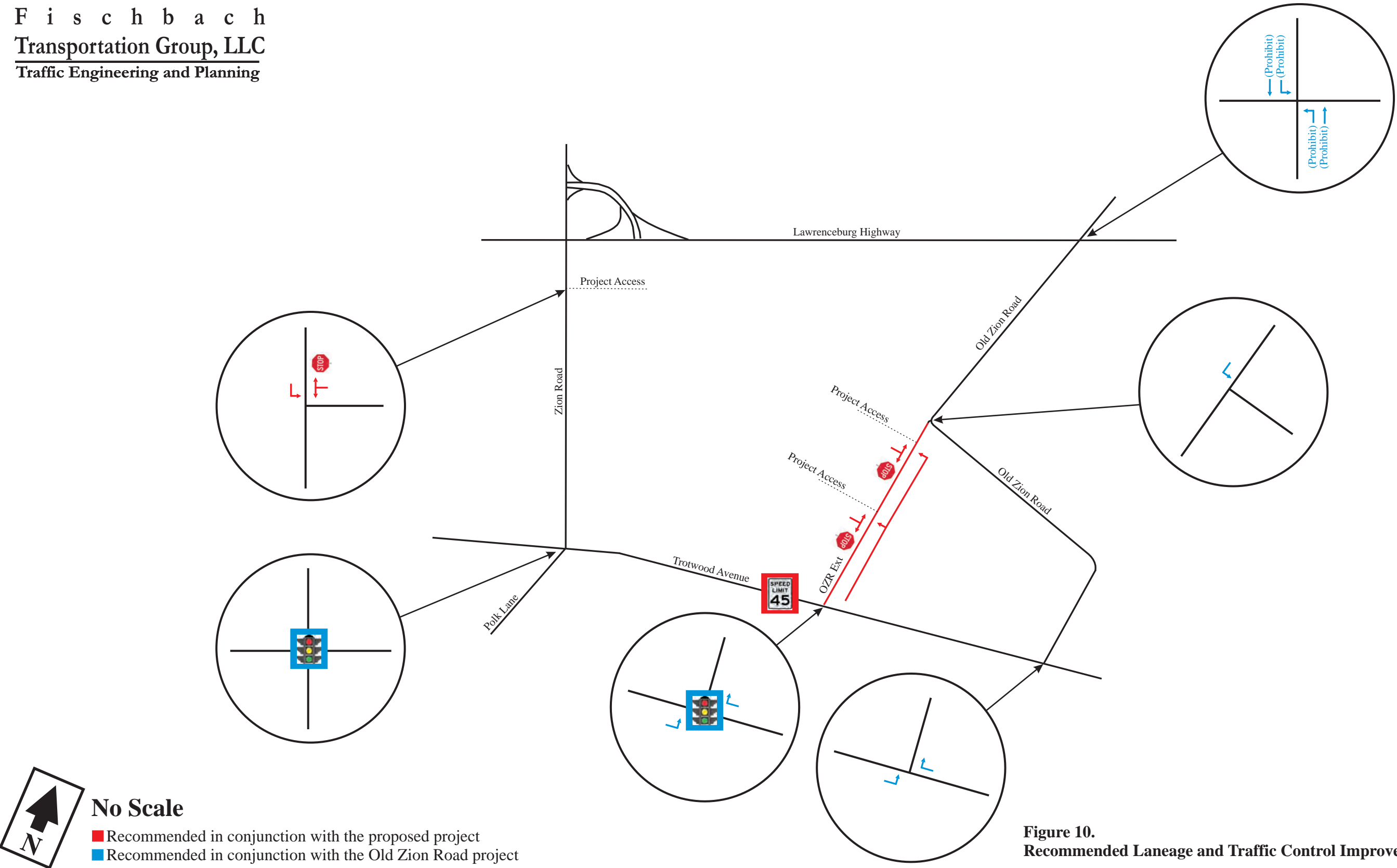
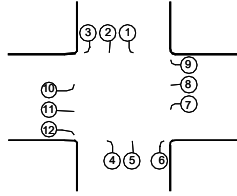


Figure 10.
Recommended Laneage and Traffic Control Improvements

**APPENDIX A
EXISTING TRAFFIC COUNTS
BACKGROUND TRAFFIC COUNTS**

INTERSECTION TRAFFIC VOLUME COUNTS



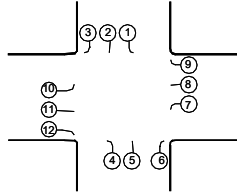
LOCATION: Trotwood Avenue and Zion Road / Polk Lane
DATE: 17-Aug-23 Thu
RECORDER: Burns
NOTES: unsignalized

LOCATION	S/B Zion Road			N/B Polk Lane			W/B Trotwood Avenue			E/B Trotwood Avenue		
TIME	1	2	3	4	5	6	7	8	9	10	11	12
6:00-6:15	5	3	6		5	11	1	22	4	2	55	
6:15-6:30	4	4	5	2	7	11	2	28	9	9	60	1
6:30-6:45	11	1	22	1	3	13	3	36	10	5	79	1
6:45-7:00	13	5	10	2	1	12	3	42	14	9	85	2
7:00-7:15	12	2	13		4	10	1	65	18	5	113	
7:15-7:30	19	2	7	1	6	12	2	49	48	8	100	
7:30-7:45	26	3	13	1	3	13	1	39	44	18	140	4
7:45-8:00	30	1	13	2	4	11	4	45	26	6	94	3
8:00-8:15	8	3	11	1	4	5	4	35	21	11	85	2
8:15-8:30	9	2	10	2	3	8	5	42	11	5	70	2
8:30-8:45	7	4	7	1	2	5	5	42	16	11	78	2
8:45-9:00	12	3	8		1	8	5	44	15	6	73	
9:00-9:15	11	3	8		1	8	6	45	15	5	71	
9:15-9:30	11	4	7		1	8	6	45	16	5	68	
9:30-9:45	10	4	7		1	8	7	46	16	4	66	
9:45-10:00	10	5	6		1	8	7	46	17	4	63	
10:00-10:15	9	5	6		1	8	8	47	17	3	61	
10:15-10:30	9	3	7		1	7	2	55	6	6	58	2
10:30-10:45	10	2	7	1	3	13	4	65	10	4	55	2
10:45-11:00	10	2	9		1	8	3	45	8	5	58	
11:00-11:15	6	2	13		2	1	6	61	21	4	54	1
11:15-11:30	9	3	2		6	7	3	51	13	7	74	2
11:30-11:45	8	2	9	2	4	4	5	45	9	4	66	2
11:45-12:00	4	1	8		2	3	5	74	19	8	65	
12:00-12:15	14		8	1	4	2	10	66	15	4	84	3
12:15-12:30	10	1	8		3	6	5	72	13	4	49	1
12:30-12:45	9	3	10		7	4	9	67	16	4	83	2
12:45-1:00	3	2	10	2	2	6	4	71	19	7	58	1
1:00-1:15	4	2	9	2	2	7	4	75	22	7	60	1
1:15-1:30	5	1	8	2	3	8	4	79	25	7	61	1
1:30-1:45	7	1	8	1	3	8	5	82	28	6	63	2
1:45-2:00	8		7	1	4	9	5	86	31	6	64	2
2:00-2:15	9		6	1	4	10	5	90	34	6	66	2
2:15-2:30	5	3	8		3	6	12	92	23	13	47	2
2:30-2:45	12	4	15	1	3	10	10	82	28	8	68	4
2:45-3:00	19	6	12	1	1	6	9	89	36	11	59	4
3:00-3:15	13	7	14	1	4	8	18	110	14	14	77	
3:15-3:30	20	2	12	1	6	2	3	80	45	12	105	6
3:30-3:45	27	7	7		2	5	16	93	43	15	82	6
3:45-4:00	22	7	9		3	6	17	99	33	15	80	4
4:00-4:15	18	7	12	1	3	7	17	104	24	14	79	2
4:15-4:30	11	6	13		1	5	19	101	35	9	76	1
4:30-4:45	13	4	18		4	6	13	108	40	8	78	
4:45-5:00	21	6	17	1	2	9	23	114	44	6	87	1
5:00-5:15	25	7	14	1	2	12	17	98	35	13	85	2
5:15-5:30	12	4	11	1	7	9	12	98	41	8	61	3
5:30-5:45	10	10	5	1	1	9	12	105	37	7	57	
5:45-6:00	7	10	16		3	6	8	92	29	5	54	
6:00-6:15	13	2	5			3	9	84	20	3	55	1
6:15-6:30	7	1	7	1	2	9	6	61	21	10	68	3
6:30-6:45	15	3	6	1	3	3	18	62	25	2	37	3
6:45-7:00	5	4	6		4	5	12	49	19	4	45	3
TOTAL	607	179	495	37	153	388	400	3,523	1,198	382	3,679	86
AM PK HR	87	8	46	4	17	46	8	198	136	37	447	7
PM PK HR	70	23	62	2	9	32	72	421	154	36	326	4

639 114
768 142
880 185
1,000 198
1,041 243
988 254
903 305
778 239
714 190
697 169
699 180
688 175
680 173
672 171
657 169
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646 165
652 156
673 176
657 149
697 171
737 177
732 160
786 189
782 211
766 172
798 214
798 185
836 195
874 204
884 214
915 223
945 233
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1,145 253
1,180 294
1,166 303
1,140 295
1,137 288
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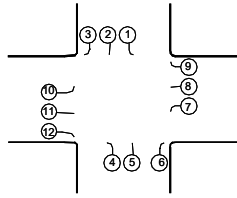
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4:15-5:15 0.91

INTERSECTION TRAFFIC VOLUME COUNTS



LOCATION: Trotwood Avenue and Old Zion Road Ext.
DATE: 18-Mar-25 Tue
RECORDER: Burns
NOTES: unsignalized

LOCATION	S/B Old Zion Road Ext			N/B			W/B Trotwood Avenue			E/B Trotwood Avenue				
TIME	1	2	3	4	5	6	7	8	9	10	11	12		
6:00-6:15	5		2					23	2	11	41		543	84
6:15-6:30	21		4					24	2	11	66		664	128
6:30-6:45	21		2					41	2	14	69		793	149
6:45-7:00	18		6					57	9	13	79		899	182
7:00-7:15	15		2					60	4	14	110		1,000	205
7:15-7:30	24		5					81	3	7	137		988	257
7:30-7:45	28		3					84	7	9	124		899	255
7:45-8:00	33		6					100	4	10	130		823	283
8:00-8:15	18		7					67	1	13	87		712	193
8:15-8:30	17		9					48	3	3	88		689	168
8:30-8:45	25		1					58	2	6	87		687	179
8:45-9:00	14		3					59		8	88		670	172
9:00-9:15	16		3					62	1	7	81		656	170
9:15-9:30	18		3					64	1	6	74		642	166
9:30-9:45	20		2					67	2	5	66		647	162
9:45-10:00	22		2					69	2	4	59		649	158
10:00-10:15	24		2					72	3	3	52		628	156
10:15-10:30	24		6					57	5	4	75		649	171
10:30-10:45	17		4					68	4	6	65		650	164
10:45-11:00	11		2					58	4	6	56		694	137
11:00-11:15	16		2					80	6	5	68		710	177
11:15-11:30	6		6					81	9	5	65		693	172
11:30-11:45	16		5					93	5	10	79		731	208
11:45-12:00	6		2					75	7	7	56		715	153
12:00-12:15	12		4					79	8	8	49		735	160
12:15-12:30	14		5					91	9	6	85		754	210
12:30-12:45	18		4					85	6	8	71		728	192
12:45-1:00	18		2					73	7	3	70		729	173
1:00-1:15	17		2					79	8	3	70		754	179
1:15-1:30	16		2					85	8	3	70		779	184
1:30-1:45	15		2					92	9	4	71		822	193
1:45-2:00	14		2					98	9	4	71		866	198
2:00-2:15	13		2					104	10	4	71		907	204
2:15-2:30	24		6					116	14	7	60		967	227
2:30-2:45	22		5					104	10	11	85		997	237
2:45-3:00	28		7					100	10	6	88		1,017	239
3:00-3:15	23		7					109	21	7	97		1,035	264
3:15-3:30	16		9					123	9	11	89		1,028	257
3:30-3:45	21		9					125	8	11	83		1,030	257
3:45-4:00	25		10					127	7	12	76		1,079	257
4:00-4:15	30		10					129	6	12	70		1,095	257
4:15-4:30	24		6					141	16	8	64		1,122	259
4:30-4:45	32		11					155	14	7	87		1,084	306
4:45-5:00	34		16					136	13	8	66		1,027	273
5:00-5:15	31		14					115	16	11	97		957	284
5:15-5:30	14		6					127	11	3	60		896	221
5:30-5:45	24		1					133	12	5	74		905	249
5:45-6:00	15		5					129	2	4	48		806	203
6:00-6:15	17		8					99	10	11	78		747	223
6:15-6:30	21		5					124	11	6	63			230
6:30-6:45	7		8					72	11	4	48			150
6:45-7:00	7		3					79	4	4	47			144
TOTAL	987		260					4,577	367	378	3,910			
AM PK HR	100		16					325	18	40	501		7:00-8:00	0.88
PM PK HR	121		47					547	59	34	314		4:15-5:15	0.92

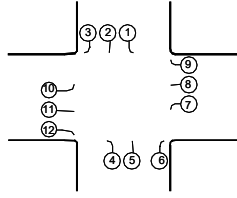


INTERSECTION TRAFFIC VOLUME COUNTS

LOCATION: Trotwood Avenue and Old Zion Road
DATE: 19-Mar-25 Wed
RECORDER: Burns
NOTES: unsignalized

LOCATION	S/B Old Zion Road			N/B			W/B Trotwood Avenue			E/B Trotwood Avenue				
TIME	1	2	3	4	5	6	7	8	9	10	11	12		
6:00-6:15								17		1	66		482	84
6:15-6:30	4							30			59		607	93
6:30-6:45	3							36	1		94		743	134
6:45-7:00	14							61	1		95		885	171
7:00-7:15	7							73			129		957	209
7:15-7:30	5							80	2		142		953	229
7:30-7:45	12							105	1		158		870	276
7:45-8:00	14							96	1		132		754	243
8:00-8:15	15							83	2		105		673	205
8:15-8:30	9							50	3		84		622	146
8:30-8:45	12							63	2		83		625	160
8:45-9:00	15							68	4	1	74		605	162
9:00-9:15	12							67	3	1	71		578	154
9:15-9:30	10							66	3	1	69		551	149
9:30-9:45	7							65	2		66		570	140
9:45-10:00	5							64	2		64		567	135
10:00-10:15	2							63	1		61		603	127
10:15-10:30	4							88			76		619	168
10:30-10:45	7		1					60	1	1	67		612	137
10:45-11:00	11							90	2		68		629	171
11:00-11:15	2							80	1		60		600	143
11:15-11:30	6							82	3		70		610	161
11:30-11:45	4							70	1		79		622	154
11:45-12:00	5		1					75	1		60		637	142
12:00-12:15	4							80	1		68		663	153
12:15-12:30	4							99			70		681	173
12:30-12:45	2							86	2		79		683	169
12:45-1:00	4							82			82		693	168
1:00-1:15	3							89			79		708	171
1:15-1:30	3							96			76		723	175
1:30-1:45	2							102	1		74		760	179
1:45-2:00	2							109	1		71		818	183
2:00-2:15	1							116	1		68		869	186
2:15-2:30	1							123	1		87		932	212
2:30-2:45	9							118	1	2	107		954	237
2:45-3:00	13							117			104		941	234
3:00-3:15	5							134	1		109		922	249
3:15-3:30	7							116	1		110		878	234
3:30-3:45	6							118	1		99		870	224
3:45-4:00	5							120	2		88		894	215
4:00-4:15	4							122	2		77		920	205
4:15-4:30	5							145	1		75		932	226
4:30-4:45	6		1					154	1		86		925	248
4:45-5:00	4							163	3	1	70		859	241
5:00-5:15	7							122	5		83		797	217
5:15-5:30	2							134	3		80		783	219
5:30-5:45	6							108			68		710	182
5:45-6:00	4							101	3		71		652	179
6:00-6:15	5							97	1		100		599	203
6:15-6:30	2							80	2		62			146
6:30-6:45	2		1					82	1	1	37			124
6:45-7:00	2							78	1		45			126
TOTAL	305		4					4,723	73	9	4,257			
AM PK HR	38							354	4		561		7:00-8:00	0.87
PM PK HR	22		1					584	10	1	314		4:15-5:15	0.94

INTERSECTION TRAFFIC VOLUME COUNTS

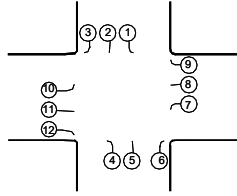


LOCATION: Zion Road and Ramps for Lawrenceburg Highway
DATE: 11-Mar-25 Tue
RECORDER: Burns
NOTES: unsignalized

LOCATION	S/B Zion Road			N/B Zion Road			W/B Ramps			E/B		
TIME	1	2	3	4	5	6	7	8	9	10	11	12
6:00-6:15	6	3			4	6	2		1			
6:15-6:30	8	15			4	11	4		5			
6:30-6:45	12	16			3	18	11		7			
6:45-7:00	16	7			9	18	10		6			
7:00-7:15	20	15			17	23	5		6			
7:15-7:30	19	19			21	26	6		18			
7:30-7:45	25	39			45	26	11		24			
7:45-8:00	27	33			48	22	10		28			
8:00-8:15	1	27			9	13	11		6			
8:15-8:30	8	17			15	18	8		5			
8:30-8:45	10	19			19	9	8		4			
8:45-9:00	4	7			4	18	6		2			
9:00-9:15	4	8			5	18	6		3			
9:15-9:30	4	8			7	19	6		4			
9:30-9:45	4	9			8	19	6		6			
9:45-10:00	4	9			10	20	6		7			
10:00-10:15	4	10			11	20	6		8			
10:15-10:30	9	13			11	18	9		5			
10:30-10:45	8	17			12	17	4		4			
10:45-11:00	4	18			20	19	6		6			
11:00-11:15	7	17			25	18	5		2			
11:15-11:30	5	15			16	16	3		6			
11:30-11:45	8	16			13	13	6		5			
11:45-12:00	8	16			12	17	4		7			
12:00-12:15	1	13			18	19	16		11			
12:15-12:30	4	13			21	13	5		8			
12:30-12:45	6	13			21	19	6		6			
12:45-1:00	5	13			25	15	9		5			
1:00-1:15	6	14			24	16	9		6			
1:15-1:30	6	15			23	17	9		7			
1:30-1:45	7	16			22	19	10		7			
1:45-2:00	7	17			21	20	10		8			
2:00-2:15	8	18			20	21	10		9			
2:15-2:30	14	15			19	37	6		5			
2:30-2:45	11	18			31	26	9		6			
2:45-3:00	7	28			29	22	11		8			
3:00-3:15	8	26			35	23	9		11			
3:15-3:30	11	21			31	20	9		11			
3:30-3:45	14	23			31	33	9		13			
3:45-4:00	10	25			32	33	7		19			
4:00-4:15	7	23			32	32	10		19			
4:15-4:30	14	39			26	34	10		16			
4:30-4:45	13	39			24	39	9		11			
4:45-5:00	17	29			30	34	9		12			
5:00-5:15	10	28			30	31	10		14			
5:15-5:30	4	23			35	31	12		14			
5:30-5:45	14	23			31	31	5		14			
5:45-6:00	4	19			20	16	8		23			
6:00-6:15	11	28			17	26	2		7			
6:15-6:30	7	17			27	24	7		8			
6:30-6:45	5	24			24	23	5		14			
6:45-7:00	8	12			12	19	5		9			
TOTAL	464	965			1,059	1,115	395		476			
AM PK HR	91	106			131	97	32		76			
PM PK HR	54	135			110	138	38		53			

202 22
266 47
328 67
431 66
533 86
514 109
476 170
375 168
248 67
225 71
202 69
185 41
200 44
215 48
232 52
242 56
259 59
274 65
270 62
269 73
260 74
264 61
267 61
277 64
285 78
282 64
295 71
305 72
316 75
327 77
346 81
366 83
388 86
414 96
421 101
443 105
464 112
475 103
511 123
523 126
528 123
528 139
508 135
491 131
450 123
418 119
389 118
366 90
341 91
90
95
65
7:00-8:00 0.78
4:15-5:15 0.95

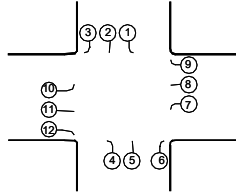
INTERSECTION TRAFFIC VOLUME COUNTS



LOCATION: Lawrenceburg Highway and Ramps for Zion Road
DATE: 12-Mar-25 Wed
RECORDER: Burns
NOTES: unsignalized

LOCATION	S/B Ramps			N/B			W/B Lawrenceburg Highway			E/B Lawrenceburg Highway				
TIME	1	2	3	4	5	6	7	8	9	10	11	12		
6:00-6:15	9		2					55	6	2	149		1,335	223
6:15-6:30	16		7					72	10	2	222		1,473	329
6:30-6:45	13		12					85	11	2	262		1,612	385
6:45-7:00	15		20					94	7	7	255		1,732	398
7:00-7:15	11		25					90	8	7	220		1,761	361
7:15-7:30	13		49					122	11	11	262		1,702	468
7:30-7:45	18		31					118	22	26	290		1,544	505
7:45-8:00	15		23					97	16	11	265		1,366	427
8:00-8:15	6		10					89	13	2	182		1,231	302
8:15-8:30	7		22					96	9	2	174		1,214	310
8:30-8:45	8		21					92	11	3	192		1,185	327
8:45-9:00	5		16					91	8	6	166		1,134	292
9:00-9:15	5		18					93	7	5	157		1,114	285
9:15-9:30	5		21					96	7	4	148		1,094	281
9:30-9:45	5		23					98	6	4	140		1,081	276
9:45-10:00	5		26					101	6	3	131		1,079	272
10:00-10:15	5		28					103	5	2	122		1,061	265
10:15-10:30	7		20					97	9	2	133		1,074	268
10:30-10:45	8		19					111	6	5	125		1,061	274
10:45-11:00	4		14					103	10	4	119		1,040	254
11:00-11:15	7		15					117	4	5	130		1,078	278
11:15-11:30	4		14					106	9	8	114		1,072	255
11:30-11:45	6		12					106	13	4	112		1,106	253
11:45-12:00	5		15					116	15	10	131		1,140	292
12:00-12:15	4		16					112	11	3	126		1,130	272
12:15-12:30	5		17					127	10	8	122		1,147	289
12:30-12:45	3		24					105	4	5	146		1,154	287
12:45-1:00	7		14					110	16	5	130		1,171	282
1:00-1:15	7		15					112	15	5	135		1,200	289
1:15-1:30	6		16					115	14	5	140		1,229	296
1:30-1:45	6		17					117	13	6	145		1,287	304
1:45-2:00	5		18					120	12	6	150		1,390	311
2:00-2:15	5		19					122	11	6	155		1,470	318
2:15-2:30	10		18					135	12	3	176		1,577	354
2:30-2:45	8		31					195	14	6	153		1,633	407
2:45-3:00	2		23					187	15	8	156		1,635	391
3:00-3:15	17		18					186	16	5	183		1,648	425
3:15-3:30	9		30					220	11	5	135		1,626	410
3:30-3:45	9		27					216	13	7	137		1,650	409
3:45-4:00	8		24					211	15	8	138		1,741	404
4:00-4:15	8		21					207	17	10	140		1,787	403
4:15-4:30	4		34					254	17	12	113		1,823	434
4:30-4:45	7		32					264	18	10	169		1,811	500
4:45-5:00	12		23					243	15	9	148		1,669	450
5:00-5:15	14		26					237	17	10	135		1,565	439
5:15-5:30	13		38					202	23	6	140		1,483	422
5:30-5:45	10		32					182	14	4	116		1,324	358
5:45-6:00	8		34					151	13	8	132		1,218	346
6:00-6:15	12		22					192	12	7	112		1,083	357
6:15-6:30	5		17					123	3	5	110			263
6:30-6:45	8		15					123	13	3	90			252
6:45-7:00	8		15					104	9	3	72			211
TOTAL	422		1,099					7,020	602	315	8,005			
AM PK HR	57		128					427	57	55	1,037		7:00-8:00	0.87
PM PK HR	37		115					998	67	41	565		4:15-5:15	0.91

INTERSECTION TRAFFIC VOLUME COUNTS



LOCATION: Lawrenceburg Highway and Old Zion Road
DATE: 13-Mar-25 Thu
RECORDER: Burns
NOTES: unsignalized

LOCATION	S/B Old Zion Road			N/B Old Zion Road			W/B Lawrenceburg Highway			E/B Lawrenceburg Highway				
TIME	1	2	3	4	5	6	7	8	9	10	11	12		
6:00-6:15	1					15	1	52		1	176	12	1,366	258
6:15-6:30		1		1		10	1	67	1		198	28	1,493	307
6:30-6:45				5		21	4	89			247	22	1,654	388
6:45-7:00	1	2		7	1	21	8	134	2	1	205	31	1,692	413
7:00-7:15		2				8	8	108	12		213	34	1,712	385
7:15-7:30	3	1		5	2	6		137	8		276	30	1,668	468
7:30-7:45	11	2	1	1	1	13	6	114	17	1	230	29	1,521	426
7:45-8:00	15	1		3	1	8	4	113	8		254	26	1,370	433
8:00-8:15	3	3	1	5	1	11	9	100	3		171	34	1,230	341
8:15-8:30	1			2		8	7	108	3		174	18	1,178	321
8:30-8:45	1	2		8		5		85	3		151	20	1,141	275
8:45-9:00	2			5	1	5	3	97	2		156	22	1,144	293
9:00-9:15	2			6	1	5	4	99	2		149	21	1,124	289
9:15-9:30	1	1		7	1	5	5	101	1		142	20	1,104	284
9:30-9:45	1	1		7		6	6	103	1		135	18	1,098	278
9:45-10:00		2		8		6	7	105			128	17	1,056	273
10:00-10:15		2		9		6	8	107			121	16	1,031	269
10:15-10:30	1			4		3	6	94			145	25	1,000	278
10:30-10:45		3	1	5	2	7	3	72	1	1	123	18	972	236
10:45-11:00		2	1	9	1	8	7	85	1	1	117	16	1,028	248
11:00-11:15		2		7	2	4	16	87	1		101	18	1,036	238
11:15-11:30	2		1	5	2	5	2	104	2		112	15	1,084	250
11:30-11:45		3		5	1	5	5	120	3		135	15	1,106	292
11:45-12:00		2		7	1	8	1	116	2		102	17	1,092	256
12:00-12:15	1	2		12	2	6	7	130	1		108	17	1,108	286
12:15-12:30	3			8	1	3	3	117	1	1	119	16	1,108	272
12:30-12:45				1		2	3	110	1		153	8	1,136	278
12:45-1:00				10	1	10	4	111	1		119	16	1,174	272
1:00-1:15				11	1	10	5	115	1		127	16	1,232	286
1:15-1:30				11	1	9	6	120	1		135	17	1,290	300
1:30-1:45	1		1	12	1	9	8	124	1		142	17	1,319	316
1:45-2:00	1		1	12	1	8	9	129	1		150	18	1,394	330
2:00-2:15	1		1	13	1	8	10	133	1		158	18	1,513	344
2:15-2:30		1		9		9	4	128	4	1	156	17	1,584	329
2:30-2:45	4	2	1	9	2	11	7	172	10		156	17	1,691	391
2:45-3:00	9	1		17		7	8	196	7		175	29	1,732	449
3:00-3:15	5	1	1	9		13	10	199	2	1	158	16	1,716	415
3:15-3:30	7	5		9	1	10	6	213	4		170	11	1,712	436
3:30-3:45	5	4		10	1	8	9	221	4		158	12	1,729	432
3:45-4:00	3	3		11		7	13	231	5		147	13	1,790	433
4:00-4:15	1	2		12		5	16	221	5		135	14	1,840	411
4:15-4:30	1	5		21	2	15	8	250	5		133	13	1,851	453
4:30-4:45	4			20	1	19	27	256	4		146	16	1,789	493
4:45-5:00				7		7	15	271	9		161	13	1,627	483
5:00-5:15	2		1	12	4	11	13	240	1		122	16	1,429	422
5:15-5:30	4	4		10		6	17	221	1		112	16	1,296	391
5:30-5:45	4			9	1	3	7	186	1	1	101	18	1,170	331
5:45-6:00		1	1	15	3	7	6	126	3		105	18	1,080	285
6:00-6:15		1		11	1	6	7	144	2	1	103	13	1,004	289
6:15-6:30	1	1		3	2	5	13	139	5		81	15		265
6:30-6:45	1			11	1	7	6	110	2		95	8		241
6:45-7:00		1		2	2	2	3	93	1		95	10		209
TOTAL	103	66	12	418	48	422	371	7,103	157	10	7,681	950		
AM PK HR	29	6	1	9	4	35	18	472	45	1	973	119	7:00-8:00	0.91
PM PK HR	7	5	1	60	7	52	63	1,017	19		562	58	4:15-5:15	0.94

TRAFFIC IMPACT STUDY
for
OLD ZION ROAD DEVELOPMENT

Columbia, Tennessee

March 21, 2022
Updated May 20, 2022
Updated June 21, 2022
Updated July 27, 2022
Updated September 19, 2022
Updated February 13, 2023

Prepared for:

Willow Branch Homes
1718 General George Patton Dr.
Brentwood, Tennessee, 37027

Prepared by:



RaganSmith

RAGAN-SMITH-ASSOCIATES, INC.
315 Woodland Street, P.O. Box 60070
Nashville, Tennessee 37206-0070
(615) 244-8591



21-0244

OLD ZION ROAD DEVELOPMENT TRAFFIC IMPACT STUDY EXECUTIVE SUMMARY

INTRODUCTION

The Old Zion Road Development is proposed between Trotwood Avenue and Lawrenceburg Highway, east of Old Zion Road in the City of Columbia, Tennessee. When completed, the Old Zion Road Development will consist of 765 single family detached homes. Access to the Old Zion Road Development will be provided by one connection to Trotwood Avenue, one connection to Old Zion Road, and connections to Ridley Park Drive near the Ridley Sports Complex.

BACKGROUND TRAFFIC

Based upon the anticipated development schedule, the year 2032 will be used to analyze the impact of the Old Zion Road Development. Background traffic growth was established by increasing base traffic volumes by **2 percent annually** for the period from 2021 to 2032.

SITE TRAFFIC

Proposed site trips were generated according to the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition*. The total estimated trip generation for the Old Zion Road Development is shown in the table below.

TRIP GENERATION: OLD ZION ROAD DEVELOPMENT								
Land Use	Total Units	Daily Trips	A.M. Peak Hour			P.M. Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total
Single Family Detached Housing	765 homes	6,560	119	356	475	424	249	673

CONCLUSIONS AND RECOMMENDATIONS

Trotwood Avenue at Cayce Lane/Sunnyside Lane

- The recommended roadway project in the City of Columbia's *ConnectColumbia* Comprehensive Plan for this intersection will provide capacity improvements that mitigate the impact of background traffic growth and traffic from the Old Zion Road Development.
- The recommended roadway project at this intersection consists of adding right turn lanes on Trotwood Avenue and closing the nearest access points within a 10-year timeframe from 2018 when *ConnectColumbia* was adopted.
- Based on the properties adjacent to the approaches of Trotwood Avenue, the turn lane design dimensions below would keep the number of properties impacted to a minimum.
 - The eastbound right turn lane can have a storage length of 150 feet and a taper length of 100 feet within the limits of the property on the southwest corner of the intersection.
 - The westbound right turn lane can have a storage length of 100 feet and a taper length of 100 feet within the limits of the property on the northeast corner of the intersection.
- Because the recommended City project is already identified in *ConnectColumbia* and is located 1.1 miles from the Old Zion Road Development, it is not reasonable to assign full responsibility of the improvement to the Old Zion Road Development. However, the proposed Old Zion Road Development should support the recommended City project in a manner that corresponds to the pro rata share of development traffic at the intersection because the improvements do provide additional capacity to mitigate the development impact. Based on statements by city staff, there

OLD ZION ROAD DEVELOPMENT TRAFFIC IMPACT STUDY EXECUTIVE SUMMARY

are traffic signal equipment and hardware replacements that can be completed by the Old Zion Road Development at this intersection to fulfill the pro rata share of the development's impact.

Trotwood Avenue at Rutherford Lane

- No intersection control or laneage modifications are recommended at the intersection of Trotwood Avenue and Rutherford Lane due to the impact of the Old Zion Road Development.

Trotwood Avenue at Ridley Park Road

- This access is planned to remain gated and under control of the City of Columbia Parks Department and site traffic from the Old Zion Development has not been distributed to it for the analysis of this report. Therefore, no improvements are recommended at the intersection due to the impact of the Old Zion Development.

Trotwood Avenue at Yeatman Lane

- A connection from the existing Ashwood Manor neighborhood to the Old Zion Road Development is proposed via an extension of Yeatman Lane but it will be gated by the City of Columbia.

Trotwood Avenue at Old Zion Road

- An eastbound left turn lane should be constructed on Trotwood Avenue as part of the Old Zion Road Development. This turn lane should include 175 feet of storage, 220 feet of bay taper, and lane transitions based on TDOT design guidelines.
- A westbound right turn lane should be constructed on Trotwood Avenue as part of the Old Zion Road Development. This turn lane should include 175 feet of storage and 220 feet of taper.
- The recommended eastbound left turn lane and westbound right turn lane on Trotwood Avenue should be constructed concurrently with phase 2D when the Old Zion Road Development connects to Old Zion Road.
- A TDOT grading permit will be required as part of the construction of the recommended eastbound left turn lane and westbound right turn lane.

Trotwood Avenue at Old Zion Ext

- An eastbound left turn lane should be constructed on Trotwood Avenue as part of the Old Zion Road Development. This turn lane should include 175 feet of storage, 220 feet of bay taper, and lane transitions based on the TDOT design guidelines.
- A westbound right turn lane should be constructed on Trotwood Avenue as part of the Old Zion Road Development. This turn lane should include 175 feet of storage and 220 feet of taper.
- The traffic signal warrant evaluation in this report indicates that this signal may be a candidate for signalization in the future. This intersection should be monitored with traffic counts and signal warrant analysis approximately every 12 months while home building is active at the Old Zion Road Development. If signal warrants are satisfied, a traffic signal should be constructed at the direction of the City Engineering Department to City of Columbia standards and specifications at the intersection of Trotwood Avenue and Old Zion Ext.

OLD ZION ROAD DEVELOPMENT TRAFFIC IMPACT STUDY EXECUTIVE SUMMARY

- The recommended eastbound left turn lane, westbound right turn lane, and traffic signal at the intersection of Trotwood Avenue and Old Zion Ext should be constructed when traffic signal warrants are satisfied by traffic counts at the intersection or at approximately 50% build out (± 400 homes) of the Old Zion Road Development. This level of development is anticipated to be concurrent with phase 2A.
- A TDOT grading permit will be required as part of the construction of the recommended eastbound left turn lane, westbound right turn lane, and traffic signal.

Trotwood Avenue at Zion Road

- The traffic signal warrant evaluation in the reports indicates that this signal may be a candidate for signalization. If signalization is not implemented based on the analysis of this report, this intersection should be monitored with traffic counts and signal warrant analysis approximately every 12 months while home building is active at the Old Zion Road Development. If signal warrants are satisfied, a traffic signal should be constructed to TDOT standards at the direction of the City Engineering Department with TDOT concurrence.
- A TDOT grading permit will be required as part of the construction of the recommended eastbound left turn lane, westbound right turn lane, and traffic signal.

Old Zion Road at Old Zion Ext

- A southbound left turn lane should be constructed on Old Zion Road concurrently with phase 2E of the Old Zion Road Development. This turn lane should include 115 feet of storage, 140 feet of bay taper, and lane transitions based on TDOT design guidelines.
- Right-of-Way on the Old Zion Road Development property at this intersection (northeast quadrant) should be dedicated so that intersection sight lines per AASHTO guidelines and future improvements by others are possible.

Lawrenceburg Highway at Old Zion Road

- The intersection of Lawrenceburg Highway and Old Zion Road includes an intersection skew of approximately 40 degrees and traffic operations on the minor street approaches will be characterized by level of service F during background traffic conditions. Intersection improvements will be appropriate to address the existing and background traffic conditions as well as accommodate the proposed Old Zion Road Development.
- The intersection of Lawrenceburg Highway and Old Zion Road may qualify for modifications into a J-turn intersections as described in the TDOT Design Guidelines (Section 2-303.00). At a J-turn intersection, direct crossing and left-turn movements from the minor approach roadway are prevented to reduce the exposure to high-speed angle collisions. There are already J-turn intersections located on Lawrenceburg Highway nearby in the City of Mt. Pleasant so this type of intersection should be familiar to many drivers in the area. The Old Zion Road Development should coordinate with the TDOT Region traffic engineering office to consider if TDOT's criteria for a J-turn intersection are met. If approved by TDOT, a J-turn intersection should be constructed concurrently with phase 2D where Old Zion Road intersects Lawrenceburg Highway.
- If a J-turn intersection is not approved by TDOT, the improvements below may be considered as alternative measures to address the existing and background traffic conditions as well as accommodate the proposed Old Zion Road Development.
 - Reduce the speed limit on Lawrenceburg Highway from 65 mph to 55 mph within the influence area of the intersection with Old Zion Road.
 - Extend the eastbound and westbound left turn lanes to a minimum length of 385 feet with 220 of bay taper and offset the left turn lanes to the center of the existing median.

**OLD ZION ROAD DEVELOPMENT
TRAFFIC IMPACT STUDY
EXECUTIVE SUMMARY**

- If warranted, install a traffic signal at the intersection of Lawrenceburg Highway and Old Zion Road. Based on the analysis of this report, the satisfaction of traffic signal warrants at this intersection may be challenging due to the high volume of right turn movements which are often subtracted from the signal warrant consideration.
 - If a traffic signal is installed at this intersection in the future, providing railroad-traffic signal preemption should be considered.
- A TDOT grading permit will be required as part of the construction of any improvements at the intersection of Lawrenceburg Highway and Old Zion Road.
- The at-grade railroad crossing on Old Zion Road south of Lawrenceburg Highway is protected by recently installed active warning devices including flashing lights and gates that lower across the roadway when activated by an approaching train. The existing warning devices are appropriate for the conditions on Old Zion Road with and without the Old Zion Road Development.

Lawrenceburg Highway at Zion Road Connector

- No intersection control or laneage modifications are recommended at the intersection of Lawrenceburg Highway at the Zion Road Connector due to the impact of the Old Zion Road Development.

Zion Road at Lawrenceburg Highway Connector

- No intersection control or laneage modifications are recommended at the intersection of Zion Road at the Lawrenceburg Highway Connector due to the impact of the Old Zion Road Development.
- The at-grade railroad crossing on Zion Road south of Lawrenceburg Highway is protected by active warning devices including flashing lights and gates that lower across the roadway when activated by an approaching train. The existing warning devices are appropriate for the conditions on Zion Road with and without the Old Zion Road Development.

Trotwood Avenue Project Access #1

- The approach of Project Access #1 should consist of one lane for traffic entering the site and two lanes for traffic exiting the site. The lanes exiting the development should be designated as separate left turn and right turn lanes with each having a storage length of 100 feet and a taper of 100 feet.
- An eastbound left turn lane should be constructed on Trotwood Avenue as part of the Old Zion Road Development. This turn lane should include 175 feet of storage, 220 feet of bay taper, and lane transitions based on TDOT design guidelines.
- A westbound right turn lane should be constructed on Trotwood Avenue as part of the Old Zion Road Development. This turn lane should include 175 feet of storage and 220 feet of taper.
- Based on the analysis in this report, this intersection appears to be a candidate for future signalization. This intersection should be monitored with traffic counts and signal warrant analysis approximately every 12 months while home building is active at the Old Zion Road Development. Traffic counts and signal warrant analysis more frequently than every 12 months should be performed if requested by City of Columbia Engineering Staff based on the continued monitoring of the intersection. If signal warrants are satisfied, a traffic signal should be constructed at the direction of the City Engineering Department to City of Columbia standards and specifications at the intersection of Trotwood Avenue and Project Access #1.

**OLD ZION ROAD DEVELOPMENT
TRAFFIC IMPACT STUDY
EXECUTIVE SUMMARY**

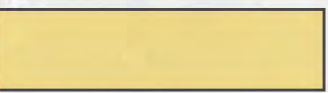

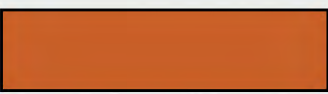



- The recommended eastbound left turn lane and westbound right turn lane at the intersection of Trotwood Avenue and Project Access #1 should be constructed as part of Project Access #1 with phase 1A.
- A TDOT entrance and grading permit will be required as part of the construction of the recommended eastbound left turn lane, westbound right turn lane, and traffic signal.

Old Zion Road at Project Access #2

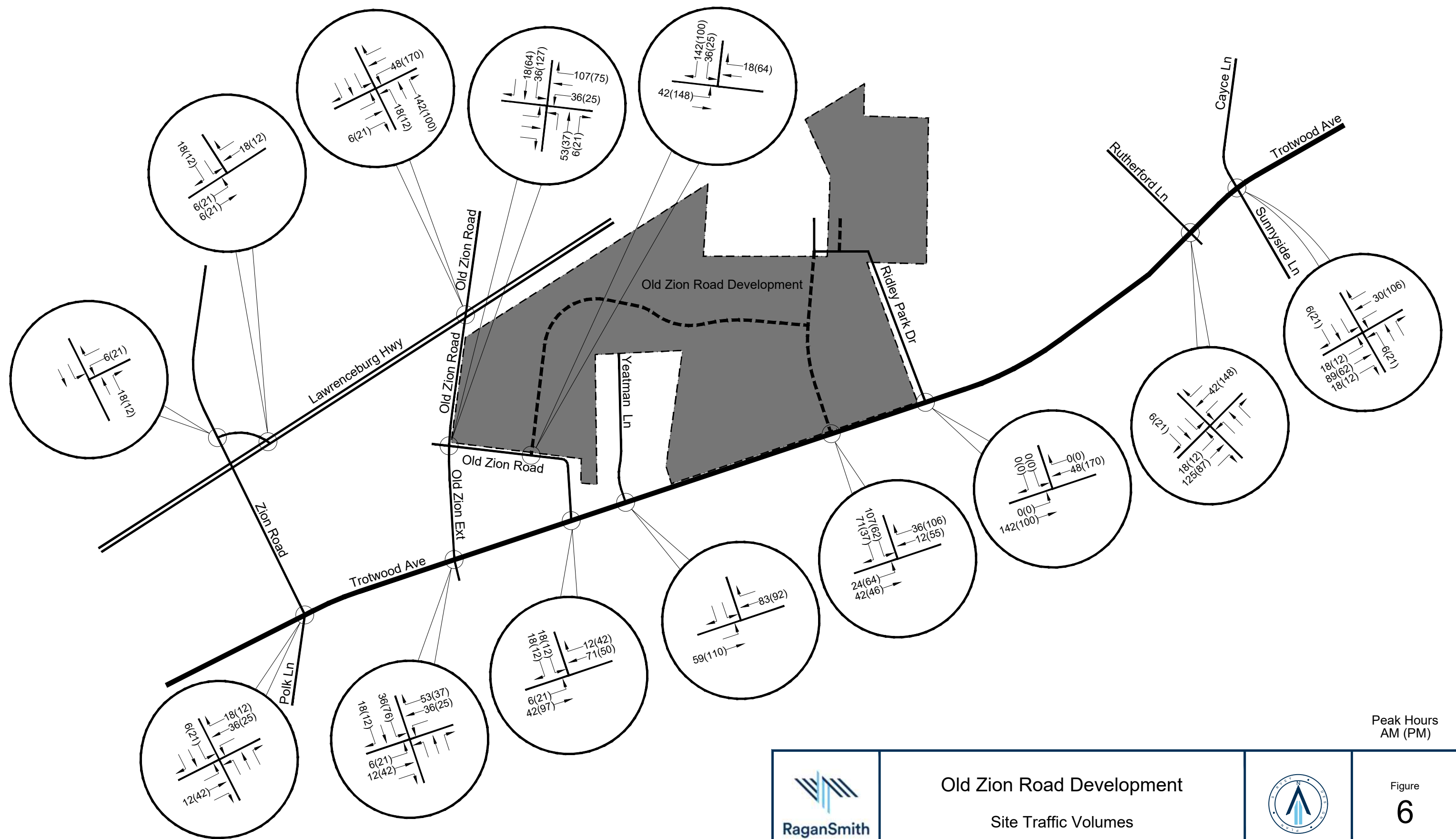
- The approach of Project Access #2 should consist of one lane for traffic entering the site and two lanes for traffic exiting the site. The lanes exiting the development should be designated as separate left turn and right turn lanes with each having a storage length of 100 feet and a taper of 100 feet.
- The portion of Old Zion Road along the project frontage within the City of Columbia should be annexed into the city, if requested by the County Highway Department. The annexed portion of Old Zion Road should be improved as part of phase 2D to meet the requirements of the City of Columbia Engineering Department including pavement markings, signage, along the roadway and at the intersections and curves along the site frontage.

Trotwood Avenue Improvements

- The Old Zion Road Development should plan for the future widening of Trotwood Avenue by the City or TDOT by maintaining a 150' buffer along the project frontage so that future roadway improvements will not be constrained by limited right-of-way.

	60' LOT ALLEY	71 LOTS
	60' LOT	370 LOTS
	75' LOT ALLEY	29 LOTS
	75' LOT	278 LOTS
	100' LOT	16 LOTS
	7AC. HISTORIC HOME	1 LOT
TOTAL		765 LOTS





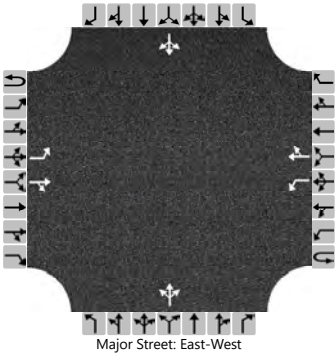
**APPENDIX B
CAPACITY ANALYSES**

EXISTING CONDITIONS

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Zion / Polk
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2025	North/South Street	Zion Road / Polk Lane
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		44	447	7		8	198	164		4	20	46		87	8	46
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

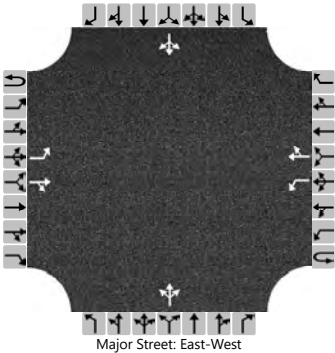
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		52				9					82					166
Capacity, c (veh/h)		1144				1044					349					226
v/c Ratio		0.05				0.01					0.24					0.74
95% Queue Length, Q ₉₅ (veh)		0.1				0.0					0.9					5.0
95% Queue Length, Q ₉₅ (ft)		2.5				0.0					22.5					125.0
Control Delay (s/veh)		8.3				8.5					18.5					55.4
Level of Service (LOS)		A				A					C					F
Approach Delay (s/veh)	0.7				0.2				18.5				55.4			
Approach LOS	A				A				C				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Zion / Polk
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2025	North/South Street	Zion Road / Polk Lane
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		45	326	4		72	421	192		2	11	32		78	26	69
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

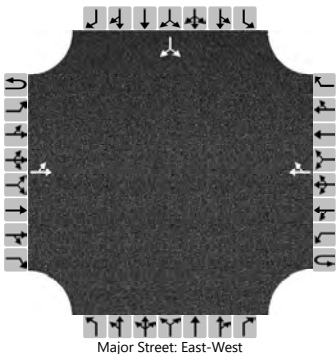
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		49				79					49				190	
Capacity, c (veh/h)		927				1207					316				190	
v/c Ratio		0.05				0.07					0.16				1.00	
95% Queue Length, Q ₉₅ (veh)		0.2				0.2					0.5				8.4	
95% Queue Length, Q ₉₅ (ft)		5.0				5.0					12.5				210.0	
Control Delay (s/veh)		9.1				8.2					18.5				115.9	
Level of Service (LOS)		A				A					C				F	
Approach Delay (s/veh)	1.1				0.9				18.5				115.9			
Approach LOS	A				A				C				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2025	North/South Street	Old Zion Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		40	540				354	18						100		16
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

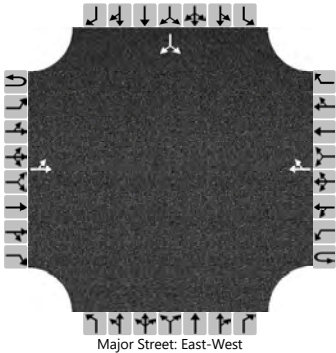
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		45													132	
Capacity, c (veh/h)		1147													239	
v/c Ratio		0.04													0.55	
95% Queue Length, Q ₉₅ (veh)		0.1													3.0	
95% Queue Length, Q ₉₅ (ft)		2.5													75.0	
Control Delay (s/veh)		8.3	0.5												37.0	
Level of Service (LOS)		A	A												E	
Approach Delay (s/veh)	1.0												37.0			
Approach LOS	A												E			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2025	North/South Street	Old Zion Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		39	397				638	69						121		47
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

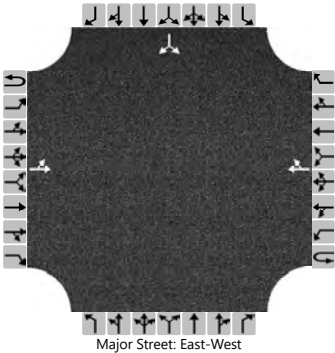
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		42													183	
Capacity, c (veh/h)		855													215	
v/c Ratio		0.05													0.85	
95% Queue Length, Q ₉₅ (veh)		0.2													6.5	
95% Queue Length, Q ₉₅ (ft)		5.0													162.5	
Control Delay (s/veh)		9.4	0.6												74.4	
Level of Service (LOS)		A	A												F	
Approach Delay (s/veh)	1.4												74.4			
Approach LOS	A												F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2025	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	640				372	4						38		0
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

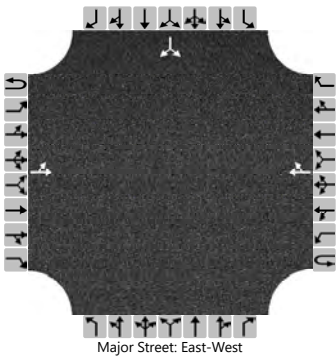
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													44	
Capacity, c (veh/h)		1138													216	
v/c Ratio		0.00													0.20	
95% Queue Length, Q ₉₅ (veh)		0.0													0.7	
95% Queue Length, Q ₉₅ (ft)		0.0													17.5	
Control Delay (s/veh)		8.2	0.0												25.8	
Level of Service (LOS)		A	A												D	
Approach Delay (s/veh)	0.0												25.8			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2025	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		1	517				706	10						22		1
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

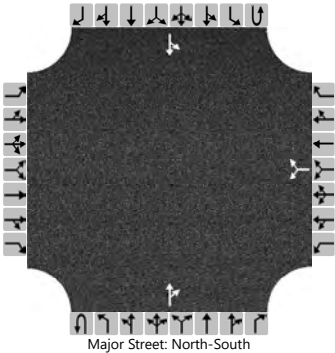
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1													24	
Capacity, c (veh/h)		860													182	
v/c Ratio		0.00													0.13	
95% Queue Length, Q ₉₅ (veh)		0.0													0.5	
95% Queue Length, Q ₉₅ (ft)		0.0													12.5	
Control Delay (s/veh)		9.2	0.0												27.9	
Level of Service (LOS)		A	A												D	
Approach Delay (s/veh)	0.0												27.9			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Old Zion Road
Analysis Year	2025	North/South Street	Old Zion Road / Old Zion Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						0		4			58	0		38	116	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

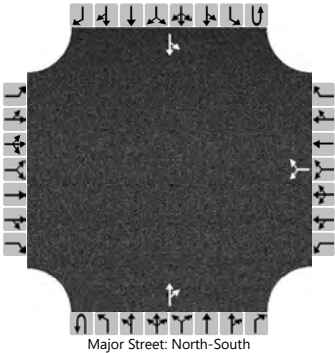
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						5								44		
Capacity, c (veh/h)						1003								1548		
v/c Ratio						0.00								0.03		
95% Queue Length, Q ₉₅ (veh)						0.0								0.1		
95% Queue Length, Q ₉₅ (ft)						0.0								2.5		
Control Delay (s/veh)						8.6								7.4	0.2	
Level of Service (LOS)						A								A	A	
Approach Delay (s/veh)					8.6								2.0			
Approach LOS					A								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Old Zion Road
Analysis Year	2025	North/South Street	Old Zion Road / Old Zion Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						0		11			108	0		23	168	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

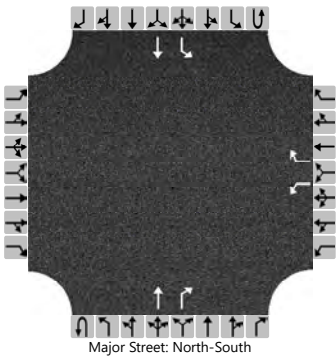
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						12								24		
Capacity, c (veh/h)						943								1487		
v/c Ratio						0.01								0.02		
95% Queue Length, Q ₉₅ (veh)						0.0								0.1		
95% Queue Length, Q ₉₅ (ft)						0.0								2.5		
Control Delay (s/veh)						8.9								7.5	0.1	
Level of Service (LOS)						A								A	A	
Approach Delay (s/veh)					8.9								1.0			
Approach LOS					A								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion / Ramps for Lawrenceburg
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Ramps for Lawrenceburg Hwy
Analysis Year	2025	North/South Street	Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.78
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						33		79			131	97		91	108	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

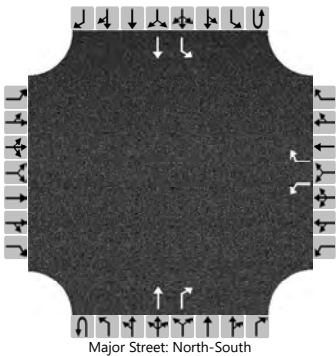
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						42		101						117		
Capacity, c (veh/h)						460		881						1281		
v/c Ratio						0.09		0.11						0.09		
95% Queue Length, Q ₉₅ (veh)						0.3		0.4						0.3		
95% Queue Length, Q ₉₅ (ft)						7.5		10.0						7.5		
Control Delay (s/veh)						13.6		9.6						8.1		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					10.8								3.7			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion / Ramps for Lawrenceburg
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Ramps for Lawrenceburg Hwy
Analysis Year	2025	North/South Street	Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						38		70			110	138		54	135	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

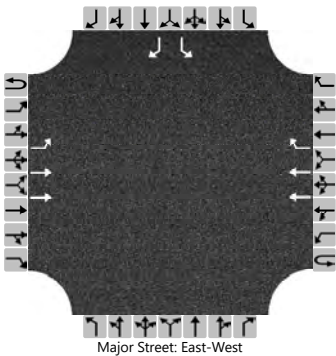
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						40		74						57		
Capacity, c (veh/h)						606		942						1315		
v/c Ratio						0.07		0.08						0.04		
95% Queue Length, Q ₉₅ (veh)						0.2		0.3						0.1		
95% Queue Length, Q ₉₅ (ft)						5.0		7.5						2.5		
Control Delay (s/veh)						11.4		9.1						7.9		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					9.9								2.2			
Approach LOS					A								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Ramps for Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2025	North/South Street	Ramps for Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume (veh/h)	0	55	1048				427	57						57		131
Percent Heavy Vehicles (%)	0	0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					Yes								Yes			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

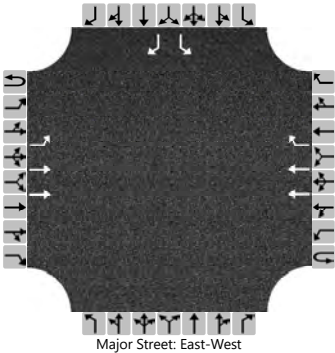
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		63												66		151
Capacity, c (veh/h)		1083												165		761
v/c Ratio		0.06												0.40		0.20
95% Queue Length, Q ₉₅ (veh)		0.2												1.7		0.7
95% Queue Length, Q ₉₅ (ft)		5.0												42.5		17.5
Control Delay (s/veh)		8.5												40.4		10.9
Level of Service (LOS)		A												E		B
Approach Delay (s/veh)	0.4												19.8			
Approach LOS	A												C			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Ramps for Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2025	North/South Street	Ramps for Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume (veh/h)	0	41	610				1011	67						40		152
Percent Heavy Vehicles (%)	0	0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					Yes								Yes			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

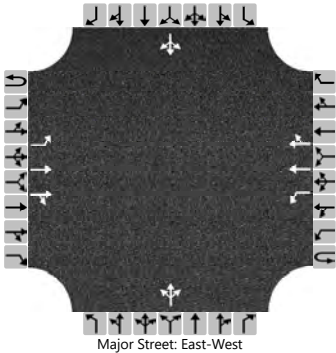
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		45												44		167
Capacity, c (veh/h)		636												101		480
v/c Ratio		0.07												0.43		0.35
95% Queue Length, Q ₉₅ (veh)		0.2												1.8		1.5
95% Queue Length, Q ₉₅ (ft)		5.0												45.0		37.5
Control Delay (s/veh)		11.1												65.5		16.4
Level of Service (LOS)		B												F		C
Approach Delay (s/veh)	0.7												26.7			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2025	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	1	974	130	0	18	474	45		9	4	49		29	6	1
Percent Heavy Vehicles (%)	0	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

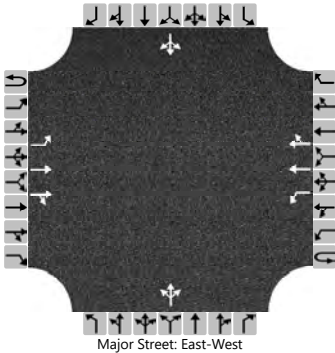
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				20					68				40	
Capacity, c (veh/h)		1012				582					229				110	
v/c Ratio		0.00				0.03					0.30				0.36	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					1.2				1.5	
95% Queue Length, Q ₉₅ (ft)		0.0				2.5					30.0				37.5	
Control Delay (s/veh)		8.6				11.4					27.3				55.4	
Level of Service (LOS)		A				B					D				F	
Approach Delay (s/veh)	0.0				0.4				27.3				55.4			
Approach LOS	A				A				D				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2025	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Existing)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	0	562	88	0	96	1017	19		60	7	52		7	7	1
Percent Heavy Vehicles (%)	0	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

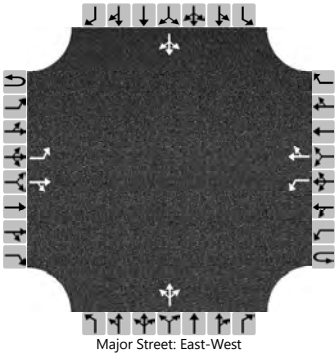
Flow Rate, v (veh/h)		0				102					127				16	
Capacity, c (veh/h)		641				913					124				54	
v/c Ratio		0.00				0.11					1.02				0.29	
95% Queue Length, Q ₉₅ (veh)		0.0				0.4					7.1				1.0	
95% Queue Length, Q ₉₅ (ft)		0.0				10.0					177.5				25.0	
Control Delay (s/veh)		10.6				9.4					155.5				96.5	
Level of Service (LOS)		B				A					F				F	
Approach Delay (s/veh)	0.0				0.8				155.5				96.5			
Approach LOS	A				A				F				F			

**BACKGROUND CONDITIONS
(WITH THE APPROVED DEVELOPMENT EAST OF THE PROPOSED PROJECT)**

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Zion / Polk
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Zion Road / Polk Lane
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		49	503	8		9	254	198		4	22	51		102	9	50
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

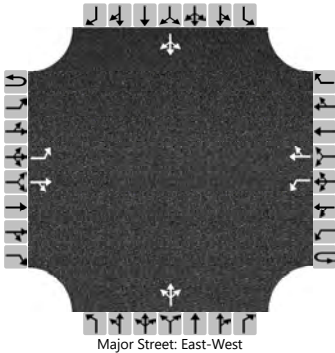
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		58				11					91				189	
Capacity, c (veh/h)		1046				986					287				160	
v/c Ratio		0.06				0.01					0.32				1.19	
95% Queue Length, Q ₉₅ (veh)		0.2				0.0					1.3				10.5	
95% Queue Length, Q ₉₅ (ft)		5.0				0.0					32.5				262.5	
Control Delay (s/veh)		8.6				8.7					23.2				186.8	
Level of Service (LOS)		A				A					C				F	
Approach Delay (s/veh)	0.8				0.2				23.2				186.8			
Approach LOS	A				A				C				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Zion / Polk
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Zion Road / Polk Lane
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		50	401	4		79	489	223		2	12	35		107	29	76
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

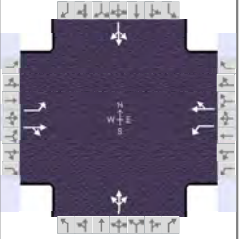
Flow Rate, v (veh/h)		55				87					54				233	
Capacity, c (veh/h)		844				1126					240				127	
v/c Ratio		0.07				0.08					0.22				1.83	
95% Queue Length, Q ₉₅ (veh)		0.2				0.3					0.8				18.1	
95% Queue Length, Q ₉₅ (ft)		5.0				7.5					20.0				452.5	
Control Delay (s/veh)		9.6				8.5					24.2				463.2	
Level of Service (LOS)		A				A					C				F	
Approach Delay (s/veh)	1.1				0.8				24.2				463.2			
Approach LOS	A				A				C				F			

HCS Signalized Intersection Results Summary

General Information

Agency	FTG		
Analyst	FTG	Analysis Date	4/11/2025
Jurisdiction	Mt. Pleasant, TN	Time Period	AM Peak Hour
Urban Street	Trotwood Avenue	Analysis Year	2030 (Back with)
Intersection	Zion Road / Polk Lane	File Name	1_bgam2_sig.xus
Project Description	11330		

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	49	503	8	9	254	198	4	22	51	102	9	50

Signal Information

Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	1.8	3.3	67.9	15.0	8.1	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	4.0	0.0		
				Red	2.0	0.0	2.0	2.0	2.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		12.0		12.0
Phase Duration, s	11.1	77.2	7.8	73.9		14.1		21.0
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.0	0.0	3.0	0.0		3.2		3.1
Queue Clearance Time (g_s), s	3.5		2.3			8.3		14.8
Green Extension Time (g_e), s	0.1	0.0	0.0	0.0		0.1		0.2
Phase Call Probability	0.85		0.30			0.95		1.00
Max Out Probability	0.00		0.00			0.00		0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	58	601		11	532			91			189	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1895		1810	1761			1694			1747	
Queue Service Time (g_s), s	1.5	22.7		0.3	22.6			6.3			12.8	
Cycle Queue Clearance Time (g_c), s	1.5	22.7		0.3	22.6			6.3			12.8	
Green Ratio (g/C)	0.61	0.59		0.58	0.57			0.07			0.12	
Capacity (c), veh/h	472	1124		409	996			114			218	
Volume-to-Capacity Ratio (X)	0.122	0.535		0.026	0.534			0.797			0.870	
Back of Queue (Q), ft/ln (95 th percentile)	26	360		5	345			125			247	
Back of Queue (Q), veh/ln (95 th percentile)	1.0	14.4		0.2	13.8			5.0			9.9	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00			0.00			0.00	
Uniform Delay (d_1), s/veh	11.8	14.5		12.6	16.2			55.2			51.6	
Incremental Delay (d_2), s/veh	0.0	1.8		0.0	2.1			4.7			7.7	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	11.8	16.4		12.6	18.3			59.9			59.2	
Level of Service (LOS)	B	B		B	B			E			E	
Approach Delay, s/veh / LOS	16.0		B	18.2		B	59.9		E	59.2		E
Intersection Delay, s/veh / LOS	25.0						C					

Multimodal Results

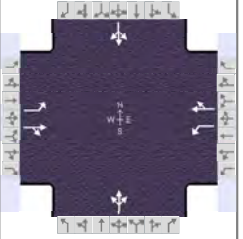
	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.66		B	1.67		B	1.96		B	1.96		B
Bicycle LOS Score / LOS	1.57		B	1.38		A	0.64		A	0.80		A

HCS Signalized Intersection Results Summary

General Information

Agency	FTG		
Analyst	FTG	Analysis Date	4/11/2025
Jurisdiction	Mt. Pleasant, TN	Time Period	PM Peak Hour
Urban Street	Trotwood Avenue	Analysis Year	2030 (Back with)
Intersection	Zion Road / Polk Lane	File Name	1_bgpm2_sig.xus
Project Description	11330		

Intersection Information



Demand Information

Approach Movement	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	50	401	4	79	489	223	2	12	35	107	29	76

Signal Information

Cycle, s	120.0	Reference Phase	2								
Offset, s	0	Reference Point	End								
Uncoordinated	No	Simult. Gap E/W	On	Green	5.0	0.6	67.3	18.1	5.0	0.0	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	4.0	0.0	
				Red	2.0	0.0	2.0	2.0	2.0	0.0	

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		12.0		12.0
Phase Duration, s	11.0	73.3	11.7	73.9		11.0		24.1
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.0	0.0	3.0	0.0		3.2		3.1
Queue Clearance Time (g_s), s	3.5		4.4			5.8		17.7
Green Extension Time (g_e), s	0.1	0.0	0.1	0.0		0.1		0.3
Phase Call Probability	0.84		0.94			0.83		1.00
Max Out Probability	0.00		0.00			0.00		0.00

Movement Group Results

Approach Movement	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	55	445		87	782			54			233	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1897		1810	1799			1681			1743	
Queue Service Time (g_s), s	1.5	16.2		2.4	40.1			3.8			15.7	
Cycle Queue Clearance Time (g_c), s	1.5	16.2		2.4	40.1			3.8			15.7	
Green Ratio (g/C)	0.60	0.56		0.61	0.57			0.04			0.15	
Capacity (c), veh/h	287	1063		554	1018			70			262	
Volume-to-Capacity Ratio (X)	0.192	0.419		0.157	0.769			0.768			0.888	
Back of Queue (Q), ft/ln (95 th percentile)	25	277		39	586			77			285	
Back of Queue (Q), veh/ln (95 th percentile)	1.0	11.1		1.6	23.4			3.1			11.4	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00			0.00			0.00	
Uniform Delay (d_1), s/veh	17.6	15.1		10.9	20.0			56.9			50.0	
Incremental Delay (d_2), s/veh	0.1	1.2		0.0	5.6			6.4			5.5	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	17.7	16.4		10.9	25.6			63.4			55.5	
Level of Service (LOS)	B	B		B	C			E			E	
Approach Delay, s/veh / LOS	16.5		B	24.1		C	63.4		E	55.5		E
Intersection Delay, s/veh / LOS	27.5						C					

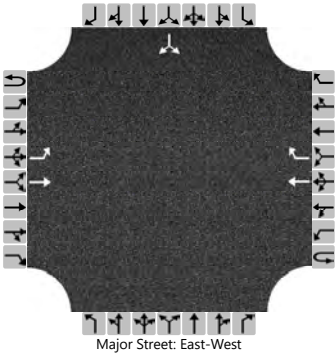
Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.67		B	1.67		B	1.96		B	1.96		B
Bicycle LOS Score / LOS	1.31		A	1.92		B	0.58		A	0.87		A

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		L	T				T	R							LR	
Volume (veh/h)		50	606				425	73						146		36
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

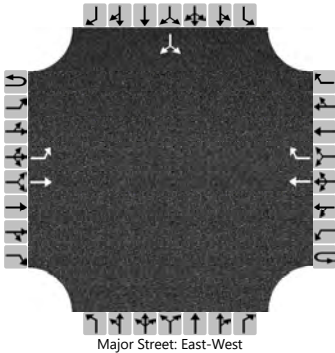
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		57													207	
Capacity, c (veh/h)		1016													201	
v/c Ratio		0.06													1.03	
95% Queue Length, Q ₉₅ (veh)		0.2													9.2	
95% Queue Length, Q ₉₅ (ft)		5.0													230.0	
Control Delay (s/veh)		8.8													120.4	
Level of Service (LOS)		A													F	
Approach Delay (s/veh)	0.7												120.4			
Approach LOS	A												F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		L	T				T	R							LR	
Volume (veh/h)		64	479				727	113						209		64
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

Delay, Queue Length, and Level of Service

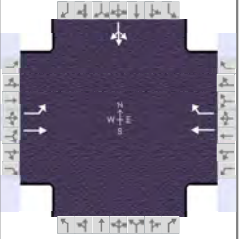
Flow Rate, v (veh/h)		70													297	
Capacity, c (veh/h)		755													157	
v/c Ratio		0.09													1.89	
95% Queue Length, Q ₉₅ (veh)		0.3													22.5	
95% Queue Length, Q ₉₅ (ft)		7.5													562.5	
Control Delay (s/veh)		10.3													474.4	
Level of Service (LOS)		B													F	
Approach Delay (s/veh)	1.2												474.4			
Approach LOS	A												F			

HCS Signalized Intersection Results Summary

General Information

Agency	FTG		
Analyst	FTG	Analysis Date	4/11/2025
Jurisdiction	Mt. Pleasant, TN	Time Period	AM Peak Hour
Urban Street	Trotwood Avenue	Analysis Year	2030 (Back with)
Intersection	Old Zion Road Ext.	File Name	2_bgam2_sig.xus
Project Description	11330		

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	50	606			425	73				146	0	36

Signal Information

Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	5.1	80.8	16.1	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0		
				Red	2.0	2.0	2.0	0.0	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	1.0	4.0		7.3				12.0
Phase Duration, s	11.1	97.9		86.8				22.1
Change Period, ($Y+R_c$), s	6.0	6.0		6.0				6.0
Max Allow Headway (MAH), s	3.0	0.0		0.0				3.1
Queue Clearance Time (g_s), s	3.0							15.8
Green Extension Time (g_e), s	0.1	0.0		0.0				0.4
Phase Call Probability	0.85							1.00
Max Out Probability	0.00							0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7	4	14
Adjusted Flow Rate (v), veh/h	57	689			483	83					207	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900			1900	1610					1766	
Queue Service Time (g_s), s	1.0	16.0			13.4	2.1					13.8	
Cycle Queue Clearance Time (g_c), s	1.0	16.0			13.4	2.1					13.8	
Green Ratio (g/C)	0.73	0.77			0.67	0.67					0.13	
Capacity (c), veh/h	657	1455			1279	1084					237	
Volume-to-Capacity Ratio (X)	0.086	0.473			0.378	0.077					0.871	
Back of Queue (Q), ft/ln (95 th percentile)	14	219			219	31					256	
Back of Queue (Q), veh/ln (95 th percentile)	0.6	8.7			8.8	1.2					10.3	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00					0.00	
Uniform Delay (d_1), s/veh	5.5	5.2			8.6	6.8					50.9	
Incremental Delay (d_2), s/veh	0.0	1.1			0.9	0.1					3.9	
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0					0.0	
Control Delay (d), s/veh	5.5	6.3			9.4	6.9					54.8	
Level of Service (LOS)	A	A			A	A					D	
Approach Delay, s/veh / LOS	6.2		A		9.1		A		0.0		54.8	
Intersection Delay, s/veh / LOS	13.9						B					

Multimodal Results

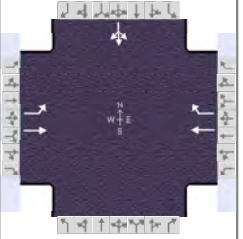
	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.33		A		1.65		B		1.96		B	
Bicycle LOS Score / LOS	1.72		B		1.42		A				0.83	

HCS Signalized Intersection Results Summary

General Information

Agency	FTG		
Analyst	FTG	Analysis Date	4/11/2025
Jurisdiction	Mt. Pleasant, TN	Time Period	PM Peak Hour
Urban Street	Trotwood Avenue	Analysis Year	2030 (Back with)
Intersection	Old Zion Road Ext.	File Name	2_bgpm2_sig.xus
Project Description	11330		

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	64	479			727	113				209	0	64

Signal Information

Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	5.5	73.2	23.3	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0		
				Red	2.0	2.0	2.0	0.0	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	1.0	4.0		7.3				12.0
Phase Duration, s	11.5	90.7		79.2				29.3
Change Period, ($Y+R_c$), s	6.0	6.0		6.0				6.0
Max Allow Headway (MAH), s	3.0	0.0		0.0				3.1
Queue Clearance Time (g_s), s	3.6							22.7
Green Extension Time (g_e), s	0.1	0.0		0.0				0.6
Phase Call Probability	0.91							1.00
Max Out Probability	0.00							0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7	4	14
Adjusted Flow Rate (v), veh/h	73	544			826	128					310	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900			1900	1610					1758	
Queue Service Time (g_s), s	1.6	14.2			36.0	4.1					20.7	
Cycle Queue Clearance Time (g_c), s	1.6	14.2			36.0	4.1					20.7	
Green Ratio (g/C)	0.67	0.71			0.61	0.61					0.19	
Capacity (c), veh/h	352	1341			1160	983					341	
Volume-to-Capacity Ratio (X)	0.207	0.406			0.712	0.131					0.909	
Back of Queue (Q), ft/ln (95 th percentile)	26	220			534	63					353	
Back of Queue (Q), veh/ln (95 th percentile)	1.0	8.8			21.3	2.5					14.1	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00					0.00	
Uniform Delay (d_1), s/veh	13.4	7.3			16.1	9.9					47.3	
Incremental Delay (d_2), s/veh	0.1	0.9			3.7	0.3					3.9	
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0					0.0	
Control Delay (d), s/veh	13.6	8.2			19.9	10.2					51.2	
Level of Service (LOS)	B	A			B	B					D	
Approach Delay, s/veh / LOS	8.8		A	18.6		B	0.0			51.2		D
Intersection Delay, s/veh / LOS	20.7						C					

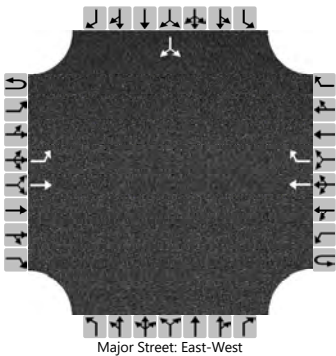
Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.35		A	1.66		B	1.96		B	1.96		B
Bicycle LOS Score / LOS	1.51		B	2.06		B				1.00		A

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		L	T				T	R							LR	
Volume (veh/h)		6	746				480	16						60		18
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

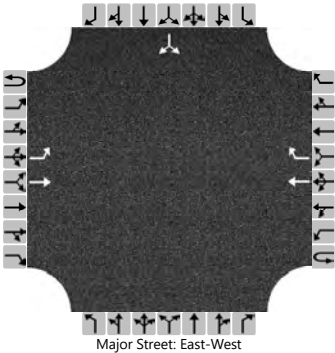
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7													90	
Capacity, c (veh/h)		1012													180	
v/c Ratio		0.01													0.50	
95% Queue Length, Q ₉₅ (veh)		0.0													2.4	
95% Queue Length, Q ₉₅ (ft)		0.0													60.0	
Control Delay (s/veh)		8.6													43.3	
Level of Service (LOS)		A													E	
Approach Delay (s/veh)	0.1												43.3			
Approach LOS	A												E			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		L	T				T	R							LR	
Volume (veh/h)		22	666				827	53						36		13
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

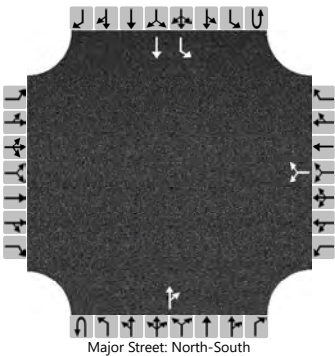
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		23													52	
Capacity, c (veh/h)		740													133	
v/c Ratio		0.03													0.39	
95% Queue Length, Q ₉₅ (veh)		0.1													1.7	
95% Queue Length, Q ₉₅ (ft)		2.5													42.5	
Control Delay (s/veh)		10.0													48.5	
Level of Service (LOS)		B													E	
Approach Delay (s/veh)	0.3												48.5			
Approach LOS	A												E			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Old Zion Road
Analysis Year	2030	North/South Street	Old Zion Road / Old Zion Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						36		111			117	6		78	146	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

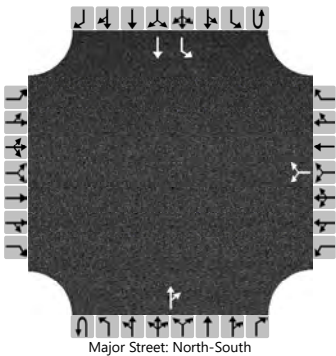
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						169								90		
Capacity, c (veh/h)						767								1454		
v/c Ratio						0.22								0.06		
95% Queue Length, Q ₉₅ (veh)						0.8								0.2		
95% Queue Length, Q ₉₅ (ft)						20.0								5.0		
Control Delay (s/veh)						11.0								7.6		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)					11.0								2.7			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Old Zion Road
Analysis Year	2030	North/South Street	Old Zion Road / Old Zion Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						24		87			156	21		152	249	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

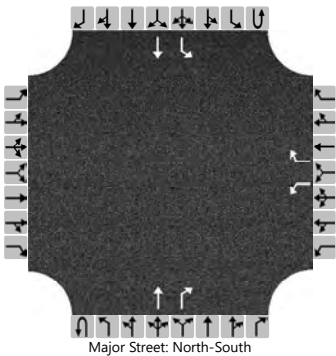
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						118								162		
Capacity, c (veh/h)						644								1398		
v/c Ratio						0.18								0.12		
95% Queue Length, Q ₉₅ (veh)						0.7								0.4		
95% Queue Length, Q ₉₅ (ft)						17.5								10.0		
Control Delay (s/veh)						11.8								7.9		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)					11.8								3.0			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion / Ramps for Lawrenceburg
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Ramps for Lawrenceburg Hwy
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.78
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						42		88			144	125		100	119	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

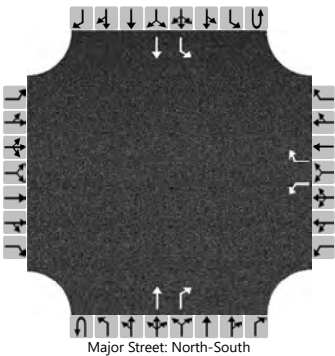
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						54		113						128		
Capacity, c (veh/h)						422		863						1225		
v/c Ratio						0.13		0.13						0.10		
95% Queue Length, Q ₉₅ (veh)						0.4		0.4						0.3		
95% Queue Length, Q ₉₅ (ft)						10.0		10.0						7.5		
Control Delay (s/veh)						14.8		9.8						8.3		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					11.4								3.8			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion / Ramps for Lawrenceburg
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Ramps for Lawrenceburg Hwy
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						63		77			121	164		59	149	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

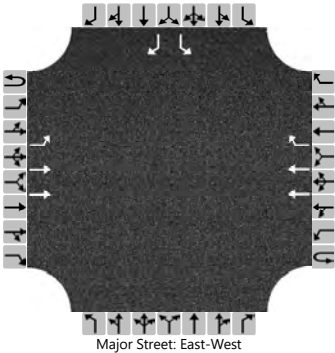
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						66		81						62		
Capacity, c (veh/h)						574		928						1273		
v/c Ratio						0.12		0.09						0.05		
95% Queue Length, Q ₉₅ (veh)						0.4		0.3						0.2		
95% Queue Length, Q ₉₅ (ft)						10.0		7.5						5.0		
Control Delay (s/veh)						12.1		9.2						8.0		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					10.5								2.3			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Ramps for Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Ramps for Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume (veh/h)	0	67	1159				488	63						63		162
Percent Heavy Vehicles (%)	0	0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					Yes								Yes			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

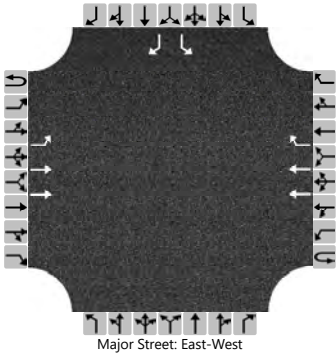
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		77												72		186
Capacity, c (veh/h)		1020												127		723
v/c Ratio		0.08												0.57		0.26
95% Queue Length, Q ₉₅ (veh)		0.2												2.8		1.0
95% Queue Length, Q ₉₅ (ft)		5.0												70.0		25.0
Control Delay (s/veh)		8.8												65.4		11.7
Level of Service (LOS)		A												F		B
Approach Delay (s/veh)	0.5												26.7			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Ramps for Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Ramps for Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume (veh/h)	0	66	692				1124	74						44		179
Percent Heavy Vehicles (%)	0	0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					Yes								Yes			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

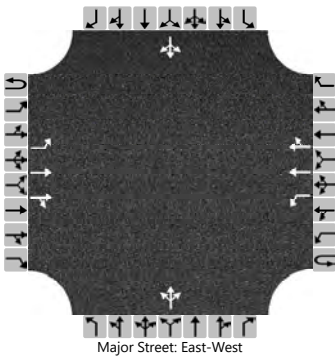
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		73												48		197
Capacity, c (veh/h)		571												67		437
v/c Ratio		0.13												0.72		0.45
95% Queue Length, Q ₉₅ (veh)		0.4												3.2		2.3
95% Queue Length, Q ₉₅ (ft)		10.0												80.0		57.5
Control Delay (s/veh)		12.2												140.5		19.8
Level of Service (LOS)		B												F		C
Approach Delay (s/veh)	1.1												43.6			
Approach LOS	A												E			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	1	1072	149	0	68	522	50		28	4	196		32	7	1
Percent Heavy Vehicles (%)	0	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

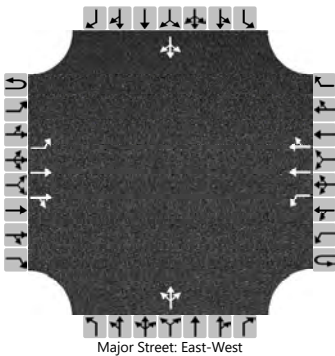
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				75					251				44	
Capacity, c (veh/h)		963				520					185				38	
v/c Ratio		0.00				0.14					1.36				1.15	
95% Queue Length, Q ₉₅ (veh)		0.0				0.5					14.6				4.4	
95% Queue Length, Q ₉₅ (ft)		0.0				12.5					365.0				110.0	
Control Delay (s/veh)		8.7				13.1					239.5				357.3	
Level of Service (LOS)		A				B					F				F	
Approach Delay (s/veh)	0.0				1.4				239.5				357.3			
Approach LOS	A				A				F				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	0	618	118	0	276	1119	21		78	8	157		8	7	1
Percent Heavy Vehicles (%)	0	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

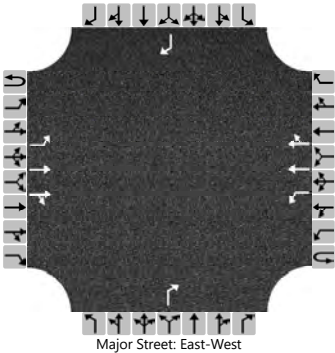
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				294					259				17	
Capacity, c (veh/h)		582				844					49				11	
v/c Ratio		0.00				0.35					5.32				1.50	
95% Queue Length, Q ₉₅ (veh)		0.0				1.6					29.5				2.9	
95% Queue Length, Q ₉₅ (ft)		0.0				40.0					737.5				72.5	
Control Delay (s/veh)		11.2				11.5					2109.5				913.6	
Level of Service (LOS)		B				B					F				F	
Approach Delay (s/veh)	0.0				2.2				2109.5				913.6			
Approach LOS	A				A				F				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	0	1		0	0	1
Configuration		L	T	TR		L	T	TR				R				R
Volume (veh/h)	0	1	1072	149	0	68	522	50				228				40
Percent Heavy Vehicles (%)	0	0			0	0						0				0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1						6.9				6.9
Critical Headway (sec)		4.10				4.10						6.90				6.90
Base Follow-Up Headway (sec)		2.2				2.2						3.3				3.3
Follow-Up Headway (sec)		2.20				2.20						3.30				3.30

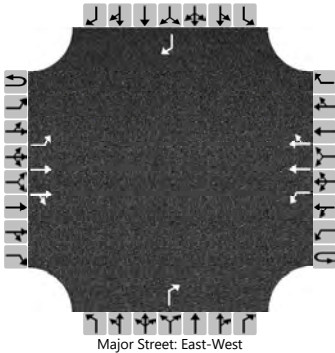
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				75						251				44
Capacity, c (veh/h)		963				520						404				687
v/c Ratio		0.00				0.14						0.62				0.06
95% Queue Length, Q ₉₅ (veh)		0.0				0.5						4.1				0.2
95% Queue Length, Q ₉₅ (ft)		0.0				12.5						102.5				5.0
Control Delay (s/veh)		8.7				13.1						27.4				10.6
Level of Service (LOS)		A				B						D				B
Approach Delay (s/veh)	0.0				1.4				27.4				10.6			
Approach LOS	A				A				D				B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	0	1		0	0	1
Configuration		L	T	TR		L	T	TR				R				R
Volume (veh/h)	0	0	618	118	0	276	1119	21				243				16
Percent Heavy Vehicles (%)	0	0			0	0						0				0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1						6.9				6.9
Critical Headway (sec)		4.10				4.10						6.90				6.90
Base Follow-Up Headway (sec)		2.2				2.2						3.3				3.3
Follow-Up Headway (sec)		2.20				2.20						3.30				3.30

Delay, Queue Length, and Level of Service

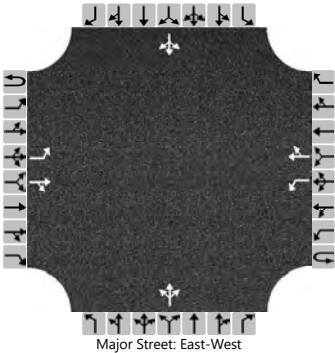
Flow Rate, v (veh/h)		0				294						259				17
Capacity, c (veh/h)		582				844						613				445
v/c Ratio		0.00				0.35						0.42				0.04
95% Queue Length, Q ₉₅ (veh)		0.0				1.6						2.1				0.1
95% Queue Length, Q ₉₅ (ft)		0.0				40.0						52.5				2.5
Control Delay (s/veh)		11.2				11.5						15.1				13.4
Level of Service (LOS)		B				B						C				B
Approach Delay (s/veh)	0.0				2.2				15.1				13.4			
Approach LOS	A				A				C				B			

**TOTAL PROJECTED CONDITIONS
(WITH THE APPROVED DEVELOPMENT EAST OF THE PROPOSED PROJECT)**

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Zion / Polk
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Zion Road / Polk Lane
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		51	505	8		9	260	198		4	22	51		102	9	56
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

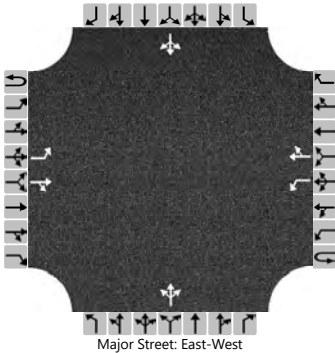
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		60				11					91				196	
Capacity, c (veh/h)		1040				984					282				160	
v/c Ratio		0.06				0.01					0.32				1.23	
95% Queue Length, Q ₉₅ (veh)		0.2				0.0					1.3				11.2	
95% Queue Length, Q ₉₅ (ft)		5.0				0.0					32.5				280.0	
Control Delay (s/veh)		8.7				8.7					23.7				202.3	
Level of Service (LOS)		A				A					C				F	
Approach Delay (s/veh)	0.8				0.2				23.7				202.3			
Approach LOS	A				A				C				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Zion / Polk
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Zion Road / Polk Lane
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		57	408	4		79	493	223		2	12	35		107	29	80
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

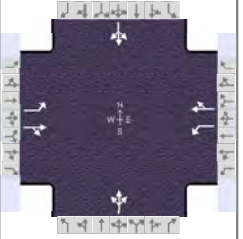
Flow Rate, v (veh/h)		63				87					54				237	
Capacity, c (veh/h)		841				1119					230				122	
v/c Ratio		0.07				0.08					0.23				1.94	
95% Queue Length, Q ₉₅ (veh)		0.2				0.3					0.9				19.1	
95% Queue Length, Q ₉₅ (ft)		5.0				7.5					22.5				477.5	
Control Delay (s/veh)		9.6				8.5					25.4				513.4	
Level of Service (LOS)		A				A					D				F	
Approach Delay (s/veh)	1.2				0.8				25.4				513.4			
Approach LOS	A				A				D				F			

HCS Signalized Intersection Results Summary

General Information

Agency	FTG		
Analyst	FTG	Analysis Date	4/11/2025
Jurisdiction	Mt. Pleasant, TN	Time Period	AM Peak Hour
Urban Street	Trotwood Avenue	Analysis Year	2030 (Total with)
Intersection	Zion Road / Polk Lane	File Name	1_fuam2_sig.xus
Project Description	11330		

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	51	505	8	9	260	198	4	22	51	102	9	56

Signal Information

Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	1.8	3.4	67.3	15.5	8.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	4.0	0.0		
				Red	2.0	0.0	2.0	2.0	2.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		12.0		12.0
Phase Duration, s	11.2	76.7	7.8	73.3		14.0		21.5
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.0	0.0	3.0	0.0		3.2		3.1
Queue Clearance Time (g_s), s	3.6		2.3			8.3		15.3
Green Extension Time (g_e), s	0.1	0.0	0.0	0.0		0.1		0.2
Phase Call Probability	0.86		0.30			0.95		1.00
Max Out Probability	0.00		0.00			0.00		0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	60	604		11	539			91			196	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1895		1810	1763			1694			1742	
Queue Service Time (g_s), s	1.6	23.1		0.3	23.2			6.3			13.3	
Cycle Queue Clearance Time (g_c), s	1.6	23.1		0.3	23.2			6.3			13.3	
Green Ratio (g/C)	0.60	0.59		0.58	0.56			0.07			0.13	
Capacity (c), veh/h	461	1116		402	988			114			225	
Volume-to-Capacity Ratio (X)	0.130	0.541		0.026	0.545			0.797			0.874	
Back of Queue (Q), ft/ln (95 th percentile)	27	367		5	355			125			258	
Back of Queue (Q), veh/ln (95 th percentile)	1.1	14.7		0.2	14.2			5.0			10.3	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00			0.00			0.00	
Uniform Delay (d_1), s/veh	12.2	14.9		12.9	16.7			55.2			51.3	
Incremental Delay (d_2), s/veh	0.0	1.9		0.0	2.2			4.8			9.4	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	12.2	16.8		12.9	18.8			59.9			60.7	
Level of Service (LOS)	B	B		B	B			E			E	
Approach Delay, s/veh / LOS	16.3	B		18.7	B		59.9	E		60.7	E	
Intersection Delay, s/veh / LOS	25.7						C					

Multimodal Results

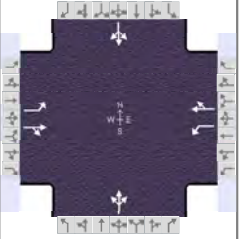
	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.67	B		1.67	B		1.96	B		1.96	B	
Bicycle LOS Score / LOS	1.58	B		1.39	A		0.64	A		0.81	A	

HCS Signalized Intersection Results Summary

General Information

Agency	FTG		
Analyst	FTG	Analysis Date	4/11/2025
Jurisdiction	Mt. Pleasant, TN	Time Period	PM Peak Hour
Urban Street	Trotwood Avenue	Analysis Year	2030 (Total with)
Intersection	Zion Road / Polk Lane	File Name	1_fupm2_sig.xus
Project Description	11330		





















Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	57	408	4	79	493	223	2	12	35	107	29	80

Signal Information

Cycle, s	120.0	Reference Phase	2											
Offset, s	0	Reference Point	End	Green	5.3	0.4	66.9	18.4	5.0	0.0				
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	4.0	4.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	0.0	2.0	2.0	2.0	0.0				

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		12.0		12.0
Phase Duration, s	11.3	72.9	11.7	73.4		11.0		24.4
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.0	0.0	3.0	0.0		3.2		3.1
Queue Clearance Time (g_s), s	3.7		4.4			5.8		18.0
Green Extension Time (g_e), s	0.1	0.0	0.1	0.0		0.1		0.3
Phase Call Probability	0.88		0.94			0.83		1.00
Max Out Probability	0.00		0.00			0.00		0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	63	453		87	787			54			237	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1897		1810	1799			1681			1741	
Queue Service Time (g_s), s	1.7	16.6		2.4	40.9			3.8			16.0	
Cycle Queue Clearance Time (g_c), s	1.7	16.6		2.4	40.9			3.8			16.0	
Green Ratio (g/C)	0.60	0.56		0.61	0.56			0.04			0.15	
Capacity (c), veh/h	281	1058		545	1010			70			267	
Volume-to-Capacity Ratio (X)	0.223	0.428		0.159	0.779			0.768			0.890	
Back of Queue (Q), ft/ln (95 th percentile)	29	284		40	599			77			292	
Back of Queue (Q), veh/ln (95 th percentile)	1.2	11.4		1.6	24.0			3.1			11.7	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00			0.00			0.00	
Uniform Delay (d_1), s/veh	18.1	15.4		11.1	20.5			56.9			49.8	
Incremental Delay (d_2), s/veh	0.1	1.3		0.1	5.9			6.4			6.4	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	18.3	16.7		11.2	26.5			63.4			56.2	
Level of Service (LOS)	B	B		B	C			E			E	
Approach Delay, s/veh / LOS	16.9		B	24.9		C	63.4		E	56.2		E
Intersection Delay, s/veh / LOS	28.1						C					

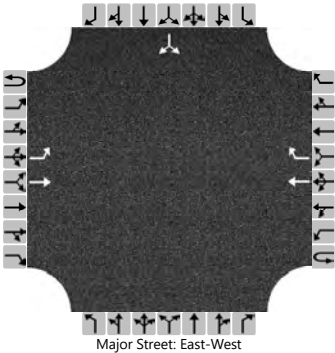
Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.67		B	1.67		B	1.96		B	1.96		B
Bicycle LOS Score / LOS	1.34		A	1.93		B	0.58		A	0.88		A

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		L	T				T	R							LR	
Volume (veh/h)		52	606				425	88						191		42
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

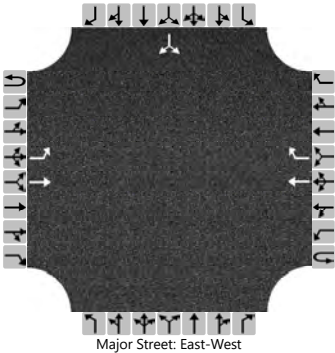
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		59													265	
Capacity, c (veh/h)		1001													197	
v/c Ratio		0.06													1.35	
95% Queue Length, Q ₉₅ (veh)		0.2													15.1	
95% Queue Length, Q ₉₅ (ft)		5.0													377.5	
Control Delay (s/veh)		8.8													232.5	
Level of Service (LOS)		A													F	
Approach Delay (s/veh)	0.7												232.5			
Approach LOS	A												F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		L	T				T	R							LR	
Volume (veh/h)		71	479				727	165						239		68
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

Delay, Queue Length, and Level of Service

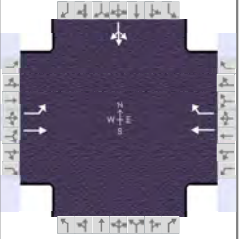
Flow Rate, v (veh/h)		77													334	
Capacity, c (veh/h)		719													150	
v/c Ratio		0.11													2.23	
95% Queue Length, Q ₉₅ (veh)		0.4													27.5	
95% Queue Length, Q ₉₅ (ft)		10.0													687.5	
Control Delay (s/veh)		10.6													622.5	
Level of Service (LOS)		B													F	
Approach Delay (s/veh)	1.4												622.5			
Approach LOS	A												F			

HCS Signalized Intersection Results Summary

General Information

Agency	FTG		
Analyst	FTG	Analysis Date	4/11/2025
Jurisdiction	Mt. Pleasant, TN	Time Period	AM Peak Hour
Urban Street	Trotwood Avenue	Analysis Year	2030 (Total with)
Intersection	Old Zion Road Ext.	File Name	2_fuam2_sig.xus
Project Description	11330		

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	52	606			425	88				191	0	42

Signal Information

Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	5.2	76.8	20.1	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0		
				Red	2.0	2.0	2.0	0.0	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	1.0	4.0		7.3				12.0
Phase Duration, s	11.2	93.9		82.8				26.1
Change Period, ($Y+R_c$), s	6.0	6.0		6.0				6.0
Max Allow Headway (MAH), s	3.0	0.0		0.0				3.1
Queue Clearance Time (g_s), s	3.2							19.6
Green Extension Time (g_e), s	0.1	0.0		0.0				0.5
Phase Call Probability	0.86							1.00
Max Out Probability	0.00							0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7	4	14
Adjusted Flow Rate (v), veh/h	59	689			483	100					265	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900			1900	1610					1770	
Queue Service Time (g_s), s	1.2	18.2			14.7	2.9					17.6	
Cycle Queue Clearance Time (g_c), s	1.2	18.2			14.7	2.9					17.6	
Green Ratio (g/C)	0.70	0.73			0.64	0.64					0.17	
Capacity (c), veh/h	617	1393			1216	1030					296	
Volume-to-Capacity Ratio (X)	0.096	0.495			0.397	0.097					0.895	
Back of Queue (Q), ft/ln (95 th percentile)	18	259			244	43					311	
Back of Queue (Q), veh/ln (95 th percentile)	0.7	10.4			9.8	1.7					12.5	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00					0.00	
Uniform Delay (d_1), s/veh	6.8	6.7			10.4	8.3					48.9	
Incremental Delay (d_2), s/veh	0.0	1.3			1.0	0.2					3.9	
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0					0.0	
Control Delay (d), s/veh	6.9	8.0			11.4	8.5					52.8	
Level of Service (LOS)	A	A			B	A					D	
Approach Delay, s/veh / LOS	7.9		A	10.9		B	0.0			52.8		D
Intersection Delay, s/veh / LOS	16.4						B					

Multimodal Results

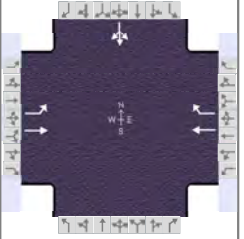
	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.34		A	1.65		B	1.96		B	1.96		B
Bicycle LOS Score / LOS	1.72		B	1.45		A				0.92		A

HCS Signalized Intersection Results Summary

General Information

Agency	FTG		
Analyst	FTG	Analysis Date	4/11/2025
Jurisdiction	Mt. Pleasant, TN	Time Period	PM Peak Hour
Urban Street	Trotwood Avenue	Analysis Year	2030 (Total with)
Intersection	Old Zion Road Ext.	File Name	2_fupm2_sig.xus
Project Description	11330		

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	71	479			727	165				239	0	68

Signal Information

Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	5.6	70.5	25.9	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0		
				Red	2.0	2.0	2.0	0.0	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	1.0	4.0		7.3				12.0
Phase Duration, s	11.6	88.1		76.5				31.9
Change Period, ($Y+R_c$), s	6.0	6.0		6.0				6.0
Max Allow Headway (MAH), s	3.0	0.0		0.0				3.1
Queue Clearance Time (g_s), s	4.0							25.2
Green Extension Time (g_e), s	0.1	0.0		0.0				0.6
Phase Call Probability	0.93							1.00
Max Out Probability	0.00							0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7	4	14
Adjusted Flow Rate (v), veh/h	81	544			826	188					349	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900			1900	1610					1761	
Queue Service Time (g_s), s	2.0	15.2			38.1	6.5					23.2	
Cycle Queue Clearance Time (g_c), s	2.0	15.2			38.1	6.5					23.2	
Green Ratio (g/C)	0.65	0.68			0.59	0.59					0.22	
Capacity (c), veh/h	326	1300			1116	946					380	
Volume-to-Capacity Ratio (X)	0.247	0.419			0.740	0.198					0.918	
Back of Queue (Q), ft/ln (95 th percentile)	32	239			572	103					387	
Back of Queue (Q), veh/ln (95 th percentile)	1.3	9.5			22.9	4.1					15.5	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00					0.00	
Uniform Delay (d_1), s/veh	15.3	8.4			18.1	11.5					46.0	
Incremental Delay (d_2), s/veh	0.1	1.0			4.4	0.5					3.9	
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0					0.0	
Control Delay (d), s/veh	15.4	9.4			22.5	12.0					49.9	
Level of Service (LOS)	B	A			C	B					D	
Approach Delay, s/veh / LOS	10.2	B		20.5	C		0.0			49.9	D	
Intersection Delay, s/veh / LOS	22.4						C					

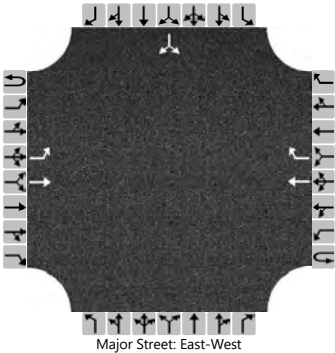
Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.35	A		1.67	B		1.96	B		1.96	B	
Bicycle LOS Score / LOS	1.52	B		2.16	B					1.06	A	

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		L	T				T	R							LR	
Volume (veh/h)		6	791				495	16						60		18
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

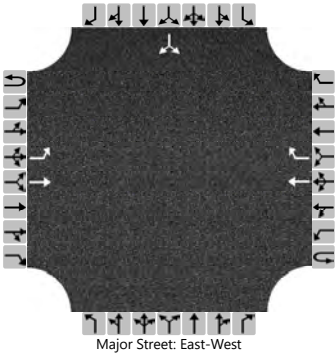
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7													90	
Capacity, c (veh/h)		998													165	
v/c Ratio		0.01													0.54	
95% Queue Length, Q ₉₅ (veh)		0.0													2.8	
95% Queue Length, Q ₉₅ (ft)		0.0													70.0	
Control Delay (s/veh)		8.6													50.4	
Level of Service (LOS)		A													F	
Approach Delay (s/veh)	0.1												50.4			
Approach LOS	A												F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		L	T				T	R							LR	
Volume (veh/h)		22	696				879	53						36		13
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

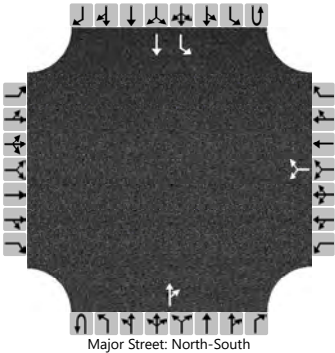
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		23													52	
Capacity, c (veh/h)		705													118	
v/c Ratio		0.03													0.44	
95% Queue Length, Q ₉₅ (veh)		0.1													1.9	
95% Queue Length, Q ₉₅ (ft)		2.5													47.5	
Control Delay (s/veh)		10.3													57.7	
Level of Service (LOS)		B													F	
Approach Delay (s/veh)	0.3												57.7			
Approach LOS	A												F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Old Zion Road
Analysis Year	2030	North/South Street	Old Zion Road / Old Zion Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						36		111			168	6		78	163	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

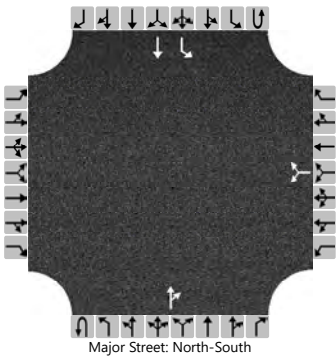
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						169								90		
Capacity, c (veh/h)						703								1384		
v/c Ratio						0.24								0.06		
95% Queue Length, Q ₉₅ (veh)						0.9								0.2		
95% Queue Length, Q ₉₅ (ft)						22.5								5.0		
Control Delay (s/veh)						11.7								7.8		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)					11.7								2.5			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Old Zion Road
Analysis Year	2030	North/South Street	Old Zion Road / Old Zion Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						24		87			190	21		152	308	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

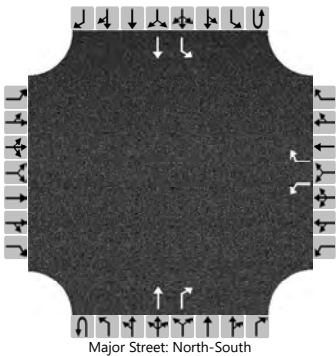
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						118								162		
Capacity, c (veh/h)						591								1356		
v/c Ratio						0.20								0.12		
95% Queue Length, Q ₉₅ (veh)						0.7								0.4		
95% Queue Length, Q ₉₅ (ft)						17.5								10.0		
Control Delay (s/veh)						12.6								8.0		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)					12.6								2.6			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion / Ramps for Lawrenceburg
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Ramps for Lawrenceburg Hwy
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.78
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						48		88			144	145		100	119	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

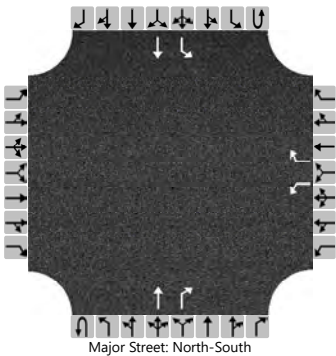
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						62		113						128		
Capacity, c (veh/h)						421		863						1199		
v/c Ratio						0.15		0.13						0.11		
95% Queue Length, Q ₉₅ (veh)						0.5		0.4						0.4		
95% Queue Length, Q ₉₅ (ft)						12.5		10.0						10.0		
Control Delay (s/veh)						15.0		9.8						8.4		
Level of Service (LOS)						C		A						A		
Approach Delay (s/veh)					11.6								3.8			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion / Ramps for Lawrenceburg
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Ramps for Lawrenceburg Hwy
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						84		77			121	178		59	149	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

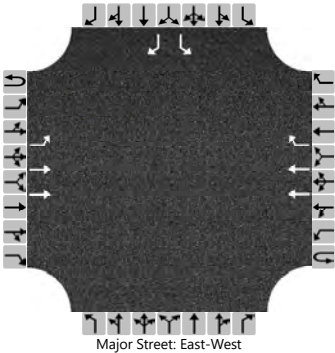
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						88		81						62		
Capacity, c (veh/h)						573		928						1257		
v/c Ratio						0.15		0.09						0.05		
95% Queue Length, Q ₉₅ (veh)						0.5		0.3						0.2		
95% Queue Length, Q ₉₅ (ft)						12.5		7.5						5.0		
Control Delay (s/veh)						12.4		9.2						8.0		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					10.9								2.3			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Ramps for Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Ramps for Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume (veh/h)	0	69	1161				494	67						77		168
Percent Heavy Vehicles (%)	0	0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					Yes								Yes			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

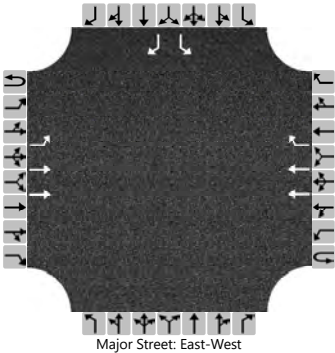
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		79												89		193
Capacity, c (veh/h)		1014												124		719
v/c Ratio		0.08												0.71		0.27
95% Queue Length, Q ₉₅ (veh)		0.3												3.9		1.1
95% Queue Length, Q ₉₅ (ft)		7.5												97.5		27.5
Control Delay (s/veh)		8.8												85.0		11.8
Level of Service (LOS)		A												F		B
Approach Delay (s/veh)	0.5												34.8			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Ramps for Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Ramps for Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume (veh/h)	0	73	699				1128	88						54		183
Percent Heavy Vehicles (%)	0	0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					Yes								Yes			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

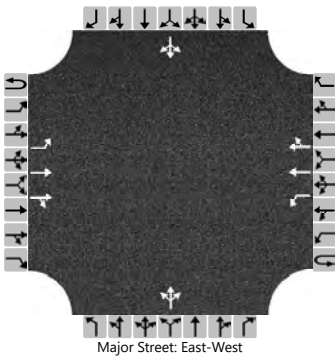
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		80												59		201
Capacity, c (veh/h)		569												64		436
v/c Ratio		0.14												0.93		0.46
95% Queue Length, Q ₉₅ (veh)		0.5												4.4		2.4
95% Queue Length, Q ₉₅ (ft)		12.5												110.0		60.0
Control Delay (s/veh)		12.4												198.9		20.1
Level of Service (LOS)		B												F		C
Approach Delay (s/veh)	1.2												60.9			
Approach LOS	A												F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	1	1086	151	0	83	526	50		34	4	241		32	7	1
Percent Heavy Vehicles (%)	0	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

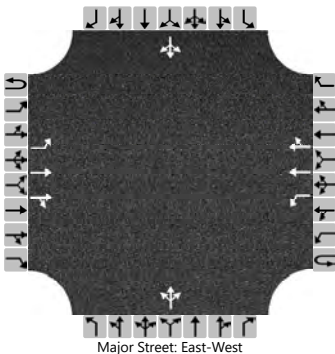
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				91					307				44	
Capacity, c (veh/h)		960				512					171				25	
v/c Ratio		0.00				0.18					1.80				1.74	
95% Queue Length, Q ₉₅ (veh)		0.0				0.6					22.2				5.4	
95% Queue Length, Q ₉₅ (ft)		0.0				15.0					555.0				135.0	
Control Delay (s/veh)		8.8				13.5					426.4				688.7	
Level of Service (LOS)		A				B					F				F	
Approach Delay (s/veh)	0.0				1.7				426.4				688.7			
Approach LOS	A				A				F				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	0	628	125	0	328	1133	21		82	8	187		8	7	1
Percent Heavy Vehicles (%)	0	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

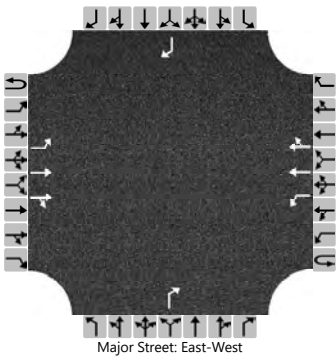
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				349					295				17	
Capacity, c (veh/h)		575				831					31				6	
v/c Ratio		0.00				0.42					9.56				2.74	
95% Queue Length, Q ₉₅ (veh)		0.0				2.1					36.0				3.3	
95% Queue Length, Q ₉₅ (ft)		0.0				52.5					900.0				82.5	
Control Delay (s/veh)		11.3				12.4					4099.7				1910.5	
Level of Service (LOS)		B				B					F				F	
Approach Delay (s/veh)	0.0				2.8				4099.7				1910.5			
Approach LOS	A				A				F				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	0	1		0	0	1
Configuration		L	T	TR		L	T	TR				R				R
Volume (veh/h)	0	1	1086	151	0	83	526	50				279				40
Percent Heavy Vehicles (%)	0	0			0	0						0				0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1						6.9				6.9
Critical Headway (sec)		4.10				4.10						6.90				6.90
Base Follow-Up Headway (sec)		2.2				2.2						3.3				3.3
Follow-Up Headway (sec)		2.20				2.20						3.30				3.30

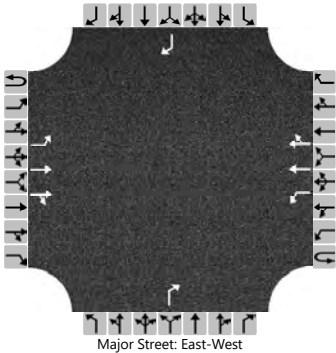
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				91						307				44
Capacity, c (veh/h)		960				512						398				685
v/c Ratio		0.00				0.18						0.77				0.06
95% Queue Length, Q ₉₅ (veh)		0.0				0.6						6.4				0.2
95% Queue Length, Q ₉₅ (ft)		0.0				15.0						160.0				5.0
Control Delay (s/veh)		8.8				13.5						38.5				10.6
Level of Service (LOS)		A				B						E				B
Approach Delay (s/veh)	0.0				1.7				38.5				10.6			
Approach LOS	A				A				E				B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	0	1		0	0	1
Configuration		L	T	TR		L	T	TR				R				R
Volume (veh/h)	0	0	628	125	0	328	1133	21				277				16
Percent Heavy Vehicles (%)	0	0			0	0						0				0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1						6.9				6.9
Critical Headway (sec)		4.10				4.10						6.90				6.90
Base Follow-Up Headway (sec)		2.2				2.2						3.3				3.3
Follow-Up Headway (sec)		2.20				2.20						3.30				3.30

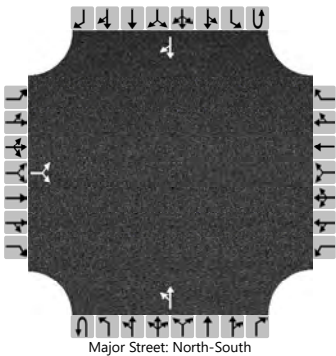
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				349						295				17
Capacity, c (veh/h)		575				831						605				440
v/c Ratio		0.00				0.42						0.49				0.04
95% Queue Length, Q ₉₅ (veh)		0.0				2.1						2.7				0.1
95% Queue Length, Q ₉₅ (ft)		0.0				52.5						67.5				2.5
Control Delay (s/veh)		11.3				12.4						16.5				13.5
Level of Service (LOS)		B				B						C				B
Approach Delay (s/veh)	0.0				2.8				16.5				13.5			
Approach LOS	A				A				C				B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion Road Ext / North Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	North Project Access
Analysis Year	2030	North/South Street	Old Zion Road Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		32		19						6	142				188	11
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

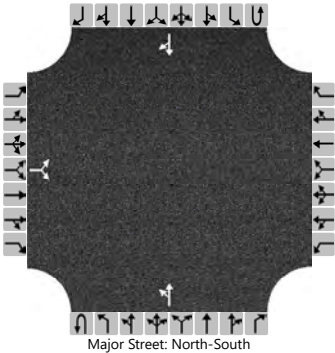
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			57							7						
Capacity, c (veh/h)			683							1360						
v/c Ratio			0.08							0.00						
95% Queue Length, Q ₉₅ (veh)			0.3							0.0						
95% Queue Length, Q ₉₅ (ft)			7.5							0.0						
Control Delay (s/veh)			10.7							7.7	0.0					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)	10.7								0.4							
Approach LOS	B								A							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion Road Ext / North Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	North Project Access
Analysis Year	2030	North/South Street	Old Zion Road Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		21		13						22	190				295	37
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

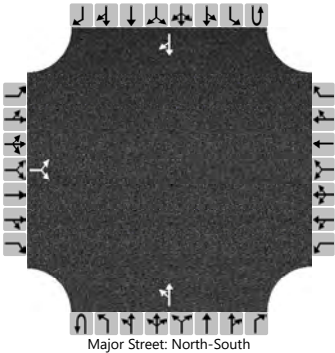
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			38							24						
Capacity, c (veh/h)			522							1201						
v/c Ratio			0.07							0.02						
95% Queue Length, Q ₉₅ (veh)			0.2							0.1						
95% Queue Length, Q ₉₅ (ft)			5.0							2.5						
Control Delay (s/veh)			12.4							8.1	0.2					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)	12.4								1.0							
Approach LOS	B								A							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion Road Ext / South Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	South Project Access
Analysis Year	2030	North/South Street	Old Zion Road Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		19		32						11	129				201	6
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

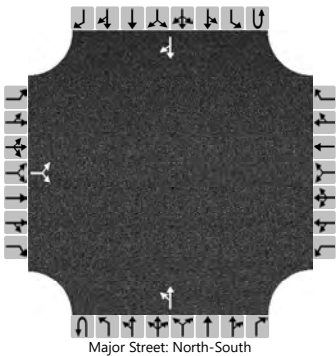
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			57							12						
Capacity, c (veh/h)			725							1350						
v/c Ratio			0.08							0.01						
95% Queue Length, Q ₉₅ (veh)			0.3							0.0						
95% Queue Length, Q ₉₅ (ft)			7.5							0.0						
Control Delay (s/veh)			10.4							7.7	0.1					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)	10.4								0.7							
Approach LOS	B								A							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion Road Ext / South Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	South Project Access
Analysis Year	2030	North/South Street	Old Zion Road Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		13		21						37	199				286	22
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

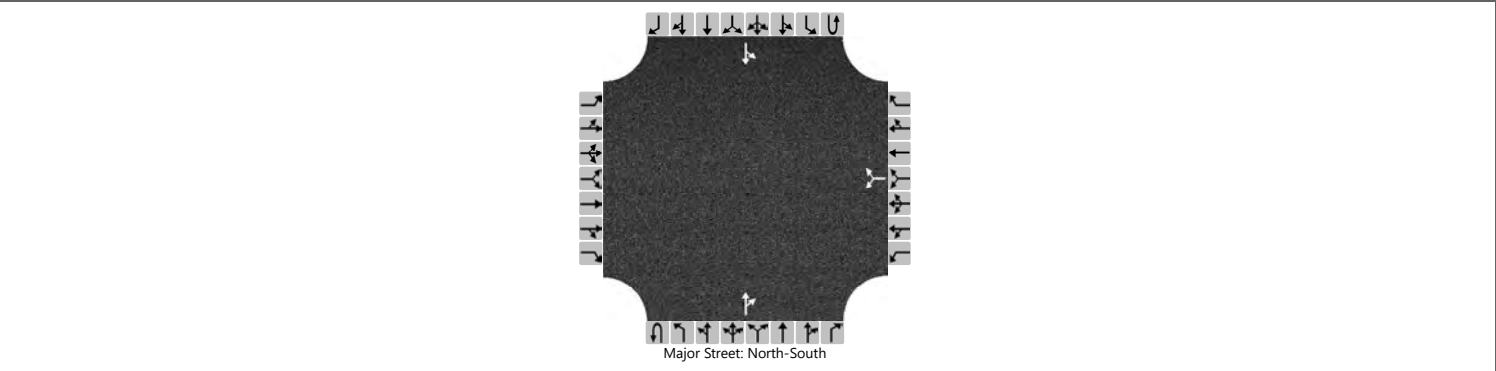
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			38							41						
Capacity, c (veh/h)			571							1228						
v/c Ratio			0.07							0.03						
95% Queue Length, Q ₉₅ (veh)			0.2							0.1						
95% Queue Length, Q ₉₅ (ft)			5.0							2.5						
Control Delay (s/veh)			11.8							8.0	0.3					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)	11.8								1.5							
Approach LOS	B								A							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion Road / Project Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Project Access
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						6		20			269	2		6	161	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

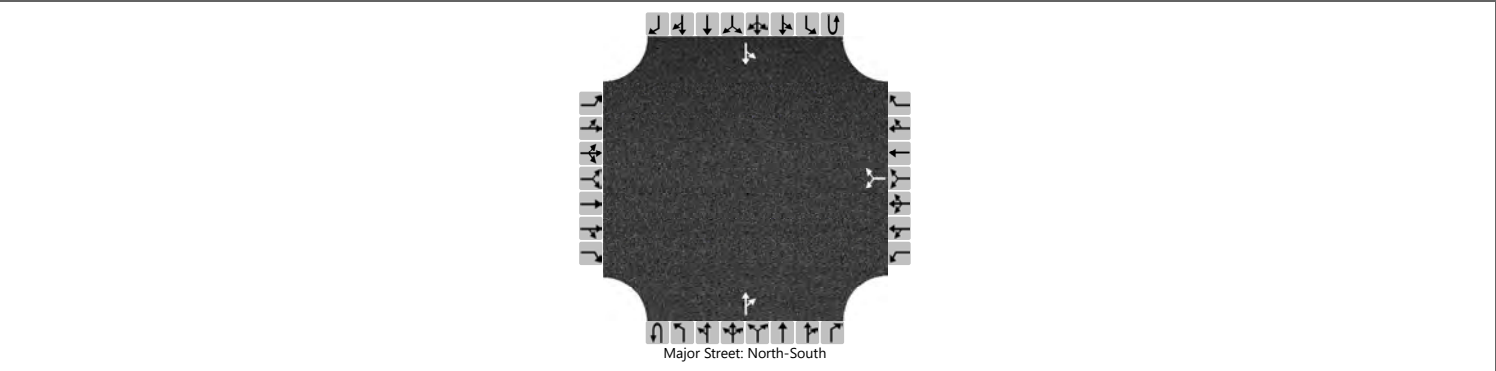
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						29								7		
Capacity, c (veh/h)						683								1271		
v/c Ratio						0.04								0.01		
95% Queue Length, Q ₉₅ (veh)						0.1								0.0		
95% Queue Length, Q ₉₅ (ft)						2.5								0.0		
Control Delay (s/veh)						10.5								7.8	0.0	
Level of Service (LOS)						B								A	A	
Approach Delay (s/veh)					10.5								0.3			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion Road / Project Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Project Access
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total with)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						4		14			285	7		21	212	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

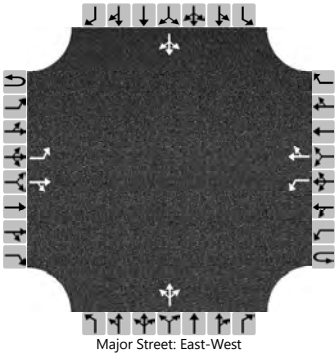
Flow Rate, v (veh/h)						20								23		
Capacity, c (veh/h)						641								1247		
v/c Ratio						0.03								0.02		
95% Queue Length, Q ₉₅ (veh)						0.1								0.1		
95% Queue Length, Q ₉₅ (ft)						2.5								2.5		
Control Delay (s/veh)						10.8								7.9	0.2	
Level of Service (LOS)						B								A	A	
Approach Delay (s/veh)					10.8								0.9			
Approach LOS					B								A			

**BACKGROUND CONDITIONS
(WITHOUT THE APPROVED DEVELOPMENT EAST OF THE PROPOSED PROJECT)**

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Zion / Polk
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Zion Road / Polk Lane
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		49	491	8		9	218	180		4	22	51		96	9	50
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

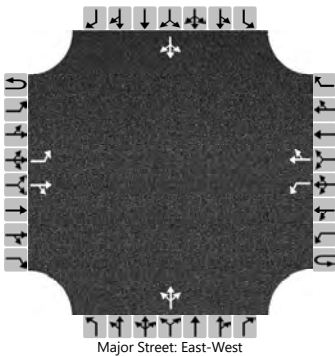
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		58				11					91				182	
Capacity, c (veh/h)		1104				998					310				183	
v/c Ratio		0.05				0.01					0.29				1.00	
95% Queue Length, Q ₉₅ (veh)		0.2				0.0					1.2				8.2	
95% Queue Length, Q ₉₅ (ft)		5.0				0.0					30.0				205.0	
Control Delay (s/veh)		8.4				8.6					21.3				117.3	
Level of Service (LOS)		A				A					C				F	
Approach Delay (s/veh)	0.8				0.2				21.3				117.3			
Approach LOS	A				A				C				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Zion / Polk
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Zion Road / Polk Lane
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		50	359	4		79	464	211		2	12	35		86	29	76
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

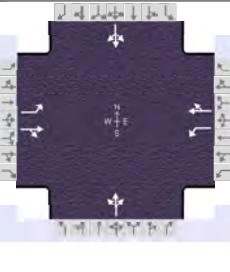
Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		55				87					54				210	
Capacity, c (veh/h)		874				1171					270				154	
v/c Ratio		0.06				0.07					0.20				1.37	
95% Queue Length, Q ₉₅ (veh)		0.2				0.2					0.7				13.1	
95% Queue Length, Q ₉₅ (ft)		5.0				5.0					17.5				327.5	
Control Delay (s/veh)		9.4				8.3					21.6				256.2	
Level of Service (LOS)		A				A					C				F	
Approach Delay (s/veh)	1.1				0.9				21.6				256.2			
Approach LOS	A				A				C				F			

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	FTG			Duration, h	0.250	
Analyst	FTG	Analysis Date	4/11/2025	Area Type	Other	
Jurisdiction	Mt. Pleasant, TN	Time Period	AM Peak Hour	PHF	0.85	
Urban Street	Trotwood Avenue	Analysis Year	2030 (Back without)	Analysis Period	1> 7:00	
Intersection	Zion Road / Polk Lane	File Name	1_bgam1_sig.xus			
Project Description	11330					

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	49	491	8	9	218	180	4	22	51	96	9	50

Signal Information											
Cycle, s	120.0	Reference Phase	2								
Offset, s	0	Reference Point	End								
Uncoordinated	No	Simult. Gap E/W	On								
Force Mode	Fixed	Simult. Gap N/S	On								

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		12.0		12.0
Phase Duration, s	11.1	77.7	7.8	74.3		14.1		20.5
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.0	0.0	3.0	0.0		3.2		3.1
Queue Clearance Time (g_s), s	3.5		2.3			8.3		14.3
Green Extension Time (g_e), s	0.1	0.0	0.0	0.0		0.1		0.2
Phase Call Probability	0.85		0.30			0.95		1.00
Max Out Probability	0.00		0.00			0.00		0.00

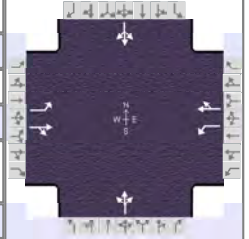
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	58	587		11	468			91			182	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1705		1810	1757			1694			1745	
Queue Service Time (g_s), s	1.5	25.4		0.3	18.8			6.3			12.3	
Cycle Queue Clearance Time (g_c), s	1.5	25.4		0.3	18.8			6.3			12.3	
Green Ratio (g/C)	0.61	0.60		0.58	0.57			0.07			0.12	
Capacity (c), veh/h	525	1018		397	1000			114			211	
Volume-to-Capacity Ratio (X)	0.110	0.576		0.027	0.468			0.797			0.865	
Back of Queue (Q), ft/ln (95 th percentile)	25	364		5	294			125			237	
Back of Queue (Q), veh/ln (95 th percentile)	1.0	14.6		0.2	11.8			5.0			9.5	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00			0.00			0.00	
Uniform Delay (d_1), s/veh	10.9	14.8		12.9	15.2			55.2			51.8	
Incremental Delay (d_2), s/veh	0.0	2.4		0.0	1.6			4.7			6.1	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	10.9	17.2		12.9	16.7			59.9			57.9	
Level of Service (LOS)	B	B		B	B			E			E	
Approach Delay, s/veh / LOS	16.7		B	16.7		B	59.9		E	57.9		E
Intersection Delay, s/veh / LOS	24.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.66	B	1.67	B	1.96	B	1.96	B
Bicycle LOS Score / LOS	1.55	B	1.28	A	0.64	A	0.79	A

HCS Signalized Intersection Results Summary

General Information

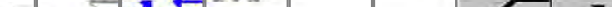


Agency	FTG		
Analyst	FTG	Analysis Date	4/11/2025
Jurisdiction	Mt. Pleasant, TN	Time Period	PM Peak Hour
Urban Street	Trotwood Avenue	Analysis Year	2030 (Back without)
Intersection	Zion Road / Polk Lane	File Name	1_bgpm1_sig.xus
Project Description	11330		



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	50	359	4	79	464	211	2	12	35	86	29	76

Signal Information

Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End	Green	5.0	0.6	68.8	16.5	5.0	0.0		
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	4.0	4.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	0.0	2.0	2.0	2.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		12.0		12.0
Phase Duration, s	11.0	74.8	11.7	75.4		11.0		22.5
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.0	0.0	3.0	0.0		3.2		3.1
Queue Clearance Time (g_s), s	3.4		4.3			5.8		16.2
Green Extension Time (g_e), s	0.1	0.0	0.1	0.0		0.1		0.3
Phase Call Probability	0.84		0.94			0.83		1.00
Max Out Probability	0.00		0.00			0.00		0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	55	399		87	742			54			210	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1896		1810	1799			1681			1737	
Queue Service Time (g_s), s	1.4	13.6		2.3	35.5			3.8			14.2	
Cycle Queue Clearance Time (g_c), s	1.4	13.6		2.3	35.5			3.8			14.2	
Green Ratio (g/C)	0.62	0.57		0.62	0.58			0.04			0.14	
Capacity (c), veh/h	330	1087		605	1041			70			239	
Volume-to-Capacity Ratio (X)	0.167	0.367		0.143	0.713			0.768			0.878	
Back of Queue (Q), ft/ln (95 th percentile)	24	240		37	517			77			260	
Back of Queue (Q), veh/ln (95 th percentile)	1.0	9.6		1.5	20.7			3.1			10.4	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00			0.00			0.00	
Uniform Delay (d_1), s/veh	15.3	13.8		9.9	18.1			56.9			50.7	
Incremental Delay (d_2), s/veh	0.1	1.0		0.0	4.2			6.4			4.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	15.4	14.8		10.0	22.3			63.4			54.8	
Level of Service (LOS)	B	B		A	C			E			D	
Approach Delay, s/veh / LOS	14.9		B	21.0		C	63.4		E	54.8		D
Intersection Delay, s/veh / LOS	25.3						C					

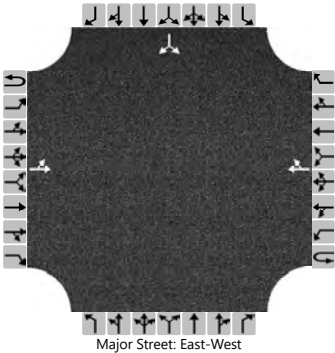
Multimodal Results

	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.67	B	1.67	B	1.96	B	1.96	B
Bicycle LOS Score / LOS	1.24	A	1.85	B	0.58	A	0.83	A

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		44	594				389	20						110		18
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

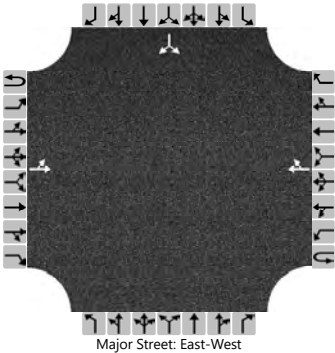
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		50													145	
Capacity, c (veh/h)		1107													204	
v/c Ratio		0.05													0.71	
95% Queue Length, Q ₉₅ (veh)		0.1													4.6	
95% Queue Length, Q ₉₅ (ft)		2.5													115.0	
Control Delay (s/veh)		8.4	0.6												57.1	
Level of Service (LOS)		A	A												F	
Approach Delay (s/veh)	1.1												57.1			
Approach LOS	A												F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		43	437				702	76						133		52
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

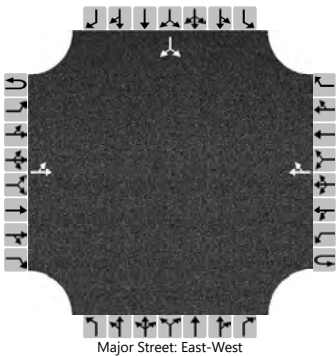
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		47													201	
Capacity, c (veh/h)		800													181	
v/c Ratio		0.06													1.11	
95% Queue Length, Q ₉₅ (veh)		0.2													10.1	
95% Queue Length, Q ₉₅ (ft)		5.0													252.5	
Control Delay (s/veh)		9.8	0.8												153.8	
Level of Service (LOS)		A	A												F	
Approach Delay (s/veh)	1.6												153.8			
Approach LOS	A												F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	704				409	4						42		0
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

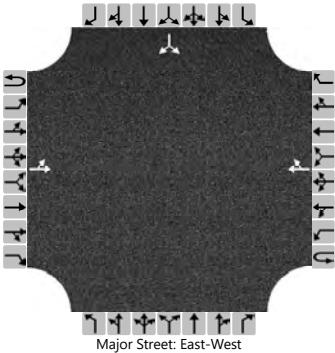
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													48	
Capacity, c (veh/h)		1098													184	
v/c Ratio		0.00													0.26	
95% Queue Length, Q ₉₅ (veh)		0.0													1.0	
95% Queue Length, Q ₉₅ (ft)		0.0													25.0	
Control Delay (s/veh)		8.3	0.0												31.3	
Level of Service (LOS)		A	A												D	
Approach Delay (s/veh)	0.0												31.3			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		1	569				777	11						24		1
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

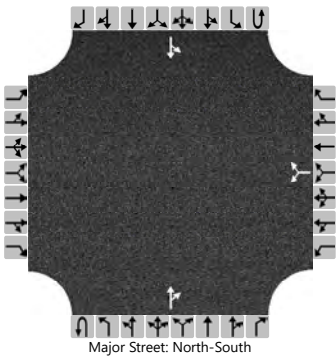
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1													27	
Capacity, c (veh/h)		805													151	
v/c Ratio		0.00													0.18	
95% Queue Length, Q ₉₅ (veh)		0.0													0.6	
95% Queue Length, Q ₉₅ (ft)		0.0													15.0	
Control Delay (s/veh)		9.5	0.0												33.8	
Level of Service (LOS)		A	A												D	
Approach Delay (s/veh)	0.0												33.8			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Old Zion Road
Analysis Year	2030	North/South Street	Old Zion Road / Old Zion Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						0		4			64	0		42	128	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

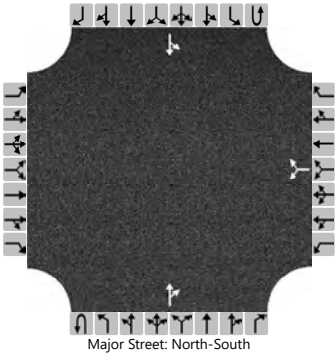
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						5								48		
Capacity, c (veh/h)						994								1539		
v/c Ratio						0.00								0.03		
95% Queue Length, Q ₉₅ (veh)						0.0								0.1		
95% Queue Length, Q ₉₅ (ft)						0.0								2.5		
Control Delay (s/veh)						8.6								7.4	0.3	
Level of Service (LOS)						A								A	A	
Approach Delay (s/veh)					8.6								2.0			
Approach LOS					A								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Old Zion Road
Analysis Year	2030	North/South Street	Old Zion Road / Old Zion Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						0		12			119	0		25	185	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

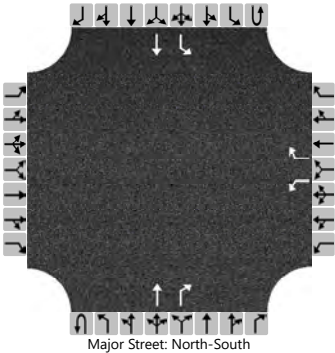
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						13								27		
Capacity, c (veh/h)						929								1472		
v/c Ratio						0.01								0.02		
95% Queue Length, Q ₉₅ (veh)						0.0								0.1		
95% Queue Length, Q ₉₅ (ft)						0.0								2.5		
Control Delay (s/veh)						8.9								7.5	0.2	
Level of Service (LOS)						A								A	A	
Approach Delay (s/veh)					8.9								1.0			
Approach LOS					A								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion / Ramps for Lawrenceburg
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Ramps for Lawrenceburg Hwy
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.78
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						36		88			144	107		100	119	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

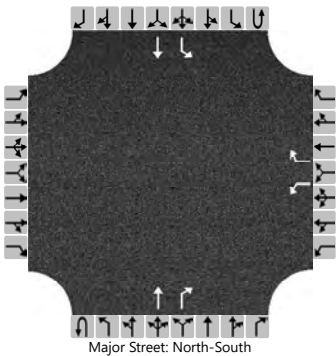
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						46		113						128		
Capacity, c (veh/h)						423		863						1249		
v/c Ratio						0.11		0.13						0.10		
95% Queue Length, Q ₉₅ (veh)						0.4		0.4						0.3		
95% Queue Length, Q ₉₅ (ft)						10.0		10.0						7.5		
Control Delay (s/veh)						14.6		9.8						8.2		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					11.2								3.7			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion / Ramps for Lawrenceburg
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Ramps for Lawrenceburg Hwy
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						42		77			121	152		59	149	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

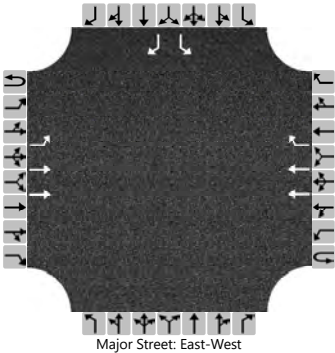
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						44		81						62		
Capacity, c (veh/h)						574		928						1286		
v/c Ratio						0.08		0.09						0.05		
95% Queue Length, Q ₉₅ (veh)						0.2		0.3						0.2		
95% Queue Length, Q ₉₅ (ft)						5.0		7.5						5.0		
Control Delay (s/veh)						11.8		9.2						7.9		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					10.1								2.3			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg/ Ramps for Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Ramps for Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume (veh/h)	0	61	1153				470	63						63		144
Percent Heavy Vehicles (%)	0	0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					Yes								Yes			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

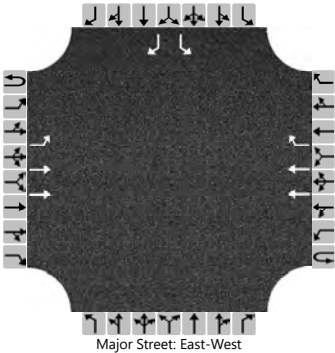
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		70												72		166
Capacity, c (veh/h)		1038												136		734
v/c Ratio		0.07												0.53		0.23
95% Queue Length, Q ₉₅ (veh)		0.2												2.6		0.9
95% Queue Length, Q ₉₅ (ft)		5.0												65.0		22.5
Control Delay (s/veh)		8.7												58.3		11.3
Level of Service (LOS)		A												F		B
Approach Delay (s/veh)	0.4												25.6			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Ramps for Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Ramps for Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume (veh/h)	0	45	671				1112	74						44		167
Percent Heavy Vehicles (%)	0	0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					Yes								Yes			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

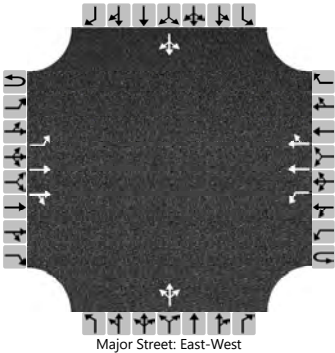
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		49												48		184
Capacity, c (veh/h)		578												79		442
v/c Ratio		0.09												0.61		0.42
95% Queue Length, Q ₉₅ (veh)		0.3												2.8		2.0
95% Queue Length, Q ₉₅ (ft)		7.5												70.0		50.0
Control Delay (s/veh)		11.8												105.9		18.8
Level of Service (LOS)		B												F		C
Approach Delay (s/veh)	0.7												37.0			
Approach LOS	A												E			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	1	1072	143	0	20	522	50		10	4	54		32	7	1
Percent Heavy Vehicles (%)	0	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

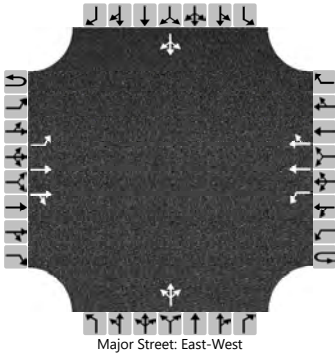
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				22					75				44	
Capacity, c (veh/h)		963				523					185				84	
v/c Ratio		0.00				0.04					0.40				0.52	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					1.8				2.3	
95% Queue Length, Q ₉₅ (ft)		0.0				2.5					45.0				57.5	
Control Delay (s/veh)		8.7				12.2					37.0				87.7	
Level of Service (LOS)		A				B					E				F	
Approach Delay (s/veh)	0.0				0.4				37.0				87.7			
Approach LOS	A				A				E				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	0	618	97	0	106	1119	21		66	8	57		8	7	1
Percent Heavy Vehicles (%)	0	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

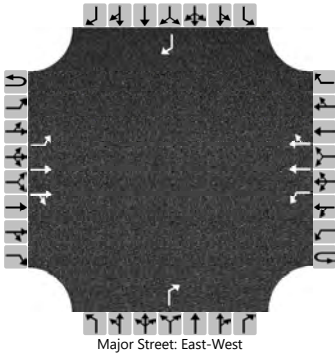
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				113					139				17	
Capacity, c (veh/h)		582				860					92				38	
v/c Ratio		0.00				0.13					1.52				0.45	
95% Queue Length, Q ₉₅ (veh)		0.0				0.5					10.8				1.5	
95% Queue Length, Q ₉₅ (ft)		0.0				12.5					270.0				37.5	
Control Delay (s/veh)		11.2				9.8					361.2				162.9	
Level of Service (LOS)		B				A					F				F	
Approach Delay (s/veh)	0.0				0.8				361.2				162.9			
Approach LOS	A				A				F				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	0	1		0	0	1
Configuration		L	T	TR		L	T	TR				R				R
Volume (veh/h)	0	1	1072	143	0	20	522	50				68				40
Percent Heavy Vehicles (%)	0	0			0	0						0				0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1						6.9				6.9
Critical Headway (sec)		4.10				4.10						6.90				6.90
Base Follow-Up Headway (sec)		2.2				2.2						3.3				3.3
Follow-Up Headway (sec)		2.20				2.20						3.30				3.30

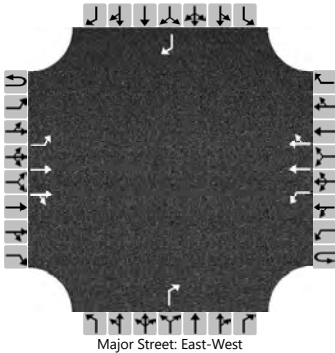
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				22						75				44
Capacity, c (veh/h)		963				523						406				687
v/c Ratio		0.00				0.04						0.18				0.06
95% Queue Length, Q ₉₅ (veh)		0.0				0.1						0.7				0.2
95% Queue Length, Q ₉₅ (ft)		0.0				2.5						17.5				5.0
Control Delay (s/veh)		8.7				12.2						15.9				10.6
Level of Service (LOS)		A				B						C				B
Approach Delay (s/veh)	0.0				0.4				15.9				10.6			
Approach LOS	A				A				C				B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Back without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	0	1		0	0	1
Configuration		L	T	TR		L	T	TR				R				R
Volume (veh/h)	0	0	618	97	0	106	1119	21				131				16
Percent Heavy Vehicles (%)	0	0			0	0						0				0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1						6.9				6.9
Critical Headway (sec)		4.10				4.10						6.90				6.90
Base Follow-Up Headway (sec)		2.2				2.2						3.3				3.3
Follow-Up Headway (sec)		2.20				2.20						3.30				3.30

Delay, Queue Length, and Level of Service

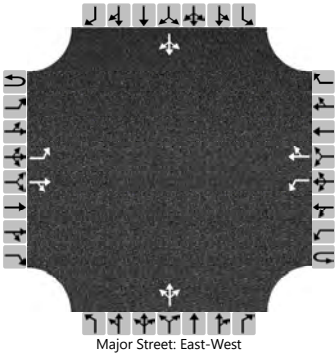
Flow Rate, v (veh/h)		0				113						139				17
Capacity, c (veh/h)		582				860						623				445
v/c Ratio		0.00				0.13						0.22				0.04
95% Queue Length, Q ₉₅ (veh)		0.0				0.5						0.9				0.1
95% Queue Length, Q ₉₅ (ft)		0.0				12.5						22.5				2.5
Control Delay (s/veh)		11.2				9.8						12.4				13.4
Level of Service (LOS)		B				A						B				B
Approach Delay (s/veh)	0.0				0.8				12.4				13.4			
Approach LOS	A				A				B				B			

**TOTAL PROJECTED CONDITIONS
(WITHOUT THE APPROVED DEVELOPMENT EAST OF THE PROPOSED PROJECT)**

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Zion / Polk
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Zion Road / Polk Lane
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		51	491	8		9	224	180		4	22	51		96	9	56
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

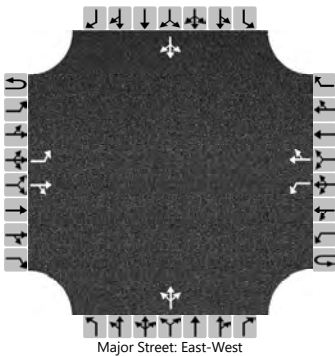
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		60				11					91				189	
Capacity, c (veh/h)		1097				998					306				184	
v/c Ratio		0.05				0.01					0.30				1.03	
95% Queue Length, Q ₉₅ (veh)		0.2				0.0					1.2				8.8	
95% Queue Length, Q ₉₅ (ft)		5.0				0.0					30.0				220.0	
Control Delay (s/veh)		8.5				8.6					21.7				126.1	
Level of Service (LOS)		A				A					C				F	
Approach Delay (s/veh)	0.8				0.2				21.7				126.1			
Approach LOS	A				A				C				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Zion / Polk
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Zion Road / Polk Lane
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	1	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		57	366	4		79	468	211		2	12	35		86	29	80
Percent Heavy Vehicles (%)		0				0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

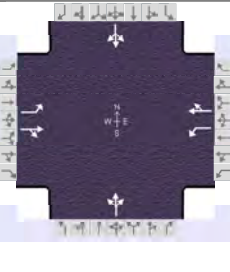
Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service



Flow Rate, v (veh/h)		63				87					54				214	
Capacity, c (veh/h)		871				1163					259				148	
v/c Ratio		0.07				0.07					0.21				1.45	
95% Queue Length, Q ₉₅ (veh)		0.2				0.2					0.8				14.0	
95% Queue Length, Q ₉₅ (ft)		5.0				5.0					20.0				350.0	
Control Delay (s/veh)		9.5				8.3					22.5				290.4	
Level of Service (LOS)		A				A					C				F	
Approach Delay (s/veh)	1.3				0.9				22.5				290.4			
Approach LOS	A				A				C				F			

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	FTG			Duration, h	0.250	
Analyst	FTG	Analysis Date	4/11/2025	Area Type	Other	
Jurisdiction	Mt. Pleasant, TN	Time Period	AM Peak Hour	PHF	0.85	
Urban Street	Trotwood Avenue	Analysis Year	2030 (Total without)	Analysis Period	1> 7:00	
Intersection	Zion Road / Polk Lane	File Name	1_fuam1_sig.xus			
Project Description	11330					

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	51	493	8	9	224	180	4	22	51	96	9	56

Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	1.8	3.4	67.7	15.0	8.1	0.0		
				Yellow	4.0	0.0	4.0	4.0	4.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	0.0	2.0	2.0	2.0	0.0		

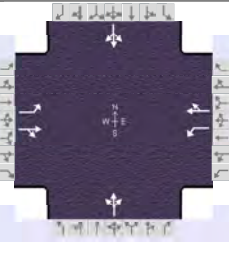
			
1	2	3	4
5	6	7	8

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		12.0		12.0
Phase Duration, s	11.2	77.1	7.8	73.7		14.1		21.0
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.0	0.0	3.0	0.0		3.2		3.1
Queue Clearance Time (g_s), s	3.6		2.3			8.3		14.8
Green Extension Time (g_e), s	0.1	0.0	0.0	0.0		0.1		0.2
Phase Call Probability	0.86		0.30			0.95		1.00
Max Out Probability	0.00		0.00			0.00		0.00

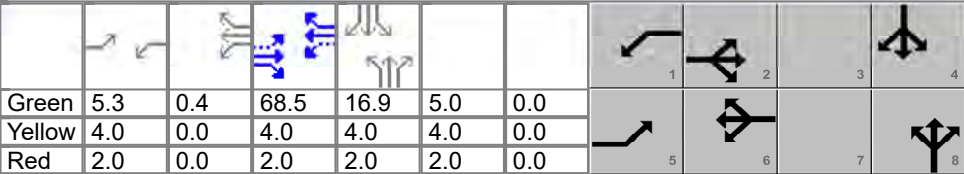
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	60	589		11	475			91			189	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1705		1810	1759			1694			1739	
Queue Service Time (g_s), s	1.6	25.8		0.3	19.4			6.3			12.8	
Cycle Queue Clearance Time (g_c), s	1.6	25.8		0.3	19.4			6.3			12.8	
Green Ratio (g/C)	0.61	0.59		0.58	0.56			0.07			0.13	
Capacity (c), veh/h	514	1011		390	993			114			218	
Volume-to-Capacity Ratio (X)	0.117	0.583		0.027	0.479			0.797			0.870	
Back of Queue (Q), ft/ln (95 th percentile)	27	371		5	303			125			248	
Back of Queue (Q), veh/ln (95 th percentile)	1.1	14.8		0.2	12.1			5.0			9.9	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00			0.00			0.00	
Uniform Delay (d_1), s/veh	11.2	15.2		13.2	15.6			55.2			51.5	
Incremental Delay (d_2), s/veh	0.0	2.5		0.0	1.7			4.7			7.9	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	11.3	17.7		13.2	17.2			59.9			59.4	
Level of Service (LOS)	B	B		B	B			E			E	
Approach Delay, s/veh / LOS	17.1	B		17.2	B		59.9	E		59.4	E	
Intersection Delay, s/veh / LOS	25.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.66	B	1.67	B	1.96	B	1.96	B
Bicycle LOS Score / LOS	1.56	B	1.29	A	0.64	A	0.80	A

HCS Signalized Intersection Results Summary

General Information					Intersection Information		
Agency	FTG				Duration, h	0.250	
Analyst	FTG	Analysis Date	4/11/2025	Area Type	Other		
Jurisdiction	Mt. Pleasant, TN	Time Period	PM Peak Hour	PHF	0.91		
Urban Street	Trotwood Avenue	Analysis Year	2030 (Total without)	Analysis Period	1> 7:00		
Intersection	Zion Road / Polk Lane	File Name	1_fupm1_sig.xus				
Project Description	11330						

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	57	366	4	79	468	211	2	12	35	86	29	80

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	5.3	0.4	68.5	16.9	5.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	4.0	0.0			
				Red	2.0	0.0	2.0	2.0	2.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		12.0		12.0
Phase Duration, s	11.3	74.5	11.7	74.9		11.0		22.9
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.0	0.0	3.0	0.0		3.2		3.1
Queue Clearance Time (g_s), s	3.7		4.3			5.8		16.5
Green Extension Time (g_e), s	0.1	0.0	0.1	0.0		0.1		0.3
Phase Call Probability	0.88		0.94			0.83		1.00
Max Out Probability	0.00		0.00			0.00		0.00

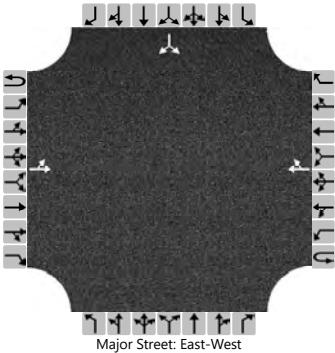
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	63	407		87	746			54			214	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1896		1810	1619			1681			1734	
Queue Service Time (g_s), s	1.7	14.1		2.3	43.7			3.8			14.5	
Cycle Queue Clearance Time (g_c), s	1.7	14.1		2.3	43.7			3.8			14.5	
Green Ratio (g/C)	0.61	0.57		0.62	0.57			0.04			0.14	
Capacity (c), veh/h	279	1082		596	930			70			244	
Volume-to-Capacity Ratio (X)	0.224	0.376		0.146	0.803			0.768			0.880	
Back of Queue (Q), ft/ln (95 th percentile)	28	246		38	583			77			264	
Back of Queue (Q), veh/ln (95 th percentile)	1.1	9.8		1.5	23.3			3.1			10.6	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00			0.00			0.00	
Uniform Delay (d_1), s/veh	18.6	14.1		10.1	20.2			56.9			50.6	
Incremental Delay (d_2), s/veh	0.1	1.0		0.0	7.3			6.4			4.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	18.8	15.1		10.2	27.5			63.4			54.6	
Level of Service (LOS)	B	B		B	C			E			D	
Approach Delay, s/veh / LOS	15.6	B		25.7	C		63.4	E		54.6	D	
Intersection Delay, s/veh / LOS	27.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.67	B	1.67	B	1.96	B	1.96	B
Bicycle LOS Score / LOS	1.26	A	1.86	B	0.58	A	0.84	A

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.88
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		46	594				389	35						155		24
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

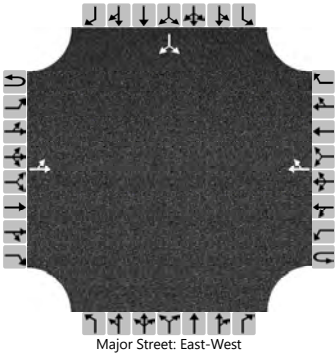
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		52													203	
Capacity, c (veh/h)		1091													199	
v/c Ratio		0.05													1.02	
95% Queue Length, Q ₉₅ (veh)		0.2													9.0	
95% Queue Length, Q ₉₅ (ft)		5.0													225.0	
Control Delay (s/veh)		8.5	0.6												120.1	
Level of Service (LOS)		A	A												F	
Approach Delay (s/veh)	1.2												120.1			
Approach LOS	A												F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		50	437				702	128						163		56
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

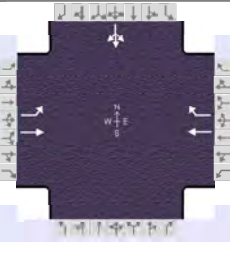
Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

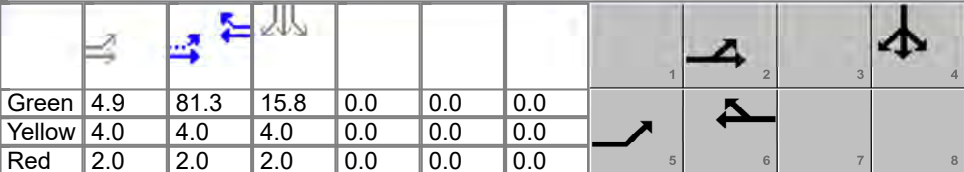
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		54													238	
Capacity, c (veh/h)		762													164	
v/c Ratio		0.07													1.45	
95% Queue Length, Q ₉₅ (veh)		0.2													15.1	
95% Queue Length, Q ₉₅ (ft)		5.0													377.5	
Control Delay (s/veh)		10.1	1.0												284.1	
Level of Service (LOS)		B	A												F	
Approach Delay (s/veh)	1.9												284.1			
Approach LOS	A												F			

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	FTG			Duration, h	0.250	
Analyst	FTG	Analysis Date	4/11/2025	Area Type	Other	
Jurisdiction	Mt. Pleasant, TN	Time Period	AM Peak Hour	PHF	0.88	
Urban Street	Trotwood Avenue	Analysis Year	2030 (Total without)	Analysis Period	1> 7:00	
Intersection	Old Zion Road Ext.	File Name	2_fuam1_sig.xus			
Project Description	11330					

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	46	594			389	35				155	0	24

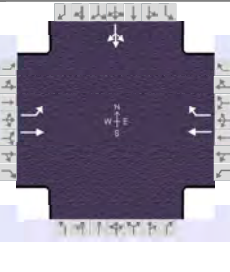
Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.9	81.3	15.8	0.0	0.0	0.0		
				Yellow	4.0	4.0	4.0	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	2.0	0.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	1.0	4.0		7.3				12.0
Phase Duration, s	10.9	98.2		87.3				21.8
Change Period, ($Y+R_c$), s	6.0	6.0		6.0				6.0
Max Allow Headway (MAH), s	3.0	0.0		0.0				3.1
Queue Clearance Time (g_s), s	2.9							15.4
Green Extension Time (g_e), s	0.1	0.0		0.0				0.4
Phase Call Probability	0.82							1.00
Max Out Probability	0.00							0.00

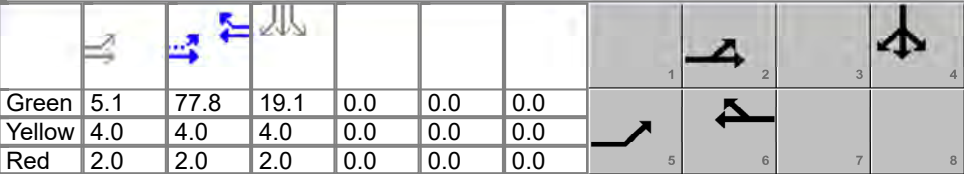








Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7	4	14
Adjusted Flow Rate (v), veh/h	52	675			442	40					203	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900			1900	1610					1780	
Queue Service Time (g_s), s	0.9	15.3			11.7	1.0					13.4	
Cycle Queue Clearance Time (g_c), s	0.9	15.3			11.7	1.0					13.4	
Green Ratio (g/C)	0.74	0.77			0.68	0.68					0.13	
Capacity (c), veh/h	692	1460			1287	1090					234	
Volume-to-Capacity Ratio (X)	0.076	0.462			0.344	0.036					0.869	
Back of Queue (Q), ft/ln (95 th percentile)	13	209			196	14					253	
Back of Queue (Q), veh/ln (95 th percentile)	0.5	8.4			7.9	0.6					10.1	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00					0.00	
Uniform Delay (d_1), s/veh	5.2	5.0			8.1	6.4					51.1	
Incremental Delay (d_2), s/veh	0.0	1.1			0.7	0.1					3.8	
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0					0.0	
Control Delay (d), s/veh	5.2	6.0			8.9	6.5					54.9	
Level of Service (LOS)	A	A			A	A					D	
Approach Delay, s/veh / LOS	6.0	A		8.7	A		0.0			54.9	D	
Intersection Delay, s/veh / LOS	14.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.33	A	1.65	B	1.96	B	1.96	B
Bicycle LOS Score / LOS	1.69	B	1.28	A			0.82	A

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	FTG			Duration, h	0.250	
Analyst	FTG	Analysis Date	4/11/2025	Area Type	Other	
Jurisdiction	Mt. Pleasant, TN	Time Period	PM Peak Hour	PHF	0.88	
Urban Street	Trotwood Avenue	Analysis Year	2030 (Total without)	Analysis Period	1> 7:00	
Intersection	Old Zion Road Ext.	File Name	2_fupm1_sig.xus			
Project Description	11330					

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	50	437			702	128				163	0	56

Signal Information											
Cycle, s	120.0	Reference Phase	2								
Offset, s	0	Reference Point	End								
Uncoordinated	No	Simult. Gap E/W	On								
Force Mode	Fixed	Simult. Gap N/S	On								
				Green	5.1	77.8	19.1	0.0	0.0	0.0	
				Yellow	4.0	4.0	4.0	0.0	0.0	0.0	
				Red	2.0	2.0	2.0	0.0	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	1.0	4.0		7.3				12.0
Phase Duration, s	11.1	94.9		83.8				25.1
Change Period, ($Y+R_c$), s	6.0	6.0		6.0				6.0
Max Allow Headway (MAH), s	3.0	0.0		0.0				3.1
Queue Clearance Time (g_s), s	3.1							18.7
Green Extension Time (g_e), s	0.1	0.0		0.0				0.5
Phase Call Probability	0.85							1.00
Max Out Probability	0.00							0.00

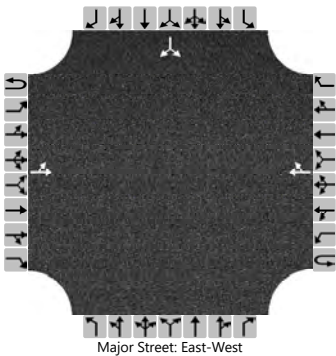
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7	4	14
Adjusted Flow Rate (v), veh/h	57	497			798	145					249	
Adjusted Saturation Flow Rate (s), veh/h/ln	1810	1900			1900	1610					1754	
Queue Service Time (g_s), s	1.1	11.0			30.6	4.2					16.7	
Cycle Queue Clearance Time (g_c), s	1.1	11.0			30.6	4.2					16.7	
Green Ratio (g/C)	0.71	0.74			0.65	0.65					0.16	
Capacity (c), veh/h	409	1407			1231	1044					280	
Volume-to-Capacity Ratio (X)	0.139	0.353			0.648	0.139					0.890	
Back of Queue (Q), ft/ln (95 th percentile)	17	167			447	62					296	
Back of Queue (Q), veh/ln (95 th percentile)	0.7	6.7			17.9	2.5					11.9	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00			0.00	0.00					0.00	
Uniform Delay (d_1), s/veh	10.1	5.5			12.8	8.2					49.4	
Incremental Delay (d_2), s/veh	0.1	0.7			2.6	0.3					3.9	
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0					0.0	
Control Delay (d), s/veh	10.2	6.2			15.4	8.4					53.3	
Level of Service (LOS)	B	A			B	A					D	
Approach Delay, s/veh / LOS	6.6	A		14.4	B		0.0			53.3	D	
Intersection Delay, s/veh / LOS	17.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.34	A	1.65	B	1.96	B	1.96	B
Bicycle LOS Score / LOS	1.40	A	2.04	B			0.90	A

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	749				424	4						42		0
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

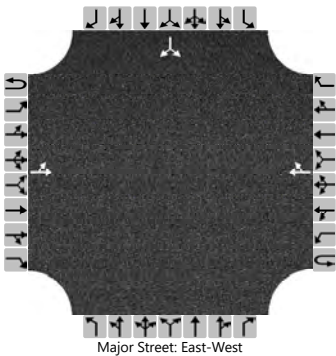
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													48	
Capacity, c (veh/h)		1082													167	
v/c Ratio		0.00													0.29	
95% Queue Length, Q ₉₅ (veh)		0.0													1.1	
95% Queue Length, Q ₉₅ (ft)		0.0													27.5	
Control Delay (s/veh)		8.3	0.0												35.0	
Level of Service (LOS)		A	A												D	
Approach Delay (s/veh)	0.0												35.0			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Trotwood / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Trotwood Avenue
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		1	599				829	11						24		1
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.40		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

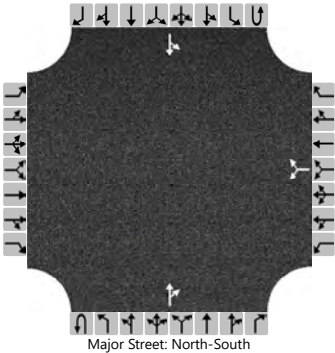
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1													27	
Capacity, c (veh/h)		768													134	
v/c Ratio		0.00													0.20	
95% Queue Length, Q ₉₅ (veh)		0.0													0.7	
95% Queue Length, Q ₉₅ (ft)		0.0													17.5	
Control Delay (s/veh)		9.7	0.0												38.5	
Level of Service (LOS)		A	A												E	
Approach Delay (s/veh)	0.0												38.5			
Approach LOS	A												E			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Old Zion Road
Analysis Year	2030	North/South Street	Old Zion Road / Old Zion Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						0		4			115	0		42	145	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

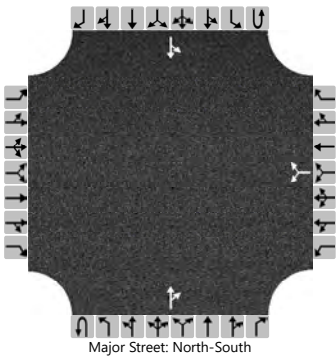
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						5								48		
Capacity, c (veh/h)						923								1465		
v/c Ratio						0.00								0.03		
95% Queue Length, Q ₉₅ (veh)						0.0								0.1		
95% Queue Length, Q ₉₅ (ft)						0.0								2.5		
Control Delay (s/veh)						8.9								7.5	0.3	
Level of Service (LOS)						A								A	A	
Approach Delay (s/veh)					8.9								1.9			
Approach LOS					A								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion / Old Zion Ext
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Old Zion Road
Analysis Year	2030	North/South Street	Old Zion Road / Old Zion Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						0		12			153	0		25	244	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

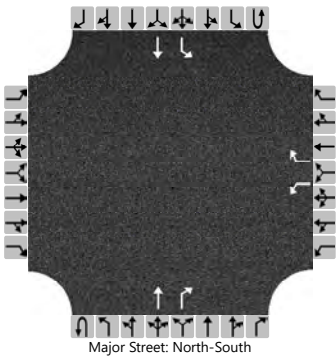
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						13								27		
Capacity, c (veh/h)						887								1428		
v/c Ratio						0.01								0.02		
95% Queue Length, Q ₉₅ (veh)						0.0								0.1		
95% Queue Length, Q ₉₅ (ft)						0.0								2.5		
Control Delay (s/veh)						9.1								7.6	0.2	
Level of Service (LOS)						A								A	A	
Approach Delay (s/veh)					9.1								0.9			
Approach LOS					A								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion / Ramps for Lawrenceburg
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Ramps for Lawrenceburg Hwy
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.78
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						42		88			144	127		100	119	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

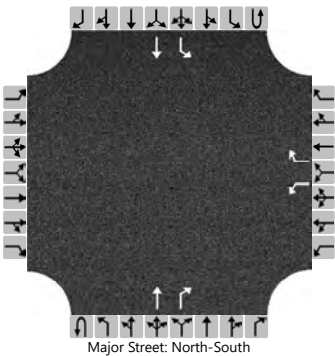
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						54		113						128		
Capacity, c (veh/h)						422		863						1223		
v/c Ratio						0.13		0.13						0.10		
95% Queue Length, Q ₉₅ (veh)						0.4		0.4						0.4		
95% Queue Length, Q ₉₅ (ft)						10.0		10.0						10.0		
Control Delay (s/veh)						14.8		9.8						8.3		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					11.4								3.8			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion / Ramps for Lawrenceburg
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Ramps for Lawrenceburg Hwy
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						63		77			121	166		59	149	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

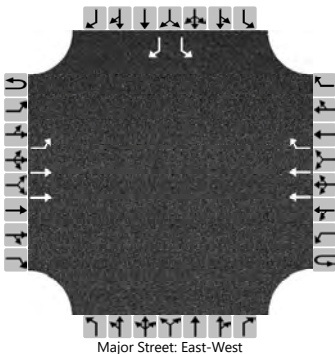
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						66		81						62		
Capacity, c (veh/h)						573		928						1270		
v/c Ratio						0.12		0.09						0.05		
95% Queue Length, Q ₉₅ (veh)						0.4		0.3						0.2		
95% Queue Length, Q ₉₅ (ft)						10.0		7.5						5.0		
Control Delay (s/veh)						12.1		9.2						8.0		
Level of Service (LOS)						B		A						A		
Approach Delay (s/veh)					10.5								2.3			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Ramps for Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Ramps for Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume (veh/h)	0	63	1155				476	67						77		150
Percent Heavy Vehicles (%)	0	0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					Yes								Yes			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

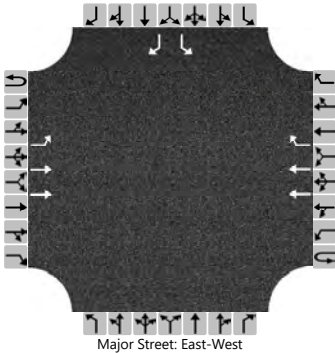
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		72												89		172
Capacity, c (veh/h)		1032												133		730
v/c Ratio		0.07												0.67		0.24
95% Queue Length, Q ₉₅ (veh)		0.2												3.6		0.9
95% Queue Length, Q ₉₅ (ft)		5.0												90.0		22.5
Control Delay (s/veh)		8.7												74.2		11.4
Level of Service (LOS)		A												F		B
Approach Delay (s/veh)	0.5												32.7			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Ramps for Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Ramps for Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	0	2	1		0	0	0		1	0	1
Configuration		L	T				T	R						L		R
Volume (veh/h)	0	52	678				1116	88						54		171
Percent Heavy Vehicles (%)	0	0												0		0
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					Yes								Yes			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

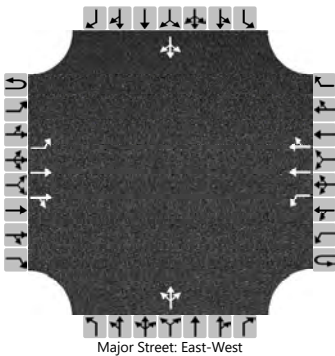
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		57												59		188
Capacity, c (veh/h)		575												75		440
v/c Ratio		0.10												0.79		0.43
95% Queue Length, Q ₉₅ (veh)		0.3												3.8		2.1
95% Queue Length, Q ₉₅ (ft)		7.5												95.0		52.5
Control Delay (s/veh)		11.9												145.6		19.1
Level of Service (LOS)		B												F		C
Approach Delay (s/veh)	0.9												49.5			
Approach LOS	A												E			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	1	1086	145	0	35	526	50		16	4	99		32	7	1
Percent Heavy Vehicles (%)	0	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

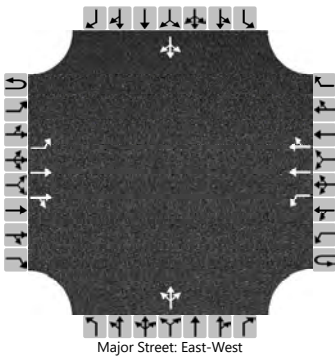
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				38					131				44	
Capacity, c (veh/h)		960				515					189				66	
v/c Ratio		0.00				0.07					0.69				0.67	
95% Queue Length, Q ₉₅ (veh)		0.0				0.2					4.3				2.9	
95% Queue Length, Q ₉₅ (ft)		0.0				5.0					107.5				72.5	
Control Delay (s/veh)		8.8				12.5					58.7				132.4	
Level of Service (LOS)		A				B					F				F	
Approach Delay (s/veh)	0.0				0.7				58.7				132.4			
Approach LOS	A				A				F				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	0	628	104	0	158	1133	21		70	8	87		8	7	1
Percent Heavy Vehicles (%)	0	0			0	0				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.10				4.10				7.50	6.50	6.90		7.50	6.50	6.90
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.20				3.50	4.00	3.30		3.50	4.00	3.30

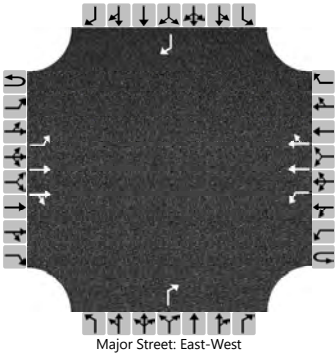
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				168					176				17	
Capacity, c (veh/h)		575				847					77				26	
v/c Ratio		0.00				0.20					2.28				0.66	
95% Queue Length, Q ₉₅ (veh)		0.0				0.7					16.3				2.0	
95% Queue Length, Q ₉₅ (ft)		0.0				17.5					407.5				50.0	
Control Delay (s/veh)		11.3				10.3					699.2				283.2	
Level of Service (LOS)		B				B					F				F	
Approach Delay (s/veh)	0.0				1.2				699.2				283.2			
Approach LOS	A				A				F				F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.91
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	0	1		0	0	1
Configuration		L	T	TR		L	T	TR				R				R
Volume (veh/h)	0	1	1086	145	0	35	526	50				119				40
Percent Heavy Vehicles (%)	0	0			0	0						0				0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1						6.9				6.9
Critical Headway (sec)		4.10				4.10						6.90				6.90
Base Follow-Up Headway (sec)		2.2				2.2						3.3				3.3
Follow-Up Headway (sec)		2.20				2.20						3.30				3.30

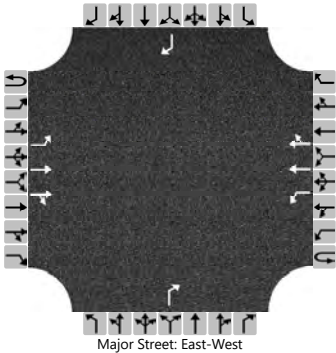
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				38						131				44
Capacity, c (veh/h)		960				515						400				685
v/c Ratio		0.00				0.07						0.33				0.06
95% Queue Length, Q ₉₅ (veh)		0.0				0.2						1.4				0.2
95% Queue Length, Q ₉₅ (ft)		0.0				5.0						35.0				5.0
Control Delay (s/veh)		8.8				12.5						18.3				10.6
Level of Service (LOS)		A				B						C				B
Approach Delay (s/veh)	0.0				0.7				18.3				10.6			
Approach LOS	A				A				C				B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Lawrenceburg / Old Zion
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Lawrenceburg Highway
Analysis Year	2030	North/South Street	Old Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.94
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	0	1		0	0	1
Configuration		L	T	TR		L	T	TR				R				R
Volume (veh/h)	0	0	628	104	0	158	1133	21				165				16
Percent Heavy Vehicles (%)	0	0			0	0						0				0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				No			
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1						6.9				6.9
Critical Headway (sec)		4.10				4.10						6.90				6.90
Base Follow-Up Headway (sec)		2.2				2.2						3.3				3.3
Follow-Up Headway (sec)		2.20				2.20						3.30				3.30

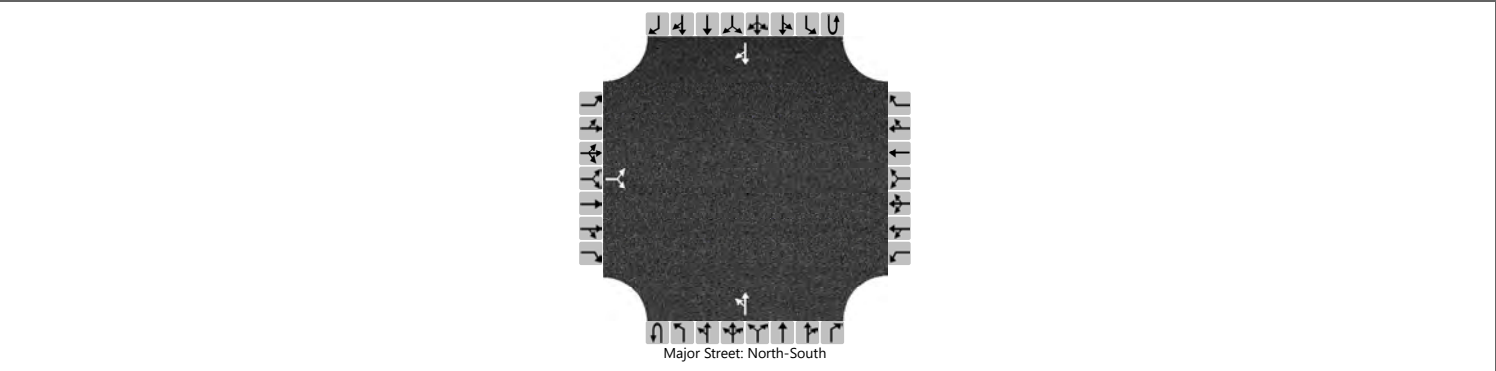
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				168						176				17
Capacity, c (veh/h)		575				847						615				440
v/c Ratio		0.00				0.20						0.29				0.04
95% Queue Length, Q ₉₅ (veh)		0.0				0.7						1.2				0.1
95% Queue Length, Q ₉₅ (ft)		0.0				17.5						30.0				2.5
Control Delay (s/veh)		11.3				10.3						13.2				13.5
Level of Service (LOS)		B				B						B				B
Approach Delay (s/veh)	0.0				1.2				13.2				13.5			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion Road Ext / North Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	North Project Access
Analysis Year	2030	North/South Street	Old Zion Road Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		32		19						6	83				134	11
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

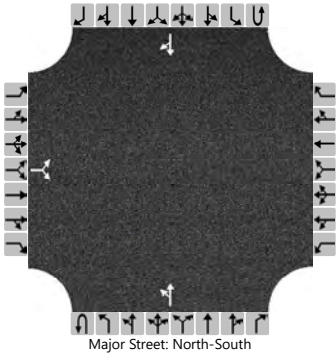
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			57							7						
Capacity, c (veh/h)			783							1430						
v/c Ratio			0.07							0.00						
95% Queue Length, Q ₉₅ (veh)			0.2							0.0						
95% Queue Length, Q ₉₅ (ft)			5.0							0.0						
Control Delay (s/veh)			10.0							7.5	0.0					
Level of Service (LOS)			A							A	A					
Approach Delay (s/veh)	10.0								0.5							
Approach LOS	A								A							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion Road Ext / North Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	North Project Access
Analysis Year	2030	North/South Street	Old Zion Road Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		21		13						22	132				207	37
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

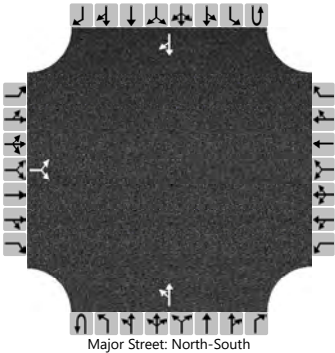
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			38							24						
Capacity, c (veh/h)			632							1304						
v/c Ratio			0.06							0.02						
95% Queue Length, Q ₉₅ (veh)			0.2							0.1						
95% Queue Length, Q ₉₅ (ft)			5.0							2.5						
Control Delay (s/veh)			11.1							7.8	0.2					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)	11.1								1.3							
Approach LOS	B								A							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion Road Ext / South Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	South Project Access
Analysis Year	2030	North/South Street	Old Zion Road Ext
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		19		32						11	70				147	6
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

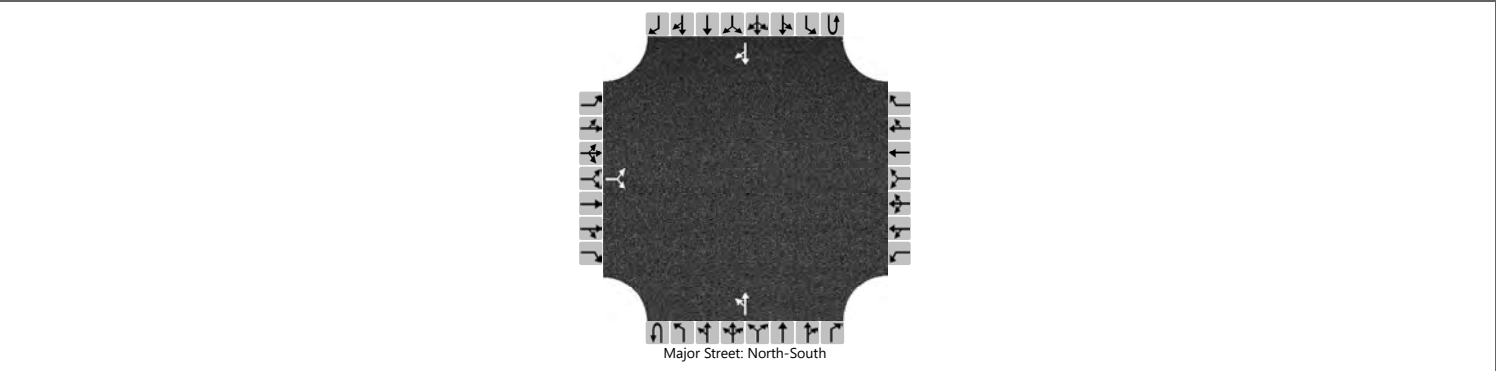
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			57							12						
Capacity, c (veh/h)			813							1420						
v/c Ratio			0.07							0.01						
95% Queue Length, Q ₉₅ (veh)			0.2							0.0						
95% Queue Length, Q ₉₅ (ft)			5.0							0.0						
Control Delay (s/veh)			9.8							7.6	0.1					
Level of Service (LOS)			A							A	A					
Approach Delay (s/veh)	9.8								1.1							
Approach LOS	A								A							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Old Zion Road Ext / South Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	South Project Access
Analysis Year	2030	North/South Street	Old Zion Road Ext
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		13		21						37	141				198	22
Percent Heavy Vehicles (%)		0		0						0						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.20						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.30						2.20						

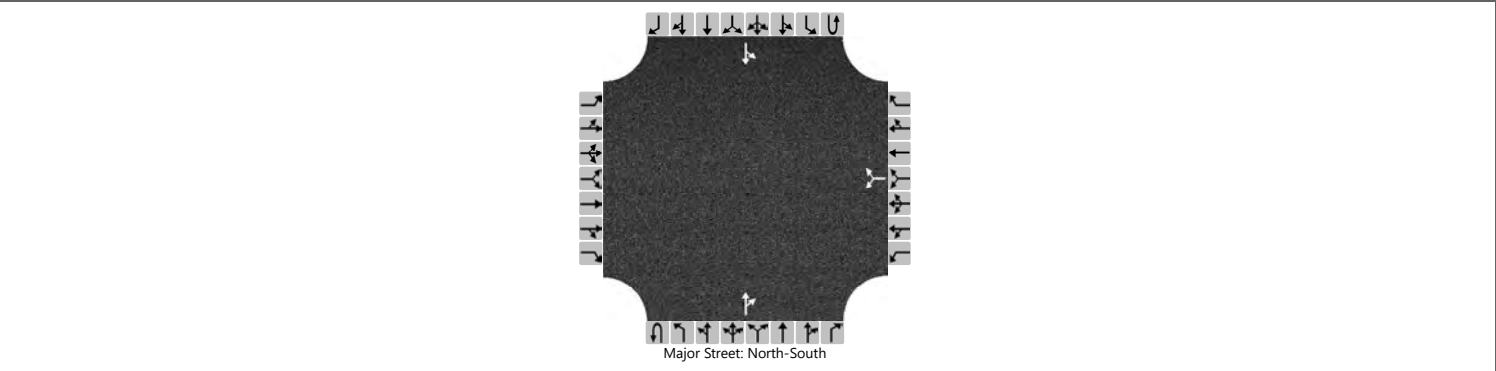
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			38							41						
Capacity, c (veh/h)			678							1334						
v/c Ratio			0.06							0.03						
95% Queue Length, Q ₉₅ (veh)			0.2							0.1						
95% Queue Length, Q ₉₅ (ft)			5.0							2.5						
Control Delay (s/veh)			10.6							7.8	0.3					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)	10.6								1.8							
Approach LOS	B								A							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion Road / Project Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Project Access
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						6		20			251	2		6	155	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

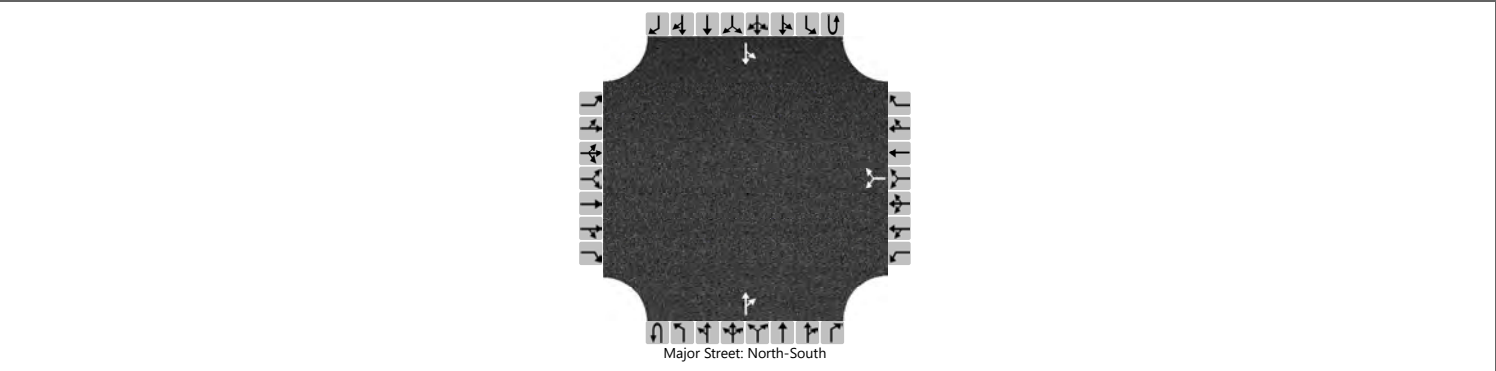
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						29								7		
Capacity, c (veh/h)						703								1293		
v/c Ratio						0.04								0.01		
95% Queue Length, Q ₉₅ (veh)						0.1								0.0		
95% Queue Length, Q ₉₅ (ft)						2.5								0.0		
Control Delay (s/veh)						10.3								7.8	0.0	
Level of Service (LOS)						B								A	A	
Approach Delay (s/veh)					10.3								0.3			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	FTG	Intersection	Zion Road / Project Access
Agency/Co.	FTG	Jurisdiction	Mt. Pleasant, TN
Date Performed	Apr 2025	East/West Street	Project Access
Analysis Year	2030	North/South Street	Zion Road
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.90
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	11269 (Total without)		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						4		14			273	7		21	191	
Percent Heavy Vehicles (%)						0		0						0		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.40		6.20						4.10		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.50		3.30						2.20		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						20								23		
Capacity, c (veh/h)						658								1261		
v/c Ratio						0.03								0.02		
95% Queue Length, Q ₉₅ (veh)						0.1								0.1		
95% Queue Length, Q ₉₅ (ft)						2.5								2.5		
Control Delay (s/veh)						10.6								7.9	0.2	
Level of Service (LOS)						B								A	A	
Approach Delay (s/veh)					10.6								0.9			
Approach LOS					B								A			

APPENDIX C
TRAFFIC SIGNAL WARRANTS

The Federal Highway Administration has published the Manual on Uniform Traffic Control Devices 2009 (MUTCD 2009), which includes eight traffic signal warrants that help traffic engineering professionals to identify when a traffic signal installation is justified at a particular location. These eight warrants include minimum conditions that are compared to existing or projected traffic conditions, and typically, traffic signals should not be installed unless at least one of the MUTCD warrants is met. Of the eight total signal warrants, the following are relevant to the intersection considered as part of this study:

Warrant 1, Eight-Hour Vehicular Volume

The Minimum Vehicular Volume, Condition A, is intended for application where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. The Interruption of Continuous Traffic, Condition B, is intended for application where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Standard: The need for a traffic control signal shall be considered if an engineering study finds that one of the following conditions exists for each of any eight hours of an average day:

- A. The vehicles per hour given in both of the 100% columns of Condition A in Table C1 exist on the major street and on the higher volume minor-street approaches, respectively, to the intersection, or
- B. The vehicles per hour given in both of the 100% columns of Condition B in Table C1 exist on the major street and on the higher volume minor-street approaches, respectively, to the intersection.

In applying each condition, the major street and minor street volumes shall be for the same eight hours. On the minor street, the higher volume shall not be required to be on the same approach during each of these eight hours.

Option: If the posted or statutory speed limit or the 85th percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes in the 70% columns in Table C1 may be used in place of the 100% columns.

Standard: The need for a traffic control signal shall be considered if an engineering study finds that both of the following conditions exists for each of any eight hours of an average day:

- A. The vehicles per hour given in both of the 80% columns of Condition A in Table C1 exist on the major street and on the higher volume minor-street approaches, respectively, to the intersection, and
- B. The vehicles per hour given in both of the 80% columns of Condition B in Table C1 exist on the major street and on the higher volume minor-street approaches, respectively, to the intersection.

These major street and minor street volumes shall be for the same eight hours for each condition; however, the eight hours satisfied in Condition A shall not be required to be the same eight hours satisfied in Condition B. On the minor street, the higher volume shall not be required to be on the same approach during each of these eight hours.

TABLE C1. WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

CONDITION A – MINIMUM VEHICULAR VOLUME							
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor street approach (one direction only)		
Major Street	Minor Street	100%	80%	70%	100%	80%	70%
1 lane	1 lane	500	400	350	150	120	105
2 or more lanes	1 lane	600	480	420	150	120	105
2 or more lanes	2 or more lanes	600	480	420	200	160	140
1 lane	2 or more lanes	500	400	350	200	160	140

CONDITION B – INTERRUPTION OF CONTINUOUS TRAFFIC							
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor street approach (one direction only)		
Major Street	Minor Street	100%	80%	70%	100%	80%	70%
1 lane	1 lane	750	600	525	75	60	53
2 or more lanes	1 lane	900	720	630	75	60	53
2 or more lanes	2 or more lanes	900	720	630	100	80	70
1 lane	2 or more lanes	750	600	525	100	80	70

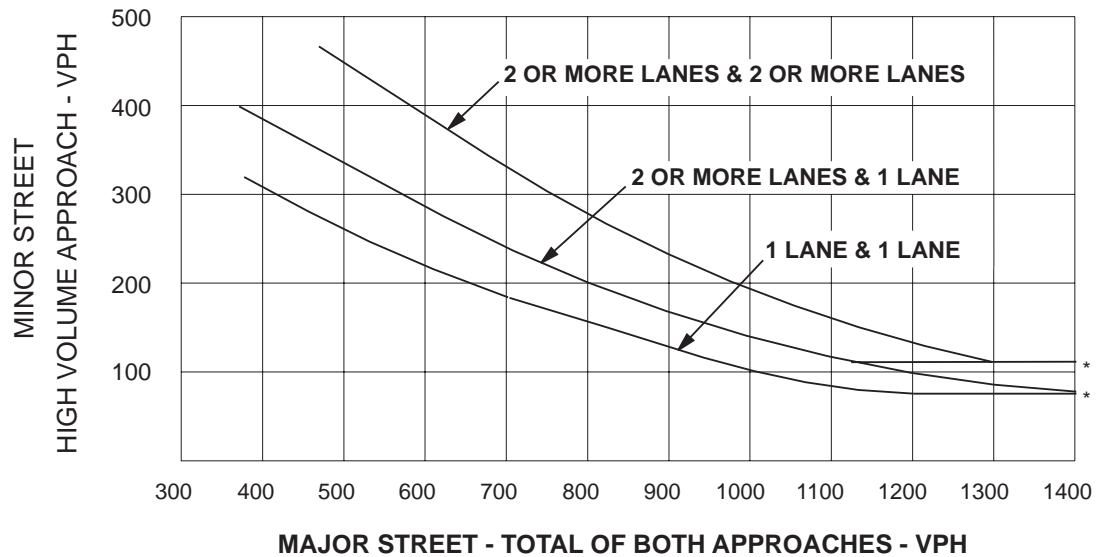
Warrant 2, Four-Hour Vehicular Volume

The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic signal.

Standard: The need for a traffic control signal shall be considered if an engineering study finds that for each of any four hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the applicable curve in Figure C1-Graph A for the existing combination of approach lanes. On the minor street, the higher volume shall not be required to be on the same approach during each of these four hours.

Option: If the posted or statutory speed limit or the 85th percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure C1-Graph B may be used in place of Figure C1-Graph A.

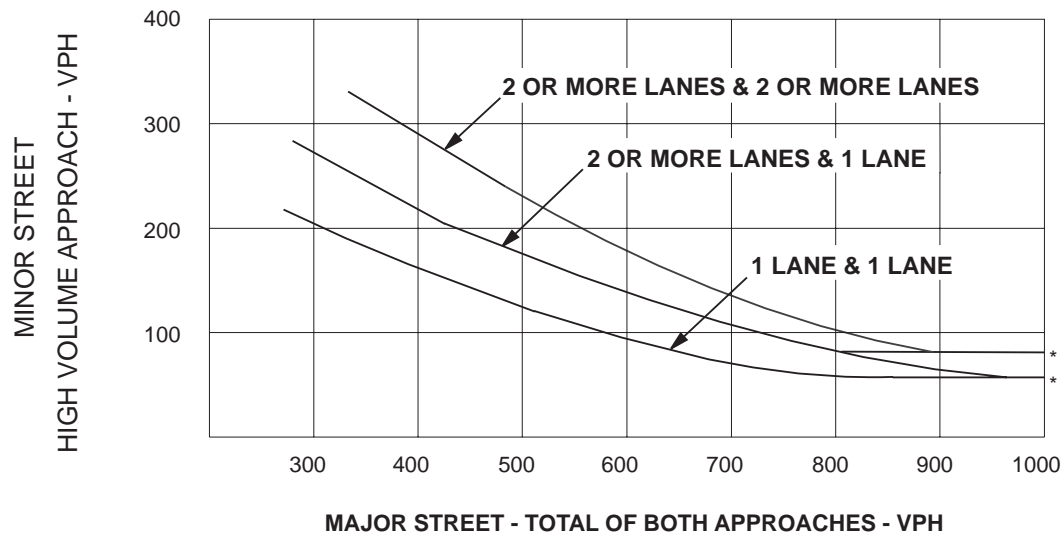
GRAPH A: FOUR HOUR VOLUME WARRANT



*NOTE: 115 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

GRAPH B: FOUR HOUR VOLUME WARRANT

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*NOTE: 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 60 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

**APPENDIX D
TRIP GENERATION**

TRIP GENERATION CALCULATIONS - Single-Family Homes Detached

The following calculations are based on the data compiled for ITE Land Use Code 210.

Average Daily Traffic

$$\ln(T) = 0.92 \ln(X) + 2.68$$

$$\ln(T) = 0.92 \ln(247) + 2.68$$

$$T = 2,318 \text{ vehicles}$$

$$\text{Enter} = 0.50 (2,318) = 1,159 \text{ vehicles}$$

$$\text{Exit} = 0.50 (2,318) = 1,159 \text{ vehicles}$$

AM traffic during peak hour of adjacent street

$$\ln(T) = 0.91 \ln(X) + 0.12$$

$$\ln(T) = 0.91 \ln(247) + 0.12$$

$$T = 170 \text{ vehicles}$$

$$\text{Enter} = 0.25 (170) = 42 \text{ vehicles}$$

$$\text{Exit} = 0.75 (170) = 128 \text{ vehicles}$$

PM traffic during peak hour of adjacent street

$$\ln(T) = 0.94 \ln(X) + 0.27$$

$$\ln(T) = 0.94 \ln(247) + 0.27$$

$$T = 232 \text{ vehicles}$$

$$\text{Enter} = 0.63 (232) = 146 \text{ vehicles}$$

$$\text{Exit} = 0.37 (232) = 86 \text{ vehicles}$$

**APPENDIX E
RELEVANT PAGES FROM
TDOT HIGHWAY SYSTEM ACCESS MANUAL, VOLUME 3**

where a left-turn lane would help mitigate traffic conflicts, not necessarily situations where a left-turn lane is required or must be constructed.

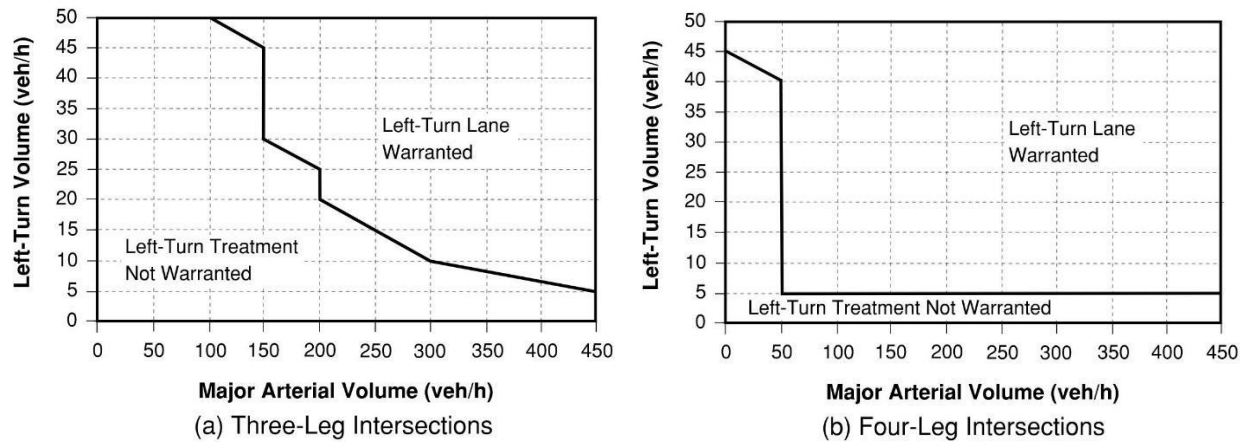


Figure 3-15: Left-Turn Lane Warrant for Urban and Suburban Arterials (Unsignalized)^{20, 21}

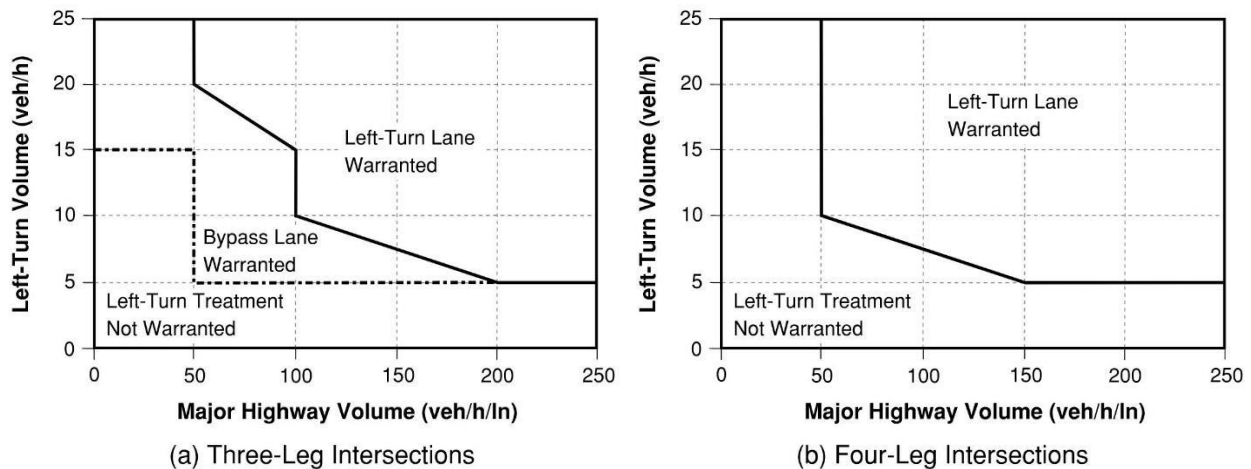


Figure 3-16: Left-Turn Lane Warrant for Two-Lane Rural Roadways (Unsignalized)^{20, 21}

²⁰ TRB, NCHRP Report 745, Left-Turn Accommodations at Unsignalized Intersections (2013)

²¹ AASHTO, A Policy on Geometric Design of Highways and Streets 7th Edition (2018)

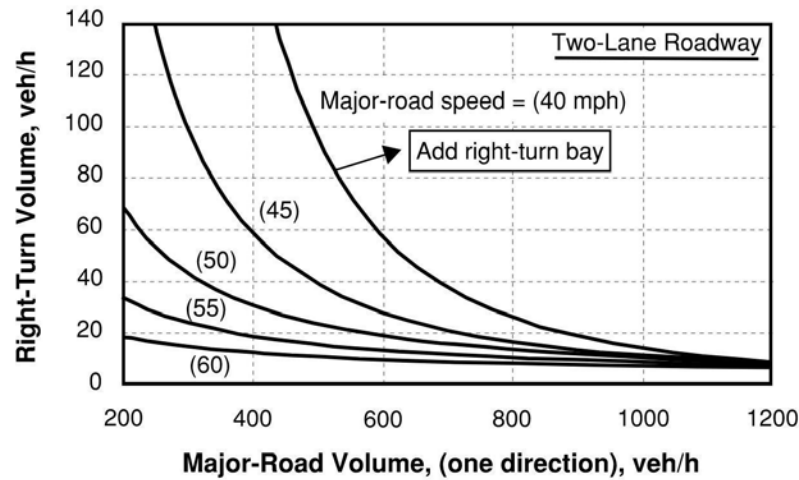


Figure 3-18: Right-Turn Lane Warrant along Two-Lane Roadway (Unsignalized Intersection with Two-Way Stop-Control)²⁴

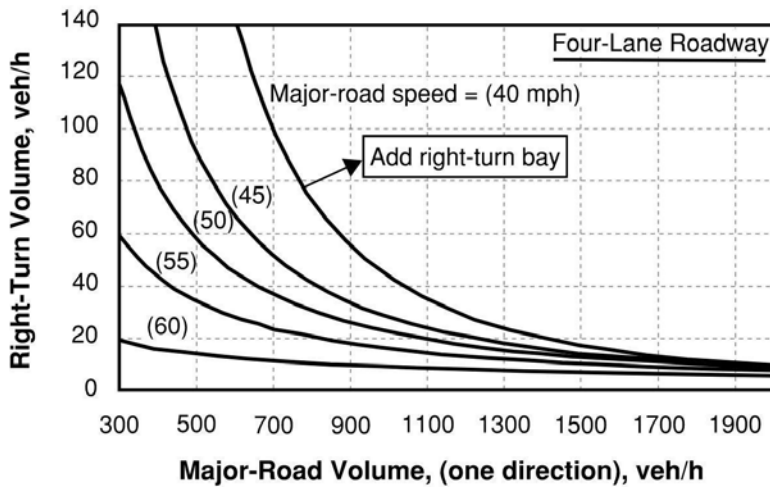


Figure 3-19: Right-Turn Lane Warrant along Four-Lane Roadway (Unsignalized Intersection with Two-Way Stop-Control)²⁵

²⁴ TRB, NCHRP 457, Evaluating Intersection Improvements (2001)

²⁵ TRB, NCHRP 457, Evaluating Intersection Improvements (2001)