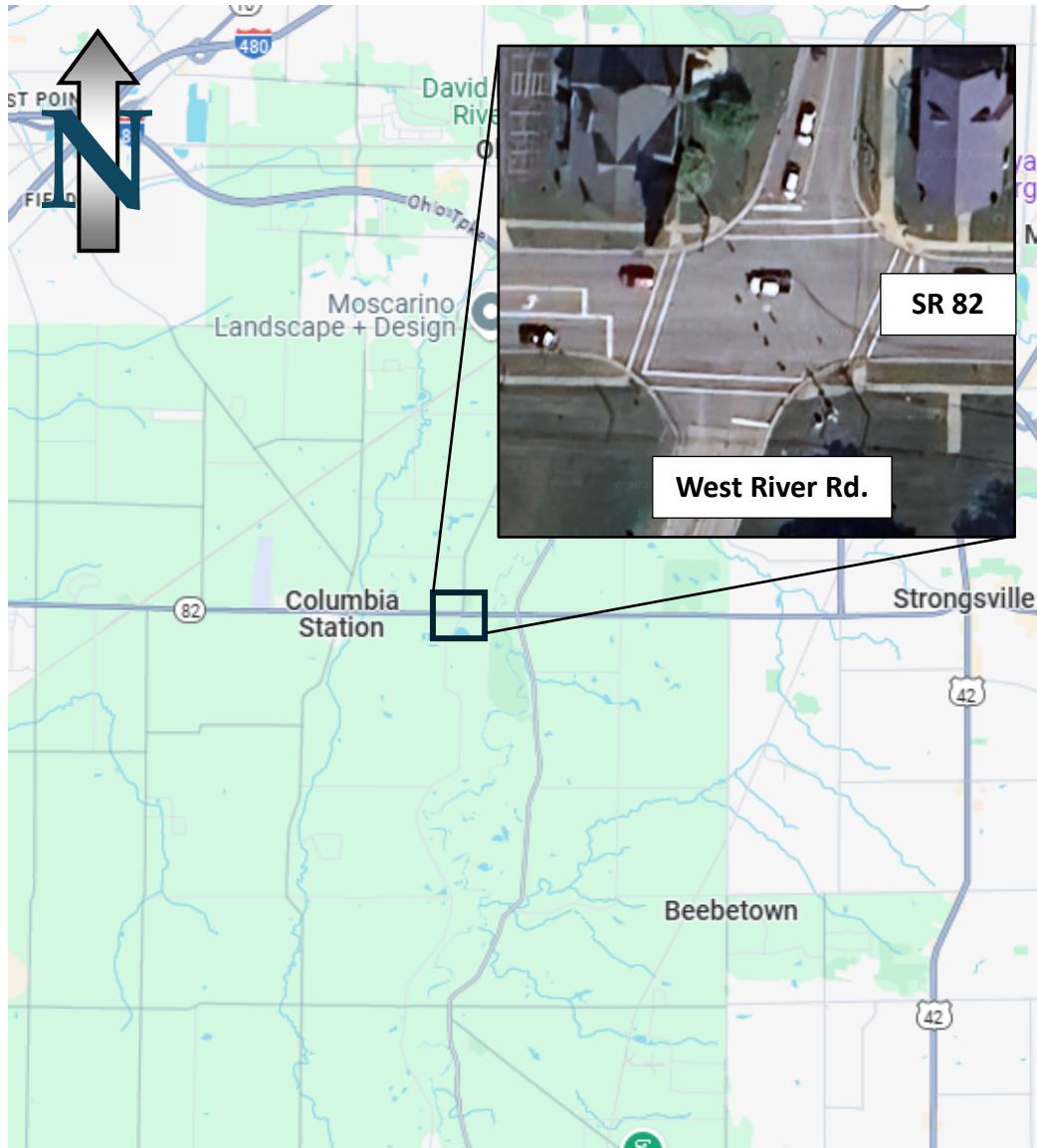


2025 Signal Evaluation

LOR County, SR Route 82, SLM 7.56 (West River Road)



Prepared By: Carrie Whitaker
Date: 10/27/2025



**Department of
Transportation**
District 3

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Study Background

The Ohio Manual of Uniform Traffic Control Devices (OMUTCD) requires the operation of existing traffic signals to be analyzed every five years. The following report considers whether an existing signal is still warranted per OMUTCD signal warrants, and if any operational changes are required to ensure the signal is performing well.

Existing Conditions

The SR 82 and West River Road (CR 60) intersection is located in Columbia Township, Lorain County, Ohio, just west of the City of Strongsville. Existing roadway data can be found in **Table 1** below.

Table 1. Existing Roadway Data

Category	Major Road	Minor Road
Route	SR 82	West River Road (CR 60)
Direction	East/West	North/South
Functional Class	4 (Minor Arterial)	North: 7 (Local)/ South: 7 (Local)
Speed Limit	45 MPH	40 MPH
National Truck Route?	Yes	No
AADT	2023: 9,087 (8% Truck)	N/A
Land Use	Residential/Agricultural/Commercial	
School Impacts?	Yes, Columbia High School and Middle School drive just to the east and north	
Alignment		
Horizontal	Straight	South leg skewed
Vertical	-	-
Skew	-	30°
Signal		
Signal Type	Simple Span	
Install Year	2006 (PID 21992)	
Turn Lanes	Eastbound left turn lane: Storage 150 ft. Westbound left turn lane: Storage 205 ft.	None
Backplates	Yes	Yes
Detection	Stop Bar and Advance EB & WB	Stop Bar and Advance NB & SB
Preemption	No	

Signal Phasing and Timing

The phasing diagram can be found in **Figure 1**. The signal timing chart is in **Table 2**, and the as-built drawings can be found in **Appendix A**.

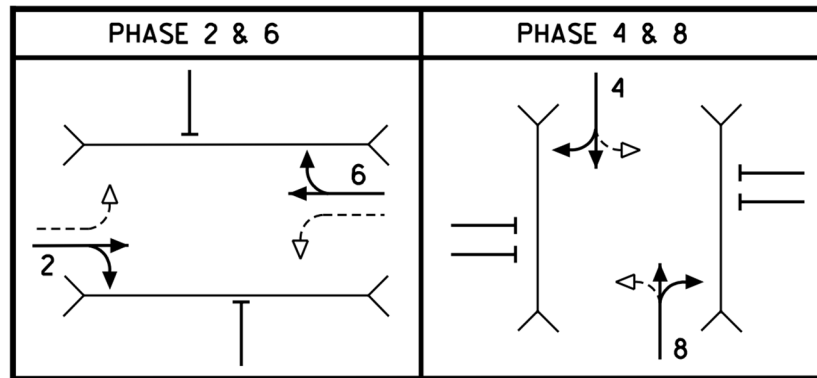


Figure 1. Phasing Diagram

Table 2. Signal Timing Chart

	PHASE NUMBER							
	1	2	3	4	5	6	7	8
INTERVAL	NOT USED	SR 82 EB	NOT USED	Columbia-West River SB	NOT USED	SR 82 WB	NOT USED	Columbia-West River NB
MINIMUM GREEN		28		12		28		12
PASSAGE TIME		3.0		3.0		3.0		3.0
YELLOW CLEARANCE		5.0		4.5		5.0		4.5
RED CLEARANCE		1.0		1.0		1.0		1.0
MAX GREEN 1		50		50		50		50
MAX GREEN 2		50		50		50		50
MAX GREEN 3		0		0		0		0
WALK		7		7		7		7
DON'T WALK		10		10		10		10
MINIMUM RECALL		+		-		+		-
MAXIMUM RECALL		-		-		-		-
NON-LOCK		-		+		-		+
ADDED INITIAL (Sec./act.)		0.0		0.0		0.0		0.0
MAXIMUM INITIAL		0		0		0		0
TIME TO REDUCE		0		0		0		0
TIME BEFORE REDUCTION		0		0		0		0
MINIMUM GAP		0		0		0		0

Field Review

A field review was conducted on Friday, October 3, 2025, and the following was noted:

- Signal in good condition.
- No operational concerns at time of review.

Existing conditions can be viewed in **Figure 2**.



Figure 2. Photo of Intersection (October 2025), standing at southwest corner looking northeast

Previous Studies and Improvements

A summary of intersection background information includes:

- **2006:** Signal and SR 82 left turn lanes installed (PID 21992)
- **2015:** SR 82 left turn phase request received from Columbia School District, operational review completed.
- **2019:** Signal evaluation completed; no recommendations.
- **2020:** SR 82 left turn phase request received from Township; recent analysis reviewed and determined there were no left turn crashes on SR 82 since 2013 and low peak hour delay not causing operational concern at intersection.
- **2024:** Advance and stop bar radar detection installed on all approaches.

Crash Data & Analysis

Crashes were reviewed at this intersection between January 1st, 2020 and December 31st, 2024 and are summarized in **Table 3** below. **Figure 3** shows the crash diagram and **Appendix B** has a crash diagram with further detail.

Table 3. Crash Data (2020-2024)

Year		Severity		Type		Road Condition	
2020	1 (11%)	Fatal	0 (0%)	Rear End	4 (45%)	Dry	9 (100%)
2021	3 (33%)	Injury	3 (33%)	Angle	2 (22%)	Wet	0 (0%)
2022	1 (11%)	PDO	6 (67%)	Left Turn	1 (11%)	Snow/Ice	0 (0%)
2023	3 (33%)			Sideswipe-Passing	1 (11%)		
2024	1 (11%)			Right Turn	1 (11%)		

Total Crashes: 9

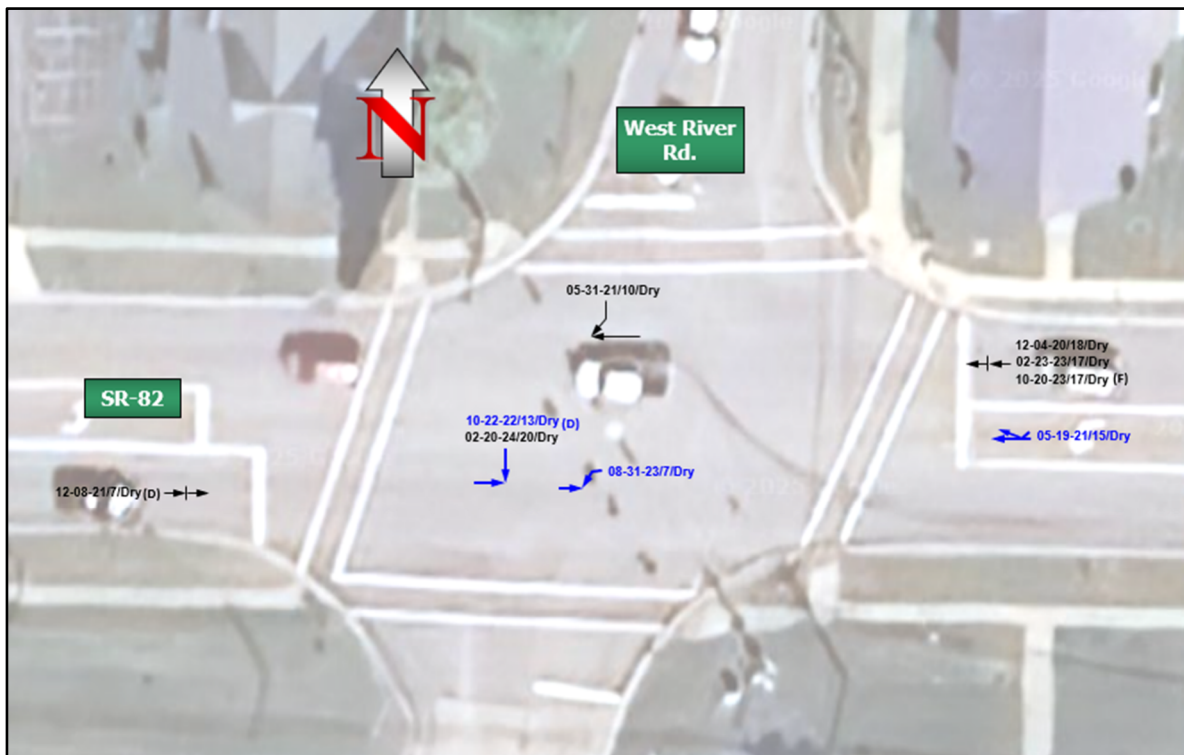


Figure 3. Crash Diagram (2020-2024)

- Crashes fluctuate from year to year between 1 crash and 3 crashes: intersection averaging 1.80 crashes/year from 2020-2024.
- 3 total injury crashes : 1 angle minor injury, 1 left turn possible injury, 1 sideswipe-passing possible injury. There were no serious injury crashes.
- 4 rear end crashes: 3 SR 82 westbound (1 fell asleep) and 1 SR 82 eastbound (distracted)
- 2 southbound angle crashes where both ran the red light (1 reported distracted)
- 1 westbound to southbound failure to yield left turn crash (older driver)
- In 1 (11%) of the crashes, the at-fault driver was a younger driver (<26 yrs.)
- In 3 (33%) of the crashes, the at-fault driver was an older driver (>64 yrs.)

Probable Causes and Potential Countermeasures

The probable causes of the crashes analyzed include:

- Driver inattention as shown by the number of reported distracted and fell asleep at-fault drivers (33%).
- Driver impatience as shown by the number of reported rear end and running the red-light type crashes.
- Driver inexperience/ability as shown by the number of young and older at-fault driver crashes (44%).

Traffic Data & Supplemental Studies

Supplemental traffic studies were performed to analyze the safety and operational capacity of the intersection. These supplemental studies are summarized below:

Turning Movement Count

A turning movement count was performed to obtain current traffic volumes for the intersection. The count was taken on Wednesday, April 9th, 2025, between the hours of 6:00 AM to 7:00 PM. The morning (AM) peak hour, afternoon (PM) peak hour, and 13-hour total are shown below in **Tables 4-6** below. The traffic count summary can be found in **Appendix C**.

Table 4. Traffic Count Data AM Peak (7:15 AM – 8:15 AM)

AM Pk	SR-82 EB			SR-82 WB			West River Rd. NB			West River Rd. SB			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	82	490	7	4	318	100	14	68	24	80	24	52	1263
	579			422			106			156			
Truck %	6.0%			5.7%			0.9%			9.6%			5.9%
PHF	0.921												

Table 5. Traffic Count Data PM Peak (4:15 PM – 5:15 PM)

PM Pk	SR-82 EB			SR-82 WB			West River Rd. NB			West River Rd. SB			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	60	482	18	39	601	63	10	29	18	67	58	104	1549
	560			703			57			229			
Truck %	2.0%			2.7%			0%			1.7%			2.2%
PHF	0.915												

Table 6. Traffic Count Data 13-Hour (6:00 AM – 7:00 PM)

13-Hr	SR-82 EB			SR-82 WB			West River Rd. NB			West River Rd. SB			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
Volume	675	4747	142	251	4696	694	187	398	247	666	374	756	13833
	5564			5641			832			1796			
Truck %	6.6%			6.2%			2.4%			5.2%			6.0%

Left Turn Phasing Evaluation

Left Turn Phase Operation Guidelines found in the Traffic Engineering Manual (TEM) were reviewed and permissive left turn phasing is appropriate at this intersection. TEM Table 497-10 can be found in **Appendix D**.

Signal Warrant Analysis

The Ohio Manual of Uniform Traffic Control Devices (OMUTCD) Section 4C lists nine warrants for the installation of a signal. Warrants 1 – 3, using 70% volumes for signal retention, were analyzed using the turning movement count data as shown in **Table 7** below. The full signal warrant analysis can be found in **Appendix E**.

Table 7. Signal Warrants

Signal Warrant		Hours Needed	Hours Met	Warrant Met
		70% Volumes		
1 - Eight Hour Vehicular Volumes		-	-	Yes
1A – Minimum Vehicular Volume		8	10	Yes
1B - Interruption of Continuous Traffic		8	12	Yes
1 A&B - Combination of Warrants	1A	8	11	Yes
	1B	8	12	
2 - Four Hour Volumes		4	12	Yes
3 - Peak Hour Volumes		-	-	Yes

Clearance Interval

Appropriate yellow and all-red clearance intervals are important to safe operation of a signal. Using the clearance interval calculation method provided by the ODOT Office of Traffic Operations (OTO), the calculated clearance intervals are shown in **Table 8** below. A PDF version of the spreadsheet is in **Appendix F**.

Table 8. Existing and Proposed Clearance Intervals

INTERSECTION MOVEMENT	1	2	3	4	5	6	7	8
		SR 82 EB		W River Rd SB		SR 82 WB		W River Rd NB
Yellow Change (Existing)		5.0		4.5		5.0		4.5
Yellow Change (Calculated)		4.8		4.5		4.8		4.5
Yellow Change (Proposed)		5.0		4.5		5.0		4.5
All Red Clearance (Existing)		1.0		1.0		1.0		1.0
All Red Clearance (Calculated)		0.5		0.4		0.4		0.5
All Red Clearance (Proposed)		1.0		1.0		1.0		1.0
Min Green + Yellow Change (Existing)		33.0		16.5		33.0		16.5
Pedestrian Clearance (Calculated)		20.0		17.1		18.6		15.7

Notes include the following:

- Yellow Change Range: 3-6 seconds; Red Clearance Range: 1-6 seconds
- District practice is to round clearance intervals up to the nearest 0.5 seconds.
- Ped Clearance is greater than Min Green + Yellow Change for Phase 4, so minimum green need increased 1 second for Phases 4 and 8.
- Change passage time to 2.0 seconds for all phases due to radar detection.

HCS Capacity Analysis

Highway Capacity Software (HCS) 2024 was used to calculate the delay and associated Level of Service (LOS) at the intersection during the AM and PM peak hours. The average delay time in seconds per vehicle (seconds/vehicle) are shown below in **Table 9**. The full capacity analysis can be found in **Appendix G**.

Table 9. Existing Intersection Level of Service by Approach

Existing Delay s/veh and (LOS)	Intersection Approach				Intersection Combined Delay
	SR 82		West River Rd		
Period	EB	WB	NB	SB	
AM Peak	19.2 (B)	17.8 (B)	28.2 (C)	30.9 (C)	20.9 (C)
PM Peak	19.0 (B)	31.9 (C)	40.7 (D)	44.4 (D)	29.4 (C)

Signal Timing Evaluation

Synchro traffic simulation software was used to calculate a signal timing plan based on site information and peak hour traffic data. Synchro then generates an optimized signal cycle length and signal phasing. Synchro uses the traffic volume and intersection geometry to minimize delay when calculating the cycle length and phase splits. Given ODOT Analysis and Traffic Simulation (OATS) Manual recommendations of major road minimum initial (green) duration of 20 seconds and minor road minimum initial duration of 10 seconds. Synchro calculates maximum green times at the intersection:

- AM Peak = 31.4 seconds for SR82, 23.6 seconds for W. River Rd (55.0 second cycle length)
- PM Peak = 36.4 seconds for SR 82, 23.6 seconds for W. River Rd (60.0 second cycle length)

Existing maximum green times are acceptable.

Recommendations

The following are recommended for implementation:

- Update minimum green time from 12 seconds to 13 seconds Phases 4 & 8
- Update passage time to 2 seconds for all phases due to radar detection

Overall, the intersection is operating well with no major operational issues.

Proposed Conditions Evaluation

Based on the above recommendations, the below **Table 10** shows the proposed operations.

These proposed timings were then analyzed in HCS, and are shown in **Table 10** below:

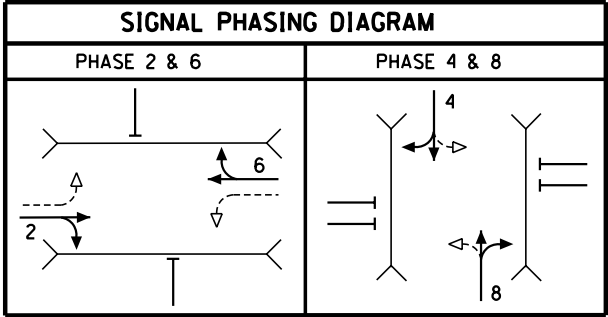
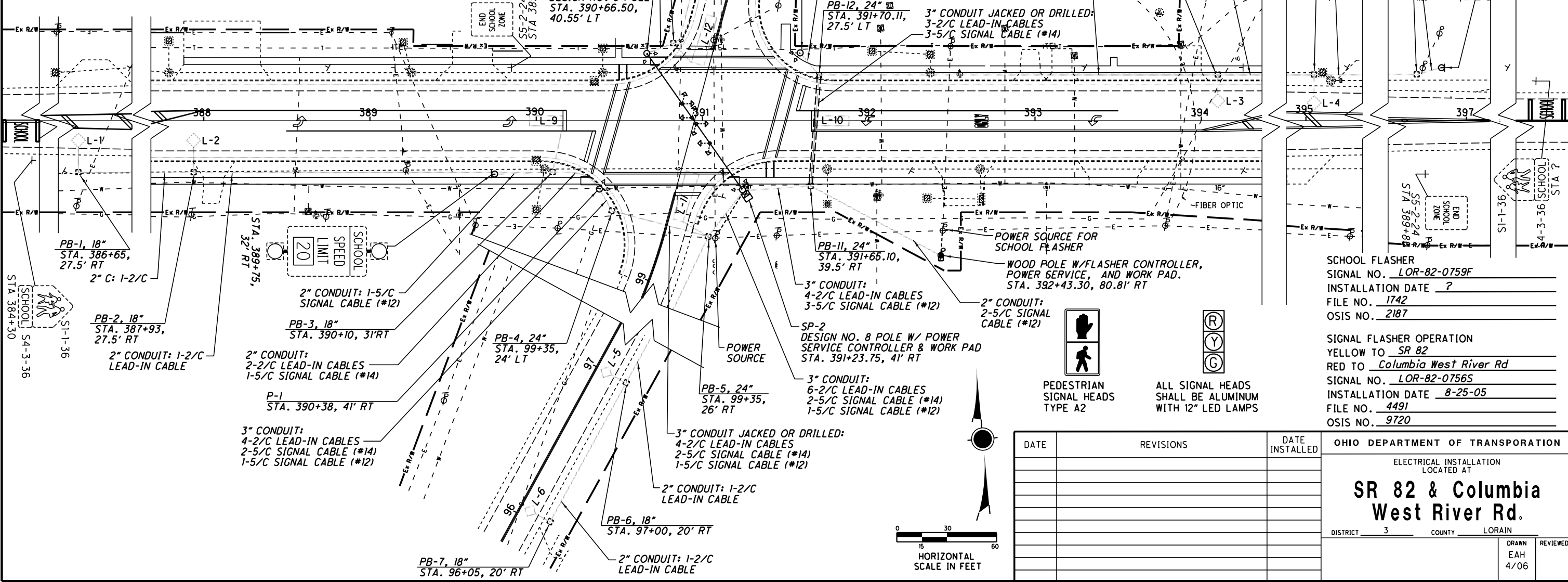
Table 10. Proposed Intersection Level of Service by Approach

Proposed Delay s/veh and (LOS)	Intersection Approach				Intersection Combined Delay
	SR 82		West River Rd		
Period	EB	WB	NB	SB	
AM Peak	20.0 (B)	18.3 (B)	26.9 (B)	28.0 (C)	21.0 (C)
PM Peak	19.0 (B)	32.6 (C)	39.3 (D)	41.2 (D)	29.2 (C)

Appendix A

As-Built Signal Plans

MATERIALS REQUIRED			
ITEM	QTY.	UNITS	DESCRIPTION
603	200	FT	4" CONDUIT, TYPE E
625	2	EACH	LIGHT POLE FOUNDATION, 24" X 6" DEEP, AS PER PLAN
625	1818	FT	CONDUIT, 2" 725.04
625	150	FT	CONDUIT, 3" , 725.04
625	67	FT	CONDUIT JACKED OR DRILLED UNDER PAVEMENT, 3"
625	11	EACH	PULL BOX, 725.08, 18"
625	4	EACH	PULL BOX, 725.08, 24"
625	8	EACH	GROUND ROD, AS PER PLAN
631	2	EACH	SCHOOL SPEED LIMIT SIGN ASSEMBLY, AS PER PLAN, 36" X 60"
632	4	EACH	VEHICULAR SIGNAL HEAD, 3 SECTION, 12" LENS, 2-WAY, APP
632	8	EACH	PEDESTRIAN SIGNAL HEAD, TYPE D2
632	8	EACH	COVERING OF VEHICULAR SIGNAL HEADS, AS PER PLAN
632	8	EACH	COVERING OF PEDESTRIAN SIGNAL HEADS
632	8	EACH	PEDESTRIAN PUSHBUTTON, AS PER PLAN
632	12	EACH	DETECTOR LOOP, AS PER PLAN
632	8	EACH	LOOP DETECTOR UNIT, DELAY AND EXTENSION TYPE, APP
632	100	FT	MESSANGER WIRE, 7 STRAND, 1/4" DIA. WITH ACCESSORIES, APP
632	100	FT	MESSANGER WIRE, 7 STRAND, 3/8" DIAMETER WITH ACCESSORIES
632	259	FT	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
632	219	FT	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG.
632	1928	FT	SIGNAL CABLE, 5 CONDUCTOR, NO. 12 AWG
632	2	EACH	STRAIN POLE FOUNDATION, AS PER PLAN
632	2	EACH	PEDESTAL FOUNDATION
632	3303	FT	LOOP DETECTOR LEAD-IN CABLE
632	60	FT	POWER CABLE, 3 CONDUCTOR, NO. 8 AWG.
632	2	EACH	POWER SERVICE, AS PER PLAN
632	2	EACH	CONDUIT RISER, 2" DIAMETER
632	2	EACH	STRAIN POLE, TYPE TC-81.10, DESIGN 8
632	1	EACH	WOOD POLE
632	2	EACH	PEDESTAL, 10', TRANSFORMER BASE
632	2	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	2	EACH	SIGNALIZATION MISC.: STEEL STRAIN POLE, 7-1/2" DIAMETER, 10-1/2" BOLT CIRCLE, 11 GAUGE, 15', AS PER PLAN
632	1	EACH	SIGNALIZATION MISC.: METER BASE, 100 AMP WITH BYPASS
633	1	EACH	CONTROLLER UNIT, TYPE TS2/A2, W/CABINET, TYPE TS1, APP(8-PHASE)
633	2	EACH	CABINET FOUNDATION
633	2	EACH	CONTROLLER WORK PAD
633	1	EACH	CONTROLLER ITEM, MISC.: FLASHER CONTROLLER, WEEKLY PROGRAMMER



LOOP DETECTOR CHART						
LOOP	SIZE (FT)	NO. OF TURNS	MODE	DELAY* (SEC)	CONNECT TO DETECTOR UNIT NO.	ASSOCIATED CONTROLLER PHASE
L-1	6x6	4	PULSE		1	2 & 6
L-2	6x6	4	PULSE		1	2 & 6
L-3	6x6	4	PULSE		2	2 & 6
L-4	6x6	4	PULSE		2	2 & 6
L-5	5x5	4	PULSE	3	3	4 & 8
L-6	5x5	4	PULSE	3	3	4 & 8
L-7	5x5	4	PULSE	3	4	4 & 8
L-8	5x5	4	PULSE	3	4	4 & 8
L-9	6x20	3	PRESENCE		5	2 & 6
L-10	6x20	3	PRESENCE		6	2 & 6
L-11	6x8x30	3	PRESENCE	10	7	4 & 8
L-12	6x8x30	3	PRESENCE	10	8	4 & 8

* INHIBIT DELAY DURING ASSOCIATED PHASE

SCHOOL FLASHER
SIGNAL NO. LOR-82-0759F
INSTALLATION DATE ?
FILE NO. 1742
OSIS NO. 2187

SIGNAL FLASHER OPERATION
YELLOW TO SR 82
RED TO Columbia West River Rd
SIGNAL NO. LOR-82-0756S
INSTALLATION DATE 8-25-05
FILE NO. 4491
OSIS NO. 9720

DATE		REVISIONS	DATE INSTALLED		OHIO DEPARTMENT OF TRANSPORTATION	
					ELECTRICAL INSTALLATION LOCATED AT	
					SR 82 & Columbia West River Rd.	
					DISTRICT <u>3</u>	COUNTY <u>LORAIN</u>
					DRAWN <u>EAH</u>	REVIEWED
					4/06	

Appendix B

Crash Diagram

CRASH DIAGRAM

LOR-082-07.56

SR-82/CR-60

Date: 1/1/2020 - 12/31/2024

West River
Rd.

Crashes By Year

2020: 1
2021: 3
2022: 1
2023: 3
2024: 1
Total: 9

Crashes By Type

Rear End: 4 (45%)
Angle: 2 (22%)
Left Turn: 1 (11%)
Sideswipe- Passing : 1 (11%)
Right Turn: 1 (11%)

Crashes By Severity

Fatal: 0 (0%)
Injury: 3 (33%)
PDO: 6 (67%)

Crashes By Road Condition

Dry: 9 (100%)
Wet: 0 (0%)
Snow/Ice: 0 (0%)



Legend:

Symbols		Types of Collisions	
	Other		Rear End
	Backing Vehicle		Head On
	Pedestrian		Side-Swipe Passing
	Parked Vehicle		Side-Swipe Meeting
	Fixed Object		Out-of-Control
	Fatal Crash		Angle
	Injury Crash		Angle
	Signal		Left Turn
	Street Name		Right Turn
	Stop Sign		Right Turn
	Animal		Right Turn

Diagram Label Key

Date/Hour/Road Condition
(F) = Fell Asleep (D) = Distracted

Appendix C

Traffic Count



Ohio Department of Transportation - Safety
 1980 West Broad Street
 Mail Stop 5160
 Columbus, Ohio, United States 43223
 +16147528099 jared.feller@dot.state.oh.us
 Office of Traffic Engineering

Count Name: LOR-82-7.56
 Site Code:
 Start Date: 04/09/2025
 Page No: 1

Turning Movement Data

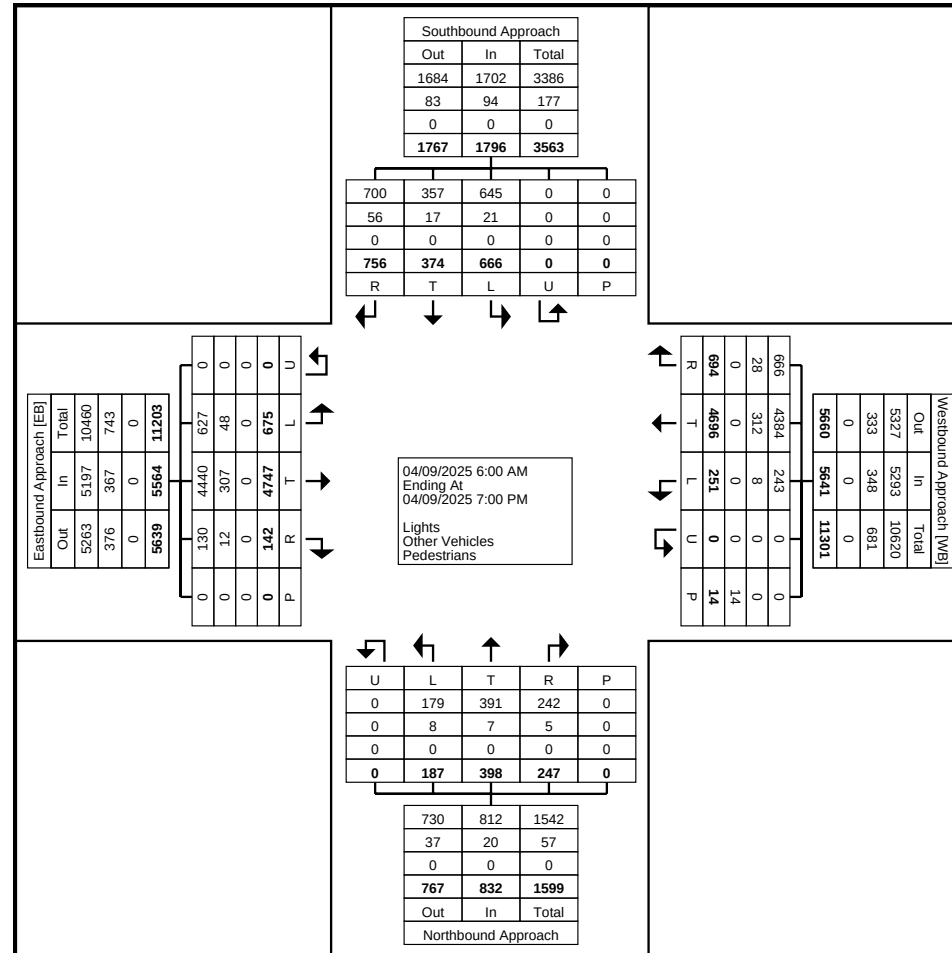
Start Time	Southbound Approach						Westbound Approach						Northbound Approach						Eastbound Approach						Int. Total
	Southbound						Westbound						Northbound						Eastbound						
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
6:00 AM	3	1	4	0	0	8	4	30	0	0	0	34	3	2	2	0	0	7	1	61	12	0	0	74	123
6:15 AM	6	0	1	0	0	7	2	35	1	0	0	38	3	6	2	0	0	11	1	89	8	0	0	98	154
6:30 AM	5	1	10	0	0	16	5	67	1	0	0	73	1	10	1	0	0	12	4	104	12	0	0	120	221
6:45 AM	10	2	5	0	0	17	10	76	1	0	0	87	5	13	4	0	0	22	2	121	11	0	0	134	260
Hourly Total	24	4	20	0	0	48	21	208	3	0	0	232	12	31	9	0	0	52	8	375	43	0	0	426	758
7:00 AM	7	3	6	0	0	16	20	80	1	0	0	101	11	14	3	0	0	28	0	99	18	0	0	117	262
7:15 AM	19	10	36	0	0	65	30	76	1	0	0	107	3	22	6	0	0	31	1	111	18	0	0	130	333
7:30 AM	10	6	16	0	0	32	22	93	1	0	0	116	9	25	4	0	0	38	3	136	18	0	0	157	343
7:45 AM	12	1	13	0	0	26	20	75	2	0	0	97	10	12	1	0	0	23	1	134	25	0	0	160	306
Hourly Total	48	20	71	0	0	139	92	324	5	0	0	421	33	73	14	0	0	120	5	480	79	0	0	564	1244
8:00 AM	11	7	15	0	0	33	28	74	0	0	0	102	2	9	3	0	0	14	2	109	21	0	0	132	281
8:15 AM	27	4	24	0	0	55	9	75	3	0	0	87	4	10	4	0	0	18	1	102	15	0	0	118	278
8:30 AM	10	5	6	0	0	21	7	60	1	0	0	68	3	7	2	0	0	12	0	71	13	0	0	84	185
8:45 AM	11	5	8	0	0	24	6	52	1	0	0	59	4	13	3	0	0	20	3	101	8	0	0	112	215
Hourly Total	59	21	53	0	0	133	50	261	5	0	0	316	13	39	12	0	0	64	6	383	57	0	0	446	959
9:00 AM	8	5	6	0	0	19	8	53	4	0	0	65	6	7	4	0	0	17	1	69	10	0	0	80	181
9:15 AM	6	3	7	0	0	16	3	56	0	0	0	59	4	4	0	0	0	8	1	91	10	0	0	102	185
9:30 AM	7	2	1	0	0	10	9	53	6	0	0	68	5	8	1	0	0	14	1	82	10	0	0	93	185
9:45 AM	12	8	6	0	0	26	11	60	4	0	0	75	5	7	4	0	0	16	3	68	9	0	0	80	197
Hourly Total	33	18	20	0	0	71	31	222	14	0	0	267	20	26	9	0	0	55	6	310	39	0	0	355	748
10:00 AM	6	8	13	0	0	27	10	52	1	0	0	63	8	6	12	0	0	26	8	79	11	0	0	98	214
10:15 AM	9	7	6	0	0	22	17	56	5	0	0	78	3	4	4	0	0	11	4	65	13	0	0	82	193
10:30 AM	15	6	21	0	0	42	7	58	5	0	0	70	5	6	0	0	0	11	2	68	8	0	0	78	201
10:45 AM	9	5	6	0	0	20	8	58	5	0	0	71	6	7	1	0	0	14	4	75	6	0	0	85	190
Hourly Total	39	26	46	0	0	111	42	224	16	0	0	282	22	23	17	0	0	62	18	287	38	0	0	343	798
11:00 AM	11	3	17	0	0	31	9	61	2	0	0	72	6	4	2	0	0	12	0	69	11	0	0	80	195
11:15 AM	7	1	12	0	0	20	12	56	3	0	0	71	7	0	6	0	0	13	1	78	10	0	0	89	193
11:30 AM	12	6	16	0	0	34	11	75	3	0	0	89	6	3	3	0	0	12	6	85	11	0	0	102	237
11:45 AM	10	2	6	0	0	18	14	66	4	0	0	84	4	8	6	0	0	18	1	97	12	0	0	110	230
Hourly Total	40	12	51	0	0	103	46	258	12	0	0	316	23	15	17	0	0	55	8	329	44	0	0	381	855
12:00 PM	12	4	12	0	0	28	19	86	8	0	0	113	6	4	2	0	0	12	2	74	9	0	0	85	238
12:15 PM	17	2	11	0	0	30	15	72	6	0	0	93	4	2	3	0	0	9	0	63	11	0	0	74	206
12:30 PM	12	4	11	0	0	27	8	103	5	0	0	116	5	7	3	0	0	15	5	77	14	0	0	96	254
12:45 PM	12	6	10	0	0	28	12	85	4	0	0	101	7	5	2	0	0	14	0	63	14	0	0	77	220

Hourly Total	53	16	44	0	0	113	54	346	23	0	0	423	22	18	10	0	0	50	7	277	48	0	0	332	918
1:00 PM	20	4	7	0	0	31	8	82	11	0	0	101	4	3	2	0	0	9	3	85	15	0	0	103	244
1:15 PM	16	8	8	0	0	32	15	84	6	0	1	105	2	5	1	0	0	8	4	90	9	0	0	103	248
1:30 PM	9	2	14	0	0	25	8	86	7	0	0	101	4	4	2	0	0	10	5	78	11	0	0	94	230
1:45 PM	18	4	6	0	0	28	13	67	2	0	0	82	2	4	2	0	0	8	4	88	12	0	0	104	222
Hourly Total	63	18	35	0	0	116	44	319	26	0	1	389	12	16	7	0	0	35	16	341	47	0	0	404	944
2:00 PM	13	8	14	0	0	35	19	94	7	0	0	120	6	9	2	0	0	17	2	68	12	0	0	82	254
2:15 PM	14	5	23	0	0	42	22	82	8	0	0	112	5	13	6	0	0	24	2	80	11	0	0	93	271
2:30 PM	13	22	26	0	0	61	7	123	1	0	0	131	2	5	4	0	0	11	5	87	20	0	0	112	315
2:45 PM	19	6	17	0	0	42	21	120	4	0	8	145	6	20	28	0	0	54	6	106	12	0	0	124	365
Hourly Total	59	41	80	0	0	180	69	419	20	0	8	508	19	47	40	0	0	106	15	341	55	0	0	411	1205
3:00 PM	17	14	15	0	0	46	7	184	9	0	2	200	4	4	4	0	0	12	7	112	12	0	0	131	389
3:15 PM	31	9	29	0	0	69	10	158	7	0	1	175	5	7	4	0	0	16	0	92	18	0	0	110	370
3:30 PM	33	16	16	0	0	65	12	180	10	0	0	202	4	5	0	0	0	9	2	96	10	0	0	108	384
3:45 PM	28	15	19	0	0	62	15	154	7	0	0	176	1	6	3	0	0	10	4	131	15	0	0	150	398
Hourly Total	109	54	79	0	0	242	44	676	33	0	3	753	14	22	11	0	0	47	13	431	55	0	0	499	1541
4:00 PM	12	19	13	0	0	44	22	129	7	0	0	158	6	10	4	0	0	20	5	114	7	0	0	126	348
4:15 PM	28	15	20	0	0	63	24	141	12	0	0	177	4	4	2	0	0	10	2	138	15	0	0	155	405
4:30 PM	32	16	20	0	0	68	12	161	6	0	0	179	5	6	3	0	0	14	5	109	13	0	0	127	388
4:45 PM	25	10	16	0	0	51	9	145	13	0	0	167	4	9	2	0	0	15	3	84	13	0	0	100	333
Hourly Total	97	60	69	0	0	226	67	576	38	0	0	681	19	29	11	0	0	59	15	445	48	0	0	508	1474
5:00 PM	19	17	11	0	0	47	18	154	8	0	0	180	5	10	3	0	0	18	8	151	19	0	0	178	423
5:15 PM	20	16	16	0	0	52	24	142	4	0	0	170	5	3	2	0	0	10	3	103	20	0	0	126	358
5:30 PM	16	19	18	0	0	53	20	121	8	0	0	149	5	8	4	0	0	17	3	121	22	0	0	146	365
5:45 PM	16	13	10	0	0	39	12	101	11	0	0	124	4	8	1	0	0	13	1	79	18	0	0	98	274
Hourly Total	71	65	55	0	0	191	74	518	31	0	0	623	19	29	10	0	0	58	15	454	79	0	0	548	1420
6:00 PM	18	5	14	0	0	37	16	107	5	0	2	128	7	8	9	0	0	24	4	83	9	0	0	96	285
6:15 PM	12	6	8	0	0	26	15	93	5	0	0	113	6	8	4	0	0	18	2	69	12	0	0	83	240
6:30 PM	14	6	11	0	0	31	14	74	7	0	0	95	4	9	3	0	0	16	1	70	12	0	0	83	225
6:45 PM	17	2	10	0	0	29	15	71	8	0	0	94	2	5	4	0	0	11	3	72	10	0	0	85	219
Hourly Total	61	19	43	0	0	123	60	345	25	0	2	430	19	30	20	0	0	69	10	294	43	0	0	347	969
Grand Total	756	374	666	0	0	1796	694	4696	251	0	14	5641	247	398	187	0	0	832	142	4747	675	0	0	5564	13833
Approach %	42.1	20.8	37.1	0.0	-	-	12.3	83.2	4.4	0.0	-	-	29.7	47.8	22.5	0.0	-	-	2.6	85.3	12.1	0.0	-	-	-
Total %	5.5	2.7	4.8	0.0	-	13.0	5.0	33.9	1.8	0.0	-	40.8	1.8	2.9	1.4	0.0	-	6.0	1.0	34.3	4.9	0.0	-	40.2	-
Lights	700	357	645	0	-	1702	666	4384	243	0	-	5293	242	391	179	0	-	812	130	4440	627	0	-	5197	13004
% Lights	92.6	95.5	96.8	-	-	94.8	96.0	93.4	96.8	-	-	93.8	98.0	98.2	95.7	-	-	97.6	91.5	93.5	92.9	-	-	93.4	94.0
Other Vehicles	56	17	21	0	-	94	28	312	8	0	-	348	5	7	8	0	-	20	12	307	48	0	-	367	829
% Other Vehicles	7.4	4.5	3.2	-	-	5.2	4.0	6.6	3.2	-	-	6.2	2.0	1.8	4.3	-	-	2.4	8.5	6.5	7.1	-	-	6.6	6.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	14	-	-	-	-	-	0	-	-	-	-	0	-	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Ohio Department of Transportation - Safety
1980 West Broad Street
Mail Stop 5160
Columbus, Ohio, United States 43223
+16147528099 jared.feller@dot.state.oh.us
Office of Traffic Engineering

Count Name: LOR-82-7.56
Site Code:
Start Date: 04/09/2025
Page No: 3



Turning Movement Data Plot



Count Name: LOR-82-7.56
Site Code:
Start Date: 04/09/2025
Page No: 4

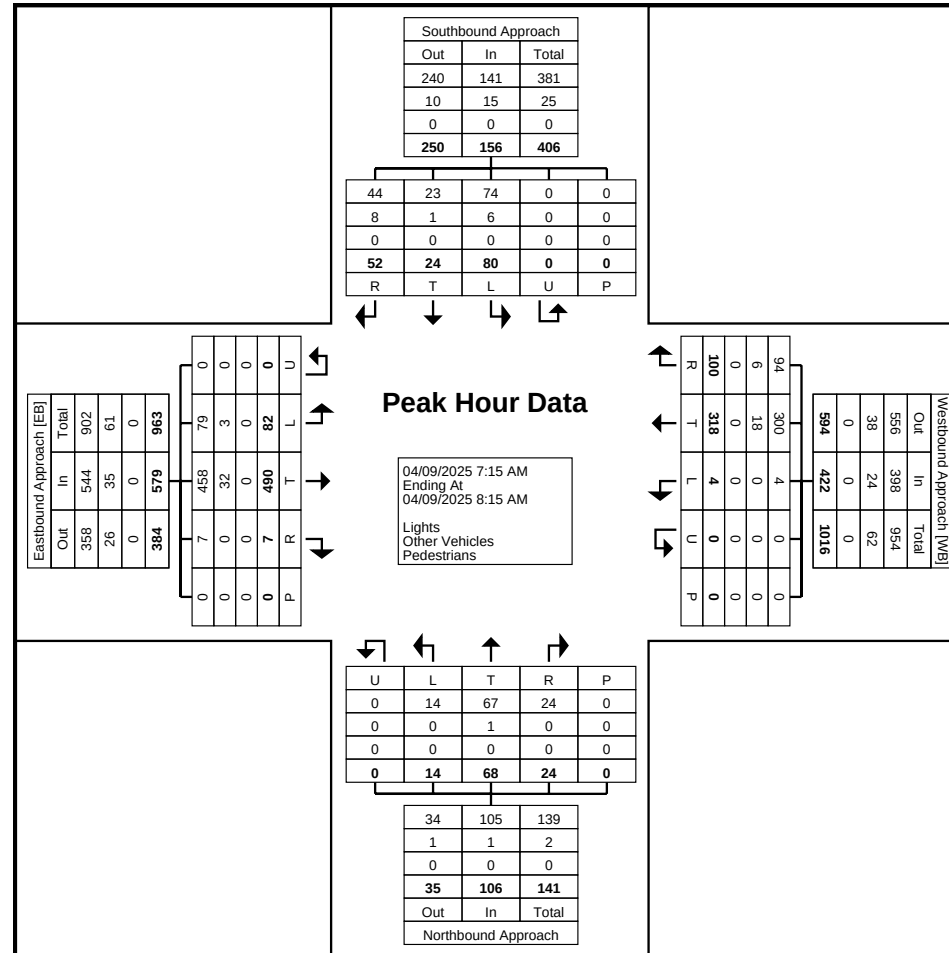
Turning Movement Peak Hour Data (7:15 AM)

[illegible]



Ohio Department of Transportation - Safety
1980 West Broad Street
Mail Stop 5160
Columbus, Ohio, United States 43223
+16147528099 jared.feller@dot.state.oh.us
Office of Traffic Engineering

Count Name: LOR-82-7.56
Site Code:
Start Date: 04/09/2025
Page No: 5



Turning Movement Peak Hour Data Plot (7:15 AM)



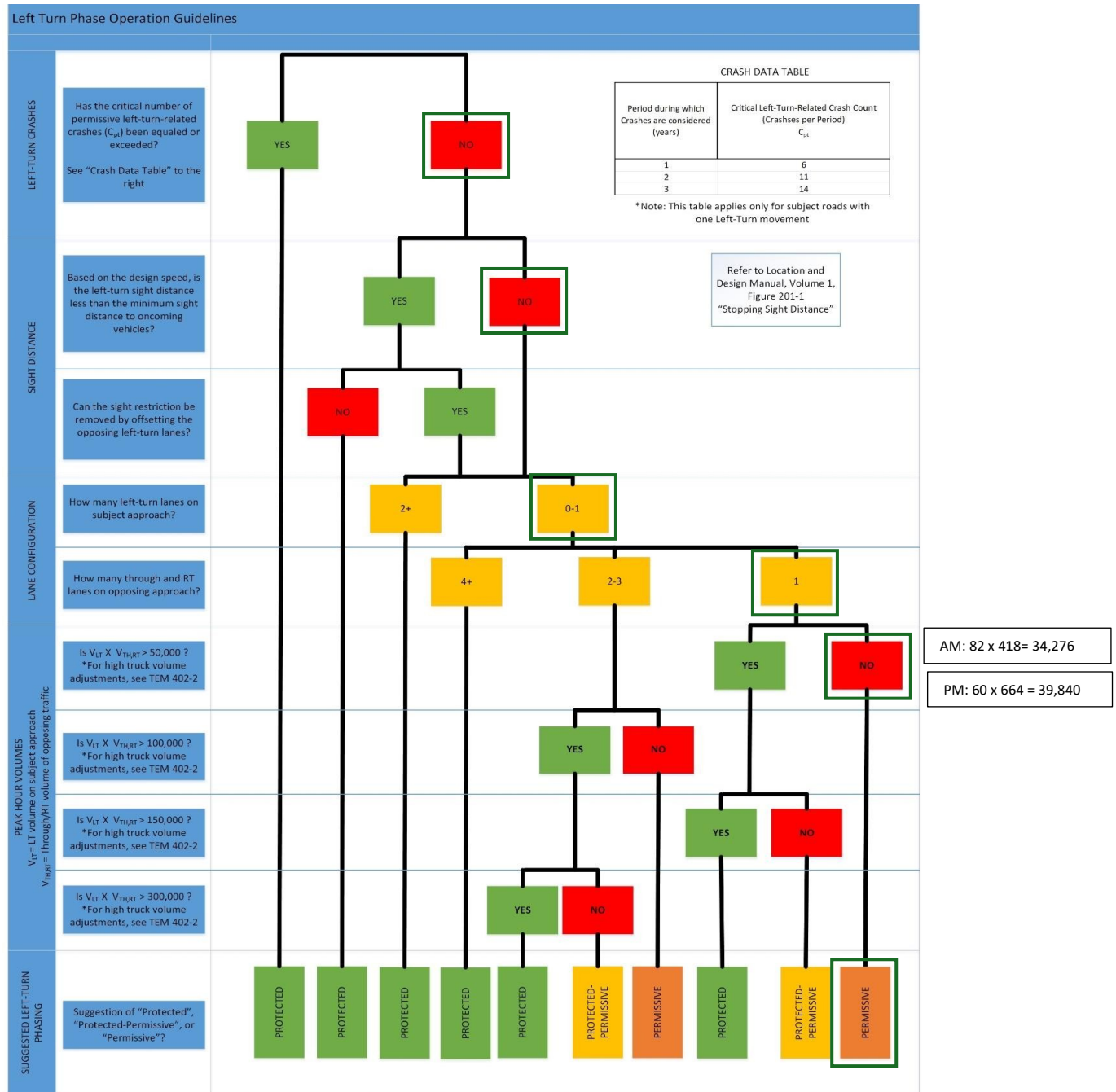
Turning Movement Peak Hour Data (4:15 PM)

[illegible]

Appendix D

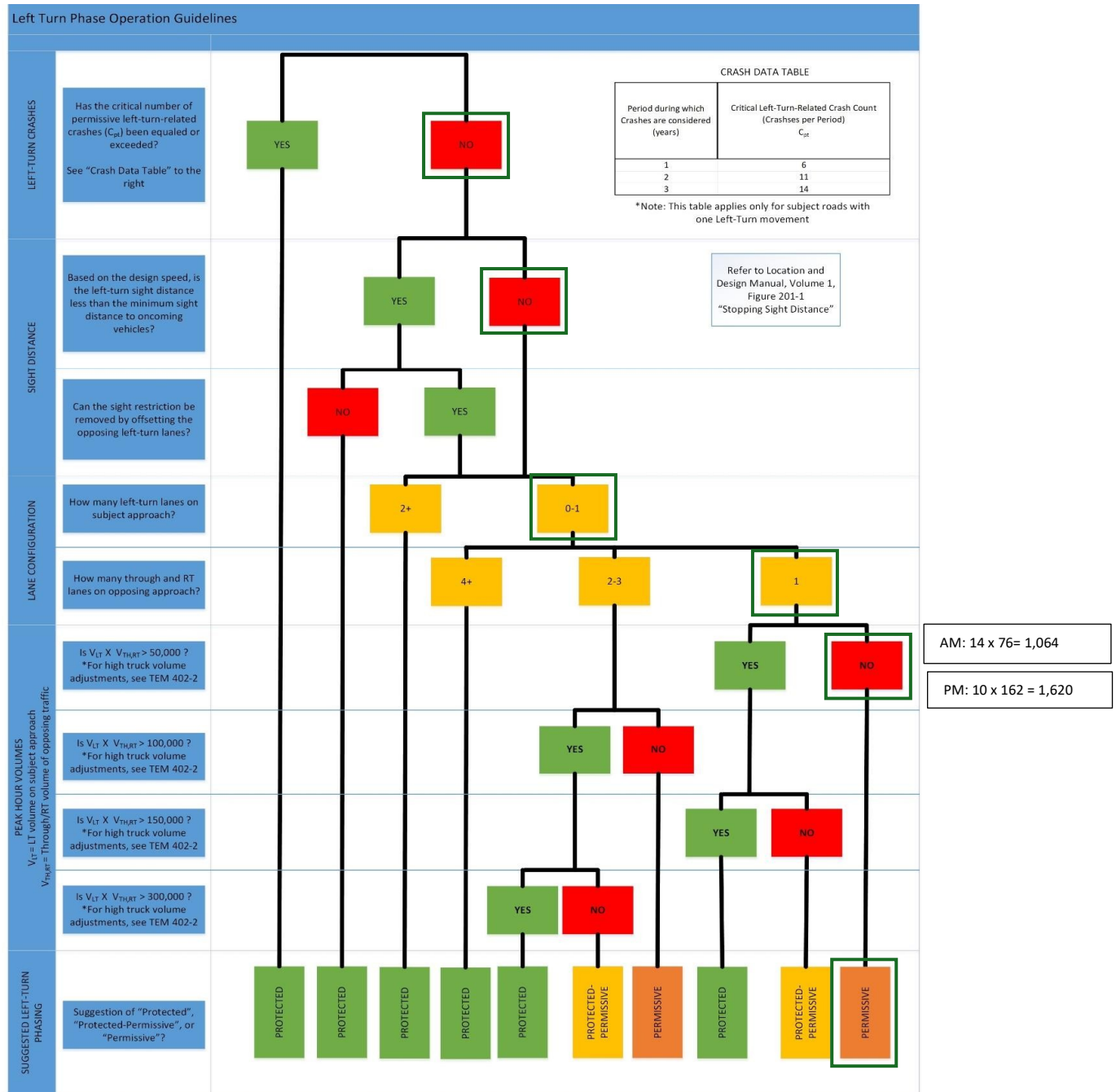
Left Turn Phasing Evaluation

Eastbound Left Turn Phase Operation Guidelines



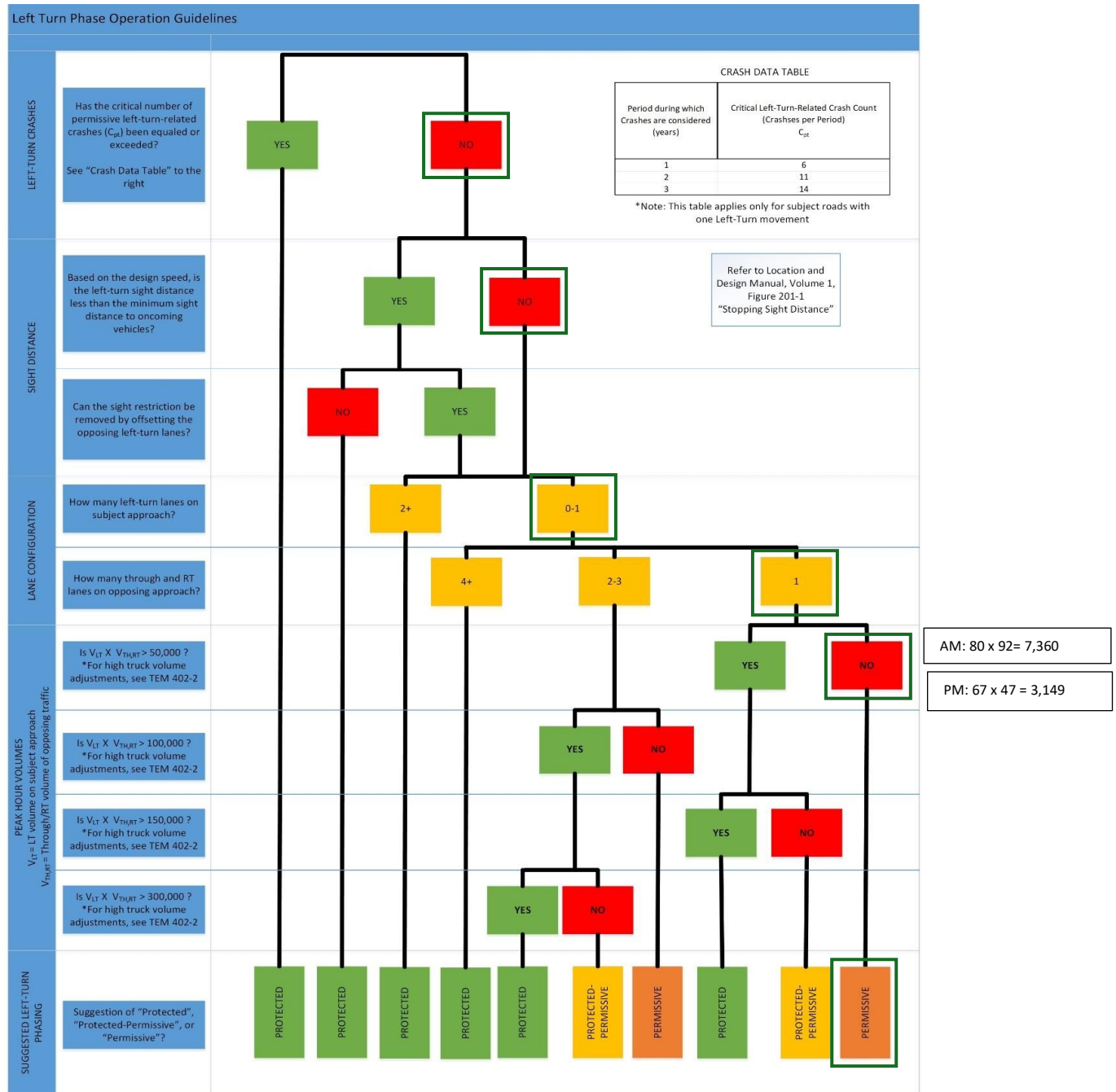
[Link to Location and Design Manual, Volume 1](#)

Northbound Left Turn Phase Operation Guidelines



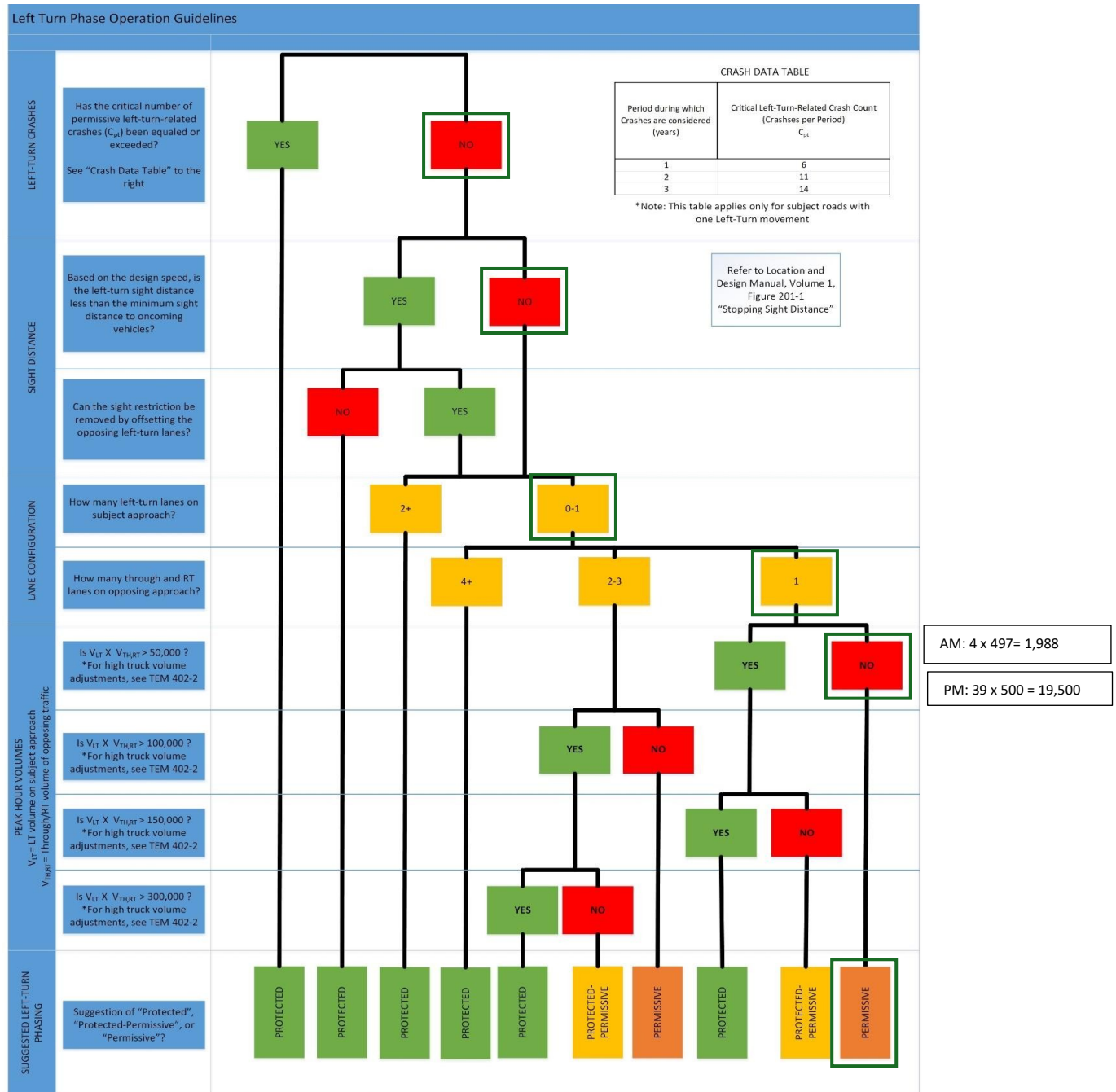
[Link to Location and Design Manual, Volume 1](#)

Southbound Left Turn Phase Operation Guidelines



[Link to Location and Design Manual, Volume 1](#)

Westbound Left Turn Phase Operation Guidelines



[Link to Location and Design Manual, Volume 1](#)

Appendix E

Signal Warrant Analysis

STUDY AND ANALYSIS INFORMATION

Municipality:	N/A	Traffic Volumes Obtained By:	Counting Cars
County:	Lorain	Analysis Date:	7/1/2025
ODOT Engineering District:	3	Agency/ Company Name Performing Warrant Analysis:	ODOT D03
Google map link:	Map		

Analysis Information

Data Collection Date:	5/23/2024
Day of the Week:	Thursday

Is the intersection in a built-up area of an isolated community of <10,000 population?	No
--	----

Existing Traffic Signal at intersection:	Yes
--	-----

Total Number of Approaches at Intersection:	4
---	---

Major Street Information

Major Street Name and Route Number:	SR 82
-------------------------------------	-------

Major Street Approach Direction:	E-Bound
	W-Bound

Number of Thru Lanes on Each Major Street Approach:	1	LANE(S)
---	---	---------

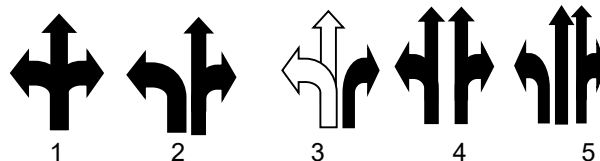
Speed Limit or 85th Percentile Speed on the Major Street*:	45	MPH
--	----	-----

*Unknown assumes below 45 mph

Minor Street Information

Minor Street Name and Route Number:	West River Road (CR 60)
-------------------------------------	-------------------------

Minor Street Approach Configuration:	1	N-Bound
	1	S-Bound



Number of Thru Lanes on Each Minor Street Approach:	1	LANE(S)
---	---	---------

Apply Right Turn Lane Reduction*:	No
-----------------------------------	----

*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

Warrant			Notes and Comments:			
	Applicable?	Satisfied?				
Warrant 1, Eight-Hour Vehicular Volume	Yes	Yes	Condition B was met. Condition A (70%) was met. Condition B (70%) was met. Combination of A/B (56%) was met.*			
Warrant 2, Four-Hour Vehicular Volume	Yes	Yes	Figure 4C-1 (100%)			
Warrant 3, Peak Hour	Yes	Yes	Signals installed under Warrant 3 should be traffic actuated.			
For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2)			<table><tr><td>Peak Hour</td></tr><tr><td>3:00 PM</td></tr><tr><td>4:00 PM</td></tr></table>	Peak Hour	3:00 PM	4:00 PM
Peak Hour						
3:00 PM						
4:00 PM						
Warrant 4, Pedestrian Volume	No		If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD.			
Warrant 5, School Crossing	No		N/A			
Warrant 6, Coordinated Signal System	No		(Shall not be used as the sole warrant in the analysis)			
Warrant 7, Crash Experience	No		If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.			
Warrant 8, Roadway Network	No		(Shall not be used as the sole warrant in the analysis)			
Warrant 9, Intersection Near a Grade Crossing	No		Figure 4C-9			
Multi-Way Stop Warrant	No		May be used as an interim measure if traffic signal warrants are satisfied.			

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

If no warrants are satisfied, additional options may be considered:

1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.
2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The **Modeling and Forecasting Section** should provide the projected traffic volumes.
3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. **Please fill inputs on PHB Score Sheet and submit to ODOT.**

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: Retain Existing Traffic Signal

Notes:

OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic
on Each Approach

Major Street: 1 Lane

Minor Street: 1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? **Yes**

*Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)

Lanes Major/ Minor	Adjusted Volumes		Condition A				Condition B				Combination A/B*							
			100%		70%		100%		70%		Cond. A		Cond. B		Cond. A		Cond. B	
	Major	Minor	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.
1 / 1	X		500	150	350	105	750	75	525	53	400	120	600	60	280	84	420	42
2+ / 1			600	150	420	105	900	75	630	53	480	120	720	60	336	84	504	42
2+ / 2+			600	200	420	140	900	100	630	70	480	160	720	80	336	112	504	56
1 / 2+			500	200	350	140	750	100	525	70	400	160	600	80	280	112	420	56
12:00 AM	0	0																
12:15 AM	0	0																
12:30 AM	0	0																
12:45 AM	0	0																
1:00 AM	0	0																
1:15 AM	0	0																
1:30 AM	0	0																
1:45 AM	0	0																
2:00 AM	0	0																
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4:15 AM	0	0																
4:30 AM	0	0																
4:45 AM	0	0																
5:00 AM	0	0																
5:15 AM	108	8																
5:30 AM	244	18																
5:45 AM	437	31			1						1				1		1	
6:00 AM	658	52	1						1				1					
6:15 AM	768	73					1											
6:30 AM	869	114																
6:45 AM	949	130			1	1					1	1			1	1	1	1
7:00 AM	985	139	1						1	1			1	1				
7:15 AM	1001	156					1	1										
7:30 AM	969	146																
7:45 AM	848	135			1	1					1	1			1	1	1	1
8:00 AM	762	133	1						1	1			1	1				
8:15 AM	673	119																
8:30 AM	629	80																
8:45 AM	638	69			1						1				1		1	1
9:00 AM	622	71	1						1	1			1	1				
9:15 AM	638	79																
9:30 AM	637	85																
9:45 AM	624	117			1	1					1				1	1	1	1

ODOT Signal Warrant Spreadsheet_March2022

10:00 AM	625	111	1						1	1			1	1				
10:15 AM	616	115																
10:30 AM	616	113																
10:45 AM	659	105			1	1				1					1	1	1	1
11:00 AM	697	103	1						1	1			1	1				
11:15 AM	743	100																
11:30 AM	750	110					1	1										
11:45 AM	771	103			1						1				1	1	1	1
12:00 PM	755	113	1						1	1			1	1				
12:15 PM	761	116																
12:30 PM	802	118					1	1										
12:45 PM	785	116			1	1					1				1	1	1	1
1:00 PM	793	116	1						1	1			1	1				
1:15 PM	791	120																
1:30 PM	788	130					1	1										
1:45 PM	836	166			1	1					1	1			1	1	1	1
2:00 PM	919	180	1	1					1	1			1	1				
2:15 PM	1048	191																
2:30 PM	1128	218					1	1										
2:45 PM	1195	222			1	1					1	1			1	1	1	1
3:00 PM	1252	242	1	1					1	1			1	1				
3:15 PM	1205	240																
3:30 PM	1252	234					1	1										
3:45 PM	1248	237			1	1					1	1			1	1	1	1
4:00 PM	1189	226	1	1					1	1			1	1				
4:15 PM	1263	229																
4:30 PM	1227	218					1	1										
4:45 PM	1216	203			1	1					1	1			1	1	1	1
5:00 PM	1171	191	1	1					1	1			1	1				
5:15 PM	1037	181																
5:30 PM	937	155					1	1										
5:45 PM	820	133			1	1					1	1			1	1	1	1
6:00 PM	777	123	1						1	1			1	1				
6:15 PM	553	86																
6:30 PM	357	60																
6:45 PM	179	29																
7:00 PM	0	0																
7:15 PM	0	0																
7:30 PM	0	0																
7:45 PM	0	0																
8:00 PM	0	0																
8:15 PM	0	0																
8:30 PM	0	0																
8:45 PM	0	0																
9:00 PM	0	0																
9:15 PM	0	0																
9:30 PM	0	0																
9:45 PM	0	0																
HOURS MET			13	4	13	10	9	8	13	12	13	7	13	12	13	11	13	12
WARRANT SATISFIED?			NO		YES		YES		YES		NO		YES		YES			

Warrant Met: **Yes**

Notes: Condition B was met. Condition A (70%) was met. Condition B (70%) was met. Combination of A/B (56%) was met.*

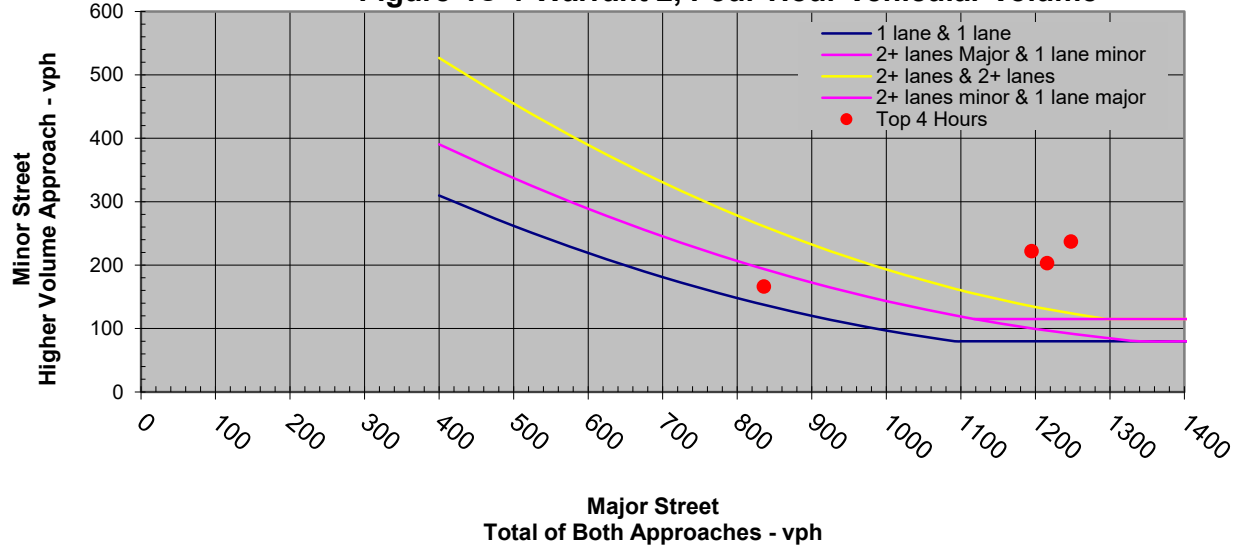
OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	Total Number of Unique Hours Met on Figure 4C-1	6
Major street: 1 Lane	Total Number of Unique Hours Met on Figure 4C-2 (70% Factor)	12
Minor Street: 1 Lane		

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? Yes

Hour Interval Beginning At	Raw Traffic Counts				Total Major Approach Volumes	Highest Actual Minor Street Approach Volumes	Hour Met?	Hour Met? (70% Factor)
	Minor - West River Road (CR 60)		Major - SR 82					
	N-Bound	S-Bound	W-Bound	E-Bound				
6:00 AM	52	48	232	426	658	52		
6:15 AM	73	56	299	469	768	73		Met
6:30 AM	93	114	368	501	869	114		
6:45 AM	119	130	411	538	949	130	Met	
7:00 AM	120	139	421	564	985	139		
7:15 AM	106	156	422	579	1001	156		Met
7:30 AM	93	146	402	567	969	146		
7:45 AM	67	135	354	494	848	135	Met	
8:00 AM	64	133	316	446	762	133		
8:15 AM	67	119	279	394	673	119		Met
8:30 AM	57	80	251	378	629	80		
8:45 AM	59	69	251	387	638	69		
9:00 AM	55	71	267	355	622	71		
9:15 AM	64	79	265	373	638	79		
9:30 AM	67	85	284	353	637	85		
9:45 AM	64	117	286	338	624	117		Met
10:00 AM	62	111	282	343	625	111		
10:15 AM	48	115	291	325	616	115		
10:30 AM	50	113	284	332	616	113		
10:45 AM	51	105	303	356	659	105		Met
11:00 AM	55	103	316	381	697	103		
11:15 AM	55	100	357	386	743	100		
11:30 AM	51	110	379	371	750	110		
11:45 AM	54	103	406	365	771	103		Met
12:00 PM	50	113	423	332	755	113		
12:15 PM	47	116	411	350	761	116		
12:30 PM	46	118	423	379	802	118		
12:45 PM	41	116	408	377	785	116		Met
1:00 PM	35	116	389	404	793	116		
1:15 PM	43	120	408	383	791	120		
1:30 PM	59	130	415	373	788	130		
1:45 PM	60	166	445	391	836	166	Met	Met
2:00 PM	106	180	508	411	919	180		
2:15 PM	101	191	588	460	1048	191		
2:30 PM	93	218	651	477	1128	218		
2:45 PM	91	222	722	473	1195	222	Met	Met
3:00 PM	47	242	753	499	1252	242		
3:15 PM	55	240	711	494	1205	240		
3:30 PM	49	234	713	539	1252	234		
3:45 PM	54	237	690	558	1248	237	Met	Met
4:00 PM	59	226	681	508	1189	226		
4:15 PM	57	229	703	560	1263	229		
4:30 PM	57	218	696	531	1227	218		
4:45 PM	60	203	666	550	1216	203	Met	Met
5:00 PM	58	191	623	548	1171	191		
5:15 PM	64	181	571	466	1037	181		
5:30 PM	72	155	514	423	937	155		
5:45 PM	71	133	460	360	820	133		Met
6:00 PM	69	123	430	347	777	123		
6:15 PM	45	86	302	251	553	86		
6:30 PM	27	60	189	168	357	60		
6:45 PM	11	29	94	85	179	29		
7:00 PM	0	0	0	0	0	0		
7:15 PM	0	0	0	0	0	0		
7:30 PM	0	0	0	0	0	0		
7:45 PM	0	0	0	0	0	0		
8:00 PM	0	0	0	0	0	0		

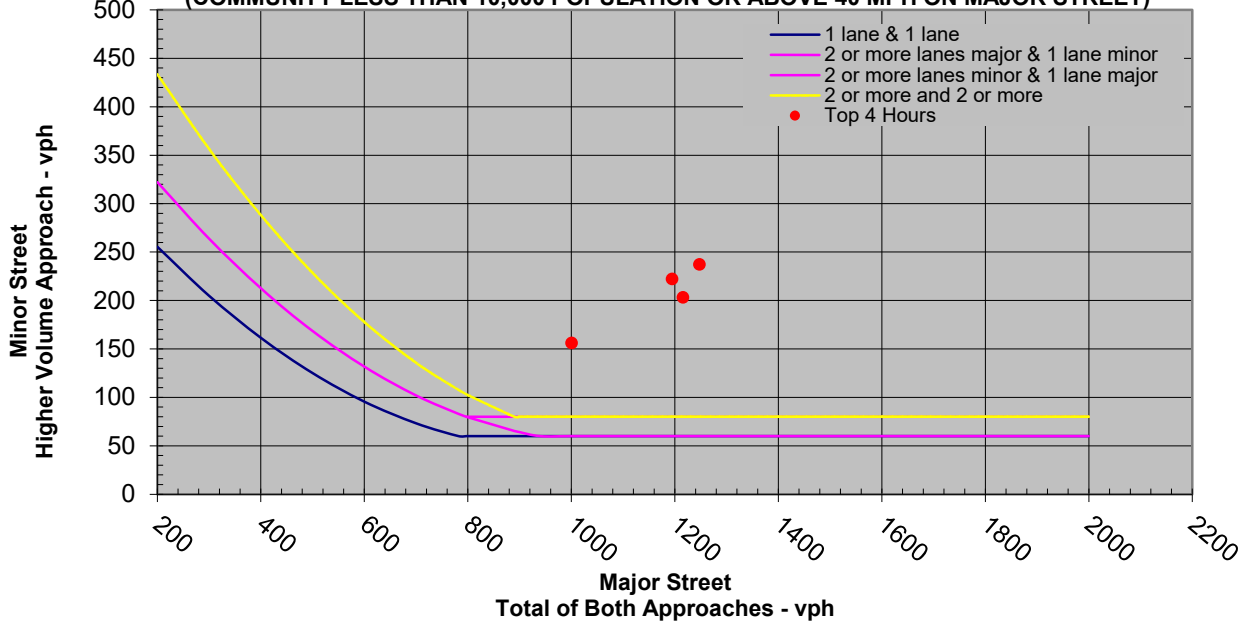
Figure 4C-1 Warrant 2, Four-Hour Vehicular Volume



Top Hours for Figure 4C-1	Start Time	End Time	Major Street	Minor Street
Top Hour	3:45 PM	4:45 PM	1248	237
2nd Highest Hour	2:45 PM	3:45 PM	1195	222
3rd Highest Hour	4:45 PM	5:45 PM	1216	203
4th Highest Hour	1:45 PM	2:45 PM	836	166

Top Hours for Figure 4C-2	Start Time	End Time	Major Street	Minor Street
Top Hour	3:45 PM	4:45 PM	1248	237
2nd Highest Hour	2:45 PM	3:45 PM	1195	222
3rd Highest Hour	4:45 PM	5:45 PM	1216	203
4th Highest Hour	7:15 AM	8:15 AM	1001	156

**Figure 4C-2 Warrant 2 Four Hour Vehicular Volume (70% Factor)
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)**



Are the requirements for Warrant 2 met?: **Yes**

OMUTCD WARRANT 3, PEAK HOUR

Number of Lanes for Moving Traffic on Each Approach		Peak Hour Start time	3:00 PM
Major Street:	1 Lane	Peak Hour End Time	4:00 PM
Minor Street:	1 Lane		

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? **Yes**

Is this signal warrant being applied for an unusual case, such as office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time? **No**

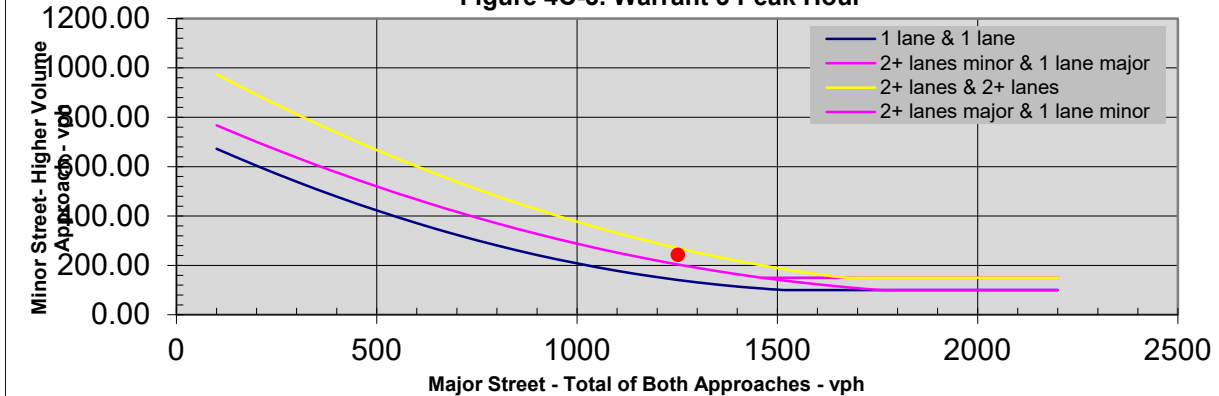
Indicate whether all three of the following conditions for the same 1 hour (any four consecutive 15-minute periods) of an average day are present*

Does the total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equal or exceed 4 vehicle-hours for a one-lane approach or 5 vehicle-hours for a two-lane approach?	
Does the volume on the same minor-street approach (one direction only) equal or exceed 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes?	Yes
Does the total entering volume serviced during the hour equal or exceed 650 vehicles per hour for intersection with three approaches or 800 vehicles per hour for intersections with four or more approaches?	Yes

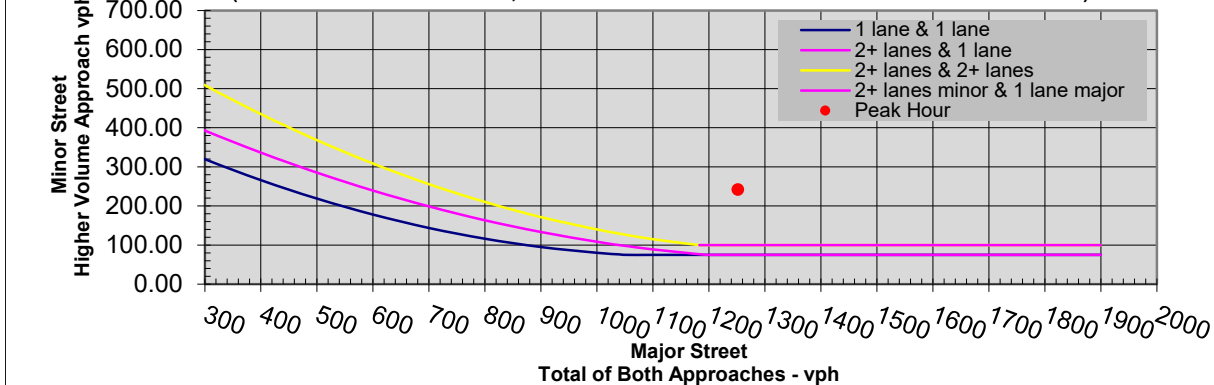
*If applicable, attach all supporting calculations and documentation.

Are the requirements for Warrant 3 met?: **Yes**

Figure 4C-3. Warrant 3 Peak Hour



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



Hour Vehicular Volume				
Hour Interval Beginning At	Major Street Combined Vehicles Per Hour (VPH)	Highest Minor Street Approach Vehicles Per Hour (VPH)	Sum of Major Street and Highest Minor Street	Sum of Major Street and Combined Minor Street
6:00 AM	658	52	710	758
6:15 AM	768	73	841	897
6:30 AM	869	114	983	1076
6:45 AM	949	130	1079	1198
7:00 AM	985	139	1124	1244
7:15 AM	1001	156	1157	1263
7:30 AM	969	146	1115	1208
7:45 AM	848	135	983	1050
8:00 AM	762	133	895	959
8:15 AM	673	119	792	859
8:30 AM	629	80	709	766
8:45 AM	638	69	707	766
9:00 AM	622	71	693	748
9:15 AM	638	79	717	781
9:30 AM	637	85	722	789
9:45 AM	624	117	741	805
10:00 AM	625	111	736	798
10:15 AM	616	115	731	779
10:30 AM	616	113	729	779
10:45 AM	659	105	764	815
11:00 AM	697	103	800	855
11:15 AM	743	100	843	898
11:30 AM	750	110	860	911
11:45 AM	771	103	874	928
12:00 PM	755	113	868	918
12:15 PM	761	116	877	924
12:30 PM	802	118	920	966
12:45 PM	785	116	901	942
1:00 PM	793	116	909	944
1:15 PM	791	120	911	954
1:30 PM	788	130	918	977
1:45 PM	836	166	1002	1062
2:00 PM	919	180	1099	1205
2:15 PM	1048	191	1239	1340
2:30 PM	1128	218	1346	1439
2:45 PM	1195	222	1417	1508
3:00 PM	1252	242	1494	1541
3:15 PM	1205	240	1445	1500
3:30 PM	1252	234	1486	1535
3:45 PM	1248	237	1485	1539
4:00 PM	1189	226	1415	1474
4:15 PM	1263	229	1492	1549
4:30 PM	1227	218	1445	1502
4:45 PM	1216	203	1419	1479
5:00 PM	1171	191	1362	1420
5:15 PM	1037	181	1218	1282
5:30 PM	937	155	1092	1164
5:45 PM	820	133	953	1024
6:00 PM	777	123	900	969
6:15 PM	553	86	639	684
6:30 PM	357	60	417	444
6:45 PM	179	29	208	219
7:00 PM	0	0	0	0
7:15 PM	0	0	0	0
7:30 PM	0	0	0	0
7:45 PM	0	0	0	0
8:00 PM	0	0	0	0

Actual Peak Hour Major Traffic Volume	Actual Peak Hour Minor Traffic Volume	Required Peak Hour Minor Traffic Volume for Fig. 4C-3	Required Peak Hour Minor Traffic Volume for Fig. 4C-4
1252	242	141	75

Appendix F

Clearance Interval

Spreadsheet

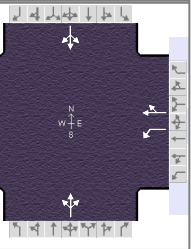
Associated Phase	Direction	Movement	Traffic Signal													Pedestrian														
			Factors *(TEM 403-2)								Calculated (TEM 403-2)			Final Clearance		Ped Movement	Associated Phase	Crosswalk Length	Pushbutton Provided	Distance to Pushbutton from Curb (furthest of the two corners)	OMUTCD 4E.06-12 Walk Interval (4-7s TYP)	OMUTCD 4E.06-07 Calculated Ped Clearance	Ped Change Interval (FDW)	3 fps Checks (OMUTCD 4E.06, 01-14)				Final Ped Timing		
			Posted Speed Limit	Perception/Reactio n Time (1s TYP)	Yellow Change Approach Speed*	Red Approach Speed*	Deceleration Rate (10 fps TYP)	Width of Intersection*	Length of Vehicle (20 ft TYP)	Approach Grade	Yellow	Red	Y + R	Yellow	Red									Y + R	(L+P)/(3 fps) (NOTE: P=6 if NO Pushbutton)	Walk + Ped Change Intervals + Yellow	IS Y>=X?	Additional Walk Interval Required	Final Walk Interval	Final Ped Change Interval (FDW)
				t	V _Y	V _R	a	W	L	g	Y	R	TOTAL	Y (3-6s TYP)	R (1-6s TYP)									TOTAL	X	Y				
MPH	SEC	MPH	MPH	FPS	FT	FT	%	SEC	SEC	SEC	SEC	SEC	SEC	SEC	FT	YES	FT	SEC	SEC	SEC	SEC	SEC	SEC	SEC	SEC	SEC	SEC	SEC		
1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2	EB	THROUGH/RT	45	1	52	52	10	93	20	0	4.8	0.5	5.3	5	1	6.0	EB	2	70	YES	4	7	20.0	15.0	24.7	27.0	YES	N/A	7	15
3	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	SB	THROUGH/RT	40	1	47	47	10	74	20	0	4.5	0.4	4.9	4.5	1	5.5	SB	4	60	YES	20	7	17.1	12.6	26.7	24.1	NO	2.5	10	13
5	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	WB	THROUGH/RT	45	1	52	52	10	90	20	0	4.8	0.4	5.2	5	1	6.0	WB	6	65	YES	12	7	18.6	13.6	25.7	25.6	NO	0.1	8	14
7	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	NB	THROUGH/RT	40	1	47	47	10	82	20	0	4.5	0.5	5.0	4.5	1	5.5	NB	8	55	YES	22	7	15.7	11.2	25.7	22.7	NO	3.0	10	12

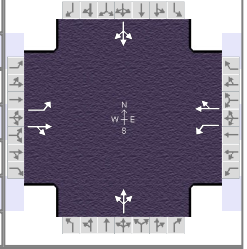
Appendix G

HCS & Synchro Capacity Analysis Reports

HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	ODOT D03			Duration, h	0.250
Analyst	KMW	Analysis Date	7/1/2025	Area Type	Other
Jurisdiction	ODOT D03	Time Period	AM Pk	PHF	0.92
Urban Street	State Route 82	Analysis Year	2025	Analysis Period	1> 7:00
Intersection	LOR-82-7.56	File Name	LOR-082-07.56 HCS AM Existing.xus		
Project Description	AM Pk Existing				





Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	82	490	7	4	318	100	14	68	24	80	24	52

Signal Information												
Cycle, s	70.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	30.7	11.6	10.7	0.0	0.0	0.0		
				Yellow	5.0	4.5	4.5	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.0	1.0	0.0	0.0	0.0		

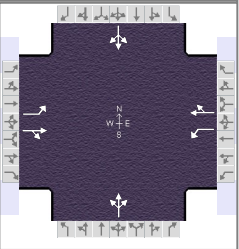
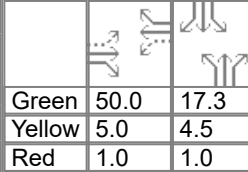
																			
												1		2		3		4	
																			
												5		6		7		8	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		6.0		6.0		12.0		12.0
Phase Duration, s		36.7		36.7		16.2		17.1
Change Period, ($Y+R_c$), s		6.0		6.0		5.5		5.5
Max Allow Headway (MAH), s		4.1		4.1		4.1		4.1
Queue Clearance Time (g_s), s		26.5		21.3		6.4		9.5
Green Extension Time (g_e), s		4.4		4.6		0.4		0.6
Phase Call Probability		1.00		1.00		0.89		0.96
Max Out Probability		0.03		0.01		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	89	540		4	454			115			170	
Adjusted Saturation Flow Rate (s), veh/h/ln	907	1664		838	1439			1658			1486	
Queue Service Time (g_s), s	6.3	18.9		0.3	18.1			4.4			7.5	
Cycle Queue Clearance Time (g_c), s	24.5	18.9		19.3	18.1			4.4			7.5	
Green Ratio (g/C)	0.44	0.44		0.44	0.44			0.15			0.17	
Capacity (c), veh/h	264	728		242	630			254			246	
Volume-to-Capacity Ratio (X)	0.338	0.742		0.018	0.721			0.453			0.690	
Back of Queue (Q), ft/ln (95 th percentile)	60	268		3	232			78			131	
Back of Queue (Q), veh/ln (95 th percentile)	2.3	10.2		0.1	8.9			3.1			4.8	
Queue Storage Ratio (RQ) (95 th percentile)	0.40	0.00		0.01	0.00			0.00			0.00	
Uniform Delay (d_1), s/veh	26.2	16.4		24.4	16.1			26.9			27.5	
Incremental Delay (d_2), s/veh	0.8	1.5		0.0	1.6			1.3			3.4	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	27.0	17.9		24.4	17.7			28.2			30.9	
Level of Service (LOS)	C	B		C	B			C			C	
Approach Delay, s/veh / LOS	19.2	B		17.8	B		28.2	C		30.9	C	
Intersection Delay, s/veh / LOS	20.9						C					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.67	B		1.67	B		1.94	B		1.93	B	
Bicycle LOS Score / LOS	1.53	B		1.24	A		0.68	A		0.77	A	

HCS Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		ODOT D03				Duration, h		0.250											
Analyst		MRF		Analysis Date		7/1/2025		Area Type		Other									
Jurisdiction		ODOT D03		Time Period		PM Pk		PHF		0.92									
Urban Street		State Route 82		Analysis Year		2025		Analysis Period		1> 7:00									
Intersection		LOR-82-7.56		File Name		LOR-082-07.56 HCS PM Existing.xus													
Project Description		PM Pk Existing																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand (v), veh/h				60	482	18	39	601	63	10	29	18	67	58	104				
Signal Information																			
Cycle, s	93.9	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	Yes	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
				Green	50.0	17.3	9.6	0.0	0.0	0.0	0.0								
				Yellow	5.0	4.5	4.5	0.0	0.0	0.0	0.0								
				Red	1.0	1.0	1.0	0.0	0.0	0.0	0.0								
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						2				6				8				4	
Case Number						6.0				6.0				12.0				12.0	
Phase Duration, s						56.0				56.0				15.1				22.8	
Change Period, (Y+R c), s						6.0				6.0				5.5				5.5	
Max Allow Headway (MAH), s						4.1				4.1				4.1				4.2	
Queue Clearance Time (g s), s						50.5				42.1				5.3				16.4	
Green Extension Time (g e), s						0.0				3.7				0.2				0.9	
Phase Call Probability						1.00				1.00				0.80				1.00	
Max Out Probability						1.00				0.64				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				65	543		42	722			62			249					
Adjusted Saturation Flow Rate (s), veh/h/ln				731	1712		856	1512			1642			1571					
Queue Service Time (g s), s				8.2	20.5		3.4	40.1			3.3			14.4					
Cycle Queue Clearance Time (g c), s				48.5	20.5		23.9	40.1			3.3			14.4					
Green Ratio (g/C)				0.53	0.53		0.53	0.53			0.10			0.18					
Capacity (c), veh/h				153	911		345	805			168			290					
Volume-to-Capacity Ratio (X)				0.427	0.597		0.123	0.897			0.368			0.859					
Back of Queue (Q), ft/ln (95 th percentile)				68	293		30	540			61			251					
Back of Queue (Q), veh/ln (95 th percentile)				2.7	11.5		1.2	21.1			2.4			9.9					
Queue Storage Ratio (RQ) (95 th percentile)				0.46	0.00		0.15	0.00			0.00			0.00					
Uniform Delay (d 1), s/veh				41.4	15.1		23.3	19.7			39.3			37.1					
Incremental Delay (d 2), s/veh				1.9	1.1		0.2	12.8			1.3			7.3					
Initial Queue Delay (d 3), s/veh				0.0	0.0		0.0	0.0			0.0			0.0					
Control Delay (d), s/veh				43.3	16.1		23.4	32.4			40.7			44.4					
Level of Service (LOS)				D	B		C	C			D			D					
Approach Delay, s/veh / LOS				19.0		B		31.9		C		40.7		D		44.4		D	
Intersection Delay, s/veh / LOS				29.4									C						
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				1.67		B		1.67		B		1.95		B		1.94		B	
Bicycle LOS Score / LOS				1.49		A		1.75		B		0.59		A		0.90		A	

Lanes, Volumes, Timings
4: W. River Rd & SR 82

10/27/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	490	7	4	318	100	14	68	24	80	24	52
Future Volume (vph)	82	490	7	4	318	100	14	68	24	80	24	52
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	150		0	205		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.964			0.969			0.955	
Flt Protected	0.950			0.950				0.994			0.975	
Satd. Flow (prot)	1568	1648	0	1568	1592	0	0	1669	0	0	1481	0
Flt Permitted	0.484			0.408				0.935			0.779	
Satd. Flow (perm)	799	1648	0	674	1592	0	0	1570	0	0	1184	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			38			26			49	
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		235			222			233			282	
Travel Time (s)		3.6			3.4			4.0			4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	1%	1%	1%	10%	10%	10%
Adj. Flow (vph)	89	533	8	4	346	109	15	74	26	87	26	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	89	541	0	4	455	0	0	115	0	0	170	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2			2			2	
Detector Template	Left	Thru		Left	Thru			Thru			Thru	
Leading Detector (ft)	20	100		20	100			100			100	
Trailing Detector (ft)	0	0		0	0			0			0	
Detector 1 Position(ft)	0	0		0	0			0			0	
Detector 1 Size(ft)	20	6		20	6			6			6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	

Lanes, Volumes, Timings

4: W. River Rd & SR 82

10/27/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0		23.5	23.5		23.5	23.5	
Total Split (s)	31.4	31.4		31.4	31.4		23.6	23.6		23.6	23.6	
Total Split (%)	57.1%	57.1%		57.1%	57.1%		42.9%	42.9%		42.9%	42.9%	
Maximum Green (s)	25.4	25.4		25.4	25.4		18.1	18.1		18.1	18.1	
Yellow Time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effct Green (s)	23.6	23.6		23.6	23.6			10.0			10.0	
Actuated g/C Ratio	0.58	0.58		0.58	0.58			0.24			0.24	
v/c Ratio	0.19	0.57		0.01	0.49			0.28			0.52	
Control Delay (s/veh)	8.8	11.9		7.0	9.8			13.0			17.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay (s/veh)	8.8	11.9		7.0	9.8			13.0			17.1	
LOS	A	B		A	A			B			B	
Approach Delay (s/veh)		11.4			9.8			13.0			17.1	
Approach LOS		B			A			B			B	
Intersection Summary												
Area Type:	Other											
Cycle Length: 55												
Actuated Cycle Length: 40.9												
Natural Cycle: 55												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.57												
Intersection Signal Delay (s/veh): 11.7												
Intersection Capacity Utilization 63.5%												
Analysis Period (min) 15												
Intersection LOS: B												
ICU Level of Service B												

Splits and Phases: 4: W. River Rd & SR 82



Lanes, Volumes, Timings

4: W. River Rd & SR 82

10/27/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	482	18	39	601	63	10	29	18	67	58	104
Future Volume (vph)	60	482	18	39	601	63	10	29	18	67	58	104
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	150		0	205		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.986			0.957			0.939	
Flt Protected	0.950			0.950				0.991			0.986	
Satd. Flow (prot)	1630	1705	0	1614	1675	0	0	1660	0	0	1588	0
Flt Permitted	0.258			0.394				0.931			0.879	
Satd. Flow (perm)	443	1705	0	669	1675	0	0	1559	0	0	1416	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			13			20			71	
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		235			222			233			282	
Travel Time (s)		3.6			3.4			4.0			4.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	0%	0%	0%	2%	2%	2%
Adj. Flow (vph)	65	524	20	42	653	68	11	32	20	73	63	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	544	0	42	721	0	0	63	0	0	249	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2			2			2	
Detector Template	Left	Thru		Left	Thru			Thru			Thru	
Leading Detector (ft)	20	100		20	100			100			100	
Trailing Detector (ft)	0	0		0	0			0			0	
Detector 1 Position(ft)	0	0		0	0			0			0	
Detector 1 Size(ft)	20	6		20	6			6			6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	

Lanes, Volumes, Timings

4: W. River Rd & SR 82

10/27/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0		23.5	23.5		23.5	23.5	
Total Split (s)	36.4	36.4		36.4	36.4		23.6	23.6		23.6	23.6	
Total Split (%)	60.7%	60.7%		60.7%	60.7%		39.3%	39.3%		39.3%	39.3%	
Maximum Green (s)	30.4	30.4		30.4	30.4		18.1	18.1		18.1	18.1	
Yellow Time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0			5.5			5.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Act Effect Green (s)	28.3	28.3		28.3	28.3			11.9			11.9	
Actuated g/C Ratio	0.55	0.55		0.55	0.55			0.23			0.23	
v/c Ratio	0.27	0.58		0.12	0.78			0.17			0.66	
Control Delay (s/veh)	11.4	11.9		8.1	18.8			13.0			21.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay (s/veh)	11.4	11.9		8.1	18.8			13.0			21.6	
LOS	B	B		A	B			B			C	
Approach Delay (s/veh)		11.9			18.2			13.0			21.6	
Approach LOS		B			B			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 51.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay (s/veh): 16.2

Intersection LOS: B

Intersection Capacity Utilization 78.2%

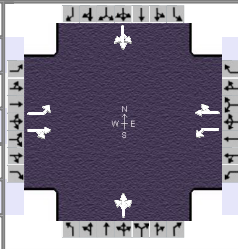
ICU Level of Service D

Analysis Period (min) 15

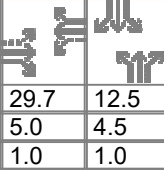
Splits and Phases: 4: W. River Rd & SR 82



HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	ODOT D03			Duration, h	0.250	
Analyst	CW	Analysis Date	7/1/2025	Area Type	Other	
Jurisdiction	ODOT D03	Time Period	AM Pk	PHF	0.92	
Urban Street	State Route 82	Analysis Year	2025	Analysis Period	1> 7:00	
Intersection	LOR-82-7.56	File Name	LOR-082-07.56 HCS AM Proposed.xus			
Project Description	AM Pk Proposed					

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	82	490	7	4	318	100	14	68	24	80	24	52

Signal Information												
Cycle, s	70.9	Reference Phase	2				 <td rowspan="4"></td>					
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
				Green	29.7	12.5	11.6	0.0	0.0	0.0		
				Yellow	5.0	4.5	4.5	0.0	0.0	0.0		
				Red	1.0	1.0	1.0	0.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		6.0		6.0		12.0		12.0
Phase Duration, s		35.7		35.7		17.1		18.0
Change Period, ($Y+R_c$), s		6.0		6.0		5.5		5.5
Max Allow Headway (MAH), s		3.1		3.1		3.1		3.1
Queue Clearance Time (g_s), s		27.7		22.2		6.4		9.5
Green Extension Time (g_e), s		2.2		2.2		0.2		0.3
Phase Call Probability		1.00		1.00		0.90		0.96
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	89	540		4	454			115			170	
Adjusted Saturation Flow Rate (s), veh/h/ln	907	1664		838	1439			1658			1486	
Queue Service Time (g_s), s	6.6	19.8		0.3	19.0			4.4			7.5	
Cycle Queue Clearance Time (g_c), s	25.7	19.8		20.2	19.0			4.4			7.5	
Green Ratio (g/C)	0.42	0.42		0.42	0.42			0.16			0.18	
Capacity (c), veh/h	235	695		216	601			273			263	
Volume-to-Capacity Ratio (X)	0.378	0.777		0.020	0.756			0.422			0.644	
Back of Queue (Q), ft/ln (95 th percentile)	63	277		3	240			75			122	
Back of Queue (Q), veh/ln (95 th percentile)	2.4	10.6		0.1	9.1			3.0			4.5	
Queue Storage Ratio (RQ) (95 th percentile)	0.42	0.00		0.01	0.00			0.00			0.00	
Uniform Delay (d_1), s/veh	28.5	17.8		26.5	17.5			26.5			27.0	
Incremental Delay (d_2), s/veh	0.4	0.7		0.0	0.7			0.4			1.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	28.9	18.5		26.5	18.3			26.9			28.0	
Level of Service (LOS)	C	B		C	B			C			C	
Approach Delay, s/veh / LOS	20.0	B		18.3	B		26.9	C		28.0	C	
Intersection Delay, s/veh / LOS	21.0						C					

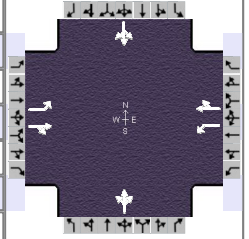
Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.67	B		1.67	B		1.94	B		1.93	B	
Bicycle LOS Score / LOS	1.53	B		1.24	A		0.68	A		0.77	A	

HCS Signalized Intersection Results Summary

General Information

Agency	ODOT D03		
Analyst	CW	Analysis Date	7/1/2025
Jurisdiction	ODOT D03	Time Period	PM Pk
Urban Street	State Route 82	Analysis Year	2025
Intersection	LOR-82-7.56	File Name	LOR-082-07.56 H
Project Description	PM Pk Proposed		

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	60	482	18	39	601	63	10	29	18	67	58	104

Signal Information

Cycle, s	94.5	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
				Green	50.0	17.0	10.4	0.0	0.0	0.0		
				Yellow	5.0	4.5	4.5	0.0	0.0	0.0		
				Red	1.0	1.0	1.0	0.0	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		6.0		6.0		12.0		12.0
Phase Duration, s		56.0		56.0		15.9		22.5
Change Period, ($Y+R_c$), s		6.0		6.0		5.5		5.5
Max Allow Headway (MAH), s		3.1		3.1		3.1		3.2
Queue Clearance Time (g_s), s		51.1		42.6		5.3		16.6
Green Extension Time (g_e), s		0.0		2.2		0.1		0.5
Phase Call Probability		1.00		1.00		0.80		1.00
Max Out Probability		1.00		0.37		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	65	543		42	722			62			249	
Adjusted Saturation Flow Rate (s), veh/h/ln	731	1712		856	1512			1642			1571	
Queue Service Time (g_s), s	8.3	20.7		3.4	40.6			3.3			14.6	
Cycle Queue Clearance Time (g_c), s	49.1	20.7		24.2	40.6			3.3			14.6	
Green Ratio (g/C)	0.53	0.53		0.53	0.53			0.11			0.18	
Capacity (c), veh/h	148	906		341	800			182			283	
Volume-to-Capacity Ratio (X)	0.441	0.600		0.124	0.902			0.341			0.878	
Back of Queue (Q), ft/ln (95 th percentile)	67	295		30	548			59			243	
Back of Queue (Q), veh/ln (95 th percentile)	2.7	11.6		1.2	21.4			2.4			9.5	
Queue Storage Ratio (RQ) (95 th percentile)	0.45	0.00		0.15	0.00			0.00			0.00	
Uniform Delay (d_1), s/veh	42.2	15.3		23.7	20.0			38.8			37.7	
Incremental Delay (d_2), s/veh	0.8	0.8		0.1	13.1			0.4			3.5	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	42.9	16.1		23.8	33.1			39.3			41.2	
Level of Service (LOS)	D	B		C	C			D			D	
Approach Delay, s/veh / LOS	19.0		B	32.6		C	39.3		D	41.2		D
Intersection Delay, s/veh / LOS	29.2						C					

Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.67		B	1.67		B	1.95		B	1.94		B
Bicycle LOS Score / LOS	1.49		A	1.75		B	0.59		A	0.90		A