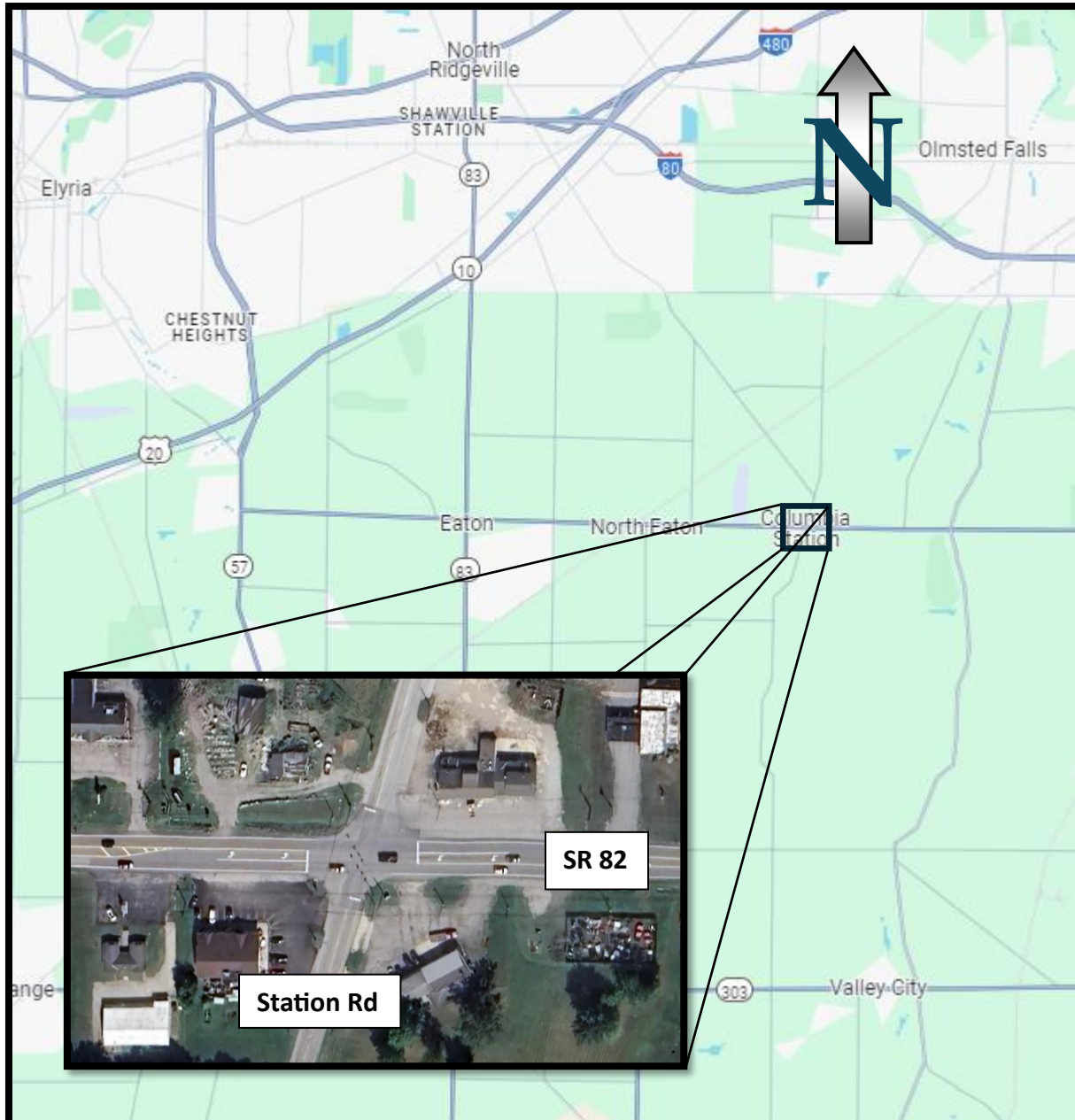


**2024 Highway Safety Improvement Program
Lorain County, State Route 82, SLM 6.43 (Station Rd)
Rural Intersection #59
Abbreviated Safety Study**



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Date: April 8, 2025



**Department of
Transportation**
District 3

LOR-82-6.43 (Station Rd) 2024 HSIP Safety Study

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Study Background

As a requirement of the Federal Highway Administration (FHWA), states are required to have a Highway Safety Improvement Program (HSIP). The Ohio Department of Transportation (ODOT) HSIP was developed using AASHTOWare Safety software to find locations that have the highest expected fatal and all injury crashes per year over the five-year analysis timeframe. Eight main categories were developed: Urban Intersections, Rural Intersections, Suburban Intersections, Urban Non-Freeway Segments, Rural Non-Freeway Segments, Suburban Non-Freeway Segments, Urban Freeway Segments, and Rural Freeway Segments. The 2024 HSIP study locations were derived after removing locations with future programmed safety projects or recent safety improvements. Based on funding availability, the HSIP locations may be improved to reduce the frequency and/or severity of crashes. The State Route (SR) 82 and County Route (CR) 61 (Station Road) intersection ranked #59 on the 2024 HSIP Rural Intersection List.

Existing Conditions

The SR 82 & Station Rd intersection is a signalized intersection located in Columbia Township, Lorain County, Ohio, approximately 3 ½ miles west of the Lorain/Cuyahoga County Line as well as the western corporation limit of the City of Strongsville. Existing roadway data about the intersection can be found in **Table 1** below.

Table 1. Existing Roadway Data - *EB (eastbound), WB (westbound), NB (northbound), SB (southbound)

Category	Major Road	Minor Road
Route	SR 82	CR 61 (Station Rd)
Functional Class	4 (Minor Arterial)	5 (Maj. Collector) / 4 (Minor Art.)
Direction	East/West	North/South
Lane Assignments	*EB/WB: 1 LT only, 1 Thru/RT	*NB/SB: 1 LT/Thru/RT
Lane Width	12 feet	11 feet
Shoulder Width	4 ft, paved	3 ft, paved
Pavement	Asphalt	Asphalt
Land Use	Commercial / Residential / Agricultural or Undeveloped	
Alignment		
Horizontal	Straight	Straight
Vertical	Flat	Flat
Skew	-	15°
Traffic Control		
Speed Limit	45 mph	55/45 mph
Traffic Signal Heads	(2) 3-Section Heads w/Backplates	(2) 3-Section Heads w/Backplates
Signal Design, Constr. Year	Simple Span, 1989	
Existing Detection	Loops, Advance	Loops, Stop Line & Advance
Signal Replacement	PID 109059, D03 TSG FY2025 (B), Constr. Phase: 8/1/25-11/30/26.	
Signal Ahead Warning signs	Single EB/WB w/Station Rd sign	Dual NB/SB
Lane Use signs	EB & WB	-
SR 82 No Parking Zone	LOR-82-6.39-6.54 EB/WB (from 0.04 mi W to 0.11 mi E of Station Rd)	
Left Turn Phasing	Permitted	Permitted

Field Review

A field review was conducted on November 7th, 2024, and the following was noted:

- Signs, pavement markings, & signal equipment appeared in good condition and placement.
- Sight distance good in all directions.
- Traffic observations: No significant queueing, driver confusion, error or other issues.

Existing conditions can be viewed in **Figures 1-4** and a full photo log can be found in **Appendix A**.



Figure 1. Station Rd northbound at the intersection



Figure 2. Station Rd southbound at the intersection



Figure 3. SR 82 eastbound at the intersection



Figure 4. SR 82 westbound at the intersection

Traffic Volume

Between 2008 and 2023, the Annual Average Daily Traffic (AADT) volumes on SR 82 fluctuated moderately, with the peak around 2017. The AADT on Station Rd since 2011 has increased, also with 2017 being the peak year to date. Available volume data for the intersection is shown in **Table 2** below, with truck percentages shown in parentheses. The data was pulled from ODOT's inventory found in MS2.

Table 2. Historical Annual Average Daily Traffic (Truck %)

Year	SR 82 (west of Station Rd)	Station Rd (south of SR 82)
2023	9,087 (8%)	3,094 (1%)
2020	8,929 (7%)	2,855 (2%)
2017	9,521 (7%)	3,338 (2%)
2014	7,324 (12%)	2,584 (6%)
2011	8,680 (7%)	2,428 (3%)
2008	8,440 (6%)	-

From the Traffic Forecasting Management System (TFMS), the future growth is anticipated to be 0.5% along SR 82 and 0.6% along Station Rd. The TFMS Report is in **Appendix B**.

Previous Safety Studies and Countermeasures

The following safety studies and countermeasures have been completed since 1986:

- **2021: Signal Evaluation** – Yellow change intervals were increased from 5 to 6 seconds.
- **2020: Operational Study** – No changes recommended.
- **2016: Signal Evaluation** – Minimum green time on SR 82 was reduced from 30 to 20 seconds.
- **2005 Signal Evaluation** – Access management controls were recommended at the intersection, but no available records of implementation.
- **1991: Speed Zone Study** – Speed limit on Station Rd SB approach reduced from 55 to 45 mph.
- **1986: Speed Zone Study** – Speed limit on both approaches of SR 82 reduced from 55 to 45 mph.

Crash Data and Analysis

Crashes were reviewed at this intersection between January 1st, 2019 and December 31st, 2023 and are summarized in **Table 3** below. **Figure 5** shows the crash diagram and **Appendix C** has the crash diagram and Crash Analysis Module (CAM) Tool crash summary.

Table 3. Crash Data (2019-2023)

Year		Severity		Type		Road Condition	
2019	4 (22%)	Fatal	0 (0%)	Rear End	7 (39%)	Dry	14 (78%)
2020	5 (28%)	Injury	7 (39%)	Left Turn	5 (28%)	Wet	4 (22%)
2021	3 (17%)	PDO	11 (61%)	Angle	2 (11%)	Snow	0 (0%)
2022	3 (17%)			*SS-Meeting	2 (11%)		
2023	3 (17%)			SS-Passing	1 (6%)		
				Head On	1 (6%)		
Total	18 (100%)			*Side-Swipe			

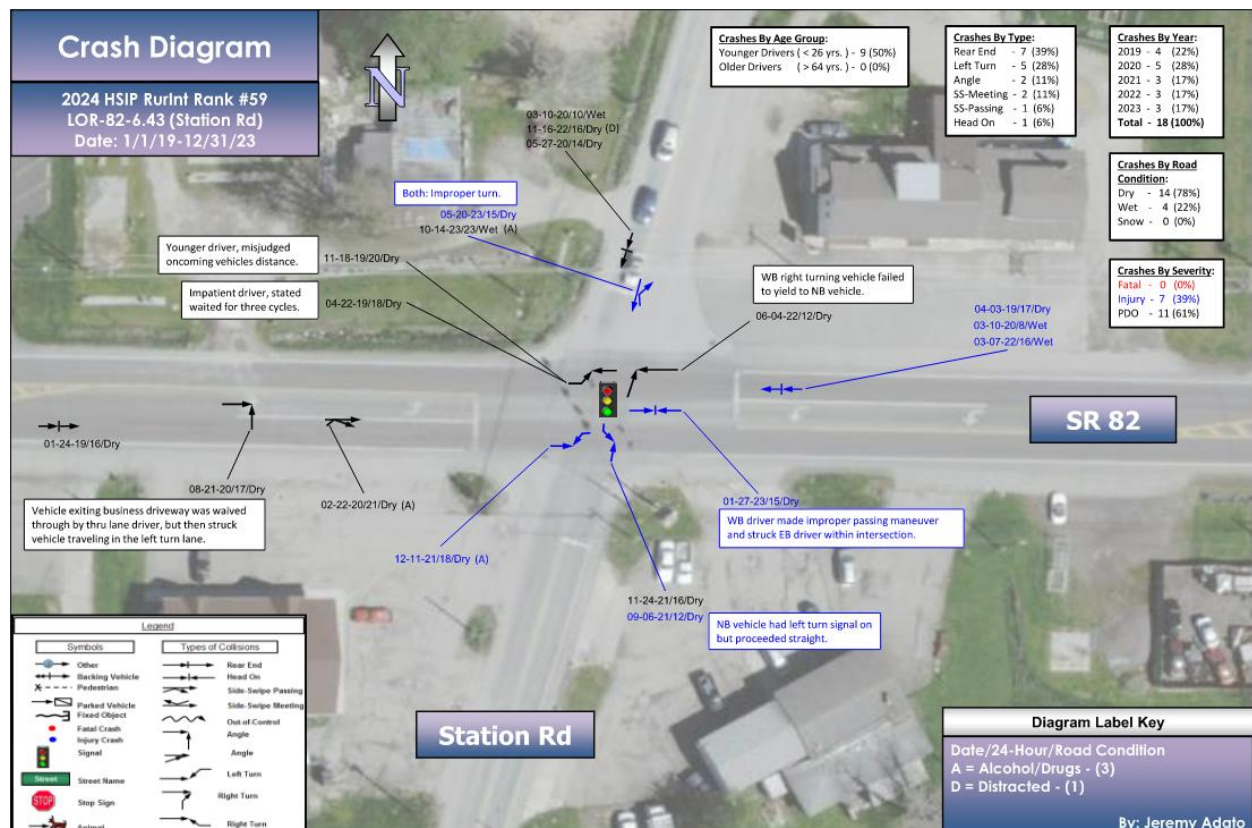


Figure 5. Crash Diagram (2019-2023)

Crash details include the following:

- **Rear End:** The most prevalent crash type was Rear End - 7 (39%). Of these, four were caused by a younger driver, one of which was reported to be distracted. There were three in the WB direction, three in the SB direction, and one in the EB direction.
- **Left Turn:** The second most prevalent crash type was Left Turn - 5 (28%). Of these, two were caused by a younger driver and another one was caused by someone under the influence of alcohol/drugs.
- **Driveways:** Only 1 (6%) of the reported crashes was driveway related.
- **Younger drivers:** (<26 years old) were at-fault in 9 (50%) of the crashes.
- **Older drivers:** (>64 years old) were at-fault in 0 (0%) of the crashes.
- **Night:** 4 (22%) of the crashes occurred at night. Of these, two were left turn, one was sideswipe-meeting, and one was sideswipe-passing. There is an existing intersection street light in the SE radius.
- **Following Too Closely/ACDA:** (Assured Clear Distance Ahead) was listed as the contributing factor in 6 (33%) of the crashes. All of these were rear end crashes.
- **Failure to Yield** was listed as the contributing factor in 6 (33%) of the crashes. Five of these were left turn crashes and one was an angle crash.
- **Drugs/alcohol** were reported to be a factor in 3 (17%) of the crashes - one left turn crash, one sideswipe-passing crash, and one sideswipe-meeting crash.
- **Distracted:** 1 (6%) of the crashes reported the at-fault driver was distracted.
- **Fatal/Serious Injury:** None of the crashes were reported as fatal or serious injury. Of the seven injury crashes, five were minor injury suspected and two were injury possible.
- **2024 crashes:** There have been 3 crashes reported in 2024 to date of this study. One was an angle crash where a NB older driver ran the red light. The other two were rear end crashes. One was in the WB direction caused by a driver under the influence of drugs. The other was in the EB direction caused by a younger driver reported to be distracted.

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 can be found in **Appendix D**. The count was taken on Tuesday, September 10th, 2024, between the hours of 6:00 AM to 7:00 PM. The morning (AM) and afternoon (PM) peak hour turning movement counts are shown in **Tables 4-6** on next page.

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

AM Pk	Station Rd SB			SR 82 WB			Station Rd NB			SR 82 EB			Total
	R	T	L	R	T	L	R	T	L	R	T	L	
Volume	42	71	113	76	272	21	63	117	22	12	386	33	1229
Truck %	1%			6%			3%			9%			6%
PHF	0.85												

Table 5. Traffic Count Data PM Peak (4:30 PM - 5:30 PM)

PM Pk	Station Rd SB			SR 82 WB			Station Rd NB			SR 82 EB			Total
	R	T	L	R	T	L	R	T	L	R	T	L	
Volume	42	102	121	161	454	80	44	95	27	12	353	50	1541
Truck %	3%			2%			2%			2%			2%
PHF	0.93												

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

13-Hr	Station Rd SB			SR 82 WB			Station Rd NB			SR 82 EB			Total
	R	T	L	R	T	L	R	T	L	R	T	L	
Volume	448	791	1129	1044	3809	509	501	875	241	206	3773	451	13780
Truck %	4%			7%			3%			9%			7%

Signal Warrant Analysis

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

Table 7. Signal Warrants

Signal Warrant		70% Volumes		
		Hours Needed	Hours Met	Warrant Met
1 - Eight Hour Vehicular Volumes		-	-	Yes
1A – Minimum Vehicular Volume		8	13	Yes
1B - Interruption of Continuous Traffic		8	13	Yes
1 A&B - Combination of Warrants	1A	8	13	Yes
	1B	8	13	
2 - Four Hour Volumes		4	13	Yes
3 - Peak Hour Volumes		-	-	Yes

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 for the existing signal and potential roundabout scenarios. The average delay time in seconds per vehicle (sec/veh) at the intersection for the AM and PM

peak hours for each scenario are shown below in **Table 8** below. The full capacity analyses can be found in **Appendix F**.

Table 8. Highway Capacity Analysis Level of Service (LOS)

Analysis Type		SR 82 Delay in sec/veh (LOS)		Station Rd Delay in sec/veh (LOS)		Intersection Delay (LOS)
		Eastbound	Westbound	Northbound	Southbound	Overall
Signal (Permitted Left Turn) existing	AM Peak	10.4 (B)	9.8 (A)	15.2 (B)	16.0 (B)	12.0 (B)
	PM Peak	10.0 (A)	12.2 (B)	18.2 (B)	20.9 (C)	13.7 (B)
Signal (Protected-Perm LT) proposed	AM Peak	14.3 (B)	14.4 (B)	18.8 (B)	19.9 (B)	16.1 (B)
	PM Peak	15.0 (B)	18.8 (B)	22.9 (C)	25.8 (C)	19.4 (B)
Roundabout	AM Peak	10.0 (B)	7.9 (A)	10.0 (A)	7.0 (A)	8.8 (A)
	PM Peak	9.3 (A)	12.9 (B)	7.5 (A)	10.3 (B)	10.9 (B)

ECAT Analysis

The ODOT Economic Crash Analysis Tool (ECAT) uses Highway Safety Manual (HSM) methodology to calculate expected crashes and predicted crashes for various roadway conditions and crash data. The ECAT tool also calculates safety benefits for different countermeasures over the design life of the specific countermeasure. **Table 9** shows the ECAT crash analysis results for the existing signal and a roundabout alternative. **Appendix G** shows the ECAT results.

Table 9. ECAT Results

Condition	Predicted Crashes/Year	Expected Crash Difference/Year	Service Life	Safety Benefit
Signal (Existing)	7.88	---	---	---
Roundabout	2.44	-5.44	20	\$2.6M

Signal Phasing Diagram

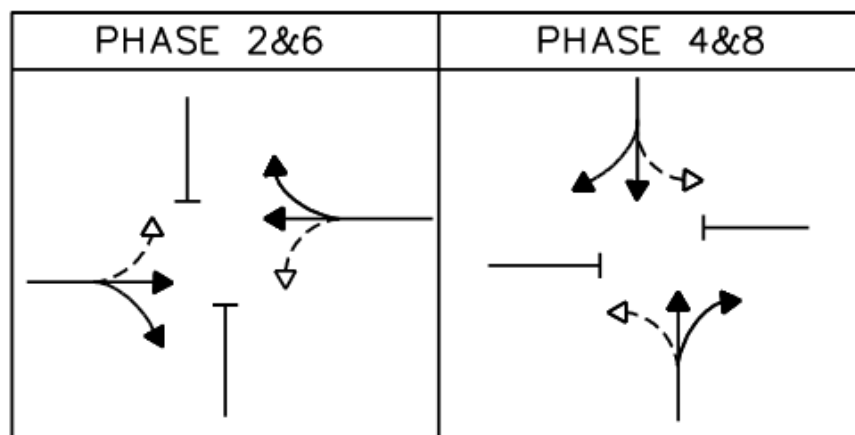


Figure 6. Signal Phasing Diagram (existing permitted left turn)

Clearance Intervals

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 10**. A PDF version of the spreadsheet is in **Appendix H**.

Table 10. Existing and Proposed Clearance Intervals

INTERSECTION MOVEMENT	1	2	3	4	5	6	7	8
		SR 82 EB		Station Rd SB		SR 82 WB		Station Rd NB
Yellow Change (Existing)		5.0		6.0		5.0		6.0
Yellow Change (Calculated)		5.0		6.0		5.0		6.0
Yellow Change (Proposed)		5.0		6.0		5.0		6.0
All Red Clearance (Existing)		1.0		1.0		1.0		1.0
All Red Clearance (Calculated)		1.0		1.0		1.0		1.0
All Red Clearance (Proposed)		1.0		1.0		1.0		1.0
Min Green + Yellow Change (Existing)		25.0		16.0		25.0		16.0
Pedestrian Clearance (Calculated)		14.6		15.4		16.6		15.7
Min Green + Yellow Change (Proposed)		25.0		16.0		25.0		16.0

Notes include the following:

- Yellow Change Range: 3-6 seconds; Red Clearance Range: 1-6 seconds
- Ped Clearance is not greater than Min Green + Yellow Change, so minimum green does not need increased and post pedestrian restriction signing is not needed.
- District practice is to round clearance intervals up to the nearest 0.5 seconds.

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 [and a left turn minimum initial duration of 7 seconds], Synchro calculates maximum green times at the intersection:

AM Peak: 23.0 seconds for SR 82, 19 seconds for Station Rd, 55 second cycle length.

PM Peak: 23.0 seconds for SR 82, 19 seconds for Station Rd, 55 second cycle length.

Note: District practice is to round up Synchro calculated max green times to the nearest 10.

The full Synchro report can be found in **Appendix I**.

Left Turn Phase Operation (TEM Table 497-10)

The left turn phase operation criteria (suggestion of “Protected”, “Protected-Permitted”, or “Permitted”) were checked for the major road approaches. The approaches fell into the category of suggested “Permitted”, which is what currently exists. Adding Protected-Permitted left turn phasing is not recommended at this time since there was not a strong safety justification and doing so would decrease level of service.

The full LTPO report can be found in **Appendix J**. The Signal Timing Chart can be found in **Appendix K**.

Probable Causes and Potential Countermeasures

The probable causes of the crashes analyzed include:

- Drivers following too closely, and failing to leave assured clear distance ahead.
- Driver inattention or impatience.
- Driver inexperience. 9 (50%) of the crashes were caused by a younger driver (<26 yrs.).
- Drivers failing to select an appropriate gap in traffic when making a left turn or entering the intersection from a driveway. Younger and older drivers can have more difficulty than average adults correctly judging speed/distance of other vehicles.

Potential countermeasures include the following:

- Make no changes and continue to monitor the intersection. **(Not Recommended)**
- Signal Phasing: Adding Protected-Permitted left turn phasing. **(Not Recommended)**
 - Adding Protected-Permitted left turn phasing is not recommended at this time since there was not a strong safety justification and doing so would decrease level of service.
- Relocate the Signal Ahead Warning sign on the SR 82 eastbound approach to increase visibility of the sign. **(Recommended)**
 - It was observed during the 11/7/2024 field review that tree branches were obstructing the visibility of the SR 82 eastbound Signal Ahead Warning sign.
- Add supplemental signal heads on EB & WB approaches. **(Recommended)**
 - Supplemental signal heads are recommended for the major approaches to the intersection due to the safety benefit.
- Install left side Signal Ahead Warning signs on the EB & WB approaches to make the installations dual. **(Recommended)**
 - Making the Signal Ahead Warning signs on the EB & WB approaches dual is recommended to increase drivers' awareness of the traffic signal in order to help mitigate the pattern of Rear End crashes at the intersection.
- Roundabout **(Recommended)**
 - A roundabout is expected to provide a substantial safety benefit by significantly reducing the frequency and severity of crashes, especially angle and left turn crashes. Additionally,

a roundabout is expected to increase the level of service by reducing overall intersection delay as well as the average delay on the individual approaches, especially the minor road approaches. The splitter islands of a roundabout would also help improve access management.

Implementation Plan

The following countermeasures are being recommended to the District 3 Safety Review Team (DSRT):

- **Short-Term/Low-Cost:**
 - **Signing:**
 - Following the field review, a work order was sent on 11/12/2024 to relocate the warning sign to a point of improved visibility.
 - Make the Signal Ahead Warning signs on the SR 82 approaches dual by sending a work order for signing updates.
 - **Planned Signal Rebuild:** The intersection has already been scheduled for a systematic signal rebuild project (PID 109059 with a construction phase from 8/1/2025-11/30/2026). The project will include new signal supports with mast arms, new signal heads with backplates, new stop line and advanced radar detection on all approaches, upgraded intersection lighting, and a new concrete island in the NE radius to help delineate driveway access to the business on the NE corner. Lighting is a safety countermeasure expected to help with nighttime crashes.
 - **Supplemental Signal Heads:** Install Supplemental Signal Heads on both SR 82 approaches by adding this work to PID 121707 D03 TSG FY2027 (M).
- **Medium-Term/Medium-Cost:**
 - **Roundabout:** After discussing the roundabout option at the 4/8/2025 D3 DSRT meeting, it was decided not to pursue a safety funding application for a roundabout at this time. Instead, the short-term/low-cost countermeasures will be implemented at this time and a roundabout may be considered again in the future if needed.

Note: Countermeasures considered for implementation are classified in terms of the following implementation timeframes: Short-Term is under 1 year, Medium-Term is 1 to 5 years, and Long-Term is over 5 years. Cost estimations are classified as follows: Low-Cost is up to \$100,000, Medium-Cost is \$100,000 to \$5,000,000, High-Cost is greater than \$5,000,000.

Appendix A

Photo Log



1. Station Rd NB 700 ft before stop line



2. Station Rd NB 50 ft before stop line



3. Station Rd SB 750 ft before stop line



4. Station Rd SB 50 ft before stop line



5. SR 82 EB 550 ft before stop line



6. SR 82 EB 50 ft before stop line



7. SR 82 WB 750 ft before stop line



8. SR 82 WB 50 ft before stop line

Appendix B

TFMS Traffic Forecast

TFMS - Segment Forecast Report

Username	Email	Script Import Date	Script Version	Model Version
Kathryn.Sharpnack	Kathryn.Sharpnack@dot.ohio.gov	4/14/2020 5:30:19 PM	2020.001	2024.1900

Forecast Summary

Project ID	Project Name	Opening Year	Design Year
	LOR-82/Station Study	2024	2044

Project Description

Safety Study

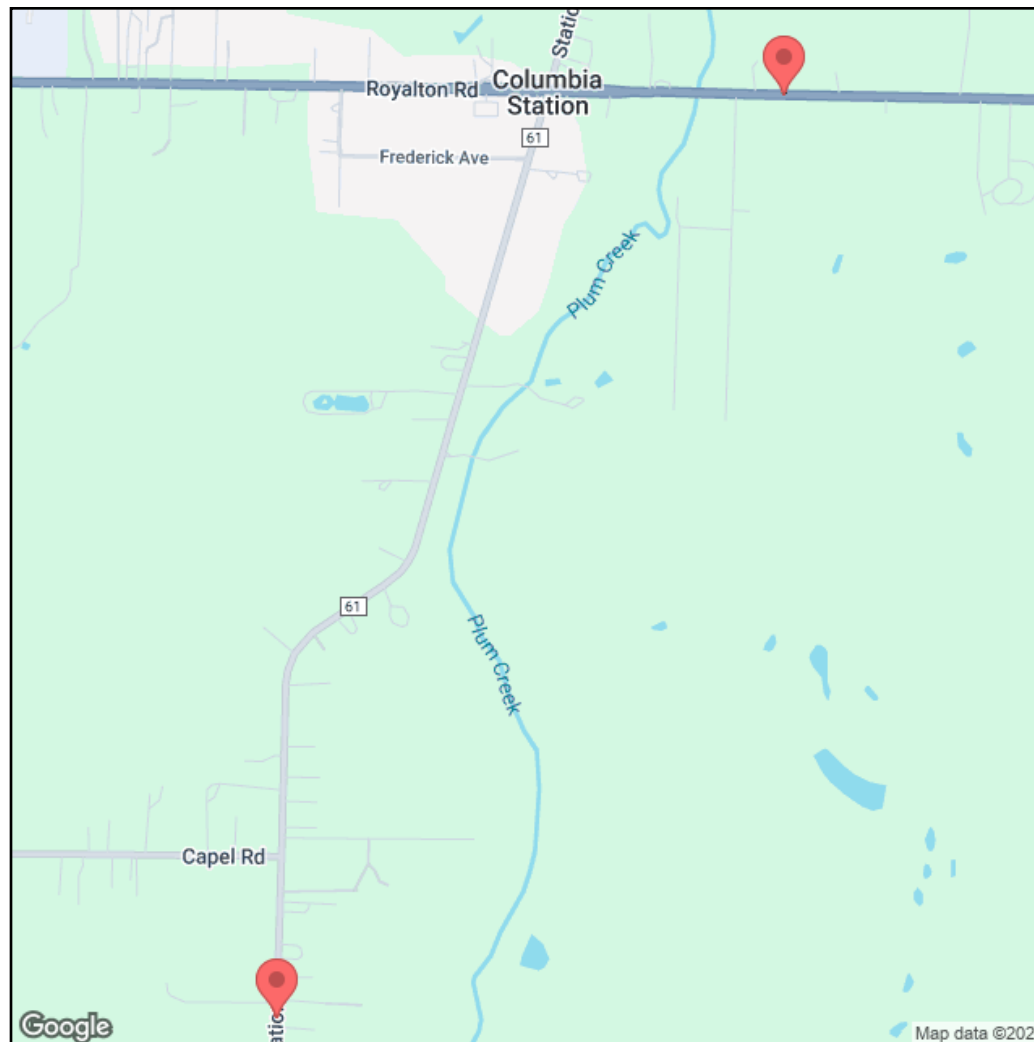
*Users of this data need to be aware that there are limitations to the forecasts generated by this product that make it suitable only for roadway design projects which are low risk.

Segment Information

Segment ID	LRS ID	BMP	EMP	Length	Latitude	Longitude
1886427	CLORCR00061**C	0.000	2.762	2.762	-81.9540126755819	41.2945721636078
1937644	SLORSR00082**C	6.059	7.397	1.338	-81.9405950623208	41.3129257813244

Forecast Information

Segment ID	2024 AADT	2044 AADT	DHV-30	K%	D%	T24%	TD%
1886427	3,100	3,500	500	13.9	54.4	1	0
1937644	9,100	10,000	1,100	11.2	61.1	9	8



Definitions:

- o AADT – Annual Average Daily Traffic
- o DHV30 – Design Hour Volume for 30th highest hour of the year
- o $DHV30 = K * AADT$
- o K % – Design Hour Factor
- o D % – Peak Direction Factor
- o T24 % – Percent Daily Trucks
- o TD % – Percent Design Hour Trucks

Forecast Segment ID	Route	BMP	EMP
1886427	CLORCR00061**C	0.000	2.762

Forecast

Year	K%	T24 % (Existing)	PA AADT	PA Method	PA Growth Rate %	PA Calculated Rate %
2050	◆ 13.9	1	3,600	Average	0.600	0.600
AADT	D%	TD % (Existing)	BC AADT	BC Method	BC Growth Rate %	BC Calculated Rate %
3,640	◆ 54.4	0	40	Average	● -3.500	0.000

● Warning: The growth rate was negative and was capped.

◆ K/D factors from TCDS were used.

Regression

Method Number	PA AADT	BC AADT	AADT
2	4,649	-22	4,627

95% Confidence Min/Max

PA Min	PA Max	BC Min	BC Max	Year
-2178	8031	-615	241	2050

Method Number	PA Growth %	BC Growth %	PA Drop Count	BC Drop Count	PA AADT	BC AADT	PA Adjustment	PA Adjustment
1	1.93	-14.81	0	0	4,727	-103	4,648	-111
2	1.93	-5.91	3	2	4,606	-14	4,649	-22
3	1.58	-35.84	0	0	4,407	-337	4,360	-321
4	2.28	-39.84	3	3	4,925	-372	4,943	-361
5	-1.14	-15.32	0	0	1,992	-116	2,112	-116
6	-999999.00	-999999.00	0	0				

Adjustment Info

ID	Adjustment Methods Name	Model vs Count AADT	Adjusted AADT	Model vs Count BC	Adjusted BC	PA Growth Rate %	BC Growth Rate %
1	DIF	1,128	2,630		27	-0.55	-1.00
2	RAT	1.57	2,364	1.00	27	-0.87	-1.00
3	MRAT	0.76	2,364	0.73	27	-0.87	-1.00
4	RAF		2,497		27	-0.71	-1.00
Adjust Method AADT		Adjust Method BC		Selected PA Growth Rate %		Selected BC Growth Rate %	
Average		Average		-0.700		-1.000	

Method 1 - 4 Volume

PA Min Volume	PA Max Volume	BC Min Volume	BC Max Volume	Total Min Volume	Total MaxVolume
2337	2603	27	27	2364	2630

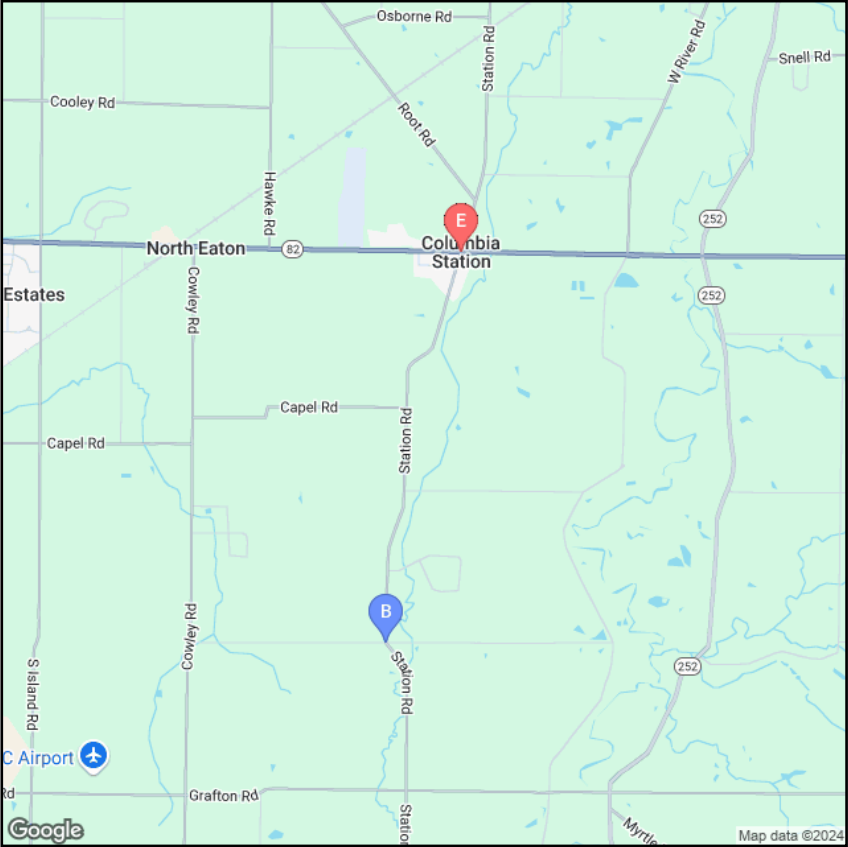
Process Flag: Adjusted model to counts with process per ODOT 255 spreadsheet

Comment: No Comment

Historical Count

Year	All	Cars	Trucks
2011	2,428	2,364	64
2014	2,584	2,419	164
2017	3,338	3,267	71
2020	2,855	2,802	53
* 2023	3,094	3,057	37

* Pivot Point



Segment ID	LRS ID	BMP	EMP	Length	Yr 2024 AADT	Yr 2044 AADT	DHV30	K %	D %	T24 %	TD %
1886427	CLORCR00061**C	0.000	2.762	2.762	3,100	3,500	500	13.9	54.4	1	0

Forecast Segment ID	Route	BMP	EMP
1937644	SLORSR00082**C	6.059	7.397

Forecast

Year	K%	T24 % (Existing)	PA AADT	PA Method	PA Growth Rate %	PA Calculated Rate %
2050	◆ 11.2	8	9,300	Model	0.400	0.400
AADT	D%	TD % (Existing)	BC AADT	BC Method	BC Growth Rate %	BC Calculated Rate %
10,210	◆ 61.1	7	910	Average	1.100	1.100

◆ K/D factors from TCDS were used.

Regression

Method Number	PA AADT	BC AADT	AADT
2	9,308	973	10,281

95% Confidence Min/Max

PA Min	PA Max	BC Min	BC Max	Year
3426	23134	-905	1671	2050

Method Number	PA Growth %	BC Growth %	PA Drop Count	BC Drop Count	PA AADT	BC AADT	PA Adjustment	PA Adjustment
1	0.61	1.11	0	0	9,766	927	9,772	903
2	0.40	1.48	3	3	9,474	971	9,308	973
3	1.02	-0.67	0	0	10,824	545	10,694	570
4	0.27	0.45	3	3	9,145	754	9,015	779
5	2.07	-2.46	0	0	13,478	171	13,082	234
6	2.73	-3.23	4	4	14,798	41	14,567	88

Adjustment Info

ID	Adjustment Methods Name	Model vs Count AADT	Adjusted AADT	Model vs Count BC	Adjusted BC	PA Growth Rate %	BC Growth Rate %
1	DIF	-5,088	10,385	173	824	0.52	0.69
2	RAT	0.64	9,919	1.33	866	0.29	0.91
3	MRAT	1.09	9,958	1.25	858	0.31	0.87
4	RAF		10,171		841	0.41	0.78
Adjust Method AADT		Adjust Method BC		Selected PA Growth Rate %		Selected BC Growth Rate %	
Average		Average		0.400		0.800	

Method 1 - 4 Volume

PA Min Volume	PA Max Volume	BC Min Volume	BC Max Volume	Total Min Volume	Total MaxVolume
9053	9561	824	866	9877	10427

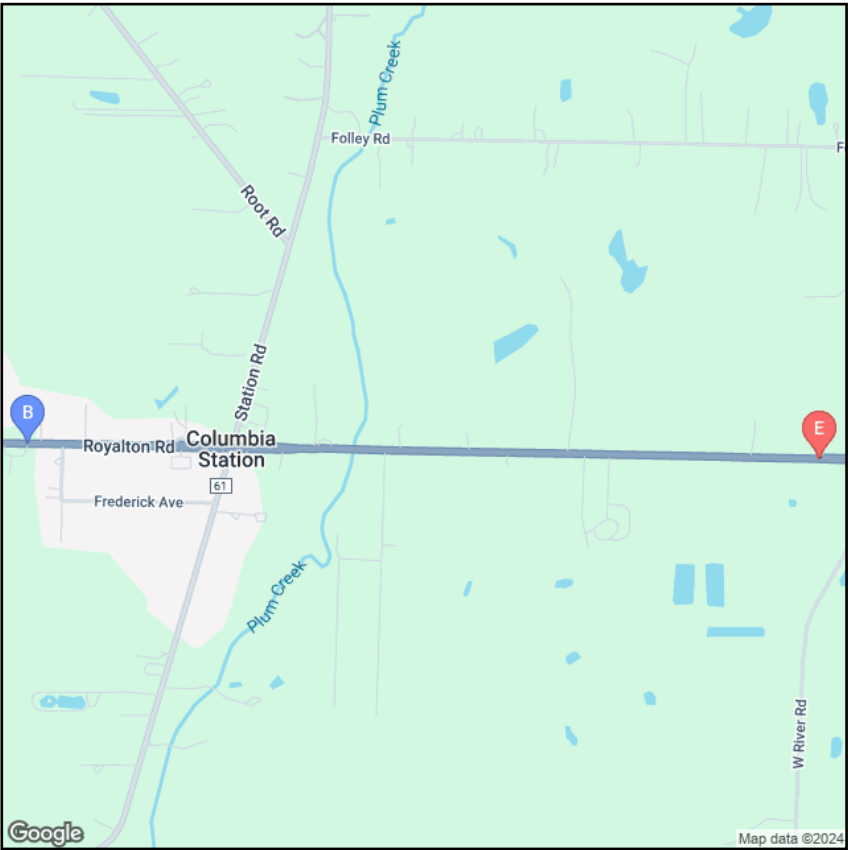
Process Flag: Adjusted model to counts with process per ODOT 255 spreadsheet

Comment: No Comment

Historical Count

Year	All	Cars	Trucks
2008	8,440	7,960	480
2011	8,680	8,030	650
2014	7,324	6,449	874
2017	9,521	8,900	621
2020	8,929	8,283	646
* 2023	9,087	8,392	695

* Pivot Point



Segment ID	LRS ID	BMP	EMP	Length	Yr 2024 AADT	Yr 2044 AADT	DHV30	K %	D %	T24 %	TD %
1937644	SLORSR00082**C	6.059	7.397	1.338	9,100	10,000	1100	11.2	61.1	9	8

Appendix C

Crash Diagram and CAM Tool Summary

Crash Diagram

2024 HSIP RurInt Rank #59
LOR-82-6.43 (Station Rd)
Date: 1/1/19-12/31/23



Crashes By Age Group:
Younger Drivers (< 26 yrs.) - 9 (50%)
Older Drivers (> 64 yrs.) - 0 (0%)

Crashes By Type:
Rear End - 7 (39%)
Left Turn - 5 (28%)
Angle - 2 (11%)
SS-Meeting - 2 (11%)
SS-Passing - 1 (6%)
Head On - 1 (6%)

Crashes By Year:
2019 - 4 (22%)
2020 - 5 (28%)
2021 - 3 (17%)
2022 - 3 (17%)
2023 - 3 (17%)
Total - 18 (100%)

Crashes By Road Condition:
Dry - 14 (78%)
Wet - 4 (22%)
Snow - 0 (0%)

Crashes By Severity:
Fatal - 0 (0%)
Injury - 7 (39%)
PDO - 11 (61%)

Both: Improper turn.
05-20-23/15/Dry
10-14-23/23/Wet (A)

Younger driver, misjudged oncoming vehicles distance.
Impatient driver, stated waited for three cycles.

WB right turning vehicle failed to yield to NB vehicle.

04-03-19/17/Dry
03-10-20/8/Wet
03-07-22/16/Wet

SR 82

01-24-19/16/Dry

08-21-20/17/Dry

Vehicle exiting business driveway was waived through by thru lane driver, but then struck vehicle traveling in the left turn lane.

02-22-20/21/Dry (A)

12-11-21/18/Dry (A)

01-27-23/15/Dry
WB driver made improper passing maneuver and struck EB driver within intersection.

11-24-21/16/Dry
09-06-21/12/Dry
NB vehicle had left turn signal on but proceeded straight.

Station Rd

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	Right Turn
Stop Sign	Right Turn
Animal	

Diagram Label Key

Date/24-Hour/Road Condition
A = Alcohol/Drugs - (3)
D = Distracted - (1)

By: Jeremy Adato

LOR-82-6.43 (Station Rd) 2024 HSIP Safety Study

	Number
Total	18

CRASH_SEVERITY	Number	%
Injury Crash	7	38.9%
Property Damage Crash	11	61.1%
Grand Total	18	100.0%

TRAFFIC_CRASH_YEAR	Number	%
2019	4	22.2%
2020	5	27.8%
2021	3	16.7%
2022	3	16.7%
2023	3	16.7%
Grand Total	18	100.0%

DAY_OF_WEEK	Number	%
(7) Saturday	5	27.8%
(4) Wednesday	4	22.2%
(2) Monday	4	22.2%
(6) Friday	2	11.1%
(3) Tuesday	2	11.1%
(5) Thursday	1	5.6%
Grand Total	18	100.0%

HOUR_OF_DAY	Number	%
8	1	5.6%
10	1	5.6%
12	2	11.1%
14	1	5.6%
15	2	11.1%
16	4	22.2%
17	2	11.1%
18	2	11.1%
20	1	5.6%
21	1	5.6%
23	1	5.6%
Grand Total	18	100.0%

TYPE_OF_CRASH	Number	%
Rear End	7	38.9%
Left Turn	5	27.8%
Sideswipe - Meeting	2	11.1%
Angle	2	11.1%
Sideswipe - Passing	1	5.6%
Head On	1	5.6%
Grand Total	18	100.0%

LOR-82-6.43 (Station Rd) 2024 HSIP Safety Study

WEATHER_CONDITION	Number	%
Clear	9	50.0%
Cloudy	6	33.3%
Rain	3	16.7%
Grand Total	18	100.0%

ROAD_CONDITION	Number	%
Dry	14	77.8%
Wet	4	22.2%
Grand Total	18	100.0%

LIGHT_CONDITION	Number	%
Daylight	13	72.2%
Dark - Roadway Not Lighted	2	11.1%
Dark - Lighted Roadway	2	11.1%
Dawn/Dusk	1	5.6%
Grand Total	18	100.0%

NUMBER_OF_VEHICLES	Number	%
2	18	100.0%
Grand Total	18	100.0%

LOCATION	Number	%
Four-Way Intersection	17	94.4%
Not An Intersection	1	5.6%
Grand Total	18	100.0%

CRASH_MONTH_NBR	Number	%
1	2	11.1%
2	1	5.6%
3	3	16.7%
4	2	11.1%
5	2	11.1%
6	1	5.6%
8	1	5.6%
9	1	5.6%
10	1	5.6%
11	3	16.7%
12	1	5.6%
Grand Total	18	100.0%

ROAD_CONTOUR	Number	%
Straight Level	18	100.0%
Grand Total	18	100.0%

SPECIAL_AREA	Number	%
(blank)	18	100.0%
Grand Total	18	100.0%

ANIMAL_TYPE	Number	%
(blank)	18	100.0%
Grand Total	18	100.0%

LOR-82-6.43 (Station Rd) 2024 HSIP Safety Study

ACTION1	Number	%
Straight Ahead	7	38.9%
Making Left Turn	7	38.9%
Making Right Turn	2	11.1%
Slowing or Stopped In Traffic	2	11.1%
Grand Total	18	100.0%

CONTRIBUTING_FACTOR1	Number	%
Failure to Yield	6	33.3%
Following Too Closely/ACDA	6	33.3%
Improper Turn	2	11.1%
Improper Passing	1	5.6%
None	1	5.6%
Unsafe Speed	1	5.6%
Drove off Road	1	5.6%
Grand Total	18	100.0%

	Number	%
Total	18	100.0%

TRAFFIC_CONTROL1	Number	%
Signal	17	94.4%
No Control	1	5.6%
Grand Total	18	100.0%

DRIVER_ALCOHOL1	Number	%
No	15	83.3%
Yes	3	16.7%
Grand Total	18	100.0%

DRIVER_DRUGS1	Number	%
No	18	100.0%
Grand Total	18	100.0%

LOR-82-6.43 (Station Rd) 2024 HSIP Safety Study

DIRECTION_FROM1	Number	%
East	7	38.9%
West	5	27.8%
North	5	27.8%
South	1	5.6%
Grand Total	18	100.0%

DIRECTION_TO1	Number	%
West	5	27.8%
North	4	22.2%
East	4	22.2%
South	4	22.2%
Northeast	1	5.6%
Grand Total	18	100.0%

POSTED_SPEED1	Number	%
45	18	100.0%
Grand Total	18	100.0%

ESTIMATED_SPEED1	Number	%
5	5	27.8%
0	4	22.2%
35	2	11.1%
10	2	11.1%
30	2	11.1%
6	1	5.6%
40	1	5.6%
15	1	5.6%
Grand Total	18	100.0%

VEHICLE_TYPE1	Number	%
Passenger Car	14	77.8%
Pick up	1	5.6%
Motorcycle 2 Wheeled	1	5.6%
Cargo Van	1	5.6%
Passenger Van (minivan)	1	5.6%
Grand Total	18	100.0%

VEHICLE_TYPE2	Number	%
Sport Utility Vehicle	7	38.9%
Passenger Car	7	38.9%
Pick up	3	16.7%
Motorcycle 2 Wheeled	1	5.6%
Grand Total	18	100.0%

LOR-82-6.43 (Station Rd) 2024 HSIP Safety Study

ACTION2	Number	%
Straight Ahead	9	50.0%
Slowing or Stopped In Traffic	8	44.4%
Making Left Turn	1	5.6%
Grand Total	18	100.0%

CONTRIBUTING_FACTOR2	Number	%
None	17	94.4%
Other Improper Action	1	5.6%
Grand Total	18	100.0%

DIRECTION_FROM2	Number	%
West	5	27.8%
East	5	27.8%
North	5	27.8%
South	2	11.1%
Southwest	1	5.6%
Grand Total	18	100.0%

DIRECTION_TO2	Number	%
West	5	27.8%
South	5	27.8%
East	4	22.2%
North	3	16.7%
Northeast	1	5.6%
Grand Total	18	100.0%

DRIVER_ALCOHOL2	Number	%
(blank)	18	100.0%
Grand Total	18	100.0%

DRIVER_DRUGS2	Number	%
(blank)	18	100.0%
Grand Total	18	100.0%

LOR-82-6.43 (Station Rd) 2024 HSIP Safety Study

SEVERITY		CRASH_SEVERITY	
TRAFFIC_CRASH_YEAR		Property Damage Crash	Injury Crash
2019		3	1
2020		4	1
2021		1	2
2022		2	1
2023		1	2
Grand Total		11	7

TRAFFIC_CRASH_YEAR	Fatalities	Incapacitating Injuries
2019	0	0
2020	0	0
2021	0	0
2022	0	0
2023	0	0
Grand Total		0

TRAFFIC_CRASH_YEAR	INJ_TYPE2_SERIOUS_VISIBLE	INJ_TYPE3_MINOR_VISIBLE	INJ_TYPE4_NO_VISIBLE
2019	0	0	1
2020	0	2	0
2021	0	2	0
2022	0	1	0
2023	0	1	1
Grand Total		6	2

Appendix D

Turning Movement Count



Ohio Department of Transportation - Safety
1980 West Broad Street
Mail Stop 5160
Columbus, Ohio, United States 43223
+16147528099 jeremy.adato@dot.ohio.gov
Office of Traffic Engineering

Count Name: LOR-82-6.43
Site Code:
Start Date: 09/10/2024
Page No: 1

Turning Movement Data

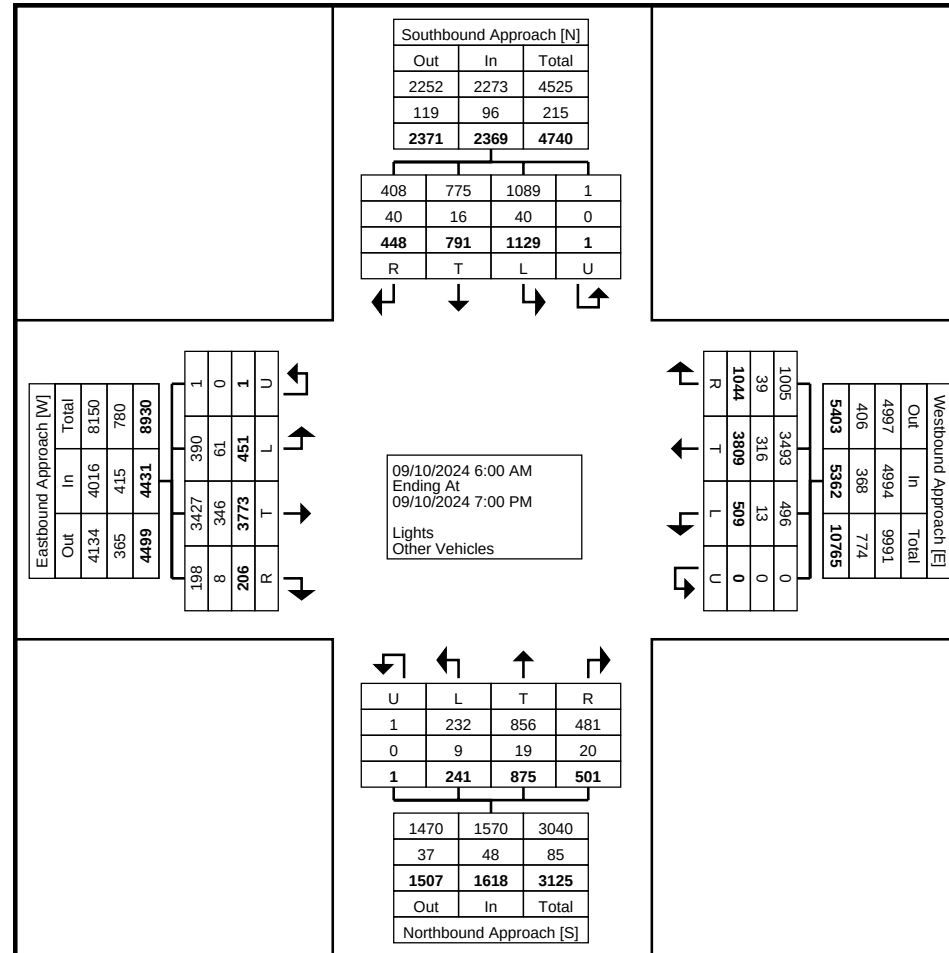
Start Time	Southbound Approach					Westbound Approach					Northbound Approach					Eastbound Approach					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
6:00 AM	1	7	13	0	21	7	21	2	0	30	11	7	3	0	21	1	55	2	0	58	130
6:15 AM	4	4	15	0	23	8	42	0	0	50	8	25	2	0	35	0	61	2	0	63	171
6:30 AM	6	11	31	0	48	13	59	1	0	73	10	18	6	0	34	3	92	5	0	100	255
6:45 AM	7	11	30	0	48	11	67	4	0	82	12	20	3	0	35	1	95	5	0	101	266
Hourly Total	18	33	89	0	140	39	189	7	0	235	41	70	14	0	125	5	303	14	0	322	822
7:00 AM	9	13	19	0	41	20	64	5	0	89	15	33	7	0	55	2	72	9	0	83	268
7:15 AM	9	19	31	0	59	15	62	9	0	86	17	37	7	0	61	2	82	7	1	92	298
7:30 AM	6	20	35	0	61	24	87	4	0	115	17	33	4	0	54	2	119	12	0	133	363
7:45 AM	17	19	19	0	55	18	65	2	0	85	15	21	5	0	41	4	108	6	0	118	299
Hourly Total	41	71	104	0	216	77	278	20	0	375	64	124	23	0	211	10	381	34	1	426	1228
8:00 AM	10	13	28	0	51	19	58	6	0	83	14	26	6	0	46	4	77	8	0	89	269
8:15 AM	7	11	17	0	35	23	68	6	0	97	8	15	3	0	26	8	69	13	0	90	248
8:30 AM	8	13	21	0	42	11	39	5	0	55	11	26	5	0	42	5	77	5	0	87	226
8:45 AM	7	10	21	0	38	10	54	5	0	69	8	22	5	0	35	6	52	7	0	65	207
Hourly Total	32	47	87	0	166	63	219	22	0	304	41	89	19	0	149	23	275	33	0	331	950
9:00 AM	8	9	11	0	28	14	67	6	0	87	12	13	4	0	29	4	52	5	0	61	205
9:15 AM	10	12	21	0	43	14	56	3	0	73	8	6	3	0	17	1	63	9	0	73	206
9:30 AM	7	7	22	0	36	16	54	3	0	73	8	10	0	0	18	4	58	10	0	72	199
9:45 AM	4	6	18	0	28	9	48	13	0	70	6	22	3	0	31	3	61	10	0	74	203
Hourly Total	29	34	72	0	135	53	225	25	0	303	34	51	10	0	95	12	234	34	0	280	813
10:00 AM	4	5	18	0	27	17	49	9	0	75	9	8	7	0	24	3	49	6	0	58	184
10:15 AM	7	9	14	0	30	13	44	5	0	62	9	12	2	0	23	4	66	10	0	80	195
10:30 AM	10	11	24	0	45	15	66	5	0	86	10	4	4	0	18	1	55	6	0	62	211
10:45 AM	4	9	11	0	24	8	51	7	0	66	9	13	2	0	24	3	69	6	0	78	192
Hourly Total	25	34	67	0	126	53	210	26	0	289	37	37	15	0	89	11	239	28	0	278	782
11:00 AM	4	4	14	0	22	19	55	10	0	84	5	12	3	0	20	1	51	10	0	62	188
11:15 AM	8	12	17	0	37	12	62	5	0	79	10	9	6	0	25	0	58	6	0	64	205
11:30 AM	8	7	14	0	29	12	72	7	0	91	9	9	5	0	23	5	72	15	0	92	235
11:45 AM	8	9	13	0	30	16	67	7	0	90	10	11	3	0	24	7	76	8	0	91	235
Hourly Total	28	32	58	0	118	59	256	29	0	344	34	41	17	0	92	13	257	39	0	309	863
12:00 PM	14	12	17	0	43	13	65	7	0	85	6	11	9	0	26	8	77	7	0	92	246
12:15 PM	5	13	9	1	28	13	69	14	0	96	7	9	6	0	22	5	75	14	0	94	240
12:30 PM	5	16	14	0	35	12	54	4	0	70	5	21	5	0	31	4	60	3	0	67	203
12:45 PM	5	14	24	0	43	23	68	7	0	98	6	11	4	0	21	5	69	7	0	81	243
Hourly Total	29	55	64	1	149	61	256	32	0	349	24	52	24	0	100	22	281	31	0	334	932

1:00 PM	10	5	20	0	35	17	54	11	0	82	13	16	7	0	36	3	67	8	0	78	231
1:15 PM	6	11	15	0	32	15	61	8	0	84	10	11	4	0	25	4	61	6	0	71	212
1:30 PM	10	12	23	0	45	14	75	6	0	95	3	13	4	0	20	7	61	4	0	72	232
1:45 PM	16	11	10	0	37	20	68	9	0	97	3	13	3	0	19	3	70	7	0	80	233
Hourly Total	42	39	68	0	149	66	258	34	0	358	29	53	18	0	100	17	259	25	0	301	908
2:00 PM	9	12	16	0	37	20	80	14	0	114	7	9	2	0	18	5	74	14	0	93	262
2:15 PM	8	14	14	0	36	28	53	14	0	95	8	15	6	0	29	1	71	15	0	87	247
2:30 PM	7	17	23	0	47	22	122	7	0	151	10	12	1	0	23	2	76	8	0	86	307
2:45 PM	12	20	28	0	60	27	105	27	0	159	9	18	4	0	31	7	73	6	0	86	336
Hourly Total	36	63	81	0	180	97	360	62	0	519	34	54	13	0	101	15	294	43	0	352	1152
3:00 PM	18	24	20	0	62	28	78	16	0	122	17	18	6	0	41	6	69	9	0	84	309
3:15 PM	18	19	36	0	73	30	107	18	0	155	10	19	3	0	32	7	79	7	0	93	353
3:30 PM	21	22	23	0	66	19	116	19	0	154	4	19	6	0	29	6	92	11	0	109	358
3:45 PM	12	37	15	0	64	31	142	14	0	187	7	19	2	0	28	8	84	11	0	103	382
Hourly Total	69	102	94	0	265	108	443	67	0	618	38	75	17	0	130	27	324	38	0	389	1402
4:00 PM	11	35	20	0	66	20	115	12	0	147	9	15	4	0	28	7	82	12	0	101	342
4:15 PM	14	27	25	0	66	38	122	16	0	176	12	28	13	0	53	3	89	16	0	108	403
4:30 PM	10	23	30	0	63	42	122	17	0	181	14	14	7	0	35	4	73	16	0	93	372
4:45 PM	8	23	31	0	62	48	98	26	0	172	10	27	8	0	45	3	101	7	0	111	390
Hourly Total	43	108	106	0	257	148	457	71	0	676	45	84	32	0	161	17	345	51	0	413	1507
5:00 PM	12	24	29	0	65	37	107	23	0	167	13	29	7	0	49	2	72	9	0	83	364
5:15 PM	12	32	31	0	75	34	127	14	0	175	7	25	5	0	37	3	107	18	0	128	415
5:30 PM	7	32	39	0	78	32	97	16	0	145	10	25	9	0	44	4	73	10	0	87	354
5:45 PM	8	26	36	0	70	33	86	10	0	129	10	16	6	0	32	2	73	11	0	86	317
Hourly Total	39	114	135	0	288	136	417	63	0	616	40	95	27	0	162	11	325	48	0	384	1450
6:00 PM	3	20	26	0	49	23	61	15	0	99	13	12	5	1	31	8	69	6	0	83	262
6:15 PM	5	15	33	0	53	21	75	10	0	106	10	14	3	0	27	8	56	13	0	77	263
6:30 PM	4	11	26	0	41	23	45	13	0	81	9	12	3	0	24	3	74	8	0	85	231
6:45 PM	5	13	19	0	37	17	60	13	0	90	8	12	1	0	21	4	57	6	0	67	215
Hourly Total	17	59	104	0	180	84	241	51	0	376	40	50	12	1	103	23	256	33	0	312	971
Grand Total	448	791	1129	1	2369	1044	3809	509	0	5362	501	875	241	1	1618	206	3773	451	1	4431	13780
Approach %	18.9	33.4	47.7	0.0	-	19.5	71.0	9.5	0.0	-	31.0	54.1	14.9	0.1	-	4.6	85.2	10.2	0.0	-	-
Total %	3.3	5.7	8.2	0.0	17.2	7.6	27.6	3.7	0.0	38.9	3.6	6.3	1.7	0.0	11.7	1.5	27.4	3.3	0.0	32.2	-
Lights	408	775	1089	1	2273	1005	3493	496	0	4994	481	856	232	1	1570	198	3427	390	1	4016	12853
% Lights	91.1	98.0	96.5	100.0	95.9	96.3	91.7	97.4	-	93.1	96.0	97.8	96.3	100.0	97.0	96.1	90.8	86.5	100.0	90.6	93.3
Other Vehicles	40	16	40	0	96	39	316	13	0	368	20	19	9	0	48	8	346	61	0	415	927
% Other Vehicles	8.9	2.0	3.5	0.0	4.1	3.7	8.3	2.6	-	6.9	4.0	2.2	3.7	0.0	3.0	3.9	9.2	13.5	0.0	9.4	6.7



Ohio Department of Transportation - Safety
1980 West Broad Street
Mail Stop 5160
Columbus, Ohio, United States 43223
+16147528099 jeremy.adato@dot.ohio.gov
Office of Traffic Engineering

Count Name: LOR-82-6.43
Site Code:
Start Date: 09/10/2024
Page No: 3



Turning Movement Data Plot



Ohio Department of Transportation - Safety
1980 West Broad Street
Mail Stop 5160
Columbus, Ohio, United States 43223
+16147528099 jeremy.adato@dot.ohio.gov
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Count Name: LOR-82-6.43
Site Code:
Start Date: 09/10/2024
Page No: 4

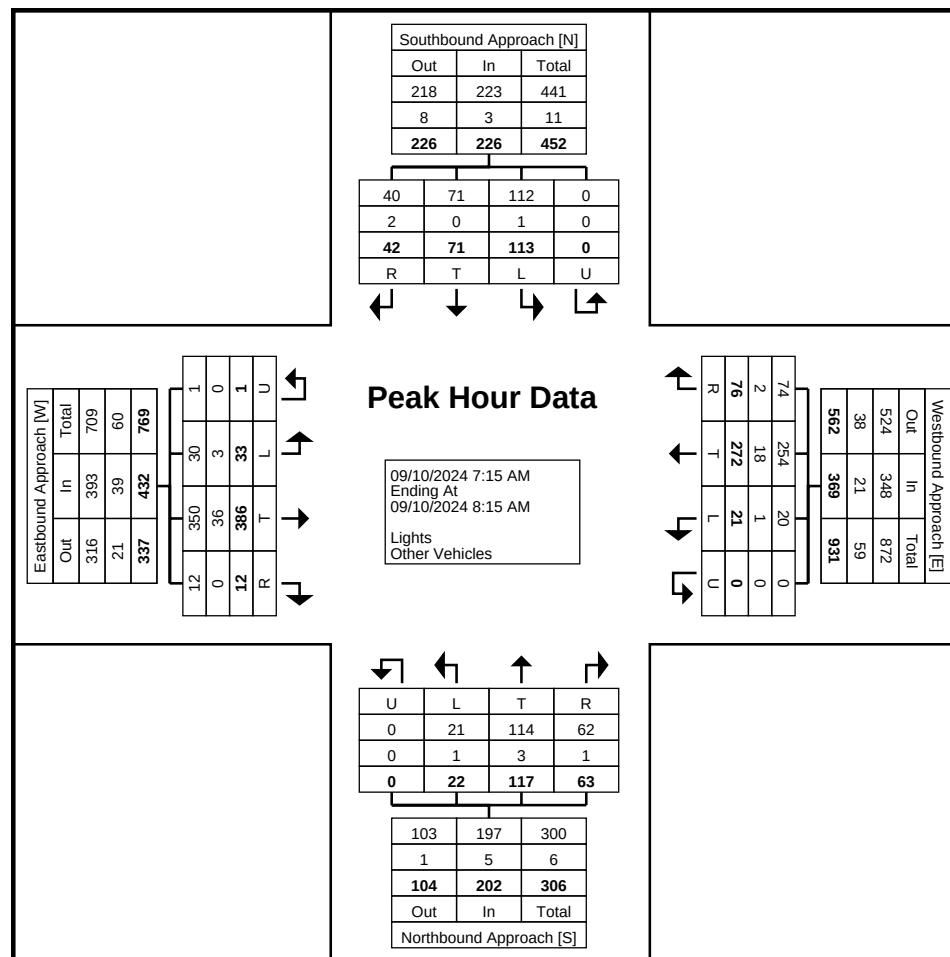
Turning Movement Peak Hour Data (7:15 AM)

Start Time	Southbound Approach					Westbound Approach					Northbound Approach					Eastbound Approach					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
7:15 AM	9	19	31	0	59	15	62	9	0	86	17	37	7	0	61	2	82	7	1	92	298
7:30 AM	6	20	35	0	61	24	87	4	0	115	17	33	4	0	54	2	119	12	0	133	363
7:45 AM	17	19	19	0	55	18	65	2	0	85	15	21	5	0	41	4	108	6	0	118	299
8:00 AM	10	13	28	0	51	19	58	6	0	83	14	26	6	0	46	4	77	8	0	89	269
Total	42	71	113	0	226	76	272	21	0	369	63	117	22	0	202	12	386	33	1	432	1229
Approach %	18.6	31.4	50.0	0.0	-	20.6	73.7	5.7	0.0	-	31.2	57.9	10.9	0.0	-	2.8	89.4	7.6	0.2	-	-
Total %	3.4	5.8	9.2	0.0	18.4	6.2	22.1	1.7	0.0	30.0	5.1	9.5	1.8	0.0	16.4	1.0	31.4	2.7	0.1	35.2	-
PHF	0.618	0.888	0.807	0.000	0.926	0.792	0.782	0.583	0.000	0.802	0.926	0.791	0.786	0.000	0.828	0.750	0.811	0.688	0.250	0.812	0.846
Lights	40	71	112	0	223	74	254	20	0	348	62	114	21	0	197	12	350	30	1	393	1161
% Lights	95.2	100.0	99.1	-	98.7	97.4	93.4	95.2	-	94.3	98.4	97.4	95.5	-	97.5	100.0	90.7	90.9	100.0	91.0	94.5
Other Vehicles	2	0	1	0	3	2	18	1	0	21	1	3	1	0	5	0	36	3	0	39	68
% Other Vehicles	4.8	0.0	0.9	-	1.3	2.6	6.6	4.8	-	5.7	1.6	2.6	4.5	-	2.5	0.0	9.3	9.1	0.0	9.0	5.5



Ohio Department of Transportation - Safety
1980 West Broad Street
Mail Stop 5160
Columbus, Ohio, United States 43223
+16147528099 jeremy.adato@dot.ohio.gov
Office of Traffic Engineering

Count Name: LOR-82-6.43
Site Code:
Start Date: 09/10/2024
Page No: 5



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



Ohio Department of Transportation - Safety
1980 West Broad Street
Mail Stop 5160
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Count Name: LOR-82-6.43
Site Code:
Start Date: 09/10/2024
Page No: 6

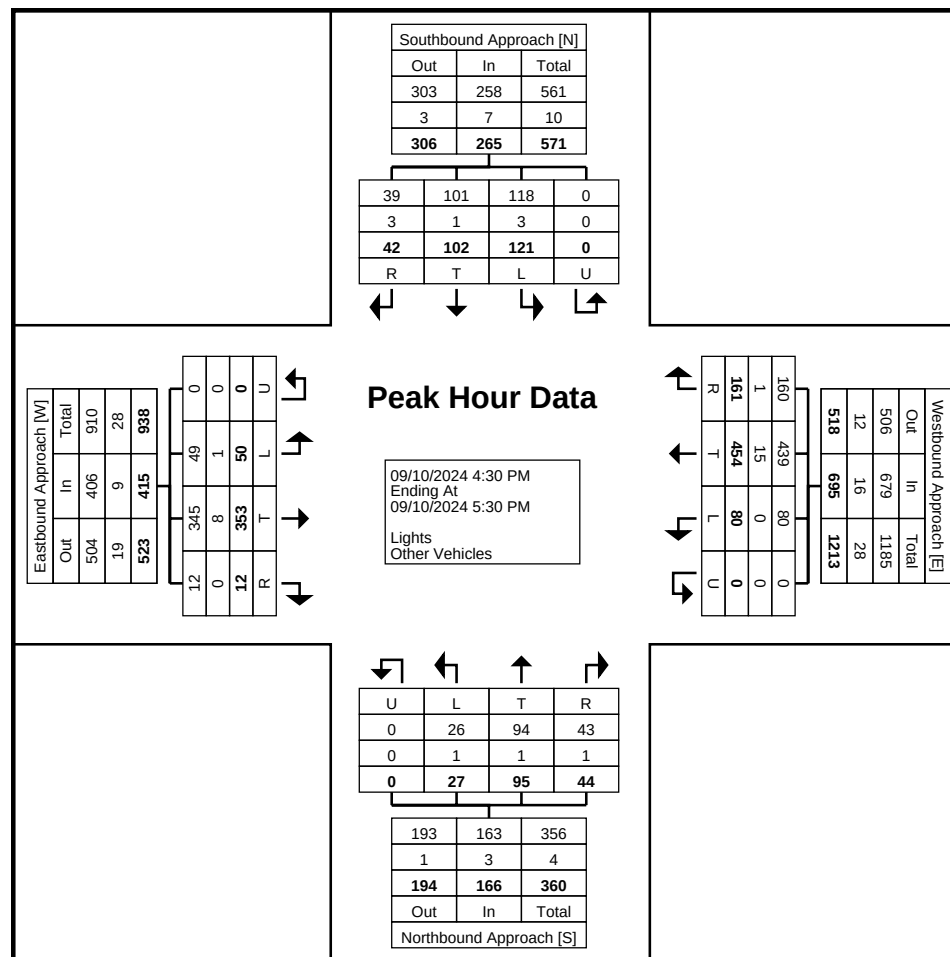
Turning Movement Peak Hour Data (4:30 PM)

Start Time	Southbound Approach					Westbound Approach					Northbound Approach					Eastbound Approach					Int. Total
	Southbound					Westbound					Northbound					Eastbound					
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
4:30 PM	10	23	30	0	63	42	122	17	0	181	14	14	7	0	35	4	73	16	0	93	372
4:45 PM	8	23	31	0	62	48	98	26	0	172	10	27	8	0	45	3	101	7	0	111	390
5:00 PM	12	24	29	0	65	37	107	23	0	167	13	29	7	0	49	2	72	9	0	83	364
5:15 PM	12	32	31	0	75	34	127	14	0	175	7	25	5	0	37	3	107	18	0	128	415
Total	42	102	121	0	265	161	454	80	0	695	44	95	27	0	166	12	353	50	0	415	1541
Approach %	15.8	38.5	45.7	0.0	-	23.2	65.3	11.5	0.0	-	26.5	57.2	16.3	0.0	-	2.9	85.1	12.0	0.0	-	-
Total %	2.7	6.6	7.9	0.0	17.2	10.4	29.5	5.2	0.0	45.1	2.9	6.2	1.8	0.0	10.8	0.8	22.9	3.2	0.0	26.9	-
PHF	0.875	0.797	0.976	0.000	0.883	0.839	0.894	0.769	0.000	0.960	0.786	0.819	0.844	0.000	0.847	0.750	0.825	0.694	0.000	0.811	0.928
Lights	39	101	118	0	258	160	439	80	0	679	43	94	26	0	163	12	345	49	0	406	1506
% Lights	92.9	99.0	97.5	-	97.4	99.4	96.7	100.0	-	97.7	97.7	98.9	96.3	-	98.2	100.0	97.7	98.0	-	97.8	97.7
Other Vehicles	3	1	3	0	7	1	15	0	0	16	1	1	1	0	3	0	8	1	0	9	35
% Other Vehicles	7.1	1.0	2.5	-	2.6	0.6	3.3	0.0	-	2.3	2.3	1.1	3.7	-	1.8	0.0	2.3	2.0	-	2.2	2.3



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Count Name: LOR-82-6.43
Site Code:
Start Date: 09/10/2024
Page No: 7



Turning Movement Peak Hour Data Plot (4:30 PM)

Appendix E

Signal Warrant Analysis

LOR-82-6.43 (Station Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-6.43 (Station Rd) 2024 HSIP

Study Date : 11/1/2024

Signal Warrants - Summary

Major Street Approaches

Eastbound: SR 83 EB

Number of Lanes : 1

Total Approach Volume: 4,431

Westbound: SR 82 WB

Number of Lanes : 1

Total Approach Volume: 5,362

Minor Street Approaches

Northbound: Station Rd NB

Number of Lanes : 1

Total Approach Volume: 1,618

Southbound: Station Rd SB

Number of Lanes : 1

Total Approach Volume: 2,369

Warrant Summary (Rural Values Apply)

Warrant 1 - Eight Hour Vehicular Volumes.....Satisfied

Warrant 1A - Minimum Vehicular Volume.....Satisfied

Required volumes reached for 13 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic.....Satisfied

Required volumes reached for 13 hours, 8 are needed

Warrant 1C - Combination of Warrants.....Satisfied

Required 1A volumes reached for 13 hours, 8 are needed

Required 1B volumes reached for 13 hours, 8 are needed

Warrant 2 - Four Hour Volumes.....Satisfied

Number of hours (13) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour.....Satisfied

Warrant 3A - Peak Hour Delay.....Satisfied

Number of one hour periods (43) volumes exceed minimum >= required (1). Delay data not evaluated.

Warrant 3B - Peak Hour Volumes.....Satisfied

Volumes exceed minimums for at least one hour period.

Warrant 4 - Pedestrian Volumes.....Not Evaluated

Warrant 5 - School Crossing.....Not Evaluated

Warrant 6 - Coordinated Signal System.....Not Evaluated

Warrant 7 - Crash Experience.....Not Evaluated

Warrant 8 - Roadway Network.....Not Evaluated

Warrant 9 - Intersection Near a Grade Crossing.....Not Evaluated

LOR-82-6.43 (Station Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-6.43 (Station Rd) 2024 HSIP

Study Date : 11/1/2024

Warrant 1A - Minimum Volumes

Description

Intended for sites where the volume of intersecting traffic is the principal reason for consideration of a signal installation.

Summary

13 one hour periods meet minimums.
Warrant IS met.

Site Data Required

Rural Settings Apply = **True**
Number of Major Lanes = **1**
Number of Minor Lanes = **1**

Volume Requirements

Rural Factor of 70 % applied
Veh/Hr Major = **350**

Veh/Hr Minor = **105**

Major Road SR 83 EB						Minor Road Station Rd NB		
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met?
16:00 - 17:00	413	+	676	=	1089	161	257	Yes
15:00 - 16:00	389	+	618	=	1007	130	265	Yes
17:00 - 18:00	384	+	616	=	1000	162	288	Yes
14:00 - 15:00	352	+	519	=	871	101	180	Yes
07:00 - 08:00	426	+	375	=	801	211	216	Yes
18:00 - 19:00	312	+	376	=	688	103	180	Yes
12:00 - 13:00	334	+	349	=	683	100	149	Yes
13:00 - 14:00	301	+	358	=	659	100	149	Yes
11:00 - 12:00	309	+	344	=	653	92	118	Yes
08:00 - 09:00	331	+	304	=	635	149	166	Yes
09:00 - 10:00	280	+	303	=	583	95	135	Yes
10:00 - 11:00	278	+	289	=	567	89	126	Yes
06:00 - 07:00	322	+	235	=	557	125	140	Yes
05:45 - 06:45	221	+	153	=	374	90	92	No
05:30 - 06:30	121	+	80	=	201	56	44	No
05:15 - 06:15	58	+	30	=	88	21	21	No
23:45 - 00:45	0	+	0	=	0	0	0	No
23:30 - 00:30	0	+	0	=	0	0	0	No
19:00 - 20:00	0	+	0	=	0	0	0	No
22:00 - 23:00	0	+	0	=	0	0	0	No
22:15 - 23:15	0	+	0	=	0	0	0	No
21:30 - 22:30	0	+	0	=	0	0	0	No
21:45 - 22:45	0	+	0	=	0	0	0	No
23:00 - 00:00	0	+	0	=	0	0	0	No
23:15 - 00:15	0		0		0	0	0	No

LOR-82-6.43 (Station Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-6.43 (Station Rd) 2024 HSIP

Study Date : 11/1/2024

Warrant 1B - Interruption of Continuous Traffic

Description

Intended for sites where the volume of the major street is so heavy that traffic on the minor street suffers excessive delay or hazard.

Summary

13 one hour periods meet minimums.
Warrant IS met.

Site Data Required

Rural Settings Apply = **True**
Number of Major Lanes = **1**
Number of Minor Lanes = **1**

Volume Requirements

Rural Factor of 70 % applied
Veh/Hr Major = **525**

Veh/Hr Minor = **52**

Major Road SR 83 EB						Minor Road Station Rd NB		
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met?
16:00 - 17:00	413	+	676	=	1089	161	257	Yes
15:00 - 16:00	389	+	618	=	1007	130	265	Yes
17:00 - 18:00	384	+	616	=	1000	162	288	Yes
14:00 - 15:00	352	+	519	=	871	101	180	Yes
07:00 - 08:00	426	+	375	=	801	211	216	Yes
18:00 - 19:00	312	+	376	=	688	103	180	Yes
12:00 - 13:00	334	+	349	=	683	100	149	Yes
13:00 - 14:00	301	+	358	=	659	100	149	Yes
11:00 - 12:00	309	+	344	=	653	92	118	Yes
08:00 - 09:00	331	+	304	=	635	149	166	Yes
09:00 - 10:00	280	+	303	=	583	95	135	Yes
10:00 - 11:00	278	+	289	=	567	89	126	Yes
06:00 - 07:00	322	+	235	=	557	125	140	Yes
05:45 - 06:45	221	+	153	=	374	90	92	No
05:30 - 06:30	121	+	80	=	201	56	44	No
05:15 - 06:15	58	+	30	=	88	21	21	No
23:45 - 00:45	0	+	0	=	0	0	0	No
23:30 - 00:30	0	+	0	=	0	0	0	No
19:00 - 20:00	0	+	0	=	0	0	0	No
22:00 - 23:00	0	+	0	=	0	0	0	No
22:15 - 23:15	0	+	0	=	0	0	0	No
21:30 - 22:30	0	+	0	=	0	0	0	No
21:45 - 22:45	0	+	0	=	0	0	0	No
23:00 - 00:00	0	+	0	=	0	0	0	No
23:15 - 00:15	0		0		0	0	0	No

LOR-82-6.43 (Station Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-6.43 (Station Rd) 2024 HSIP

Study Date : 11/1/2024

Warrant 1C Combination of Warrants

Description

Intended for sites where the traffic volumes don't meet individual warrants but where Warrants 1A and 1B are both met to 80% of their stated values.

Summary

13 hours meet 1A minimums.
13 hours meet 1B minimums.
Warrant IS met.

Site Data Required

Rural Settings Apply = **True**
Number of Major Lanes = **1**
Number of Minor Lanes = **1**

Volume Requirements

Rural Factor of 70% applied
Warrant 1A 1B
Veh/Hr Major = **280 420**

Veh/Hr Minor = **84 42**

Major Road						Minor Road			
SR 83 EB						Station Rd NB			
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met1A?	
15:45 - 16:45	405	+	691	=	1096	144	259	Yes	
16:45 - 17:45	409	+	659	=	1068	175	280	Yes	
14:45 - 15:45	372	+	590	=	962	133	261	Yes	
13:45 - 14:45	346	+	457	=	803	89	157	Yes	
06:45 - 07:45	409	+	372	=	781	205	209	Yes	
17:45 - 18:45	331	+	415	=	746	114	213	Yes	
07:45 - 08:45	384	+	320	=	704	155	183	Yes	
11:45 - 12:45	344	+	341	=	685	103	136	Yes	
12:45 - 13:45	302	+	359	=	661	102	155	Yes	
10:45 - 11:45	296	+	320	=	616	92	112	Yes	
08:45 - 09:45	271	+	302	=	573	99	145	Yes	
09:45 - 10:45	274		293		567	96	130	Yes	

Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met1B?	
16:00 - 17:00	413	+	676	=	1089	161	257	Yes	
15:00 - 16:00	389	+	618	=	1007	130	265	Yes	
17:00 - 18:00	384	+	616	=	1000	162	288	Yes	
14:00 - 15:00	352	+	519	=	871	101	180	Yes	
07:00 - 08:00	426	+	375	=	801	211	216	Yes	
18:00 - 19:00	312	+	376	=	688	103	180	Yes	
12:00 - 13:00	334	+	349	=	683	100	149	Yes	
13:00 - 14:00	301	+	358	=	659	100	149	Yes	
11:00 - 12:00	309	+	344	=	653	92	118	Yes	
08:00 - 09:00	331	+	304	=	635	149	166	Yes	
09:00 - 10:00	280	+	303	=	583	95	135	Yes	
10:00 - 11:00	278		289		567	89	126	Yes	

LOR-82-6.43 (Station Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-6.43 (Station Rd) 2024 HSIP

Study Date : 11/1/2024

Warrant 2 - Four Hour Volumes

Description

Intended for sites where the volume of intersecting traffic during any four hours of the day is the principal reason for consideration of a signal installation.

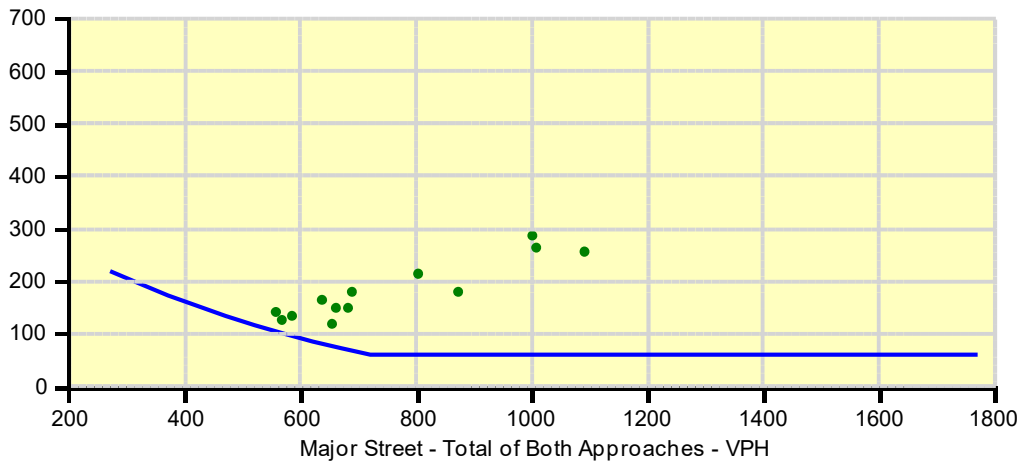
Summary

13 one hour periods meet minimums.
Warrant IS met.

Site Data Required

Rural Settings Apply = True
Number of Major Lanes = 1
Number of Minor Lanes = 1

Major Road SR 83 EB						Minor Road Station Rd NB		Met?
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	
16:00 - 17:00	413	+	676	=	1089	161	257	Yes
15:00 - 16:00	389	+	618	=	1007	130	265	Yes
17:00 - 18:00	384	+	616	=	1000	162	288	Yes
14:00 - 15:00	352	+	519	=	871	101	180	Yes
07:00 - 08:00	426	+	375	=	801	211	216	Yes
18:00 - 19:00	312	+	376	=	688	103	180	Yes
12:00 - 13:00	334	+	349	=	683	100	149	Yes
13:00 - 14:00	301	+	358	=	659	100	149	Yes
11:00 - 12:00	309	+	344	=	653	92	118	Yes
08:00 - 09:00	331	+	304	=	635	149	166	Yes
09:00 - 10:00	280	+	303	=	583	95	135	Yes
							126	Yes



LOR-82-6.43 (Station Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-6.43 (Station Rd) 2024 HSIP

Study Date : 11/1/2024

Warrant 3A - Peak Hour Delay

Description

Intended for sites where for one hour of the day minor street traffic suffers undue traffic delay entering or crossing the major street.

Summary

43 one hour periods meet minimums.
Warrant IS met.

Site Data Required

Number of Minor Lanes = 1

Volume and Delay Requirements

Veh/Hr All Approaches = 800

Veh/Hr Minor = 100

Total Delay (Veh-Hrs) = 4

Major Road						Minor Road			
SR 83 EB						Station Rd NB			
Time	Total of All Approaches	Met?	Minor NB	Delay NB	Met?	Minor SB	Delay SB	Met?	Warrant Met?
16:30 - 17:30	1541	Yes	166	-	---	265	-	Yes	Yes
16:15 - 17:15	1529	Yes	182	-	---	256	-	Yes	Yes
16:45 - 17:45	1523	Yes	175	-	---	280	-	Yes	Yes
16:00 - 17:00	1507	Yes	161	-	---	257	-	Yes	Yes
15:45 - 16:45	1499	Yes	144	-	---	259	-	Yes	Yes
15:30 - 16:30	1485	Yes	138	-	---	262	-	Yes	Yes
17:00 - 18:00	1450	Yes	162	-	---	288	-	Yes	Yes
15:15 - 16:15	1435	Yes	117	-	---	269	-	Yes	Yes
15:00 - 16:00	1402	Yes	130	-	---	265	-	Yes	Yes
14:45 - 15:45	1356	Yes	133	-	---	261	-	Yes	Yes
17:15 - 18:15	1348	Yes	144	-	---	272	-	Yes	Yes
14:30 - 15:30	1305	Yes	127	-	---	242	-	Yes	Yes
07:15 - 08:15	1229	Yes	202	-	---	226	-	Yes	Yes
07:00 - 08:00	1228	Yes	211	-	---	216	-	Yes	Yes
14:15 - 15:15	1199	Yes	124	-	---	205	-	Yes	Yes
17:30 - 18:30	1196	Yes	134	-	---	250	-	Yes	Yes
06:45 - 07:45	1195	Yes	205	-	---	209	-	Yes	Yes
07:30 - 08:30	1179	Yes	167	-	---	202	-	Yes	Yes
14:00 - 15:00	1152	Yes	101	-	---	180	-	Yes	Yes
06:30 - 07:30	1087	Yes	185	-	---	196	-	Yes	Yes
17:45 - 18:45	1073	Yes	114	-	---	213	-	Yes	Yes
13:45 - 14:45	1049	Yes	89	-	---	157	-	Yes	Yes
07:45 - 08:45	1042	Yes	155	-	---	183	-	Yes	Yes
13:30 - 14:30	974	Yes	86	-	---	155	-	Yes	Yes
18:00 - 19:00	971	Yes	103	-	---	180	-	Yes	Yes

LOR-82-6.43 (Station Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-6.43 (Station Rd) 2024 HSIP

Study Date : 11/1/2024

Warrant 3B - Peak Hour Volumes

Description

Intended for sites where the volume of intersecting traffic during one hour of the day is the principal reason for consideration of a signal installation.

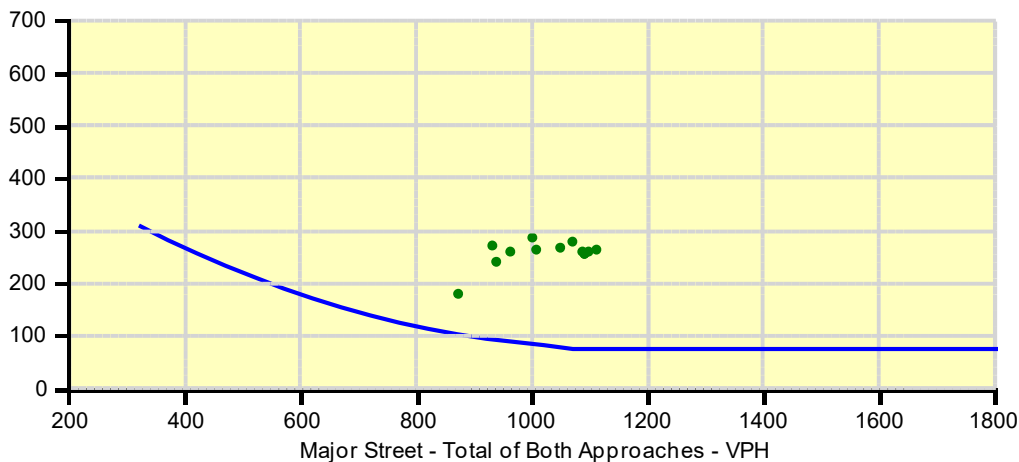
Summary

27 one hour periods meet minimums.
Warrant IS met.

Site Data Required

Rural Settings Apply = True
Number of Major Lanes = 1
Number of Minor Lanes = 1

Major Road SR 83 EB						Minor Road Station Rd NB		
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met?
16:30 - 17:30	415	+	695	=	1110	166	265	Yes
15:45 - 16:45	405	+	691	=	1096	144	259	Yes
16:15 - 17:15	395	+	696	=	1091	182	256	Yes
16:00 - 17:00	413	+	676	=	1089	161	257	Yes
15:30 - 16:30	421	+	664	=	1085	138	262	Yes
16:45 - 17:45	409	+	659	=	1068	175	280	Yes
15:15 - 16:15	406	+	643	=	1049	117	269	Yes
15:00 - 16:00	389	+	618	=	1007	130	265	Yes
17:00 - 18:00	384	+	616	=	1000	162	288	Yes
14:45 - 15:45	372	+	590	=	962	133	261	Yes
14:30 - 15:30	349	+	587	=	936	127	242	Yes
							272	Yes

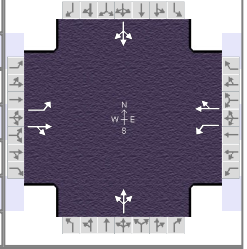


Appendix F

Highway Capacity Software (HCS) Analysis

HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst		Analysis Date	11/1/2024	Area Type	Other
Jurisdiction		Time Period		PHF	0.85
Urban Street	2024 HSIP Safety Study	Analysis Year	2024	Analysis Period	1> 7:00
Intersection	LOR-82-6.43 (Station Rd)	File Name	1. Existing Signalized AM Peak.xus		
Project Description	Existing Signalized AM Peak				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	33	386	12	21	272	76	22	117	63	113	71	42

Signal Information											
Cycle, s	44.2	Reference Phase	2								
Offset, s	0	Reference Point	End								
Uncoordinated	Yes	Simult. Gap E/W	On	Green	20.0	11.2	0.0	0.0	0.0	0.0	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	5.0	6.0	0.0	0.0	0.0	0.0	
				Red	1.0	1.0	0.0	0.0	0.0	0.0	

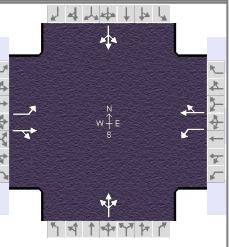
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		6.0		6.0		8.0		8.0
Phase Duration, s		26.0		26.0		18.2		18.2
Change Period, ($Y+R_c$), s		6.0		6.0		7.0		7.0
Max Allow Headway (MAH), s		4.1		4.1		4.1		4.1
Queue Clearance Time (g_s), s		11.8		12.8		7.7		9.4
Green Extension Time (g_e), s		3.8		3.8		1.8		1.8
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.00		0.00

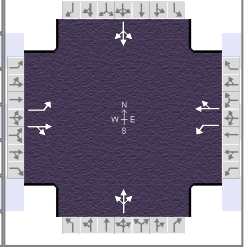
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	39	468		25	409			238			266	
Adjusted Saturation Flow Rate (s), veh/h/ln	922	1618		895	1605			1602			1422	
Queue Service Time (g_s), s	1.4	9.8		1.0	8.3			0.0			1.8	
Cycle Queue Clearance Time (g_c), s	9.7	9.8		10.8	8.3			5.7			7.4	
Green Ratio (g/C)	0.45	0.45		0.45	0.45			0.25			0.25	
Capacity (c), veh/h	408	733		369	727			496			482	
Volume-to-Capacity Ratio (X)	0.095	0.639		0.067	0.563			0.479			0.552	
Back of Queue (Q), ft/ln (95 th percentile)	11	109		7	88			71			89	
Back of Queue (Q), veh/ln (95 th percentile)	0.4	4.1		0.3	3.4			2.8			3.5	
Queue Storage Ratio (RQ) (95 th percentile)	0.07	0.08		0.05	0.07			0.16			0.05	
Uniform Delay (d_1), s/veh	12.4	9.3		13.5	8.9			14.4			15.0	
Incremental Delay (d_2), s/veh	0.1	0.9		0.1	0.7			0.7			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	12.5	10.2		13.5	9.6			15.2			16.0	
Level of Service (LOS)	B	B		B	A			B			B	
Approach Delay, s/veh / LOS	10.4	B		9.8	A		15.2	B		16.0	B	
Intersection Delay, s/veh / LOS	12.0						B					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.65	B		1.65	B		1.90	B		1.90	B	
Bicycle LOS Score / LOS	1.32	A		1.20	A		0.88	A		0.93	A	

HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst		Analysis Date	11/1/2024	Area Type	Other
Jurisdiction		Time Period		PHF	0.93
Urban Street	2024 HSIP Safety Study	Analysis Year	2024	Analysis Period	1> 7:00
Intersection	LOR-82-6.43 (Station Rd)	File Name	2. Existing Signalized PM Peak.xus		
Project Description	Existing Signalized PM Peak				





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	353	12	80	454	161	27	95	44	121	102	42

Signal Information											
Cycle, s	55.5	Reference Phase	2								
Offset, s	0	Reference Point	End								
Uncoordinated	Yes	Simult. Gap E/W	On	Green	28.9	13.7	0.0	0.0	0.0	0.0	
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	5.0	6.0	0.0	0.0	0.0	0.0	
				Red	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		8.0		8.0
Phase Duration, s		34.9		34.9		20.7		20.7
Change Period, ($Y+R_c$), s		6.0		6.0		7.0		7.0
Max Allow Headway (MAH), s		4.1		4.1		4.1		4.1
Queue Clearance Time (g_s), s		23.2		19.9		7.1		12.1
Green Extension Time (g_e), s		5.6		5.6		1.6		1.5
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.01		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	54	392		86	661			178			285	
Adjusted Saturation Flow Rate (s), veh/h/ln	773	1713		992	1645			1612			1453	
Queue Service Time (g_s), s	3.3	7.9		3.3	17.9			0.0			5.0	
Cycle Queue Clearance Time (g_c), s	21.2	7.9		11.1	17.9			5.1			10.1	
Green Ratio (g/C)	0.52	0.52		0.52	0.52			0.25			0.25	
Capacity (c), veh/h	282	890		505	855			472			452	
Volume-to-Capacity Ratio (X)	0.190	0.441		0.170	0.773			0.378			0.630	
Back of Queue (Q), ft/ln (95 th percentile)	24	94		27	207			73			140	
Back of Queue (Q), veh/ln (95 th percentile)	1.0	3.7		1.1	8.1			2.9			5.5	
Queue Storage Ratio (RQ) (95 th percentile)	0.16	0.07		0.16	0.17			0.16			0.08	
Uniform Delay (d_1), s/veh	19.2	8.3		11.8	10.7			17.7			19.5	
Incremental Delay (d_2), s/veh	0.3	0.3		0.2	1.5			0.5			1.5	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	19.6	8.7		11.9	12.2			18.2			20.9	
Level of Service (LOS)	B	A		B	B			B			C	
Approach Delay, s/veh / LOS	10.0		A	12.2		B	18.2		B	20.9		C
Intersection Delay, s/veh / LOS	13.7						B					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.65	B		1.65	B		1.91	B		1.91	B	
Bicycle LOS Score / LOS	1.22	A		1.72	B		0.78	A		0.96	A	

HCS Roundabouts Report

General Information

Site Information

Analyst	Jeremy Adato		Intersection	LOR-82-6.43 (Station Rd)
Agency or Co.	ODOT D3		E/W Street Name	SR 82
Date Performed	11/4/2024		N/S Street Name	Station Rd
Analysis Year	2024		Analysis Time Period, hrs	0.25
Time Analyzed	AM Peak		Peak Hour Factor	0.85
Project Description	2024 HSIP Safety Study		Jurisdiction	ODOT D3

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	1	33	386	12	0	21	272	76	0	22	117	63	0	113	71	42
Percent Heavy Vehicles, %	9	9	9	9	6	6	6	6	3	3	3	3	1	1	1	1
Flow Rate (v_{PCE}), pc/h	1	42	495	15	0	26	339	95	0	27	142	76	0	134	84	50
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

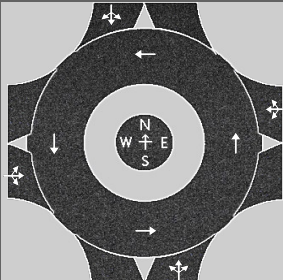
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway, s		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		553			460			245			268	
Entry Volume, veh/h		507			434			238			265	
Circulating Flow (v_c), pc/h	244			212			672			393		
Exiting Flow (v_{ex}), pc/h	705			417			279			125		
Capacity (C_{pc}), pc/h		1076			1112			695			924	
Capacity (c), veh/h		987			1049			675			915	
v/c Ratio (x)		0.51			0.41			0.35			0.29	

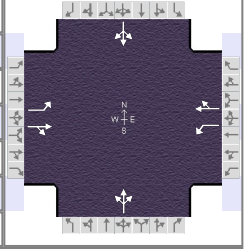
Delay and Level of Service	

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		10.0			7.9			10.0			7.0	
Lane LOS		B			A			A			A	
95% Queue Length, Q ₉₅ (veh)		3.0			2.1			1.6			1.2	
95% Queue Length, Q ₉₅ (ft)		80.4			55.0			41.0			30.2	
Approach Delay, s/veh LOS	10.0		B	7.9		A	10.0		A	7.0		A
Intersection Delay, s/veh LOS	8.8						A					

HCS Roundabouts Report																	
General Information								Site Information									
Analyst	Jeremy Adato								Intersection				LOR-82-6.43 (Station Rd)				
Agency or Co.	ODOT D3								E/W Street Name				SR 82				
Date Performed	11/4/2024								N/S Street Name				Station Rd				
Analysis Year	2024								Analysis Time Period, hrs				0.25				
Time Analyzed	PM Peak								Peak Hour Factor				0.93				
Project Description	2024 HSIP Safety Study								Jurisdiction				ODOT D3				
Volume Adjustments and Site Characteristics																	
Approach	EB				WB				NB				SB				
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	
Lane Assignment			LTR				LTR				LTR				LTR		
Volume (V), veh/h	0	50	353	12	0	80	454	161	0	27	95	44	0	121	102	42	
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	
Flow Rate (v _{PCE}), pc/h	0	55	387	13	0	88	498	177	0	30	104	48	0	134	113	47	
Right-Turn Bypass	None				None				None				None				
Conflicting Lanes	1				1				1				1				
Pedestrians Crossing, p/h	0				0				0				0				
Proportion of CAVs, %	0																
Critical and Follow-Up Headway Adjustment																	
Approach	EB				WB				NB				SB				
Lane	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		
Critical Headway, s		4.9763				4.9763				4.9763				4.9763			
Follow-Up Headway, s		2.6087				2.6087				2.6087				2.6087			
Flow Computations, Capacity and v/c Ratios																	
Approach	EB				WB				NB				SB				
Lane	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		
Entry Flow (v _e), pc/h		455				763				182				294			
Entry Volume, veh/h		446				748				178				285			
Circulating Flow (v _c), pc/h	335				189				576				616				
Exiting Flow (v _{ex}), pc/h	569				575				336				214				
Capacity (C _{pce}), pc/h		981				1138				767				736			
Capacity (C), veh/h		961				1116				752				715			
v/c Ratio (x)		0.46				0.67				0.24				0.40			
Delay and Level of Service																	
Approach	EB				WB				NB				SB				
Lane	Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		Left	Right	Bypass		
Lane Control Delay (d), s/veh		9.3				12.9				7.5				10.3			
Lane LOS		A				B				A				B			
95% Queue Length, Q ₉₅ (veh)		2.5				5.5				0.9				1.9			
95% Queue Length, Q ₉₅ (ft)		63.5				139.7				22.9				48.6			
Approach Delay, s/veh LOS	9.3		A		12.9		B		7.5		A		10.3		B		
Intersection Delay, s/veh LOS					10.9								B				

HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst		Analysis Date	11/1/2024	Area Type	Other
Jurisdiction		Time Period		PHF	0.85
Urban Street	2024 HSIP Safety Study	Analysis Year	2024	Analysis Period	1> 7:00
Intersection	LOR-82-6.43 (Station Rd)	File Name	5. LOR 82 & Station Proposed Prot-Perm LT Sign...		
Project Description	Existing Signalized AM Peak				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	33	386	12	21	272	76	22	117	63	113	71	42

Signal Information											
Cycle, s	53.5	Reference Phase	2								
Offset, s	0	Reference Point	End								
Uncoordinated	Yes	Simult. Gap E/W	On								
Force Mode	Fixed	Simult. Gap N/S	On								

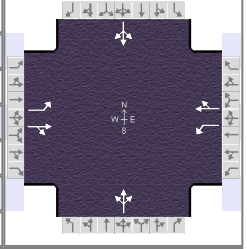
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		8.0		8.0
Phase Duration, s	8.1	26.9	7.2	26.0		19.4		19.4
Change Period, ($Y+R_c$), s	5.0	6.0	5.0	6.0		7.0		7.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0		3.1		3.1
Queue Clearance Time (g_s), s	2.8	15.3	2.5	13.5		9.0		11.5
Green Extension Time (g_e), s	0.0	1.6	0.0	1.6		0.9		0.9
Phase Call Probability	0.44	1.00	0.31	1.00		1.00		1.00
Max Out Probability	0.00	0.00	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	39	468		25	409			238			266	
Adjusted Saturation Flow Rate (s), veh/h/ln	1550	1618		1589	1605			1611			1401	
Queue Service Time (g_s), s	0.8	13.3		0.5	11.5			0.0			2.5	
Cycle Queue Clearance Time (g_c), s	0.8	13.3		0.5	11.5			7.0			9.5	
Green Ratio (g/C)	0.43	0.39		0.41	0.37			0.23			0.23	
Capacity (c), veh/h	371	633		293	600			449			426	
Volume-to-Capacity Ratio (X)	0.105	0.740		0.084	0.682			0.530			0.624	
Back of Queue (Q), ft/ln (95 th percentile)	10	180		6	153			97			119	
Back of Queue (Q), veh/ln (95 th percentile)	0.4	6.7		0.2	5.8			3.8			4.7	
Queue Storage Ratio (RQ) (95 th percentile)	0.06	0.13		0.04	0.12			0.21			0.07	
Uniform Delay (d_1), s/veh	10.2	14.0		11.3	14.1			18.5			19.3	
Incremental Delay (d_2), s/veh	0.0	0.6		0.0	0.5			0.4			0.6	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	10.2	14.6		11.3	14.6			18.8			19.9	
Level of Service (LOS)	B	B		B	B			B			B	
Approach Delay, s/veh / LOS	14.3	B		14.4	B		18.8	B		19.9	B	
Intersection Delay, s/veh / LOS	16.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.66	B	1.67	B	1.91	B	1.91	B
Bicycle LOS Score / LOS	1.32	A	1.20	A	0.88	A	0.93	A

HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst		Analysis Date	11/1/2024	Area Type	Other
Jurisdiction		Time Period		PHF	0.93
Urban Street	2024 HSIP Safety Study	Analysis Year	2024	Analysis Period	1 > 7:00
Intersection	LOR-82-6.43 (Station Rd)	File Name	6. LOR 82 & Station Proposed Prot-Perm LT Sign...		
Project Description	Existing Signalized PM Peak				



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	353	12	80	454	161	27	95	44	121	102	42

Signal Information											
Cycle, s	67.9	Reference Phase	2								
Offset, s	0	Reference Point	End								
Uncoordinated	Yes	Simult. Gap E/W	On								
Force Mode	Fixed	Simult. Gap N/S	On								

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		8.0		8.0
Phase Duration, s	9.5	34.7	10.6	35.8		22.6		22.6
Change Period, ($Y+R_c$), s	5.0	6.0	5.0	6.0		7.0		7.0
Max Allow Headway (MAH), s	3.0	3.0	3.0	3.0		3.1		3.1
Queue Clearance Time (g_s), s	3.2	13.7	3.9	27.7		8.4		14.8
Green Extension Time (g_e), s	0.0	2.1	0.0	2.1		0.8		0.8
Phase Call Probability	0.64	1.00	0.80	1.00		1.00		1.00
Max Out Probability	0.00	0.00	0.01	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	54	392		86	661			178			285	
Adjusted Saturation Flow Rate (s), veh/h/ln	1641	1713		1641	1645			1615			1449	
Queue Service Time (g_s), s	1.2	11.7		1.9	25.7			0.0			6.4	
Cycle Queue Clearance Time (g_c), s	1.2	11.7		1.9	25.7			6.4			12.8	
Green Ratio (g/C)	0.49	0.42		0.51	0.44			0.23			0.23	
Capacity (c), veh/h	240	724		493	723			433			410	
Volume-to-Capacity Ratio (X)	0.224	0.542		0.174	0.914			0.412			0.694	
Back of Queue (Q), ft/ln (95 th percentile)	16	174		24	327			98			183	
Back of Queue (Q), veh/ln (95 th percentile)	0.6	6.8		1.0	12.9			3.9			7.2	
Queue Storage Ratio (RQ) (95 th percentile)	0.11	0.12		0.15	0.26			0.22			0.10	
Uniform Delay (d_1), s/veh	14.7	14.7		9.9	17.9			22.7			25.0	
Incremental Delay (d_2), s/veh	0.2	0.2		0.1	2.0			0.2			0.8	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0			0.0			0.0	
Control Delay (d), s/veh	14.9	15.0		9.9	19.9			22.9			25.8	
Level of Service (LOS)	B	B		A	B			C			C	
Approach Delay, s/veh / LOS	15.0	B		18.8	B			22.9	C		25.8	C
Intersection Delay, s/veh / LOS	19.4						B					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.67	B		1.67	B		1.92	B		1.92	B	
Bicycle LOS Score / LOS	1.22	A		1.72	B		0.78	A		0.96	A	

Appendix G

Economic Crash Analysis Tool (ECAT) Reports



Project Information

General Information

Project Name	LOR-82-6.43 (Station Rd)	Contact Email	jeremy.adato@dot.ohio.gov
Project Description	Existing Signal	Contact Phone	(419) 207-7186
Reference Number	-	Date Performed	11/4/2024
Analyst	Jeremy Adato	Analysis Year	2024
Agency/Company	ODOT D3		
Perform Benefit Cost Analysis?	No		

Do the proposed improvements fundamentally change the conditions of the base safety performance function (SPF),
Or is crash data unavailable for the analysis condition,
Or is only predicted (and not expected) analysis needed for the existing or proposed condition?

Yes

(Examples: unsignalized to signalized, undivided to divided, increase or decrease in the number of lanes, change the number of approaches to an intersection, significant realignment of the roadway)

If Yes, are you analyzing the existing or proposed conditions?

Existing

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint (Leave blank for Intersection)	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name
LOR 82 & Station	Rural Two-Lane Two Way Intersection	Signalized	SLORSR00082**C	6.43		0.05	CLORCR0006	Station Rd

Project Elements Description Table								
Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint (Leave blank for Intersection)	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name

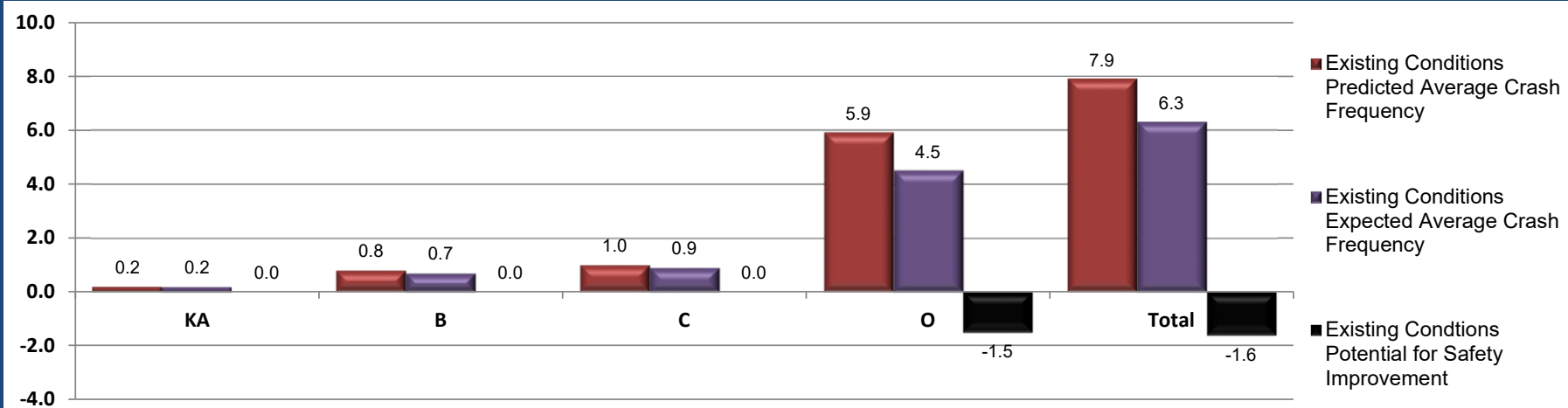


Project Safety Performance Report

General Information

Project Name	LOR-82-6.43 (Station Rd)	Contact Email	jeremy.adato@dot.ohio.gov
Project Description	Existing Signal	Contact Phone	(419) 207-7186
Reference Number	-	Date Performed	11/4/2024
Analyst	Jeremy Adato	Analysis Year	2024
Agency/Company	ODOT D3		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{\text{predicted}} - \text{Existing Conditions}$	0.1846	0.7840	0.9906	5.9217	7.8809
$N_{\text{expected}} - \text{Existing Conditions}$	0.1749	0.7441	0.9410	4.4537	6.3137
$N_{\text{potential for improvement}} - \text{Existing Conditions}$	-0.0097	-0.0399	-0.0496	-1.4680	-1.5672



Project Information

General Information

Project Name	LOR-82-6.43 (Station Rd)	Contact Email	jeremy.adato@dot.ohio.gov
Project Description	Proposed Roundabout	Contact Phone	(419) 207-7186
Reference Number	-	Date Performed	11/4/2024
Analyst	Jeremy Adato	Analysis Year	2024
Agency/Company	ODOT D3		
Perform Benefit Cost Analysis?	Yes		

Do the proposed improvements fundamentally change the conditions of the base safety performance function (SPF),
Or is crash data unavailable for the analysis condition,
Or is only predicted (and not expected) analysis needed for the existing or proposed condition?

Yes

(Examples: unsignalized to signalized, undivided to divided, increase or decrease in the number of lanes, change the number of approaches to an intersection, significant realignment of the roadway)

If Yes, are you analyzing the existing or proposed conditions?

Proposed

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint (Leave blank for Intersection)	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name
LOR 82 & Station	Roundabout	Unsignalized	SLORSR00082**C	6.43		0.05	CLORCR0006	Station Rd

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

	Year	AADT	
Present ADT (PADT)			veh / day
Future ADT (FADT)			veh / day
Annual Linear Growth Rate		0.0050	

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information				
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint (Leave blank for Intersection)	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)

Select Other Non-Site Characteristic Based Countermeasures For Entire Project

CMF Nbr	Countermeasure	CMF KA Value	CMF B Value	CMF C Value	CMF O Value	CMF Valid for the Following Site Types
CMF 1						
CMF 2						
CMF 3						
CMF 4						
CMF 5						
CMF 6						
CMF 7						
CMF 8						
CMF 9						
CMF 10						

**ECAT**

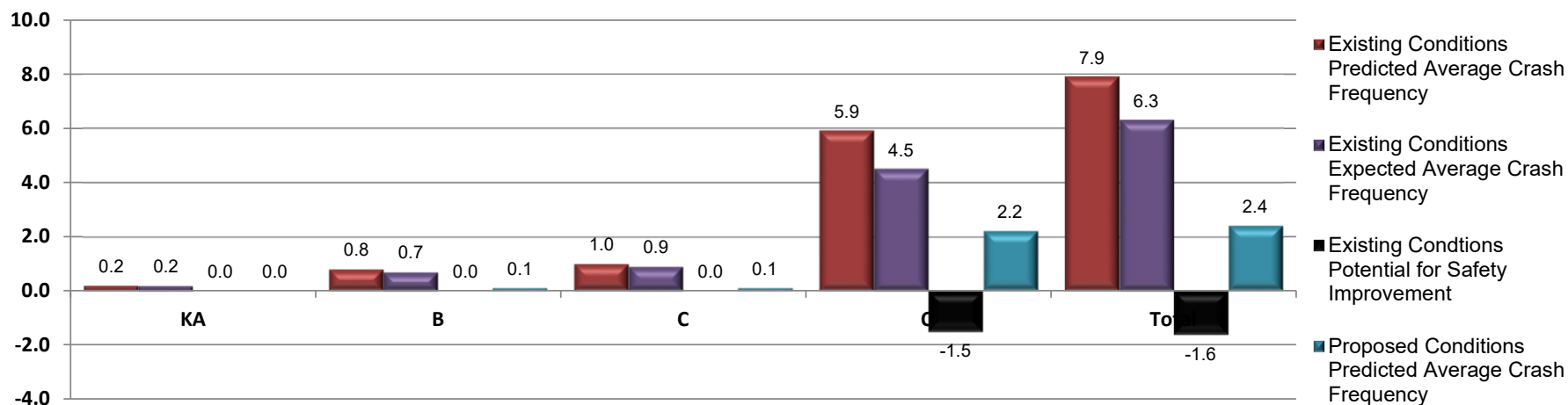
Economic Crash Analysis Tool

Project Safety Performance Report

General Information

Project Name	LOR-82-6.43 (Station Rd)	Contact Email	jeremy.adato@dot.ohio.gov
Project Description	Proposed Roundabout	Contact Phone	(419) 207-7186
Reference Number	-	Date Performed	11/4/2024
Analyst	Jeremy Adato	Analysis Year	2024
Agency/Company	ODOT D3		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{\text{predicted}} - \text{Existing Conditions}$	0.1846	0.7840	0.9906	5.9217	7.8809
$N_{\text{expected}} - \text{Existing Conditions}$	0.1749	0.7441	0.9410	4.4537	6.3137
$N_{\text{potential for improvement}} - \text{Existing Conditions}$	-0.0097	-0.0399	-0.0496	-1.4680	-1.5672
$N_{\text{expected}} - \text{Proposed Conditions}$	0.0109	0.0907	0.1120	2.2272	2.4408

Appendix H

Clearance Intervals

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	OMUTCD 4E.06-07	PED CHANGE INTERVAL (FDW)	3 fps CHECKS (OMUTCD 4E.06, 01-14)			FINAL PED TIMING								
			POSTED SPEED LIMIT	PERCEPTION/REACTION 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	WALK INTERVAL (4-7s TYP)	CALCULATED PED CLEARANCE	PED CHANGE INTERVAL (FDW)	(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											
				MPH	SEC	MPH	MPH	FPS	FT	FT	%	SEC	SEC	SEC	SEC									SEC											
1	-	-	45	1	-	-	10	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
2	EB	THROUGH/RT	45	1	52	52	10	70	20	0	4.8	0.2	5.0	5	1	6.0	-	-	51	-	-	14.6	9.6	-	-	-	-	-	-	-	10				
3	-	-	-	1	-	-	10	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
4	SB	THROUGH/RT	45	1	52	52	10	74	20	0	4.8	0.2	5.0	6	1	7.0	-	-	54	-	-	15.4	9.4	-	-	-	-	-	-	-	10				
5	-	-	-	1	-	-	10	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
6	WB	THROUGH/RT	45	1	52	52	10	71	20	0	4.8	0.2	5.0	5	1	6.0	-	-	58	-	-	16.6	11.6	-	-	-	-	-	-	-	12				
7	-	-	-	1	-	-	10	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
8	NB	THROUGH/RT	55	1	62	62	10	69	20	0	5.6	0.0	5.6	6	1	7.0	-	-	55	-	-	15.7	9.7	-	-	-	-	-	-	-	10				

Appendix I

Synchro Analysis

Lanes, Volumes, Timings

3:

03/26/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	386	12	21	272	76	22	117	63	113	71	42
Future Volume (vph)	33	386	12	21	272	76	22	117	63	113	71	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Storage Length (ft)	155		0	166		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		0.996			0.967			0.958			0.975	
Flt Protected	0.950			0.950				0.995			0.976	
Satd. Flow (prot)	1525	1599	0	1568	1596	0	0	1566	0	0	1594	0
Flt Permitted	0.473			0.414				0.932			0.764	
Satd. Flow (perm)	759	1599	0	683	1596	0	0	1466	0	0	1248	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			31			45			23	
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		316			289			237			242	
Travel Time (s)		4.8			4.4			2.9			3.7	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles (%)	9%	9%	9%	6%	6%	6%	3%	3%	3%	1%	1%	1%
Adj. Flow (vph)	39	454	14	25	320	89	26	138	74	133	84	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	468	0	25	409	0	0	238	0	0	266	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	1.16	1.16	1.16	1.16	1.16	1.16
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		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		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		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		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	

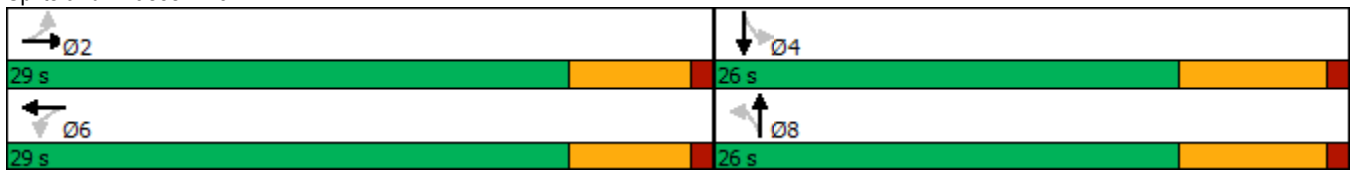
Lanes, Volumes, Timings

3:

03/26/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	2				6		8				4	
Permitted Phases	2			6				8		4		
Detector Phase	2	2	6		6	8		8	4		4	
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0		20.0	10.0		10.0	10.0		10.0	
Minimum Split (s)	26.0	26.0	26.0		26.0	25.0		25.0	25.0		25.0	
Total Split (s)	29.0	29.0	29.0		29.0	26.0		26.0	26.0		26.0	
Total Split (%)	52.7%	52.7%	52.7%		52.7%	47.3%		47.3%	47.3%		47.3%	
Maximum Green (s)	23.0	23.0	23.0		23.0	19.0		19.0	19.0		19.0	
Yellow Time (s)	5.0	5.0	5.0		5.0	6.0		6.0	6.0		6.0	
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			7.0			7.0	
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	Max	Max	None		None	None		None	None		None	
Walk Time (s)	7.0	7.0	7.0		7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0		11.0	11.0		11.0	
Pedestrian Calls (#/hr)	0	0	0		0	0		0	0		0	
Act Effct Green (s)	23.1	23.1	23.1		23.1			14.8			14.8	
Actuated g/C Ratio	0.45	0.45	0.45		0.45			0.29			0.29	
v/c Ratio	0.11	0.64	0.08		0.55			0.52			0.70	
Control Delay	10.5	17.1	10.3		13.8			16.3			25.5	
Queue Delay	0.0	0.0	0.0		0.0			0.0			0.0	
Total Delay	10.5	17.1	10.3		13.8			16.3			25.5	
LOS	B	B	B		B			B			C	
Approach Delay	16.6				13.6			16.3			25.5	
Approach LOS	B				B			B			C	
Queue Length 50th (ft)	6	101	4		76			46			63	
Queue Length 95th (ft)	22	193	16		152			91			119	
Internal Link Dist (ft)	236				209			157			162	
Turn Bay Length (ft)	155			166								
Base Capacity (vph)	344	727	309		740			577			481	
Starvation Cap Reductn	0	0	0		0			0			0	
Spillback Cap Reductn	0	0	0		0			0			0	
Storage Cap Reductn	0	0	0		0			0			0	
Reduced v/c Ratio	0.11	0.64	0.08		0.55			0.41			0.55	
Intersection Summary												
Area Type:		Other										
Cycle Length: 55												
Actuated Cycle Length: 51												
Natural Cycle: 55												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.70												
Intersection Signal Delay: 17.3					Intersection LOS: B							
Intersection Capacity Utilization 72.2%					ICU Level of Service C							
Analysis Period (min) 15												

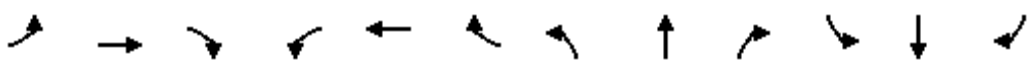
Splits and Phases: 3:



Lanes, Volumes, Timings

3:

03/26/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	353	12	80	454	161	27	95	44	121	102	42
Future Volume (vph)	50	353	12	80	454	161	27	95	44	121	102	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12	11	11	11	11	11	11
Storage Length (ft)	155		0	166		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		0.995			0.961			0.964			0.979	
Flt Protected	0.950			0.950				0.992			0.978	
Satd. Flow (prot)	1630	1707	0	1630	1649	0	0	1586	0	0	1573	0
Flt Permitted	0.227			0.486				0.905			0.769	
Satd. Flow (perm)	389	1707	0	834	1649	0	0	1447	0	0	1236	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			40			36			19	
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		316			289			237			242	
Travel Time (s)		4.8			4.4			2.9			3.7	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	54	380	13	86	488	173	29	102	47	130	110	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	393	0	86	661	0	0	178	0	0	285	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	1.16	1.16	1.16	1.16	1.16	1.16
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		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		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		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		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	

Lanes, Volumes, Timings

3:

03/26/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.0	26.0		26.0	26.0		25.0	25.0		25.0	25.0	
Total Split (s)	29.0	29.0		29.0	29.0		26.0	26.0		26.0	26.0	
Total Split (%)	52.7%	52.7%		52.7%	52.7%		47.3%	47.3%		47.3%	47.3%	
Maximum Green (s)	23.0	23.0		23.0	23.0		19.0	19.0		19.0	19.0	
Yellow Time (s)	5.0	5.0		5.0	5.0		6.0	6.0		6.0	6.0	
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			7.0			7.0	
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	Max	Max		None	None		None	None		None	None	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	23.1	23.1		23.1	23.1			15.3			15.3	
Actuated g/C Ratio	0.45	0.45		0.45	0.45			0.30			0.30	
v/c Ratio	0.31	0.51		0.23	0.87			0.39			0.75	
Control Delay	16.6	13.9		12.1	29.2			13.9			28.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	16.6	13.9		12.1	29.2			13.9			28.8	
LOS	B	B		B	C			B			C	
Approach Delay		14.3			27.2			13.9			28.8	
Approach LOS		B			C			B			C	
Queue Length 50th (ft)	10	82		16	167			33			71	
Queue Length 95th (ft)	38	162		44	#384			74			#165	
Internal Link Dist (ft)		236			209			157			162	
Turn Bay Length (ft)	155			166								
Base Capacity (vph)	174	768		374	761			559			470	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.31	0.51		0.23	0.87			0.32			0.61	
Intersection Summary												
Area Type:	Other											
Cycle Length: 55												
Actuated Cycle Length: 51.5												
Natural Cycle: 60												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.87												
Intersection Signal Delay: 22.6					Intersection LOS: C							
Intersection Capacity Utilization 100.7%					ICU Level of Service G							
Analysis Period (min) 15												

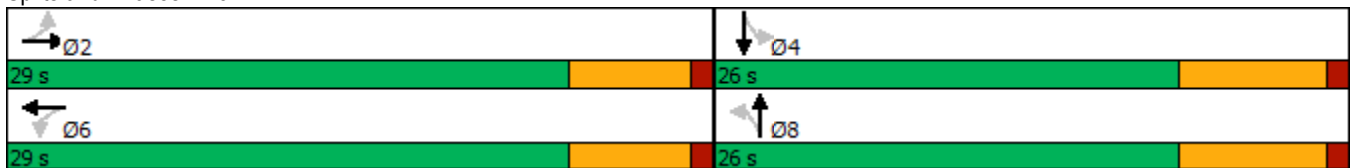
Lanes, Volumes, Timings

3:

03/26/2025

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3:

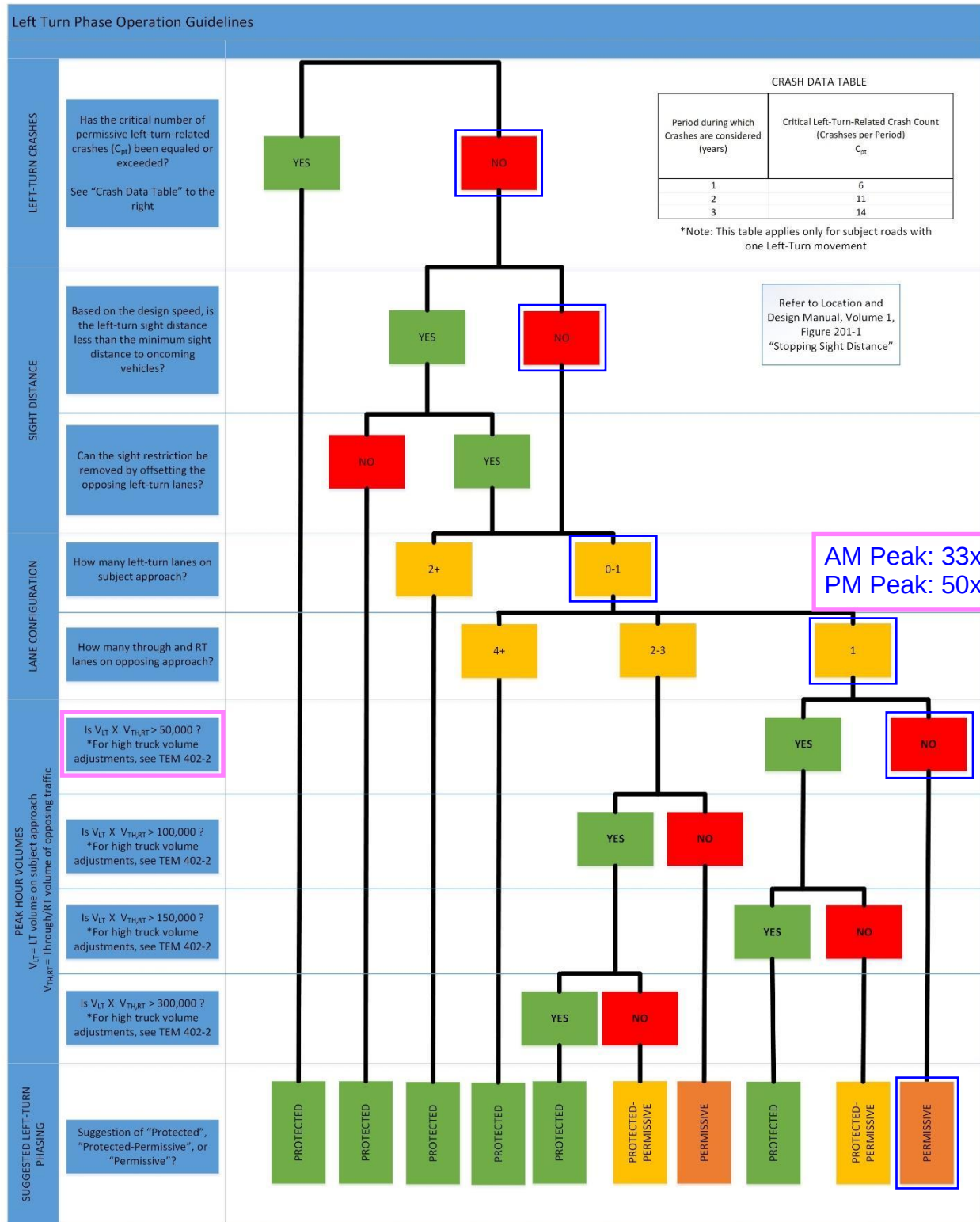


Appendix H

Left Turn Phase Operation Guidelines

LOR-82-6.43 (Station Rd) EB

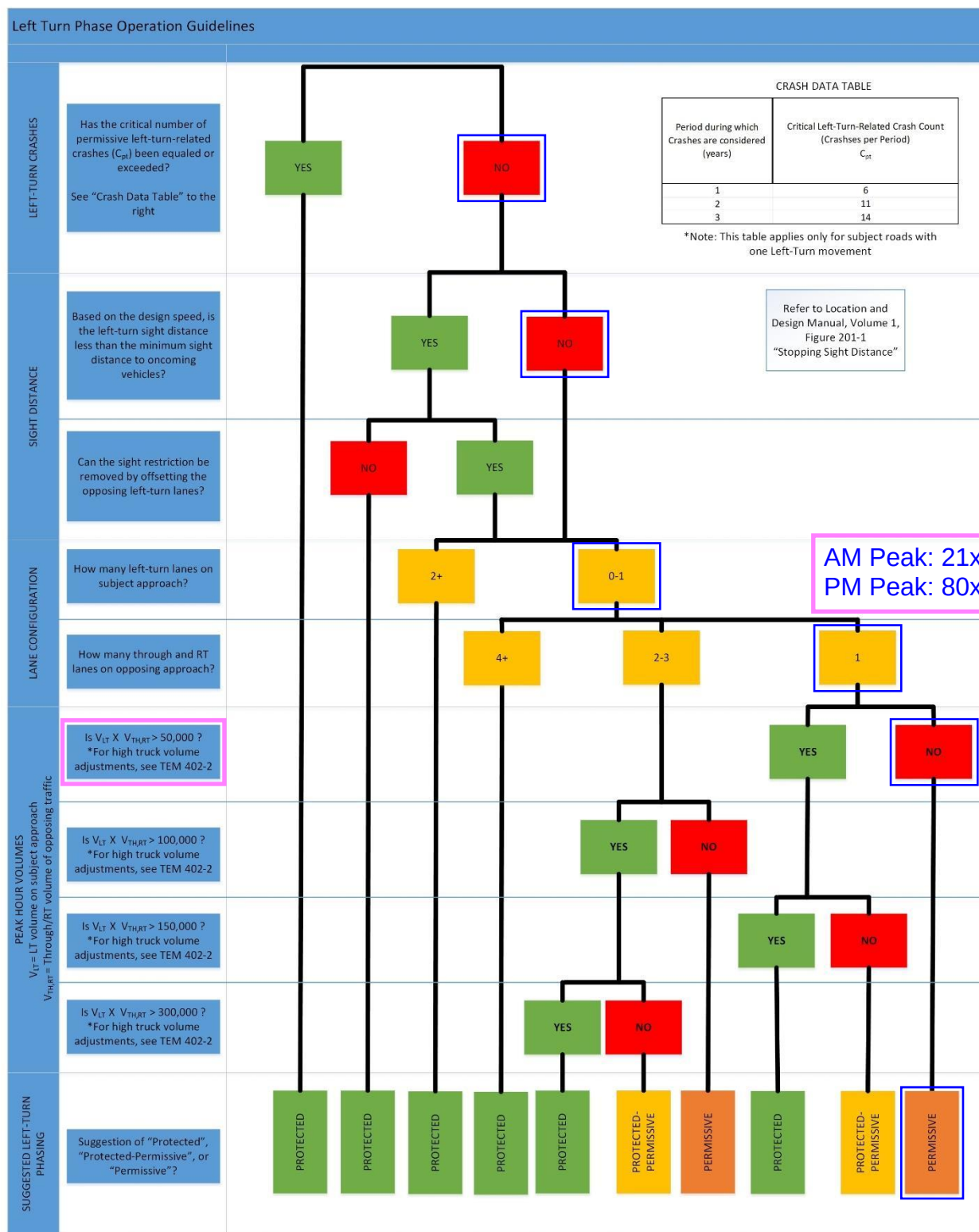
Left Turn Phase Operation Guidelines



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

LOR-82-6.43 (Station Rd) WB

Left Turn Phase Operation Guidelines



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

Appendix K

Signal Timing Chart

TRAFFIC SIGNAL TIMING (In Seconds)								
LOCATION:	SR 82 / STATION RD.							
DATE:	2/17/22							
PERSONNEL:	BGOFF							
	PHASE NUMBER							
INTERVAL	1	2	3	4	5	6	7	8
	NOT USED	SR 82 EB	NOT USED	STATION RD. SB	NOT USED	SR 82 WB	NOT USED	STATION RD. NB
MINIMUM GREEN		20		10		20		10
PASSAGE TIME		3.0		30		3.0		3.0
YELLOW CLEARANCE		5.0		6.0		5.0		6.0
RED CLEARANCE		1.0		1.0		1.0		1.0
MAX GREEN 1		60		30		60		30
MAX GREEN 2		60		30		60		30
MAX GREEN 3		0		0		0		0
WALK		0		0		0		0
DON'T WALK		0		0		0		0
MINIMUM RECALL		+		-		+		+
MAXIMUM RECALL		-		-		-		-
NON-LOCK		-		+		-		+
ADDED INITIAL (Sec./act.)		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
NOTES: Changes in red 2/17/2022, WO2022-008								
BLANK or N/A = Not Applicable or Not Used. (+) = Yes or On. (-) = No or Off								