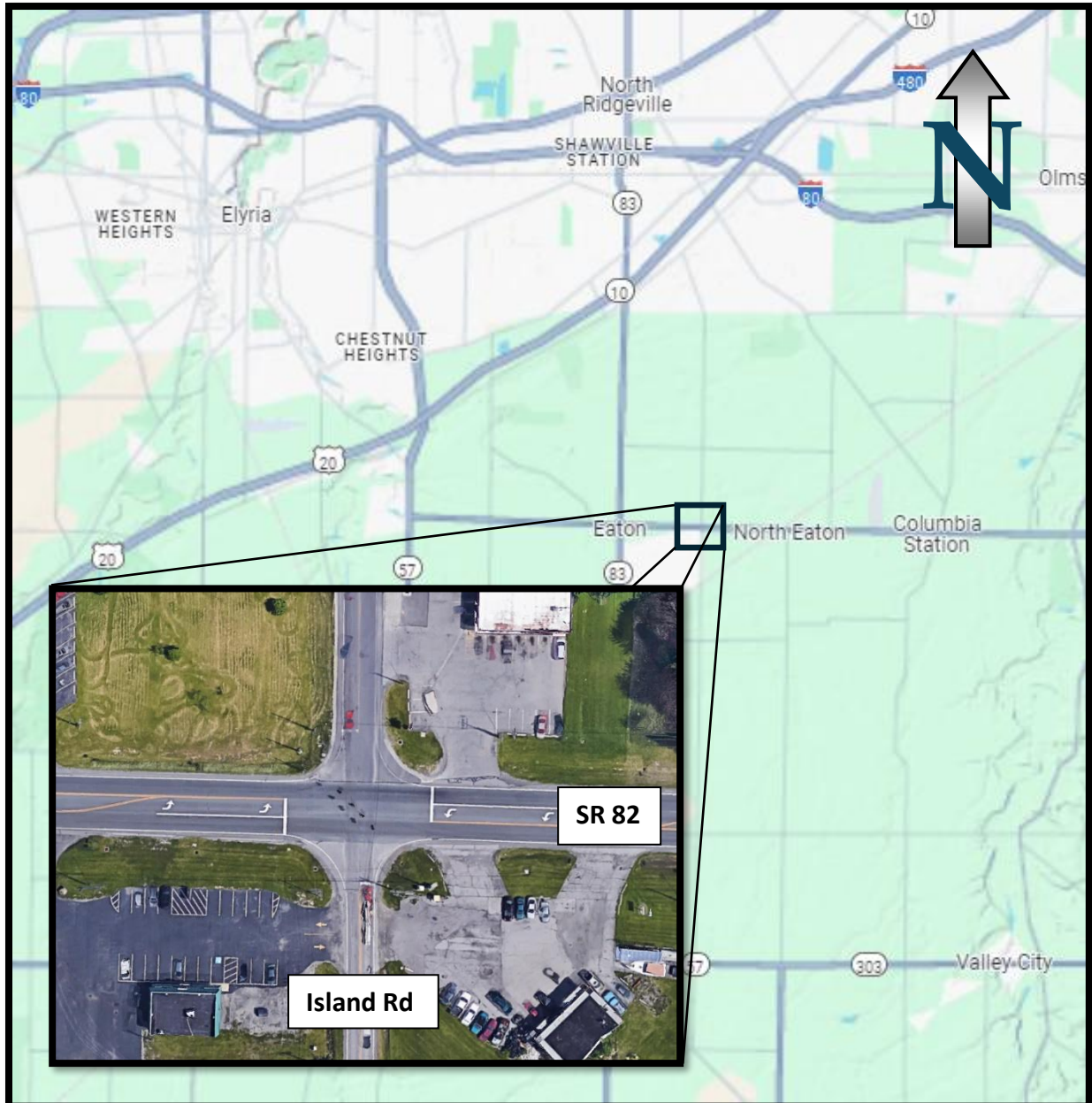


**2024 Highway Safety Improvement Program
Lorain County, State Route 82, SLM 3.56 (Island Rd)
Rural Intersection #60
Abbreviated Safety Study**



Prepared By: Jeremy Adato, P.E.
Date: April 8, 2025



**Department of
Transportation**
District 3

LOR-82-3.56 (Island 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) 58 (Island Road) intersection ranked #60 on the 2024 HSIP Rural Intersection List.

Existing Conditions

The SR 82 & Island Rd intersection is a signalized intersection located in Eaton Township, Lorain County, Ohio, approximately 2 ½ miles south of the southern corporation limit of the City of North Ridgeville and approximately 1 mile north of the northern corporation limit of the Village of Grafton. 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 58 (Island Rd)
Functional Class	4 (Minor Arterial)	6 (Minor Collector) / 7 (Local)
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	10 feet
Shoulder Width	3 ft, paved/compacted gravel	1 ft, paved/compacted gravel
Pavement	Asphalt	Asphalt
Land Use	Commercial / Residential / Agricultural or Undeveloped	
Alignment		
Horizontal	Straight	Straight
Vertical	Flat	Slight inclines to the N & S
Skew	-	1°
Traffic Control		
Speed Limit	50 mph	40/45 mph
Traffic Signal Heads	(2) 3-Section Heads w/Backplates	(2) 3-Section Heads w/Backplates
Signal Design	Simple Span	
Signal Construction Year	1999	
Existing Detection	Loops, Advance	Loops, Stop Line & Advance
Detection Upgrade	Upgrade to Radar, PID 108020, Constr. Phase 1/29/2024 - 5/3/2024.	
Signal Ahead Warning signs	Single EB/WB w/Island Rd sign	Dual NB/SB
Lane Use signs	EB & WB	-
Left Turn Phasing	Permitted	Permitted

Field Review

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

- Signs, pavement markings, and signal equipment appeared in good condition and placement.
- Sight distance is 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. Island Rd northbound at the intersection



Figure 2. Island 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 Island Rd since 2011 has increased, with 2023 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 (east of Island Rd)	Island Rd (south of SR 82)
2023	9,087 (8%)	1,702 (2%)
2020	8,929 (7%)	1,549 (1%)
2017	9,521 (7%)	1,566 (2%)
2014	7,324 (12%)	1,612 (5%)
2011	8,680 (7%)	1,042 (2%)
2008	8,440 (6%)	-

From the Traffic Forecasting Management System (TFMS), the future growth is anticipated to be 0.8% along SR 82 and 1.8% along Island Rd. The TFMS Report is in **Appendix B**.

Previous Safety Studies and Countermeasures

The following safety studies and countermeasures have been completed since 1994:

- **2022: Signal Evaluation** - Upgraded detection from loops to radar, PID 108020, FY24.
- **2017: Signal Evaluation** - Reduced EB/WB minimum green time from 30 sec to 20 sec.
- **2004: Signal Evaluation** - Replaced missing signage, continue to monitor the intersection.
- **1994: HSP Safety Study** - Replaced existing overhead flasher with full traffic signal.

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	3 (17%)	Fatal	0 (0%)	Rear End	8 (44%)	Dry	13 (72%)
2020	6 (33%)	Injury	7 (39%)	Angle	6 (33%)	Wet	4 (22%)
2021	4 (22%)	PDO	11 (61%)	*SS-Passing	2 (11%)	Snow	1 (6%)
2022	2 (11%)			SS-Meeting	1 (6%)		
2023	3 (17%)			Left Turn	1 (6%)		
Total	18 (100%)			*Side-Swipe			

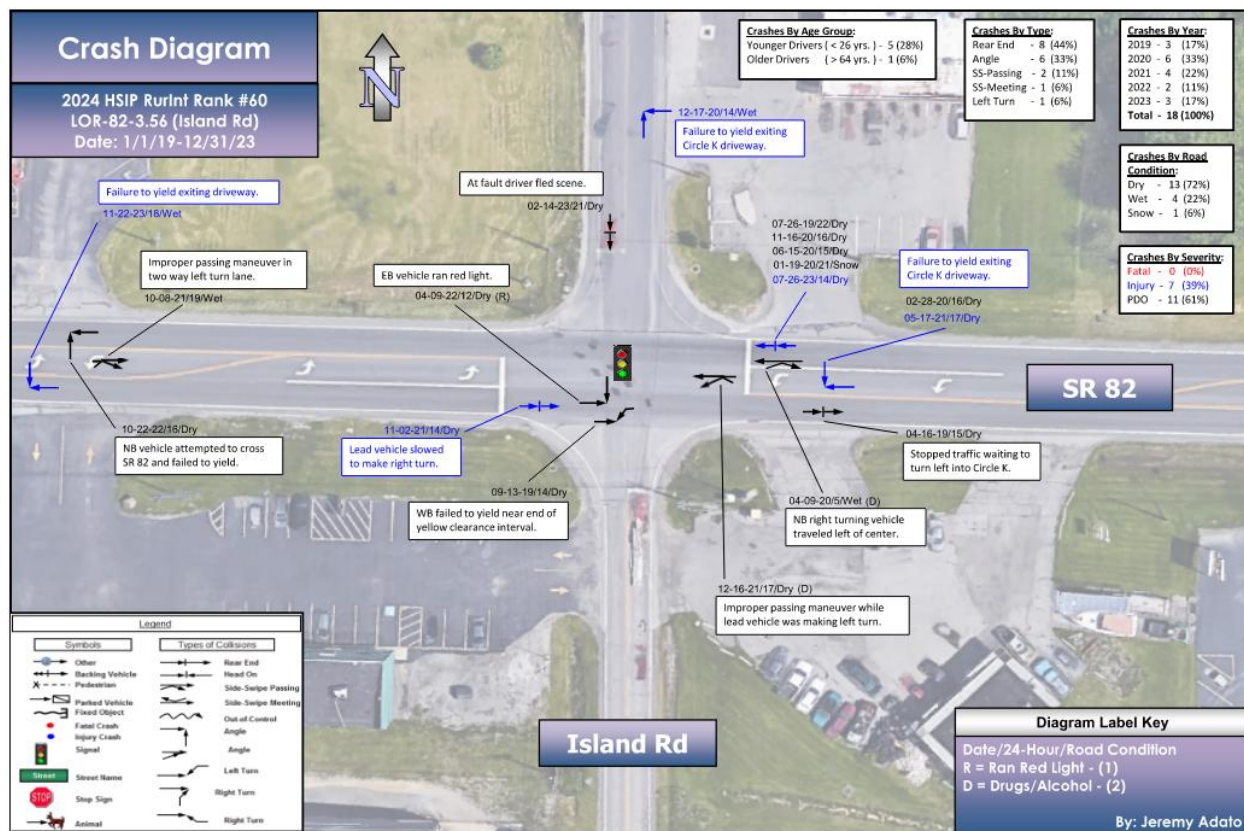


Figure 5. Crash Diagram (2019-2023)

Crash details include the following:

- **Driveways:** 6 (33%) of the crashes were driveway related. 5 of these crashes were Angle crashes caused by a driver exiting a commercial driveway and failing to yield:
 - 2 exiting the Circle K south driveway onto SR 82.
 - 1 exiting the Circle K west driveway onto Island Rd.

- 1 exiting the Jones Bones BBQ north driveway onto SR 82.
- 1 exiting the Bill's Burger's south driveway onto SR 82.
- The 1 remaining driveway related crash was a Rear End crash that occurred while a SR 82 EB driver was stopped in traffic waiting to turn left into Circle K.
- **Rear End:** The most prevalent crash type were Rear End crashes 8 (44%). 5 were in the WB direction at/near the stop line, 1 was in the SB direction at the stop line, 1 was in the EB direction while the lead vehicle was slowing to make a right turn, and 1 was in EB direction and commercial driveway-related.
- **Angle:** The second most prevalent crash type were Angle crashes 6 (33%). 5 of these were caused by drivers exiting various commercial driveways near the intersection. The 1 remaining Angle crash at the intersection was caused by a 24-year-old EB driver who Ran the Red Light.
- **Night:** 6 (33%) of the crashes occurred at night. There is an existing intersection street light in the NW radius.
- **Younger drivers** (<26 years old) were at-fault in 5 (28%) of the crashes.
- **Older drivers** (>64 years old) were at-fault in 1 (6%) of the crashes.
- **Failure to Yield** was listed as the contributing factor in 6 (33%) of the crashes. 5 were Angle and 1 was a Left Turn.
- **Following Too Closely/ACDA** (Assured Clear Distance Ahead) was listed as the contributing factor in 6 (33%) of the crashes. All 6 of these crashes were Rear End.
- **Drugs/alcohol** were reported to be a factor in 2 (11%) of the crashes.
- **Sideswipe-Passing:** 2 (11%) of the crashes, both involved an improper passing maneuver.
- **Sideswipe-Meeting:** 1 (6%) of the crashes was caused by a NB driver making a RT turn who lost control during snow.
- **Left Turn:** 1 (6%) of the crashes was caused by a WB driver who failed to yield to an oncoming driver near the end of the yellow clearance interval.
- **Fatal/Serious Injury:** 1 (6%) of the crashes were reported as serious injury. This was the Angle crash occurring on 5/17/21 caused by a vehicle exiting the south Circle K driveway. None of the crashes were fatal crashes.
- **Distracted drivers:** None of the crash reports showed distracted driving as a contributing factor.
- **2024 crashes:** There have been 2 crashes reported in 2024 to date of this study. One was a Fixed Object crash occurring on 2/12/24 at night in the WB direction. The driver fled the scene after their vehicle struck a utility pole. The other reported crash was a Read End crash on 6/15/24 that occurred at the WB stop line. Alcohol was reported to be involved.

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 below in **Tables 4-6** on next page.

Table 4. Traffic Count Data AM Peak (7:00 AM - 8:00 AM)

AM Pk	Island Rd SB			SR 82 WB			Island Rd NB			SR 82 EB			Total
	R	T	L	R	T	L	R	T	L	R	T	L	
Volume	34	30	35	43	257	6	19	74	42	25	370	55	990
Truck %	2%			10%			2%			8%			7%
PHF	0.91												

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

PM Pk	Island Rd SB			SR 82 WB			Island Rd NB			SR 82 EB			Total
	R	T	L	R	T	L	R	T	L	R	T	L	
Volume	63	98	56	56	431	23	13	50	40	35	342	48	1255
Truck %	2%			2%			3%			3%			3%
PHF	0.94												

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

13-Hr	Island Rd SB			SR 82 WB			Island Rd NB			SR 82 EB			Total
	R	T	L	R	T	L	R	T	L	R	T	L	
Volume	484	538	449	444	3687	145	169	506	347	301	3666	496	11232
Truck %	3%			8%			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	9	Yes
1B - Interruption of Continuous Traffic		8	12	Yes
1 A&B - Combination of Warrants	1A	8	11	Yes
	1B	8	13	
2 - Four Hour Volumes		4	9	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)		Island Rd Delay in sec/veh (LOS)		Intersection Delay (LOS)
		Eastbound	Westbound	Northbound	Southbound	Overall
Signal	AM Peak	8.3 (A)	7.5 (A)	13.9 (B)	13.6 (B)	9.4 (A)
	PM Peak	8.5 (A)	8.9 (A)	13.4 (B)	14.9 (B)	10.2 (B)
Roundabout	AM Peak	7.4 (A)	6.8 (A)	6.7 (A)	5.0 (A)	6.9 (A)
	PM Peak	7.6 (A)	8.2 (A)	5.8 (A)	8.0 (A)	7.7 (A)

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.

The predicted crashes per year for the existing signal is 6.99 and the observed crashes per year for this study period was 3.60. Since the observed crashes per year were less than the predicted amount, this gave rise to a -1.17 potential for improvement within the HSM methodology. Nevertheless, the traffic safety review team felt that various safety improvements could be implemented for the intersection and it would therefore be worthwhile to proceed with the abbreviated safety study.

Table 9. ECAT Results

Condition	Predicted Crashes/Year	Expected Crash Difference/Year	Service Life	Safety Benefit
Signal (Existing)	6.99	---	---	---
Roundabout	1.92	-5.07	20	\$2.4M

Signal Phasing Diagram

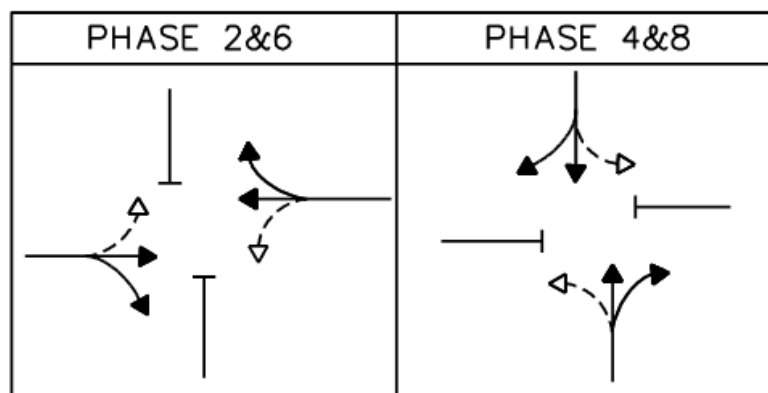


Figure 6. Signal Phasing Diagram

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		Island Rd SB		SR 82 WB		Island Rd NB
Yellow Change (Existing)		5.5		5.0		5.5		5.0
Yellow Change (Calculated)		5.2		4.8		5.2		4.5
Yellow Change (Proposed)		5.5		5.0		5.5		5.0
All Red Clearance (Existing)		1.0		1.0		1.0		1.0
All Red Clearance (Calculated)		-0.1		0.2		-0.1		0.3
All Red Clearance (Proposed)		1.0		1.0		1.0		1.0
Min Green + Yellow Change (Existing)		25.5		17.0		25.5		17.0
Pedestrian Clearance (Calculated)		10.9		14.6		11.1		13.1
Min Green + Yellow Change (Proposed)		25.5		17.0		25.5		17.0

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: 24.5 seconds for SR 82, 18 seconds for Island Rd, 55 second cycle length.

PM Peak: 24.5 seconds for SR 82, 18 seconds for Island 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 all approaches. All four approaches fell into the category of suggested “Permitted”, which is what currently exists.

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.
- Driver inexperience. 5 (28%) of the crashes were caused by a younger driver (<26 yrs.).
- Poor access management. A prevalence of driveway-related crashes was observed in the study. However, only one of the commercial driveways within the influence area of the intersection reported more than one crash. If there were a major project at the intersection, access to the businesses would be addressed at that time.
- Drivers failing to select an appropriate gap in traffic when making a left turn or entering the intersection from a commercial driveway.

Potential countermeasures include the following:

- Make no changes and continue to monitor the intersection. **(Not Recommended)**
 - Based on observed crash patterns, safety countermeasures were reviewed and several relevant countermeasures are recommended.
- 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.
- Access Management: Install Qwick Kurb along both SR 82 approaches to the intersection. **(Recommended)**
 - Due to the prevalence of driveway related crashes, installing Qwick Kurb is recommended to help mitigate this crash pattern. All four corner parcels have driveways to the minor road (Island Rd). Drivers exiting these businesses wanting to make a left turn can first exit onto Island Rd and then make a left turn at the signal.
- Signal Timing **(Recommended)** Optimizing change and clearance intervals can help reduce angle and rear end crashes at signalized intersections if change interval lengths are possibly too short.
 - Passage Time: Reduce from 4.0/3.0 sec to 2.0 sec for new radar detection.
 - *Yellow & Red clearance intervals are okay as is.*

- Roundabout (**Recommended**)
 - A roundabout is expected to provide a substantial safety benefit by reducing the frequency and severity of crashes. Additionally, a roundabout is expected to increase the level of service by significantly reducing overall intersection delay as well as the average delay per vehicle on all four approaches, especially the minor road approaches. If the intersection were to be converted to a roundabout, permanent access management improvements would also be made at that time. Another benefit of a roundabout is that the splitter islands would also provide additional access management.

Implementation Plan

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

Short-Term/Low-Cost:

- **Signing:** Make the Signal Ahead Warning signs on the SR 82 approaches dual by sending a work order for signing updates.
- **Qwick Kurb:** Install Qwick Kurb along both SR 82 approaches to the intersection and remove the TWLTL arrows on the EB approach by sending a work order.
- **Supplemental Signal Heads:** Install Supplemental Signal Heads on both SR 82 approaches by adding this work to PID 121707 D03 TSG FY2027 (M).
- **Signal Timing:**
 - Passage Time: Reduce from 4.0/3.0 sec to 2.0 sec for new radar detection (work order).
 - *Yellow & Red clearance intervals are okay as is.*

Medium-Term/Medium-Cost:

- 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. Island Rd NB 650 ft before stop line



2. Island Rd NB 50 ft before stop line



3. Island Rd SB 700 ft before stop line



4. Island Rd SB 50 ft before stop line



5. SR 82 EB 700 ft before stop line



6. SR 82 EB 50 ft before stop line



7. SR 82 WB 700 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/Island Study	2024	2044

Project Description

Safety Study

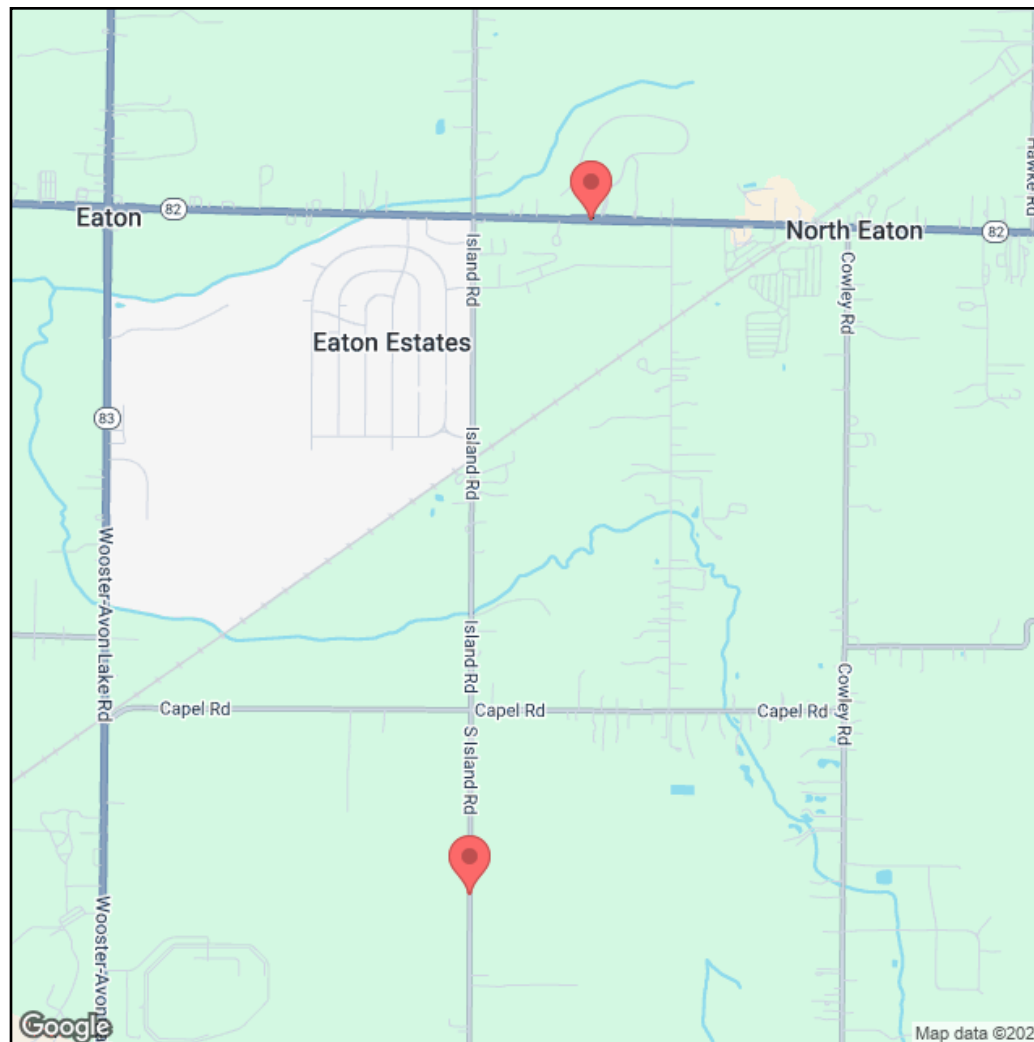
*Users of this data need to be aware that there are limitations to the forecasts generated by this product that make it suitable only for roadway design projects which are low risk.

Segment Information

Segment ID	LRS ID	BMP	EMP	Length	Latitude	Longitude
1886415	CLORCR00058**C	1.561	5.281	3.720	-82.0015969943624	41.2869697527285
1937642	SLORSR00082**C	2.666	5.105	2.439	-81.9952099516316	41.3137979531677

Forecast Information

Segment ID	2024 AADT	2044 AADT	DHV-30	K%	D%	T24%	TD%
1886415	1,700	2,300	350	15.0	59.8	2	2
1937642	9,100	10,500	1,200	11.2	61.1	7	6



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
1886415	CLORCR00058**C	1.561	5.281

Forecast

Year	K%	T24 % (Existing)	PA AADT	PA Method	PA Growth Rate %	PA Calculated Rate %
2050	◆ 15.0	2	2,500	Average	1.800	1.800
AADT	D%	TD % (Existing)	BC AADT	BC Method	BC Growth Rate %	BC Calculated Rate %
2,540	◆ 59.8	2	40	Model	0.400	0.400

◆ K/D factors from TCDS were used.

Regression

Method Number	PA AADT	BC AADT	AADT
2	3,071	74	3,145

95% Confidence Min/Max

PA Min	PA Max	BC Min	BC Max	Year
1440	4050	-360	354	2050

Method Number	PA Growth %	BC Growth %	PA Drop Count	BC Drop Count	PA AADT	BC AADT	PA Adjustment	PA Adjustment
1	2.56	-1.57	0	0	2,864	13	2,810	23
2	3.14	3.15	2	2	3,125	64	3,071	74
3	0.75	-9.81	0	0	1,962	-86	1,998	-66
4	0.89	-7.41	4	4	2,055	-48	2,063	-40
5	1.20	6.67	0	0	2,180	105	2,201	112
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	1,554	1,896	39	44	0.42	0.37
2	RAT	11.54	3,935	28.57	143	4.75	9.54
3	MRAT	2.31	2,778	3.57	71	2.33	2.87
4	RAF		2,337		57	1.38	1.57
Adjust Method AADT		Adjust Method BC		Selected PA Growth Rate %		Selected BC Growth Rate %	
Difference		Difference		0.400		0.400	

Method 1 - 4 Volume

PA Min Volume	PA Max Volume	BC Min Volume	BC Max Volume	Total Min Volume	Total MaxVolume
1852	3792	44	143	1896	3935

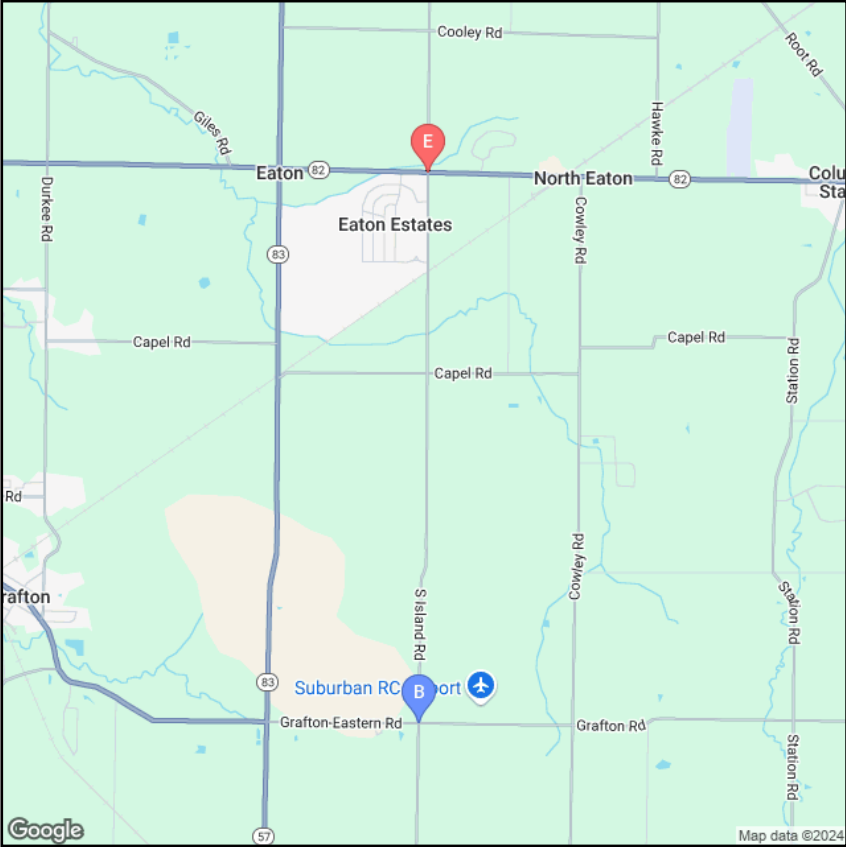
Process Flag: Adjusted model to counts with process per ODOT 255 spreadsheet

Comment: No Comment

Historical Count

Year	All	Cars	Trucks
2011	1,042	1,025	17
2014	1,612	1,536	75
2017	1,566	1,542	24
2020	1,549	1,538	11
* 2023	1,702	1,662	40

* Pivot Point



Segment ID	LRS ID	BMP	EMP	Length	Yr 2024 AADT	Yr 2044 AADT	DHV30	K %	D %	T24 %	TD %
1886415	CLORCR00058**C	1.561	5.281	3.720	1,700	2,300	350	15.0	59.8	2	2

Forecast Segment ID	Route	BMP	EMP
1937642	SLORSR00082**C	2.666	5.105

Forecast

Year	K%	T24 % (Existing)	PA AADT	PA Method	PA Growth Rate %	PA Calculated Rate %
2050	◆ 11.2	8	9,900	Model	0.700	0.700
AADT	D%	TD % (Existing)	BC AADT	BC Method	BC Growth Rate %	BC Calculated Rate %
10,650	◆ 61.1	7	750	Model	0.300	0.300

◆ 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	-2,196	10,798	325	735	0.74	0.21
2	RAT	0.81	10,465	1.88	769	0.58	0.39
3	MRAT	1.15	10,509	1.11	766	0.60	0.38
4	RAF		10,653		750	0.67	0.29
Adjust Method AADT		Adjust Method BC		Selected PA Growth Rate %		Selected BC Growth Rate %	
Average		Average		0.700		0.300	

Method 1 - 4 Volume

PA Min Volume	PA Max Volume	BC Min Volume	BC Max Volume	Total Min Volume	Total MaxVolume
9696	10063	735	769	10431	10832

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 %
1937642	SLORSR00082**C	2.666	5.105	2.439	9,100	10,500	1200	11.2	61.1	7	6

Appendix C

Crash Diagram and CAM Tool Summary

Crash Diagram

2024 HSIP RurInt Rank #60
LOR-82-3.56 (Island Rd)
Date: 1/1/19-12/31/23



Crashes By Age Group:

Younger Drivers (< 26 yrs.) - 5 (28%)
Older Drivers (> 64 yrs.) - 1 (6%)

Crashes By Type:

Rear End - 8 (44%)
Angle - 6 (33%)
SS-Passing - 2 (11%)
SS-Meeting - 1 (6%)
Left Turn - 1 (6%)

Crashes By Year:

2019 - 3 (17%)
2020 - 6 (33%)
2021 - 4 (22%)
2022 - 2 (11%)
2023 - 3 (17%)
Total - 18 (100%)

Crashes By Road

Condition:

Dry - 13 (72%)
Wet - 4 (22%)
Snow - 1 (6%)

Crashes By Severity:

Fatal - 0 (0%)
Injury - 7 (39%)
PDO - 11 (61%)

SR 82

Island Rd

Diagram Label Key

Date/24-Hour/Road Condition

R = Ran Red Light - (1)

D = Drugs/Alcohol - (2)

By: Jeremy Adato

Failure to yield exiting driveway.

11-22-23/18/Wet

Improper passing maneuver in
two way left turn lane.

10-08-21/19/Wet

10-22-22/16/Dry

NB vehicle attempted to cross
SR 82 and failed to yield.

At fault driver fled scene.

02-14-23/21/Dry

EB vehicle ran red light.

04-09-22/12/Dry (R)

11-02-21/14/Dry

Lead vehicle slowed
to make right turn.

09-13-19/14/Dry

WB failed to yield near end of
yellow clearance interval.

12-17-20/14/Wet

Failure to yield exiting
Circle K driveway.

07-26-19/22/Dry

11-16-20/16/Dry

06-15-20/15/Dry

01-19-20/21/Snow

07-26-23/14/Dry

Failure to yield exiting
Circle K driveway.

02-28-20/16/Dry

05-17-21/17/Dry

04-16-19/15/Dry

Stopped traffic waiting to
turn left into Circle K.

04-09-20/5/Wet (D)

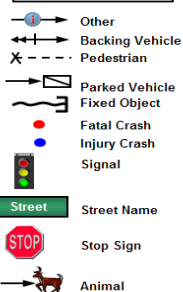
NB right turning vehicle
traveled left of center.

12-16-21/17/Dry (D)

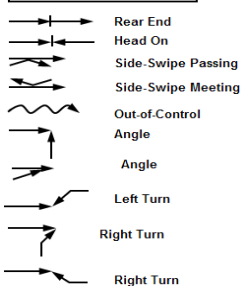
Improper passing maneuver while
lead vehicle was making left turn.

Legend:

Symbols



Types of Collisions



LOR-82-3.56 (Island Rd) 2024 HSIP Safety Study

Crash Summary Sheet

Fatalities	0
Serious Injuries	1
Other Injuries	8

Crash Severity	Crashes	%
(2) Serious Injury Suspected	1	5.56%
(3) Minor Injury Suspected	3	16.67%
(4) Injury Possible	3	16.67%
(5) PDO/No Injury	11	61.11%
Grand Total	18	100.00%

Day of Week	Crashes	%
(1) Sunday	1	5.56%
(2) Monday	3	16.67%
(3) Tuesday	3	16.67%
(4) Wednesday	2	11.11%
(5) Thursday	3	16.67%
(6) Friday	4	22.22%
(7) Saturday	2	11.11%
Grand Total	18	100.00%

Hour of Day	Crashes	%
5	1	5.56%
12	1	5.56%
14	4	22.22%
15	2	11.11%
16	3	16.67%
17	2	11.11%
18	1	5.56%
19	1	5.56%
21	2	11.11%
22	1	5.56%
Grand Total	18	100.00%

Crashes Per Year	3.60
Fatal and All Injury Crashes	7
Percent Injury	38.9%
Equivalent PDO Index Value	4.98

Year	Crashes	%
2019	3	16.67%
2020	6	33.33%
2021	4	22.22%
2022	2	11.11%
2023	3	16.67%
Grand Total	18	100.00%

Crash Type	Crashes	%
Rear End	8	44.44%
Angle	6	33.33%
Sideswipe - Passing	2	11.11%
Left Turn	1	5.56%
Right Turn	1	5.56%
Grand Total	18	100.00%

Month	Crashes	%
1	1	5.56%
2	2	11.11%
4	3	16.67%
5	1	5.56%
6	1	5.56%
7	2	11.11%
9	1	5.56%
10	2	11.11%
11	3	16.67%
12	2	11.11%
Grand Total	18	100.00%

LOR-82-3.56 (Island Rd) 2024 HSIP Safety Study

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	10	55.56%
Cloudy	5	27.78%
Snow	2	11.11%
Rain	1	5.56%
Grand Total	18	100.00%

Light Condition	Crashes	%
Daylight	10	55.56%
Dark - Lighted Roadway	4	22.22%
Dawn/Dusk	2	11.11%
Dark - Roadway Not Lighted	2	11.11%
Grand Total	18	100.00%

ODOT Location	Crashes	%
Not An Intersection	10	55.56%
Four-Way Intersection	8	44.44%
Grand Total	18	100.00%

Contour	Crashes	%
Straight Level	18	100.00%
Grand Total	18	100.00%

Roadway Departure	Crashes	%
No	16	88.89%
Yes	2	11.11%
Grand Total	18	100.00%

Intersection Related	Crashes	%
Yes	13	72.22%
No	5	27.78%
Grand Total	18	100.00%

Speed Related	Crashes	%
No	18	100.00%
Grand Total	18	100.00%

Road Condition	Crashes	%
Dry	13	72.22%
Wet	4	22.22%
Snow	1	5.56%
Grand Total	18	100.00%

Number of Units	Crashes	%
2	16	88.89%
3	2	11.11%
Grand Total	18	100.00%

Work Zone Related	Crashes	%
No	18	100.00%
Grand Total	18	100.00%

Alcohol Related	Crashes	%
No	18	100.00%
Grand Total	18	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	16	88.89%
Yes	2	11.11%
Grand Total	18	100.00%

Marijuana Related	Crashes	%
No	18	100.00%
Grand Total	18	100.00%

Older Driver (65+)	Crashes	%
No	15	83.33%
Yes	3	16.67%
Grand Total	18	100.00%

Young Driver (15-25)	Crashes	%
No	9	50.00%
Yes	9	50.00%
Grand Total	18	100.00%

Motorcycle Involved	Crashes	%
No	18	100.00%
Grand Total	18	100.00%

LOR-82-3.56 (Island Rd) 2024 HSIP Safety Study

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	10	55.56%
Making Left Turn	3	16.67%
Overtaking/Passing	2	11.11%
Entering Traffic Lane	2	11.11%
Making Right Turn	1	5.56%
Grand Total	18	100.00%

Unit 1 Contributing Factor	Crashes	%
Failure to Yield	6	33.33%
Following Too Closely/ACDA	6	33.33%
Improper Passing	2	11.11%
None	1	5.56%
Ran Red Light	1	5.56%
Improper Start From a Parked Position	1	5.56%
Left of Center	1	5.56%
Grand Total	18	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	18	100.00%
Grand Total	18	100.00%

Unit 1 Traffic Control	Crashes	%
Signal	10	55.56%
No Control	8	44.44%
Grand Total	18	100.00%

Unit 1 Posted Speed	Crashes	%
0	1	5.56%
40	1	5.56%
45	3	16.67%
50	12	66.67%
55	1	5.56%
Grand Total	18	100.00%

Unit 1 Direction From	Crashes	%
East	8	44.44%
West	4	22.22%
North	4	22.22%
South	2	11.11%
Grand Total	18	100.00%

Unit 1 Direction To	Crashes	%
East	8	44.44%
West	6	33.33%
South	3	16.67%
North	1	5.56%
Grand Total	18	100.00%

LOR-82-3.56 (Island Rd) 2024 HSIP Safety Study

Crash Summary Sheet

Unit 1 Summary

Unit 1 Type	Crashes	%
Passenger Car	12	66.67%
Sport Utility Vehicle	4	22.22%
Pick up	2	11.11%
Grand Total	18	100.00%

Unit 1 Special Function	Crashes	%
None	18	100.00%
Grand Total	18	100.00%

LOR-82-3.56 (Island Rd) 2024 HSIP Safety Study
Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Straight Ahead	10	55.56%
Slowing or Stopped In Traffic	5	27.78%
Changing Lanes	1	5.56%
Making Left Turn	1	5.56%
Making Right Turn	1	5.56%
Grand Total	18	100.00%

Unit 2 Contributing Factor	Crashes	%
None	18	100.00%
Grand Total	18	100.00%

Unit 2 Direction From	Crashes	%
East	10	55.56%
North	2	11.11%
South	1	5.56%
West	5	27.78%
Grand Total	18	100.00%

Unit 2 Direction To	Crashes	%
East	4	22.22%
North	1	5.56%
South	3	16.67%
Southwest	1	5.56%
West	9	50.00%
Grand Total	18	100.00%

Unit 2 Type	Crashes	%
Passenger Car	13	72.22%
Sport Utility Vehicle	4	22.22%
Passenger Van (minivan)	1	5.56%
Grand Total	18	100.00%

Unit 2 Special Function	Crashes	%
None	18	100.00%
Grand Total	18	100.00%

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-82-3.58
Site Code:
Start Date: 09/10/2024
Page No: 1

Turning Movement Data

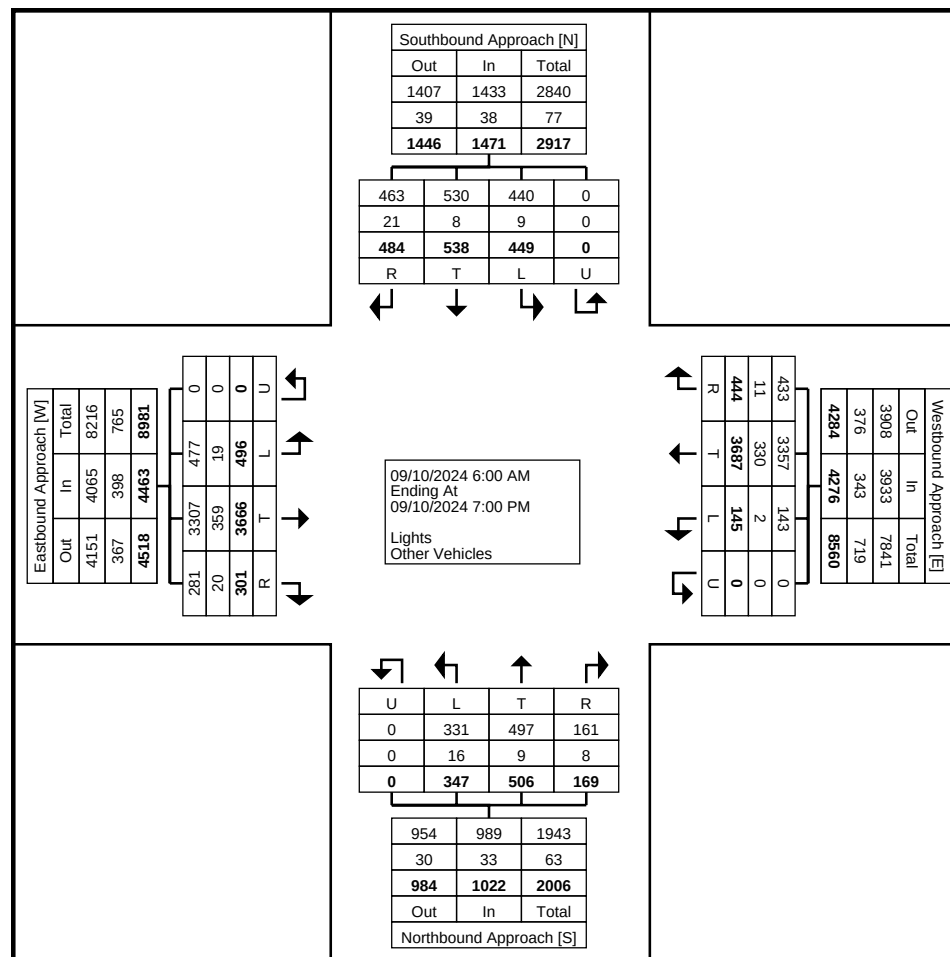
Start Time	Southbound Approach					Westbound Approach					Northbound Approach					Eastbound Approach					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
6:00 AM	2	2	4	0	8	7	30	0	0	37	6	6	4	0	16	1	54	7	0	62	123
6:15 AM	6	6	3	0	15	8	46	0	0	54	1	9	2	0	12	4	62	9	0	75	156
6:30 AM	8	8	2	0	18	5	47	0	0	52	2	17	10	0	29	8	90	12	0	110	209
6:45 AM	6	4	7	0	17	8	59	1	0	68	4	16	2	0	22	3	86	9	0	98	205
Hourly Total	22	20	16	0	58	28	182	1	0	211	13	48	18	0	79	16	292	37	0	345	693
7:00 AM	5	6	7	0	18	13	57	3	0	73	3	11	10	0	24	12	86	8	0	106	221
7:15 AM	10	5	8	0	23	14	71	2	0	87	7	22	9	0	38	6	90	21	0	117	265
7:30 AM	7	11	11	0	29	7	61	0	0	68	6	21	11	0	38	0	88	9	0	97	232
7:45 AM	12	8	9	0	29	9	68	1	0	78	3	20	12	0	35	7	106	17	0	130	272
Hourly Total	34	30	35	0	99	43	257	6	0	306	19	74	42	0	135	25	370	55	0	450	990
8:00 AM	12	6	7	0	25	5	51	1	0	57	7	12	8	0	27	5	72	8	0	85	194
8:15 AM	7	5	13	0	25	5	57	1	0	63	6	12	6	0	24	1	59	12	0	72	184
8:30 AM	7	3	4	0	14	8	46	2	0	56	4	6	5	0	15	4	67	10	0	81	166
8:45 AM	5	6	8	0	19	5	49	2	0	56	2	6	6	0	14	7	52	6	0	65	154
Hourly Total	31	20	32	0	83	23	203	6	0	232	19	36	25	0	80	17	250	36	0	303	698
9:00 AM	4	9	1	0	14	4	56	1	0	61	3	9	2	0	14	3	49	4	0	56	145
9:15 AM	4	6	10	0	20	3	52	1	0	56	2	5	0	0	7	1	56	4	0	61	144
9:30 AM	9	6	5	0	20	5	52	1	0	58	1	5	5	0	11	4	68	5	0	77	166
9:45 AM	4	6	8	0	18	2	52	3	0	57	2	9	2	0	13	4	42	7	0	53	141
Hourly Total	21	27	24	0	72	14	212	6	0	232	8	28	9	0	45	12	215	20	0	247	596
10:00 AM	6	7	9	0	22	6	52	5	0	63	4	2	5	0	11	2	65	6	0	73	169
10:15 AM	7	1	7	0	15	10	51	4	0	65	1	6	6	0	13	5	50	9	0	64	157
10:30 AM	6	10	6	0	22	8	62	0	0	70	5	3	1	0	9	1	54	11	0	66	167
10:45 AM	10	6	8	0	24	5	62	2	0	69	5	9	5	0	19	3	60	5	0	68	180
Hourly Total	29	24	30	0	83	29	227	11	0	267	15	20	17	0	52	11	229	31	0	271	673
11:00 AM	7	10	10	0	27	7	54	1	0	62	2	12	4	0	18	10	55	7	0	72	179
11:15 AM	7	5	7	0	19	12	52	3	0	67	2	12	9	0	23	2	59	14	0	75	184
11:30 AM	8	6	4	0	18	16	67	2	0	85	5	4	4	0	13	4	72	6	0	82	198
11:45 AM	6	12	3	0	21	6	57	3	0	66	4	4	8	0	16	8	62	4	0	74	177
Hourly Total	28	33	24	0	85	41	230	9	0	280	13	32	25	0	70	24	248	31	0	303	738
12:00 PM	9	9	11	0	29	11	72	3	0	86	2	11	4	0	17	8	80	9	0	97	229
12:15 PM	8	6	9	0	23	5	63	2	0	70	3	8	9	0	20	5	68	15	0	88	201
12:30 PM	10	8	12	0	30	10	86	4	0	100	3	8	4	0	15	6	66	5	0	77	222
12:45 PM	8	8	11	0	27	7	53	3	0	63	4	9	5	0	18	7	75	12	0	94	202
Hourly Total	35	31	43	0	109	33	274	12	0	319	12	36	22	0	70	26	289	41	0	356	854

1:00 PM	12	12	10	0	34	8	56	1	0	65	6	4	5	0	15	4	47	6	0	57	171
1:15 PM	8	9	10	0	27	10	63	4	0	77	2	5	8	0	15	3	64	7	0	74	193
1:30 PM	13	9	8	0	30	11	72	2	0	85	3	10	4	0	17	4	72	5	0	81	213
1:45 PM	6	5	6	0	17	8	73	3	0	84	4	4	4	0	12	7	76	11	0	94	207
Hourly Total	39	35	34	0	108	37	264	10	0	311	15	23	21	0	59	18	259	29	0	306	784
2:00 PM	7	14	13	0	34	5	66	3	0	74	8	8	11	0	27	2	48	9	0	59	194
2:15 PM	9	13	10	0	32	8	68	5	0	81	1	11	12	0	24	6	67	5	0	78	215
2:30 PM	6	7	8	0	21	7	87	2	0	96	0	5	10	0	15	8	77	12	0	97	229
2:45 PM	18	9	7	0	34	11	111	3	0	125	2	10	10	0	22	8	66	13	0	87	268
Hourly Total	40	43	38	0	121	31	332	13	0	376	11	34	43	0	88	24	258	39	0	321	906
3:00 PM	7	13	10	0	30	10	87	5	0	102	1	4	6	0	11	10	83	11	0	104	247
3:15 PM	7	18	11	0	36	10	99	3	0	112	5	10	10	0	25	11	89	11	0	111	284
3:30 PM	13	11	12	0	36	4	104	5	0	113	1	9	5	0	15	4	78	8	0	90	254
3:45 PM	7	19	12	0	38	13	158	3	0	174	2	21	7	0	30	5	87	12	0	104	346
Hourly Total	34	61	45	0	140	37	448	16	0	501	9	44	28	0	81	30	337	42	0	409	1131
4:00 PM	12	24	12	0	48	10	92	3	0	105	3	14	8	0	25	13	81	7	0	101	279
4:15 PM	16	18	13	0	47	13	119	8	0	140	2	14	6	0	22	5	82	10	0	97	306
4:30 PM	12	28	17	0	57	12	86	6	0	104	4	15	11	0	30	13	90	16	0	119	310
4:45 PM	21	28	10	0	59	12	126	7	0	145	2	11	10	0	23	7	81	15	0	103	330
Hourly Total	61	98	52	0	211	47	423	24	0	494	11	54	35	0	100	38	334	48	0	420	1225
5:00 PM	15	14	18	0	47	12	87	4	0	103	5	8	10	0	23	13	87	9	0	109	282
5:15 PM	15	28	11	0	54	20	132	6	0	158	2	16	9	0	27	2	84	8	0	94	333
5:30 PM	14	10	13	0	37	8	95	1	0	104	1	12	6	0	19	8	77	10	0	95	255
5:45 PM	15	15	6	0	36	12	75	5	0	92	3	9	7	0	19	6	95	15	0	116	263
Hourly Total	59	67	48	0	174	52	389	16	0	457	11	45	32	0	88	29	343	42	0	414	1133
6:00 PM	15	10	8	0	33	10	62	3	0	75	3	9	8	0	20	6	66	12	0	84	212
6:15 PM	12	17	4	0	33	2	72	2	0	76	3	7	6	0	16	7	82	10	0	99	224
6:30 PM	13	12	9	0	34	11	55	2	0	68	5	9	10	0	24	11	58	10	0	79	205
6:45 PM	11	10	7	0	28	6	57	8	0	71	2	7	6	0	15	7	36	13	0	56	170
Hourly Total	51	49	28	0	128	29	246	15	0	290	13	32	30	0	75	31	242	45	0	318	811
Grand Total	484	538	449	0	1471	444	3687	145	0	4276	169	506	347	0	1022	301	3666	496	0	4463	11232
Approach %	32.9	36.6	30.5	0.0	-	10.4	86.2	3.4	0.0	-	16.5	49.5	34.0	0.0	-	6.7	82.1	11.1	0.0	-	-
Total %	4.3	4.8	4.0	0.0	13.1	4.0	32.8	1.3	0.0	38.1	1.5	4.5	3.1	0.0	9.1	2.7	32.6	4.4	0.0	39.7	-
Lights	463	530	440	0	1433	433	3357	143	0	3933	161	497	331	0	989	281	3307	477	0	4065	10420
% Lights	95.7	98.5	98.0	-	97.4	97.5	91.0	98.6	-	92.0	95.3	98.2	95.4	-	96.8	93.4	90.2	96.2	-	91.1	92.8
Other Vehicles	21	8	9	0	38	11	330	2	0	343	8	9	16	0	33	20	359	19	0	398	812
% Other Vehicles	4.3	1.5	2.0	-	2.6	2.5	9.0	1.4	-	8.0	4.7	1.8	4.6	-	3.2	6.6	9.8	3.8	-	8.9	7.2



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-82-3.58
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
Office of Traffic Engineering

Count Name: LOR-82-3.58
Site Code:
Start Date: 09/10/2024
Page No: 4

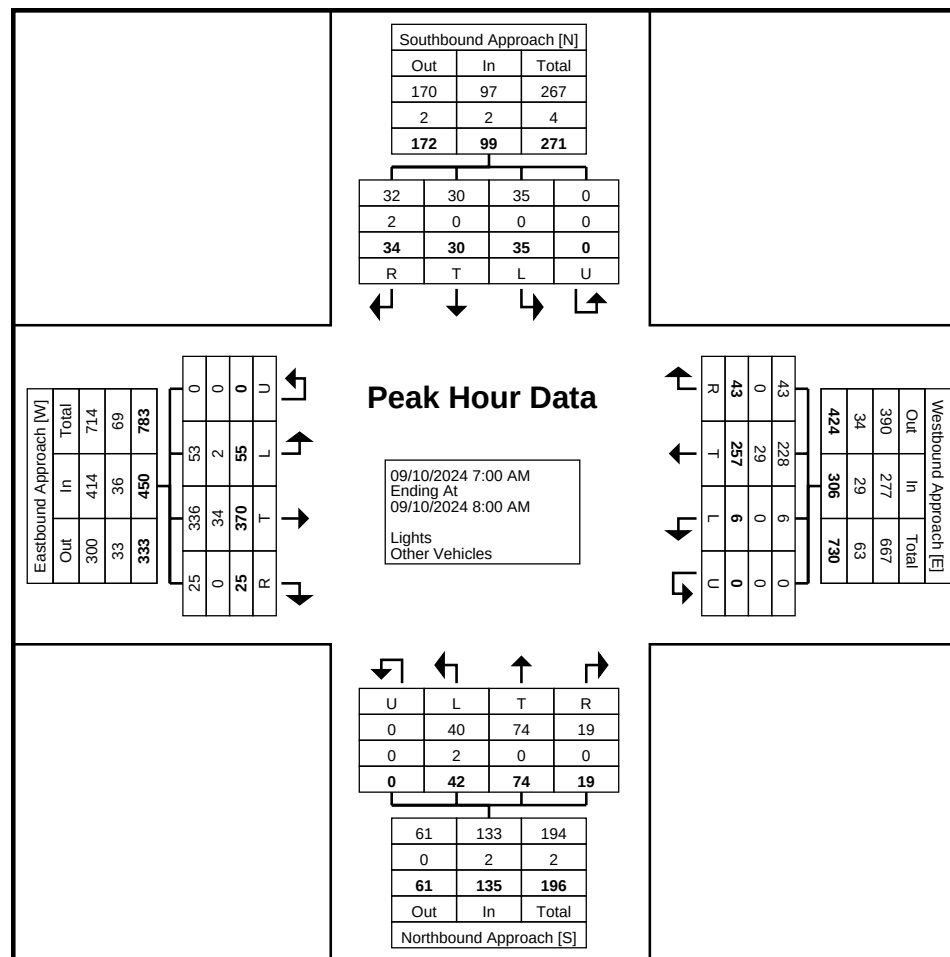
Turning Movement Peak Hour Data (7:00 AM)

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	
7:00 AM	5	6	7	0	18	13	57	3	0	73	3	11	10	0	24	12	86	8	0	106	221
7:15 AM	10	5	8	0	23	14	71	2	0	87	7	22	9	0	38	6	90	21	0	117	265
7:30 AM	7	11	11	0	29	7	61	0	0	68	6	21	11	0	38	0	88	9	0	97	232
7:45 AM	12	8	9	0	29	9	68	1	0	78	3	20	12	0	35	7	106	17	0	130	272
Total	34	30	35	0	99	43	257	6	0	306	19	74	42	0	135	25	370	55	0	450	990
Approach %	34.3	30.3	35.4	0.0	-	14.1	84.0	2.0	0.0	-	14.1	54.8	31.1	0.0	-	5.6	82.2	12.2	0.0	-	-
Total %	3.4	3.0	3.5	0.0	10.0	4.3	26.0	0.6	0.0	30.9	1.9	7.5	4.2	0.0	13.6	2.5	37.4	5.6	0.0	45.5	-
PHF	0.708	0.682	0.795	0.000	0.853	0.768	0.905	0.500	0.000	0.879	0.679	0.841	0.875	0.000	0.888	0.521	0.873	0.655	0.000	0.865	0.910
Lights	32	30	35	0	97	43	228	6	0	277	19	74	40	0	133	25	336	53	0	414	921
% Lights	94.1	100.0	100.0	-	98.0	100.0	88.7	100.0	-	90.5	100.0	100.0	95.2	-	98.5	100.0	90.8	96.4	-	92.0	93.0
Other Vehicles	2	0	0	0	2	0	29	0	0	29	0	0	2	0	2	0	34	2	0	36	69
% Other Vehicles	5.9	0.0	0.0	-	2.0	0.0	11.3	0.0	-	9.5	0.0	0.0	4.8	-	1.5	0.0	9.2	3.6	-	8.0	7.0



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-82-3.58
Site Code:
Start Date: 09/10/2024
Page No: 5



Turning Movement Peak Hour Data Plot (7:00 AM)



Ohio Department of Transportation - Safety
1980 West Broad Street
Mail Stop 5160
Columbus, Ohio, United States 43223
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Office of Traffic Engineering

Count Name: LOR-82-3.58
Site Code:
Start Date: 09/10/2024
Page No: 6

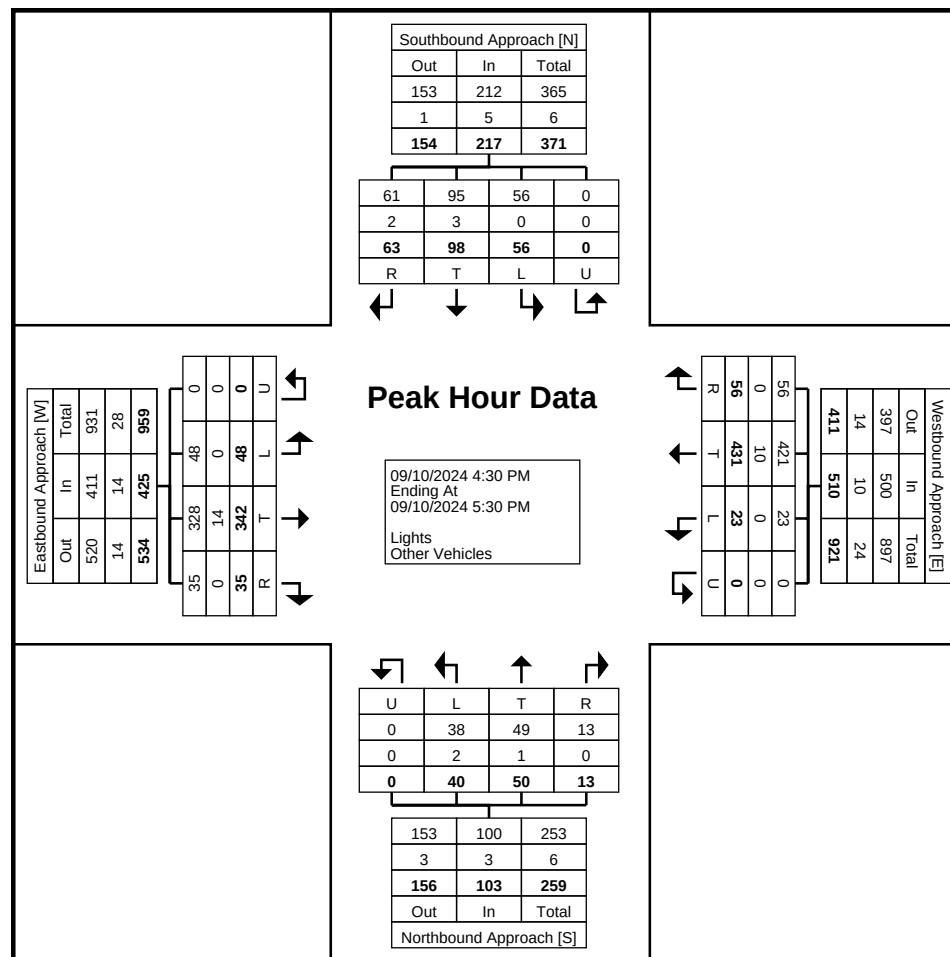
Turning Movement Peak Hour Data (4:30 PM)

Start Time	Southbound Approach					Westbound Approach					Northbound Approach					Eastbound Approach					Int. Total
	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	12	28	17	0	57	12	86	6	0	104	4	15	11	0	30	13	90	16	0	119	310
4:45 PM	21	28	10	0	59	12	126	7	0	145	2	11	10	0	23	7	81	15	0	103	330
5:00 PM	15	14	18	0	47	12	87	4	0	103	5	8	10	0	23	13	87	9	0	109	282
5:15 PM	15	28	11	0	54	20	132	6	0	158	2	16	9	0	27	2	84	8	0	94	333
Total	63	98	56	0	217	56	431	23	0	510	13	50	40	0	103	35	342	48	0	425	1255
Approach %	29.0	45.2	25.8	0.0	-	11.0	84.5	4.5	0.0	-	12.6	48.5	38.8	0.0	-	8.2	80.5	11.3	0.0	-	-
Total %	5.0	7.8	4.5	0.0	17.3	4.5	34.3	1.8	0.0	40.6	1.0	4.0	3.2	0.0	8.2	2.8	27.3	3.8	0.0	33.9	-
PHF	0.750	0.875	0.778	0.000	0.919	0.700	0.816	0.821	0.000	0.807	0.650	0.781	0.909	0.000	0.858	0.673	0.950	0.750	0.000	0.893	0.942
Lights	61	95	56	0	212	56	421	23	0	500	13	49	38	0	100	35	328	48	0	411	1223
% Lights	96.8	96.9	100.0	-	97.7	100.0	97.7	100.0	-	98.0	100.0	98.0	95.0	-	97.1	100.0	95.9	100.0	-	96.7	97.5
Other Vehicles	2	3	0	0	5	0	10	0	0	10	0	1	2	0	3	0	14	0	0	14	32
% Other Vehicles	3.2	3.1	0.0	-	2.3	0.0	2.3	0.0	-	2.0	0.0	2.0	5.0	-	2.9	0.0	4.1	0.0	-	3.3	2.5



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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-82-3.56 (Island Rd)
2024 Abbreviated HSIP Study
70% Volumes

Study Name: LOR-82-3.56 (Island Rd) 2024 HSIP

Study Date : 10/22/2024

Signal Warrants - Summary

Major Street Approaches

Eastbound: SR 82 EB

Number of Lanes : 1

Total Approach Volume: 4,463

Westbound: SR 82 WB

Number of Lanes :1

Total Approach Volume: 4,276

Minor Street Approaches

Northbound: Island Rd NB

Number of Lanes :1

Total Approach Volume: 1,022

Southbound: Island Rd SB

Number of Lanes :1

Total Approach Volume: 1,471

Warrant Summary (Rural Values Apply)

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

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

Required volumes reached for 9 hours, 8 are needed

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

Required volumes reached for 12 hours, 8 are needed

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

Required 1A volumes reached for 11 hours, 8 are needed

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

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

Number of hours (9) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour.....Satisfied

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

Number of one hour periods (28) 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-82-3.56 (Island Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-3.56 (Island Rd) 2024 HSIP

Study Date : 10/22/2024

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

9 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					Minor Road					
	SR 82 EB					Island Rd NB					
Time	Major EB	+	Major WB	=	Total		Minor NB		Minor SB		Met?
16:00 - 17:00	420	+	494	=	914		100		211		Yes
15:00 - 16:00	409	+	501	=	910		81		140		Yes
17:00 - 18:00	414	+	457	=	871		88		174		Yes
06:30 - 07:30	431	+	280	=	711		113		76		Yes
14:00 - 15:00	321	+	376	=	697		88		121		Yes
12:00 - 13:00	356	+	319	=	675		70		109		Yes
07:30 - 08:30	384	+	266	=	650		124		108		Yes
13:00 - 14:00	306	+	311	=	617		59		108		Yes
18:00 - 19:00	318	+	290	=	608		75		128		Yes
11:45 - 12:45	336	+	322	=	658		68		103		No
11:30 - 12:30	341	+	307	=	648		66		91		No
06:15 - 07:15	389	+	247	=	636		87		68		No
11:15 - 12:15	328	+	304	=	632		69		87		No
11:00 - 12:00	303	+	280	=	583		70		85		No
10:45 - 11:45	297	+	283	=	580		73		88		No
06:00 - 07:00	345	+	211	=	556		79		58		No
10:30 - 11:30	281	+	268	=	549		69		92		No
10:00 - 11:00	271	+	267	=	538		52		83		No
10:15 - 11:15	270	+	266	=	536		59		88		No
09:45 - 10:45	256	+	255	=	511		46		77		No
09:30 - 10:30	267	+	243	=	510		48		75		No
09:15 - 10:15	264	+	234	=	498		42		80		No
08:30 - 09:30	263	+	229	=	492		50		67		No
08:45 - 09:45	259	+	231	=	490		46		73		No
09:00 - 10:00	247		232		479		45		72		No

LOR-82-3.56 (Island Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-3.56 (Island Rd) 2024 HSIP

Study Date : 10/22/2024

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

12 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				Minor Road						
	SR 82 EB				Island Rd NB						
Time	Major EB	+	Major WB	=	Total		Minor NB		Minor SB		Met?
16:00 - 17:00	420	+	494	=	914		100		211		Yes
15:00 - 16:00	409	+	501	=	910		81		140		Yes
17:00 - 18:00	414	+	457	=	871		88		174		Yes
07:00 - 08:00	450	+	306	=	756		135		99		Yes
14:00 - 15:00	321	+	376	=	697		88		121		Yes
12:00 - 13:00	356	+	319	=	675		70		109		Yes
13:00 - 14:00	306	+	311	=	617		59		108		Yes
18:00 - 19:00	318	+	290	=	608		75		128		Yes
11:00 - 12:00	303	+	280	=	583		70		85		Yes
06:00 - 07:00	345	+	211	=	556		79		58		Yes
10:00 - 11:00	271	+	267	=	538		52		83		Yes
08:00 - 09:00	303	+	232	=	535		80		83		Yes
09:45 - 10:45	256	+	255	=	511		46		77		No
09:30 - 10:30	267	+	243	=	510		48		75		No
09:15 - 10:15	264	+	234	=	498		42		80		No
09:00 - 10:00	247	+	232	=	479		45		72		No
05:45 - 06:45	247	+	143	=	390		57		41		No
05:30 - 06:30	137	+	91	=	228		28		23		No
05:15 - 06:15	62	+	37	=	99		16		8		No
21:45 - 22:45	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
23:45 - 00:45	0	+	0	=	0		0		0		No
23:15 - 00:15	0	+	0	=	0		0		0		No
23:30 - 00:30	0		0		0		0		0		No

LOR-82-3.56 (Island Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-3.56 (Island Rd) 2024 HSIP

Study Date : 10/22/2024

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

11 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 82 EB						Island Rd NB			
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met1A?	
16:15 - 17:15	428	+	492	=	920	98	210	Yes	
15:15 - 16:15	406	+	504	=	910	95	158	Yes	
17:15 - 18:15	389	+	429	=	818	85	160	Yes	
14:15 - 15:15	366	+	404	=	770	72	117	Yes	
07:15 - 08:15	429	+	290	=	719	138	106	Yes	
06:15 - 07:15	389	+	247	=	636	87	68	Yes	
11:15 - 12:15	328	+	304	=	632	69	87	Yes	
13:15 - 14:15	308	+	320	=	628	71	108	Yes	
12:15 - 13:15	316	+	298	=	614	68	114	Yes	
10:15 - 11:15	270	+	266	=	536	59	88	Yes	
18:15 - 19:15	234	+	215	=	449	55	95	Yes	
06:00 - 07:00	345		211		556	79	58	No	

Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met1B?	
16:00 - 17:00	420	+	494	=	914	100	211	Yes	
15:00 - 16:00	409	+	501	=	910	81	140	Yes	
17:00 - 18:00	414	+	457	=	871	88	174	Yes	
07:00 - 08:00	450	+	306	=	756	135	99	Yes	
14:00 - 15:00	321	+	376	=	697	88	121	Yes	
12:00 - 13:00	356	+	319	=	675	70	109	Yes	
13:00 - 14:00	306	+	311	=	617	59	108	Yes	
18:00 - 19:00	318	+	290	=	608	75	128	Yes	
11:00 - 12:00	303	+	280	=	583	70	85	Yes	
06:00 - 07:00	345	+	211	=	556	79	58	Yes	
10:00 - 11:00	271	+	267	=	538	52	83	Yes	
08:00 - 09:00	303		232		535	80	83	Yes	

LOR-82-3.56 (Island Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-3.56 (Island Rd) 2024 HSIP

Study Date : 10/22/2024

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.

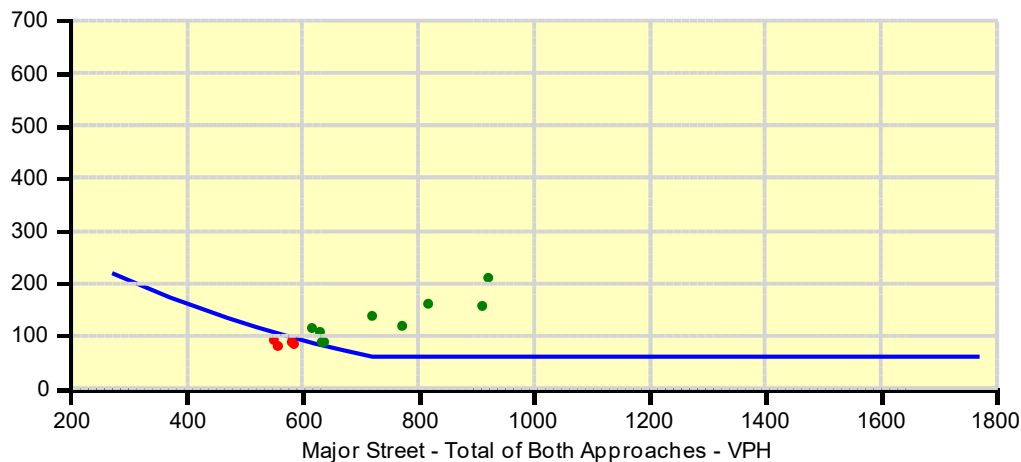
Summary

9 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						Minor Road		
SR 82 EB						Island Rd NB		
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met?
16:15 - 17:15	428	+	492	=	920	98	210	Yes
15:15 - 16:15	406	+	504	=	910	95	158	Yes
17:15 - 18:15	389	+	429	=	818	85	160	Yes
14:15 - 15:15	366	+	404	=	770	72	117	Yes
07:15 - 08:15	429	+	290	=	719	138	106	Yes
06:15 - 07:15	389	+	247	=	636	87	68	Yes
11:15 - 12:15	328	+	304	=	632	69	87	Yes
13:15 - 14:15	308	+	320	=	628	71	108	Yes
12:15 - 13:15	316	+	298	=	614	68	114	Yes
11:00 - 12:00	303	+	280	=	583	70	85	No
10:45 - 11:45	297	+	283	=	580	73	88	No
							58	No



LOR-82-3.56 (Island Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-3.56 (Island Rd) 2024 HSIP

Study Date : 10/22/2024

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

29 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 82 EB						Island Rd NB			
Time	Total of All Approaches	Met?	Minor NB	Delay NB	Met?	Minor SB	Delay SB	Met?	Warrant Met?
16:30 - 17:30	1255	Yes	103	-	---	217	-	Yes	Yes
15:45 - 16:45	1241	Yes	107	-	---	190	-	Yes	Yes
16:15 - 17:15	1228	Yes	98	-	---	210	-	Yes	Yes
16:00 - 17:00	1225	Yes	100	-	---	211	-	Yes	Yes
16:45 - 17:45	1200	Yes	92	-	---	197	-	Yes	Yes
15:30 - 16:30	1185	Yes	92	-	---	169	-	Yes	Yes
15:15 - 16:15	1163	Yes	95	-	---	158	-	Yes	Yes
17:00 - 18:00	1133	Yes	88	-	---	174	-	Yes	Yes
15:00 - 16:00	1131	Yes	81	-	---	140	-	Yes	Yes
17:15 - 18:15	1063	Yes	85	-	---	160	-	Yes	Yes
14:45 - 15:45	1053	Yes	73	-	---	136	-	Yes	Yes
14:30 - 15:30	1028	Yes	73	-	---	121	-	Yes	Yes
07:00 - 08:00	990	Yes	135	-	Yes	99	-	---	Yes
07:15 - 08:15	963	Yes	138	-	Yes	106	-	---	Yes
14:15 - 15:15	959	Yes	72	-	---	117	-	Yes	Yes
17:30 - 18:30	954	Yes	74	-	---	139	-	Yes	Yes
06:45 - 07:45	923	Yes	122	-	Yes	87	-	---	Yes
14:00 - 15:00	906	Yes	88	-	---	121	-	Yes	Yes
17:45 - 18:45	904	Yes	79	-	---	136	-	Yes	Yes
06:30 - 07:30	900	Yes	113	-	Yes	76	-	---	Yes
07:30 - 08:30	882	Yes	124	-	Yes	108	-	---	Yes
12:00 - 13:00	854	Yes	70	-	---	109	-	Yes	Yes
13:45 - 14:45	845	Yes	78	-	---	104	-	Yes	Yes
11:45 - 12:45	829	Yes	68	-	---	103	-	Yes	Yes
13:30 - 14:30	829	Yes	80	-	---	113	-	Yes	Yes

LOR-82-3.56 (Island Rd)

2024 Abbreviated HSIP Study

70% Volumes

Study Name: LOR-82-3.56 (Island Rd) 2024 HSIP

Study Date : 10/22/2024

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.

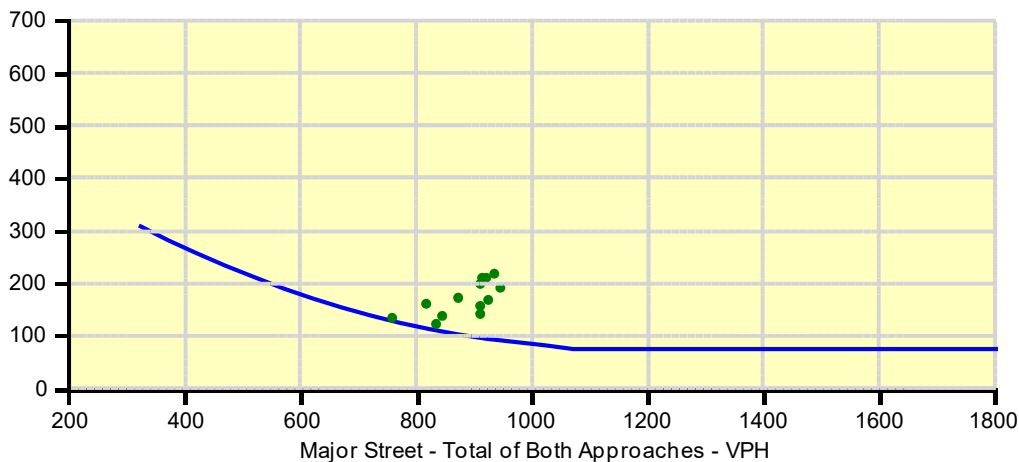
Summary

14 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**

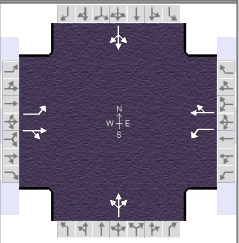
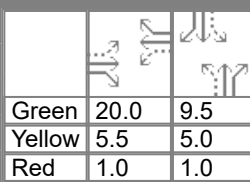
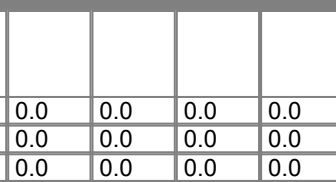
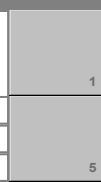
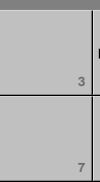
Major Road SR 82 EB						Minor Road Island Rd NB		
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met?
15:45 - 16:45	421	+	523	=	944	107	190	Yes
16:30 - 17:30	425	+	510	=	935	103	217	Yes
15:30 - 16:30	392	+	532	=	924	92	169	Yes
16:15 - 17:15	428	+	492	=	920	98	210	Yes
16:00 - 17:00	420	+	494	=	914	100	211	Yes
16:45 - 17:45	401	+	510	=	911	92	197	Yes
15:00 - 16:00	409	+	501	=	910	81	140	Yes
15:15 - 16:15	406	+	504	=	910	95	158	Yes
17:00 - 18:00	414	+	457	=	871	88	174	Yes
14:45 - 15:45	392	+	452	=	844	73	136	Yes
14:30 - 15:30	399	+	435	=	834	73	121	Yes
							160	Yes



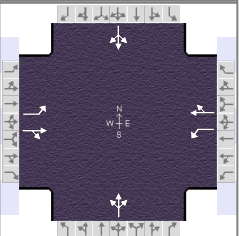
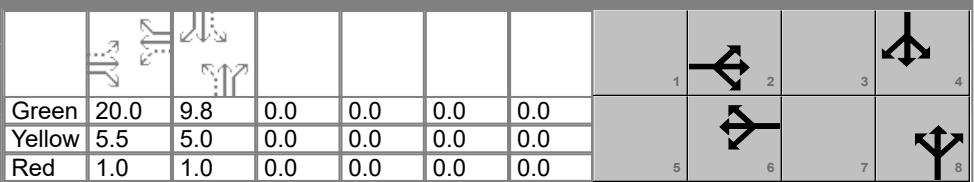
Appendix F

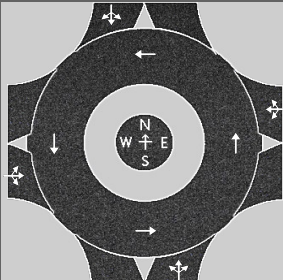
Highway Capacity Software (HCS) Analysis

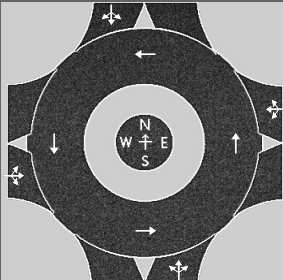
HCS Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		ODOT				Duration, h		0.250											
Analyst		Jeremy Adato		Analysis Date		Oct 21, 2024		Area Type		Other									
Jurisdiction		D3		Time Period				PHF		0.91									
Urban Street		2024 HSIP Safety Study		Analysis Year		2024		Analysis Period		1> 7:00									
Intersection		LOR-82-3.56 (Island Rd)		File Name		1. Revised 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				55	370	25	6	257	43	42	74	19	35	30	34				
Signal Information																			
Cycle, s	42.0	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	20.0	9.5	0.0	0.0	0.0	0.0									
				Yellow	5.5	5.0	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						26.5				26.5				15.5				15.5	
Change Period, (Y+R c), s						6.5				6.5				6.0				6.0	
Max Allow Headway (MAH), s						3.0				3.0				3.1				3.1	
Queue Clearance Time (g s), s						10.0				10.3				5.1				4.3	
Green Extension Time (g e), s						1.5				1.5				0.4				0.4	
Phase Call Probability						1.00				1.00				0.95				0.95	
Max Out Probability						0.00				0.00				0.00				0.00	
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				5	2	12	1	6	16	3	8	18	7	4	14				
Adjusted Flow Rate (v), veh/h				60	434		7	330			148			109					
Adjusted Saturation Flow Rate (s), veh/h/ln				1000	1622		894	1573			1590			1515					
Queue Service Time (g s), s				1.8	8.0		0.2	5.8			0.0			0.0					
Cycle Queue Clearance Time (g c), s				7.6	8.0		8.3	5.8			3.1			2.3					
Green Ratio (g/C)				0.48	0.48		0.48	0.48			0.23			0.23					
Capacity (c), veh/h				509	773		426	749			472			459					
Volume-to-Capacity Ratio (X)				0.119	0.562		0.015	0.440			0.314			0.237					
Back of Queue (Q), ft/ln (95 th percentile)				12	69		2	49			43			30					
Back of Queue (Q), veh/ln (95 th percentile)				0.5	2.6		0.1	1.8			1.7			1.2					
Queue Storage Ratio (RQ) (95 th percentile)				0.13	0.08		0.01	0.03			0.05			0.01					
Uniform Delay (d 1), s/veh				9.8	7.9		10.8	7.3			13.8			13.5					
Incremental Delay (d 2), s/veh				0.0	0.2		0.0	0.2			0.1			0.1					
Initial Queue Delay (d 3), s/veh				0.0	0.0		0.0	0.0			0.0			0.0					
Control Delay (d), s/veh				9.9	8.1		10.8	7.4			13.9			13.6					
Level of Service (LOS)				A	A		B	A			B			B					
Approach Delay, s/veh / LOS				8.3		A		7.5		A		13.9		B		13.6		B	
Intersection Delay, s/veh / LOS				9.4						A									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				1.64		B		1.64		B		1.90		B		1.90		B	
Bicycle LOS Score / LOS				1.30		A		1.04		A		0.73		A		0.67		A	

HCS Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		ODOT				Duration, h		0.250											
Analyst		Jeremy Adato		Analysis Date		Oct 21, 2024		Area Type		Other									
Jurisdiction		D3		Time Period				PHF		0.94									
Urban Street		2024 HSIP Safety Study		Analysis Year		2024		Analysis Period		1> 7:00									
Intersection		LOR-82-3.56 (Island Rd)		File Name		2. Revised 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				48	342	35	23	431	56	40	50	13	56	98	63				
Signal Information																			
Cycle, s	42.3	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	Yes	Simult. Gap E/W	On					Green	20.0	9.8	0.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On					Yellow	5.5	5.0	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						26.5				26.5				15.8				15.8	
Change Period, (Y+R c), s						6.5				6.5				6.0				6.0	
Max Allow Headway (MAH), s						3.0				3.0				3.1				3.1	
Queue Clearance Time (g s), s						13.9				11.9				4.3				7.5	
Green Extension Time (g e), s						1.9				1.9				0.6				0.6	
Phase Call Probability						1.00				1.00				0.98				0.98	
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				51	401		24	518			110			231					
Adjusted Saturation Flow Rate (s), veh/h/ln				876	1681		984	1688			1516			1561					
Queue Service Time (g s), s				2.0	7.0		0.7	9.9			0.0			2.6					
Cycle Queue Clearance Time (g c), s				11.9	7.0		7.7	9.9			2.3			5.5					
Green Ratio (g/C)				0.47	0.47		0.47	0.47			0.23			0.23					
Capacity (c), veh/h				380	794		473	798			470			469					
Volume-to-Capacity Ratio (X)				0.135	0.505		0.052	0.649			0.233			0.492					
Back of Queue (Q), ft/ln (95 th percentile)				13	60		5	86			31			69					
Back of Queue (Q), veh/ln (95 th percentile)				0.5	2.4		0.2	3.4			1.2			2.7					
Queue Storage Ratio (RQ) (95 th percentile)				0.14	0.07		0.03	0.05			0.03			0.01					
Uniform Delay (d 1), s/veh				13.0	7.7		10.4	8.5			13.4			14.6					
Incremental Delay (d 2), s/veh				0.1	0.2		0.0	0.3			0.1			0.3					
Initial Queue Delay (d 3), s/veh				0.0	0.0		0.0	0.0			0.0			0.0					
Control Delay (d), s/veh				13.1	7.9		10.4	8.8			13.4			14.9					
Level of Service (LOS)				B	A		B	A			B			B					
Approach Delay, s/veh / LOS				8.5		A		8.9		A		13.4		B		14.9		B	
Intersection Delay, s/veh / LOS				10.2						B									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				1.64		B		1.64		B		1.90		B		1.90		B	
Bicycle LOS Score / LOS				1.23		A		1.38		A		0.67		A		0.87		A	

HCS Roundabouts Report																	
General Information									Site Information								
Analyst	Jeremy Adato								Intersection				LOR-82-3.56 (Island Rd)				
Agency or Co.	ODOT								E/W Street Name				SR 82				
Date Performed	10/21/2024								N/S Street Name				Island Rd				
Analysis Year	2024								Analysis Time Period, hrs				0.25				
Time Analyzed	AM Peak								Peak Hour Factor				0.91				
Project Description	Proposed RAB AM Peak								Jurisdiction				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	55	370	25	0	6	257	43	0	42	74	19	0	35	30	34	
Percent Heavy Vehicles, %	0	8	8	8	0	10	10	10	0	2	2	2	0	2	2	2	
Flow Rate (v _{PCE}), pc/h	0	65	439	30	0	7	311	52	0	47	83	21	0	39	34	38	
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		534				370				151				111			
Entry Volume, veh/h		494				336				148				109			
Circulating Flow (v _c), pc/h	80				195				543				365				
Exiting Flow (v _{ex}), pc/h	499				396				200				71				
Capacity (c _{pce}), pc/h		1272				1131				793				951			
Capacity (c), veh/h		1178				1028				778				932			
v/c Ratio (x)		0.42				0.33				0.19				0.12			
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		7.4				6.8				6.7				5.0			
Lane LOS		A				A				A				A			
95% Queue Length, Q ₉₅ (veh)		2.1				1.4				0.7				0.4			
95% Queue Length, Q ₉₅ (ft)		55.9				37.8				17.8				10.2			
Approach Delay, s/veh LOS	7.4		A		6.8		A		6.7		A		5.0		A		
Intersection Delay, s/veh LOS					6.9								A				

HCS Roundabouts Report																	
General Information									Site Information								
Analyst	Jeremy Adato								Intersection				LOR-82-3.56 (Island Rd)				
Agency or Co.	ODOT								E/W Street Name				SR 82				
Date Performed	10/21/2024								N/S Street Name				Island Rd				
Analysis Year	2024								Analysis Time Period, hrs				0.25				
Time Analyzed	PM Peak								Peak Hour Factor				0.94				
Project Description	Proposed RAB PM Peak								Jurisdiction				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	48	342	35	0	23	431	56	0	40	50	13	0	56	98	63	
Percent Heavy Vehicles, %	0	3	3	3	0	2	2	2	0	3	3	3	0	2	2	2	
Flow Rate (v _{PCE}), pc/h	0	53	375	38	0	25	468	61	0	44	55	14	0	61	106	68	
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		466				554				113				235			
Entry Volume, veh/h		452				543				110				230			
Circulating Flow (v _c), pc/h	192				152				489				537				
Exiting Flow (v _{ex}), pc/h	450				580				169				169				
Capacity (c _{pce}), pc/h		1135				1182				838				798			
Capacity (c), veh/h		1102				1159				814				782			
v/c Ratio (x)		0.41				0.47				0.13				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		7.6				8.2				5.8				8.0			
Lane LOS		A				A				A				A			
95% Queue Length, Q ₉₅ (veh)		2.0				2.6				0.5				1.2			
95% Queue Length, Q ₉₅ (ft)		51.2				66.0				12.8				30.5			
Approach Delay, s/veh LOS	7.6		A		8.2		A		5.8		A		8.0		A		
Intersection Delay, s/veh LOS	7.7								A								

Appendix G

Economic Crash Analysis Tool (ECAT) Reports



Project Information

General Information

Project Name	LOR-82-3.56 (Island Rd) Safety Study	Contact Email	jeremy.adato@dot.ohio.gov
Project Description	Existing Signal	Contact Phone	(419) 207-7186
Reference Number	-	Date Performed	10/22/2024
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 & Island	Rural Two-Lane Two Way Intersection	Signalized	SLORSR00082**C	3.56		0.05	CLORCR0005	Island 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

**ECAT**

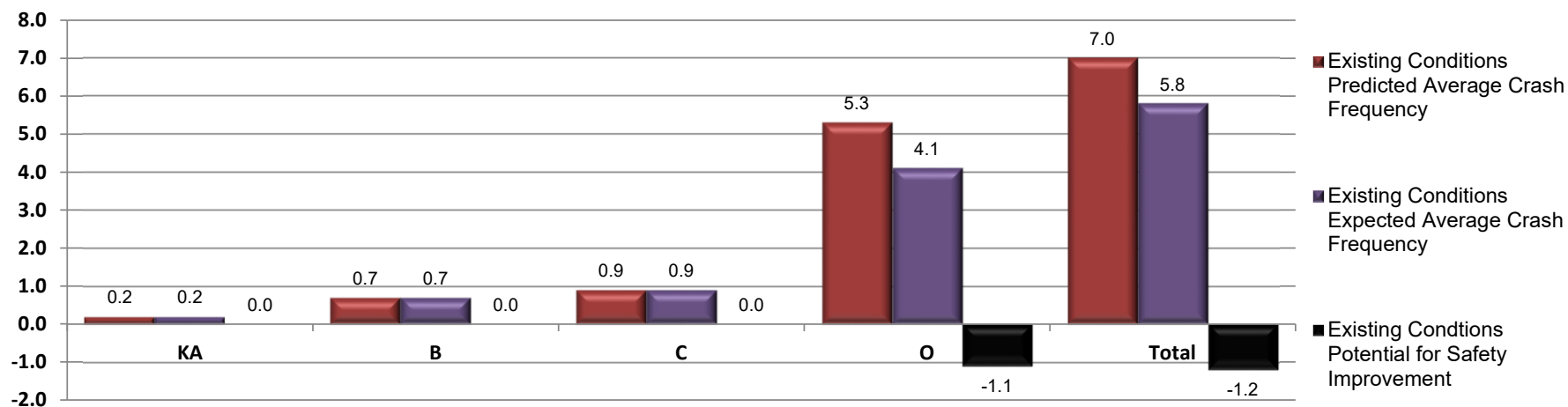
Economic Crash Analysis Tool

Project Safety Performance Report

General Information

Project Name	LOR-82-3.56 (Island Rd) Safety Study	Contact Email	jeremy.adato@dot.ohio.gov
Project Description	Existing Signal	Contact Phone	(419) 207-7186
Reference Number	-	Date Performed	10/22/2024
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
$N_{\text{predicted}} - \text{Existing Conditions}$	0.1637	0.6956	0.8792	5.2546	6.9931
$N_{\text{expected}} - \text{Existing Conditions}$	0.1583	0.6737	0.8518	4.1356	5.8194
$N_{\text{potential for improvement}} - \text{Existing Conditions}$	-0.0054	-0.0219	-0.0274	-1.1190	-1.1737



Project Information

General Information

Project Name	LOR-82-3.56 (Island Rd) Safety Study	Contact Email	jeremy.adato@dot.ohio.gov
Project Description	Proposed Roundabout	Contact Phone	(419) 207-7186
Reference Number		Date Performed	10/22/2024
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 & Island	Roundabout	Unsignalized	SLORSR00082**C	3.56		0.05	CLORCR0005	Island 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		0.0100	

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**

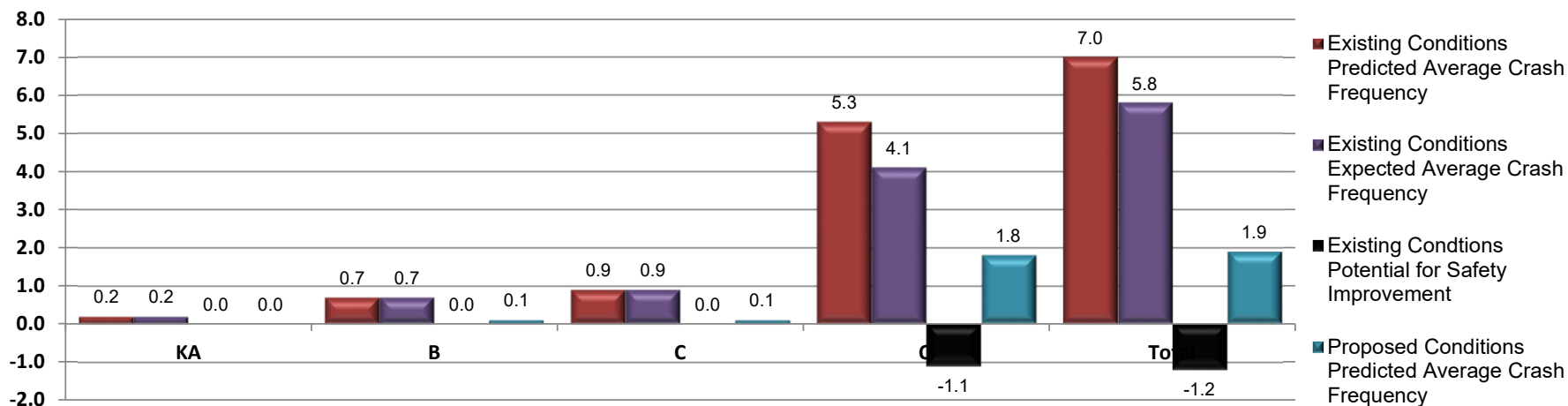
Economic Crash Analysis Tool

Project Safety Performance Report

General Information

Project Name	LOR-82-3.56 (Island Rd) Safety Study	Contact Email	jeremy.adato@dot.ohio.gov
Project Description	Proposed Roundabout	Contact Phone	(419) 207-7186
Reference Number		Date Performed	10/22/2024
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
$N_{\text{predicted}} - \text{Existing Conditions}$	0.1637	0.6956	0.8792	5.2546	6.9931
$N_{\text{expected}} - \text{Existing Conditions}$	0.1583	0.6737	0.8518	4.1356	5.8194
$N_{\text{potential for improvement}} - \text{Existing Conditions}$	-0.0054	-0.0219	-0.0274	-1.1190	-1.1737
$N_{\text{expected}} - \text{Proposed Conditions}$	0.0084	0.0701	0.0866	1.7577	1.9228

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	-	-	50	1	-	-	10	-	20	-	-	-	-	5.5	-	6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
2	EB	THROUGH/RT	50	1	57	57	10	54	20	0	5.2	-0.1	5.1	5.5	1	6.5	-	-	38	-	-	-	10.9	5.4	-	-	-	-	-	6					
3	-	-	-	1	-	-	10	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
4	SB	THROUGH/RT	45	1	52	52	10	68	20	0	4.8	0.2	5.0	5	1	6.0	-	-	51	-	-	-	14.6	9.6	-	-	-	-	-	10					
5	-	-	-	1	-	-	10	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
6	WB	THROUGH/RT	50	1	57	57	10	58	20	0	5.2	-0.1	5.1	5.5	1	6.5	-	-	39	-	-	-	11.1	5.6	-	-	-	-	-	6					
7	-	-	-	1	-	-	10	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
8	NB	THROUGH/RT	40	1	47	47	10	71	20	0	4.5	0.3	4.8	5	1	6.0	-	-	46	-	-	-	13.1	8.1	-	-	-	-	-	9					

Appendix I

Synchro Analysis

Lanes, Volumes, Timings

3:

03/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	370	25	6	257	43	42	74	19	35	30	34
Future Volume (vph)	55	370	25	6	257	43	42	74	19	35	30	34
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12	10	10	10	10	10	10
Storage Length (ft)	95		0	150		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		0.991			0.979			0.981			0.954	
Flt Protected	0.950			0.950				0.985			0.983	
Satd. Flow (prot)	1539	1606	0	1511	1557	0	0	1547	0	0	1502	0
Flt Permitted	0.562			0.504				0.856			0.861	
Satd. Flow (perm)	911	1606	0	802	1557	0	0	1345	0	0	1315	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			20			16			37	
Link Speed (mph)		50			50			40			45	
Link Distance (ft)		285			260			247			239	
Travel Time (s)		3.9			3.5			4.2			3.6	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	8%	8%	8%	10%	10%	10%	2%	2%	2%	2%	2%	2%
Adj. Flow (vph)	60	407	27	7	282	47	46	81	21	38	33	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	434	0	7	329	0	0	148	0	0	108	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	1.21	1.21	1.21	1.21	1.21	1.21
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:

03/25/2025

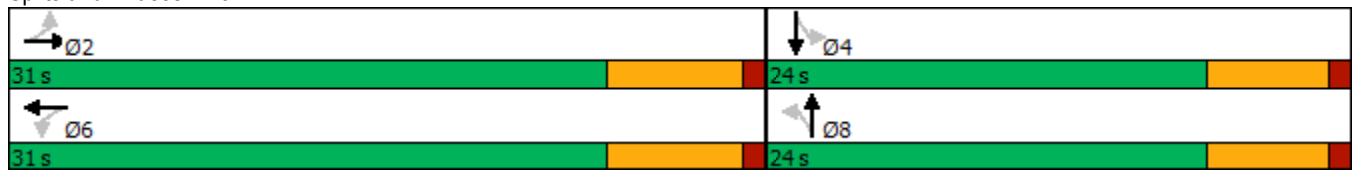
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.5	26.5		26.5	26.5		24.0	24.0		24.0	24.0	
Total Split (s)	31.0	31.0		31.0	31.0		24.0	24.0		24.0	24.0	
Total Split (%)	56.4%	56.4%		56.4%	56.4%		43.6%	43.6%		43.6%	43.6%	
Maximum Green (s)	24.5	24.5		24.5	24.5		18.0	18.0		18.0	18.0	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
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)	6.5	6.5		6.5	6.5			6.0			6.0	
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)	29.0	29.0		29.0	29.0			11.2			11.2	
Actuated g/C Ratio	0.60	0.60		0.60	0.60			0.23			0.23	
v/c Ratio	0.11	0.45		0.01	0.35			0.46			0.32	
Control Delay	7.6	9.7		6.8	8.3			19.2			13.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	7.6	9.7		6.8	8.3			19.2			13.8	
LOS	A	A		A	A			B			B	
Approach Delay		9.5			8.3			19.2			13.8	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	7	66		1	44			32			16	
Queue Length 95th (ft)	26	157		6	109			72			48	
Internal Link Dist (ft)		205			180			167			159	
Turn Bay Length (ft)	95			150								
Base Capacity (vph)	550	973		484	948			514			516	
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	0.45		0.01	0.35			0.29			0.21	
Intersection Summary												
Area Type:	Other											
Cycle Length: 55												
Actuated Cycle Length: 48												
Natural Cycle: 55												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.46												
Intersection Signal Delay: 10.8				Intersection LOS: B								
Intersection Capacity Utilization 65.3%				ICU Level of Service C								
Analysis Period (min) 15												

Lanes, Volumes, Timings

3:

03/25/2025

Splits and Phases: 3:



Lanes, Volumes, Timings

3:

03/25/2025

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	342	35	23	431	56	40	50	13	56	98	63
Future Volume (vph)	48	342	35	23	431	56	40	50	13	56	98	63
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Lane Width (ft)	12	12	12	12	12	12	10	10	10	10	10	10
Storage Length (ft)	95		0	150		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		0.986			0.983			0.983			0.961	
Flt Protected	0.950			0.950				0.981			0.987	
Satd. Flow (prot)	1614	1675	0	1630	1687	0	0	1529	0	0	1519	0
Flt Permitted	0.402			0.510				0.822			0.876	
Satd. Flow (perm)	683	1675	0	875	1687	0	0	1281	0	0	1348	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			15			14			40	
Link Speed (mph)		50			50			40			45	
Link Distance (ft)		285			260			247			239	
Travel Time (s)		3.9			3.5			4.2			3.6	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	51	364	37	24	459	60	43	53	14	60	104	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	401	0	24	519	0	0	110	0	0	231	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	1.21	1.21	1.21	1.21	1.21	1.21
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

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03/25/2025

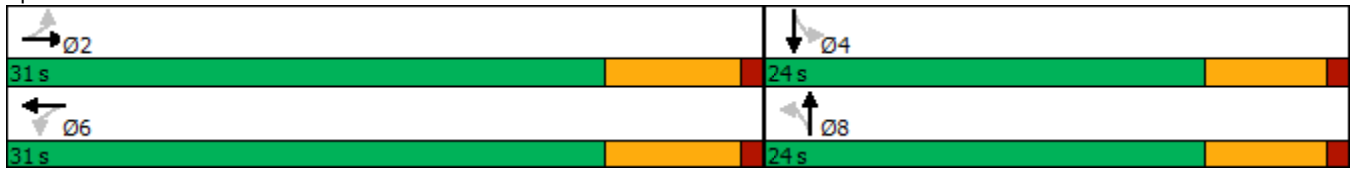
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	20.0	20.0		20.0	20.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	26.5	26.5		26.5	26.5		24.0	24.0		24.0	24.0	
Total Split (s)	31.0	31.0		31.0	31.0		24.0	24.0		24.0	24.0	
Total Split (%)	56.4%	56.4%		56.4%	56.4%		43.6%	43.6%		43.6%	43.6%	
Maximum Green (s)	24.5	24.5		24.5	24.5		18.0	18.0		18.0	18.0	
Yellow Time (s)	5.5	5.5		5.5	5.5		5.0	5.0		5.0	5.0	
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)	6.5	6.5		6.5	6.5			6.0			6.0	
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)	25.7	25.7		25.7	25.7			12.9			12.9	
Actuated g/C Ratio	0.50	0.50		0.50	0.50			0.25			0.25	
v/c Ratio	0.15	0.47		0.05	0.61			0.33			0.62	
Control Delay	9.6	11.3		8.4	13.6			16.0			21.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	9.6	11.3		8.4	13.6			16.0			21.4	
LOS	A	B		A	B			B			C	
Approach Delay		11.1			13.3			16.0			21.4	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)	7	66		3	94			22			48	
Queue Length 95th (ft)	28	156		15	219			55			104	
Internal Link Dist (ft)		205			180			167			159	
Turn Bay Length (ft)	95			150								
Base Capacity (vph)	343	847		439	855			460			501	
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	0.15	0.47		0.05	0.61			0.24			0.46	
Intersection Summary												
Area Type:	Other											
Cycle Length: 55												
Actuated Cycle Length: 51.2												
Natural Cycle: 55												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.62												
Intersection Signal Delay: 14.2				Intersection LOS: B								
Intersection Capacity Utilization 68.9%				ICU Level of Service C								
Analysis Period (min) 15												

Lanes, Volumes, Timings

3:

03/25/2025

Splits and Phases: 3:

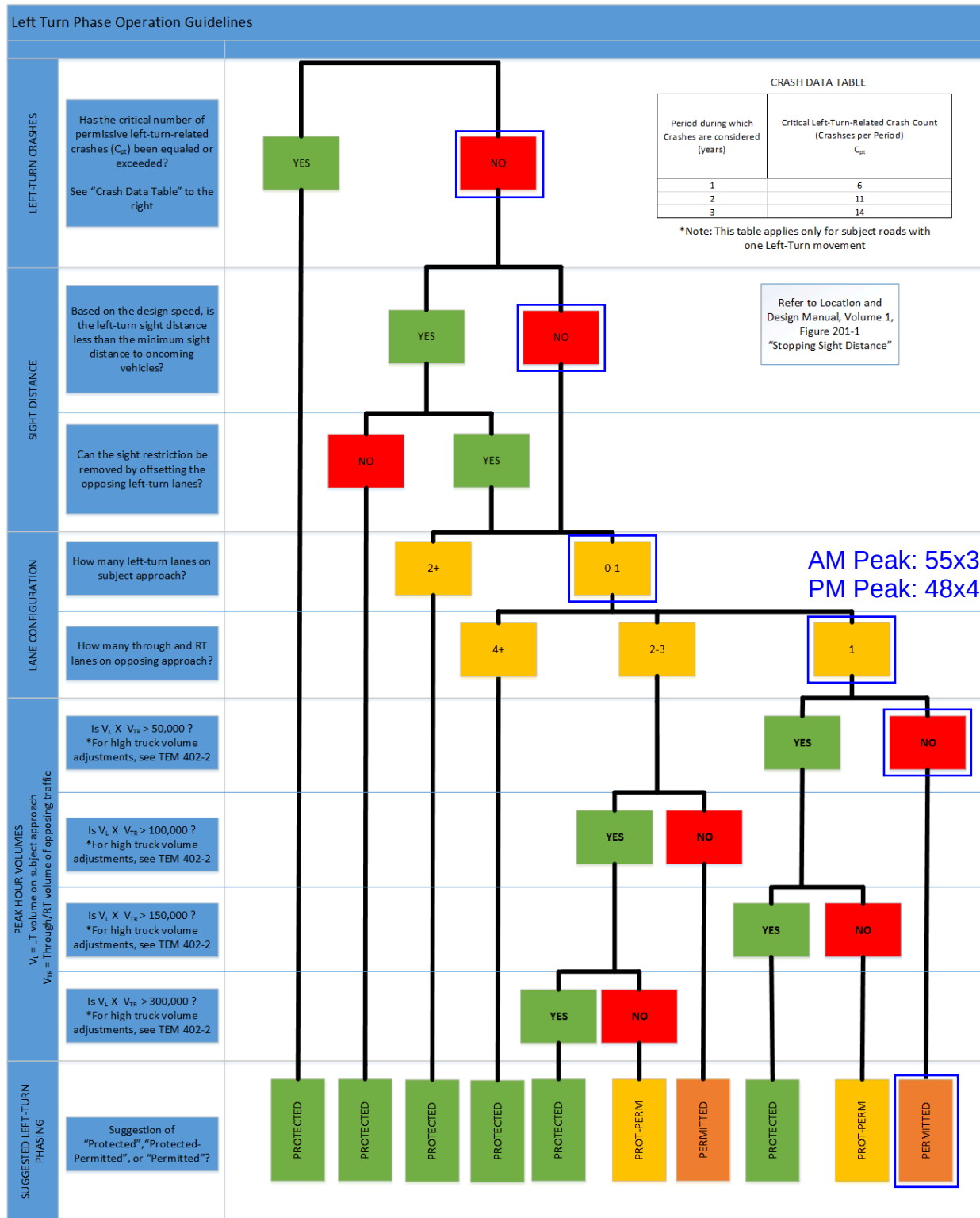


Appendix J

Left Turn Phase Operation

LOR-82-3.58 EB

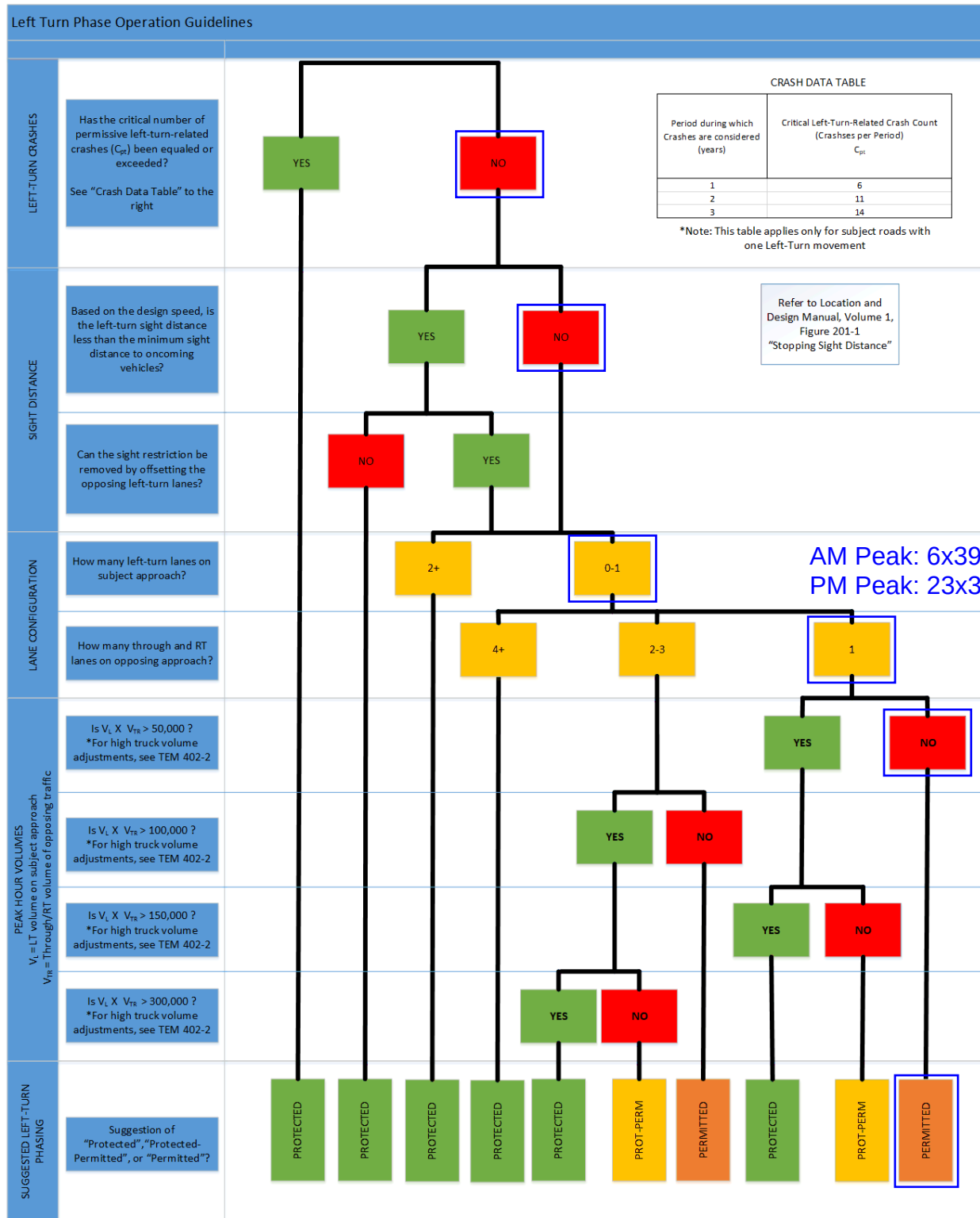
Left Turn Phase Operation Guidelines



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

LOR-82-3.58 WB

Left Turn Phase Operation Guidelines



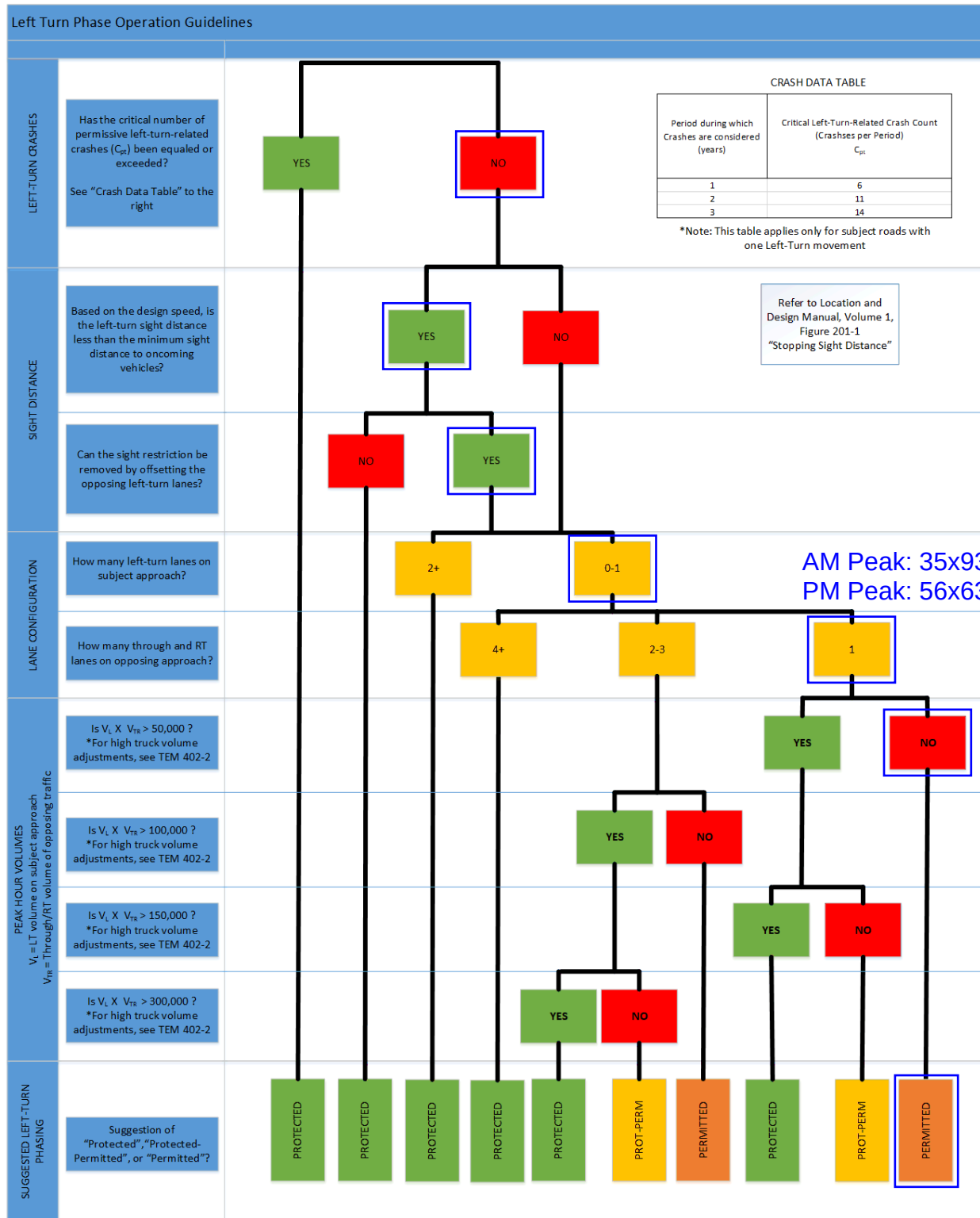
[Link to Location and Design Manual, Volume 1](#)

Left Turn Phase Operation Guidelines



LOR-82-3.58 SB

Left Turn Phase Operation Guidelines



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

Appendix K

Signal Timing Chart

TRAFFIC SIGNAL TIMING (In Seconds)								
LOCATION: SR82 / ISLAND RD.								
DATE: 9/28/2017								
PERSONEL: BP, JC								
INTERVAL	PHASE NUMBER							
	1	2	3	4	5	6	7	8
	N/A	EB SR 82	N/A	SB ISLAND RD.	N/A	WB SR 82	N/A	NB ISLAND RD.
MINIMUM GREEN		20		12		20		12
PASSAGE TIME		3.0		4.0		3.0		4.0
YELLOW CLEARANCE		5.5		5		5.5		5
RED CLEARANCE		1.0		1		1.0		1
MAX GREEN 1		50		30		50		30
MAX GREEN 2		50		30		50		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 made 09/28/17 by RJ/BG per Anthony Deprator W/O 2017-043. Minimum green on phases 2, 6, reduced from 30 to 20, 05/15/2018 KC per Scott Ockunzzi WO2018-051.								
N/A = Not Applicable or Not Used. (+) = Yes or On. (-) = No or Off								