



Ohio Department of Transportation, District 3

2024 Highway Safety Improvement Program

Lorain County, State Route 57, SLM 11.75 (SR 82)

Abbreviated Study for Rural Intersection, Location Rank No.149

By: Jeremy Adato, P.E.

Date: September 2024

Study Location Map



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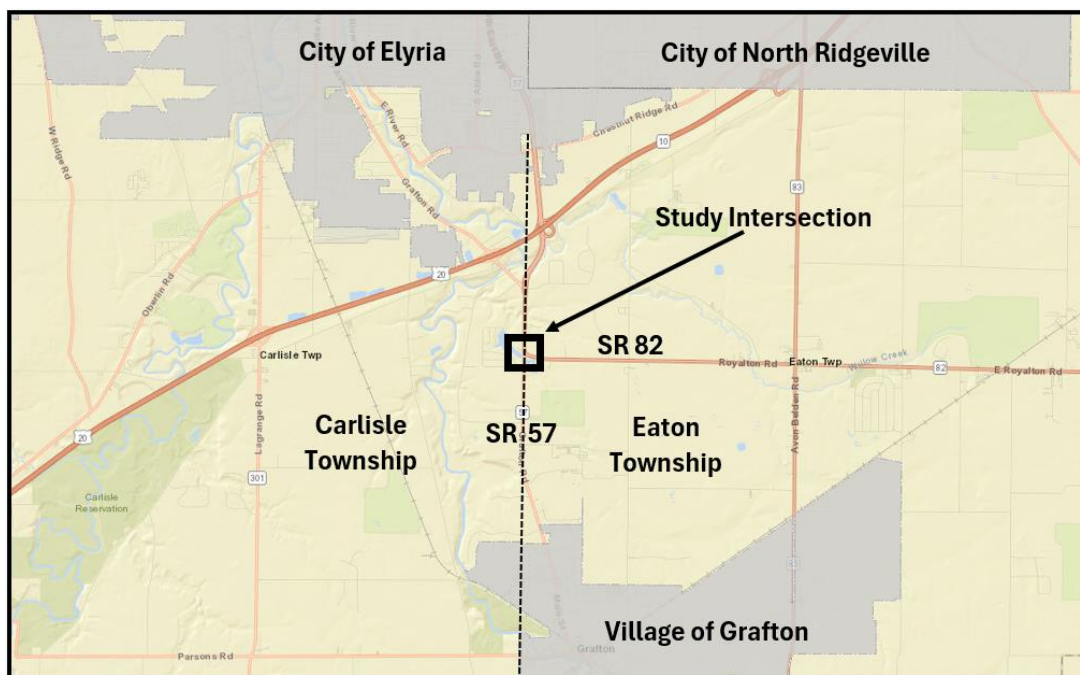
Study Background

As a requirement of the Federal Highway Administration (FHWA), states are required to have a Highway Safety Improvement Program (HSIP). As part of HSIP, the FHWA encourages each state to use more than one network screening approach to find locations that have the highest potential for safety improvement. FHWA developed Safety Analyst (SA), which is a network screening program designed to help improve the programming of site-specific highway safety improvements by incorporating safety management approaches with computerized analytical tools.

ODOT's Highway Safety Improvement Program (HSIP) was developed using SA. Eight main categories were developed using the SA program: 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.

Existing Conditions

The study location is a T-intersection with SR 82 stopping for SR 57. The intersection is located in Lorain County along the dividing line between Carlisle and Eaton Townships. The City of Elyria is approximately two miles to the north and the Village of Grafton is approximately two miles to the south. The intersection is also located approximately one mile south of the US 20 / SR 10 / SR 57 interchange. The area surrounding the intersection is a mixture of usage types including residential, commercial, agricultural, and undeveloped. Midview High School is located approximately one mile to the south off SR 57. Pedestrian or bicycle activity around the intersection was not observed during the field review.



Existing roadway data about the intersection can be found in **Table 1** below.

Table 1 – Existing Roadway Data:

Category	Major Road	Minor Road
Route	SR 57	SR 82
Approach Directions	Northbound/Southbound	Westbound only
Movement	Free	Stop w/Right Turn Slip Lane
Lane Width	11 ft	12 ft
Shoulder Width	3 ft	6 ft
Pavement	Asphalt	Asphalt
Land Use	Residential/Commercial/Agricultural	
Alignment		
Horizontal	Straight	Mild curve to the east
Vertical	Flat	Flat
Skew	-	22 degrees
Stopping Sight Distance	All approaches > 1,000 ft	
Intersection Sight Distance	All approaches > 1,000 ft	
Traffic Control		
Speed Limit	45 mph	50 mph
Overhead Flashing Beacon	Yellow flashing	Red flashing
Stop Signs	-	Dual
Stop Ahead Warning Signs	-	Dual
Yield Sign	-	Downstream End of WB Slip Lane
Cross Road Warning Signs	Single NB/SB w/Road Names	-
Street Name Signs	JCT & Route Shields	JCT & Route Shields

Field Review Pictures

SR 82 Westbound approach (including Slip Lane to the right)



SR 82 WB Stop Line looking left



SR 82 WB Stop Line looking right



SR 82 WB to SR 57 NB Slip Lane



SR 57 Northbound approach



SR 57 Southbound approach (Grover Ct seen on RT)



Traffic Volumes

Between the years of 2011 and 2023, the Annual Average Daily Traffic (AADT) volumes on SR 57 and SR 82 fluctuated moderately. Available AADT data for the intersection is shown in **Table 2** below, truck percentages shown in parentheses.

Table 2 – Historical AADT for SR 57 & SR 82: ([TDMS \(ms2soft.com\)](https://www.ms2soft.com)).

Year	SR 57 (south of 82)	SR 57 (north of 82)	SR 82
2023	10,558 (2%)	18,749 (4%)	9,123 (6%)
2020	9,707 (3%)	17,293 (5%)	8,873 (8%)
2017	9,236 (2%)	19,450 (5%)	9,239 (6%)
2014	10,025 (4%)	14,709 (4%)	9,037 (9%)
2011	10,250 (2%)	18,140 (4%)	9,160 (6%)

History of Intersection Improvements

2017 Safety Study (LOR-82-0.00-0.30): Overhead flashing beacons replaced, minor sign & pavement marking updates.

2015 Operational Study: Sideroad warning signs on both approaches of SR 57 both were upgraded to include the Grover Ct intersection in addition to Edgewood Dr and SR 82.

2013 Operational Study: Existing guardrail on west side of SR 57 extended 37 feet further north to cover the width of SR 82.

Crash Data and Analysis

Crash data from 2019 to 2023 at the intersection of SR 57 & SR 82 was analyzed and is shown in **Table 3** below, and a crash diagram can be found in **Appendix A**.

Table 3 – Crash Data:

Year		Severity		Type		Road Condition	
2019	9 (43%)	Fatal	0 (0%)	Rear End	14 (67%)	Dry	17 (81%)
2020	2 (10%)	Injury	9 (43%)	Left Turn	3 (14%)	Wet	3 (14%)
2021	5 (24%)	PDO	12 (57%)	Fixed Object	2 (10%)	Snow	1 (5%)
2022	2 (10%)			Angle	1 (5%)		
2023	3 (14%)			SS-Passing	1 (5%)		
Total	21 (100%)						

- **Grover Ct:** Five (24%) of the crashes involved a driver turning (or waiting to turn) into or out of Grover Court (3 Rear End, 1 Angle, 1 Left Turn).
- **Slip Lane:** Four (19%) of the crashes occurred on the Slip Lane when the lead vehicle slowed or stopped for the Yield sign. All were Rear End.
- **Marathon Driveway:** Two (10%) of the crashes involved a driver turning into the Marathon driveway on SR 57.
- In 13 (62%) of the crashes, the primary contributing factor listed in the crash reports was Following Too Closely/ACDA. All were Rear End crashes.
- In 13 (62%) of the crashes, the at-fault driver was a younger driver (<26 yrs.). 9 Rear End, 2 Fixed Object, 1 Angle, 1 Sideswipe (SS)-Passing.
- In three (14%) of the crashes, the at-fault driver was an older driver (>64 yrs.).
- Three (14%) of the crashes occurred at night.
- One (5%) of the crashes was caused by a driver under the influence. This was one of the SB Rear End crashes.
- None of the crashes reported that the at-fault driver Ran the Stop sign or thought the intersection was All-Way Stop.
- There were no crashes involving the lane merge in the 57 SB direction just south of the intersection.
- There have been no reported crashes at the intersection in 2024 to date of this report.

Turning Movements

A traffic count performed on Tuesday, August 30, 2022, was used to analyze the traffic volumes and turning movements for the intersection. The count information can be found in **Table 4** below, and the full turning movement count can be found in **Appendix B**.

Table 4 – Turning Movement Count:

Peak Hour (Start Time)	SR 57 Southbound				SR 82 Westbound				SR 57 Northbound				Total
	R	T	L	Tot	R	T	L	Tot	R	T	L	Tot	
Total Count	-	2523	2574	5097	2548	-	220	2768	297	2431	-	2728	10593
AM Peak (7:00)	-	199	427	626	324	-	15	339	35	367	-	402	1367
PM Peak (4:30)	-	494	361	855	423	-	32	455	34	316	-	350	1660

Signal Warrant Analysis

Signal warrants were analyzed at this intersection to verify if a signal should be considered. The OMUTCD Section 4C lists nine warrants for the installation of a signal. Warrants 1–3 (8-Hour Volume, 4-Hour Volume, Peak Hour Volume) were all analyzed based on the Turning Movement Count data. The results of our analysis using the **100 percent volumes without Right Turn Reduction Factor (RTRF)** is shown in **Table 5** below, and the full signal warrant analysis can be found in **Appendix C**.

Table 5 – Signal Warrants:

Warrant	Hours Needed	Hours Met	Warrant Met
1 - Eight Hour Vehicular Volumes	-	-	No
1A – Minimum Vehicular Volume	8	0	No
1B - Interruption of Continuous Traffic	8	0	No
1 A&B - Combination of Warrants	1A 8	0	No
	1B 8	0	
2 - Four Hour Volumes	4	0	No
3 - Peak Hour Volumes	-	-	No

Signal Warrants Notes:

- 70% volumes (without RTRF) were also analyzed and still none of the warrants were met. However, 100% volumes are typically required for new ODOT signals. Following TEM Section 402-3.2, the approach speed on the major road is greater than 40 mph, but the intersection did not meet the criteria of five or more correctable crashes (with the addition of a signal) in one year.

Signal Warrants Notes continued:

- As part of an alternatives analysis, signal warrants were ran at 100% volumes and including Slip Lane volumes:
 - With RTRF: the intersection met Warrants 2 & 3 only.
 - Without RTRF: the intersection met Warrants 1, 2, & 3.
- While the intersection did meet signal warrants after including the Slip Lane volumes, a signal is not recommended since the majority of crashes at the intersection were Rear End crashes, which are not considered correctable by installing a traffic signal. Rear End crashes often increase after signalization.

All-Way Stop Warrant Analysis

The OMUTCD Section 2B.07 lists four warrants for the installation of All-Way Stop Control (AWSC). Warrants B, C, and D were analyzed based on the Turning Movement Count and Crash Data. The summary of all-way stop warrants B, C, and D is shown in **Table 6** below, and the full warrant analyses can be found in **Appendix D**.

Table 6 – All-Way Stop Warrants:

Warrant	Required	100% Values Applied	
		Field Data	Warrant Met
Warrant B – Crash Experience (correctable crashes/12-month period)	5 crashes	2 crashes	No
Warrant C – Minimum Volumes (8-hour average volume Major/Minor Rds, and peak delay per vehicle)	300 / 200 >30 sec/veh	898 / 26 112 sec/veh	No
Warrant D – Combination of Warrants (80% of volumes & correctable crashes)	240 / 160 4 crashes	898 / 26 2 crashes	No

AWSC Notes:

- OMUTCD Section 2B.07, paragraph 01 states: *[AWSC] is used where the volume of traffic on the intersecting roads is approximately equal.* In addition to not meeting any of the AWSC warrants, AWSC is not recommended at this intersection due to the imbalance of traffic volumes on the major/minor approaches.

Capacity Analysis

Highway Capacity Software (HCS 2024) was used to analyze the Level of Service (LOS) of each approach at the intersection. The LOS is based on the calculated seconds of delay for each approach at an intersection using the Highway Capacity Manual (HCM) methodology. The results are summarized in **Table 7** below, and the full capacity analysis can be found in **Appendix E**.

Table 7 – Existing Intersection Level of Service by Approach:

Existing Delay s/veh and (LOS)	Intersection Approach				Intersection Combined Delay
	SR 82		SR 57		
Period	EB	WB	NB	SB	
Two Way Stop Control (TWSC) (existing)					
AM Peak	-	104.4 (F)	-	7.8 (A)	-
PM Peak	-	107.6 (F)	-	4.1 (A)	-
All-Way Stop Control (AWSC)					
AM Peak	-	10.0 (A)	16.3 (C)	20.4 (C)	18.7 (C)
PM Peak	-	10.2 (B)	14.3 (B)	19.8 (C)	18.0 (C)
Signal					
AM Peak	-	41.5 (D)	19.7 (B)	14.4 (B)	16.9 (B)
PM Peak	-	42.3 (D)	18.2 (B)	9.0 (A)	12.5 (B)
1x1 Roundabout					
AM Peak	-	11.7 (B)	14.9 (B)	9.8 (A)	11.8 (B)
PM Peak	-	12.4 (B)	9.5 (A)	15.2 (C)	13.2 (B)
1x1 Roundabout (with Slip Lane)					
AM Peak	-	0.2 (A)	14.9 (B)	9.8 (A)	8.9 (A)
PM Peak	-	0.3 (A)	9.5 (A)	15.2 (C)	9.9 (A)

Capacity Analysis Notes:

- For the SR 57 SB approach in TWSC, the delay applies to left turning vehicles only. The SB free thru movement has zero delay.

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 8** shows the ECAT crash analysis results for the existing two-way stop control (TWSC), all-way stop control (AWSC), signal, and roundabout. The full ECAT results can be found in **Appendix F**.

Table 8 – ECAT Analysis:

Condition	Predicted Crashes/Year	Expected Crash Difference/Year	Service Life	Safety Benefit
TWSC (Existing)	3.07	---	---	---
AWSC	1.47	-1.81	10	\$678K
Signal	11.09	+8.02	20	\$-2.1M
RAB (No Slip)	2.10	-0.96	20	\$1.7M
RAB (Slip)	2.07	-1.00	20	\$1.8M

Probable Causes and Potential Countermeasures

Probable causes for the frequency and severity of crashes in this study location are:

- Drivers following too closely, and failing to leave assured clear distance ahead.
- Driver inattention.
- Driver inexperience. [13 (64%) of the crashes were caused by a younger driver (<26 yrs.)], and Midview High School is located off SR 57 within one mile of the intersection.
- Excessive delay for left turning vehicles at the intersection.
- Poor access management. The single ingress/egress point for Grover Court is approximately 130 feet from the center point of the intersection, which is within the intersection influence area. Additionally, it is not desirable to have driveways within the influence area of an intersection such as the gas station driveways on the SE corner. There were very few reported crashes that were driveway related. If there were a major project at the intersection, access to the gas station would be addressed at that time.
- Driver confusion caused by inappropriate signing for the Slip Lane. A Yield sign is posted at the downstream end of the Slip Lane when, in fact, drivers may proceed with continuous flow without Yielding, since there is not an actual Merging condition. Rather, the Slip Lane becomes an Added Thru Lane on SR 57 NB.

Potential Countermeasures for the study location include:

Short-Term:

- Remove the Yield sign at the downstream end of the Slip Lane since it becomes an added lane to SR 57 NB. Keep the NB Added Lane sign in the island since it complies with OMUTCD recommendations and is visible from both approaches.

Medium-Term:

- Convert the SR 57 & 82 intersection into a 1x1 roundabout including Grover Court as the fourth leg of the roundabout. (Recommended due to the safety and economic benefits, as well as increased Level of Service of roundabouts.)

Implementation Plan

Short-Term: Send a work order to remove Yield sign on Slip Lane (already sent 8/28/2024).

Medium-Term: Explore funding opportunities to convert the intersection into a roundabout. Also, continue to monitor location for any changes in crash patterns.

Appendix A – Crash Diagram



CRASH DIAGRAM

2024 HSIP Rurlnt Rank #149
LOR-57-11.75 (SR 82)
Date: 1/1/19-12/31/23



Grover Ct

Crashes By Age Group:
Younger Drivers (< 26 yrs.) - 13 (62%)
Older Drivers (> 64 yrs.) - 3 (14%)

Crashes By Type:
Rear End - 14 (67%)
Left Turn - 3 (14%)
Fixed Object - 2 (10%)
Angle - 1 (5%)
SS-Passing - 1 (5%)

Crashes By Year:
2019 - 9 (43%)
2020 - 2 (10%)
2021 - 5 (24%)
2022 - 2 (10%)
2023 - 3 (14%)
Total - 21 (100%)

Crashes By Road Condition:
Dry - 17 (81%)
Wet - 3 (14%)
Snow - 1 (5%)

Crashes By Severity:
Fatal - 0 (0%)
Injury - 9 (43%)
PDO - 12 (57%)

Waived through by driver in SB LT Turn lane then hit by vehicle in thru lane.

05-09-19/14/Dry

05-16-23/15/Dry

Improper lane change.

09-11-19/7/Dry

11-04-19/7/Dry
10-22-20/6/Wet
02-16-21/16/Wet
05-10-22/7/Dry

04-10-21/14/Dry
12-09-22/14/Dry

04-09-21/18/Dry

Lead vehicle stopped to let SB vehicles turn LT.

09-11-19/7/Dry

Lead vehicle waiting to turn into driveway.

Lead vehicle waiting to turn LT into Grover Ct.

09-25-19/15/Dry
12-19-19/14/Dry
11-18-21/14/Dry

03-24-19/22/Wet
04-24-19/18/Dry
10-21-19/13/Dry
08-31-23/11/Dry

Lead vehicle slowed or stopped for Yield sign.

02-04-21/2/Dry



SR 82

11-28-23/11/Snow

Turned RT into driveway too quickly during snow.

SR 57

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	Left Turn
Signal	Right Turn
Street	Right Turn
Stop Sign	
Animal	

Diagram Label Key

Date/24-Hour/Road Condition

By: Jeremy Adato

Appendix B – Turning Movement Count



VEHICULAR TRAFFIC COUNT SUMMARY

Municipality: Grafton At Intersection of: Grafton Road (SR 57) and Royalton Road (SR 82)
 Date: 8/30/2022 Day: Tue. Comments: _____ Project: 22-119
 Weather: Rain Recorder(s): SLC Data entry by: JJO Date entered: Aug. 31, 2022 n Rd (SR 57) & Royalton Rd (SR 82) 05

TIME BEGINS	Grafton Rd. (SR 57) FROM NORTH						Grafton Rd. (SR 57) FROM SOUTH						TOTAL NORTH SOUTH	Royalton Rd. (SR 82) FROM EAST						FROM WEST						TOTAL EAST WEST	TOTAL ALL DIREC.	PEAK HOUR FACTOR			
	Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus		Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus			North	South	East	West
06:00																															
07:00	427	199	0	626	39	8	0	367	35	402	4	1	1028	15	0	324	339	35	0							339	1367	0.832	0.852	0.856	0.000
08:00	224	153	0	377	42	5	0	237	28	265	13	1	642	10	0	232	242	37	3							242	884	0.842	0.933	0.877	0.000
09:00	235	169	0	404	66	0	0	217	27	244	11	0	648	22	0	213	235	56	1							235	883	0.902	0.813	0.918	0.000
10:00																															
11:00	175	212	0	387	51	1	0	206	40	246	6	0	633	23	0	171	194	37	0							194	827	0.800	0.715	0.866	0.000
12:00	210	237	0	447	49	0	0	244	25	269	13	0	716	30	0	232	262	34	0							262	978	0.931	0.830	0.809	0.000
1:00	257	235	0	492	40	0	0	243	35	278	16	3	770	22	0	230	252	36	2							252	1022	0.953	0.903	0.875	0.000
2:00																															
3:00	325	358	0	683	37	3	0	325	41	366	3	2	1049	41	0	395	436	30	3							436	1485	0.938	0.847	0.801	0.000
4:00	394	452	0	846	18	1	0	267	26	293	12	1	1139	24	0	358	382	15	3							382	1521	0.908	0.763	0.910	0.000
5:00	327	508	0	835	18	2	0	325	40	365	4	0	1200	33	0	393	426	12	1							426	1626	0.928	0.787	0.755	0.000
6:00																															
7:00																															
8:00																															
9:00																															
TOTALS	2574	2523	0	5097	360	20	0	2431	297	2728	82	8	7825	220	0	2548	2768	292	13							2768	10593				
ADT	3583	3512	0	7096	7.5%		0	3384	413	3798	3.3%		10893	306	0	3547	3853	11.0%								3853	14747				

N Leg Hourly Factor:
S Leg Hourly Factor:
N Leg Monthly Factor:
S Leg Monthly Factor:

1.57
1.57
0.88
0.88

E Leg Hourly Factor:
W Leg Hourly Factor:
E Leg Monthly Factor:
W Leg Monthly Factor:

1.57
0.00
0.88
0.00

N Leg Combined Factor:
S Leg Combined Factor:

1.39
1.39

E Leg Combined Factor:
W Leg Combined Factor:

1.39

TMS ENGINEERS, INC.

2112 Case Parkway South #7

Twinsburg, Ohio 44087

(330) 686-6402 FAX: (330) 686-6417

Figure #:

Page #:

TMS Engineers, Inc.

2112 Case Parkway S.

Twinsburg, Ohio 44087

Tel. (330) 686-6402 Fax (330) 686-6417

City: Grafton

Intersection: SR 57 & SR 82

Counter: SLC

Day of the Week: Tuesday

File Name : Grafton Traffic Count #1 SR57 Grafton Rd & SR82 Royalton Rd 083022 Sue

Site Code : 00000000

Start Date : 8/30/2022

Page No : 1

Groups Printed- Cars - Trucks - Buses

[illegible]

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Groups Printed- Cars - Trucks - Buses

	GRAFTON ROAD (SR 57) From North					ROYALTON ROAD (SR 82) From East					GRAFTON ROAD (SR 57) From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
03:00 PM	0	94	61	0	155	113	0	9	0	122	11	85	0	0	96	0	0	0	0	0	373
03:15 PM	0	74	92	0	166	81	0	14	0	95	6	78	0	0	84	0	0	0	0	0	345
03:30 PM	0	90	90	0	180	75	0	8	0	83	11	97	0	0	108	0	0	0	0	0	371
03:45 PM	0	100	82	0	182	126	0	10	0	136	13	65	0	0	78	0	0	0	0	0	396
Total	0	358	325	0	683	395	0	41	0	436	41	325	0	0	366	0	0	0	0	0	1485
04:00 PM	0	88	115	0	203	87	0	6	0	93	8	44	0	0	52	0	0	0	0	0	348
04:15 PM	0	125	108	0	233	82	0	8	0	90	5	55	0	0	60	0	0	0	0	0	383
04:30 PM	0	121	89	0	210	103	0	2	0	105	5	91	0	0	96	0	0	0	0	0	411
04:45 PM	0	118	82	0	200	86	0	8	0	94	8	77	0	0	85	0	0	0	0	0	379
Total	0	452	394	0	846	358	0	24	0	382	26	267	0	0	293	0	0	0	0	0	1521
05:00 PM	0	121	99	0	220	132	0	9	0	141	10	81	0	0	91	0	0	0	0	0	452
05:15 PM	0	134	91	0	225	102	0	13	0	115	11	67	0	0	78	0	0	0	0	0	418
05:30 PM	0	124	84	0	208	95	0	5	0	100	10	70	0	0	80	0	0	0	0	0	388
05:45 PM	0	129	53	0	182	64	0	6	0	70	9	107	0	0	116	0	0	0	0	0	368
Total	0	508	327	0	835	393	0	33	0	426	40	325	0	0	365	0	0	0	0	0	1626
Grand Total	0	2523	2574	0	5097	2548	0	220	0	2768	297	2431	0	0	2728	0	0	0	0	0	10593
Apprch %	0	49.5	50.5	0		92.1	0	7.9	0		10.9	89.1	0	0		0	0	0	0		
Total %	0	23.8	24.3	0	48.1	24.1	0	2.1	0	26.1	2.8	22.9	0	0	25.8	0	0	0	0	0	
Cars	0	2452	2265	0	4717	2261	0	202	0	2463	278	2360	0	0	2638	0	0	0	0	0	9818
% Cars	0	97.2	88	0	92.5	88.7	0	91.8	0	89	93.6	97.1	0	0	96.7	0	0	0	0	0	92.7
Trucks	0	65	295	0	360	277	0	15	0	292	18	64	0	0	82	0	0	0	0	0	734
% Trucks	0	2.6	11.5	0	7.1	10.9	0	6.8	0	10.5	6.1	2.6	0	0	3	0	0	0	0	0	6.9
Buses	0	6	14	0	20	10	0	3	0	13	1	7	0	0	8	0	0	0	0	0	41
% Buses	0	0.2	0.5	0	0.4	0.4	0	1.4	0	0.5	0.3	0.3	0	0	0.3	0	0	0	0	0	0.4

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Start Date : 8/30/2022
Page No : 4

	GRAFTON ROAD (SR 57) From North					ROYALTON ROAD (SR 82) From East					GRAFTON ROAD (SR 57) From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	44	105	0	149	58	0	3	0	61	8	64	0	0	72	0	0	0	0	0	282
07:15 AM	0	38	92	0	130	83	0	2	0	85	8	102	0	0	110	0	0	0	0	0	325
07:30 AM	0	57	131	0	188	93	0	1	0	94	9	109	0	0	118	0	0	0	0	0	400
07:45 AM	0	60	99	0	159	90	0	9	0	99	10	92	0	0	102	0	0	0	0	0	360
Total Volume	0	199	427	0	626	324	0	15	0	339	35	367	0	0	402	0	0	0	0	0	1367
% App. Total	0	31.8	68.2	0		95.6	0	4.4	0		8.7	91.3	0	0		0	0	0	0		
PHF	.000	.829	.815	.000	.832	.871	.000	.417	.000	.856	.875	.842	.000	.000	.852	.000	.000	.000	.000	.000	.854

Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:30 PM

04:30 PM	0	121	89	0	210	103	0	2	0	105	5	91	0	0	96	0	0	0	0	0	411
04:45 PM	0	118	82	0	200	86	0	8	0	94	8	77	0	0	85	0	0	0	0	0	379
05:00 PM	0	121	99	0	220	132	0	9	0	141	10	81	0	0	91	0	0	0	0	0	452
05:15 PM	0	134	91	0	225	102	0	13	0	115	11	67	0	0	78	0	0	0	0	0	418
Total Volume	0	494	361	0	855	423	0	32	0	455	34	316	0	0	350	0	0	0	0	0	1660
% App. Total	0	57.8	42.2	0		93	0	7	0		9.7	90.3	0	0		0	0	0	0		
PHF	.000	.922	.912	.000	.950	.801	.000	.615	.000	.807	.773	.868	.000	.000	.911	.000	.000	.000	.000	.000	.918

Appendix C – Signal Warrants



LOR-57-11.75 (SR 82)
2024 Abbreviated HSIP Study
100 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82), 100%, no RTRF

Study Date : 8/5/2024

Signal Warrants - Summary

Major Street Approaches

Northbound: SR 57 NB

Number of Lanes : 1

Total Approach Volume: 2,728

Southbound: SR 57 SB

Number of Lanes :2+

Total Approach Volume: 5,097

Minor Street Approaches

Eastbound: n/a

Number of Lanes :1

Total Approach Volume: 0

Westbound: SR 82 WB

Number of Lanes :1

Total Approach Volume: 220

Warrant Summary (Urban Values Apply)

Warrant 1 - Eight Hour Vehicular Volumes.....Not Satisfied

Warrant 1A - Minimum Vehicular Volume.....Not Satisfied

Required volumes reached for 0 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic.....Not Satisfied

Required volumes reached for 0 hours, 8 are needed

Warrant 1C - Combination of Warrants.....Not Satisfied

Required 1A volumes reached for 0 hours, 8 are needed

Required 1B volumes reached for 0 hours, 8 are needed

Warrant 2 - Four Hour Volumes.....Not Satisfied

Number of hours (0) volumes exceed minimum < minimum required (4).

Warrant 3 - Peak Hour.....Not Satisfied

Warrant 3A - Peak Hour Delay.....Not Satisfied

Approach volumes on minor street don't exceed minimums for any one hour period. Delay data not evaluated.

Warrant 3B - Peak Hour Volumes.....Not Satisfied

Volumes do not exceed minimums for any 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-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82), 100%, no RTRF

Study Date : 8/5/2024

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

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Veh/Hr Major = **600**

Veh/Hr Minor = **150**

	Major Road					Minor Road					
	SR 57 NB					n/a					
Time	Major NB	+	Major SB	=	Total		Minor EB		Minor WB		Met?
16:30 - 17:30	350	+	855	=	1205		0		32		No
17:00 - 18:00	365	+	835	=	1200		0		33		No
16:15 - 17:15	332	+	863	=	1195		0		27		No
16:45 - 17:45	334	+	853	=	1187		0		35		No
16:00 - 17:00	293	+	846	=	1139		0		24		No
15:45 - 16:45	286	+	828	=	1114		0		26		No
15:30 - 16:30	298	+	798	=	1096		0		32		No
15:15 - 16:15	322	+	731	=	1053		0		38		No
15:00 - 16:00	366	+	683	=	1049		0		41		No
07:00 - 08:00	402	+	626	=	1028		0		15		No
07:15 - 08:15	394	+	579	=	973		0		15		No
07:30 - 08:30	343	+	561	=	904		0		15		No
17:15 - 18:15	274	+	615	=	889		0		24		No
14:45 - 15:45	288	+	501	=	789		0		31		No
12:45 - 13:45	295	+	493	=	788		0		26		No
13:00 - 14:00	278	+	492	=	770		0		22		No
06:45 - 07:45	300	+	467	=	767		0		6		No
12:30 - 13:30	279	+	482	=	761		0		27		No
07:45 - 08:45	296	+	439	=	735		0		16		No
12:15 - 13:15	277	+	454	=	731		0		33		No
12:00 - 13:00	269	+	447	=	716		0		30		No
11:45 - 12:45	251	+	450	=	701		0		31		No
11:30 - 12:30	239	+	423	=	662		0		29		No
09:00 - 10:00	244	+	404	=	648		0		22		No
08:00 - 09:00	265		377		642		0		10		No

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82), 100%, no RTRF

Study Date : 8/5/2024

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

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Veh/Hr Major = **900**

Veh/Hr Minor = **75**

		Major Road				Minor Road					
		SR 57 NB				n/a					
Time	Major NB	+	Major SB	=	Total		Minor EB		Minor WB		Met?
16:30 - 17:30	350	+	855	=	1205		0		32		No
17:00 - 18:00	365	+	835	=	1200		0		33		No
16:15 - 17:15	332	+	863	=	1195		0		27		No
16:45 - 17:45	334	+	853	=	1187		0		35		No
16:00 - 17:00	293	+	846	=	1139		0		24		No
15:45 - 16:45	286	+	828	=	1114		0		26		No
15:30 - 16:30	298	+	798	=	1096		0		32		No
15:15 - 16:15	322	+	731	=	1053		0		38		No
15:00 - 16:00	366	+	683	=	1049		0		41		No
07:00 - 08:00	402	+	626	=	1028		0		15		No
07:15 - 08:15	394	+	579	=	973		0		15		No
07:30 - 08:30	343	+	561	=	904		0		15		No
17:15 - 18:15	274	+	615	=	889		0		24		No
14:45 - 15:45	288	+	501	=	789		0		31		No
12:45 - 13:45	295	+	493	=	788		0		26		No
13:00 - 14:00	278	+	492	=	770		0		22		No
06:45 - 07:45	300	+	467	=	767		0		6		No
12:30 - 13:30	279	+	482	=	761		0		27		No
07:45 - 08:45	296	+	439	=	735		0		16		No
12:15 - 13:15	277	+	454	=	731		0		33		No
12:00 - 13:00	269	+	447	=	716		0		30		No
11:45 - 12:45	251	+	450	=	701		0		31		No
11:30 - 12:30	239	+	423	=	662		0		29		No
09:00 - 10:00	244	+	404	=	648		0		22		No
08:00 - 09:00	265		377		642		0		10		No

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82), 100%, no RTRF

Study Date : 8/5/2024

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

Only 0 hours meet 1A minimums.
Only 0 hours meet 1B minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Warrant 1A 1B
Veh/Hr Major = **480 720**

Veh/Hr Minor = **120 60**

Major Road						Minor Road			
SR 57 NB						n/a			
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1A?	
16:30 - 17:30	350	+	855	=	1205	0	32	No	
17:00 - 18:00	365	+	835	=	1200	0	33	No	
16:15 - 17:15	332	+	863	=	1195	0	27	No	
16:45 - 17:45	334	+	853	=	1187	0	35	No	
16:00 - 17:00	293	+	846	=	1139	0	24	No	
15:45 - 16:45	286	+	828	=	1114	0	26	No	
15:30 - 16:30	298	+	798	=	1096	0	32	No	
15:15 - 16:15	322	+	731	=	1053	0	38	No	
15:00 - 16:00	366	+	683	=	1049	0	41	No	
07:00 - 08:00	402	+	626	=	1028	0	15	No	
07:15 - 08:15	394	+	579	=	973	0	15	No	
07:30 - 08:30	343		561		904	0	15	No	

Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1B?	
16:30 - 17:30	350	+	855	=	1205	0	32	No	
17:00 - 18:00	365	+	835	=	1200	0	33	No	
16:15 - 17:15	332	+	863	=	1195	0	27	No	
16:45 - 17:45	334	+	853	=	1187	0	35	No	
16:00 - 17:00	293	+	846	=	1139	0	24	No	
15:45 - 16:45	286	+	828	=	1114	0	26	No	
15:30 - 16:30	298	+	798	=	1096	0	32	No	
15:15 - 16:15	322	+	731	=	1053	0	38	No	
15:00 - 16:00	366	+	683	=	1049	0	41	No	
07:00 - 08:00	402	+	626	=	1028	0	15	No	
07:15 - 08:15	394	+	579	=	973	0	15	No	
07:30 - 08:30	343		561		904	0	15	No	

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82), 100%, no RTRF

Study Date : 8/5/2024

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.

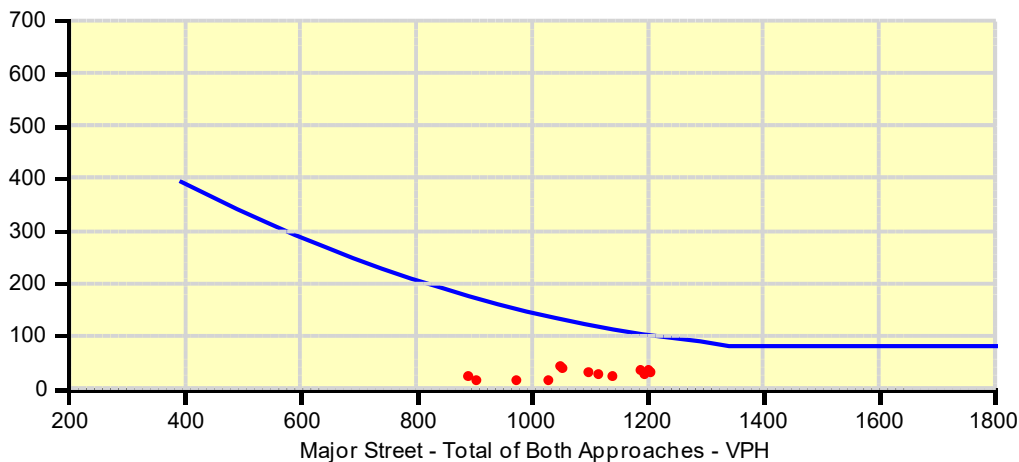
Summary

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Major Road						Minor Road		
SR 57 NB						n/a		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:30 - 17:30	350	+	855	=	1205	0	32	No
17:00 - 18:00	365	+	835	=	1200	0	33	No
16:15 - 17:15	332	+	863	=	1195	0	27	No
16:45 - 17:45	334	+	853	=	1187	0	35	No
16:00 - 17:00	293	+	846	=	1139	0	24	No
15:45 - 16:45	286	+	828	=	1114	0	26	No
15:30 - 16:30	298	+	798	=	1096	0	32	No
15:15 - 16:15	322	+	731	=	1053	0	38	No
15:00 - 16:00	366	+	683	=	1049	0	41	No
07:00 - 08:00	402	+	626	=	1028	0	15	No
07:15 - 08:15	394	+	579	=	973	0	15	No



LOR-57-11.75 (SR 82)
2024 Abbreviated HSIP Study
 100 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82), 100%, no RTRF

Study Date : 8/5/2024

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

15 one hour periods meet minimums.
 Warrant is NOT 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 57 NB						n/a				
Time	Total of All Approaches	Met?	Minor EB	Delay EB	Met?	Minor WB	Delay WB	Met?	Warrant Met?	
16:30 - 17:30	1237	Yes	0	-	---	32	-	No	No	
17:00 - 18:00	1233	Yes	0	-	---	33	-	No	No	
16:15 - 17:15	1222	Yes	0	-	---	27	-	No	No	
16:45 - 17:45	1222	Yes	0	-	---	35	-	No	No	
16:00 - 17:00	1163	Yes	0	-	---	24	-	No	No	
15:45 - 16:45	1140	Yes	0	-	---	26	-	No	No	
15:30 - 16:30	1128	Yes	0	-	---	32	-	No	No	
15:15 - 16:15	1091	Yes	0	-	---	38	-	No	No	
15:00 - 16:00	1090	Yes	0	-	---	41	-	No	No	
07:00 - 08:00	1043	Yes	0	-	---	15	-	No	No	
07:15 - 08:15	988	Yes	0	-	---	15	-	No	No	
07:30 - 08:30	919	Yes	0	-	---	15	-	No	No	
17:15 - 18:15	913	Yes	0	-	---	24	-	No	No	
14:45 - 15:45	820	Yes	0	-	---	31	-	No	No	
12:45 - 13:45	814	Yes	0	-	---	26	-	No	No	
13:00 - 14:00	792	No	0	-	---	22	-	No	No	
12:30 - 13:30	788	No	0	-	---	27	-	No	No	
06:45 - 07:45	773	No	0	-	---	6	-	No	No	
12:15 - 13:15	764	No	0	-	---	33	-	No	No	
07:45 - 08:45	751	No	0	-	---	16	-	No	No	
12:00 - 13:00	746	No	0	-	---	30	-	No	No	
11:45 - 12:45	732	No	0	-	---	31	-	No	No	
11:30 - 12:30	691	No	0	-	---	29	-	No	No	
09:00 - 10:00	670	No	0	-	---	22	-	No	No	
11:00 - 12:00	656	No	0	-	---	23	-	No	No	

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82), 100%, no RTRF

Study Date : 8/5/2024

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.

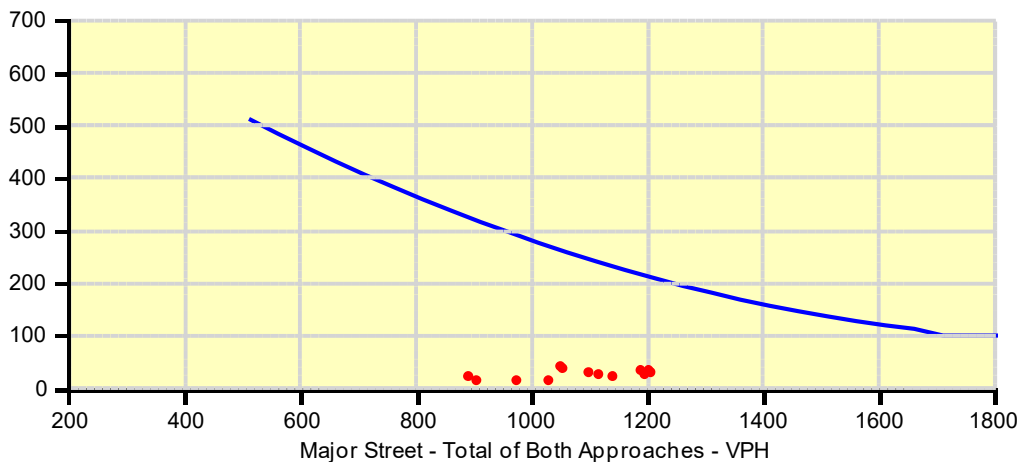
Summary

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Major Road						Minor Road		
SR 57 NB						n/a		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:30 - 17:30	350	+	855	=	1205	0	32	No
17:00 - 18:00	365	+	835	=	1200	0	33	No
16:15 - 17:15	332	+	863	=	1195	0	27	No
16:45 - 17:45	334	+	853	=	1187	0	35	No
16:00 - 17:00	293	+	846	=	1139	0	24	No
15:45 - 16:45	286	+	828	=	1114	0	26	No
15:30 - 16:30	298	+	798	=	1096	0	32	No
15:15 - 16:15	322	+	731	=	1053	0	38	No
15:00 - 16:00	366	+	683	=	1049	0	41	No
07:00 - 08:00	402	+	626	=	1028	0	15	No
07:15 - 08:15	394	+	579	=	973	0	15	No



LOR-57-11.75 (SR 82)
2024 Abbreviated HSIP Study
70 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82) 70%, no RTRF

Study Date : 7/30/2024

Signal Warrants - Summary

Major Street Approaches

Northbound: SR 57 NB

Number of Lanes : 1

Total Approach Volume: 2,728

Southbound: SR 57 SB

Number of Lanes :2+

Total Approach Volume: 5,097

Minor Street Approaches

Eastbound: n/a

Number of Lanes :1

Total Approach Volume: 0

Westbound: SR 82 WB

Number of Lanes :1

Total Approach Volume: 220

Warrant Summary (Rural Values Apply)

Warrant 1 - Eight Hour Vehicular Volumes.....Not Satisfied

Warrant 1A - Minimum Vehicular Volume.....Not Satisfied

Required volumes reached for 0 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic.....Not Satisfied

Required volumes reached for 0 hours, 8 are needed

Warrant 1C - Combination of Warrants.....Not Satisfied

Required 1A volumes reached for 0 hours, 8 are needed

Required 1B volumes reached for 0 hours, 8 are needed

Warrant 2 - Four Hour Volumes.....Not Satisfied

Number of hours (0) volumes exceed minimum < minimum required (4).

Warrant 3 - Peak Hour.....Not Satisfied

Warrant 3A - Peak Hour Delay.....Not Satisfied

Approach volumes on minor street don't exceed minimums for any one hour period. Delay data not evaluated.

Warrant 3B - Peak Hour Volumes.....Not Satisfied

Volumes do not exceed minimums for any 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-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

70 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82) 70%, no RTRF

Study Date : 7/30/2024

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

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **True**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Rural Factor of 70 % applied
Veh/Hr Major = **420**

Veh/Hr Minor = **105**

		Major Road				Minor Road					
		SR 57 NB				n/a					
Time	Major NB	+	Major SB	=	Total		Minor EB		Minor WB		Met?
16:30 - 17:30	350	+	855	=	1205		0		32		No
17:00 - 18:00	365	+	835	=	1200		0		33		No
16:15 - 17:15	332	+	863	=	1195		0		27		No
16:45 - 17:45	334	+	853	=	1187		0		35		No
16:00 - 17:00	293	+	846	=	1139		0		24		No
15:45 - 16:45	286	+	828	=	1114		0		26		No
15:30 - 16:30	298	+	798	=	1096		0		32		No
15:15 - 16:15	322	+	731	=	1053		0		38		No
15:00 - 16:00	366	+	683	=	1049		0		41		No
07:00 - 08:00	402	+	626	=	1028		0		15		No
07:15 - 08:15	394	+	579	=	973		0		15		No
07:30 - 08:30	343	+	561	=	904		0		15		No
17:15 - 18:15	274	+	615	=	889		0		24		No
14:45 - 15:45	288	+	501	=	789		0		31		No
12:45 - 13:45	295	+	493	=	788		0		26		No
13:00 - 14:00	278	+	492	=	770		0		22		No
06:45 - 07:45	300	+	467	=	767		0		6		No
12:30 - 13:30	279	+	482	=	761		0		27		No
07:45 - 08:45	296	+	439	=	735		0		16		No
12:15 - 13:15	277	+	454	=	731		0		33		No
12:00 - 13:00	269	+	447	=	716		0		30		No
11:45 - 12:45	251	+	450	=	701		0		31		No
11:30 - 12:30	239	+	423	=	662		0		29		No
09:00 - 10:00	244	+	404	=	648		0		22		No
08:00 - 09:00	265		377		642		0		10		No

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

70 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82) 70%, no RTRF

Study Date : 7/30/2024

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

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **True**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Rural Factor of 70 % applied
Veh/Hr Major = **630**

Veh/Hr Minor = **52**

Major Road						Minor Road		
SR 57 NB						n/a		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:30 - 17:30	350	+	855	=	1205	0	32	No
17:00 - 18:00	365	+	835	=	1200	0	33	No
16:15 - 17:15	332	+	863	=	1195	0	27	No
16:45 - 17:45	334	+	853	=	1187	0	35	No
16:00 - 17:00	293	+	846	=	1139	0	24	No
15:45 - 16:45	286	+	828	=	1114	0	26	No
15:30 - 16:30	298	+	798	=	1096	0	32	No
15:15 - 16:15	322	+	731	=	1053	0	38	No
15:00 - 16:00	366	+	683	=	1049	0	41	No
07:00 - 08:00	402	+	626	=	1028	0	15	No
07:15 - 08:15	394	+	579	=	973	0	15	No
07:30 - 08:30	343	+	561	=	904	0	15	No
17:15 - 18:15	274	+	615	=	889	0	24	No
14:45 - 15:45	288	+	501	=	789	0	31	No
12:45 - 13:45	295	+	493	=	788	0	26	No
13:00 - 14:00	278	+	492	=	770	0	22	No
06:45 - 07:45	300	+	467	=	767	0	6	No
12:30 - 13:30	279	+	482	=	761	0	27	No
07:45 - 08:45	296	+	439	=	735	0	16	No
12:15 - 13:15	277	+	454	=	731	0	33	No
12:00 - 13:00	269	+	447	=	716	0	30	No
11:45 - 12:45	251	+	450	=	701	0	31	No
11:30 - 12:30	239	+	423	=	662	0	29	No
09:00 - 10:00	244	+	404	=	648	0	22	No
08:00 - 09:00	265		377		642	0	10	No

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

70 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82) 70%, no RTRF

Study Date : 7/30/2024

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

Only 0 hours meet 1A minimums.
Only 0 hours meet 1B minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **True**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Rural Factor of 70% applied
Warrant 1A 1B
Veh/Hr Major = **336 504**

Veh/Hr Minor = **84 42**

Major Road						Minor Road			
SR 57 NB						n/a			
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1A?	
16:30 - 17:30	350	+	855	=	1205	0	32	No	
17:00 - 18:00	365	+	835	=	1200	0	33	No	
16:15 - 17:15	332	+	863	=	1195	0	27	No	
16:45 - 17:45	334	+	853	=	1187	0	35	No	
16:00 - 17:00	293	+	846	=	1139	0	24	No	
15:45 - 16:45	286	+	828	=	1114	0	26	No	
15:30 - 16:30	298	+	798	=	1096	0	32	No	
15:15 - 16:15	322	+	731	=	1053	0	38	No	
15:00 - 16:00	366	+	683	=	1049	0	41	No	
07:00 - 08:00	402	+	626	=	1028	0	15	No	
07:15 - 08:15	394	+	579	=	973	0	15	No	
07:30 - 08:30	343		561		904	0	15	No	

Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1B?	
16:30 - 17:30	350	+	855	=	1205	0	32	No	
17:00 - 18:00	365	+	835	=	1200	0	33	No	
16:15 - 17:15	332	+	863	=	1195	0	27	No	
16:45 - 17:45	334	+	853	=	1187	0	35	No	
16:00 - 17:00	293	+	846	=	1139	0	24	No	
15:45 - 16:45	286	+	828	=	1114	0	26	No	
15:30 - 16:30	298	+	798	=	1096	0	32	No	
15:15 - 16:15	322	+	731	=	1053	0	38	No	
15:00 - 16:00	366	+	683	=	1049	0	41	No	
07:00 - 08:00	402	+	626	=	1028	0	15	No	
07:15 - 08:15	394	+	579	=	973	0	15	No	
07:30 - 08:30	343		561		904	0	15	No	

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

70 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82) 70%, no RTRF

Study Date : 7/30/2024

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.

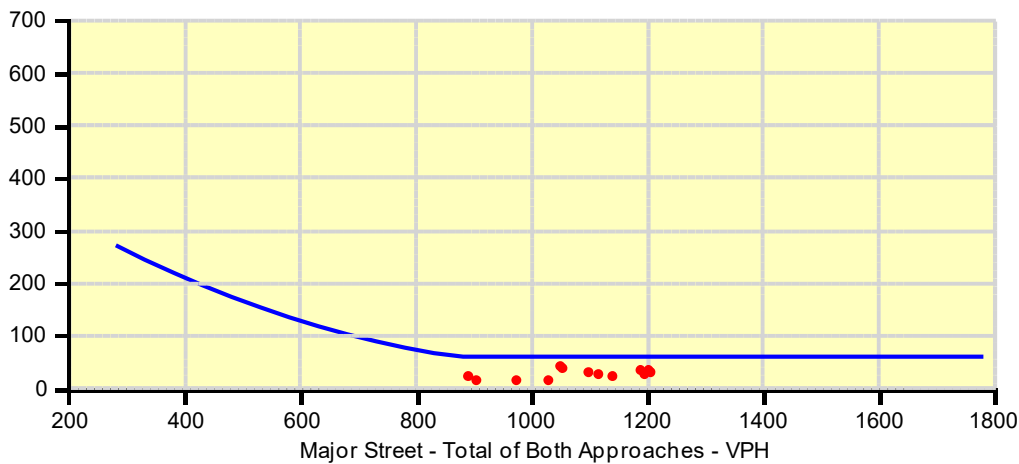
Summary

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **True**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Major Road						Minor Road		
SR 57 NB						n/a		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:30 - 17:30	350	+	855	=	1205	0	32	No
17:00 - 18:00	365	+	835	=	1200	0	33	No
16:15 - 17:15	332	+	863	=	1195	0	27	No
16:45 - 17:45	334	+	853	=	1187	0	35	No
16:00 - 17:00	293	+	846	=	1139	0	24	No
15:45 - 16:45	286	+	828	=	1114	0	26	No
15:30 - 16:30	298	+	798	=	1096	0	32	No
15:15 - 16:15	322	+	731	=	1053	0	38	No
15:00 - 16:00	366	+	683	=	1049	0	41	No
07:00 - 08:00	402	+	626	=	1028	0	15	No
07:15 - 08:15	394	+	579	=	973	0	15	No



LOR-57-11.75 (SR 82)
2024 Abbreviated HSIP Study
 70 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82) 70%, no RTRF

Study Date : 7/30/2024

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

15 one hour periods meet minimums.
 Warrant is NOT 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 57 NB						n/a				
Time	Total of All Approaches	Met?	Minor EB	Delay EB	Met?	Minor WB	Delay WB	Met?	Warrant Met?	
16:30 - 17:30	1237	Yes	0	-	---	32	-	No	No	
17:00 - 18:00	1233	Yes	0	-	---	33	-	No	No	
16:15 - 17:15	1222	Yes	0	-	---	27	-	No	No	
16:45 - 17:45	1222	Yes	0	-	---	35	-	No	No	
16:00 - 17:00	1163	Yes	0	-	---	24	-	No	No	
15:45 - 16:45	1140	Yes	0	-	---	26	-	No	No	
15:30 - 16:30	1128	Yes	0	-	---	32	-	No	No	
15:15 - 16:15	1091	Yes	0	-	---	38	-	No	No	
15:00 - 16:00	1090	Yes	0	-	---	41	-	No	No	
07:00 - 08:00	1043	Yes	0	-	---	15	-	No	No	
07:15 - 08:15	988	Yes	0	-	---	15	-	No	No	
07:30 - 08:30	919	Yes	0	-	---	15	-	No	No	
17:15 - 18:15	913	Yes	0	-	---	24	-	No	No	
14:45 - 15:45	820	Yes	0	-	---	31	-	No	No	
12:45 - 13:45	814	Yes	0	-	---	26	-	No	No	
13:00 - 14:00	792	No	0	-	---	22	-	No	No	
12:30 - 13:30	788	No	0	-	---	27	-	No	No	
06:45 - 07:45	773	No	0	-	---	6	-	No	No	
12:15 - 13:15	764	No	0	-	---	33	-	No	No	
07:45 - 08:45	751	No	0	-	---	16	-	No	No	
12:00 - 13:00	746	No	0	-	---	30	-	No	No	
11:45 - 12:45	732	No	0	-	---	31	-	No	No	
11:30 - 12:30	691	No	0	-	---	29	-	No	No	
09:00 - 10:00	670	No	0	-	---	22	-	No	No	
11:00 - 12:00	656	No	0	-	---	23	-	No	No	

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

70 % Volumes, without RTRF

Study Name: LOR-57-11.75 (SR 82) 70%, no RTRF

Study Date : 7/30/2024

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.

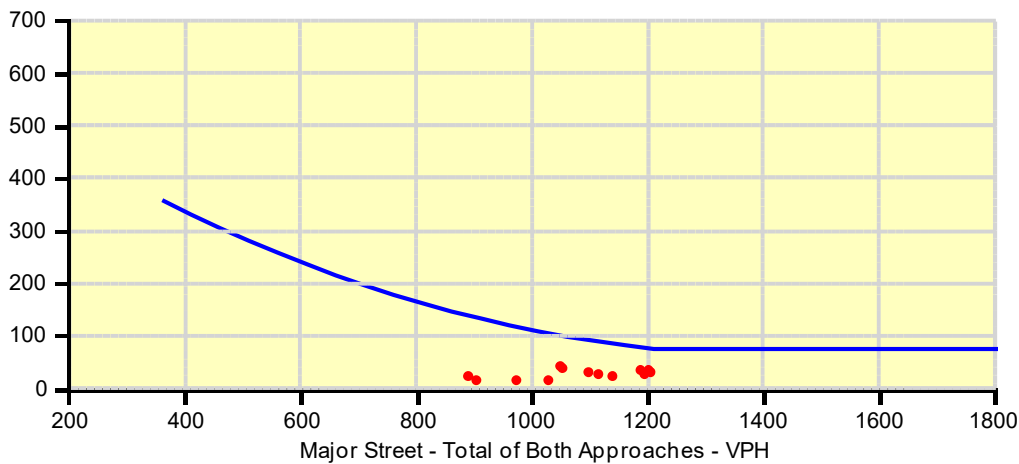
Summary

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **True**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Major Road						Minor Road		
SR 57 NB						n/a		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:30 - 17:30	350	+	855	=	1205	0	32	No
17:00 - 18:00	365	+	835	=	1200	0	33	No
16:15 - 17:15	332	+	863	=	1195	0	27	No
16:45 - 17:45	334	+	853	=	1187	0	35	No
16:00 - 17:00	293	+	846	=	1139	0	24	No
15:45 - 16:45	286	+	828	=	1114	0	26	No
15:30 - 16:30	298	+	798	=	1096	0	32	No
15:15 - 16:15	322	+	731	=	1053	0	38	No
15:00 - 16:00	366	+	683	=	1049	0	41	No
07:00 - 08:00	402	+	626	=	1028	0	15	No
07:15 - 08:15	394	+	579	=	973	0	15	No



LOR-57-11.75 (SR 82)
2024 Abbreviated HSIP Study
100 % Volumes, with RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, with RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

Signal Warrants - Summary

Major Street Approaches

Northbound: SR 57 NB

Number of Lanes : 1

Total Approach Volume: 2,728

Southbound: SR 57 SB

Number of Lanes :2+

Total Approach Volume: 5,097

Minor Street Approaches

Eastbound: n/a

Number of Lanes :1

Total Approach Volume: 0

Westbound: SR 82 WB

Number of Lanes :1

Total Approach Volume: 1,239

Warrant Summary (Urban Values Apply)

Warrant 1 - Eight Hour Vehicular Volumes.....Not Satisfied

Warrant 1A - Minimum Vehicular Volume.....Not Satisfied

Required volumes reached for 3 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic.....Not Satisfied

Required volumes reached for 4 hours, 8 are needed

Warrant 1C - Combination of Warrants.....Not Satisfied

Required 1A volumes reached for 5 hours, 8 are needed

Required 1B volumes reached for 6 hours, 8 are needed

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

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

Warrant 3 - Peak Hour.....Satisfied

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

Number of one hour periods (21) volumes exceed minimum >= required (1). Delay data not evaluated.

Warrant 3B - Peak Hour Volumes.....Not Satisfied

Volumes do not exceed minimums for any 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-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, with RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, with RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

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

Only 3 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Veh/Hr Major = **600**

Veh/Hr Minor = **150**

Major Road						Minor Road		
SR 57 NB						n/a		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
17:00 - 18:00	365	+	835	=	1200	0	190	Yes
16:00 - 17:00	293	+	846	=	1139	0	167	Yes
15:00 - 16:00	366	+	683	=	1049	0	199	Yes
07:00 - 08:00	402	+	626	=	1028	0	145	No
07:15 - 08:15	394	+	579	=	973	0	147	No
07:30 - 08:30	343	+	561	=	904	0	136	No
14:45 - 15:45	288	+	501	=	789	0	138	No
12:45 - 13:45	295	+	493	=	788	0	125	No
13:00 - 14:00	278	+	492	=	770	0	114	No
06:45 - 07:45	300	+	467	=	767	0	99	No
12:30 - 13:30	279	+	482	=	761	0	123	No
07:45 - 08:45	296	+	439	=	735	0	127	No
12:15 - 13:15	277	+	454	=	731	0	131	No
12:00 - 13:00	269	+	447	=	716	0	123	No
11:45 - 12:45	251	+	450	=	701	0	118	No
11:30 - 12:30	239	+	423	=	662	0	109	No
09:00 - 10:00	244	+	404	=	648	0	107	No
08:00 - 09:00	265	+	377	=	642	0	103	No
08:45 - 09:45	240	+	394	=	634	0	101	No
11:00 - 12:00	246	+	387	=	633	0	91	No
11:15 - 12:15	221	+	407	=	628	0	85	No
08:15 - 09:15	259	+	366	=	625	0	102	No
08:30 - 09:30	253	+	366	=	619	0	103	No
13:15 - 14:15	209	+	365	=	574	0	85	No
14:30 - 15:30	180		321		501	0	100	No

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, with RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, with RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

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

Only 4 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Veh/Hr Major = **900**

Veh/Hr Minor = **75**

		Major Road				Minor Road					
		SR 57 NB				n/a					
Time	Major NB	+	Major SB	=	Total		Minor EB		Minor WB		Met?
17:00 - 18:00	365	+	835	=	1200		0		190		Yes
16:00 - 17:00	293	+	846	=	1139		0		167		Yes
15:00 - 16:00	366	+	683	=	1049		0		199		Yes
07:00 - 08:00	402	+	626	=	1028		0		145		Yes
14:45 - 15:45	288	+	501	=	789		0		138		No
12:45 - 13:45	295	+	493	=	788		0		125		No
13:00 - 14:00	278	+	492	=	770		0		114		No
06:45 - 07:45	300	+	467	=	767		0		99		No
12:30 - 13:30	279	+	482	=	761		0		123		No
12:15 - 13:15	277	+	454	=	731		0		131		No
12:00 - 13:00	269	+	447	=	716		0		123		No
11:45 - 12:45	251	+	450	=	701		0		118		No
11:30 - 12:30	239	+	423	=	662		0		109		No
09:00 - 10:00	244	+	404	=	648		0		107		No
08:00 - 09:00	265	+	377	=	642		0		103		No
08:45 - 09:45	240	+	394	=	634		0		101		No
11:00 - 12:00	246	+	387	=	633		0		91		No
11:15 - 12:15	221	+	407	=	628		0		85		No
08:15 - 09:15	259	+	366	=	625		0		102		No
08:30 - 09:30	253	+	366	=	619		0		103		No
13:15 - 14:15	209	+	365	=	574		0		85		No
14:30 - 15:30	180	+	321	=	501		0		100		No
09:15 - 10:15	186	+	313	=	499		0		80		No
06:30 - 07:30	182	+	279	=	461		0		61		No
10:45 - 11:45	183		266		449		0		64		No

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, with RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, with RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

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

Only 5 hours meet 1A minimums.
Only 6 hours meet 1B minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Warrant 1A 1B
Veh/Hr Major = **480 720**

Veh/Hr Minor = **120 60**

Major Road						Minor Road			
SR 57 NB						n/a			
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1A?	
16:45 - 17:45	334	+	853	=	1187	0	201	Yes	
15:45 - 16:45	286	+	828	=	1114	0	186	Yes	
07:00 - 08:00	402	+	626	=	1028	0	145	Yes	
14:45 - 15:45	288	+	501	=	789	0	138	Yes	
12:00 - 13:00	269	+	447	=	716	0	123	Yes	
13:00 - 14:00	278	+	492	=	770	0	114	No	
06:45 - 07:45	300	+	467	=	767	0	99	No	
11:45 - 12:45	251	+	450	=	701	0	118	No	
11:30 - 12:30	239	+	423	=	662	0	109	No	
09:00 - 10:00	244	+	404	=	648	0	107	No	
08:00 - 09:00	265	+	377	=	642	0	103	No	
08:45 - 09:45	240	+	394	=	634	0	101	No	

Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1B?	
16:45 - 17:45	334	+	853	=	1187	0	201	Yes	
15:45 - 16:45	286	+	828	=	1114	0	186	Yes	
14:45 - 15:45	288	+	501	=	789	0	138	Yes	
06:45 - 07:45	300	+	467	=	767	0	99	Yes	
07:45 - 08:45	296	+	439	=	735	0	127	Yes	
12:15 - 13:15	277	+	454	=	731	0	131	Yes	
12:00 - 13:00	269	+	447	=	716	0	123	No	
11:45 - 12:45	251	+	450	=	701	0	118	No	
11:30 - 12:30	239	+	423	=	662	0	109	No	
09:00 - 10:00	244	+	404	=	648	0	107	No	
08:45 - 09:45	240	+	394	=	634	0	101	No	
11:00 - 12:00	246	+	387	=	633	0	91	No	

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, with RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, with RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

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.

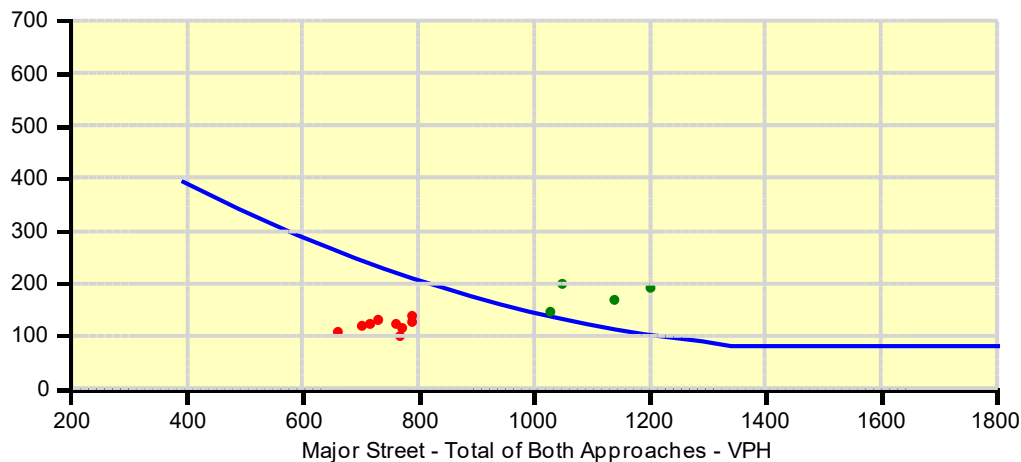
Summary

4 one hour periods meet minimums.
Warrant IS met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Major Road						Minor Road		
SR 57 NB						n/a		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
17:00 - 18:00	365	+	835	=	1200	0	190	Yes
16:00 - 17:00	293	+	846	=	1139	0	167	Yes
15:00 - 16:00	366	+	683	=	1049	0	199	Yes
07:00 - 08:00	402	+	626	=	1028	0	145	Yes
14:45 - 15:45	288	+	501	=	789	0	138	No
12:45 - 13:45	295	+	493	=	788	0	125	No
13:00 - 14:00	278	+	492	=	770	0	114	No
06:45 - 07:45	300	+	467	=	767	0	99	No
12:30 - 13:30	279	+	482	=	761	0	123	No
12:15 - 13:15	277	+	454	=	731	0	131	No
12:00 - 13:00	269	+	447	=	716	0	123	No
							118	No



LOR-57-11.75 (SR 82)
2024 Abbreviated HSIP Study
100 % Volumes, with RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, with RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

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

22 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 57 NB						n/a			
Time	Total of All Approaches	Met?	Minor EB	Delay EB	Met?	Minor WB	Delay WB	Met?	Warrant Met?
16:30 - 17:30	1406	Yes	0	-	---	201	-	Yes	Yes
17:00 - 18:00	1390	Yes	0	-	---	190	-	Yes	Yes
16:45 - 17:45	1388	Yes	0	-	---	201	-	Yes	Yes
16:15 - 17:15	1383	Yes	0	-	---	188	-	Yes	Yes
16:00 - 17:00	1306	Yes	0	-	---	167	-	Yes	Yes
15:45 - 16:45	1300	Yes	0	-	---	186	-	Yes	Yes
15:30 - 16:30	1277	Yes	0	-	---	181	-	Yes	Yes
15:00 - 16:00	1248	Yes	0	-	---	199	-	Yes	Yes
15:15 - 16:15	1239	Yes	0	-	---	186	-	Yes	Yes
07:00 - 08:00	1173	Yes	0	-	---	145	-	Yes	Yes
07:15 - 08:15	1120	Yes	0	-	---	147	-	Yes	Yes
07:30 - 08:30	1040	Yes	0	-	---	136	-	Yes	Yes
17:15 - 18:15	1017	Yes	0	-	---	128	-	Yes	Yes
14:45 - 15:45	927	Yes	0	-	---	138	-	Yes	Yes
12:45 - 13:45	913	Yes	0	-	---	125	-	Yes	Yes
13:00 - 14:00	884	Yes	0	-	---	114	-	Yes	Yes
12:30 - 13:30	884	Yes	0	-	---	123	-	Yes	Yes
07:45 - 08:45	862	Yes	0	-	---	127	-	Yes	Yes
12:15 - 13:15	862	Yes	0	-	---	131	-	Yes	Yes
12:00 - 13:00	839	Yes	0	-	---	123	-	Yes	Yes
11:45 - 12:45	819	Yes	0	-	---	118	-	Yes	Yes
06:45 - 07:45	866	Yes	0	-	---	99	-	No	No
11:30 - 12:30	771	No	0	-	---	109	-	Yes	No
09:00 - 10:00	755	No	0	-	---	107	-	Yes	No
08:00 - 09:00	745	No	0	-	---	103	-	Yes	No

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, with RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, with RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

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.

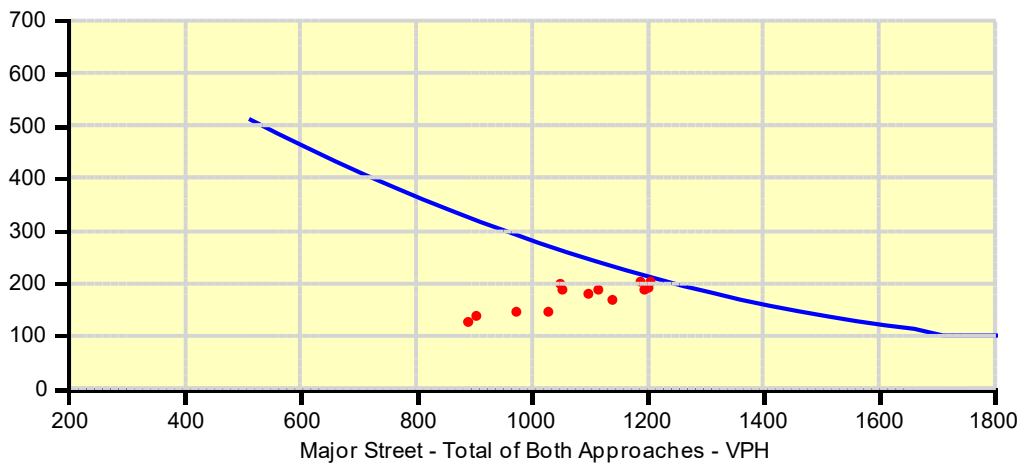
Summary

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Major Road						Minor Road		
SR 57 NB						n/a		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:30 - 17:30	350	+	855	=	1205	0	201	No
17:00 - 18:00	365	+	835	=	1200	0	190	No
16:15 - 17:15	332	+	863	=	1195	0	188	No
16:45 - 17:45	334	+	853	=	1187	0	201	No
16:00 - 17:00	293	+	846	=	1139	0	167	No
15:45 - 16:45	286	+	828	=	1114	0	186	No
15:30 - 16:30	298	+	798	=	1096	0	181	No
15:15 - 16:15	322	+	731	=	1053	0	186	No
15:00 - 16:00	366	+	683	=	1049	0	199	No
07:00 - 08:00	402	+	626	=	1028	0	145	No
07:15 - 08:15	394	+	579	=	973	0	147	No
							136	No



LOR-57-11.75 (SR 82)
2024 Abbreviated HSIP Study
100 % Volumes, without RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, no RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

Signal Warrants - Summary

Major Street Approaches

Northbound: SR 57 NB

Number of Lanes : 1

Total Approach Volume: 2,728

Southbound: SR 57 SB

Number of Lanes :2+

Total Approach Volume: 5,097

Minor Street Approaches

Eastbound: n/a

Number of Lanes :1

Total Approach Volume: 0

Westbound: SR 82 WB

Number of Lanes :1

Total Approach Volume: 2,768

Warrant Summary (Urban 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.....Not Satisfied

Required volumes reached for 4 hours, 8 are needed

Warrant 1C - Combination of Warrants.....Not Satisfied

Required 1A volumes reached for 10 hours, 8 are needed

Required 1B volumes reached for 6 hours, 8 are needed

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

Number of hours (7) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour.....Satisfied

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

Number of one hour periods (30) 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-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, without RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, no RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

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 = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Veh/Hr Major = **600**

Veh/Hr Minor = **150**

Major Road						Minor Road			
SR 57 NB						n/a			
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?	
16:45 - 17:45	334	+	853	=	1187	0	450	Yes	
15:45 - 16:45	286	+	828	=	1114	0	424	Yes	
14:45 - 15:45	288	+	501	=	789	0	300	Yes	
13:00 - 14:00	278	+	492	=	770	0	252	Yes	
06:45 - 07:45	300	+	467	=	767	0	240	Yes	
07:45 - 08:45	296	+	439	=	735	0	289	Yes	
12:00 - 13:00	269	+	447	=	716	0	262	Yes	
08:45 - 09:45	240	+	394	=	634	0	232	Yes	
11:00 - 12:00	246	+	387	=	633	0	194	Yes	
14:30 - 15:30	180	+	321	=	501	0	217	No	
06:30 - 07:30	182	+	279	=	461	0	146	No	
10:45 - 11:45	183	+	266	=	449	0	139	No	
10:30 - 11:30	143	+	185	=	328	0	94	No	
17:45 - 18:45	116	+	182	=	298	0	70	No	
14:15 - 15:15	96	+	155	=	251	0	122	No	
06:15 - 07:15	72	+	149	=	221	0	61	No	
10:15 - 11:15	86	+	100	=	186	0	56	No	
09:45 - 10:45	75	+	107	=	182	0	55	No	
18:00 - 19:00	0	+	0	=	0	0	0	No	
23:30 - 00:30	0	+	0	=	0	0	0	No	
23:45 - 00:45	0	+	0	=	0	0	0	No	
14:00 - 15:00	0	+	0	=	0	0	0	No	
21:45 - 22:45	0	+	0	=	0	0	0	No	
22:00 - 23:00	0	+	0	=	0	0	0	No	
21:30 - 22:30	0		0		0	0	0	No	

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, without RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, no RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

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

Only 4 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Veh/Hr Major = **900**

Veh/Hr Minor = **75**

		Major Road				Minor Road					
		SR 57 NB				n/a					
Time	Major NB	+	Major SB	=	Total		Minor EB		Minor WB		Met?
17:00 - 18:00	365	+	835	=	1200		0		426		Yes
16:00 - 17:00	293	+	846	=	1139		0		382		Yes
15:00 - 16:00	366	+	683	=	1049		0		436		Yes
07:00 - 08:00	402	+	626	=	1028		0		339		Yes
14:45 - 15:45	288	+	501	=	789		0		300		No
12:45 - 13:45	295	+	493	=	788		0		275		No
13:00 - 14:00	278	+	492	=	770		0		252		No
06:45 - 07:45	300	+	467	=	767		0		240		No
12:30 - 13:30	279	+	482	=	761		0		270		No
12:15 - 13:15	277	+	454	=	731		0		279		No
12:00 - 13:00	269	+	447	=	716		0		262		No
11:45 - 12:45	251	+	450	=	701		0		248		No
11:30 - 12:30	239	+	423	=	662		0		228		No
09:00 - 10:00	244	+	404	=	648		0		235		No
08:00 - 09:00	265	+	377	=	642		0		242		No
08:45 - 09:45	240	+	394	=	634		0		232		No
11:00 - 12:00	246	+	387	=	633		0		194		No
11:15 - 12:15	221	+	407	=	628		0		185		No
08:15 - 09:15	259	+	366	=	625		0		238		No
08:30 - 09:30	253	+	366	=	619		0		237		No
13:15 - 14:15	209	+	365	=	574		0		188		No
14:30 - 15:30	180	+	321	=	501		0		217		No
09:15 - 10:15	186	+	313	=	499		0		174		No
06:30 - 07:30	182	+	279	=	461		0		146		No
10:45 - 11:45	183		266		449		0		139		No

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, without RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, no RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

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

10 hours meet 1A minimums.
Only 6 hours meet 1B minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Warrant 1A 1B
Veh/Hr Major = **480 720**

Veh/Hr Minor = **120 60**

Major Road						Minor Road			
SR 57 NB						n/a			
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1A?	
16:30 - 17:30	350	+	855	=	1205	0	455	Yes	
15:30 - 16:30	298	+	798	=	1096	0	402	Yes	
13:00 - 14:00	278	+	492	=	770	0	252	Yes	
06:45 - 07:45	300	+	467	=	767	0	240	Yes	
07:45 - 08:45	296	+	439	=	735	0	289	Yes	
12:00 - 13:00	269	+	447	=	716	0	262	Yes	
08:45 - 09:45	240	+	394	=	634	0	232	Yes	
11:00 - 12:00	246	+	387	=	633	0	194	Yes	
17:30 - 18:30	196	+	390	=	586	0	170	Yes	
14:30 - 15:30	180	+	321	=	501	0	217	Yes	
06:30 - 07:30	182	+	279	=	461	0	146	No	
10:45 - 11:45	183	+	266	=	449	0	139	No	

Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1B?	
16:45 - 17:45	334	+	853	=	1187	0	450	Yes	
15:45 - 16:45	286	+	828	=	1114	0	424	Yes	
14:45 - 15:45	288	+	501	=	789	0	300	Yes	
06:45 - 07:45	300	+	467	=	767	0	240	Yes	
07:45 - 08:45	296	+	439	=	735	0	289	Yes	
12:15 - 13:15	277	+	454	=	731	0	279	Yes	
12:00 - 13:00	269	+	447	=	716	0	262	No	
11:45 - 12:45	251	+	450	=	701	0	248	No	
11:30 - 12:30	239	+	423	=	662	0	228	No	
09:00 - 10:00	244	+	404	=	648	0	235	No	
08:45 - 09:45	240	+	394	=	634	0	232	No	
11:00 - 12:00	246	+	387	=	633	0	194	No	

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, without RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, no RTRF, w/SlipLaneVolumes

Study Date : 7/26/2024

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.

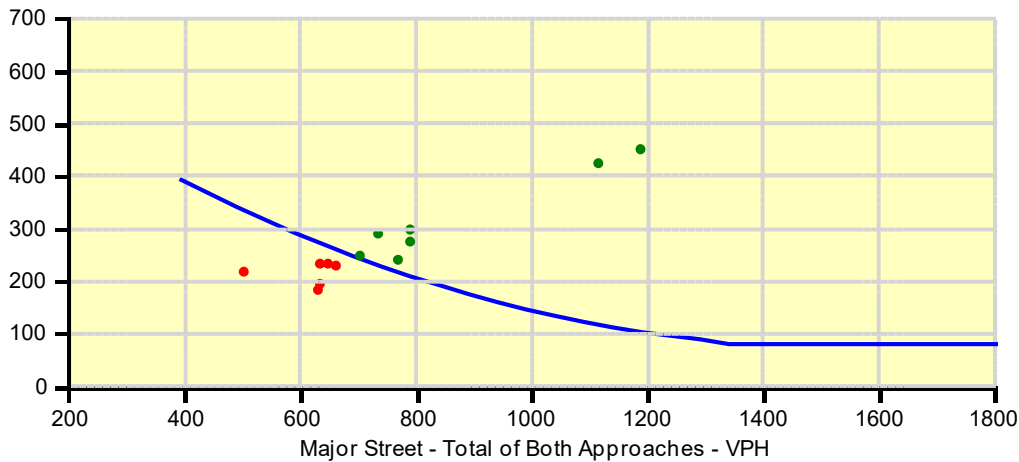
Summary

7 one hour periods meet minimums.
Warrant IS met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Major Road SR 57 NB						Minor Road n/a		Met?
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	
16:45 - 17:45	334	+	853	=	1187	0	450	Yes
15:45 - 16:45	286	+	828	=	1114	0	424	Yes
14:45 - 15:45	288	+	501	=	789	0	300	Yes
12:45 - 13:45	295	+	493	=	788	0	275	Yes
06:45 - 07:45	300	+	467	=	767	0	240	Yes
07:45 - 08:45	296	+	439	=	735	0	289	Yes
11:45 - 12:45	251	+	450	=	701	0	248	Yes
11:30 - 12:30	239	+	423	=	662	0	228	No
09:00 - 10:00	244	+	404	=	648	0	235	No
08:45 - 09:45	240	+	394	=	634	0	232	No
11:00 - 12:00	246	+	387	=	633	0	194	No
							185	No



LOR-57-11.75 (SR 82)
2024 Abbreviated HSIP Study
100 % Volumes, without RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, no RTRF, wSlipLaneVolumes

Study Date : 7/26/2024

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

30 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 57 NB						n/a			
Time	Total of All Approaches	Met?	Minor EB	Delay EB	Met?	Minor WB	Delay WB	Met?	Warrant Met?
16:30 - 17:30	1660	Yes	0	-	---	455	-	Yes	Yes
16:45 - 17:45	1637	Yes	0	-	---	450	-	Yes	Yes
17:00 - 18:00	1626	Yes	0	-	---	426	-	Yes	Yes
16:15 - 17:15	1625	Yes	0	-	---	430	-	Yes	Yes
15:45 - 16:45	1538	Yes	0	-	---	424	-	Yes	Yes
16:00 - 17:00	1521	Yes	0	-	---	382	-	Yes	Yes
15:30 - 16:30	1498	Yes	0	-	---	402	-	Yes	Yes
15:00 - 16:00	1485	Yes	0	-	---	436	-	Yes	Yes
15:15 - 16:15	1460	Yes	0	-	---	407	-	Yes	Yes
07:00 - 08:00	1367	Yes	0	-	---	339	-	Yes	Yes
07:15 - 08:15	1316	Yes	0	-	---	343	-	Yes	Yes
07:30 - 08:30	1218	Yes	0	-	---	314	-	Yes	Yes
17:15 - 18:15	1174	Yes	0	-	---	285	-	Yes	Yes
14:45 - 15:45	1089	Yes	0	-	---	300	-	Yes	Yes
12:45 - 13:45	1063	Yes	0	-	---	275	-	Yes	Yes
12:30 - 13:30	1031	Yes	0	-	---	270	-	Yes	Yes
07:45 - 08:45	1024	Yes	0	-	---	289	-	Yes	Yes
13:00 - 14:00	1022	Yes	0	-	---	252	-	Yes	Yes
12:15 - 13:15	1010	Yes	0	-	---	279	-	Yes	Yes
06:45 - 07:45	1007	Yes	0	-	---	240	-	Yes	Yes
12:00 - 13:00	978	Yes	0	-	---	262	-	Yes	Yes
11:45 - 12:45	949	Yes	0	-	---	248	-	Yes	Yes
11:30 - 12:30	890	Yes	0	-	---	228	-	Yes	Yes
08:00 - 09:00	884	Yes	0	-	---	242	-	Yes	Yes
09:00 - 10:00	883	Yes	0	-	---	235	-	Yes	Yes

LOR-57-11.75 (SR 82)

2024 Abbreviated HSIP Study

100 % Volumes, without RTRF, w/Slip Lane Volumes

Study Name: LOR-57-11.75 (SR 82) 100%, no RTRF, wSlipLaneVolumes

Study Date : 7/26/2024

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.

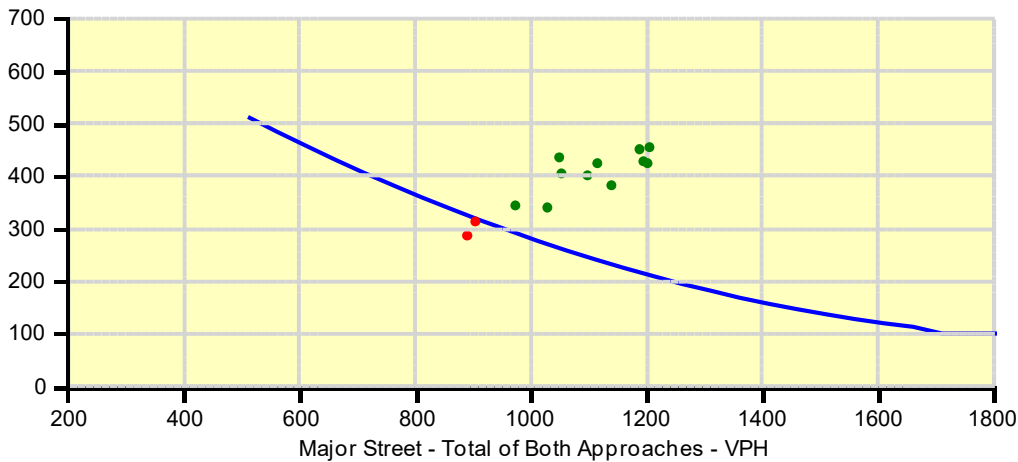
Summary

11 one hour periods meet minimums.
Warrant IS met.

Site Data Required

Rural Settings Apply = **False**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Major Road						Minor Road		
SR 57 NB						n/a		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:30 - 17:30	350	+	855	=	1205	0	455	Yes
17:00 - 18:00	365	+	835	=	1200	0	426	Yes
16:15 - 17:15	332	+	863	=	1195	0	430	Yes
16:45 - 17:45	334	+	853	=	1187	0	450	Yes
16:00 - 17:00	293	+	846	=	1139	0	382	Yes
15:45 - 16:45	286	+	828	=	1114	0	424	Yes
15:30 - 16:30	298	+	798	=	1096	0	402	Yes
15:15 - 16:15	322	+	731	=	1053	0	407	Yes
15:00 - 16:00	366	+	683	=	1049	0	436	Yes
07:00 - 08:00	402	+	626	=	1028	0	339	Yes
07:15 - 08:15	394	+	579	=	973	0	343	Yes
							314	No



Appendix D – AWSC Warrants



OMUTCD: Section 2B.07

2	(OMUTCD.2B.07.04.B)
Yes	(OMUTCD.2B.07.04.C.3)

[illegible]

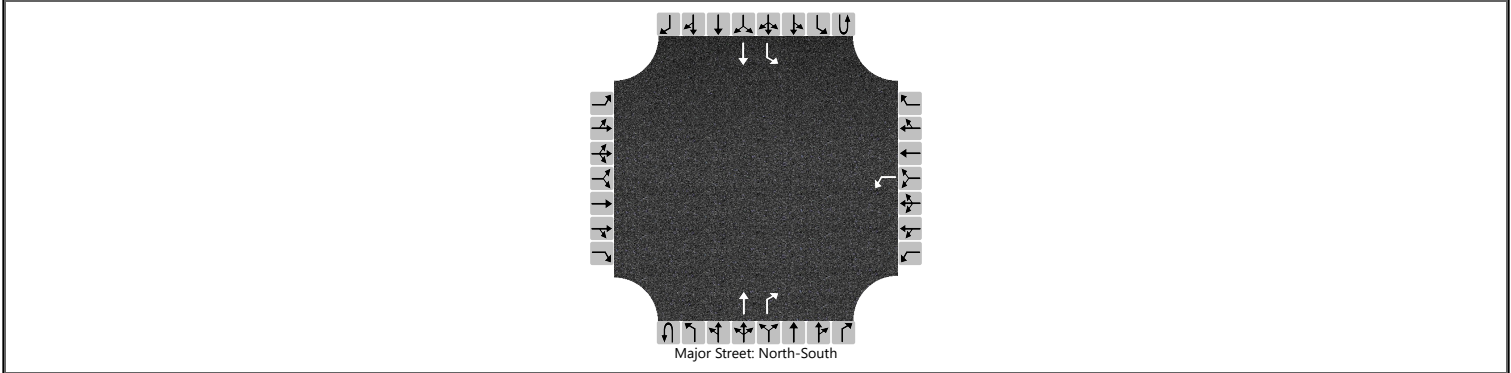
Appendix E – HCS 2024 Analysis



HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Jeremy Adato	Intersection	LOR-57-11.75 (SR 82)
Agency/Co.	ODOT D3	Jurisdiction	ODOT D3
Date Performed	8/28/2024	East/West Street	SR 82
Analysis Year	2024	North/South Street	SR 57
Time Analyzed	AM Peak Existing	Peak Hour Factor	0.85
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	2024 HSIP Safety Study		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	0	0	0	1	1	0	1	1	0
Configuration						L					T	R		L	T	
Volume (veh/h)						15					367	35		427	199	
Percent Heavy Vehicles (%)						11								8		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1									4.1		
Critical Headway (sec)						6.51									4.18		
Base Follow-Up Headway (sec)						3.5									2.2		
Follow-Up Headway (sec)						3.60									2.27		

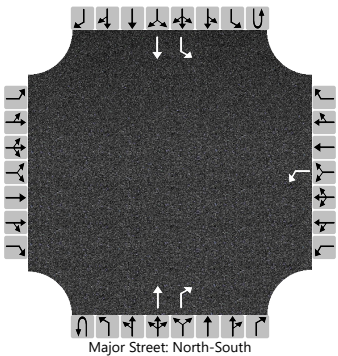
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						18								502		
Capacity, c (veh/h)						53								1058		
v/c Ratio						0.33								0.47		
95% Queue Length, Q ₉₅ (veh)						1.2								2.6		
95% Queue Length, Q ₉₅ (ft)						32.6								69.2		
Control Delay (s/veh)						104.4								11.4		
Level of Service (LOS)						F								B		
Approach Delay (s/veh)						104.4								7.8		
Approach LOS						F								A		

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Jeremy Adato	Intersection	LOR-57-11.75 (SR 82)
Agency/Co.	ODOT D3	Jurisdiction	ODOT D3
Date Performed	8/28/2024	East/West Street	SR 82
Analysis Year	2024	North/South Street	SR 57
Time Analyzed	PM Peak Existing	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	2024 HSIP Safety Study		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	0	0	0	1	1	0	1	1	0
Configuration						L					T	R		L	T	
Volume (veh/h)						32					316	34		361	494	
Percent Heavy Vehicles (%)						11								8		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized									No							
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1								4.1		
Critical Headway (sec)						6.51								4.18		
Base Follow-Up Headway (sec)						3.5								2.2		
Follow-Up Headway (sec)						3.60								2.27		

Delay, Queue Length, and Level of Service

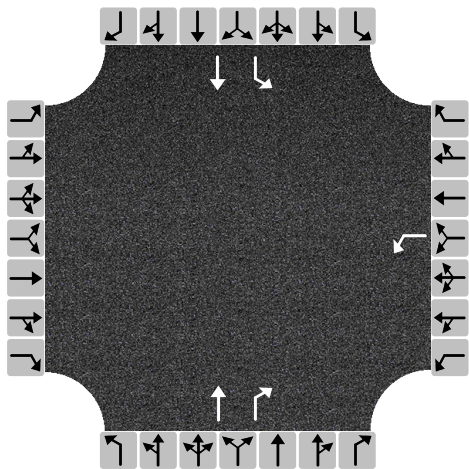
Flow Rate, v (veh/h)						35								392		
Capacity, c (veh/h)						66								1146		
v/c Ratio						0.52								0.34		
95% Queue Length, Q ₉₅ (veh)						2.1								1.5		
95% Queue Length, Q ₉₅ (ft)						57.1								39.9		
Control Delay (s/veh)						107.6								9.8		
Level of Service (LOS)						F								A		
Approach Delay (s/veh)					107.6								4.1			
Approach LOS					F								A			

HCS All-Way Stop Control Report

General and Site Information

Analyst	Jeremy Adato
Agency/Co.	ODOT D3
Date Performed	8/28/2024
Analysis Year	2024
Analysis Time Period (hrs)	0.25
Time Analyzed	AM Peak
Project Description	2024 HSIP Safety Study
Intersection	LOR-57-11.75 (SR 82)
Jurisdiction	ODOT D3
East/West Street	SR 82
North/South Street	SR 57
Peak Hour Factor	0.85

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh/h)				15				367	35	427	199	
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				L			T	R		L	T	
Flow Rate, v (veh/h)				18			432	41		502	234	
Percent Heavy Vehicles				11			3	3		8	8	
Initial Departure Headway, h _d (s)				3.20			3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x				0.016			0.384	0.037		0.447	0.208	
Final Departure Headway, h _d (s)				6.74			5.35	4.65		5.58	5.08	
Final Degree of Utilization, x				0.033			0.642	0.053		0.779	0.330	
Move-Up Time, m (s)				2.0			2.3	2.3		2.3	2.3	
Service Time, t _s (s)				4.74			3.05	2.35		3.28	2.78	

Capacity, Delay and Level of Service

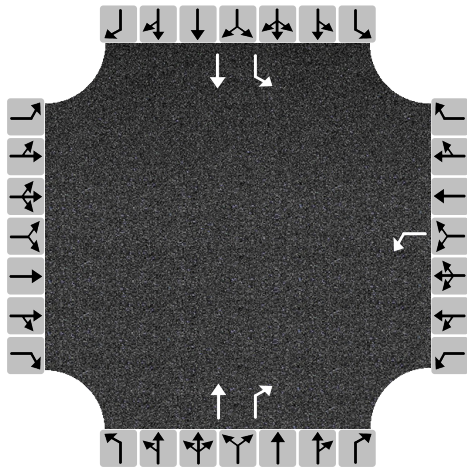
Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				L			T	R		L	T	
Flow Rate, v (veh/h)				18			432	41		502	234	
Capacity (veh/h)				534			673	774		645	709	
95% Queue Length, Q ₉₅ (veh)				0.1			4.7	0.2		7.5	1.4	
95% Queue Length, Q ₉₅ (ft)				2.7			120.3	5.1		199.5	37.2	
Control Delay (s/veh)				10.0			17.1	7.6		25.1	10.3	
Level of Service, LOS				A			C	A		D	B	
Approach Delay (s/veh) LOS				10.0		A	16.3		C	20.4		C
Intersection Delay (s/veh) LOS	18.7						C					

HCS All-Way Stop Control Report

General and Site Information

Analyst	Jeremy Adato
Agency/Co.	ODOT D3
Date Performed	8/28/2024
Analysis Year	2024
Analysis Time Period (hrs)	0.25
Time Analyzed	PM Peak
Project Description	2024 HSIP Safety Study
Intersection	LOR-57-11.75 (SR 82)
Jurisdiction	ODOT D3
East/West Street	SR 82
North/South Street	SR 57
Peak Hour Factor	0.92

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh/h)				32				316	34	361	494	
% Thrus in Shared Lane												

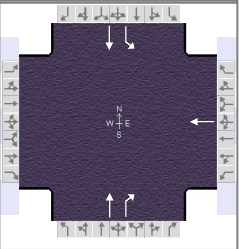
Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				L			T	R		L	T	
Flow Rate, v (veh/h)				35			343	37		392	537	
Percent Heavy Vehicles				11			3	3		8	8	
Initial Departure Headway, h_d (s)				3.20			3.20	3.20		3.20	3.20	
Initial Degree of Utilization, x				0.031			0.305	0.033		0.349	0.477	
Final Departure Headway, h_d (s)				6.69			5.69	4.99		5.60	5.10	
Final Degree of Utilization, x				0.065			0.543	0.051		0.610	0.761	
Move-Up Time, m (s)				2.0			2.3	2.3		2.3	2.3	
Service Time, t_s (s)				4.69			3.39	2.69		3.30	2.80	

Capacity, Delay and Level of Service

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				L			T	R		L	T	
Flow Rate, v (veh/h)				35			343	37		392	537	
Capacity (veh/h)				538			633	722		643	706	
95% Queue Length, Q ₉₅ (veh)				0.2			3.3	0.2		4.2	7.1	
95% Queue Length, Q ₉₅ (ft)				5.4			84.5	5.1		111.7	188.9	
Control Delay (s/veh)				10.2			14.9	8.0		16.7	22.1	
Level of Service, LOS				B			B	A		C	C	
Approach Delay (s/veh) LOS				10.2		B	14.3		B	19.8		C
Intersection Delay (s/veh) LOS	18.0						C					

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency				Duration, h	0.250	
Analyst		Analysis Date	8/28/2024	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-57-11.75 (SR 82)	File Name	5. Signal AM Peak.xus			
Project Description	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					15			367	35	427	199	

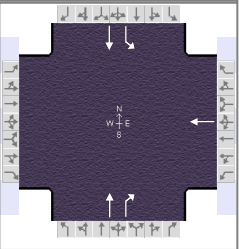
Signal Information													
Cycle, s	118.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	20.0	60.0	20.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0			
				Red	2.0	2.0	2.0	0.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8		2	1	6
Case Number				12.0		7.3	1.0	4.0
Phase Duration, s				26.0		66.0	26.0	92.0
Change Period, ($Y+R_c$), s				6.0		6.0	6.0	6.0
Max Allow Headway (MAH), s				2.9		2.9	3.0	2.9
Queue Clearance Time (g_s), s				3.0		19.6	17.1	6.8
Green Extension Time (g_e), s				0.0		1.2	0.4	1.2
Phase Call Probability				1.00		1.00	1.00	1.00
Max Out Probability				0.00		0.00	1.00	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					8			2	12	1	6	
Adjusted Flow Rate (v), veh/h					18			432	41	502	234	
Adjusted Saturation Flow Rate (s), veh/h/ln					1737			1856	1572	1697	1781	
Queue Service Time (g_s), s					1.0			17.6	1.6	15.1	4.8	
Cycle Queue Clearance Time (g_c), s					1.0			17.6	1.6	15.1	4.8	
Green Ratio (g/C)					0.17			0.51	0.51	0.69	0.73	
Capacity (c), veh/h					294			943	800	676	1298	
Volume-to-Capacity Ratio (X)					0.060			0.458	0.051	0.743	0.180	
Back of Queue (Q), ft/ln (95 th percentile)					22			306	26	264	74	
Back of Queue (Q), veh/ln (95 th percentile)					0.8			12.0	1.0	9.9	2.8	
Queue Storage Ratio (RQ) (95 th percentile)					0.00			0.00	0.11	0.33	0.00	
Uniform Delay (d_1), s/veh					41.1			18.6	14.6	11.4	5.0	
Incremental Delay (d_2), s/veh					0.4			1.6	0.1	7.3	0.3	
Initial Queue Delay (d_3), s/veh					0.0			0.0	0.0	0.0	0.0	
Control Delay (d), s/veh					41.5			20.2	14.8	18.7	5.3	
Level of Service (LOS)					D			C	B	B	A	
Approach Delay, s/veh / LOS	0.0			41.5		D	19.7		B	14.4		B
Intersection Delay, s/veh / LOS	16.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.96	B	1.96	B	1.68	B	1.34	A
Bicycle LOS Score / LOS			0.52	A	1.27	A	1.70	B

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency				Duration, h	0.250	
Analyst		Analysis Date	8/28/2024	Area Type	Other	
Jurisdiction		Time Period		PHF	0.92	
Urban Street	2024 HSIP Safety Study	Analysis Year	2024	Analysis Period	1> 7:00	
Intersection	LOR-57-11.75 (SR 82)	File Name	6. Signal PM Peak.xus			
Project Description	PM Peak					

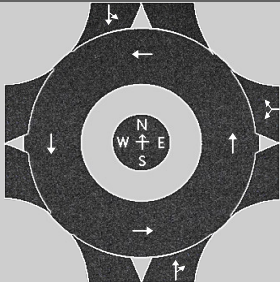
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h					32			316	34	361	494	

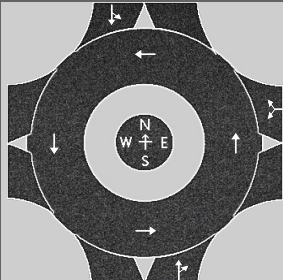
Signal Information													
Cycle, s	118.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	20.0	60.0	20.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0			
				Red	2.0	2.0	2.0	0.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase				8		2	1	6
Case Number				12.0		7.3	1.0	4.0
Phase Duration, s				26.0		66.0	26.0	92.0
Change Period, ($Y+R_c$), s				6.0		6.0	6.0	6.0
Max Allow Headway (MAH), s				2.9		2.9	3.0	2.9
Queue Clearance Time (g_s), s				4.0		15.2	12.8	15.8
Green Extension Time (g_e), s				0.0		1.6	0.5	1.6
Phase Call Probability				1.00		1.00	1.00	1.00
Max Out Probability				0.00		0.00	0.05	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					8			2	12	1	6	
Adjusted Flow Rate (v), veh/h					35			343	37	392	537	
Adjusted Saturation Flow Rate (s), veh/h/ln					1737			1856	1572	1697	1781	
Queue Service Time (g_s), s					2.0			13.2	1.4	10.8	13.8	
Cycle Queue Clearance Time (g_c), s					2.0			13.2	1.4	10.8	13.8	
Green Ratio (g/C)					0.17			0.51	0.51	0.69	0.73	
Capacity (c), veh/h					294			943	800	740	1298	
Volume-to-Capacity Ratio (X)					0.118			0.364	0.046	0.530	0.414	
Back of Queue (Q), ft/ln (95 th percentile)					44			242	23	183	210	
Back of Queue (Q), veh/ln (95 th percentile)					1.6			9.4	0.9	6.9	7.9	
Queue Storage Ratio (RQ) (95 th percentile)					0.00			0.00	0.10	0.23	0.00	
Uniform Delay (d_1), s/veh					41.5			17.5	14.6	8.8	6.2	
Incremental Delay (d_2), s/veh					0.8			1.1	0.1	2.7	1.0	
Initial Queue Delay (d_3), s/veh					0.0			0.0	0.0	0.0	0.0	
Control Delay (d), s/veh					42.3			18.6	14.7	11.5	7.2	
Level of Service (LOS)					D			B	B	B	A	
Approach Delay, s/veh / LOS	0.0			42.3		D	18.2		B	9.0		A
Intersection Delay, s/veh / LOS	12.5						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.96	B	1.96	B	1.68	B	1.34	A
Bicycle LOS Score / LOS			0.54	A	1.12	A	2.02	B

HCS Roundabouts Report																	
General Information								Site Information									
Analyst	Jeremy Adato								Intersection			LOR-57-11.75 (SR 82)					
Agency or Co.	ODOT D3								E/W Street Name			SR 82					
Date Performed	8/29/2024								N/S Street Name			SR 57					
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	0	0	0	0	1	0	0	0	1	0	0	0	1	0	
Lane Assignment							LR				TR				LT		
Volume (V), veh/h					0	15		324	0		367	35	0	427	199		
Percent Heavy Vehicles, %					11	11		11	3		3	3	8	8	8		
Flow Rate (v _{PCE}), pc/h					0	20		423	0		445	42	0	543	253		
Right-Turn Bypass	None				None				None				None				
Conflicting Lanes					1				1				1				
Pedestrians Crossing, p/h					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			
Follow-Up Headway, s						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						443				487				796			
Entry Volume, veh/h						399				473				737			
Circulating Flow (v _c), pc/h	816				445				543				20				
Exiting Flow (v _{ex}), pc/h	585				0				868				273				
Capacity (c _{pce}), pc/h						877				793				1352			
Capacity (c), veh/h						790				770				1252			
v/c Ratio (x)						0.51				0.61				0.59			
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						11.7				14.9				9.8			
Lane LOS						B				B				A			
95% Queue Length, Q ₉₅ (veh)						2.9				4.3				4.0			
95% Queue Length, Q ₉₅ (ft)						78.9				110.1				100.0			
Approach Delay, s/veh LOS					11.7		B		14.9		B		9.8		A		
Intersection Delay, s/veh LOS	11.8								B								

HCS Roundabouts Report																	
General Information								Site Information									
Analyst	Jeremy Adato								Intersection				LOR-57-11.75 (SR 82)				
Agency or Co.	ODOT D3								E/W Street Name				SR 82				
Date Performed	8/29/2024								N/S Street Name				SR 57				
Analysis Year	2024								Analysis Time Period, hrs				0.25				
Time Analyzed	PM Peak								Peak Hour Factor				0.92				
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	0	0	0	0	1	0	0	0	1	0	0	0	1	0	
Lane Assignment							LR				TR				LT		
Volume (V), veh/h					0	32		423	0		316	34	0	361	494		
Percent Heavy Vehicles, %					11	11		11	3		3	3	8	8	8		
Flow Rate (v _{PCE}), pc/h					0	39		510	0		354	38	0	424	580		
Right-Turn Bypass	None				None				None				None				
Conflicting Lanes					1				1				1				
Pedestrians Crossing, p/h					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						
Follow-Up Headway, s					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					549			392			1004						
Entry Volume, veh/h					495			381			930						
Circulating Flow (v _c), pc/h	1043			354			424			39							
Exiting Flow (v _{ex}), pc/h	462			0			864			619							
Capacity (C _{pce}), pc/h					962			895			1326						
Capacity (C), veh/h					866			869			1228						
v/c Ratio (x)					0.57			0.44			0.76						
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					12.4			9.5			15.2						
Lane LOS					B			A			C						
95% Queue Length, Q ₉₅ (veh)					3.7			2.3			7.7						
95% Queue Length, Q ₉₅ (ft)					100.6			58.9			192.5						
Approach Delay, s/veh LOS					12.4	B		9.5	A		15.2	C					
Intersection Delay, s/veh LOS	13.2						B										

HCS Roundabouts Report

General Information	Site Information
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Analyst	Jeremy Adato		Intersection	LOR-57-11.75 (SR 82)
Agency or Co.	ODOT D3		E/W Street Name	SR 82
Date Performed	8/29/2024		N/S Street Name	SR 57
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	0	0	0	1	0	0	0	0	1	0	0	0	1	0
Lane Assignment							L				TR				LT	
Volume (V), veh/h					0	15		324	0		367	35	0	427	199	
Percent Heavy Vehicles, %					11	11		11	3		3	3	8	8	8	
Flow Rate (v _{PCE}), pc/h					0	20		423	0		445	42	0	543	253	
Right-Turn Bypass	None				Non-Yielding				None				None			
Conflicting Lanes					1				1				1			
Pedestrians Crossing, p/h					0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

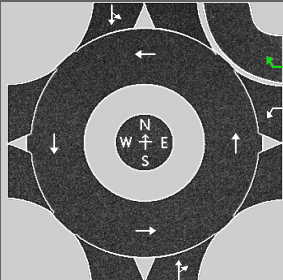
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s					4.9763			4.9763			4.9763	
Follow-Up Headway, s					2.6087			2.6087			2.6087	

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					20	423		487			796	
Entry Volume, veh/h					18	381		473			737	
Circulating Flow (v_c), pc/h	816			445			543			20		
Exiting Flow (v_{ex}), pc/h	585			0			445			273		
Capacity (C_{pce}), pc/h					877			793			1352	
Capacity (c), veh/h					790			770			1252	
v/c Ratio (x)					0.02			0.61			0.59	

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					4.8			14.9			9.8	
Lane LOS					A	A		B			A	
95% Queue Length, Q ₉₅ (veh)					0.1			4.3			4.0	
95% Queue Length, Q ₉₅ (ft)					2.7			110.1			100.0	
Approach Delay, s/veh LOS				0.2		A	14.9		B	9.8		A
Intersection Delay, s/veh LOS	8.9						A					

HCS Roundabouts Report																	
General Information									Site Information								
Analyst	Jeremy Adato								Intersection			LOR-57-11.75 (SR 82)					
Agency or Co.	ODOT D3								E/W Street Name			SR 82					
Date Performed	8/29/2024								N/S Street Name			SR 57					
Analysis Year	2024								Analysis Time Period, hrs			0.25					
Time Analyzed	PM Peak								Peak Hour Factor			0.92					
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	0	0	0	1	0	0	0	0	1	0	0	0	1	0	
Lane Assignment							L				TR				LT		
Volume (V), veh/h					0	32		423	0		316	34	0	361	494		
Percent Heavy Vehicles, %					11	11		11	3		3	3	8	8	8		
Flow Rate (v _{PCE}), pc/h					0	39		510	0		354	38	0	424	580		
Right-Turn Bypass	None				Non-Yielding				None				None				
Conflicting Lanes					1				1				1				
Pedestrians Crossing, p/h					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			
Follow-Up Headway, s						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						39	510			392				1004			
Entry Volume, veh/h						35	459			381				930			
Circulating Flow (v _c), pc/h	1043				354				424				39				
Exiting Flow (v _{ex}), pc/h	462				0				354				619				
Capacity (c _{pce}), pc/h						962				895				1326			
Capacity (c), veh/h						866				869				1228			
v/c Ratio (x)						0.04				0.44				0.76			
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						4.5				9.5				15.2			
Lane LOS						A	A			A				C			
95% Queue Length, Q ₉₅ (veh)						0.1				2.3				7.7			
95% Queue Length, Q ₉₅ (ft)						2.7				58.9				192.5			
Approach Delay, s/veh LOS					0.3		A		9.5		A		15.2		C		
Intersection Delay, s/veh LOS					9.9								A				

Appendix F – ECAT Analysis





Project Information

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Existing TWSC	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		
Perform Benefit Cost Analysis?			

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-57-11.75	Rural Two-Lane Two Way Intersection	Unsignalized	SLORSR00057**C	11.75		0.05	TLORTR0140	SR-57 & SR-82
LOR-57-12.00	Rural Two-Lane Two Way Intersection	Unsignalized	SLORSR00057**C	11.8		0.05	SLORSR0008	SR-57 & Grover

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

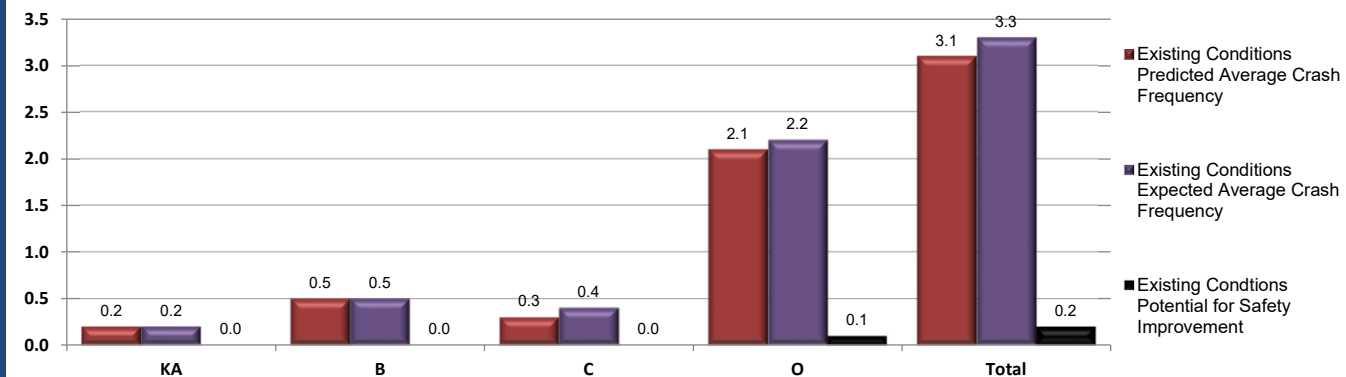


Project Safety Performance Report

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Existing TWSC	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		

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



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
N_{predicted} - Existing Conditions	0.1656	0.4799	0.3490	2.0732	3.0677
N_{expected} - Existing Conditions	0.1787	0.5182	0.3772	2.2065	3.2806
N_{potential for improvement} - Existing Conditions	0.0131	0.0383	0.0282	0.1333	0.2129

Existing Conditions: General Information and Data for Rural Two-Lane Two-Way Intersection						
General Information				Location Information		
Analyst		KMW		Route		SR57
Agency or Company		ODOT D03		Logpoint		11.75
Date Performed		09/03/24		Common Name		SR-57 & SR-82
Intersection		LOR-57-11.75		Analysis Year		2024
Signalized/Unsignalized		Unsignalized				
Input Data				Existing Conditions		HSM Base Conditions
Intersection type (3ST, 4ST, 4SG)				3ST		--
AADT _{major} (veh/day)		AADT _{MAX} = 19,500 (veh/day)		11,000		--
AADT _{minor} (veh/day)		AADT _{MAX} = 4,300 (veh/day)		4,300		--
Intersection skew angle (degrees)				Skew for Leg 1 (All):	18	0
Skew Angle Help						
Number of uncontrolled approaches with a left-turn lane (0, 1, 2, 3)				1		0
Number of uncontrolled approaches with a right-turn lane (0, 1, 2, 3)				1		0
Intersection lighting (present/not present)				Present		Not Present
Calibration Factor, C _i				0.91		1.00
Locality:				State System		

Existing Conditions: Crash Modification Factors (CMFs) for Rural Two-Lane Two-Way Intersection				
(1) CMF for Intersection Skew Angle CMF _{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF _{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF _{3i} from Table 10-14	(4) CMF for Lighting CMF _{4i} from Equation 10-24	(5) Combined CMF CMF _{COMB} (1)*(2)*(3)*(4)
1.0747	0.5600	0.8600	0.9995	0.5173

Existing Conditions: Predicted Crash Summary for Rural Two-Lane Two-Way Intersection							
(1) Crash Severity Level	(2) N _{spf} 3ST, 4ST or 4SG from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) N _{spf} 3ST, 4ST or 4SG by Severity Distribution (2) _{TOTAL} * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C _i	(8) Predicted average crash frequency, N _{predicted int} (5)*(6)*(7)
Total	4.909	0.54	1.000	4.909	0.52	0.91	2.311
Fatal and Injury (FI)	--	--	0.324	1.591	0.52	0.91	0.749
Property Damage Only (PDO)	--	--	0.676	3.317	0.52	0.91	1.562

Existing Conditions: General Information and Data for Rural Two-Lane Two-Way Intersection						
General Information				Location Information		
Analyst		KMW		Route		SR57
Agency or Company		ODOT D03		Logpoint		11.8
Date Performed		09/03/24		Common Name		SR-57 & Grover
Intersection		LOR-57-12.00		Analysis Year		2024
Signalized/Unsignalized		Unsignalized				
Input Data				Existing Conditions		HSM Base Conditions
Intersection type (3ST, 4ST, 4SG)				3ST		--
AADT _{major} (veh/day)		AADT _{MAX} = 19,500 (veh/day)		11,000		--
AADT _{minor} (veh/day)		AADT _{MAX} = 4,300 (veh/day)		100		--
Intersection skew angle (degrees)				Skew for Leg 1 (All):	17	0
Skew Angle Help						
Number of uncontrolled approaches with a left-turn lane (0, 1, 2, 3)				0		0
Number of uncontrolled approaches with a right-turn lane (0, 1, 2, 3)				0		0
Intersection lighting (present/not present)				Not Present		Not Present
Calibration Factor, C _i				0.91		1.00
Locality:				State System		

Existing Conditions: Crash Modification Factors (CMFs) for Rural Two-Lane Two-Way Intersection				
(1) CMF for Intersection Skew Angle CMF _{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF _{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF _{3i} from Table 10-14	(4) CMF for Lighting CMF _{4i} from Equation 10-24	(5) Combined CMF CMF _{COMB} (1)*(2)*(3)*(4)
1.0704	1.0000	1.0000	1.0000	1.0704

Existing Conditions: Predicted Crash Summary for Rural Two-Lane Two-Way Intersection							
(1) Crash Severity Level	(2) N _{spt} 3ST, 4ST or 4SG from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) N _{spt} 3ST, 4ST or 4SG by Severity Distribution (2) _{TOTAL} * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C _i	(8) Predicted average crash frequency, N _{predicted int} (5)*(6)*(7)
Total	0.777	0.54	1.000	0.777	1.07	0.91	0.757
Fatal and Injury (FI)	--	--	0.324	0.252	1.07	0.91	0.245
Property Damage Only (PDO)	--	--	0.676	0.525	1.07	0.91	0.512



Project Information

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed AWSC	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		
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?

No

(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)

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-57-11.75	Rural Two-Lane Two Way Intersection	Unsignalized	SLORSR00057**C	11.75		0.05	TLORTR0140	SR-57 & SR-82
LOR-57-12.00	Rural Two-Lane Two Way Intersection	Unsignalized	SLORSR00057**C	11.8		0.05	SLORSR0008	SR-57 & Grover

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		0.0090	

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	Convert minor-road stop control to all-way stop control	By Crash Type	By Crash Type	By Crash Type	By Crash Type	2 / 5 / 7 / 10
CMF 2						
CMF 3						
CMF 4						
CMF 5						
CMF 6						
CMF 7						
CMF 8						
CMF 9						
CMF 10						

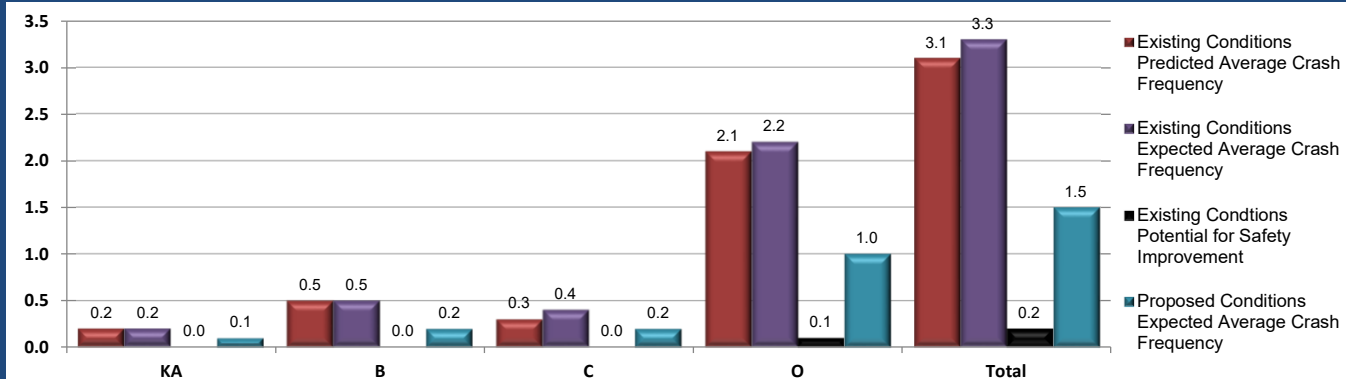


Project Safety Performance Report

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed AWSC	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		

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



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
N_{predicted} - Existing Conditions	0.1656	0.4799	0.3490	2.0732	3.0677
N_{expected} - Existing Conditions	0.1787	0.5182	0.3772	2.2065	3.2806
N_{potential for improvement} - Existing Conditions	0.0131	0.0383	0.0282	0.1333	0.2129
N_{expected} - Proposed Conditions	0.0808	0.2345	0.1706	0.9860	1.4719



Safety Benefit - Cost Analysis

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed AWSC	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		

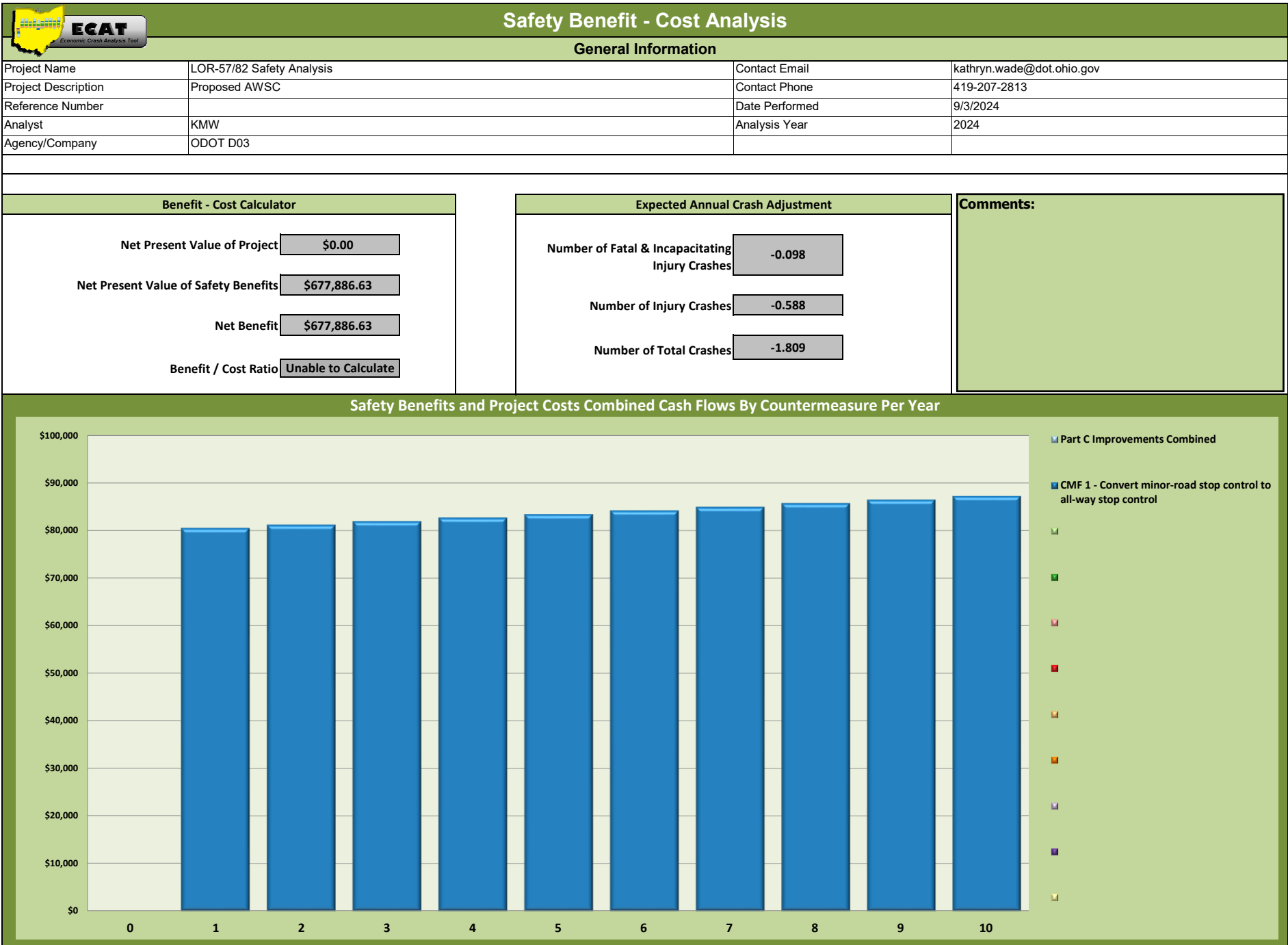
Select Site Types to be used in Benefit-Cost Analysis:

All Sites

Comments:

Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Site Characteristic Improvements (Please add description about improvements i.e. Lane widening)					\$0.00	\$0.00	0.000	\$0
Site Characteristic Improvements (Please add description about improvements i.e. Lighting)					\$0.00	\$0.00		
Site Characteristic Improvements (Please add description about improvements i.e. Signal Phasing)					\$0.00	\$0.00		
Site Characteristic Improvements (Please add description about improvements i.e. Added Right Turn Lane)					\$0.00	\$0.00		
CMF 1 - Convert minor-road stop control to all-way stop control	10				\$0.00	\$0.00	-1.809	\$677,887
					\$0.00	\$0.00	0.000	\$0
					\$0.00	\$0.00	0.000	\$0
					\$0.00	\$0.00	0.000	\$0
					\$0.00	\$0.00	0.000	\$0
					\$0.00	\$0.00	0.000	\$0
					\$0.00	\$0.00	0.000	\$0
					\$0.00	\$0.00	0.000	\$0
					\$0.00	\$0.00	0.000	\$0
					\$0.00	\$0.00	0.000	\$0
					\$0.00	\$0.00	0.000	\$0
Totals		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	-1.809	\$677,887



Existing Conditions: General Information and Data for Rural Two-Lane Two-Way Intersection						
General Information				Location Information		
Analyst		KMW		Route		SR57
Agency or Company		ODOT D03		Logpoint		11.75
Date Performed		09/03/24		Common Name		SR-57 & SR-82
Intersection		LOR-57-11.75		Analysis Year		2024
Signalized/Unsignalized		Unsignalized				
Input Data				Existing Conditions		HSM Base Conditions
Intersection type (3ST, 4ST, 4SG)				3ST		--
AADT _{major} (veh/day)		AADT _{MAX} = 19,500 (veh/day)		11,000		--
AADT _{minor} (veh/day)		AADT _{MAX} = 4,300 (veh/day)		4,300		--
Intersection skew angle (degrees)				Skew for Leg 1 (All):	18	0
Skew Angle Help						
Number of uncontrolled approaches with a left-turn lane (0, 1, 2, 3)				1		0
Number of uncontrolled approaches with a right-turn lane (0, 1, 2, 3)				1		0
Intersection lighting (present/not present)				Present		Not Present
Calibration Factor, C _i				0.91		1.00
Locality:				State System		

Existing Conditions: Crash Modification Factors (CMFs) for Rural Two-Lane Two-Way Intersection				
(1) CMF for Intersection Skew Angle CMF _{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF _{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF _{3i} from Table 10-14	(4) CMF for Lighting CMF _{4i} from Equation 10-24	(5) Combined CMF CMF _{COMB} (1)*(2)*(3)*(4)
1.0747	0.5600	0.8600	0.9995	0.5173

Existing Conditions: Predicted Crash Summary for Rural Two-Lane Two-Way Intersection							
(1) Crash Severity Level	(2) N _{spf} 3ST, 4ST or 4SG from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) N _{spf} 3ST, 4ST or 4SG by Severity Distribution (2) _{TOTAL} * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C _i	(8) Predicted average crash frequency, N _{predicted int} (5)*(6)*(7)
Total	4.909	0.54	1.000	4.909	0.52	0.91	2.311
Fatal and Injury (FI)	--	--	0.324	1.591	0.52	0.91	0.749
Property Damage Only (PDO)	--	--	0.676	3.317	0.52	0.91	1.562

Existing Conditions: General Information and Data for Rural Two-Lane Two-Way Intersection						
General Information				Location Information		
Analyst		KMW		Route		SR57
Agency or Company		ODOT D03		Logpoint		11.8
Date Performed		09/03/24		Common Name		SR-57 & Grover
Intersection		LOR-57-12.00		Analysis Year		2024
Signalized/Unsignalized		Unsignalized				
Input Data				Existing Conditions		HSM Base Conditions
Intersection type (3ST, 4ST, 4SG)				3ST		--
AADT _{major} (veh/day)		AADT _{MAX} = 19,500 (veh/day)		11,000		--
AADT _{minor} (veh/day)		AADT _{MAX} = 4,300 (veh/day)		100		--
Intersection skew angle (degrees)				Skew for Leg 1 (All):	17	
Skew Angle Help						0
Number of uncontrolled approaches with a left-turn lane (0, 1, 2, 3)				0		0
Number of uncontrolled approaches with a right-turn lane (0, 1, 2, 3)				0		0
Intersection lighting (present/not present)				Not Present		Not Present
Calibration Factor, C _i				0.91		1.00
Locality:				State System		

Existing Conditions: Crash Modification Factors (CMFs) for Rural Two-Lane Two-Way Intersection				
(1) CMF for Intersection Skew Angle CMF _{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF _{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF _{3i} from Table 10-14	(4) CMF for Lighting CMF _{4i} from Equation 10-24	(5) Combined CMF CMF _{COMB} (1)*(2)*(3)*(4)
1.0704	1.0000	1.0000	1.0000	1.0704

Existing Conditions: Predicted Crash Summary for Rural Two-Lane Two-Way Intersection							
(1) Crash Severity Level	(2) N _{spt} 3ST, 4ST or 4SG from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) N _{spt} 3ST, 4ST or 4SG by Severity Distribution (2) _{TOTAL} * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C _i	(8) Predicted average crash frequency, N _{predicted int} (5)*(6)*(7)
Total	0.777	0.54	1.000	0.777	1.07	0.91	0.757
Fatal and Injury (FI)	--	--	0.324	0.252	1.07	0.91	0.245
Property Damage Only (PDO)	--	--	0.676	0.525	1.07	0.91	0.512



Project Information

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed Signal	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		
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-57-11.75	Rural Two-Lane Two Way Intersection	Signalized	SLORSR00057**C	11.75		0.05	TLORTR0140	SR-57 & SR-82

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

	Year	AADT	
Present ADT (PADT)	2030	9,700	veh / day
Future ADT (FADT)	2050	11,500	veh / day
Annual Linear Growth Rate		0.0093	

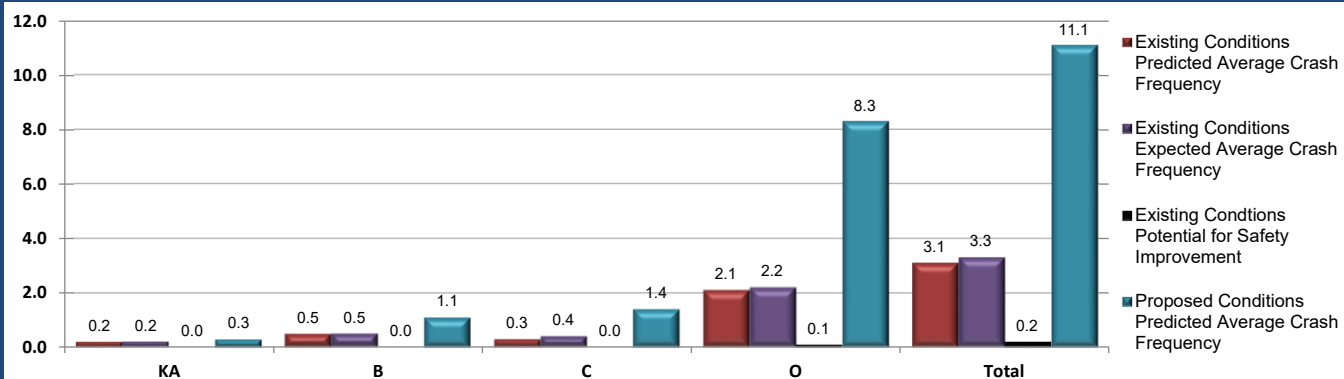


Project Safety Performance Report

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed Signal	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		

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



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
N_{predicted} - Existing Conditions	0.1656	0.4799	0.3490	2.0732	3.0677
N_{expected} - Existing Conditions	0.1787	0.5182	0.3772	2.2065	3.2806
N_{potential for improvement} - Existing Conditions	0.0131	0.0383	0.0282	0.1333	0.2129
N_{expected} - Proposed Conditions	0.2595	1.1033	1.3944	8.3336	11.0908

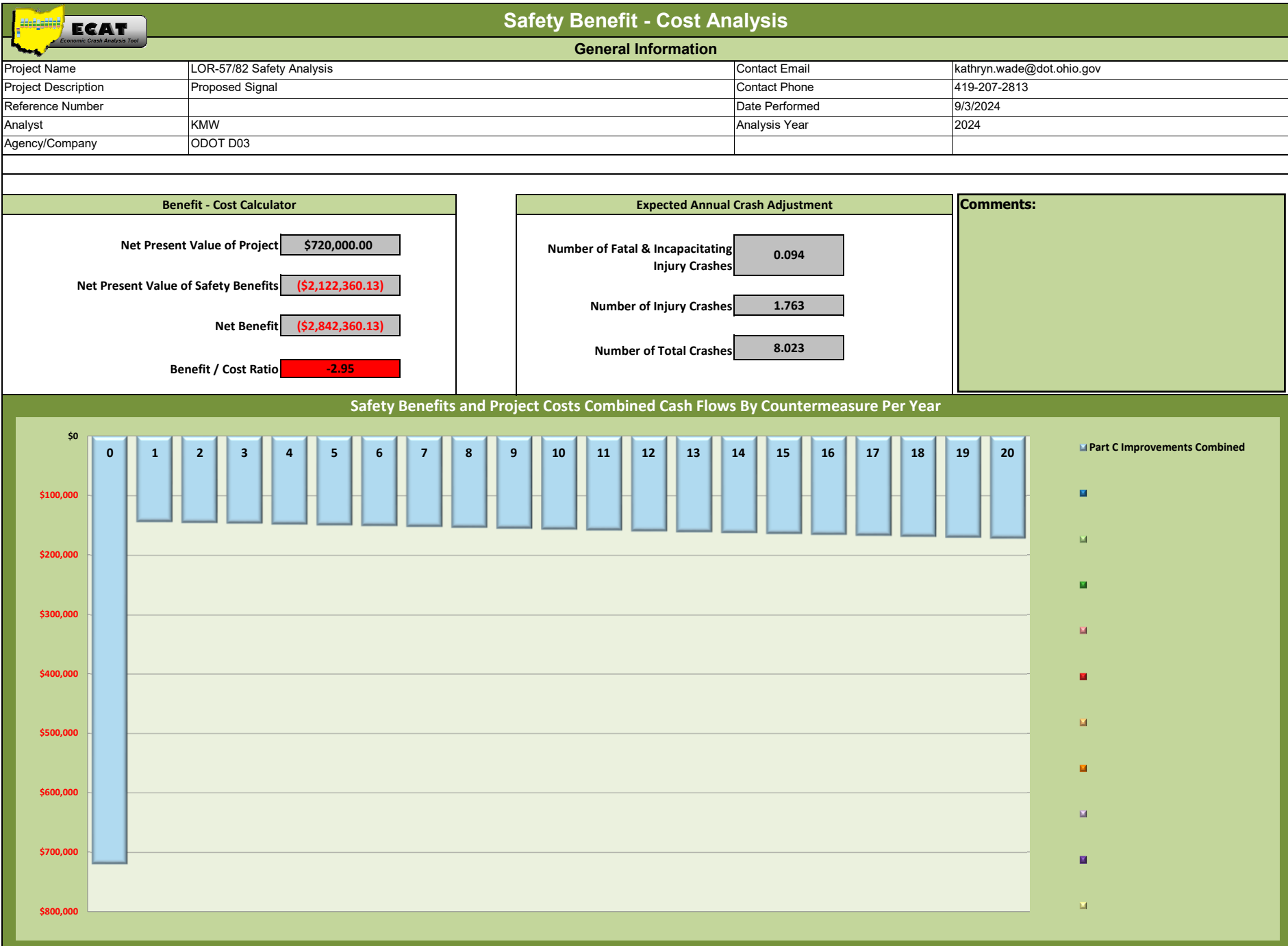


Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed Signal	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		

Comments:

Countermeasure Service Lives, Costs, and Safety Benefits

Created by the Office of Systems Planning and Program Management



Proposed Conditions: General Information and Data for Rural Two-Lane Two-Way Intersection									
General Information					Location Information				
Analyst		KMW			Route		SR57		
Agency or Company		ODOT D03			Logpoint		11.75		
Date Performed		09/03/24			Common Name		SR-57 & SR-82		
Intersection		LOR-57-11.75			Analysis Year		2024		
Signalized/Unsignalized		Signalized							
Input Data					Proposed Conditions			HSM Base Conditions	
Intersection type (3ST, 4ST, 4SG)					4SG			--	
AADT _{major} (veh/day)		AADT _{MAX} = 25,200 (veh/day)			11,000			--	
AADT _{minor} (veh/day)		AADT _{MAX} = 12,500 (veh/day)			4,300			--	
Intersection skew angle (degrees)					Skew for Leg 1 (All):	18	Skew for Leg 2 (4ST only):	0	
Skew Angle Help		Does skew differ for minor legs? Else, No.		No					
Number of signalized approaches with a left-turn lane (0, 1, 2, 3, 4)					1			0	
Number of signalized approaches with a right-turn lane (0, 1, 2, 3, 4)					1			0	
Intersection lighting (present/not present)					Present			Not Present	
Calibration Factor, C _i					1.68			1.00	
Locality:					State System				

Proposed Conditions: Crash Modification Factors (CMFs) for Rural Two-Lane Two-Way Intersection				
(1) CMF for Intersection Skew Angle CMF _{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF _{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF _{3i} from Table 10-14	(4) CMF for Lighting CMF _{4i} from Equation 10-24	(5) Combined CMF CMF _{COMB} (1)*(2)*(3)*(4)
1.0000	0.8200	0.9600	0.9999	0.7871

Proposed Conditions: Predicted Crash Summary for Rural Two-Lane Two-Way Intersection							
(1) Crash Severity Level	(2) N _{spf} 3ST, 4ST or 4SG from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) N _{spf} 3ST, 4ST or 4SG by Severity Distribution (2) _{TOTAL} * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C _i	(8) Predicted average crash frequency, N _{predicted int} (5)*(6)*(7)
Total	8.387	0.11	1.000	8.387	0.79	1.68	11.091
Fatal and Injury (FI)	--	--	0.249	2.085	0.79	1.68	2.757
Property Damage Only (PDO)	--	--	0.751	6.302	0.79	1.68	8.334



Project Information

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed Roundabout (No Slip Lane + Grover)	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		
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-57-11.75	Roundabout	Unsignalized	SLORSR00057**C	11.75		0.05	TLORTR0140	SR-57 & SR-82 + Grover

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

	Year	AADT	
Present ADT (PADT)	2030	9,700	veh / day
Future ADT (FADT)	2050	11,500	veh / day
Annual Linear Growth Rate		0.0093	

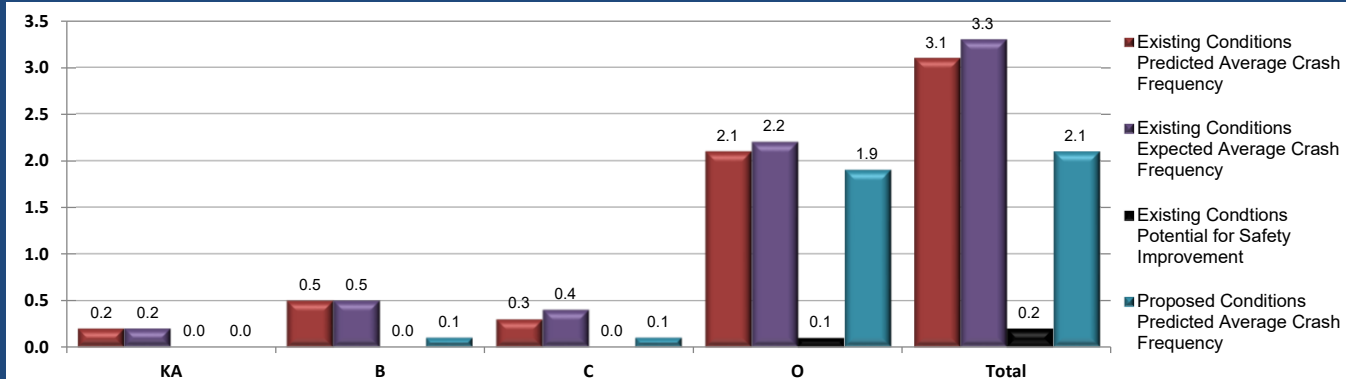


Project Safety Performance Report

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed Roundabout (No Slip Lane + Grover)	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		

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



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
N_{predicted} - Existing Conditions	0.1656	0.4799	0.3490	2.0732	3.0677
N_{expected} - Existing Conditions	0.1787	0.5182	0.3772	2.2065	3.2806
N_{potential for improvement} - Existing Conditions	0.0131	0.0383	0.0282	0.1333	0.2129
N_{expected} - Proposed Conditions	0.0100	0.0835	0.1034	1.9072	2.1041



Safety Benefit - Cost Analysis

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed Roundabout (No Slip Lane + Grover)	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		

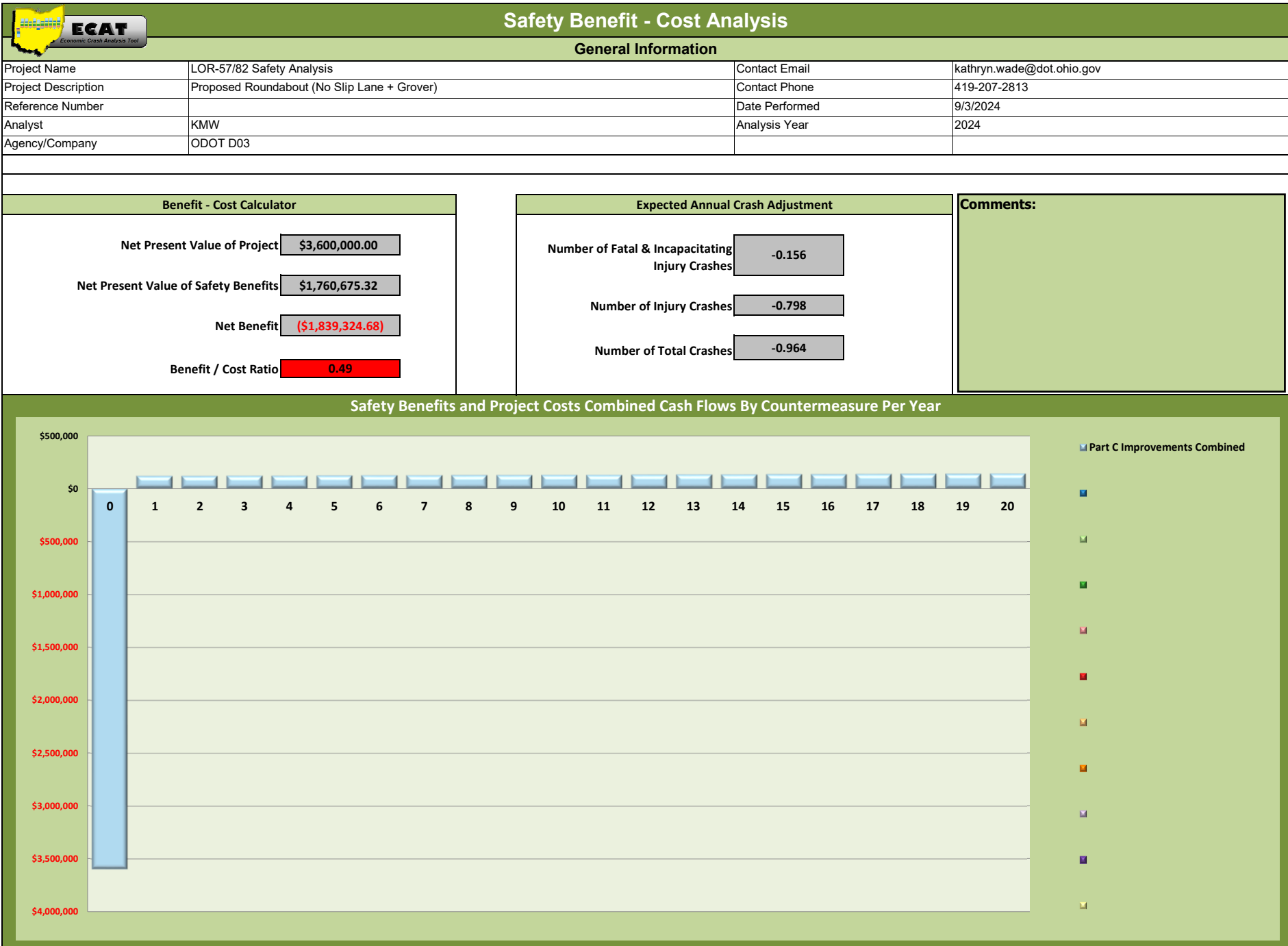
Select Site Types to be used in Benefit-Cost Analysis:

All Sites

Comments:

Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Roundabout	20	\$3,600,000.00			\$3,600,000.00	\$3,600,000.00	-0.964	\$1,760,675
		\$0.00			\$0.00	\$0.00		
		\$0.00			\$0.00	\$0.00		
		\$0.00			\$0.00	\$0.00		
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
Totals		\$3,600,000.00	\$0.00	\$0.00	\$3,600,000.00	\$3,600,000.00	-0.964	\$1,760,675



Proposed Conditions: General Information and Data for Roundabout Intersection						
General Information				Location Information		
Analyst	KMW		Route		SR57	
Agency or Company	ODOT D03		Logpoint		11.75	
Date Performed	09/03/24		Common Name		SR-57 & SR-82 + Grover	
Intersection	LOR-57-11.75		Analysis Year		2024	
Signalized/Unsignalized	Unsignalized					
Input Data			Proposed Conditions		HSM Base Conditions	
Area Type (Rural, Urban)			Rural		--	
Number of Legs (3 or 4)			4		--	
Single-Lane or Multi-lane Roundabout			Single-Lane		--	
Total Entering AADT (veh/day)			15,350		--	
					0	
Presence of Outbound Only Leg (present/not present)			Not Present		Not Present	
Calibration Factor, C _i			Varies, See Below		1.00	
Locality:			State System		--	
Leg 1	Leg 1 Entering AADT (veh/day)	AADT _{MAX} = 19,733 (veh/day)	7,300		--	
	Bypass lane (present/not present) - Leg 1		Not Present		--	
	Number of driveways or unsignalized access points - Leg 1		0		--	
	Entry width (feet) - Leg 1		20		16-25 ft	
	Number of entering lanes (1 lane, 2 lanes) - Leg 1		1		--	
Leg 2	Leg 2 Entering AADT (veh/day)	AADT _{MAX} = 19,733 (veh/day)	4,000		--	
	Bypass lane (present/not present) - Leg 2		Not Present		--	
	Number of driveways or unsignalized access points - Leg 2		1		--	
	Entry width (feet) - Leg 2		20		16-25 ft	
	Number of entering lanes (1 lane, 2 lanes) - Leg 2		1		--	
Leg 3	Leg 3 Entering AADT (veh/day)	AADT _{MAX} = 19,733 (veh/day)	4,000		--	
	Bypass lane (present/not present) - Leg 3		Not Present		--	
	Number of driveways or unsignalized access points - Leg 3		1		--	
	Entry width (feet) - Leg 3		20		16-25 ft	
	Number of entering lanes (1 lane, 2 lanes) - Leg 3		1		--	
Leg 4	Leg 4 Entering AADT (veh/day)	AADT _{MAX} = 19,733 (veh/day)	50		--	
	Bypass lane (present/not present) - Leg 4		Not Present		--	
	Number of driveways or unsignalized access points - Leg 4		0		--	
	Entry width (feet) - Leg 4		20		16-25 ft	
	Number of entering lanes (1 lane, 2 lanes) - Leg 4		1		--	

Proposed Conditions: Crash Modification Factors (CMFs) for Roundabout Intersection								
Crash Severity Level	Inscribed Circle CMF	Outbound Only Leg CMF	Leg CMFs					Combined CMF
			Leg 1 CMF	Leg 2 CMF	Leg 3 CMF	Leg 4 CMF	Total CMF Legs	
Fatal and Injury (FI)	1.00	0.43	1.00	1.07	1.07	1.00	1.04	0.44
Property Damage Only (PDO)	1.00	1.00	1.00	1.09	1.09	1.00	1.05	1.05

Proposed Conditions: Predicted Crash Summary for Roundabout Intersection

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients			N _{spf int}	Overdispersion Parameter, k	Combined CMFs	Calibration Factor, C _i	Predicted average crash frequency, N _{predicted int}
	from Table 11-7 or 11-8					from (6) of Worksheet 2B		
	a	b	c			from Equation 11-11 or 11-12		from Table 11-7 or 11-8
Total	--	--	--	--	--	--	--	2.125
Fatal and Injury (FI)	-3.503	0.915	0.206	0.450	0.33	0.44	1.00	0.199
Property Damage Only (PDO)	-1.475	0.702	0.168	1.84	0.80	1.05	1.00	1.927



Project Information

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed Roundabout (Slip Lane + Grover)	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		
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-57-11.75	Roundabout	Unsignalized	SLORSR00057**C	11.75		0.05	TLORTR0140	SR-57 & SR-82 + Grover

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

	Year	AADT	
Present ADT (PADT)	2030	9,700	veh / day
Future ADT (FADT)	2050	11,500	veh / day
Annual Linear Growth Rate		0.0093	

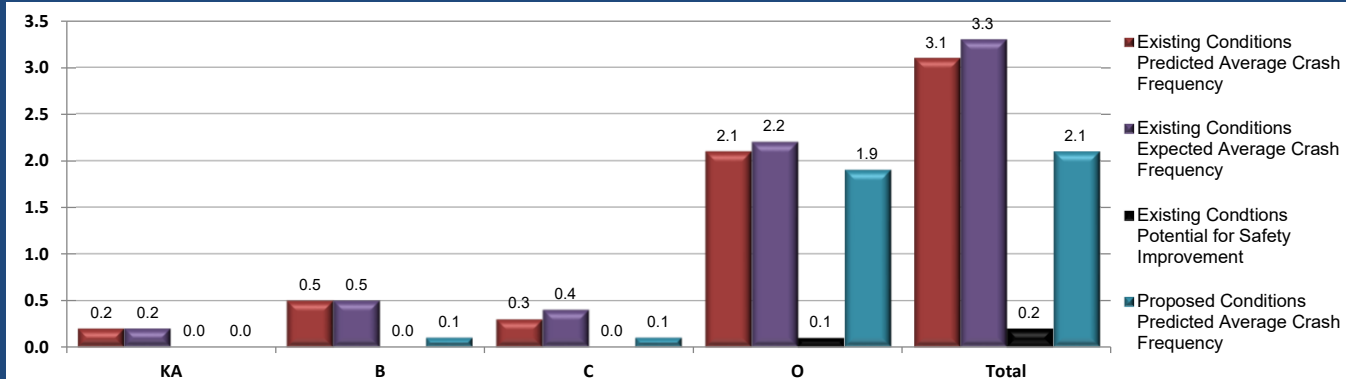


Project Safety Performance Report

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed Roundabout (Slip Lane + Grover)	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		

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



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
N_{predicted} - Existing Conditions	0.1656	0.4799	0.3490	2.0732	3.0677
N_{expected} - Existing Conditions	0.1787	0.5182	0.3772	2.2065	3.2806
N_{potential for improvement} - Existing Conditions	0.0131	0.0383	0.0282	0.1333	0.2129
N_{expected} - Proposed Conditions	0.0081	0.0685	0.0849	1.9072	2.0687



Safety Benefit - Cost Analysis

General Information

Project Name	LOR-57/82 Safety Analysis	Contact Email	kathryn.wade@dot.ohio.gov
Project Description	Proposed Roundabout (Slip Lane + Grover)	Contact Phone	419-207-2813
Reference Number		Date Performed	9/3/2024
Analyst	KMW	Analysis Year	2024
Agency/Company	ODOT D03		

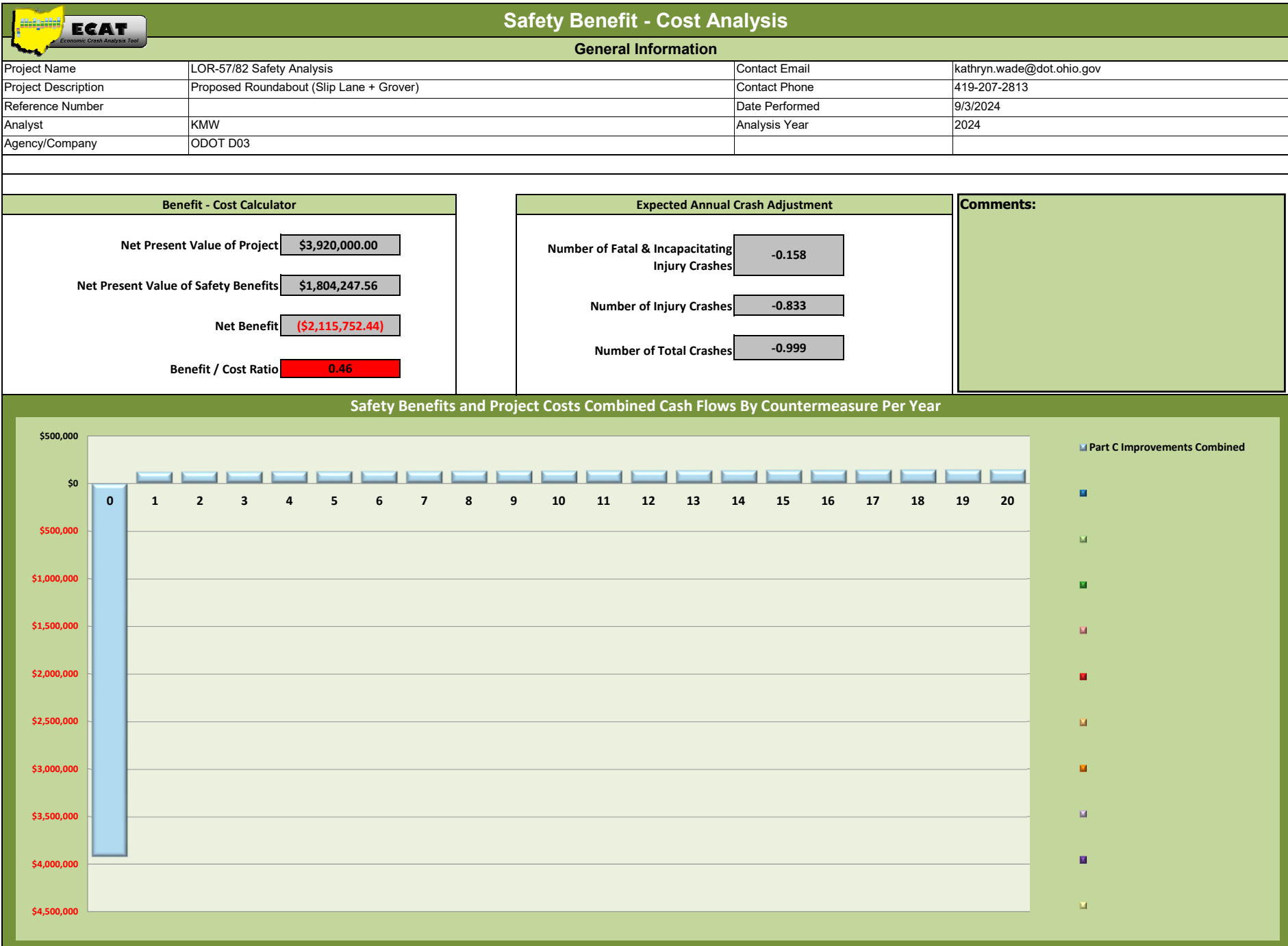
Select Site Types to be used in Benefit-Cost Analysis:

All Sites

Comments:

Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Roundabout	20	\$3,920,000.00			\$3,920,000.00	\$3,920,000.00	-0.999	\$1,804,248
		\$0.00			\$0.00	\$0.00		
		\$0.00			\$0.00	\$0.00		
		\$0.00			\$0.00	\$0.00		
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
Totals		\$3,920,000.00	\$0.00	\$0.00	\$3,920,000.00	\$3,920,000.00	-0.999	\$1,804,248



Proposed Conditions: General Information and Data for Roundabout Intersection						
General Information				Location Information		
Analyst	KMW		Route		SR57	
Agency or Company	ODOT D03		Logpoint		11.75	
Date Performed	09/03/24		Common Name		SR-57 & SR-82 + Grover	
Intersection	LOR-57-11.75		Analysis Year		2024	
Signalized/Unsignalized	Unsignalized					
Input Data			Proposed Conditions		HSM Base Conditions	
Area Type (Rural, Urban)			Rural		--	
Number of Legs (3 or 4)			4		--	
Single-Lane or Multi-lane Roundabout			Single-Lane		--	
Total Entering AADT (veh/day)			15,350		--	
					0	
Presence of Outbound Only Leg (present/not present)			Not Present		Not Present	
Calibration Factor, C _i			Varies, See Below		1.00	
Locality:			State System		--	
Leg 1	Leg 1 Entering AADT (veh/day)	AADT _{MAX} = 19,733 (veh/day)	7,300		--	
	Bypass lane (present/not present) - Leg 1		Not Present		--	
	Number of driveways or unsignalized access points - Leg 1		0		--	
	Entry width (feet) - Leg 1		20		16-25 ft	
	Number of entering lanes (1 lane, 2 lanes) - Leg 1		1		--	
Leg 2	Leg 2 Entering AADT (veh/day)	AADT _{MAX} = 19,733 (veh/day)	4,000		--	
	Bypass lane (present/not present) - Leg 2		Present		--	
	Number of driveways or unsignalized access points - Leg 2		1		--	
	Entry width (feet) - Leg 2		20		16-25 ft	
	Number of entering lanes (1 lane, 2 lanes) - Leg 2		1		--	
Leg 3	Leg 3 Entering AADT (veh/day)	AADT _{MAX} = 19,733 (veh/day)	4,000		--	
	Bypass lane (present/not present) - Leg 3		Not Present		--	
	Number of driveways or unsignalized access points - Leg 3		1		--	
	Entry width (feet) - Leg 3		20		16-25 ft	
	Number of entering lanes (1 lane, 2 lanes) - Leg 3		1		--	
Leg 4	Leg 4 Entering AADT (veh/day)	AADT _{MAX} = 19,733 (veh/day)	50		--	
	Bypass lane (present/not present) - Leg 4		Not Present		--	
	Number of driveways or unsignalized access points - Leg 4		0		--	
	Entry width (feet) - Leg 4		20		16-25 ft	
	Number of entering lanes (1 lane, 2 lanes) - Leg 4		1		--	

Proposed Conditions: Crash Modification Factors (CMFs) for Roundabout Intersection								
Crash Severity Level	Inscribed Circle CMF	Outbound Only Leg CMF	Leg CMFs					Combined CMF
			Leg 1 CMF	Leg 2 CMF	Leg 3 CMF	Leg 4 CMF	Total CMF Legs	
Fatal and Injury (FI)	1.00	0.43	1.00	0.36	1.07	1.00	0.85	0.36
Property Damage Only (PDO)	1.00	1.00	1.00	1.09	1.09	1.00	1.05	1.05

Proposed Conditions: Predicted Crash Summary for Roundabout Intersection

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients			N _{spf int}	Overdispersion Parameter, k	Combined CMFs	Calibration Factor, C _i	Predicted average crash frequency, N _{predicted int}
	from Table 11-7 or 11-8					from (6) of Worksheet 2B		
	a	b	c		from Equation 11-11 or 11-12	from Table 11-7 or 11-8		
Total	--	--	--	--	--	--	--	2.090
Fatal and Injury (FI)	-3.503	0.915	0.206	0.450	0.33	0.36	1.00	0.163
Property Damage Only (PDO)	-1.475	0.702	0.168	1.84	0.80	1.05	1.00	1.927