



Ohio Department of Transportation, District 3
2021 Signal Evaluation
Lorain County SR 82, SLM 8.08
SR 252 Intersection

By: Jared Feller

Date: February 2022



Signal Evaluation Background

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

Existing Signal

The following features are present at the existing signal constructed in 2001:

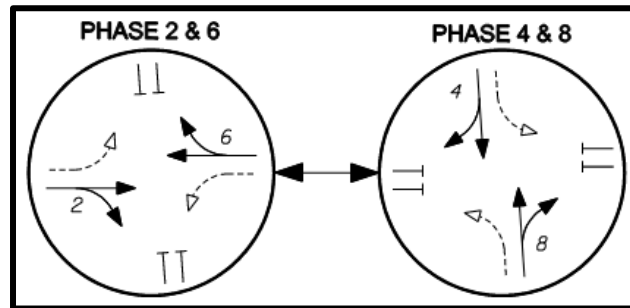
- Signal Type: Box Span
- Signal Heads: Black Polycarbonate, 12-inch LEDs with Reflective Backplates
- Controller: Ground Mounted with Battery Backup
- Turn Lanes: Left Turn Lanes (storage lengths listed below)
 - EB Approach = 120', WB Approach = 235'
 - NB Approach = 140', SB Approach = 180'
- Detection: Stop Bar (SR 82, SR 252) – Loops
Dilemma Zone (SR 82, SR 252) – Loops
- Timing: See **Table 1** below.

Table 1 – Traffic Signal Timing

DATE: 9/28/2017		OVERLAP				A	B	C	D
FLASH MODE: ALL RED		PHASES							
INTERVAL OR FEATURE		CONTROLLER MOVEMENT No.							
		1	2	3	4	5	6	7	8
INTERSECTION MOVEMENT			EB		SB		WB		NB
MINIMUM GREEN (INITIAL)	(SEC)		20		12		20		12
PASSAGE TIME (GAP)	(SEC)		3		3		3		3
MAXIMUM GREEN	(SEC)		60		40		60		40
YELLOW CHANGE	(SEC)		5		5		5		5
ALL RED CLEARANCE	(SEC)		1		1		1		1
WALK	(SEC)								
PEDESTRIAN CLEARANCE	(SEC)								
RECALL	MINIMUM (ON/OFF)	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
	MAXIMUM (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	PEDESTRIAN (ON/OFF)	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
NON-LOCK	(ON/OFF)	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
ADDED INITIAL	(SEC)								
MAXIMUM INITIAL	(SEC)								
TIME TO REDUCE	(SEC)								
TIME BEFORE REDUCTION	(SEC)								
MINIMUM GAP	(SEC)								

- Phasing: See **Figure 1** below.

Figure 1 – Phasing Diagram



- Photo: See **Image 1** below for a photograph of the intersection.



Image 1 – SR 82 & SR 252 Signal from the southwest corner (January 2022)

- Speeds: SR 82 = 45 MPH, SR 252 = 45 MPH
- Traffic: Moderate to heavy traffic volumes on SR 82 and light to moderate traffic volumes on SR 252 were observed on field visit. (mid-afternoon on 1/5/2022)
- Other Issues: No signal operation or queueing issues were observed.

Crash Data

Crashes were analyzed at the SR 82 & SR 252 intersection from January 1, 2016 through December 31, 2020. The reported crashes are summarized in **Table 2**.

Table 2 – Crash Data

YEAR		SEVERITY		TYPE		ROAD CONDITION	
2016	1 (9%)	Fatal	0 (0%)	Rear End	4 (36%)	Dry	8 (73%)
2017	5 (46%)	Injury	3 (27%)	Left Turn	4 (36%)	Wet	2 (18%)
2018	2 (18%)	PDO	8 (73%)	SS – Meeting	1 (9%)	Snow/Ice	1 (9%)
2019	2 (18%)			SS – Passing	1 (9%)		
2020	1 (9%)			Backing	1 (9%)		
TOTAL	11 (100%)						

- There were four rear end crashes reported at the intersection from 2016 – 2020. This is a reduction in the frequency of rear end crashes compared to the time frame reviewed with the previous signal evaluation (four rear end crashes from 2013 – 2015). Two rear end crashes occurred on each of the SR 82 approaches and two of the rear end crashes were caused by younger drivers (under 25 years old).
- There were four left turn crashes at the intersection from 2016 – 2020. This is a significant increase in frequency compared to the time frame reviewed with the previous signal evaluation (one left turn crashes from 2013 – 2015). Three of the left turn crashes were caused by drivers who were westbound on SR 82. One of these was drug related and one was related to distracted driving.
- There were no angle crashes reported at the intersection from 2016 – 2020. There were two angle crashes reported during the time frame reviewed with the previous signal evaluation (2013 – 2015).
- The number of crashes in 2020 may have been affected by reduced traffic volumes due to the COVID-19 pandemic.

Supplemental Evaluations

The following additional studies were performed to ensure safe and efficient operation of the signal:

1. **Turning Movements:** A traffic count was requested to obtain updated traffic volumes for the intersection. The traffic count was performed on October 7, 2021 between the hours of 6:00 AM – 6:00 PM. The count information can be found in in **Table 3** below:

Table 3 – Turning Movement Count

Peak Hour (Start Time)	SR 252 Southbound				SR 82 Westbound				SR 252 Northbound				SR 82 Eastbound				Total
	R	T	L	Tot	R	T	L	Tot	R	T	L	Tot	R	T	L	Tot	
Total Count	857	1,026	846	2,729	742	4,051	364	5,157	414	1,091	541	2,046	499	4,305	776	5,580	15,512
AM Peak (7:15)	107	71	95	273	56	312	6	374	41	130	56	227	30	461	110	601	1,475
PM Peak (4:30)	101	171	90	362	110	580	62	752	31	119	56	206	77	472	87	636	1,956

2. **Signal Warrant:** The signal warrant was analyzed at this intersection to verify if the existing signal should be retained. 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 intersection met the following signal warrants using the 70 percent volumes for signal retention as shown in **Table 4**:

Table 4 – Signal Warrant

Warrant	Hours Needed	Hours Met	Warrant Met
1A - Eight Hour Vehicular Volumes	8	12	Yes
1B - Interruption of Continuous Traffic	8	12	Yes
1 A&B - Combination of Warrants	1A 8	12	Yes
	1B 8	12	
2 - Four Hour Volumes	4	12	Yes
3 - Peak Hour Volumes	-	-	Yes

- 3. Clearance Interval Calculation:** Appropriate yellow and all-red clearance intervals are important to safe operation of a signal. Yellow and all red clearance intervals were calculated based on current ODOT Traffic Engineering Manual (TEM) guidelines, with the exception that all calculated values were rounded up to the nearest half second. Clearance intervals were previously updated in 2017 and the current intervals are appropriate. The calculated clearance intervals are shown in **Table 5**:

Table 5 – Clearance Intervals

INTERVAL OR FEATURE	CONTROLLER MOVEMENT No.							
	1	2	3	4	5	6	7	8
INTERSECTION MOVEMENT		EB		SB		WB		NB
YELLOW CHANGE (SEC)		4.8		4.8		4.8		4.8
ALL RED CLEARANCE (SEC)		0.1		0.1		0.2		0.2
PEDESTRIAN CLEARANCE** (SEC)		17.4		18.3		19.4		16.6

**Pedestrian signals and crosswalks are not provided at the intersection. Pedestrian Clearance intervals are less than the Minimum Green + Yellow Change (25 seconds) for the eastbound and westbound movements. The Minimum Green for the northbound and southbound phases will be increased to 13.5 seconds to accommodate the pedestrian clearance.

- 4. Capacity Analysis:** Highway Capacity Software (HCS 7) was used to analyze the Level of Service (LOS) of each approach for existing timing 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 6** below:

Table 6 – Existing Intersection Level of Service by Approach

Existing Delay s/veh and (LOS)	Intersection Approach				Intersection Combined Delay
	SR 82		SR 252		
	EB	WB	NB	SB	
AM Peak	12.0 (B)	9.7 (A)	14.6 (B)	15.1 (B)	12.4 (B)
PM Peak	12.5 (B)	13.3 (B)	24.3 (C)	25.4 (C)	16.4 (B)

Signal Evaluation Recommendations

- Change Minimum Green for Phases 4 and 8 to 13.5 seconds to accommodate pedestrian clearance

The signal is operating well based on the capacity analysis and operations observed during the field review.

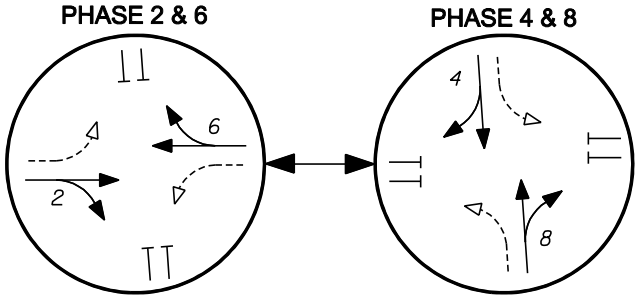
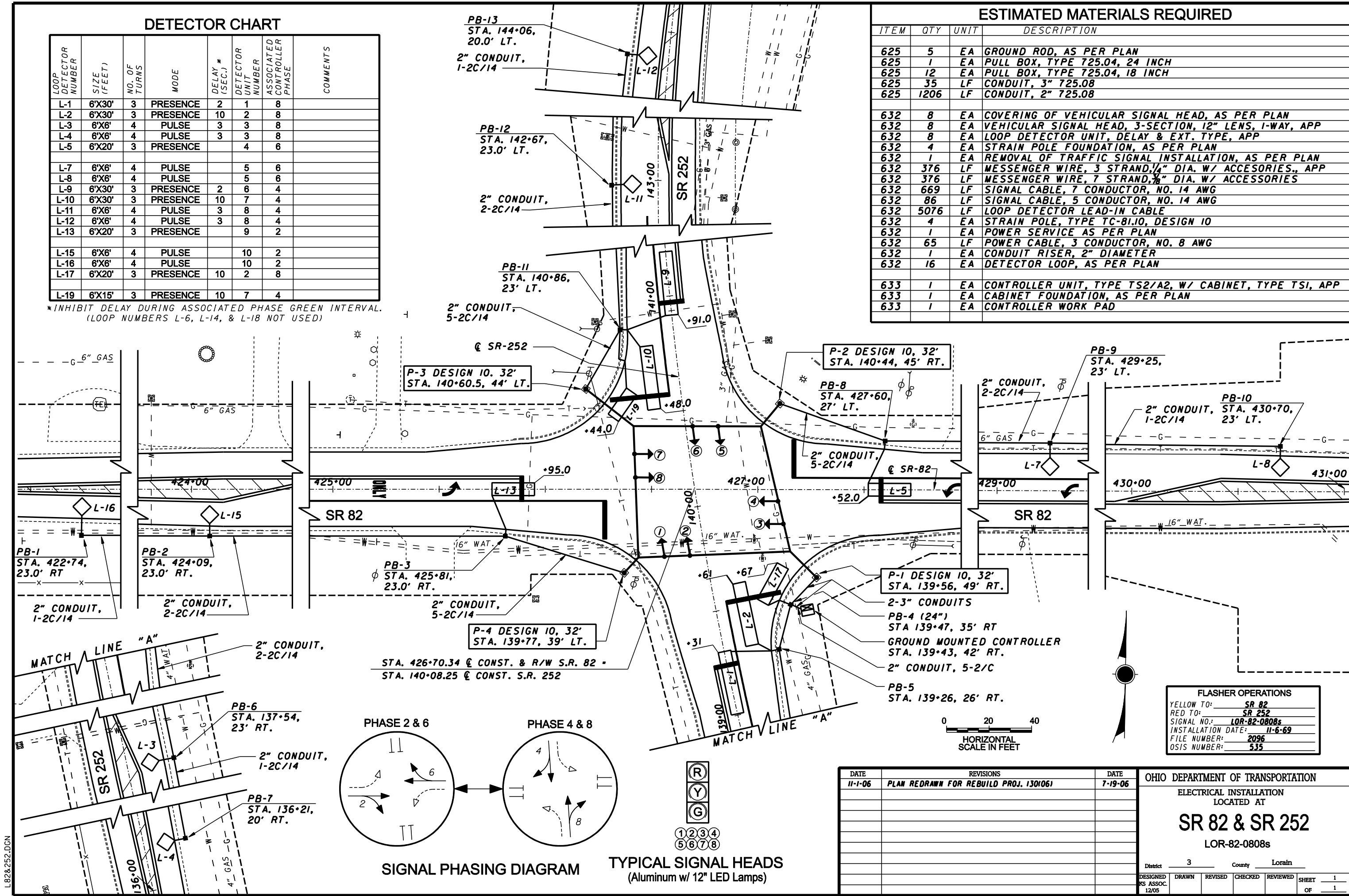
DETECTOR CHART

LOOP DETECTOR NUMBER	SIZE (FEET)	NO. OF TURNS	MODE	DELAY * (SEC.)	DETECTOR UNIT NUMBER	ASSOCIATED CONTROLLER PHASE	COMMENTS
L-1	6'X30'	3	PRESENCE	2	1	8	
L-2	6'X30'	3	PRESENCE	10	2	8	
L-3	6'X6'	4	PULSE	3	3	8	
L-4	6'X6'	4	PULSE	3	3	8	
L-5	6'X20'	3	PRESENCE		4	6	
L-7	6'X6'	4	PULSE		5	6	
L-8	6'X6'	4	PULSE		5	6	
L-9	6'X30'	3	PRESENCE	2	6	4	
L-10	6'X30'	3	PRESENCE	10	7	4	
L-11	6'X6'	4	PULSE	3	8	4	
L-12	6'X6'	4	PULSE	3	8	4	
L-13	6'X20'	3	PRESENCE		9	2	
L-15	6'X6'	4	PULSE		10	2	
L-16	6'X6'	4	PULSE		10	2	
L-17	6'X20'	3	PRESENCE	10	2	8	
L-19	6'X15'	3	PRESENCE	10	7	4	

*INHIBIT DELAY DURING ASSOCIATED PHASE GREEN INTERVAL. (LOOP NUMBERS L-6, L-14, & L-18 NOT USED)

ESTIMATED MATERIALS REQUIRED

ITEM	QTY	UNIT	DESCRIPTION
625	5	EA	GROUND ROD, AS PER PLAN
625	1	EA	PULL BOX, TYPE 725.04, 24 INCH
625	12	EA	PULL BOX, TYPE 725.04, 18 INCH
625	35	LF	CONDUIT, 3" 725.08
625	1206	LF	CONDUIT, 2" 725.08
632	8	EA	COVERING OF VEHICULAR SIGNAL HEAD, AS PER PLAN
632	8	EA	VEHICULAR SIGNAL HEAD, 3-SECTION, 12" LENS, 1-WAY, APP
632	8	EA	LOOP DETECTOR UNIT, DELAY & EXT. TYPE, APP
632	4	EA	STRAIN POLE FOUNDATION, AS PER PLAN
632	1	EA	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN
632	376	LF	MESSANGER WIRE, 3 STRAND, 1/4" DIA. W/ ACCESSORIES., APP
632	376	LF	MESSANGER WIRE, 7 STRAND, 3/8" DIA. W/ ACCESSORIES
632	669	LF	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG
632	86	LF	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG
632	5076	LF	LOOP DETECTOR LEAD-IN CABLE
632	4	EA	STRAIN POLE, TYPE TC-81.10, DESIGN 10
632	1	EA	POWER SERVICE AS PER PLAN
632	65	LF	POWER CABLE, 3 CONDUCTOR, NO. 8 AWG
632	1	EA	CONDUIT RISER, 2" DIAMETER
632	16	EA	DETECTOR LOOP, AS PER PLAN
633	1	EA	CONTROLLER UNIT, TYPE TS2/A2, W/ CABINET, TYPE TSI, APP
633	1	EA	CABINET FOUNDATION, AS PER PLAN
633	1	EA	CONTROLLER WORK PAD



SIGNAL PHASING DIAGRAM

TYPICAL SIGNAL HEADS
(Aluminum w/ 12" LED Lamps)

P-2 DESIGN 10, 32'
STA. 140+44, 45' RT.

PB-8
STA. 427+60,
27' LT.

2" CONDUIT,
5-2C/14

P-1 DESIGN 10, 32'
STA. 139+56, 49' RT.

2-3" CONDUITS
PB-4 (24")
STA 139+47, 35' RT
GROUND MOUNTED CONTROLLER
STA. 139+43, 42' RT.
2" CONDUIT, 5-2/C
PB-5
STA. 139+26, 26' RT.

PB-9
STA. 429+25,
23' LT.

PB-10
STA. 430+70,
23' LT.

FLASHER OPERATIONS	
YELLOW TO:	SR 82
RED TO:	SR 252
SIGNAL NO.:	LOR-82-0808s
INSTALLATION DATE:	11-6-69
FILE NUMBER:	2096
OSIS NUMBER:	535

DATE	REVISIONS	DATE
11-1-06	PLAN REDRAWN FOR REBUILD PROJ. 1301061	7-19-06

OHIO DEPARTMENT OF TRANSPORTATION	
ELECTRICAL INSTALLATION LOCATED AT	
SR 82 & SR 252	
LOR-82-0808s	
District	3
County	Lorain
DESIGNED	DRAWN
RS ASSOC.	REVIS
12/05	CHECKED
	REVIEWED
	SHEET 1
	OF 1

Ohio Department of Transportation



MOVING TRAFFIC FORWARD

SR 82 & SR 252 - D03, Lorain, Lorain County - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	0	20	0	12	0	20	0	12	0	0	0	0	0	0	0	0
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	0.0	3.0	0.0	3.0	0.0	3.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	0	60	0	40	0	60	0	40	0	0	0	0	0	0	0	0
Max2	0	60	0	40	0	60	0	40	0	0	0	0	0	0	0	0
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	0.0	5.0	0.0	5.0	0.0	5.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Clear	0.0	1.0	0.0	1.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CRASH DIAGRAM

Lorain Co. SR-82, SLM 8.08
SR-252 Intersection
Date: 1/1/2016 - 12/31/2020

Crashes By Year

2016: 1
2017: 5
2018: 2
2019: 2
2020: 1

Total: 11

NOTES

-4 rear end
-4 left turn
-1 sideswipe passing
-1 sideswipe meeting
-1 backing

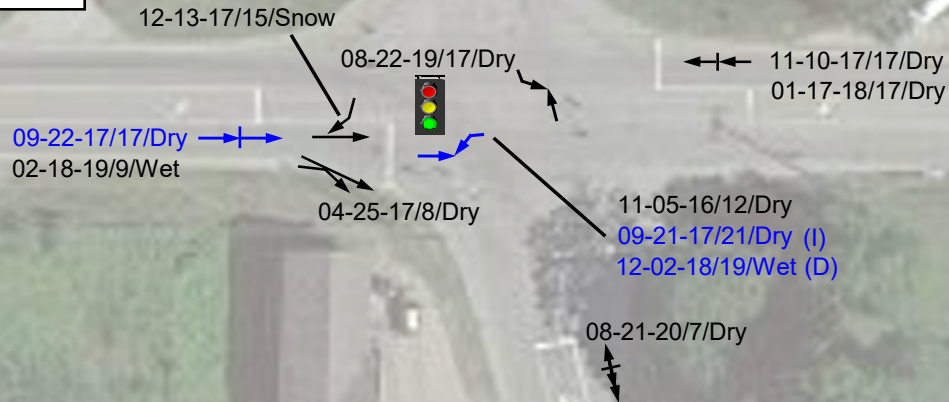
Crashes By Serverity

Fatal: 0
Injury: 3
PDO: 8



SR-252

SR-82



Legend

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

Diagram Label Key

Date/Hour/Road Condition
(I) = Alcohol, Drugs (D) = Distracted
Jacob Molnar



Ohio DOT - Traffic Operations
1606 West Broad Street

Columbus, Ohio, United States 43223
+16144667170 D03trafficcunts@dot.ohio.gov

Count Name: LOR-82-8.08
Site Code:
Start Date: 10/07/2021
Page No: 1

Turning Movement Data

Start Time	Southbound Approach					Westbound Approach					Northbound Approach					Eastbound Approach					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
6:00 AM	2	8	7	0	17	6	32	3	0	41	7	13	3	0	23	5	50	7	0	62	143
6:15 AM	18	5	8	0	31	6	53	0	0	59	10	19	6	0	35	4	58	2	0	64	189
6:30 AM	8	10	21	0	39	15	63	2	0	80	3	28	5	0	36	4	113	24	0	141	296
6:45 AM	14	11	13	0	38	9	47	0	0	56	12	30	6	0	48	6	99	14	0	119	261
Hourly Total	42	34	49	0	125	36	195	5	0	236	32	90	20	0	142	19	320	47	0	386	889
7:00 AM	31	17	10	0	58	11	63	5	0	79	7	26	19	0	52	7	80	14	0	101	290
7:15 AM	42	12	17	0	71	11	93	0	0	104	6	32	19	0	57	5	122	46	0	173	405
7:30 AM	22	30	28	0	80	16	81	3	0	100	12	34	13	0	59	7	133	30	0	170	409
7:45 AM	23	16	32	0	71	18	82	2	0	102	15	29	14	0	58	12	108	15	0	135	366
Hourly Total	118	75	87	0	280	56	319	10	0	385	40	121	65	0	226	31	443	105	0	579	1470
8:00 AM	20	13	18	0	51	11	56	1	0	68	8	35	10	0	53	6	98	19	0	123	295
8:15 AM	26	14	21	0	61	10	76	3	0	89	8	22	8	0	38	9	92	19	0	120	308
8:30 AM	10	15	22	0	47	14	48	1	0	63	8	26	8	0	42	9	92	17	0	118	270
8:45 AM	11	14	14	0	39	23	64	4	0	91	11	22	11	0	44	6	73	10	0	89	263
Hourly Total	67	56	75	0	198	58	244	9	0	311	35	105	37	0	177	30	355	65	0	450	1136
9:00 AM	14	16	5	0	35	12	59	0	0	71	10	14	5	0	29	14	81	12	0	107	242
9:15 AM	6	14	15	0	35	6	48	5	0	59	5	27	3	0	35	6	58	13	0	77	206
9:30 AM	17	11	19	0	47	17	59	1	0	77	10	16	6	0	32	5	80	9	0	94	250
9:45 AM	12	9	17	0	38	12	77	11	0	100	9	22	9	0	40	8	72	12	0	92	270
Hourly Total	49	50	56	0	155	47	243	17	0	307	34	79	23	0	136	33	291	46	0	370	968
10:00 AM	11	12	11	0	34	8	55	4	0	67	5	18	7	0	30	6	85	14	0	105	236
10:15 AM	20	10	12	0	42	10	63	6	0	79	8	18	10	0	36	9	69	6	0	84	241
10:30 AM	9	14	17	0	40	10	55	8	0	73	5	22	11	0	38	11	87	17	0	115	266
10:45 AM	11	22	11	0	44	11	63	4	0	78	8	11	8	0	27	6	71	10	0	87	236
Hourly Total	51	58	51	0	160	39	236	22	0	297	26	69	36	0	131	32	312	47	0	391	979
11:00 AM	10	21	18	0	49	18	50	4	0	72	6	19	8	0	33	7	75	10	0	92	246
11:15 AM	14	14	12	0	40	16	81	5	0	102	9	10	10	0	29	4	79	7	0	90	261
11:30 AM	13	13	10	0	36	14	59	8	0	81	9	7	14	0	30	7	73	12	0	92	239
11:45 AM	15	22	16	0	53	8	75	9	0	92	8	13	12	0	33	0	102	12	0	114	292
Hourly Total	52	70	56	0	178	56	265	26	0	347	32	49	44	0	125	18	329	41	0	388	1038
12:00 PM	17	15	29	0	61	20	81	10	0	111	5	21	11	0	37	9	69	12	0	90	299
12:15 PM	12	15	24	0	51	22	67	12	0	101	16	23	11	0	50	12	92	17	0	121	323
12:30 PM	11	21	19	0	51	16	85	13	0	114	9	18	9	0	36	12	101	6	0	119	320
12:45 PM	12	7	14	0	33	13	75	10	0	98	14	18	6	0	38	11	80	13	0	104	273
Hourly Total	52	58	86	0	196	71	308	45	0	424	44	80	37	0	161	44	342	48	0	434	1215
1:00 PM	16	19	16	0	51	12	84	5	0	101	8	17	8	0	33	13	79	17	0	109	294

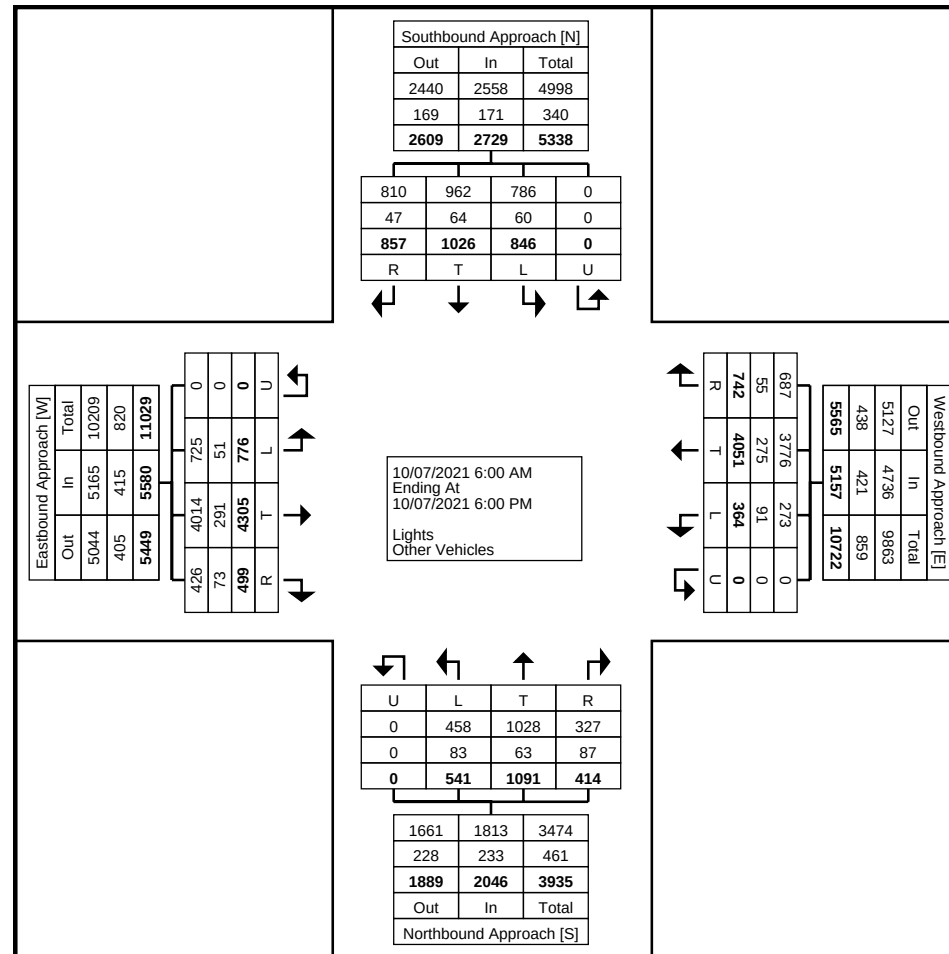
1:15 PM	15	26	24	0	65	12	87	15	0	114	6	23	16	0	45	8	68	7	0	83	307
1:30 PM	15	27	17	0	59	17	79	11	0	107	13	17	10	0	40	9	72	14	0	95	301
1:45 PM	8	22	20	0	50	17	63	11	0	91	16	23	12	0	51	15	80	25	0	120	312
Hourly Total	54	94	77	0	225	58	313	42	0	413	43	80	46	0	169	45	299	63	0	407	1214
2:00 PM	20	27	12	0	59	15	93	8	0	116	9	23	12	0	44	9	85	18	0	112	331
2:15 PM	19	24	16	0	59	14	117	11	0	142	13	20	11	0	44	13	106	13	0	132	377
2:30 PM	28	33	19	0	80	15	118	13	0	146	5	24	13	0	42	12	74	22	0	108	376
2:45 PM	17	23	26	0	66	14	111	8	0	133	8	25	18	0	51	17	99	35	0	151	401
Hourly Total	84	107	73	0	264	58	439	40	0	537	35	92	54	0	181	51	364	88	0	503	1485
3:00 PM	30	31	19	0	80	16	100	10	0	126	8	23	17	0	48	17	83	15	0	115	369
3:15 PM	16	33	15	0	64	14	116	12	0	142	6	21	12	0	39	10	85	18	0	113	358
3:30 PM	28	24	18	0	70	23	133	11	0	167	11	23	21	0	55	17	116	18	0	151	443
3:45 PM	21	40	19	0	80	20	114	13	0	147	9	26	20	0	55	11	110	22	0	143	425
Hourly Total	95	128	71	0	294	73	463	46	0	582	34	93	70	0	197	55	394	73	0	522	1595
4:00 PM	30	33	15	0	78	21	137	7	0	165	8	35	18	0	61	22	108	20	0	150	454
4:15 PM	14	38	23	0	75	26	126	13	0	165	9	27	13	0	49	9	104	16	0	129	418
4:30 PM	29	35	19	0	83	36	148	13	0	197	6	30	9	0	45	22	128	26	0	176	501
4:45 PM	24	48	23	0	95	24	145	13	0	182	4	32	16	0	52	27	112	19	0	158	487
Hourly Total	97	154	80	0	331	107	556	46	0	709	27	124	56	0	207	80	452	81	0	613	1860
5:00 PM	24	38	24	0	86	23	135	15	0	173	7	26	10	0	43	17	116	26	0	159	461
5:15 PM	24	50	24	0	98	27	152	21	0	200	14	31	21	0	66	11	116	16	0	143	507
5:30 PM	18	33	16	0	67	17	101	9	0	127	5	32	11	0	48	18	92	14	0	124	366
5:45 PM	30	21	21	0	72	16	82	11	0	109	6	20	11	0	37	15	80	16	0	111	329
Hourly Total	96	142	85	0	323	83	470	56	0	609	32	109	53	0	194	61	404	72	0	537	1663
Grand Total	857	1026	846	0	2729	742	4051	364	0	5157	414	1091	541	0	2046	499	4305	776	0	5580	15512
Approach %	31.4	37.6	31.0	0.0	-	14.4	78.6	7.1	0.0	-	20.2	53.3	26.4	0.0	-	8.9	77.2	13.9	0.0	-	-
Total %	5.5	6.6	5.5	0.0	17.6	4.8	26.1	2.3	0.0	33.2	2.7	7.0	3.5	0.0	13.2	3.2	27.8	5.0	0.0	36.0	-
Lights	810	962	786	0	2558	687	3776	273	0	4736	327	1028	458	0	1813	426	4014	725	0	5165	14272
% Lights	94.5	93.8	92.9	-	93.7	92.6	93.2	75.0	-	91.8	79.0	94.2	84.7	-	88.6	85.4	93.2	93.4	-	92.6	92.0
Other Vehicles	47	64	60	0	171	55	275	91	0	421	87	63	83	0	233	73	291	51	0	415	1240
% Other Vehicles	5.5	6.2	7.1	-	6.3	7.4	6.8	25.0	-	8.2	21.0	5.8	15.3	-	11.4	14.6	6.8	6.6	-	7.4	8.0



Ohio DOT - Traffic Operations
1606 West Broad Street

Columbus, Ohio, United States 43223
+16144667170 D03trafficcunts@dot.ohio.gov

Count Name: LOR-82-8.08
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Turning Movement Data Plot



Ohio DOT - Traffic Operations
1606 West Broad Street

Columbus, Ohio, United States 43223
+16144667170 D03trafficcounts@dot.ohio.gov

Count Name: LOR-82-8.08
Site Code:
Start Date: 10/07/2021
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Turning Movement Peak Hour Data (7:15 AM)

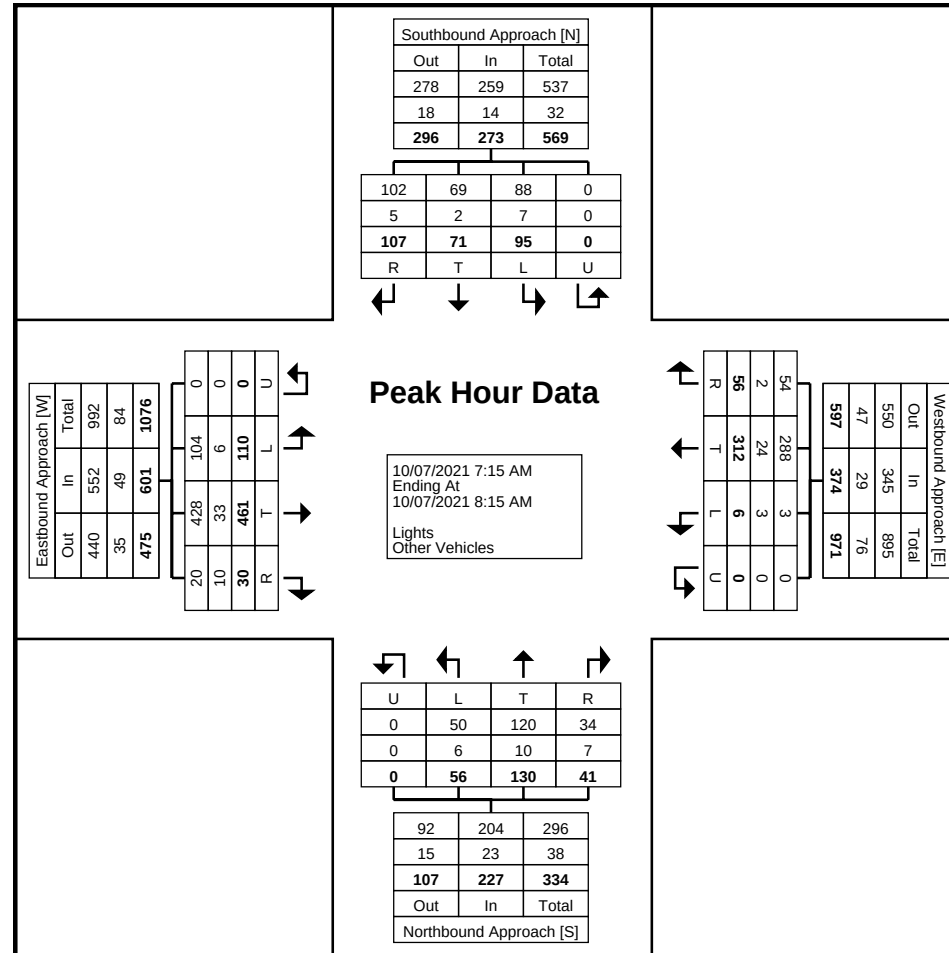
Start Time	Southbound Approach Southbound					Westbound Approach Westbound					Northbound Approach Northbound					Eastbound Approach Eastbound					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
7:15 AM	42	12	17	0	71	11	93	0	0	104	6	32	19	0	57	5	122	46	0	173	405
7:30 AM	22	30	28	0	80	16	81	3	0	100	12	34	13	0	59	7	133	30	0	170	409
7:45 AM	23	16	32	0	71	18	82	2	0	102	15	29	14	0	58	12	108	15	0	135	366
8:00 AM	20	13	18	0	51	11	56	1	0	68	8	35	10	0	53	6	98	19	0	123	295
Total	107	71	95	0	273	56	312	6	0	374	41	130	56	0	227	30	461	110	0	601	1475
Approach %	39.2	26.0	34.8	0.0	-	15.0	83.4	1.6	0.0	-	18.1	57.3	24.7	0.0	-	5.0	76.7	18.3	0.0	-	-
Total %	7.3	4.8	6.4	0.0	18.5	3.8	21.2	0.4	0.0	25.4	2.8	8.8	3.8	0.0	15.4	2.0	31.3	7.5	0.0	40.7	-
PHF	0.637	0.592	0.742	0.000	0.853	0.778	0.839	0.500	0.000	0.899	0.683	0.929	0.737	0.000	0.962	0.625	0.867	0.598	0.000	0.868	0.902
Lights	102	69	88	0	259	54	288	3	0	345	34	120	50	0	204	20	428	104	0	552	1360
% Lights	95.3	97.2	92.6	-	94.9	96.4	92.3	50.0	-	92.2	82.9	92.3	89.3	-	89.9	66.7	92.8	94.5	-	91.8	92.2
Other Vehicles	5	2	7	0	14	2	24	3	0	29	7	10	6	0	23	10	33	6	0	49	115
% Other Vehicles	4.7	2.8	7.4	-	5.1	3.6	7.7	50.0	-	7.8	17.1	7.7	10.7	-	10.1	33.3	7.2	5.5	-	8.2	7.8



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



Ohio DOT - Traffic Operations
1606 West Broad Street

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Turning Movement Peak Hour Data (4:30 PM)

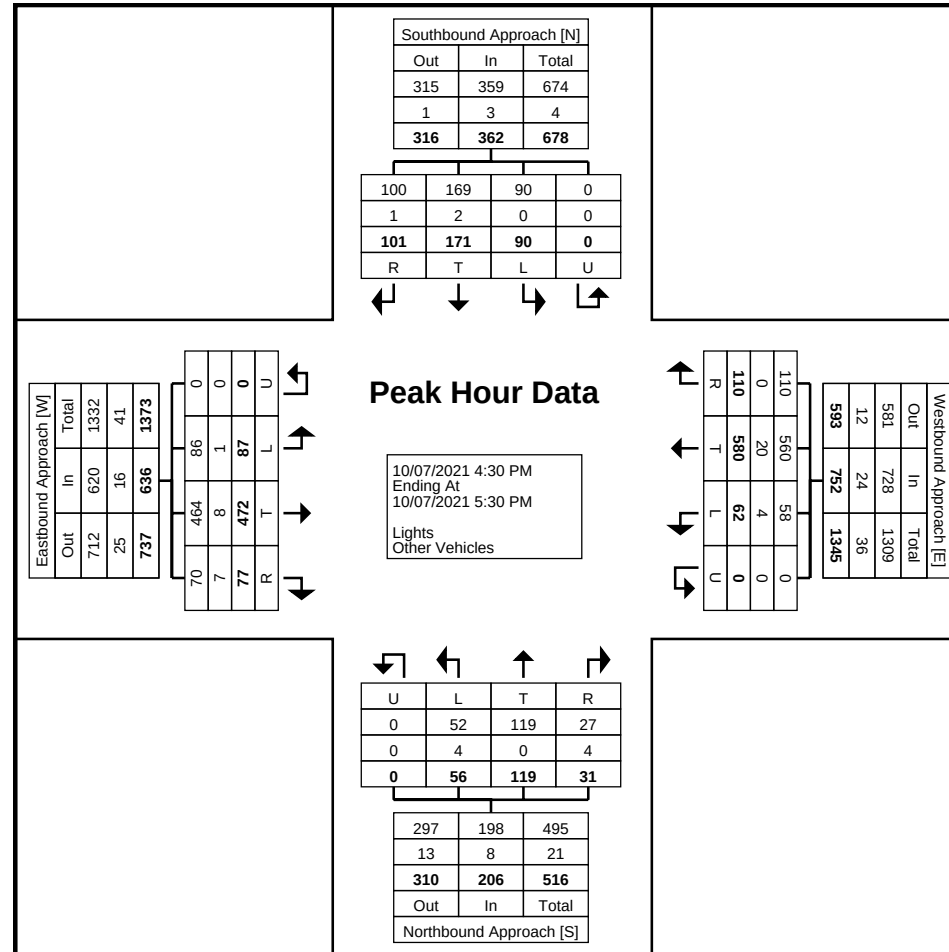
Start Time	Southbound Approach Southbound					Westbound Approach Westbound					Northbound Approach Northbound					Eastbound Approach Eastbound					Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	
4:30 PM	29	35	19	0	83	36	148	13	0	197	6	30	9	0	45	22	128	26	0	176	501
4:45 PM	24	48	23	0	95	24	145	13	0	182	4	32	16	0	52	27	112	19	0	158	487
5:00 PM	24	38	24	0	86	23	135	15	0	173	7	26	10	0	43	17	116	26	0	159	461
5:15 PM	24	50	24	0	98	27	152	21	0	200	14	31	21	0	66	11	116	16	0	143	507
Total	101	171	90	0	362	110	580	62	0	752	31	119	56	0	206	77	472	87	0	636	1956
Approach %	27.9	47.2	24.9	0.0	-	14.6	77.1	8.2	0.0	-	15.0	57.8	27.2	0.0	-	12.1	74.2	13.7	0.0	-	-
Total %	5.2	8.7	4.6	0.0	18.5	5.6	29.7	3.2	0.0	38.4	1.6	6.1	2.9	0.0	10.5	3.9	24.1	4.4	0.0	32.5	-
PHF	0.871	0.855	0.938	0.000	0.923	0.764	0.954	0.738	0.000	0.940	0.554	0.930	0.667	0.000	0.780	0.713	0.922	0.837	0.000	0.903	0.964
Lights	100	169	90	0	359	110	560	58	0	728	27	119	52	0	198	70	464	86	0	620	1905
% Lights	99.0	98.8	100.0	-	99.2	100.0	96.6	93.5	-	96.8	87.1	100.0	92.9	-	96.1	90.9	98.3	98.9	-	97.5	97.4
Other Vehicles	1	2	0	0	3	0	20	4	0	24	4	0	4	0	8	7	8	1	0	16	51
% Other Vehicles	1.0	1.2	0.0	-	0.8	0.0	3.4	6.5	-	3.2	12.9	0.0	7.1	-	3.9	9.1	1.7	1.1	-	2.5	2.6



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

Report Title 1

Report Title 2

Report Title 3

Study Name: LOR-82_252 Warrants

Study Date : 10/25/2021

Signal Warrants - Summary

Major Street Approaches

Eastbound: SR 82

Number of Lanes : 1

Total Approach Volume: 5,580

Westbound: SR 82

Number of Lanes :1

Total Approach Volume: 5,157

Minor Street Approaches

Northbound: SR 252

Number of Lanes :1

Total Approach Volume: 2,046

Southbound: SR 252

Number of Lanes :1

Total Approach Volume: 2,729

Warrant Summary (Rural Values Apply)

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

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

Required volumes reached for 12 hours, 8 are needed

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

Required volumes reached for 12 hours, 8 are needed

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

Required 1A volumes reached for 12 hours, 8 are needed

Required 1B volumes reached for 12 hours, 8 are needed

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

Number of hours (12) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour.....Satisfied

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

Number of one hour periods (46) 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

Report Title 1

Report Title 2

Report Title 3

Study Name: LOR-82_252 Warrants

Study Date : 10/25/2021

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

12 one hour periods meet minimums.
Warrant IS met.

Site Data Required

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

Volume Requirements

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

Veh/Hr Minor = **105**

Major Road SR 82						Minor Road SR 252		
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met?
16:00 - 17:00	613	+	709	=	1322	207	331	Yes
17:00 - 18:00	537	+	609	=	1146	194	323	Yes
15:00 - 16:00	522	+	582	=	1104	197	294	Yes
14:00 - 15:00	503	+	537	=	1040	181	264	Yes
07:00 - 08:00	579	+	385	=	964	226	280	Yes
12:00 - 13:00	434	+	424	=	858	161	196	Yes
13:00 - 14:00	407	+	413	=	820	169	225	Yes
08:00 - 09:00	450	+	311	=	761	177	198	Yes
11:00 - 12:00	388	+	347	=	735	125	178	Yes
10:00 - 11:00	391	+	297	=	688	131	160	Yes
09:00 - 10:00	370	+	307	=	677	136	155	Yes
06:00 - 07:00	386	+	236	=	622	142	125	Yes
05:45 - 06:45	267	+	180	=	447	94	87	No
05:30 - 06:30	126	+	100	=	226	58	48	No
05:15 - 06:15	62	+	41	=	103	23	17	No
18:30 - 19:30	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
18:15 - 19:15	0	+	0	=	0	0	0	No
18:00 - 19:00	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
21:15 - 22:15	0	+	0	=	0	0	0	No
21:30 - 22:30	0	+	0	=	0	0	0	No
22:15 - 23:15	0		0		0	0	0	No

Report Title 1

Report Title 2

Report Title 3

Study Name: LOR-82_252 Warrants

Study Date : 10/25/2021

Warrant 1B - Interruption of Continuous Traffic

Description

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

Summary

12 one hour periods meet minimums.
Warrant IS met.

Site Data Required

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

Volume Requirements

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

Veh/Hr Minor = **52**

Major Road SR 82						Minor Road SR 252		
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met?
16:00 - 17:00	613	+	709	=	1322	207	331	Yes
17:00 - 18:00	537	+	609	=	1146	194	323	Yes
15:00 - 16:00	522	+	582	=	1104	197	294	Yes
14:00 - 15:00	503	+	537	=	1040	181	264	Yes
07:00 - 08:00	579	+	385	=	964	226	280	Yes
12:00 - 13:00	434	+	424	=	858	161	196	Yes
13:00 - 14:00	407	+	413	=	820	169	225	Yes
08:00 - 09:00	450	+	311	=	761	177	198	Yes
11:00 - 12:00	388	+	347	=	735	125	178	Yes
10:00 - 11:00	391	+	297	=	688	131	160	Yes
09:00 - 10:00	370	+	307	=	677	136	155	Yes
06:00 - 07:00	386	+	236	=	622	142	125	Yes
05:45 - 06:45	267	+	180	=	447	94	87	No
05:30 - 06:30	126	+	100	=	226	58	48	No
05:15 - 06:15	62	+	41	=	103	23	17	No
18:30 - 19:30	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
18:15 - 19:15	0	+	0	=	0	0	0	No
18:00 - 19:00	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
21:15 - 22:15	0	+	0	=	0	0	0	No
21:30 - 22:30	0	+	0	=	0	0	0	No
22:15 - 23:15	0		0		0	0	0	No

Report Title 1

Report Title 2

Report Title 3

Study Name: LOR-82_252 Warrants

Study Date : 10/25/2021

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

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

Site Data Required

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

Volume Requirements

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

Veh/Hr Minor = **84 42**

Major Road						Minor Road			
SR 82						SR 252			
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met1A?	
15:45 - 16:45	598	+	674	=	1272	210	316	Yes	
16:45 - 17:45	584	+	682	=	1266	209	346	Yes	
14:45 - 15:45	530	+	568	=	1098	193	280	Yes	
13:45 - 14:45	472	+	495	=	967	181	248	Yes	
06:45 - 07:45	563	+	339	=	902	216	247	Yes	
11:45 - 12:45	444	+	418	=	862	156	216	Yes	
07:45 - 08:45	496	+	322	=	818	191	230	Yes	
12:45 - 13:45	391	+	420	=	811	156	208	Yes	
09:45 - 10:45	396	+	319	=	715	144	154	Yes	
10:45 - 11:45	361	+	333	=	694	119	169	Yes	
08:45 - 09:45	367	+	298	=	665	140	156	Yes	
05:45 - 06:45	267		180		447	94	87	Yes	

Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	Met1B?	
15:45 - 16:45	598	+	674	=	1272	210	316	Yes	
16:45 - 17:45	584	+	682	=	1266	209	346	Yes	
14:45 - 15:45	530	+	568	=	1098	193	280	Yes	
13:45 - 14:45	472	+	495	=	967	181	248	Yes	
06:45 - 07:45	563	+	339	=	902	216	247	Yes	
11:45 - 12:45	444	+	418	=	862	156	216	Yes	
07:45 - 08:45	496	+	322	=	818	191	230	Yes	
12:45 - 13:45	391	+	420	=	811	156	208	Yes	
09:45 - 10:45	396	+	319	=	715	144	154	Yes	
10:45 - 11:45	361	+	333	=	694	119	169	Yes	
08:45 - 09:45	367	+	298	=	665	140	156	Yes	
05:45 - 06:45	267		180		447	94	87	Yes	

Report Title 1

Report Title 2

Report Title 3

Study Name: LOR-82_252 Warrants

Study Date : 10/25/2021

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.

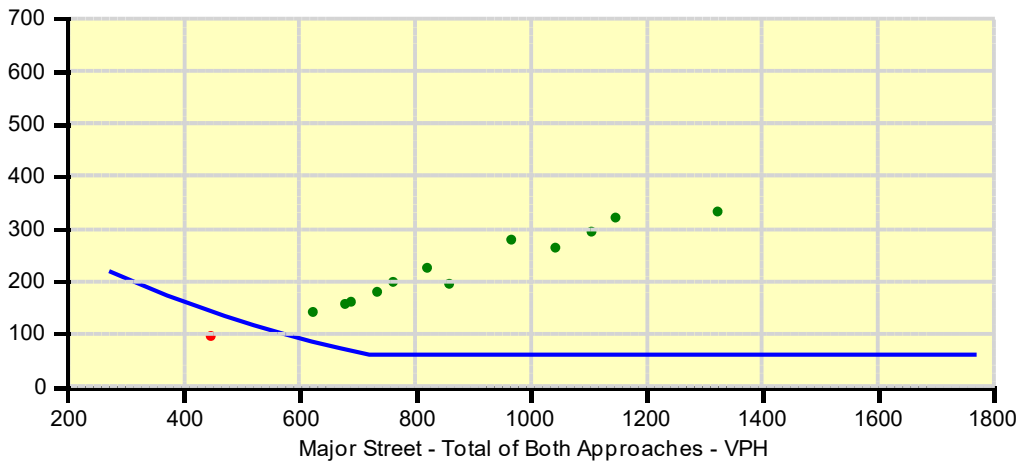
Summary

12 one hour periods meet minimums.
Warrant IS met.

Site Data Required

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

Major Road SR 82						Minor Road SR 252		Met?
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	
16:00 - 17:00	613	+	709	=	1322	207	331	Yes
17:00 - 18:00	537	+	609	=	1146	194	323	Yes
15:00 - 16:00	522	+	582	=	1104	197	294	Yes
14:00 - 15:00	503	+	537	=	1040	181	264	Yes
07:00 - 08:00	579	+	385	=	964	226	280	Yes
12:00 - 13:00	434	+	424	=	858	161	196	Yes
13:00 - 14:00	407	+	413	=	820	169	225	Yes
08:00 - 09:00	450	+	311	=	761	177	198	Yes
11:00 - 12:00	388	+	347	=	735	125	178	Yes
10:00 - 11:00	391	+	297	=	688	131	160	Yes
09:00 - 10:00	370	+	307	=	677	136	155	Yes
							125	Yes



Report Title 1

Report Title 2

Report Title 3

Study Name: LOR-82_252 Warrants

Study Date : 10/25/2021

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

46 one hour periods meet minimums.
Warrant IS met.

Site Data Required

Number of Minor Lanes = 1

Volume and Delay Requirements

Veh/Hr All Approaches = 800

Veh/Hr Minor = 100

Total Delay (Veh-Hrs) = 4

Major Road						Minor Road			
SR 82						SR 252			
Time	Total of All Approaches	Met?	Minor NB	Delay NB	Met?	Minor SB	Delay SB	Met?	Warrant Met?
16:30 - 17:30	1956	Yes	206	-	---	362	-	Yes	Yes
16:15 - 17:15	1867	Yes	189	-	---	339	-	Yes	Yes
16:00 - 17:00	1860	Yes	207	-	---	331	-	Yes	Yes
16:45 - 17:45	1821	Yes	209	-	---	346	-	Yes	Yes
15:45 - 16:45	1798	Yes	210	-	---	316	-	Yes	Yes
15:30 - 16:30	1740	Yes	220	-	---	303	-	Yes	Yes
15:15 - 16:15	1680	Yes	210	-	---	292	-	Yes	Yes
17:00 - 18:00	1663	Yes	194	-	---	323	-	Yes	Yes
15:00 - 16:00	1595	Yes	197	-	---	294	-	Yes	Yes
14:45 - 15:45	1571	Yes	193	-	---	280	-	Yes	Yes
14:15 - 15:15	1523	Yes	185	-	---	285	-	Yes	Yes
14:30 - 15:30	1504	Yes	180	-	---	290	-	Yes	Yes
14:00 - 15:00	1485	Yes	181	-	---	264	-	Yes	Yes
07:15 - 08:15	1475	Yes	227	-	---	273	-	Yes	Yes
07:00 - 08:00	1470	Yes	226	-	---	280	-	Yes	Yes
13:45 - 14:45	1396	Yes	181	-	---	248	-	Yes	Yes
07:30 - 08:30	1378	Yes	208	-	---	263	-	Yes	Yes
06:45 - 07:45	1365	Yes	216	-	---	247	-	Yes	Yes
13:30 - 14:30	1321	Yes	179	-	---	227	-	Yes	Yes
06:30 - 07:30	1252	Yes	193	-	---	206	-	Yes	Yes
13:15 - 14:15	1251	Yes	180	-	---	233	-	Yes	Yes
07:45 - 08:45	1239	Yes	191	-	---	230	-	Yes	Yes
11:45 - 12:45	1234	Yes	156	-	---	216	-	Yes	Yes
12:00 - 13:00	1215	Yes	161	-	---	196	-	Yes	Yes
13:00 - 14:00	1214	Yes	169	-	---	225	-	Yes	Yes

Report Title 1

Report Title 2

Report Title 3

Study Name: LOR-82_252 Warrants

Study Date : 10/25/2021

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.

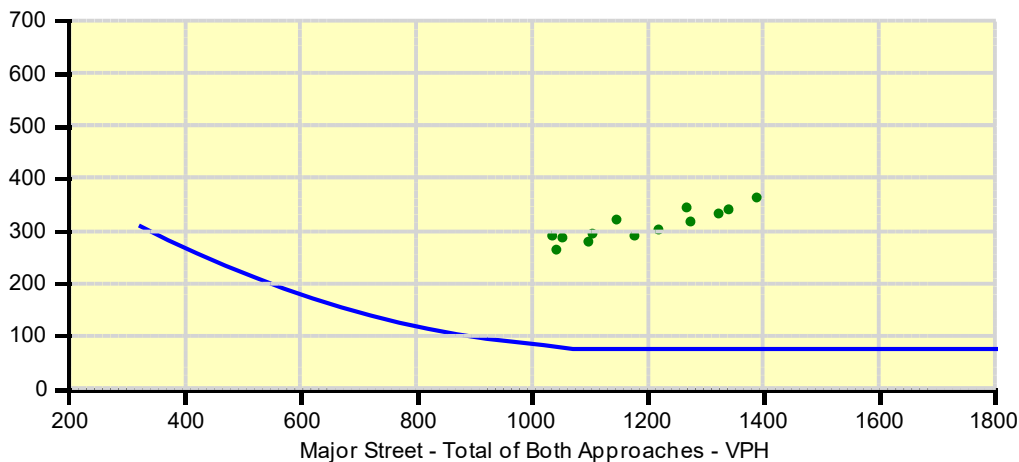
Summary

45 one hour periods meet minimums.
Warrant IS met.

Site Data Required

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

Major Road SR 82						Minor Road SR 252		Met?
Time	Major EB	+	Major WB	=	Total	Minor NB	Minor SB	
16:30 - 17:30	636	+	752	=	1388	206	362	Yes
16:15 - 17:15	622	+	717	=	1339	189	339	Yes
16:00 - 17:00	613	+	709	=	1322	207	331	Yes
15:45 - 16:45	598	+	674	=	1272	210	316	Yes
16:45 - 17:45	584	+	682	=	1266	209	346	Yes
15:30 - 16:30	573	+	644	=	1217	220	303	Yes
15:15 - 16:15	557	+	621	=	1178	210	292	Yes
17:00 - 18:00	537	+	609	=	1146	194	323	Yes
15:00 - 16:00	522	+	582	=	1104	197	294	Yes
14:45 - 15:45	530	+	568	=	1098	193	280	Yes
14:15 - 15:15	506	+	547	=	1053	185	285	Yes
							264	Yes



Associated Phase	Direction	Movement	Traffic Signal													Pedestrian														
			Factors *(TEM 403-2)								Calculated (TEM 403-2)			Final Clearance		Ped Movement	Associated Phase	Crosswalk Length	Pushbutton Provided	Distance to Pushbutton from Curb (furthest of the two corners)	OMUTCD 4E.06-12 Walk Interval (4-7s TYP)	OMUTCD 4E.06-07 Calculated Ped Clearance	Ped Change Interval (FDW)	3 fps Checks (OMUTCD 4E.06, 01-14)				Final Ped Timing		
			Posted Speed Limit	Perception/Reactio n Time (1s TYP)	Yellow Change Approach Speed*	Red Approach Speed*	Deceleration Rate (10 fps TYP)	Width of Intersection*	Length of Vehicle (20 ft TYP)	Approach Grade	Yellow	Red	Y + R	Yellow	Red									Y + R	(L+P)/(3 fps) (NOTE: P=6 IF NO PUSHBUTTON)	Walk + Ped Change Intervals + Yellow	IS Y>=X?	Additional Walk Interval Required	Final Walk Interval	Final Ped Change Interval (FDW)
				t	V _Y	V _R	a	W	L	g	Y	R	TOTAL	Y (3-6s TYP)	R (1-6s TYP)									TOTAL	X	Y				
MPH	SEC	MPH	MPH	FPS	FT	FT	%	SEC	SEC	SEC	SEC	SEC	SEC	SEC	FT	FT	SEC	SEC	SEC	SEC	SEC	SEC	SEC	SEC	SEC	SEC	SEC			
1	-	-	-	1	-	-	10	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
2	EB	THROUGH/RT	45	1	52	52	10	61	20	0	4.8	0.1	4.9	-	-	-	EB	-	61	NO	-	-	17.4	#VALUE!	22.3	-	-	#VALUE!		
3	-	-	-	1	-	-	10	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
4	SB	THROUGH/RT	45	1	52	52	10	65	20	0	4.8	0.1	4.9	-	-	-	SB	-	64	NO	-	-	18.3	#VALUE!	23.3	-	-	#VALUE!		
5	-	-	-	1	-	-	10	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
6	WB	THROUGH/RT	45	1	52	52	10	75	20	0	4.8	0.2	5.0	-	-	-	WB	-	68	NO	-	-	19.4	#VALUE!	24.7	-	-	#VALUE!		
7	-	-	-	1	-	-	10	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
8	NB	THROUGH/RT	45	1	52	52	10	72	20	0	4.8	0.2	5.0	-	-	-	NB	-	58	NO	-	-	16.6	#VALUE!	21.3	-	-	#VALUE!		

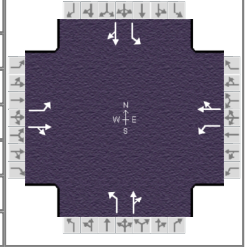
HCS7 Signalized Intersection Results Summary

General Information

Agency		Analysis Date	10/25/2021	Duration, h	0.250
Analyst		Area Type	Other	PHF	0.90
Jurisdiction		Analysis Year	2021	Analysis Period	1> 7:00
Urban Street	SR 82	File Name	LOR-82_252 AM Peak.xus		
Intersection	SR 252				
Project Description	AM Peak				

Intersection Information

Duration, h	0.250
Area Type	Other
PHF	0.90
Analysis Period	1> 7:00
File Name	LOR-82_252 AM Peak.xus



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	110	461	30	6	312	56	56	130	41	95	71	107

Signal Information

Cycle, s	44.2	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	20.0	12.2	0.0	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	5.0	5.0	0.0	0.0	0.0	0.0		
				Red	1.0	1.0	0.0	0.0	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		6.0		6.0		6.0		6.0
Phase Duration, s		26.0		26.0		18.2		18.2
Change Period, ($Y+R_c$), s		6.0		6.0		6.0		6.0
Max Allow Headway (MAH), s		4.1		4.1		4.2		4.2
Queue Clearance Time (g_s), s		15.2		14.5		9.0		10.1
Green Extension Time (g_e), s		4.6		4.6		2.1		2.1
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.00		0.00		0.00		0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	122	546		7	409		62	190		106	198	
Adjusted Saturation Flow Rate (s), veh/h/ln	930	1623		820	1597		1110	1547		1165	1518	
Queue Service Time (g_s), s	4.9	12.3		0.3	8.3		2.2	4.5		3.6	4.8	
Cycle Queue Clearance Time (g_c), s	13.2	12.3		12.5	8.3		7.0	4.5		8.1	4.8	
Green Ratio (g/C)	0.45	0.45		0.45	0.45		0.28	0.28		0.28	0.28	
Capacity (c), veh/h	410	735		308	723		348	427		365	419	
Volume-to-Capacity Ratio (X)	0.298	0.743		0.022	0.566		0.179	0.445		0.289	0.472	
Back of Queue (Q), ft/ln (95 th percentile)	37.3	129.4		2.1	83.4		21.7	57.8		36.5	58.8	
Back of Queue (Q), veh/ln (95 th percentile)	1.4	4.9		0.1	3.1		0.8	2.1		1.4	2.3	
Queue Storage Ratio (RQ) (95 th percentile)	0.31	0.00		0.01	0.00		0.16	0.00		0.20	0.00	
Uniform Delay (d_1), s/veh	13.7	10.0		15.1	8.9		16.3	13.2		16.6	13.3	
Incremental Delay (d_2), s/veh	0.4	1.5		0.0	0.7		0.2	0.7		0.4	0.8	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	14.1	11.5		15.1	9.6		16.5	13.9		17.0	14.2	
Level of Service (LOS)	B	B		B	A		B	B		B	B	
Approach Delay, s/veh / LOS	12.0	B		9.7	A		14.6	B		15.1	B	
Intersection Delay, s/veh / LOS	12.4						B					

Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.87	B		1.87	B		1.90	B		1.90	B	
Bicycle LOS Score / LOS	1.59	B		1.17	A		0.90	A		0.99	A	

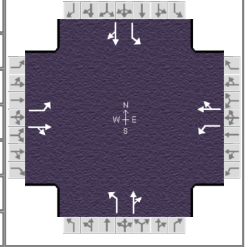
HCS7 Signalized Intersection Results Summary

General Information

Agency		Analysis Date	10/25/2021	Duration, h	0.250
Analyst		Time Period		Area Type	Other
Jurisdiction		Analysis Year	2021	PHF	0.96
Urban Street	SR 82	File Name	LOR-82_252 PM Peak.xus	Analysis Period	1 > 7:00
Intersection	SR 252				
Project Description	PM Peak				

Intersection Information

Duration, h	0.250
Area Type	Other
PHF	0.96
Analysis Period	1 > 7:00



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	87	472	77	62	580	110	56	119	31	90	171	101

Signal Information

Cycle, s	70.9	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	40.3	18.7	0.0	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	5.0	5.0	0.0	0.0	0.0	0.0		
				Red	1.0	1.0	0.0	0.0	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		6.0		6.0		6.0		6.0
Phase Duration, s		46.3		46.3		24.7		24.7
Change Period, (Y+R _c), s		6.0		6.0		6.0		6.0
Max Allow Headway (MAH), s		4.1		4.1		4.1		4.1
Queue Clearance Time (g _s), s		33.1		25.3		16.6		13.1
Green Extension Time (g _e), s		7.0		7.3		2.1		2.1
Phase Call Probability		1.00		1.00		1.00		1.00
Max Out Probability		0.09		0.04		0.00		0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	91	572		65	719		58	156		94	283	
Adjusted Saturation Flow Rate (s), veh/h/ln	727	1667		834	1661		1078	1635		1240	1628	
Queue Service Time (g _s), s	7.7	16.0		3.9	23.3		3.6	5.5		4.7	11.1	
Cycle Queue Clearance Time (g _c), s	31.1	16.0		19.9	23.3		14.6	5.5		10.2	11.1	
Green Ratio (g/C)	0.57	0.57		0.57	0.57		0.26	0.26		0.26	0.26	
Capacity (c), veh/h	276	949		388	946		217	428		330	426	
Volume-to-Capacity Ratio (X)	0.328	0.602		0.166	0.760		0.269	0.365		0.284	0.665	
Back of Queue (Q), ft/ln (95 th percentile)	55.9	195.2		30.5	267.2		41.4	89.4		58.5	177.1	
Back of Queue (Q), veh/ln (95 th percentile)	2.2	7.6		1.2	10.4		1.6	3.5		2.3	7.0	
Queue Storage Ratio (RQ) (95 th percentile)	0.47	0.00		0.13	0.00		0.30	0.00		0.32	0.00	
Uniform Delay (d ₁), s/veh	23.4	10.0		16.6	11.6		30.0	21.4		25.6	23.5	
Incremental Delay (d ₂), s/veh	0.7	0.6		0.2	1.4		0.7	0.5		0.5	1.8	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	24.1	10.6		16.8	13.0		30.6	21.9		26.0	25.2	
Level of Service (LOS)	C	B		B	B		C	C		C	C	
Approach Delay, s/veh / LOS	12.5	B		13.3	B		24.3	C		25.4	C	
Intersection Delay, s/veh / LOS	16.4						B					

Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.87	B		1.87	B		1.92	B		1.92	B	
Bicycle LOS Score / LOS	1.58	B		1.78	B		0.84	A		1.11	A	