

DEL-23-21.33 US 23 at SR 229 2020 Rural Segment Rank #177,274,276

SAFETY STUDY

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Purpose and Need

This study analyzes the intersection of US 23 and SR 229 in Delaware County. This portion of US 23 is ranked 177, 274, and 276 on ODOT's 2020 rural non-freeway segment list, and has ranked as high as 22 in recent years. It should also be noted that there were crashes resulting in fatalities at this intersection in 2014 and 2015.

The purpose of this report is to study this location and analyze the crashes to determine what, if any, actions can be taken to reduce the high percentage of left turn, rear end and angle crashes that have occurred in the study area.

In addition, ODOT is seeking to proactively implement improvements along the US 23 corridor north of the City of Delaware that will eliminate existing signals by constructing interchanges and innovative intersections. This intersection has been identified as a priority location in the US 23 Corridor Study in order to create a free-flowing connection between the Columbus and Toledo regions.

Existing Conditions

The intersection of US 23 and SR 229 is a rural 4-legged isolated signalized intersection located in northern Delaware County approximately 10 miles north of Delaware and 12 miles south of Marion. This section of US 23 is a 4-lane, divided controlled access roadway classified as a rural principal arterial with a 60 mph speed limit. North of the intersection, US 23 becomes a rural freeway with a 65 mph speed limit. SR 229 (Norton Road) is a 2-lane undivided roadway classified as a rural major collector east and west of US 23 with both legs having a 55 mph speed limit. Current daily traffic volumes are approximately 26,000 (16% trucks) on US 23 south of the intersection, 28,000 (14% trucks) on US 23 north of the intersection, 3,320 (13% trucks) on SR 229 east of US 23, and 1,580 (9% trucks) west of US 23. A 2022 turning movement count is also available in the **Appendix A** for reference.

The signalized intersection has backplates and advanced radar dilemma zone detection. There are left turn lanes for the northbound and southbound approaches, which operate as permissive only movements. Lighting for the intersection is located at the southwest and northeast corners of the intersection. Signal ahead signs are provided on the north, south and eastbound approaches and the southbound approach includes dual signal ahead signs with one having flashing LED's. In addition, there is a southbound slip ramp from US 23 to SR 229 located approximately 2550 feet north of the intersection and the speed limit reduces from 65 mph to 60 mph for southbound traffic just north of this ramp.

The study area is predominantly rural with undeveloped land, farms, cemeteries and low-density single-family residences. Undeveloped, wooded land is located in the adjacent northwest, northeast and southeast corners of the intersection. Adjacent to the southwest corner is Cox Road which provides access to two (2) single family residences. In addition, a sporting goods store is located approximately 500 feet west of the intersection on the north side of SR 229 (Norton Rd). The intersection of SR 229/Norton Waldo Road and Norton Road is located 600 feet west of the intersection where SR 229 continues to the north. The two (2) cemeteries are on the southside of SR 229 located 500 feet and 1300 feet east of US 23

respectively. The intersection of SR 229 and Brundage Road/Weiser Road is located approximately 700 feet to the east of US 23.

Recent improvements at this intersection include the removal of the prepare to stop when flashing signs, installation of advanced radar dilemma zone detection, supplementary signal heads, signal head reflective backplates, advanced LED flashing signal ahead sign for southbound traffic on US 23, and upgrading the intersection lighting to LED. In addition, yellow and all red clearance times have been evaluated and updated as needed and red light running settings were recently implemented to extend the red when vehicles do not stop.



FIGURE 1 AERIAL VIEW



FIGURE 2 NORTHBOUND APPROACH



FIGURE 3 SOUTHBOUND APPROACH



FIGURE 4 EASTBOUND APPROACH



FIGURE 5 WESTBOUND APPROACH

Data Collection

Updated traffic counts were obtained by ODOT. The counts were collected on June 9, 2022 from 6AM to 6PM. The peak hour turning movement counts, which were used to develop future volumes used for the capacity analysis, can be found in the **Appendix A**.

Crash Trends

A total of 36 crashes were reported at this intersection from 2019 to 2021, 13 (36%) resulted in injuries with 3 having serious injuries. Of these crashes, 12 (33%) were rear end, 9 (25%) were left turn, 5 (14%) were angle, and 2 (8%) were side swipe crashes. The remaining crashes include run off the road (2), right turn (1) and other (3).

Of the 12 rear end crashes, 6 occurred in the northbound direction and 6 occurred in the southbound direction. Most of the rear-end crashes occurred during the day on dry pavement under no adverse weather conditions.

Of the 9 left turn crashes, 6 crashes were as a result of southbound US 23 drivers turning left in front of northbound traffic and 3 were due to a northbound left vehicles turning in front of southbound traffic. Of the southbound crashes, 3 serious injuries were reported.

Of the 5 angle crashes, 4 were as a result of drivers on US 23 running the red light. Of these 4 crashes, 3 were in the southbound direction and 1 was in the northbound direction.

The crashes have occurred throughout the day, with an increase in the afternoon hours. Almost all of the crashes (78%) occurred in the daylight. The crashes spiked in October (22%), with the remaining crashes spread throughout the year.

The high percentage of rear end crashes indicates that the high-speed traffic on US 23 is having difficulty stopping in time for traffic that is stopped at the signalized intersection. Especially coming from the north, the US 23 and SR 229 intersection is the first signalized intersection for miles, so drivers may not expect to see a signal on this high-speed, freeway like roadway.

The crash diagram can be found below and the full crash data is available in the **Appendix B**. Also, the ECAT analysis for existing and build conditions can be found in **Appendices C and D** respectively.

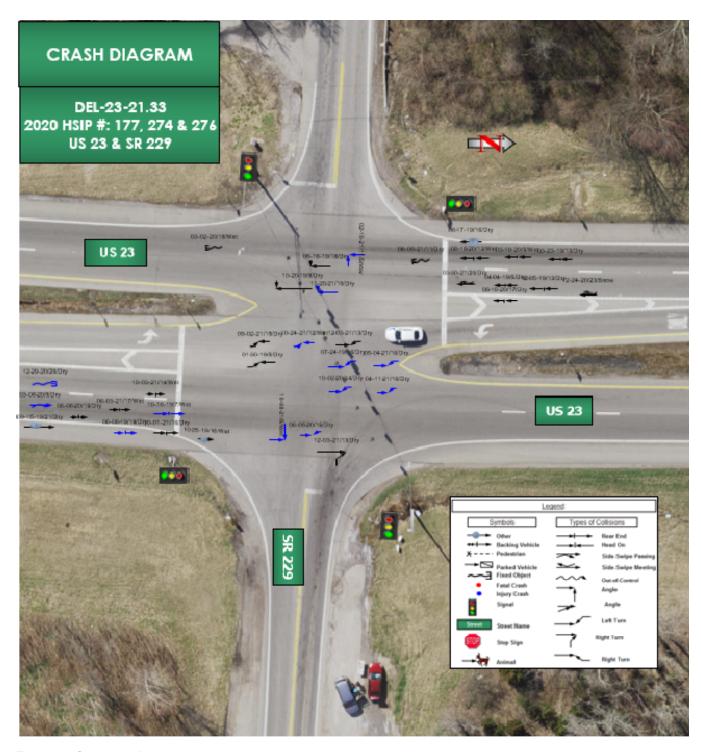


FIGURE 6 COLLISION DIAGRAM

Traffic Operations

Traffic volumes for opening year 2026 and design year 2046 were obtained from ODOT's Traffic Forecast Management System (TFMS). These volumes can be found in **Appendix E**.

A preliminary operational analysis was performed utilizing these volumes for the No Build and a Restricted Crossing U-Turn (RCUT) alternative using Highway Capacity Software (HCS). All HCS printouts can be found in **Appendix F**.

Based on the preliminary operational analysis, it was determined that the RCUT alternative would still need to be signalized to operate at an acceptable Level of Service (LOS). Therefore, an interchange type solution would be required in order to obtain acceptable LOS for design year 2046 volumes.

Conclusion and Recommendations

US 23 and SR 229 is an intersection that has a history of rear-end, left turn and angle crashes which have resulted in serious injuries and even fatalities in past years. This intersection has already had several low-cost countermeasures performed, which have been present for almost 10-years. Another short term countermeasure that could be considered is converting the northbound and southbound left turn movements from permissive to protected only movements, but this would only address the left turn crashes. Given that the same crash patterns remain and the fact that traffic volumes will continue to increase, a more long term countermeasure is needed. Based on the predicted crash reduction, corresponding safety benefit and preliminary operational analysis performed, it is recommended that the interchange alternative described under the long term countermeasures below be further analyzed, developed, designed and constructed.

Potential Short Term Countermeasures

 Convert northbound and southbound left turn movements from permissive to protected only movements.

Potential Long Term Countermeasures

- Remove existing traffic signal and construct overpass to grade separate US 23 over SR 229. Construct new ramps to the east of US 23 to provided access to/from SR 229 to northbound US 23. Modify existing ramps on the westside of US 23 to provide access to/from SR 229 to southbound US 23.
- Remove existing traffic signal and construct overpass to grade separate US 23 over SR 229. Construct right-in, right-out to the east of US 23 to provide access to/from SR 229 to northbound US 23. Modify existing ramps on the westside of US 23 to provide access to/from SR 229 to southbound US 23.

Appendices

Appendix A: Traffic Counts



Peak Hour Data for Intersection

Int ID: 21421

 Community: Zone:
 N/A

 Road 1:
 US 23
 Road 2:
 SR 229

 Road 3:
 US 23
 Road 4:
 SR 229

AM Peak Hour (06/09/2022)

✓ Articulated Trucks ✓ Bus ✓ Cars & Light Goods ✓ Motorcycles ✓ Single Units

ID 21421

	NB				EB					S	В		WB			
Start Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total
7:15 AM	4	165	2	171	0	3	10	13	8	223	1	232	19	4	13	36
7:30 AM	6	207	5	218	2	2	10	14	15	255	1	271	9	2	22	33
7:45 AM	2	176	2	180	3	5	7	15	6	213	1	220	11	10	17	38
8:00 AM	6	189	7	202	3	4	12	19	12	215	1	228	8	4	9	21
Total	18	737	16	771	8	14	39	61	41	906	4	951	47	20	61	128
App %	2%	96%	2%		13%	23%	64%		4%	95%	0%		37%	16%	48%	
PHF	0.75	0.89	0.57	0.88	0.67	0.70	0.81	0.80	0.68	0.89	1.00	0.88	0.62	0.50	0.69	0.84
HV %	11%	16%	38%	16%	13%	21%	3%	8%	22%	17%		17%	2%	10%	18%	11%
Total %	1%	39 %	1%	40%	0%	1%	2%	3%	2%	47%	0%	50%	2%	1%	3%	7%

Articulated Trucks & Bus & Cars & Light Goods & Motorcycles & Single Units

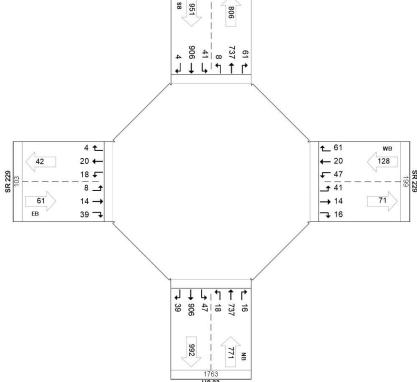
US 23

1757

88 95 1 806

06/09/2022

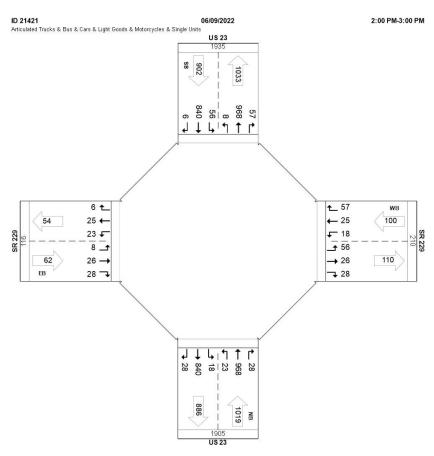
7:15 AM-8:15 AM



Midday Peak Hour (06/09/2022)

✓ Articulated Trucks ✓ Bus ✓ Cars & Light Goods ✓ Motorcycles ✓ Single Units

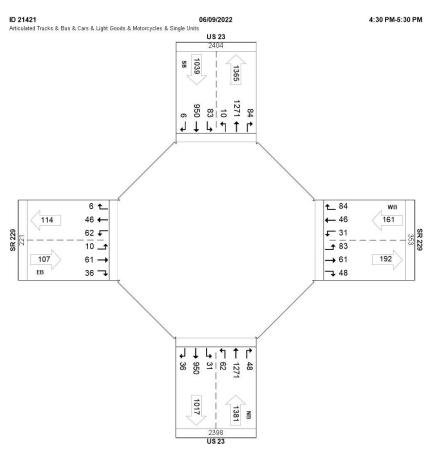
		N	IB			Е	EB SB				WB					
Start Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total
2:00 PM	5	237	6	248	1	3	12	16	14	199	0	213	3	9	14	26
2:15 PM	6	196	7	209	3	5	5	13	16	234	1	251	7	4	15	26
2:30 PM	4	252	8	264	3	6	5	14	12	209	2	223	4	6	10	20
2:45 PM	8	283	7	298	1	12	6	19	14	198	3	215	4	6	18	28
Total	23	968	28	1,019	8	26	28	62	56	840	6	902	18	25	57	100
App %	2%	95%	3%		13%	42%	45%		6%	93%	1%		18%	25%	57%	
PHF	0.72	0.86	0.88	0.85	0.67	0.54	0.58	0.82	0.88	0.90	0.50	0.90	0.64	0.69	0.79	0.89
HV %	9 %	15%	7%	15%	13%	8%	4%	6%	23%	18%	17%	18%	11%	16%	19 %	17%
Total %	1%	46%	1%	49%	0%	1%	1%	3%	3%	40%	0%	43%	1%	1%	3%	5%



PM Peak Hour (06/09/2022)

✓ Articulated Trucks ✓ Bus ✓ Cars & Light Goods ✓ Motorcycles ✓ Single Units

	NB				EB					S	В		WB			
Start Time	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total
4:30 PM	10	275	11	296	2	17	8	27	18	242	3	263	9	9	31	49
4:45 PM	23	322	13	358	3	14	10	27	24	236	1	261	5	14	14	33
5:00 PM	19	321	11	351	3	17	9	29	13	230	1	244	11	10	21	42
5:15 PM	10	353	13	376	2	13	9	24	28	242	1	271	6	13	18	37
Total	62	1,271	48	1,381	10	61	36	107	83	950	6	1,039	31	46	84	161
App %	4%	92%	3%		9 %	57%	34%		8%	91 %	1%		1 9 %	29%	52%	
PHF	0.67	0.90	0.92	0.92	0.83	0.90	0.90	0.92	0.74	0.98	0.50	0.96	0.70	0.82	0.68	0.82
HV %		8%	2%	8%	10%	2%	6%	4%	13%	12%	17%	12%	3%		6%	4%
Total %	2%	47%	2%	51%	0%	2%	1%	4%	3%	35%	0%	39%	1%	2%	3%	6 %

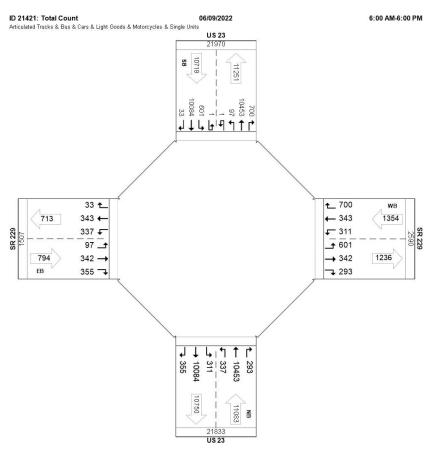


AllDay (06/09/2022)

✓ Articulated Trucks ✓ Bus ✓ Cars & Light Goods ✓ Motorcycles ✓ Single Units

	NB					EB					SB					WB				
Start Time	Left	Thru	Right	U- Turn	Total	Left	Thru	Right	U- Turn	Total	Left	Thru	Right	U- Turn	Total	Left	Thru	Right	U- Turn	Total
6:00 AM	2	90	0	0	92	0	2	8	0	10	4	187	0	0	191	5	3	9	0	17
6:15 AM	2	87	1	0	90	2	9	13	0	24	12	184	0	0	196	3	2	9	0	14
6:30 AM	3	111	1	0	115	1	4	16	0	21	8	219	0	0	227	8	4	10	0	22
6:45 AM	3	140	0	0	143	0	5	6	0	11	16	198	0	0	214	12	4	8	0	24
7:00 AM	3	126	0	0	129	3	2	9	0	14	16	221	0	0	237	12	4	13	0	29
7:15 AM	4	165	2	0	171	0	3	10	0	13	8	223	1	0	232	19	4	13	0	36
7:30 AM	6	207	5	0	218	2	2	10	0	14	15	255	1	0	271	9	2	22	0	33
7:45 AM	2	176	2	0	180	3	5	7	0	15	6	213	1	0	220	11	10	17	0	38
8:00 AM	6	189	7	0	202	3	4	12	0	19	12	215	1	0	228	8	4	9	0	21
8:15 AM	3	188	2	0	193	3	6	6	0	15	11	198	1	0	210	5	7	18	0	30
8:30 AM	4	182	3	0	189	2	4	6	0	12	6	212	1	0	219	3	10	14	0	27
8:45 AM	4	185	3	0	192	1	7	5	0	13	12	182	0	1	195	7	2	9	0	18
9:00 AM	3	176	7	0	186	3	2	5	0	10	12	223	1	0	236	2	5	10	0	17
9:15 AM	2	187	4	0	193	1	7	5	0	13	17	193	0	0	210	5	6	9	0	20
9:30 AM	3	180	2	0	185	0	6	9	0	15	13	200	2	0	215	5	9	13	0	27
9:45 AM	2	182	4	0	188	1	3	10	0	14	12	200	0	0	212	8	8	13	0	29
10:00 AM	4	199	6	0	209	0	3	1	0	4	10	180	0	0	190	8	5	19	0	32
10:15 AM	5	204	5	0	214	2	5	6	0	13	13	170	1	0	184	9	3	10	0	22
10:30 AM	6	156	6	0	168	4	5	2	0	11	7	202	1	0	210	9	5	16	0	30
10:45 AM	4	199	3	0	206	2	5	10	0	17	10	180	1	0	191	6	9	14	0	29
11:00 AM	9	210	7	0	226	0	8	2	0	10	7	184	1	0	192	3	4	8	0	15
11:15 AM	8	254	7	0	269	2	5	9	0	16	10	180	0	0	190	3	1	13	0	17
11:30 AM	9	196	4	0	209	1	8	6	0	15	9	201	0	0	210	4	1	15	0	20
11:45 AM	4	206	5	0	215	1	5	10	0	16	15	171	0	0	186	5	14	7	0	26
12:00 PM	8	188	13	0	209	1	•	6	0		11	198	1	0	210	4	3		0	20
12:15 PM	9	187	3	0	199	4	3	11	0	18	13	183	1	0	197	2	6	24	0	32
12:30 PM	7	187	15	0	209	4	9	5	0	18	6	213	2	0	221	4	9	17	0	30
12:45 PM	4	203	3	0	210	2	8	7	0	17	12	198	0	0	210	9	6	16	0	31
1:00 PM	7	207	8	0	222	1	4	6	0	11	6	194	1	0	201	5	12	10	0	27
1:15 PM	2	183	5	0	190	0	5	8	0	13	11	212	1	0	224	2	4	16	0	22
1:30 PM	4	223	8	0	235	2	7	5	0	14	17	213	0	0	230	7	12	13	0	32
1:45 PM	11	222	2	0	235	2	8	6	0	16	10	245	0	0	255	3	4	14	0	21
2:00 PM	5	237	6	0	248	1	3	12	0	16	14	199	0	0	213	3	9	14	0	26
2:15 PM	6	196	7	0	209	3	5	5	0	13	16	234	1	0	251	7	4	15	0	26
2:30 PM	4	252	8	0	264	3	6	5	0	14	12	209	2	0	223	4	6	10	0	20
2:45 PM	8	283	7	0	298	1	12	6	0	19	14	198	3	0	215	4	6	18	0	28
3:00 PM	9	230	8	0	247	0	11	7	0	18	16 15	196	0	0	212	6	16	13	0	35 27
3:15 PM	17 14	328	4	0	349	4	13	9	0	26	15	226	0	0	241	3	15	19	0	37 40
3:30 PM	14	345	11	0	370	4	8	3	0	15	13	229	0	0	242	7	9	24	0	40

			NB					EB					SB					WB		
Start Time	Left	Thru	Right	U- Turn	Total	Left	Thru	Right	U- Turn	Total	Left	Thru	Right	U- Turn	Total	Left	Thru	Right	U- Turn	Total
3:45 PM	15	302	10	0	327	2	14	4	0	20	8	258	1	0	267	3	8	23	0	34
4:00 PM	10	334	13	0	357	5	11	10	0	26	10	238	1	0	249	10	13	14	0	37
4:15 PM	7	333	11	0	351	4	12	7	0	23	19	250	0	0	269	4	13	17	0	34
4:30 PM	10	275	11	0	296	2	17	8	0	27	18	242	3	0	263	9	9	31	0	49
4:45 PM	23	322	13	0	358	3	14	10	0	27	24	236	1	0	261	5	14	14	0	33
5:00 PM	19	321	11	0	351	3	17	9	0	29	13	230	1	0	244	11	10	21	0	42
5:15 PM	10	353	13	0	376	2	13	9	0	24	28	242	1	0	271	6	13	18	0	37
5:30 PM	19	286	7	0	312	4	12	8	0	24	17	251	0	0	268	11	11	9	0	31
5:45 PM	8	261	10	0	279	3	7	6	0	16	17	199	0	0	216	13	5	19	0	37
Total	337	10,453	293	0	11,083	97	342	355	0	794	601	10,084	33	1	10,719	311	343	700	0	1,354
App %	3%	94%	3%	0%		12%	43%	45%	0%		6%	94%	0%	0%		23%	25%	52%	0%	
PHF	0.31	0.62	0.41		0.61	0.40	0.42	0.46		0.57	0.45	0.81	0.23	0.02	0.82	0.34	0.45	0.47		0.58
HV %	4%	16%	9 %		16%	18%	9 %	6%		8%	21%	17%	12%	100%	17%	9 %	11%	17%		14%
Total %	1%	44%	1%	0%	46%	0%	1%	1%	0%	3%	3%	42%	0%	0%	45%	1%	1%	3%	0%	6%



Appendix B: 2019-2021 CAM Tool

Crash Summary Sheet

Fatalities	0
Serious Injuries	3
Other Injuries	23

Crash Severity	Crashes	%
(2) Serious Injury Suspected	2	5.56%
(3) Minor Injury Suspected	6	16.67%
(4) Injury Possible	5	13.89%
(5) PDO/No Injury	23	63.89%
Grand Total	36	100.00%

Day of Week	Crashes	%
(1) Sunday	8	22.22%
(2) Monday	2	5.56%
(3) Tuesday	5	13.89%
(4) Wednesday	3	8.33%
(5) Thursday	7	19.44%
(6) Friday	6	16.67%
(7) Saturday	5	13.89%
Grand Total	36	100.00%

Hour of Day	Crashes	%
5	1	2.78%
6	2	5.56%
7	1	2.78%
9	3	8.33%
10	2	5.56%
11	2	5.56%
12	1	2.78%
13	5	13.89%
14	2	5.56%
15	1	2.78%
16	6	16.67%
17	2	5.56%
18	2	5.56%
19	2	5.56%
20	2	5.56%
21	1	2.78%
23	1	2.78%
Grand Total	36	100.00%

Crashes Per Year	12.00
Fatal and All Injury Crashes	13
Percent Injury	36.1%
Equivalent PDO Index Value	5.48

Year	Crashes	%
2019	12	33.33%
2020	10	27.78%
2021	14	38.89%
Grand Total	36	100.00%

Crash Type	Crashes	%
Rear End	12	33.33%
Left Turn	9	25.00%
Angle	5	13.89%
Fixed Object	3	8.33%
Sideswipe - Passing	3	8.33%
Other Non-Collision	3	8.33%
Right Turn	1	2.78%
Grand Total	36	100.00%

Month	Crashes	%
1	1	2.78%
2	1	2.78%
3	5	13.89%
4	2	5.56%
5	1	2.78%
6	5	13.89%
7	1	2.78%
8	4	11.11%
9	2	5.56%
10	8	22.22%
11	1	2.78%
12	5	13.89%
Grand Total	36	100.00%

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	19	52.78%
Cloudy	11	30.56%
Rain	4	11.11%
Snow	2	5.56%
Grand Total	36	100.00%

Road Condition	Crashes	%
Dry	25	69.44%
Wet	9	25.00%
Snow	2	5.56%
Grand Total	36	100.00%

Light Condition	Crashes	%
Daylight	28	77.78%
Dark - Roadway Not Lighted	6	16.67%
Dawn/Dusk	2	5.56%
Grand Total	36	100.00%

Number of Units	Crashes	%
2	26	72.22%
1	6	16.67%
3	4	11.11%
Grand Total	36	100.00%

ODOT Location	Crashes	%
Four-Way Intersection	26	72.22%
Not An Intersection	7	19.44%
5 Or More Point Intersection	2	5.56%
T-Intersection	1	2.78%
Grand Total	36	100.00%

Work Zone Related	Crashes	%
No	36	100.00%
Grand Total	36	100.00%

Alcohol Related	Crashes	%
No	35	97.22%
Yes	1	2.78%
Grand Total	36	100.00%
,		

Drug Related (Inc. Marijuana)	Crashes	%
No	36	100.00%
Grand Total	36	100.00%

Marijuana Related	Crashes	%
No	36	100.00%
Grand Total	36	100.00%

Roadway Departure	Crashes	%
No	32	88.89%
Yes	4	11.11%
Grand Total	36	100.00%

Grand Total

Crashes

1 2.78% 35 97.22% 36 100.00%

Contour Straight Grade Straight Level

Intersection Related	Crashes	%
Yes	30	83.33%
No	6	16.67%
Grand Total	36	100.00%

Speed Related	Crashes	%
No	32	88.89%
Yes	4	11.11%
Grand Total	36	100.00%

Older Driver (65+)	Crashes	%
No	29	80.56%
Yes	7	19.44%
Grand Total	36	100.00%

Young Driver (15-25)	Crashes	%
No	23	63.89%
Yes	13	36.11%
Grand Total	36	100.00%

Motorcycle Involved	Crashes	%
No	36	100.00%
Grand Total	36	100.00%

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	21	58.33%
Making Left Turn	10	27.78%
Slowing or Stopped In Traffic	3	8.33%
Changing Lanes	1	2.78%
Making Right Turn	1	2.78%
Grand Total	36	100.00%

Unit 1 Contributing Factor	Crashes	%
Following Too Closely/ACDA	12	33.33%
Failure to Yield	10	27.78%
Ran Red Light	4	11.11%
Improper Lane Change	2	5.56%
None	2	5.56%
Swerving to Avoid	1	2.78%
Drove off Road	1	2.78%
Unsafe Speed	1	2.78%
Operating Defective Equipment	1	2.78%
Improper Passing	1	2.78%
Not Discernible	1	2.78%
Grand Total	36	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	32	88.89%
Tree	1	2.78%
Traffic Sign Post	1	2.78%
Guardrail Face	1	2.78%
Ditch	1	2.78%
Grand Total	36	100.00%

Unit 1 Traffic Control	Crashes	%
Signal	24	66.67%
No Control	12	33.33%
Grand Total	36	100.00%

Unit 1 Posted Speed	Crashes	%
0	1	2.78%
55	5	13.89%
60	28	77.78%
65	2	5.56%
Grand Total	36	100.00%

Unit 1 Direction From	Crashes	%
North	20	55.56%
South	13	36.11%
East	2	5.56%
West	1	2.78%
Grand Total	36	100.00%

Helt A Discretion To	0	0/
Unit 1 Direction To	Crashes	%
South	12	33.33%
North	11	30.56%
East	8	22.22%
West	3	8.33%
Unknown	2	5.56%
Grand Total	36	100 00%

DEL-23 at 229 (2019-21) Crash Summary Sheet Unit 1 Summary

Unit 1 Type	Crashes	%
Passenger Car	15	41.67%
Sport Utility Vehicle	7	19.44%
Semi-Tractor	6	16.67%
Pick up	3	8.33%
Passenger Van (minivan)	2	5.56%
Single Unit Truck	2	5.56%
Unknown or Hit/Skip	1	2.78%
Grand Total	36	100.00%

Unit 1 Special Function	Crashes	%
None	34	94.44%
Other / Unknown	1	2.78%
Farm	1	2.78%
Grand Total	36	100.00%

Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Straight Ahead	17	47.22%
Slowing or Stopped In Traffic	13	36.11%
	6	16.67%
Grand Total	36	100.00%

Unit 2 Contributing Factor	Crashes	%
None	28	77.78%
	6	16.67%
Following Too Closely/ACDA	1	2.78%
Not Discernible	1	2.78%
Grand Total	36	100.00%

Unit 2 Direction From	Crashes	%
	6	16.67%
North	12	33.33%
South	15	41.67%
West	3	8.33%
Grand Total	36	100.00%

Unit 2 Direction To	Crashes	%
	8	22.22%
East	2	5.56%
North	15	41.67%
South	11	30.56%
Grand Total	36	100.00%

Unit 2 Type	Crashes	%
Sport Utility Vehicle	16	44.44%
Passenger Car	8	22.22%
	6	16.67%
Pick up	2	5.56%
Passenger Van (minivan)	2	5.56%
Cargo Van	1	2.78%
Semi-Tractor	1	2.78%
Grand Total	36	100.00%

Unit 2 Special Function	Crashes	%
None	30	83.33%
	6	16.67%
Grand Total	36	100.00%

	Number
Total	36

CRASH_SEVERITY	Number	%
Injury Crash	13	36.1%
Property Damage Crash	23	63.9%
Grand Total	36	100.0%

TRAFFIC_CRASH_YEAR		Number	%
	2019	12	33.3%
	2020	10	27.8%
	2021	14	38.9%
Grand Total		36	100.0%

DAY_OF_WEEK	Number	%
(1) Sunday	8	22.2%
(5) Thursday	7	19.4%
(6) Friday	6	16.7%
(3) Tuesday	5	13.9%
(7) Saturday	5	13.9%
(4) Wednesday	3	8.3%
(2) Monday	2	5.6%
Grand Total	36	100.0%

HOUR_OF_DAY	Number	%
5	1	2.8%
6	2	5.6%
7	1	2.8%
9	3	8.3%
10	2	5.6%
11	2	5.6%
12	1	2.8%
13	5	13.9%
14	2	5.6%
15	1	2.8%
16	6	16.7%
17	2	5.6%
18	2	5.6%
19	2	5.6%
20	2	5.6%
21	1	2.8%
23	1	2.8%
Grand Total	36	100.0%

TYPE_OF_CRASH	Number	%
Rear End	12	33.3%
Left Turn	9	25.0%
Angle	5	13.9%
Sideswipe - Passing	3	8.3%
Other Non-Collision	3	8.3%
Fixed Object	3	8.3%
Right Turn	1	2.8%
Grand Total	36	100.0%

WEATHER_CONDITION	Number	%
Clear	19	52.8%
Cloudy	11	30.6%
Rain	4	11.1%
Snow	2	5.6%
Grand Total	36	100.0%

ROAD_CONDITION	Number	%
Dry	25	69.4%
Wet	9	25.0%
Snow	2	5.6%
Grand Total	36	100.0%

LIGHT_CONDITION	Number	%
Daylight	28	77.8%
Dark - Roadway Not Lighted	6	16.7%
Dawn/Dusk	2	5.6%
Grand Total	36	100.0%

NUMBER_OF_VEHICLES	Number	%
1	6	16.7%
2	26	72.2%
3	4	11.1%
Grand Total	36	100.0%

LOCATION	Number	%
Four-Way Intersection	26	72.2%
Not An Intersection	7	19.4%
5 Or More Point Intersection	2	5.6%
T-Intersection	1	2.8%
Grand Total	36	100.0%

CRASH_MONTH_NBR	Number	%
1	1	2.8%
2	1	2.8%
3	5	13.9%
4	2	5.6%
5	1	2.8%
6	5	13.9%
7	1	2.8%
8	4	11.1%
9	2	5.6%
10	8	22.2%
11	1	2.8%
12	5	13.9%
Grand Total	36	100.0%

ROAD_CONTOUR	Number	%
Straight Level	35	97.2%
Straight Grade	1	2.8%
Grand Total	36	100.0%

SPECIAL_AREA	Number	%
(blank)	36	100.0%
Grand Total	36	100.0%

ANIMAL_TYPE	Number	%
(blank)	36	100.0%
Grand Total	36	100.0%

ACTION1	Number	%
Straight Ahead	21	58.3%
Making Left Turn	10	27.8%
Slowing or Stopped In Traffic	3	8.3%
Making Right Turn	1	2.8%
Changing Lanes	1	2.8%
Grand Total	36	100.0%

CONTRIBUTING_FACTOR1	Number	%
Following Too Closely/ACDA	12	33.3%
Failure to Yield	10	27.8%
Ran Red Light	4	11.1%
Improper Lane Change	2	5.6%
None	2	5.6%
Swerving to Avoid	1	2.8%
Unsafe Speed	1	2.8%
Operating Defective Equipment	1	2.8%
Drove off Road	1	2.8%
Not Discernible	1	2.8%
Improper Passing	1	2.8%
Grand Total	36	100.0%

	Number	%
Total	36	100.0%

TRAFFIC_CONTROL1	Number	%
Signal	24	66.7%
No Control	12	33.3%
Grand Total	36	100.0%

DRIVER_ALCOHOL1	Number	%
No	35	97.2%
Yes	1	2.8%
Grand Total	36	100.0%

DRIVER_DRUGS1	Number	%
No	36	100.0%
Grand Total	36	100.0%

DIRECTION_FROM1	Number	%
North	20	55.6%
South	13	36.1%
East	2	5.6%
West	1	2.8%
Grand Total	36	100.0%

DIRECTION_TO1	Numbe	- %
South	12	33.3%
North	11	30.6%
East	8	22.2%
West	3	8.3%
Unknown	2	5.6%
Grand Total	36	100.0%

POSTED_SPEED1	Number	%
60	28	77.8%
55	5	13.9%
65	2	5.6%
0	1	2.8%
Grand Total	36	100.0%

VEHICLE_TYPE1	Number	%
Passenger Car	15	41.7%
Sport Utility Vehicle	7	19.4%
Semi-Tractor	6	16.7%
Pick up	3	8.3%
Single Unit Truck	2	5.6%
Passenger Van (minivan)	2	5.6%
Unknown or Hit/Skip	1	2.8%
Grand Total	36	100.0%

ESTIMATED_SPEED1	Number	%
20	6	16.7%
60	5	13.9%
10	5	13.9%
0	4	11.1%
45	2	5.6%
65	2	5.6%
50	2	5.6%
5	2	5.6%
30	2	5.6%
35	1	2.8%
25	1	2.8%
3	1	2.8%
15	1	2.8%
55	1	2.8%
40	1	2.8%
Grand Total	36	100.0%
VEHICLE_TYPE2	Number	%
Sport Utility Vehicle	16	44.4%
Passenger Car	8	22.2%
	6	16.7%
Pick up	2	5.6%
Passenger Van (minivan)	2	5.6%
Semi-Tractor	1	2.8%
Cargo Van	1	2.8%
Grand Total	36	100.0%

ACTION2	Number	%
Straight Ahead	17	47.2%
Slowing or Stopped In Traffic	13	36.1%
	6	16.7%
Grand Total	36	100.0%

CONTRIBUTING_FACTOR2	Number	%
None	28	77.8%
	6	16.7%
Following Too Closely/ACDA	1	2.8%
Not Discernible	1	2.8%
Grand Total	36	100.0%

DIRECTION_FROM2	Number	%
South	15	41.7%
North	12	33.3%
	6	16.7%
West	3	8.3%
Grand Total	36	100.0%

DIRECTION_TO2	Number	%
North	15	41.7%
South	11	30.6%
	8	22.2%
East	2	5.6%
Grand Total	36	100.0%

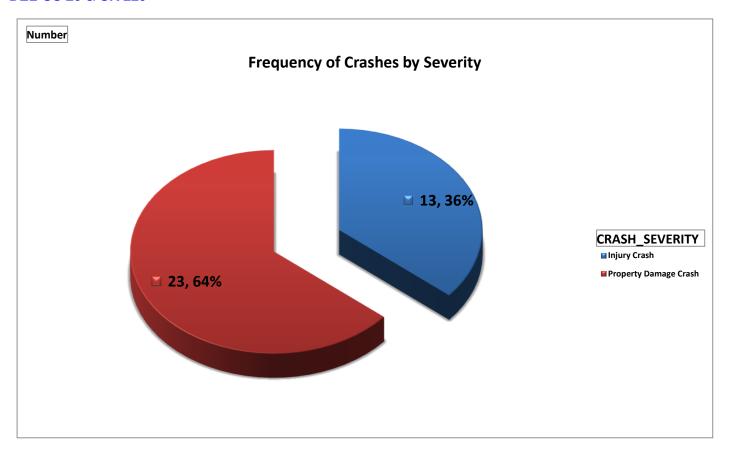
DRIVER_ALCOHOL2	Number	%
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Grand Total	36	100.0%

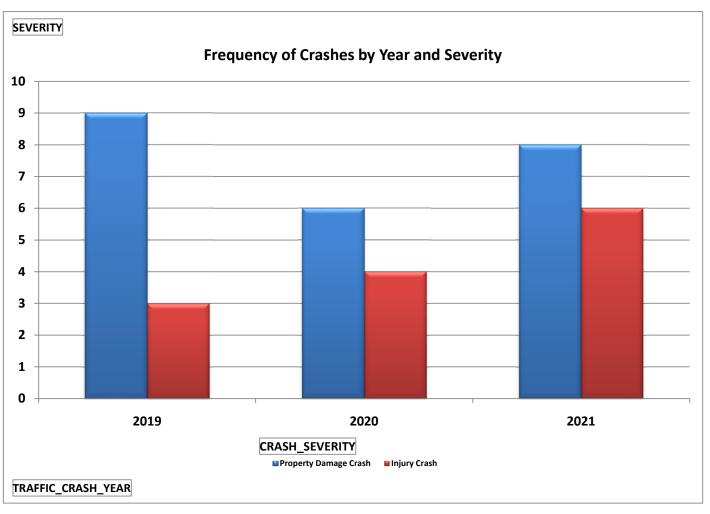
DRIVER_DRUGS2	Number	%
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Grand Total	36	100.0%

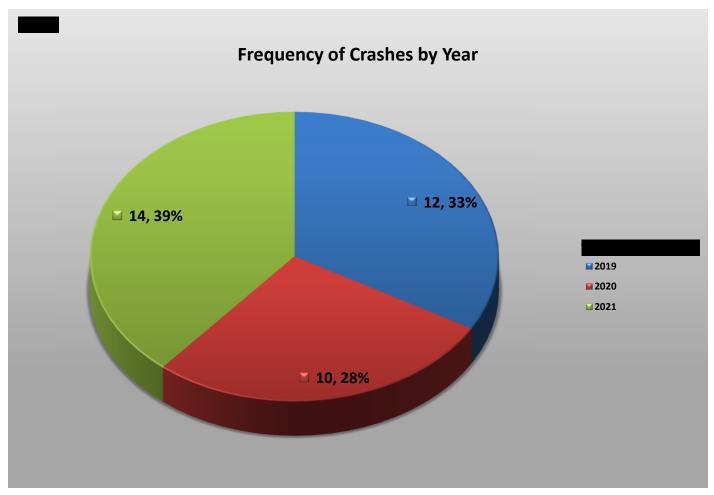
SEVERITY	CRASH_SEVERITY					
TRAFFIC_CRASH_YEAR	Property Damage Crash	Injury Crash				
2019	9	3				
2020	6	4				
2021	8	6				
Grand Total	23	13				

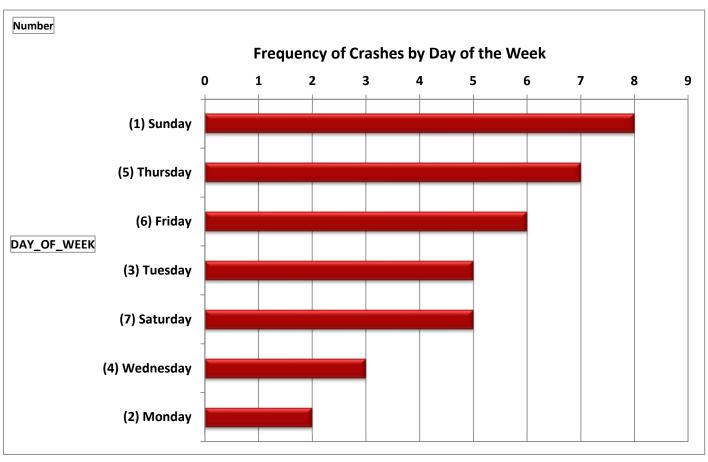
TRAFFIC_CRASH_YEAR	Fatalities	Incapacitating Injuries
2019	0	2
2020	0	0
2021	0	1
Grand Total	0	3

TRAFFIC_CRASH_YEAR	INJ_TYPE2_SERIOUS_VISIBLE	INJ_TYPE3_MINOR_VISIBLE	INJ_TYPE4_NO_VISIBLE
2019	2	3	3
2020	0	3	2
2021	1	7	5
Grand Total	3	13	10

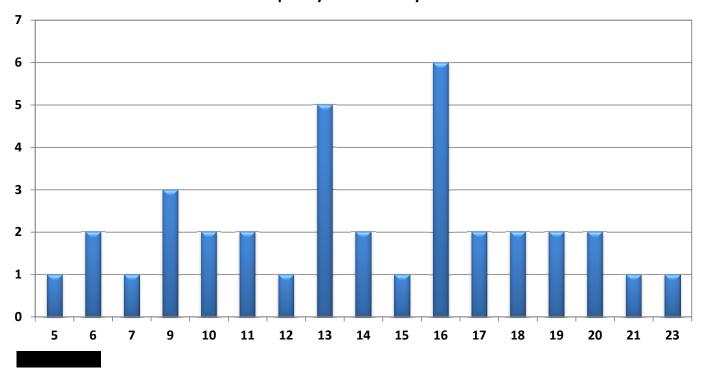


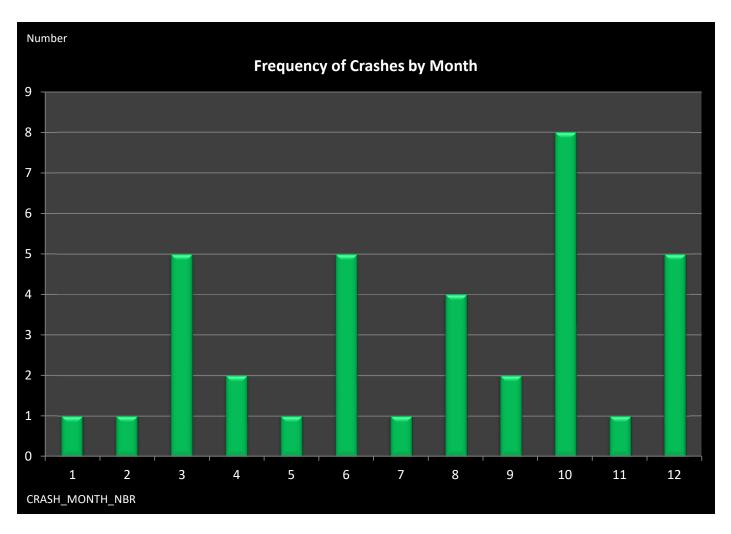


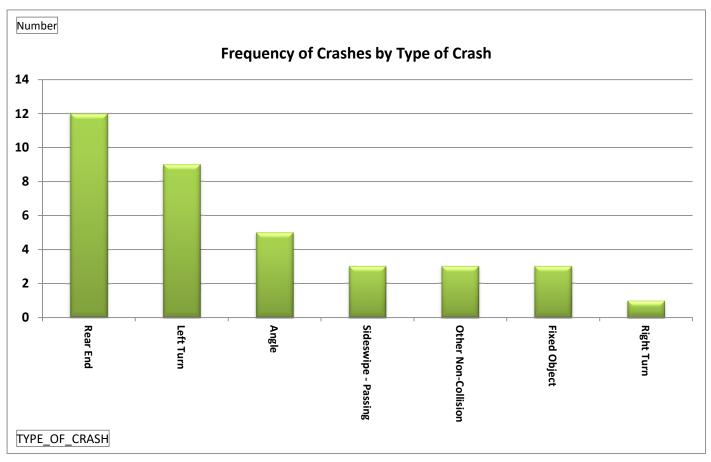


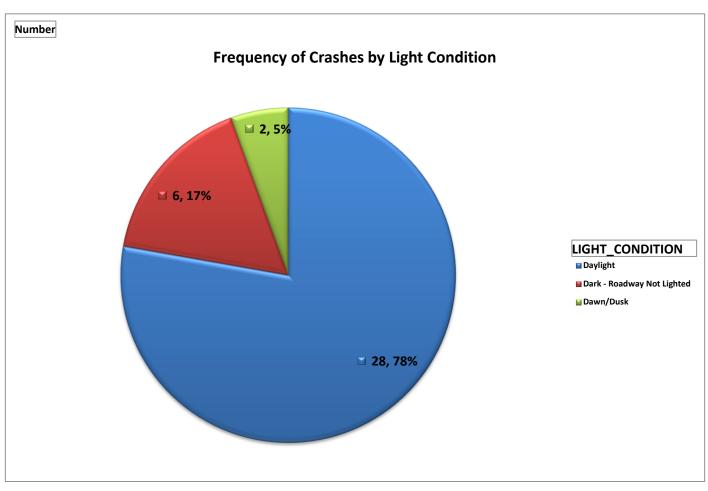


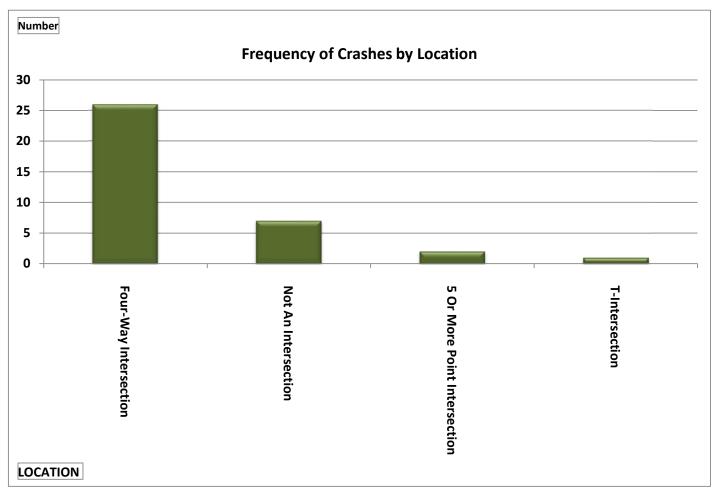


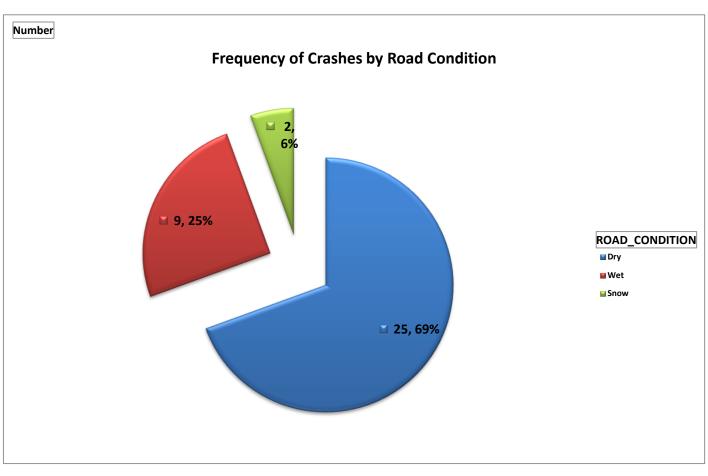


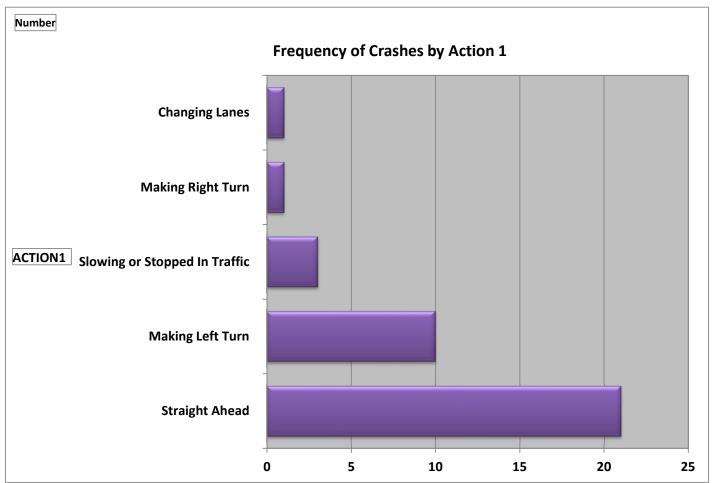


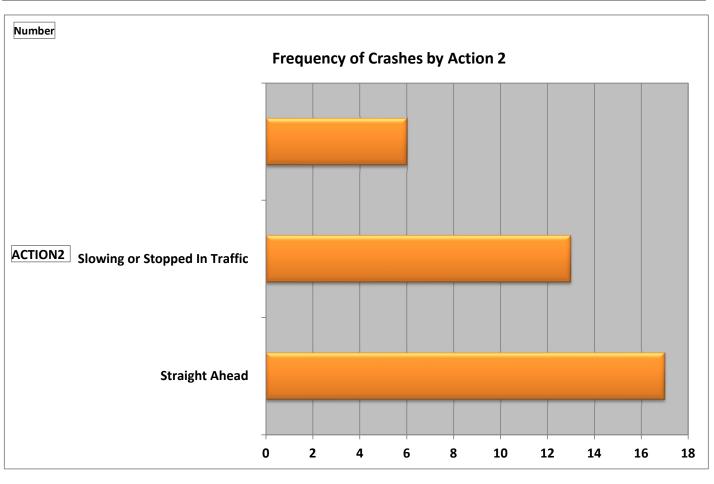






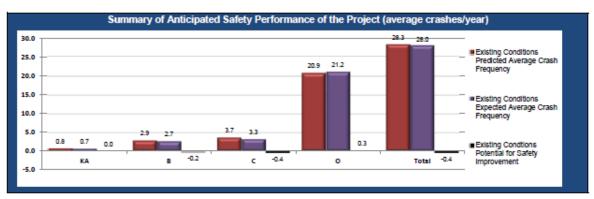






Appendix C: Existing ECAT Analysis

Project Safety Performance Report						
General Information						
Project Name	DEL-23-21.33 (US 23 at SR 229)	Contact Email	andrew.hurst@dot.ohio.gov			
Project Description	Interchange	Contact Phone	740-833-8345			
Reference Number		Date Performed				
Analyst	Drew Hurst	Analysis Year	2026			
Agency/Company	ODOT District 6					



Project Summary Results (Without Animal Crashes)								
	KA B C O Total							
N _{predicted} - Existing Conditions	0.7596	2.9030	3.7356	20.9355	28.3337			
N _{expected} - Existing Conditions	0.7412	2.7127	3.3088	21.2035	27.9662			
N _{potential} for improvement - Existing Conditions	-0.0184	-0.1903	-0.4268	0.2680	-0.3675			

Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)						
Project Element ID	Common Name			Crash Severity Level		
Project Element ID	Common Name	KA	æ	0	0	Total
SR229: 0.12-0.25	SR 229 between US 23 and Norton Rd	0.0106	0.0277	0.0131	0.0772	0.1286
SR229; 0.26-0.4	SR 229 between US 23 and Welser Rd/Brunds	0.0071	0.019	0.0095	0.0535	0.0891
US23: 20.78-21.42	US 23 south of SR 229	0.131	0.3362	0.1819	1.6703	2.3194
U823; 21.42-21.55	US 23 north of SR 229	0.0287	0.0739	0.0398	0.3695	0.5119
TR366: 0-0.18	Brundage Rd north of SR 229	0.0001	0.0007	0.0006	0.0021	0.0035
SR229; 0.4	3R 229 and Weiser Rd/Brundage Rd intersect	0.0436	0.1055	0.0706	0.3783	0.598
U823: 21.42	US 23 and SR 229 Intersection	0.5385	2.34	3.4201	18.3846	24.6832

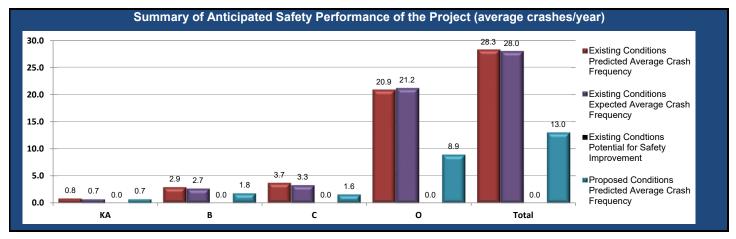
	Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)						
Project Element ID	Common Name			Crash Severity Level			
Project Element ID	Common Name	KA	В	С	0	Total	
SR229: 0.12-0.25	SR 229 between US 23 and Norton Rd	0.0098	0.0254	0.0119	0.1319	0.179	
SR229; 0.26-0.4	SR 229 between US 23 and Weiser Rd/Brunds	0.0067	0.0179	0.0085	0.0451	0.0782	
US23: 20.78-21.42	US 23 south of SR 229	0.1799	0.4625	0.2505	1.8518	2.7447	
U823; 21.42-21.55	US 23 north of SR 229	0.0452	0.1165	0.063	0.3857	0.6104	
TR366: 0-0.18	Brundage Rd north of SR 229	0.0001	0.0007	0.0003	0.002	0.0031	
SR229; 0.4	SR 229 and Weiser Rd/Brundage Rd Intersect	0.0416	0.1004	0.067	0.4024	0.6114	
U823: 21.42	US 23 and SR 229 Intersection	0.4579	1.9893	2.9076	18.3846	23.7394	

Exi	Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)						
Project Element ID	Common Name			Crash Severity Level			
Project Element ID	Common Name	KA	В	0	0	Total	
SR229: 0.12-0.25	SR 229 between US 23 and Norton Rd	-0.0008	-0.0023	-0.0012	0.0647	0.0504	
SR229; 0.26-0.4	SR 229 between US 23 and Weiser Rd/Brunds	-0.0004	-0.0011	-0.001	-0.0084	-0.0109	
US23: 20.78-21.42	US 23 south of SR 229	0.0488	0.1283	0.0888	0.1816	0.4253	
U823; 21.42-21.55	US 23 north of SR 229	0.0186	0.0428	0.0232	0.0182	0.0986	
TR366: 0-0.18	Brundage Rd north of SR 229	0	0	-0.0003	-0.0001	-0.0004	
8R229; 0.4	SR 229 and Weiser Rd/Brundage Rd Intersect	-0.002	-0.0051	-0.0036	0.0241	0.0134	
US23: 21.42	US 23 and SR 229 Intersection	-0.0806	-0.3507	-0.5125	0	-0.9438	

	Summary by Crash Type						
		Existing		Proposed			
Crash Type	Predicted Crash Frequency	Expected Crach Frequency	P8I	Expected Crash Frequency			
Unknown	0.0573	0.0615	0.0042				
Head On	0.1456	0.1372	-0.0084				
Rear End	10.9851	10.7375	-0.2476				
Backing	0.9525	0.9538	0.0013				
Sideswipe - Meeting	0.3796	0.3832	0.0038				
Sideswipe - Passing	3.4997	3.5092	0.0086				
Angle	4.9799	4.8013	-0.1786				
Parked Vehicle	1.0599	1.0545	-0.0054				
Pedestrian	0.3482	0.3092	-0.0390				
Animai	3.3852	3.7886	0.4034				
Train	0.0044	0.0040	-0.0004				
Pedalcycles	0.2207	0.1989	-0.0218				
Other Non-Vehicle	0.0000	0.0000	0.0000				
Fixed Object	2.4046	2.5922	0.1878				
Other Object	0.2030	0.2200	0.0170				
Overtuming	0.1776	0.2076	0.0800				
Other Non-Collision	0.2559	0.2758	0.0199				
Left Turn	2.6597	2.5203	-0.1394				
Right Turn	0.0000	0.0000	0.0000				

Appendix D: Build Alternative ECAT Analysis

Project Safety Performance Report						
Economic Crash Analysis Tool	General Information					
Project Name	DEL-23-21.33 (US 23 at SR 229)	Contact Email	andrew.hurst@dot.ohio.gov			
Project Description	Interchange	Contact Phone	740-833-8345			
Reference Number		Date Performed				
Analyst	Drew Hurst	Analysis Year	2026			
Agency/Company	ODOT District 6					



Project Summary Results (Without Animal Crashes)						
	KA	В	С	0	Total	
N _{predicted} - Existing Conditions	0.7596	2.9030	3.7356	20.9355	28.3337	
N _{expected} - Existing Conditions	0.7412	2.7127	3.3088	21.2035	27.9662	
N _{potential for improvement} - Existing Conditions	0.0000	0.0000	0.0000	0.0000	0.0000	
N _{expected} - Proposed Conditions	0.6837	1.8196	1.6309	8.8587	12.9929	

ECAT	Project Safety	Performance Repo	ort			
Economic Crash Analysis Tool	General Information					
Project Name	DEL-23-21.33 (US 23 at SR 229)	Contact Email	andrew.hurst@dot.ohio.gov			
Project Description	Interchange	Contact Phone	740-833-8345			
Reference Number		Date Performed				
Analyst	Drew Hurst	Analysis Year	2026			
Agency/Company	ODOT District 6					

	Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)						
Project Element ID	nt ID Common Name Crash Seve			Crash Severity Level	everity Level		
Project Element ID	Common Name	KA	В	С	0	Total	
SR229; 0.12-0.25	SR 229 between US 23 and Norton Rd	0.0106	0.0277	0.0131	0.0772	0.1286	
SR229; 0.26-0.4	SR 229 between US 23 and Weiser Rd/Brunda	0.0071	0.019	0.0095	0.0535	0.0891	
US23; 20.78-21.42	US 23 south of SR 229	0.131	0.3362	0.1819	1.6703	2.3194	
US23; 21.42-21.55	US 23 north of SR 229	0.0287	0.0739	0.0398	0.3695	0.5119	
TR366; 0-0.18	Brundage Rd north of SR 229	0.0001	0.0007	0.0006	0.0021	0.0035	
SR229; 0.4	SR 229 and Weiser Rd/Brundage Rd intersect	0.0436	0.1055	0.0706	0.3783	0.598	
US23; 21.42	US 23 and SR 229 intersection	0.5385	2.34	3.4201	18.3846	24.6832	



ECAT	Project Safety Performance Report						
Economic Crash Analysis Tool	General Information						
Project Name	DEL-23-21.33 (US 23 at SR 229)	Contact Email	andrew.hurst@dot.ohio.gov				
Project Description	Interchange	Contact Phone	740-833-8345				
Reference Number		Date Performed					
Analyst	Drew Hurst	Analysis Year	2026				
Agency/Company	ODOT District 6						

	Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)						
Project Element ID	ment ID Common Name Crash Severity Lev			Crash Severity Level			
Project Element ID	Common Name	KA	В	С	0	Total	
SR229; 0.12-0.25	SR 229 between US 23 and Norton Rd	0.0098	0.0254	0.0119	0.1319	0.179	
SR229; 0.26-0.4	SR 229 between US 23 and Weiser Rd/Brunda	0.0067	0.0179	0.0085	0.0451	0.0782	
US23; 20.78-21.42	US 23 south of SR 229	0.1799	0.4625	0.2505	1.8518	2.7447	
US23; 21.42-21.55	US 23 north of SR 229	0.0452	0.1165	0.063	0.3857	0.6104	
TR366; 0-0.18	Brundage Rd north of SR 229	0.0001	0.0007	0.0003	0.002	0.0031	
SR229; 0.4	SR 229 and Weiser Rd/Brundage Rd intersect	0.0416	0.1004	0.067	0.4024	0.6114	
US23; 21.42	US 23 and SR 229 intersection	0.4579	1.9893	2.9076	18.3846	23.7394	



ECAT	Project Safety	Project Safety Performance Report				
General Information						
Project Name	DEL-23-21.33 (US 23 at SR 229)	Contact Email	andrew.hurst@dot.ohio.gov			
Project Description	Interchange	Contact Phone	740-833-8345			
Reference Number		Date Performed				
Analyst	Drew Hurst	Analysis Year	2026			
Agency/Company	ODOT District 6					

Exi	Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)						
Project Element ID	Common Name			Crash Severity Level			
Project Element ID	Common Name	KA	В	С	0	Total	
SR229; 0.12-0.25	SR 229 between US 23 and Norton Rd	-0.0008	-0.0023	-0.0012	0.0547	0.0504	
SR229; 0.26-0.4	SR 229 between US 23 and Weiser Rd/Brunda	-0.0004	-0.0011	-0.001	-0.0084	-0.0109	
US23; 20.78-21.42	US 23 south of SR 229	0.0489	0.1263	0.0686	0.1815	0.4253	
US23; 21.42-21.55	US 23 north of SR 229	0.0165	0.0426	0.0232	0.0162	0.0985	
TR366; 0-0.18	Brundage Rd north of SR 229	0	0	-0.0003	-0.0001	-0.0004	
SR229; 0.4	SR 229 and Weiser Rd/Brundage Rd intersect	-0.002	-0.0051	-0.0036	0.0241	0.0134	
US23; 21.42	US 23 and SR 229 intersection	-0.0806	-0.3507	-0.5125	0	-0.9438	



ECAT	Project Safety	Project Safety Performance Report				
General Information						
Project Name	DEL-23-21.33 (US 23 at SR 229)	Contact Email	andrew.hurst@dot.ohio.gov			
Project Description	Interchange	Contact Phone	740-833-8345			
Reference Number		Date Performed				
Analyst	Drew Hurst	Analysis Year	2026			
Agonov/Company	ODOT District 6					

	Proposed Conditions Project Element Predicted Crash Summary (Without Animal Crashes)						
Drainet Floment ID	Common Name			Crash Severity Level			
Project Element ID	Common Name	KA	В	С	0	Total	
US23; 20.78-21.55	US 23 north of SR 229	0.1574	0.4045	0.2191	2.0095	2.7905	
TR366; 0.18-0.23	east side connection to Brundage Rd	0.0017	0.0043	0.0025	0.0127	0.0212	
US23; 21.55	US 23 and east side access	0.276	0.7819	0.9954	4.5494	6.6027	
SR229; 0.26-0.4	SR 229 between US 23 and Weiser Rd/Brunda	0.0071	0.019	0.0095	0.0535	0.0891	
SR229; 0.12-0.25	SR 229 between US 23 and Norton Rd	0.0144	0.0382	0.0183	0.1063	0.1772	
TR366; 0-0.18	Brundage Rd north of SR 229	0.0063	0.0165	0.0083	0.0467	0.0778	
SR229; 0.4	SR 229 and Weiser Rd/Brundage Rd intersect	0.1778	0.4304	0.2868	1.541	2.436	
TR366; 0.18	Brundage Rd and connection to US 23 north	0.043	0.1248	0.091	0.5396	0.7984	

Project Safety Performance Report					
General Information					
Project Name	DEL-23-21.33 (US 23 at SR 229)	Contact Email	andrew.hurst@dot.ohio.gov		
Project Description	Interchange	Contact Phone	740-833-8345		
Reference Number		Date Performed			
Analyst	Drew Hurst	Analysis Year	2026		
Agency/Company	ODOT District 6				

Summary by Crash Type								
		Existing		Proposed				
Crash Type	Predicted Crash Frequency	Expected Crash Frequency	PSI	Predicted Crash Frequency				
Unknown	0.0573	0.0615		0.0621				
Head On	0.1456	0.1372		0.0871				
Rear End	10.9851	10.7375		3.3807				
Backing	0.9525	0.9538		0.4148				
Sideswipe - Meeting	0.3796	0.3832		0.3210				
Sideswipe - Passing	3.4997	3.5092		1.3994				
Angle	4.9799	4.8013		2.6066				
Parked Vehicle	1.0599	1.0545		0.6676				
Pedestrian	0.3482	0.3092		0.1328				
Animal	3.3852	3.7886		3.4369				
Train	0.0044	0.0040		0.0006				
Pedalcycles	0.2207	0.1989		0.1040				
Other Non-Vehicle	0.0000	0.0000		0.0003				
Fixed Object	2.4046	2.5922		2.6495				
Other Object	0.2030	0.2200		0.1927				
Overturning	0.1776	0.2076		0.2026				
Other Non-Collision	0.2559	0.2758		0.2851				
Left Turn	2.6597	2.5203		0.4860				
Right Turn	0.0000	0.0000		0.0000				



ECAT		S	afety Benef	it - Cost An	alysis				
Economic Crash Analysis Tool			Genera	I Information					
Project Name	DEL-23-21.33 (US 23 at SR 229)				Contact Email		andrew.hurst@dot.o	hio.gov	
Project Description	Interchange				Contact Phone		740-833-8345		
Reference Number					Date Performed				
Analyst	Drew Hurst				Analysis Year		2026		
Agency/Company	ODOT District 6								
Select Site Types to be used in Benefit-Cost Analysis: All Sites		Comm	ents:						
All Sites			· · · · · · · · · · · · · · · · · · ·	ives Costs and	I Cafatu Banafita				
		ounterm	easure Service L	ives, Costs, and	Safety Benefits	5			
(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 Lane widening)	(Please add description about improvements i.e.	20	\$1.00			\$1.00	\$1.00		
Site Characteristic Improvements (Please add description about improvements i.e. Lighting) Site Characteristic Improvements (Please add description about improvements i.e.						\$0.00	\$0.00	15 244	\$2,671,950
Site Characteristic Improvements (Please add description about improvements i.e. Signal Phasing)						\$0.00	\$0.00	-15.341	
Site Characteristic Improvements (Please add description about improvements i.e. Added Right Turn Lane)						\$0.00	\$0.00		
						\$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

\$1.00

\$0.00

\$0.00

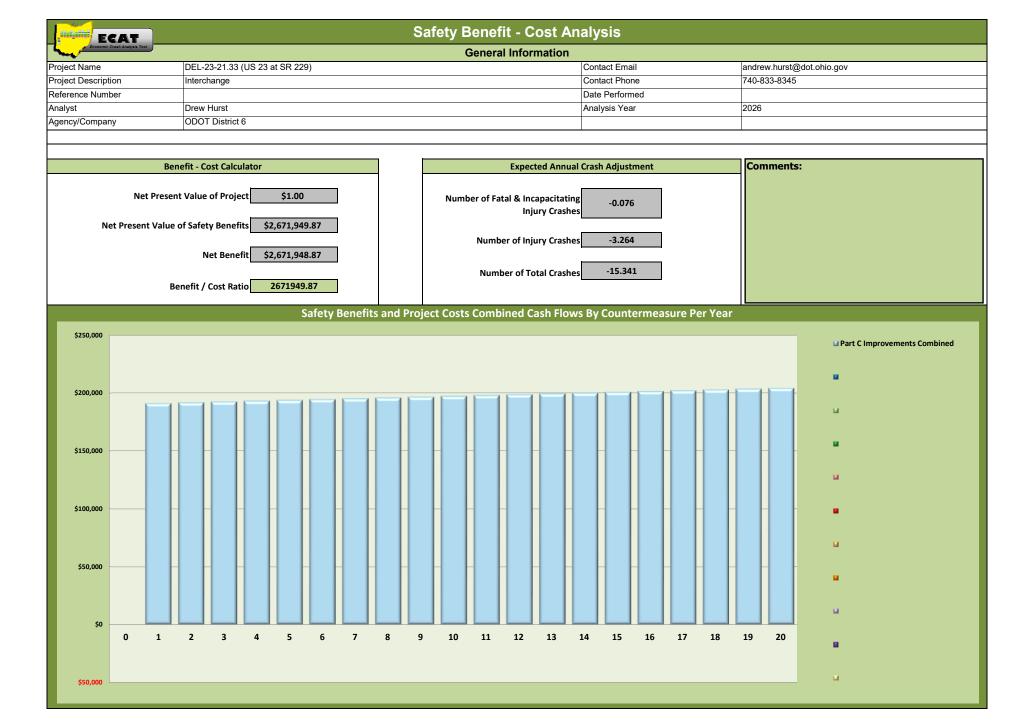
\$1.00

\$1.00

-15.341

\$2,671,950

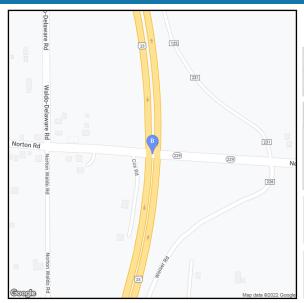
Totals



Appendix E: Traffic Volume Forecasts



Forecast Summary



Project Id	Project Name

Project Description

l	Model Version	Script Date		Script Version		
	2022.1900	4/14/2020	5:30:19 PM	2020.001		
	Username		Email Address			
e	Andrew.Hurst		Andrew.Hurst@dot.ohio.gov			

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

Road Name	2026 AADT	2046 AADT	K%	DHV30	D%	T24%	TD%
US 23	28,500	28,500	12.0	3420	70	17.2	9.4
SR 229	2,000	2,000	13.0	260	70	12.3	3.7
US 23	29,000	29,000	12.0	3480	70	17.2	10.0
SR 229	3,500	3,950	13.0	510	70	12.4	5.4

The values in parentheses have been overridden.

Pivot Count Date: 06/09/2022



Segment Information									
Aproach Name Segment ID LRS ID BMP Midpoint EMP Length Latitude Longitude									
NB	1755	SDELUS00023**C	18.831	20.132	21.433	2.602	40.4152106824452	-83.0741640665798	
EB	1756	SDELSR00229**C	0.123	0.1865	0.250	0.127	40.4339748200424	-83.0736768323419	
SB	1757	SDELUS00023**C	18.831	20.132	21.433	2.602	40.4152106824452	-83.0741640665798	
WB	1758	SDELSR00229**C	0.250	0.256	0.262	0.012	40.43391047765	-83.0723596718048	

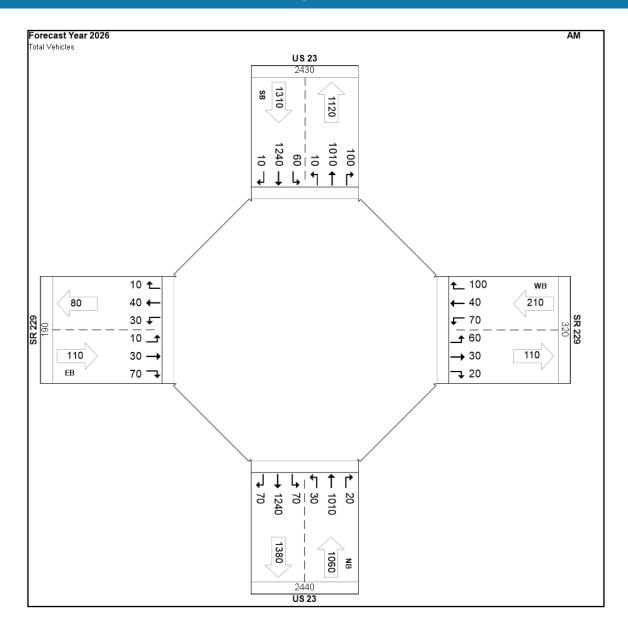
	Target Value Summary									
Aproach Name	Adt Growth Rate	Adt Growth	2026 AADT	2046 AADT	2026 AM	2046 AM	2026 PM	2046 PM		
NB	0.000	0.000	28,500	28,500	2,450	2,450	3,450	3,450		
EB	0.100	2.000	2,000	2,000	180	190	260	260		
SB	0.000	0.000	29,000	29,000	2,450	2,450	3,450	3,450		
WB	0.700	24.000	3,500	3,950	320	370	450	520		

The values in parentheses have been overridden.

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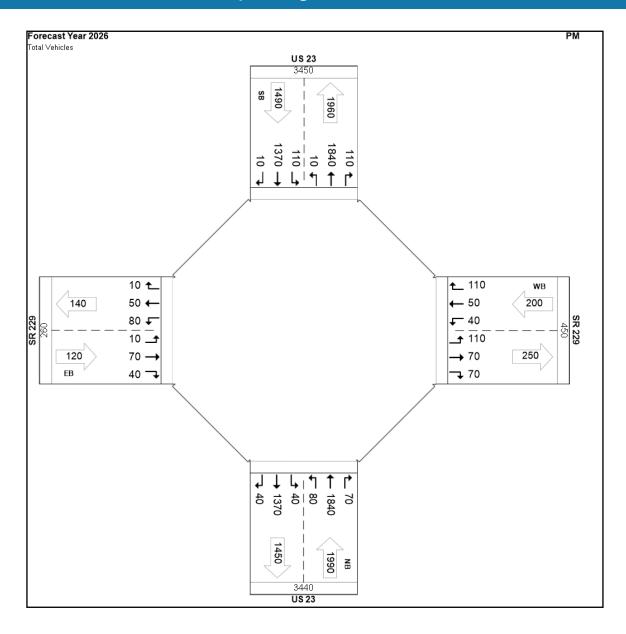
Opening Year AM



Generated 7/15/2022 at 09:29:16AM Page 3 of 35



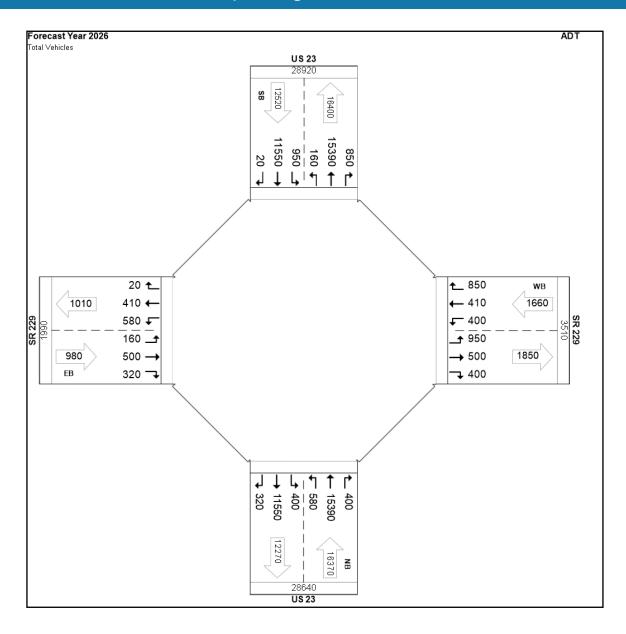
Opening Year PM



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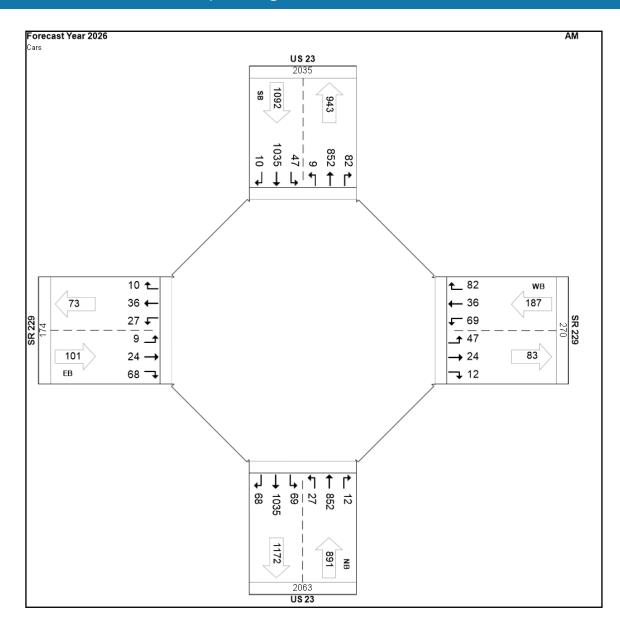
Opening Year ADT



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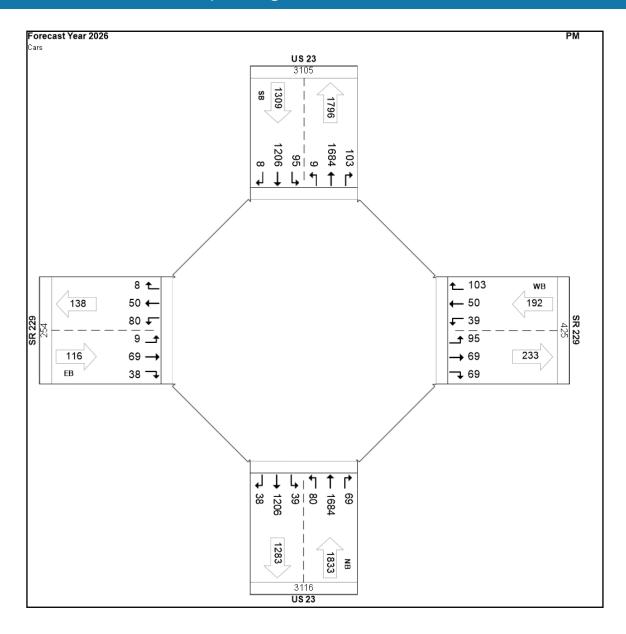
Opening Year Cars AM



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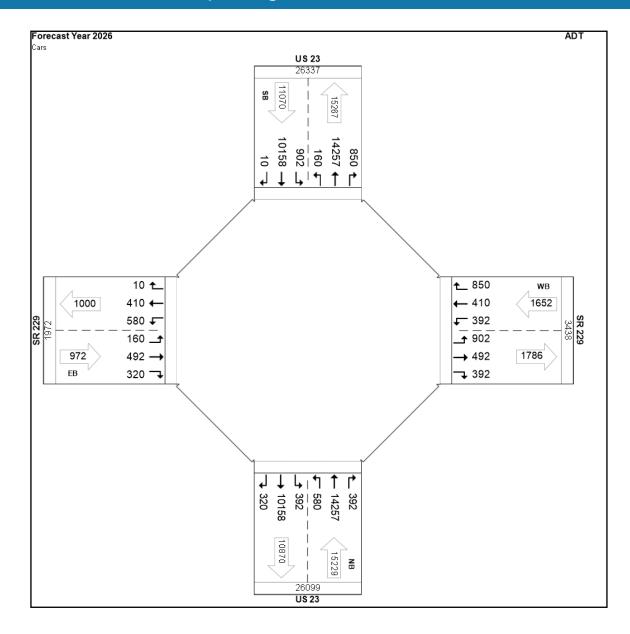
Opening Year Cars PM



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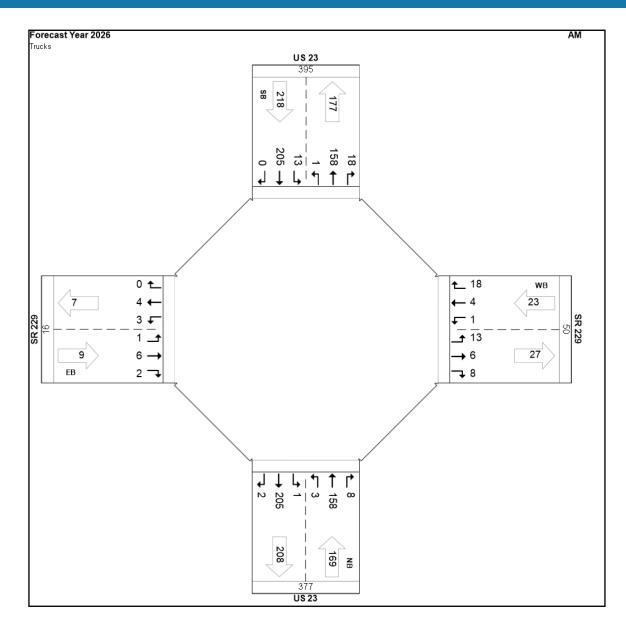
Opening Year Cars ADT



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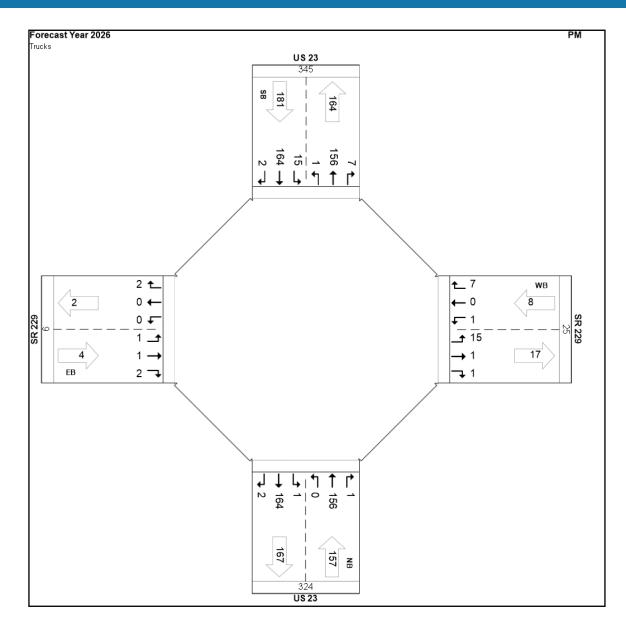
Opening Year Trucks AM



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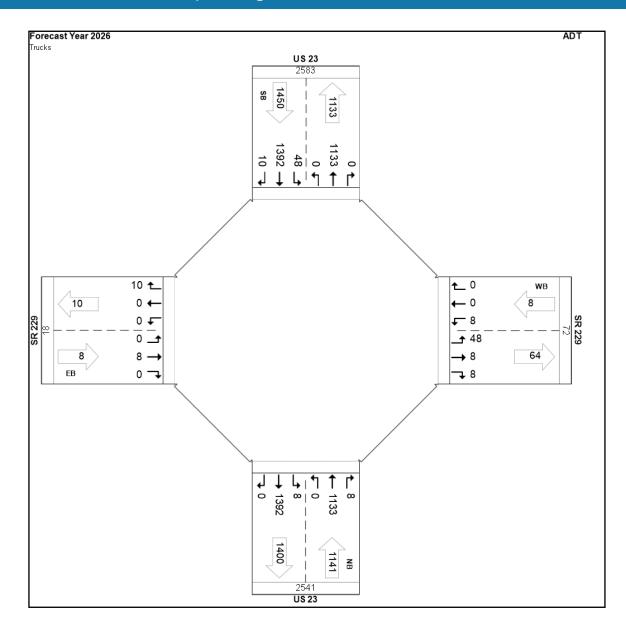
Opening Year Trucks PM



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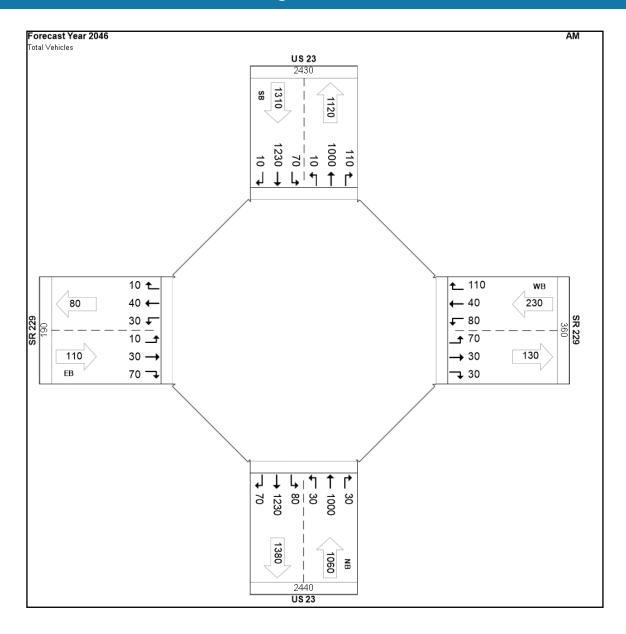
Opening Year Trucks ADT



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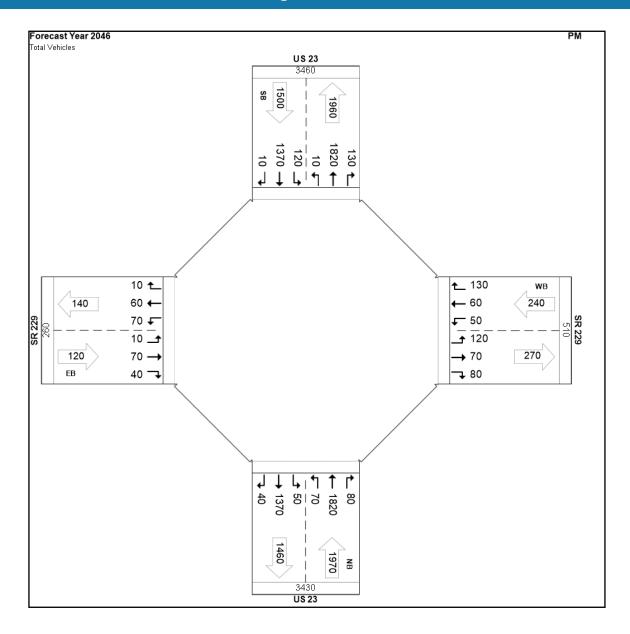
Design Year AM



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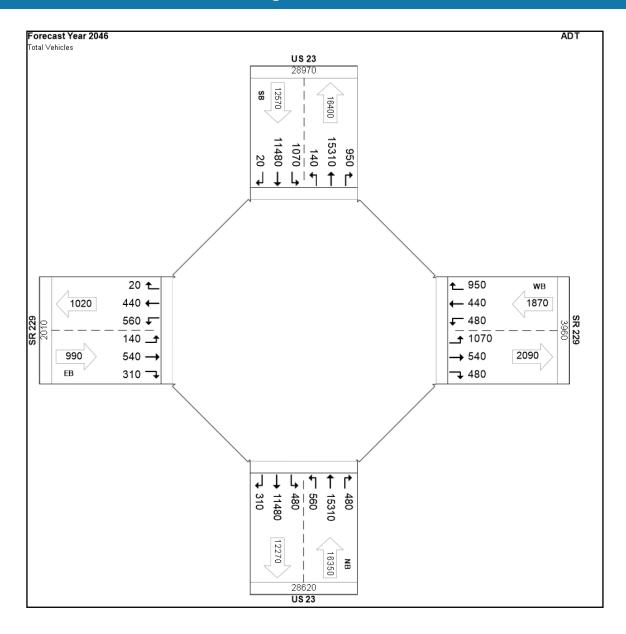
Design Year PM



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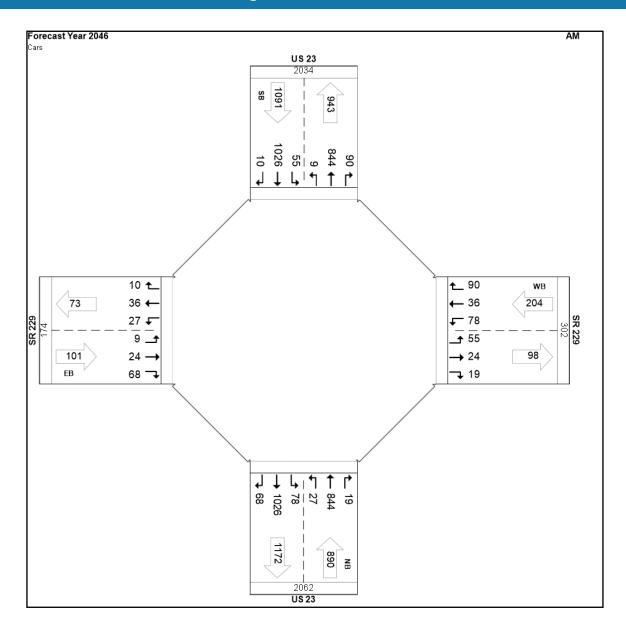
Design Year ADT



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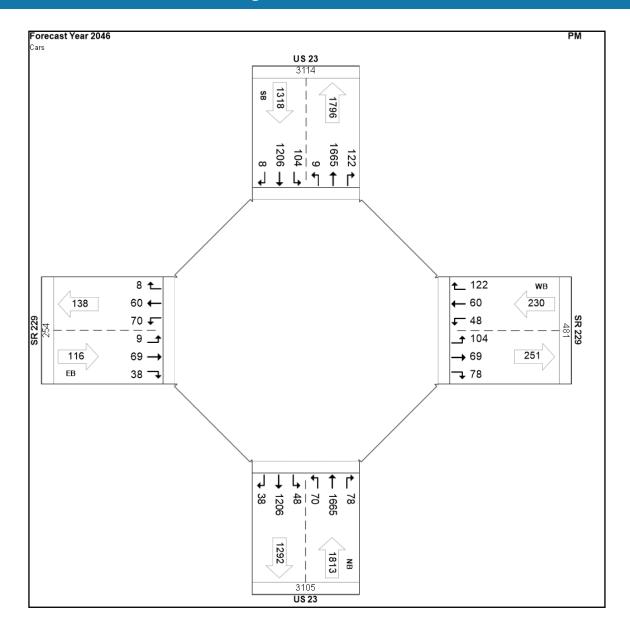
Design Year Cars AM



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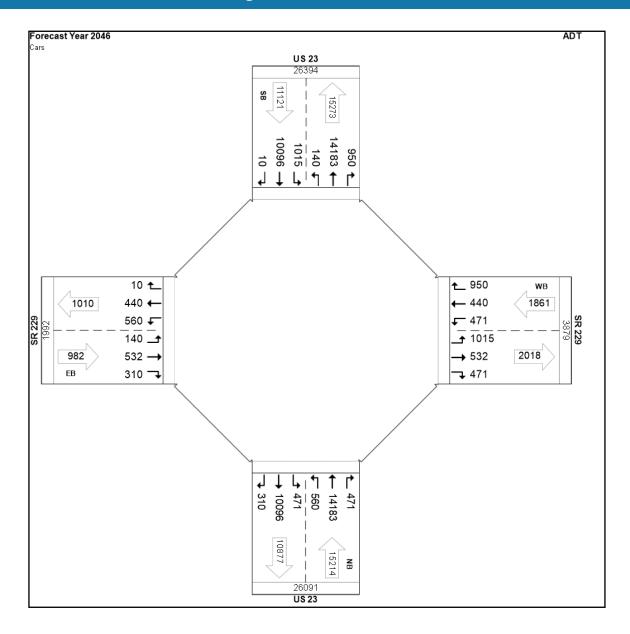
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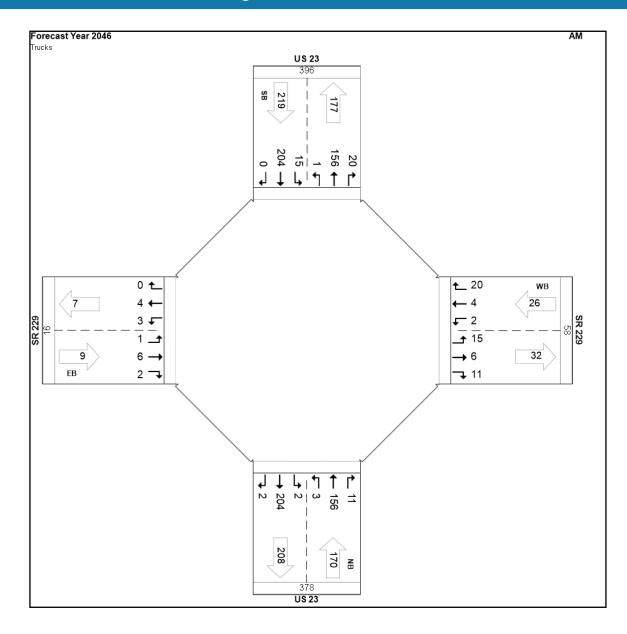
Design Year Cars ADT



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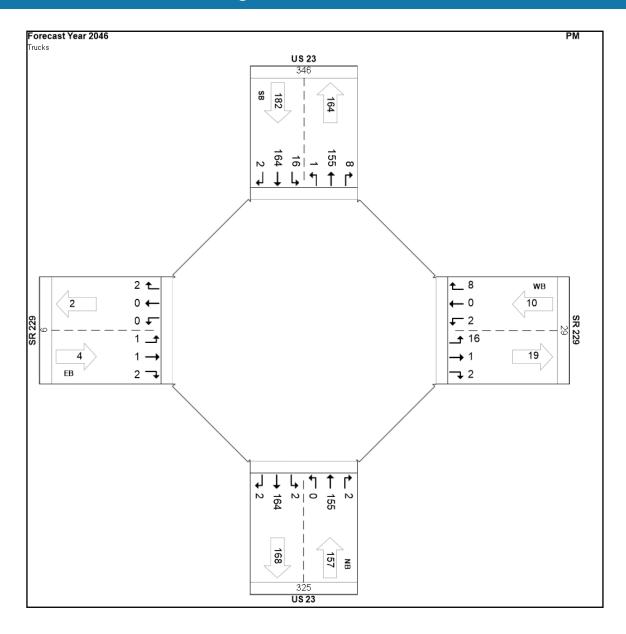
Design Year Trucks AM



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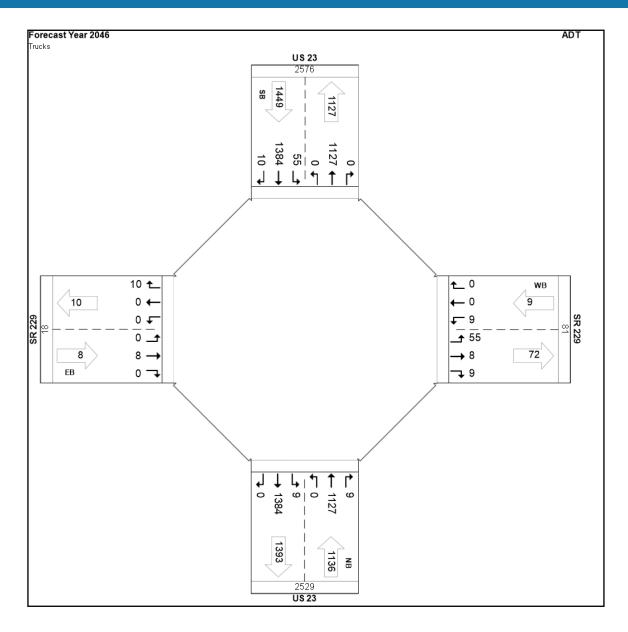
Design Year Trucks PM



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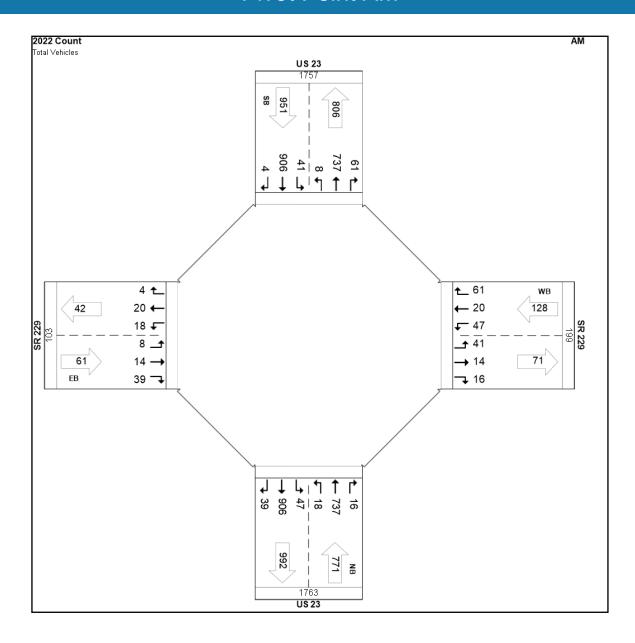
Design Year Trucks ADT



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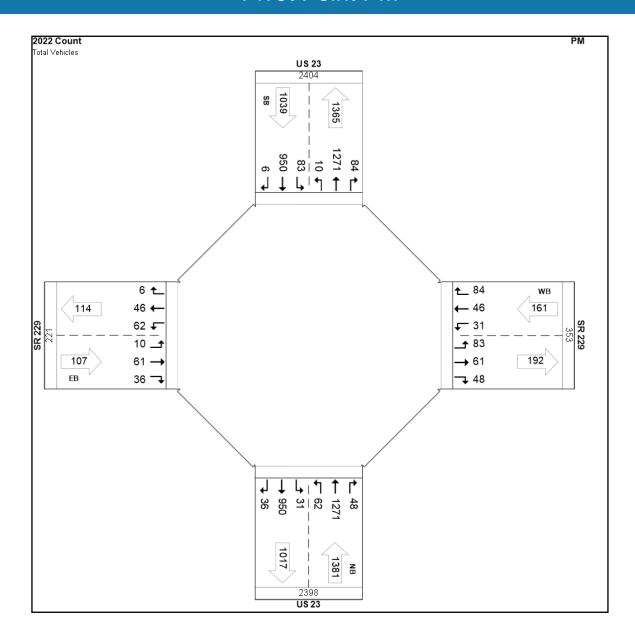
Pivot Point AM



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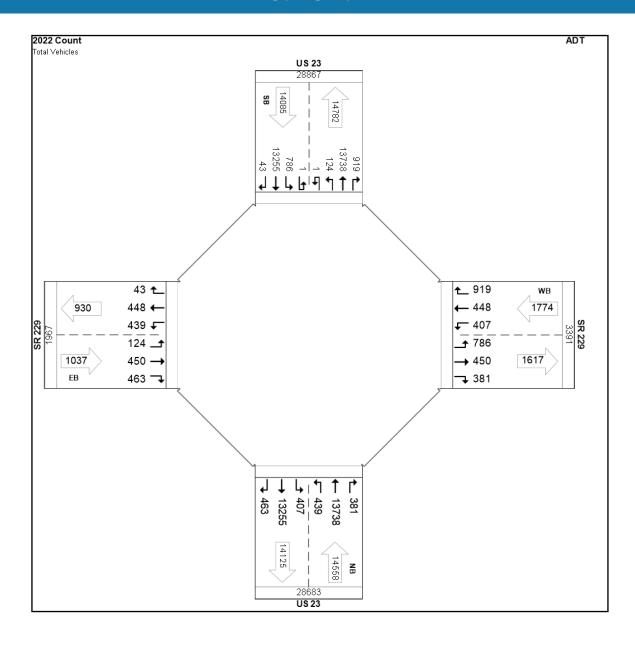
Pivot Point PM



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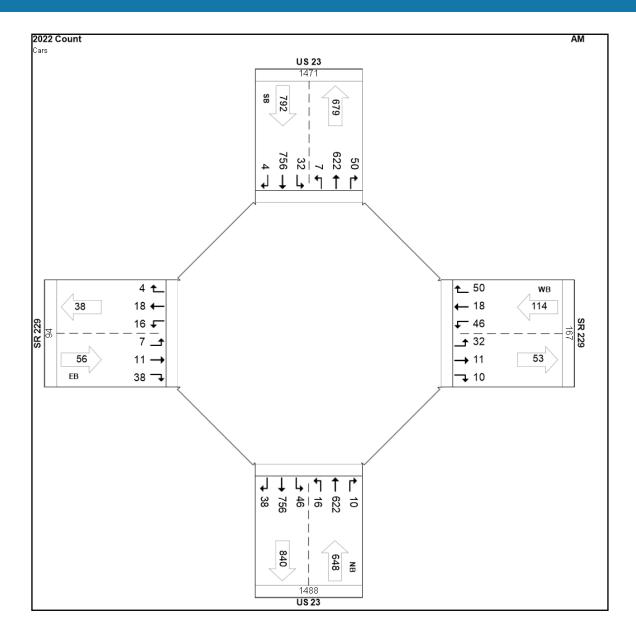
Pivot Point ADT



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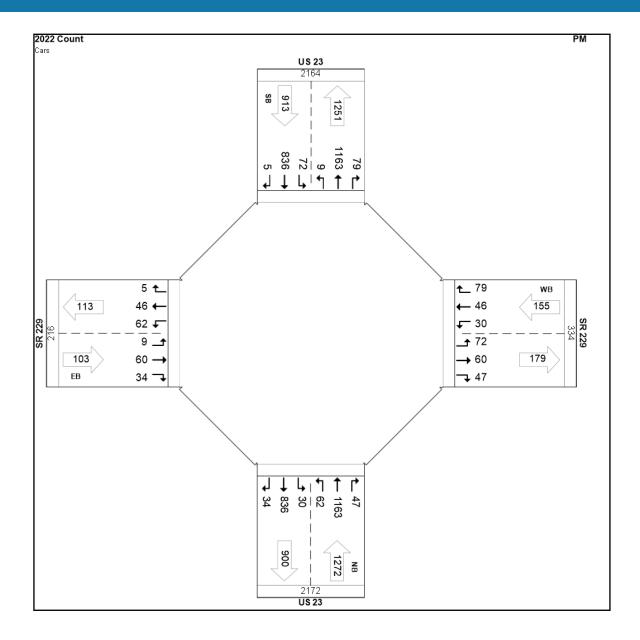
Pivot Point Cars AM



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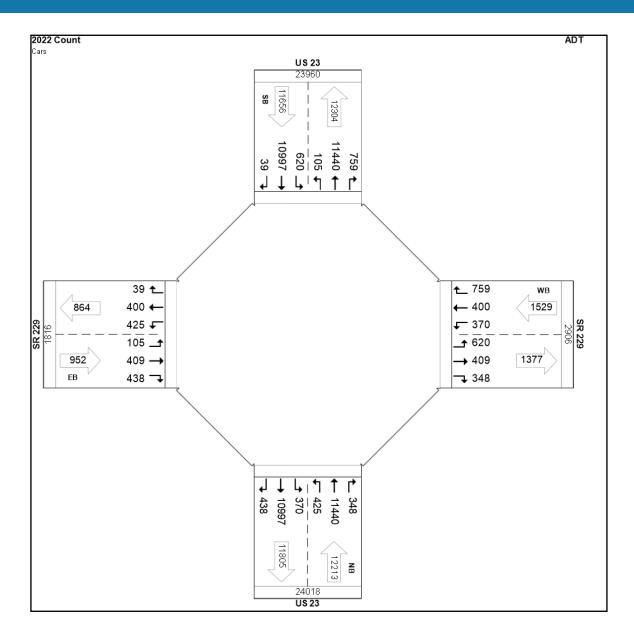
Pivot Point Cars PM



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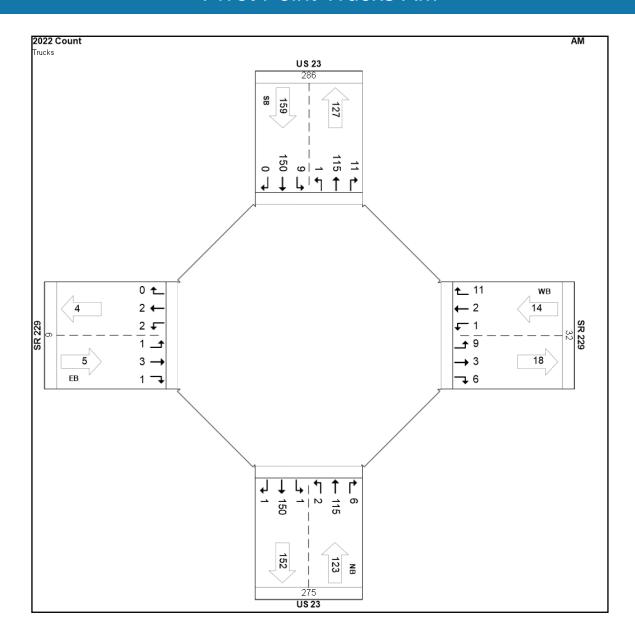
Pivot Point Cars ADT



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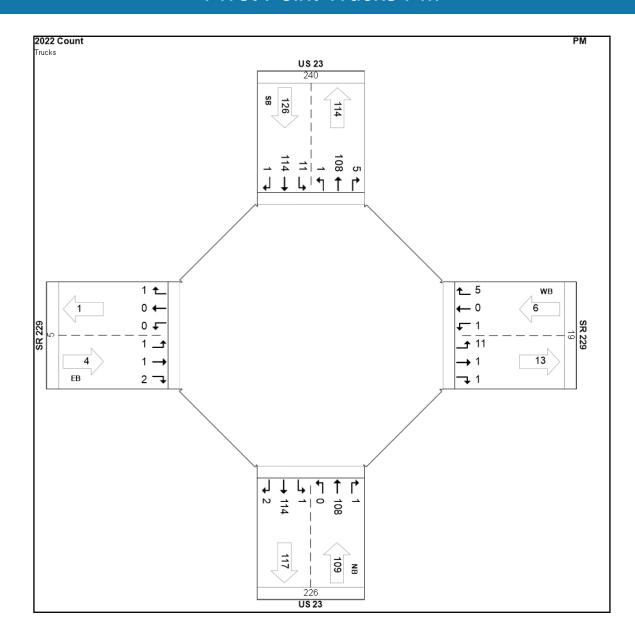
Pivot Point Trucks AM



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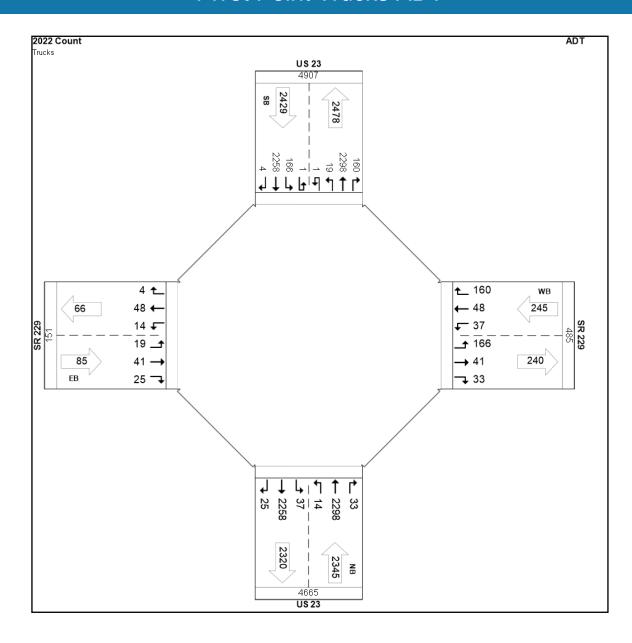
Pivot Point Trucks PM



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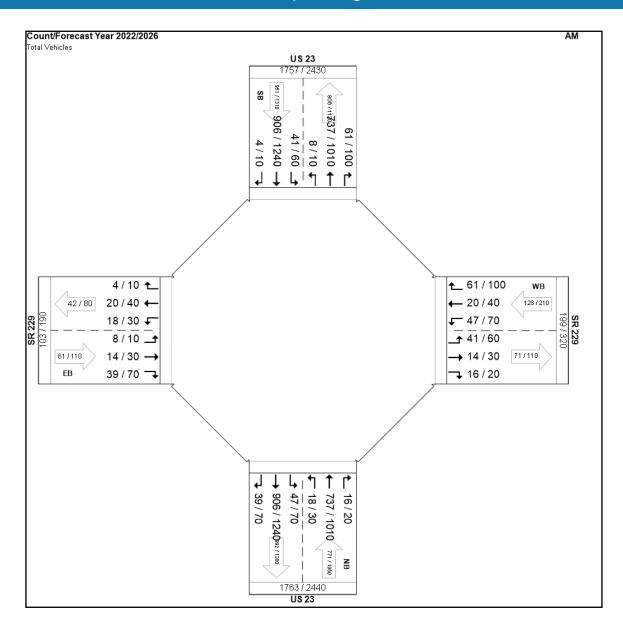
Pivot Point Trucks ADT



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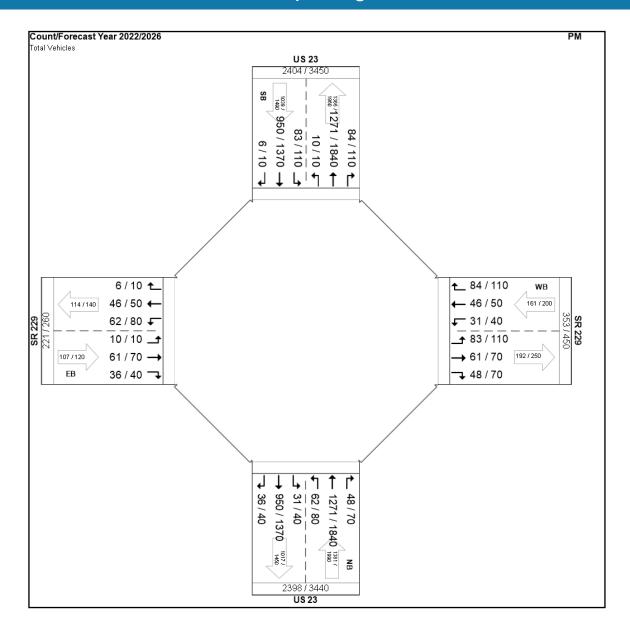
Count VS Opening Year AM



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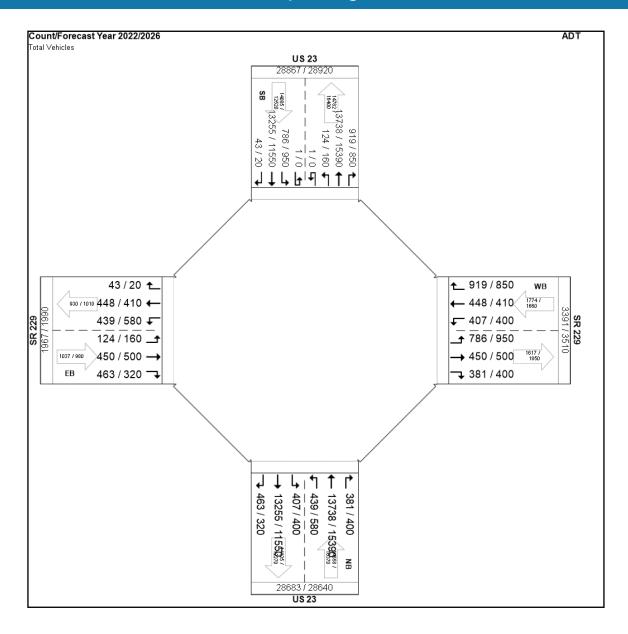
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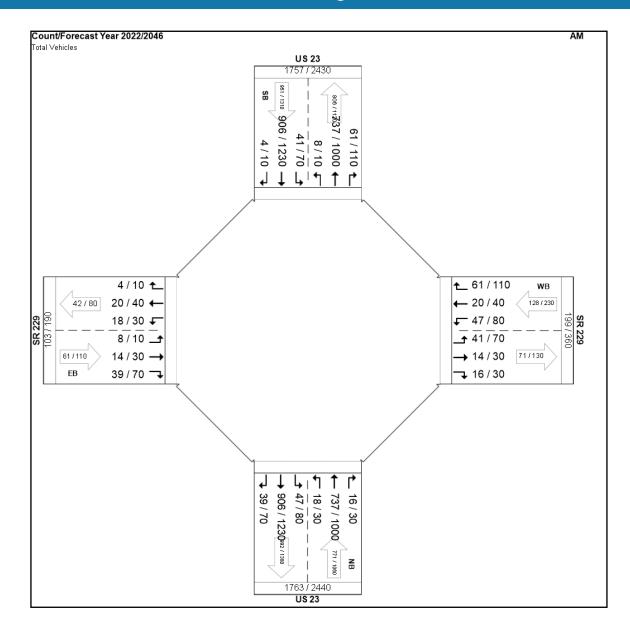
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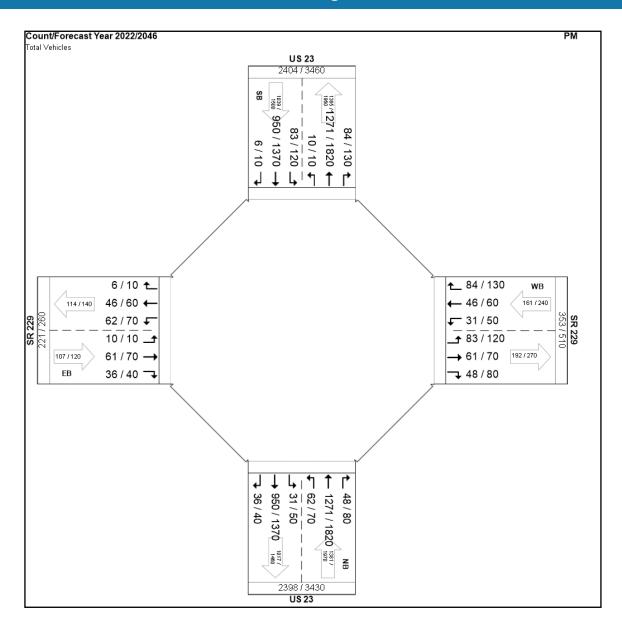
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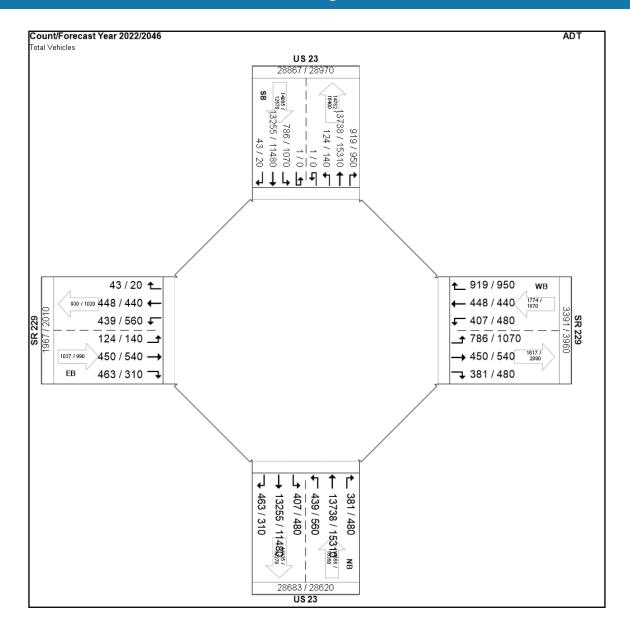
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Count VS Design Year ADT

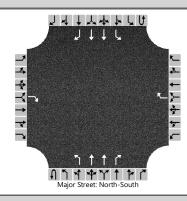


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Appendix F: Traffic Operations HCS Output

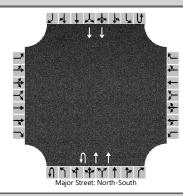
		HCS	S Sigr	nalize	d Int	tersec	ctic	on Re	esult	ts Su	mma	ry					
											. 1		41 .			4 7 4 1	k I
General Inform	nation									Interse		nto	_	n		111	Dr. C.
Agency									_	Duratio			0.250		_7		Pt.
Analyst						te Aug				Area Ty	/ре		Other		<i>±</i> , →		<u></u>
Jurisdiction				Time F				M		PHF			0.92		♦ - ♦	W ∓ E 8	
Urban Street		US 23		Analys						Analysi	s Perio	od	1> 7:0	00	<u>→</u>		*# [
Intersection		SR 229		File Na	ame	2020	6 AI	M No E	Build.x	us						5 ተ ጅ	
Project Descrip	tion	2026 AM No Build													*	1 ተቀጥ	7 4
Demand Inform	nation				EE	3			WE	3			NB		T	SB	
Approach Move	ment			L	Т	R		L	Т	R		L	Т	R	L	Т	R
Demand (v), v				10	30) 70)	70	40	10	0 3	30	1010	20	60	1240	10
					Г П:			_	Ļ								
Signal Informa		T=	_		1	3	\succeq								-4-		_
Cycle, s	60.0	Reference Phase	2		R		E							1	Ψ_{z}	3	→
Offset, s	0	Reference Point	End	Green			3	0.0	0.0	0.0	0	.0					<u>-</u>
Uncoordinated	No	Simult. Gap E/W	On	Yellow	_	4.0		0.0	0.0	0.0		.0					7
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0		0.0	0.0	0.0	0	.0		5	6	7	8
Timer Results				EBL	T	EBT	Ŧ	WBI		WBT	I	NBL		NBT	SBI		SBT
Assigned Phase	<u> </u>					4	7			8				2			6
Case Number					_	8.0	+			8.0	1			6.0	_		6.0
Phase Duration	-				-	15.3	+		-	15.3	+		_	14.7	_		44.7
Change Period,	<u> </u>	-) c		_	-	4.0	+		_	4.0	+		_	4.0	_		4.0
Max Allow Head	•	,			-	3.1	+		-	3.1	+-		_	0.0	_		0.0
Queue Clearan		,				6.0	ł			10.7	-			0.0	_		0.0
Green Extensio		, - ,			-	0.6	+			0.6	-		_	0.0			0.0
Phase Call Prob		(g e), s				1.00	+			1.00	1			0.0			0.0
Max Out Probal					_	0.00	+			0.00	1						
	,																
Movement Gro	up Res	sults			EB				WB				NB			SB	
Approach Move	ment			L	T	R	_	L	T	R	L		T	R	L	T	R
Assigned Move	ment			7	4	14		3	8	18	5		2	12	1	6	16
Adjusted Flow F	Rate (v), veh/h			120				228		33	3	562	558	65	680	679
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n		159°	1			1483		36	6	1707	1695	459	1707	1702
Queue Service	Time (g	g s), s			0.0				4.8		3.1	1	9.5	9.5	4.8	12.8	12.8
Cycle Queue Cl	learanc	e Time (<i>g շ</i>), s			4.0				8.7		16.	0	9.5	9.5	14.3	12.8	12.8
Green Ratio (g	/C)				0.19	9			0.19		0.6	8	0.68	0.68	0.68	0.68	0.68
Capacity (c), v	eh/h				366				360		29	0	1158	1150	359	1158	1154
Volume-to-Capa	acity Ra	ntio (X)			0.32	7			0.635	5	0.1	12	0.485	0.485	0.182	0.588	0.588
Back of Queue	(Q), ft	t/In (95 th percentile	:)														
Back of Queue	(Q), ve	eh/In (95 th percenti	ile)		2.2				4.7		0.4	1	2.6	2.6	0.7	3.6	3.6
Queue Storage	Ratio (RQ) (95 th percent	tile)		0.00)			0.00		0.0	0	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s	/veh			21.4	1			23.2		9.4	1	4.6	4.6	8.1	5.2	5.2
Incremental De	lay (<i>d</i> 2), s/veh			0.2				0.7		3.0	3	1.5	1.5	1.1	2.2	2.2
Initial Queue De	elay (<i>d</i>	з), s/veh			0.0				0.0		0.0)	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/ve	eh			21.6	3			23.9		10.	2	6.1	6.1	9.2	7.4	7.4
Level of Service					С				С		В		Α	Α	Α	Α	Α
Approach Delay				21.6	6	С	Ť	23.9		С	6	3.2		Α	7.4		Α
Intersection Delay, s/veh / LOS							8.8	3							A		
Multimodal Re					EB		1		WB				NB			SB	
Pedestrian LOS				2.28	_	В		2.28	-	В	_	.62		В	1.62	_	В
Bicycle LOS Sc	ore / LC	OS		0.68	3	Α		0.86		Α	1	.44		Α	1.66	6	В

	HCS Two-Way Stop	-Control Report	
General Information		Site Information	
Analyst		Intersection	US 23 & SR 229
Agency/Co.		Jurisdiction	
Date Performed	7/15/2022	East/West Street	SR 229
Analysis Year	2022	North/South Street	US 23
Time Analyzed	2026 AM	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	RCUT		



Vehicle Volumes and Adj	ustme	nts														
Approach		Eastb	ound			Westl	oound			North	bound			South	bound	
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	1	0	1	2	1	0	1	2	1
Configuration				R				R		L	Т	R		L	Т	R
Volume (veh/h)				110				210	0	30	1020	50	0	60	1310	50
Percent Heavy Vehicles (%)				9				11	13	10			13	21		
Proportion Time Blocked																
Percent Grade (%)			0			()									
Right Turn Channelized		Ν	10			Ν	lo			N	lo			Ν	lo	
Median Type Storage				Left	Only								1			
Critical and Follow-up H	eadwa	ys														
Base Critical Headway (sec)				6.9				6.9		4.1				4.1		
Critical Headway (sec)				7.08				7.12		4.30				4.52		
Base Follow-Up Headway (sec)				3.3				3.3		2.2				2.2		
Follow-Up Headway (sec)				3.39				3.41		2.30				2.41		
Delay, Queue Length, an	d Leve	l of S	ervice													
Flow Rate, v (veh/h)				120				228		33				65		
Capacity, c (veh/h)				359				453		414				499		
v/c Ratio				0.33				0.50		0.08				0.13		
95% Queue Length, Q ₉₅ (veh)				1.4				2.8		0.3				0.4		
Control Delay (s/veh)				19.9				20.7		14.4				13.3		
Level of Service (LOS)				С				С		В				В		
Approach Delay (s/veh)		19	9.9			20	0.7	•		0	.4			0	.6	
Approach LOS			С			(C			,	4			,	4	

	HCS Two-Way Stop	-Control Report	
General Information		Site Information	
Analyst		Intersection	US 23 & SR 229
Agency/Co.		Jurisdiction	
Date Performed	5/25/2022	East/West Street	SR 229
Analysis Year	2022	North/South Street	US 23
Time Analyzed	2026 AM	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	RCUT north intersection		



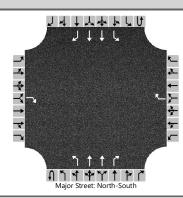
Vehicle Volumes and Ad	justme	nts														
Approach		Eastb	ound			Westl	oound			North	bound			South	bound	
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	0	1	0	2	0	0	0	2	0
Configuration									U		Т				Т	
Volume (veh/h)									110		1120				1310	
Percent Heavy Vehicles (%)									13							
Proportion Time Blocked																
Percent Grade (%)																
Right Turn Channelized																
Median Type Storage				Left	Only								1			
Critical and Follow-up H	eadwa	ys														
Base Critical Headway (sec)									4.3							
Critical Headway (sec)									4.60							
Base Follow-Up Headway (sec)									2.6							
Follow-Up Headway (sec)									2.70							
Delay, Queue Length, an	d Leve	l of S	ervice													
Flow Rate, v (veh/h)	T								120							
Capacity, c (veh/h)									352							
v/c Ratio									0.34							
95% Queue Length, Q ₉₅ (veh)									1.5							
Control Delay (s/veh)									20.4							
Level of Service (LOS)	Ì								С							
Approach Delay (s/veh)						•	-	-		1	.8	•		•	•	
Approach LOS										,	A					

			HCS	S Alte	rnativ	e Inte	rsect	ions F	Result	ts Sui	nmar	у						
General In	nformation									Alt	ernati	ve Inte	ersect	ion In	forma	tion		
Agency										Inte	ersection	on Typ	е		RCU	T with	TWSC	;
Analyst					An	alysis	Date	7/15/	2022	Se	gment	One [Distanc	ce, ft	800			
Jurisdiction	n				Du	ration,	h	0.25		Se	gment	Two D	Distanc	e, ft	800			
Intersectio	on .	US 23 & SR 22	9		PH	F		0.92			erial D				North	n-Sout	:h	
Main Inters	section File	2026 AM RCUT	.xtw															
North Cros	ssover File	2026 AM RCUT	north	.xtw														
South Cro	ssover File	2026 AM RCUT	south	xtw														
Project De		RCUT																
1 10,000 00	occupation .	11001																
Demand			EBU	EBL	EBT	ГРР	WELL	WDI	WDT	WDD	NBU	NDI	NBT	NBR	CDLL	SBL	SBT	SBF
	O D	/ //-	EDU	EDL	EDI	EDK	VVDU	VVDL	VVDI	VVDIC		INDL		INDIX	SDU	SDL		SDF
	on One Demar	· /				110				0.10	110	0.0	1120	50	_	00	1310	
	n Two Demar	. ,				110				210	0	30	1020		0	60	1310	
Intersectio	on Three Dem	and (<i>v</i>), veh/h											1060		40		1380	
	(1) North C	crossover				(2) Ma	ain Inte	ersection	on				(3)) South	Cross	sover		
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		PROTEIN CONTRACTOR OF THE PARTY					J								↓ U	20		
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7	በጎ ቀ ቀን	† † †			7	በ ካ Major	ጎ † † ተ ነው ነገ Street: No	rth-South	7			- ₹				outh		
	በጎ ቀ ቀን	1 YIT F 7 North-South	EBU	EBL	EBT				WBT	WBR	NBU				t: North-S			SBF
Queue-to-	Major Street. N	1 YIT F 7 North-South	EBU	EBL					WBT	WBR				Major Stree	t: North-S			SBF
Queue-to-	Major Street: N Storage Ration One (Ra)	1 YIT F 7 North-South	EBU	EBL		EBR			WBT		NBU 0.12	NBL		Major Stree	t: North-S	SBL	SBT	SBF
Queue-to- Intersectio	Major Street No. Storage Ration One (Ra)	1 YIT F 7 North-South	EBU	EBL					WBT	WBR 0.22				Major Stree	SBU		SBT	SBF
Queue-to- Intersectio	Major Street: N Storage Ration One (Ra)	1 YIT F 7 North-South	EBU	EBL		EBR			WBT			NBL		Major Stree	t: North-S	SBL	SBT	SBF
Queue-to- Intersectio Intersectio	Major Street. NoStorage Ration One (Ro) on Two (Ro) on Three (Ro)	Toorth-South	EBU	EBL		EBR			WBT			NBL		Major Stree	SBU	SBL	SBT	SBF
Queue-to- Intersectio Intersectio Intersectio	Storage Ration One (Ra) on Two (Ra) on Three (Ra)	to Results	EBU		EBT	0.11	WBU	WBL		0.22	0.12	NBL 0.02	NBT	NBR	SBU	SBL 0.04	SBT	
Queue-to- Intersectio Intersectio Intersectio	Storage Ration One (Ra) on Two (Ra) on Three (Ra)	North-South Results Movements			EBT	0.11	WBU	WBL	ay (s/v	0.22	0.12 DTT (s	NBL 0.02 s/veh)	NBT	NBR	SBU 0.03	SBL 0.04	SBT	LOS
Queue-to- Intersectio Intersectio Intersectio	Storage Ration One (Ra) on Two (Ra) on Three (Ra) or Three (Ca) or EBR(2) +	Results Movements SBU(3) + NBT(2)	2)		EBT Rate (1	0.11	WBU	WBL rol Del:	ay (s/w	0.22	0.12 DTT (\$	NBL 0.02 s/veh)	NBT	NBR (s/veh	SBU 0.03	SBL 0.04	SBT Ra>1?	LOS
Queue-to- Intersection Intersection Intersection Alternative O-D EBL EBT	Storage Ration One (Ra) on Two (Ra) on Three (Ra) or Three (Ca) or EBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2	2)		EBT Rate (1 11 33	0.11	WBU	WBL rol Dela 33. 33.	ay (s/v 6	0.22	0.12 DTT (\$ 18.	NBL 0.02 s/veh) 1	NBT ETT 5	NBR (s/veh 51.7	SBU 0.03	SBL 0.04	SBT Ra>1? No No	LOS D
Queue-to- Intersection Intersection Intersection Alternative O-D EBL EBT EBR	Storage Ration One (Ra) on Two (Ra) on Three (Ra) Ye Intesection Con EBR(2) + EBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2)	2)		EBT Rate (1 11 33 76	0.11	WBU	WBL Tol Del: 33. 33.	ay (s/v 6 6 9	0.22	0.12 DTT (s 18. 18.	0.02 6/veh) 1	NBT ETT 5	NBR (s/veh 51.7 19.9	SBU 0.03	>1? lo lo lo	SBT Ro>1? No No No	LOS D D
Queue-to- Intersection Intersection Alternativ O-D EBL EBT EBR WBL	Storage Ration One (Ra) on Two (Ra) on Three (Ra) on EBR(2) + EBR(2) + WBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) NBU(1) + SBT(3)	2) 2) 2)		EBT Rate (1 11 33 76 76	0.11	WBU	rol Del: 33. 33. 19. 41.	ay (s/v 6 6 9	0.22	0.12 DTT (\$ 18. 18. 	NBL 0.02 s/veh) 1	NBT ETT 55 11	(s/veh 51.7 51.7 19.9 59.2	SBU 0.03	SBL 0.04	SBT Ro>1? No No No No	LOS D D B E
Queue-to- Intersection Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) NBU(1) + SBT(3 NBU(1) + SBR(3)	2) 2) 2)		EBT Rate (* 11 33 76 76 43	0.11	WBU	WBL 33. 33. 19. 41.	ay (s/v 6 6 9 1	0.22	0.12 DTT (s 18. 18.	NBL 0.02 s/veh) 1	ETT 55 55 55 55 55 55 55 55 55 55 55 55 5	(s/veh 51.7 59.2 59.2	SBU 0.03	SBL 0.04	SBT Ro>1? No No No	LOS D D B E
Queue-to- Intersection Intersection Alternativ O-D EBL EBT EBR WBL	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) NBU(1) + SBT(3)	2) 2) 2)		EBT Rate (1 11 33 76 76	0.11	WBU	rol Del: 33. 33. 19. 41.	ay (s/v 6 6 9 1	0.22	0.12 DTT (\$ 18. 18. 	NBL 0.02 s/veh) 1	ETT 55 55 55 55 55 55 55 55 55 55 55 55 5	(s/veh 51.7 51.7 19.9 59.2	SBU 0.03	SBL 0.04	SBT Ro>1? No No No No	LOS D D B E
Queue-to- Intersection Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) NBU(1) + SBT(3 NBU(1) + SBR(3)	2) 2) 2)		EBT Rate (* 11 33 76 76 43	0.11	WBU	WBL 33. 33. 19. 41.	ay (s/v 6 6 9 1	0.22	0.12 DTT (s 18. 18. 18.	NBL 0.02 s/veh) 1	NBT ETT 55 11 55 22	(s/veh 51.7 59.2 59.2	SBU 0.03	SBL 0.04	SBT No No No No No	LOS D D B E
Queue-to- Intersectio Intersectio Intersectio Alternativ O-D EBL EBT EBR WBL WBT WBR	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) - NBU(1) + SBT(3 WBR(2)	2) 2) 2)		EBT Rate (11 33 76 76 43 109	0.11	WBU	WBL 33. 33. 19. 41. 20.	ay (s/v 6 6 9 1 1 7	0.22	0.12 DTT (\$ 18. 18. 18.	NBL 0.02 s/veh) 1	NBT 55 56 21 11	(s/veh 51.7 51.7 19.9 59.2 20.7	SBU 0.03	SBL 0.04 >1? lo lo lo lo lo	SBT RQ>1? NO NO NO NO NO	LOS D D B E E
Queue-to- Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT WBR NBL	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) NBU(1) + SBT(3 NBU(1) + SBR(3 WBR(2) NBL(2)	2) 2) 2)		EBT Rate (1 11 33 76 76 43 109 33	0.11	WBU	Tol Del: 33. 33. 19. 41. 41. 20.	ay (s/v 6 6 9 1 1 7 4	0.22	0.12 DTT (s 18. 18. 18.	NBL 0.02 s/veh) 1 1	ETT 55 55 55 22 11 0	(s/veh 51.7 51.7 59.2 59.2 20.7	SBU 0.03 V/C N N N N	SBL 0.04 >1? lo lo lo lo lo	SBT No No No No No No No	LOS D D B E E C
Queue-to- Intersection Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBL	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBT(2 NBU(1) + SBT(2 NBU(1) + SBR(2) NBU(2) NBL(2) NBL(2) NBR(2)	2) 2) 2)		EBT Rate (* 11 33 76 76 43 109 33 1098	0.11	WBU	WBL 33. 33. 19. 41. 20. 14. 0.6	ay (s/v 6 6 9 1 1 7 4	0.22	0.12 DTT (s 18. 18. 18.	NBL 0.02 s/veh) 1 1	ETT 55 55 55 22 11 00 00 00 00 00 00 00 00 00 00 00 00	(s/veh 51.7 59.2 59.2 20.7 14.4	SBU 0.03) V/c: N N N N	SBL 0.04 >1? lo lo lo lo lo lo lo lo lo l	SBT No	LOS D D B E E C C B A
Queue-to- Intersection Intersection Intersection Intersection Alternative O-D EBL EBT EBR WBL WBT WBR NBL NBT NBL NBT NBR	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2) NBU(1) + SBR(2) NBU(1) + SBR(2) NBU(2) NBL(2) NBR(2) NBR(2) SBL(2)	2) 2) 2)		EBT Rate (11 33 76 76 43 109 33 1098 22	0.11	WBU	Tol Del: 33. 33. 19. 41. 20. 14. 0.0 13.	ay (s/v 6 6 9 1 1 7 4 0	0.22	0.12 DTT (\$ 18. 18. 18.	NBL 0.02 s/veh) 1 1	NBT 55 55 11 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	(s/veh 51.7 51.7 59.2 59.2 20.7 14.4 0.0 0.0 13.3	SBU 0.03 V/c: N N N N N N N N N N N N N	SBL 0.04 >1? lo lo lo lo lo	SBT SBT No No No No No No	LOS D D B E E C C B A A B B
Queue-to- Intersection Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBT(2 FBR(2) NBU(1) + SBT(3 WBR(2) NBL(2) NBL(2) NBL(2) SBL(2) SBL(2) SBT(2)	2) 2) 2)		EBT Rate (*11 33 76 43 1098 32 65 1348	0.11	WBU	rol Del: 33. 33. 19. 41. 20. 14. 0.0 0.0 13.	ay (s/v 6 6 9 1 1 7 4 0 0	0.22	0.12 DTT (s 18. 18. 18.	NBL 0.02 s/veh) 1 1	ETT 55 55 11 10 10 10 11 11 11 11 11 11 11 11 11	(s/veh 51.7 51.7 19.9 59.2 20.7 14.4 0.0 0.0 13.3 0.0	0.03 V/C N N N N N N N N N	>1? lo lo lo lo lo lo lo l	SBT No	LOS D D B E E C C B A A B B A
Queue-to- Intersectio Intersectio Intersectio Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2) NBU(1) + SBR(2) NBU(1) + SBR(2) NBU(2) NBL(2) NBR(2) NBR(2) SBL(2)	2) 2) 2)		EBT Rate (1 11 33 76 76 43 109 33 1098 22 65	0.11	WBU	Tol Del: 33. 33. 19. 41. 20. 14. 0.0 13.	ay (s/v 6 6 9 1 1 7 4 0 0	0.22	0.12 DTT (s 18. 18. 18. 	NBL 0.02 s/veh) 1 1	ETT 55 55 11 10 10 10 11 11 11 11 11 11 11 11 11	(s/veh 51.7 51.7 59.2 59.2 20.7 14.4 0.0 0.0 13.3	0.03 V/C N N N N N N N N N	SBL 0.04 >1? lo lo lo lo lo lo lo lo	SBT No No No No No No No No No	LOS D D B E E C C B A A B B
Queue-to- Intersectio Intersectio Intersectio Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR	Storage Ration One (Ra) on Two (Ra) on Three (Ra) on Three (Ra) we Intersection CEBR(2) + WBR(2) + WBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBT(2 FBR(2) NBU(1) + SBT(3 WBR(2) NBL(2) NBL(2) NBL(2) SBL(2) SBL(2) SBT(2)	2) 2) 2)	Flow	EBT Rate (1 1 33 76 76 43 1099 33 1098 22 65 1348 11	0.11	WBU	Tol Del: 33. 33. 19. 41. 41. 20. 14. 0.0 0.0	ay (s/v 6 6 9 1 1 7 4 0)	0.22	0.12 DTT (s 18. 18. 18. 	NBL 0.02 s/veh) 1 1	ETT 55 55 11 00 00 11 10 00 10 10 10 10 10 10 10	(s/veh 51.7 51.7 19.9 59.2 20.7 14.4 0.0 0.0 13.3 0.0	0.03 V/C N N N N N N N N N	SBL 0.04 >1? lo lo lo lo lo	SBT Ra>1? No No No No No No No	LOS D D B E E C B A A B B
Queue-to- Intersectio Intersectio Intersectio Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR	Storage Ration One (Ra) on Two (Ra) on Three (Ra) on Three (Ra) we Interection O-D EBR(2) + EBR(2) + WBR(2) + WBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBT(2 - NBU(1) + SBT(2 - NBU(1) + SBR(2 - NBL(2) - NBL(2) - NBR(2) - SBL(2) - SBL(2) - SBL(2) - SBL(2) - SBR(2) - SBR(2) - SBR(2) - SBR(2)	2) 2) 2) 2)	Flow	EBT Rate (*11 33 76 76 43 1098 22 65 1348 11 EB	EBR 0.11 veh/h)	Contr	WBL rol Del: 33. 33. 19. 41. 20. 14. 0.0 0.0 13. 0.0	ay (s/v 6 6 9 1 1 7 4 0) 0	0.22	0.12 DTT (s 18. 18. 	NBL 0.02 s/veh) 1 1	ETT 55 55 11 (1) (1) (1) (1) (1) (1) (1) (1) (1)	(s/veh 51.7 51.7 19.9 59.2 20.7 14.4 0.0 0.0 13.3 0.0	SBU 0.03) V/C3 N N N N N	>1? lo lo lo lo lo lo lo l	SBT No No No No No No No SBB	LOS D D B E E C C B A A B A A A
Queue-to- Intersection Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR Overall Re Approach	Storage Ration One (Ra) on Two (Ra) on Three (Ra) on Three (Ra) we Intersection CEBR(2) + WBR(2) + WBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 - NBU(1) + SBT(2 - NBU(1) + SBR(2 NBL(2) NBL(2) NBL(2) NBL(2) NBR(2) SBL(2) SBL(2) SBL(2) SBR(2) SBR(2)	2) 2) 2) 2)	Flow	EBT Rate (*11 33 76 76 43 1098 22 65 1348 11 EB	EBR 0.11	WBU	WBL rol Del: 33. 33. 19. 41. 20. 14. 0.0 0.0 13. 0.0	ay (s/v 6 6 9 1 1 7 4 0)	0.22	0.12 DTT (s 18. 18. 18. 	NBL 0.02 s/veh) 1 1	ETT 55 55 11 (1) (1) (1) (1) (1) (1) (1) (1) (1)	(s/veh 51.7 51.7 19.9 59.2 20.7 14.4 0.0 0.0 13.3 0.0	SBU	SBL 0.04 >1? lo lo lo lo lo	SBT No No No No No No No SBB	LOS D D B E E C B A A B B

			HCS	S Alte	rnativ	e Inte	rsect	ions F	Result	ts Sui	nmar	у						
General In	nformation									Alt	ernati	ve Inte	ersect	ion In	forma	tion		
Agency										Inte	ersection	on Typ	е		RCU	T with	TWSC	;
Analyst					An	alysis	Date	7/15/	2022	Se	gment	One [Distanc	ce, ft	800			
Jurisdiction	n				Du	ration,	h	0.25		Se	gment	Two D	Distanc	e, ft	800			
Intersectio	on .	US 23 & SR 22	9		PH	F		0.92			erial D				North	n-Sout	:h	
Main Inters	section File	2026 AM RCUT	.xtw															
North Cros	ssover File	2026 AM RCUT	north	.xtw														
South Cro	ssover File	2026 AM RCUT	south	xtw														
Project De		RCUT																
1 10,000 00	occupation .	11001																
Demand			EBU	EBL	EBT	ГРР	WELL	WDI	WDT	WDD	NBU	NDI	NBT	NBR	CDLL	SBL	SBT	SBF
	O D	/ //-	EDU	EDL	EDI	EDK	VVDU	VVDL	VVDI	VVDIC		INDL		INDIX	SDU	SDL		SDF
	on One Demar	· /				110				0.10	110	0.0	1120	50	_	00	1310	
	n Two Demar	. ,				110				210	0	30	1020		0	60	1310	
Intersectio	on Three Dem	and (<i>v</i>), veh/h											1060		40		1380	
	(1) North C	crossover				(2) Ma	ain Inte	ersection	on				(3)) South	Cross	sover		
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7	በጎ ቀ ቀን	† † †			7	በ ካ Major	ጎ † † ተ ነው ነገ Street: No	rth-South	7			- ₹				outh		
	በጎ ቀ ቀን	1 YIT F 7 North-South	EBU	EBL	EBT				WBT	WBR	NBU				t: North-S			SBF
Queue-to-	Major Street. N	1 YIT F 7 North-South	EBU	EBL					WBT	WBR				Major Stree	t: North-S			SBF
Queue-to-	Major Street: N Storage Ration One (Ra)	1 YIT F 7 North-South	EBU	EBL		EBR			WBT		NBU 0.12	NBL		Major Stree	t: North-S	SBL	SBT	SBF
Queue-to- Intersectio	Major Street No. Storage Ration One (Ra)	1 YIT F 7 North-South	EBU	EBL					WBT	WBR 0.22				Major Stree	SBU		SBT	SBF
Queue-to- Intersectio	Major Street: N Storage Ration One (Ra)	1 YIT F 7 North-South	EBU	EBL		EBR			WBT			NBL		Major Stree	t: North-S	SBL	SBT	SBF
Queue-to- Intersectio Intersectio	Major Street. NoStorage Ration One (Ro) on Two (Ro) on Three (Ro)	Toorth-South	EBU	EBL		EBR			WBT			NBL		Major Stree	SBU	SBL	SBT	SBF
Queue-to- Intersectio Intersectio Intersectio	Storage Ration One (Ra) on Two (Ra) on Three (Ra)	to Results	EBU		EBT	0.11	WBU	WBL		0.22	0.12	NBL 0.02	NBT	NBR	SBU	SBL 0.04	SBT	
Queue-to- Intersectio Intersectio Intersectio	Storage Ration One (Ra) on Two (Ra) on Three (Ra)	North-South Results Movements			EBT	0.11	WBU	WBL	ay (s/v	0.22	0.12 DTT (s	NBL 0.02 s/veh)	NBT	NBR	SBU 0.03	SBL 0.04	SBT	LOS
Queue-to- Intersectio Intersectio Intersectio	Storage Ration One (Ra) on Two (Ra) on Three (Ra) or Three (Ca) or EBR(2) +	Results Movements SBU(3) + NBT(2)	2)		EBT Rate (1	0.11	WBU	WBL rol Del:	ay (s/w	0.22	0.12 DTT (\$	NBL 0.02 s/veh)	NBT	NBR (s/veh	SBU 0.03	SBL 0.04	SBT Ra>1?	LOS
Queue-to- Intersection Intersection Intersection Alternative O-D EBL EBT	Storage Ration One (Ra) on Two (Ra) on Three (Ra) or Three (Ca) or EBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2	2)		EBT Rate (1 11 33	0.11	WBU	WBL rol Dela 33. 33.	ay (s/v 6	0.22	0.12 DTT (\$ 18.	NBL 0.02 s/veh) 1	NBT ETT 5	NBR (s/veh 51.7	SBU 0.03	SBL 0.04	SBT Ra>1? No No	LOS D
Queue-to- Intersection Intersection Intersection Alternative O-D EBL EBT EBR	Storage Ration One (Ra) on Two (Ra) on Three (Ra) Ye Intesection Con EBR(2) + EBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2)	2)		EBT Rate (1 11 33 76	0.11	WBU	WBL Tol Del: 33. 33.	ay (s/v 6 6 9	0.22	0.12 DTT (s 18. 18.	0.02 6/veh) 1	NBT ETT 5	NBR (s/veh 51.7 19.9	SBU 0.03	>1? lo lo lo	SBT Ro>1? No No No	LOS D D
Queue-to- Intersection Intersection Alternativ O-D EBL EBT EBR WBL	Storage Ration One (Ra) on Two (Ra) on Three (Ra) on EBR(2) + EBR(2) + WBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) NBU(1) + SBT(3)	2) 2) 2)		EBT Rate (1 11 33 76 76	0.11	WBU	rol Del: 33. 33. 19. 41.	ay (s/v 6 6 9	0.22	0.12 DTT (\$ 18. 18. 	NBL 0.02 s/veh) 1	NBT ETT 55 11	(s/veh 51.7 51.7 19.9 59.2	SBU 0.03	SBL 0.04	SBT Ro>1? No No No No	LOS D D B E
Queue-to- Intersection Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) NBU(1) + SBT(3 NBU(1) + SBR(3)	2) 2) 2)		EBT Rate (* 11 33 76 76 43	0.11	WBU	WBL 33. 33. 19. 41.	ay (s/v 6 6 9 1	0.22	0.12 DTT (s 18. 18.	NBL 0.02 s/veh) 1	ETT 55 55 55 55 55 55 55 55 55 55 55 55 5	(s/veh 51.7 59.2 59.2	SBU 0.03	SBL 0.04	SBT Ro>1? No No No	LOS D D B E
Queue-to- Intersection Intersection Alternativ O-D EBL EBT EBR WBL	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) NBU(1) + SBT(3)	2) 2) 2)		EBT Rate (1 11 33 76 76	0.11	WBU	rol Del: 33. 33. 19. 41.	ay (s/v 6 6 9 1	0.22	0.12 DTT (\$ 18. 18. 	NBL 0.02 s/veh) 1	ETT 55 55 55 55 55 55 55 55 55 55 55 55 5	(s/veh 51.7 51.7 19.9 59.2	SBU 0.03	SBL 0.04	SBT Ro>1? No No No No	LOS D D B E
Queue-to- Intersection Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) NBU(1) + SBT(3 NBU(1) + SBR(3)	2) 2) 2)		EBT Rate (* 11 33 76 76 43	0.11	WBU	WBL 33. 33. 19. 41.	ay (s/v 6 6 9 1	0.22	0.12 DTT (s 18. 18. 18.	NBL 0.02 s/veh) 1	NBT ETT 55 11 55 22	(s/veh 51.7 59.2 59.2	SBU 0.03	SBL 0.04	SBT No No No No No	LOS D D B E
Queue-to- Intersectio Intersectio Intersectio Alternativ O-D EBL EBT EBR WBL WBT WBR	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) - NBU(1) + SBT(3 WBR(2)	2) 2) 2)		EBT Rate (11 33 76 76 43 109	0.11	WBU	WBL 33. 33. 19. 41. 20.	ay (s/v 6 6 9 1 1 7	0.22	0.12 DTT (\$ 18. 18. 18.	NBL 0.02 s/veh) 1	NBT 55 56 21 11	(s/veh 51.7 51.7 19.9 59.2 20.7	SBU 0.03	SBL 0.04 >1? lo lo lo lo lo	SBT RQ>1? NO NO NO NO NO	LOS D D B E E
Queue-to- Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT WBR NBL	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 EBR(2) NBU(1) + SBT(3 NBU(1) + SBR(3 WBR(2) NBL(2)	2) 2) 2)		EBT Rate (1 11 33 76 76 43 109 33	0.11	WBU	Tol Del: 33. 33. 19. 41. 41. 20.	ay (s/v 6 6 9 1 1 7 4	0.22	0.12 DTT (s 18. 18. 18.	NBL 0.02 s/veh) 1 1	ETT 55 55 55 22 11 0	(s/veh 51.7 51.7 59.2 59.2 20.7	SBU 0.03 V/C N N N N	SBL 0.04 >1? lo lo lo lo lo	SBT No No No No No No No	LOS D D B E E C
Queue-to- Intersection Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBL	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBT(2 NBU(1) + SBT(2 NBU(1) + SBR(2) NBU(2) NBL(2) NBL(2) NBR(2)	2) 2) 2)		EBT Rate (* 11 33 76 76 43 109 33 1098	0.11	WBU	WBL 33. 33. 19. 41. 20. 14. 0.6	ay (s/v 6 6 9 1 1 7 4	0.22	0.12 DTT (s 18. 18. 18.	NBL 0.02 s/veh) 1 1	ETT 55 55 55 22 11 00 00 00 00 00 00 00 00 00 00 00 00	(s/veh 51.7 59.2 59.2 20.7 14.4	SBU 0.03) V/c: N N N N	SBL 0.04 >1? lo lo lo lo lo lo lo lo lo l	SBT No	LOS D D B E E C C B A
Queue-to- Intersection Intersection Intersection Intersection Alternative O-D EBL EBT EBR WBL WBT WBR NBL NBT NBL NBT NBR	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2) NBU(1) + SBR(2) NBU(1) + SBR(2) NBU(2) NBL(2) NBR(2) NBR(2) SBL(2)	2) 2) 2)		EBT Rate (11 33 76 76 43 109 33 1098 22	0.11	WBU	Tol Del: 33. 33. 19. 41. 20. 14. 0.0 13.	ay (s/v 6 6 9 1 1 7 4 0	0.22	0.12 DTT (\$ 18. 18. 18.	NBL 0.02 s/veh) 1 1	NBT 55 55 11 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	(s/veh 51.7 51.7 59.2 59.2 20.7 14.4 0.0 0.0 13.3	SBU 0.03 V/c: N N N N N N N N N N N N N	SBL 0.04 >1? lo lo lo lo lo	SBT SBT No No No No No No	LOS D D B E E C C B A A B B
Queue-to- Intersection Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBT(2 FBR(2) NBU(1) + SBT(3 WBR(2) NBL(2) NBL(2) NBL(2) SBL(2) SBL(2) SBT(2)	2) 2) 2)		EBT Rate (*11 33 76 43 1098 32 65 1348	0.11	WBU	rol Del: 33. 33. 19. 41. 20. 14. 0.0 0.0 13.	ay (s/v 6 6 9 1 1 7 4 0 0	0.22	0.12 DTT (s 18. 18. 18.	NBL 0.02 s/veh) 1 1	ETT 55 55 11 10 10 10 11 11 11 11 11 11 11 11 11	(s/veh 51.7 51.7 19.9 59.2 20.7 14.4 0.0 0.0 13.3 0.0	0.03 V/C N N N N N N N N N	>1? lo lo lo lo lo lo lo l	SBT No	LOS D D B E E C C B A A B B A
Queue-to- Intersectio Intersectio Intersectio Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL	Major Street. No. Major Street	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2) NBU(1) + SBR(2) NBU(1) + SBR(2) NBU(2) NBL(2) NBR(2) NBR(2) SBL(2)	2) 2) 2)		EBT Rate (1 11 33 76 76 43 109 33 1098 22 65	0.11	WBU	Tol Del: 33. 33. 19. 41. 20. 14. 0.0 13.	ay (s/v 6 6 9 1 1 7 4 0 0	0.22	0.12 DTT (s 18. 18. 18. 	NBL 0.02 s/veh) 1 1	ETT 55 55 11 10 10 10 11 11 11 11 11 11 11 11 11	(s/veh 51.7 51.7 59.2 59.2 20.7 14.4 0.0 0.0 13.3	0.03 V/C N N N N N N N N N	SBL 0.04 >1? lo lo lo lo lo lo lo lo	SBT No No No No No No No No No	LOS D D B E E C C B A A B B
Queue-to- Intersectio Intersectio Intersectio Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR	Storage Ration One (Ra) on Two (Ra) on Three (Ra) on Three (Ra) we Intersection CEBR(2) + WBR(2) + WBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBT(2 FBR(2) NBU(1) + SBT(3 WBR(2) NBL(2) NBL(2) NBL(2) SBL(2) SBL(2) SBT(2)	2) 2) 2)	Flow	EBT Rate (1 1 33 76 76 43 1099 33 1098 22 65 1348 11	0.11	WBU	Tol Del: 33. 33. 19. 41. 41. 20. 14. 0.0 0.0	ay (s/v 6 6 9 1 1 7 4 0)	0.22	0.12 DTT (s 18. 18. 18. 	NBL 0.02 s/veh) 1 1	ETT 55 55 11 00 00 11 10 00 10 10 10 10 10 10 10	(s/veh 51.7 51.7 19.9 59.2 20.7 14.4 0.0 0.0 13.3 0.0	0.03 V/C N N N N N N N N N	SBL 0.04 >1? lo lo lo lo lo	SBT Ra>1? No No No No No No No	LOS D D B E E C B A A B B
Queue-to- Intersectio Intersectio Intersectio Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR	Storage Ration One (Ra) on Two (Ra) on Three (Ra) on Three (Ra) we Interection O-D EBR(2) + EBR(2) + WBR(2) + WBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBT(2 - NBU(1) + SBT(2 - NBU(1) + SBR(2 - NBL(2) - NBL(2) - NBR(2) - SBL(2) - SBL(2) - SBL(2) - SBL(2) - SBR(2) - SBR(2) - SBR(2) - SBR(2)	2) 2) 2) 2)	Flow	EBT Rate (*11 33 76 76 43 1098 22 65 1348 11 EB	EBR 0.11 veh/h)	Contr	WBL rol Del: 33. 33. 19. 41. 20. 14. 0.0 0.0 13. 0.0	ay (s/v 6 6 9 1 1 7 4 0) 0	0.22	0.12 DTT (s 18. 18. 	NBL 0.02 s/veh) 1 1	ETT 55 55 11 (1) (1) (1) (1) (1) (1) (1) (1) (1)	(s/veh 51.7 51.7 19.9 59.2 20.7 14.4 0.0 0.0 13.3 0.0	SBU 0.03) V/C3 N N N N N	>1? lo lo lo lo lo lo lo l	SBT No No No No No No No SBB	LOS D D B E E C C B A A B A A A
Queue-to- Intersection Intersection Intersection Alternativ O-D EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR Overall Re Approach	Storage Ration One (Ra) on Two (Ra) on Three (Ra) on Three (Ra) we Intersection CEBR(2) + WBR(2) + WBR(2) +	Results Movements SBU(3) + NBT(2 SBU(3) + NBR(2 - NBU(1) + SBT(2 - NBU(1) + SBR(2 NBL(2) NBL(2) NBL(2) NBL(2) NBR(2) SBL(2) SBL(2) SBL(2) SBR(2) SBR(2)	2) 2) 2) 2)	Flow	EBT Rate (*11 33 76 76 43 1098 22 65 1348 11 EB	EBR 0.11	WBU	WBL rol Del: 33. 33. 19. 41. 20. 14. 0.0 0.0 13. 0.0	ay (s/v 6 6 9 1 1 7 4 0)	0.22	0.12 DTT (s 18. 18. 18. 	NBL 0.02 s/veh) 1 1	ETT 55 55 11 (1) (1) (1) (1) (1) (1) (1) (1) (1)	(s/veh 51.7 51.7 19.9 59.2 20.7 14.4 0.0 0.0 13.3 0.0	SBU	SBL 0.04 >1? lo lo lo lo lo	SBT No No No No No No No SBB	LOS D D B E E C B A A B B

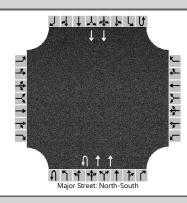
		HCS	S Sigr	nalized	d Int	ersect	ion R	esul	ts Sun	nmary	/				
Company Inform									Intonos	diam ind	41		Ţ.	14741	la L
General Inform	nation	1						_	Intersec				ľ	411	1 A
Agency				Γ		T			Duration		0.250				R
Analyst						e Aug 1			Area Typ	ре	Other		<i>Z</i> _b →		<u></u>
Jurisdiction				Time F		2026	PM		PHF		0.92		♦♦	W∓E s	*}
Urban Street		US 23		Analys					Analysis	Period	1> 16	5:30	立		'इ ८'
Intersection		SR 229		File Na	ame	2026	PM No	Build.x	us					为个种	
Project Descrip	tion	2026 PM No Build											*	1 1 4 Y	7 1
Demand Inform	nation				EB		Т	WE	3		NB			SB	
Approach Move				L	Т	R	L	Т	R	L	Т	R		Т	R
Demand (v), v				10	70	40	40	50	_		1840		110	1370	_
Bornaria (1), 1	011,711			10	. 0	1.0	.0		110		1010		110	1010	
Signal Informa	ition				11.	_ 5	<u> </u>	T	\top	T					
Cycle, s	60.0	Reference Phase	2			7	<u>~</u>						Ψ		-
Offset, s	0	Reference Point	End	Green	41.4	10.6	0.0	0.0	0.0	0.0		1	2	3	4
Uncoordinated	No	Simult. Gap E/W	On	Yellow		4.0	0.0	0.0		0.0					→
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	0.0	0.0		0.0		5	6	7	8
Timer Results				EBL	-	EBT	WB	L L	WBT	NB	L	NBT	SBI		SBT
Assigned Phase	е				_	4		\dashv	8			2		$-\!$	6
Case Number						8.0			8.0			6.0			6.0
Phase Duration						14.6		\perp	14.6			45.4			45.4
Change Period	_ `					4.0			4.0			4.0			4.0
Max Allow Head		,				3.0		\bot	3.0			0.0		-	0.0
Queue Clearan		, - ,				6.2			10.1						
Green Extension		(<i>g</i> _e), s				0.6			0.6			0.0			0.0
Phase Call Prol	bability					1.00			1.00						
Max Out Proba	bility					0.00			0.00						
Movement Gro	un Res	sults			EB			WB			NB			SB	
Approach Move		, and		L	T	R	L	T	R	L	T	R		T	R
Assigned Move				7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow F					130	+		217		87	1038	1038	120	751	749
		ow Rate (s), veh/h/li	n		1655			1531		319	1707	1685	182	1707	1703
Queue Service					0.0	+		3.9	+	12.5	28.9	29.9	11.5	14.6	14.6
Cycle Queue C	· · ·	- ,			4.2	+		8.1		27.1	28.9	29.9	41.4	14.6	14.6
Green Ratio (g		σ τιπο (g τ), σ			0.18	+		0.18	+	0.69	0.69	0.69	0.69	0.69	0.69
Capacity (c), v					358			343		262	1177	1162	155	1177	1174
Volume-to-Capa		atio (X)			0.364			0.633		0.332	_		0.772	0.638	0.638
-		t/ln (95 th percentile)		5.504			0.000		0.002	0.002	0.000	0.112	0.000	0.000
	• •	eh/In (95 th percenti	_		2.5			4.5		1.5	9.6	10.1	5.0	3.8	3.9
	• •	RQ) (95 th percent			0.00			0.00	+	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (, , , , , , , , , , , , , , , , , , , ,			22.0			23.6		12.7	7.4	7.5	28.3	5.2	5.2
Incremental De	` ,				0.2			0.7		3.4	9.7	10.6	30.4	2.6	2.7
Initial Queue De		,			0.2			0.0	1	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (22.3			24.3		16.1	17.0	18.2	58.7	7.8	7.8
Level of Service					22.3 C			24.3 C	1	В	B	B	56.7 E	7.6 A	7.6 A
				22.3		С	24.3		С	17.		В	11.6		В
Approach Delay, s/veh / LOS Intersection Delay, s/veh / LOS				22.0			5.7			17.			В	,	
inici section De				10	, ı										
Multimodal Re	sults				EB			WB			NB			SB	
		/100		2.28		В	2.28		В	1.6		В	1.6		В
Pedestrian LOS	Score	/ LUS													

	HCS Two-Way Stop	-Control Report	
General Information		Site Information	
Analyst		Intersection	US 23 & SR 229
Agency/Co.		Jurisdiction	
Date Performed	7/15/2022	East/West Street	SR 229
Analysis Year	2022	North/South Street	US 23
Time Analyzed	2026 PM	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	RCUT		



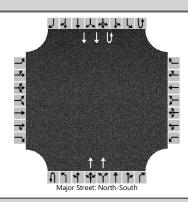
Vehicle Volumes and Adj	ustme	nts														
Approach		Eastb	ound			Westk	oound			North	bound			South	bound	
Movement	U	L	Т	R	U	L	Т	R	U	L	T	R	U	L	Т	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	1	0	1	2	1	0	1	2	1
Configuration				R				R		L	T	R		L	Т	R
Volume (veh/h)				120				200	0	80	1850	140	0	110	1410	60
Percent Heavy Vehicles (%)				4				5	13	10			13	10		
Proportion Time Blocked																
Percent Grade (%)			0			()									
Right Turn Channelized		Ν	lo			N	lo			N	lo			Ν	lo	
Median Type Storage				Left	Only								1			
Critical and Follow-up H	eadwa	ys														
Base Critical Headway (sec)				6.9				6.9		4.1				4.1		
Critical Headway (sec)				6.98				7.00		4.30				4.30		
Base Follow-Up Headway (sec)				3.3				3.3		2.2				2.2		
Follow-Up Headway (sec)				3.34				3.35		2.30				2.30		
Delay, Queue Length, an	d Leve	l of Se	ervice													
Flow Rate, v (veh/h)				130				217		87				120		
Capacity, c (veh/h)				341				234		370				218		
v/c Ratio				0.38				0.93		0.23				0.55		
95% Queue Length, Q ₉₅ (veh)				1.7				8.0		0.9				2.9		
Control Delay (s/veh)				22.0				85.9		17.7				39.9		
Level of Service (LOS)				С				F		С				E		
Approach Delay (s/veh)		22	2.0			85	5.9			0	.7			2	.8	
Approach LOS		(С				F			A	4			,	4	

	HCS Two-Way Stop	-Control Report	
General Information		Site Information	
Analyst		Intersection	US 23 & SR 229
Agency/Co.		Jurisdiction	
Date Performed	5/25/2022	East/West Street	SR 229
Analysis Year	2022	North/South Street	US 23
Time Analyzed	2026 PM	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	RCUT north intersection		



Approach	T	Easth	ound			West	oound			North	bound			South	bound	
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
<u> </u>		_							-							
Number of Lanes	+	0	0	0		0	0	0	1	0	2	0	0	0	2	0
Configuration									U		T				T	
Volume (veh/h)									90		1960				1490	
Percent Heavy Vehicles (%)									13							
Proportion Time Blocked																
Percent Grade (%)																
Right Turn Channelized																
Median Type Storage				Left	Only								1			
Critical and Follow-up H	eadwa	ys														
Base Critical Headway (sec)									4.3							
Critical Headway (sec)									4.60							
Base Follow-Up Headway (sec)									2.6							
Follow-Up Headway (sec)	Ì								2.70							
Delay, Queue Length, an	d Leve	l of Se	ervice								<u> </u>					
Flow Rate, v (veh/h)	Т								98							
Capacity, c (veh/h)									291							
v/c Ratio									0.34							
95% Queue Length, Q ₉₅ (veh)									1.4							
Control Delay (s/veh)									23.5							
Level of Service (LOS)									С							
Approach Delay (s/veh)										1	.0					
Approach LOS											A					

	HCS Two-Way Stop-Control Report												
General Information		Site Information											
Analyst		Intersection	US 23 & SR 229										
Agency/Co.		Jurisdiction											
Date Performed	7/15/2022	East/West Street	SR 229										
Analysis Year	2022	North/South Street	US 23										
Time Analyzed	2026 PM	Peak Hour Factor	0.92										
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25										
Project Description	RCUT south intersection												



Vehicle Volumes and Adj	ustme	nts															
Approach		Eastb	ound			Westl	oound			North	bound			South	bound		
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	0	0		0	0	0	0	0	2	0	1	0	2	0	
Configuration											Т		U		Т		
Volume (veh/h)											1990		80		1450		
Percent Heavy Vehicles (%)													13				
Proportion Time Blocked																	
Percent Grade (%)																	
Right Turn Channelized																	
Median Type Storage				Left	Only								1				
Critical and Follow-up H	eadwa	ys															
Base Critical Headway (sec)													4.3				
Critical Headway (sec)													4.60				
Base Follow-Up Headway (sec)													2.6				
Follow-Up Headway (sec)													2.70				
Delay, Queue Length, an	d Leve	l of S	ervice														
Flow Rate, v (veh/h)													87				
Capacity, c (veh/h)													170				
v/c Ratio													0.51				
95% Queue Length, Q ₉₅ (veh)													2.5				
Control Delay (s/veh)													46.5				
Level of Service (LOS)													E				
Approach Delay (s/veh)														2	.4		
Approach LOS															A		

General Information Agency Analyst Jurisdiction Intersection Main Intersection File									A 14										
Agency Analyst Jurisdiction Intersection																			
Analyst Jurisdiction Intersection										Alternative Intersection Information									
Jurisdiction Intersection	Analysis					<u> </u>	7/45/	0000		ersection Type RCUT with TW							<i>;</i>		
Intersection				_			7/15/	2022	_	egment One Distance, ft 800 egment Two Distance, ft 800									
					ration,	n	0.25						æ, π	800					
Main intersection File	US 23 & SR 229 PHF					0.92		Art	erial D	irectio	n		North	-Sout	n				
N (1 0 F1	2026 PM RCUT.xtw 2026 PM RCUT north.xtw																		
North Crossover File																			
South Crossover File	2026 PM RCUT	south	ı.xtw																
Project Description	RCUT																		
		EDIL	EDI	EDT	EDD	NA/DII	NA/FOI	MOT	\4/DD	NIDILI	NIDI	NDT	NDD	ODL	ODI	ODT	000		
Demand		EBU	EBL	EBT	EBR	WBU	WBL	WBI	WBR	NBU	NBL		NBR	SBU	SBL	SBT	SBR		
Intersection One Demai	. ,									90		1960				1490			
Intersection Two Demar	` '				120				200	0	80	1850		0	110	1410			
Intersection Three Dem	and (<i>v</i>), veh/h											1990		80		1450			
(1) North C	Crossover				(2) Ma	ain Inte	ersecti	on				(3)) South	Cross	sover				
7414	THE REPORT OF THE PARTY OF THE			_] ↑ ↑ ↑ Υ ❤	L.	J			<u></u>			1 ft 7 44 14	L U	R.			
4 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		* * * * * * * * * * * * * * * * * * *																	
Major Street: I		EDIL	EDI	EDT		Street: No		I W/DT	WDD	NDU	NIDI		Major Stree	et: North-S		CDT	CDD		
Queue-to-Storage Rati	10	EBU	EBL	EBT	EBK	WBU	WBL	WBI	WBR	NBU	NBL	INRI	NBK	SBU	SBL	SBT	SBR		
Intersection One (Ra)																			
Intersection Two (RQ)																			
Intersection Three (RQ)																			
Alternative Intesection																			
	Movements		Flow		veh/h)	Conti			eh) E	DTT ((s/veh			RQ>1?			
	SBU(3) + NBT(2)			11		68.5				18.			36.6	_	lo	No	F		
· · ·	SBU(3) + NBR(2	2)		76		68.5				18.	1	_	36.6	N	lo	No	F		
EBR	EBR(2)			43			22.					22.0		N	lo	No	С		
	- NBU(1) + SBT(43			109			18.		127.6		_	lo	No	F		
	- NBU(1) + SBR(2)		54			109			18.	1	127.6		_	lo	No	F		
WBR	WBR(2)			120			85.					85.9			lo	No	F		
NBL	NBL(2)		87				17.					17.7		N	lo	No	В		
NBT	NBT(2)		2000				0.0					0.0			-		Α		
NBR	NBR(2)		76				0.0						0.0	-	-		Α		
SBL	SBL(2)	120			39.9						39.9		N	lo	No	D			
SBT SBT(2)				1489			0.0					0.0		-	-		Α		
SBR	SBR(2)			11			0.0)					0.0		-		Α		
	Overall Results			.D			WB			NB					SB				
				В												DD			
Overall Results Approach ETT, s/veh L Intersection ETT, s/veh		65	5.2		=	.1	4.5		=	0	.7		A	3.	.0	_	Ą		

Assigned Phase			HCS	S Sign	nalize	d Int	ersec	tior	n Re	esult	ts Sur	nmary	/				
Agency	0	1.									1.4					la l'a. i	L I
Analyst																	
Time Part					Γ		Τ.			_							R
Unban Street									2022			ре			→ ■		<u> </u>
Intersection					-					_					-\$ -\$	₩ ‡ E 8	- ∳
Project Description												Period	1> 7:0	00	<u>→</u>		** **
Demand Information	_				File Na	ame	2046	S AM	No B	Build.x	us					514	
Approach Movement	Project Descrip	tion	2046 AM No Build												*	4 1 4 4	7 1
Demand (v), veh/h	Demand Inforr	nation				EB	3	Т		WE	3		NB		T	SB	
Demand (v), veh/h				L	Т	R		L	Т	R	L	Т	R	L	Т	R	
Signal Information					10	30	_	_	80	40		30	1000	_	70	1230	_
Cycle, s 60.0 Reference Phase 2 Offset, s 0 Reference Point End Uncoordinated No Simult. Gap EN/S On Force Mode Fixed Simult. Gap EN/S On Red 0.0 0.0 0.0 0.0 Assigned Phase 4 8 2 6 Case Number 8.0 8.0 8.0 6.0 6.0 Phase Duration, s 16.3 16.3 43.7 43 43.7 43 Change Period. (Y+R c), s 4.0																	
Offset, s. On Continated No Simult Gap EAW On Fixed Simult Gap EAW On	Signal Informa	ition						2									
Offset, s. On Continated No Simult Gap EAW On Fixed Simult Gap EAW On	Cycle, s	60.0	Reference Phase	2]	1		ğ							Ψ		→
Uncoordinated No Simult. Gap E/M On Red 0.0 0	Offset, s	0	Reference Point	End	Green			3 (<u> </u>	0.0	0.0	0.0		1	2	3	¥ 4
Force Mode Fixed Simult. Gap N/S On Red 0.0 <td>Uncoordinated</td> <td>No</td> <td>Simult. Gap E/W</td> <td>On</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td>→</td>	Uncoordinated	No	Simult. Gap E/W	On										1			→
Assigned Phase	Force Mode	Fixed	Simult. Gap N/S	On	1	_								5	6	7	8
Assigned Phase	Time D. K						EDT	Ţ.	\A/D:)A/DT	l lie		NDT	05:		ODT
Case Number 8.0 8.0 6.0 6.0 6.0 Phase Duration, s 16.3 16.3 43.7 43 Change Period, (Y+R c), s 4.0 4.0 4.0 4.0 4.0 Max Allow Headway (MAH), s 3.1 3.1 0.0 0.0 0.0 Queue Clearance Time (g s), s 5.9 11.7 Green Extension Time (g s), s 0.7 0.6 0.0 0.0 Phase Call Probability 1.00 1.00 1.00 Max Out Probability 0.00 0.00 0.0 Movement Group Results EB WB NB SB Approach Movement L T R L T R L T R L T R L T R L T A L T R L T R L T R L T R L T R L T R L T R L T R L					EBL	-		-	WBL	-		NB	L		SBI	-	SBT
Phase Duration, s 16.3 16.3 43.7 43 Change Period, (Y+R c), s 4.0		e				_	· ·	_		_		_					6
Change Period, (Y+Rc), s 4.0 <td></td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td></td> <td>_</td> <td></td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>6.0</td>						_		_		_							6.0
Max Allow Headway ($\it MAH$), s 3.1 3.1 0.0 0.0 Queue Clearance Time ($\it gs$), s 5.9 111.7 0.0 0.0 Green Extension Time ($\it gs$), s 0.7 0.6 0.0 0.0 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 L T R L T R L T R L T R L T R L T R L T R L T R L T R L T R L T R L T R L T R L T R L T R L						16.3	┸			16.3			43.7			43.7	
Queue Clearance Time (g s), s 5.9 11.7 0.6 0.0 0.0 Phase Call Probability 1.00<	Change Period, (Y+R c), s						┸						4.0			4.0	
Green Extension Time (g e), s 0.7 0.6 0.0 0.0 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 <td< td=""><td colspan="3">Max Allow Headway (MAH), s</td><td></td><td></td><td></td><td></td><td></td><td></td><td>3.1</td><td></td><td></td><td>0.0</td><td></td><td></td><td>0.0</td></td<>	Max Allow Headway (MAH), s									3.1			0.0			0.0	
Phase Call Probability	Queue Clearance Time (g s), s					5.9	\perp			11.7							
Movement Group Results EB WB NB SB Approach Movement L T R L T <td colspan="3">Green Extension Time (g e), s</td> <td></td> <td></td> <td>0.7</td> <td></td> <td></td> <td></td> <td>0.6</td> <td></td> <td></td> <td>0.0</td> <td></td> <td></td> <td>0.0</td>	Green Extension Time (g e), s					0.7				0.6			0.0			0.0	
Movement Group Results EB WB NB SB Approach Movement L T R L T B A A	Phase Call Probability					1.00				1.00							
Approach Movement L T R L T B L T B B A B A B A B A B A B A B A B A B A B A A B A A	Max Out Probability					0.00				0.00							
Approach Movement L T R L T B L T B B A B A B A B A B A B A B A B A B A B A A B A A	Movement Gro	un Res	sults			FR		т		WR			NR			SB	
Assigned Movement 7 4 14 3 8 18 5 2 12 1 6 6 Adjusted Flow Rate (v), veh/h 120 250 33 563 557 76 675 6 Adjusted Saturation Flow Rate (s), veh/h/ln 1591 1471 370 1707 1690 459 1707 1 Queue Service Time (g s), s 0.0 5.8 3.2 10.0 10.0 6.0 13.3 7 Cycle Queue Clearance Time (g c), s 3.9 9.7 16.5 10.0 10.0 16.0 13.3 7 Green Ratio (g/C) 0.20 0.20 0.66 0.66 0.66 0.66 0.66 0.66			Juito			_	-	-	1		R			R		_	R
Adjusted Flow Rate (v), veh/h Adjusted Saturation Flow Rate (s), veh/h/ln 120 250 33 563 557 76 675 407 Adjusted Saturation Flow Rate (s), veh/h/ln 1591 1471 370 1707 1690 459 1707 1 Queue Service Time (g s), s 0.0 5.8 3.2 10.0 10.0 6.0 13.3 7 Cycle Queue Clearance Time (g c), s Green Ratio (g/C) Capacity (c), veh/h 391 382 283 1130 1118 348 1130 1 Volume-to-Capacity Ratio (X) Back of Queue (Q), ft/ln (95 th percentile) Back of Queue (Q), veh/ln (95 th percentile) Back of Queue (Q), veh/ln (95 th percentile) Queue Storage Ratio (RQ) (95 th percentile) Uniform Delay (d 1), s/veh 102 103 104 105 105 107 108 108 108 109 109 109 109 109						<u> </u>		_	_	_		_	_			<u> </u>	16
Adjusted Saturation Flow Rate (s), veh/h/ln 1591 1471 370 1707 1690 459 1707 1 Queue Service Time (g s), s 0.0 5.8 3.2 10.0 10.0 6.0 13.3 6.0 13.3 6.0 10.0 10.0 10.0 16.0 13.3 6.0 13.3 6.0 10.0 10.0 10.0 16.0 13.3 6.0 10.0 10.0 16.0 13.3 6.0 13.3 6.0 10.0 10.0 16.0 13.3 6.0 16.5 10.0 10.0 16.0 13.3 7.0 10.0 16.0 13.3 7.0 16.5 10.0 10.0 16.0 13.3 7.0 16.5 10.0 10.0 16.0 13.3 7.0 16.5 10.0 10.0 16.0 13.3 7.0 16.5 10.0 10.0 16.0) voh/h		,			-	3		10		-				673
Queue Service Time (g s), s 0.0 5.8 3.2 10.0 10.0 6.0 13.3 Cycle Queue Clearance Time (g c), s 3.9 9.7 16.5 10.0 10.0 16.0 13.3 Green Ratio (g/C) 0.20 0.20 0.66 0.68 0.78 0.78 0.78 0.78 0.78 0.78 0.78 0.78 0.78 0.78 0.78 0.78			,.	n		_		+							_		1702
Cycle Queue Clearance Time (g c), s 3.9 9.7 16.5 10.0 10.0 16.0 13.3 7 Green Ratio (g/C) 0.20 0.20 0.66 0.68 0.219 0.29 0.219	-		· , , , .	11		_		-									13.3
Green Ratio (g/C) 0.20 0.20 0.66 0.68 0.498 0.219 0.597 0 0.597 0 0.597 0 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90 0.90		· · ·	- /			_		+								_	13.3
Capacity (c), veh/h 391 382 283 1130 1118 348 1130 1 Volume-to-Capacity Ratio (X) 0.306 0.654 0.115 0.498 0.498 0.219 0.597 0 Back of Queue (Q), ft/ln (95 th percentile) 2.2 5.1 0.4 3.0 3.0 0.9 4.2 Queue Storage Ratio (RQ) (95 th percentile) 0.00 0	-		$\frac{e^{-11111e}(g_c), s}{e^{-11111e}}$			_		+		_	+						
Volume-to-Capacity Ratio (X) 0.306 0.654 0.115 0.498 0.498 0.219 0.597 0 Back of Queue (Q), ft/ln (95 th percentile) 2.2 5.1 0.4 3.0 3.0 0.9 4.2 Queue Storage Ratio (RQ) (95 th percentile) 0.00	, -					_	_	-				_					0.66
Back of Queue (Q), ft/ln (95 th percentile) 2.2 5.1 0.4 3.0 3.0 0.9 4.2 Queue Storage Ratio (RQ) (95 th percentile) 0.00 <td< td=""><td colspan="2"></td><td></td><td>_</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td></td<>				_		-					_						
Back of Queue (Q), veh/ln (95 th percentile) 2.2 5.1 0.4 3.0 3.0 0.9 4.2 Queue Storage Ratio (RQ) (95 th percentile) 0.00 <t< td=""><td></td><td></td><td></td><td></td><td></td><td>0.30</td><td>U</td><td></td><td></td><td>0.054</td><td></td><td>0.115</td><td>0.498</td><td>0.498</td><td>0.219</td><td>0.597</td><td>0.597</td></t<>						0.30	U			0.054		0.115	0.498	0.498	0.219	0.597	0.597
Queue Storage Ratio (RQ) (95 th percentile) 0.00	` ' ` ` ` ` '			2.2		-		F 1		0.4	2.0	2.0	0.0	4.2	11		
Uniform Delay (d 1), s/veh 20.5 22.7 10.3 5.1 5.1 9.2 5.7 Incremental Delay (d 2), s/veh 0.2 0.7 0.8 1.6 1.6 1.4 2.3 Initial Queue Delay (d 3), s/veh 0.0	, , , , , , , , , , , , , , , , , , , ,				\vdash		-		_		_	_				4.1	
Incremental Delay (d 2), s/veh 0.2 0.7 0.8 1.6 1.6 1.4 2.3 Initial Queue Delay (d 3), s/veh 0.0					_		-				_		_			0.00	
Initial Queue Delay (d 3), s/veh 0.0		` ,				_		-		_		_	_			_	5.7
Control Delay (d), s/veh 20.7 23.4 11.1 6.7 6.7 10.6 8.0 Level of Service (LOS) C C B A A B A Approach Delay, s/veh / LOS 20.7 C 23.4 C 6.8 A 8.1 A									_							2.3	
Level of Service (LOS) C C B A A B A Approach Delay, s/veh / LOS 20.7 C 23.4 C 6.8 A 8.1 A						_		+				_	_	_			0.0
Approach Delay, s/veh / LOS 20.7 C 23.4 C 6.8 A 8.1 A	- '					_		-		_			_		_		8.0
	` '						-			<u> </u>					L A	A	
Intersection Delay, s/veh / LOS 9.4 A			20.7	7			23.4		С	6.8					Α		
	Intersection De	lay, s/ve	eh / LOS					9.4							Α		
Multimodal Results EB WB NB SB	Multimodal Pa	eulte				ED			\\/D				NID			Q.D.	
			/108		2 20		EB				P	1 64		R	1 60		В
								_		-		_	_			_	В

	HCS	S Sigr	nalize	d Int	ersect	ion R	esult	ts Sun	nmary	′				
O a manual lunfa umanti a m									4: I £					L. I.
General Information							_	Intersec		117474127				
Agency			Г		T		_	Duration.		0.250				R
Analyst					e Aug 1			Area Typ	е	Other	-	<u> </u>		<u> </u>
Jurisdiction			Time F		2046	PM		PHF		0.92		♦ - \$	₩ 1 E 8	-
Urban Street	US 23		Analys					Analysis	Period	1> 7:0	00	<u>_</u> <u>≯</u>		*# 4"
Intersection	SR 229		File Na	ame	2046	PM No I	Build.x	us					为什种	
Project Description	2046 PM No Build											*	1 1 1 4 Y	7 1
Demand Information				EB		Т	WE	3	Т	NB			SB	
Approach Movement			L	T	R	L	Т	R	L	Т	R	L	Т	R
Demand (v), veh/h			10	70	40	50	60	130	70	1820	08	120	1370	10
Signal Information			<u> </u>	1 11:		Т	7	Г		_				
	Reference Phase	2	-	1		∄						KÎZ		7
Cycle, s 60.0				<u>*</u> 1							1	2	3	→ 4
Offset, s 0 Uncoordinated No	Reference Point	End	Green			0.0	0.0		0.0					5
	Simult. Gap E/W	On	Yellow		4.0	0.0	0.0		0.0	_		D		Z
Force Mode Fixed	Simult. Gap N/S	On	Red	0.0	0.0	0.0	0.0	0.0	0.0		5	6	7	8
Timer Results			EBI	- T	EBT	WB	L	WBT	NBI	L	NBT	SBI	_	SBT
Assigned Phase					4			8			2			6
Case Number					8.0			8.0			6.0			6.0
Phase Duration, s					16.4			16.4		\neg	43.6			43.6
Change Period, (Y+R	'c), S				4.0			4.0			4.0			4.0
Max Allow Headway (MAH), s					3.1		3.1			\neg	0.0			0.0
Queue Clearance Time (g s), s					6.0			11.8						
Green Extension Time (g e), s					0.7			0.7		\neg	0.0		\neg	0.0
Phase Call Probability					1.00			1.00						
Max Out Probability				0.00			0.00							
Movement Group Re	culte			EB			WB			NB			SB	
Approach Movement	SuitS		L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement			7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate ()	() voh/h		-	130		3	261	10	76	1033	1033	130	751	749
Adjusted Saturation Fl		n		1654			1521		319	1707	1682	184	1707	1703
Queue Service Time (· · ·	11		0.0			5.7		11.4	31.2	32.5	7.1	16.0	16.0
Cycle Queue Clearand	- ,			4.0			9.8		27.5	31.2	32.5	39.6	16.0	16.0
	$\frac{\partial e}{\partial t}$ Time ($g \in J$, s				_	-					_			
Green Ratio (g/C)				0.21			0.21 387		0.66 245	0.66 1126	0.66	0.66 142	0.66	0.66
Capacity (c), veh/h Volume-to-Capacity Ratio (X)				407 0.320			0.674		0.310		0.931	0.920	1126 0.666	
	· · · · · · · · · · · · · · · · · · ·	,)		0.320	,		0.074		0.310	0.917	0.931	0.920	0.000	0.007
Back of Queue (Q), ft/ln (95 th percentile) Back of Queue (Q), veh/ln (95 th percentile)				2.4			5.3		1.5	12.5	13.3	6.9	5.3	5.3
Queue Storage Ratio (RQ) (95 th percentile)							0.00			_	_		_	_
Uniform Delay (d 1), s/veh				0.00			_		0.00	0.00	0.00	0.00	0.00	0.00
Incremental Delay (d 2), s/veh				20.5			22.6		14.6	8.8	9.0	29.4	6.2	6.2
Initial Queue Delay (d 3), s/veh			0.2			8.0		3.3	13.1	14.8	56.7	3.1	3.1	
				0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/v				20.6 C			23.4		17.8	21.8 C	23.8	86.1 F	9.3	9.3
Level of Service (LOS)			20.0			C 02.4			B		C		A	A
Approach Delay, s/veh / LOS		20.6)	C 10	23.4	+	С	22.6)	С	15.5)	В	
Intersection Delay, s/v	en / LOS				18	9.8						В		
Multima del Desulto											QD.			
Multimodal Results				EB			WB			NB			SB	
Multimodal Results Pedestrian LOS Score	:/LOS		2.27	EB	В	2.27	WB	В	1.62	NB 2	В	1.62		В