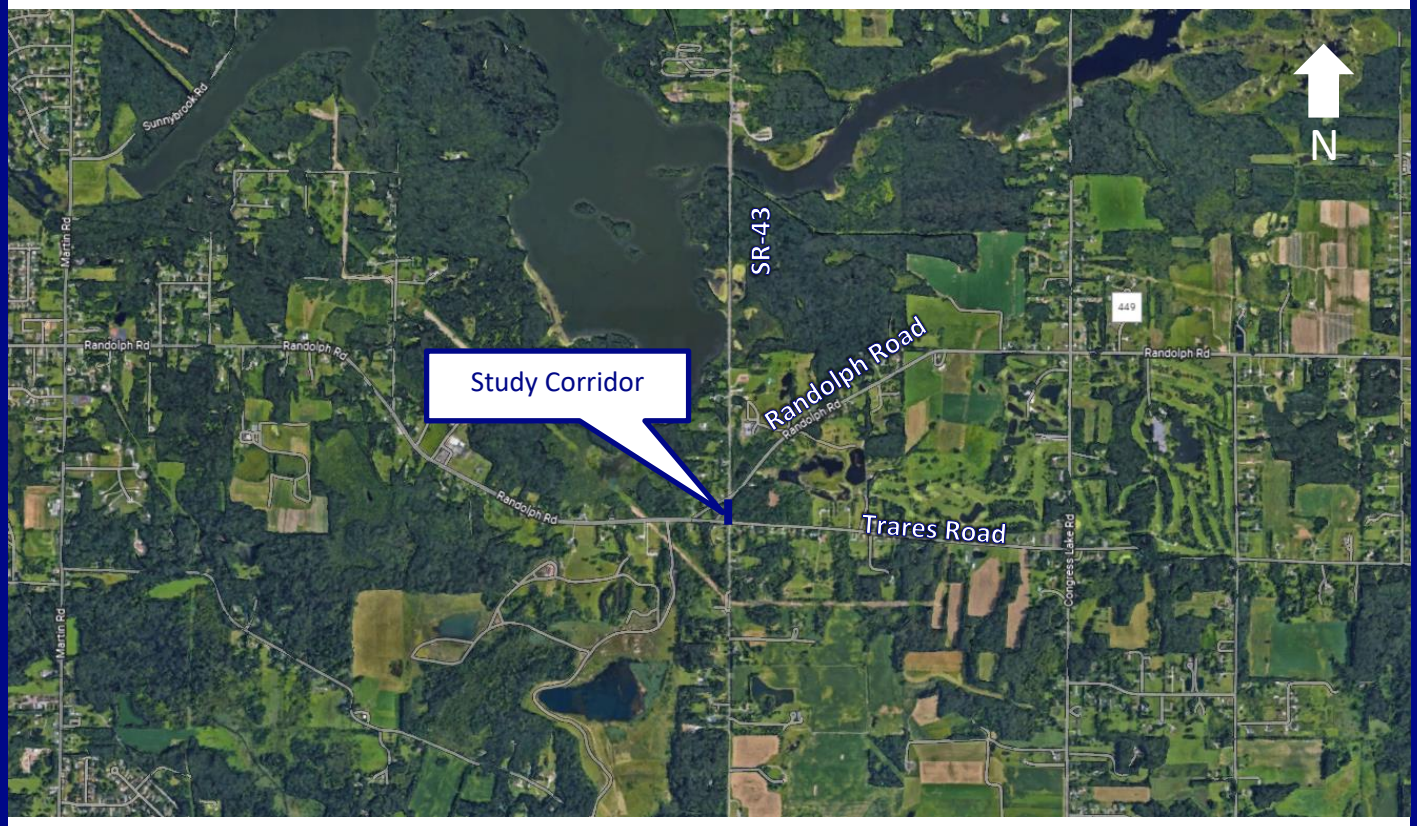
FINAL REPORT
MARCH 2025

POR-43-3.87-3.94

Safety Study
SR-43 at Trares Road & Randolph Road
Suffield Township | Portage County
Crash Data (2016-2020)



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1.0 Executive Summary

The study area is along the corridor of SR-43 (Cleveland Canton Road) in Suffield Township, within Portage County. It includes the unsignalized intersections of SR-43 at Randolph Road and SR-43 at Trares Road, which is located approximately 350 feet to the south of Randolph Road. The intersections of SR-43 at Randolph Road and Trares Road appeared on ODOT's Highway Safety Improvement Program's (HSIP) Priority Locations list, ranking #54 and #53, respectively, on the 2020 rural intersection list.

SR-43 is classified as a rural principal arterial. At its intersection with Randolph Road, the east leg of Randolph is a local road while the west leg is a major collector. At Trares Road intersection, the east and west legs of Trares Road are classified as local roads.

In the five-year period between 2016 and 2020, a total of 21 crashes occurred at the intersection of SR-43 & Randolph Road, with one involving serious injuries, four involving minor injuries, and four involving possible injuries. These crashes consisted of 16 angle crashes, three rear end crashes, and two left turn crashes. Failure to yield was the highest contributing factor, accounting for 76% of the crashes. These trends indicate that drivers are accepting a smaller gap in traffic to complete their turns.

In the five-year period between 2016 and 2020, a total of 16 crashes occurred at the intersection of SR-43 & Trares Road, with two involving serious injuries, seven involving minor injuries, and one involving possible injuries. These crashes consisted of six angle crashes, four rear end crashes, four left turn crashes, one fixed object crash, and one overturning crash. Failure to yield was the highest contributing factor, accounting for 43% of the crashes.

According to HSM methods, the study segment and intersections combined are performing slightly worse than their peers overall. While the Randolph Road intersection is the only element that shows a potential for safety improvement for all crash severities, it does show a higher likelihood of injury crashes at the Trares Road intersection compared to similar intersections. Based on the findings of the study, it is recommended to implement the following countermeasures listed below:

Short Term

- Add an advance warning sign (W7-6) on the south leg of the Randolph Road intersection and on the north leg of the Trares Road intersection.

Long Term

- Alterative 2: Install a mountable median on SR-43 at the Randolph Road intersection in order to restrict movements at the intersection. This also includes constructing a single lane roundabout at SR-43 & Trares Road.

2.0 Purpose and Need

The intersections of SR-43 at Randolph Road and at Trares Road appeared on ODOT's Highway Safety Improvement Program's (HSIP) Priority Locations list, ranking #54 and #53, respectively, on the 2020 rural intersection list.

The purpose of this study is to analyze the existing safety performance of the ranked intersections above and to identify potential countermeasures to reduce crashes and to improve overall safety.

3.0 Existing Conditions

SR-43 and Randolph Road

The intersection of SR-43 and Randolph Road is unsignalized with traffic operating free flow along SR-43 (northbound/southbound) and stop-controlled along Randolph Road (eastbound/westbound). It is a two-lane road with a speed limit of 45 mph.

Approximately 570 feet north of the intersection with Randolph Road, there is an Advisory Speed sign of 35 mph cautioning for the limited sight distance along SR-43 approaching adjacent intersections. The existing travel lanes are approximately 11 feet wide with five-foot paved shoulders on both sides. There are no pedestrian facilities such as sidewalks, curb ramps, or crosswalks present at the intersection. The cross street, Randolph Road, is one lane in each direction and it does not have paved shoulders. There are dual Stop Signs and Advance Stop Ahead signs located on both legs of Randolph Road at the intersection. The east leg of Randolph is at an approximate 47-degree skew angle while the west leg is at a 26-degree skew angle. The speed limit on Randolph Road is 45 mph. The lanes on Randolph Road are approximately 10 feet wide. There are luminaires present at the intersection.

The north leg of SR-43 has an approximate downgrade of 5.8% to the intersection while the south leg has an approximate downgrade of 5.2% to the intersection. This is notable as downhill grades greater than 3% increase breaking distances. The east and west legs of Randolph Road have an approximate upgrade of 1.0% and 1.3% respectively. The west leg segment is nearly 650 feet in length and terminates at Trares Road, creating a stop-controlled T-intersection. A sight distance study was completed by ODOT in 2021 and the results show a restricted stopping sight distance (SSD) in the northbound direction. The SSD is approximately 360 feet where the design SSD adjusted for the grade is 470 feet, according to the design standards from the *Location & Design Manual, Volume 1*. The southbound direction of SR-43 does not have sight distance issues based on that study.

Both the eastbound and westbound traffic have restricted intersection sight distance when looking south due to the roadway profile of SR-43. Additionally, sight lines for eastbound traffic are restricted by vegetation when looking north.

SR-43 is classified as a rural principal arterial at its intersection with Randolph Road. The east leg of Randolph is a local road while the west leg is a major collector. Pavement and pavement markings on SR-43 and Randolph Road are in good condition. Based on ODOT's Transportation Information Management Systems (TIMS), the Pavement Condition Rating (PCR) is 94 on SR-43, which is in very good condition. There is no PCR data for the east leg of Randolph Road, while the PCR for the west leg is 81, indicating that it is in good condition.

SR-43 and Trares Road

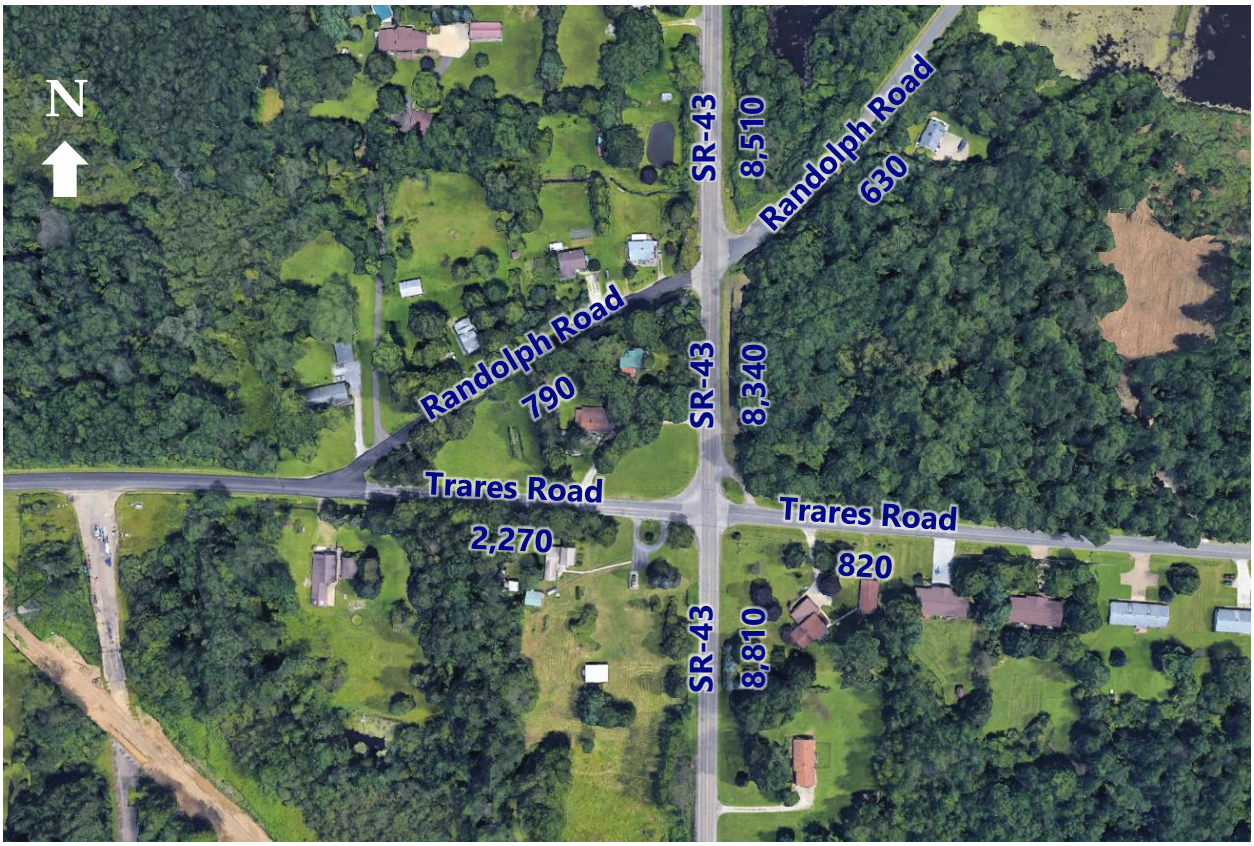
The intersection of SR-43 and Trares Road is unsignalized with traffic operating free flow along SR-43 (northbound/southbound) and stop controlled along Trares Road (eastbound/westbound). The speed limit on both sides of the minor street is 45 mph. Approximately 660 feet south of the intersection with Trares Road, there is an Advisory Speed sign of 35 mph due to the limited sight distance along SR-43 approaching adjacent intersections. The existing travel lanes are approximately 11 feet wide with paved five-foot shoulders on both sides. Trares Road has one roughly 10 foot lane in each direction and paved shoulders are not present. The north leg of SR-43 has an approximate upgrade of 5.2% to the intersection while the south leg has an approximate upgrade of 2.0% to the intersection. The east leg of Trares Road has an approximate downgrade of 2.0% and the west leg has an approximate upgrade of 3.5%. The 2021 ODOT Sight Distance study shows the southbound direction of SR-43 has a restricted stopping sight distance of 250 feet, well below the design standard of 425 feet. The eastbound and westbound directions have restricted intersection sight distance due to the roadway profile of SR-43 when looking to the north.

SR-43 is classified as a rural principal arterial at its intersection with Trares Road. The east leg of Trares Road is classified as a local road. The west leg of Trares Road is classified as a local road until the T-intersection with Randolph Road, at which point it transitions to a classification of a major collector. On both the eastbound and westbound approaches of the intersection, there are dual stop signs. Pavement and pavement markings on SR-43 and Randolph Road/Trares Road are in good condition. The PCR for SR-43 is 94, which is in very good condition. The PCR for the west leg is 81 up until the T-intersection with Randolph Road, indicating that it is in good condition. There is no PCR data for Randolph Road/Trares Road east of the T-intersection.

The study area is rural in nature due to being surrounded by largely undeveloped land with few homes interspersed. There is existing lighting at both intersections, with one luminaire on utility poles (not high/low mast poles) at each intersection. Suffield Township is an unincorporated community located just southeast of the city of Akron. The existing conditions diagram for the corridor can be found in **Appendix A**, while the sight distance and spot speed data can be found in **Appendix B**.

Figure 1 shows the study area with AADT's calculated from the count data.

Figure 1: Study Area



A field review was conducted on September 23, 2022. Below is a summary of observations:

- The intersection of SR-43 at Randolph Road has limited sight distance for the minor road approaches. In the summer, large amounts of vegetation can be found on the northeast and northwest corners, which may make it difficult for drivers to determine suitable gaps in traffic to cross or turn from Randolph Road. Large trees and bushes are visible in both corners, while a large sign (not expected to be an encroachment) on the northeast corner is observed in **Photo 1.**

Photo 1: Randolph Road Eastbound Approach Looking North (Photo taken 9/23/2022)

- In the summertime, foliage creates additional interference of the sight distance for the minor road approach of SR-43 at Randolph.
- **Photo 2** was taken at the driver's eye level at 17.8 feet offset from the nearest edge line and shows the sight distance at the eastbound approach looking north.

Photo 2: Randolph Road Eastbound Approach Looking North (Photo taken 11/5/2021)

- Looking south from the minor road approaches shows that the intersection sight distance is restricted due to the profile of the roadway, as seen in **Photo 3.**

Photo 3: Randolph Road Eastbound Approach Looking North (Photo taken 9/23/2022)

- The SR-43 southbound approach to the intersection with Randolph Road includes an approximately 5.8% downgrade sag curve (**Photo 4**), which may contribute to the observed southbound vehicles' excessive speeds. While the posted speed limit is 45 mph with additional advisory speeds of 35 mph, spot speed data indicated vehicles typically exceeded the posted speed limit on both the northbound and southbound approaches. The speeding vehicles in addition to the high volume of traffic traveling along SR-43 may be contributing to the large number of angle crashes at this intersection.

Photo 4: SR-43 at Randolph Road Looking North (Photo taken 9/23/2022)

- The north leg of SR-43 at the intersection with Trares Road includes an approximately 5.2% upgrade crest curve toward the intersection, while the south leg includes a 2.0% upgrade. As observed in **Photo 5**, this grade differential causes a visibility issue, with southbound vehicles disappearing briefly to drivers on the northbound approach.

Photo 5: SR-43 at Trares Road Northbound Approach (Photo taken 9/23/2022)

4.0 Traffic Volume Development

Turning movement counts were collected at the study intersection on May 4, 2022, from 7 AM – 7 PM. Using the count data, the peak hours were determined to be 7:00-8:00 AM and 4:15-5:15 PM for the corridor. At the intersection of SR-43 at Randolph Road, the daily heavy vehicle traffic accounts for about 5% of the traffic on northbound SR-43, 4% on southbound SR-43, and 2% on eastbound and westbound Randolph. At the intersection of SR-43 at Trares Road, the daily heavy vehicle traffic accounts for about 5% of the traffic on northbound SR-43, 4% on southbound SR-43, 2% on eastbound Randolph Road, and 4% on westbound Randolph Road.

2022 ODOT Peak Hour to Design Hour factors were applied to the count data. A design hour factor of 1.19 was applied to the AM and PM peak hours to determine the peak design hours for SR-43 (northbound and southbound). For the eastbound and westbound approaches, a design hour factor of 1.10 was applied to both Randolph Road and Trares Road. Annual growth rates of 0.25% were applied to SR-43, while a growth rate of 2% was applied to both Randolph Road and Trares Road. These values were obtained from ODOT's Transportation Data Management System (TFMS). Count data is provided in **Appendix C**.

The count, opening, and design year volumes are shown for the corridor in Figure 2 and Figure 3. Traffic volume calculations are provided in **Appendix C**.

Figure 2: SR-43 at Randolph Road Volumes (AM/PM)

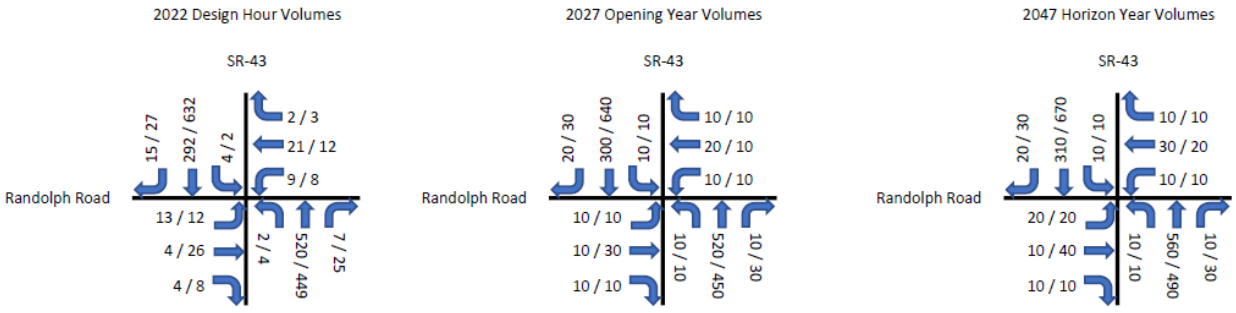
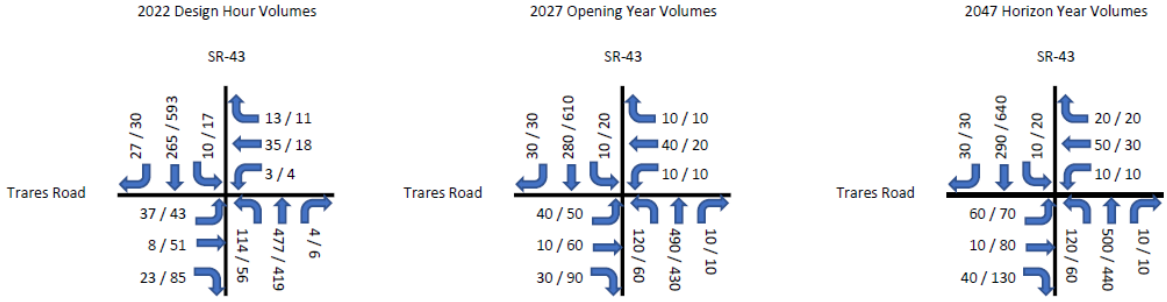


Figure 3: SR-43 at Trares Road Volumes (AM/PM)



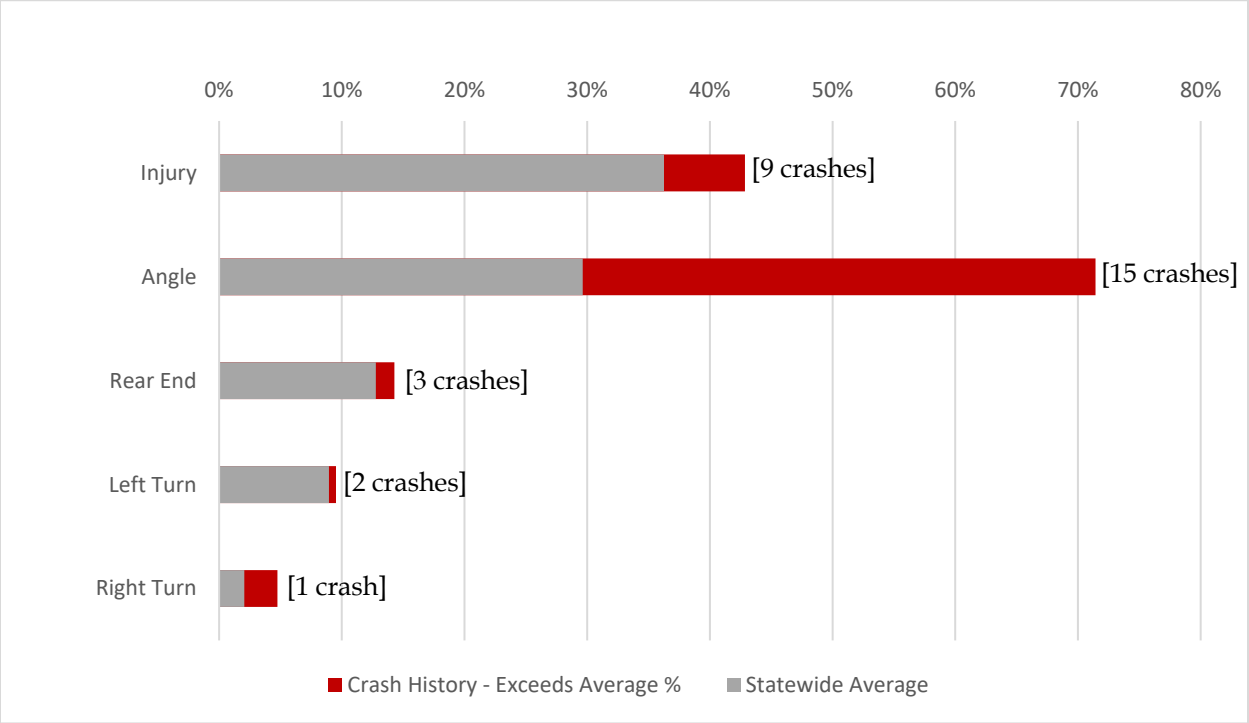
5.0 Crash Data

Crash data, the Crash Analysis Module (CAM) tool, and crash diagrams between 2016 and 2020 were obtained from ODOT. A total of 37 crashes occurred within the study area with three involving serious injuries, eleven involving minor injuries, and five involving possible injuries. This results in an injury rate of 51.3%.

A total of 21 crashes occurred at the intersection of SR-43 & Randolph Road, with one involving serious injuries, four involving minor injuries, and four involving possible injuries. These crashes consisted of 15 angle crashes, three rear end crashes, and two left turn crashes. Failure to yield was the highest contributing factor, accounting for 76% of the crashes. These trends indicate that drivers are accepting a smaller gap in traffic to complete their turns to cross over SR-43.

A total of 16 crashes occurred at the intersection of SR-43 & Trares Road, with two involving serious injuries, seven involving minor injuries, and one involving possible injuries. These crashes consisted of six angle crashes, four rear end crashes, four left turn crashes, one fixed object crash, and one overturning crash. Failure to yield was the highest contributing factor, accounting for 43% of the crashes.

Graph 1: Percentage of Crashes by Type Versus Statewide Averages – Randolph Road



Graph 1 shows that at the SR-43 & Randolph Road intersection, all crash types occur more frequently than is typical. **Table 1** shows notable crash statistics for this intersection and **Appendix D** contains the full crash data from the CAM tool. The crash diagram for this intersection is shown in **Figure 4**.

Crashes at the Randolph intersection were slightly higher on weekdays, especially on Tuesday (19%) and Wednesday (19%), but the peak occurred on Friday (24%). The crashes were spread evenly throughout the day with a slight peak from 2:00-3:00 PM. There was a large proportion of crashes in September, with 24% occurring during that month. Failure to yield was the highest contributing factor (76%) of crashes. Failure to yield consisted of fourteen angle crashes and two left turn crashes. Both of the left turn crashes are between a northbound left turning vehicle and a southbound vehicle, indicating drivers were accepting a smaller gap in traffic. Following too closely/assured clear distance ahead (ACDA) was the next most common contributing factor (14%), with all three being rear end crashes. Pavement friction is likely not a significant contributing factor since 81% of the crashes occurred on dry pavement.

Table 1: Randolph Road Crash Statistics

Hour of Day	Number	%
7	1	5
8	2	10
9	1	5
10	2	10
12	2	10
13	2	10
14	4	19
15	1	5
16	1	5
18	1	5
19	2	10
20	1	5
22	1	5

Light Condition	Number	%
Daylight	18	85
Dark - Lighted Roadway	1	5
Dark - Roadway Not Lighted	1	5
Dawn/Dusk	1	5

Road Condition	Number	%
Dry	17	**81**
Wet	4	19

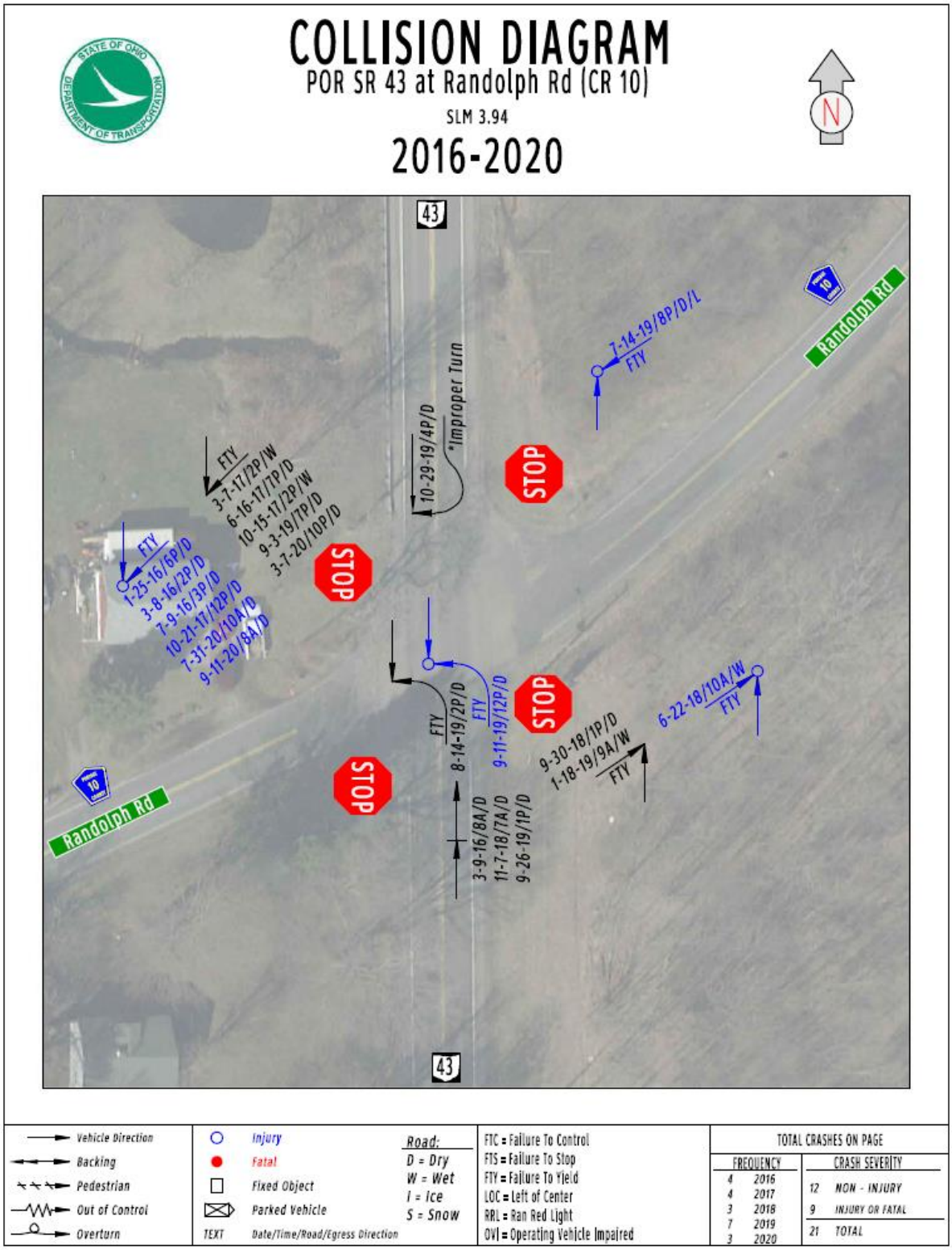
Contributing Factor	Number	%
Failure to Yield	**16**	**76**
Following Too Closely/ACDA	3	14
Improper Lane Change	1	5
Ran Stop Sign	1	**5**

Crash Month	Number	%
January	2	10
March	4	19
June	2	10
July	3	14
August	1	5
September	5	24
October	3	14
November	1	5

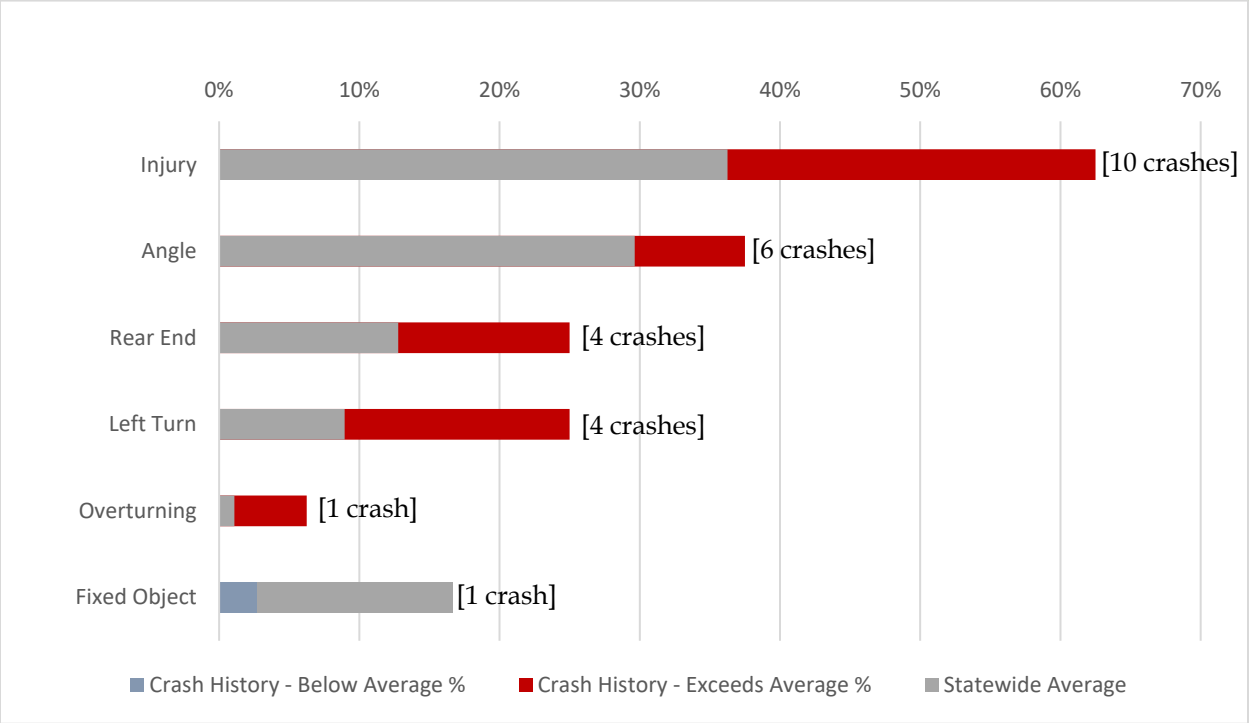
Day of Week	Number	%
Sunday	3	14
Monday	1	5
Tuesday	4	19
Wednesday	4	19
Thursday	1	5
Friday	5	24
Saturday	3	14

Estimated Speed (mph)	Number	%
<15	12	57
15-19	2	**10**
20-24	3	14
30-34	2	10
40-44	2	10

Figure 4: Crash Diagram: SR-43 at Randolph Road



Graph 2: Percentage of Crashes by Type Versus Statewide Averages – Trares Road



Graph 2 shows that all crash types at the SR-43 & Trares Road intersection, except fixed object crashes, occur more frequently than is typical. **Table 2** shows notable crash statistics at this intersection and **Appendix D** contains the full crash data from the CAM tool. The crash diagram for this intersection is shown in **Figure 5**. Crashes at this intersection were slightly higher on weekdays, especially on Monday (19%) and Tuesday (19%), but the peak occurred on Saturday (38%). The crashes were spread evenly throughout the day with a slight peak from 6:00-7:00 PM. There was a large proportion of crashes in September, with 25% occurring during that month. Failure to yield was the highest contributing factor (56%) of crashes. Failure to yield consisted of five angle crashes and four left turn crashes. Three of the left turn crashes are from movements from the free-flowing northbound or southbound SR-43, indicating drivers were accepting a smaller gap in traffic. Following too closely/assured clear distance ahead (ACDA) was the next most common contributing factor (19%), with all three being rear end crashes. Pavement friction is likely not a significant contributing factor since 88% of the crashes occurred on dry pavement.

Table 2: Trares Road Crash Statistics

Hour of Day	Number	%
8	1	6
9	1	6
10	1	6
11	1	6
12	2	13
13	2	13
14	1	6
17	2	13
18	3	19
19	1	6
20	1	6

Light Condition	Number	%
Daylight	14	88
Dark - Lighted Roadway	1	6
Dark - Roadway Not Lighted	1	6

Road Condition	Number	%
Dry	14	88
Snow	1	6
Wet	1	**6**

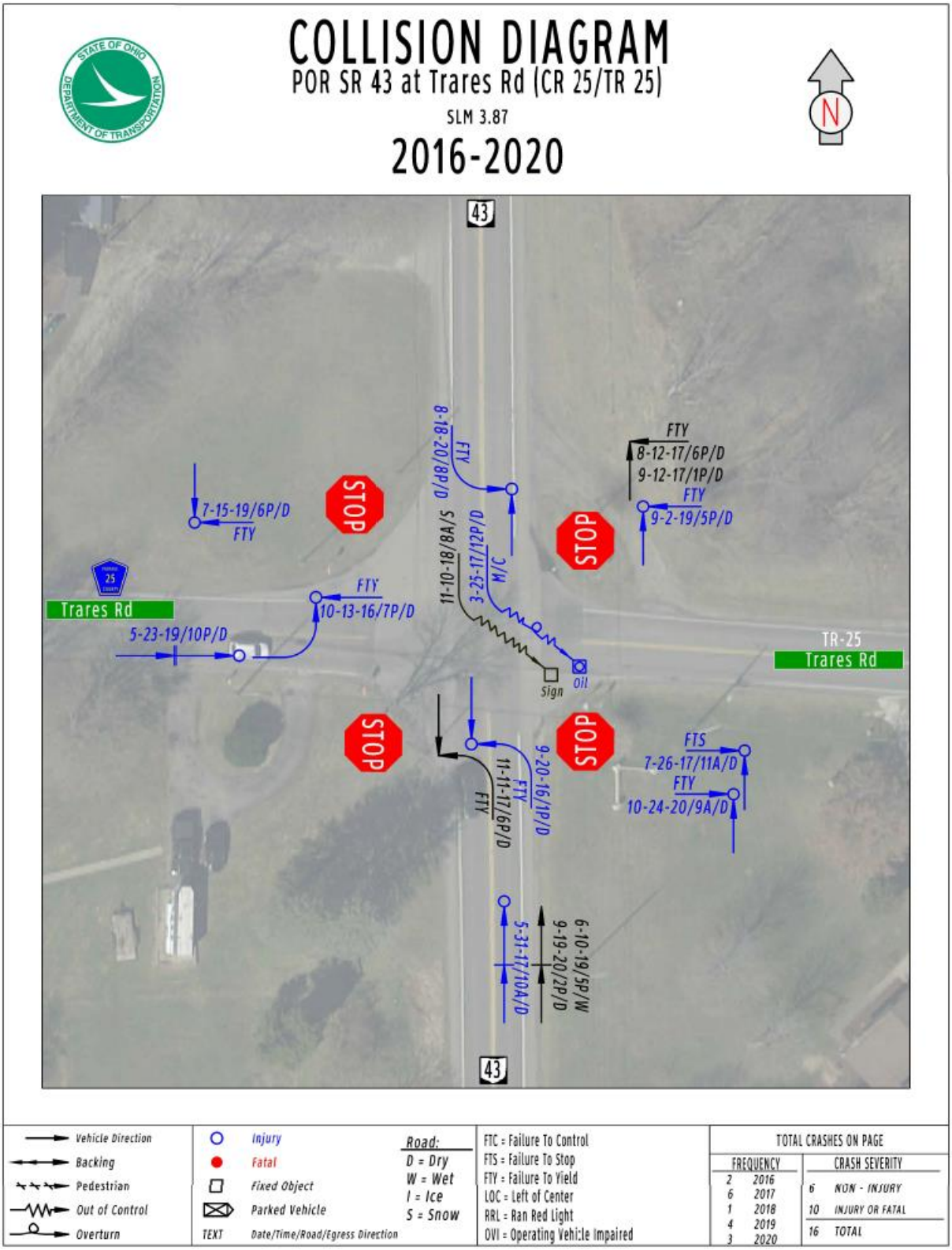
Contributing Factor	Number	%
Failure to Yield	9	56
Following Too Closely/ACDA	3	19
Improper Lane Change	1	6
Ran Stop Sign	1	**6**
Other Improper Action	1	6
Improper Start From a Parked Position	1	6

Crash Month	Number	%
March	1	6
May	2	13
June	1	6
July	2	13
August	2	13
September	4	25
October	2	13
November	2	13

Day of Week	Number	%
Monday	3	19
Tuesday	3	19
Wednesday	2	13
Thursday	2	13
Saturday	6	38

Estimated Speed (mph)	Number	%
<15	11	69
15-19	1	**6**
35-39	1	6
40-44	1	6
45-49	2	13

Figure 5: Crash Diagram: SR-43 at Trares Road



6.0 Existing Transportation Analysis

Capacity Analysis

Capacity analysis for the existing conditions was performed in *HCS Version 2024* for the unsignalized intersections. **Table 3** shows the level of service (LOS) and volume-to-capacity (v/c) ratio thresholds for both unsignalized intersections and roundabouts as published in the *Highway Capacity Manual*.

Table 3: HCM LOS Criteria

Level of Service	Unsignalized Intersection Delay (Seconds)	Roundabout Delay (Seconds)
A	≤ 10	≤ 10
B	> 10 – 15	> 10 – 15
C	> 15 - 25	> 15 - 25
D	> 25 - 35	> 25 - 35
E	> 35 - 50	> 35 - 50
F	> 50 or V/C ratio > 1.00	> 50 or V/C ratio > 1.00

Per OATS Section 5.9, an LOS of D for the overall intersection and E for each approach and movement is considered acceptable.

Table 4 shows the results of the existing 2022 capacity analysis for the study intersections for the AM and PM peak hours.

Table 4: 2022 Existing Conditions Results

Movement		AM Peak				PM Peak			
		LOS	Delay (sec)	V/C	95th% Queue (feet)	LOS	Delay (sec)	V/C	95th% Queue (feet)
SR-43 at Randolph Road	EBLTR	C	23.8	0.12	10	D	28.7	0.24	23
	WBLTR	C	24.7	0.18	16	D	28.1	0.13	13
	NBLTR	A	0.10	0.00	0	A	0.10	0.00	0
	SBLTR	A	0.20	0.00	0	A	0.10	0.00	0
SR-43 at Trares Road	EBLTR	F	68.4	0.62	80	**F**	**84.4**	0.89	180
	WBLTR	E	37.3	0.36	38	D	25.9	0.15	13
	NBLTR	A	2.8	0.12	8	A	1.7	0.06	4
	SBLTR	A	0.4	0.01	0	A	0.40	0.02	0

The unsignalized intersection, SR-43 at Randolph Road, functions in an acceptable manner on the minor street with a LOS D, and functions well on the major street with a

LOS A in both the AM and PM peaks. The v/c ratio is low for SR-43 at Randolph Road in the AM and PM peaks.

The unsignalized intersection, SR-43 at Trares Road, functions in an unacceptable manner on the minor street with an eastbound LOS F in both the AM and PM peaks. In the AM peak, the westbound approach operates poorly at a LOS E while in the PM peak, the westbound approach operates well at a LOS D. The v/c ratio remains low on the major street but has high ratios for the eastbound approach. Full capacity analysis printouts are in **Appendix E**.

Tables 5 and 6 show the 2027 and 2047 No Build capacity analysis results for the AM and PM design hours.

Table 5: 2027 Opening Year No Build Results

Movement		AM Peak				PM Peak			
		LOS	Delay (sec)	V/C	95th% Queue (feet)	LOS	Delay (sec)	V/C	95th% Queue (feet)
SR-43 at Randolph Road	EBLTR	C	23.3	0.16	16	D	31.1	0.28	28
	WBLTR	D	25.8	0.22	21	D	28.0	0.17	16
	NBLTR	A	0.30	0.01	0	A	0.30	0.01	0
	SBLTR	A	0.40	0.01	0	A	0.30	0.01	0
SR-43 at Trares Road	EBLTR	**F**	**108.8**	0.82	123	**F**	**150.0**	**1.11**	257
	WBLTR	**F**	**56.6**	0.53	63	**F**	**51.3**	0.35	36
	NBLTR	A	3.0	0.13	8	A	1.8	0.07	4
	SBLTR	A	0.40	0.01	0	A	0.50	0.02	2

For the 2027 model, the intersection of SR-43 at Randolph Road performs in a similar manner to the existing conditions for the major road. The eastbound and westbound approaches perform with acceptable delays, but they have worsened in the five-year forecast, increasing in delay time from a LOS C to LOS D. The northbound and southbound approaches continue to perform well with a LOS A.

The intersection of SR-43 at Trares Road worsened significantly for the minor road with the 2027 model. Both the eastbound and westbound approaches had failing LOS results. The eastbound approach had a v/c ratio approaching 1.0 in the AM peak and it was greater than 1.0 in the PM peak, indicating that it is overcapacity.

Table 6: 2047 Design Year No Build Results

Movement		AM Peak				PM Peak			
		LOS	Delay (sec)	V/C	95th% Queue (feet)	LOS	Delay (sec)	V/C	95th% Queue (feet)
SR-43 at Randolph Road	EBLTR	D	33.0	0.28	29	E	47.0	0.47	55
	WBLTR	D	31.0	0.31	34	E	35.9	0.26	26
	NBLTR	A	0.30	0.01	0	A	0.30	0.01	0
	SBLTR	A	0.40	0.01	0	A	0.30	0.01	0
SR-43 at Trares Road	EBLTR	F	351.2	1.49	260	F	391.6	1.71	517
	WBLTR	F	70.2	0.67	95	F	94.4	0.60	69
	NBLTR	A	3.0	0.13	8	A	1.9	0.07	4
	SBLTR	A	0.40	0.01	0	A	0.50	0.02	2

For the 2047 model, the intersection of SR-43 at Randolph Road has acceptable delays for the minor street in the AM peak with a LOS D. The PM peak has increased delay times leading to an underperforming LOS of E for the eastbound and westbound approaches. SR-43 continues to perform well in both directions during both peaks.

At the SR-43 and Trares Road intersection, both the eastbound and westbound approaches had failing LOS results for both the AM and PM peaks. Also the v/c ratio is over 1.0 for the eastbound approach, indicating that Trares Road is overcapacity. The northbound and southbound approaches had LOS of A with minimal delay.

Signal Warrant Analysis

Signal warrant analyses were performed at the study intersections using the standards outlined in the OMUTCD Chapter 4 to investigate if a traffic signal is warranted. Warrant 1 (eight-hour volume threshold), Warrant 2 (four-hour volume threshold), and Warrant 7 (crash experience) were evaluated using the existing volumes and crash data. All other warrants outlined in the OMUTCD are not applicable to the study area. Right turn reductions were applied to the count volumes for both intersections.

Per section 402-3.2 in the Traffic Engineering Manual (TEM), for new ODOT signals, Warrants 1 and 2 shall be based on the 100 percent values in the OMUTCD and right-turn reduction factors, unless there are five or more correctable crashes in one year (that can be corrected with the addition of a signal) and the speed exceeds 40 miles per hour on the major street. If both of the exceptions are applicable, then Warrants 1 and 2 may be based on the 70 percent values combined with engineering judgment and right-turn reduction factors.

SR-43 and Randolph Road

Between 2016 and 2020, there were 16 crashes that would be corrected by the installation of a signal at this intersection. However, there is never an instance where five of these crashes occurred within a 12-month period. Therefore, Warrant 1 and Warrant 2 cannot be met with 70% volume thresholds for this intersection.

Warrant 1 is based on 8 hours of traffic meeting the prescribed volume thresholds outlined in the OMUTCD. This warrant can be met if either Condition A or Condition B are satisfied (using 100% of the volumes due to ODOT's requirement for new signals) or if 80% of Condition A and Condition B are satisfied. Condition A requires that SR-43 has a minimum volume of 500 vehicles per hour and Randolph Road has a minimum volume of 150 vehicles for at least 8 hours. Condition B requires that SR-43 has a minimum volume of 750 vehicles per hour and Randolph Road has a minimum volume of 75 vehicles for at least 8 hours. At the 80% volume threshold, S-43 needs a minimum volume of 400 vehicles per hour and Randolph Road needs a minimum of 120 vehicles for Condition A. At the 80% volume threshold, SR-43 needs a minimum volume of 600 vehicles per hour and Randolph Road needs a minimum of 60 vehicles for Condition B. None of the volumes met or exceeded the requirements for either condition, therefore Warrant 1 was not met.

Warrant 2 is based on 4 hours of traffic meeting the volume thresholds shown on Figure 4C-1 of the OMUTCD. Utilizing the 100% volume requirements per ODOT's requirements for new signals, the minimum volume on the major street for both approaches is 400 vehicles per hour. For the four highest volume hours on SR-43, Randolph Road would need a minimum of approximately 310 vehicles for each of those four hours. None of those four hours met the criteria set in Figure 4C-1 of the OMUTCD, therefore the signal warrant is not met.

Warrant 7 (Crash Experience) signal warrant conditions are intended for application where the type and frequency of crashes are the principal reasons to consider installing a traffic control signal. As stated earlier, there was no 12-month period between 2016-2020 where five correctable crashes occurred. Therefore, this warrant was not met.

SR-43 and Trares Road

Between 2016 and 2020, there were six crashes that would be corrected by the installation of a signal at this intersection. However, there is never an instance where five of these crashes occurred within a 12-month period. Therefore, Warrant 1 and Warrant 2 cannot be met with 70% volume thresholds for this intersection.

For the intersection of SR-43 at Trares Road, Condition A (100%), Condition B (100%), and Combination A and B (80%) were not met for Warrant 1.

Warrant 2 had two unique hours that met the volume requirements on Figure 4C-1. Warrant 2 requires four unique hours to meet the threshold and as there were only two hours that reached the threshold, a traffic signal remains unwarranted.

As stated earlier, between 2016-2020 there was no 12-month period where 5 or more correctable crashes occurred at this intersection. Therefore, installing a new traffic signal at this location is not warranted based on Warrant 7.

Neither intersection of SR-43 at Randolph Road nor Trares Road met the criteria required for the installation of a traffic signal. The detailed signal warrant analyses are in **Appendix F**.

All-Way Stop Control Analysis

All-way stop control was analyzed for both intersections. According to the OMUTCD Section 2B.07, an all-way stop control criteria may be satisfied if it meets any of the listed four requirements. Criterion A is applying an all-way stop control for an intersection where a traffic control signal is warranted, as an interim measure. Criterion B requires five or more reported crashes in a twelve-month period that are susceptible to correction by an all-way stop control installation. Criterion C focuses on minimum volume requirements over eight 1-hour periods and Criterion D allows for a combination of the other criteria being satisfied to 80% of minimum volume requirements.

For the SR-43 & Randolph Road intersection only Criteria B was satisfied due to six crashes occurring between 9/30/2018-9/11/2019 that could possibly be corrected with the installation of all-way stop-control. Therefore, all-way stop-control could be considered for this intersection, but was ultimately dismissed for reasons discussed later in this report.

For the SR-43 & Trares Road intersection only Criteria B was satisfied due to five crashes occurring between 9/20/2016-9/12/2017 that could possibly be corrected with the installation of all-way stop-control. Therefore, all-way stop-control should be considered for this intersection.

The detailed all-way stop control analyses are in **Appendix F**.

Turn Lane Warrant

Turn lane warrant analyses were completed for left and right turn lanes at both intersections. The left turn lane warrant for two-lane high-speed roads is found in the *Location & Design Manual, Volume 1*, Figure 401-5b. This warrant is a function of the

advancing (approach) traffic and the opposing traffic. The right turn lane warrant for two-lane high-speed roads is found in the *Location & Design Manual, Volume 1*, Figure 401-6b. The balanced 2047 design traffic volumes were used in the analyses.

For SR-43 & Randolph Road, a 225' northbound left turn lane, a 225' southbound left turn lane, and a 225' southbound right turn lane are warranted. All turn lane lengths are inclusive of a 50' diverging taper.

For SR-43 & Trares Road, a 245' northbound left turn lane, a 225' southbound left turn lane, and a 225' southbound right turn lane are warranted. All turn lane lengths are inclusive of a 50' diverging taper.

It should be noted that only approximately 300' of space is available between the Randolph Road and Trares Road intersections, so installation of a 225' northbound left turn lane at Randolph Road and a 225' southbound left turn lane at Trares Road is not feasible.

Overall, while turn lanes are warranted at the study intersections, the installation of turn lanes alone will not mitigate the primary crash pattern (angle crashes). Therefore, it is not recommended that installing turn lanes be recommended as a safety improvement, unless the turn lanes are paired with an additional improvement that will mitigate the primary crash pattern.

The detailed turn lane warrant analyses are in **Appendix F**.

Speed Limit Review

Section 4511.21 of the Ohio Revised Code sets the statutory speed limit for rural highways at 55 mph, however, speed limits may be altered based on an engineering study. One of the primary factors in the determination of a speed zone is the 85th percentile speed that vehicles are currently travelling; it is generally considered to be a safe speed, minimizing crashes, and promoting uniform traffic flow along a corridor. Although a full speed study was not performed, the most recent speed check completed by ODOT in 2021 was reviewed. Based on the data provided, the 50th percentile speed ranges between 46 and 48 mph and the pace is between 44-53 mph. The 85th percentile speed is between 51 to 52 mph. This indicates the existing 45 mph speed limit on SR-43 is appropriate since the speeds are near the existing speed limit. As a result, a speed reduction is not warranted. The spot speed data is included in **Appendix B**.

7.0 Probable Causes

The major crash patterns within the study area are described below:

- **Angle:** Angle crashes are the most prominent type of crash that occurred in the SR-43 corridor, with a total of 21 crashes during the four-year study period. At the intersection of SR-43 at Randolph Road, there were 15 angle crashes. Eleven of the crashes involved southbound and westbound vehicles, three were northbound and eastbound vehicles, and the remaining one was northbound and westbound vehicles. At the intersection of SR-43 at Trares Road, there were six angle crashes. Three of the crashes involved northbound and westbound vehicles, two involved northbound and eastbound vehicles, and the last crash involved a southbound and westbound vehicle. Eighteen of the angle crashes for the corridor had failure to yield as the primary contributing factor and two had running the stop sign as the primary contributing factor. Failure to yield crashes are typically due to drivers having difficulty judging gaps along the mainline. Other possible reasons could include driver inattention, poor judgment, speeding along the major street, and sight distance issues. In past speed samples collected within the study area, it was found that the 85th percentile speed was 51 mph for SR-43 between Randolph Road and Trares Road. The posted speed limit for SR-43 is 45 mph with 35 mph advisory signs located before each of the intersections. Additionally, there are considerable issues with sight distance at both intersections. SR-43 at Randolph Road has a vertical curve on the north leg which may have contributed to the high number of angle crashes involving southbound and eastbound/westbound vehicles.

- **Rear End:** Rear end crashes are the second most prominent type of crash that occurred in the SR-43 corridor, with a total of seven crashes during the four-year study period. At the intersection of SR-43 and Randolph Road, there were three northbound rear end crashes. At the intersection of SR-43 and Trares Road, there were three northbound and one eastbound rear end crashes. All seven crashes were approaching the intersections; all had following too closely as the primary contributing factor. It is suspected that the rear end crashes are the result of the lack of turn lanes at the intersections, especially on the free-flow northbound/southbound approaches.

- **Left Turn:** Left turn crashes are the third most common crash type that occurred along the SR-43 corridor, with a total of six crashes during the five-year study period (2016-2020). At the intersection of SR-43 at Randolph, there were two northbound left turn movement crashes. At the intersection of SR-43 and Trares Road, there were two left turn movement crashes in the northbound direction, one

in the southbound direction, and one in the eastbound direction. All had failure to yield as the primary contributing factor. Crashes at both intersections are most likely due to sight distance issues. For the intersection of SR-43 at Randolph Road, the crossing itself is located in a valley between two hills which limits the sight distance for southbound vehicles especially. Northbound vehicles also have a vertical crest that blocks southbound vehicles north of the intersection, though to a lesser degree than what southbound vehicles contend with at the intersection. At SR-43 and Trares Road, there is an existing vertical dip on SR-43, just north of the intersection. This causes southbound vehicles to be briefly invisible to drivers on the northbound approach of SR-43.

8.0 Potential Countermeasures

Angle, rear end, and left turn crashes are the most prominent crash types throughout the corridor, so countermeasures should focus on mitigating these crash types. The following section suggests potential improvements that may reduce the potential for the most common crash types.

Short Term

- Add an advance warning sign (W7-6) with advisory speed plaque.
    - At the Randolph Road intersection, the SSD on the northbound approach falls short of the required, grade adjusted distance of 465 feet. The measured SSD is 360 feet, therefore the advisory speed should be 45 MPH, based on ODOT's stopping sight distance table.

W7-6

    - At the Trares Road intersection, the SSD on the southbound approach falls short of the required distance of 425 feet, with a measured SSD of 250 feet. Therefore the advisory speed should be 35 MPH, based on ODOT's stopping sight distance table.
    - These signs should be installed in the right-of-way at a distance of 250 feet from the corresponding intersection.
- Convert both intersections from a two-way stop control to an all-way stop control (AWSC).

Long Term

- Alternative 1: Construct single-lane roundabouts for both SR-43 at Randolph Road and Trares Road.

  - Note: constructing a peanut roundabout was considered, but had no apparent benefit compared to two single-lane roundabouts.
- Alterative 2: Install a median at the Randloph Road intersection to restrict eastbound/westbound left and through movements, as well as northbound/southbound left turn movements. This also includes constructing a northbound right turn lane at Randloph Road and a single-lane roundabout at SR-43 & Trares Road.
  - Note: adding cul-de-sacs on the east and west legs of the Randloph Road intersection was considered, but installing a median is expected to provide similar safety benefits while reducing costs and right-of-way impacts.

All-Way Stop-Control

Capacity analysis for the all-way stop-control countermeasure is shown in **Tables 7 and 8**. Full capacity results for the all-way stop-control countermeasure are in **Appendix G**.

Table 7: 2027 Opening Year AWSC Intersections Results

Movement		AM Peak				PM Peak			
		LOS	Delay (sec)	V/C	95th% Queue (feet)	LOS	Delay (sec)	V/C	95th% Queue (feet)
SR-43 at Randolph Road	EBLTR	A	9.9	0.07	5	B	10.4	0.10	8
	WBLTR	B	10.1	0.09	8	B	10.2	0.06	5
	NBLTR	D	32.6	0.89	294	C	19.8	0.72	156
	SBLTR	B	14.4	0.57	93	E	43.9	0.95	361
	Overall	C	24.5			**D**	**32.3**		
SR-43 at Trares Road	EBLTR	B	11.1	0.18	15	B	14.1	0.39	48
	WBLTR	B	10.8	0.14	13	B	11.4	0.09	8
	NBLTR	**F**	**82.5**	**1.09**	550	D	33.1	0.85	238
	SBLTR	C	16.0	0.59	101	**F**	**86.9**	**1.09**	513
	Overall	**F**	**53.6**			**F**	**55.2**		

The 2027 HCS model shows a general decline in the operation of both intersections.

For SR-43 at Randolph Road, the eastbound and westbound directions have improved LOS in comparison to the 2027 No Build. The v/c ratios and queue lengths remain low. In contrast, the northbound and southbound directions worsen from a LOS A to a LOS C through F. In addition, the delay times are much longer due to the conversion of the free-flow approach to a stop-control approach. The v/c ratio approaches 1.0 and there are now queue lengths as compared to none in the No Build condition. The intersection

performs in an acceptable manner with a LOS C in the AM peak and LOS D in the PM peak.

For SR-43 at Trares Road, the eastbound and westbound directions have improved from failing LOS F in the No Build to a LOS B for both the AM and PM peaks. The v/c ratios and queue lengths remain low. The northbound and southbound directions worsen from a LOS A to a LOS range from C through F. The v/c ratio is greater than 1.0 in the northbound AM peak and the southbound PM peak, indicating the intersection is overcapacity. The overall intersection fails to perform with long delay times and significant queuing northbound and southbound. Note, the southbound queues are expected to extend past the next upstream intersection.

Table 8: 2047 Design Year AWSC Intersections Results

Movement		AM Peak				PM Peak			
		LOS	Delay (sec)	V/C	95th% Queue (feet)	LOS	Delay (sec)	V/C	95th% Queue (feet)
SR-43 at Randolph Road	EBLTR	B	10.6	0.09	8	B	11.0	0.14	13
	WBLTR	B	10.7	0.12	11	B	10.6	0.08	8
	NBLTR	**F**	**51.0**	**0.98**	406	D	25.7	0.80	207
	SBLTR	C	16.2	0.61	108	**F**	**66.7**	**1.04**	470
	Overall	**E**	**35.7**			**E**	**46.0**		
SR-43 at Trares Road	EBLTR	B	12.1	0.25	25	C	19.0	0.57	88
	WBLTR	B	11.6	0.19	18	B	12.6	0.14	13
	NBLTR	**F**	**116.3**	**1.18**	671	**F**	**50.9**	0.94	315
	SBLTR	C	18.5	0.64	120	**F**	**157.6**	**1.27**	729
	Overall	**F**	**71.0**			**F**	**91.4**		

The 2047 HCS model behaves in a similar way to the 2027 HCS model.

For SR-43 at Randolph Road, the eastbound and westbound directions improve from a range of LOS D through F to a LOS B. The delay times are greatly reduced, while the v/c ratios and queue lengths remain low. The northbound and southbound directs were formerly at a LOS A due to the free-flow traffic, but have now worsened to a range of LOS C through F. The v/c ratios greatly increase, with the northbound AM peak and southbound PM peak exceeding 1.0, leading to overcapacity conditions. The overall LOS deteriorated to an E in the AM peak and PM peak.

For SR-43 at Trares Road, the eastbound and westbound movements have improved upon the No Build condition, with scores of LOS B and C. The v/c ratios are significantly lower and the queue lengths are shorter. The reverse is true for the northbound and

southbound movements. All movements fail in the AM and PM peaks with the exception of the southbound AM peak having a LOS C. The v/c ratios and queue lengths are much higher than the No Build condition. The overall LOS for both AM and PM peaks is unacceptable at an F.

Converting the SR-43 intersections with Randolph Road and Trares Road from two-way stop-control to all-way stop-control is not expected to significantly increase vehicular and EMS travel times, as all movements that currently exist at the intersections will be retained.

Stopping sight distance analyses were conducted for both intersections due to concerns about installing a stop-controlled condition for SR-43 traffic in the presence of vertical curvature. Since SR-43 has a posted speed limit of 45 MPH, a stopping sight distance of 360' was utilized for this analysis. For the Trares Road intersection, it was determined that both southbound and northbound traffic would be able to see the stop sign. However, it is expected that the vertical curvature south of the Trares Road intersection would hide, or shadow, a vehicle stopped at the stop-sign, which may lead to rear-end crashes. Additionally, it is expected that southbound vehicles at the Randolph Road intersection would be unable to see vehicles stopped at the stop sign due to the vertical curvature north of Randolph Road.

It is advised that an all-way stop control be disregarded as a countermeasure to improve the operation and safety of these intersections due to the excessively long queues and the overcapacity conditions it creates on SR-43. Additionally, installing an all-way stop control at both intersections will most likely lead to an increase in rear end crashes as SR-43 had previously been free-flowing and has a hill between the two intersections with limited sight distance. The stopping sight distance exhibits can be seen in **Appendix G.**

Alternative 1

The capacity analysis for the long-term countermeasure, Alternative 1 is shown in **Tables 9 and 10**.

Table 9: 2027 Design Year Alternative 1 Results

Movement		AM Peak				PM Peak			
		LOS	Delay (sec)	V/C	95th% Queue (feet)	LOS	Delay (sec)	V/C	95th% Queue (feet)
SR-43 at Randolph Road	EBLTR	A	4.6	0.04	3	A	6.2	0.08	5
	WBLTR	A	6.6	0.08	5	A	5.0	0.04	3
	NBLTR	A	8.6	0.05	83	A	6.7	0.40	51
	SBLTR	A	5.8	0.32	36	A	8.7	0.54	86
	Overall	A	7.4			A	7.7		
SR-43 at Trares Road	EBLTR	A	4.8	0.11	10	A	9.1	0.31	33
	WBLTR	A	7.6	0.12	10	A	5.4	0.06	5
	NBLTR	B	10.8	0.62	117	A	7.8	0.45	61
	SBLTR	A	7.2	0.37	44	A	9.4	0.56	91
	Overall	A	9.1			A	8.7		

The 2027 HCS model for single-lane roundabouts at both intersections shows positive results. All movements have a LOS B or better, with minimal delay times and v/c ratios well below 1.0. The 95th percentile queue lengths are shorter for the eastbound and westbound movements compared to the No Build and the overall LOS is an A for both intersections in both peaks.

Table 10: 2047 Design Year Alternative 1 Results

Movement		AM Peak				PM Peak			
		LOS	Delay (sec)	V/C	95th% Queue (feet)	LOS	Delay (sec)	V/C	95th% Queue (feet)
SR-43 at Randolph Road	EBLTR	A	4.8	0.06	5	A	6.8	0.11	10
	WBLTR	A	7.3	0.10	8	A	5.4	0.06	5
	NBLTR	A	9.6	0.57	99	A	7.4	0.44	89
	SBLTR	A	6.1	0.34	39	A	9.3	0.57	97
	Overall	A	8.1			A	8.3		
SR-43 at Trares Road	EBLTR	A	5.3	0.15	13	B	11.9	0.44	58
	WBLTR	B	8.5	0.17	15	A	5.9	0.09	8
	NBLTR	B	11.6	0.65	130	A	8.5	0.48	67
	SBLTR	A	7.5	0.39	47	B	10.1	0.59	104
	Overall	B	9.6			B	9.8		

The 2047 HCS model for single-lane roundabouts at both intersections shows positive results. All movements have a LOS B or better, with minimal delay times and v/c ratios

well below 1.0. The 95th percentile queue lengths are shorter for the eastbound and westbound movements compared to the No Build and the overall LOS is an A for the Randolph Road intersection and LOS B for the Trares Road intersection in both peaks.

The conversion from a two-way stop-controlled intersection to a roundabout appears to have positive effects on the operation of the intersection; however, consideration must be taken regarding the elevation difference in the area. There is a hill on the north leg of SR-43 at Randolph Road, which may cause increased speeds on the southbound approach going into the proposed roundabout. The crest of the hill is approximately 550' beyond the tie-in point for the north leg of the roundabout. The 95th percentile queue on the southbound approach is 97' in the Design Year PM peak. The cost estimate for this proposed project assumed grades will be improved as much as possible within the limits of the proposed roundabout and legs. If this countermeasure is to be considered, additional signage, enhanced pavement markings, lighting, and other additional traffic calming features should be evaluated during design.

This alternative is expected to have minimal impact on the surrounding properties at Trares Road/Randolph Road with the exception of some driveway relocations. Considering the Randolph intersection, it is likely the construction of a roundabout will require a partial or full take of the residential property at the northwest corner.

Converting the SR-43 intersections with Randolph Road and Trares Road from two-way stop-control to roundabouts is not expected to significantly increase local traffic or EMS travel times, as all movements that currently exist at the intersections will be retained.

Alternative 2

A signal warrant was performed at SR-43 & Trares Road assuming that traffic from the Randolph Road intersection would be rerouted to the Trares Road intersection due to restricted movements caused by the median. The results of the signal warrant analysis show that neither Warrant 1 nor Warrant 2 were met with the rerouted volumes.

Per the Intersection Control Evaluation (ICE) methodology, CAP-X was utilized to determine the best control type for the Trares Road intersection with the rerouted volumes. Since the signal warrants are not met for the Trares Road intersection, it was not included in the CAP-X analysis.

The CAP-X analysis evaluated two-way stop-control, all-way stop-control, and a single-lane roundabout. Since all-way stop-control was previously analyzed and showed failing levels of service before the additional rerouted traffic was added to the Trares Road intersection, it was concluded that all-way stop-control would not be an acceptable traffic control type for this alternative. It was determined that a single-lane roundabout was the

best control type option for the Trares Road intersection, as it is the only intersection type that provides a v/c ratio of less than 1.0.

The capacity analysis for the long-term countermeasure, Alternative 2 is shown in **Tables 11 and 12**.

Table 11: 2027 Design Year Alternative 2 Results

Movement		AM Peak				PM Peak			
		LOS	Delay (sec)	V/C	95th% Queue (feet)	LOS	Delay (sec)	V/C	95th% Queue (feet)
SR-43 at Randolph Road	EBR	B	10.7	0.02	3	B	13.2	0.02	3
	WBR	B	13.1	0.03	3	B	11.3	0.02	3
SR-43 at Trares Road	EBLTR	A	5.2	0.13	13	B	10.3	0.37	43
	WBLTR	A	8.6	0.19	18	A	6.0	0.09	8
	NBLTR	B	11.7	0.64	130	A	8.5	0.47	67
	SBLTR	A	7.8	0.39	49	B	10.0	0.58	99
	Overall	A	9.7			A	9.4		

The 2027 HCS model for a two-way stop-control with restricted movements at Randolph and a single-lane roundabout at Trares shows positive results. All movements have a LOS B or better, with minimal delay times and v/c ratios well below 1.0. The 95th percentile queue lengths are shorter for the eastbound and westbound movements at Trares Road compared to the No Build.

Table 12: 2047 Design Year Alternative 2 Results

Movement		AM Peak				PM Peak			
		LOS	Delay (sec)	V/C	95th% Queue (feet)	LOS	Delay (sec)	V/C	95th% Queue (feet)
SR-43 at Randolph Road	EBR	B	10.8	0.02	3	B	13.6	0.02	3
	WBR	B	13.8	0.03	3	B	11.8	0.02	3
SR-43 at Trares Road	EBLTR	A	5.8	0.19	18	B	14.5	0.54	83
	WBLTR	B	10.2	0.27	28	A	6.9	0.14	13
	NBLTR	B	13.0	0.68	146	A	9.6	0.51	77
	SBLTR	A	8.3	0.41	52	B	11.1	0.62	114
	Overall	B	10.6			B	11.1		

The 2047 HCS model for a two-way stop-control with restricted movements at Randolph and a single-lane roundabout at Trares shows positive results. All movements have a LOS B or better, with minimal delay times and v/c ratios well below 1.0. The 95th percentile queue lengths are shorter for the eastbound and westbound movements at Trares compared to the No Build and the overall LOS is B for the Trares Road intersection in both peaks.

Right turn lane warrant analyses were completed at the SR-43 & Randolph Road intersection to see if the warrants changed with the rerouted volumes. The analysis shows that a 245' northbound right turn lane and a 225' southbound right turn lane are warranted with rerouted volumes. In consideration that vehicle speeds are lower immediately downstream of a roundabout, a low-speed (less than or equal to 40 MPH) northbound right turn lane warrant was also conducted. The results show that a 150' northbound right turn lane is warranted. All turn lane lengths are inclusive of a 50' diverging taper. Due to the proximity of the Trares Road intersection, the expected lower speeds immediately downstream of a roundabout, the rerouted volumes result in a higher volume of vehicles making a northbound right movement at Randolph Road it is recommended that a 150' northbound right turn lane be installed at the Randolph Road intersection, since. It is not recommended that the 225' southbound right turn lane be installed, as that movement is not expected to experience any changes in volumes. The detailed turn lane warrant analyses are in **Appendix F**.

Eastbound right turning vehicles at Randolph Road can have acceptable sight lines as long as vegetation on the northwest corner of the Randolph Road intersection is properly maintained.

Unless grading is performed on SR-43 to flatten the roadway profile of SR-43 between the two study intersections, the westbound right turning vehicles at Randolph Road will still have restricted sight lines. However, it is expected that vehicles exiting the proposed roundabout at Trares Road would be at a lower speed than the posted speed limit of 45 MPH, thereby potentially decreasing the required intersection sight distance for westbound right turning vehicles at Randolph Road. It is recommended that this be further investigated during detailed design.

Alternative 2 is expected to have minimal impact on the surrounding properties at Trares Road with the exception of some drive relocations. The construction of a mountable median at the Randolph intersection will minimally impact adjacent residential properties.

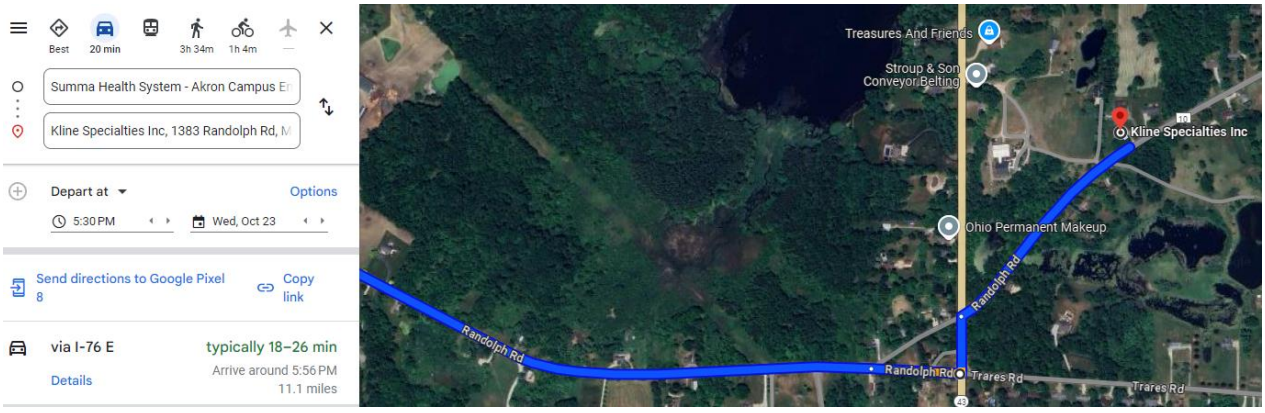
Restricting access to SR-43 via a mountable median at the Randolph Road intersection is

expected to increase vehicular and EMS travel times. However, by utilizing Google Maps, the increase in travel time is expected to be minimal with the reroute.

An example of this difference can be seen in the photos below. **Photo 6** shows the current travel time (approximately 5:30 PM on a Wednesday in October) from the Summa Akron City Hospital, located west of the study area in Akron, to a business located on the east leg of Randolph Road. **Photo 7** shows the new route that would be taken to reach the same location. It is not expected to add any additional time to the EMS travel time if the eastbound through movement were restricted at the Randolph Road intersection. A similar result was found at 8:00 AM on a Thursday.

Photo 6: Current Travel Time

Photo 7: Proposed Travel Time



Another example of this difference can be seen in the photos below. **Photo 8** shows the current travel time (approximately 5:30 PM on a Wednesday in October) from the Suffield Township Fire Station, located south of the study area, to a residential house located on the west leg of Randolph Road. **Photo 9** shows the new route that would be taken to reach the same location. It is expected to add approximately one minute to the travel time if the

northbound left movement were restricted at the Randolph Road intersection. A similar result of a one-minute addition to the travel time was found at 8:00 AM on a Thursday.

Photo 8: Current Travel Time

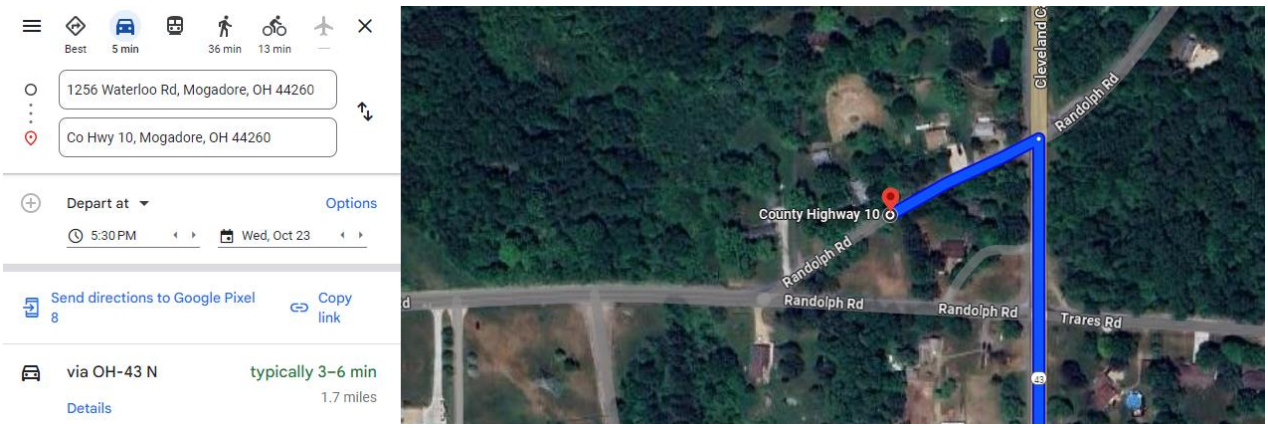


Photo 9: Proposed Travel Time

The movement that will be impacted the most from this change is the current westbound left-turning vehicles, which are expected to be mostly local drivers. **Photo 10** shows the current travel time (approximately 5:30 PM on a Wednesday in October) from a residential road on the east leg of the Randolph intersection to Suffield Elementary School, located south of the study area. **Photo 11** shows the new route that would be taken to reach the same location. It is expected to add approximately four minutes to the travel time if the westbound left movement were restricted at the Randolph Road intersection. A similar result of a five-minute addition to the travel time was found at 8:00 AM on a Thursday.

Photo 10: Current Travel Time

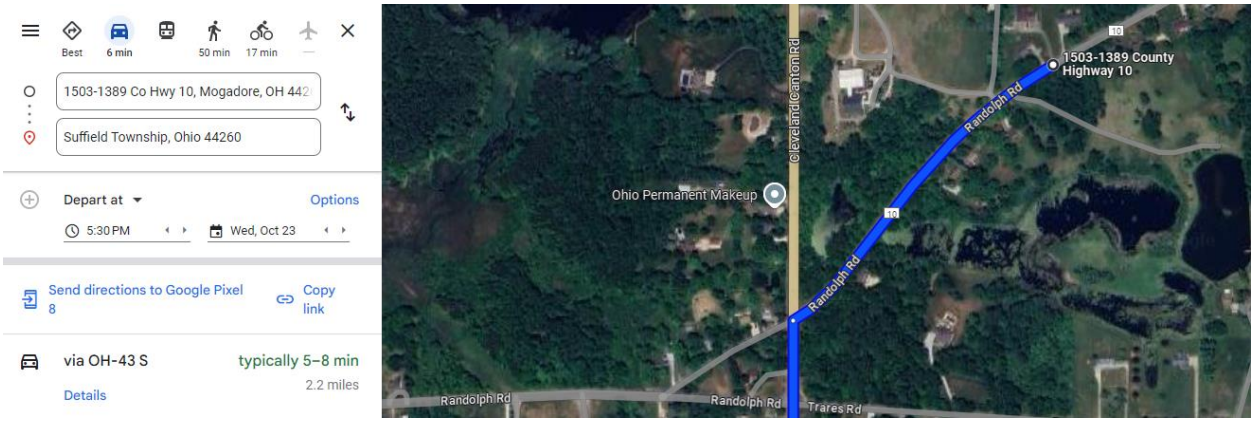
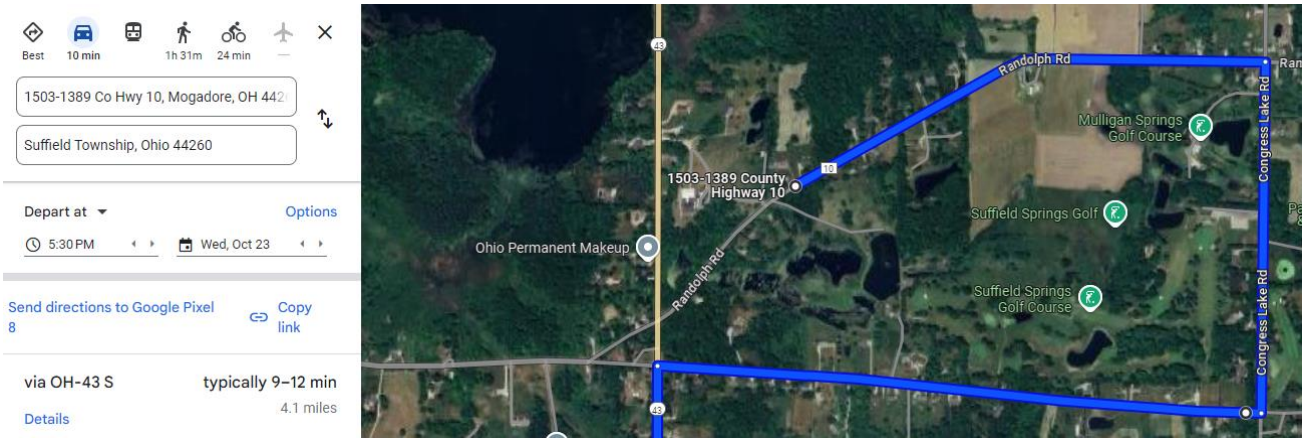


Photo 11: Proposed Travel Time



9.0 Safety Benefits

The Highway Safety Manual (HSM) is used to determine how a corridor is performing compared to similar corridors and to assess the safety benefit of countermeasures. ODOT's Economic Crash Analysis Tool (ECAT) was used to evaluate both the existing corridor and the proposed long-term countermeasures.

Crash modification factors (CMF) are used in ECAT to calculate the reduction in crashes for each countermeasure. For example, a CMF of 0.85 reduces crashes by 15%. Not all countermeasures have been studied adequately enough to provide a CMF value. The CMF values used for each scenario are listed below. To avoid overestimating the value of the combined countermeasures, ODOT recommends that no more than four CMF values should be used per scenario.

Short Term

- Install "Hill Blocks View" (W7-6) sign: No CMF was applied for this countermeasure. However, this countermeasure is expected to reduce rear end crashes as drivers may potentially reduce their speeds and/or enhance their situational awareness which could improve their reaction time.
    - According to the OMUTCD Table 2C-4, the advance placement of warning signs should be located approximately 250 feet from the intersection. The 85th percentile speed on SR-43 is 51 mph and the Condition B deceleration is 0 mph.
    - Two signs should be installed: one on each mainline approach of SR-43 at Randolph Road. The northbound advisory speed should be 35 MPH and the southbound advisory speed should be 45 MPH, according to ODOT's stopping sight distance standards.
    - These countermeasures were not analyzed in ECAT due to the lack of applicable CMFs.

Long Term: Alternative 1

- Convert both intersections from a minor-road stop control to single-lane roundabouts: No direct CMF was applied. Instead, the intersections were analyzed directly in the ECAT by changing the site type to a roundabout.

Long Term: Alternative 2

- Restrict movements at the intersection at SR-43 and Randolph Road to right-in/right-out (RIRO): A CMF of 0.20 for fatal and serious injury crashes and 0.32 for all other crashes was applied. These CMFs were found on the CMF Clearinghouse and are provided in **Appendix H**.
- Construct a northbound right turn lane at SR-43 and Randolph Road: No direct CMF was applied. Instead, the intersections were analyzed directly in the ECAT by changing the proposed conditions to include a right turn lane.
- Construct a single lane roundabout at SR-43 and Trares Road: In a similar manner to Alternative 1, no direct CMF was applied.

Table 13 shows how the existing corridor ($N_{expected\_existing}$) compares to similar corridors ($N_{predicted\_existing}$) and the proposed conditions ($N_{predicted\_proposed}$). From the table, the study area is functioning worse than its peers for injury type crashes. For the proposed scenarios, only the CMFs listed for each scenario above are used, i.e. the long-term

predicted crashes do not include CMFs for the short-term countermeasures. Full HSM results are included in **Appendix H**.

Table 13: HSM Results Summary

	KA	B	C	O	Total
$N_{predicted}$ - Existing Conditions	0.4736	1.1505	0.7602	4.0919	6.4762
$N_{expected}$ - Existing Conditions	0.5335	1.2954	0.8573	3.8484	6.5346
$N_{potential\ for\ improvement}$ - Existing Conditions	0.0599	0.1449	0.0971	-0.2435	0.0584
$N_{expected}$ - Proposed Conditions, Alt. 1 Roundabout	0.0255	0.1416	0.1510	2.8440	3.1621
$N_{expected}$ - Proposed Conditions, Alt. 2 RIRO Randolph/Roundabout Trares	0.0352	0.1524	0.1300	1.8350	2.1526

Based on the ECAT calculations, the long-term Alternative 1 countermeasures are expected to reduce the number of crashes per year by about 3.37 crashes compared to the existing conditions. The long-term Alternative 2 countermeasures are expected to reduce the number of crashes per year by about 4.38 crashes per year. Note, the CMFs applied for the roundabout installations are not necessarily comparable to the CMF applied for the RIRO installation. It is expected that installing a RIRO at the Randolph Road intersection will mitigate more crashes than a roundabout installation at this intersection.

10.0 Conclusions and Recommendations

A benefit cost analysis was prepared using the ECAT tool to compare the estimated cost of the long-term countermeasures to their respective safety benefit. Benefit cost ratios greater than 1.00 indicate a positive return on the investment. The results of the benefit cost analysis are shown in **Table 14**. Full calculations and detailed cost estimates are in **Appendix I**.

Table 14: Benefit Cost Analysis

	Long Term Alt. 1	Long Term Alt. 2
Expected Annual Crash Adjustment	-3.314	-4.324
Net Present Value of Project	$5,933,217.10	$3,696,477.20
Net Present Value of Safety Benefit	$4,558,661.83	$4,494,271.66
Benefit Cost Ratio	0.77	1.22

The benefit-cost (b/c) ratio for Alternative 2 is favorable since it is above the threshold value of 1.00. Alternative 1 has an unfavorable b/c ratio of 0.77.

Alternative 2 is recommended because it is expected to mitigate crash issues at both intersections at a lower cost than Alternative 1. The median on SR-43 would eliminate angle and left turn crashes, with minimal increases in travel time. Additionally, Alternative 1 is expected to require more right-of-way, thus having a greater impact on the surrounding private properties. The roundabout on Trares Road is expected to improve capacity, which would reduce rear-end crashes. The roundabout is also expected to have a significant impact on the angle and left turn crashes occurring at this intersection.

See **Figure 6** and **Figure 7** for the long-term concept plans. See **Appendix I** for roundabout dimensions, critical design parameters, and truck turns through the roundabout. Note, the design is conceptual and will be further refined during detailed design when survey data is available.

Figure 6: Long Term Alternative 1

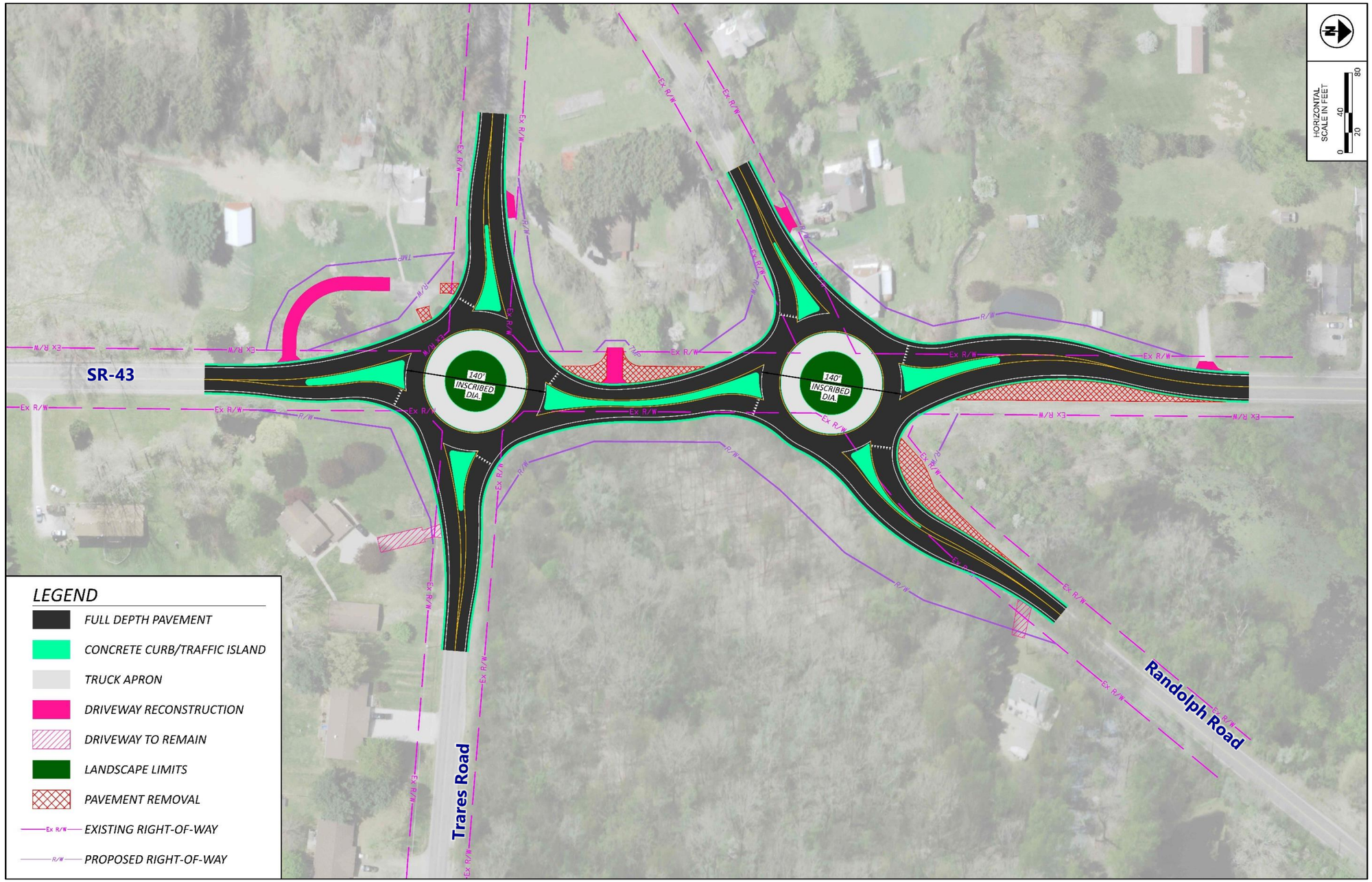
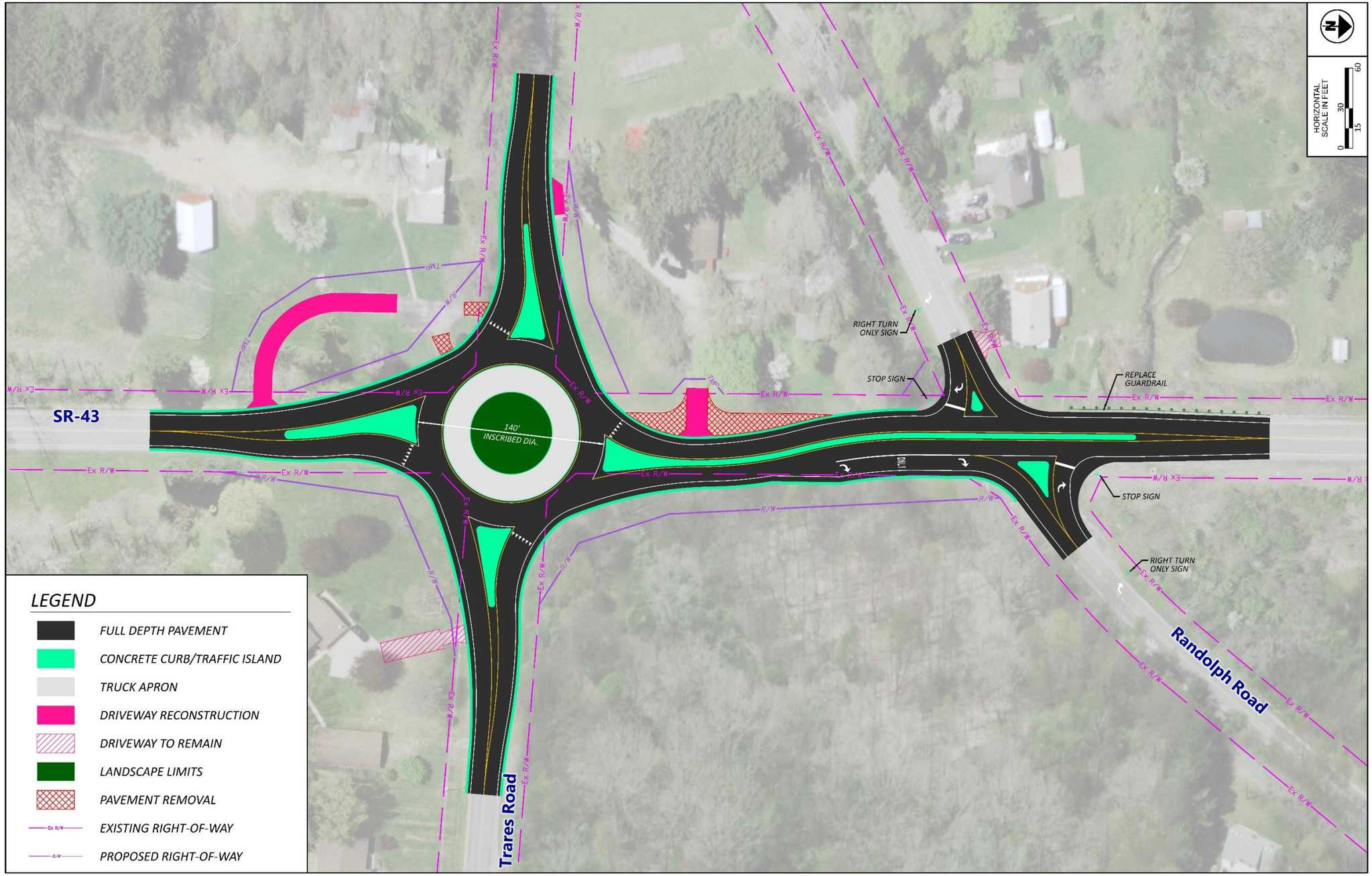
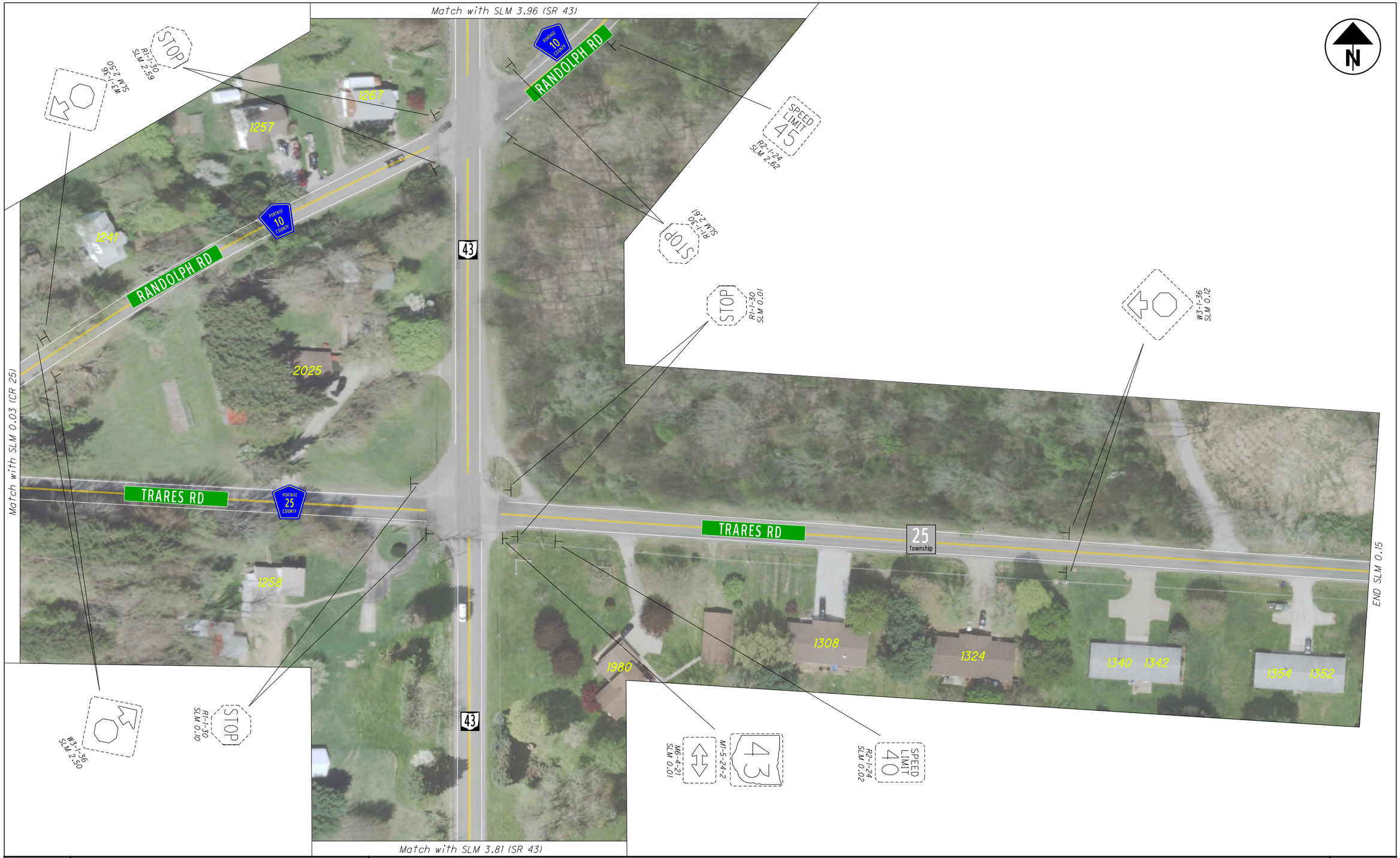


Figure 7: Long Term Alternative 2



Appendix A
Existing Conditions Diagram

CARPENTER MARTY transportation

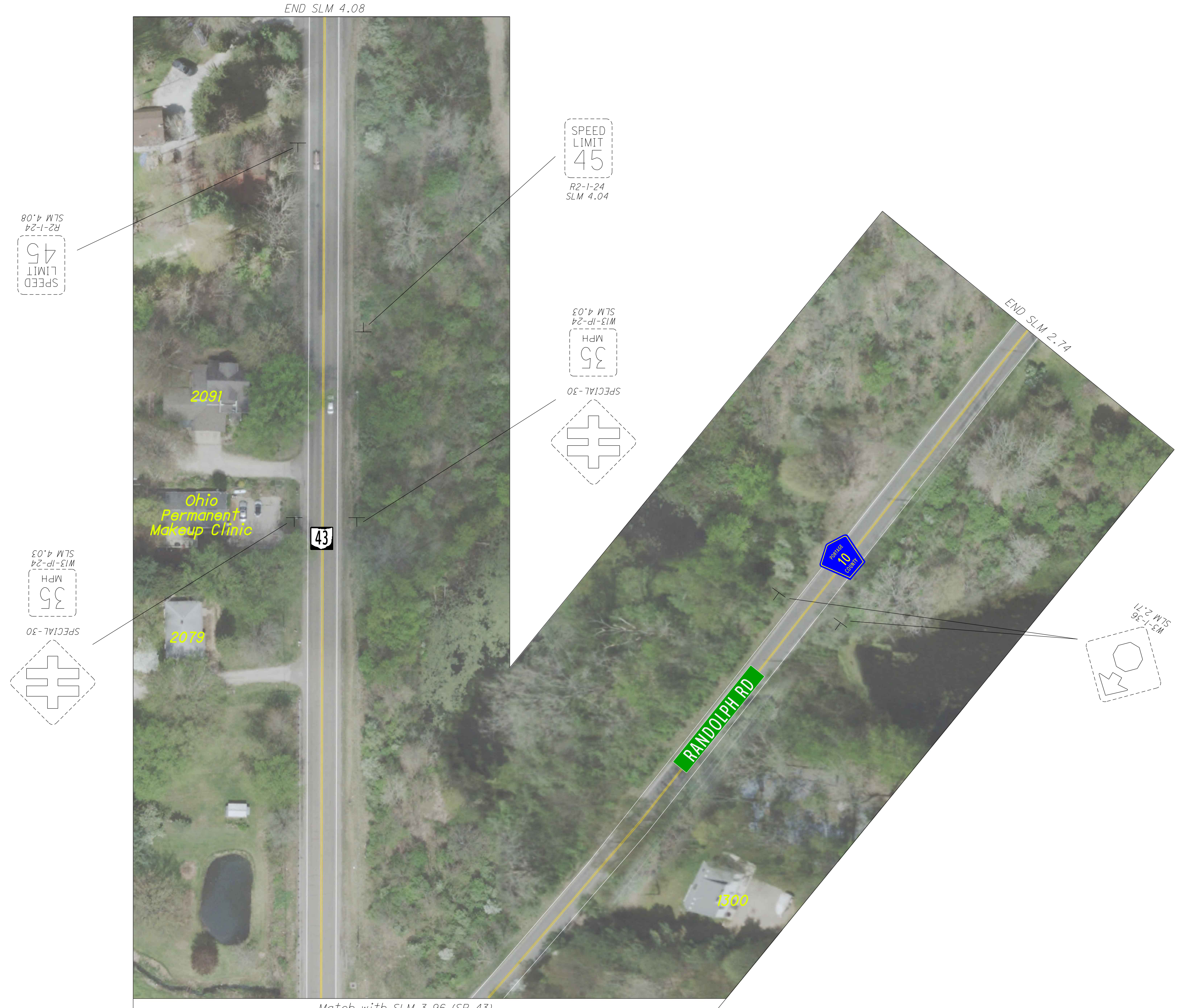


1
4

EXISTING CONDITIONS AS OF JUNE 2022

POR SR 43 AT TRARES AND RANDOLPH RD

PREPARED BY
AFL
ISSUED BY
DEG



2/4

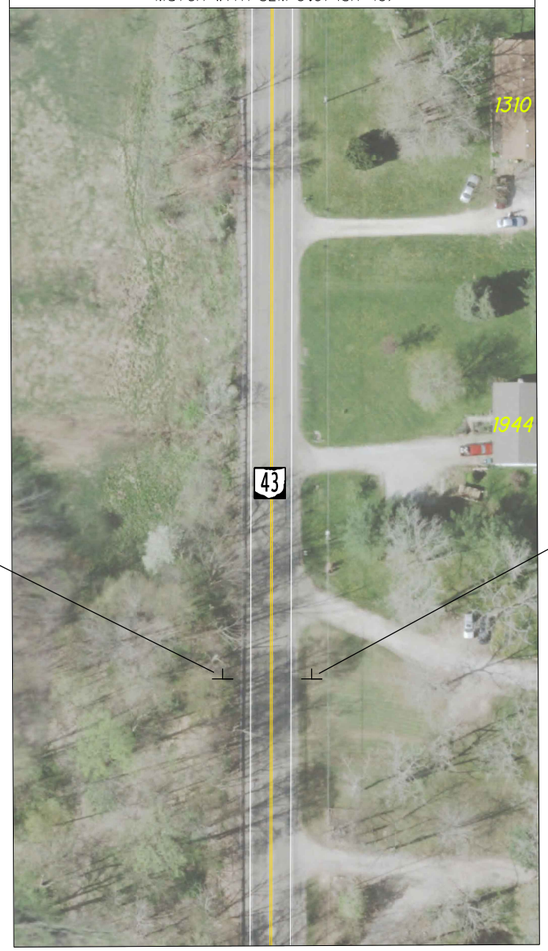
EXISTING CONDITIONS AS OF JUNE 2022

POR SR 43 AT TRARES AND RANDOLPH RD

PREPARED BY AFL

ISSUED BY DEG

Match with SLM 3.81 (SR 43)



END SLM 3.70

SPECIAL-30

35 MPH

W13-1P-24
SLM 3.73

SPECIAL-30

35 MPH

W13-1P-24
SLM 3.73

N

3
4

EXISTING CONDITIONS
AS OF JUNE 2022

POR SR 43 AT TRARES AND RANDOLPH RD

PREPARED BY
AFL

ISSUED BY
DEG

4/4

EXISTING CONDITIONS
AS OF JUNE 2022

POR SR 43 AT TRARES AND RANDOLPH RD

A5 of 5

PREPARED BY
AFL

ISSUED BY
DEG

Appendix B
Sight Distance and Spot Speed Studies

CARPENTER MARTY transportation

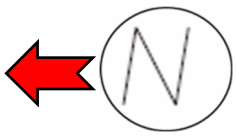
OHIO DEPARTMENT OF TRANSPORTATION

Sight Distance Study

sCOUNTY:	POR	**ROUTE:**	43	**SLM:**	3.93	**LOCATION:**	SR 43 at Randolph Rd
DATE:	11-5-21	**DAY:**	Friday	**TIME:**	1:45	**OBSERVER(S):**	K. Kubus, J. Durbin
REASON FOR ANALYSIS:							

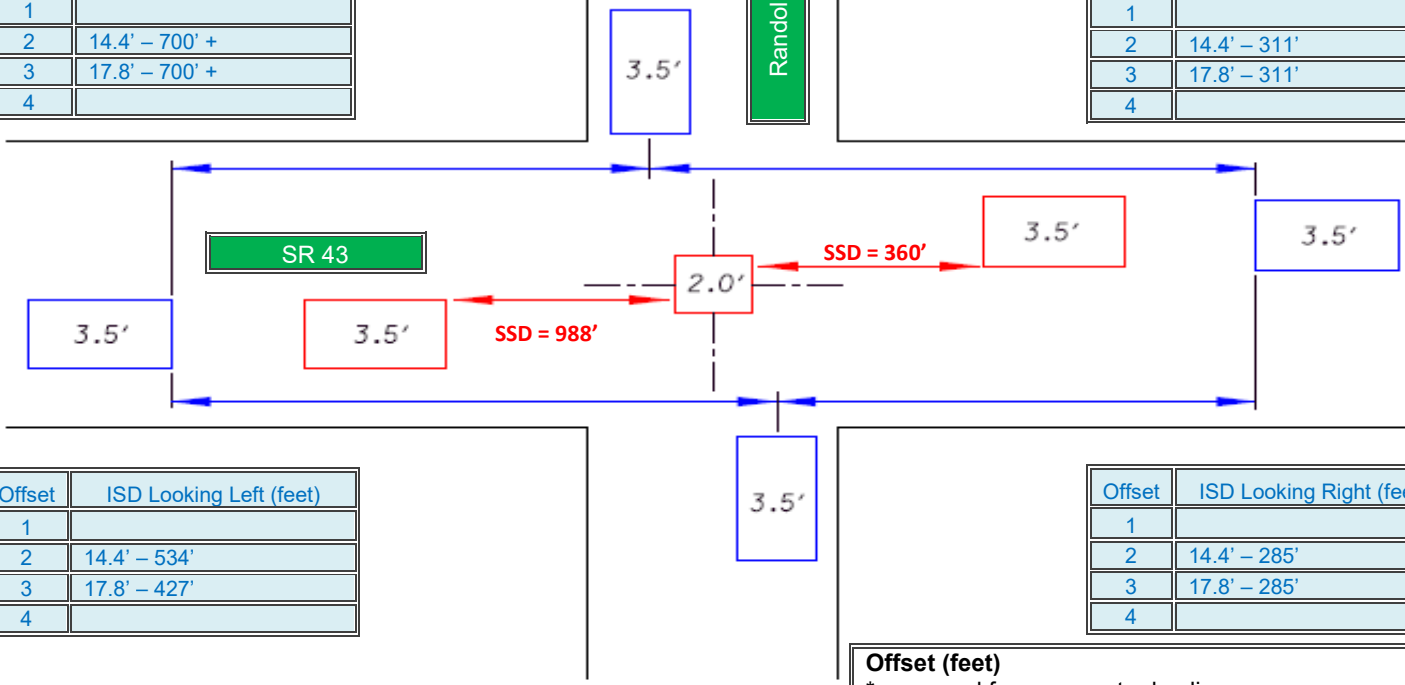
Mainline Speed Limit = 45 MPH	Mainline 85th %tile Speed = 51 MPH	Design Speed = 50 MPH

Minimum Standard
SSD = 425'
ISD = 555'



Offset	ISD Looking Right (feet)
1	
2	14.4' – 700' +
3	17.8' – 700' +
4	

Offset	ISD Looking Left (feet)
1	
2	14.4' – 311'
3	17.8' – 311'
4	



Offset	ISD Looking Left (feet)
1	
2	14.4' – 534'
3	17.8' – 427'
4	

Offset	ISD Looking Right (feet)
1	
2	14.4' – 285'
3	17.8' – 285'
4	

When observing trucks, see Table 201-5 of the L&D Manual for ISD.

Offset (feet) *measured from nearest edge line	
Offset 1	Driver's eye at 7.5 feet (limits of Travel)
Offset 2	Drivers eye at 14.4 feet
Offset 3	Drivers eye at 17.8 feet
Offset 4	

*Label road names and draw north arrow. Draw in neighboring drives with distances if necessary. Describe what is blocking the sight distance such as vegetation, pavement on hill crest, etc.

Notes/Recommendations:

EB traffic stopped at 17', 17', 24', 9', and 14'.

All traffic squared up to intersection.

ISD (555') Looking north restricted by vegetation/ Looking south restricted by roadway profile

WB traffic stopped at 17' and 10'.

All traffic squared up to intersection.

ISD (555') Looking north not restricted / Looking south restricted by roadway profile

SB SSD (425') adjusted for grade = 475' (Not Restricted)

NB SSD (425') adjusted for grade = 470' (Restricted)

Design standards from L & D Manual (Vol 1, Sect Rev July 2013)			
DESIGN SPEED (mph)	SSD (fig 201-1E)	ISD for passenger car turning left (Fig 201-5E)	ISD for passenger car turning right or crossing (Fig 201-5E)
20	115'	225'	195'
25	155'	280'	240'
30	200'	335'	290'
35	250'	390'	335'
40	305'	445'	385'
45	360'	500'	430'
50	425'	555'	480'
55	495'	610'	530'
60	570'	665'	575'

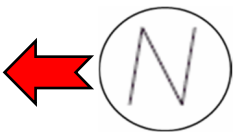
OHIO DEPARTMENT OF TRANSPORTATION

Sight Distance Study

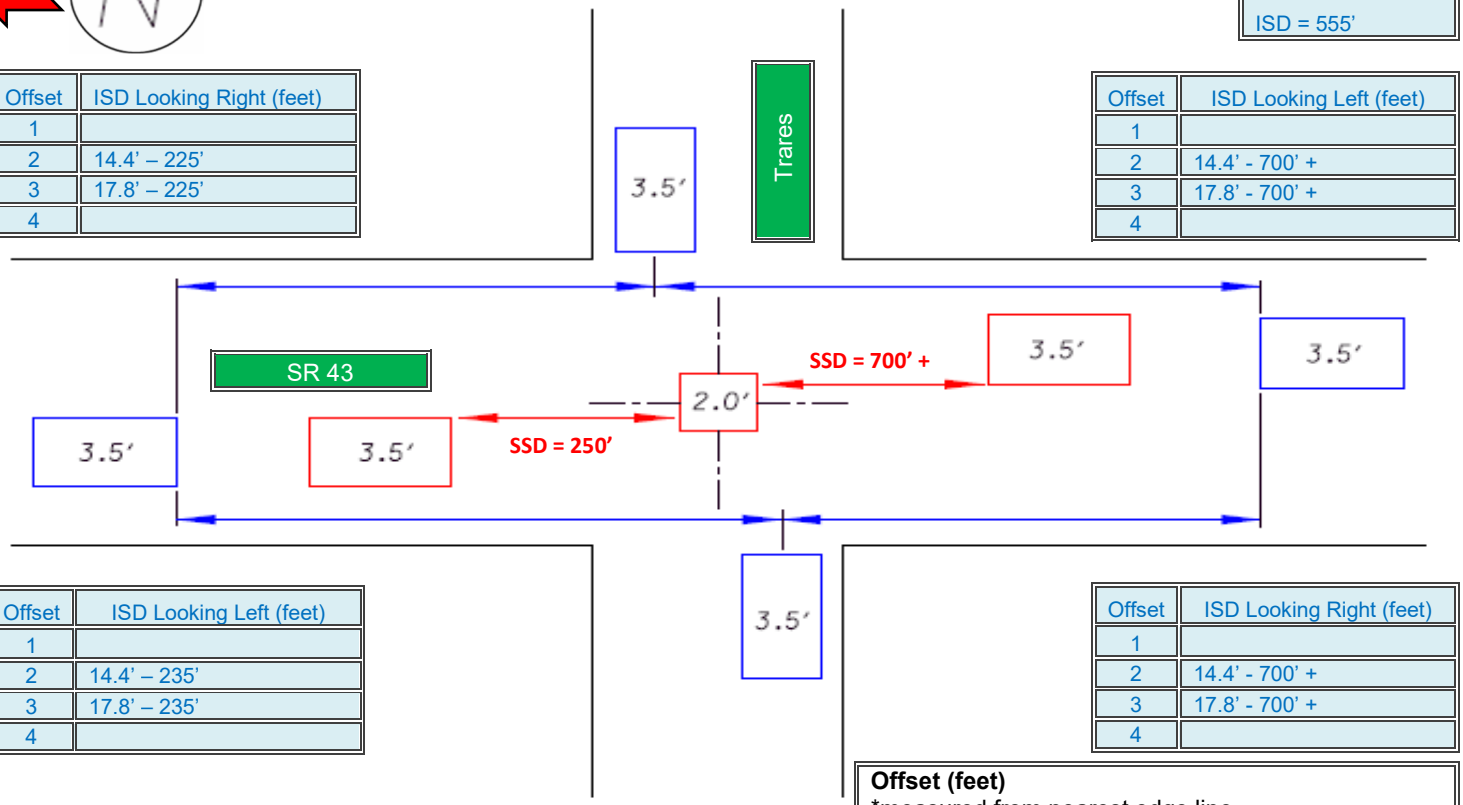
COUNTY:	POR	**ROUTE:**	43	**SLM:**	3.87	**LOCATION:**	SR 43 at Trares Rd
DATE:	11-5-21	**DAY:**	Friday	**TIME:**	12:45	**OBSERVER(S):**	K. Kubus, J. Durbin
REASON FOR ANALYSIS:							

Mainline Speed Limit = 45 MPH	Mainline 85th %tile Speed = 51 MPH	Design Speed = 50 mph

Minimum Standard
SSD = 425'
ISD = 555'



Offset	ISD Looking Right (feet)
1	
2	14.4' – 225'
3	17.8' – 225'
4	



Offset	ISD Looking Left (feet)
1	
2	14.4' - 700' +
3	17.8' - 700' +
4	

Offset	ISD Looking Left (feet)
1	
2	14.4' – 235'
3	17.8' – 235'
4	

Offset	ISD Looking Right (feet)
1	
2	14.4' - 700' +
3	17.8' - 700' +
4	

When observing trucks, see Table 201-5 of the L&D Manual for ISD.

Offset (feet) *measured from nearest edge line	
Offset 1	Driver's eye at 7.5 feet (limits of Travel)
Offset 2	Drivers eye at 14.4 feet
Offset 3	Drivers eye at 17.8 feet
Offset 4	

*Label road names and draw north arrow. Draw in neighboring drives with distances if necessary. Describe what is blocking the sight distance such as vegetation, pavement on hill crest, etc.

Notes/Recommendations:

EB traffic stopped at 17', 14', 14', 17' and 25'.

All stopping traffic squared up to the stop intersection.

ISD (555') Looking north restricted by roadway profile / Looking south not restricted

WB traffic stopped at 20' and 14'.

ISD (555') Looking north restricted by roadway profile / Looking south not restricted

SSD (425') not adjusted for grade - NB not restricted / SB restricted

Design standards from L & D Manual (Vol 1, Sect Rev July 2013)			
DESIGN SPEED (mph)	SSD (fig 201-1E)	ISD for passenger car turning left (Fig 201-5E)	ISD for passenger car turning right or crossing (Fig 201-5E)
20	115'	225'	195'
25	155'	280'	240'
30	200'	335'	290'
35	250'	390'	335'
40	305'	445'	385'
45	360'	500'	430'
50	425'	555'	480'
55	495'	610'	530'
60	570'	665'	575'

OHIO DEPARTMENT OF TRANSPORTATION

FORM 1296-5

SPEED CHECK

COUNTY: POR **ROUTE:** 43 **SLM:** 3.93 **LOCATION:** SR 43 at Randolph Rd

PAVEMENT TYPE: ASPHAULT **DRY:** **WET:** X **CONDITION:** Good **LANE WIDTH:** 11' **NO. OF LANES:** 2

DATE: 11/12/2021 **DAY:** Friday **WEATHER:** Clear **TEMPERATURE:** 39

OBSERVER: K. Kubus, J. Durbin

North BOUND TIME: 8:15 AM TO 8:45 AM				MPH	South BOUND TIME: 8:15 AM TO 8:45 AM			
CUM. %	CUM. TOTA	NO.	VEHICLES		VEHICLES	NO.	CUM. TOTA	CUM. %
				≥ 66				
				65				
				64				
				63				
				62				
				61				
				60				
				59				
				58				
				57		1	59	100%
				56				
100%	66	1		55				
98%	65	1		54		3	58	98%
97%	64	6		53		3	55	93%
88%	58	1		52		3	52	88%
86%	57	6		51		4	49	83%
77%	51	2		50		8	45	76%
74%	49	1		49		4	37	63%
73%	48	6		48		10	33	56%
64%	42	7		47		3	23	39%
53%	35	9		46		5	20	34%
39%	26	6		45		7	15	25%
30%	20	7		44		4	8	14%
				43		2	4	7%
20%	13	3		42		1	2	3%
15%	10	4		41				
9%	6	1		40				
				39				
8%	5	3		38		1	1	2%
				37				
3%	2	1		36				
				35				
2%	1	1		34				
				33				
				32				
				31				
				30				
				29				
				28				
				27				
				26				
				25				
				24				
				23				
				22				
				21				
				≤ 20				
		66		TOTALS		59		

50^{TH} %:	46	MPH	85^{TH} %:	51	MPH	PACE: 44 - 53 MPH	50^{TH} %:	48	MPH	85^{TH} %:	51	MPH	PACE: 44 - 53 MPH

OHIO DEPARTMENT OF TRANSPORTATION

FORM 1296-5

SPEED CHECK

COUNTY: POR **ROUTE:** 43 **SLM:** 3.87 **LOCATION:** SR 43 at Trares Rd

PAVEMENT TYPE: ASPHAULT **DRY:** **WET:** X **CONDITION:** Good **LANE WIDTH:** 11' **NO. OF LANES:** 2

DATE: 11/12/2021 **DAY:** Friday **WEATHER:** Clear **TEMPERATURE:** 41

OBSERVER: K. Kubus, J. Dubrin

North BOUND TIME: 7:40 AM TO 8:10 AM				MPH	South BOUND TIME: 7:40 AM TO 8:10 AM			
CUM. %	CUM. TOTA	NO.	VEHICLES		VEHICLES	NO.	CUM. TOTA	CUM. %
				≥ 66				
				65				
				64				
				63				
				62				
				61				
				60				
				59				
100%	61	1		58				
				57				
				56		1	71	100%
				55				
98%	60	1		54		1	70	99%
97%	59	3		53		3	69	97%
92%	56	3		52		2	66	93%
87%	53	5		51		4	64	90%
79%	48	6		50		9	60	85%
69%	42	2		49		9	51	72%
66%	40	10		48		8	42	59%
49%	30	6		47		14	34	48%
39%	24	10		46		6	20	28%
23%	14	4		45		4	14	20%
16%	10	8		44		5	10	14%
				43		2	5	7%
				42		2	3	4%
3%	2	2		41		1	1	1%
				40				
				39				
				38				
				37				
				36				
				35				
				34				
				33				
				32				
				31				
				30				
				29				
				28				
				27				
				26				
				25				
				24				
				23				
				22				
				21				
				≤ 20				
		61		TOTALS		71		

50^{TH} %:	47	MPH	85^{TH} %:	51	MPH	PACE: 44 - 53 MPH	50^{TH} %:	47	MPH
85^{TH} %:	50	MPH	PACE:	44	-	53 MPH			

Appendix C
Count Data and Volume Calculations

CARPENTER MARTY transportation

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Lights

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 1

Groups Printed- Lights

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	1	39	1	0	41	0	5	1	0	6	0	100	1	0	101	1	1	0	0	2	150
07:15 AM	0	49	2	0	51	2	9	3	0	14	1	109	0	0	110	0	0	2	0	2	177
07:30 AM	4	71	0	0	75	0	2	0	0	2	2	137	0	0	139	1	2	7	0	10	226
07:45 AM	7	76	0	0	83	0	3	2	0	5	3	69	1	0	73	2	0	3	0	5	166
Total	12	235	3	0	250	2	19	6	0	27	6	415	2	0	423	4	3	12	0	19	719
08:00 AM	1	44	0	0	45	0	6	4	0	10	0	54	1	0	55	0	2	1	0	3	113
08:15 AM	0	51	1	1	53	2	4	1	0	7	2	62	0	0	64	0	0	0	0	0	124
08:30 AM	5	42	0	0	47	0	0	1	0	1	3	80	0	0	83	2	1	1	0	4	135
08:45 AM	2	47	0	0	49	1	1	1	0	3	2	72	0	0	74	0	0	1	0	1	127
Total	8	184	1	1	194	3	11	7	0	21	7	268	1	0	276	2	3	3	0	8	499
09:00 AM	5	36	0	0	41	0	6	1	0	7	0	56	0	0	56	0	1	0	0	1	105
09:15 AM	2	37	0	0	39	1	3	0	0	4	0	43	0	0	43	1	0	0	0	1	87
09:30 AM	2	40	1	0	43	0	2	3	0	5	4	44	0	0	48	0	1	0	0	1	97
09:45 AM	2	42	0	0	44	1	2	1	0	4	2	50	0	0	52	0	2	1	0	3	103
Total	11	155	1	0	167	2	13	5	0	20	6	193	0	0	199	1	4	1	0	6	392
10:00 AM	8	44	0	0	52	1	2	0	0	3	2	50	1	0	53	1	3	0	0	4	112
10:15 AM	2	50	0	0	52	0	3	0	0	3	0	47	0	0	47	0	2	0	0	2	104
10:30 AM	4	45	0	0	49	0	4	3	0	7	3	44	0	0	47	0	1	5	0	6	109
10:45 AM	6	33	1	0	40	0	3	4	0	7	3	46	0	0	49	0	0	0	0	0	96
Total	20	172	1	0	193	1	12	7	0	20	8	187	1	0	196	1	6	5	0	12	421
11:00 AM	5	50	2	0	57	1	5	1	0	7	2	41	1	0	44	2	3	1	0	6	114
11:15 AM	2	40	0	0	42	0	3	0	0	3	1	50	0	0	51	0	1	5	0	6	102
11:30 AM	7	49	0	0	56	0	4	0	0	4	2	40	0	0	42	2	1	2	0	5	107
11:45 AM	0	37	0	0	37	1	4	2	0	7	3	54	0	0	57	0	4	1	0	5	106
Total	14	176	2	0	192	2	16	3	0	21	8	185	1	0	194	4	9	9	0	22	429
12:00 PM	5	69	0	0	74	0	2	1	0	3	4	39	0	0	43	1	2	1	0	4	124
12:15 PM	7	36	0	0	43	1	0	0	0	1	1	52	0	0	53	0	3	3	0	6	103
12:30 PM	2	53	0	0	55	1	3	2	0	6	2	48	0	0	50	0	1	5	0	6	117
12:45 PM	3	52	0	0	55	0	2	0	0	2	5	49	0	0	54	1	4	2	0	7	118
Total	17	210	0	0	227	2	7	3	0	12	12	188	0	0	200	2	10	11	0	23	462
01:00 PM	3	46	0	0	49	1	2	3	0	6	3	56	0	0	59	0	2	2	0	4	118
01:15 PM	9	51	0	0	60	1	5	0	0	6	2	73	2	0	77	0	3	5	0	8	151
01:30 PM	9	51	0	0	60	1	3	3	0	7	1	65	0	0	66	0	2	3	0	5	138

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Lights

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 2

Groups Printed- Lights

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
01:45 PM	5	47	0	0	52	0	5	0	0	5	3	51	1	0	55	0	2	2	0	4	116
Total	26	195	0	0	221	3	15	6	0	24	9	245	3	0	257	0	9	12	0	21	523
02:00 PM	5	61	0	0	66	1	3	2	0	6	4	55	2	0	61	1	4	1	0	6	139
02:15 PM	2	73	0	0	75	1	1	2	0	4	1	75	1	0	77	1	6	6	0	13	169
02:30 PM	11	77	1	0	89	1	0	0	0	1	3	78	2	0	83	0	1	6	0	7	180
02:45 PM	8	89	0	0	97	0	6	1	0	7	3	67	0	0	70	2	2	5	0	9	183
Total	26	300	1	0	327	3	10	5	0	18	11	275	5	0	291	4	13	18	0	35	671
03:00 PM	11	114	3	0	128	0	1	3	0	4	7	59	1	0	67	4	3	5	0	12	211
03:15 PM	4	87	0	0	91	0	2	2	0	4	7	77	0	0	84	0	3	2	0	5	184
03:30 PM	7	89	0	0	96	0	1	1	0	2	8	65	0	0	73	1	11	1	0	13	184
03:45 PM	14	104	1	0	119	0	5	3	0	8	5	95	1	0	101	0	4	3	0	7	235
Total	36	394	4	0	434	0	9	9	0	18	27	296	2	0	325	5	21	11	0	37	814
04:00 PM	7	86	0	0	93	1	1	0	0	2	1	90	0	0	91	0	8	2	0	10	196
04:15 PM	5	148	0	0	153	1	1	1	0	3	5	74	1	0	80	3	5	1	0	9	245
04:30 PM	8	111	0	0	119	0	4	1	0	5	6	101	1	0	108	4	5	4	0	13	245
04:45 PM	3	135	2	0	140	0	5	1	0	6	4	90	0	0	94	0	6	1	0	7	247
Total	23	480	2	0	505	2	11	3	0	16	16	355	2	0	373	7	24	8	0	39	933
05:00 PM	7	127	0	0	134	1	1	4	0	6	5	101	1	0	107	0	9	5	0	14	261
05:15 PM	3	113	3	0	119	2	2	1	0	5	8	93	1	0	102	3	4	4	0	11	237
05:30 PM	10	96	1	0	107	0	9	2	0	11	5	85	0	0	90	2	6	1	0	9	217
05:45 PM	3	89	0	0	92	1	5	0	0	6	1	83	1	0	85	1	7	2	0	10	193
Total	23	425	4	0	452	4	17	7	0	28	19	362	3	0	384	6	26	12	0	44	908
06:00 PM	4	70	0	0	74	0	5	0	0	5	5	51	0	0	56	4	2	1	0	7	142
06:15 PM	0	67	0	0	67	1	4	0	0	5	3	69	0	0	72	0	6	1	0	7	151
06:30 PM	2	74	2	0	78	0	3	4	0	7	0	65	0	0	65	2	1	2	0	5	155
06:45 PM	1	48	2	0	51	2	4	2	0	8	8	32	0	0	40	1	3	2	0	6	105
Total	7	259	4	0	270	3	16	6	0	25	16	217	0	0	233	7	12	6	0	25	553
Grand Total	223	3185	23	1	3432	27	156	67	0	250	145	3186	20	0	3351	43	140	108	0	291	7324
Apprch %	6.5	92.8	0.7	0		10.8	62.4	26.8	0		4.3	95.1	0.6	0		14.8	48.1	37.1	0		
Total %	3	43.5	0.3	0	46.9	0.4	2.1	0.9	0	3.4	2	43.5	0.3	0	45.8	0.6	1.9	1.5	0	4	

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Lights

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 3

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	1	39	1	0	41	0	5	1	0	6	0	100	**1**	0	101	1	1	0	0	2	150
07:15 AM	0	49	**2**	0	51	**2**	**9**	**3**	0	**14**	1	109	0	0	110	0	0	2	0	2	177
07:30 AM	4	71	0	0	75	0	2	0	0	2	2	**137**	0	0	**139**	1	**2**	**7**	0	**10**	**226**
07:45 AM	**7**	**76**	0	0	**83**	0	3	2	0	5	**3**	69	1	0	73	**2**	0	3	0	5	166
Total Volume	12	235	3	0	250	2	19	6	0	27	6	415	2	0	423	4	3	12	0	19	719
% App. Total	4.8	94	1.2	0		7.4	70.4	22.2	0		1.4	98.1	0.5	0		21.1	15.8	63.2	0		
PHF	.429	.773	.375	.000	.753	.250	.528	.500	.000	.482	.500	.757	.500	.000	.761	.500	.375	.429	.000	.475	.795

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Lights

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 4

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	5	**148**	0	0	**153**	**1**	1	1	0	3	5	74	**1**	0	80	3	5	1	0	9	245
04:30 PM	**8**	111	0	0	119	0	4	1	0	5	**6**	**101**	1	0	**108**	**4**	5	4	0	13	245
04:45 PM	3	135	**2**	0	140	0	**5**	1	0	**6**	4	90	0	0	94	0	6	1	0	7	247
05:00 PM	7	127	0	0	134	1	1	**4**	0	6	5	101	1	0	107	0	**9**	**5**	0	**14**	**261**
Total Volume	23	521	2	0	546	2	11	7	0	20	20	366	3	0	389	7	25	11	0	43	998
% App. Total	4.2	95.4	0.4	0		10	55	35	0		5.1	94.1	0.8	0		16.3	58.1	25.6	0		
PHF	.719	.880	.250	.000	.892	.500	.550	.438	.000	.833	.833	.906	.750	.000	.900	.438	.694	.550	.000	.768	.956

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Mediums

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 1

Groups Printed- Mediums

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	0	1	0	0	1	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	6
07:15 AM	0	3	0	0	3	0	0	0	0	0	0	7	0	0	7	0	1	0	0	1	11
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	5
07:45 AM	0	5	0	0	5	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	10
Total	0	9	0	0	9	0	0	2	0	2	0	20	0	0	20	0	1	0	0	1	32
08:00 AM	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	6
08:15 AM	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	7
08:30 AM	1	1	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
08:45 AM	0	6	0	0	6	0	0	0	0	0	1	7	0	0	8	0	0	0	0	0	14
Total	1	12	0	0	13	0	0	0	0	0	1	16	0	0	17	0	0	1	0	1	31
09:00 AM	0	2	0	0	2	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	10
09:15 AM	0	0	0	0	0	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	5
09:30 AM	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	8
09:45 AM	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
Total	0	7	0	0	7	0	0	0	0	0	1	20	0	0	21	0	0	0	0	0	28
10:00 AM	1	2	0	0	3	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	7
10:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10:30 AM	2	1	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
10:45 AM	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	6
Total	3	7	0	0	10	0	0	0	0	0	0	8	0	0	8	0	0	1	0	1	19
11:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
11:15 AM	1	0	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
11:30 AM	1	1	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
11:45 AM	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
Total	2	5	0	0	7	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	15
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
12:15 PM	0	3	0	0	3	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	7
12:30 PM	0	1	0	0	1	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	5
12:45 PM	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
Total	0	7	0	0	7	0	0	0	0	0	0	11	0	0	11	0	0	1	0	1	19
01:00 PM	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
01:15 PM	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
01:30 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Mediums

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 2

Groups Printed- Mediums

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
01:45 PM	0	1	0	0	1	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	6
Total	0	7	0	0	7	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	20
02:00 PM	0	4	0	0	4	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	6
02:15 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
02:30 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
02:45 PM	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Total	0	13	0	0	13	0	0	1	0	1	0	5	0	0	5	0	0	0	0	0	19
03:00 PM	0	6	0	0	6	0	0	0	0	0	0	2	0	0	2	0	1	0	0	1	9
03:15 PM	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
03:30 PM	0	2	0	0	2	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	5
03:45 PM	0	2	0	0	2	0	0	0	0	0	1	3	0	0	4	0	0	0	0	0	6
Total	0	12	0	0	12	0	1	0	0	1	1	10	0	0	11	0	1	0	0	1	25
04:00 PM	0	3	0	0	3	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	8
04:15 PM	0	2	0	0	2	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	7
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	5	0	0	5	0	0	0	0	0	2	11	0	0	13	0	0	0	0	0	18
05:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
05:15 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
05:30 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
Total	0	5	0	0	5	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	10
06:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
06:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Grand Total	6	90	0	0	96	0	1	3	0	4	5	128	0	0	133	0	2	3	0	5	238
Apprch %	6.2	93.8	0	0		0	25	75	0		3.8	96.2	0	0		0	40	60	0		
Total %	2.5	37.8	0	0	40.3	0	0.4	1.3	0	1.7	2.1	53.8	0	0	55.9	0	0.8	1.3	0	2.1	

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Mediums

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 3

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:45 AM																					
08:45 AM	0	**6**	0	0	**6**	0	0	0	0	0	**1**	7	0	0	**8**	0	0	0	0	0	**14**
09:00 AM	0	2	0	0	2	0	0	0	0	0	0	**8**	0	0	8	0	0	0	0	0	10
09:15 AM	0	0	0	0	0	0	0	0	0	0	1	4	0	0	5	0	0	0	0	0	5
09:30 AM	0	3	0	0	3	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	8
Total Volume	0	11	0	0	11	0	0	0	0	0	2	24	0	0	26	0	0	0	0	0	37
% App. Total	0	100	0	0		0	0	0	0		7.7	92.3	0	0		0	0	0	0		
PHF	.000	.458	.000	.000	.458	.000	.000	.000	.000	.000	.500	.750	.000	.000	.813	.000	.000	.000	.000	.000	.661

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Mediums

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 4

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:45 PM																					
02:45 PM	0	**7**	0	0	**7**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
03:00 PM	0	6	0	0	6	0	0	0	0	0	0	2	0	0	2	0	**1**	0	0	**1**	**9**
03:15 PM	0	2	0	0	2	0	0	0	0	0	0	**3**	0	0	**3**	0	0	0	0	0	5
03:30 PM	0	2	0	0	2	0	**1**	0	0	**1**	0	2	0	0	2	0	0	0	0	0	5
Total Volume	0	17	0	0	17	0	1	0	0	1	0	7	0	0	7	0	1	0	0	1	26
% App. Total	0	100	0	0		0	100	0	0		0	100	0	0		0	100	0	0		
PHF	.000	.607	.000	.000	.607	.000	.250	.000	.000	.250	.000	.583	.000	.000	.583	.000	.250	.000	.000	.250	.722

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Articulated Trucks

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 1

Groups Printed- Articulated Trucks

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
07:45 AM	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Total	1	1	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
09:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
09:15 AM	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
09:45 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	10
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
10:15 AM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
10:30 AM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
Total	0	3	0	0	3	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	10
11:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
11:15 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	6
12:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12:15 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
12:30 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
12:45 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	1	5	0	0	6	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	10
01:00 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
01:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Articulated Trucks

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 2

Groups Printed- Articulated Trucks

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
01:45 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	10
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
02:15 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
02:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
02:45 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Total	0	5	0	0	5	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	10
03:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03:15 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
03:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	5	0	0	5	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	6
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
04:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
04:45 PM	0	3	0	0	3	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	6
Total	0	5	0	0	5	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	10
05:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	6
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Grand Total	2	38	0	0	40	1	0	0	0	1	0	45	0	0	45	0	0	0	0	0	86
Apprch %	5	95	0	0		100	0	0	0		0	100	0	0		0	0	0	0		
Total %	2.3	44.2	0	0	46.5	1.2	0	0	0	1.2	0	52.3	0	0	52.3	0	0	0	0	0	

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Articulated Trucks

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 3

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 09:00 AM																					
09:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
09:15 AM	0	**2**	0	0	**2**	0	0	0	0	0	0	**3**	0	0	**3**	0	0	0	0	0	**5**
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
09:45 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total Volume	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	10
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.500

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Articulated Trucks

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 4

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:15 PM																					
12:15 PM	0	**1**	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
12:30 PM	0	1	0	0	1	0	0	0	0	0	0	**3**	0	0	**3**	0	0	0	0	0	**4**
12:45 PM	**1**	1	0	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
01:00 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
Total Volume	1	4	0	0	5	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	12
% App. Total	20	80	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.250	1.00	.000	.000	.625	.000	.000	.000	.000	.000	.000	.583	.000	.000	.583	.000	.000	.000	.000	.000	.750

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Combined

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	1	40	1	0	42	0	5	2	0	7	0	104	1	0	105	1	1	0	0	2	156
07:15 AM	0	52	2	0	54	2	9	3	0	14	1	116	0	0	117	0	1	2	0	3	188
07:30 AM	4	71	0	0	75	0	2	0	0	2	2	143	0	0	145	1	2	7	0	10	232
07:45 AM	8	82	0	0	90	0	3	3	0	6	3	74	1	0	78	2	0	3	0	5	179
Total	13	245	3	0	261	2	19	8	0	29	6	437	2	0	445	4	4	12	0	20	755
08:00 AM	1	46	0	0	47	0	6	4	0	10	0	58	1	0	59	0	2	1	0	3	119
08:15 AM	0	55	1	1	57	2	4	1	0	7	2	65	0	0	67	0	0	1	0	1	132
08:30 AM	6	44	0	0	50	0	0	1	0	1	3	83	0	0	86	2	1	1	0	4	141
08:45 AM	2	53	0	0	55	1	1	1	0	3	3	79	0	0	82	0	0	1	0	1	141
Total	9	198	1	1	209	3	11	7	0	21	8	285	1	0	294	2	3	4	0	9	533
09:00 AM	5	39	0	0	44	0	6	1	0	7	0	65	0	0	65	0	1	0	0	1	117
09:15 AM	2	39	0	0	41	1	3	0	0	4	1	50	0	0	51	1	0	0	0	1	97
09:30 AM	2	43	1	0	46	0	2	3	0	5	4	50	0	0	54	0	1	0	0	1	106
09:45 AM	2	45	0	0	47	1	2	1	0	4	2	54	0	0	56	0	2	1	0	3	110
Total	11	166	1	0	178	2	13	5	0	20	7	219	0	0	226	1	4	1	0	6	430
10:00 AM	9	46	0	0	55	1	2	0	0	3	2	55	1	0	58	1	3	1	0	5	121
10:15 AM	2	52	0	0	54	0	3	0	0	3	0	49	0	0	49	0	2	0	0	2	108
10:30 AM	6	48	0	0	54	0	4	3	0	7	3	47	0	0	50	0	1	5	0	6	117
10:45 AM	6	36	1	0	43	0	3	4	0	7	3	51	0	0	54	0	0	0	0	0	104
Total	23	182	1	0	206	1	12	7	0	20	8	202	1	0	211	1	6	6	0	13	450
11:00 AM	5	52	2	0	59	1	5	1	0	7	2	43	1	0	46	2	3	1	0	6	118
11:15 AM	3	41	0	0	44	0	3	0	0	3	1	54	0	0	55	0	1	5	0	6	108
11:30 AM	8	50	0	0	58	0	4	0	0	4	2	44	0	0	46	2	1	2	0	5	113
11:45 AM	0	40	0	0	40	1	4	2	0	7	3	56	0	0	59	0	4	1	0	5	111
Total	16	183	2	0	201	2	16	3	0	21	8	197	1	0	206	4	9	9	0	22	450
12:00 PM	5	71	0	0	76	0	2	1	0	3	4	41	0	0	45	1	2	1	0	4	128
12:15 PM	7	40	0	0	47	1	0	0	0	1	1	56	0	0	57	0	3	4	0	7	112
12:30 PM	2	55	0	0	57	1	3	2	0	6	2	55	0	0	57	0	1	5	0	6	126
12:45 PM	4	56	0	0	60	0	2	0	0	2	5	51	0	0	56	1	4	2	0	7	125
Total	18	222	0	0	240	2	7	3	0	12	12	203	0	0	215	2	10	12	0	24	491
01:00 PM	3	49	0	0	52	1	2	3	0	6	3	62	0	0	65	0	2	2	0	4	127
01:15 PM	9	54	0	0	63	1	5	0	0	6	2	76	2	0	80	0	3	5	0	8	157
01:30 PM	9	53	0	0	62	1	3	3	0	7	1	70	0	0	71	0	2	3	0	5	145

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Combined

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 2

Groups Printed- Lights - Mediums - Articulated Trucks

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
01:45 PM	5	50	0	0	55	0	5	0	0	5	3	56	1	0	60	0	2	2	0	4	124
Total	26	206	0	0	232	3	15	6	0	24	9	264	3	0	276	0	9	12	0	21	553
02:00 PM	5	65	0	0	70	1	3	3	0	7	4	58	2	0	64	1	4	1	0	6	147
02:15 PM	2	76	0	0	78	1	1	2	0	4	1	77	1	0	79	1	6	6	0	13	174
02:30 PM	11	79	1	0	91	1	0	0	0	1	3	82	2	0	87	0	1	6	0	7	186
02:45 PM	8	98	0	0	106	0	6	1	0	7	3	68	0	0	71	2	2	5	0	9	193
Total	26	318	1	0	345	3	10	6	0	19	11	285	5	0	301	4	13	18	0	35	700
03:00 PM	11	121	3	0	135	0	1	3	0	4	7	61	1	0	69	4	4	5	0	13	221
03:15 PM	4	91	0	0	95	0	2	2	0	4	7	81	0	0	88	0	3	2	0	5	192
03:30 PM	7	92	0	0	99	0	2	1	0	3	8	67	0	0	75	1	11	1	0	13	190
03:45 PM	14	107	1	0	122	0	5	3	0	8	6	98	1	0	105	0	4	3	0	7	242
Total	36	411	4	0	451	0	10	9	0	19	28	307	2	0	337	5	22	11	0	38	845
04:00 PM	7	89	0	0	96	1	1	0	0	2	2	95	0	0	97	0	8	2	0	10	205
04:15 PM	5	151	0	0	156	1	1	1	0	3	6	78	1	0	85	3	5	1	0	9	253
04:30 PM	8	112	0	0	120	0	4	1	0	5	6	105	1	0	112	4	5	4	0	13	250
04:45 PM	3	138	2	0	143	1	5	1	0	7	4	92	0	0	96	0	6	1	0	7	253
Total	23	490	2	0	515	3	11	3	0	17	18	370	2	0	390	7	24	8	0	39	961
05:00 PM	7	130	0	0	137	1	1	4	0	6	5	102	1	0	108	0	9	5	0	14	265
05:15 PM	3	115	3	0	121	2	2	1	0	5	8	95	1	0	104	3	4	4	0	11	241
05:30 PM	10	98	1	0	109	0	9	2	0	11	5	88	0	0	93	2	6	1	0	9	222
05:45 PM	3	89	0	0	92	1	5	0	0	6	1	86	1	0	88	1	7	2	0	10	196
Total	23	432	4	0	459	4	17	7	0	28	19	371	3	0	393	6	26	12	0	44	924
06:00 PM	4	71	0	0	75	0	5	0	0	5	5	52	0	0	57	4	2	1	0	7	144
06:15 PM	0	67	0	0	67	1	4	0	0	5	3	70	0	0	73	0	6	1	0	7	152
06:30 PM	2	74	2	0	78	0	3	4	0	7	0	65	0	0	65	2	1	2	0	5	155
06:45 PM	1	48	2	0	51	2	4	2	0	8	8	32	0	0	40	1	3	2	0	6	105
Total	7	260	4	0	271	3	16	6	0	25	16	219	0	0	235	7	12	6	0	25	556
Grand Total	231	3313	23	1	3568	28	157	70	0	255	150	3359	20	0	3529	43	142	111	0	296	7648
Apprch %	6.5	92.9	0.6	0		11	61.6	27.5	0		4.3	95.2	0.6	0		14.5	48	37.5	0		
Total %	3	43.3	0.3	0	46.7	0.4	2.1	0.9	0	3.3	2	43.9	0.3	0	46.1	0.6	1.9	1.5	0	3.9	
Lights	223	3185	23	1	3432	27	156	67	0	250	145	3186	20	0	3351	43	140	108	0	291	7324
% Lights	96.5	96.1	100	100	96.2	96.4	99.4	95.7	0	98	96.7	94.8	100	0	95	100	98.6	97.3	0	98.3	95.8
Mediums	6	90	0	0	96	0	1	3	0	4	5	128	0	0	133	0	2	3	0	5	238
% Mediums	2.6	2.7	0	0	2.7	0	0.6	4.3	0	1.6	3.3	3.8	0	0	3.8	0	1.4	2.7	0	1.7	3.1
Articulated Trucks	2	38	0	0	40	1	0	0	0	1	0	45	0	0	45	0	0	0	0	0	86
% Articulated Trucks	0.9	1.1	0	0	1.1	3.6	0	0	0	0.4	0	1.3	0	0	1.3	0	0	0	0	0	1.1

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
Combined

File Name : POR-43_at_Randolph_Rd_(3.936)_956903_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 3

	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	1	40	1	0	42	0	5	2	0	7	0	104	**1**	0	105	1	1	0	0	2	156
07:15 AM	0	52	**2**	0	54	**2**	**9**	**3**	0	**14**	1	116	0	0	117	0	1	2	0	3	188
07:30 AM	4	71	0	0	75	0	2	0	0	2	2	**143**	0	0	**145**	1	**2**	**7**	0	**10**	**232**
07:45 AM	**8**	**82**	0	0	**90**	0	3	3	0	6	**3**	74	1	0	78	**2**	0	3	0	5	179
Total Volume	13	245	3	0	261	2	19	8	0	29	6	437	2	0	445	4	4	12	0	20	755
% App. Total	5	93.9	1.1	0		6.9	65.5	27.6	0		1.3	98.2	0.4	0		20	20	60	0		
PHF	.406	.747	.375	.000	.725	.250	.528	.667	.000	.518	.500	.764	.500	.000	.767	.500	.500	.429	.000	.500	.814

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR SR-43 at Randolph Rd
7:00AM-7:00PM
5/4/2022
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Start Date : 5/4/2022
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	SR-43 Southbound					Randolph Rd Westbound					SR-43 Northbound					Randolph Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	5	**151**	0	0	**156**	**1**	1	1	0	3	**6**	78	**1**	0	85	3	5	1	0	9	253
04:30 PM	**8**	112	0	0	120	0	4	1	0	5	6	**105**	1	0	**112**	**4**	5	4	0	13	250
04:45 PM	3	138	**2**	0	143	1	**5**	1	0	**7**	4	92	0	0	96	0	6	1	0	7	253
05:00 PM	7	130	0	0	137	1	1	**4**	0	6	5	102	1	0	108	0	**9**	**5**	0	**14**	**265**
Total Volume	23	531	2	0	556	3	11	7	0	21	21	377	3	0	401	7	25	11	0	43	1021
% App. Total	4.1	95.5	0.4	0		14.3	52.4	33.3	0		5.2	94	0.7	0		16.3	58.1	25.6	0		
PHF	.719	.879	.250	.000	.891	.750	.550	.438	.000	.750	.875	.898	.750	.000	.895	.438	.694	.550	.000	.768	.963

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Lights

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 1

Groups Printed- Lights

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	1	38	0	0	39	4	3	2	0	9	1	98	12	0	111	2	1	3	0	6	165
07:15 AM	5	49	0	0	54	4	8	0	0	12	0	95	27	0	122	10	1	10	0	21	209
07:30 AM	8	60	2	0	70	3	13	1	0	17	2	118	25	0	145	6	3	15	0	24	256
07:45 AM	7	67	5	0	79	1	8	0	0	9	0	69	28	0	97	3	2	6	0	11	196
Total	21	214	7	0	242	12	32	3	0	47	3	380	92	0	475	21	7	34	0	62	826
08:00 AM	2	43	1	0	46	1	4	2	0	7	1	57	19	0	77	1	3	1	0	5	135
08:15 AM	0	54	0	0	54	0	4	0	0	4	2	56	10	0	68	5	0	2	0	7	133
08:30 AM	2	42	0	0	44	2	3	2	0	7	1	82	22	0	105	4	2	1	0	7	163
08:45 AM	4	44	1	0	49	1	7	1	0	9	1	65	13	0	79	5	3	7	0	15	152
Total	8	183	2	0	193	4	18	5	0	27	5	260	64	0	329	15	8	11	0	34	583
09:00 AM	2	34	1	0	37	2	7	0	0	9	3	54	13	0	70	7	1	2	0	10	126
09:15 AM	1	37	0	0	38	2	9	0	0	11	3	42	8	0	53	6	7	2	0	15	117
09:30 AM	2	40	1	0	43	1	7	0	0	8	0	42	10	0	52	8	4	6	0	18	121
09:45 AM	6	36	1	0	43	4	1	1	0	6	1	47	12	0	60	6	2	2	0	10	119
Total	11	147	3	0	161	9	24	1	0	34	7	185	43	0	235	27	14	12	0	53	483
10:00 AM	5	41	0	0	46	1	5	1	0	7	1	45	5	0	51	2	5	5	0	12	116
10:15 AM	2	45	1	0	48	1	2	1	0	4	2	45	11	0	58	4	3	3	0	10	120
10:30 AM	3	44	1	0	48	0	4	0	0	4	1	41	4	0	46	6	2	8	0	16	114
10:45 AM	2	34	1	0	37	1	5	1	0	7	2	47	6	0	55	5	3	2	0	10	109
Total	12	164	3	0	179	3	16	3	0	22	6	178	26	0	210	17	13	18	0	48	459
11:00 AM	5	45	1	0	51	0	4	1	0	5	0	41	2	0	43	3	4	5	0	12	111
11:15 AM	1	39	2	0	42	1	2	0	0	3	0	40	7	0	47	7	4	7	0	18	110
11:30 AM	2	46	0	0	48	3	5	1	0	9	3	34	13	0	50	7	3	6	0	16	123
11:45 AM	3	42	2	0	47	0	3	1	0	4	1	49	6	0	56	9	3	7	1	20	127
Total	11	172	5	0	188	4	14	3	0	21	4	164	28	0	196	26	14	25	1	66	471
12:00 PM	5	55	2	0	62	3	6	0	0	9	1	35	16	0	52	8	4	5	0	17	140
12:15 PM	6	30	1	0	37	3	4	2	0	9	0	45	9	0	54	7	3	7	0	17	117
12:30 PM	4	49	2	0	55	2	2	2	0	6	0	45	9	0	54	14	4	5	0	23	138
12:45 PM	5	47	0	0	52	3	4	0	0	7	2	40	7	0	49	9	3	9	0	21	129
Total	20	181	5	0	206	11	16	4	0	31	3	165	41	0	209	38	14	26	0	78	524
01:00 PM	4	46	1	0	51	0	7	0	0	7	2	53	9	0	64	5	4	10	0	19	141
01:15 PM	3	44	1	0	48	1	6	0	0	7	1	69	6	0	76	6	2	6	0	14	145
01:30 PM	5	47	2	0	54	1	3	1	0	5	0	58	5	0	63	13	2	6	0	21	143

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Lights

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 2

Groups Printed- Lights

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
01:45 PM	5	44	1	0	50	0	2	1	0	3	2	51	11	0	64	9	6	4	0	19	136
Total	17	181	5	0	203	2	18	2	0	22	5	231	31	0	267	33	14	26	0	73	565
02:00 PM	10	50	2	0	62	1	2	1	0	4	2	59	7	0	68	10	8	6	0	24	158
02:15 PM	5	70	1	0	76	3	2	0	0	5	2	55	11	0	68	13	8	11	0	32	181
02:30 PM	6	70	0	0	76	4	4	0	0	8	1	73	14	0	88	22	2	11	0	35	207
02:45 PM	10	88	3	0	101	2	1	0	0	3	0	63	7	0	70	6	6	6	0	18	192
Total	31	278	6	0	315	10	9	1	0	20	5	250	39	0	294	51	24	34	0	109	738
03:00 PM	15	93	2	0	110	1	3	0	0	4	3	56	7	0	66	9	6	11	0	26	206
03:15 PM	6	80	2	0	88	1	5	0	0	6	2	78	13	0	93	18	13	6	0	37	224
03:30 PM	4	88	3	0	95	1	3	1	0	5	2	71	12	0	85	15	10	4	0	29	214
03:45 PM	9	87	7	0	103	0	3	0	0	3	2	85	9	0	96	23	11	13	0	47	249
Total	34	348	14	0	396	3	14	1	0	18	9	290	41	0	340	65	40	34	0	139	893
04:00 PM	4	86	3	0	93	1	6	0	0	7	4	81	9	0	94	28	10	9	0	47	241
04:15 PM	6	135	3	0	144	2	5	0	0	7	2	72	12	0	86	20	13	10	0	43	280
04:30 PM	8	101	6	0	115	3	6	1	0	10	0	96	12	0	108	13	9	8	0	30	263
04:45 PM	3	131	1	0	135	2	3	1	0	6	1	79	10	0	90	25	10	9	0	44	275
Total	21	453	13	0	487	8	20	2	0	30	7	328	43	0	378	86	42	36	0	164	1059
05:00 PM	8	121	4	0	133	2	2	2	0	6	2	95	13	0	110	18	13	12	0	43	292
05:15 PM	5	106	5	0	116	3	7	3	0	13	0	88	9	0	97	26	16	14	0	56	282
05:30 PM	8	90	2	0	100	1	4	2	0	7	3	82	14	0	99	11	9	4	0	24	230
05:45 PM	3	79	6	0	88	4	0	2	0	6	1	81	7	0	89	10	11	5	0	26	209
Total	24	396	17	0	437	10	13	9	0	32	6	346	43	0	395	65	49	35	0	149	1013
06:00 PM	3	67	3	0	73	2	3	2	0	7	1	46	4	0	51	7	6	5	0	18	149
06:15 PM	2	64	2	0	68	1	5	2	0	8	2	73	6	0	81	8	4	1	0	13	170
06:30 PM	5	70	3	0	78	2	1	1	0	4	4	62	14	0	80	8	1	5	0	14	176
06:45 PM	3	47	2	0	52	2	3	1	0	6	1	33	5	0	39	4	6	3	0	13	110
Total	13	248	10	0	271	7	12	6	0	25	8	214	29	0	251	27	17	14	0	58	605
Grand Total	223	2965	90	0	3278	83	206	40	0	329	68	2991	520	0	3579	471	256	305	1	1033	8219
Apprch %	6.8	90.5	2.7	0		25.2	62.6	12.2	0		1.9	83.6	14.5	0		45.6	24.8	29.5	0.1		
Total %	2.7	36.1	1.1	0	39.9	1	2.5	0.5	0	4	0.8	36.4	6.3	0	43.5	5.7	3.1	3.7	0	12.6	

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Lights

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
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	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	1	38	0	0	39	**4**	3	**2**	0	9	1	98	12	0	111	2	1	3	0	6	165
07:15 AM	5	49	0	0	54	4	8	0	0	12	0	95	27	0	122	**10**	1	10	0	21	209
07:30 AM	**8**	60	2	0	70	3	**13**	1	0	**17**	**2**	**118**	25	0	**145**	6	**3**	**15**	0	**24**	**256**
07:45 AM	7	**67**	**5**	0	**79**	1	8	0	0	9	0	69	**28**	0	97	3	2	6	0	11	196
Total Volume	21	214	7	0	242	12	32	3	0	47	3	380	92	0	475	21	7	34	0	62	826
% App. Total	8.7	88.4	2.9	0		25.5	68.1	6.4	0		0.6	80	19.4	0		33.9	11.3	54.8	0		
PHF	.656	.799	.350	.000	.766	.750	.615	.375	.000	.691	.375	.805	.821	.000	.819	.525	.583	.567	.000	.646	.807

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Lights

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
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	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	**8**	101	**6**	0	115	**3**	6	1	0	10	0	**96**	12	0	108	13	9	8	0	30	263
04:45 PM	3	**131**	1	0	**135**	2	3	1	0	6	1	79	10	0	90	25	10	9	0	44	275
05:00 PM	8	121	4	0	133	2	2	2	0	6	**2**	95	**13**	0	**110**	18	13	12	0	43	**292**
05:15 PM	5	106	5	0	116	3	**7**	**3**	0	**13**	0	88	9	0	97	**26**	**16**	**14**	0	**56**	282
Total Volume	24	459	16	0	499	10	18	7	0	35	3	358	44	0	405	82	48	43	0	173	1112
% App. Total	4.8	92	3.2	0		28.6	51.4	20	0		0.7	88.4	10.9	0		47.4	27.7	24.9	0		
PHF	.750	.876	.667	.000	.924	.833	.643	.583	.000	.673	.375	.932	.846	.000	.920	.788	.750	.768	.000	.772	.952

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Mediums

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
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Groups Printed- Mediums

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	0	2	0	0	2	0	0	0	0	0	0	4	2	0	6	0	0	0	0	0	8
07:15 AM	0	2	1	0	3	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	9
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	6
07:45 AM	2	4	0	0	6	0	0	0	0	0	0	3	2	0	5	0	0	0	0	0	11
Total	2	8	1	0	11	0	0	0	0	0	0	19	4	0	23	0	0	0	0	0	34
08:00 AM	0	1	0	0	1	0	0	0	0	0	0	3	2	0	5	0	0	0	0	0	6
08:15 AM	0	1	1	0	2	0	0	0	0	0	0	1	1	0	2	0	0	2	0	2	6
08:30 AM	0	1	0	0	1	0	0	1	0	1	0	2	0	0	2	1	0	0	0	1	5
08:45 AM	1	4	0	0	5	0	0	1	0	1	0	9	0	0	9	1	0	0	0	1	16
Total	1	7	1	0	9	0	0	2	0	2	0	15	3	0	18	2	0	2	0	4	33
09:00 AM	0	2	0	0	2	1	0	0	0	1	0	5	0	0	5	1	0	0	0	1	9
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	4
09:30 AM	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7
09:45 AM	0	2	0	0	2	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	5
Total	0	7	0	0	7	1	0	0	0	1	0	15	1	0	16	1	0	0	0	1	25
10:00 AM	0	2	0	0	2	0	0	0	0	0	0	2	2	0	4	0	0	1	0	1	7
10:15 AM	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
10:30 AM	0	1	0	0	1	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	3
10:45 AM	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
Total	0	6	1	0	7	1	0	0	0	1	0	5	3	0	8	0	0	1	0	1	17
11:00 AM	0	2	0	0	2	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	4
11:15 AM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	5
11:30 AM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
11:45 AM	1	1	0	0	2	0	0	0	1	1	0	2	0	0	2	1	0	0	0	1	6
Total	1	5	0	0	6	0	0	0	1	1	0	9	1	0	10	2	0	0	0	2	19
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
12:15 PM	1	1	0	0	2	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	5
12:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	2	0	4	0	0	1	0	1	6
12:45 PM	0	3	0	0	3	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	5
Total	1	5	0	0	6	0	0	0	0	0	0	7	3	0	10	0	0	1	0	1	17
01:00 PM	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	8
01:15 PM	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
01:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Mediums

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
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Groups Printed- Mediums

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
01:45 PM	0	1	0	0	1	0	0	0	0	0	0	5	1	0	6	0	0	0	0	0	7
Total	0	7	0	0	7	0	0	0	0	0	0	13	1	0	14	1	0	0	0	1	22
02:00 PM	0	5	0	0	5	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	7
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	3
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3	0	0	0	0	0	3
02:45 PM	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Total	0	12	0	0	12	0	0	0	0	0	0	4	3	0	7	1	0	0	0	1	20
03:00 PM	0	4	1	0	5	0	0	0	0	0	0	2	0	0	2	1	0	0	0	1	8
03:15 PM	1	2	0	0	3	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	6
03:30 PM	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	4
03:45 PM	0	2	0	0	2	0	0	1	0	1	1	3	0	0	4	0	0	0	0	0	7
Total	2	9	1	0	12	0	0	2	0	2	1	8	0	0	9	1	0	1	0	2	25
04:00 PM	0	3	0	0	3	1	0	0	0	1	0	2	0	0	2	2	0	2	0	4	10
04:15 PM	0	3	0	0	3	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	7
04:30 PM	0	0	0	0	0	1	0	0	0	1	0	3	0	0	3	0	0	0	0	0	4
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	6	0	0	6	2	0	0	0	2	0	9	0	0	9	2	1	2	0	5	22
05:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
05:15 PM	1	0	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
05:30 PM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
Total	1	5	0	0	6	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	11
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
06:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Grand Total	8	77	4	0	89	4	0	4	1	9	1	110	19	0	130	10	1	7	0	18	246
Apprch %	9	86.5	4.5	0		44.4	0	44.4	11.1		0.8	84.6	14.6	0		55.6	5.6	38.9	0		
Total %	3.3	31.3	1.6	0	36.2	1.6	0	1.6	0.4	3.7	0.4	44.7	7.7	0	52.8	4.1	0.4	2.8	0	7.3	

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Mediums

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 3

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	0	1	**1**	0	2	0	0	0	0	0	0	1	**1**	0	2	0	0	**2**	0	**2**	6
08:30 AM	0	1	0	0	1	0	0	**1**	0	**1**	0	2	0	0	2	**1**	0	0	0	1	5
08:45 AM	**1**	**4**	0	0	**5**	0	0	1	0	1	0	**9**	0	0	**9**	1	0	0	0	1	**16**
09:00 AM	0	2	0	0	2	**1**	0	0	0	1	0	5	0	0	5	1	0	0	0	1	9
Total Volume	1	8	1	0	10	1	0	2	0	3	0	17	1	0	18	3	0	2	0	5	36
% App. Total	10	80	10	0		33.3	0	66.7	0		0	94.4	5.6	0		60	0	40	0		
PHF	.250	.500	.250	.000	.500	.250	.000	.500	.000	.750	.000	.472	.250	.000	.500	.750	.000	.250	.000	.625	.563

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Mediums

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 4

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:30 PM																					
03:30 PM	**1**	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	4
03:45 PM	0	2	0	0	2	0	0	**1**	0	**1**	**1**	3	0	0	**4**	0	0	0	0	0	7
04:00 PM	0	**3**	0	0	**3**	**1**	0	0	0	1	0	2	0	0	2	**2**	0	**2**	0	**4**	**10**
04:15 PM	0	3	0	0	3	0	0	0	0	0	0	**4**	0	0	4	0	0	0	0	0	7
Total Volume	1	9	0	0	10	1	0	1	0	2	1	10	0	0	11	2	0	3	0	5	28
% App. Total	10	90	0	0		50	0	50	0		9.1	90.9	0	0		40	0	60	0		
PHF	.250	.750	.000	.000	.833	.250	.000	.250	.000	.500	.250	.625	.000	.000	.688	.250	.000	.375	.000	.313	.700

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Articulated Trucks

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 1

Groups Printed- Articulated Trucks

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
07:45 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
09:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
09:15 AM	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	5
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
09:45 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	10
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
10:15 AM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
10:30 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
Total	0	2	0	0	2	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	9
11:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
11:15 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
11:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
Total	0	3	0	0	3	0	0	0	0	0	0	4	1	0	5	0	0	0	0	0	8
12:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
12:30 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
12:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	5	0	0	5	0	0	0	0	0	0	3	0	0	3	0	0	1	0	1	9
01:00 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
01:30 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Articulated Trucks

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 2

Groups Printed- Articulated Trucks

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
01:45 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
Total	0	4	0	0	4	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	11
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
02:15 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
02:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
02:45 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total	0	4	0	0	4	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	8
03:00 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
03:15 PM	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
03:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	7	0	0	7	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	8
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
04:45 PM	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	5
Total	0	4	0	0	4	0	0	0	0	0	0	2	0	0	2	1	0	1	0	2	8
05:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	0	2	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	6
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Grand Total	1	37	0	0	38	0	0	0	0	0	0	42	1	0	43	1	0	2	0	3	84
Apprch %	2.6	97.4	0	0		0	0	0	0		0	97.7	2.3	0		33.3	0	66.7	0		
Total %	1.2	44	0	0	45.2	0	0	0	0	0	0	50	1.2	0	51.2	1.2	0	2.4	0	3.6	

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Articulated Trucks

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 09:00 AM																					
09:00 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
09:15 AM	0	**2**	0	0	**2**	0	0	0	0	0	0	**3**	0	0	**3**	0	0	0	0	0	**5**
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
09:45 AM	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Total Volume	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	10
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.500

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Articulated Trucks

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:15 PM																					
12:15 PM	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	2
12:30 PM	0	1	0	0	1	0	0	0	0	0	0	**3**	0	0	**3**	0	0	0	0	0	**4**
12:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
01:00 PM	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
Total Volume	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	0	0	1	0	1	11
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	0	100	0		
PHF	.000	1.00	.000	.000	1.00	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.250	.000	.250	.688

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Combined

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
Page No : 1

Groups Printed- Lights - Mediums - Articulated Trucks

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
07:00 AM	1	40	0	0	41	4	3	2	0	9	1	102	14	0	117	2	1	3	0	6	173
07:15 AM	5	51	1	0	57	4	8	0	0	12	0	101	27	0	128	10	1	10	0	21	218
07:30 AM	8	60	2	0	70	3	13	1	0	17	2	125	25	0	152	6	3	15	0	24	263
07:45 AM	9	72	5	0	86	1	8	0	0	9	0	73	30	0	103	3	2	6	0	11	209
Total	23	223	8	0	254	12	32	3	0	47	3	401	96	0	500	21	7	34	0	62	863
08:00 AM	2	44	1	0	47	1	4	2	0	7	1	60	21	0	82	1	3	1	0	5	141
08:15 AM	0	56	1	0	57	0	4	0	0	4	2	57	11	0	70	5	0	4	0	9	140
08:30 AM	3	43	0	0	46	2	3	3	0	8	1	85	22	0	108	5	2	1	0	8	170
08:45 AM	5	48	1	0	54	1	7	2	0	10	1	74	13	0	88	6	3	7	0	16	168
Total	10	191	3	0	204	4	18	7	0	29	5	276	67	0	348	17	8	13	0	38	619
09:00 AM	2	37	1	0	40	3	7	0	0	10	3	60	13	0	76	8	1	2	0	11	137
09:15 AM	1	39	0	0	40	2	9	0	0	11	3	49	8	0	60	6	7	2	0	15	126
09:30 AM	2	43	1	0	46	1	7	0	0	8	0	47	10	0	57	8	4	6	0	18	129
09:45 AM	6	39	1	0	46	4	1	1	0	6	1	50	13	0	64	6	2	2	0	10	126
Total	11	158	3	0	172	10	24	1	0	35	7	206	44	0	257	28	14	12	0	54	518
10:00 AM	5	43	0	0	48	1	5	1	0	7	1	49	7	0	57	2	5	6	0	13	125
10:15 AM	2	46	2	0	50	1	2	1	0	4	2	47	12	0	61	4	3	3	0	10	125
10:30 AM	3	46	1	0	50	1	4	0	0	5	1	43	4	0	48	6	2	8	0	16	119
10:45 AM	2	37	1	0	40	1	5	1	0	7	2	51	6	0	59	5	3	2	0	10	116
Total	12	172	4	0	188	4	16	3	0	23	6	190	29	0	225	17	13	19	0	49	485
11:00 AM	5	48	1	0	54	0	4	1	0	5	0	43	3	0	46	3	4	5	0	12	117
11:15 AM	1	41	2	0	44	1	2	0	0	3	0	44	7	0	51	8	4	7	0	19	117
11:30 AM	2	47	0	0	49	3	5	1	0	9	3	39	13	0	55	7	3	6	0	16	129
11:45 AM	4	44	2	0	50	0	3	1	1	5	1	51	7	0	59	10	3	7	1	21	135
Total	12	180	5	0	197	4	14	3	1	22	4	177	30	0	211	28	14	25	1	68	498
12:00 PM	5	57	2	0	64	3	6	0	0	9	1	36	16	0	53	8	4	5	0	17	143
12:15 PM	7	32	1	0	40	3	4	2	0	9	0	47	10	0	57	7	3	8	0	18	124
12:30 PM	4	51	2	0	57	2	2	2	0	6	0	50	11	0	61	14	4	6	0	24	148
12:45 PM	5	51	0	0	56	3	4	0	0	7	2	42	7	0	51	9	3	9	0	21	135
Total	21	191	5	0	217	11	16	4	0	31	3	175	44	0	222	38	14	28	0	80	550
01:00 PM	4	49	1	0	54	0	7	0	0	7	2	61	9	0	72	6	4	10	0	20	153
01:15 PM	3	47	1	0	51	1	6	0	0	7	1	71	6	0	78	6	2	6	0	14	150
01:30 PM	5	49	2	0	56	1	3	1	0	5	0	62	5	0	67	13	2	6	0	21	149

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
7:00AM-7:00PM
Combined

File Name : POR-43_at_Trares_Rd_(3.867)_956910_05-04-2022
Site Code :
Start Date : 5/4/2022
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Groups Printed- Lights - Mediums - Articulated Trucks

	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
01:45 PM	5	47	1	0	53	0	2	1	0	3	2	57	12	0	71	9	6	4	0	19	146
Total	17	192	5	0	214	2	18	2	0	22	5	251	32	0	288	34	14	26	0	74	598
02:00 PM	10	55	2	0	67	1	2	1	0	4	2	62	8	0	72	10	8	6	0	24	167
02:15 PM	5	72	1	0	78	3	2	0	0	5	2	58	11	0	71	14	8	11	0	33	187
02:30 PM	6	71	0	0	77	4	4	0	0	8	1	74	16	0	91	22	2	11	0	35	211
02:45 PM	10	96	3	0	109	2	1	0	0	3	0	64	7	0	71	6	6	6	0	18	201
Total	31	294	6	0	331	10	9	1	0	20	5	258	42	0	305	52	24	34	0	110	766
03:00 PM	15	99	3	0	117	1	3	0	0	4	3	58	7	0	68	10	6	11	0	27	216
03:15 PM	7	85	2	0	94	1	5	1	0	7	2	81	13	0	96	18	13	6	0	37	234
03:30 PM	5	90	3	0	98	1	3	1	0	5	2	72	12	0	86	15	10	5	0	30	219
03:45 PM	9	90	7	0	106	0	3	1	0	4	3	88	9	0	100	23	11	13	0	47	257
Total	36	364	15	0	415	3	14	3	0	20	10	299	41	0	350	66	40	35	0	141	926
04:00 PM	4	89	3	0	96	2	6	0	0	8	4	83	9	0	96	30	10	12	0	52	252
04:15 PM	6	138	3	0	147	2	5	0	0	7	2	76	12	0	90	20	13	10	0	43	287
04:30 PM	8	102	6	0	116	4	6	1	0	11	0	100	12	0	112	13	9	8	0	30	269
04:45 PM	3	134	1	0	138	2	3	1	0	6	1	80	10	0	91	26	11	9	0	46	281
Total	21	463	13	0	497	10	20	2	0	32	7	339	43	0	389	89	43	39	0	171	1089
05:00 PM	8	124	4	0	136	2	2	2	0	6	2	96	13	0	111	18	13	12	0	43	296
05:15 PM	6	107	5	0	118	3	7	3	0	13	0	90	9	0	99	26	16	14	0	56	286
05:30 PM	8	93	2	0	103	1	4	2	0	7	3	85	14	0	102	11	9	4	0	24	236
05:45 PM	3	79	6	0	88	4	0	2	0	6	1	84	7	0	92	10	11	5	0	26	212
Total	25	403	17	0	445	10	13	9	0	32	6	355	43	0	404	65	49	35	0	149	1030
06:00 PM	3	67	3	0	73	2	3	2	0	7	1	47	4	0	52	7	6	5	0	18	150
06:15 PM	2	64	2	0	68	1	5	2	0	8	2	74	6	0	82	8	4	1	0	13	171
06:30 PM	5	70	3	0	78	2	1	1	0	4	4	62	14	0	80	8	1	5	0	14	176
06:45 PM	3	47	2	0	52	2	3	1	0	6	1	33	5	0	39	4	6	3	0	13	110
Total	13	248	10	0	271	7	12	6	0	25	8	216	29	0	253	27	17	14	0	58	607
Grand Total	232	3079	94	0	3405	87	206	44	1	338	69	3143	540	0	3752	482	257	314	1	1054	8549
Apprch %	6.8	90.4	2.8	0		25.7	60.9	13	0.3		1.8	83.8	14.4	0		45.7	24.4	29.8	0.1		
Total %	2.7	36	1.1	0	39.8	1	2.4	0.5	0	4	0.8	36.8	6.3	0	43.9	5.6	3	3.7	0	12.3	
Lights	223	2965	90	0	3278	83	206	40	0	329	68	2991	520	0	3579	471	256	305	1	1033	8219
% Lights	96.1	96.3	95.7	0	96.3	95.4	100	90.9	0	97.3	98.6	95.2	96.3	0	95.4	97.7	99.6	97.1	100	98	96.1
Mediums	8	77	4	0	89	4	0	4	1	9	1	110	19	0	130	10	1	7	0	18	246
% Mediums	3.4	2.5	4.3	0	2.6	4.6	0	9.1	100	2.7	1.4	3.5	3.5	0	3.5	2.1	0.4	2.2	0	1.7	2.9
Articulated Trucks	1	37	0	0	38	0	0	0	0	0	0	42	1	0	43	1	0	2	0	3	84
% Articulated Trucks	0.4	1.2	0	0	1.1	0	0	0	0	0	0	1.3	0.2	0	1.1	0.2	0	0.6	0	0.3	1

Ohio Department of Transportation

2088 S. Arlington Rd
Akron, OH 44306

POR 43 at Trares Rd
5/4/2022
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Site Code :
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	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	1	40	0	0	41	**4**	3	**2**	0	9	1	102	14	0	117	2	1	3	0	6	173
07:15 AM	5	51	1	0	57	4	8	0	0	12	0	101	27	0	128	**10**	1	10	0	21	218
07:30 AM	8	60	2	0	70	3	**13**	1	0	**17**	**2**	**125**	25	0	**152**	6	**3**	**15**	0	**24**	**263**
07:45 AM	**9**	**72**	**5**	0	**86**	1	8	0	0	9	0	73	**30**	0	103	3	2	6	0	11	209
Total Volume	23	223	8	0	254	12	32	3	0	47	3	401	96	0	500	21	7	34	0	62	863
% App. Total	9.1	87.8	3.1	0		25.5	68.1	6.4	0		0.6	80.2	19.2	0		33.9	11.3	54.8	0		
PHF	.639	.774	.400	.000	.738	.750	.615	.375	.000	.691	.375	.802	.800	.000	.822	.525	.583	.567	.000	.646	.820

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POR 43 at Trares Rd
5/4/2022
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Site Code :
Start Date : 5/4/2022
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	SR-43 Southbound					Trares Rd Westbound					SR-43 Northbound					Trares Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	6	**138**	3	0	**147**	2	5	0	0	7	**2**	76	12	0	90	20	**13**	10	0	43	287
04:30 PM	**8**	102	**6**	0	116	**4**	**6**	1	0	**11**	0	**100**	12	0	**112**	13	9	8	0	30	269
04:45 PM	3	134	1	0	138	2	3	1	0	6	1	80	10	0	91	**26**	11	9	0	**46**	281
05:00 PM	8	124	4	0	136	2	2	**2**	0	6	2	96	**13**	0	111	18	13	**12**	0	43	**296**
Total Volume	25	498	14	0	537	10	16	4	0	30	5	352	47	0	404	77	46	39	0	162	1133
% App. Total	4.7	92.7	2.6	0		33.3	53.3	13.3	0		1.2	87.1	11.6	0		47.5	28.4	24.1	0		
PHF	.781	.902	.583	.000	.913	.625	.667	.500	.000	.682	.625	.880	.904	.000	.902	.740	.885	.813	.000	.880	.957

For converting partial day turning movements counts to seasonally adjusted 24 hour (AADT) counts.
Yellow boxes require user input. Scroll down for 24 hour diagrams. Use the Seasonal AdjuistmtFactors_YYYY spreadsheet to lookup seasonal factor.
Use Avg TD by FC.xslx to compute P&A B&C FACTORs.

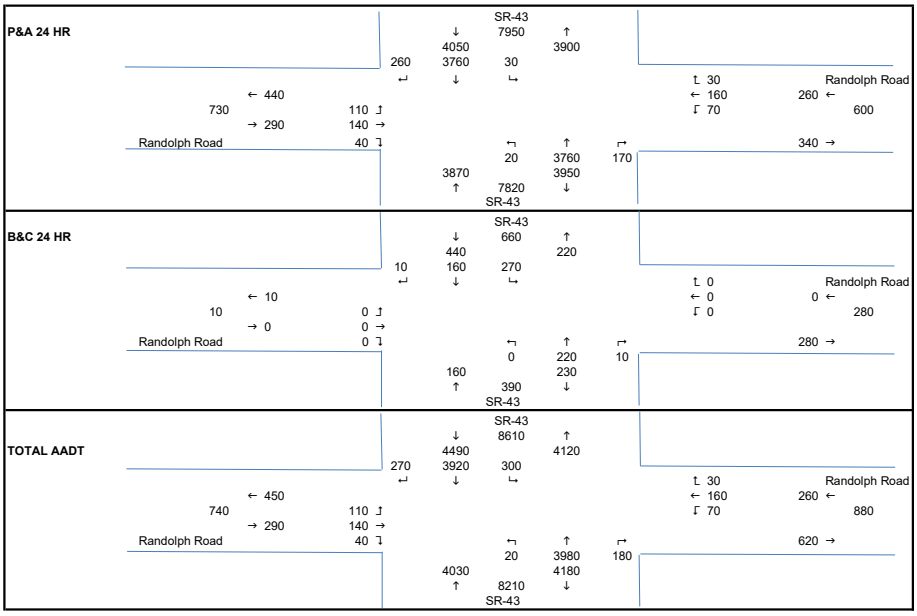
Date of Count: 5/4/2022 4 Wednesd May

PART 1: INPUT PARTIAL DAY P&A VEHICLES — ROUTE SR-43
PARTIAL COUNT * FACTOR * SEASONAL FACTOR = 24 HR P&A

SOUTH LEG	SR-43	FC =	Rural Principal Arte	northbound			APROACH TOTAL	DEPART TOTAL		**SOUTH LEG**		**APROACH TOTAL**	**DEPART TOTAL**
				LT	**THRU**	**RT**			**LT**	**THRU**	**RT**		
	LT	THRU	RT	20	3186	145	3351	3295					
P&A FACTOR	1.281	1.281	1.281	25.62	4081.27	185.745	4292.63	4212.71	30	4080	190	4300	4210
SEASONAL FACTOR	0.922	0.922	0.922	23.6216	3762.93	171.257	3957.81	3876.55	***20***	***3760***	***170***	***3950***	***3870***
WEST LEG	Randolph R	FC =	Rural Major Collect	eastbound			APROACH TOTAL	DEPART TOTAL		**WEST LEG**		**APROACH TOTAL**	**DEPART TOTAL**
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**THRU**	**RT**		
	LT	THRU	RT	108	140	43	291	399					
P&A FACTOR	1.195	1.195	1.195	129.06	167.3	51.385	347.745	500.667	130	170	50	350	510
SEASONAL F	0.865	0.865	0.865	111.637	144.715	44.448	300.799	450.82	***110***	***140***	***40***	***290***	***440***
NORTH LEG	SR-43	FC =	Rural Principal Arte	southbound			APROACH TOTAL	DEPART TOTAL		**NORTH LEG**		**APROACH TOTAL**	**DEPART TOTAL**
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**THRU**	**RT**		
	LT	THRU	RT	23	3185	223	3431	3321					
P&A FACTOR	1.281	1.281	1.281	29.463	4079.99	285.663	4395.11	4243.1	30	4080	290	4400	4240
SEASONAL F	0.922	0.922	0.922	27.1649	3761.75	263.381	4052.29	3902.92	***30***	***3760***	***260***	***4050***	***3900***
EAST LEG	Randolph R	FC =	Rural Local Road	westbound			APROACH TOTAL	DEPART TOTAL		**EAST LEG**		**APROACH TOTAL**	**DEPART TOTAL**
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**THRU**	**RT**		
	LT	THRU	RT	67	156	27	250	308					
P&A FACTOR	1.214	1.214	1.214	81.338	189.384	32.778	303.5	382.508	80	190	30	300	390
SEASONAL F	0.865	0.865	0.865	70.3574	163.817	28.353	262.528	343.136	***70***	***160***	***30***	***260***	***340***

PART 2: INPUT PARTIAL DAY B&C VEHICLES — ROUTE SR-43
PARTIAL COUNT * FACTOR = 24 HR B&C

SOUTH LEG	SR-43	FC =	Rural Principal Arte	northbound			APROACH TOTAL	DEPART TOTAL		**SOUTH LEG**		**APROACH TOTAL**	**DEPART TOTAL**
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**THRU**	**RT**		
	LT	THRU	RT	0	173	5	178	131					
B&C FACTOR	1.392	1.392	1.392	0	240.816	6.96	247.776	181.794	0	240	10	250	180
SEASONAL FACTOR	0.922	0.922	0.922	0	222.032	6.41712	228.449	167.408	***0***	***220***	***10***	***230***	***160***
WEST LEG	Randolph R	FC =	Rural Major Collect	eastbound			APROACH TOTAL	DEPART TOTAL		**WEST LEG**		**APROACH TOTAL**	**DEPART TOTAL**
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**THRU**	**RT**		
	LT	THRU	RT	3	2	0	5	9					
B&C FACTOR	1.189	1.189	1.189	3.5661	2.3774	0	5.9435	12.342	0	0	0	0	10
SEASONAL FACTOR	0.865	0.865	0.865	3.08468	2.05645	0	5.14113	11.3106	***0***	***0***	***0***	***0***	***10***
NORTH LEG	SR-43	FC =	Rural Principal Arte	southbound			APROACH TOTAL	DEPART TOTAL		**NORTH LEG**		**APROACH TOTAL**	**DEPART TOTAL**
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**THRU**	**RT**		
	LT	THRU	RT	208	128	8	344	177					
B&C FACTOR	1.392	1.392	1.392	289.536	178.176	11.136	478.848	245.588	290	180	10	480	240
SEASONAL FACTOR	0.922	0.922	0.922	266.952	164.278	10.2674	441.498	226.16	***270***	***160***	***10***	***440***	***220***
EAST LEG	Randolph R	FC =	Rural Local Road	westbound			APROACH TOTAL	DEPART TOTAL		**EAST LEG**		**APROACH TOTAL**	**DEPART TOTAL**
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**THRU**	**RT**		
	LT	THRU	RT	3	1	1	5	215					
B&C FACTOR	1.206	1.206	1.206	3.618	1.206	1.206	6.03	298.873	0	0	0	0	300
SEASONAL FACTOR	0.865	0.865	0.865	3.12957	1.04319	1.04319	5.21595	275.426	***0***	***0***	***0***	***0***	***280***



For converting partial day turning movements counts to seasonally adjusted 24 hour (AADT) counts.
Yellow boxes require user input. Scroll down for 24 hour diagrams. Use the Seasonal AdjuistmtFactors_YYYY spreadsheet to lookup seasonal factor.
Use Avg TD by FC.xslx to compute P&A B&C FACTORs.

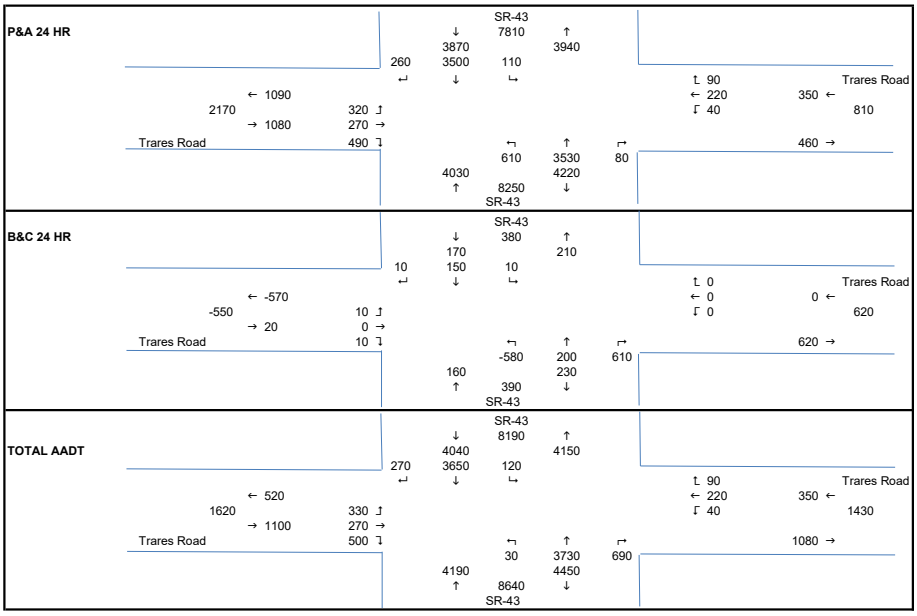
Date of Count: 5/4/2022 4 Wednesd May

PART 1: INPUT PARTIAL DAY P&A VEHICLES — ROUTE SR-43
PARTIAL COUNT * FACTOR * SEASONAL FACTOR = 24 HR P&A

SOUTH LEG	SR-43	FC =	Rural Principal Arte	northbound			APROACH TOTAL	DEPART TOTAL		**SOUTH LEG**		**APROACH TOTAL**	**DEPART TOTAL**
				LT	**THRU**	**RT**			**LT**	**THRU**	**RT**		
	LT	THRU	RT	520	2991	68	3476						
P&A FACTOR	1.281	1.281	1.281	666.12	3831.47	87.108	4584.7	4418.52	670	3830	90	4590	4420
SEASONAL FACTOR	0.922	0.922	0.922	614.163	3532.62	80.3136	4227.09	4038.51	***610***	***3530***	***80***	***4220***	***4030***
WEST LEG	Trares Road	FC =	Rural Local Road	eastbound			APROACH TOTAL	DEPART TOTAL					
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**WEST LEG THRU**	**RT**	**APROACH TOTAL**	**DEPART TOTAL**
	LT	THRU	RT	305	256	471	1032	949					
P&A FACTOR	1.214	1.214	1.214	370.27	310.784	571.794	1252.85	1201.87	370	310	570	1250	1210
SEASONAL F	0.865	0.865	0.865	320.284	268.828	494.602	1083.71	1093.87	***320***	***270***	***490***	***1080***	***1090***
NORTH LEG	SR-43	FC =	Rural Principal Arte	southbound			APROACH TOTAL	DEPART TOTAL					
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**NORTH LEG THRU**	**RT**	**APROACH TOTAL**	**DEPART TOTAL**
	LT	THRU	RT	90	2965	223	3278	3379					
P&A FACTOR	1.281	1.281	1.281	115.29	3798.17	285.663	4199.12	4302.5	120	3800	290	4210	4300
SEASONAL F	0.922	0.922	0.922	106.297	3501.91	263.381	3871.59	3940.06	***110***	***3500***	***260***	***3870***	***3940***
EAST LEG	Trares Road	FC =	Rural Local Road	westbound			APROACH TOTAL	DEPART TOTAL					
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**EAST LEG THRU**	**RT**	**APROACH TOTAL**	**DEPART TOTAL**
	LT	THRU	RT	40	206	83	329	414					
P&A FACTOR	1.214	1.214	1.214	48.56	250.084	100.762	399.406	513.182	50	250	100	400	520
SEASONAL F	0.865	0.865	0.865	42.0044	216.323	87.1591	345.486	455.439	***40***	***220***	***90***	***350***	***460***

PART 2: INPUT PARTIAL DAY B&C VEHICLES — ROUTE SR-43
PARTIAL COUNT * FACTOR = 24 HR B&C

SOUTH LEG	SR-43	FC =	Rural Principal Arte	northbound			APROACH TOTAL	DEPART TOTAL		**SOUTH LEG**		**APROACH TOTAL**	**DEPART TOTAL**
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**THRU**	**RT**		
	LT	THRU	RT	-451	152	472	173	129					
B&C FACTOR	1.392	1.392	1.392	-627.79	211.584	657.024	240.816	176.778	-630	210	660	240	170
SEASONAL FACTOR	0.922	0.922	0.922	-578.82	195.08	605.776	222.032	161.958	***-580***	***200***	***610***	***230***	***160***
WEST LEG	Trares Road	FC =	Rural Local Road	eastbound			APROACH TOTAL	DEPART TOTAL					
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**WEST LEG THRU**	**RT**	**APROACH TOTAL**	**DEPART TOTAL**
	LT	THRU	RT	9	1	11	21	-442					
B&C FACTOR	1.206	1.206	1.206	10.854	1.206	13.266	25.326	-615.26	10	0	10	20	-620
SEASONAL FACTOR	0.865	0.865	0.865	9.38871	1.04319	11.4751	21.907	11.5508	***10***	***0***	***10***	***20***	***-570***
NORTH LEG	SR-43	FC =	Rural Principal Arte	southbound			APROACH TOTAL	DEPART TOTAL					
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**NORTH LEG THRU**	**RT**	**APROACH TOTAL**	**DEPART TOTAL**
	LT	THRU	RT	7	114	9	130	165					
B&C FACTOR	1.392	1.392	1.392	9.744	158.688	12.528	180.96	227.262	10	160	10	180	220
SEASONAL FACTOR	0.922	0.922	0.922	8.98397	146.31	11.5508	166.845	208.642	***10***	***150***	***10***	***170***	***210***
EAST LEG	Trares Road	FC =	Rural Local Road	westbound			APROACH TOTAL	DEPART TOTAL					
	FACTOR			**LT**	**THRU**	**RT**			**LT**	**EAST LEG THRU**	**RT**	**APROACH TOTAL**	**DEPART TOTAL**
	LT	THRU	RT	4	0	4	8	480					
B&C FACTOR	1.206	1.206	1.206	4.824	0	4.824	9.648	667.974	0	0	0	0	670
SEASONAL FACTOR	0.865	0.865	0.865	4.17276	0	4.17276	8.34552	615.803	***0***	***0***	***0***	***0***	***620***



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
		AM	Peak Hour Factors and Truck Percentages	

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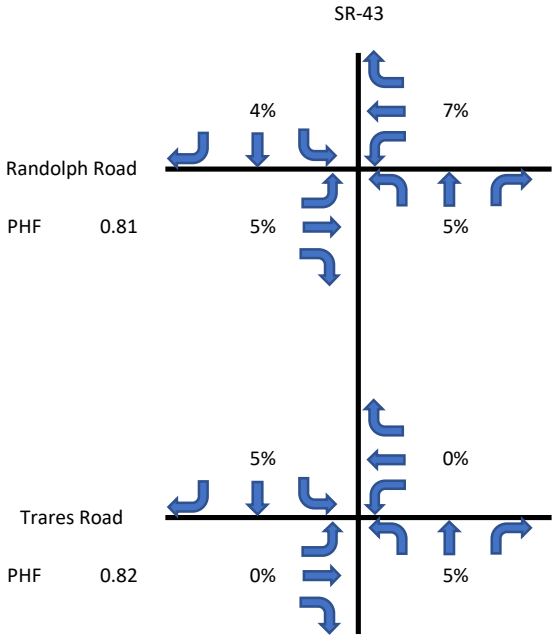

CARPENTER MARTY transportation	Year	Period	Scenario	Plate
		PM	Peak Hour Factors and Truck Percentages	

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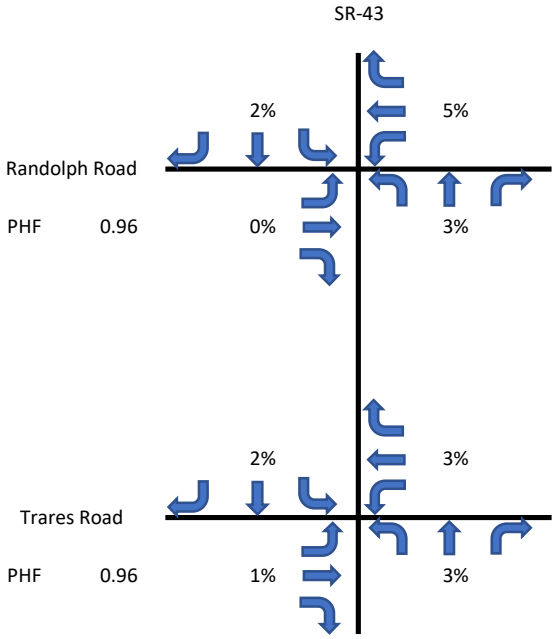
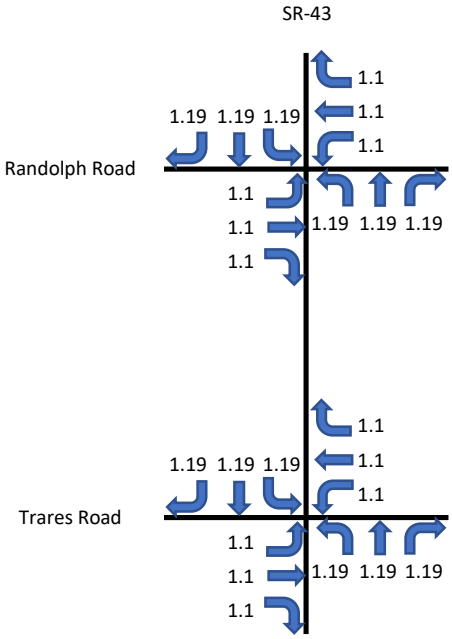


CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2022		Peak Hour to Design Hour Factors	

^
N

2022 Peak Hour to Design Hour Factors obtained from ODOT. Note, the east leg of the SR-43 & Randolph Road intersection and both the east and west legs of the Trares Road intersection are classified as Rural Local Roads and do not have defined Peak Hour to Design Hour Factors. Due to this, they are utilizing the factor used for the west leg of the Randolph Road intersection, which is classified as a Rural Major Collector.



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2022		Growth Rates	

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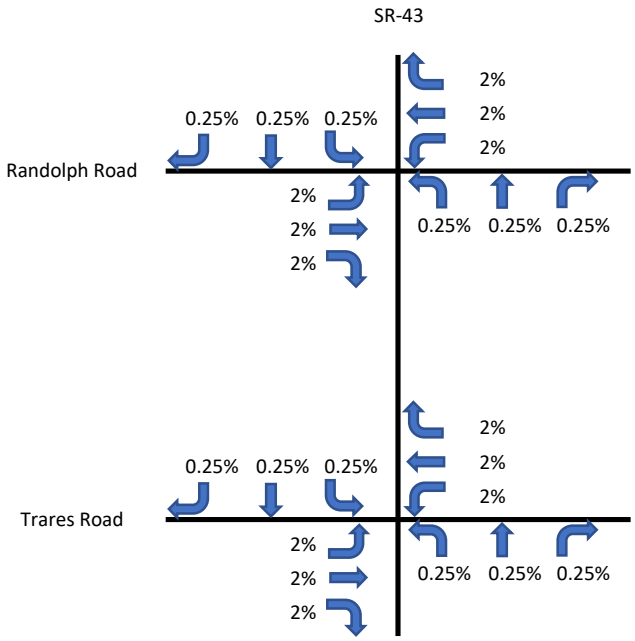

CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2022	AM	Count	

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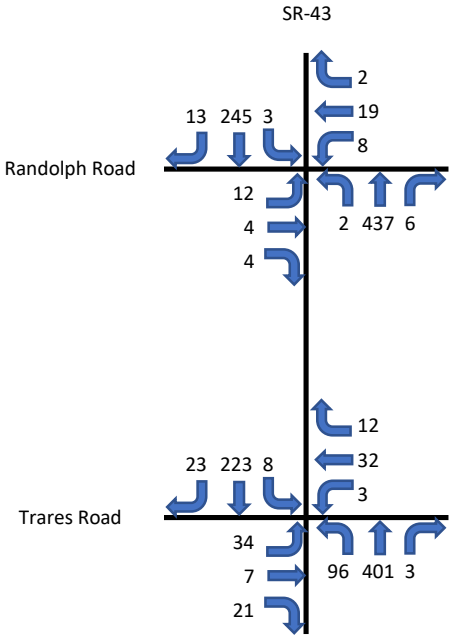
N

An overall AM Peak of 7:00-8:00 AM was utilized



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2022	AM	Design Hour Volumes	

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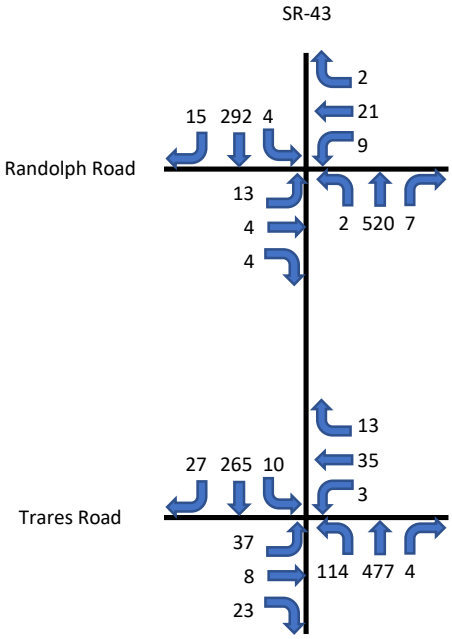
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2027	AM	Opening Year Volumes	

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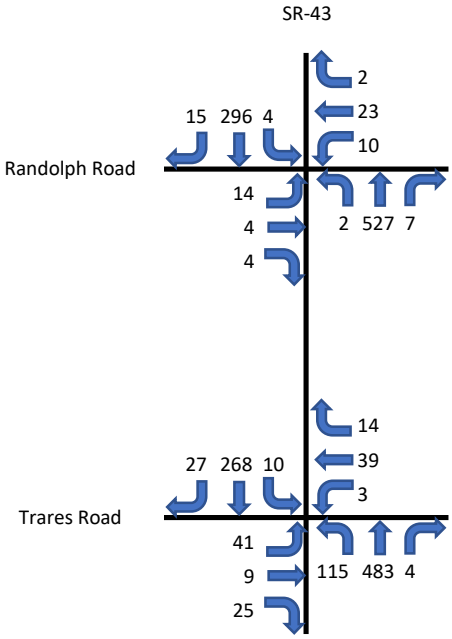
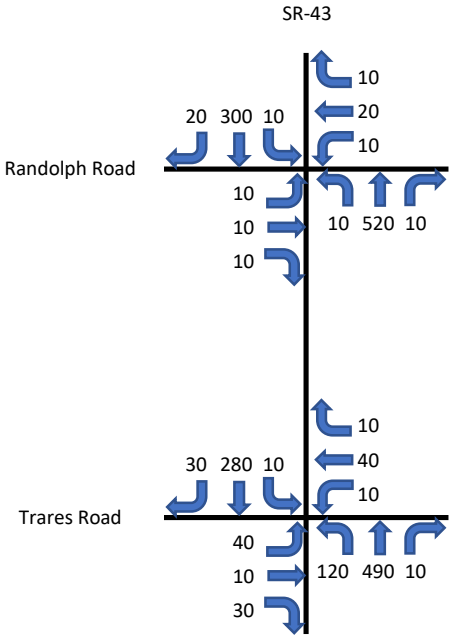
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2027	AM	Opening Year Volumes - Rounded and Balanced	

^

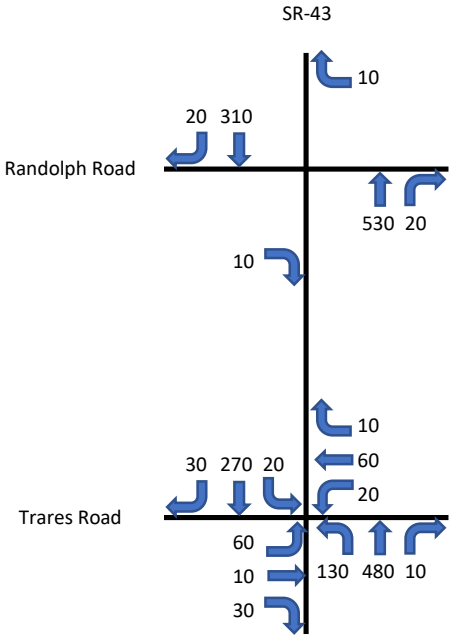
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2027	AM	Opening Year Volumes - Alt 2 Rerouted	

^

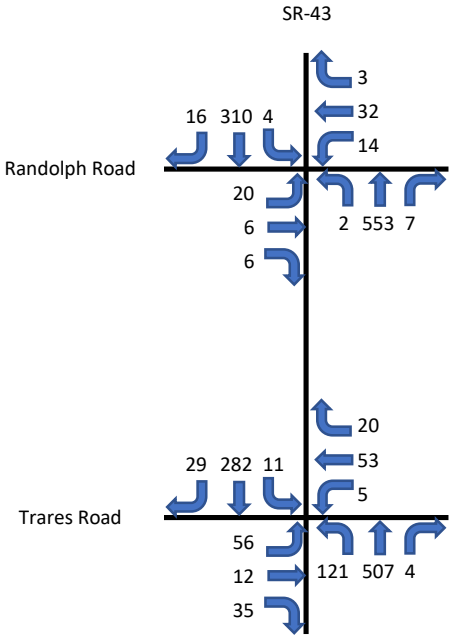
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2047	AM	Horizon Year Volumes	

^

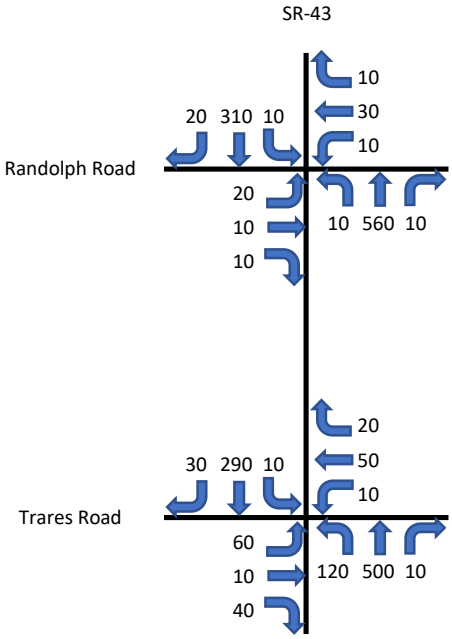
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2047	AM	Horizon Year Volumes - Rounded and Balanced	

^

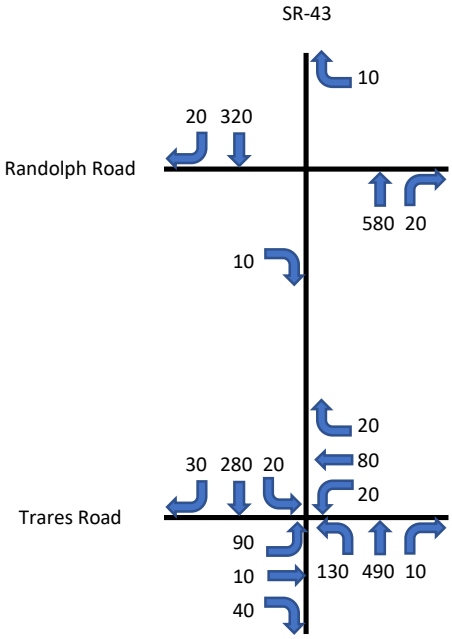
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2047	AM	Horizon Year Volumes - Alt 2 Rerouted	

^

N

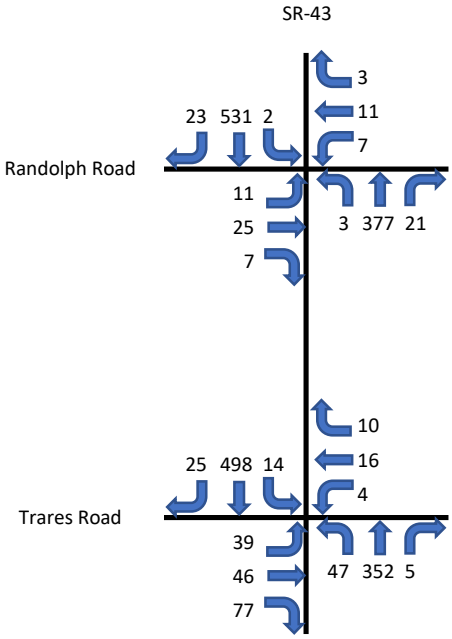


CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2022	PM	Count	

^

N

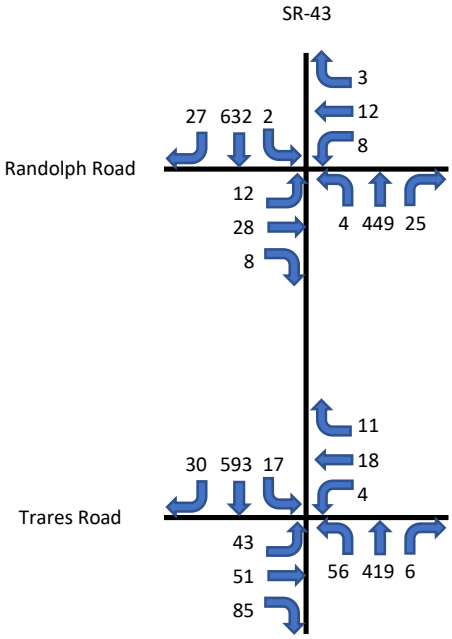
An overall AM Peak of 4:15-5:25 PM was utilized



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2022	PM	Design Hour Volumes	

^

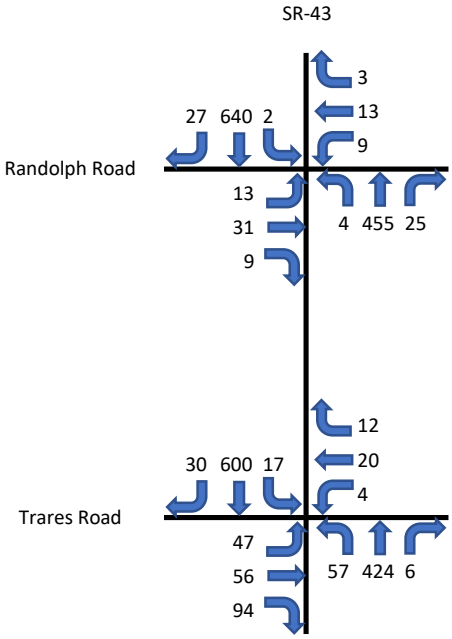
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2027	PM	Opening Year Volumes	

^

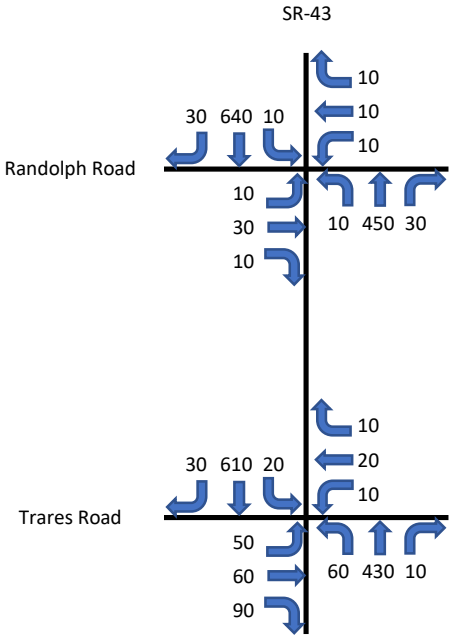
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2027	PM	Opening Year Volumes - Rounded and Balanced	

^

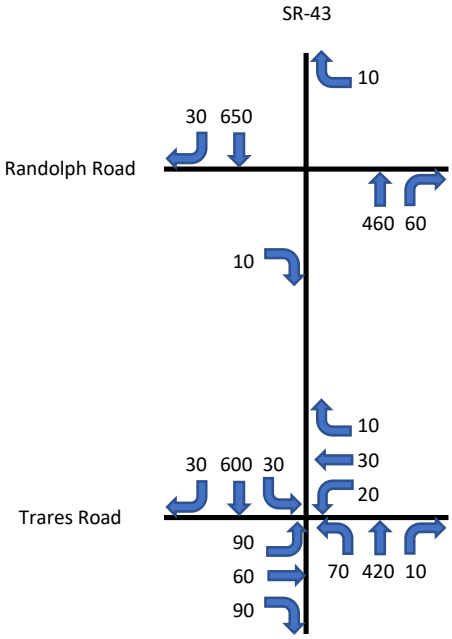
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2027	PM	Opening Year Volumes - Alt 2 Rerouted	

^

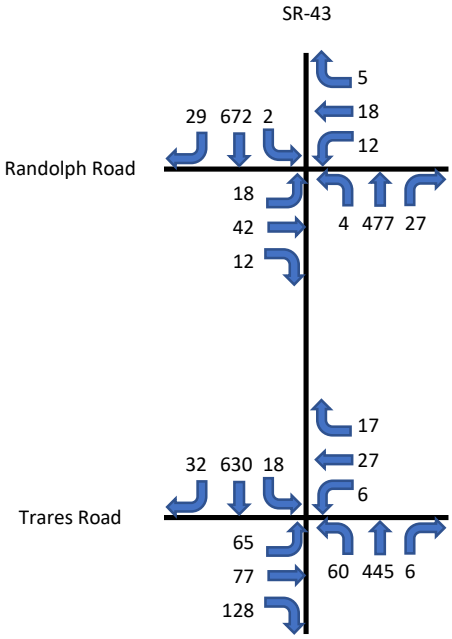
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2047	PM	Horizon Year Volumes	

^

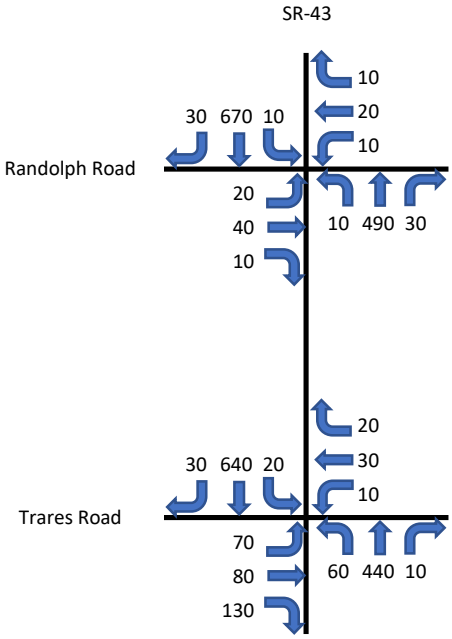
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2047	PM	Horizon Year Volumes - Rounded and Balanced	

^

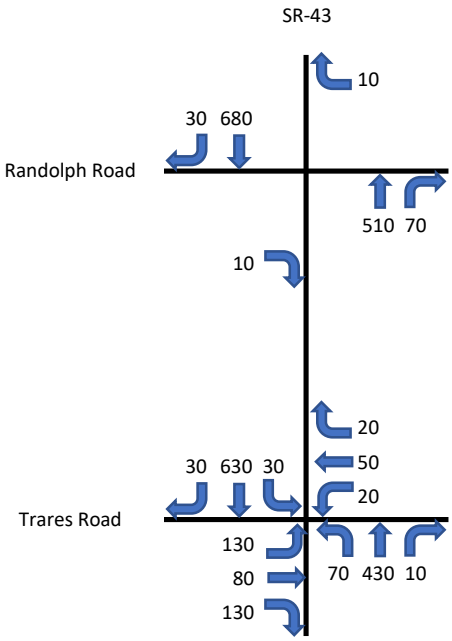
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2047	PM	Horizon Year Volumes - Alt 2 Rerouted	

^

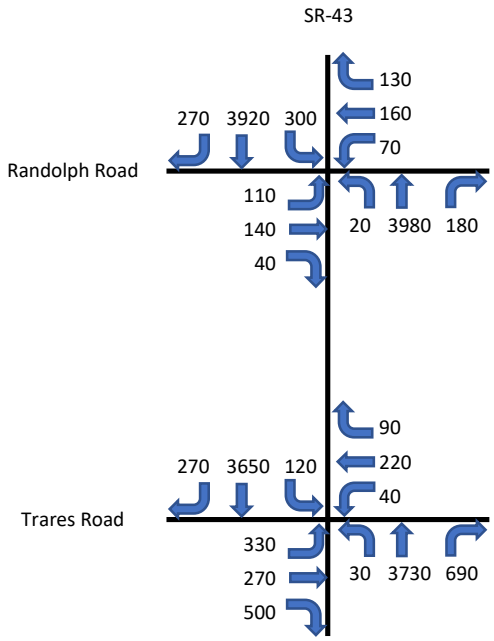
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2022	ADT	Count	

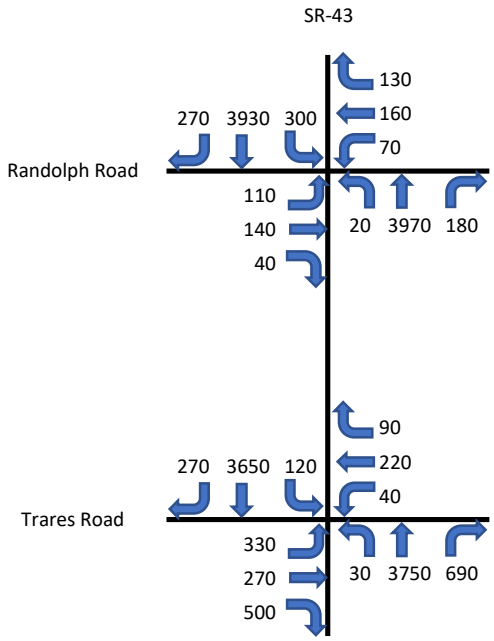
^

N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2022	PM	Count	

^
N



CARPENTER MARTY transportation	Year	Period	Scenario	Plate
	2022	PM	Count	

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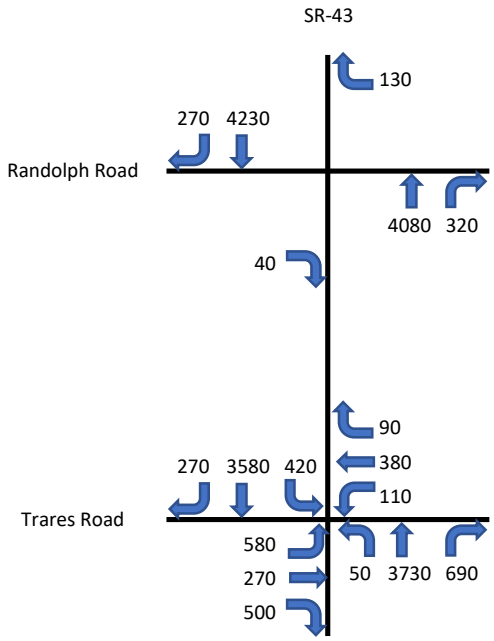
N



Appendix D
Crash Data

CARPENTER MARTY transportation

Appendix D

POR-43 at Randolph Road & Trares Road

Crash Summary Sheet

Fatalities	0
Total Serious Injuries	1
Total Non-Serious & Possible Injuries	10

Crashes Per Year	4.20
Fatal and All Injury Crashes	9
Percent Injury	42.9%
Equivalent PDO Index Value	4.82

Crash Severity	Crashes	%
(2) Serious Injury Suspected	1	4.76%
(3) Minor Injury Suspected	4	19.05%
(4) Injury Possible	4	19.05%
(5) PDO/No Injury	12	57.14%
Grand Total	21	100.00%

Year	Crashes	%
2016	4	19.05%
2017	4	19.05%
2018	3	14.29%
2019	7	33.33%
2020	3	14.29%
Grand Total	21	100.00%

Day of Week	Crashes	%
(1) Sunday	3	14.29%
(2) Monday	1	4.76%
(3) Tuesday	4	19.05%
(4) Wednesday	4	19.05%
(5) Thursday	1	4.76%
(6) Friday	5	23.81%
(7) Saturday	3	14.29%
Grand Total	21	100.00%

Crash Type	Crashes	%
Angle	15	71.43%
Rear End	3	14.29%
Left Turn	2	9.52%
Right Turn	1	4.76%
Grand Total	21	100.00%

Hour of Day	Crashes	%
7	1	4.76%
8	2	9.52%
9	1	4.76%
10	2	9.52%
12	2	9.52%
13	2	9.52%
14	4	19.05%
15	1	4.76%
16	1	4.76%
18	1	4.76%
19	2	9.52%
20	1	4.76%
22	1	4.76%
Grand Total	21	100.00%

Month	Crashes	%
1	2	9.52%
3	4	19.05%
6	2	9.52%
7	3	14.29%
8	1	4.76%
9	5	23.81%
10	3	14.29%
11	1	4.76%
Grand Total	21	100.00%

POR-43 at Randolph Road & Trares Road

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	13	61.90%
Cloudy	7	33.33%
Rain	1	4.76%
Grand Total	21	100.00%

Road Condition	Crashes	%
Dry	17	80.95%
Wet	4	19.05%
Grand Total	21	100.00%

Light Condition	Crashes	%
Daylight	18	85.71%
Dawn/Dusk	1	4.76%
Dark - Lighted Roadway	1	4.76%
Dark - Roadway Not Lighted	1	4.76%
Grand Total	21	100.00%

Number of Units	Crashes	%
2	20	95.24%
3	1	4.76%
Grand Total	21	100.00%

ODOT Location	Crashes	%
Four-Way Intersection	21	100.00%
Grand Total	21	100.00%

Work Zone Related	Crashes	%
No	21	100.00%
Grand Total	21	100.00%

Contour	Crashes	%
Straight Grade	19	90.48%
Straight Level	2	9.52%
Grand Total	21	100.00%

Alcohol Related	Crashes	%
No	21	100.00%
Grand Total	21	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	21	100.00%
Grand Total	21	100.00%

Roadway Departure	Crashes	%
No	19	90.48%
Yes	2	9.52%
Grand Total	21	100.00%

Marijuana Related	Crashes	%
No	21	100.00%
Grand Total	21	100.00%

Intersection Related	Crashes	%
Yes	20	95.24%
No	1	4.76%
Grand Total	21	100.00%

Older Driver (65+)	Crashes	%
No	15	71.43%
Yes	6	28.57%
Grand Total	21	100.00%

Speed Related	Crashes	%
No	19	90.48%
Yes	2	9.52%
Grand Total	21	100.00%

Young Driver (15-25)	Crashes	%
No	12	57.14%
Yes	9	42.86%
Grand Total	21	100.00%

Motorcycle Involved	Crashes	%
No	21	100.00%
Grand Total	21	100.00%

POR-43 at Randolph Road & Trares Road

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	16	76.19%
Making Left Turn	3	14.29%
Entering Traffic Lane	1	4.76%
Leaving Traffic Lane	1	4.76%
Grand Total	21	100.00%

Unit 1 Contributing Factor	Crashes	%
Failure to Yield	16	76.19%
Following Too Closely/ACDA	3	14.29%
Ran Stop Sign	1	4.76%
Improper Lane Change	1	4.76%
Grand Total	21	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	20	95.24%
Ditch	1	4.76%
Grand Total	21	100.00%

Unit 1 Traffic Control	Crashes	%
Stop Sign	15	71.43%
No Control	6	28.57%
Grand Total	21	100.00%

Unit 1 Direction From	Crashes	%
Northeast	10	47.62%
South	5	23.81%
West	3	14.29%
East	2	9.52%
North	1	4.76%
Grand Total	21	100.00%

Unit 1 Estimated Speed	Crashes	%
<15	12	57.14%
15-19	2	9.52%
20-24	3	14.29%
30-34	2	9.52%
40-44	2	9.52%
Grand Total	21	100.00%

Unit 1 Direction To	Crashes	%
Southwest	10	47.62%
West	4	19.05%
East	3	14.29%
North	3	14.29%
South	1	4.76%
Grand Total	21	100.00%

Unit 1 Posted Speed	Crashes	%
0	1	4.76%
40	2	9.52%
45	18	85.71%
Grand Total	21	100.00%

Unit 1 Type	Crashes	%
Passenger Car	8	38.10%
Sport Utility Vehicle	7	33.33%
Pick up	5	23.81%
Unknown or Hit/Skip	1	4.76%
Grand Total	21	100.00%

Unit 1 Special Function	Crashes	%
None	21	100.00%
Grand Total	21	100.00%

POR-43 at Randolph Road & Trares Road
Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Straight Ahead	20	95.24%
Slowing or Stopped In Traffic	1	4.76%
Grand Total	21	100.00%

Unit 2 Contributing Factor	Crashes	%
None	21	100.00%
Grand Total	21	100.00%

Unit 2 Direction From	Crashes	%
North	13	61.90%
South	8	38.10%
Grand Total	21	100.00%

Unit 2 Direction To	Crashes	%
North	8	38.10%
South	13	61.90%
Grand Total	21	100.00%

Unit 2 Type	Crashes	%
Passenger Car	14	66.67%
Sport Utility Vehicle	3	14.29%
Pick up	2	9.52%
Passenger Van (minivan)	2	9.52%
Grand Total	21	100.00%

Unit 2 Special Function	Crashes	%
None	21	100.00%
Grand Total	21	100.00%

POR-43 at Randolph Road & Trares Road

Crash Summary Sheet

Fatalities	0
Total Serious Injuries	2
Total Non-Serious & Possible Injuries	16

Crashes Per Year	3.20
Fatal and All Injury Crashes	10
Percent Injury	62.5%
Equivalent PDO Index Value	9.17

Crash Severity	Crashes	%
(2) Serious Injury Suspected	2	12.50%
(3) Minor Injury Suspected	7	43.75%
(4) Injury Possible	1	6.25%
(5) PDO/No Injury	6	37.50%
Grand Total	16	100.00%

Year	Crashes	%
2016	2	12.50%
2017	6	37.50%
2018	1	6.25%
2019	4	25.00%
2020	3	18.75%
Grand Total	16	100.00%

Day of Week	Crashes	%
(2) Monday	3	18.75%
(3) Tuesday	3	18.75%
(4) Wednesday	2	12.50%
(5) Thursday	2	12.50%
(7) Saturday	6	37.50%
Grand Total	16	100.00%

Crash Type	Crashes	%
Angle	6	37.50%
Rear End	4	25.00%
Left Turn	4	25.00%
Fixed Object	1	6.25%
Overturning	1	6.25%
Grand Total	16	100.00%

Hour of Day	Crashes	%
8	1	6.25%
9	1	6.25%
10	1	6.25%
11	1	6.25%
12	2	12.50%
13	2	12.50%
14	1	6.25%
17	2	12.50%
18	3	18.75%
19	1	6.25%
20	1	6.25%
Grand Total	16	100.00%

Month	Crashes	%
3	1	6.25%
5	2	12.50%
6	1	6.25%
7	2	12.50%
8	2	12.50%
9	4	25.00%
10	2	12.50%
11	2	12.50%
Grand Total	16	100.00%

POR-43 at Randolph Road & Trares Road

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	11	68.75%
Cloudy	5	31.25%
Grand Total	16	100.00%

Road Condition	Crashes	%
Dry	14	87.50%
Wet	1	6.25%
Snow	1	6.25%
Grand Total	16	100.00%

Light Condition	Crashes	%
Daylight	14	87.50%
Dark - Lighted Roadway	1	6.25%
Dark - Roadway Not Lighted	1	6.25%
Grand Total	16	100.00%

Number of Units	Crashes	%
2	13	81.25%
1	2	12.50%
3	1	6.25%
Grand Total	16	100.00%

ODOT Location	Crashes	%
Four-Way Intersection	16	100.00%
Grand Total	16	100.00%

Work Zone Related	Crashes	%
No	14	87.50%
Yes	2	12.50%
Grand Total	16	100.00%

Contour	Crashes	%
Straight Grade	11	68.75%
Straight Level	5	31.25%
Grand Total	16	100.00%

Alcohol Related	Crashes	%
No	16	100.00%
Grand Total	16	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	16	100.00%
Grand Total	16	100.00%

Roadway Departure	Crashes	%
No	13	81.25%
Yes	3	18.75%
Grand Total	16	100.00%

Marijuana Related	Crashes	%
No	16	100.00%
Grand Total	16	100.00%

Intersection Related	Crashes	%
Yes	15	93.75%
No	1	6.25%
Grand Total	16	100.00%

Older Driver (65+)	Crashes	%
No	11	68.75%
Yes	5	31.25%
Grand Total	16	100.00%

Speed Related	Crashes	%
No	16	100.00%
Grand Total	16	100.00%

Young Driver (15-25)	Crashes	%
No	6	37.50%
Yes	10	62.50%
Grand Total	16	100.00%

Motorcycle Involved	Crashes	%
No	13	81.25%
Yes	3	18.75%
Grand Total	16	100.00%

POR-43 at Randolph Road & Trares Road

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	8	50.00%
Making Left Turn	5	31.25%
Slowing or Stopped In Traffic	2	12.50%
Entering Traffic Lane	1	6.25%
Grand Total	16	100.00%

Unit 1 Contributing Factor	Crashes	%
Failure to Yield	9	56.25%
Following Too Closely/ACDA	3	18.75%
Improper Lane Change	1	6.25%
Ran Stop Sign	1	6.25%
Other Improper Action	1	6.25%
Improper Start From a Parked Position	1	6.25%
Grand Total	16	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	15	93.75%
Traffic Sign Post	1	6.25%
Grand Total	16	100.00%

Unit 1 Traffic Control	Crashes	%
Stop Sign	8	50.00%
No Control	8	50.00%
Grand Total	16	100.00%

Unit 1 Direction From	Crashes	%
South	5	31.25%
East	5	31.25%
West	3	18.75%
North	3	18.75%
Grand Total	16	100.00%

Unit 1 Estimated Speed	Crashes	%
<15	11	68.75%
15-19	1	6.25%
35-39	1	6.25%
40-44	1	6.25%
45-49	2	12.50%
Grand Total	16	100.00%

Unit 1 Direction To	Crashes	%
West	7	43.75%
East	5	31.25%
North	3	18.75%
Southeast	1	6.25%
Grand Total	16	100.00%

Unit 1 Posted Speed	Crashes	%
40	4	25.00%
45	12	75.00%
Grand Total	16	100.00%

Unit 1 Type	Crashes	%
Passenger Car	7	43.75%
Sport Utility Vehicle	4	25.00%
Pick up	3	18.75%
Motorcycle 2 Wheeled	2	12.50%
Grand Total	16	100.00%

Unit 1 Special Function	Crashes	%
None	16	100.00%
Grand Total	16	100.00%

POR-43 at Randolph Road & Trares Road
Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Straight Ahead	9	56.25%
Slowing or Stopped In Traffic	3	18.75%
	2	12.50%
Making Left Turn	2	12.50%
Grand Total	16	100.00%

Unit 2 Contributing Factor	Crashes	%
None	13	81.25%
	2	12.50%
Swerving to Avoid	1	6.25%
Grand Total	16	100.00%

Unit 2 Direction From	Crashes	%
	2	12.50%
North	3	18.75%
South	9	56.25%
West	2	12.50%
Grand Total	16	100.00%

Unit 2 Direction To	Crashes	%
	2	12.50%
East	1	6.25%
North	9	56.25%
South	3	18.75%
West	1	6.25%
Grand Total	16	100.00%

Unit 2 Type	Crashes	%
Passenger Car	7	43.75%
Sport Utility Vehicle	3	18.75%
	2	12.50%
Motorcycle 2 Wheeled	1	6.25%
Semi-Tractor	1	6.25%
Cargo Van	1	6.25%
Pick up	1	6.25%
Grand Total	16	100.00%

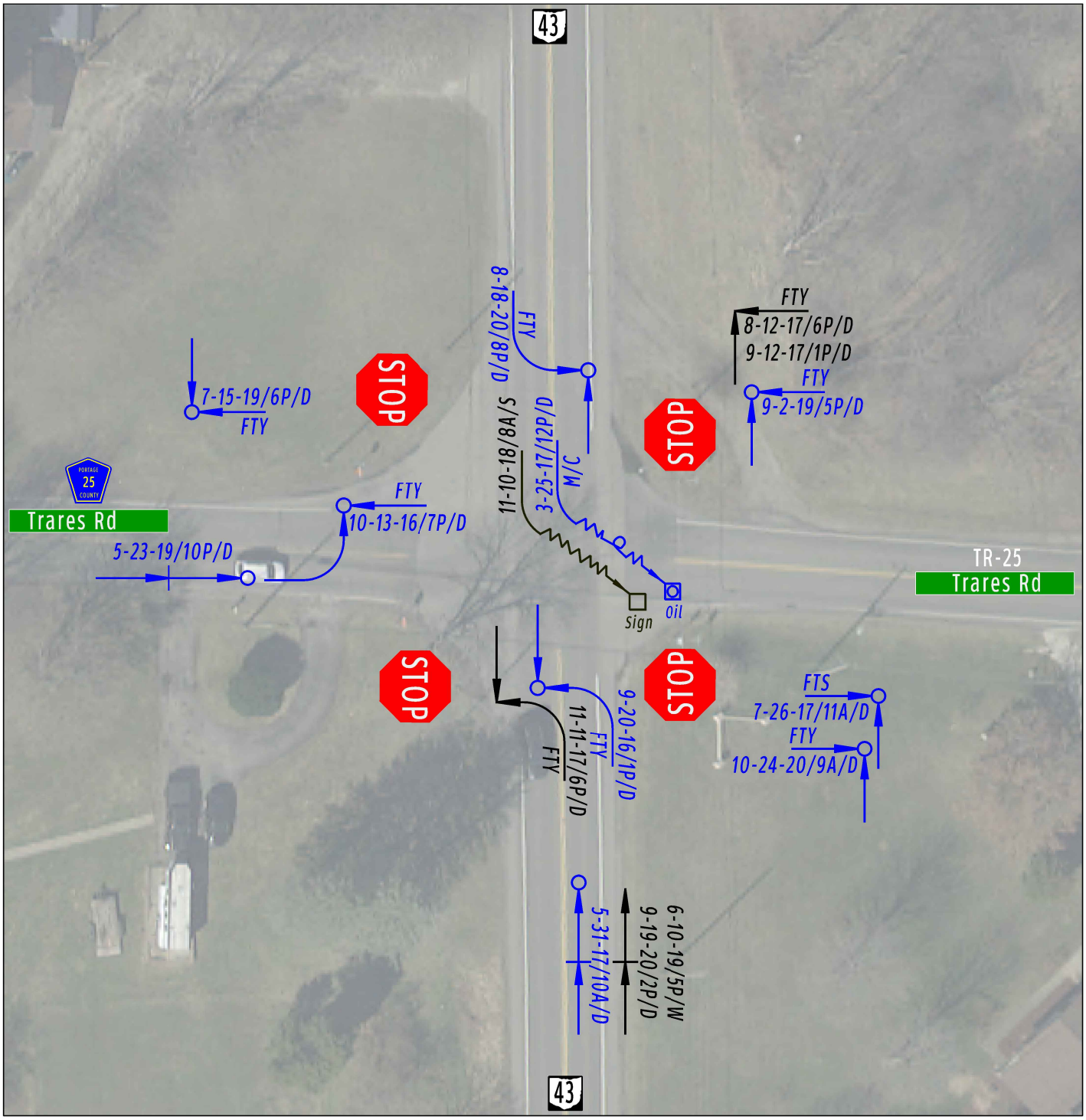
Unit 2 Special Function	Crashes	%
None	13	81.25%
	2	12.50%
Farm	1	6.25%
Grand Total	16	100.00%

COLLISION DIAGRAM

POR SR 43 at Trares Rd (CR 25/TR 25)

SLM 3.87

2016-2020



Vehicle Direction	Injury	Road:	FTC = Failure To Control
Backing	Fatal	D = Dry	FTS = Failure To Stop
Pedestrian	Fixed Object	W = Wet	FTY = Failure To Yield
Out of Control	Parked Vehicle	I = Ice	LOC = Left of Center
Overturn	TEXT Date/Time/Road/Egress Direction	S = Snow	RRL = Ran Red Light
			OVI = Operating Vehicle Impaired

TOTAL CRASHES ON PAGE

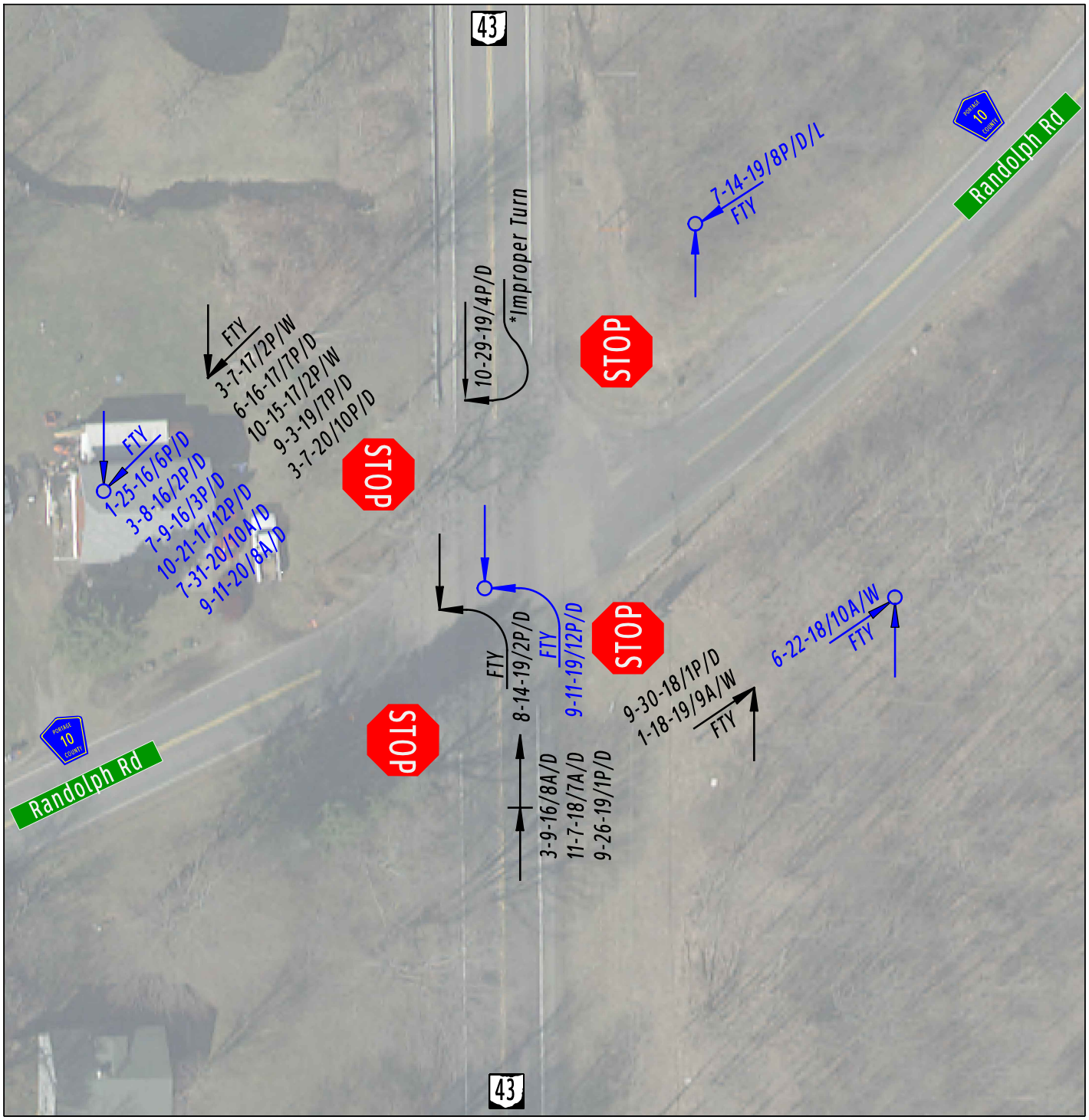
FREQUENCY		CRASH SEVERITY	
2	2016	6	NON - INJURY
6	2017	10	INJURY OR FATAL
1	2018	16	TOTAL
4	2019		
3	2020		

COLLISION DIAGRAM

POR SR 43 at Randolph Rd (CR 10)

SLM 3.94

2016-2020



Vehicle Direction	Injury	Road:	FTC = Failure To Control	TOTAL CRASHES ON PAGE
Backing	Fatal	D = Dry	FTS = Failure To Stop	FREQUENCY: 4 2016; 4 2017; 3 2018; 7 2019; 3 2020
Pedestrian	Fixed Object	W = Wet	FTY = Failure To Yield	CRASH SEVERITY: 12 NON - INJURY; 9 INJURY OR FATAL; 21 TOTAL
Out of Control	Parked Vehicle	I = Ice	LOC = Left of Center	
Overturn	TEXT Date/Time/Road/Egress Direction	S = Snow	RRL = Ran Red Light	
			OVI = Operating Vehicle Impaired	

Appendix E
Existing and No Build Capacity Analysis

CARPENTER MARTY transportation

HCS Two-Way Stop-Control Report

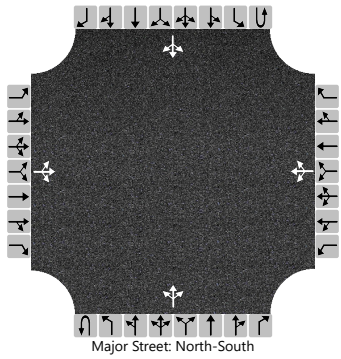
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2022
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Randolph Existing AM

Site Information

Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph
North/South Street	SR-43
Peak Hour Factor	0.81
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		13	4	4		9	21	2		2	520	7		4	292	15
Percent Heavy Vehicles (%)		5	5	5		7	7	7		5				4		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.15	6.55	6.25		7.17	6.57	6.27		4.15				4.14		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.55	4.05	3.35		3.56	4.06	3.36		2.25				2.24		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			26				40			2				5		
Capacity, c (veh/h)			217				222			1163				926		
v/c Ratio			0.12				0.18			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.4				0.6			0.0				0.0		
95% Queue Length, Q_{95} (ft)			10.4				15.8									
Control Delay (s/veh)			23.8				24.7			8.1	0.0	0.0		8.9	0.1	0.1
Level of Service (LOS)			C				C			A	A	A		A	A	A
Approach Delay (s/veh)	23.8				24.7				0.1				0.2			
Approach LOS	C				C				A				A			

HCS Two-Way Stop-Control Report

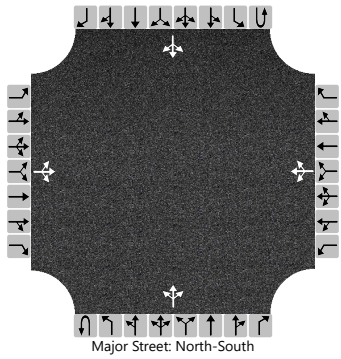
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2022
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Randolph Existing PM

Site Information

Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph
North/South Street	SR-43
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		12	26	8		8	12	3		4	449	25		2	632	27
Percent Heavy Vehicles (%)		0	0	0		5	5	5		3				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.15	6.55	6.25		4.13				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.55	4.05	3.35		2.23				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			48				24			4				2		
Capacity, c (veh/h)			200				180			903				1070		
v/c Ratio			0.24				0.13			0.00				0.00		
95% Queue Length, Q_{95} (veh)			0.9				0.5			0.0				0.0		
95% Queue Length, Q_{95} (ft)			22.5				13.0									
Control Delay (s/veh)			28.7				28.1			9.0	0.1	0.1		8.4	0.0	0.0
Level of Service (LOS)			D				D			A	A	A		A	A	A
Approach Delay (s/veh)	28.7				28.1				0.1				0.1			
Approach LOS	D				D				A				A			

HCS Two-Way Stop-Control Report

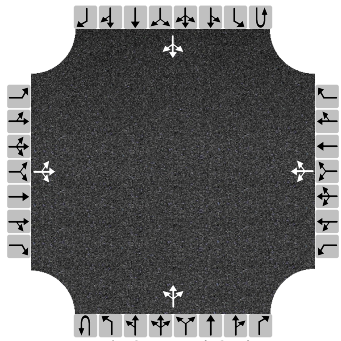
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Randolph No Build OY AM

Site Information

Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph
North/South Street	SR-43
Peak Hour Factor	0.81
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		10	10	10		10	20	10		10	520	10		10	300	20
Percent Heavy Vehicles (%)		5	5	5		7	7	7		5				4		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.15	6.55	6.25		7.17	6.57	6.27		4.15				4.14		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.55	4.05	3.35		3.56	4.06	3.36		2.25				2.24		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			37				49			12				12		
Capacity, c (veh/h)			234				222			1147				923		
v/c Ratio			0.16				0.22			0.01				0.01		
95% Queue Length, Q_{95} (veh)			0.6				0.8			0.0				0.0		
95% Queue Length, Q_{95} (ft)			15.6				21.1									
Control Delay (s/veh)			23.2				25.8			8.2	0.1	0.1		9.0	0.2	0.2
Level of Service (LOS)			C				D			A	A	A		A	A	A
Approach Delay (s/veh)	23.2				25.8				0.3				0.4			
Approach LOS	C				D				A				A			

HCS Two-Way Stop-Control Report

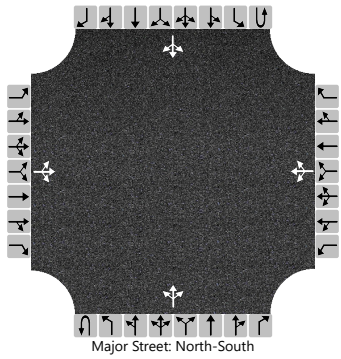
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Randolph No Build OY PM

Site Information

Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph
North/South Street	SR-43
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		10	30	10		10	10	10		10	450	30		10	640	30
Percent Heavy Vehicles (%)		0	0	0		5	5	5		3				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.15	6.55	6.25		4.13				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.55	4.05	3.35		2.23				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			52				31			10				10		
Capacity, c (veh/h)			189				188			894				1064		
v/c Ratio			0.28				0.17			0.01				0.01		
95% Queue Length, Q_{95} (veh)			1.1				0.6			0.0				0.0		
95% Queue Length, Q_{95} (ft)			27.5				15.6									
Control Delay (s/veh)			31.1				28.0			9.1	0.1	0.1		8.4	0.1	0.1
Level of Service (LOS)			D				D			A	A	A		A	A	A
Approach Delay (s/veh)	31.1				28.0				0.3				0.3			
Approach LOS	D				D				A				A			

HCS Two-Way Stop-Control Report

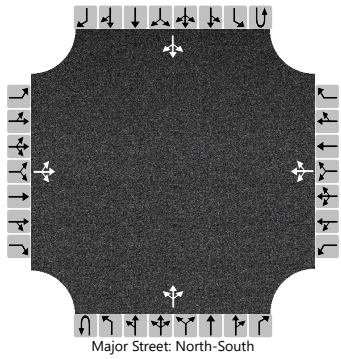
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Randolph No Build DY AM

Site Information

Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph
North/South Street	SR-43
Peak Hour Factor	0.81
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		20	10	10		10	30	10		10	560	10		10	310	20
Percent Heavy Vehicles (%)		5	5	5		7	7	7		5				4		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.15	6.55	6.25		7.17	6.57	6.27		4.15				4.14		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.55	4.05	3.35		3.56	4.06	3.36		2.25				2.24		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			49				62			12				12		
Capacity, c (veh/h)			177				199			1135				885		
v/c Ratio			0.28				0.31			0.01				0.01		
95% Queue Length, Q_{95} (veh)			1.1				1.3			0.0				0.0		
95% Queue Length, Q_{95} (ft)			28.6				34.3									
Control Delay (s/veh)			33.0				31.0			8.2	0.1	0.1		9.1	0.2	0.2
Level of Service (LOS)			D				D			A	A	A		A	A	A
Approach Delay (s/veh)	33.0				31.0				0.3				0.4			
Approach LOS	D				D				A				A			

HCS Two-Way Stop-Control Report

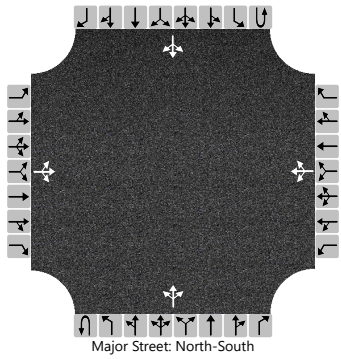
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Randolph No Build DY PM

Site Information

Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph
North/South Street	SR-43
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		20	40	10		10	20	10		10	490	30		10	670	30
Percent Heavy Vehicles (%)		0	0	0		5	5	5		3				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.15	6.55	6.25		4.13				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.55	4.05	3.35		2.23				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			73				42			10				10		
Capacity, c (veh/h)			156				157			870				1027		
v/c Ratio			0.47				0.26			0.01				0.01		
95% Queue Length, Q_{95} (veh)			2.2				1.0			0.0				0.0		
95% Queue Length, Q_{95} (ft)			55.0				26.0									
Control Delay (s/veh)			47.0				35.9			9.2	0.2	0.2		8.5	0.1	0.1
Level of Service (LOS)			E				E			A	A	A		A	A	A
Approach Delay (s/veh)	47.0				35.9				0.3				0.3			
Approach LOS	E				E				A				A			

HCS Two-Way Stop-Control Report

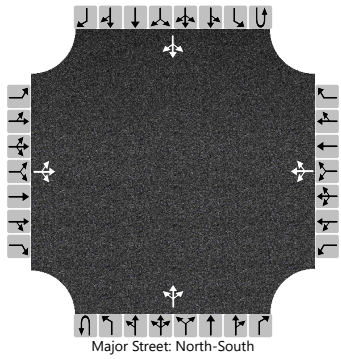
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2022
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Trares Existing AM

Site Information

Intersection	SR-43 at Trares
Jurisdiction	ODOT District 4
East/West Street	Trares
North/South Street	SR-43
Peak Hour Factor	0.82
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		37	8	23		3	35	13		114	477	4		10	265	27
Percent Heavy Vehicles (%)		0	0	0		0	0	0		5				5		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.15				4.15		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.25				2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			83				62			139				12		
Capacity, c (veh/h)			134				172			1186				974		
v/c Ratio			0.62				0.36			0.12				0.01		
95% Queue Length, Q_{95} (veh)			3.2				1.5			0.4				0.0		
95% Queue Length, Q_{95} (ft)			80.0				37.5									
Control Delay (s/veh)			68.4				37.3			8.4	1.5	1.5		8.7	0.1	0.1
Level of Service (LOS)			F				E			A	A	A		A	A	A
Approach Delay (s/veh)	68.4				37.3				2.8				0.4			
Approach LOS	F				E				A				A			

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HCS Two-Way Stop-Control Report

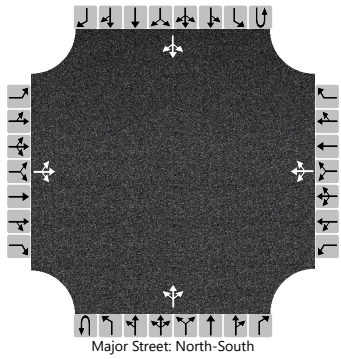
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2022
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Trares Existing PM

Site Information

Intersection	SR-43 at Trares
Jurisdiction	ODOT District 4
East/West Street	Trares
North/South Street	SR-43
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		43	51	85		1	18	11		56	419	6		17	593	30
Percent Heavy Vehicles (%)		1	1	1		3	3	3		3				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.11	6.51	6.21		7.13	6.53	6.23		4.13				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.51	4.01	3.31		3.53	4.03	3.33		2.23				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			186				31			58				18		
Capacity, c (veh/h)			209				203			932				1117		
v/c Ratio			0.89				0.15			0.06				0.02		
95% Queue Length, Q_{95} (veh)			7.1				0.5			0.2				0.0		
95% Queue Length, Q_{95} (ft)			178.9				12.8									
Control Delay (s/veh)			84.4				25.9			9.1	0.8	0.8		8.3	0.2	0.2
Level of Service (LOS)			F				D			A	A	A		A	A	A
Approach Delay (s/veh)	84.4				25.9				1.7				0.4			
Approach LOS	F				D				A				A			

HCS Two-Way Stop-Control Report

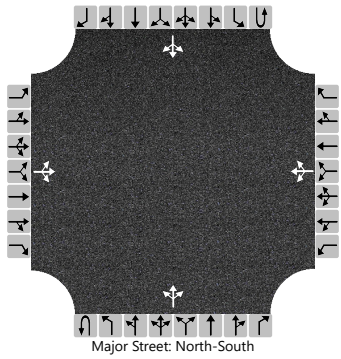
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Trares No Build OY AM

Site Information

Intersection	SR-43 at Trares
Jurisdiction	ODOT District 4
East/West Street	Trares
North/South Street	SR-43
Peak Hour Factor	0.82
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		40	10	30		10	40	10		120	490	10		10	280	30
Percent Heavy Vehicles (%)		0	0	0		0	0	0		5				5		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.15				4.15		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.25				2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			98				73			146				12		
Capacity, c (veh/h)			119				139			1164				954		
v/c Ratio			0.82				0.53			0.13				0.01		
95% Queue Length, Q_{95} (veh)			4.9				2.5			0.4				0.0		
95% Queue Length, Q_{95} (ft)			122.5				62.5									
Control Delay (s/veh)			108.8				56.6			8.5	1.6	1.6		8.8	0.1	0.1
Level of Service (LOS)			F				F			A	A	A		A	A	A
Approach Delay (s/veh)	108.8				56.6				3.0				0.4			
Approach LOS	F				F				A				A			

HCS Two-Way Stop-Control Report

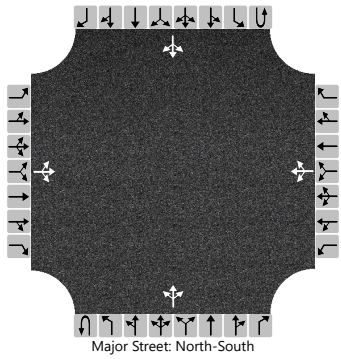
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Trares No Build OY PM

Site Information

Intersection	SR-43 at Trares
Jurisdiction	ODOT District 4
East/West Street	Trares
North/South Street	SR-43
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		50	60	90		10	20	10		60	430	10		20	610	30
Percent Heavy Vehicles (%)		1	1	1		3	3	3		3				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.11	6.51	6.21		7.13	6.53	6.23		4.13				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.51	4.01	3.31		3.53	4.03	3.33		2.23				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			208				42			63				21		
Capacity, c (veh/h)			188				118			918				1103		
v/c Ratio			1.11				0.35			0.07				0.02		
95% Queue Length, Q_{95} (veh)			10.2				1.4			0.2				0.1		
95% Queue Length, Q_{95} (ft)			257.0				35.8									
Control Delay (s/veh)			150.0				51.3			9.2	0.8	0.8		8.3	0.3	0.3
Level of Service (LOS)			F				F			A	A	A		A	A	A
Approach Delay (s/veh)	150.0				51.3				1.8				0.5			
Approach LOS	F				F				A				A			

HCS Two-Way Stop-Control Report

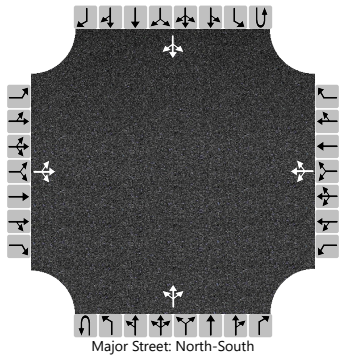
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Trares No Build DY AM

Site Information

Intersection	SR-43 at Trares
Jurisdiction	ODOT District 4
East/West Street	Trares
North/South Street	SR-43
Peak Hour Factor	0.82
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		60	10	40		10	50	20		120	500	10		10	290	30
Percent Heavy Vehicles (%)		0	0	0		0	0	0		5				5		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.10	6.50	6.20		7.10	6.50	6.20		4.15				4.15		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.30		2.25				2.25		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			134				98			146				12		
Capacity, c (veh/h)			90				145			1152				945		
v/c Ratio			1.49				0.67			0.13				0.01		
95% Queue Length, Q_{95} (veh)			10.4				3.8			0.4				0.0		
95% Queue Length, Q_{95} (ft)			260.0				95.0									
Control Delay (s/veh)			351.2				70.2			8.6	1.7	1.7		8.9	0.1	0.1
Level of Service (LOS)			F				F			A	A	A		A	A	A
Approach Delay (s/veh)	351.2				70.2				3.0				0.4			
Approach LOS	F				F				A				A			

HCS Two-Way Stop-Control Report

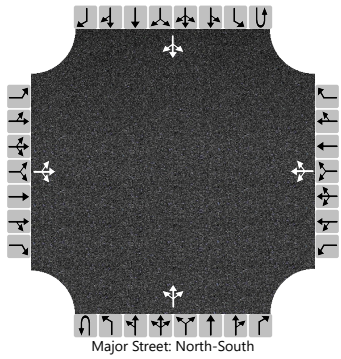
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Trares No Build DY PM

Site Information

Intersection	SR-43 at Trares
Jurisdiction	ODOT District 4
East/West Street	Trares
North/South Street	SR-43
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		70	80	130		10	30	10		60	440	10		20	640	30
Percent Heavy Vehicles (%)		1	1	1		3	3	3		3				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.11	6.51	6.21		7.13	6.53	6.23		4.13				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.51	4.01	3.31		3.53	4.03	3.33		2.23				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			292				52			63				21		
Capacity, c (veh/h)			170				87			894				1093		
v/c Ratio			1.71				0.60			0.07				0.02		
95% Queue Length, Q_{95} (veh)			20.5				2.7			0.2				0.1		
95% Queue Length, Q_{95} (ft)			516.6				69.1									
Control Delay (s/veh)			391.6				94.4			9.3	0.9	0.9		8.4	0.3	0.3
Level of Service (LOS)			F				F			A	A	A		A	A	A
Approach Delay (s/veh)	391.6				94.4				1.9				0.5			
Approach LOS	F				F				A				A			

Appendix F
Signal, All-Way Stop-Control, and Turn Lane Warrants

Appendix F

CARPENTER MARTY transportation

STUDY AND ANALYSIS INFORMATION

Municipality:	Suffield Township	**Traffic Volumes Obtained By:**	ODOT
County:	Portage	**Analysis Date:**	9/8/2022
ODOT Engineering District:	4	**Agency/ Company Name Performing Warrant Analysis:**	Lanham Engineering, LLC
Google map link:	Map		

Analysis Information

Data Collection Date: 5/4/2022

Day of the Week: Wednesday

Is the intersection in a built-up area of an isolated community of <10,000 population? No

Existing Traffic Signal at intersection: No

Total Number of Approaches at Intersection: 4

Major Street Information

Major Street Name and Route Number: SR-43

Major Street Approach Direction: N-Bound, S-Bound

Number of Thru Lanes on Each Major Street Approach: 1 **LANE(S)**

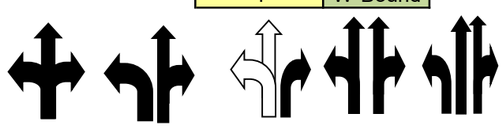
Speed Limit or 85th Percentile Speed on the Major Street*: 45 **MPH**

*Unknown assumes below 45 mph

Minor Street Information

Minor Street Name and Route Number: Randolph Road

Minor Street Approach Configuration: 1 E-Bound, 1 W-Bound



Number of Thru Lanes on Each Minor Street Approach: 1 **LANE(S)**

Apply Right Turn Lane Reduction*: Yes

*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Satisfied?	Notes and Comments:
Warrant 1, Eight-Hour Vehicular Volume	Yes	**No**	
Warrant 2, Four-Hour Vehicular Volume	Yes	**No**	
Warrant 3, Peak Hour	No		Signals installed under Warrant 3 should be traffic actuated. Peak Hour: 4:15 PM, 5:15 PM
For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2)			
Warrant 4, Pedestrian Volume	No		If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD. Peak Hour: 4:15 PM, 5:15 PM
Warrant 5, School Crossing	No		N/A
Warrant 6, Coordinated Signal System	No		(Shall not be used as the sole warrant in the analysis)
Warrant 7, Crash Experience	Yes	**No**	If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.
Warrant 8, Roadway Network	No		(Shall not be used as the sole warrant in the analysis)
Warrant 9, Intersection Near a Grade Crossing	No		Figure 4C-9
Multi-Way Stop Warrant	Yes	**Yes**	May be used as an interim measure if traffic signal warrants are satisfied.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

If no warrants are satisfied, additional options may be considered:

1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.
2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The **Modeling and Forecasting Section** should provide the projected traffic volumes.
3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. **Please fill inputs on PHB Score Sheet and submit to ODOT.**

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: Do Not Install New Traffic Signal

Notes:

OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? Yes

**Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

Lanes Major/ Minor	Adjusted Volumes		Condition A				Condition B				Combination A/B*							
											Cond. A		Cond. B		Cond. A		Cond. B	
	Major	Minor	100%		70%		100%		70%		80%		80%		56%		56%	
			Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.
1 / 1	X		500	150	350	105	750	75	525	53	400	120	600	60	280	84	420	42
2+ / 1			600	150	420	105	900	75	630	53	480	120	720	60	336	84	504	42
2+ / 2+			600	200	420	140	900	100	630	70	480	160	720	80	336	112	504	56
1 / 2+			500	200	350	140	750	100	525	70	400	160	600	80	280	112	420	56
12:00 AM	0	0																
12:15 AM	0	0																
12:30 AM	0	0																
12:45 AM	0	0																
1:00 AM	0	0																
1:15 AM	0	0																
1:30 AM	0	0																
1:45 AM	0	0																
2:00 AM	0	0																
2:15 AM	0	0																
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5:00 AM	0	0																
5:15 AM	0	0																
5:30 AM	0	0																
5:45 AM	0	0																
6:00 AM	0	0																
6:15 AM	147	7																
6:30 AM	318	21													1			
6:45 AM	538	23	1		1				1		1						1	
7:00 AM	706	29											1					
7:15 AM	665	32																
7:30 AM	617	25													1			
7:45 AM	533	24	1		1				1		1						1	
8:00 AM	502	21																
8:15 AM	505	18																
8:30 AM	474	15													1			
8:45 AM	438	19			1						1						1	
9:00 AM	404	20																
9:15 AM	408	16																
9:30 AM	419	15													1			
9:45 AM	423	17			1						1						1	
10:00 AM	417	20																
10:15 AM	409	24																
10:30 AM	405	24													1			
10:45 AM	405	21			1						1							
11:00 AM	407	22																
11:15 AM	423	20															1	
11:30 AM	428	21													1			
11:45 AM	438	22			1						1							
12:00 PM	455	24																
12:15 PM	451	24															1	
12:30 PM	490	25													1			
12:45 PM	509	24	1		1						1							
1:00 PM	508	24																
1:15 PM	525	25							1								1	
1:30 PM	539	28													1			
1:45 PM	584	30	1		1						1							
2:00 PM	646	35											1					
2:15 PM	716	41							1								1	
2:30 PM	742	33													1			
2:45 PM	738	39	1		1						1							
3:00 PM	788	38					1						1					
3:15 PM	777	35							1								1	
3:30 PM	835	39													1			
3:45 PM	893	38	1		1						1							
4:00 PM	905	38					1						1					
4:15 PM	957	43							1								1	1
4:30 PM	941	45													1			
4:45 PM	911	41	1		1						1							
5:00 PM	852	44					1						1					
5:15 PM	739	35							1								1	
5:30 PM	654	32													1			
5:45 PM	595	28	1		1						1							
6:00 PM	506	25																
6:15 PM	374	20																
6:30 PM	234	15																
6:45 PM	91	8																
7:00 PM	0	0																
7:15 PM	0	0																
7:30 PM	0	0																
7:45 PM	0	0																
8:00 PM	0	0																
8:15 PM	0	0																
8:30 PM	0	0																
8:45 PM	0	0																
9:00 PM	0	0																
9:15 PM	0	0																
9:30 PM	0	0																
9:45 PM	0	0																
HOURS MET			**8**	**0**	**12**	**0**	**3**	**0**	**7**	**0**	**12**	**0**	**5**	**0**	**12**	**0**	**11**	**1**
WARRANT SATISFIED?			**NO**		**NO**		**NO**		**NO**		**NO**				**NO**			

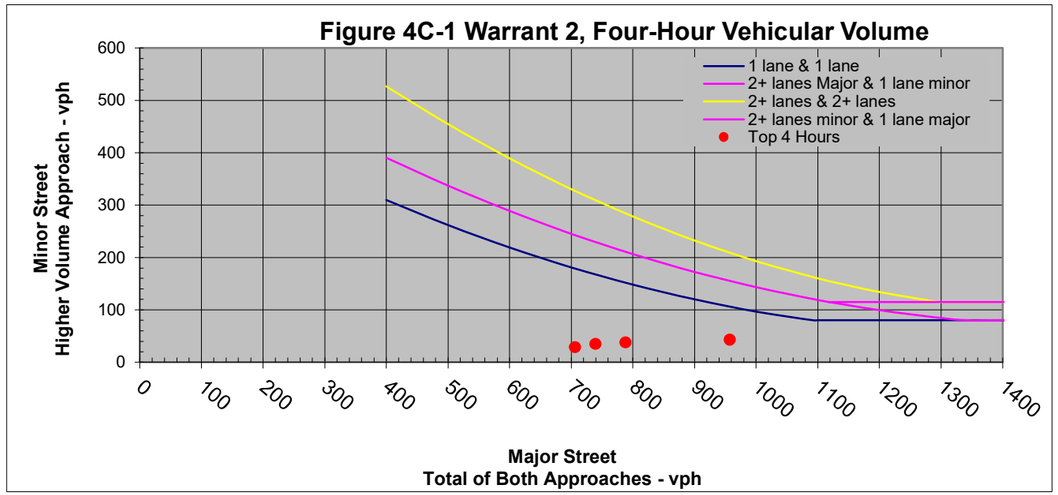
Warrant Met: No

Notes:

OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

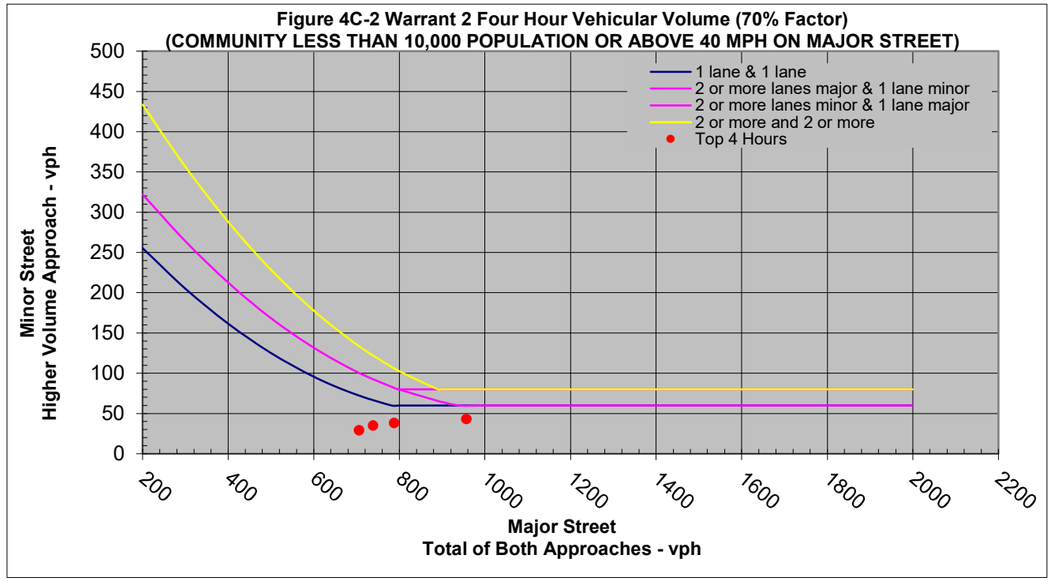
Number of Lanes for Moving Traffic on Each Approach		Total Number of Unique Hours Met on Figure 4C-1	0
Major street:	1 Lane	Total Number of Unique Hours Met on Figure 4C-2 (70% Factor)	0
Minor Street:	1 Lane		
Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street?			Yes

Hour Interval Beginning At	Raw Traffic Counts				Total Major Approach Volumes	Highest Actual Minor Street Approach Volumes	Hour Met?	Hour Met? (70% Factor)
	Major - SR-43		Minor - Randolph Road					
	N-Bound	S-Bound	W-Bound	E-Bound				
6:00 AM	0	0	0	0	0	0		
6:15 AM	105	42	7	2	147	7		
6:30 AM	222	96	21	5	318	21		
6:45 AM	367	171	23	15	538	23		
7:00 AM	445	261	29	20	706	29		
7:15 AM	399	266	32	21	665	32		
7:30 AM	349	268	25	19	617	25		
7:45 AM	290	243	24	13	533	24		
8:00 AM	294	208	21	9	502	21		
8:15 AM	300	205	18	7	505	18		
8:30 AM	284	190	15	6	474	15		
8:45 AM	252	186	19	4	438	19		
9:00 AM	226	178	20	6	404	20		
9:15 AM	219	189	16	10	408	16		
9:30 AM	217	202	15	11	419	15		
9:45 AM	213	210	17	16	423	17		
10:00 AM	211	206	20	13	417	20		
10:15 AM	199	210	24	14	409	24		
10:30 AM	205	200	24	18	405	24		
10:45 AM	201	204	21	17	405	21		
11:00 AM	206	201	21	22	407	22		
11:15 AM	205	218	17	20	423	20		
11:30 AM	207	221	15	21	428	21		
11:45 AM	218	220	17	22	438	22		
12:00 PM	215	240	12	24	455	24		
12:15 PM	235	216	15	24	451	24		
12:30 PM	258	232	20	25	490	25		
12:45 PM	272	237	21	24	509	24		
1:00 PM	276	232	24	21	508	24		
1:15 PM	275	250	25	23	525	25		
1:30 PM	274	265	23	28	539	28		
1:45 PM	290	294	17	30	584	30		
2:00 PM	301	345	19	35	646	35		
2:15 PM	306	410	16	41	716	41		
2:30 PM	315	427	16	33	742	33		
2:45 PM	303	435	18	39	738	39		
3:00 PM	337	451	19	38	788	38		
3:15 PM	365	412	17	35	777	35		
3:30 PM	362	473	16	39	835	39		
3:45 PM	399	494	18	38	893	38		
4:00 PM	390	515	17	38	905	38		
4:15 PM	401	556	21	43	957	43		
4:30 PM	420	521	23	45	941	45		
4:45 PM	401	510	29	41	911	41		
5:00 PM	393	459	28	44	852	44		
5:15 PM	342	397	27	35	739	35		
5:30 PM	311	343	27	32	654	32		
5:45 PM	283	312	23	28	595	28		
6:00 PM	235	271	25	24	506	25		
6:15 PM	178	196	20	18	374	20		
6:30 PM	105	129	15	11	234	15		
6:45 PM	40	51	8	6	91	8		
7:00 PM	0	0	0	0	0	0		
7:15 PM	0	0	0	0	0	0		
7:30 PM	0	0	0	0	0	0		
7:45 PM	0	0	0	0	0	0		
8:00 PM	0	0	0	0	0	0		



Top Hours for Figure 4C-1	Start Time	End Time	Major Street	Minor Street
Top Hour	4:15 PM	5:15 PM	957	43
2nd Highest Hour	3:00 PM	4:00 PM	788	38
3rd Highest Hour	5:15 PM	6:15 PM	739	35
4th Highest Hour	7:00 AM	8:00 AM	706	29

Top Hours for Figure 4C-2	Start Time	End Time	Major Street	Minor Street
Top Hour	4:15 PM	5:15 PM	957	43
2nd Highest Hour	3:00 PM	4:00 PM	788	38
3rd Highest Hour	5:15 PM	6:15 PM	739	35
4th Highest Hour	7:00 AM	8:00 AM	706	29



Are the requirements for Warrant 2 met?: No

Start Time	Southbound Approach						Westbound Approach						Northbound Approach						Eastbound Approach						NOTES:
	Southbound						Westbound						Nouthbound						Eastbound						
	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	
12:00 AM						0						0						0						0	It should be noted that if data is copied overtop of the Hourly Totals or Approach Totals, that the 'AutoSum' Formula will be lost. This should not affect the actual totals if the data was copied from a program that performs the calculations for the user.
12:15 AM						0						0						0						0	
12:30 AM						0						0						0						0	
12:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:00 AM						0						0						0						0	
1:15 AM						0						0						0						0	
1:30 AM						0						0						0						0	
1:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:00 AM						0						0						0						0	
2:15 AM						0						0						0						0	
2:30 AM						0						0						0						0	
2:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 AM						0						0						0						0	
3:15 AM						0						0						0						0	
3:30 AM						0						0						0						0	
3:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:00 AM						0						0						0						0	
4:15 AM						0						0						0						0	
4:30 AM						0						0						0						0	
4:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 AM						0						0						0						0	
5:15 AM						0						0						0						0	
5:30 AM						0						0						0						0	
5:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:00 AM						0						0						0						0	
6:15 AM						0						0						0						0	
6:30 AM						0						0						0						0	
6:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 AM	1	40	1			42	0	5	2			7	0	104	1			105	1	1	0			2	
7:15 AM	0	52	2			54	2	9	3			14	1	116	0			117	0	1	2			3	
7:30 AM	4	71	0			75	0	2	0			2	2	143	0			145	1	2	7			10	
7:45 AM	8	82	0			90	0	3	3			6	3	74	1			78	2	0	3			5	
Hourly Total	13	245	3	0	0	261	2	19	8	0	0	29	6	437	2	0	0	445	4	4	12	0	0	20	
8:00 AM	1	46	0			47	0	6	4			10	0	58	1			59	0	2	1			3	
8:15 AM	0	55	1			56	2	4	1			7	2	65	0			67	0	0	1			1	
8:30 AM	6	44	0			50	0	0	1			1	3	83	0			86	2	1	1			4	
8:45 AM	2	53	0			55	1	1	1			3	3	79	0			82	0	0	1			1	
Hourly Total	9	198	1	0	0	208	3	11	7	0	0	21	8	285	1	0	0	294	2	3	4	0	0	9	
9:00 AM	5	39	0			44	0	6	1			7	0	65	0			65	0	1	0			1	
9:15 AM	2	39	0			41	1	3	0			4	1	50	0			51	1	0	0			1	
9:30 AM	2	43	1			46	0	2	3			5	4	50	0			54	0	1	0			1	
9:45 AM	2	45	0			47	1	2	1			4	2	54	0			56	0	2	1			3	
Hourly Total	11	166	1	0	0	178	2	13	5	0	0	20	7	219	0	0	0	226	1	4	1	0	0	6	
10:00 AM	9	46	0			55	1	2	0			3	2	55	1			58	1	3	1			5	
10:15 AM	2	52	0			54	0	3	0			3	0	49	0			49	0	2	0			2	
10:30 AM	6	48	0			54	0	4	3			7	3	47	0			50	0	1	5			6	
10:45 AM	6	36	1			43	0	3	4			7	3	51	0			54	0	0	0			0	
Hourly Total	23	182	1	0	0	206	1	12	7	0	0	20	8	202	1	0	0	211	1	6	6	0	0	13	
11:00 AM	5	52	2			59	1	5	1			7	2	43	1			46	2	3	1			6	
11:15 AM	3	41	0			44	0	3	0			3	1	54	0			55	0	1	5			6	
11:30 AM	8	50	0			58	0	4	0			4	2	44	0			46	2	1	2			5	
11:45 AM	0	40	0			40	1	4	2			7	3	56	0			59	0	4	1			5	
Hourly Total	16	183	2	0	0	201	2	16	3	0	0	21	8	197	1	0	0	206	4	9	9	0	0	22	
12:00 PM	5	71	0			76	0	2	1			3	4	41	0			45	1	2	1			4	
12:15 PM	7	40	0			47	1	0	0			1	1	56	0			57	0	3	4			7	
12:30 PM	2	55	0			57	1	3	2			6	2	55	0			57	0	1	5			6	
12:45 PM	4	56	0			60	0	2	0			2	5	51	0			56	1	4	2			7	
Hourly Total	18	222	0	0	0	240	2	7	3	0	0	12	12	203	0	0	0	215	2	10	12	0	0	24	
1:00 PM	3	49	0			52	1	2	3			6	3	62	0			65	0	2	2			4	
1:15 PM	9	54	0			63	1	5	0			6	2	76	2			80	0	3	5			8	
1:30 PM	9	53	0			62	1	3	3			7	1	70	0			71	0	2	3			5	
1:45 PM	5	50	0			55	0	5	0			5	3	56	1			60	0	2	2			4	
Hourly Total	26	206	0	0	0	232	3	15	6	0	0	24	9	264	3	0	0	276	0	9	12	0	0	21	
2:00 PM	5	65	0			70	1	3	3			7	4	58	2			64	1	4	1			6	
2:15 PM	2	76	0			78	1	1	2			4	1	77	1			79	1	6	6			13	
2:30 PM	11	79	1			91	1	0	0			1	3	82	2			87	0	1	6			7	
2:45 PM	8	98	0			106	0	6	1			7	3	68	0			71	2	2	5			9	
Hourly Total	26	318	1	0	0	345	3	10	6	0	0	19	11	285	5	0	0	301	4	13	18	0	0	35	
3:00 PM	11	121	3			135	0	1	3			4	7	61	1			69	4	4	5			13	
3:15 PM	4	91	0			95	0	2	2			4	7	81	0			88	0	3	2			5	
3:30 PM	7	92	0			99	0	2	1			3	8	67	0			75	1	11	1			13	
3:45 PM	14	107	1			122	0	5	3			8	6	98	1			105	0	4	3			7	
Hourly Total	36	411	4	0	0	451	0	10	9	0	0	19	28	307	2	0	0	337	5	22	11	0	0	38	
4:00 PM	7	89	0			96	1	1	0			2	2	95	0			97	0	8	2			10	
4:15 PM	5	151	0			156	1	1	1			3	6	78	1			85	3	5	1			9	
4:30 PM	8	112	0			120	0	4	1			5	6	105	1			112	4	5	4			13	
4:45 PM	3	138	2			143	1	5	1			7	4	92	0			96	0	6	1			7	
Hourly Total	23	490	2	0	0	515	3	11	3	0	0	17	18	370	2	0	0	390	7	24	8	0	0	39	
5:00 PM	7	130	0			137	1	1	4			6	5	102	1			108	0	9	5			14	
5:15 PM	3	115	3			121	2	2	1			5	8	95	1			104	3	4	4			11	
5:30 PM	10	98	1			109	0	9	2			11	5	88	0			93	2	6	1			9	
5:45 PM	3	89	0			92	1	5	0			6	1	86	1			88	1	7	2			10	
Hourly Total	23	432	4	0	0	459	4	17	7	0	0	28	19	371	3	0	0	393	6	26	12	0	0	44	
6:00 PM	4	71	0			75	0	5	0			5	5	52	0			57	4	2	1			7	
6:15 PM	0	67	0			67	1	4	0			5	3	70	0			73	0	6	1			7	
6:30 PM	2	74	2			78	0	3	4			7	0	65	0			65	2	1	2			5	
6:45 PM	1	48	2			51	2	4	2			8	8	32	0			40	1	3	2			6	
Hourly Total	7	260	4	0	0	271	3	16	6	0	0	25	16	219	0	0	0	235	7	12	6	0	0	25	
7:00 PM						0						0						0						0	
7:15 PM						0						0						0						0	
7:30 PM						0						0						0						0	
7:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM						0						0						0						0	
8:15 PM						0						0						0						0	
8:30 PM						0						0						0						0	
8:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM						0						0						0						0	
9:15 PM						0						0						0						0	
9:30 PM						0						0						0						0	
9:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:00 PM						0						0						0						0	
10:15 PM						0						0						0						0	
10:30 PM						0						0						0						0	
10:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00 PM						0						0						0						0	
11:15 PM						0						0						0						0	
11:30 PM						0						0						0						0	
11:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Multi-Way Stop Application

OMUTCD Section 2B.07

	Warranted ?
A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.	No
B. Five or more reported crashes in a 12-month period that are susceptible to correction by a multiway stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.	Yes
C. Minimum Volumes:	
1 The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day.	Yes
2 The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour.* *If this condition is satisfied, there must also be an average delay of at least 30 seconds per vehicle during the peak hour.	No
3 If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum volume warrants are 70 percent of the values provided in Items 1 and 2.	Yes
D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.	No

Other criteria that may be considered in an engineering study include:

A. The need to control left-turn conflicts;	No
B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;	No
C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and	No
D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.	No

Are the requirements for Multi-Way Stop Satisfied?: Yes

AUTOCALC table Each hour is individually checked and tallied if "met"								
Lanes Major/ Minor	ADJUSTED VOLUMES		Condition C.1		Condition C.2		Condition D	
	MAJOR	MINOR	100%		70%		80%	
			MAJ.	MIN.	MAJ.	MIN.	MAJ.	MIN.
Required Volumes			300	200	210	140	240	160
6:00 AM	0	0						
6:15 AM	147	7						
6:30 AM	318	21	1		1		1	
6:45 AM	538	23						
7:00 AM	706	29						
7:15 AM	665	32						
7:30 AM	617	25	1		1		1	
7:45 AM	533	24						
8:00 AM	502	21						
8:15 AM	505	18						
8:30 AM	474	15	1		1		1	
8:45 AM	438	19						
9:00 AM	404	20						
9:15 AM	408	16						
9:30 AM	419	15	1		1		1	
9:45 AM	423	17						
10:00 AM	417	20						
10:15 AM	409	24						
10:30 AM	405	24	1		1		1	
10:45 AM	405	21						
11:00 AM	407	22						
11:15 AM	423	20						
11:30 AM	428	21	1		1		1	
11:45 AM	438	22						
12:00 PM	455	24						
12:15 PM	451	24						
12:30 PM	490	25	1		1		1	
12:45 PM	509	24						
1:00 PM	508	24						
1:15 PM	525	25						
1:30 PM	539	28	1		1		1	
1:45 PM	584	30						
2:00 PM	646	35						
2:15 PM	716	41						
2:30 PM	742	33	1		1		1	
2:45 PM	738	39						
3:00 PM	788	38						
3:15 PM	777	35						
3:30 PM	835	39	1		1		1	
3:45 PM	893	38						
4:00 PM	905	38						
4:15 PM	957	43						
4:30 PM	941	45	1		1		1	
4:45 PM	911	41						
5:00 PM	852	44						
5:15 PM	739	35						
5:30 PM	654	32	1		1		1	

5:45 PM	595	28						
6:00 PM	506	25						
6:15 PM	374	20						
6:30 PM	234	15			1			
6:45 PM	91	8						
7:00 PM	0	0						
7:15 PM	0	0						
7:30 PM	0	0						
7:45 PM	0	0						
8:00 PM	0	0						
8:15 PM	0	0						
8:30 PM	0	0						
8:45 PM	0	0						
9:00 PM	0	0						
9:15 PM	0	0						
9:30 PM	0	0						
9:45 PM	0	0						
10:00 PM	0	0						
10:15 PM	0	0						
10:30 PM	0	0						
10:45 PM	0	0						
11:00 PM	0	0						
11:15 PM	0	0						
11:30 PM	0	0						
11:45 PM	0	0						
HOURS MET			**12**	**0**	**13**	**0**	**12**	**0**
CONDITION SATISFIED?			**NO**		**NO**		**NO**	

STUDY AND ANALYSIS INFORMATION

Municipality:	Suffield Township	**Traffic Volumes Obtained By:**	ODOT
County:	Portage	**Analysis Date:**	9/8/2022
ODOT Engineering District:	4	**Agency/ Company Name Performing Warrant Analysis:**	Lanham Engineering, LLC
Google map link:	Map		

Analysis Information

Data Collection Date:	5/4/2022
Day of the Week:	Wednesday
Is the intersection in a built-up area of an isolated community of <10,000 population?	No
Existing Traffic Signal at intersection:	No
Total Number of Approaches at Intersection:	4

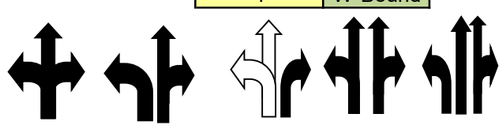
Major Street Information

Major Street Name and Route Number:	SR-43	
Major Street Approach Direction:	N-Bound S-Bound	
Number of Thru Lanes on Each Major Street Approach:	1	**LANE(S)**
Speed Limit or 85th Percentile Speed on the Major Street*:	45	**MPH**

*Unknown assumes below 45 mph

Minor Street Information

Minor Street Name and Route Number:	Trares	
Minor Street Approach Configuration:	1	E-Bound
	1	W-Bound



1 2 3 4 5

Number of Thru Lanes on Each Minor Street Approach:	1	**LANE(S)**
Apply Right Turn Lane Reduction*:	Yes	

*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Satisfied?	Notes and Comments:
Warrant 1, Eight-Hour Vehicular Volume	Yes	**No**	
Warrant 2, Four-Hour Vehicular Volume	Yes	**No**	Figure 4C-2 (70% Factor)
Warrant 3, Peak Hour	No		Signals installed under Warrant 3 should be traffic actuated. **Peak Hour** 4:15 PM 5:15 PM

For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2)

Warrant 4, Pedestrian Volume	No		If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD. **Peak Hour** 4:15 PM 5:15 PM
Warrant 5, School Crossing	No		N/A
Warrant 6, Coordinated Signal System	No		(Shall not be used as the sole warrant in the analysis)
Warrant 7, Crash Experience	Yes	**No**	If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.
Warrant 8, Roadway Network	No		(Shall not be used as the sole warrant in the analysis)
Warrant 9, Intersection Near a Grade Crossing	No		Figure 4C-9
Multi-Way Stop Warrant	Yes	**Yes**	May be used as an interim measure if traffic signal warrants are satisfied.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

If no warrants are satisfied, additional options may be considered:

1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.
2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The **Modeling and Forecasting Section** should provide the projected traffic volumes.
3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. **Please fill inputs on PHB Score Sheet and submit to ODOT.**

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: Do Not Install New Traffic Signal

Notes:

OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? Yes

**Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

Lanes Major/ Minor	Adjusted Volumes		Condition A				Condition B				Combination A/B*							
											Cond. A		Cond. B		Cond. A		Cond. B	
	Major	Minor	100%		70%		100%		70%		80%		80%		56%		56%	
			Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.
1 / 1	X		500	150	350	105	750	75	525	53	400	120	600	60	280	84	420	42
2+ / 1			600	150	420	105	900	75	630	53	480	120	720	60	336	84	504	42
2+ / 2+			600	200	420	140	900	100	630	70	480	160	720	80	336	112	504	56
1 / 2+			500	200	350	140	750	100	525	70	400	160	600	80	280	112	420	56
12:00 AM	0	0																
12:15 AM	0	0																
12:30 AM	0	0																
12:45 AM	0	0																
1:00 AM	0	0																
1:15 AM	0	0																
1:30 AM	0	0																
1:45 AM	0	0																
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5:00 AM	0	0																
5:15 AM	0	0																
5:30 AM	0	0																
5:45 AM	0	0																
6:00 AM	0	0																
6:15 AM	158	8																
6:30 AM	343	23													1			
6:45 AM	565	44	1		1				1		1						1	1
7:00 AM	754	58					1						1					
7:15 AM	725	57																
7:30 AM	667	46													1			
7:45 AM	599	28	1		1				1		1						1	
8:00 AM	552	32																
8:15 AM	539	35																
8:30 AM	512	40													1			
8:45 AM	461	49			1						1						1	1
9:00 AM	429	43																
9:15 AM	418	48																
9:30 AM	429	43													1			
9:45 AM	424	42			1						1						1	1
10:00 AM	413	46																
10:15 AM	408	41																
10:30 AM	392	49													1			
10:45 AM	398	48			1													
11:00 AM	408	56									1							
11:15 AM	425	59															1	1
11:30 AM	427	59													1			
11:45 AM	441	64			1													
12:00 PM	439	65									1							
12:15 PM	448	69															1	1
12:30 PM	480	65													1			
12:45 PM	485	63			1													
1:00 PM	502	61	1								1							
1:15 PM	515	63															1	1
1:30 PM	535	79							1	1					1			
1:45 PM	580	89			1													
2:00 PM	636	90	1								1		1	1				
2:15 PM	682	93															1	1
2:30 PM	723	95							1	1					1	1		
2:45 PM	739	93			1													
3:00 PM	765	115	1				1	1			1		1	1				
3:15 PM	772	132															1	1
3:30 PM	819	142							1	1					1	1		
3:45 PM	863	142			1	1												
4:00 PM	886	140	1				1	1			1	1	1	1				
4:15 PM	941	139															1	1
4:30 PM	921	146							1	1					1	1		
4:45 PM	898	141			1	1												
5:00 PM	849	127	1				1	1			1	1	1	1				
5:15 PM	727	103															1	1
5:30 PM	660	67							1	1					1			
5:45 PM	613	58			1													
6:00 PM	524	48	1								1							
6:15 PM	399	32																
6:30 PM	249	23																
6:45 PM	91	13																
7:00 PM	0	0																
7:15 PM	0	0																
7:30 PM	0	0																
7:45 PM	0	0																
8:00 PM	0	0																
8:15 PM	0	0																
8:30 PM	0	0																
8:45 PM	0	0																
9:00 PM	0	0																
9:15 PM	0	0																
9:30 PM	0	0																
9:45 PM	0	0																
HOURS MET			**8**	**0**	**12**	**2**	**4**	**3**	**7**	**5**	**12**	**2**	**5**	**4**	**12**	**3**	**11**	**10**
WARRANT SATISFIED?			**NO**		**NO**		**NO**		**NO**		**NO**				**NO**			

Warrant Met: No

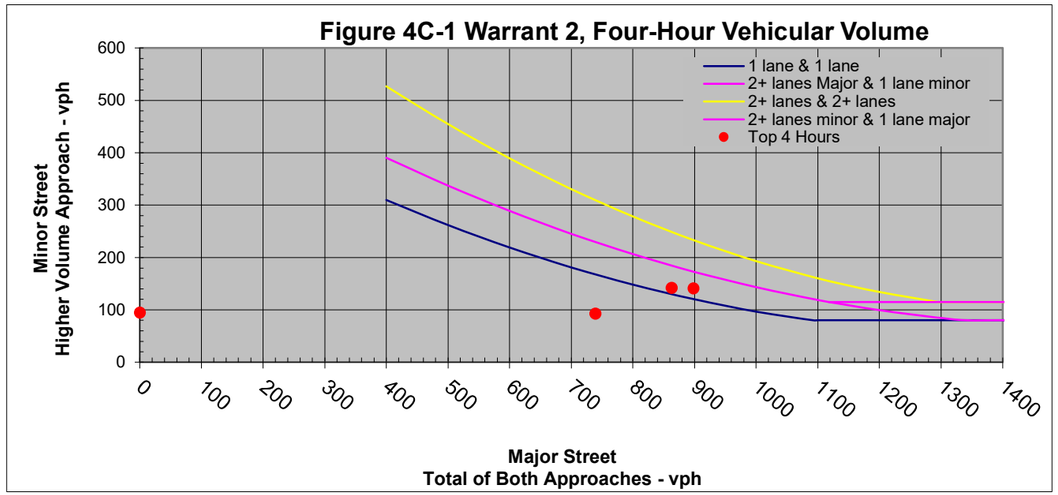
Notes:

OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach		Total Number of Unique Hours Met on Figure 4C-1	2
Major street:	1 Lane	Total Number of Unique Hours Met on Figure 4C-2 (70% Factor)	4
Minor Street:	1 Lane		

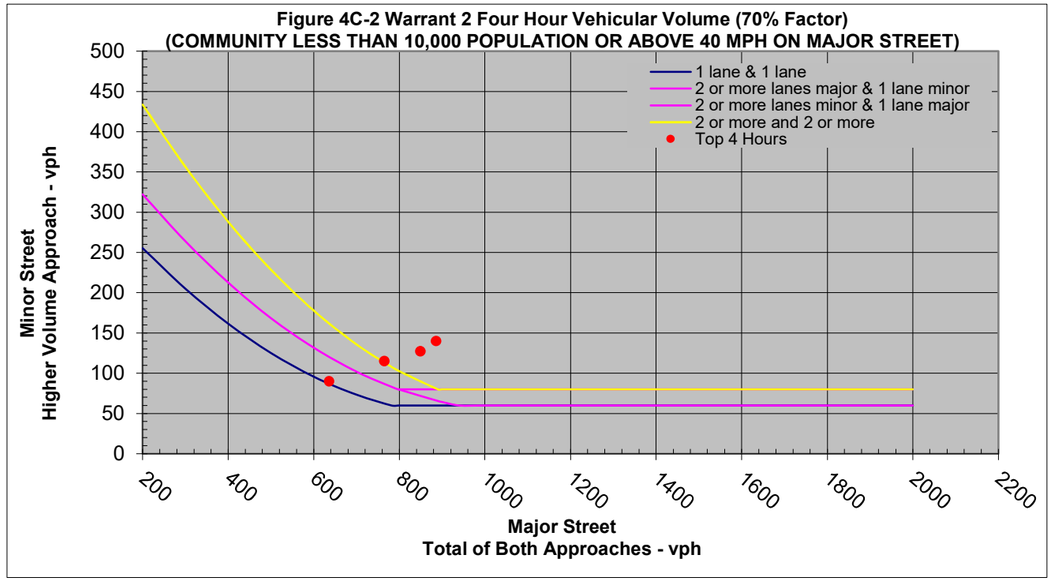
Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? Yes

Hour Interval Beginning At	Raw Traffic Counts				Total Major Approach Volumes	Highest Actual Minor Street Approach Volumes	Hour Met?	Hour Met? (70% Factor)
	Major - SR-43		Minor - Trares					
	N-Bound	S-Bound	W-Bound	E-Bound				
6:00 AM	0	0	0	0	0	0		
6:15 AM	117	41	8	6	158	8		
6:30 AM	245	98	18	23	343	23		
6:45 AM	397	168	36	44	565	44		
7:00 AM	500	254	46	58	754	58		
7:15 AM	465	260	44	57	725	57		
7:30 AM	407	260	37	46	667	46		
7:45 AM	363	236	28	28	599	28		
8:00 AM	348	204	29	32	552	32		
8:15 AM	342	197	31	35	539	35		
8:30 AM	332	180	38	40	512	40		
8:45 AM	281	180	38	49	461	49		
9:00 AM	257	172	33	43	429	43		
9:15 AM	238	180	31	48	418	48		
9:30 AM	239	190	24	43	429	43		
9:45 AM	230	194	21	42	424	42		
10:00 AM	225	188	23	46	413	46		
10:15 AM	214	194	21	41	408	41		
10:30 AM	204	188	20	49	392	49		
10:45 AM	211	187	23	48	398	48		
11:00 AM	211	197	21	56	408	56		
11:15 AM	218	207	24	59	425	59		
11:30 AM	224	203	30	59	427	59		
11:45 AM	230	211	27	64	441	64		
12:00 PM	222	217	27	65	439	65		
12:15 PM	241	207	28	69	448	69		
12:30 PM	262	218	26	65	480	65		
12:45 PM	268	217	25	63	485	63		
1:00 PM	288	214	22	61	502	61		
1:15 PM	288	227	19	63	515	63		
1:30 PM	281	254	16	79	535	79		
1:45 PM	305	275	17	89	580	89		
2:00 PM	305	331	16	90	636	90		Met
2:15 PM	301	381	16	93	682	93		
2:30 PM	326	397	19	95	723	95		
2:45 PM	321	418	18	93	739	93		
3:00 PM	350	415	20	115	765	115		Met
3:15 PM	378	394	24	132	772	132		
3:30 PM	372	447	23	142	819	142		
3:45 PM	398	465	29	142	863	142	Met	
4:00 PM	389	497	30	140	886	140		Met
4:15 PM	404	537	28	139	941	139		
4:30 PM	413	508	35	146	921	146		
4:45 PM	403	495	31	141	898	141	Met	
5:00 PM	404	445	30	127	849	127		Met
5:15 PM	345	382	31	103	727	103		
5:30 PM	328	332	27	67	660	67		
5:45 PM	306	307	22	58	613	58		
6:00 PM	253	271	24	48	524	48		
6:15 PM	201	198	17	32	399	32		
6:30 PM	119	130	9	23	249	23		
6:45 PM	39	52	6	13	91	13		
7:00 PM	0	0	0	0	0	0		
7:15 PM	0	0	0	0	0	0		
7:30 PM	0	0	0	0	0	0		
7:45 PM	0	0	0	0	0	0		
8:00 PM	0	0	0	0	0	0		



Top Hours for Figure 4C-1	Start Time	End Time	Major Street	Minor Street
Top Hour	4:45 PM	5:45 PM	898	141
2nd Highest Hour	3:45 PM	4:45 PM	863	142
3rd Highest Hour	12:00 AM	1:00 AM	0	95
4th Highest Hour	2:45 PM	3:45 PM	739	93

Top Hours for Figure 4C-2	Start Time	End Time	Major Street	Minor Street
Top Hour	4:00 PM	5:00 PM	886	140
2nd Highest Hour	5:00 PM	6:00 PM	849	127
3rd Highest Hour	3:00 PM	4:00 PM	765	115
4th Highest Hour	2:00 PM	3:00 PM	636	90



Are the requirements for Warrant 2 met?: No

Start Time	Southbound Approach						Westbound Approach						Northbound Approach						Eastbound Approach						NOTES:
	Southbound						Westbound						Nouthbound						Eastbound						
	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	
12:00 AM						0						0						0						0	It should be noted that if data is copied overtop of the Hourly Totals or Approach Totals, that the 'AutoSum' Formula will be lost. This should not affect the actual totals if the data was copied from a program that performs the calculations for the user.
12:15 AM						0						0						0						0	
12:30 AM						0						0						0						0	
12:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:00 AM						0						0						0						0	
1:15 AM						0						0						0						0	
1:30 AM						0						0						0						0	
1:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:00 AM						0						0						0						0	
2:15 AM						0						0						0						0	
2:30 AM						0						0						0						0	
2:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 AM						0						0						0						0	
3:15 AM						0						0						0						0	
3:30 AM						0						0						0						0	
3:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:00 AM						0						0						0						0	
4:15 AM						0						0						0						0	
4:30 AM						0						0						0						0	
4:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 AM						0						0						0						0	
5:15 AM						0						0						0						0	
5:30 AM						0						0						0						0	
5:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:00 AM						0						0						0						0	
6:15 AM						0						0						0						0	
6:30 AM						0						0						0						0	
6:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 AM	1	40	0			41	4	3	2			9	1	102	14			117	2	1	3			6	
7:15 AM	5	51	1			57	4	8	0			12	0	101	27			128	10	1	10			21	
7:30 AM	8	60	2			70	3	13	1			17	2	125	25			152	6	3	15			24	
7:45 AM	9	72	5			86	1	8	0			9	0	73	30			103	3	2	6			11	
Hourly Total	23	223	8	0	0	254	12	32	3	0	0	47	3	401	96	0	0	500	21	7	34	0	0	62	
8:00 AM	2	44	1			47	1	4	2			7	1	60	21			82	1	3	1			5	
8:15 AM	0	56	1			57	0	4	0			4	2	57	11			70	5	0	4			9	
8:30 AM	3	43	0			46	2	3	3			8	1	85	22			108	5	2	1			8	
8:45 AM	5	48	1			54	1	7	2			10	1	74	13			88	6	3	7			16	
Hourly Total	10	191	3	0	0	204	4	18	7	0	0	29	5	276	67	0	0	348	17	8	13	0	0	38	
9:00 AM	2	37	1			40	3	7	0			10	3	60	13			76	8	1	2			11	
9:15 AM	1	39	0			40	2	9	0			11	3	49	8			60	6	7	2			15	
9:30 AM	2	43	1			46	1	7	0			8	0	47	10			57	8	4	6			18	
9:45 AM	6	39	1			46	4	1	1			6	1	50	13			64	6	2	2			10	
Hourly Total	11	158	3	0	0	172	10	24	1	0	0	35	7	206	44	0	0	257	28	14	12	0	0	54	
10:00 AM	5	43	0			48	1	5	1			7	1	49	7			57	2	5	6			13	
10:15 AM	2	46	2			50	1	2	1			4	2	47	12			61	4	3	3			10	
10:30 AM	3	46	1			50	1	4	0			5	1	43	4			48	6	2	8			16	
10:45 AM	2	37	1			40	1	5	1			7	2	51	6			59	5	3	2			10	
Hourly Total	12	172	4	0	0	188	4	16	3	0	0	23	6	190	29	0	0	225	17	13	19	0	0	49	
11:00 AM	5	48	1			54	0	4	1			5	0	43	3			46	3	4	5			12	
11:15 AM	1	41	2			44	1	2	0			3	0	44	7			51	8	4	7			19	
11:30 AM	2	47	0			49	3	5	1			9	3	39	13			55	7	3	6			16	
11:45 AM	4	44	2			50	0	3	1			4	1	51	7			59	10	3	7			20	
Hourly Total	12	180	5	0	0	197	4	14	3	0	0	21	4	177	30	0	0	211	28	14	25	0	0	67	
12:00 PM	5	57	2			64	3	6	0			9	1	36	16			53	8	4	5			17	
12:15 PM	7	32	1			40	3	4	2			9	0	47	10			57	7	3	8			18	
12:30 PM	4	51	2			57	2	2	2			6	0	50	11			61	14	4	6			24	
12:45 PM	5	51	0			56	3	4	0			7	2	42	7			51	9	3	9			21	
Hourly Total	21	191	5	0	0	217	11	16	4	0	0	31	3	175	44	0	0	222	38	14	28	0	0	80	
1:00 PM	4	49	1			54	0	7	0			7	2	61	9			72	6	4	10			20	
1:15 PM	3	47	1			51	1	6	0			7	1	71	6			78	6	2	6			14	
1:30 PM	5	49	2			56	1	3	1			5	0	62	5			67	13	2	6			21	
1:45 PM	5	47	1			53	0	2	1			3	2	57	12			71	9	6	4			19	
Hourly Total	17	192	5	0	0	214	2	18	2	0	0	22	5	251	32	0	0	288	34	14	26	0	0	74	
2:00 PM	10	55	2			67	1	2	1			4	2	62	8			72	10	8	6			24	
2:15 PM	5	72	1			78	3	2	0			5	2	58	11			71	14	8	11			33	
2:30 PM	6	71	0			77	4	4	0			8	1	74	16			91	22	2	11			35	
2:45 PM	10	96	3			109	2	1	0			3	0	64	7			71	6	6	6			18	
Hourly Total	31	294	6	0	0	331	10	9	1	0	0	20	5	258	42	0	0	305	52	24	34	0	0	110	
3:00 PM	15	99	3			117	1	3	0			4	3	58	7			68	10	6	11			27	
3:15 PM	7	85	2			94	1	5	1			7	2	81	13			96	18	13	6			37	
3:30 PM	5	90	3			98	1	3	1			5	2	72	12			86	15	10	5			30	
3:45 PM	9	90	7			106	0	3	1			4	3	88	9			100	23	11	13			47	
Hourly Total	36	364	15	0	0	415	3	14	3	0	0	20	10	299	41	0	0	350	66	40	35	0	0	141	
4:00 PM	4	89	3			96	2	6	0			8	4	83	9			96	30	10	12			52	
4:15 PM	6	138	3			147	2	5	0			7	2	76	12			90	20	13	10			43	
4:30 PM	8	102	6			116	4	6	1			11	0	100	12			112	13	9	8			30	
4:45 PM	3	134	1			138	2	3	1			6	1	80	10			91	26	11	9			46	
Hourly Total	21	463	13	0	0	497	10	20	2	0	0	32	7	339	43	0	0	389	89	43	39	0	0	171	
5:00 PM	8	124	4			136	2	2	2			6	2	96	13			111	18	13	12			43	
5:15 PM	6	107	5			118	3	7	3			13	0	90	9			99	26	16	14			56	
5:30 PM	8	93	2			103	1	4	2			7	3	85	14			102	11	9	4			24	
5:45 PM	3	79	6			88	4	0	2			6	1	84	7			92	10	11	5			26	
Hourly Total	25	403	17	0	0	445	10	13	9	0	0	32	6	355	43	0	0	404	65	49	35	0	0	149	
6:00 PM	3	67	3			73	2	3	2			7	1	47	4			52	7	6	5			18	
6:15 PM	2	64	2			68	1	5	2			8	2	74	6			82	8	4	1			13	
6:30 PM	5	70	3			78	2	1	1			4	4	62	14			80	8	1	5			14	
6:45 PM	3	47	2			52	2	3	1			6	1	33	5			39	4	6	3			13	
Hourly Total	13	248	10	0	0	271	7	12	6	0	0	25	8	216	29	0	0	253	27	17	14	0	0	58	
7:00 PM						0						0						0						0	
7:15 PM						0						0						0						0	
7:30 PM						0						0						0						0	
7:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM						0						0						0						0	
8:15 PM						0						0						0						0	
8:30 PM						0						0						0						0	
8:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM						0						0						0						0	
9:15 PM						0						0						0						0	
9:30 PM						0						0						0						0	
9:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:00 PM						0						0						0						0	
10:15 PM						0						0						0						0	
10:30 PM						0						0						0						0	
10:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00 PM						0						0						0						0	
11:15 PM						0						0						0						0	
11:30 PM						0						0						0						0	
11:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Multi-Way Stop Application

OMUTCD Section 2B.07

	Warranted ?
A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.	No
B. Five or more reported crashes in a 12-month period that are susceptible to correction by a multiway stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.	Yes
C. Minimum Volumes:	
1 The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day.	Yes
2 The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour.* *If this condition is satisfied, there must also be an average delay of at least 30 seconds per vehicle during the peak hour.	No
3 If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum volume warrants are 70 percent of the values provided in Items 1 and 2.	Yes
D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.	No

Other criteria that may be considered in an engineering study include:

A. The need to control left-turn conflicts;	No
B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;	No
C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and	No
D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.	No

Are the requirements for Multi-Way Stop Satisfied?: Yes

AUTOCALC table Each hour is individually checked and tallied if "met"								
Lanes Major/ Minor	ADJUSTED VOLUMES		Condition C.1		Condition C.2		Condition D	
	MAJOR	MINOR	100%		70%		80%	
			MAJ.	MIN.	MAJ.	MIN.	MAJ.	MIN.
Required Volumes			300	200	210	140	240	160
6:00 AM	0	0						
6:15 AM	158	8						
6:30 AM	343	23	1		1		1	
6:45 AM	565	44						
7:00 AM	754	58						
7:15 AM	725	57						
7:30 AM	667	46	1		1		1	
7:45 AM	599	28						
8:00 AM	552	32						
8:15 AM	539	35						
8:30 AM	512	40	1		1		1	
8:45 AM	461	49						
9:00 AM	429	43						
9:15 AM	418	48						
9:30 AM	429	43	1		1		1	
9:45 AM	424	42						
10:00 AM	413	46						
10:15 AM	408	41						
10:30 AM	392	49	1		1		1	
10:45 AM	398	48						
11:00 AM	408	56						
11:15 AM	425	59						
11:30 AM	427	59	1		1		1	
11:45 AM	441	64						
12:00 PM	439	65						
12:15 PM	448	69						
12:30 PM	480	65	1		1		1	
12:45 PM	485	63						
1:00 PM	502	61						
1:15 PM	515	63						
1:30 PM	535	79	1		1		1	
1:45 PM	580	89						
2:00 PM	636	90						
2:15 PM	682	93						
2:30 PM	723	95	1		1		1	
2:45 PM	739	93						
3:00 PM	765	115						
3:15 PM	772	132						
3:30 PM	819	142	1		1	1	1	
3:45 PM	863	142						
4:00 PM	886	140						
4:15 PM	941	139						
4:30 PM	921	146	1		1	1	1	
4:45 PM	898	141						
5:00 PM	849	127						
5:15 PM	727	103						
5:30 PM	660	67	1		1		1	

5:45 PM	613	58						
6:00 PM	524	48						
6:15 PM	399	32						
6:30 PM	249	23			1		1	
6:45 PM	91	13						
7:00 PM	0	0						
7:15 PM	0	0						
7:30 PM	0	0						
7:45 PM	0	0						
8:00 PM	0	0						
8:15 PM	0	0						
8:30 PM	0	0						
8:45 PM	0	0						
9:00 PM	0	0						
9:15 PM	0	0						
9:30 PM	0	0						
9:45 PM	0	0						
10:00 PM	0	0						
10:15 PM	0	0						
10:30 PM	0	0						
10:45 PM	0	0						
11:00 PM	0	0						
11:15 PM	0	0						
11:30 PM	0	0						
11:45 PM	0	0						
HOURS MET			**12**	**0**	**13**	**2**	**13**	**0**
CONDITION SATISFIED?			**NO**		**NO**		**NO**	

STUDY AND ANALYSIS INFORMATION

Municipality:	Suffield Township	**Traffic Volumes Obtained By:**	ODOT
County:	Portage	**Analysis Date:**	9/8/2022
ODOT Engineering District:	4	**Agency/ Company Name Performing Warrant Analysis:**	Lanham Engineering, LLC
Google map link:	Map		

Analysis Information

Data Collection Date:	5/4/2022
Day of the Week:	Wednesday
Is the intersection in a built-up area of an isolated community of <10,000 population?	No
Existing Traffic Signal at intersection:	No
Total Number of Approaches at Intersection:	4

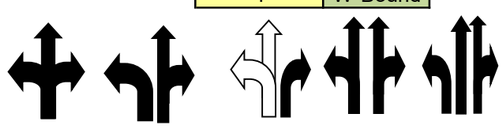
Major Street Information

Major Street Name and Route Number:	SR-43	
Major Street Approach Direction:	N-Bound S-Bound	
Number of Thru Lanes on Each Major Street Approach:	1	**LANE(S)**
Speed Limit or 85th Percentile Speed on the Major Street*:	45	**MPH**

*Unknown assumes below 45 mph

Minor Street Information

Minor Street Name and Route Number:	Trares	
Minor Street Approach Configuration:	1	E-Bound
	1	W-Bound



Number of Thru Lanes on Each Minor Street Approach:	1	**LANE(S)**
Apply Right Turn Lane Reduction*:	Yes	

*Right Turn Lane Reduction Shall be used for Warrants 1, 2, & 3 for New ODOT Signals. Please refer to TEM 402-3.2 for clarification and criteria under which Right Turn Reduction is not required.

TRAFFIC SIGNAL WARRANT ANALYSIS FINDINGS

	Applicable?	Warrant Satisfied?	Notes and Comments:
Warrant 1, Eight-Hour Vehicular Volume	Yes	**No**	
Warrant 2, Four-Hour Vehicular Volume	Yes	**No**	Figure 4C-2 (70% Factor)
Warrant 3, Peak Hour	No		Signals installed under Warrant 3 should be traffic actuated. **Peak Hour** 4:30 PM, 5:30 PM

For Warrants 1-3, new ODOT signals must be based off of 100% volume thresholds (TEM 402-3.2)

Warrant 4, Pedestrian Volume	No		If this warrant is met, and a traffic control signal is justified by an engineering study, the traffic control signal shall be equipped with pedestrian signal heads complying with the provisions set forth in Chapter 4E of the OMUTCD. **Peak Hour** 4:15 PM, 5:15 PM
Warrant 5, School Crossing	No		N/A
Warrant 6, Coordinated Signal System	No		(Shall not be used as the sole warrant in the analysis)
Warrant 7, Crash Experience	No		If this is the sole warrant, signal must be semi-actuated with control devices which provide proper coordination if installed at an intersection within a coordinated system and normally should be fully traffic actuated if installed at an isolated intersection.
Warrant 8, Roadway Network	No		(Shall not be used as the sole warrant in the analysis)
Warrant 9, Intersection Near a Grade Crossing	No		Figure 4C-9
Multi-Way Stop Warrant	No		May be used as an interim measure if traffic signal warrants are satisfied.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

If no warrants are satisfied, additional options may be considered:

1. An engineering study, performed by a firm prequalified by ODOT for signal design, if approved by the ODOT district, may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet the published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that serves to reduce queuing across the tracks.
2. According to TEM 402-2, If the actual turning movement counts fail to satisfy a signal warrant, it may be acceptable to use traffic volumes projected to the second year after project completion. The **Modeling and Forecasting Section** should provide the projected traffic volumes.
3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location that does not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants under Sections 4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. **Please fill inputs on PHB Score Sheet and submit to ODOT.**

Considerations such as geometrics and lack of sight distance generally have not been accepted in lieu of satisfying signal warrants. These considerations may allow an otherwise unwarranted traffic signal to be retained at **100 percent** local cost. Please review TEM 402-4 for details.

Conclusion: Do Not Install New Traffic Signal

Notes:

OMUTCD WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach	
Major Street:	1 Lane
Minor Street:	1 Lane

Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? Yes

**Only applicable after an adequate trial of other alternatives (See section 4C.02.06 of the 2012 OMUTCD)*

Lanes Major/ Minor	Adjusted Volumes		Condition A				Condition B				Combination A/B*							
											Cond. A		Cond. B		Cond. A		Cond. B	
	Major	Minor	100%		70%		100%		70%		80%		80%		56%		56%	
			Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.	Maj.	Min.
1 / 1	X		500	150	350	105	750	75	525	53	400	120	600	60	280	84	420	42
2+ / 1			600	150	420	105	900	75	630	53	480	120	720	60	336	84	504	42
2+ / 2+			600	200	420	140	900	100	630	70	480	160	720	80	336	112	504	56
1 / 2+			500	200	350	140	750	100	525	70	400	160	600	80	280	112	420	56
12:00 AM	0	0																
12:15 AM	0	0																
12:30 AM	0	0																
12:45 AM	0	0																
1:00 AM	0	0																
1:15 AM	0	0																
1:30 AM	0	0																
1:45 AM	0	0																
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5:15 AM	0	0																
5:30 AM	0	0																
5:45 AM	0	0																
6:00 AM	0	0																
6:15 AM	157	16																
6:30 AM	341	39													1			
6:45 AM	563	61	1		1				1	1	1						1	1
7:00 AM	749	74											1	1				
7:15 AM	717	75																
7:30 AM	660	62													1			
7:45 AM	591	50	1		1				1		1						1	1
8:00 AM	546	47																
8:15 AM	536	46																
8:30 AM	509	51													1			
8:45 AM	457	55			1						1						1	1
9:00 AM	425	51																
9:15 AM	415	60																
9:30 AM	426	57													1			
9:45 AM	420	61			1						1						1	1
10:00 AM	407	58																
10:15 AM	403	57																
10:30 AM	387	69													1			
10:45 AM	396	66			1													
11:00 AM	407	80									1							
11:15 AM	422	76															1	1
11:30 AM	424	77													1			
11:45 AM	436	85			1													
12:00 PM	436	87									1							
12:15 PM	443	99															1	1
12:30 PM	475	96													1	1		
12:45 PM	479	93			1													
1:00 PM	496	82									1							
1:15 PM	509	85	1														1	1
1:30 PM	527	105							1	1					1	1		
1:45 PM	576	117			1	1												
2:00 PM	631	121									1	1	1	1				
2:15 PM	680	128	1														1	1
2:30 PM	721	123							1	1					1	1		
2:45 PM	735	136			1	1												
3:00 PM	760	148					1	1			1	1	1	1				
3:15 PM	767	166	1	1													1	1
3:30 PM	815	177							1	1					1	1		
3:45 PM	859	174			1	1												
4:00 PM	885	172					1	1			1	1	1	1				
4:15 PM	936	175	1	1													1	1
4:30 PM	919	184							1	1					1	1		
4:45 PM	896	177			1	1												
5:00 PM	846	178					1	1			1	1	1	1				
5:15 PM	728	130	1														1	1
5:30 PM	659	100							1	1					1	1		
5:45 PM	611	80			1													
6:00 PM	522	66									1							
6:15 PM	397	47																
6:30 PM	247	33																
6:45 PM	91	18																
7:00 PM	0	0																
7:15 PM	0	0																
7:30 PM	0	0																
7:45 PM	0	0																
8:00 PM	0	0																
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8:45 PM	0	0																
9:00 PM	0	0																
9:15 PM	0	0																
9:30 PM	0	0																
9:45 PM	0	0																
HOURS MET			**7**	**2**	**12**	**4**	**3**	**3**	**7**	**6**	**12**	**4**	**5**	**5**	**12**	**6**	**11**	**11**
WARRANT SATISFIED?			**NO**		**NO**		**NO**		**NO**		**NO**				**NO**			

Warrant Met: No

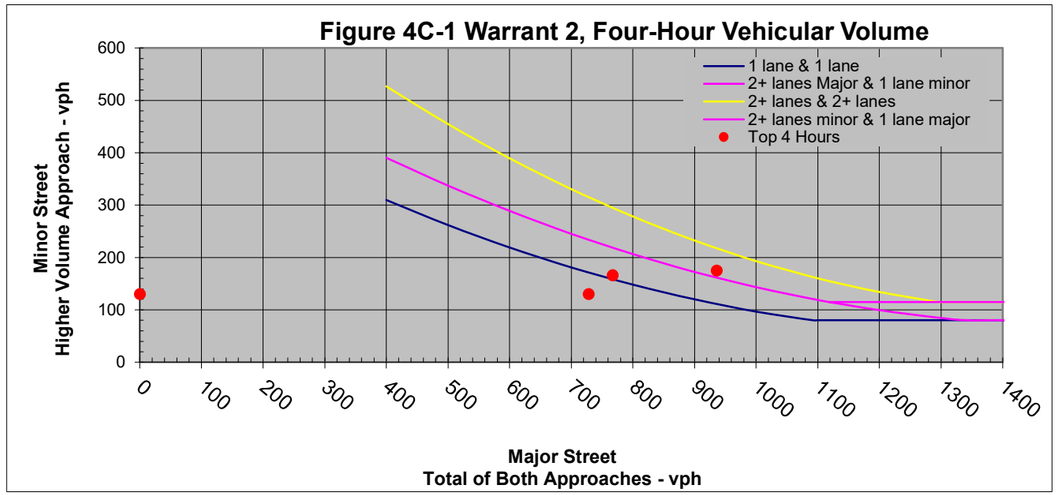
Notes:

OMUTCD WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

Number of Lanes for Moving Traffic on Each Approach		Total Number of Unique Hours Met on Figure 4C-1	2
Major street:	1 Lane	Total Number of Unique Hours Met on Figure 4C-2 (70% Factor)	5
Minor Street:	1 Lane		

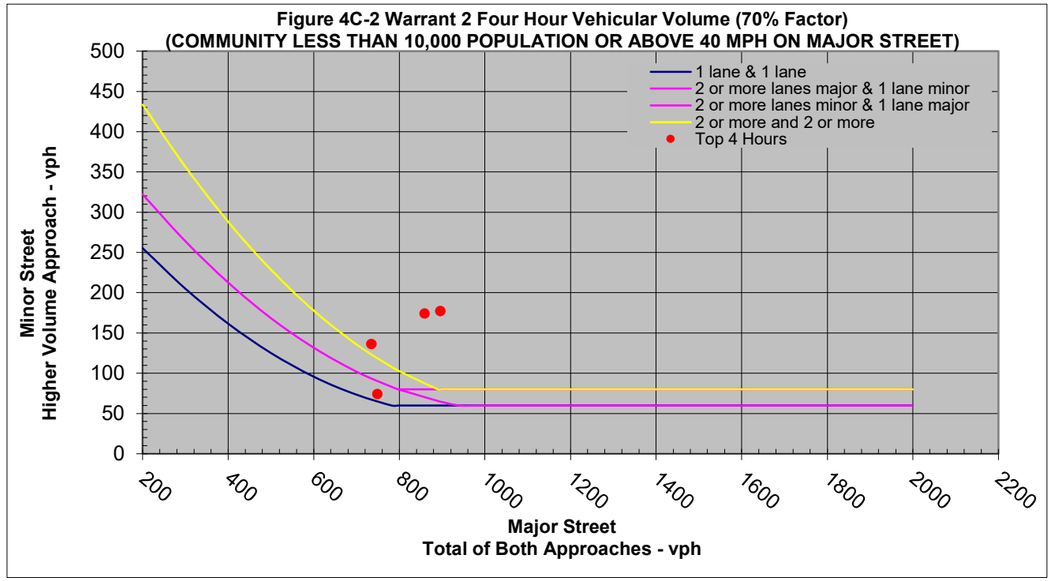
Built up Isolated Community with Less Than 10,000 Population or Above 40 MPH on Major Street? Yes

Hour Interval Beginning At	Raw Traffic Counts				Total Major Approach Volumes	Highest Actual Minor Street Approach Volumes	Hour Met?	Hour Met? (70% Factor)
	Major - SR-43		Minor - Trares					
	N-Bound	S-Bound	W-Bound	E-Bound				
6:00 AM	0	0	0	0	0	0		
6:15 AM	117	40	16	7	157	16		
6:30 AM	245	96	39	27	341	39		
6:45 AM	397	166	57	61	563	61		
7:00 AM	500	249	73	74	749	74		Met
7:15 AM	465	252	74	75	717	75		
7:30 AM	407	253	60	62	660	62		
7:45 AM	363	228	50	40	591	50		
8:00 AM	348	198	47	39	546	47		
8:15 AM	342	194	46	40	536	46		
8:30 AM	332	177	51	44	509	51		
8:45 AM	281	176	55	52	457	55		
9:00 AM	257	168	51	48	425	51		
9:15 AM	238	177	44	60	415	60		
9:30 AM	239	187	37	57	426	57		
9:45 AM	230	190	36	61	420	61		
10:00 AM	225	182	42	58	407	58		
10:15 AM	214	189	44	57	403	57		
10:30 AM	204	183	43	69	387	69		
10:45 AM	211	185	43	66	396	66		
11:00 AM	211	196	40	80	407	80		
11:15 AM	218	204	40	76	422	76		
11:30 AM	224	200	43	77	424	77		
11:45 AM	230	206	41	85	436	85		
12:00 PM	222	214	39	87	436	87		
12:15 PM	241	202	40	99	443	99		
12:30 PM	262	213	43	96	475	96		
12:45 PM	268	211	43	93	479	93		
1:00 PM	288	208	43	82	496	82		
1:15 PM	288	221	41	85	509	85		
1:30 PM	281	246	36	105	527	105		
1:45 PM	305	271	33	117	576	117		Met
2:00 PM	305	326	34	121	631	121		
2:15 PM	301	379	32	128	680	128		
2:30 PM	326	395	36	123	721	123		
2:45 PM	321	414	36	136	735	136		Met
3:00 PM	350	410	39	148	760	148		
3:15 PM	378	389	40	166	767	166	Met	
3:30 PM	372	443	37	177	815	177		
3:45 PM	398	461	45	174	859	174		Met
4:00 PM	389	496	44	172	885	172		
4:15 PM	404	532	46	175	936	175	Met	
4:30 PM	413	506	54	184	919	184		
4:45 PM	403	493	56	177	896	177		Met
5:00 PM	404	442	54	178	846	178		
5:15 PM	345	383	55	130	728	130		
5:30 PM	328	331	52	100	659	100		
5:45 PM	306	305	45	80	611	80		
6:00 PM	253	269	46	66	522	66		
6:15 PM	201	196	34	47	397	47		
6:30 PM	119	128	23	33	247	33		
6:45 PM	39	52	12	18	91	18		
7:00 PM	0	0	0	0	0	0		
7:15 PM	0	0	0	0	0	0		
7:30 PM	0	0	0	0	0	0		
7:45 PM	0	0	0	0	0	0		
8:00 PM	0	0	0	0	0	0		



Top Hours for Figure 4C-1	Start Time	End Time	Major Street	Minor Street
Top Hour	4:15 PM	5:15 PM	936	175
2nd Highest Hour	3:15 PM	4:15 PM	767	166
3rd Highest Hour	12:00 AM	1:00 AM	0	130
4th Highest Hour	5:15 PM	6:15 PM	728	130

Top Hours for Figure 4C-2	Start Time	End Time	Major Street	Minor Street
Top Hour	4:45 PM	5:45 PM	896	177
2nd Highest Hour	3:45 PM	4:45 PM	859	174
3rd Highest Hour	2:45 PM	3:45 PM	735	136
4th Highest Hour	7:00 AM	8:00 AM	749	74



Are the requirements for Warrant 2 met?: No

Start Time	Southbound Approach						Westbound Approach						Northbound Approach						Eastbound Approach						NOTES:
	Southbound						Westbound						Nouthbound						Eastbound						
	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	
12:00 AM						0						0						0						0	It should be noted that if data is copied overtop of the Hourly Totals or Approach Totals, that the 'AutoSum' Formula will be lost. This should not affect the actual totals if the data was copied from a program that performs the calculations for the user.
12:15 AM						0						0						0						0	
12:30 AM						0						0						0						0	
12:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:00 AM						0						0						0						0	
1:15 AM						0						0						0						0	
1:30 AM						0						0						0						0	
1:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:00 AM						0						0						0						0	
2:15 AM						0						0						0						0	
2:30 AM						0						0						0						0	
2:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 AM						0						0						0						0	
3:15 AM						0						0						0						0	
3:30 AM						0						0						0						0	
3:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:00 AM						0						0						0						0	
4:15 AM						0						0						0						0	
4:30 AM						0						0						0						0	
4:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 AM						0						0						0						0	
5:15 AM						0						0						0						0	
5:30 AM						0						0						0						0	
5:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:00 AM						0						0						0						0	
6:15 AM						0						0						0						0	
6:30 AM						0						0						0						0	
6:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 AM	1	38	1			40	4	8	4			16	1	101	15			117	2	1	4			7	
7:15 AM	5	48	3			56	4	17	3			24	0	101	27			128	10	1	13			24	
7:30 AM	8	60	2			70	3	15	1			19	2	125	25			152	6	3	24			33	
7:45 AM	9	69	5			83	1	11	3			15	0	72	31			103	3	2	9			14	
Hourly Total	23	215	11	0	0	249	12	51	11	0	0	74	3	399	98	0	0	500	21	7	50	0	0	78	
8:00 AM	2	40	1			43	1	10	6			17	1	59	22			82	1	3	4			8	
8:15 AM	0	55	2			57	0	8	1			9	2	57	11			70	5	0	5			10	
8:30 AM	3	42	0			45	2	3	4			9	1	85	22			108	5	2	3			10	
8:45 AM	5	47	1			53	1	8	3			12	1	74	13			88	6	3	8			17	
Hourly Total	10	184	4	0	0	198	4	29	14	0	0	47	5	275	68	0	0	348	17	8	20	0	0	45	
9:00 AM	2	36	1			39	3	13	1			17	3	60	13			76	8	1	3			12	
9:15 AM	1	39	0			40	2	12	0			14	3	49	8			60	6	7	2			15	
9:30 AM	2	40	2			44	1	9	3			13	0	47	10			57	8	4	7			19	
9:45 AM	6	38	1			45	4	3	2			9	1	50	13			64	6	2	5			13	
Hourly Total	11	153	4	0	0	168	10	37	6	0	0	53	7	206	44	0	0	257	28	14	17	0	0	59	
10:00 AM	5	43	0			48	1	7	1			9	1	48	8			57	2	5	10			17	
10:15 AM	2	46	2			50	1	5	1			7	2	47	12			61	4	3	5			12	
10:30 AM	3	43	1			47	1	8	3			12	1	43	4			48	6	2	14			22	
10:45 AM	2	33	2			37	1	8	5			14	2	51	6			59	5	3	2			10	
Hourly Total	12	165	5	0	0	182	4	28	10	0	0	42	6	189	30	0	0	225	17	13	31	0	0	61	
11:00 AM	5	47	3			55	0	9	2			11	0	42	4			46	3	4	9			16	
11:15 AM	1	41	2			44	1	5	0			6	0	44	7			51	8	4	13			25	
11:30 AM	2	47	0			49	3	9	1			13	3	39	13			55	7	3	9			19	
11:45 AM	4	42	2			48	0	7	3			10	1	51	7			59	10	3	12			25	
Hourly Total	12	177	7	0	0	196	4	30	6	0	0	40	4	176	31	0	0	211	28	14	43	0	0	85	
12:00 PM	5	56	2			63	3	8	1			12	1	36	16			53	8	4	8			20	
12:15 PM	7	32	1			40	3	4	2			9	0	47	10			57	7	3	15			25	
12:30 PM	4	49	2			55	2	5	4			11	0	50	11			61	14	4	12			30	
12:45 PM	5	51	0			56	3	6	0			9	2	42	7			51	9	3	15			27	
Hourly Total	21	188	5	0	0	214	11	23	7	0	0	41	3	175	44	0	0	222	38	14	50	0	0	102	
1:00 PM	4	46	1			51	0	9	3			12	2	61	9			72	6	4	14			24	
1:15 PM	3	47	1			51	1	11	0			12	1	69	8			78	6	2	14			22	
1:30 PM	5	46	2			53	1	6	4			11	0	62	5			67	13	2	11			26	
1:45 PM	5	47	1			53	0	7	1			8	2	56	13			71	9	6	8			23	
Hourly Total	17	186	5	0	0	208	2	33	8	0	0	43	5	248	35	0	0	288	34	14	47	0	0	95	
2:00 PM	10	52	2			64	1	5	4			10	2	60	10			72	10	8	11			29	
2:15 PM	5	70	1			76	3	3	2			8	2	57	12			71	14	8	23			45	
2:30 PM	6	71	1			78	4	4	0			8	1	72	18			91	22	2	18			42	
2:45 PM	10	95	3			108	2	7	1			10	0	64	7			71	6	6	13			25	
Hourly Total	31	288	7	0	0	326	10	19	7	0	0	36	5	253	47	0	0	305	52	24	65	0	0	141	
3:00 PM	15	96	6			117	1	4	3			8	3	57	8			68	10	6	20			36	
3:15 PM	7	83	2			92	1	7	3			11	2	81	13			96	18	13	11			42	
3:30 PM	5	89	3			97	1	5	2			8	2	72	12			86	15	10	17			42	
3:45 PM	9	87	8			104	0	8	4			12	3	87	10			100	23	11	20			54	
Hourly Total	36	355	19	0	0	410	3	24	12	0	0	39	10	297	43	0	0	350	66	40	68	0	0	174	
4:00 PM	4	89	3			96	2	7	0			9	4	83	9			96	30	10	22			62	
4:15 PM	6	137	3			146	2	6	1			9	2	75	13			90	20	13	16			49	
4:30 PM	8	101	6			115	4	10	2			16	0	99	13			112	13	9	17			39	
4:45 PM	3	133	3			139	2	8	2			12	1	80	10			91	26	11	16			53	
Hourly Total	21	460	15	0	0	496	10	31	5	0	0	46	7	337	45	0	0	389	89	43	71	0	0	203	
5:00 PM	8	120	4			132	2	3	6			11	2	95	14			111	18	13	26			57	
5:15 PM	6	106	8			120	3	9	4			16	0	89	10			99	26	16	22			64	
5:30 PM	8	91	3			102	1	13	4			18	3	85	14			102	11	9	11			31	
5:45 PM	3	79	6			88	4	5	2			11	1	83	8			92	10	11	14			35	
Hourly Total	25	396	21	0	0	442	10	30	16	0	0	56	6	352	46	0	0	404	65	49	73	0	0	187	
6:00 PM	3	67	3			73	2	8	2			12	1	47	4			52	7	6	8			21	
6:15 PM	2	64	2			68	1	9	2			12	2	74	6			82	8	4	8			20	
6:30 PM	5	66	5			76	2	4	5			11	4	62	14			80	8	1	8			17	
6:45 PM	3	45	4			52	2	7	3			12	1	33	5			39	4	6	8			18	
Hourly Total	13	242	14	0	0	269	7	28	12	0	0	47	8	216	29	0	0	253	27	17	32	0	0	76	
7:00 PM						0						0						0						0	
7:15 PM						0						0						0						0	
7:30 PM						0						0						0						0	
7:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM						0						0						0						0	
8:15 PM						0						0						0						0	
8:30 PM						0						0						0						0	
8:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM						0						0						0						0	
9:15 PM						0						0						0						0	
9:30 PM						0						0						0						0	
9:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:00 PM						0						0						0						0	
10:15 PM						0						0						0						0	
10:30 PM						0						0						0						0	
10:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00 PM						0						0						0						0	
11:15 PM						0						0						0						0	
11:30 PM						0						0						0						0	
11:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Start Time	Southbound Approach						Westbound Approach						Northbound Approach						Eastbound Approach						NOTES:
	Southbound						Westbound						Nouthbound						Eastbound						
	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	
12:00 AM						0						0						0						0	It should be noted that if data is copied overtop of the Hourly Totals or Approach Totals, that the 'AutoSum' Formula will be lost. This should not affect the actual totals if the data was copied from a program that performs the calculations for the user.
12:15 AM						0						0						0						0	
12:30 AM						0						0						0						0	
12:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:00 AM						0						0						0						0	
1:15 AM						0						0						0						0	
1:30 AM						0						0						0						0	
1:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:00 AM						0						0						0						0	
2:15 AM						0						0						0						0	
2:30 AM						0						0						0						0	
2:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 AM						0						0						0						0	
3:15 AM						0						0						0						0	
3:30 AM						0						0						0						0	
3:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:00 AM						0						0						0						0	
4:15 AM						0						0						0						0	
4:30 AM						0						0						0						0	
4:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 AM						0						0						0						0	
5:15 AM						0						0						0						0	
5:30 AM						0						0						0						0	
5:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:00 AM						0						0						0						0	
6:15 AM						0						0						0						0	
6:30 AM						0						0						0						0	
6:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 AM	1	40	0			41	4	3	2			9	1	102	14			117	2	1	3			6	
7:15 AM	5	51	1			57	4	8	0			12	0	101	27			128	10	1	10			21	
7:30 AM	8	60	2			70	3	13	1			17	2	125	25			152	6	3	15			24	
7:45 AM	9	72	5			86	1	8	0			9	0	73	30			103	3	2	6			11	
Hourly Total	23	223	8	0	0	254	12	32	3	0	0	47	3	401	96	0	0	500	21	7	34	0	0	62	
8:00 AM	2	44	1			47	1	4	2			7	1	60	21			82	1	3	1			5	
8:15 AM	0	56	1			57	0	4	0			4	2	57	11			70	5	0	4			9	
8:30 AM	3	43	0			46	2	3	3			8	1	85	22			108	5	2	1			8	
8:45 AM	5	48	1			54	1	7	2			10	1	74	13			88	6	3	7			16	
Hourly Total	10	191	3	0	0	204	4	18	7	0	0	29	5	276	67	0	0	348	17	8	13	0	0	38	
9:00 AM	2	37	1			40	3	7	0			10	3	60	13			76	8	1	2			11	
9:15 AM	1	39	0			40	2	9	0			11	3	49	8			60	6	7	2			15	
9:30 AM	2	43	1			46	1	7	0			8	0	47	10			57	8	4	6			18	
9:45 AM	6	39	1			46	4	1	1			6	1	50	13			64	6	2	2			10	
Hourly Total	11	158	3	0	0	172	10	24	1	0	0	35	7	206	44	0	0	257	28	14	12	0	0	54	
10:00 AM	5	43	0			48	1	5	1			7	1	49	7			57	2	5	6			13	
10:15 AM	2	46	2			50	1	2	1			4	2	47	12			61	4	3	3			10	
10:30 AM	3	46	1			50	1	4	0			5	1	43	4			48	6	2	8			16	
10:45 AM	2	37	1			40	1	5	1			7	2	51	6			59	5	3	2			10	
Hourly Total	12	172	4	0	0	188	4	16	3	0	0	23	6	190	29	0	0	225	17	13	19	0	0	49	
11:00 AM	5	48	1			54	0	4	1			5	0	43	3			46	3	4	5			12	
11:15 AM	1	41	2			44	1	2	0			3	0	44	7			51	8	4	7			19	
11:30 AM	2	47	0			49	3	5	1			9	3	39	13			55	7	3	6			16	
11:45 AM	4	44	2			50	0	3	1			4	1	51	7			59	10	3	7			20	
Hourly Total	12	180	5	0	0	197	4	14	3	0	0	21	4	177	30	0	0	211	28	14	25	0	0	67	
12:00 PM	5	57	2			64	3	6	0			9	1	36	16			53	8	4	5			17	
12:15 PM	7	32	1			40	3	4	2			9	0	47	10			57	7	3	8			18	
12:30 PM	4	51	2			57	2	2	2			6	0	50	11			61	14	4	6			24	
12:45 PM	5	51	0			56	3	4	0			7	2	42	7			51	9	3	9			21	
Hourly Total	21	191	5	0	0	217	11	16	4	0	0	31	3	175	44	0	0	222	38	14	28	0	0	80	
1:00 PM	4	49	1			54	0	7	0			7	2	61	9			72	6	4	10			20	
1:15 PM	3	47	1			51	1	6	0			7	1	71	6			78	6	2	6			14	
1:30 PM	5	49	2			56	1	3	1			5	0	62	5			67	13	2	6			21	
1:45 PM	5	47	1			53	0	2	1			3	2	57	12			71	9	6	4			19	
Hourly Total	17	192	5	0	0	214	2	18	2	0	0	22	5	251	32	0	0	288	34	14	26	0	0	74	
2:00 PM	10	55	2			67	1	2	1			4	2	62	8			72	10	8	6			24	
2:15 PM	5	72	1			78	3	2	0			5	2	58	11			71	14	8	11			33	
2:30 PM	6	71	0			77	4	4	0			8	1	74	16			91	22	2	11			35	
2:45 PM	10	96	3			109	2	1	0			3	0	64	7			71	6	6	6			18	
Hourly Total	31	294	6	0	0	331	10	9	1	0	0	20	5	258	42	0	0	305	52	24	34	0	0	110	
3:00 PM	15	99	3			117	1	3	0			4	3	58	7			68	10	6	11			27	
3:15 PM	7	85	2			94	1	5	1			7	2	81	13			96	18	13	6			37	
3:30 PM	5	90	3			98	1	3	1			5	2	72	12			86	15	10	5			30	
3:45 PM	9	90	7			106	0	3	1			4	3	88	9			100	23	11	13			47	
Hourly Total	36	364	15	0	0	415	3	14	3	0	0	20	10	299	41	0	0	350	66	40	35	0	0	141	
4:00 PM	4	89	3			96	2	6	0			8	4	83	9			96	30	10	12			52	
4:15 PM	6	138	3			147	2	5	0			7	2	76	12			90	20	13	10			43	
4:30 PM	8	102	6			116	4	6	1			11	0	100	12			112	13	9	8			30	
4:45 PM	3	134	1			138	2	3	1			6	1	80	10			91	26	11	9			46	
Hourly Total	21	463	13	0	0	497	10	20	2	0	0	32	7	339	43	0	0	389	89	43	39	0	0	171	
5:00 PM	8	124	4			136	2	2	2			6	2	96	13			111	18	13	12			43	
5:15 PM	6	107	5			118	3	7	3			13	0	90	9			99	26	16	14			56	
5:30 PM	8	93	2			103	1	4	2			7	3	85	14			102	11	9	4			24	
5:45 PM	3	79	6			88	4	0	2			6	1	84	7			92	10	11	5			26	
Hourly Total	25	403	17	0	0	445	10	13	9	0	0	32	6	355	43	0	0	404	65	49	35	0	0	149	
6:00 PM	3	67	3			73	2	3	2			7	1	47	4			52	7	6	5			18	
6:15 PM	2	64	2			68	1	5	2			8	2	74	6			82	8	4	1			13	
6:30 PM	5	70	3			78	2	1	1			4	4	62	14			80	8	1	5			14	
6:45 PM	3	47	2			52	2	3	1			6	1	33	5			39	4	6	3			13	
Hourly Total	13	248	10	0	0	271	7	12	6	0	0	25	8	216	29	0	0	253	27	17	14	0	0	58	
7:00 PM						0						0						0						0	
7:15 PM						0						0						0						0	
7:30 PM						0						0						0						0	
7:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM						0						0						0						0	
8:15 PM						0						0						0						0	
8:30 PM						0						0						0						0	
8:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM						0						0						0						0	
9:15 PM						0						0						0						0	
9:30 PM						0						0						0						0	
9:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:00 PM						0						0						0						0	
10:15 PM						0						0						0						0	
10:30 PM						0						0						0						0	
10:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00 PM						0						0						0						0	
11:15 PM						0						0						0						0	
11:30 PM						0						0						0						0	
11:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Start Time	Southbound Approach						Westbound Approach						Northbound Approach						Eastbound Approach						NOTES:
	Southbound						Westbound						Nouthbound						Eastbound						
	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	
12:00 AM						0						0						0						0	It should be noted that if data is copied overtop of the Hourly Totals or Approach Totals, that the 'AutoSum' Formula will be lost. This should not affect the actual totals if the data was copied from a program that performs the calculations for the user.
12:15 AM						0						0						0						0	
12:30 AM						0						0						0						0	
12:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:00 AM						0						0						0						0	
1:15 AM						0						0						0						0	
1:30 AM						0						0						0						0	
1:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:00 AM						0						0						0						0	
2:15 AM						0						0						0						0	
2:30 AM						0						0						0						0	
2:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 AM						0						0						0						0	
3:15 AM						0						0						0						0	
3:30 AM						0						0						0						0	
3:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:00 AM						0						0						0						0	
4:15 AM						0						0						0						0	
4:30 AM						0						0						0						0	
4:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 AM						0						0						0						0	
5:15 AM						0						0						0						0	
5:30 AM						0						0						0						0	
5:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:00 AM						0						0						0						0	
6:15 AM						0						0						0						0	
6:30 AM						0						0						0						0	
6:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 AM	1	40	1			42	0	5	2			7	0	104	1			105	1	1	0			2	
7:15 AM	0	52	2			54	2	9	3			14	1	116	0			117	0	1	2			3	
7:30 AM	4	71	0			75	0	2	0			2	2	143	0			145	1	2	7			10	
7:45 AM	8	82	0			90	0	3	3			6	3	74	1			78	2	0	3			5	
Hourly Total	13	245	3	0	0	261	2	19	8	0	0	29	6	437	2	0	0	445	4	4	12	0	0	20	
8:00 AM	1	46	0			47	0	6	4			10	0	58	1			59	0	2	1			3	
8:15 AM	0	55	1			56	2	4	1			7	2	65	0			67	0	0	1			1	
8:30 AM	6	44	0			50	0	0	1			1	3	83	0			86	2	1	1			4	
8:45 AM	2	53	0			55	1	1	1			3	3	79	0			82	0	0	1			1	
Hourly Total	9	198	1	0	0	208	3	11	7	0	0	21	8	285	1	0	0	294	2	3	4	0	0	9	
9:00 AM	5	39	0			44	0	6	1			7	0	65	0			65	0	1	0			1	
9:15 AM	2	39	0			41	1	3	0			4	1	50	0			51	1	0	0			1	
9:30 AM	2	43	1			46	0	2	3			5	4	50	0			54	0	1	0			1	
9:45 AM	2	45	0			47	1	2	1			4	2	54	0			56	0	2	1			3	
Hourly Total	11	166	1	0	0	178	2	13	5	0	0	20	7	219	0	0	0	226	1	4	1	0	0	6	
10:00 AM	9	46	0			55	1	2	0			3	2	55	1			58	1	3	1			5	
10:15 AM	2	52	0			54	0	3	0			3	0	49	0			49	0	2	0			2	
10:30 AM	6	48	0			54	0	4	3			7	3	47	0			50	0	1	5			6	
10:45 AM	6	36	1			43	0	3	4			7	3	51	0			54	0	0	0			0	
Hourly Total	23	182	1	0	0	206	1	12	7	0	0	20	8	202	1	0	0	211	1	6	6	0	0	13	
11:00 AM	5	52	2			59	1	5	1			7	2	43	1			46	2	3	1			6	
11:15 AM	3	41	0			44	0	3	0			3	1	54	0			55	0	1	5			6	
11:30 AM	8	50	0			58	0	4	0			4	2	44	0			46	2	1	2			5	
11:45 AM	0	40	0			40	1	4	2			7	3	56	0			59	0	4	1			5	
Hourly Total	16	183	2	0	0	201	2	16	3	0	0	21	8	197	1	0	0	206	4	9	9	0	0	22	
12:00 PM	5	71	0			76	0	2	1			3	4	41	0			45	1	2	1			4	
12:15 PM	7	40	0			47	1	0	0			1	1	56	0			57	0	3	4			7	
12:30 PM	2	55	0			57	1	3	2			6	2	55	0			57	0	1	5			6	
12:45 PM	4	56	0			60	0	2	0			2	5	51	0			56	1	4	2			7	
Hourly Total	18	222	0	0	0	240	2	7	3	0	0	12	12	203	0	0	0	215	2	10	12	0	0	24	
1:00 PM	3	49	0			52	1	2	3			6	3	62	0			65	0	2	2			4	
1:15 PM	9	54	0			63	1	5	0			6	2	76	2			80	0	3	5			8	
1:30 PM	9	53	0			62	1	3	3			7	1	70	0			71	0	2	3			5	
1:45 PM	5	50	0			55	0	5	0			5	3	56	1			60	0	2	2			4	
Hourly Total	26	206	0	0	0	232	3	15	6	0	0	24	9	264	3	0	0	276	0	9	12	0	0	21	
2:00 PM	5	65	0			70	1	3	3			7	4	58	2			64	1	4	1			6	
2:15 PM	2	76	0			78	1	1	2			4	1	77	1			79	1	6	6			13	
2:30 PM	11	79	1			91	1	0	0			1	3	82	2			87	0	1	6			7	
2:45 PM	8	98	0			106	0	6	1			7	3	68	0			71	2	2	5			9	
Hourly Total	26	318	1	0	0	345	3	10	6	0	0	19	11	285	5	0	0	301	4	13	18	0	0	35	
3:00 PM	11	121	3			135	0	1	3			4	7	61	1			69	4	4	5			13	
3:15 PM	4	91	0			95	0	2	2			4	7	81	0			88	0	3	2			5	
3:30 PM	7	92	0			99	0	2	1			3	8	67	0			75	1	11	1			13	
3:45 PM	14	107	1			122	0	5	3			8	6	98	1			105	0	4	3			7	
Hourly Total	36	411	4	0	0	451	0	10	9	0	0	19	28	307	2	0	0	337	5	22	11	0	0	38	
4:00 PM	7	89	0			96	1	1	0			2	2	95	0			97	0	8	2			10	
4:15 PM	5	151	0			156	1	1	1			3	6	78	1			85	3	5	1			9	
4:30 PM	8	112	0			120	0	4	1			5	6	105	1			112	4	5	4			13	
4:45 PM	3	138	2			143	1	5	1			7	4	92	0			96	0	6	1			7	
Hourly Total	23	490	2	0	0	515	3	11	3	0	0	17	18	370	2	0	0	390	7	24	8	0	0	39	
5:00 PM	7	130	0			137	1	1	4			6	5	102	1			108	0	9	5			14	
5:15 PM	3	115	3			121	2	2	1			5	8	95	1			104	3	4	4			11	
5:30 PM	10	98	1			109	0	9	2			11	5	88	0			93	2	6	1			9	
5:45 PM	3	89	0			92	1	5	0			6	1	86	1			88	1	7	2			10	
Hourly Total	23	432	4	0	0	459	4	17	7	0	0	28	19	371	3	0	0	393	6	26	12	0	0	44	
6:00 PM	4	71	0			75	0	5	0			5	5	52	0			57	4	2	1			7	
6:15 PM	0	67	0			67	1	4	0			5	3	70	0			73	0	6	1			7	
6:30 PM	2	74	2			78	0	3	4			7	0	65	0			65	2	1	2			5	
6:45 PM	1	48	2			51	2	4	2			8	8	32	0			40	1	3	2			6	
Hourly Total	7	260	4	0	0	271	3	16	6	0	0	25	16	219	0	0	0	235	7	12	6	0	0	25	
7:00 PM						0						0						0						0	
7:15 PM						0						0						0						0	
7:30 PM						0						0						0						0	
7:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM						0						0						0						0	
8:15 PM						0						0						0						0	
8:30 PM						0						0						0						0	
8:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM						0						0						0						0	
9:15 PM						0						0						0						0	
9:30 PM						0						0						0						0	
9:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:00 PM						0						0						0						0	
10:15 PM						0						0						0						0	
10:30 PM						0						0						0						0	
10:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00 PM						0						0						0						0	
11:15 PM						0						0						0						0	
11:30 PM						0						0						0						0	
11:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Start Time	Southbound Approach						Westbound Approach						Northbound Approach						Eastbound Approach						NOTES:
	Southbound						Westbound						Nouthbound						Eastbound						
	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	Right	Thru	Left	U-Turn	Peds	App Total	
12:00 AM						0						0						0						0	It should be noted that if data is copied overtop of the Hourly Totals or Approach Totals, that the 'AutoSum' Formula will be lost. This should not affect the actual totals if the data was copied from a program that performs the calculations for the user.
12:15 AM						0						0						0						0	
12:30 AM						0						0						0						0	
12:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:00 AM						0						0						0						0	
1:15 AM						0						0						0						0	
1:30 AM						0						0						0						0	
1:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:00 AM						0						0						0						0	
2:15 AM						0						0						0						0	
2:30 AM						0						0						0						0	
2:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 AM						0						0						0						0	
3:15 AM						0						0						0						0	
3:30 AM						0						0						0						0	
3:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:00 AM						0						0						0						0	
4:15 AM						0						0						0						0	
4:30 AM						0						0						0						0	
4:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 AM						0						0						0						0	
5:15 AM						0						0						0						0	
5:30 AM						0						0						0						0	
5:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:00 AM						0						0						0						0	
6:15 AM						0						0						0						0	
6:30 AM						0						0						0						0	
6:45 AM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 AM	1	38	1			40	4	8	4			16	1	101	15			117	2	1	4			7	
7:15 AM	5	48	3			56	4	17	3			24	0	101	27			128	10	1	13			24	
7:30 AM	8	60	2			70	3	15	1			19	2	125	25			152	6	3	24			33	
7:45 AM	9	69	5			83	1	11	3			15	0	72	31			103	3	2	9			14	
Hourly Total	23	215	11	0	0	249	12	51	11	0	0	74	3	399	98	0	0	500	21	7	50	0	0	78	
8:00 AM	2	40	1			43	1	10	6			17	1	59	22			82	1	3	4			8	
8:15 AM	0	55	2			57	0	8	1			9	2	57	11			70	5	0	5			10	
8:30 AM	3	42	0			45	2	3	4			9	1	85	22			108	5	2	3			10	
8:45 AM	5	47	1			53	1	8	3			12	1	74	13			88	6	3	8			17	
Hourly Total	10	184	4	0	0	198	4	29	14	0	0	47	5	275	68	0	0	348	17	8	20	0	0	45	
9:00 AM	2	36	1			39	3	13	1			17	3	60	13			76	8	1	3			12	
9:15 AM	1	39	0			40	2	12	0			14	3	49	8			60	6	7	2			15	
9:30 AM	2	40	2			44	1	9	3			13	0	47	10			57	8	4	7			19	
9:45 AM	6	38	1			45	4	3	2			9	1	50	13			64	6	2	5			13	
Hourly Total	11	153	4	0	0	168	10	37	6	0	0	53	7	206	44	0	0	257	28	14	17	0	0	59	
10:00 AM	5	43	0			48	1	7	1			9	1	48	8			57	2	5	10			17	
10:15 AM	2	46	2			50	1	5	1			7	2	47	12			61	4	3	5			12	
10:30 AM	3	43	1			47	1	8	3			12	1	43	4			48	6	2	14			22	
10:45 AM	2	33	2			37	1	8	5			14	2	51	6			59	5	3	2			10	
Hourly Total	12	165	5	0	0	182	4	28	10	0	0	42	6	189	30	0	0	225	17	13	31	0	0	61	
11:00 AM	5	47	3			55	0	9	2			11	0	42	4			46	3	4	9			16	
11:15 AM	1	41	2			44	1	5	0			6	0	44	7			51	8	4	13			25	
11:30 AM	2	47	0			49	3	9	1			13	3	39	13			55	7	3	9			19	
11:45 AM	4	42	2			48	0	7	3			10	1	51	7			59	10	3	12			25	
Hourly Total	12	177	7	0	0	196	4	30	6	0	0	40	4	176	31	0	0	211	28	14	43	0	0	85	
12:00 PM	5	56	2			63	3	8	1			12	1	36	16			53	8	4	8			20	
12:15 PM	7	32	1			40	3	4	2			9	0	47	10			57	7	3	15			25	
12:30 PM	4	49	2			55	2	5	4			11	0	50	11			61	14	4	12			30	
12:45 PM	5	51	0			56	3	6	0			9	2	42	7			51	9	3	15			27	
Hourly Total	21	188	5	0	0	214	11	23	7	0	0	41	3	175	44	0	0	222	38	14	50	0	0	102	
1:00 PM	4	46	1			51	0	9	3			12	2	61	9			72	6	4	14			24	
1:15 PM	3	47	1			51	1	11	0			12	1	69	8			78	6	2	14			22	
1:30 PM	5	46	2			53	1	6	4			11	0	62	5			67	13	2	11			26	
1:45 PM	5	47	1			53	0	7	1			8	2	56	13			71	9	6	8			23	
Hourly Total	17	186	5	0	0	208	2	33	8	0	0	43	5	248	35	0	0	288	34	14	47	0	0	95	
2:00 PM	10	52	2			64	1	5	4			10	2	60	10			72	10	8	11			29	
2:15 PM	5	70	1			76	3	3	2			8	2	57	12			71	14	8	23			45	
2:30 PM	6	71	1			78	4	4	0			8	1	72	18			91	22	2	18			42	
2:45 PM	10	95	3			108	2	7	1			10	0	64	7			71	6	6	13			25	
Hourly Total	31	288	7	0	0	326	10	19	7	0	0	36	5	253	47	0	0	305	52	24	65	0	0	141	
3:00 PM	15	96	6			117	1	4	3			8	3	57	8			68	10	6	20			36	
3:15 PM	7	83	2			92	1	7	3			11	2	81	13			96	18	13	11			42	
3:30 PM	5	89	3			97	1	5	2			8	2	72	12			86	15	10	17			42	
3:45 PM	9	87	8			104	0	8	4			12	3	87	10			100	23	11	20			54	
Hourly Total	36	355	19	0	0	410	3	24	12	0	0	39	10	297	43	0	0	350	66	40	68	0	0	174	
4:00 PM	4	89	3			96	2	7	0			9	4	83	9			96	30	10	22			62	
4:15 PM	6	137	3			146	2	6	1			9	2	75	13			90	20	13	16			49	
4:30 PM	8	101	6			115	4	10	2			16	0	99	13			112	13	9	17			39	
4:45 PM	3	133	3			139	2	8	2			12	1	80	10			91	26	11	16			53	
Hourly Total	21	460	15	0	0	496	10	31	5	0	0	46	7	337	45	0	0	389	89	43	71	0	0	203	
5:00 PM	8	120	4			132	2	3	6			11	2	95	14			111	18	13	26			57	
5:15 PM	6	106	8			120	3	9	4			16	0	89	10			99	26	16	22			64	
5:30 PM	8	91	3			102	1	13	4			18	3	85	14			102	11	9	11			31	
5:45 PM	3	79	6			88	4	5	2			11	1	83	8			92	10	11	14			35	
Hourly Total	25	396	21	0	0	442	10	30	16	0	0	56	6	352	46	0	0	404	65	49	73	0	0	187	
6:00 PM	3	67	3			73	2	8	2			12	1	47	4			52	7	6	8			21	
6:15 PM	2	64	2			68	1	9	2			12	2	74	6			82	8	4	8			20	
6:30 PM	5	66	5			76	2	4	5			11	4	62	14			80	8	1	8			17	
6:45 PM	3	45	4			52	2	7	3			12	1	33	5			39	4	6	8			18	
Hourly Total	13	242	14	0	0	269	7	28	12	0	0	47	8	216	29	0	0	253	27	17	32	0	0	76	
7:00 PM						0						0						0						0	
7:15 PM						0						0						0						0	
7:30 PM						0						0						0						0	
7:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM						0						0						0						0	
8:15 PM						0						0						0						0	
8:30 PM						0						0						0						0	
8:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM						0						0						0						0	
9:15 PM						0						0						0						0	
9:30 PM						0						0						0						0	
9:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:00 PM						0						0						0						0	
10:15 PM						0						0						0						0	
10:30 PM						0						0						0						0	
10:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00 PM						0						0						0						0	
11:15 PM						0						0						0						0	
11:30 PM						0						0						0						0	
11:45 PM						0						0						0						0	
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Multi-Way Stop Application

OMUTCD Section 2B.07

	Warranted ?
A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.	No
B. Five or more reported crashes in a 12-month period that are susceptible to correction by a multiway stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.	Yes
C. Minimum Volumes:	
1 The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day.	Yes
2 The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour.* *If this condition is satisfied, there must also be an average delay of at least 30 seconds per vehicle during the peak hour.	No
3 If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum volume warrants are 70 percent of the values provided in Items 1 and 2.	Yes
D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.	No

Other criteria that may be considered in an engineering study include:

A. The need to control left-turn conflicts;	No
B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;	No
C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and	No
D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.	No

Are the requirements for Multi-Way Stop Satisfied?: Yes

AUTOCALC table Each hour is individually checked and tallied if "met"								
Lanes Major/ Minor	ADJUSTED VOLUMES		Condition C.1		Condition C.2		Condition D	
	MAJOR	MINOR	100%		70%		80%	
			MAJ.	MIN.	MAJ.	MIN.	MAJ.	MIN.
Required Volumes			300	200	210	140	240	160
6:00 AM	0	0						
6:15 AM	157	16						
6:30 AM	341	39	1		1		1	
6:45 AM	563	61						
7:00 AM	749	74						
7:15 AM	717	75						
7:30 AM	660	62	1		1		1	
7:45 AM	591	50						
8:00 AM	546	47						
8:15 AM	536	46						
8:30 AM	509	51	1		1		1	
8:45 AM	457	55						
9:00 AM	425	51						
9:15 AM	415	60						
9:30 AM	426	57	1		1		1	
9:45 AM	420	61						
10:00 AM	407	58						
10:15 AM	403	57						
10:30 AM	387	69	1		1		1	
10:45 AM	396	66						
11:00 AM	407	80						
11:15 AM	422	76						
11:30 AM	424	77	1		1		1	
11:45 AM	436	85						
12:00 PM	436	87						
12:15 PM	443	99						
12:30 PM	475	96	1		1		1	
12:45 PM	479	93						
1:00 PM	496	82						
1:15 PM	509	85						
1:30 PM	527	105	1		1		1	
1:45 PM	576	117						
2:00 PM	631	121						
2:15 PM	680	128						
2:30 PM	721	123	1		1		1	
2:45 PM	735	136						
3:00 PM	760	148						
3:15 PM	767	166						
3:30 PM	815	177	1		1	1	1	1
3:45 PM	859	174						
4:00 PM	885	172						
4:15 PM	936	175						
4:30 PM	919	184	1		1	1	1	1
4:45 PM	896	177						
5:00 PM	846	178						
5:15 PM	728	130						
5:30 PM	659	100	1		1		1	

5:45 PM	611	80						
6:00 PM	522	66						
6:15 PM	397	47						
6:30 PM	247	33			1		1	
6:45 PM	91	18						
7:00 PM	0	0						
7:15 PM	0	0						
7:30 PM	0	0						
7:45 PM	0	0						
8:00 PM	0	0						
8:15 PM	0	0						
8:30 PM	0	0						
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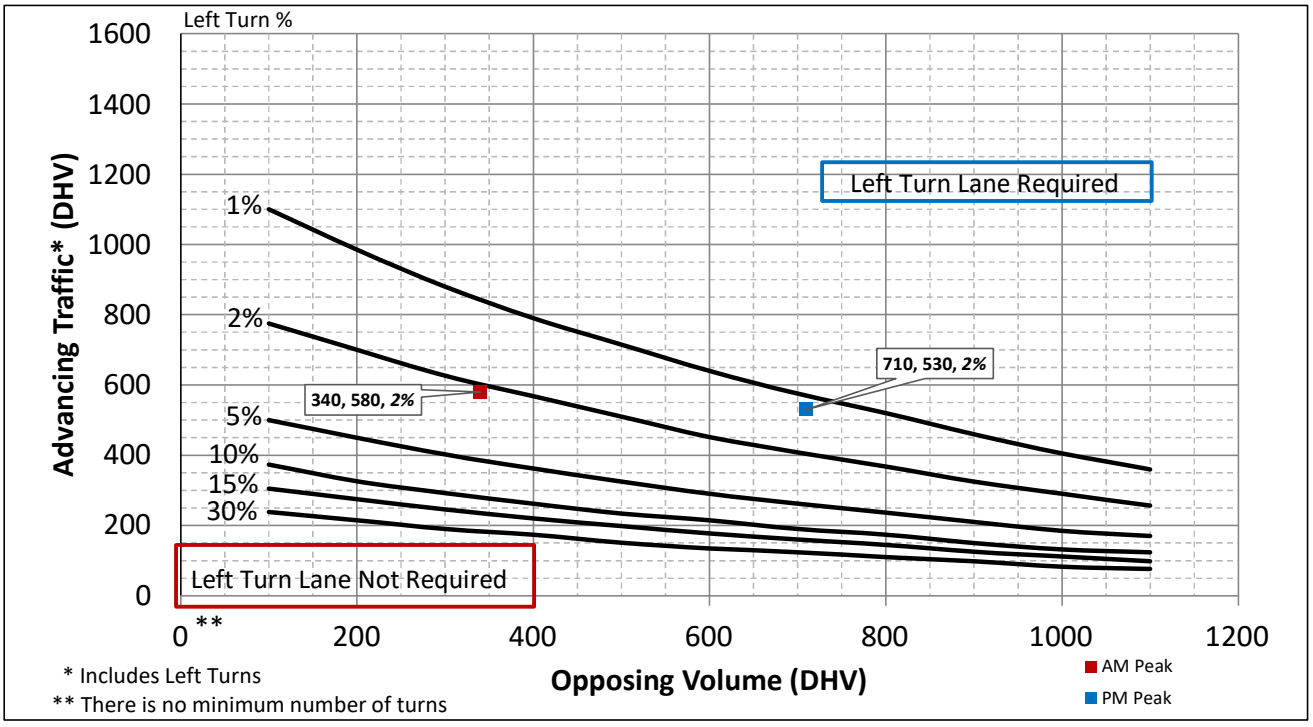
9:15 PM	0	0						
9:30 PM	0	0						
9:45 PM	0	0						
10:00 PM	0	0						
10:15 PM	0	0						
10:30 PM	0	0						
10:45 PM	0	0						
11:00 PM	0	0						
11:15 PM	0	0						
11:30 PM	0	0						
11:45 PM	0	0						
HOURS MET			**12**	**0**	**13**	**2**	**13**	**2**
CONDITION SATISFIED?			**NO**		**NO**		**NO**	

2-Lane Highway Left Turn Lane Warrant

(> 40 mph or 70 kph Posted Speed)

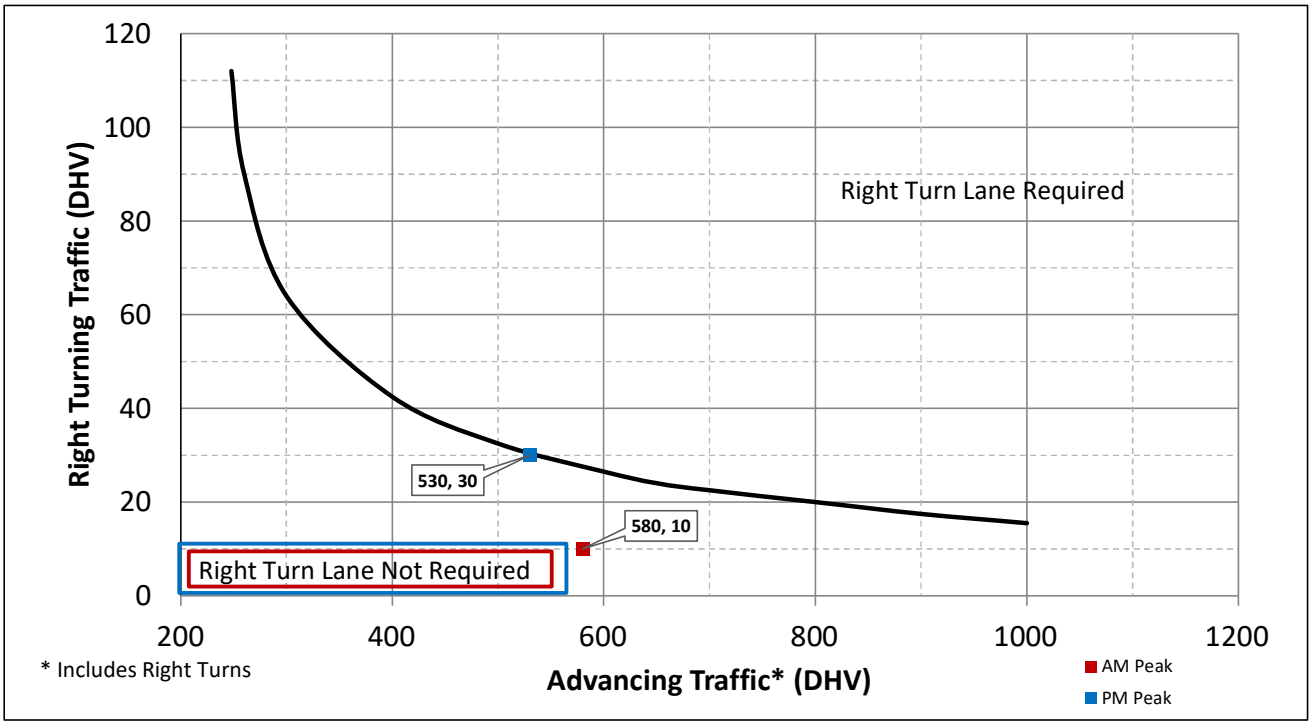


Turn Lane Length Calculations

AM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	10	VPH
	Advancing Traffic	580	VPH
	Opposing Volume	340	VPH
	Left Turn Percentage	2%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	* Turn Lane Length includes 50 ft diverging taper
	Offset Width	12	
	Approach Taper	600	
PM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	10	VPH
	Advancing Traffic	530	VPH
	Opposing Volume	710	VPH
	Left Turn Percentage	2%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	* Turn Lane Length includes 50 ft diverging taper
	Offset Width	12	
	Approach Taper	600	
Is Left Turn Warrant Met		Yes	**See Above**

2-Lane Highway Right Turn Lane Warrant

(> 40 mph or 70 kph Posted Speed)



Turn Lane Length Calculations

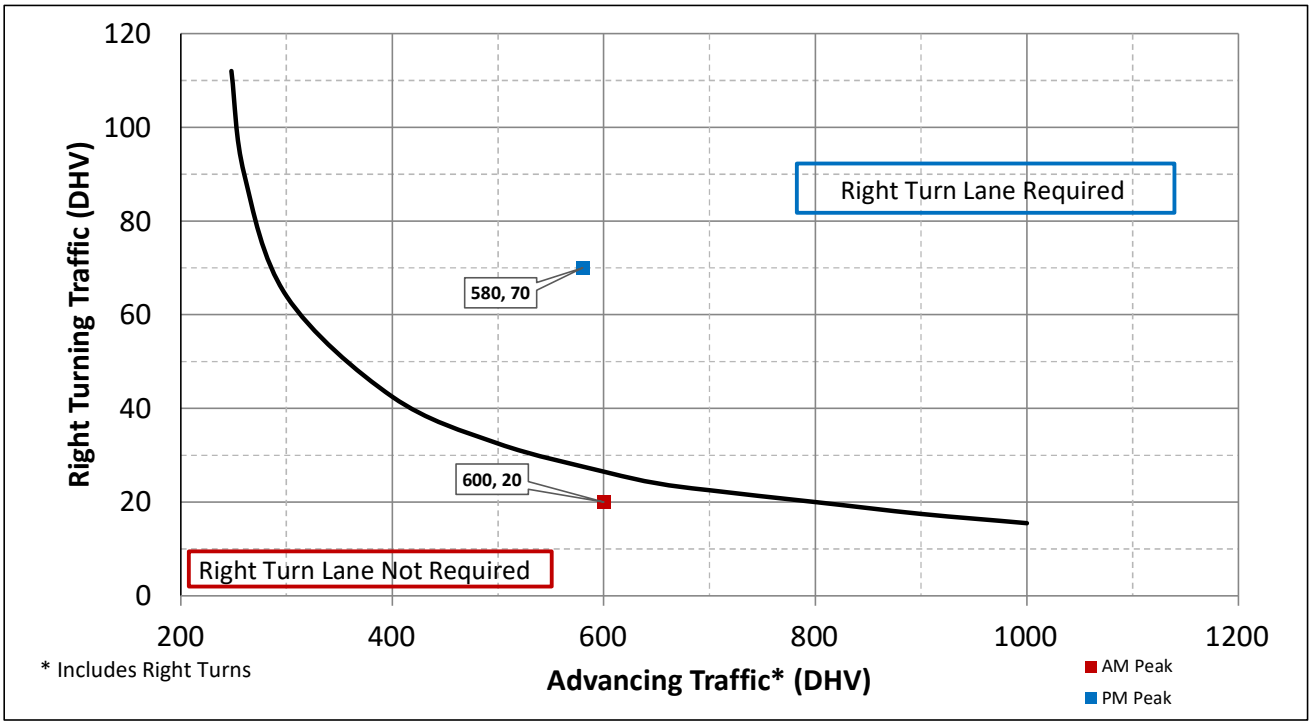
AM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	10	VPH
	Advancing Traffic	580	VPH
	Right Turn Percentage	2%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	
PM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	30	VPH
	Advancing Traffic	530	VPH
	Right Turn Percentage	6%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	
Is Right Turn Warrant Met		No	No Right Turn Lane Required

** Turn Lane Length includes 50 ft diverging taper*

** Turn Lane Length includes 50 ft diverging taper*

2-Lane Highway Right Turn Lane Warrant

(> 40 mph or 70 kph Posted Speed)

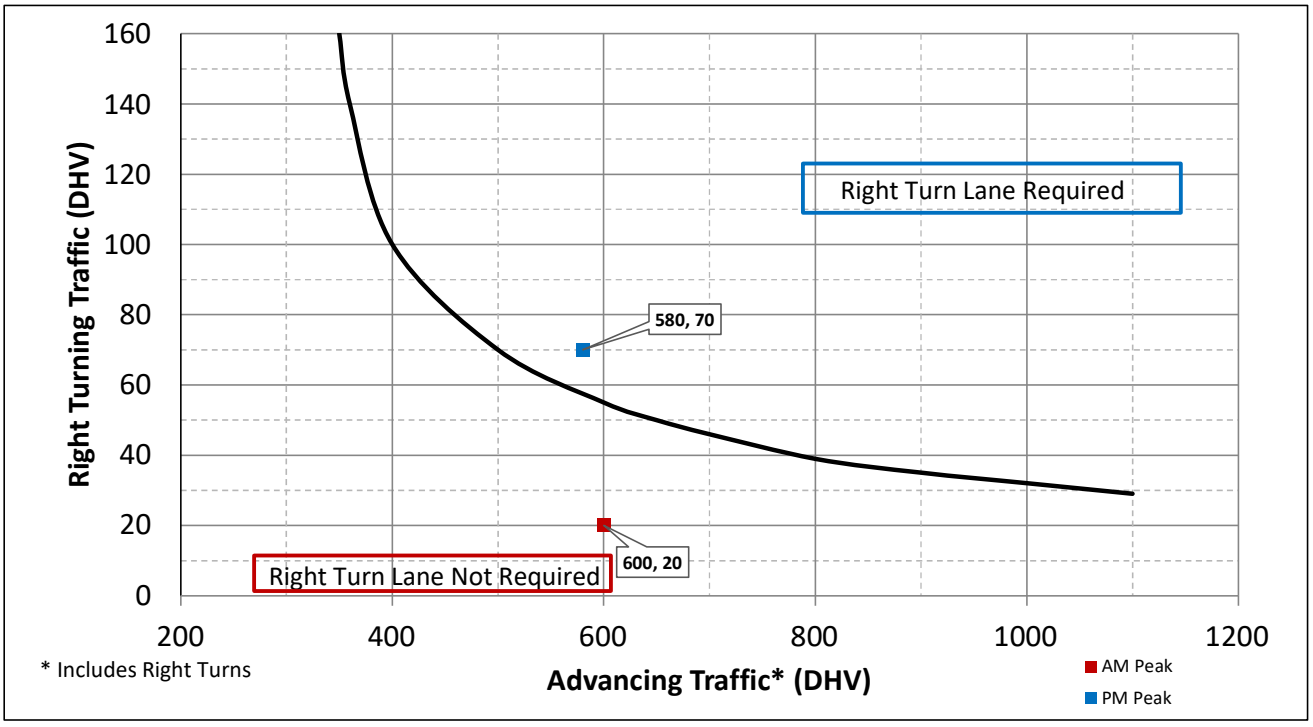


Turn Lane Length Calculations

AM Peak	Design Speed	50	mph	
	Traffic Control	Unsignalized		
	Cycle Length	Unsignalized		
	Cycles Per Hour	60	*Assume 60*	
	Turn Lane Volume	20	VPH	
	Advancing Traffic	600	VPH	
	Right Turn Percentage	3%		
	Location Type	Through Road		
	Condition	B		
	Vehicles/Cycle	1		
	Turn Lane Length	225		* Turn Lane Length includes 50 ft diverging taper
PM Peak	Design Speed	50	mph	
	Traffic Control	Unsignalized		
	Cycle Length	Unsignalized		
	Cycles Per Hour	60	*Assume 60*	
	Turn Lane Volume	70	VPH	
	Advancing Traffic	580	VPH	
	Right Turn Percentage	12%		
	Location Type	Through Road		
	Condition	B or C		
	Vehicles/Cycle	2		
	Turn Lane Length	See Column to Right	245	* Turn Lane Length includes 50 ft diverging taper
Is Right Turn Warrant Met		Yes	**See Above**	

2-Lane Highway Right Turn Lane Warrant

(= < 40 mph or 70 kph Posted Speed)



Turn Lane Length Calculations

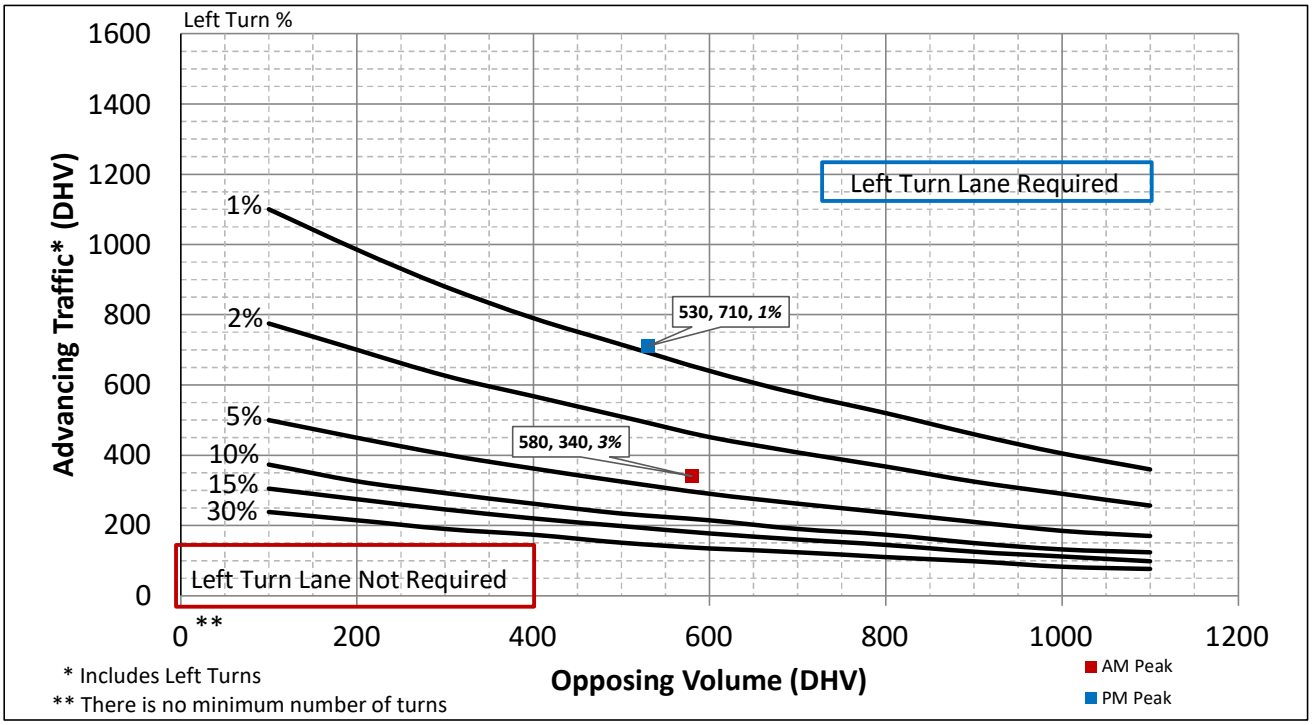
AM Peak	Design Speed	35	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	20	VPH
	Advancing Traffic	600	VPH
	Right Turn Percentage	3%	
	Location Type	Through Road	
	Condition	A	
	Vehicles/Cycle	1	
	Turn Lane Length	100	
PM Peak	Design Speed	35	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	70	VPH
	Advancing Traffic	580	VPH
	Right Turn Percentage	12%	
	Location Type	Through Road	
	Condition	A	
	Vehicles/Cycle	2	
	Turn Lane Length	150	
Is Right Turn Warrant Met		Yes	**See Above**

** Turn Lane Length includes 50 ft diverging taper*

** Turn Lane Length includes 50 ft diverging taper*

2-Lane Highway Left Turn Lane Warrant

(> 40 mph or 70 kph Posted Speed)

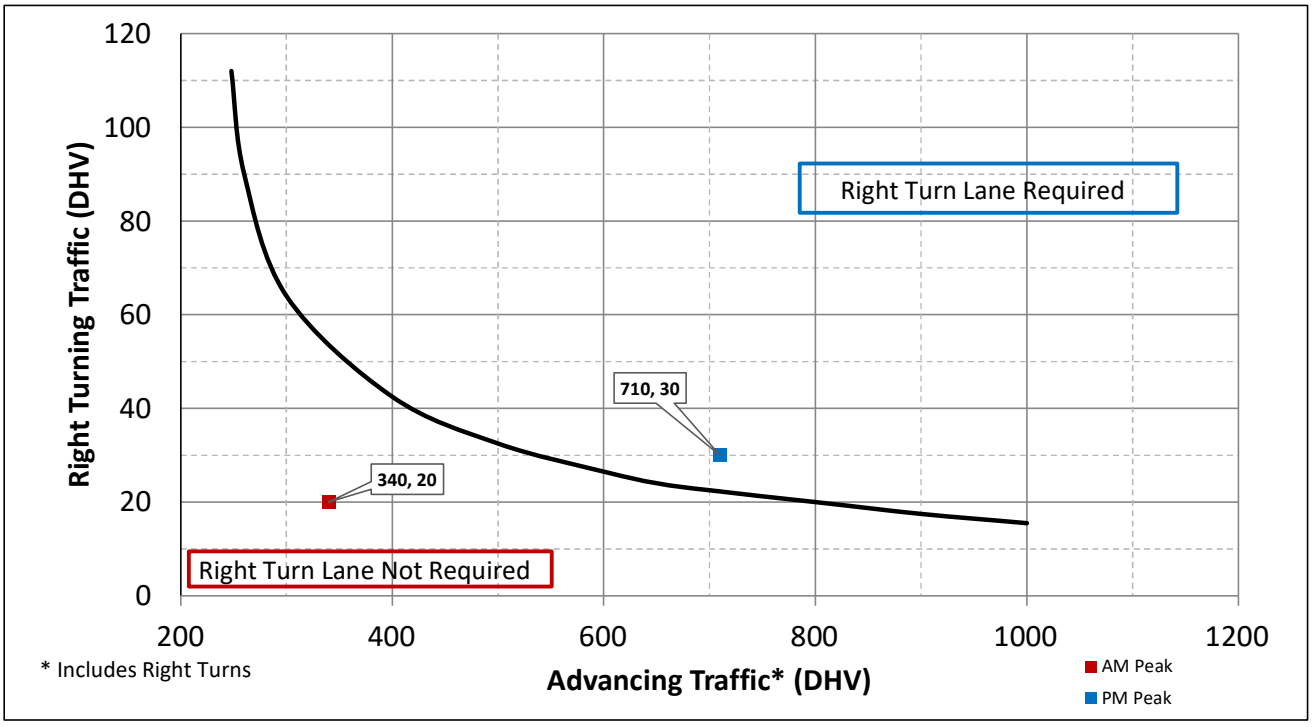


Turn Lane Length Calculations

AM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	10	VPH
	Advancing Traffic	340	VPH
	Opposing Volume	580	VPH
	Left Turn Percentage	3%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	* Turn Lane Length includes 50 ft diverging taper
	Offset Width	12	
	Approach Taper	600	
PM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	10	VPH
	Advancing Traffic	710	VPH
	Opposing Volume	530	VPH
	Left Turn Percentage	1%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	* Turn Lane Length includes 50 ft diverging taper
	Offset Width	12	
	Approach Taper	600	
Is Left Turn Warrant Met		Yes	**See Above**

2-Lane Highway Right Turn Lane Warrant

(> 40 mph or 70 kph Posted Speed)



Turn Lane Length Calculations

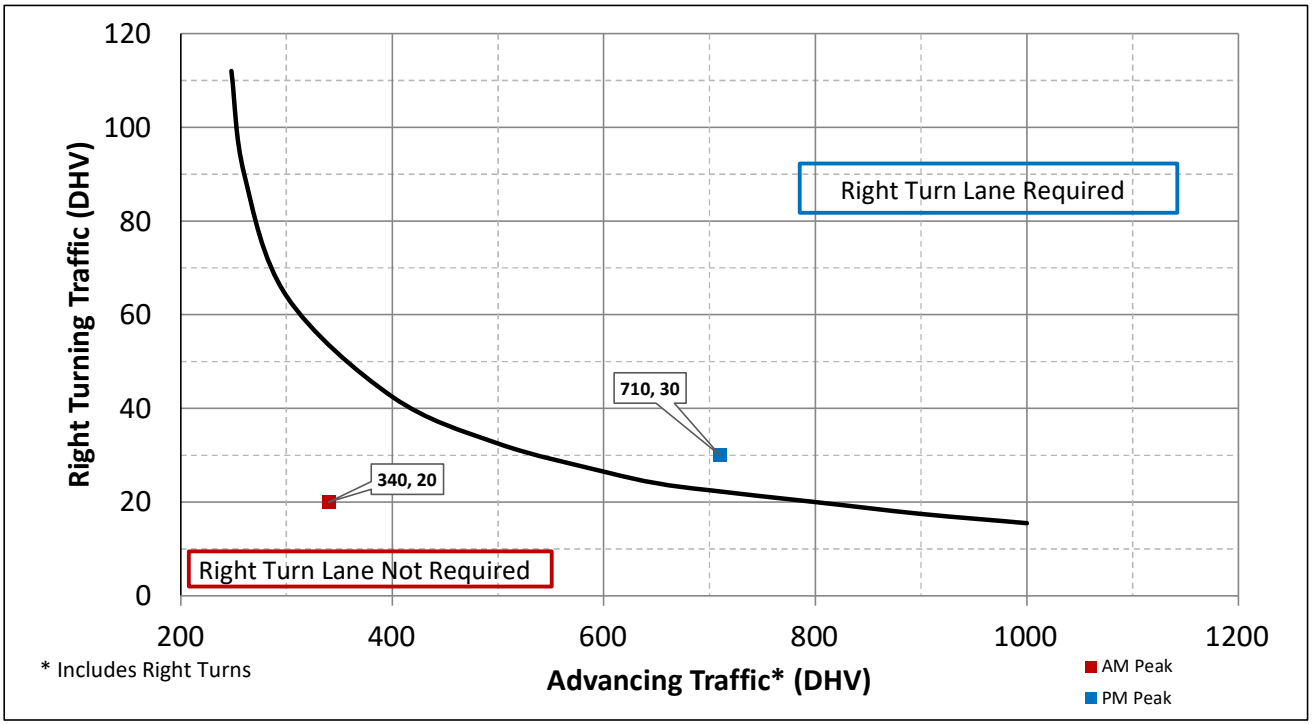
AM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	20	VPH
	Advancing Traffic	340	VPH
	Right Turn Percentage	6%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	
PM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	30	VPH
	Advancing Traffic	710	VPH
	Right Turn Percentage	4%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	
Is Right Turn Warrant Met		Yes	**See Above**

** Turn Lane Length includes 50 ft diverging taper*

** Turn Lane Length includes 50 ft diverging taper*

2-Lane Highway Right Turn Lane Warrant

(> 40 mph or 70 kph Posted Speed)



Turn Lane Length Calculations

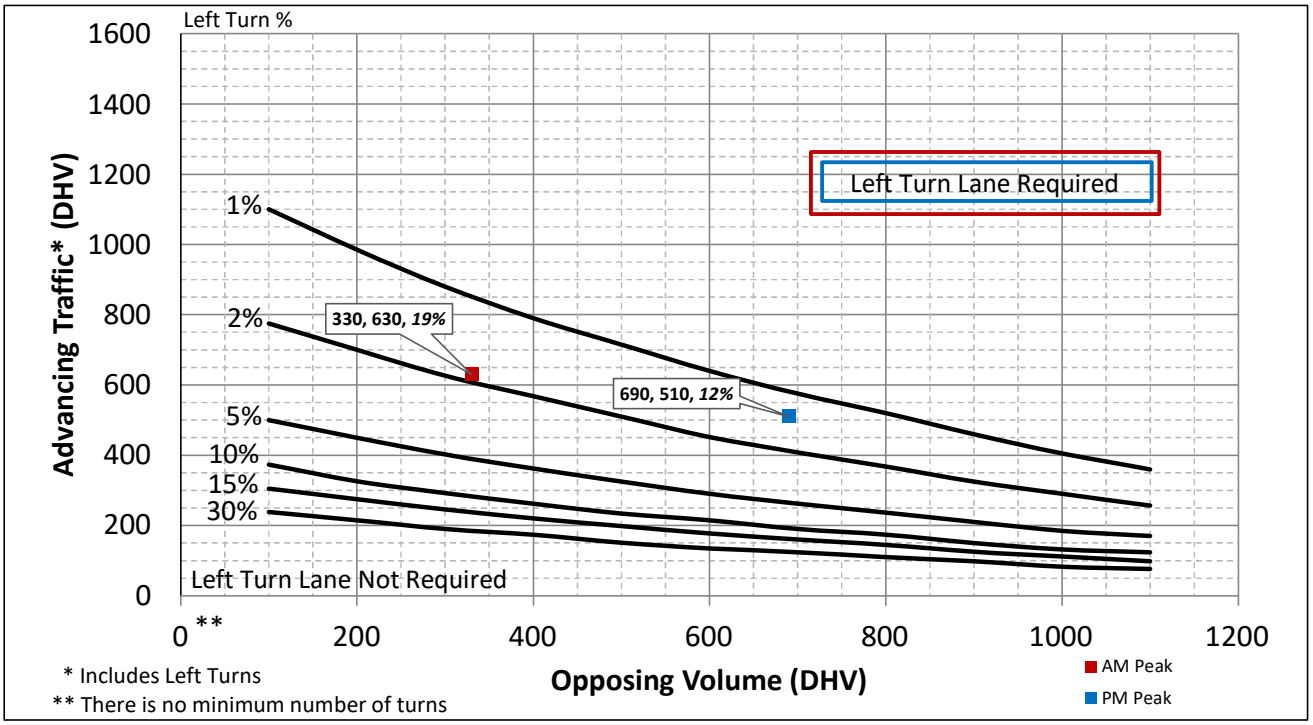
AM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	20	VPH
	Advancing Traffic	340	VPH
	Right Turn Percentage	6%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	
PM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	30	VPH
	Advancing Traffic	710	VPH
	Right Turn Percentage	4%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	
Is Right Turn Warrant Met		Yes	**See Above**

** Turn Lane Length includes 50 ft diverging taper*

** Turn Lane Length includes 50 ft diverging taper*

2-Lane Highway Left Turn Lane Warrant

(> 40 mph or 70 kph Posted Speed)

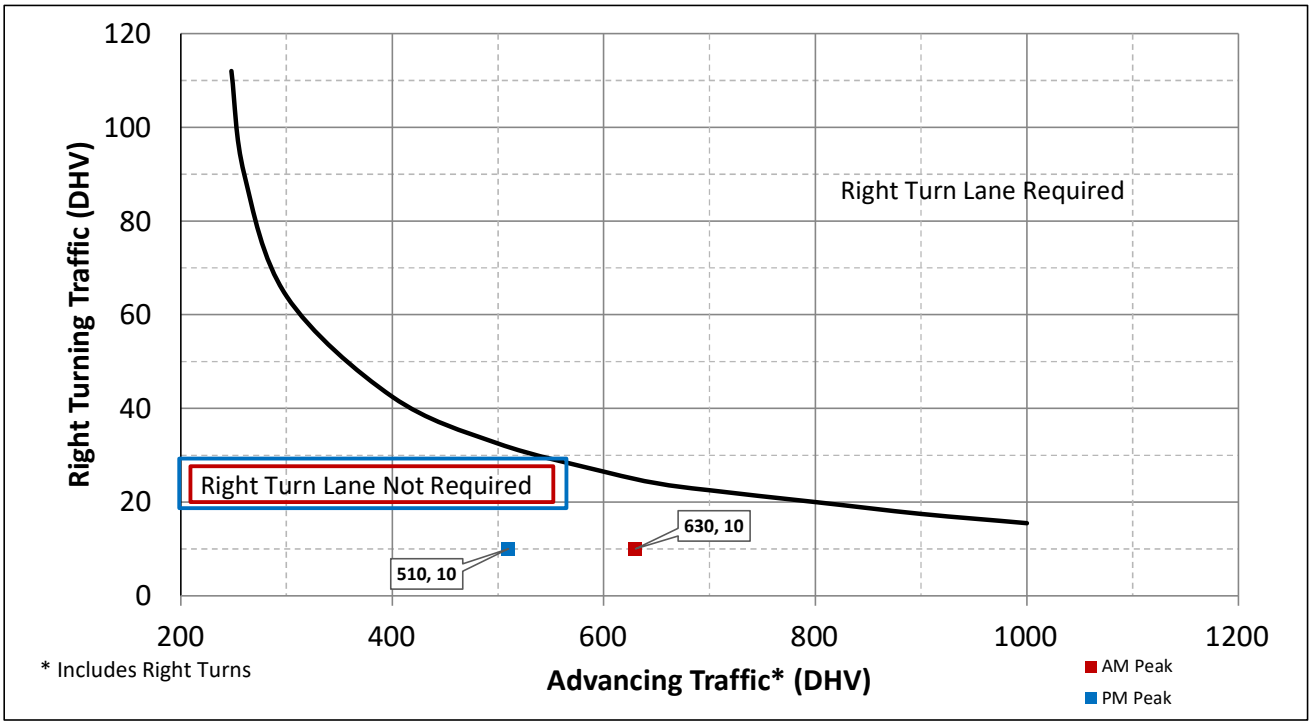


Turn Lane Length Calculations

AM Peak	Design Speed	50	mph	
	Traffic Control	Unsignalized		
	Cycle Length	Unsignalized		
	Cycles Per Hour	60	*Assume 60*	
	Turn Lane Volume	120	VPH	
	Advancing Traffic	630	VPH	
	Opposing Volume	330	VPH	
	Left Turn Percentage	19%		
	Location Type	Through Road		
	Condition	B or C		
	Vehicles/Cycle	2		
	Turn Lane Length	See Column to Right	245	* Turn Lane Length includes 50 ft diverging taper
	Offset Width	12		
	Approach Taper	600		
PM Peak	Design Speed	50	mph	
	Traffic Control	Unsignalized		
	Cycle Length	Unsignalized		
	Cycles Per Hour	60	*Assume 60*	
	Turn Lane Volume	60	VPH	
	Advancing Traffic	510	VPH	
	Opposing Volume	690	VPH	
	Left Turn Percentage	12%		
	Location Type	Through Road		
	Condition	B or C		
	Vehicles/Cycle	1		
	Turn Lane Length	See Column to Right	225	* Turn Lane Length includes 50 ft diverging taper
	Offset Width	12		
	Approach Taper	600		
Is Left Turn Warrant Met		Yes	**See Above**	

2-Lane Highway Right Turn Lane Warrant

(> 40 mph or 70 kph Posted Speed)



Turn Lane Length Calculations

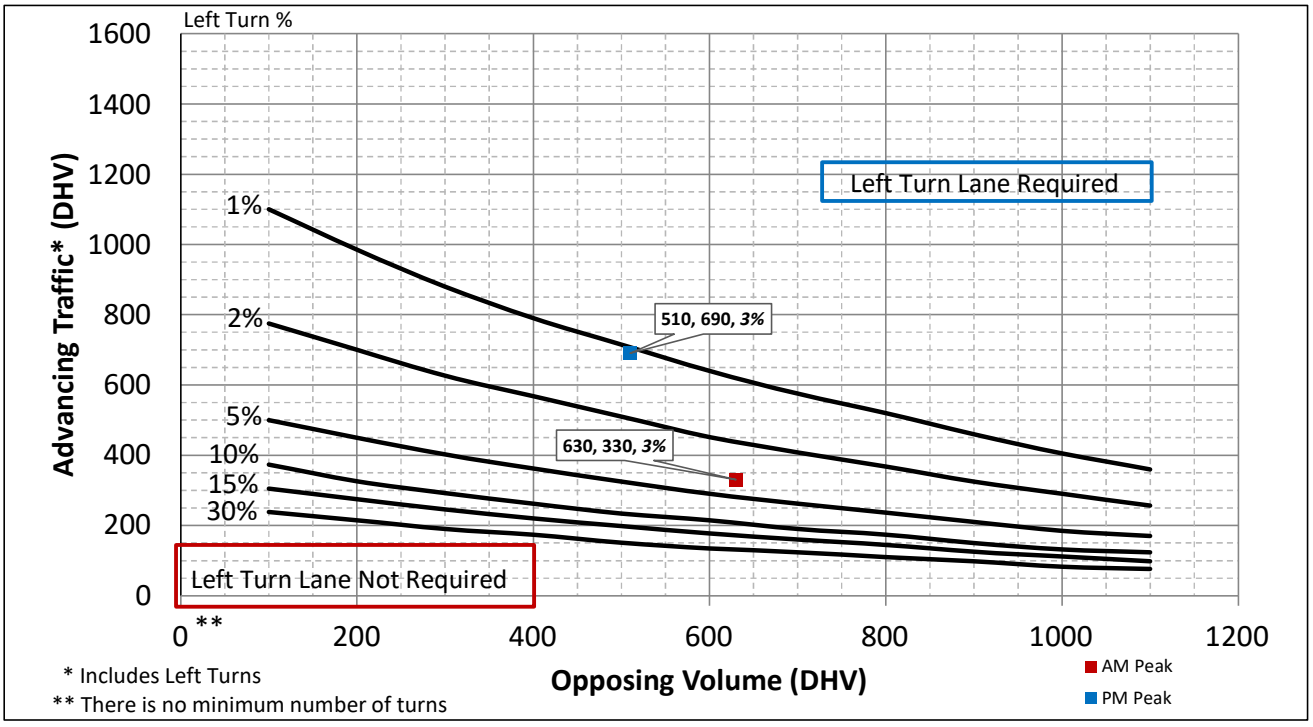
AM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	10	VPH
	Advancing Traffic	630	VPH
	Right Turn Percentage	2%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	
PM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	10	VPH
	Advancing Traffic	510	VPH
	Right Turn Percentage	2%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	
Is Right Turn Warrant Met		No	No Right Turn Lane Required

** Turn Lane Length includes 50 ft diverging taper*

** Turn Lane Length includes 50 ft diverging taper*

2-Lane Highway Left Turn Lane Warrant

(> 40 mph or 70 kph Posted Speed)

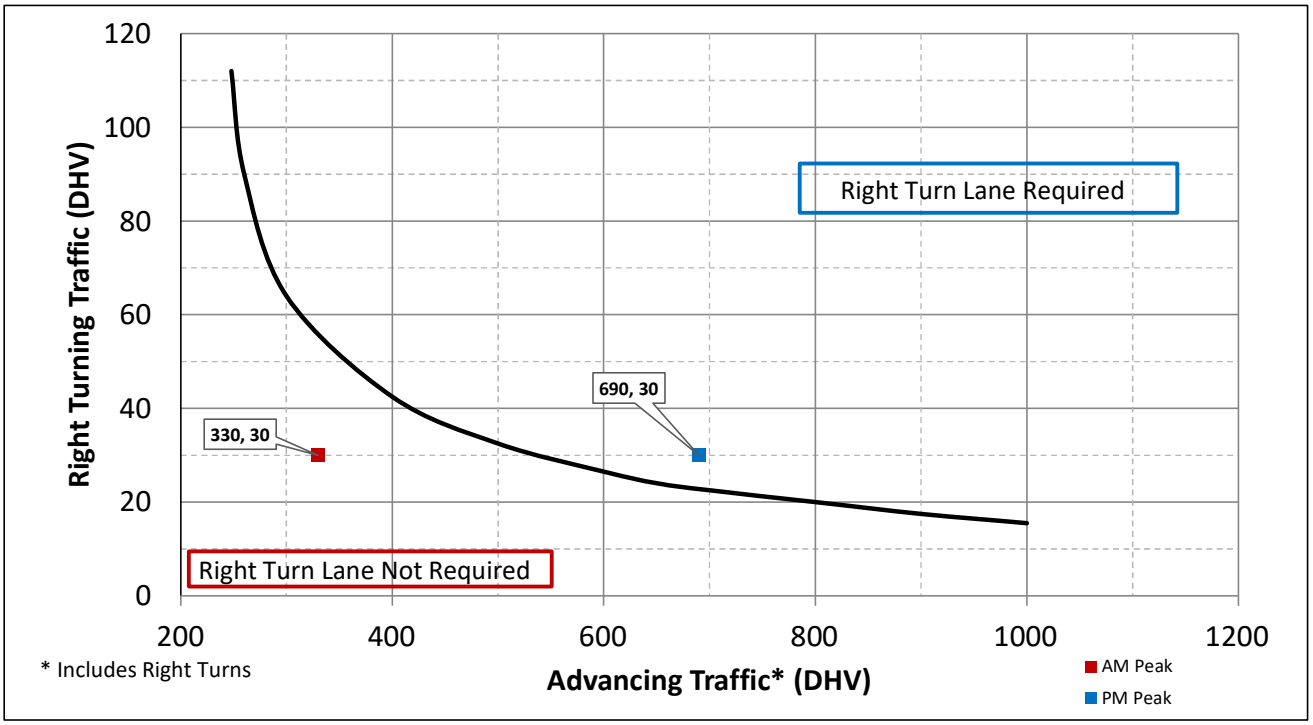


Turn Lane Length Calculations

AM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	10	VPH
	Advancing Traffic	330	VPH
	Opposing Volume	630	VPH
	Left Turn Percentage	3%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	* Turn Lane Length includes 50 ft diverging taper
	Offset Width	12	
	Approach Taper	600	
PM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	20	VPH
	Advancing Traffic	690	VPH
	Opposing Volume	510	VPH
	Left Turn Percentage	3%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	* Turn Lane Length includes 50 ft diverging taper
	Offset Width	12	
	Approach Taper	600	
Is Left Turn Warrant Met		Yes	**See Above**

2-Lane Highway Right Turn Lane Warrant

(> 40 mph or 70 kph Posted Speed)



Turn Lane Length Calculations

AM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	30	VPH
	Advancing Traffic	330	VPH
	Right Turn Percentage	9%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	
PM Peak	Design Speed	50	mph
	Traffic Control	Unsignalized	
	Cycle Length	Unsignalized	
	Cycles Per Hour	60	*Assume 60*
	Turn Lane Volume	30	VPH
	Advancing Traffic	690	VPH
	Right Turn Percentage	4%	
	Location Type	Through Road	
	Condition	B	
	Vehicles/Cycle	1	
	Turn Lane Length	225	
Is Right Turn Warrant Met		Yes	See Above

** Turn Lane Length includes 50 ft diverging taper*

** Turn Lane Length includes 50 ft diverging taper*

Appendix G
Proposed Capacity Analysis

Appendix G

CARPENTER MARTY transportation

Capacity Analysis for Planning of Junctions

Summary Report

Project Name:	POR-SR-43 at Trares and Randolph Road Safety Study
Project Number:	0
Location:	SR-43 & Trares Road
Date:	2047 PM
Number of Intersection Legs:	4
Major Street Direction	North-South

Traffic Volume Demand

	Volume (Veh/hr)				Percent (%)	
	U-Turn	Left	Thru	Right	Heavy Vehicles	Volume Growth
Eastbound	0	130	80	130	1.00%	0.00%
Westbound	0	20	50	20	3.00%	0.00%
Southbound	0	30	630	30	2.00%	0.00%
Northbound	0	70	430	10	3.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	**0.80**	**0.95**		**0.85**		

Truck to PCE Factor		**Suggested = 2.00**	2.00
Multimodal Activity Level	**0**		
E-W / Crossing East-West Legs	**Low**	**Low**	**Low**
N-S / Crossing North-South Legs	**Low**	**Low**	**Low**
Critical Lane Volume Threshold — 2-phase signal	**Suggested = 1800 (Urban), 1650 (Rural)**		**1620**
Critical Lane Volume Threshold — 3-phase signal	**Suggested = 1750 (Urban), 1600 (Rural)**		**1600**
Critical Lane Volume Threshold — 4-phase signal	**Suggested = 1700 (Urban), 1550 (Rural)**		**1550**

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Summary Report

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TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Pedestrian Accommodations	Bicycle Accommodations
1 X 1 Roundabout	**0.60**	**1**	**5.36**	**4.75**
All-Way Stop Control	**1.44**	**2**	**4.12**	**4.79**
Two-Way Stop Control N-S	**2.37**	**3**	**2.94**	**4.08**
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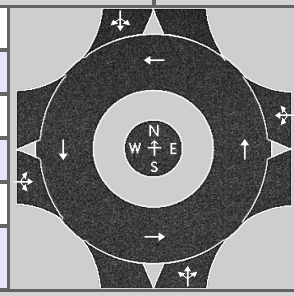
HCS Roundabouts Report

General Information

Analyst	VHD
Agency or Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Time Analyzed	OY AM
Project Description	SR-43 Alt 1



Site Information

Intersection	SR-43 at Randolph Rd
E/W Street Name	Randolph Rd
N/S Street Name	SR-43
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.81
Jurisdiction	ODOT District 4

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	10	10	10	0	10	20	10	0	10	520	10	0	10	300	20
Percent Heavy Vehicles, %	0	5	5	5	0	7	7	7	0	5	5	5	0	4	4	4
Flow Rate (v_{PCE}), pc/h	0	13	13	13	0	13	26	13	0	13	674	13	0	13	385	26
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		39			52			700			424	
Entry Volume, veh/h		37			49			667			408	
Circulating Flow (v_c), pc/h	411			700			39			52		
Exiting Flow (v_{ex}), pc/h	39			65			700			411		
Capacity (c_{pce}), pc/h		907			676			1326			1309	
Capacity (c), veh/h		864			632			1263			1258	
v/c Ratio (x)		0.04			0.08			0.53			0.32	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6			6.6			8.6			5.8	
Lane LOS		A			A			A			A	
95% Queue Length, Q_{95} (veh)		0.1			0.2			3.2			1.4	
95% Queue Length, Q_{95} (ft)		2.6			5.3			83.2			36.1	
Approach Delay, s/veh | LOS	4.6	A		6.6	A		8.6	A		5.8	A	
Intersection Delay, s/veh | LOS	7.4						A					

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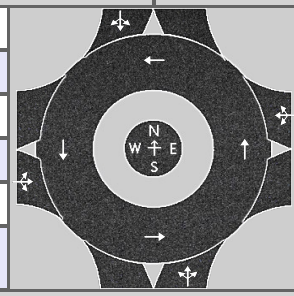

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Peak Hour Factor	0.96
Jurisdiction	ODOT District 4

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	10	30	10	0	10	10	10	0	10	450	30	0	10	640	30
Percent Heavy Vehicles, %	0	0	0	0	0	5	5	5	0	3	3	3	0	2	2	2
Flow Rate (v_{PCE}), pc/h	0	10	31	10	0	11	11	11	0	11	483	32	0	11	680	32
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		51			33			526			723	
Entry Volume, veh/h		51			31			511			709	
Circulating Flow (v_c), pc/h	702			504			52			33		
Exiting Flow (v_{ex}), pc/h	74			54			504			701		
Capacity (c_{pce}), pc/h		674			825			1309			1334	
Capacity (c), veh/h		674			786			1271			1308	
v/c Ratio (x)		0.08			0.04			0.40			0.54	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.2			5.0			6.7			8.7	
Lane LOS		A			A			A			A	
95% Queue Length, Q_{95} (veh)		0.2			0.1			2.0			3.4	
95% Queue Length, Q_{95} (ft)		5.0			2.6			51.2			86.4	
Approach Delay, s/veh | LOS	6.2	A		5.0	A		6.7	A		8.7	A	
Intersection Delay, s/veh | LOS	7.7						A					

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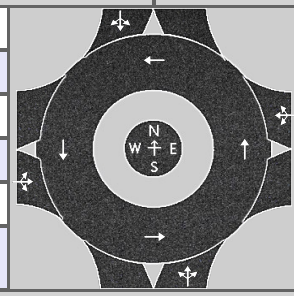

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Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	20	10	10	0	10	30	10	0	10	560	10	0	10	310	20
Percent Heavy Vehicles, %	0	5	5	5	0	7	7	7	0	5	5	5	0	4	4	4
Flow Rate (v_{PCE}), pc/h	0	26	13	13	0	13	40	13	0	13	726	13	0	13	398	26
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		52			66			752			437	
Entry Volume, veh/h		50			62			716			420	
Circulating Flow (v_c), pc/h	424			765			52			66		
Exiting Flow (v_{ex}), pc/h	39			79			765			424		
Capacity (c_{pce}), pc/h		895			632			1309			1290	
Capacity (c), veh/h		853			591			1246			1241	
v/c Ratio (x)		0.06			0.10			0.57			0.34	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.8			7.3			9.6			6.1	
Lane LOS		A			A			A			A	
95% Queue Length, Q_{95} (veh)		0.2			0.3			3.8			1.5	
95% Queue Length, Q_{95} (ft)		5.2			7.9			98.8			38.7	
Approach Delay, s/veh | LOS	4.8	A		7.3	A		9.6	A		6.1	A	
Intersection Delay, s/veh | LOS	8.1						A					

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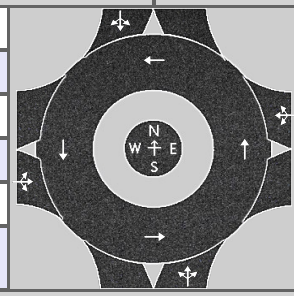

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Analysis Time Period, hrs	0.25
Peak Hour Factor	0.96
Jurisdiction	ODOT District 4

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	20	40	10	0	10	20	10	0	10	490	30	0	10	670	30
Percent Heavy Vehicles, %	0	0	0	0	0	5	5	5	0	3	3	3	0	2	2	2
Flow Rate (v_{PCE}), pc/h	0	21	42	10	0	11	22	11	0	11	526	32	0	11	712	32
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		73			44			569			755	
Entry Volume, veh/h		73			42			552			740	
Circulating Flow (v_c), pc/h	734			558			74			44		
Exiting Flow (v_{ex}), pc/h	85			65			558			733		
Capacity (c_{pce}), pc/h		653			781			1280			1319	
Capacity (c), veh/h		653			744			1242			1294	
v/c Ratio (x)		0.11			0.06			0.44			0.57	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.8			5.4			7.4			9.3	
Lane LOS		A			A			A			A	
95% Queue Length, Q_{95} (veh)		0.4			0.2			2.3			3.8	
95% Queue Length, Q_{95} (ft)		10.0			5.2			58.9			96.5	
Approach Delay, s/veh | LOS	6.8	A		5.4	A		7.4	A		9.3	A	
Intersection Delay, s/veh | LOS	8.3						A					

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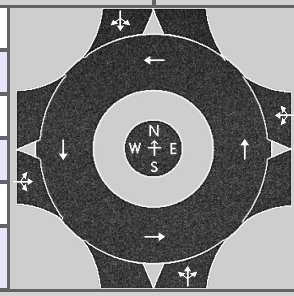

Site Information

Intersection	SR-43 at Trares Rd
E/W Street Name	Trares Rd
N/S Street Name	SR-43
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.82
Jurisdiction	ODOT District 4

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	40	10	30	0	10	40	10	0	120	490	10	0	10	280	30
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	5	5	5	0	5	5	5
Flow Rate (v_{PCE}), pc/h	0	49	12	37	0	12	49	12	0	154	627	13	0	13	359	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		98			73			794			410	
Entry Volume, veh/h		98			73			756			390	
Circulating Flow (v_c), pc/h	384			830			74			215		
Exiting Flow (v_{ex}), pc/h	38			241			688			408		
Capacity (c_{pce}), pc/h		933			592			1280			1108	
Capacity (c), veh/h		933			592			1219			1055	
v/c Ratio (x)		0.11			0.12			0.62			0.37	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.8			7.6			10.8			7.2	
Lane LOS		A			A			B			A	
95% Queue Length, Q_{95} (veh)		0.4			0.4			4.5			1.7	
95% Queue Length, Q_{95} (ft)		10.0			10.0			117.0			44.2	
Approach Delay, s/veh | LOS	4.8	A		7.6	A		10.8	B		7.2	A	
Intersection Delay, s/veh | LOS	9.1						A					

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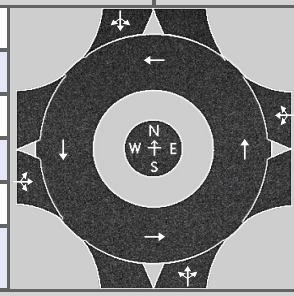

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Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	50	60	90	0	10	20	10	0	60	430	10	0	20	610	30
Percent Heavy Vehicles, %	0	1	1	1	0	3	3	3	0	3	3	3	0	2	2	2
Flow Rate (v_{PCE}), pc/h	0	53	63	95	0	11	21	11	0	64	461	11	0	21	648	32
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		211			43			536			701	
Entry Volume, veh/h		209			42			520			687	
Circulating Flow (v_c), pc/h	680			578			137			96		
Exiting Flow (v_{ex}), pc/h	95			117			525			754		
Capacity (c_{pce}), pc/h		690			765			1200			1251	
Capacity (c), veh/h		683			743			1165			1227	
v/c Ratio (x)		0.31			0.06			0.45			0.56	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.1			5.4			7.8			9.4	
Lane LOS		A			A			A			A	
95% Queue Length, Q_{95} (veh)		1.3			0.2			2.4			3.6	
95% Queue Length, Q_{95} (ft)		32.8			5.1			61.4			91.4	
Approach Delay, s/veh | LOS	9.1	A		5.4	A		7.8	A		9.4	A	
Intersection Delay, s/veh | LOS	8.7						A					

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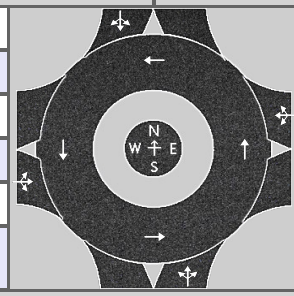

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Jurisdiction	ODOT District 4

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	60	10	40	0	10	50	20	0	120	500	10	0	10	290	30
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	5	5	5	0	5	5	5
Flow Rate (v_{PCE}), pc/h	0	73	12	49	0	12	61	24	0	154	640	13	0	13	371	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		134			97			807			422	
Entry Volume, veh/h		134			97			769			402	
Circulating Flow (v_c), pc/h	396			867			98			227		
Exiting Flow (v_{ex}), pc/h	38			253			737			432		
Capacity (c_{pce}), pc/h		921			570			1249			1095	
Capacity (c), veh/h		921			570			1189			1043	
v/c Ratio (x)		0.15			0.17			0.65			0.39	

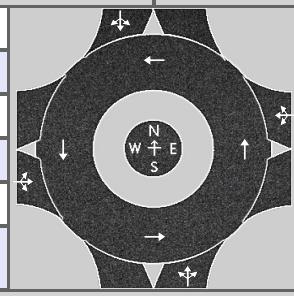
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.3			8.5			11.6			7.5	
Lane LOS		A			A			B			A	
95% Queue Length, Q_{95} (veh)		0.5			0.6			5.0			1.8	
95% Queue Length, Q_{95} (ft)		12.5			15.0			130.0			46.8	
Approach Delay, s/veh | LOS	5.3	A		8.5	A		11.6	B		7.5	A	
Intersection Delay, s/veh | LOS	9.6						A					

HCS Roundabouts Report

General Information

Analyst	VHD
Agency or Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Time Analyzed	DY PM
Project Description	SR-43 Alt 1



Site Information

Intersection	SR-43 at Trares Rd
E/W Street Name	Trares Rd
N/S Street Name	SR-43
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.96
Jurisdiction	ODOT District 4

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	70	80	130	0	10	30	20	0	60	440	10	0	20	640	30
Percent Heavy Vehicles, %	0	1	1	1	0	3	3	3	0	3	3	3	0	2	2	2
Flow Rate (v_{PCE}), pc/h	0	74	84	137	0	11	32	21	0	64	472	11	0	21	680	32
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		295			64			547			733	
Entry Volume, veh/h		292			62			531			719	
Circulating Flow (v_c), pc/h	712			610			179			107		
Exiting Flow (v_{ex}), pc/h	116			128			567			828		
Capacity (c_{pce}), pc/h		668			741			1150			1237	
Capacity (c), veh/h		661			719			1116			1213	
v/c Ratio (x)		0.44			0.09			0.48			0.59	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		11.9			5.9			8.5			10.1	
Lane LOS		B			A			A			B	
95% Queue Length, Q_{95} (veh)		2.3			0.3			2.6			4.1	
95% Queue Length, Q_{95} (ft)		58.0			7.7			66.6			104.1	
Approach Delay, s/veh | LOS	11.9	B		5.9	A		8.5	A		10.1	B	
Intersection Delay, s/veh | LOS	9.8						A					

HCS Two-Way Stop-Control Report

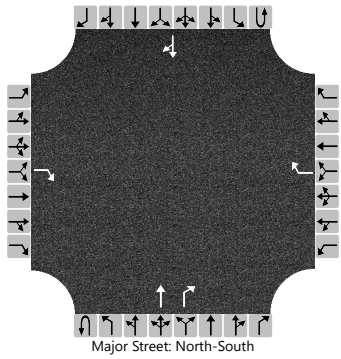
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Randolph Alt 2

Site Information

Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph
North/South Street	SR-43
Peak Hour Factor	0.81
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	1	0	0	1	1	0	0	1	0
Configuration				R				R			T	R				TR
Volume (veh/h)				10				10			530	20			310	20
Percent Heavy Vehicles (%)				5				7								
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2				6.2								
Critical Headway (sec)				6.25				6.27								
Base Follow-Up Headway (sec)				3.3				3.3								
Follow-Up Headway (sec)				3.35				3.36								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				12				12								
Capacity, c (veh/h)				648				458								
v/c Ratio				0.02				0.03								
95% Queue Length, Q_{95} (veh)				0.1				0.1								
95% Queue Length, Q_{95} (ft)				2.6				2.6								
Control Delay (s/veh)				10.7				13.1								
Level of Service (LOS)				B				B								
Approach Delay (s/veh)	10.7				13.1											
Approach LOS	B				B											

HCS Two-Way Stop-Control Report

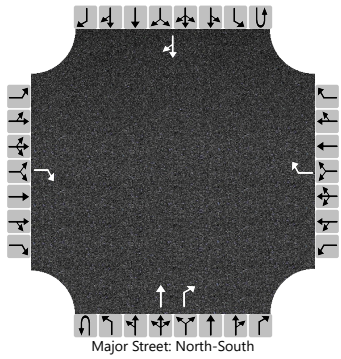
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Randolph Alt 2

Site Information

Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph
North/South Street	SR-43
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	1	0	0	1	1	0	0	1	0
Configuration				R				R			T	R				TR
Volume (veh/h)				10				10			460	60			650	30
Percent Heavy Vehicles (%)				0				5								
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2				6.2								
Critical Headway (sec)				6.20				6.25								
Base Follow-Up Headway (sec)				3.3				3.3								
Follow-Up Headway (sec)				3.30				3.35								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				10				10								
Capacity, c (veh/h)				447				580								
v/c Ratio				0.02				0.02								
95% Queue Length, Q_{95} (veh)				0.1				0.1								
95% Queue Length, Q_{95} (ft)				2.5				2.6								
Control Delay (s/veh)				13.2				11.3								
Level of Service (LOS)				B				B								
Approach Delay (s/veh)	13.2				11.3											
Approach LOS	B				B											

HCS Two-Way Stop-Control Report

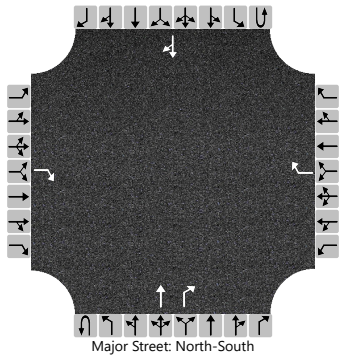
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Randolph Alt 2

Site Information

Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph
North/South Street	SR-43
Peak Hour Factor	0.81
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	1	0	0	1	1	0	0	1	0
Configuration				R				R			T	R				TR
Volume (veh/h)				10				10			580	20			320	20
Percent Heavy Vehicles (%)				5				7								
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2				6.2								
Critical Headway (sec)				6.25				6.27								
Base Follow-Up Headway (sec)				3.3				3.3								
Follow-Up Headway (sec)				3.35				3.36								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				12				12								
Capacity, c (veh/h)				637				422								
v/c Ratio				0.02				0.03								
95% Queue Length, Q_{95} (veh)				0.1				0.1								
95% Queue Length, Q_{95} (ft)				2.6				2.6								
Control Delay (s/veh)				10.8				13.8								
Level of Service (LOS)				B				B								
Approach Delay (s/veh)	10.8				13.8											
Approach LOS	B				B											

HCS Two-Way Stop-Control Report

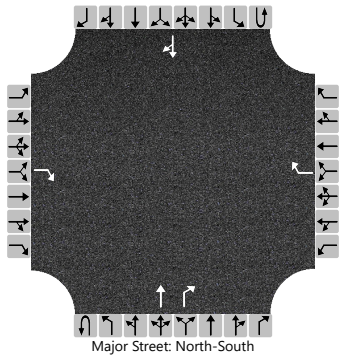
General Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	SR-43 at Randolph Alt 2

Site Information

Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph
North/South Street	SR-43
Peak Hour Factor	0.96
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	1		0	0	1	0	0	1	1	0	0	1	0
Configuration				R				R			T	R				TR
Volume (veh/h)				10				10			510	70			680	30
Percent Heavy Vehicles (%)				0				5								
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized	No				No				No							
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)				6.2				6.2								
Critical Headway (sec)				6.20				6.25								
Base Follow-Up Headway (sec)				3.3				3.3								
Follow-Up Headway (sec)				3.30				3.35								

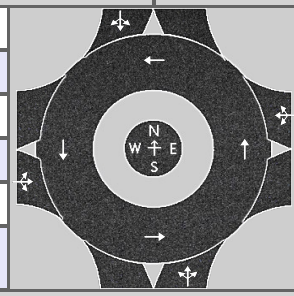
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)				10				10								
Capacity, c (veh/h)				429				542								
v/c Ratio				0.02				0.02								
95% Queue Length, Q_{95} (veh)				0.1				0.1								
95% Queue Length, Q_{95} (ft)				2.5				2.6								
Control Delay (s/veh)				13.6				11.8								
Level of Service (LOS)				B				B								
Approach Delay (s/veh)	13.6				11.8											
Approach LOS	B				B											

HCS Roundabouts Report

General Information

Analyst	VHD
Agency or Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Time Analyzed	OY AM
Project Description	SR-43 Alt 2



Site Information

Intersection	SR-43 at Trares Rd
E/W Street Name	Trares Rd
N/S Street Name	SR-43
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.82
Jurisdiction	ODOT District 4

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	60	10	30	0	20	60	10	0	130	480	10	0	20	270	30
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	5	5	5	0	5	5	5
Flow Rate (v_{PCE}), pc/h	0	73	12	37	0	24	73	12	0	166	615	13	0	26	346	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		122			109			794			410	
Entry Volume, veh/h		122			109			756			390	
Circulating Flow (v_c), pc/h	396			854			111			263		
Exiting Flow (v_{ex}), pc/h	51			277			700			407		
Capacity (c_{pce}), pc/h		921			578			1232			1055	
Capacity (c), veh/h		921			578			1174			1005	
v/c Ratio (x)		0.13			0.19			0.64			0.39	

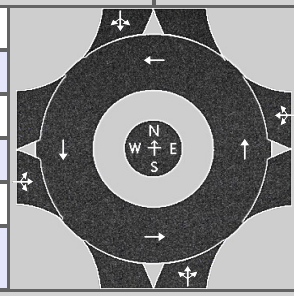
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.2			8.6			11.7			7.8	
Lane LOS		A			A			B			A	
95% Queue Length, Q_{95} (veh)		0.5			0.7			5.0			1.9	
95% Queue Length, Q_{95} (ft)		12.5			17.5			130.0			49.4	
Approach Delay, s/veh | LOS	5.2	A		8.6	A		11.7	B		7.8	A	
Intersection Delay, s/veh | LOS	9.7						A					

HCS Roundabouts Report

General Information

Analyst	VHD
Agency or Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Time Analyzed	OY PM
Project Description	SR-43 Alt 2



Site Information

Intersection	SR-43 at Trares Rd
E/W Street Name	Trares Rd
N/S Street Name	SR-43
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.96
Jurisdiction	ODOT District 4

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	90	60	90	0	20	30	10	0	70	420	10	0	30	600	30
Percent Heavy Vehicles, %	0	1	1	1	0	3	3	3	0	3	3	3	0	2	2	2
Flow Rate (v_{PCE}), pc/h	0	95	63	95	0	21	32	11	0	75	451	11	0	32	638	32
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		253			64			537			702	
Entry Volume, veh/h		250			62			521			688	
Circulating Flow (v_c), pc/h	691			621			190			128		
Exiting Flow (v_{ex}), pc/h	106			139			557			754		
Capacity (c_{pce}), pc/h		682			732			1137			1211	
Capacity (c), veh/h		675			711			1104			1187	
v/c Ratio (x)		0.37			0.09			0.47			0.58	

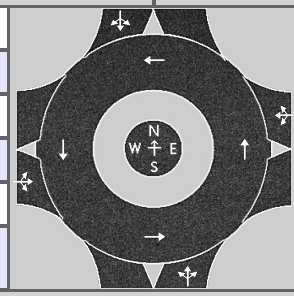
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		10.3			6.0			8.5			10.0	
Lane LOS		B			A			A			B	
95% Queue Length, Q_{95} (veh)		1.7			0.3			2.6			3.9	
95% Queue Length, Q_{95} (ft)		42.8			7.7			66.6			99.1	
Approach Delay, s/veh | LOS	10.3	B		6.0	A		8.5	A		10.0	B	
Intersection Delay, s/veh | LOS	9.4						A					

HCS Roundabouts Report

General Information

Analyst	VHD
Agency or Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Time Analyzed	DY AM
Project Description	SR-43 Alt 2



Site Information

Intersection	SR-43 at Trares Rd
E/W Street Name	Trares Rd
N/S Street Name	SR-43
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.82
Jurisdiction	ODOT District 4

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	90	10	40	0	20	80	20	0	130	490	10	0	20	280	30
Percent Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	5	5	5	0	5	5	5
Flow Rate (v_{PCE}), pc/h	0	110	12	49	0	24	98	24	0	166	627	13	0	26	359	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		171			146			806			423	
Entry Volume, veh/h		171			146			768			403	
Circulating Flow (v_c), pc/h	409			903			148			288		
Exiting Flow (v_{ex}), pc/h	51			302			761			432		
Capacity (c_{pce}), pc/h		909			549			1187			1029	
Capacity (c), veh/h		909			549			1130			980	
v/c Ratio (x)		0.19			0.27			0.68			0.41	

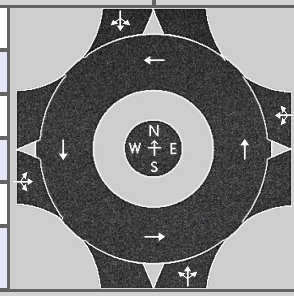
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.8			10.2			13.0			8.3	
Lane LOS		A			B			B			A	
95% Queue Length, Q_{95} (veh)		0.7			1.1			5.6			2.0	
95% Queue Length, Q_{95} (ft)		17.5			27.5			145.6			52.0	
Approach Delay, s/veh | LOS	5.8	A		10.2	B		13.0	B		8.3	A	
Intersection Delay, s/veh | LOS	10.6						B					

HCS Roundabouts Report

General Information

Analyst	VHD
Agency or Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Time Analyzed	DY PM
Project Description	SR-43 Alt 2



Site Information

Intersection	SR-43 at Trares Rd
E/W Street Name	Trares Rd
N/S Street Name	SR-43
Analysis Time Period, hrs	0.25
Peak Hour Factor	0.96
Jurisdiction	ODOT District 4

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	130	80	130	0	20	50	20	0	70	430	10	0	30	630	30
Percent Heavy Vehicles, %	0	1	1	1	0	3	3	3	0	3	3	3	0	2	2	2
Flow Rate (v_{PCE}), pc/h	0	137	84	137	0	21	54	21	0	75	461	11	0	32	669	32
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

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

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		358			96			547			733	
Entry Volume, veh/h		354			93			531			719	
Circulating Flow (v_c), pc/h	722			673			253			150		
Exiting Flow (v_{ex}), pc/h	127			161			619			827		
Capacity (c_{pce}), pc/h		661			695			1066			1184	
Capacity (c), veh/h		654			674			1035			1161	
v/c Ratio (x)		0.54			0.14			0.51			0.62	

Delay and Level of Service

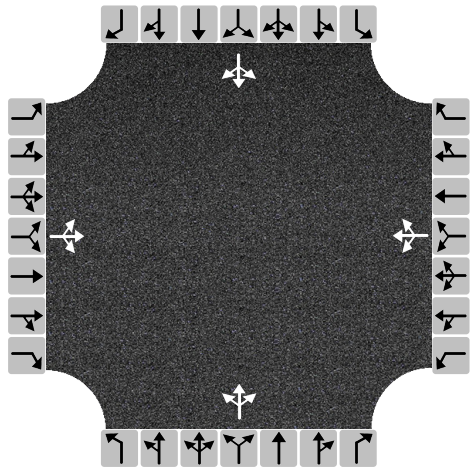
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		14.5			6.9			9.6			11.1	
Lane LOS		B			A			A			B	
95% Queue Length, Q_{95} (veh)		3.3			0.5			3.0			4.5	
95% Queue Length, Q_{95} (ft)		83.2			12.8			76.8			114.3	
Approach Delay, s/veh | LOS	14.5	B		6.9	A		9.6	A		11.1	B	
Intersection Delay, s/veh | LOS	11.1						B					

HCS All-Way Stop Control Report

General and Site Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Analysis Time Period (hrs)	0.25
Time Analyzed	AM Peak
Project Description	SR-43 at Randolph AWSC
Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph Road
North/South Street	SR-43
Peak Hour Factor	0.81

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh/h)	10	10	10	10	20	10	10	520	10	10	300	20
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	37			49			667			407		
Percent Heavy Vehicles	5			7			5			4		
Initial Departure Headway, h_d (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.033			0.044			0.593			0.362		
Final Departure Headway, h_d (s)	6.47			6.50			4.78			5.02		
Final Degree of Utilization, x	0.067			0.089			0.885			0.568		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, t_s (s)	4.47			4.50			2.78			3.02		

Capacity, Delay and Level of Service

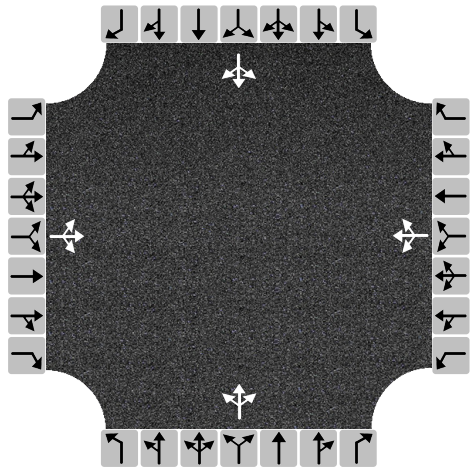
Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	37			49			667			407		
Capacity (veh/h)	556			554			753			717		
95% Queue Length, Q_{95} (veh)	0.2			0.3			11.3			3.6		
95% Queue Length, Q_{95} (ft)	5.2			7.9			293.8			92.9		
Control Delay (s/veh)	9.9			10.1			32.6			14.4		
Level of Service, LOS	A			B			D			B		
Approach Delay (s/veh) | LOS	9.9	A		10.1	B		32.6	D		14.4	B	
Intersection Delay (s/veh) | LOS	24.5						C					

HCS All-Way Stop Control Report

General and Site Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Analysis Time Period (hrs)	0.25
Time Analyzed	PM Peak
Project Description	SR-43 at Randolph AWSC
Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph Road
North/South Street	SR-43
Peak Hour Factor	0.96

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh/h)	10	30	10	10	10	10	10	450	30	10	640	30
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	52			31			510			708		
Percent Heavy Vehicles	0			5			3			2		
Initial Departure Headway, h_d (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.046			0.028			0.454			0.630		
Final Departure Headway, h_d (s)	6.69			6.80			5.06			4.84		
Final Degree of Utilization, x	0.097			0.059			0.717			0.952		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, t_s (s)	4.69			4.80			3.06			2.84		

Capacity, Delay and Level of Service

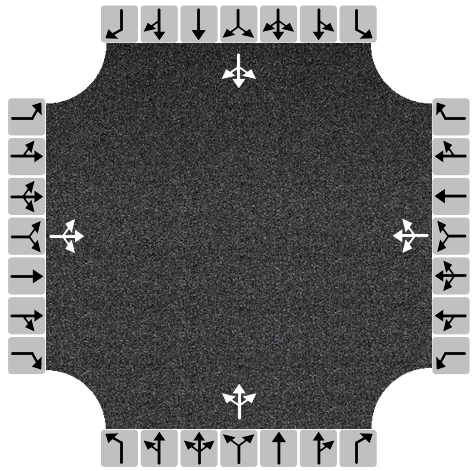
Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	52			31			510			708		
Capacity (veh/h)	538			529			712			744		
95% Queue Length, Q_{95} (veh)	0.3			0.2			6.1			14.2		
95% Queue Length, Q_{95} (ft)	7.5			5.2			156.2			360.7		
Control Delay (s/veh)	10.4			10.2			19.8			43.9		
Level of Service, LOS	B			B			C			E		
Approach Delay (s/veh) | LOS	10.4	B		10.2	B		19.8	C		43.9	E	
Intersection Delay (s/veh) | LOS	32.3						D					

HCS All-Way Stop Control Report

General and Site Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Analysis Time Period (hrs)	0.25
Time Analyzed	AM Peak
Project Description	SR-43 at Randolph AWSC
Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph Road
North/South Street	SR-43
Peak Hour Factor	0.81

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh/h)	20	10	10	10	30	10	10	560	10	10	310	20
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	49			62			716			420		
Percent Heavy Vehicles	5			7			5			4		
Initial Departure Headway, h_d (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.044			0.055			0.636			0.373		
Final Departure Headway, h_d (s)	6.87			6.83			4.94			5.25		
Final Degree of Utilization, x	0.094			0.117			0.983			0.612		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, t_s (s)	4.87			4.83			2.94			3.25		

Capacity, Delay and Level of Service

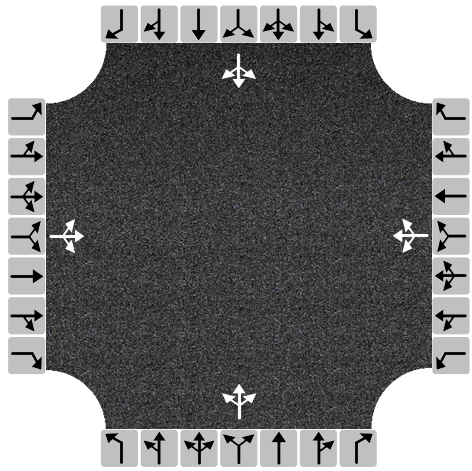
Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	49			62			716			420		
Capacity (veh/h)	524			527			728			685		
95% Queue Length, Q_{95} (veh)	0.3			0.4			15.6			4.2		
95% Queue Length, Q_{95} (ft)	7.8			10.6			405.6			108.4		
Control Delay (s/veh)	10.6			10.7			51.0			16.2		
Level of Service, LOS	B			B			F			C		
Approach Delay (s/veh) | LOS	10.6	B		10.7	B		51.0	F		16.2	C	
Intersection Delay (s/veh) | LOS	35.7						E					

HCS All-Way Stop Control Report

General and Site Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Analysis Time Period (hrs)	0.25
Time Analyzed	PM Peak
Project Description	SR-43 at Randolph AWSC
Intersection	SR-43 at Randolph
Jurisdiction	ODOT District 4
East/West Street	Randolph Road
North/South Street	SR-43
Peak Hour Factor	0.96

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh/h)	20	40	10	10	20	10	10	490	30	10	670	30
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	73			42			552			740		
Percent Heavy Vehicles	0			5			3			2		
Initial Departure Headway, h_d (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.065			0.037			0.491			0.657		
Final Departure Headway, h_d (s)	6.88			7.03			5.22			5.06		
Final Degree of Utilization, x	0.139			0.081			0.800			1.040		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, t_s (s)	4.88			5.03			3.22			3.06		

Capacity, Delay and Level of Service

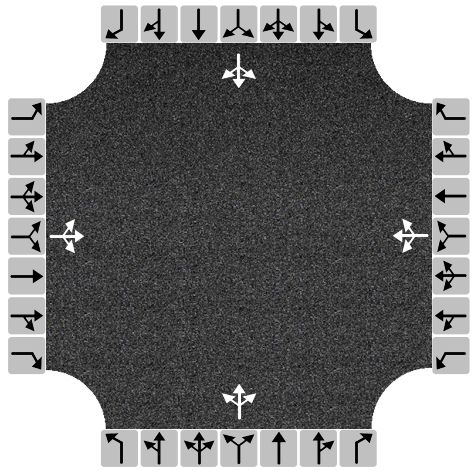
Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	73			42			552			740		
Capacity (veh/h)	523			512			690			711		
95% Queue Length, Q_{95} (veh)	0.5			0.3			8.1			18.5		
95% Queue Length, Q_{95} (ft)	12.5			7.8			207.4			469.9		
Control Delay (s/veh)	11.0			10.6			25.7			66.7		
Level of Service, LOS	B			B			D			F		
Approach Delay (s/veh) | LOS	11.0	B		10.6	B		25.7	D		66.7	F	
Intersection Delay (s/veh) | LOS	46.0						E					

HCS All-Way Stop Control Report

General and Site Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Analysis Time Period (hrs)	0.25
Time Analyzed	AM Peak
Project Description	SR-43 at Trares AWSC
Intersection	SR-43 at Trares
Jurisdiction	ODOT District 4
East/West Street	Trares Road
North/South Street	SR-43
Peak Hour Factor	0.82

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh/h)	40	10	30	10	40	10	120	490	10	10	280	30
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	98			73			756			390		
Percent Heavy Vehicles	0			0			5			5		
Initial Departure Headway, h_d (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.087			0.065			0.672			0.347		
Final Departure Headway, h_d (s)	6.63			6.77			5.19			5.45		
Final Degree of Utilization, x	0.180			0.138			1.089			0.591		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, t_s (s)	4.63			4.77			3.19			3.45		

Capacity, Delay and Level of Service

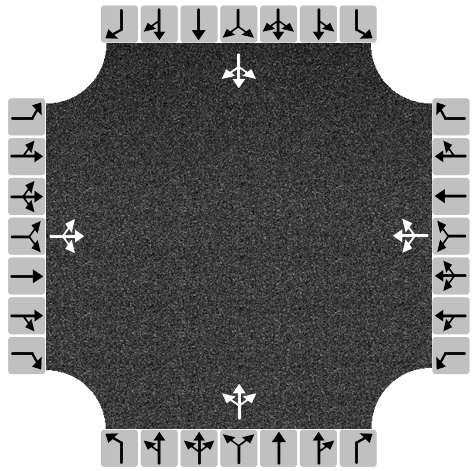
Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	98			73			756			390		
Capacity (veh/h)	543			532			694			660		
95% Queue Length, Q_{95} (veh)	0.6			0.5			21.2			3.9		
95% Queue Length, Q_{95} (ft)	15.0			12.5			551.2			101.4		
Control Delay (s/veh)	11.1			10.8			82.5			16.0		
Level of Service, LOS	B			B			F			C		
Approach Delay (s/veh) | LOS	11.1	B		10.8	B		82.5	F		16.0	C	
Intersection Delay (s/veh) | LOS	53.6						F					

HCS All-Way Stop Control Report

General and Site Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2027
Analysis Time Period (hrs)	0.25
Time Analyzed	PM Peak
Project Description	SR-43 at Trares AWSC
Intersection	SR-43 at Trares
Jurisdiction	ODOT District 4
East/West Street	Trares Road
North/South Street	SR-43
Peak Hour Factor	0.96

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh/h)	50	60	90	10	20	10	60	430	10	20	610	30
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	208			42			521			688		
Percent Heavy Vehicles	1			3			3			2		
Initial Departure Headway, h_d (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.185			0.037			0.463			0.611		
Final Departure Headway, h_d (s)	6.80			7.68			5.87			5.73		
Final Degree of Utilization, x	0.393			0.089			0.849			1.094		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, t_s (s)	4.80			5.68			3.87			3.73		

Capacity, Delay and Level of Service

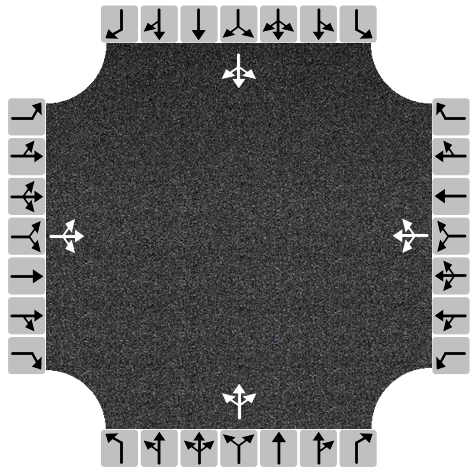
Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	208			42			521			688		
Capacity (veh/h)	530			469			614			629		
95% Queue Length, Q_{95} (veh)	1.9			0.3			9.3			20.2		
95% Queue Length, Q_{95} (ft)	47.9			7.7			238.1			513.1		
Control Delay (s/veh)	14.1			11.4			33.1			86.9		
Level of Service, LOS	B			B			D			F		
Approach Delay (s/veh) | LOS	14.1	B		11.4	B		33.1	D		86.9	F	
Intersection Delay (s/veh) | LOS	55.2						F					

HCS All-Way Stop Control Report

General and Site Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Analysis Time Period (hrs)	0.25
Time Analyzed	AM Peak
Project Description	SR-43 at Trares AWSC
Intersection	SR-43 at Trares
Jurisdiction	ODOT District 4
East/West Street	Trares Road
North/South Street	SR-43
Peak Hour Factor	0.82

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh/h)	60	10	40	10	50	20	120	500	10	10	290	30
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	134			98			768			402		
Percent Heavy Vehicles	0			0			5			5		
Initial Departure Headway, h_d (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.119			0.087			0.683			0.358		
Final Departure Headway, h_d (s)	6.83			6.95			5.52			5.76		
Final Degree of Utilization, x	0.255			0.188			1.179			0.643		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, t_s (s)	4.83			4.95			3.52			3.76		

Capacity, Delay and Level of Service

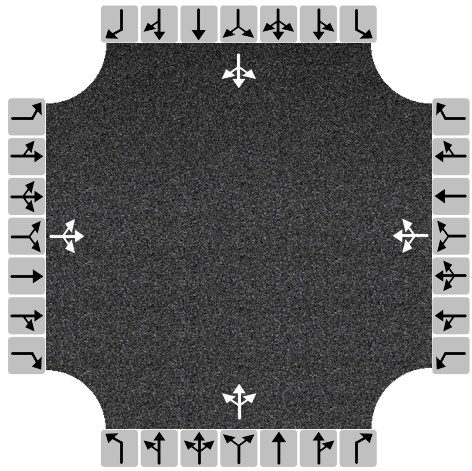
Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	134			98			768			402		
Capacity (veh/h)	527			518			652			625		
95% Queue Length, Q_{95} (veh)	1.0			0.7			25.8			4.6		
95% Queue Length, Q_{95} (ft)	25.0			17.5			670.8			119.6		
Control Delay (s/veh)	12.1			11.6			116.3			18.5		
Level of Service, LOS	B			B			F			C		
Approach Delay (s/veh) | LOS	12.1	B		11.6	B		116.3	F		18.5	C	
Intersection Delay (s/veh) | LOS	71.0						F					

HCS All-Way Stop Control Report

General and Site Information

Analyst	VHD
Agency/Co.	Lanham Engineering, LLC
Date Performed	
Analysis Year	2047
Analysis Time Period (hrs)	0.25
Time Analyzed	PM Peak
Project Description	SR-43 at Trares AWSC
Intersection	SR-43 at Trares
Jurisdiction	ODOT District 4
East/West Street	Trares Road
North/South Street	SR-43
Peak Hour Factor	0.96

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh/h)	70	80	130	10	30	20	60	440	10	20	640	30
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	292			63			531			719		
Percent Heavy Vehicles	1			3			3			2		
Initial Departure Headway, h_d (s)	3.20			3.20			3.20			3.20		
Initial Degree of Utilization, x	0.259			0.056			0.472			0.639		
Final Departure Headway, h_d (s)	7.05			8.22			6.41			6.38		
Final Degree of Utilization, x	0.571			0.143			0.946			1.275		
Move-Up Time, m (s)	2.0			2.0			2.0			2.0		
Service Time, t_s (s)	5.05			6.22			4.41			4.38		

Capacity, Delay and Level of Service

Approach	Eastbound			Westbound			Northbound			Southbound		
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LTR			LTR			LTR			LTR		
Flow Rate, v (veh/h)	292			63			531			719		
Capacity (veh/h)	511			438			562			564		
95% Queue Length, Q_{95} (veh)	3.5			0.5			12.3			28.7		
95% Queue Length, Q_{95} (ft)	88.2			12.8			314.9			729.0		
Control Delay (s/veh)	19.0			12.6			50.9			157.6		
Level of Service, LOS	C			B			F			F		
Approach Delay (s/veh) | LOS	19.0	C		12.6	B		50.9	F		157.6	F	
Intersection Delay (s/veh) | LOS	91.4						F					

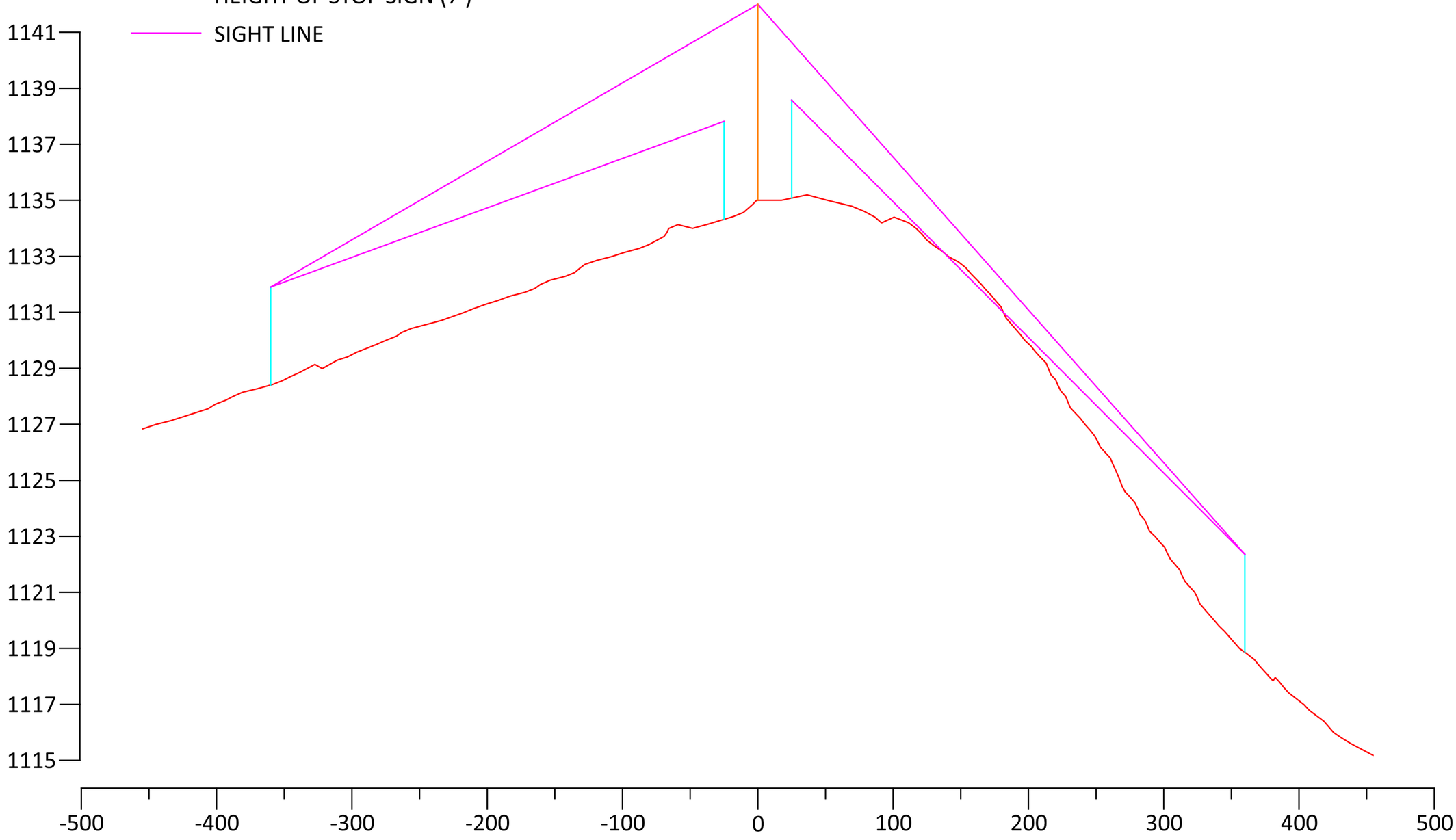
LEGEND:

ELEVATION OF SR-43

HEIGHT OF DRIVER'S EYE (3.5')

HEIGHT OF STOP SIGN (7')

SIGHT LINE



D4 SAFETY STUDY - POR-SR 43 & TRARES & RANDOLPH

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D4 SAFETY STUDY - POR-SR 43 & TRARES & RANDOLPH
POR-SR 43 & TRARES STOPPING SIGHT DISTANCE EXHIBIT

DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER ASP

REVIEWER LRY 01-29-25

PROJECT ID 0

SHEET P.1 TOTAL 2

LEGEND:

- ELEVATION OF SR-43
- HEIGHT OF DRIVER'S EYE (3.5')
- HEIGHT OF STOP SIGN (7')
- SIGHT LINE

D4 SAFETY STUDY - POR-SR 43 & TRARES & RANDOLPH

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D4 SAFETY STUDY - POR-SR 43 & TRARES & RANDOLPH
POR-SR 43 & RANDOLPH STOPPING SIGHT DISTANCE EXHIBIT

DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER	ASP
REVIEWER	LRY 01-29-25
PROJECT ID	0
SHEET	P.2
TOTAL	2

Appendix H
HSM Analysis

CARPENTER MARTY transportation

Appendix H

Project Information

General Information

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Existing	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	10/28/2024
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		
Perform Benefit Cost Analysis?	Yes		

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

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

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

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name
SR43; 3.868-3.936	Rural Two-Lane Two Way Segment		SPORSR00043**C	3.868	3.936	0.068		SR-43 (Cleveland Canton Road)
SR43; 3.868	Rural Two-Lane Two Way Intersection	Unsignalized	SPORSR00043**C	3.868		0.05	CPORCR0002	SR-43 @ Trares Road
SR43; 3.936	Rural Two-Lane Two Way Intersection	Unsignalized	SPORSR00043**C	3.936		0.05	CPORCR0001	SR-43 @ Randolph Road

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

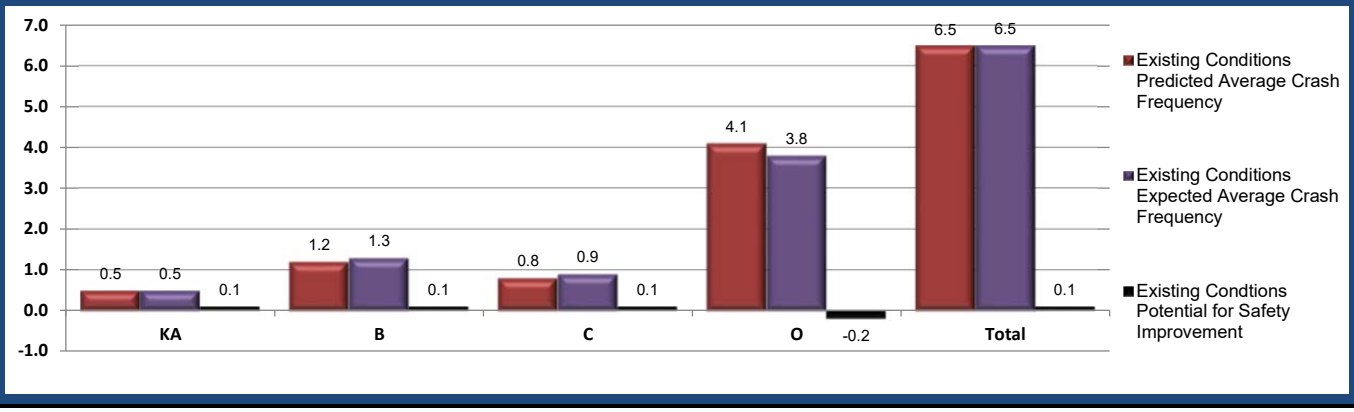
	Year	AADT	
Present ADT (PADT)			veh / day
Future ADT (FADT)			veh / day
Annual Linear Growth Rate			

Project Safety Performance Report

General Information

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Existing	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	10/28/2024
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		

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



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{predicted}$ - Existing Conditions	0.4736	1.1505	0.7602	4.0919	6.4762
$N_{expected}$ - Existing Conditions	0.5335	1.2954	0.8573	3.8484	6.5346
$N_{potential\ for\ improvement}$ - Existing Conditions	**0.0599**	**0.1449**	**0.0971**	-0.2435	**0.0584**

Project Safety Performance Report

General Information

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Existing	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	10/28/2024
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		

Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
SR43; 3.868-3.936	SR-43 (Cleveland Canton Road)	0.0125	0.0325	0.0158	0.0912	0.152
SR43; 3.868	SR-43 @ Trares Road	0.2727	0.6613	0.4404	2.3665	3.7409
SR43; 3.936	SR-43 @ Randolph Road	0.1884	0.4567	0.304	1.6342	2.5833

Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
SR43; 3.868-3.936	SR-43 (Cleveland Canton Road)	0.0102	0.0268	0.0125	0.0546	0.1041
SR43; 3.868	SR-43 @ Trares Road	0.3036	0.7359	0.4901	1.9438	3.4734
SR43; 3.936	SR-43 @ Randolph Road	0.2197	0.5327	0.3547	1.85	2.9571

Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
SR43; 3.868-3.936	SR-43 (Cleveland Canton Road)	-0.0023	-0.0057	-0.0033	-0.0366	-0.0479
SR43; 3.868	SR-43 @ Trares Road	**0.0309**	**0.0746**	**0.0497**	-0.4227	-0.2675
SR43; 3.936	SR-43 @ Randolph Road	**0.0313**	**0.076**	**0.0507**	**0.2158**	**0.3738**

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Expected Crash Frequency
Unknown	0.0325	0.0306	-0.0019	
Head On	0.0716	0.0709	-0.0007	
Rear End	1.7720	1.6568	-0.1152	
Backing	0.3309	0.2953	-0.0356	
Sideswipe - Meeting	0.2481	0.2341	-0.0140	
Sideswipe - Passing	0.3768	0.3463	-0.0305	
Angle	3.1254	3.0244	-0.1010	
Parked Vehicle	0.2925	0.2639	-0.0286	
Pedestrian	0.0406	0.0416	**0.0010**	
Animal	0.1063	0.0645	-0.0418	
Train	0.0014	0.0014	0.0000	
Pedalcycles	0.0304	0.0307	**0.0003**	
Other Non-Vehicle	0.0006	0.0007	**0.0001**	
Fixed Object	1.4494	1.3343	-0.1151	
Other Object	0.0510	0.0452	-0.0058	
Overturning	0.0892	0.0865	-0.0027	
Other Non-Collision	0.1125	0.1017	-0.0108	
Left Turn	0.2999	0.2888	-0.0111	
Right Turn	0.0000	0.0000	0.0000	

Existing Conditions: General Information and Data for Rural Two-Lane Two-Way Intersection

General Information		Location Information	
Analyst	GMB	Route	SR43
Agency or Company	Carpenter Marty Transportation	Logpoint	3.936
Date Performed	10/28/24	Common Name	SR-43 @ Randolph Road
Intersection	SR43; 3.936	Analysis Year	2022
Signalized/Unsignalized	Unsignalized		

Input Data				Existing Conditions				HSM Base Conditions
Intersection type (3ST, 4ST, 4SG)				4ST				--
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	14,700	(veh/day)	8,670				--
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	3,500	(veh/day)	650				--
Intersection skew angle (degrees) Skew Angle Help	Does skew differ for minor legs? Else, No.		Yes	Skew for Leg 1 (All):	20	Skew for Leg 2 (4ST only):	20	0
Number of uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0				0
Number of uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0				0
Intersection lighting (present/not present)				Present				Not Present
Calibration Factor, C_i				1.01				1.00
Locality:				State System				

Existing Conditions: Crash Modification Factors (CMFs) for Rural Two-Lane Two-Way Intersection

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.1140	1.0000	1.0000	0.9996	1.1136

Existing Conditions: Predicted Crash Summary for Rural Two-Lane Two-Way Intersection

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	2.297	0.24	1.000	2.297	1.11	1.01	2.583
Fatal and Injury (FI)	--	--	0.367	0.844	1.11	1.01	0.949
Property Damage Only (PDO)	--	--	0.633	1.453	1.11	1.01	1.634

Existing Conditions: General Information and Data for Rural Two-Lane Two-Way Intersection

General Information		Location Information	
Analyst	GMB	Route	SR43
Agency or Company	Carpenter Marty Transportation	Logpoint	3.868
Date Performed	10/28/24	Common Name	SR-43 @ Trares Road
Intersection	SR43; 3.868	Analysis Year	2022
Signalized/Unsignalized	Unsignalized		

Input Data				Existing Conditions				HSM Base Conditions
Intersection type (3ST, 4ST, 4SG)				4ST				--
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	14,700	(veh/day)	8,510				--
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	3,500	(veh/day)	1,450				--
Intersection skew angle (degrees) Skew Angle Help	Does skew differ for minor legs? Else, No.		Yes	Skew for Leg 1 (All):	0	Skew for Leg 2 (4ST only):	0	0
Number of uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0				0
Number of uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				0				0
Intersection lighting (present/not present)				Present				Not Present
Calibration Factor, C_i				1.01				1.00
Locality:				State System				

Existing Conditions: Crash Modification Factors (CMFs) for Rural Two-Lane Two-Way Intersection

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.0000	1.0000	1.0000	0.9996	0.9996

Existing Conditions: Predicted Crash Summary for Rural Two-Lane Two-Way Intersection

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	3.705	0.24	1.000	3.705	1.00	1.01	3.741
Fatal and Injury (FI)	--	--	0.367	1.361	1.00	1.01	1.374
Property Damage Only (PDO)	--	--	0.633	2.344	1.00	1.01	2.366

Existing Conditions: General Information and Data for Rural Two-Lane Two-Way Roadway Segment

General Information		Location Information	
Analyst	GMB	Route	SR43
Agency or Company	Carpenter Marty Transportation	Logpoints	3.868 to 3.936
Date Performed	10/28/24	Common Name	SR-43 (Cleveland Canton Road)
Segment for Analysis	SR43; 3.868-3.936	Analysis Year	2022

Input Data		Existing Conditions				HSM Base Conditions
Length of segment, L (mi)		0.068				--
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	8,210				--
Lane width (ft)		11				12
Shoulder width (ft)		Right Shld:	5	Left Shld:	5	6
Shoulder type		Right Shld:	Paved	Left Shld:	Paved	Paved
Length of horizontal curve (mi)		0.0				0
Radius of curvature (ft)		0				0
Spiral transition curve (present/not present)		Not Present				Not Present
Superelevation variance (ft/ft)		0				< 0.01
Grade (%)		4.7				0
Driveway density (driveways/mile)		16.24616184				5
Centerline rumble strips (present/not present)		Not Present				Not Present
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present				Not Present
Two-way left-turn lane (present/not present)		Not Present				Not Present
Roadside hazard rating (1-7 scale)		4				3
Segment lighting (present/not present)		Not Present				Not Present
Auto speed enforcement (present/not present)		Not Present				Not Present
Calibration Factor, Cr		1.20				1
Locality:		State System				

Project Information

General Information

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Alt 1	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	2/6/2025
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		
Perform Benefit Cost Analysis?	Yes		

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

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

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

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name
SR43; 3.868-3.936	Rural Two-Lane Two Way Segment		SPORSR00043**C	3.868	3.936	0.068		SR-43 (Cleveland Canton Road)
SR43; 3.868	Roundabout	Unsignalized	SPORSR00043**C	3.868		0.05	CPORCR0002	SR-43 @ Trares Road
SR43; 3.936	Roundabout	Unsignalized	SPORSR00043**C	3.936		0.05	CPORCR0001	SR-43 @ Randolph Road

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

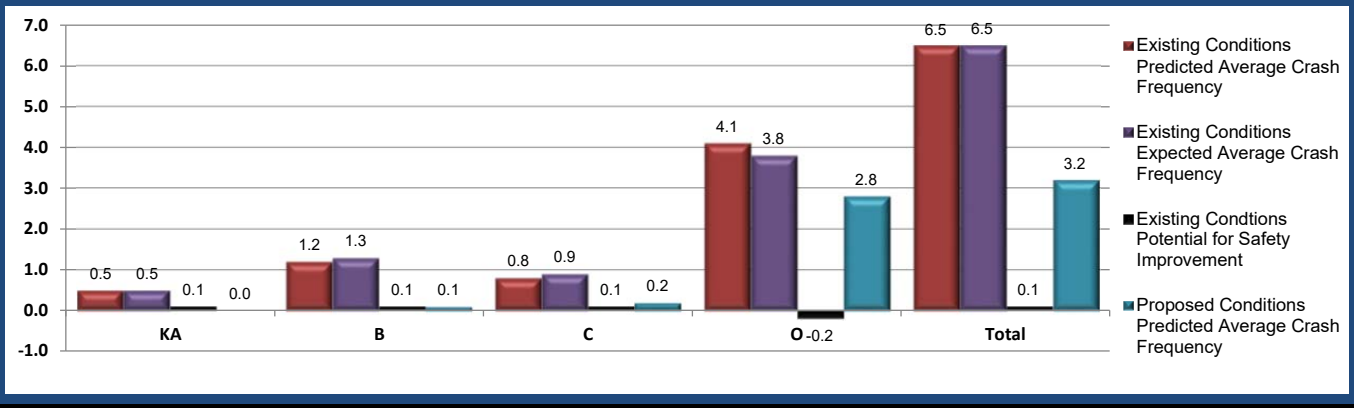
	Year	AADT	
Present ADT (PADT)			veh / day
Future ADT (FADT)			veh / day
Annual Linear Growth Rate		0.0025	

Project Safety Performance Report

General Information

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Alt 1	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	2/6/2025
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		

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



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{predicted}$ - Existing Conditions	0.4736	1.1505	0.7602	4.0919	6.4762
$N_{expected}$ - Existing Conditions	0.5335	1.2954	0.8573	3.8484	6.5346
$N_{potential\ for\ improvement}$ - Existing Conditions	**0.0599**	**0.1449**	**0.0971**	-0.2435	**0.0584**
$N_{expected}$ - Proposed Conditions	0.0255	0.1416	0.1510	2.8440	3.1621

Project Safety Performance Report

General Information

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Alt 1	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	2/6/2025
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		

Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
SR43; 3.868-3.936	SR-43 (Cleveland Canton Road)	0.0125	0.0325	0.0158	0.0912	0.152
SR43; 3.868	SR-43 @ Trares Road	0.2727	0.6613	0.4404	2.3665	3.7409
SR43; 3.936	SR-43 @ Randolph Road	0.1884	0.4567	0.304	1.6342	2.5833

Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
SR43; 3.868-3.936	SR-43 (Cleveland Canton Road)	0.0102	0.0268	0.0125	0.0546	0.1041
SR43; 3.868	SR-43 @ Trares Road	0.3036	0.7359	0.4901	1.9438	3.4734
SR43; 3.936	SR-43 @ Randolph Road	0.2197	0.5327	0.3547	1.85	2.9571

Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
SR43; 3.868-3.936	SR-43 (Cleveland Canton Road)	-0.0023	-0.0057	-0.0033	-0.0366	-0.0479
SR43; 3.868	SR-43 @ Trares Road	**0.0309**	**0.0746**	**0.0497**	-0.4227	-0.2675
SR43; 3.936	SR-43 @ Randolph Road	**0.0313**	**0.076**	**0.0507**	**0.2158**	**0.3738**

Proposed Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
SR43; 3.868-3.936	SR-43 (Cleveland Canton Road)	0.0125	0.0325	0.0158	0.0912	0.152
SR43; 3.868	SR-43 @ Trares Road	0.007	0.0581	0.0719	1.4653	1.6023
SR43; 3.936	SR-43 @ Randolph Road	0.006	0.051	0.0633	1.2875	1.4078

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Predicted Crash Frequency
Unknown	0.0325	0.0306	-0.0019	0.0864
Head On	0.0716	0.0709	-0.0007	0.0040
Rear End	1.7720	1.6568	-0.1152	0.4859
Backing	0.3309	0.2953	-0.0356	0.0300
Sideswipe - Meeting	0.2481	0.2341	-0.0140	0.0108
Sideswipe - Passing	0.3768	0.3463	-0.0305	0.9529
Angle	3.1254	3.0244	-0.1010	0.8574
Parked Vehicle	0.2925	0.2639	-0.0286	0.0018
Pedestrian	0.0406	0.0416	**0.0010**	0.0034
Animal	0.1063	0.0645	-0.0418	0.1367
Train	0.0014	0.0014	0.0000	0.0000
Pedalcycles	0.0304	0.0307	**0.0003**	0.0030
Other Non-Vehicle	0.0006	0.0007	**0.0001**	0.0000
Fixed Object	1.4494	1.3343	-0.1151	0.3832
Other Object	0.0510	0.0452	-0.0058	0.0033
Overturning	0.0892	0.0865	-0.0027	0.0090
Other Non-Collision	0.1125	0.1017	-0.0108	0.0624
Left Turn	0.2999	0.2888	-0.0111	0.0690
Right Turn	0.0000	0.0000	0.0000	0.2053

Proposed Conditions: General Information and Data for Rural Two-Lane Two-Way Roadway Segment

General Information		Location Information	
Analyst	GMB	Route	SR43
Agency or Company	Carpenter Marty Transportation	Logpoints	3.868 to 3.936
Date Performed	02/06/25	Common Name	SR-43 (Cleveland Canton Road)
Segment for Analysis	SR43; 3.868-3.936	Analysis Year	2022

Input Data		Proposed Conditions				HSM Base Conditions
Length of segment, L (mi)		0.068				--
AADT (veh/day)	$AADT_{MAX}$ = 17,800 (veh/day)	8,210				--
Lane width (ft)		11				12
Shoulder width (ft)		Right Shld:	5	Left Shld:	5	6
Shoulder type		Right Shld:	Paved	Left Shld:	Paved	Paved
Length of horizontal curve (mi)		0.0				0
Radius of curvature (ft)		0				0
Spiral transition curve (present/not present)		Not Present				Not Present
Superelevation variance (ft/ft)		0				< 0.01
Grade (%)		4.7				0
Driveway density (driveways/mile)		16.24616184				5
Centerline rumble strips (present/not present)		Not Present				Not Present
Passing lanes [present (1 lane) /present (2 lane) / not present)]		Not Present				Not Present
Two-way left-turn lane (present/not present)		Not Present				Not Present
Roadside hazard rating (1-7 scale)		4				3
Segment lighting (present/not present)		Not Present				Not Present
Auto speed enforcement (present/not present)		Not Present				Not Present
Calibration Factor, Cr		1.20				1
Locality:		State System				

Proposed Conditions: Crash Modification Factors (CMFs) for Rural Two-Lane Two-Way Roadway Segment

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.0195	1.0312	1.0000	1.0000	1.1000	1.1601	1.0000	1.0000	1.0000	1.0691	1.0000	1.0000	**1.4341**

Proposed Conditions: Predicted Crash Summary for Rural Two-Lane Two-Way Roadway Segment

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**N spf rs**	**Overdispersion Parameter, k**	**Crash Severity Distribution**	**N spf rs by Severity Distribution**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted average crash frequency, N predicted rs (crashes/year)**
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.1492	3.4706	1.0000	0.1492	1.4341	1.2000	**0.256696**
Fatal and Injury (FI)	--	--	0.2549	0.0380	1.4341	1.2000	**0.065432**
Property Damage Only (PDO)	--	--	0.7451	0.1111	1.4341	1.2000	**0.191264**

Proposed Conditions: General Information and Data for Roundabout Intersection

General Information		Location Information	
Analyst	GMB	Route	SR43
Agency or Company	Carpenter Marty Transportation	Logpoint	3.868
Date Performed	02/06/25	Common Name	SR-43 @ Trares Road
Intersection	SR43; 3.868	Analysis Year	2022
Signalized/Unsignalized	Unsignalized		

Input Data			Proposed Conditions	HSM Base Conditions
Area Type (Rural, Urban)			Rural	--
Number of Legs (3 or 4)			4	--
Single-Lane or Multi-lane Roundabout			Single-Lane	--
Total Entering AADT (veh/day)			9,960	--
				0
Presence of Outbound Only Leg (present/not present)			Not Present	Not Present
Calibration Factor, C_i			Varies, See Below	1.00
Locality:			State System	--
Leg 1	Leg 1 Entering AADT (veh/day)	$AADT_{MAX}$ = 19,733 (veh/day)	4,470	--
	Bypass lane (present/not present) - Leg 1		Not Present	--
	Number of driveways or unsignalized access points - Leg 1		1	--
	Entry width (feet) - Leg 1		23	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 1		1	--
Leg 2	Leg 2 Entering AADT (veh/day)	$AADT_{MAX}$ = 19,733 (veh/day)	350	--
	Bypass lane (present/not present) - Leg 2		Not Present	--
	Number of driveways or unsignalized access points - Leg 2		1	--
	Entry width (feet) - Leg 2		23	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 2		1	--
Leg 3	Leg 3 Entering AADT (veh/day)	$AADT_{MAX}$ = 19,733 (veh/day)	4,040	--
	Bypass lane (present/not present) - Leg 3		Not Present	--
	Number of driveways or unsignalized access points - Leg 3		1	--
	Entry width (feet) - Leg 3		21	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 3		1	--
Leg 4	Leg 4 Entering AADT (veh/day)	$AADT_{MAX}$ = 19,733 (veh/day)	1,100	--
	Bypass lane (present/not present) - Leg 4		Not Present	--
	Number of driveways or unsignalized access points - Leg 4		1	--
	Entry width (feet) - Leg 4		23	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 4		1	--

Proposed Conditions: Crash Modification Factors (CMFs) for Roundabout Intersection

Crash Severity Level	Inscribed Circle CMF	Outbound Only Leg CMF	Leg CMFs					Combined CMF
			Leg 1 CMF	Leg 2 CMF	Leg 3 CMF	Leg 4 CMF	Total CMF Legs	
Fatal and Injury (FI)	1.00	0.43	1.07	1.07	1.07	1.07	1.07	0.46
Property Damage Only (PDO)	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.09

Proposed Conditions: Predicted Crash Summary for Roundabout Intersection

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 11-7 or 11-8			$N_{spf\ int}$	Overdispersion Parameter, k	Combined CMFs	Calibration Factor, C_i	Predicted average crash frequency, $N_{predicted\ int}$
	a	b	c	from Equation 11-11 or 11-12	from Table 11-7 or 11-8	from (6) of Worksheet 2B		(3)*(5)*(6)
Total	--	--	--	--	--	--	--	1.618
Fatal and Injury (FI)	-3.503	0.915	0.206	0.303	0.33	0.46	1.00	0.138
Property Damage Only (PDO)	-1.475	0.702	0.168	1.36	0.80	1.09	1.00	1.480

Proposed Conditions: General Information and Data for Roundabout Intersection

General Information		Location Information	
Analyst	GMB	Route	SR43
Agency or Company	Carpenter Marty Transportation	Logpoint	3.936
Date Performed	02/06/25	Common Name	SR-43 @ Randolph Road
Intersection	SR43; 3.936	Analysis Year	2022
Signalized/Unsignalized	Unsignalized		

Input Data					Proposed Conditions	HSM Base Conditions
Area Type (Rural, Urban)					Rural	--
Number of Legs (3 or 4)					4	--
Single-Lane or Multi-lane Roundabout					Single-Lane	--
Total Entering AADT (veh/day)					9,320	--
						0
Presence of Outbound Only Leg (present/not present)					Not Present	Not Present
Calibration Factor, C_i					Varies, See Below	1.00
Locality:					State System	--
Leg 1	Leg 1 Entering AADT (veh/day)	$AADT_{MAX}$ =	19,733	(veh/day)	4,170	--
	Bypass lane (present/not present) - Leg 1				Not Present	--
	Number of driveways or unsignalized access points - Leg 1				0	--
	Entry width (feet) - Leg 1				23	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 1				1	--
Leg 2	Leg 2 Entering AADT (veh/day)	$AADT_{MAX}$ =	19,733	(veh/day)	360	--
	Bypass lane (present/not present) - Leg 2				Not Present	--
	Number of driveways or unsignalized access points - Leg 2				0	--
	Entry width (feet) - Leg 2				27	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 2				1	--
Leg 3	Leg 3 Entering AADT (veh/day)	$AADT_{MAX}$ =	19,733	(veh/day)	4,500	--
	Bypass lane (present/not present) - Leg 3				Not Present	--
	Number of driveways or unsignalized access points - Leg 3				0	--
	Entry width (feet) - Leg 3				24	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 3				1	--
Leg 4	Leg 4 Entering AADT (veh/day)	$AADT_{MAX}$ =	19,733	(veh/day)	290	--
	Bypass lane (present/not present) - Leg 4				Not Present	--
	Number of driveways or unsignalized access points - Leg 4				1	--
	Entry width (feet) - Leg 4				23	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 4				1	--

Proposed Conditions: Crash Modification Factors (CMFs) for Roundabout Intersection

Crash Severity Level	Inscribed Circle CMF	Outbound Only Leg CMF	Leg CMFs					Combined CMF
			Leg 1 CMF	Leg 2 CMF	Leg 3 CMF	Leg 4 CMF	Total CMF Legs	
Fatal and Injury (FI)	1.00	0.43	1.00	1.00	1.00	1.07	1.00	0.43
Property Damage Only (PDO)	1.00	1.00	1.00	1.00	1.00	1.09	1.00	1.00

Proposed Conditions: Predicted Crash Summary for Roundabout Intersection

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 11-7 or 11-8			$N_{spf\ int}$	Overdispersion Parameter, k	Combined CMFs	Calibration Factor, C_i	Predicted average crash frequency, $N_{predicted\ int}$
	a	b	c	from Equation 11-11 or 11-12	from Table 11-7 or 11-8	from (6) of Worksheet 2B		(3)*(5)*(6)
Total	--	--	--	--	--	--	--	1.422
Fatal and Injury (FI)	-3.503	0.915	0.206	0.285	0.33	0.43	1.00	0.122
Property Damage Only (PDO)	-1.475	0.702	0.168	1.30	0.80	1.00	1.00	1.301

Project Information

General Information

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Alt 2	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	10/28/2024
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		
Perform Benefit Cost Analysis?	Yes		

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

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

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

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name
SR43; 3.868-3.936	Rural Two-Lane Two Way Segment		SPORSR00043**C	3.868	3.936	0.068		SR-43 (Cleveland Canton Road)
SR43; 3.868	Roundabout	Unsignalized	SPORSR00043**C	3.868		0.05	CPORCR0002	SR-43 @ Trares Road
SR43; 3.936	Rural Two-Lane Two Way Intersection	Unsignalized	SPORSR00043**C	3.936		0.05	CPORCR0001	SR-43 @ Randolph Road

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

	Year	AADT	
Present ADT (PADT)			veh / day
Future ADT (FADT)			veh / day
Annual Linear Growth Rate		0.0025	

Select Other Non-Site Characteristic Based Countermeasures For Entire Project

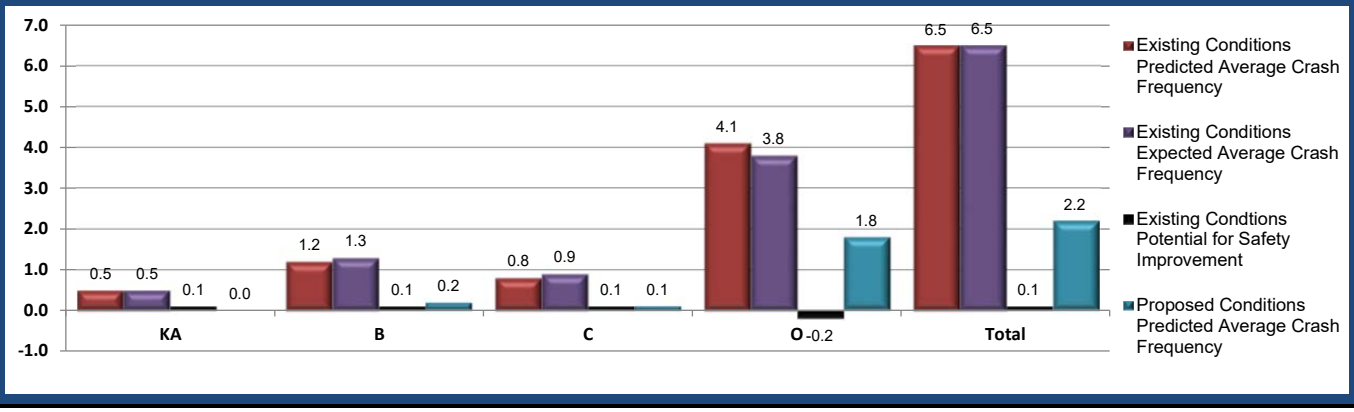
CMF Nbr	Countermeasure	CMF KA Value	CMF B Value	CMF C Value	CMF O Value	CMF Valid for the Following Site Types
CMF 1	Install right-in-right-out (RIRO) operations at stop-controlled intersections	0.2	0.32	0.32	0.32	2

Project Safety Performance Report

General Information

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Alt 2	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	10/28/2024
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		

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



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{predicted}$ - Existing Conditions	0.4736	1.1505	0.7602	4.0919	6.4762
$N_{expected}$ - Existing Conditions	0.5335	1.2954	0.8573	3.8484	6.5346
$N_{potential\ for\ improvement}$ - Existing Conditions	**0.0599**	**0.1449**	**0.0971**	-0.2435	**0.0584**
$N_{expected}$ - Proposed Conditions	0.0352	0.1524	0.1300	1.8350	2.1526

Project Safety Performance Report

General Information

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Alt 2	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	10/28/2024
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		

Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
SR43; 3.868-3.936	SR-43 (Cleveland Canton Road)	0.0125	0.0325	0.0158	0.0912	0.152
SR43; 3.868	SR-43 @ Trares Road	0.2727	0.6613	0.4404	2.3665	3.7409
SR43; 3.936	SR-43 @ Randolph Road	0.1884	0.4567	0.304	1.6342	2.5833

Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
SR43; 3.868-3.936	SR-43 (Cleveland Canton Road)	0.0102	0.0268	0.0125	0.0546	0.1041
SR43; 3.868	SR-43 @ Trares Road	0.3036	0.7359	0.4901	1.9438	3.4734
SR43; 3.936	SR-43 @ Randolph Road	0.2197	0.5327	0.3547	1.85	2.9571

Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
SR43; 3.868-3.936	SR-43 (Cleveland Canton Road)	-0.0023	-0.0057	-0.0033	-0.0366	-0.0479
SR43; 3.868	SR-43 @ Trares Road	**0.0309**	**0.0746**	**0.0497**	-0.4227	-0.2675
SR43; 3.936	SR-43 @ Randolph Road	**0.0313**	**0.076**	**0.0507**	**0.2158**	**0.3738**

Proposed Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
SR43; 3.868-3.936	SR-43 (Cleveland Canton Road)	0.0133	0.0343	0.0162	0.0955	0.1593
SR43; 3.868	SR-43 @ Trares Road	0.0074	0.0618	0.0763	1.5379	1.6834
SR43; 3.936	SR-43 @ Randolph Road	0.0145	0.0563	0.0375	0.2016	0.3099

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Predicted Crash Frequency
Unknown	0.0325	0.0306	-0.0019	0.0528
Head On	0.0716	0.0709	-0.0007	0.0155
Rear End	1.7720	1.6568	-0.1152	0.6137
Backing	0.3309	0.2953	-0.0356	0.0818
Sideswipe - Meeting	0.2481	0.2341	-0.0140	0.0554
Sideswipe - Passing	0.3768	0.3463	-0.0305	0.5883
Angle	3.1254	3.0244	-0.1010	1.0531
Parked Vehicle	0.2925	0.2639	-0.0286	0.0587
Pedestrian	0.0406	0.0416	**0.0010**	0.0092
Animal	0.1063	0.0645	-0.0418	0.1227
Train	0.0014	0.0014	0.0000	0.0003
Pedalcycles	0.0304	0.0307	**0.0003**	0.0073
Other Non-Vehicle	0.0006	0.0007	**0.0001**	0.0001
Fixed Object	1.4494	1.3343	-0.1151	0.5067
Other Object	0.0510	0.0452	-0.0058	0.0126
Overturning	0.0892	0.0865	-0.0027	0.0230
Other Non-Collision	0.1125	0.1017	-0.0108	0.0565
Left Turn	0.2999	0.2888	-0.0111	0.0945
Right Turn	0.0000	0.0000	0.0000	0.1106

Proposed Conditions: General Information and Data for Rural Two-Lane Two-Way Roadway Segment

General Information		Location Information	
Analyst	GMB	Route	SR43
Agency or Company	Carpenter Marty Transportation	Logpoints	3.868 to 3.936
Date Performed	10/28/24	Common Name	SR-43 (Cleveland Canton Road)
Segment for Analysis	SR43; 3.868-3.936	Analysis Year	2022

Input Data	Proposed Conditions	HSM Base Conditions
Length of segment, L (mi)	0.068	--
AADT (veh/day) ($AADT_{MAX}$ = 17,800 (veh/day))	8,670	--
Lane width (ft)	11	12
Shoulder width (ft)	Right Shld: 5 / Left Shld: 5	6
Shoulder type	Right Shld: Paved / Left Shld: Paved	Paved
Length of horizontal curve (mi)	0.0	0
Radius of curvature (ft)	0	0
Spiral transition curve (present/not present)	Not Present	Not Present
Superelevation variance (ft/ft)	0	< 0.01
Grade (%)	4.7	0
Driveway density (driveways/mile)	16.24616184	5
Centerline rumble strips (present/not present)	Not Present	Not Present
Passing lanes [present (1 lane) /present (2 lane) / not present)]	Not Present	Not Present
Two-way left-turn lane (present/not present)	Not Present	Not Present
Roadside hazard rating (1-7 scale)	4	3
Segment lighting (present/not present)	Not Present	Not Present
Auto speed enforcement (present/not present)	Not Present	Not Present
Calibration Factor, Cr	1.20	1
Locality:	State System	

Proposed Conditions: Crash Modification Factors (CMFs) for Rural Two-Lane Two-Way Roadway Segment

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CMF for Lane Width	CMF for Shoulder Width and Type	CMF for Horizontal Curves	CMF for Super-elevation	CMF for Grades	CMF for Driveway Density	CMF for Centerline Rumble Strips	CMF for Passing Lanes	CMF for Two-Way Left-Turn Lane	CMF for Roadside Design	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMR 5r*	*CMF 6r*	*CMF 7r*	*CMF 8r*	*CMF 9r*	*CMF 10r*	*CMF 11r*	*CMF 12r*	*CMF comb*
from Equation 10-11	from Equation 10-12	from Equation 10-13	from Equations 10-14, 10-15, or 10-16	from Table 10-11	from Equation 10-17	from Section 10.7.1	from Section 10.7.1	from Equation 10-18 & 10-19	from Equation 10-20	from Equation 10-21	from Section 10.7.1	(1)x(2)x … x(11)x(12)
1.0195	1.0312	1.0000	1.0000	1.1000	1.1518	1.0000	1.0000	1.0000	1.0691	1.0000	1.0000	**1.4239**

Proposed Conditions: Predicted Crash Summary for Rural Two-Lane Two-Way Roadway Segment

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**N spf rs**	**Overdispersion Parameter, k**	**Crash Severity Distribution**	**N spf rs by Severity Distribution**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted average crash frequency, N predicted rs (crashes/year)**
	from Equation 10-6	from Equation 10-7	from Table 10-3 (proportion)	(2)TOTAL x (4)	(13) from Worksheet 1B		(5)x(6)x(7)
Total	0.1575	3.4706	1.0000	0.1575	1.4239	1.2000	**0.269151**
Fatal and Injury (FI)	--	--	0.2549	0.0402	1.4239	1.2000	**0.068606**
Property Damage Only (PDO)	--	--	0.7451	0.1174	1.4239	1.2000	**0.200545**

Proposed Conditions: General Information and Data for Roundabout Intersection

General Information		Location Information	
Analyst	GMB	Route	SR43
Agency or Company	Carpenter Marty Transportation	Logpoint	3.868
Date Performed	10/28/24	Common Name	SR-43 @ Trares Road
Intersection	SR43; 3.868	Analysis Year	2022
Signalized/Unsignalized	Unsignalized		

Input Data			Proposed Conditions	HSM Base Conditions
Area Type (Rural, Urban)			Rural	--
Number of Legs (3 or 4)			4	--
Single-Lane or Multi-lane Roundabout			Single-Lane	--
Total Entering AADT (veh/day)			10,670	--
				0
Presence of Outbound Only Leg (present/not present)			Not Present	Not Present
Calibration Factor, C_i			Varies, See Below	1.00
Locality:			State System	--
Leg 1	Leg 1 Entering AADT (veh/day)	$AADT_{MAX}$ = 19,733 (veh/day)	4,570	--
	Bypass lane (present/not present) - Leg 1		Not Present	--
	Number of driveways or unsignalized access points - Leg 1		1	--
	Entry width (feet) - Leg 1		23	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 1		1	--
Leg 2	Leg 2 Entering AADT (veh/day)	$AADT_{MAX}$ = 19,733 (veh/day)	350	--
	Bypass lane (present/not present) - Leg 2		Not Present	--
	Number of driveways or unsignalized access points - Leg 2		1	--
	Entry width (feet) - Leg 2		23	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 2		1	--
Leg 3	Leg 3 Entering AADT (veh/day)	$AADT_{MAX}$ = 19,733 (veh/day)	4,120	--
	Bypass lane (present/not present) - Leg 3		Not Present	--
	Number of driveways or unsignalized access points - Leg 3		1	--
	Entry width (feet) - Leg 3		21	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 3		1	--
Leg 4	Leg 4 Entering AADT (veh/day)	$AADT_{MAX}$ = 19,733 (veh/day)	1,110	--
	Bypass lane (present/not present) - Leg 4		Not Present	--
	Number of driveways or unsignalized access points - Leg 4		1	--
	Entry width (feet) - Leg 4		23	16-25 ft
	Number of entering lanes (1 lane, 2 lanes) - Leg 4		1	--

Proposed Conditions: Crash Modification Factors (CMFs) for Roundabout Intersection

Crash Severity Level	Inscribed Circle CMF	Outbound Only Leg CMF	Leg CMFs					Combined CMF
			Leg 1 CMF	Leg 2 CMF	Leg 3 CMF	Leg 4 CMF	Total CMF Legs	
Fatal and Injury (FI)	1.00	0.43	1.07	1.07	1.07	1.07	1.07	0.46
Property Damage Only (PDO)	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.09

Proposed Conditions: Predicted Crash Summary for Roundabout Intersection

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 11-7 or 11-8			$N_{spf\ int}$	Overdispersion Parameter, k	Combined CMFs	Calibration Factor, C_i	Predicted average crash frequency, $N_{predicted\ int}$
	a	b	c	from Equation 11-11 or 11-12	from Table 11-7 or 11-8	from (6) of Worksheet 2B		(3)*(5)*(6)
Total	--	--	--	--	--	--	--	1.700
Fatal and Injury (FI)	-3.503	0.915	0.206	0.323	0.33	0.46	1.00	0.147
Property Damage Only (PDO)	-1.475	0.702	0.168	1.43	0.80	1.09	1.00	1.553

Proposed Conditions: General Information and Data for Rural Two-Lane Two-Way Intersection

General Information		Location Information	
Analyst	GMB	Route	SR43
Agency or Company	Carpenter Marty Transportation	Logpoint	3.936
Date Performed	10/28/24	Common Name	SR-43 @ Randolph Road
Intersection	SR43; 3.936	Analysis Year	2022
Signalized/Unsignalized	Unsignalized		

Input Data				Proposed Conditions				HSM Base Conditions
Intersection type (3ST, 4ST, 4SG)				4ST				--
$AADT_{major}$ (veh/day)	$AADT_{MAX}$ =	14,700	(veh/day)	8,900				--
$AADT_{minor}$ (veh/day)	$AADT_{MAX}$ =	3,500	(veh/day)	170				--
Intersection skew angle (degrees) Skew Angle Help	Does skew differ for minor legs? Else, No.		Yes	Skew for Leg 1 (All):	20	Skew for Leg 2 (4ST only):	20	0
Number of uncontrolled approaches with a left-turn lane (0, 1, 2, 3, 4)				0				0
Number of uncontrolled approaches with a right-turn lane (0, 1, 2, 3, 4)				1				0
Intersection lighting (present/not present)				Present				Not Present
Calibration Factor, C_i				1.01				1.00
Locality:				State System				

Proposed Conditions: Crash Modification Factors (CMFs) for Rural Two-Lane Two-Way Intersection

(1) CMF for Intersection Skew Angle CMF_{1i} from Equations 10-22 or 10-23	(2) CMF for Left-Turn Lanes CMF_{2i} from Table 10-13	(3) CMF for Right-Turn Lanes CMF_{3i} from Table 10-14	(4) CMF for Lighting CMF_{4i} from Equation 10-24	(5) Combined CMF CMF_{COMB} (1)*(2)*(3)*(4)
1.1140	1.0000	0.8600	0.9996	0.9577

Proposed Conditions: Predicted Crash Summary for Rural Two-Lane Two-Way Intersection

(1) Crash Severity Level	(2) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ from Equations 10-8, 10-9, or 10-10	(3) Overdispersion Parameter, k from Section 10.6.2	(4) Crash Severity Distribution from Table 10-5	(5) $N_{spf\ 3ST,\ 4ST\ or\ 4SG}$ by Severity Distribution $(2)_{TOTAL}$ * (4)	(6) Combined CMFs from (5) of Worksheet 2B	(7) Calibration Factor, C_i	(8) Predicted average crash frequency, $N_{predicted\ int}$ (5)*(6)*(7)
Total	1.030	0.24	1.000	1.030	0.96	1.01	0.996
Fatal and Injury (FI)	--	--	0.367	0.378	0.96	1.01	0.366
Property Damage Only (PDO)	--	--	0.633	0.651	0.96	1.01	0.630

Proposed Conditions: Summary of Other CMFs (Without Animal Crashes)						
CMF Nbr	Countermeasure	KA Value	B Value	C Value	O Value	Total
CMF 1	Install right-in-right-out (RIRO) operations at stop-controlled intersections	-0.0582	-0.1196	-0.0798	-0.4284	-0.6860
		0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	0.0000	0.0000	0.0000	0.0000
Total		*-0.0582*	*-0.1196*	*-0.0798*	*-0.4284*	*-0.6860*

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF Details

CMF ID: 9822

CMF Name: Install right-in-right-out (RIRO) operations at stop-controlled interse

Description:

Prior Condition: No Prior Condition(s)

Category: Access management

Study ID: *Safety Effects of Turning Movement Restrictions at Stop-Controlled Intersections*, Le et al. 2018

Star Quality Rating	
Star Quality Rating:	3 Stars

Crash Modification Factor (CMF)	
Value:	0.32
Adjusted Standard Error:	
Unadjusted Standard Error:	0.08

Crash Reduction Factor	
Value:	68
Adjusted Standard Error:	
Unadjusted Standard Error:	8

Applicability	
Crash Type:	Other
Crash Severity:	All
Roadway Types:	Not specified
Minimum Number of Lanes:	4
Maximum Number of Lanes:	6
Number of Lanes Direction:	
Number of Lanes Comment:	4 and 6 Lanes
Road Division Type:	Divided by Median
Minimum Speed Limit:	
Maximum Speed Limit:	
Speed Unit:	
Speed Limit Comment:	
Area Type:	Urban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based.	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg
Traffic Control:	Stop-controlled
Major Road Traffic Volume:	Minimum of 13433 to Maximum of 75000 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	Minimum of 51 to Maximum of 2600 Annual Average Daily Traffic (AADT)

Average Major Road Volume:	38724 Annual Average Daily Traffic (AADT)
Average Minor Road Volume:	519 Annual Average Daily Traffic (AADT)

Development Details

Date Range of Data Used:	
Municipality:	
State:	CA
Country:	USA
Type of Methodology Used:	Regression cross-section
Sample Size (crashes):	199 crashes
Sample Size (sites):	138 sites

Other Details

Included in HSM:	No
Date Added to Clearinghouse:	Oct 27, 2018
Comments:	This CMF compares urban, three-legged, stop-controlled intersections with RIRO operation to full movement. This CMF looks at Intersection-related crashes. Intersection-related crashes are defined as all crashes within 100 ft of intersection defined as 'intersection-related' by the reporting officer (all types and severities combined)

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CMF / CRF Details

CMF ID: 9823

CMF Name: Install right-in-right-out (RIRO) operations at stop-controlled interse

Description:

Prior Condition: No Prior Condition(s)

Category: Access management

Study ID: *Safety Effects of Turning Movement Restrictions at Stop-Controlled Intersections*, Le et al. 2018

Star Quality Rating	
Star Quality Rating:	3 Stars

Crash Modification Factor (CMF)	
Value:	0.2
Adjusted Standard Error:	
Unadjusted Standard Error:	0.07

Crash Reduction Factor	
Value:	80
Adjusted Standard Error:	
Unadjusted Standard Error:	7

Applicability	
Crash Type:	Other
Crash Severity:	K (fatal),A (serious injury),B (minor injury),C (possible injury)
Roadway Types:	Not specified
Minimum Number of Lanes:	4
Maximum Number of Lanes:	6
Number of Lanes Direction:	
Number of Lanes Comment:	4 and 6 Lanes
Road Division Type:	Divided by Median
Minimum Speed Limit:	
Maximum Speed Limit:	
Speed Unit:	
Speed Limit Comment:	
Area Type:	Urban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based.	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg
Traffic Control:	Stop-controlled
Major Road Traffic Volume:	Minimum of 13433 to Maximum of 75000 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	Minimum of 51 to Maximum of 2600 Annual Average Daily Traffic (AADT)

Average Major Road Volume:	38724 Annual Average Daily Traffic (AADT)
Average Minor Road Volume:	519 Annual Average Daily Traffic (AADT)

Development Details

Date Range of Data Used:	
Municipality:	
State:	CA
Country:	USA
Type of Methodology Used:	Regression cross-section
Sample Size (crashes):	101 crashes
Sample Size (sites):	138 sites

Other Details

Included in HSM:	No
Date Added to Clearinghouse:	Oct 27, 2018
Comments:	This CMF compares urban, three-legged, stop-controlled intersections with RIRO operation to full movement. This CMF looks at Fatal and Injury, Intersection-related crashes. Intersection-related crashes are defined as all crashes within 100 ft of intersection defined as 'intersection-related' by the reporting officer (K, A, B, and C injuries on KABCO scale)

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center

Appendix I
Cost Estimates, Benefit Cost Analysis, and Design Parameters

CARPENTER MARTY transportation

Appendix I

SR-43, RANDOLPH ROAD, AND TRARES ROAD

MODEL: CLX_SR43 - RAB [Sheet] PAPERSIZE: 17x11 (in.) DATE: 3/10/2025 TIME: 5:35:54 PM USER: cflach
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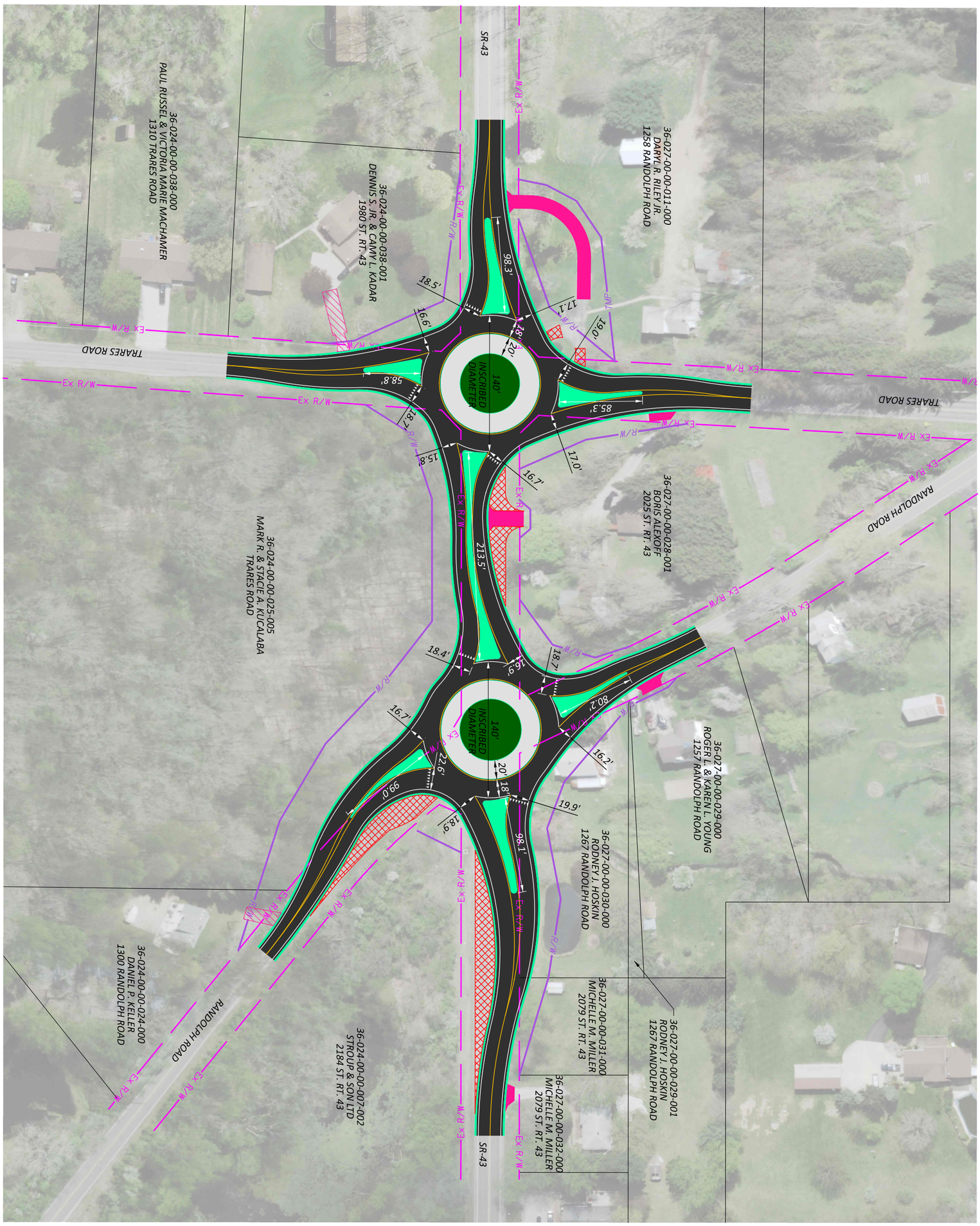


SHEET	TOTAL
1	13

PROJECT ID: 0

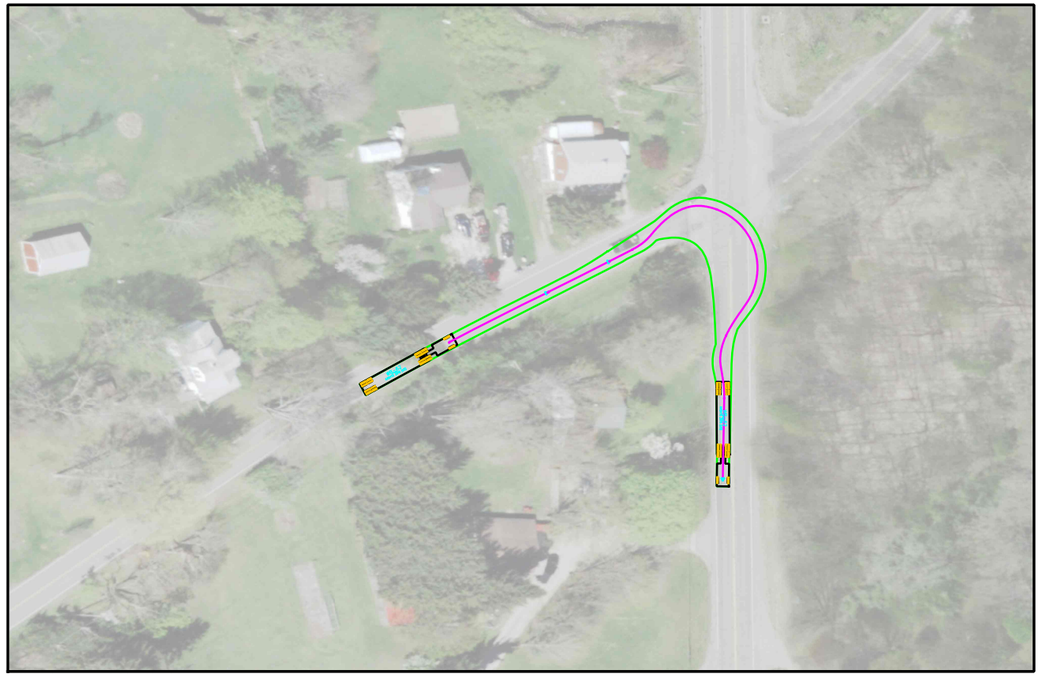
REVIEWER: DMG 02-04-25

DESIGNER: CEF

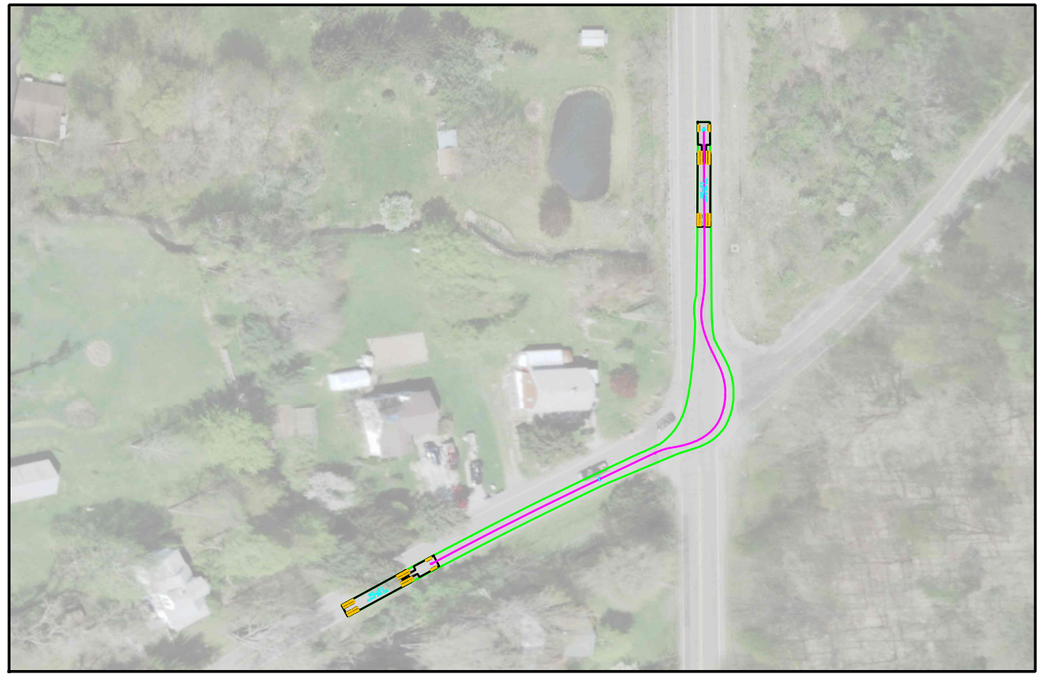
DESIGN AGENCY: CARPENTER MARTY transportation

SR-43 AND RANDOLPH ROAD AND TRARES ROAD ROUNDABOUTS (ALT. 1)
SCHEMATIC PLAN

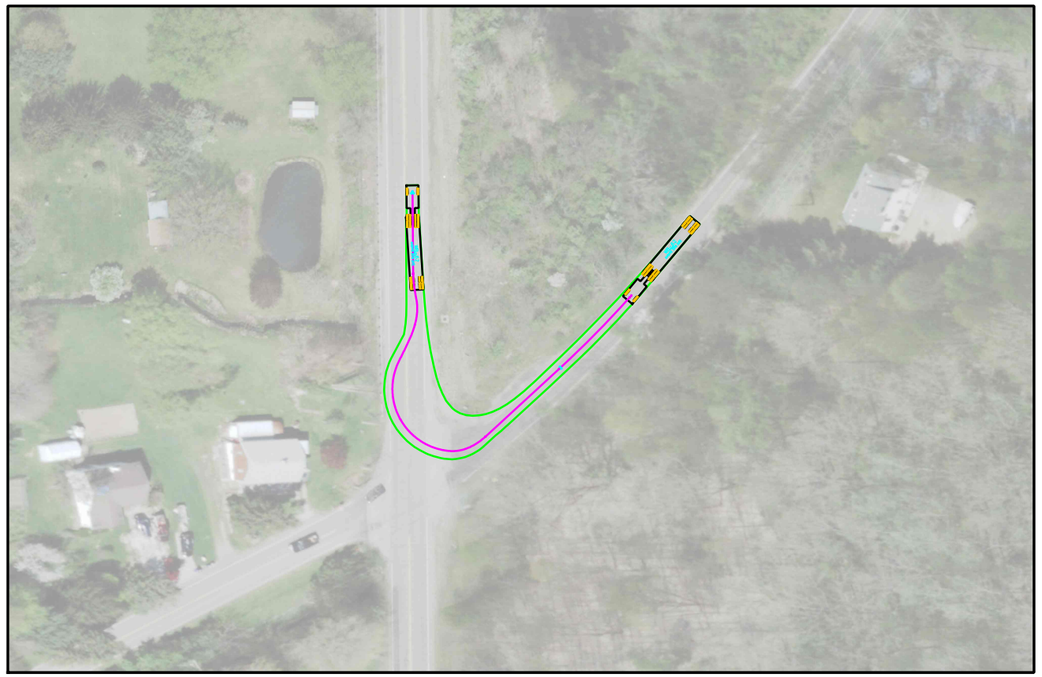
HORIZONTAL SCALE IN FEET
0 50
25 100



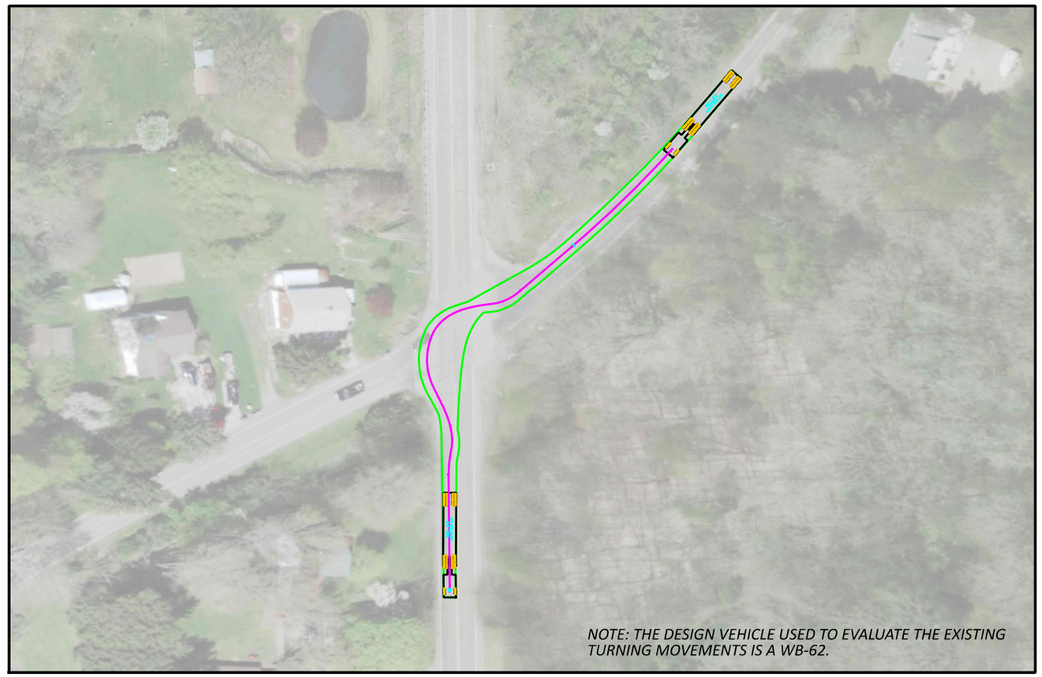
EASTBOUND RANDOLPH ROAD: RIGHT TURN MOVEMENT



EASTBOUND RANDOLPH ROAD: LEFT TURN MOVEMENT



WESTBOUND RANDOLPH ROAD: RIGHT TURN MOVEMENT



NOTE: THE DESIGN VEHICLE USED TO EVALUATE THE EXISTING TURNING MOVEMENTS IS A WB-62.

WESTBOUND RANDOLPH ROAD: LEFT TURN MOVEMENT

HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD EXISTING CONDITIONS
EASTBOUND AND WESTBOUND WB-62 TRUCK TURNING MOVEMENTS

SR-43, RANDOLPH ROAD, AND TRARES ROAD

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DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER
CEF

REVIEWER
BAA 02-04-25

PROJECT ID
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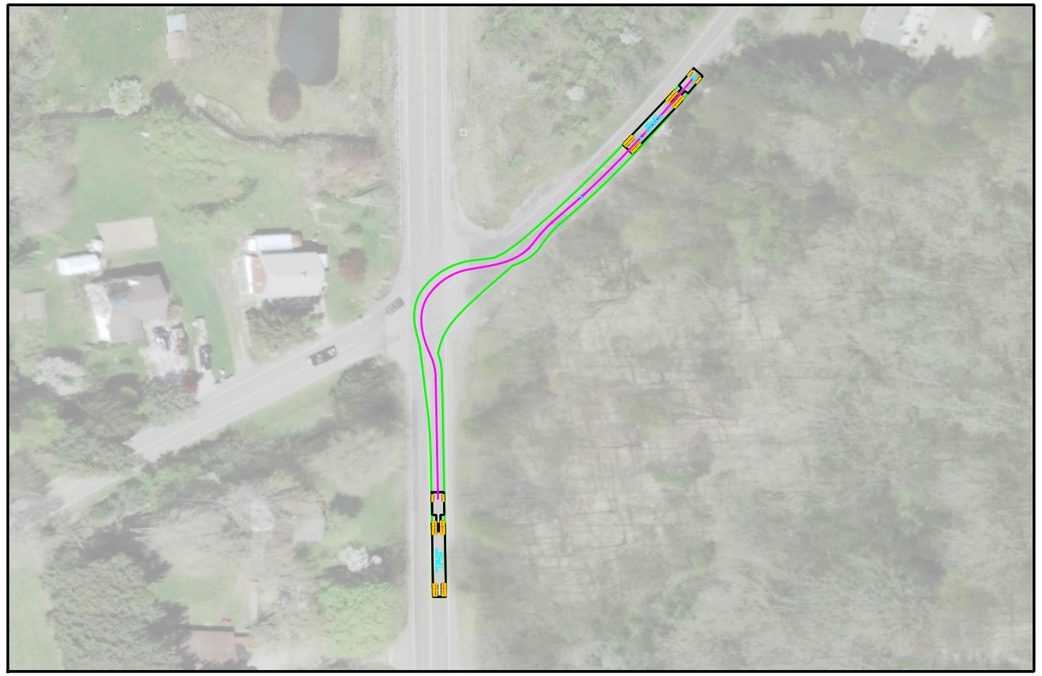
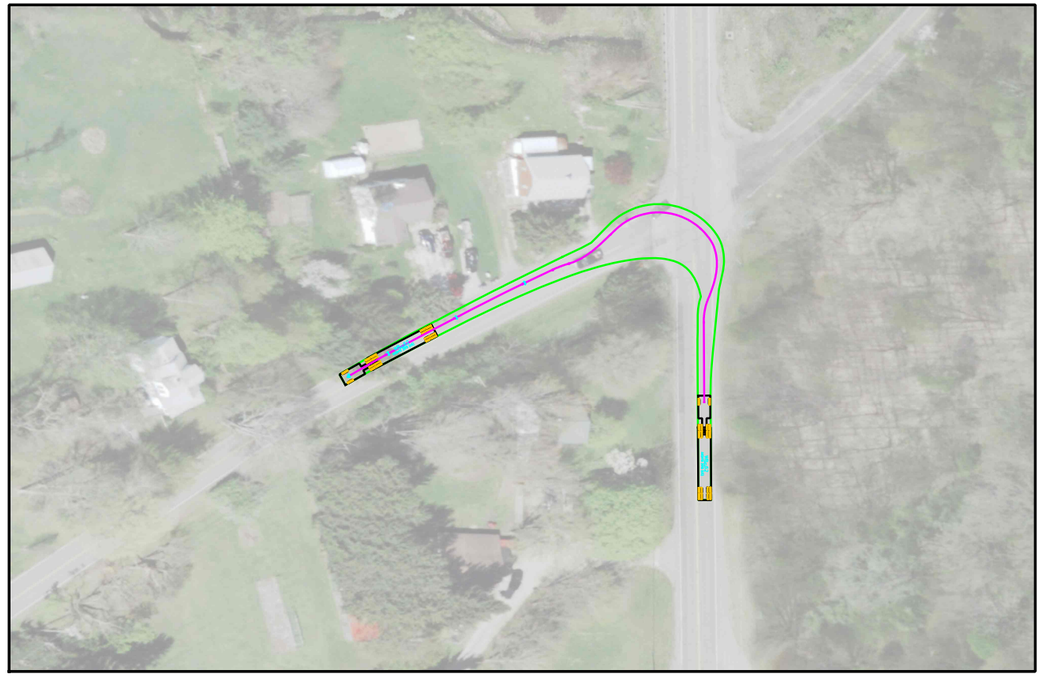
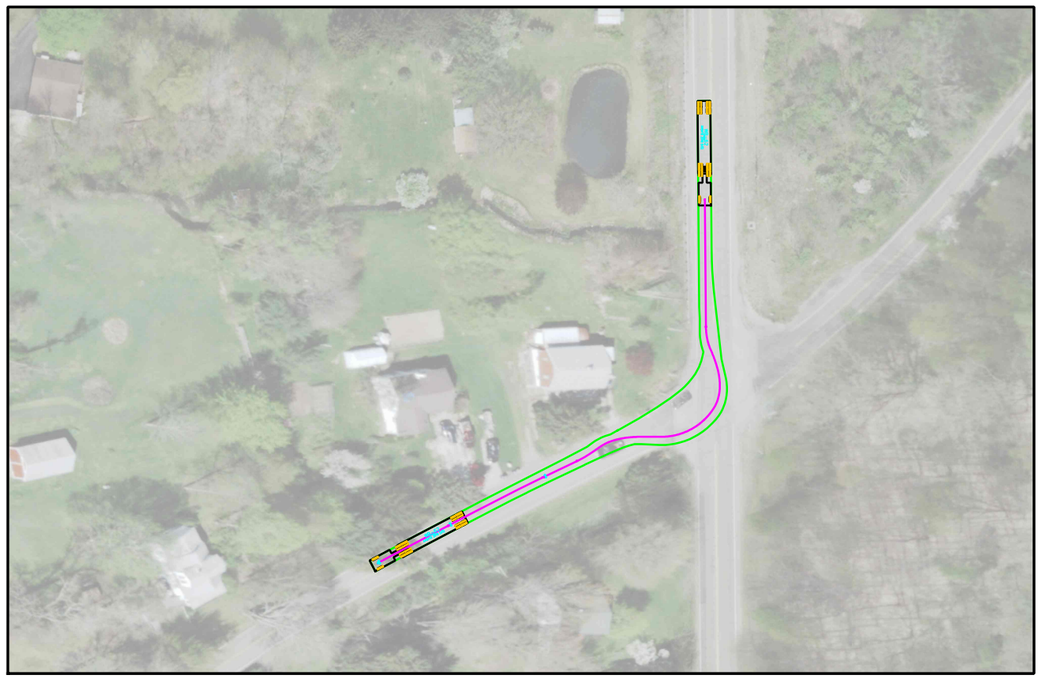
SHEET 2 TOTAL 13



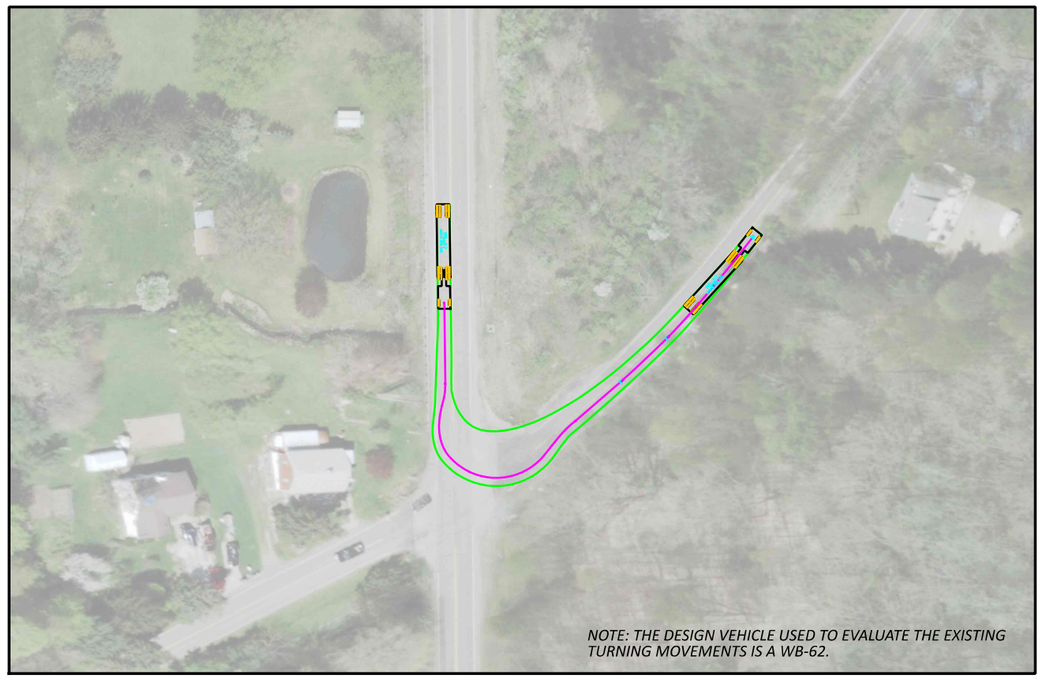
NORTHBOUND SR-43: RIGHT TURN MOVEMENT



NORTHBOUND SR-43: LEFT TURN MOVEMENT



SOUTHBOUND SR-43: RIGHT TURN MOVEMENT



SOUTHBOUND RANDOLPH ROAD: LEFT TURN MOVEMENT

HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD EXISTING CONDITIONS
NORTHBOUND AND SOUTHBOUND WB-62 TRUCK TURNING MOVEMENTS

DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER
CEF

REVIEWER
BAA 02-04-25

PROJECT ID
0

SHEET 3 TOTAL 13

SR-43, RANDOLPH ROAD, AND TRARES ROAD

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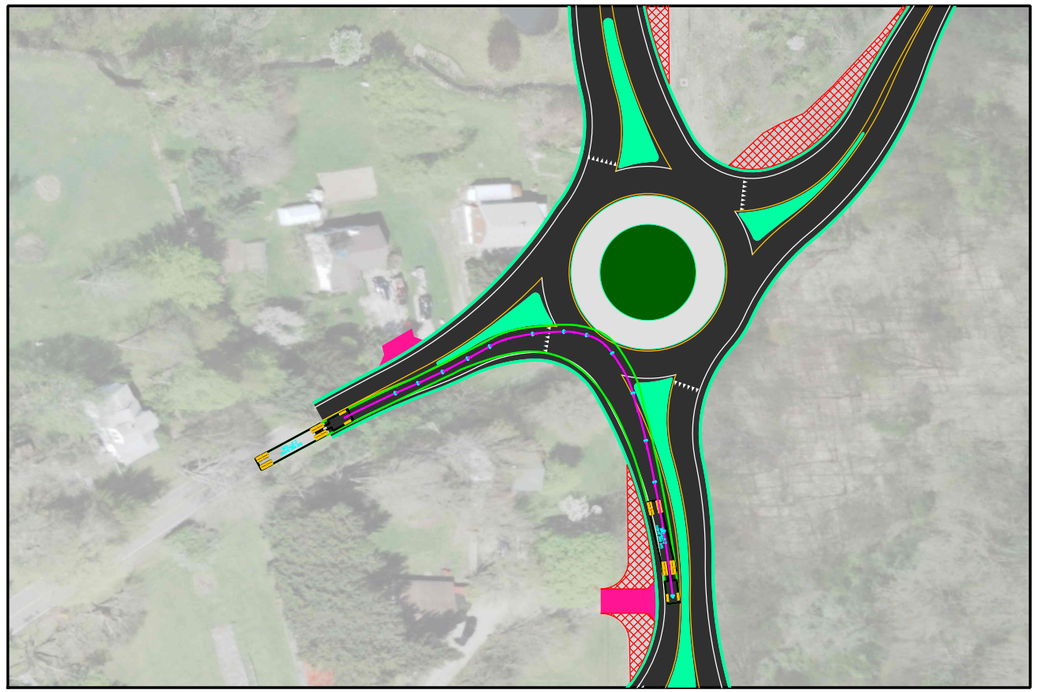
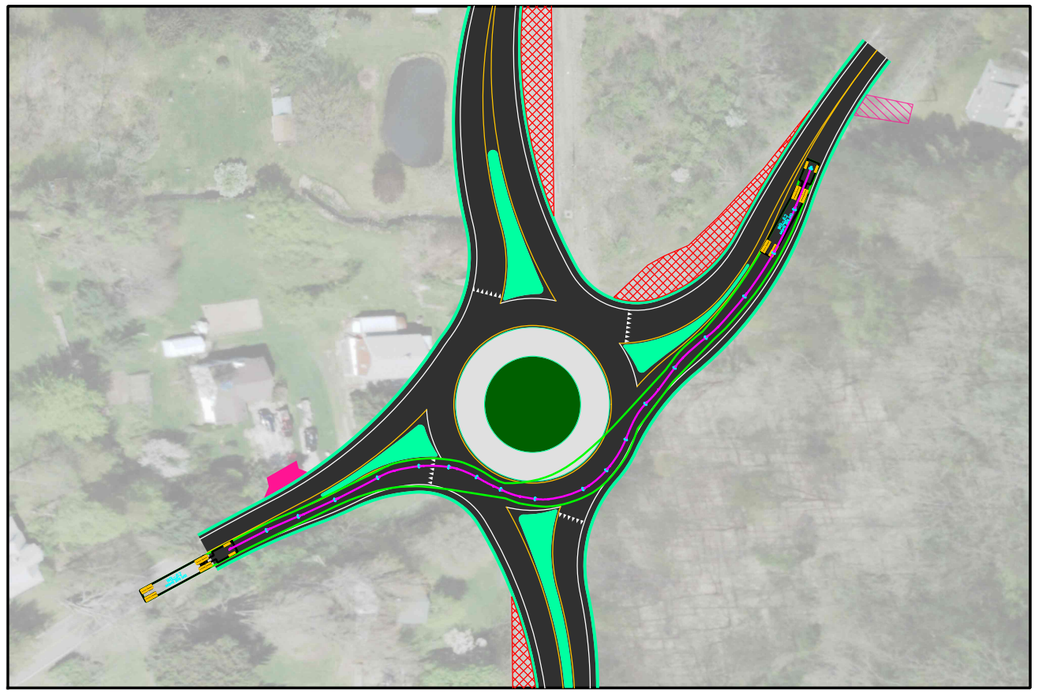
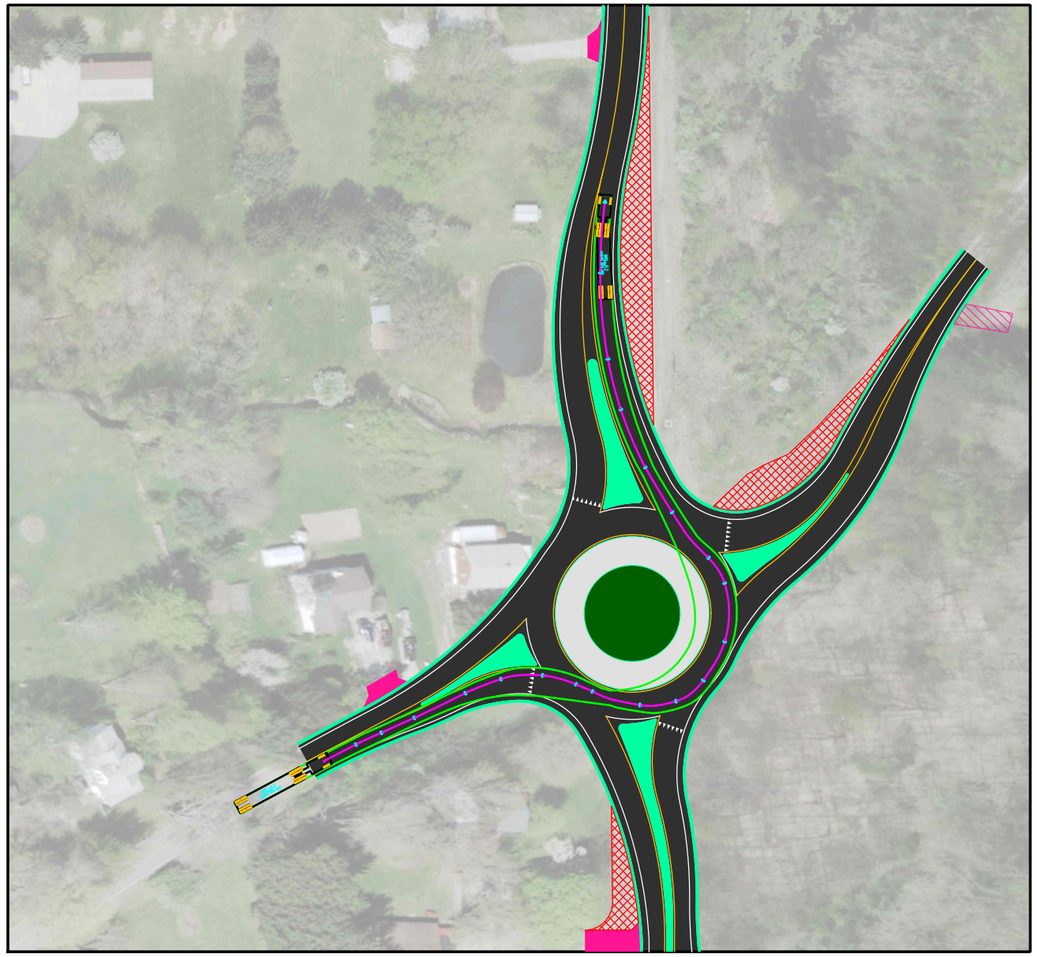


EASTBOUND RANDOLPH ROAD: RIGHT TURN MOVEMENT



EASTBOUND RANDOLPH ROAD: THROUGH MOVEMENT



EASTBOUND RANDOLPH ROAD: LEFT TURN MOVEMENT

NOTE: THE DESIGN VEHICLE USED FOR THE GEOMETRIC LAYOUT OF THE ROUNDABOUTS IS A WB-62.

HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD ROUNDABOUT
EASTBOUND WB-62 TRUCK TURNING MOVEMENTS

SR-43, RANDOLPH ROAD, AND TRARES ROAD

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DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER	CEF
REVIEWER	BAA 02-04-25
PROJECT ID	0
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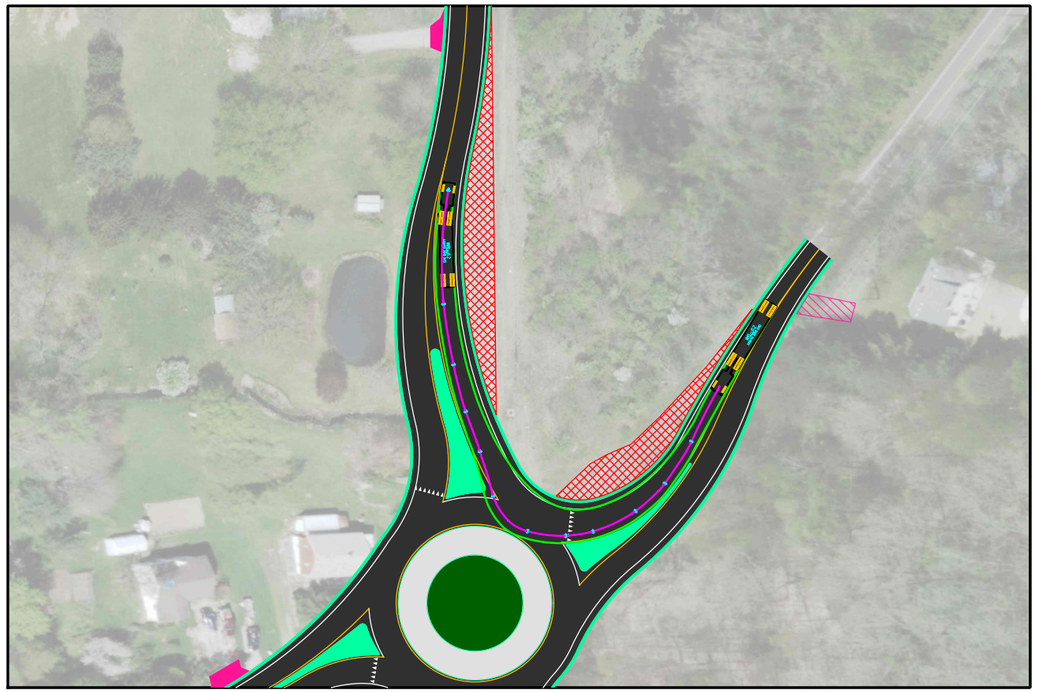
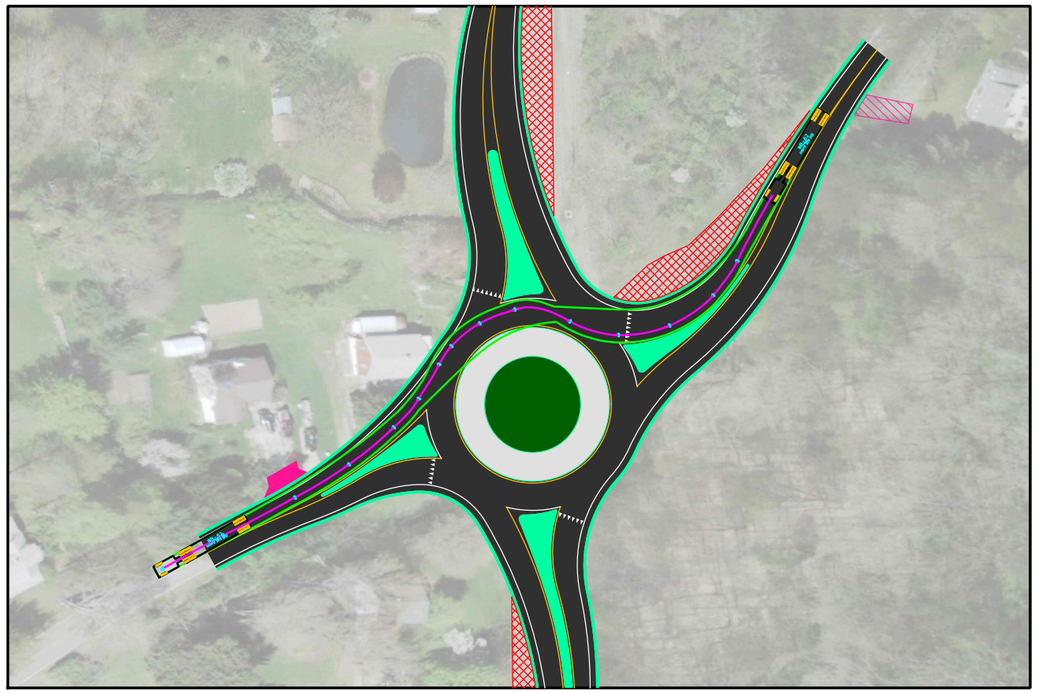
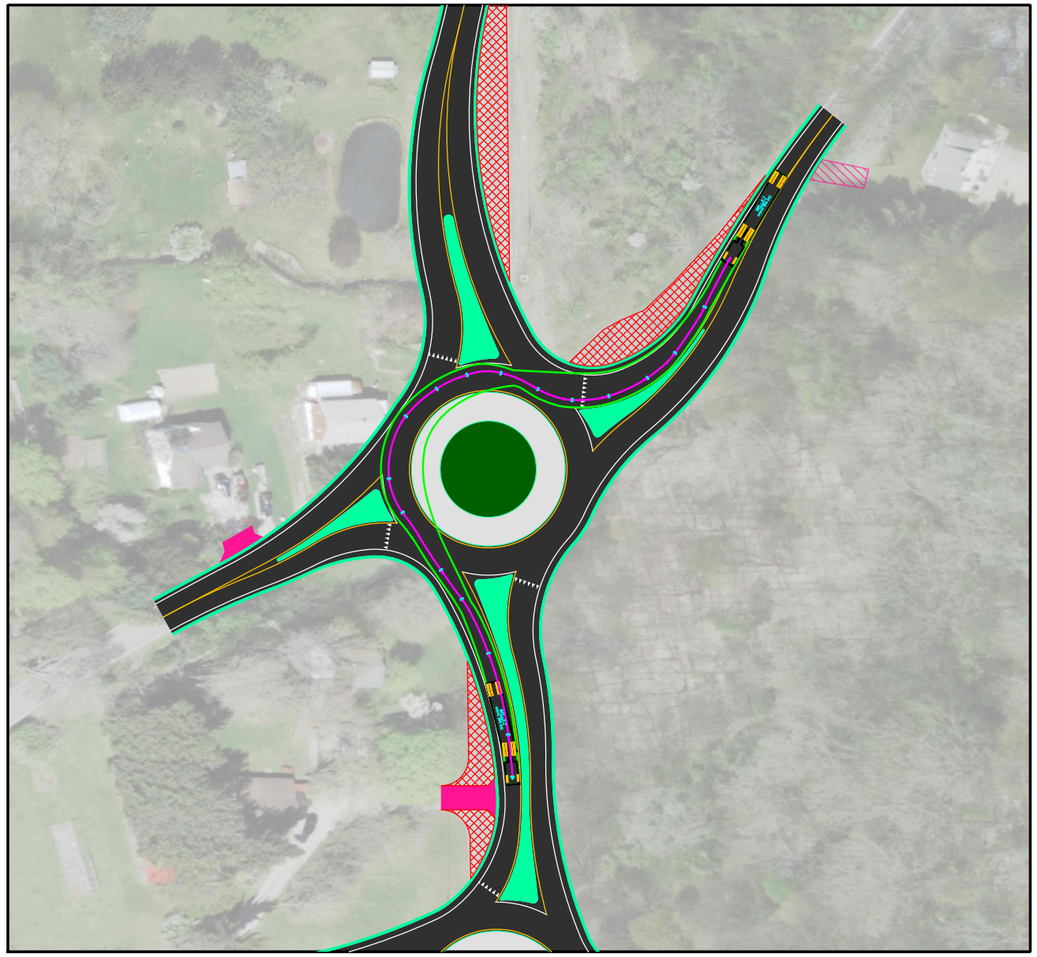
TOTAL	13



WESTBOUND RANDOLPH ROAD: RIGHT TURN MOVEMENT



WESTBOUND RANDOLPH ROAD: THROUGH MOVEMENT



WESTBOUND RANDOLPH ROAD: LEFT TURN MOVEMENT

NOTE: THE DESIGN VEHICLE USED FOR THE GEOMETRIC LAYOUT OF THE ROUNDABOUTS IS A WB-62.

HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD ROUNDABOUT
WESTBOUND WB-62 TRUCK TURNING MOVEMENTS

SR-43, RANDOLPH ROAD, AND TRARES ROAD

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DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER	CEF
REVIEWER	BAA 02-04-25
PROJECT ID	0
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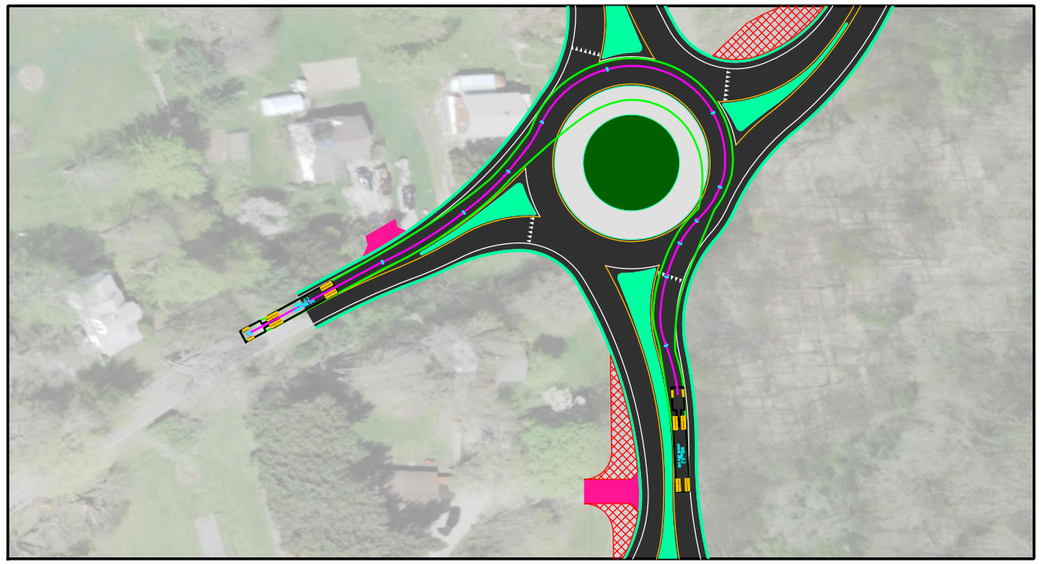
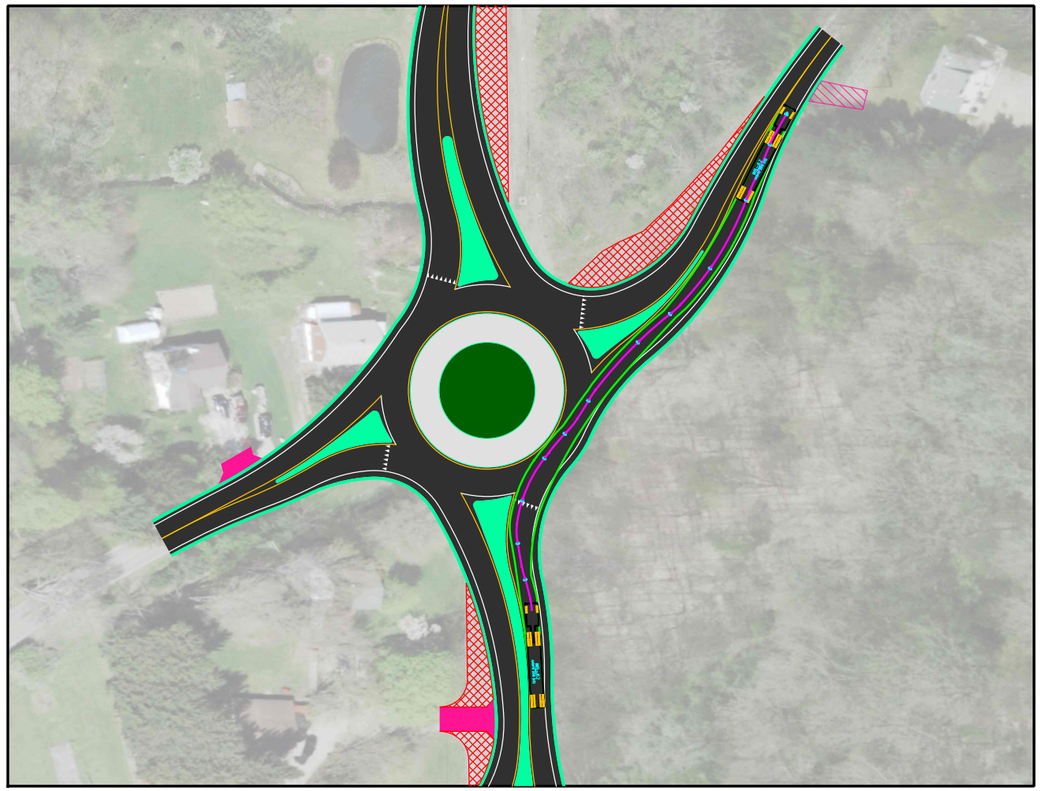
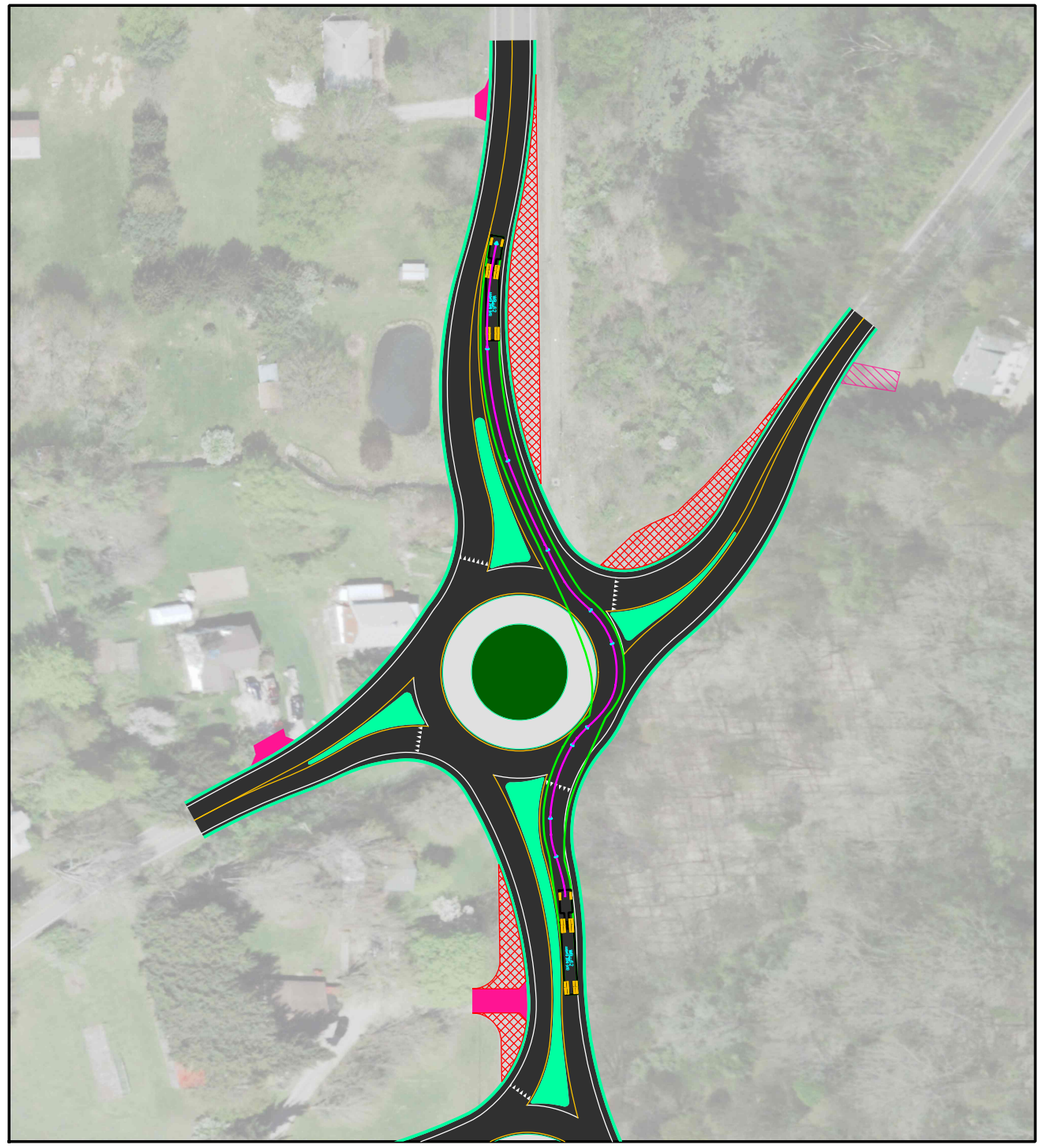
TOTAL	13



NORTHBOUND SR-43: LEFT TURN MOVEMENT



NORTHBOUND SR-43: RIGHT TURN MOVEMENT



NORTHBOUND SR-43: THROUGH MOVEMENT

NOTE: THE DESIGN VEHICLE USED FOR THE GEOMETRIC LAYOUT OF THE ROUNDABOUTS IS A WB-62.

HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD ROUNDABOUT
NORTHBOUND WB-62 TRUCK TURNING MOVEMENTS

DESIGN AGENCY
CARPENTER MARTY Transportation

DESIGNER
CEF

REVIEWER
BAA 02-04-25

PROJECT ID
0

SHEET 6 TOTAL 13

SR-43, RANDOLPH ROAD, AND TRARES ROAD

MODEL: North RAB_003_North Bound PAPERSIZE: 17x11 (in.) DATE: 3/10/2025 TIME: 5:36:08 PM USER: cflach
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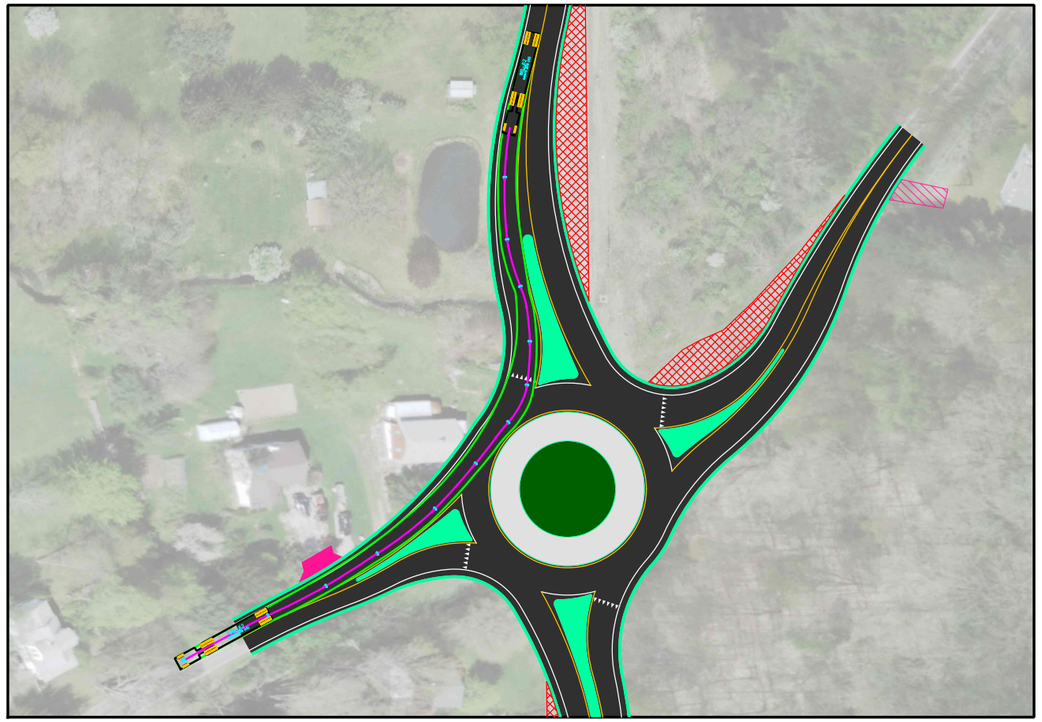
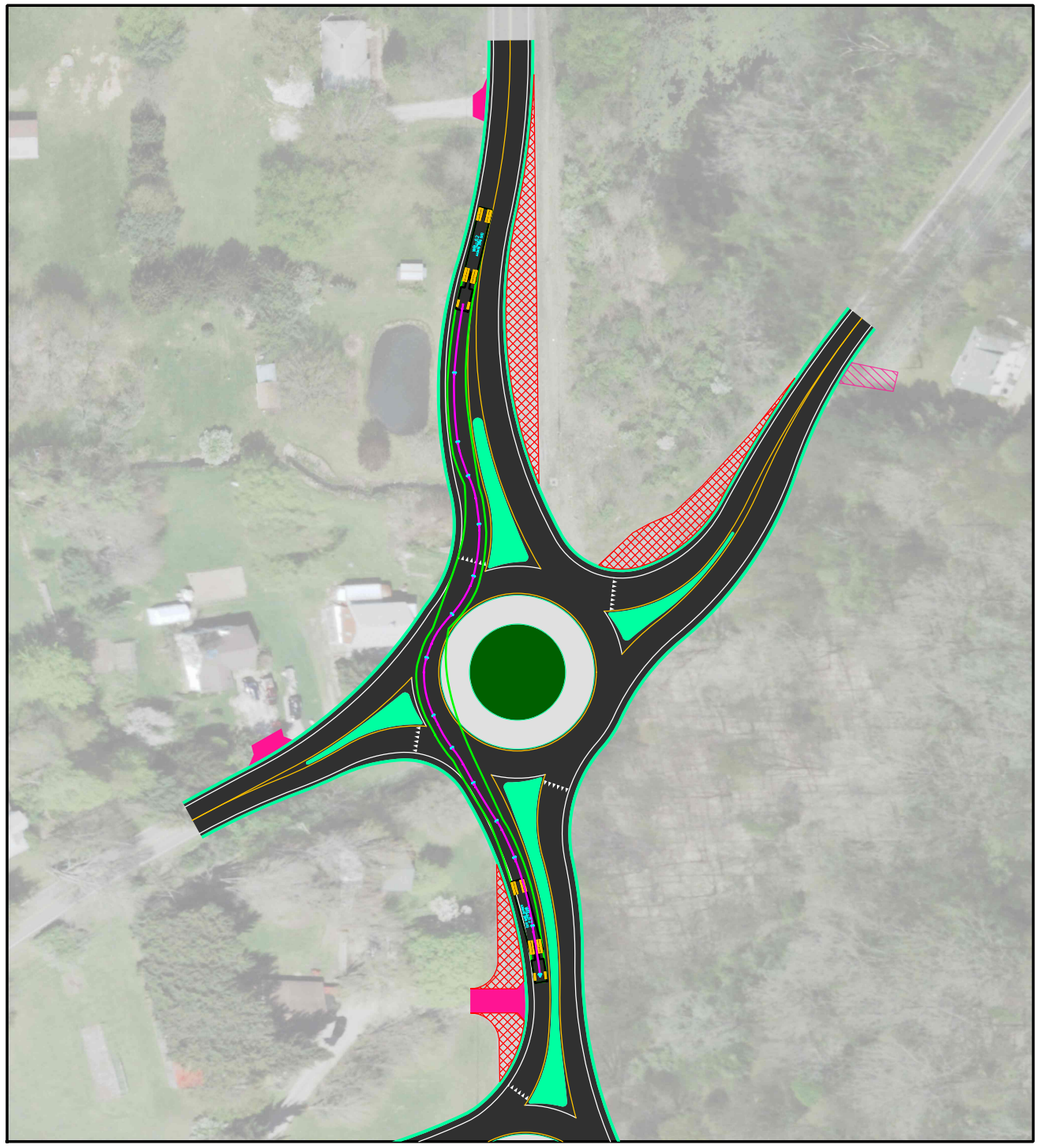
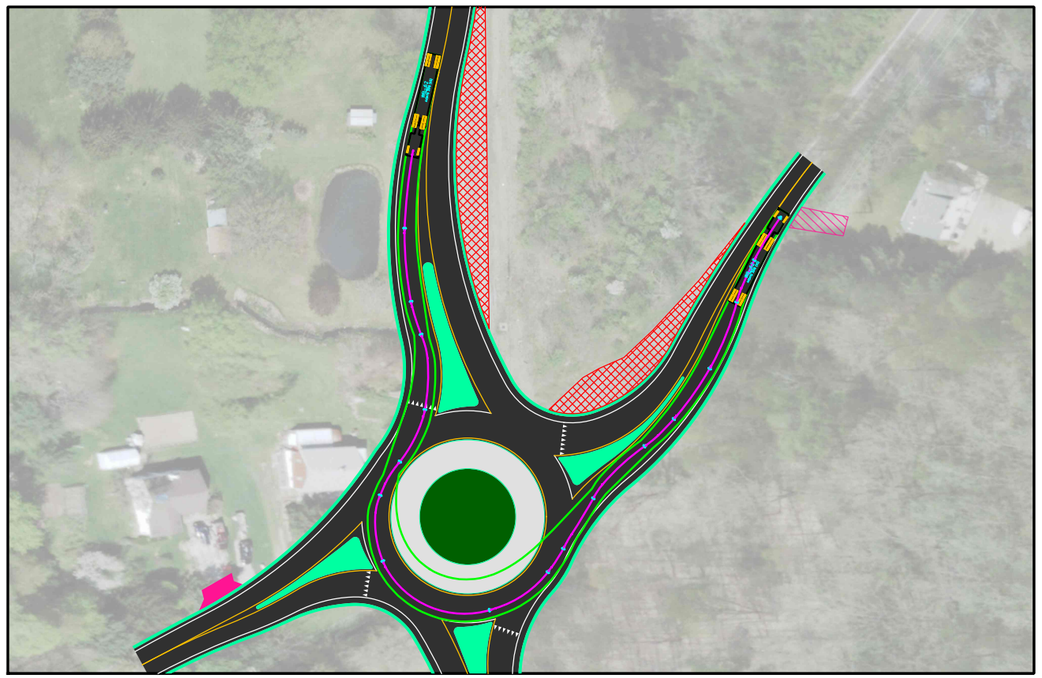


SOUTHBOUND SR-43: RIGHT TURN MOVEMENT



SOUTHBOUND SR-43: THROUGH MOVEMENT



SOUTHBOUND SR-43: LEFT TURN MOVEMENT

NOTE: THE DESIGN VEHICLE USED FOR THE GEOMETRIC LAYOUT OF THE ROUNDABOUTS IS A WB-62.

HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD ROUNDABOUT
SOUTHBOUND WB-62 TRUCK TURNING MOVEMENTS

SR-43, RANDOLPH ROAD, AND TRARES ROAD

MODEL: North RAB_004_South Bound PAPERSIZE: 17x11 (in.) DATE: 3/10/2025 TIME: 5:36:09 PM USER: cflach
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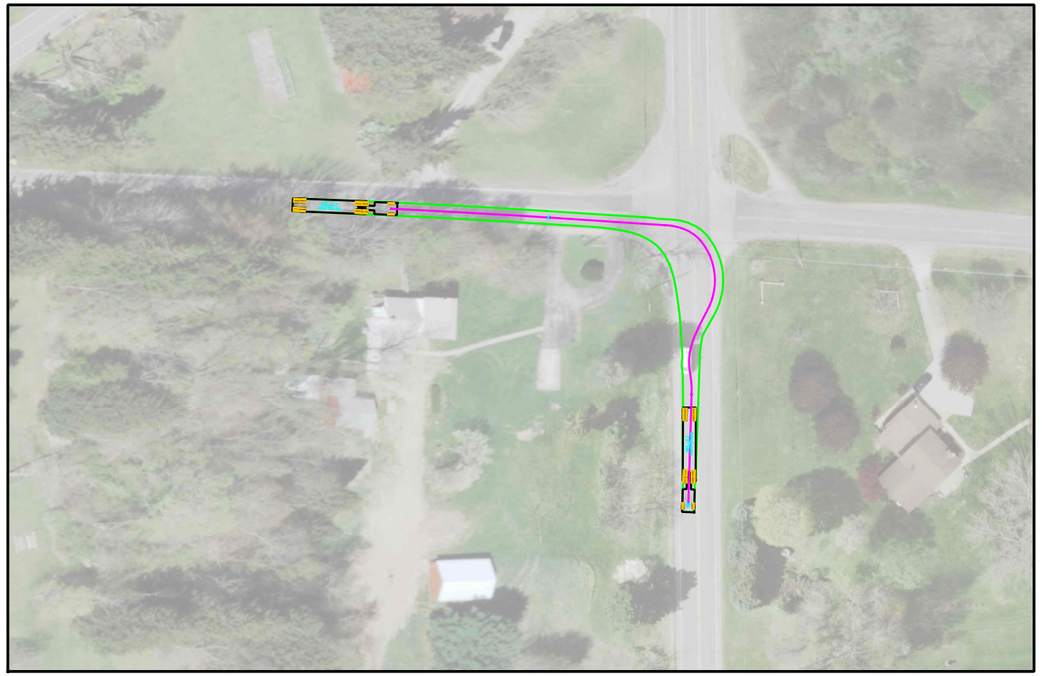
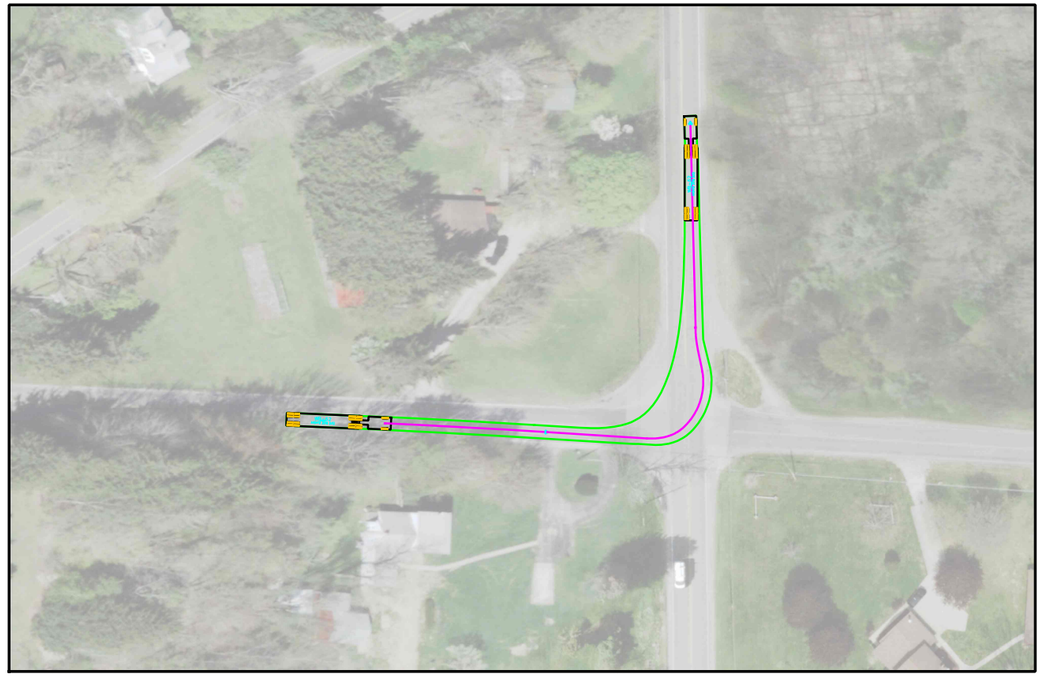
DESIGN AGENCY
CARPENTER MARTY transportation

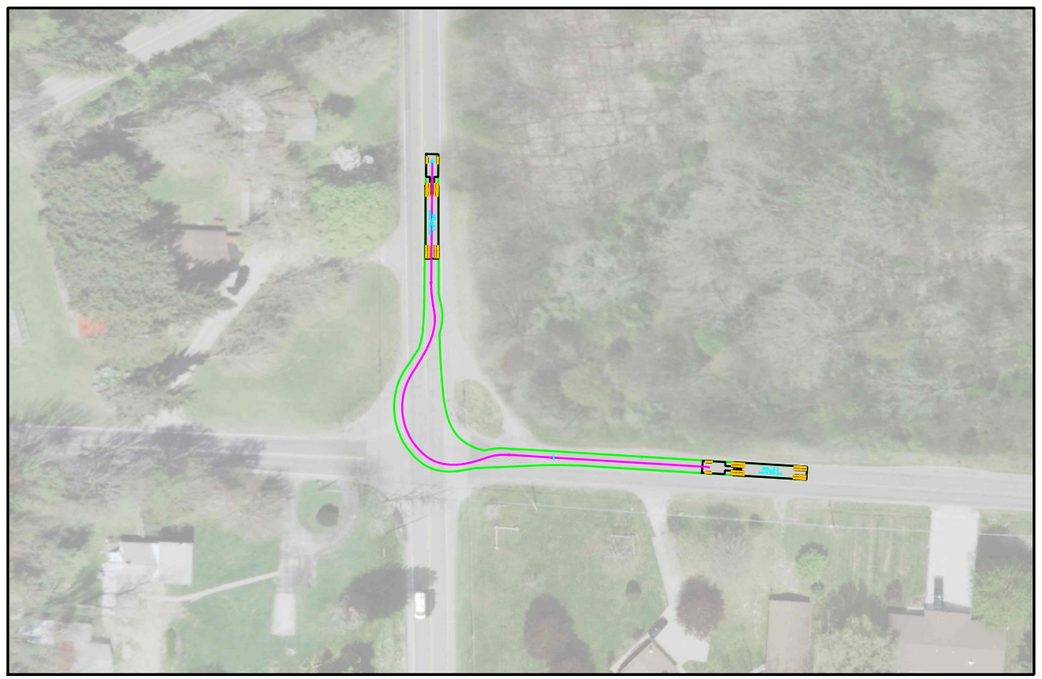
DESIGNER CEF
REVIEWER BAA 02-04-25
PROJECT ID 0
SHEET 7 TOTAL 13



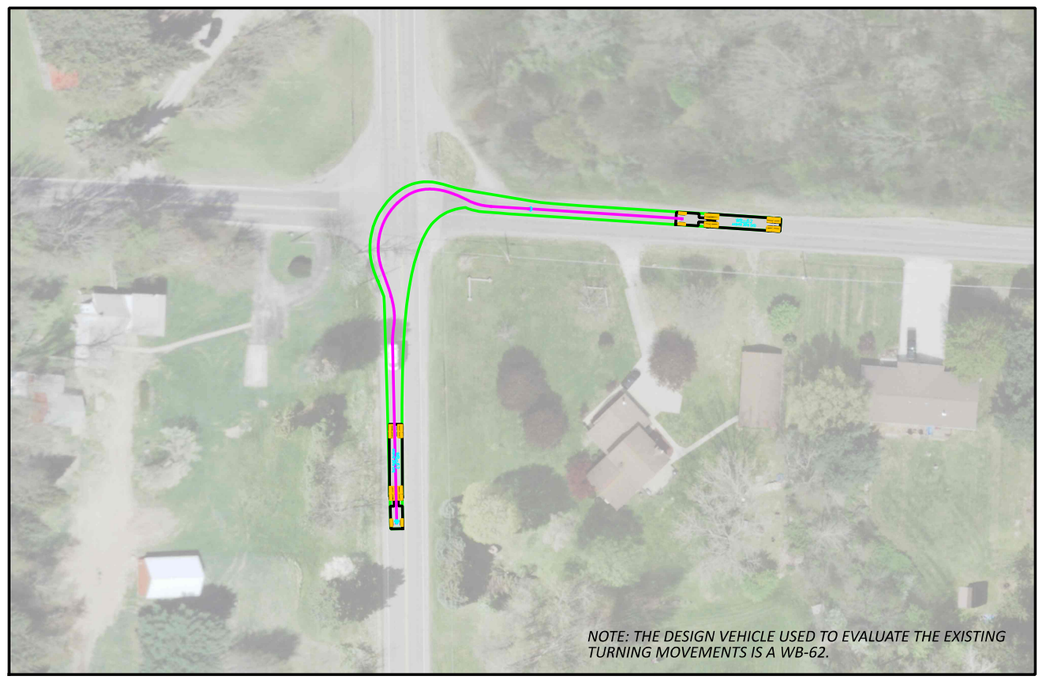
EASTBOUND RANDOLPH ROAD: RIGHT TURN MOVEMENT



EASTBOUND RANDOLPH ROAD: LEFT TURN MOVEMENT



WESTBOUND TRARES ROAD: RIGHT TURN MOVEMENT



WESTBOUND TRARES ROAD: LEFT TURN MOVEMENT

HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD EXISTING CONDITIONS
EASTBOUND AND WESTBOUND WB-62 TRUCK TURNING MOVEMENTS

SR-43, RANDOLPH ROAD, AND TRARES ROAD

MODEL: South Existing_001_East and West PAPERSIZE: 17x11 (in.) DATE: 3/10/2025 TIME: 5:36:10 PM USER: dflach
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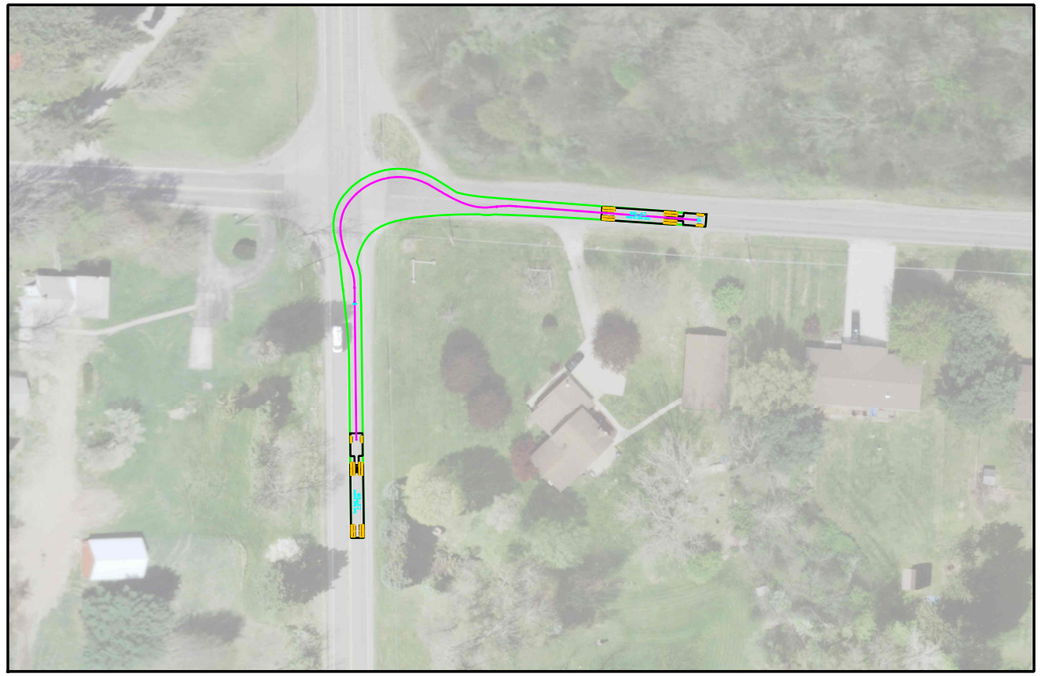
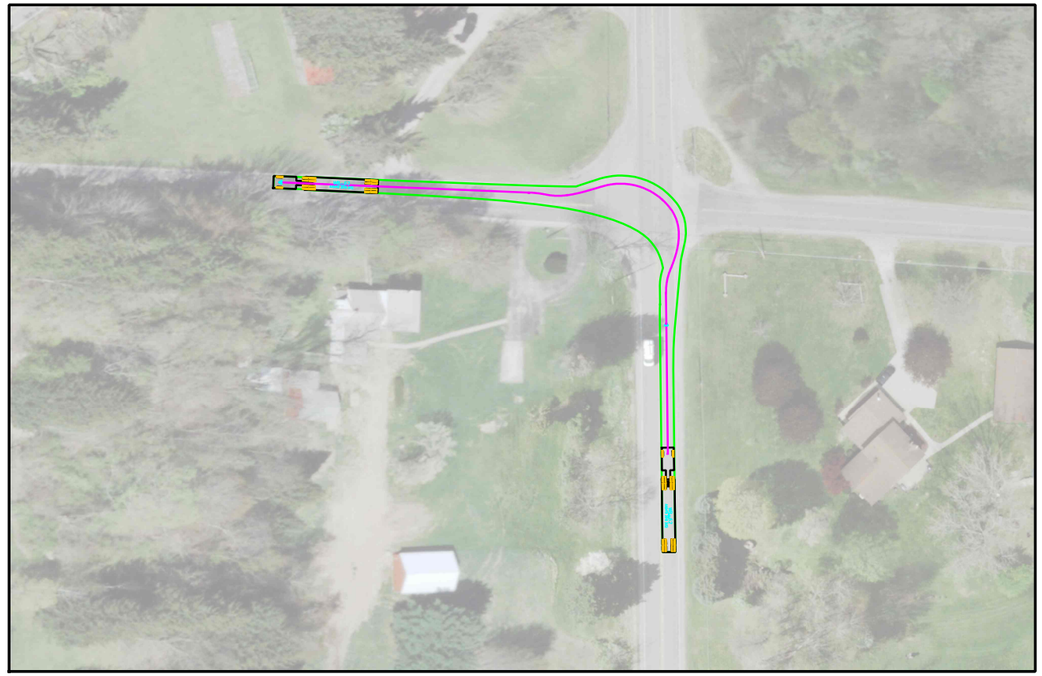
DESIGN AGENCY
CARPENTER MARTY Transportation

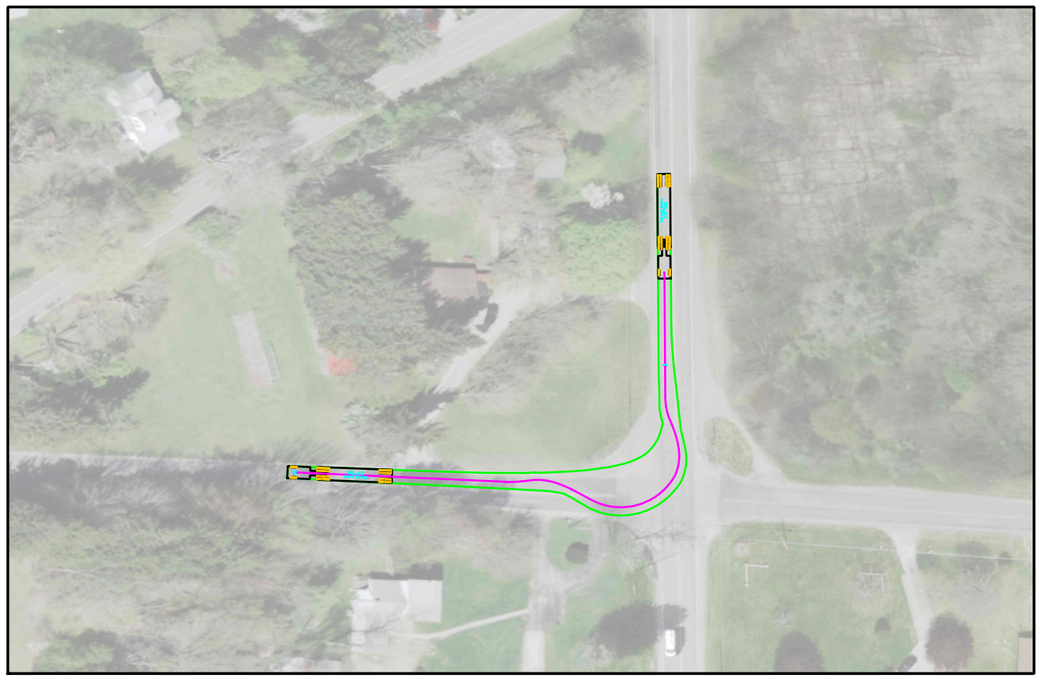
DESIGNER	CEF
REVIEWER	BAA 02-04-25
PROJECT ID	0
SHEET	8
TOTAL	13



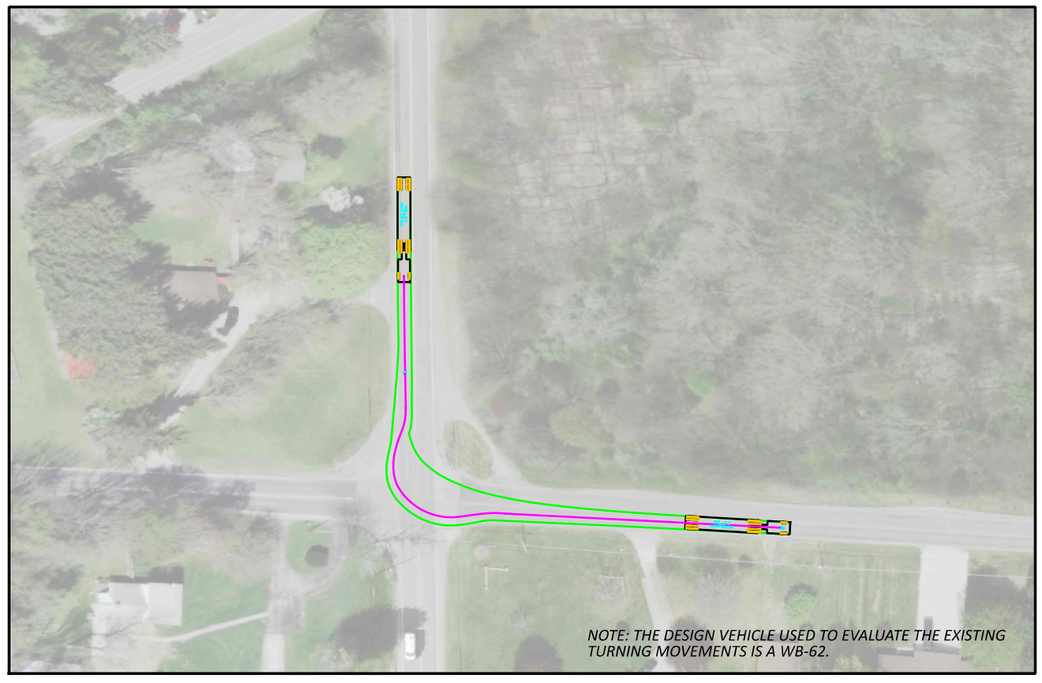
NORTHBOUND SR-43: RIGHT TURN MOVEMENT



NORTHBOUND SR-43: LEFT TURN MOVEMENT



SOUTHBOUND SR-43: RIGHT TURN MOVEMENT



SOUTHBOUND SR-43: LEFT TURN MOVEMENT

SR-43, RANDOLPH ROAD, AND TRARES ROAD

MODEL: South Existing_002_North and South PAPERSIZE: 17x11 (in.) DATE: 3/10/2025 TIME: 5:36:12 PM USER: cflach
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HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD EXISTING CONDITIONS NORTHBOUND AND SOUTHBOUND WB-62 TRUCK TURNING MOVEMENTS

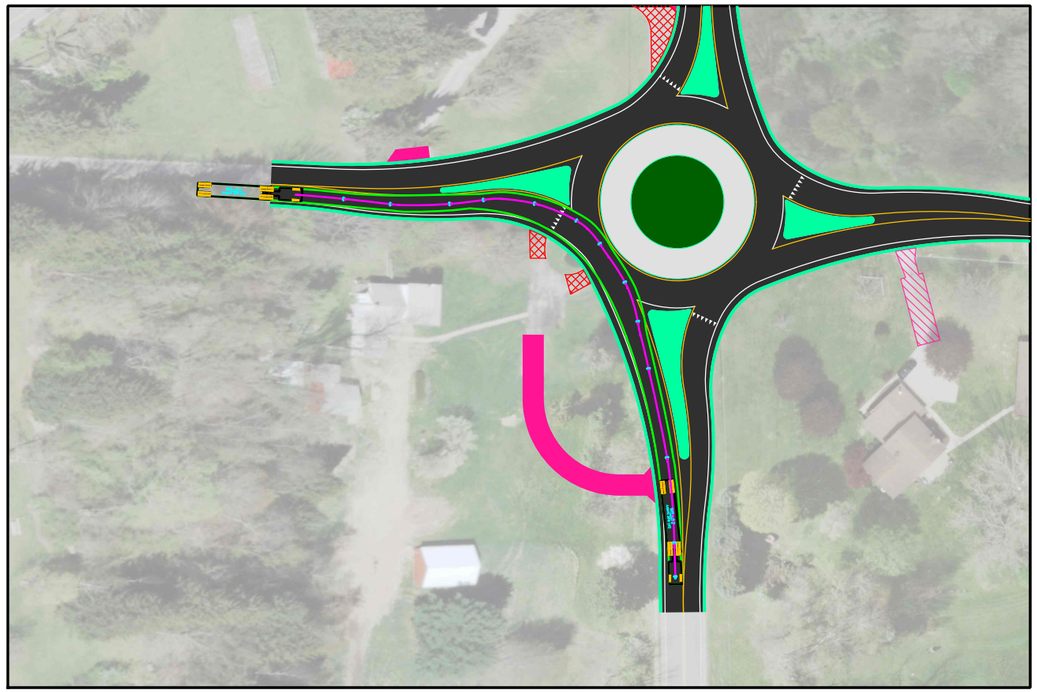
DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER
CEF

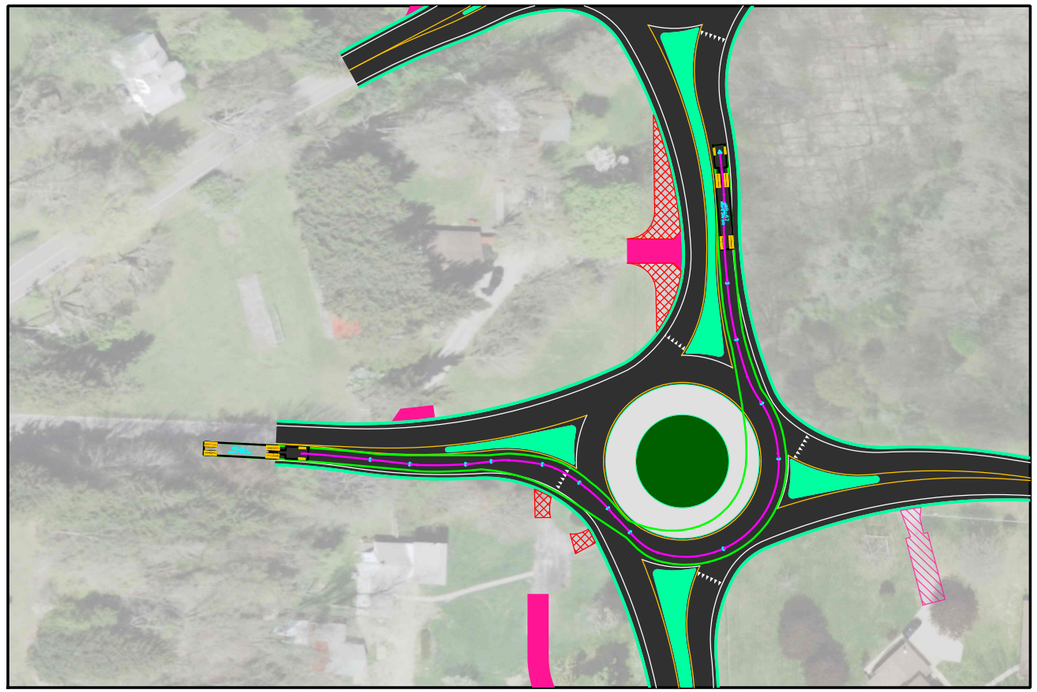
REVIEWER
BAA 02-04-25

PROJECT ID
0

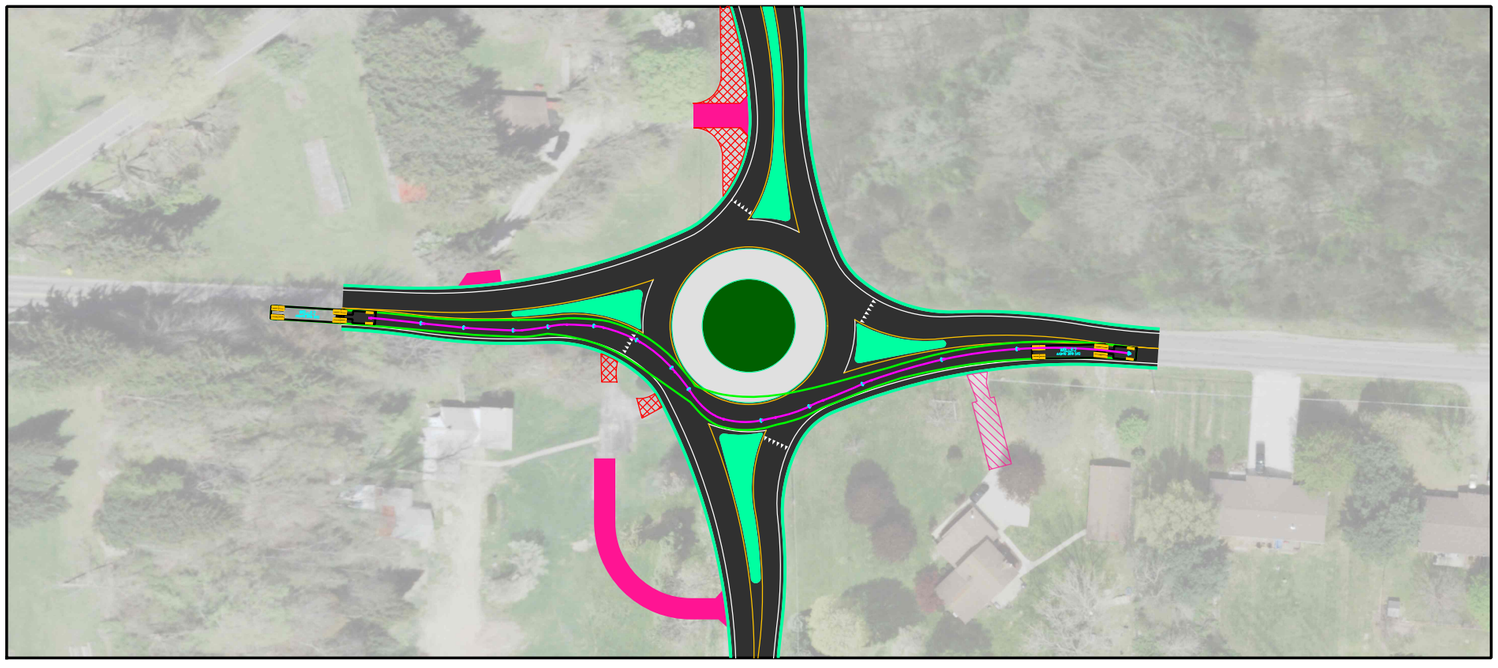
SHEET 9 TOTAL 13



EASTBOUND RANDOLPH ROAD: RIGHT TURN MOVEMENT



EASTBOUND RANDOLPH ROAD: LEFT TURN MOVEMENT



EASTBOUND RANDOLPH ROAD: THROUGH MOVEMENT

NOTE: THE DESIGN VEHICLE USED FOR THE GEOMETRIC LAYOUT OF THE ROUNDABOUTS IS A WB-62.

HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD ROUNDABOUT AND TRARES ROAD ROUNDABOUT EASTBOUND WB-62 TRUCK TURNING MOVEMENTS

SR-43, RANDOLPH ROAD, AND TRARES ROAD

MODEL: South RAB_001_East Bound PAPERSIZE: 17x11 (in.) DATE: 3/10/2025 TIME: 5:36:13 PM USER: cflach
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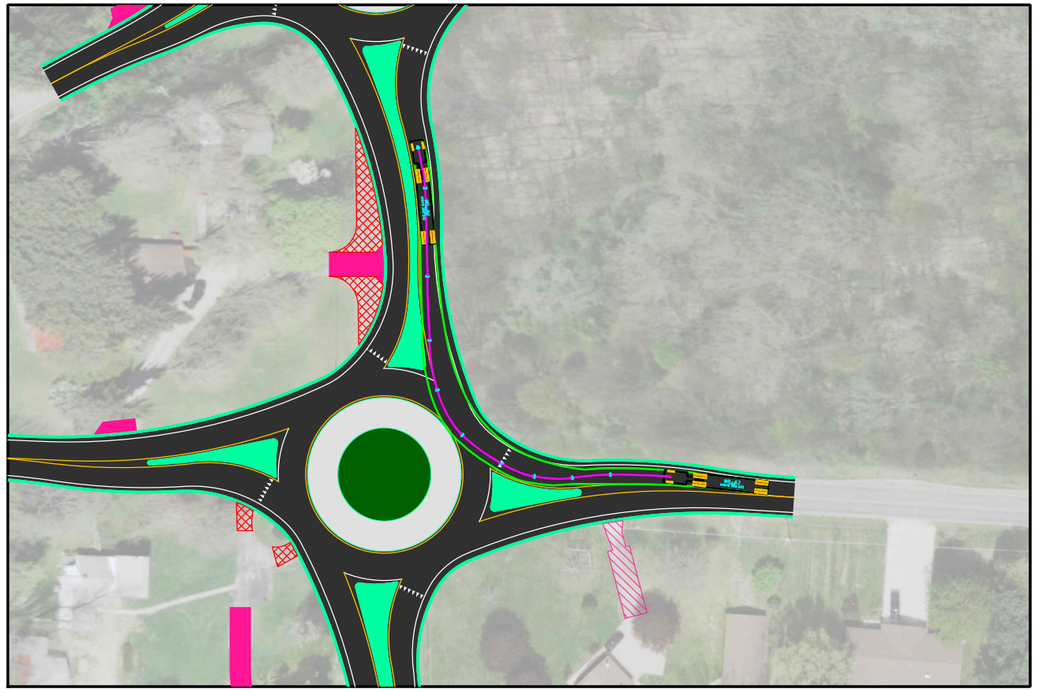
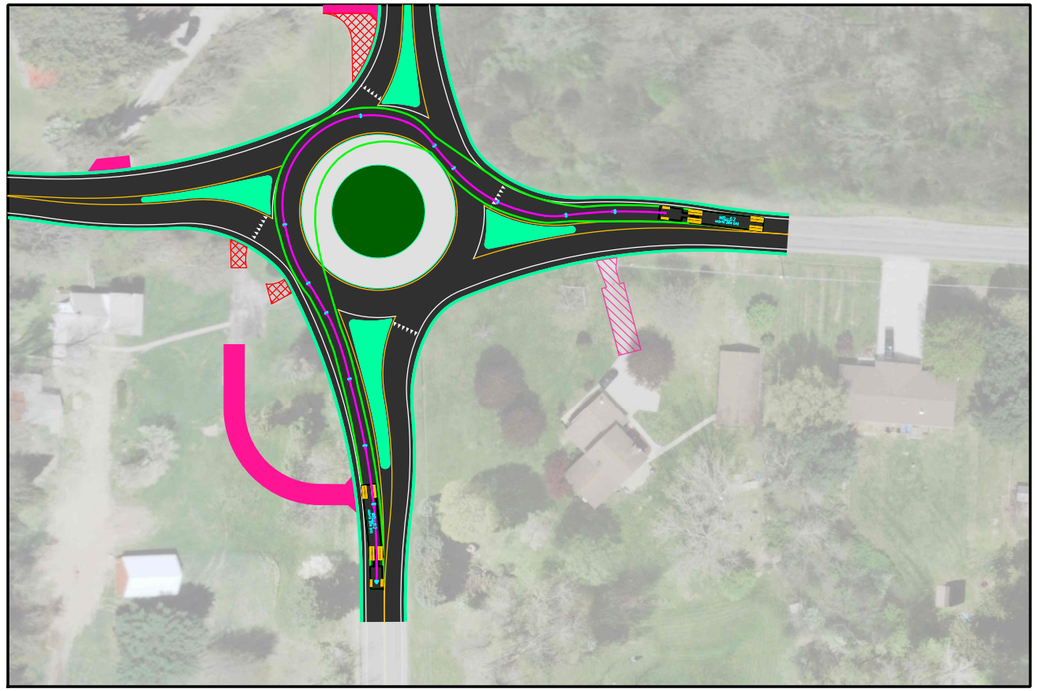
DESIGN AGENCY
CARPENTER MARTY transportation

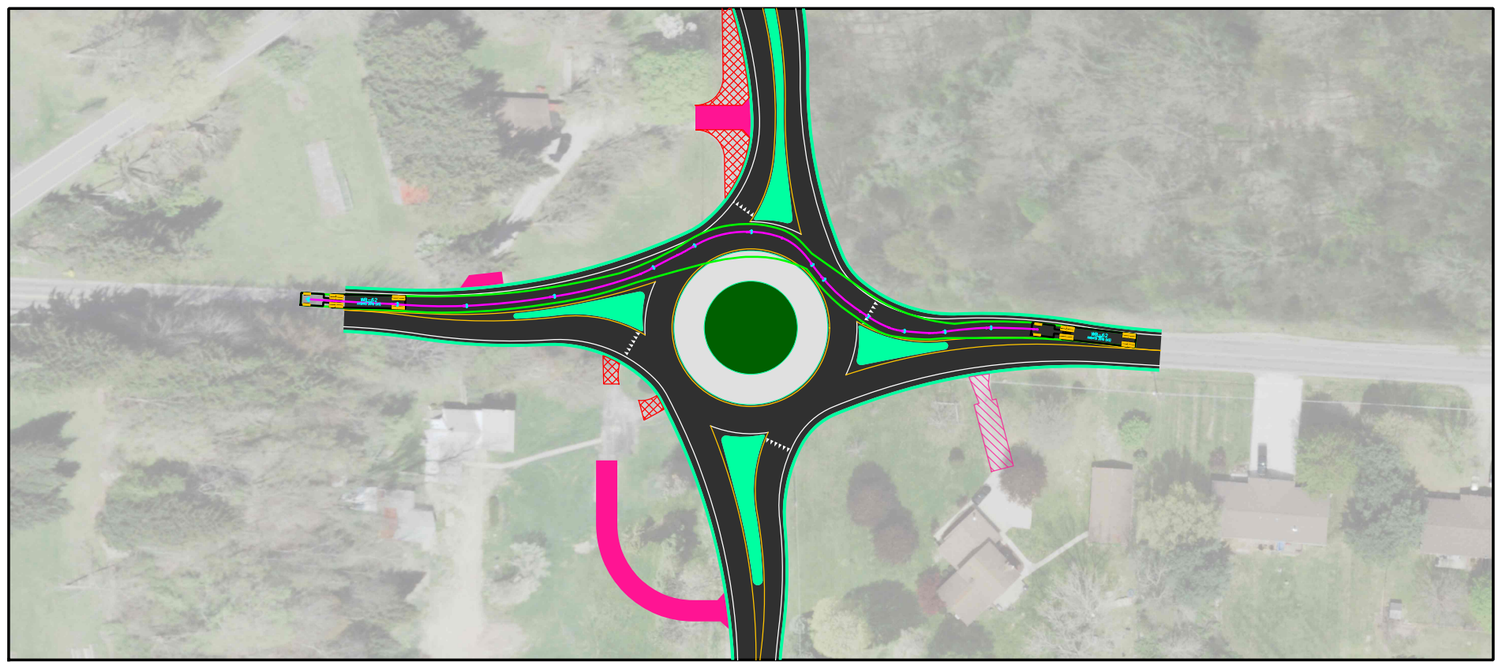
DESIGNER	CEF
REVIEWER	BAA 02-04-25
PROJECT ID	0
SHEET	10
TOTAL	13



WESTBOUND TRARES ROAD: RIGHT TURN MOVEMENT



WESTBOUND TRARES ROAD: LEFT TURN MOVEMENT



WESTBOUND TRARES ROAD: THROUGH MOVEMENT

NOTE: THE DESIGN VEHICLE USED FOR THE GEOMETRIC LAYOUT OF THE ROUNDABOUTS IS A WB-62.

HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD ROUNDABOUT
WESTBOUND WB-62 TRUCK TURNING MOVEMENTS

DESIGN AGENCY
CARPENTER MARTY Transportation

DESIGNER
CEF

REVIEWER
BAA 02-04-25

PROJECT ID
0

SHEET 11 TOTAL 13

SR-43, RANDOLPH ROAD, AND TRARES ROAD

MODEL: South RAB_002_WestBound PAPERSIZE: 17x11 (in.) DATE: 3/10/2025 TIME: 5:36:15 PM USER: cflach
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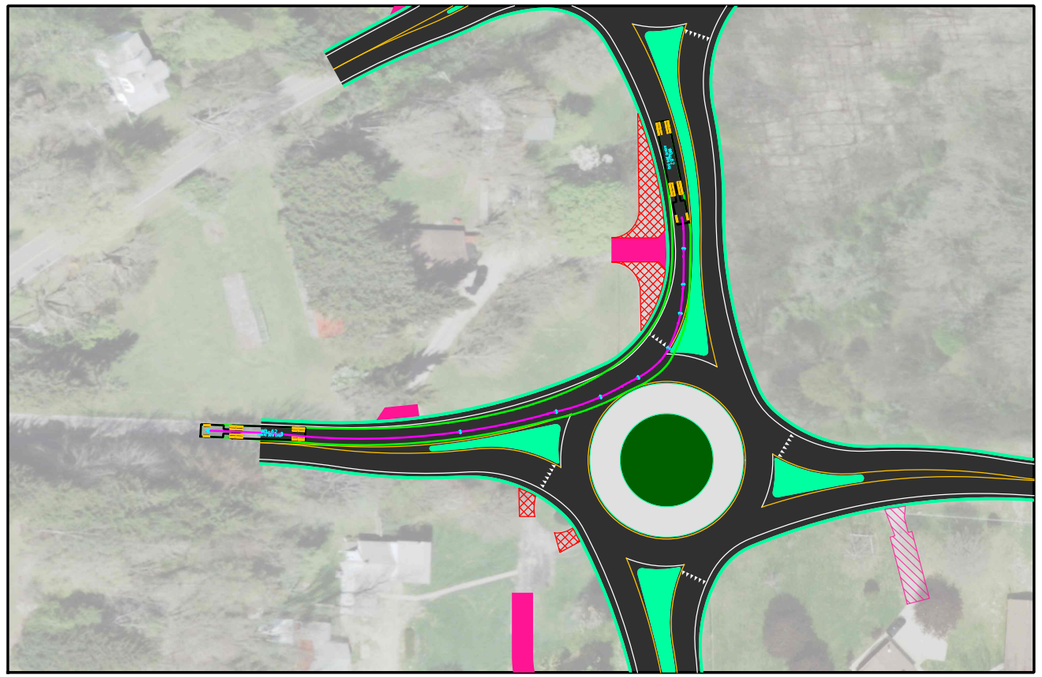
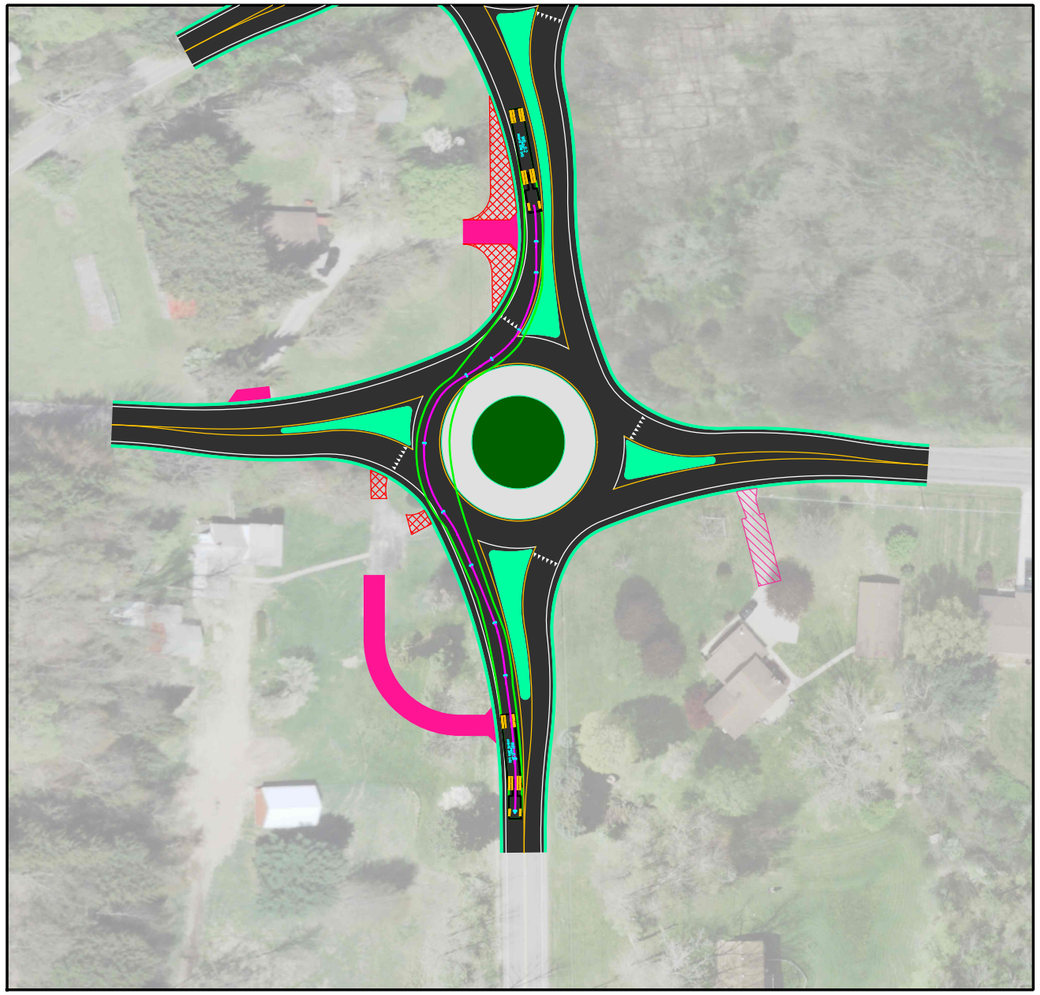
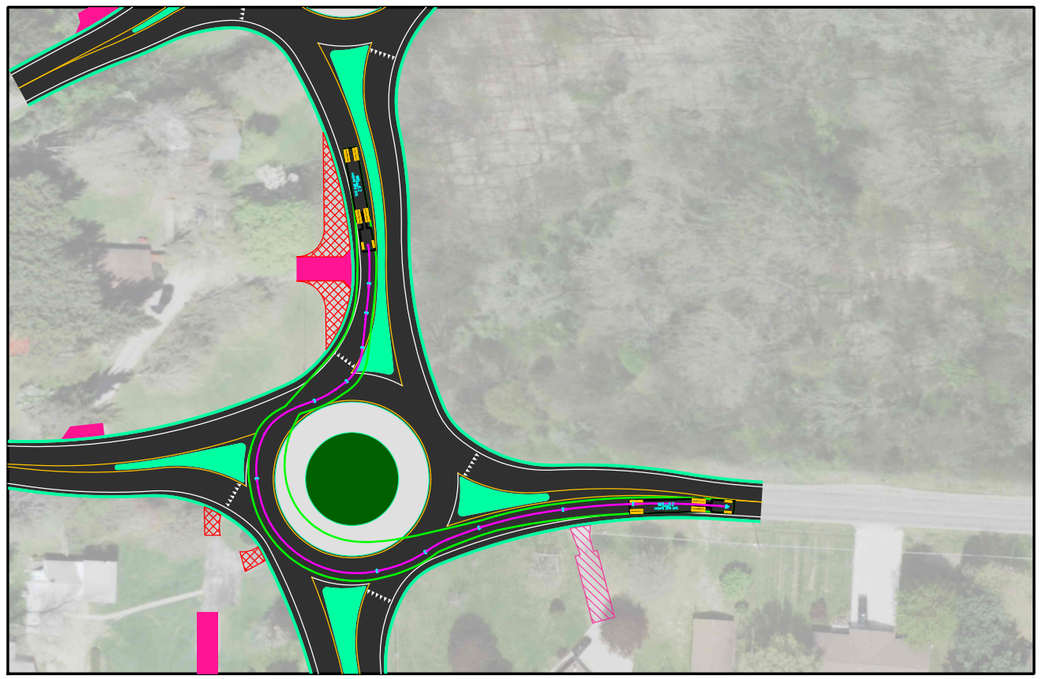


SOUTHBOUND SR-43: RIGHT TURN MOVEMENT



SOUTHBOUND SR-43: THROUGH MOVEMENT



SOUTHBOUND SR-43: LEFT TURN MOVEMENT

NOTE: THE DESIGN VEHICLE USED FOR THE GEOMETRIC LAYOUT OF THE ROUNDABOUTS IS A WB-62.

HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD ROUNDABOUT
SOUTHBOUND WB-62 TRUCK TURNING MOVEMENTS

DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER	CEF
REVIEWER	BAA 02-04-25
PROJECT ID	0
SHEET	12
TOTAL	13

SR-43, RANDOLPH ROAD, AND TRARES ROAD

MODEL: South RAB_003_South Bound PAPERSIZE: 17x11 (in.) DATE: 3/10/2025 TIME: 5:36:16 PM USER: cflach
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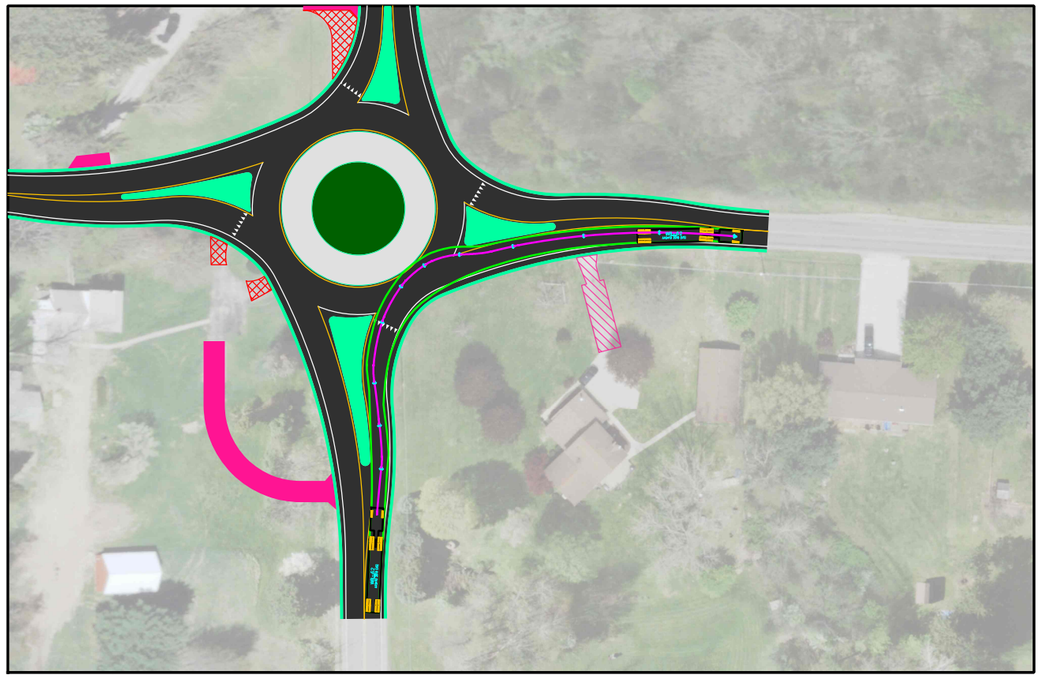
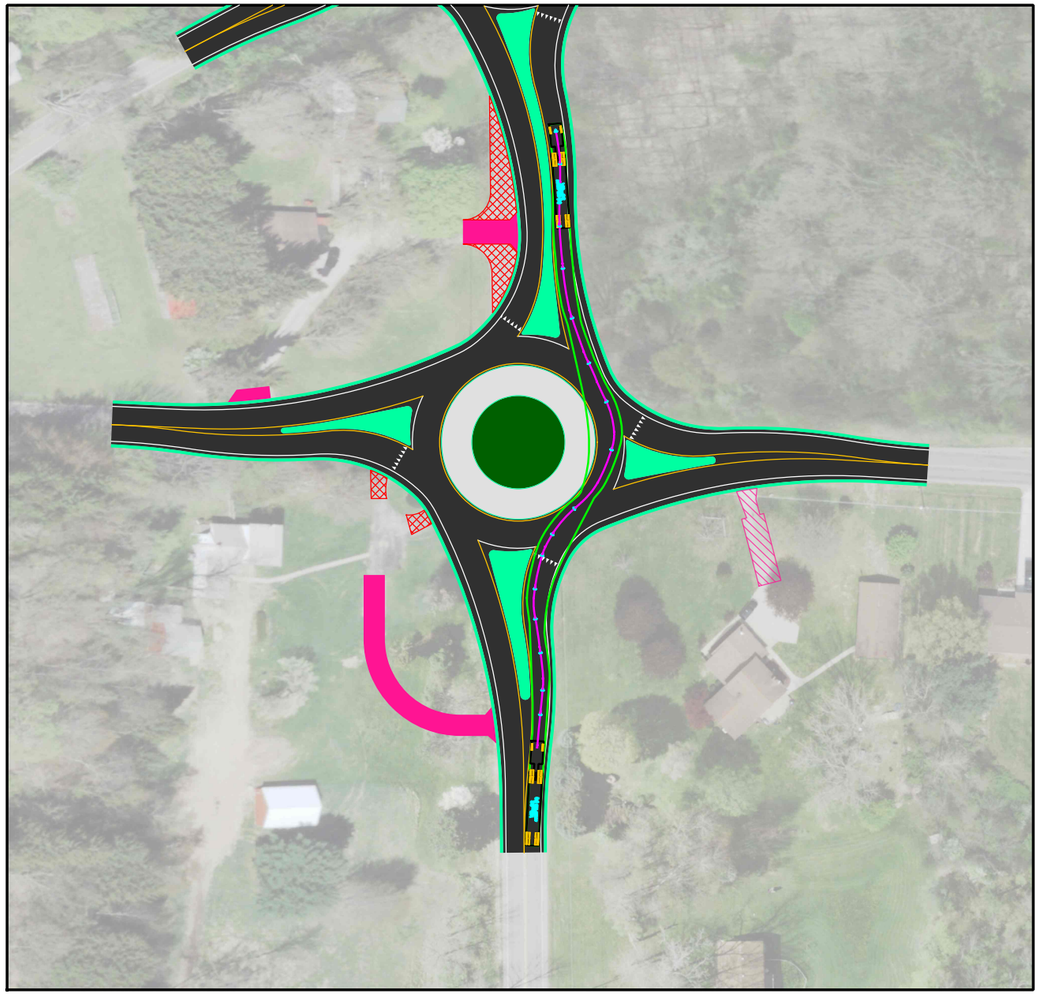
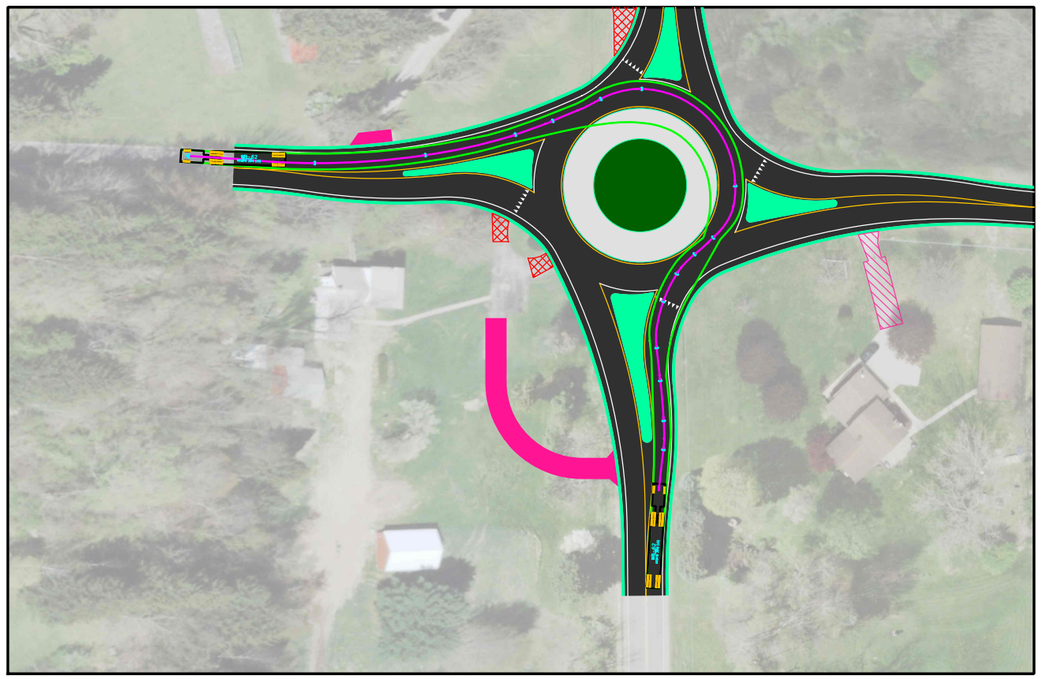


NORTHBOUND SR-43: RIGHT TURN MOVEMENT



NORTHBOUND SR-43: THROUGH MOVEMENT



NORTHBOUND SR-43: LEFT TURN MOVEMENT

NOTE: THE DESIGN VEHICLE USED FOR THE GEOMETRIC LAYOUT OF THE ROUNDABOUTS IS A WB-62.

HORIZONTAL SCALE IN FEET
0 25 50 100

SR-43 AND RANDOLPH ROAD ROUNDABOUT
NORTHBOUND WB-62 TRUCK TURNING MOVEMENTS

SR-43, RANDOLPH ROAD, AND TRARES ROAD

MODEL: South RAB_004_North Bound PAPERSIZE: 17x11 (in.) DATE: 3/10/2025 TIME: 5:36:18 PM USER: cflach
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DESIGN AGENCY
CARPENTER MARTY transportation

DESIGNER	CEF
REVIEWER	BAA 02-04-25
PROJECT ID	0
SHEET	13
TOTAL	13

Roundabout Critical Design Parameters
North Roundabout (SR-43 and Randolph)

Design Parameters	Leg 1 (North)	Leg 2 (West)	Leg 3 (South)	Leg 4 (East)
Inscribed Circle Diameter, FT	140			
Entry Width, FT	19.9	18.7	18.4	22.6
Entry Angle PHI ϕ, DEG	10	20	6	20
Exit Width, FT	18.9	16.2	16.9	16.7
Circulatory Roadway Width Upstream of Entry, FT	18	18	18	18

Fastest Path Speed	Leg 1 (North)	Leg 2 (West)	Leg 3 (South)	Leg 4 (East)
R_1, Radius/Speed, FT/MPH	158.17	97.83	137.73	82.91
R_1, Speed, MPH	24.54	20.49	23.33	19.24
R_2, Radius/Speed, FT/MPH	92.78	79.14	88.66	91.91
R_2, Speed, MPH	19.0	17.93	18.7	18.95
R_3, Radius/Speed, FT/MPH	246.69	355.62	214.46	377.11
R_3, Speed, MPH	28.94	33.2	27.5	33.98
R_4, Radius/Speed, FT/MPH	57.00	57.00	57.00	57.00
R_4, Speed, MPH	15.8	15.8	15.8	15.8
R_5, Radius/Speed, FT/MPH	N/A	N/A	N/A	80.27
R_5, Speed, MPH	N/A	N/A	N/A	19
R_5, Bypass Radius/Speed, FT/MPH				

Minimum Sight Parameters	Leg 1 (North)	Leg 2 (West)	Leg 3 (South)	Leg 4 (East)
Approach Design Speed, MPH	24.5	20.5	23.3	19.2
Approach Stopping Sight Distance, FT/MPH				
Circulatory Stopping Sight Distance, FT/MPH				
Exit (Crosswalk) Stopping Sight Distance, FT/MPH	N/A	N/A	N/A	N/A
Intersection Sight Distance, FT/MPH				

General	
Design Vehicle(s)	WB-62
Truck Apron Width, FT	20

Designer: Colleen Flach

Signature:

Date: 2/4/2025

Roundabout Critical Design Parameters
South Roundabout (SR-43 and Trares)

Design Parameters	Leg 1 (North)	Leg 2 (West)	Leg 3 (South)	Leg 4 (East)
Inscribed Circle Diameter, FT	140			
Entry Width, FT	16.7	19.0	18.5	18.7
Entry Angle PHI ϕ, DEG	14	15	18	18
Exit Width, FT	15.8	17.0	17.1	16.6
Circulatory Roadway Width Upstream of Entry, FT	18	18	18	18

Fastest Path Speed	Leg 1 (North)	Leg 2 (West)	Leg 3 (South)	Leg 4 (East)
R_1, Radius/Speed, FT/MPH	103.86	122.05	116.79	116.17
R_1, Speed, MPH	20.97	22.30	21.93	21.89
R_2, Radius/Speed, FT/MPH	78.63	89.89	96.05	84.01
R_2, Speed, MPH	17.89	18.80	19.26	18.33
R_3, Radius/Speed, FT/MPH	394.18	407.30	347.80	404.93
R_3, Speed, MPH	34.54	34.97	32.96	34.89
R_4, Radius/Speed, FT/MPH	57.00	57.00	57.00	57.00
R_4, Speed, MPH	15.80	15.80	15.80	15.80
R_5, Radius/Speed, FT/MPH	136.98	N/A	N/A	N/A
R_5, Speed, MPH	23.28	N/A	N/A	N/A
R_5, Bypass Radius/Speed, FT/MPH				

Minimum Sight Parameters	Leg 1 (North)	Leg 2 (West)	Leg 3 (South)	Leg 4 (East)
Approach Design Speed, MPH	21.0	22.3	21.9	21.9
Approach Stopping Sight Distance, FT/MPH				
Circulatory Stopping Sight Distance, FT/MPH				
Exit (Crosswalk) Stopping Sight Distance, FT/MPH	N/A	N/A	N/A	N/A
Intersection Sight Distance, FT/MPH				

General	
Design Vehicle(s)	WB-62
Truck Apron Width, FT	20

Designer: Colleen Flach

Signature:

Date: 2/4/2025

Roadway Improvements

Item	Description	Quantity	Units	Unit Cost	Total Cost
201	Clearing and Grubbing *Clearing of trees and overgrowth in wooded areas*	1	LUMP	$ 25,000.00	$ 25,000.00
202	Building Demolished	1	EACH	$ 60,000.00	$ 60,000.00
202	Pavement Removed	7770	SY	$ 22.50	$ 174,825.00
203	Earthwork *Required for leveling vertical alignments of roadways and grading beyond the limits of new pavement*	1	LUMP	$ 650,000.00	$ 650,000.00
204	Subgrade Compaction	11630	SY	$ 3.25	$ 37,797.50
441	Asphalt Drive	260	SY	$ 115.00	$ 29,900.00
441	Full Depth Pavement (Asphalt)	9165	SY	$ 115.00	$ 1,053,975.00
452	Concrete Truck Apron	1090	SY	$ 125.00	$ 136,250.00
452	Concrete Drive	235	SY	$ 105.00	$ 24,675.00
609	Concrete Curb	4640	FT	$ 45.00	$ 208,800.00
609	Concrete Traffic Island	840	SY	$ 150.00	$ 126,000.00
611	Drainage *Installation of closed storm sewer (catch basins, manholes, conduits, BMP, etc.)*	1	LUMP	$ 500,000.00	$ 500,000.00
625	Lighting *Installation of two (2) light poles per leg*	1	LUMP	$ 200,000.00	$ 200,000.00
630	Signage *Flat sheet sign installations along legs and within the central island and splitter islands*	1	LUMP	$ 10,000.00	$ 10,000.00
644	Pavement Markings *Installation of edge lines, center lines, and yield lines*	1	LUMP	$ 15,000.00	$ 15,000.00
659	Seeding and Mulching *Restoration of disturbed areas within the project limits*	1	LUMP	$ 50,000.00	$ 50,000.00
832	Erosion Control *Assumed based on the size and elements of the project*	1	LUMP	$ 20,000.00	$ 20,000.00
			Itemized Subtotal		**$ 3,322,230.00**

	Incidentals				
614	Maintenance of Traffic	1	LUMP	$ 150,000.00	$ 150,000.00
623	Construction Layout Stakes	1	LUMP	$ 25,000.00	$ 25,000.00
624	Mobilization	1	LUMP	$ 100,000.00	$ 100,000.00
			Incidentals Subtotal		**$ 275,000.00**
				Contingency (30%)	**$ 1,079,200.00**
			Construction Subtotal		**$ 4,676,430.00**

Engineering Design (15%)	**$ 701,500.00**
Environmental, Geotechnical, Miscellaneous Federal Requirements (10%)	**$ 467,700.00**
Right-of-Way* (Includes 30% Contingency)	**$ 87,474.00**
Subtotal	**$ 5,933,200.00**
Inflation* (13.5%)	**$ 801,000.00**
Total	**$ 6,734,200.00**

Note: Cost estimate does not include utility relocation costs.

*Inflation based on 2027 Construction. Note, inflation rates have been irregularly high recently. If the proposed project is not immediately moved forward, this cost estimate will likely need revised as time passes.

CARPENTER MARTY transportation

Right-of-Way Cost Estimate - Roundabouts - Combined
Alternate 1
SR-43 at Trares Road and Randolph Road

Acquisition	Parcel	Unit (Acreage)	Cost/Unit ($$/Acre)	Subtotal Land Value	Structure Value (If Taken)	Damages (Loss in Value to the Residue)	Subtotal Structures & Damages	Total Non-Labor Acquisition Costs	Parcel Count	Total Takes	Partial Takes	No. of Structures Impacted
Residential	36-024-00-00-007-002	0.033	$15,000	$495	$0	$0	$0	$495	10	1	9	1
	36-024-00-00-024-000	0.022	$30,000	$660	$0	$0	$0	$660				
	36-024-00-00-025-005	0.663	$8,000	$5,304	$0	$0	$0	$5,304				
	36-024-00-00-038-001	0.105	$35,000	$3,675	$0	$0	$0	$3,675				
	36-027-00-00-011-000	0.337	$15,000	$5,055	$0	$0	$0	$5,055				
	36-027-00-00-028-001	0.170	$20,000	$3,400	$0	$0	$0	$3,400				
	36-027-00-00-029-000	0.006	$20,000	$120	$0	$0	$0	$120				
	36-027-00-00-029-001	0.001	$20,000	$20	$0	$0	$0	$20				
	36-027-00-00-030-000	0.253	$20,000	$5,060	$0	$0	$0	$5,060				
	36-027-00-00-031-000	0.034	$55,000	$1,870	$0	$0	$0	$1,870				
Commercial			$0	$0	$0	$0	$0	$0				0
Industrial			$0	$0	$0	$0	$0	$0				0
Agricultural			$0	$0	$0	$0	$0	$0				0

Relocation	Unit (Displacement)	RHP/RSP	Move Cost	Re-establishment	Total Non-Labor RAP Costs
Residential					
Owner Occupant	1	$34,000	$6,000		$40,000
Tenant	0	$10,000	$1750		$0
Commercial/Farm/NPO					
Owner	0		$15,000	$10,000	$0
Tenant	0		$15,000	$10,000	$0
Personal Property	0		$1,000		$0

Estimate amount of time necessary to relocate all RAP
Estimated number of years until project wide R/W acquisition begins =3

[[(total of acquisition cost) x 0.09]x0.025] + [[(total of acquisition cost) x 0.15] x 1.20] + [[(total of acquisition cost) x 0.10] x 1.50] =	**Contingency** (Incidentals, Admin. Review, & Appropriation)	**$21,815**
	Total Non-Labor R/W Costs	**$87,474**

RHP - Replacement Housing Payment
RSP - Rent Supplemental Payment
NPO - Non-Profit Organization

Labor (External)	Unit (Parcels)	Unit Price	Total Cost
Titles	0	$1,000	$0
Appraisals			
Simple	0	$750	$0
Detailed	0	$4,500	$0
Appraisal Review			
Simple	0	$500	$0
Detailed	0	$2,000	$0
Negotiations	0	$1,800	$0
Relocations			
Personal Property	0	$2,000	$0
Residential	0	$8,000	$0
Commericial/Farm/NPO	0	$6,000	$0
Closings	0	$500	$0
Package Billing & Review	0	$500	$0
Project Management	0	$4,000	$0
Asbestos Testing & Abatement	0	$5,000	$0
	Total Labor Costs		**$0**

This R/W Cost Estimate Prepared by	Date
Carpenter Marty Transportation	10/23/2023

Total Labor Costs	----
Total Non-Labor R/W Costs	$87,474
Contingency	----
TOTAL R/W COSTS	**$87,474**

Roadway Improvements

Item	Description	Quantity	Units	Unit Cost	Total Cost
201	Clearing and Grubbing *Clearing of trees and overgrowth in wooded areas*	1	LUMP	$ 15,000.00	$ 15,000.00
202	Building Demolished	1	EACH	$ 60,000.00	$ 60,000.00
202	Pavement Removed	3900	SY	$ 22.50	$ 87,750.00
203	Earthwork *Required for leveling vertical alignments of roadways and grading beyond the limits of new pavement*	1	LUMP	$ 350,000.00	$ 350,000.00
204	Subgrade Compaction	6210	SY	$ 3.25	$ 20,182.50
441	Asphalt Drive	20	SY	$ 115.00	$ 2,300.00
441	Full Depth Pavement (Asphalt)	4950	SY	$ 115.00	$ 569,250.00
452	Concrete Truck Apron	535	SY	$ 125.00	$ 66,875.00
452	Concrete Drive	30	SY	$ 105.00	$ 3,150.00
609	Concrete Curb	2510	FT	$ 45.00	$ 112,950.00
609	Concrete Traffic Island	410	SY	$ 150.00	$ 61,500.00
611	Drainage *Installation of closed storm sewer (catch basins, manholes, conduits, BMP, etc.)*	1	LUMP	$ 250,000.00	$ 250,000.00
625	Lighting *Installation of two (2) light poles per leg*	1	LUMP	$ 100,000.00	$ 100,000.00
630	Signage *Flat sheet sign installations along legs and within the central island and splitter islands*	1	LUMP	$ 5,000.00	$ 5,000.00
644	Pavement Markings *Installation of edge lines, center lines, and yield lines*	1	LUMP	$ 7,500.00	$ 7,500.00
659	Seeding and Mulching *Restoration of disturbed areas within the project limits*	1	LUMP	$ 25,000.00	$ 25,000.00
832	Erosion Control *Assumed based on the size and elements of the project*	1	LUMP	$ 10,000.00	$ 10,000.00
			Itemized Subtotal		**$ 1,746,460.00**

	Incidentals				
614	Maintenance of Traffic	1	LUMP	$ 100,000.00	$ 100,000.00
623	Construction Layout Stakes	1	LUMP	$ 12,500.00	$ 12,500.00
624	Mobilization	1	LUMP	$ 100,000.00	$ 100,000.00
			Incidentals Subtotal		**$ 212,500.00**
				Contingency (30%)	**$ 587,700.00**
			Construction Subtotal		**$ 2,546,660.00**

Engineering Design (15%)	**$ 382,000.00**
Environmental, Geotechnical, Miscellaneous Federal Requirements (10%)	**$ 254,700.00**
Right-of-Way* (Includes 30% Contingency)	**$ 71,064.00**
Subtotal	**$ 3,254,500.00**
Inflation* (13.5%)	**$ 439,400.00**
Total	**$ 3,693,900.00**

Note: Cost estimate does not include utility relocation costs.

*Inflation based on 2027 Construction. Note, inflation rates have been irregularly high recently. If the proposed project is not immediately moved forward, this cost estimate will likely need revised as time passes.

Acquisition	Parcel	Unit (Acreage)	Cost/Unit ($$/Acre)	Subtotal Land Value	Structure Value (If Taken)	Damages (Loss in Value to the Residue)	Subtotal Structures & Damages	Total Non-Labor Acquisition Costs	Parcel Count	Total Takes	Partial Takes	No. of Structures Impacted
Residential	36-024-00-00-007-002	0.033	$15,000	$495	$0	$0	$0	$495	7	1	6	1
	36-024-00-00-024-000	0.022	$30,000	$660	$0	$0	$0	$660				
	36-024-00-00-025-005	0.442	$8,000	$3,536	$0	$0	$0	$3,536				
	36-027-00-00-028-001	0.080	$20,000	$1,600	$0	$0	$0	$1,600				
	36-027-00-00-029-000	0.006	$20,000	$120	$0	$0	$0	$120				
	36-027-00-00-030-000	0.253	$20,000	$5,060	$0	$0	$0	$5,060				
	36-027-00-00-031-000	0.034	$55,000	$1,870	$0	$0	$0	$1,870				
Commercial			$0	$0	$0	$0	$0	$0				0
Industrial			$0	$0	$0	$0	$0	$0				0
Agricultural			$0	$0	$0	$0	$0	$0				0

Relocation	Unit (Displacement)	RHP/RSP	Move Cost	Re-establishment	Total Non-Labor RAP Costs
Residential					
Owner Occupant	1	$34,000	$6,000		$40,000
Tenant	0	$10,000	$1750		$0
Commercial/Farm/NPO					
Owner	0		$15,000	$10,000	$0
Tenant	0		$15,000	$10,000	$0
Personal Property	0		$1,000		$0

Estimate amount of time necessary to relocate all RAP
Estimated number of years until project wide R/W acquisition begins =3

[[(total of acquisition cost) x 0.09]x0.025] + [[(total of acquisition cost) x 0.15] x 1.20] + [[(total of acquisition cost) x 0.10] x 1.50] =	**Contingency** (Incidentals, Admin. Review, & Appropriation)	**$17,723**
	Total Non-Labor R/W Costs	**$71,064**

RHP - Replacement Housing Payment
RSP - Rent Supplemental Payment
NPO - Non-Profit Organization

Labor (External)	Unit (Parcels)	Unit Price	Total Cost
Titles	0	$1,000	$0
Appraisals			
Simple	0	$750	$0
Detailed	0	$4,500	$0
Appraisal Review			
Simple	0	$500	$0
Detailed	0	$2,000	$0
Negotiations	0	$1,800	$0
Relocations			
Personal Property	0	$2,000	$0
Residential	0	$8,000	$0
Commericial/Farm/NPO	0	$6,000	$0
Closings	0	$500	$0
Package Billing & Review	0	$500	$0
Project Management	0	$4,000	$0
Asbestos Testing & Abatement	0	$5,000	$0
	Total Labor Costs		**$0**

This R/W Cost Estimate Prepared by	Date
Carpenter Marty Transportation	1/31/2025

Total Labor Costs	----
Total Non-Labor R/W Costs	$71,064
Contingency	----
TOTAL R/W COSTS	**$71,064**

Roadway Improvements

Item	Description	Quantity	Units	Unit Cost	Total Cost
201	Clearing and Grubbing *Clearing of trees and overgrowth in wooded areas*	1	LUMP	$ 10,000.00	$ 10,000.00
202	Pavement Removed	3870	SY	$ 22.50	$ 87,075.00
203	Earthwork *Required for leveling vertical alignments of roadways and grading beyond the limits of new pavement*	1	LUMP	$ 300,000.00	$ 300,000.00
204	Subgrade Compaction	5420	SY	$ 3.25	$ 17,615.00
441	Asphalt Drive	240	SY	$ 115.00	$ 27,600.00
441	Full Depth Pavement (Asphalt)	4215	SY	$ 115.00	$ 484,725.00
452	Concrete Truck Apron	555	SY	$ 125.00	$ 69,375.00
452	Concrete Drive	205	SY	$ 105.00	$ 21,525.00
609	Concrete Curb	2130	FT	$ 45.00	$ 95,850.00
609	Concrete Traffic Island	430	SY	$ 150.00	$ 64,500.00
611	Drainage *Installation of closed storm sewer (catch basins, manholes, conduits, BMP, etc.)*	1	LUMP	$ 250,000.00	$ 250,000.00
625	Lighting *Installation of two (2) light poles per leg*	1	LUMP	$ 100,000.00	$ 100,000.00
630	Signage *Flat sheet sign installations along legs and within the central island and splitter islands*	1	LUMP	$ 5,000.00	$ 5,000.00
644	Pavement Markings *Installation of edge lines, center lines, and yield lines*	1	LUMP	$ 7,500.00	$ 7,500.00
659	Seeding and Mulching *Restoration of disturbed areas within the project limits*	1	LUMP	$ 25,000.00	$ 25,000.00
832	Erosion Control *Assumed based on the size and elements of the project*	1	LUMP	$ 10,000.00	$ 10,000.00
			Itemized Subtotal		**$ 1,575,770.00**

	Incidentals				
614	Maintenance of Traffic	1	LUMP	$ 100,000.00	$ 100,000.00
623	Construction Layout Stakes	1	LUMP	$ 12,500.00	$ 12,500.00
624	Mobilization	1	LUMP	$ 100,000.00	$ 100,000.00
			Incidentals Subtotal		**$ 212,500.00**
				Contingency (30%)	**$ 536,500.00**
			Construction Subtotal		**$ 2,324,770.00**

Engineering Design (15%)	**$ 348,800.00**
Environmental, Geotechnical, Miscellaneous Federal Requirements (10%)	**$ 232,500.00**
Right-of-Way* (Includes 30% Contingency)	**$ 16,384.00**
Subtotal	**$ 2,922,500.00**
Inflation* (13.5%)	**$ 394,600.00**
Total	**$ 3,317,100.00**

Note: Cost estimate does not include utility relocation costs.

*Inflation based on 2027 Construction. Note, inflation rates have been irregularly high recently. If the proposed project is not immediately moved forward, this cost estimate will likely need revised as time passes.

Acquisition	Parcel	Unit (Acreage)	Cost/Unit ($$/Acre)	Subtotal Land Value	Structure Value (If Taken)	Damages (Loss in Value to the Residue)	Subtotal Structures & Damages	Total Non-Labor Acquisition Costs	Parcel Count	Total Takes	Partial Takes	No. of Structures Impacted
	36-024-00-00-025-005	0.221	$8,000	$1,768	$0	$0	$0	$1,768	4	0	4	0
	36-024-00-00-038-001	0.105	$35,000	$3,675	$0	$0	$0	$3,675				
	36-027-00-00-011-000	0.337	$15,000	$5,055	$0	$0	$0	$5,055				
	36-027-00-00-028-001	0.090	$20,000	$1,800	$0	$0	$0	$1,800				
Commercial			$0	$0	$0	$0	$0	$0				0
Industrial			$0	$0	$0	$0	$0	$0				0
Agricultural			$0	$0	$0	$0	$0	$0				0

Relocation	Unit (Displacement)	RHP/RSP	Move Cost	Re-establishment	Total Non-Labor RAP Costs	Estimate amount of time necessary to relocate all RAP
Residential						Estimated number of years until project wide R/W
Owner Occupant	0	$34,000	$6,000		$0	acquisition begins =3
Tenant	0	$10,000	$1750		$0	
Commercial/Farm/NPO						
Owner	0		$15,000	$10,000	$0	
Tenant	0		$15,000	$10,000	$0	
Personal Property	0		$1,000		$0	

[[(total of acquisition cost) x 0.09}x0.025] + [[(total of acquisition cost) x 0.15] x 1.20] + [[(total of acquisition cost) x 0.10] x 1.50] =	**Contingency** (Incidentals, Admin, Review, & Appropriation)	**$4,086**
	Total Non-Labor R/W Costs	**$16,384**

RHP - Replacement Housing Payment
RSP - Rent Supplemental Payment
NPO - Non-Profit Organization

Labor (External)	Unit (Parcels)	Unit Price	Total Cost
Titles	0	$1,000	$0
Appraisals			
Simple	0	$750	$0
Detailed	0	$4,500	$0
Appraisal Review			
Simple	0	$500	$0
Detailed	0	$2,000	$0
Negotiations	0	$1,800	$0
Relocations			
Personal Property	0	$2,000	$0
Residential	0	$8,000	$0
Commericial/Farm/NPO	0	$6,000	$0
Closings	0	$500	$0
Package Billing & Review	0	$500	$0
Project Management	0	$4,000	$0
Asbestos Testing & Abatement	0	$5,000	$0
	Total Labor Costs		**$0**

This R/W Cost Estimate Prepared by	Date
Carpenter Marty Transportation	1/31/2025

Total Labor Costs	----
Total Non-Labor R/W Costs	$16,384
Contingency	----
TOTAL R/W COSTS	**$16,384**

Project Cost Estimate

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Alt 1	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	2/6/2025
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		

Engineering Design %	25%
Contingency %	30%

Countermeasures	Construction Costs	Right of Way Costs	Engineering Design Costs	Contingency Amount	Total Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value
Install Roundabouts	$3,740,408.00	$87,474.00	$956,970.50	$1,148,364.60	**$5,933,217.10**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
Totals	**$3,740,408.00**	**$87,474.00**	**$956,970.50**	**$1,148,364.60**	$5,933,217.10	**$0.00**	**$0.00**

Inflation %	14%

Final Costruction Cost:	**$6,734,201.41**

*Final construction cost should match the Project Cost Estimate

Safety Benefit - Cost Analysis

General Information

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Alt 1	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	2/6/2025
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		

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

All Sites

Comments:

Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Install Roundabouts	20	$5,933,217.10			$5,933,217.10	$5,933,217.10	-3.314	$4,558,662
		$0.00			$0.00	$0.00		
		$0.00			$0.00	$0.00		
		$0.00			$0.00	$0.00		
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
Totals		**$5,933,217.10**	**$0.00**	**$0.00**	**$5,933,217.10**	**$5,933,217.10**	**-3.314**	**$4,558,662**

Benefit - Cost Calculator

Net Present Value of Project	**$5,933,217.10**
Net Present Value of Safety Benefits	**$4,558,661.83**
Net Benefit	**($1,374,555.27)**
Benefit / Cost Ratio	**0.77**

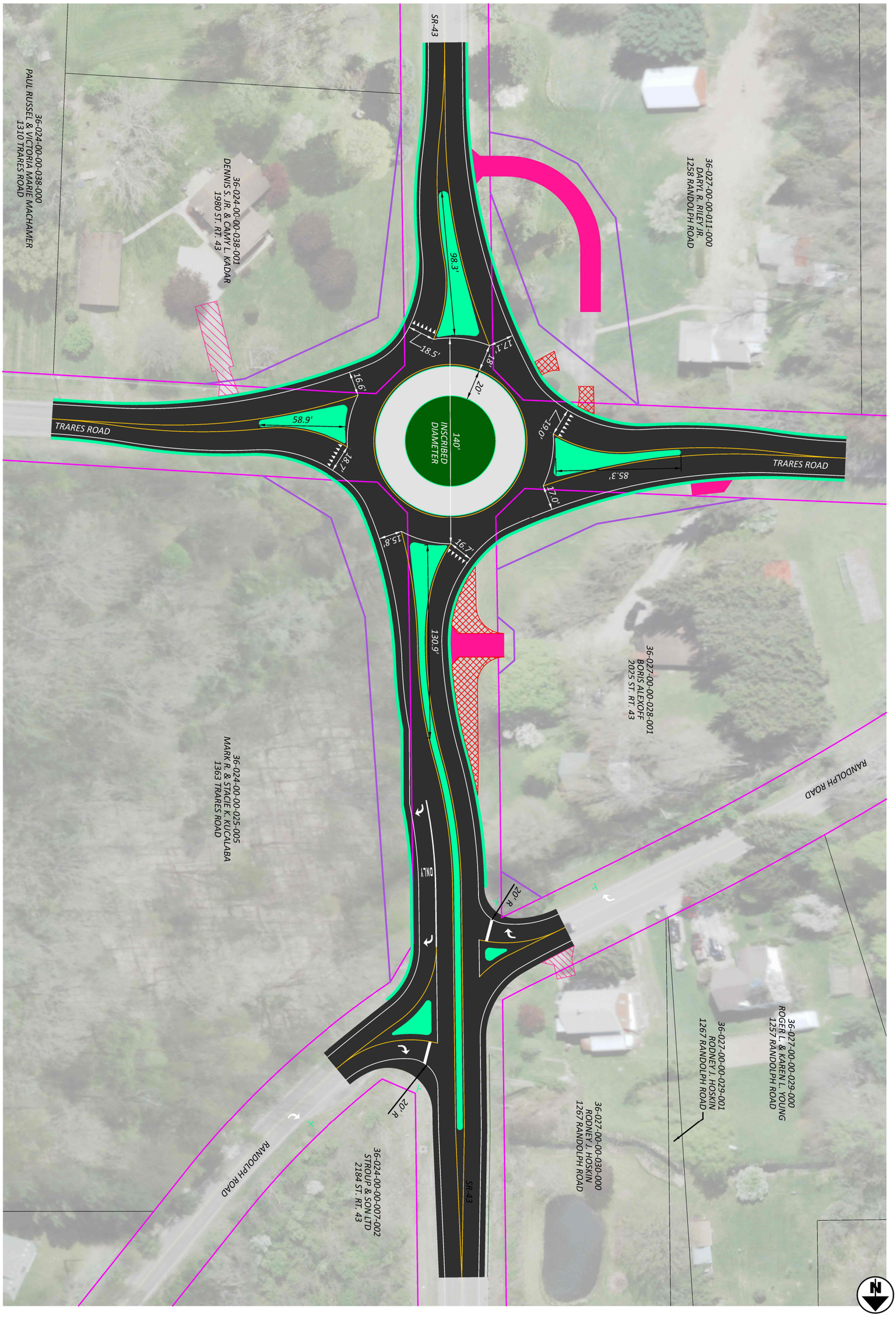
Expected Annual Crash Adjustment

Number of Fatal & Incapacitating Injury Crashes	**-0.448**
Number of Injury Crashes	**-2.066**
Number of Total Crashes	**-3.314**

Comments:

SR-43, RANDOLPH ROAD, AND TRARES ROAD

MODEL: Schematic Plan - RIRO PAPERSIZE: 17x11 (in.) DATE: 3/10/2025 TIME: 5:39:53 PM USER: cflach
P:\ODT\ST\0035_D4 Safety Studies (Task 4)\POR-SR 43 & Trares & Randolph\Site plan\SR-43_Trares_Randolph_Schematic and Truck Turns_RIRO.dgn



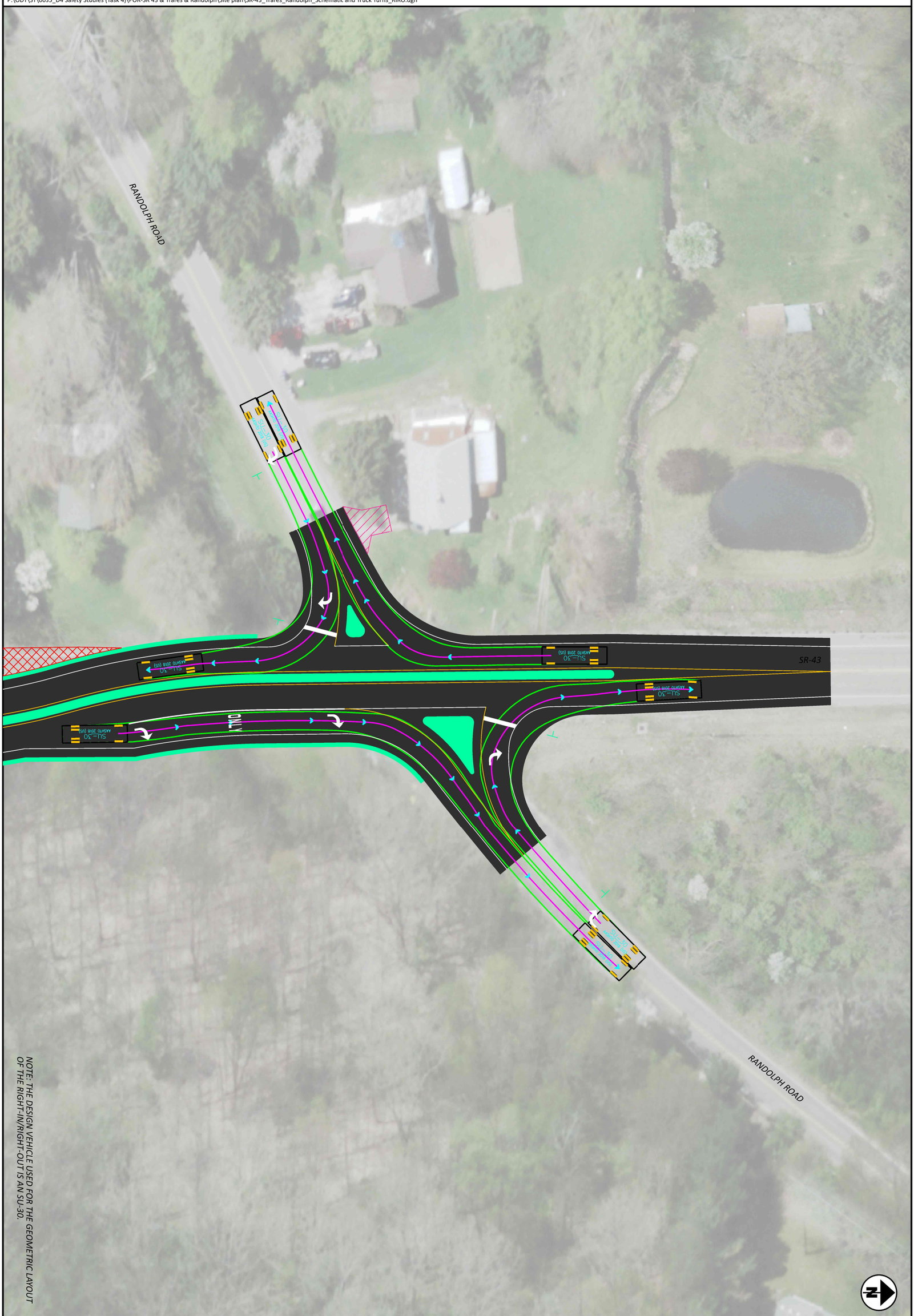
SHEET 1 TOTAL 2
PROJECT ID 0
REVIEWER BAA 02-04-25
DESIGNER CEF
DESIGN AGENCY CARPENTER MARTY transportation

SR-43 AND RANDOLPH ROAD RIGHT-IN/RIGHT-OUT AND ROUNDABOUT (ALT. 2) SCHEMATIC PLAN

HORIZONTAL SCALE IN FEET
0 30
15 60

SR-43, RANDOLPH ROAD, AND TRARES ROAD

MODEL: Truck Turn - RIRO PAPERSIZE: 17x11 (in.) DATE: 3/10/2025 TIME: 5:40:24 PM USER: cflach
P:\ODT\ST\0035_D4 Safety Studies (Task 4)\POR-SR 43 & Trares & Randolph\Site plan\SR-43_Trares_Randolph_Schematic and Truck Turns_RIRO.dgn



NOTE: THE DESIGN VEHICLE USED FOR THE GEOMETRIC LAYOUT OF THE RIGHT-IN/RIGHT-OUT IS AN SU-30.

I26 of 30

SHEET	TOTAL	PROJECT ID	REVIEWER	DESIGNER	DESIGN AGENCY
2	2	0	BAA 02-04-25	CEF	CARPENTER MARTY transportation

SR-43 AND RANDOLPH ROAD RIGHT-IN/RIGHT-OUT TRUCK TURNS

HORIZONTAL SCALE IN FEET
0 20
10 40

CARPENTER MARTY transportation

Cost Estimate - Right-In/Right-Out and South Roundabout
Alternate 2
SR-43 at Trares Road and Randolph Road

Roadway Improvements

Item	Description	Quantity	Units	Unit Cost	Total Cost
201	Clearing and Grubbing *Clearing of trees and overgrowth in wooded areas*	1	LUMP	$ 25,000.00	$ 25,000.00
202	Pavement Removed	6250	SY	$ 22.50	$ 140,625.00
202	Guardrail Removed	150	FT	$ 4.00	$ 600.00
203	Earthwork *Required for leveling vertical alignments of roadways and grading beyond the limits of new pavement*	1	LUMP	$ 400,000.00	$ 400,000.00
204	Subgrade Compaction	7000	SY	$ 3.25	$ 22,750.00
441	Asphalt Drive	240	SY	$ 115.00	$ 27,600.00
441	Full Depth Pavement (Asphalt)	6120	SY	$ 115.00	$ 703,800.00
452	Concrete Truck Apron	555	SY	$ 125.00	$ 69,375.00
452	Concrete Drive	205	SY	$ 105.00	$ 21,525.00
606	Guardrail	150	FT	$ 30.00	$ 4,500.00
608	Concrete Curb	2470	FT	$ 45.00	$ 111,150.00
609	Concrete Traffic Island	595	SY	$ 150.00	$ 89,250.00
611	Drainage *Installation of closed storm sewer (catch basins, manholes, conduits, BMP, etc.)*	1	LUMP	$ 325,000.00	$ 325,000.00
625	Lighting *Installation of two (2) light poles per leg and two (2) at the RIRO*	1	LUMP	$ 120,000.00	$ 120,000.00
630	Signage *Flat sheet sign installations along legs and within the central island and splitter islands*	1	LUMP	$ 8,500.00	$ 8,500.00
644	Pavement Markings *Installation of edge lines, center lines, yield lines, stop lines, channelizing lines, and lane arrows*	1	LUMP	$ 12,500.00	$ 12,500.00
659	Seeding and Mulching *Restoration of disturbed areas within the project limits*	1	LUMP	$ 38,000.00	$ 38,000.00
832	Erosion Control *Assumed based on the size and elements of the project*	1	LUMP	$ 16,000.00	$ 16,000.00
			Itemized Subtotal		**$ 2,136,180.00**

	Incidentals				
614	Maintenance of Traffic	1	LUMP	$ 75,000.00	$ 75,000.00
623	Construction Layout Stakes	1	LUMP	$ 12,500.00	$ 12,500.00
624	Mobilization	1	LUMP	$ 20,000.00	$ 20,000.00
			Incidentals Subtotal		**$ 107,500.00**
				Contingency (30%)	**$ 673,200.00**
				Construction Subtotal	**$ 2,916,880.00**

Engineering Design (15%)	**$ 437,600.00**
Environmental, Geotechnical, Miscellaneous Federal Requirements (10%)	**$ 291,700.00**
Right-of-Way* (Includes 30% Contingency)	**$ 50,162.00**
Subtotal	**$ 3,696,400.00**
Inflation* (13.5%)	**$ 499,100.00**
Total	**$ 4,195,500.00**

Note: Cost estimate does not include utility relocation costs.

*Inflation based on 2027 Construction. Note, inflation rates have been irregularly high recently. If the proposed project is not immediately moved forward, this cost estimate will likely need revised as time passes.

CARPENTER MARTY transportation

Right-of-Way Cost Estimate - Right-In/Right Out and South Roundabout
Alternate 2
SR-43 at Trares Road and Randolph Road

Acquisition	Parcel	Unit (Acreage)	Cost/Unit ($$/Acre)	Subtotal Land Value	Structure Value (If Taken)	Damages (Loss in Value to the Residue)	Subtotal Structures & Damages	Total Non-Labor Acquisition Costs	Parcel Count	Total Takes	Partial Takes	No. of Structures Impacted
Residential	36-027-00-00-011-000	0.337	$15,000	$5,055	$0	$0	$0	$5,055	4	0	4	0
	36-027-00-00-028-001	0.980	$20,000	$19,600	$0	$0	$0	$19,600				
	36-024-00-00-038-001	0.105	$35,000	$3,675	$0	$0	$0	$3,675				
	36-024-00-00-025-005	0.229	$8,000	$1,832	$0	$0	$0	$1,832				
Commercial			$0	$0	$0	$0	$0	$0				0
Industrial			$0	$0	$0	$0	$0	$0				0
Agricultural			$0	$0	$0	$0	$0	$0				0

Relocation	Unit (Displacement)	RHP/RSP	Move Cost	Re-establishment	Total Non-Labor RAP Costs	Estimate amount of time necessary to relocate all RAP
Residential						Estimated number of years until project wide R/W
Owner Occupant	0	$34,000	$6,000		$0	acquisition begins =3
Tenant	0	$10,000	$1750		$0	
Commercial/Farm/NPO						
Owner	0		$15,000	$10,000	$0	
Tenant	0		$15,000	$10,000	$0	
Personal Property	0		$1,000		$0	

[[(total of acquisition cost) x 0.09}x0.025] + [[(total of acquisition cost) x 0.15] x 1.20] + [[(total of acquisition cost) x 0.10] x 1.50] =	**Contingency** (Incidentals, Admin, Review, & Appropriation)	**$20,000**
	Total Non-Labor R/W Costs	**$50,162**

RHP - Replacement Housing Payment
RSP - Rent Supplemental Payment
NPO - Non-Profit Organization

Labor (External)	Unit (Parcels)	Unit Price	Total Cost
Titles	0	$1,000	$0
Appraisals			
Simple	0	$750	$0
Detailed	0	$4,500	$0
Appraisal Review			
Simple	0	$500	$0
Detailed	0	$2,000	$0
Negotiations	0	$1,800	$0
Relocations			
Personal Property	0	$2,000	$0
Residential	0	$8,000	$0
Commericial/Farm/NPO	0	$6,000	$0
Closings	0	$500	$0
Package Billing & Review	0	$500	$0
Project Management	0	$4,000	$0
Asbestos Testing & Abatement	0	$5,000	$0
	Total Labor Costs		**$0**

This R/W Cost Estimate Prepared by	Date
Carpenter Marty Transportation	11/01/2024

Total Labor Costs	----
Total Non-Labor R/W Costs	$50,162
Contingency	----
TOTAL R/W COSTS	**$50,162**

Project Cost Estimate

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Alt 2	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	10/28/2024
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		

Engineering Design %	25%
Contingency %	30%

Countermeasures	Construction Costs	Right of Way Costs	Engineering Design Costs	Contingency Amount	Total Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value
Roundabout at Trares	$1,879,252.00	$16,384.00	$473,909.00	$568,690.80	**$2,938,235.80**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
CMF 1 - Install right-in-right-out (RIRO) operations at stop-controlled intersections	$455,410.00	$33,778.00	$122,297.00	$146,756.40	**$758,241.40**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
Totals	**$2,334,662.00**	**$50,162.00**	**$596,206.00**	**$715,447.20**	**$3,696,477.20**	**$0.00**	**$0.00**

Inflation %	14%

Final Costruction Cost:	**$4,195,501.62**

*Final construction cost should match the Project Cost Estimate

Safety Benefit - Cost Analysis

General Information

Project Name	SR-43 at Randolph Road & Trares Road	Contact Email	gbalsamo@cmtran.com
Project Description	SR-43 Safety Study: Alt 2	Contact Phone	614-656-2429
Reference Number	ODOT PID 1147572	Date Performed	10/28/2024
Analyst	GMB	Analysis Year	2022
Agency/Company	Carpenter Marty Transportation		

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

All Sites

Comments:

Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Roundabout at Trares	20	$2,938,235.80			$2,938,235.80	$2,938,235.80	-3.638	$3,913,190
		$0.00			$0.00	$0.00		
		$0.00			$0.00	$0.00		
		$0.00			$0.00	$0.00		
CMF 1 - Install right-in-right-out (RIRO) operations at stop-controlled intersections	20	$758,241.40			$758,241.40	$758,241.40	-0.686	$581,082
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
Totals		**$3,696,477.20**	**$0.00**	**$0.00**	**$3,696,477.20**	**$3,696,477.20**	**-4.324**	**$4,494,272**

Benefit - Cost Calculator

Net Present Value of Project	$3,696,477.20
Net Present Value of Safety Benefits	$4,494,271.66
Net Benefit	$797,794.46
Benefit / Cost Ratio	1.22

Expected Annual Crash Adjustment

Number of Fatal & Incapacitating Injury Crashes	-0.438
Number of Injury Crashes	-2.067
Number of Total Crashes	-4.324

Comments: