

Construct a Single Lane Modern Roundabout Warren County 2025 HSIP Formal Safety Application



Description

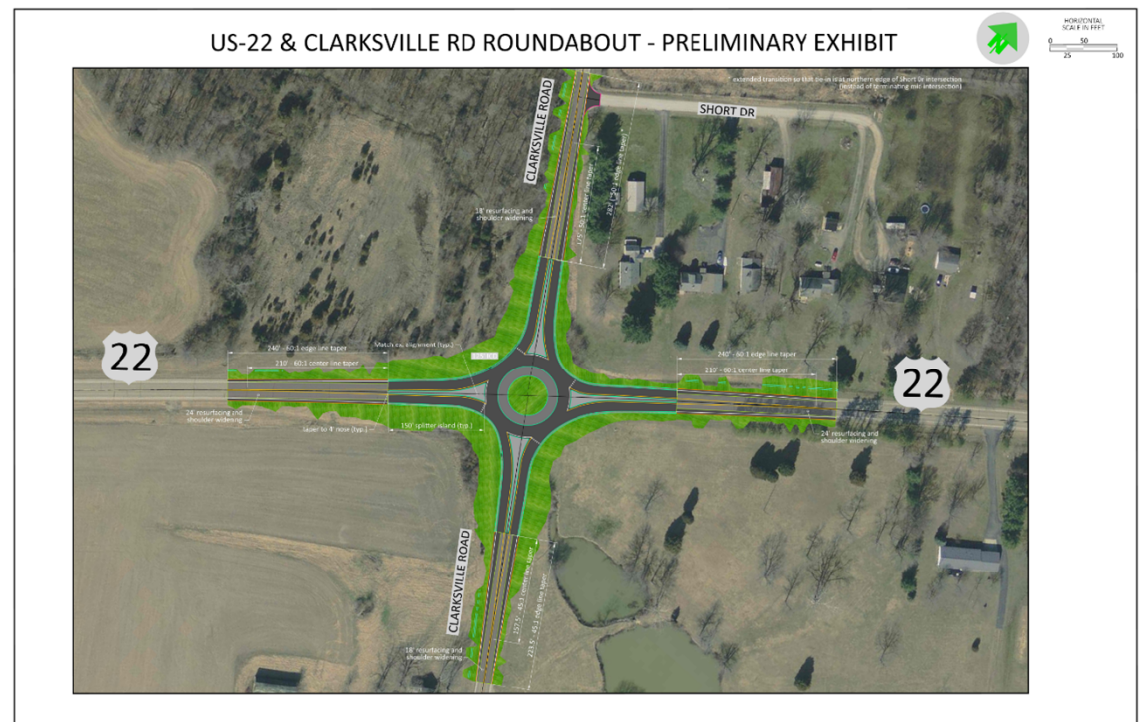
- Construct a single lane modern roundabout at the US 22/Clarksville Rd intersection

Funding

Project Phase	FY	Safety Funds	Total
PE - ENV	2026	\$400,000	\$400,000
PE - DD	2028	\$125,000	\$125,000
ROW	2028	\$200,000	\$200,000
CC	2029	\$2,373,862	\$2,373,862
Total		\$3,098,862	\$3,098,862

Schedule

Authorize Design Consultant	May 2026
Stage 1 Plans - Submitted	January 2027
Enviro Doc Approved	November 2027
Stage 3 Plans - Submitted	June 2028
R/W Acquisition Complete	December 2028
Award	April 2029



Highway Safety Improvement Program

Formal Funding Application

General Project Information	
Project Sponsoring Agency	ODOT
Project Name	WAR US 22 19.24 (Clarksville Rd)
PID	TBD
Applicant Name	Tom Mazza
Contact Phone	513-933-6591
Contact Email	Thomas.Mazza@dot.ohio.gov

Location Information			
ODOT District	8	County	WAR
Route Number	US-22	Road Name	US-22
Begin Logpoint	19.240	End Logpoint	19.240
Begin Latitude	39.417	Begin Longitude	-83.999
End Latitude	39.417	End Longitude	-83.999

Project Description

Summary of Crash Patterns

From 2022-2024, there were 22 total crashes at the US 22/Clarksville Rd intersection (WAR US 22 19.24). There were 7 crashes in 2022, 6 crashes in 2023, and 9 crashes in 2024. There were 0 fatal crashes, 2 serious injury crashes, 13 minor injury crashes, 4 possible injury crashes, and 3 property damage only crashes. The fatal and injury crash rate was 86.4%.

Every crash at the US 22/Clarksville Rd intersection was an angle crash. Crashes occurred most often in dry (86%) and daylight (77%) conditions. The majority of crashes occurred between 2-7 PM. Running the stop sign is NOT a major contributing factor with only 14% of crashes resulting from running a stop sign. The most common angle crash was WB/NB with 10 occurrences. There were 15 angle crashes involving westbound vehicles on US 22.

Historically, there have been 2-3 angle crashes at the US 22/Clarksville Rd intersection each year from 2015-2020. However, the past 4 years have seen a significant increase in the number of angle crashes. There have been at least 5 angle crashes each year from 2021-2024, with a peak of 9 angle crashes in 2024. A long-term solution is needed to eliminate the potential for high severity angle crashes.

Summary of Recommended Countermeasures

StreetLight Data was used to create an estimated AADT and turning movement count at the intersection. This data was used to complete a signal warrant analysis utilizing ODOT's Traffic Signal Warrant Spreadsheet. Based on this analysis, a traffic signal is not warranted at the US 22/Clarksville Rd intersection. ODOT District 8 will not pursue a new traffic signal at this location because a traffic signal is not warranted and a new traffic signal is predicted to increase the number of overall crashes.

All-way stop control is not being considered at this intersection. The 85th percentile speeds on US 22 are near 60 mph and the nearest stopped conditions on US 22 are over 8 miles away in either direction (Nelson Ave to the north and SR 123 to the south).

Based on the historical crash data and past countermeasures, the recommended countermeasure at this time is to construct a single lane modern roundabout at US 22/Clarksville Rd. If funding is awarded to this project, a new traffic count will need to be collected. Then, proper traffic analysis would be completed to confirm a traffic signal is unwarranted and a single lane modern roundabout would operate sufficiently in the design year.

Project Priority Information

Per the 2024 HSIP priority list, the US 22/Clarksville Rd intersection is ranked as rural intersection #105. This intersection does not appear on the current SIP map.

Highway Safety Improvement Program

Formal Funding Application

Crash Data					
Crash Totals (average per year)					
	Fatal & Serious Injury (KA)	Visible Injury (B)	Non-Visible (C)	Property Damage Only (O)	Total
Existing Conditions: Predicted Crash Frequency	0.0943	0.2288	0.1523	0.8185	1.29
Existing Conditions: Expected Crash Frequency	0.2135	0.5173	0.3445	0.8483	1.92
Potential for Safety Improvement	0.1192	0.2885	0.1922	0.0298	0.63
Proposed Conditions: Expected Crash Frequency	0.0021	0.0184	0.0230	0.5928	0.64
Observed Crashes	0.6667	4.3333	1.3333	1.0000	7.33
Observed People Injury Totals					
	Fatal Injury (K)	Serious Injury (A)	Visible Injury (B)	Non-Visible (C)	Total
Observed People Injury Totals	0.0000	1.0000	7.6667	4.6667	13.33

Application Scoring			
Category	Scoring Value	Points Awarded	Points Possible
Ratio of Observed Fatal and Serious Injuries to Observed Total Crashes	0.14	28	30
Percentage of the Potential for Safety Improvement to Total Expected Crashes	32.81%	20	20
Relative Severity Index	54,875.84	20	20
Equivalent Property Damage Only Index	8.08	20	20
Location Equity Measure	3.00%	0	10
Total		88	100

Safety Key Metrics			
Functional Class	5 - Major Collector Roadway	Active Transportation Need	1
Major Route AADT	2,200	Active Transportation Demand	1
Maximum Posted Speed Limit	55	Bicycle Level of traffic stress (if available)	
		TOAST Score (if available)	90.80

Strategic Highway Safety Plan	
Ohio Emphasis Area	Serious Crash Types
Ohio Emphasis Area Subcategory	Intersection
FHWA Emphasis Area	Improving the design and operation of highway intersections
FHWA Improvement Category	Intersection traffic control
FHWA Improvement Subcategory	Modify control - two-way stop to roundabout

Work Locations					
NLFID	Begin Logpoint	End Logpoint	Begin Latitude	Begin Longitude	Location Termini (i.e. from Street 1 to Street 2)
SWARUS00022**C	19.240	19.240	39.417	-83.9987	US 22 and Clarksville Rd

Highway Safety Improvement Program Formal Funding Application

Project Funding							
Project Phase	Safety Study	Interchange Mod. Study	PE - Environmental	PE - Detailed Design	Right of Way /Utilities	Construction	Total
Fiscal Year			2026	2028	2028	2029	
Project Phase Completed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	N/A	
Previous Safety							\$0.00
New Safety			\$400,000.00	\$125,000.00	\$200,000.00	\$2,373,862.00	\$3,098,862.00
Sponsor Funding							\$0.00
Total	\$0.00	\$0.00	\$400,000.00	\$125,000.00	\$200,000.00	\$2,373,862.00	\$3,098,862.00

Additional Funding Detail
 District requesting funding be combined with the CLI US 22 RAB application (202503D08-02). Design and construction for both roundabouts to be completed as 1 project. Design consultant to be selected through the January 2026 programmatic.

Safety Economic Analysis Results			
Net Present Value of Project	\$2,714,862.00	Net Benefit	-\$1,753,686.75
Net Present Value of Safety Benefits	\$961,175.25	Benefit / Total Project Cost Ratio	0.35
		Benefit / Safety Funding Request Ratio	0.31

Applicant Information		
Name	Title	Phone Number
Tom Mazza	Traffic Studies Engineer	513-933-6591
Signature		Date
		March 31, 2025

Version: 20230523

The following information should be included in submission of the safety project application:

1. An electronic copy of the Safety Engineering Study
2. All Excel Analysis Files
 - May include Crash Analysis Module (CAM) Tool, Economic Crash Analysis Tool (ECAT), HSIP Application and Scoring Tool.
3. Benefit-Cost Results (Economic Analysis)
4. DSRT approval signatures

District Safety Review Team Signatures

Name	Title	Approve	Disapprove
	Capital Programs Administrator	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Signature		Date	
Suzanne Enclaus			

Comments: should be built with SR 300/Creek RAB since in the same corridor.

Name	Title	Approve	Disapprove
R. M. Hall RSM	Highway Management Administrator	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Signature		Date	
		3/12/25	

Comments:

Name	Title	Approve	Disapprove
CHARLIE ROWE	Design Engineer	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Signature		Date	
		3/12/25	

Comments: TALK TO C.O. SAFETY TO PILOT A NEW APPROACH SIGNING/STIPING/LIGHTING TO BRING MORE AWARENESS TO DRIVERS AS THEY APPROACH THE ROUNDABOUT

Name	Title	Approve	Disapprove
Scott Brown	Planning Engineer	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Signature		Date	
Scott A Brown		3/12/25	

Comments:

Name	Title	Approve	Disapprove
MARC GRACE	Traffic Engineer	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Signature		Date	
Marc G. Grace		3/12/25	

Comments:

Name	Title	Approve	Disapprove
Brianne Hetzer	DSRT Chairperson	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Signature		Date	
Brianne Hetzer		3/12/25	

Comments: See above comments

Location & Rankings

The intersection addressed in this study is WAR US 22 19.24 (Clarksville Rd). The intersection is within Washington Township just north of the Village of Clarksville and west of the City of Wilmington.

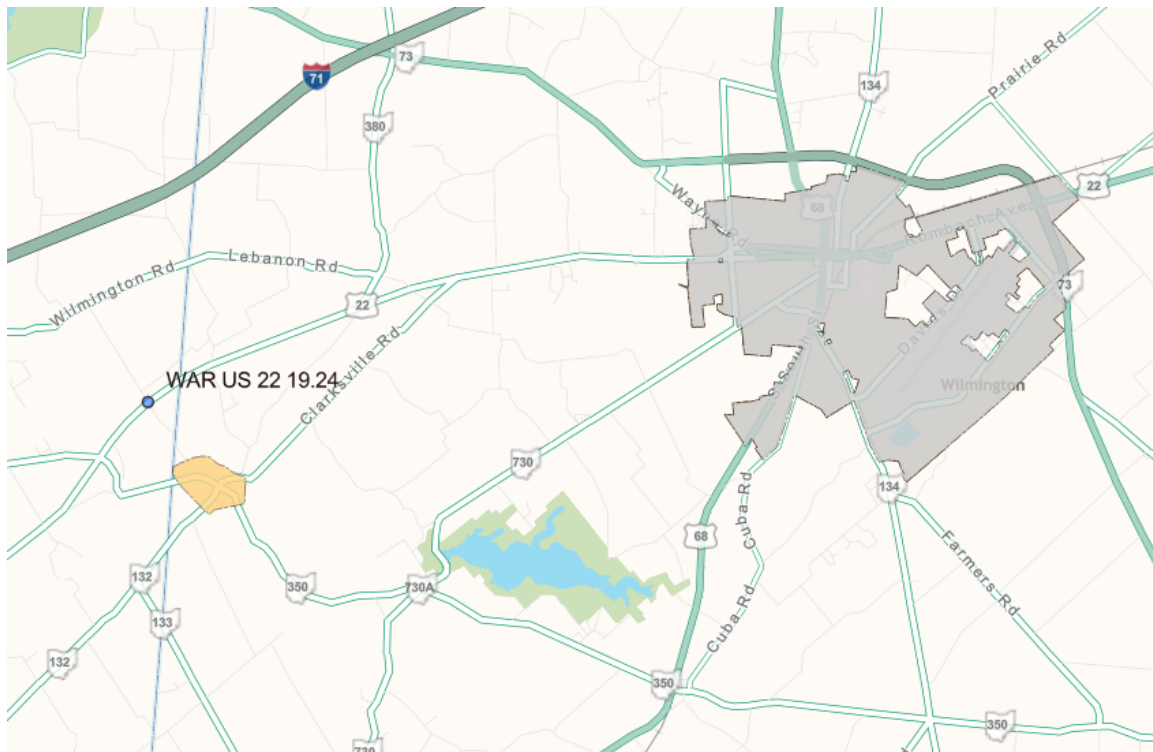


Figure 1: Intersection Location Map

The intersection is ranked on the 2024 Highway Safety Improvement Program (HSIP) priority ranking list as rural intersection #105. The intersection is not listed on the current SIP Map. The subject intersection has not appeared on any Safety Analyst study lists in the past 5 years (2017-2018 SA lists, 2020-2021 SA lists, and FY25 HSIP list). The TOAST score for WAR US 22 12.82-19.77 is 90.80%. There are no congestion issues on US 22 in this area.

The purpose of this study is to analyze the crash trends at this location and recommend countermeasures to mitigate any safety or congestion issues.

Potential Stakeholders

The major stakeholder for the study location is the Ohio Department of Transportation (ODOT). ODOT is responsible for all maintenance on US 22. Warren County Engineer's Office (WCEO) is a minor stakeholder for this study location because Clarksville Rd is a county route. ODOT will coordinate with WCEO should funding be awarded for a project. A public involvement meeting will be included as part of the project development process.

ODOT will take the lead on applying for safety funding and managing any future projects.

Physical Conditions

At the studied intersection, US 22 has 1 travel lane in each direction with no turn lanes. The functional classification for US 22 is a rural major collector. The speed limit on US 22 is 55 MPH. There are no speed zones within the study limits. A traffic count was collected on US 22 approximately 0.5 miles southwest of Clarksville Rd in 2022 showing an AADT of 2,156.

Clarksville Rd has 1 travel lane in each direction with no turn lanes. Clarksville Rd is classified as a rural local roadway. The speed limit is 55 MPH. There are no speed zones within the study limits. StreetLight Data was used to estimate a turning movement count at the US 22/Clarksville Rd intersection. This data shows the volumes of traffic on US 22 and Clarksville Rd are very similar (2,000 - 3,000 vehicles per day).

The intersection of US 22 and Clarksville Rd is stop controlled on Clarksville Rd with free flow traffic on US 22. There are no turn lanes for any approach at this intersection, no intersection lighting, and no pedestrian facilities. There are dual stop ahead warning signs and dual stop signs with cross traffic does not stop plaques for both approaches on Clarksville Rd. There are dual intersection ahead warning signs with street name plaques for both approaches on US 22.



Figure 2: Google Street View Looking Northeast on US 22

The travelled lanes on US 22 are approximately 12' wide with 4' wide paved shoulders. The travelled lanes on Clarksville Rd are approximately 10-11' wide with 0' wide paved shoulders. All measurements were made using Google Maps.

There are 2 culverts near the US 22/Clarksville Rd intersection: CFN 1839769 (48" concrete) and CFN 1855157 (30" concrete). Both culverts would be impacted by a future transportation project (realignment, roundabout, etc.).

The studied intersection is surrounded by farm fields and residential homes. There are no driveways off US 22 within 500' of the intersection. Clarksville Rd is used as a main connection from US 22 to IR 71. Clarksville Rd dead ends to the north at Wilmington Rd. The IR 71/Wilmington Rd interchange is 3.5 miles to the west of Clarksville Rd.



Figure 3: Google Street View Looking Northwest on Clarksville Rd

Background Information

Multiple work orders have been completed within the past 5 years. In 2021, ODOT installed oversized stop signs on Clarksville Rd. In 2023, ODOT added additional cross traffic does not stop plaques (some stop signs did not have one). In the fall of 2023, ODOT implemented new pavement markings on US 22 in an attempt to lower speeds and reduce the number of crashes. The new pavement markings can be seen in Figure 2. The lane widths were narrowed on the approach to the intersection and rumble stripes were added to the center and edge lines. An FHWA study ([Two Low-Cost Safety Concepts for Two-Way Stop-Controlled, Rural Intersections on High-Speed Two-Lane, Two-Way Roadways - FHWA-HRT-08-063](#)) from 2008 showed this countermeasure could lower speeds by 3-4 mph. Unfortunately, before/after speed data did not show a noticeable difference in speeds along US 22 near the intersection. Additionally, the number of angle crashes at the intersection have increased in the past 3 years with the most angle crashes in 2024.

WAR US 22 19.24
HSIP Formal Safety Application
March 2025

ODOT receives public inquiries at the US 22/Clarksville Rd intersection on a routine basis. The typical request is for flashing LED border stop signs, for flashing beacons on warning signs, or for a traffic signal. Crash data is updated regularly when the public inquiries are received.

The rural intersection at US 22/Clarksville Rd has not appeared on any Safety Analyst study lists in the past 5 years (2017-2018 SA lists, 2020-2021 SA lists, and FY25 HSIP list).

The most recent paving project was PID 83823. This project installed a fine polymer asphalt concrete overlay on US 22 in 2013. A crack sealing project (PID 96537) was also completed in 2019. The current work plan, through FY2031, has 1 proposed project in the study area. PID 116337 (FY2028) will resurface US 22 with an asphalt concrete overlay with repairs. Construction on this project is scheduled to begin in the summer of 2028. This resurfacing project will need to be coordinated with the proposed construction of any safety project.

Primary Crash Pattern

From 2022-2024, there were 22 total crashes at the US 22/Clarksville Rd intersection. There were 7 crashes in 2022, 6 crashes in 2023, and 9 crashes in 2024. There were 0 fatal crashes, 2 serious injury crashes, 13 minor injury crashes, 4 possible injury crashes, and 3 property damage only crashes. The fatal and injury crash rate was 86.4%. All 22 crashes at the intersection were angle crashes. Crashes occurred most often in dry (86%) and daylight (77%) conditions.

The primary crash pattern is angle crashes at the intersection of US 22/Clarksville Rd. There were 22 total angle crashes from 2022-2024. There were 15 angle crashes involving westbound vehicles on US 22. The most common angle crash was between westbound and northbound traffic with 10 occurrences. See the crash diagram for additional information.

Failure to yield was the most common reason for an angle crash to occur. Only 3 of the 22 angle crashes were caused by running a stop sign. The angle crashes occurred most often from 2-7 PM during the peak PM commuting hours.

Historically, there have been 2-3 angle crashes at the US 22/Clarksville Rd intersection each year from 2015-2020. However, the past 4 years have seen a significant increase in the number of angle crashes. There have been at least 5 angle crashes each year from 2021-2024, with a peak of 9 angle crashes in 2024. A long-term solution is needed to eliminate the potential for high severity angle crashes.

Table 1: Angle Crashes by Year at the US 22/Clarksville Rd Intersection

2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
4	3	1	3	2	3	5	7	6	9

Primary Crash Countermeasure

The proper signs and pavement markings are already in place at the US 22/Clarksville Rd intersection. Low cost countermeasures (oversized stop signs, cross traffic does not stop plaques, and pavement markings) have been implemented at this intersection in the past 5 years. A long-term solution is needed to eliminate the potential for high severity crashes. The injury rate at this intersection is over 86% based on the last 3 years of full data.

ODOT District 8 received safety funds in early 2025 to install LED border flashing intersection ahead warning signs on US 22 in both directions approaching the US 22/Clarksville Rd intersection. A total of 4 signs will be installed (2 signs in each direction). These signs will be installed in the Summer/Fall of 2025.

StreetLight Data was used to create an estimated AADT and turning movement count at the intersection. This data was used to complete a signal warrant analysis utilizing ODOT's Traffic Signal Warrant Spreadsheet. Based on this analysis, a traffic signal is not warranted at the US 22/Clarksville Rd intersection. ODOT District 8 will not pursue a new traffic signal at this location because a traffic signal is not warranted and a new traffic signal is predicted to increase the number of overall crashes.

All-way stop control is not being considered at this intersection. The 85th percentile speeds on US 22 are near 60 mph and the nearest stopped conditions on US 22 are over 8 miles away in either direction (Nelson Ave to the north and SR 123 to the south).

Based on the historical crash data and past countermeasures, the recommended countermeasure at this time is to construct a single lane modern roundabout at US 22/Clarksville Rd. If funding is awarded to this project, a new traffic count will need to be collected. Then, proper traffic analysis would be completed to confirm a traffic signal is unwarranted and a single lane modern roundabout would operate sufficiently in the design year.

Safety analysis was completed for the proposed single lane modern roundabout. The ECAT shows a proposed reduction of 1.3 crashes per year and a net present value of safety benefits of \$961,175.25 with the construction of a roundabout. The proposed roundabout has a benefit/cost ratio of 0.35.

Relevance to the Ohio Strategic Highway Safety Plan (SHSP)

Strategic Highway Safety Plan (SHSP)

These recommended countermeasures help the state meet the performance measurement goals stated in the Ohio Strategic Highway Safety Plan. The countermeasures recommended are aiding in reducing fatalities, serious injuries, and all crashes on public roads in Ohio. The major emphasis area addressed in this study is intersections.

Ohio's top strategies for addressing intersections include using new technology and implementing proven, low-cost systemic safety improvements. Low-cost improvements have already been tried at this location without success. Therefore, the recommended countermeasure is a single lane modern roundabout. The roundabout is the best long-term improvement for safety. The roundabout is the only alternative that can eliminate the potential for high severity crashes.



WAR US 22 19.24 Crash Diagrams/Analysis

CRASH DIAGRAM 2022-2024






















WAR US 22 19.24 (Clarksville Rd)
2024 HSIP Priority List
Rural Intersection #105
March 2025 Safety Applications

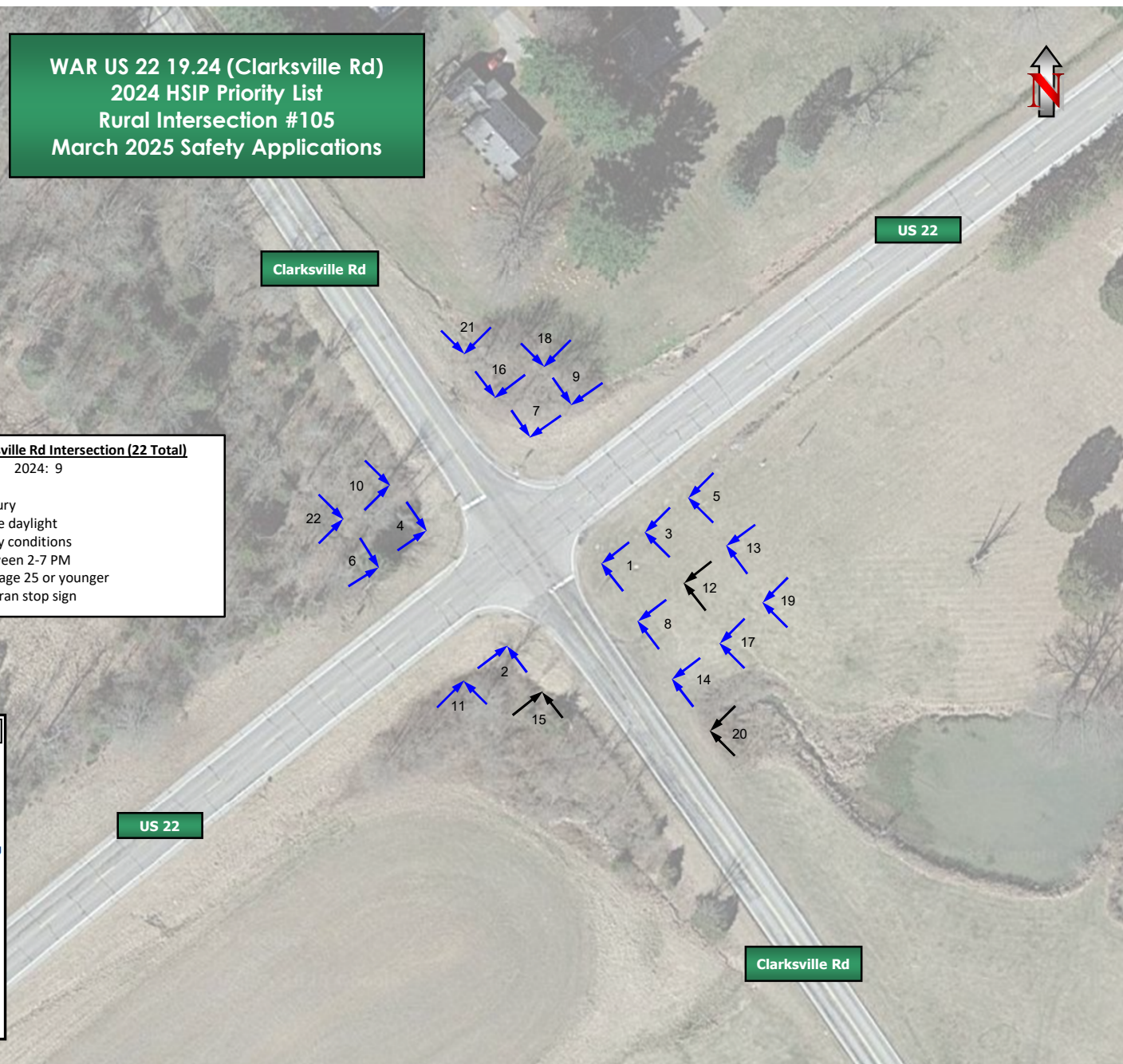
Total Crashes: 22
2022: 7
2023: 6
2024: 9

Angle Crashes at US22/Clarksville Rd Intersection (22 Total)

2022: 7 2023: 6 2024: 9

86% of crashes resulted in injury
77% of crashes occurred in the daylight
86% of crashes occurred in dry conditions
73% of crashes occurred between 2-7 PM
36% of crashes at fault driver age 25 or younger
14% of crashes at fault driver ran stop sign

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

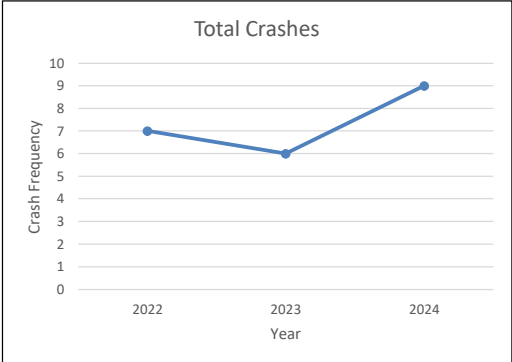
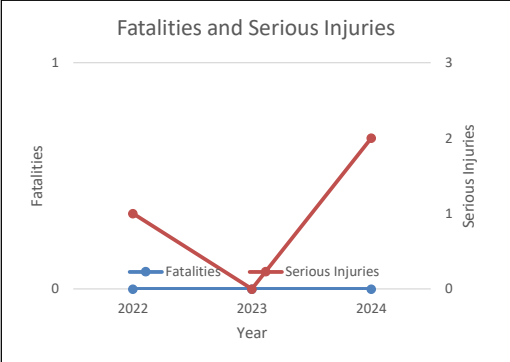


WAR US 22 19.24 (Clarksville Rd) All Crashes 2022-2024

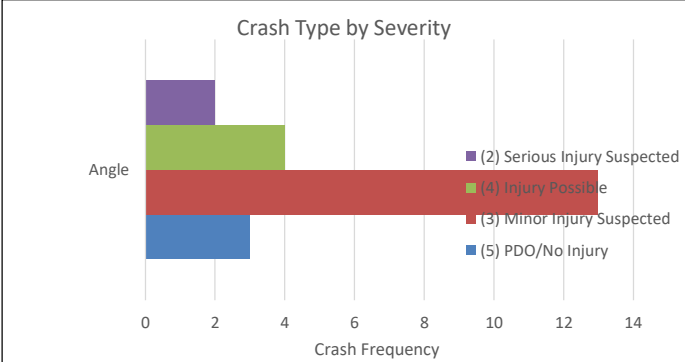
Crash Summary Sheet

Crashes Per Year	7.33	Percent Injury	86.4%	EPDO	8.97
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Year	Total Crashes	Fatalities	Serious Injuries
2022	7	0	1
2023	6	0	0
2024	9	0	2
Grand Total	22	0	3



Total Crashes	Injury Level					
Crash Type	(2) Serious Inju	(3) Minor Injury	(4) Injury Possil	(5) PDO/No Inju	Grand Total	
Angle	2	13	4	3	22	
Grand Total	2	13	4	3	22	



WAR US 22 19.24 (Clarksville Rd) All Crashes 2022-2024

Crash Summary Sheet

Crashes Per Year	7.33	Percent Injury	86.4%	EPDO	8.97
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Road Condition	Total Crashes	Fatalities	Serious Injuries
Dry	19	0	2
Wet	3	0	1
Grand Total	22	0	3

Hour of Day	Total Crashes
6	1
10	1
14	2
15	6
16	3
17	3
18	2
19	1
20	1
21	2
Grand Total	22

Month	Total Crashes
January	2
March	1
May	3
July	2
August	2
September	4
October	2
November	2
December	4
Grand Total	22

Weather	Total Crashes	Fatalities	Serious Injuries
Cloudy	12	0	2
Clear	9	0	0
Rain	1	0	1
Grand Total	22	0	3

Day in Week	Total Crashes
(1) Sunday	3
(2) Monday	2
(3) Tuesday	2
(4) Wednesday	7
(5) Thursday	2
(6) Friday	5
(7) Saturday	1
Grand Total	22

Crash Location	Total Crashes	Fatalities	Serious Injuries
Four-Way Intersection	10	0	2
Not An Intersection	2	0	0
Data Not Valid or Not Provided	10	0	1
Grand Total	22	0	3

Roadway Contour	Total Crashes	Fatalities	Serious Injuries
Straight Level	21	0	3
Straight Grade	1	0	0
Grand Total	22	0	3

WAR US 22 19.24 ECAT Report

Safety Performance Report
Cost Estimate
B/C Analysis

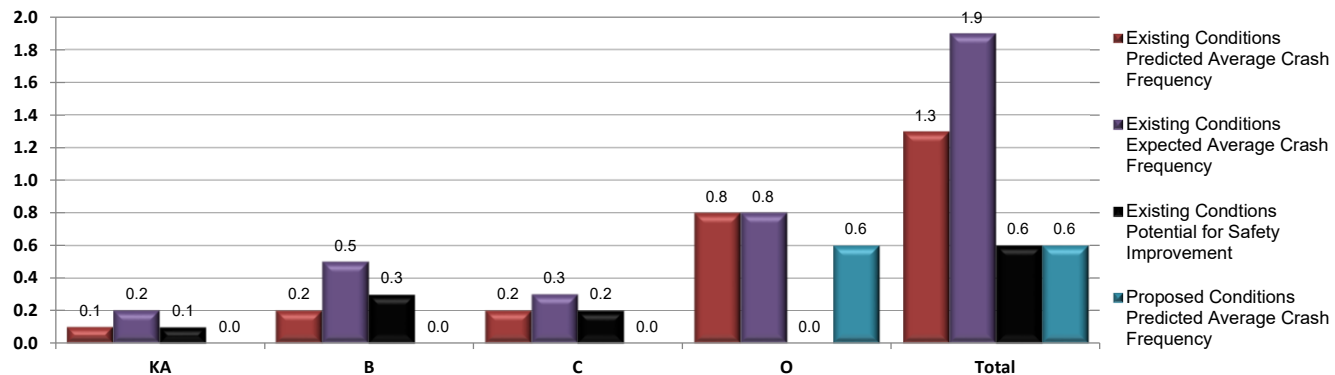


Project Safety Performance Report

General Information

Project Name	WAR US 22 19.24 (Clarksville Rd)	Contact Email	Thomas.Mazza@dot.ohio.gov
Project Description	Proposed Single Lane Roundabout	Contact Phone	513-933-6591
Reference Number	TBD	Date Performed	3/4/2025
Analyst	Tom Mazza	Analysis Year	2029
Agency/Company	ODOT D08		

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	0.0943	0.2288	0.1523	0.8185	1.2939
N_{expected} - Existing Conditions	0.2135	0.5173	0.3445	0.8483	1.9236
N_{potential for improvement} - Existing Conditions	0.1192	0.2885	0.1922	0.0298	0.6297
N_{expected} - Proposed Conditions	0.0021	0.0184	0.0230	0.5928	0.6363



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Reference Number	TBD	Date Performed	3/4/2025
Analyst	Tom Mazza	Analysis Year	2029
Agency/Company	ODOT D08		

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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
US22: 19.24	US 22 and Clarksville Rd	0.0943	0.2288	0.1523	0.8185	1.2939



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Agency/Company	ODOT D08		

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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
US22: 19.24	US 22 and Clarksville Rd	0.2135	0.5173	0.3445	0.8483	1.9236



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Reference Number	TBD	Date Performed	3/4/2025
Analyst	Tom Mazza	Analysis Year	2029
Agency/Company	ODOT D08		

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
US22: 19.24	US 22 and Clarksville Rd	0.1192	0.2885	0.1922	0.0298	0.6297



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Analyst	Tom Mazza	Analysis Year	2029
Agency/Company	ODOT D08		

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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
US22: 19.24	US 22 and Clarksville Rd	0.0021	0.0184	0.023	0.5928	0.6363



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Analyst	Tom Mazza	Analysis Year	2029
Agency/Company	ODOT D08		

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Predicted Crash Frequency
Unknown	0.0052	0.0071	0.0019	0.0183
Head On	0.0111	0.0205	0.0094	0.0004
Rear End	0.2766	0.3920	0.1154	0.0958
Backing	0.0520	0.0571	0.0051	0.0060
Sideswipe - Meeting	0.0376	0.0576	0.0200	0.0000
Sideswipe - Passing	0.0584	0.0770	0.0186	0.2009
Angle	0.4937	0.8052	0.3115	0.1796
Parked Vehicle	0.0460	0.0538	0.0078	0.0000
Pedestrian	0.0064	0.0131	0.0067	0.0004
Animal	0.0000	0.0000	0.0000	0.0064
Train	0.0002	0.0004	0.0002	0.0000
Pedalcycles	0.0047	0.0093	0.0046	0.0004
Other Non-Vehicle	0.0001	0.0002	0.0001	0.0000
Fixed Object	0.2170	0.3010	0.0840	0.0643
Other Object	0.0075	0.0089	0.0014	0.0000
Overturning	0.0131	0.0236	0.0105	0.0004
Other Non-Collision	0.0172	0.0211	0.0039	0.0124
Left Turn	0.0471	0.0757	0.0286	0.0137
Right Turn	0.0000	0.0000	0.0000	0.0437

Project Cost Estimate			
Project Name	WAR US 22 19.24 (Clarksville Rd)	Contact Email	Thomas.Mazza@dot.ohio.gov
Project Description	Proposed Single Lane Roundabout	Contact Phone	513-933-6591
Reference Number	TBD	Date Performed	3/4/2025
Analyst	Tom Mazza	Analysis Year	2029
Agency/Company	ODOT D08		


Engineering Design %	0%
Contingency %	0%

Countermeasures	Construction Costs	Right of Way Costs	Engineering Design Costs	Contingency Amount	Total Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value
Single Lane Modern Roundabout	\$1,530,862.00	\$200,000.00	\$525,000.00	\$459,000.00	\$2,714,862.00		
			\$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	\$0.00		
			\$0.00	\$0.00	\$0.00		
Totals	\$1,530,862.00	\$200,000.00	\$525,000.00	\$459,000.00	\$2,714,862.00	\$0.00	\$0.00

Inflation %	
-------------	--

Final Costruction Cost:	\$2,714,862.00
-------------------------	-----------------------

*Final construction cost should match the Project Cost Estimate



Safety Benefit - Cost Analysis

General Information

Project Name	WAR US 22 19.24 (Clarksville Rd)	Contact Email	Thomas.Mazza@dot.ohio.gov
Project Description	Proposed Single Lane Roundabout	Contact Phone	513-933-6591
Reference Number	TBD	Date Performed	3/4/2025
Analyst	Tom Mazza	Analysis Year	2029
Agency/Company	ODOT D08		

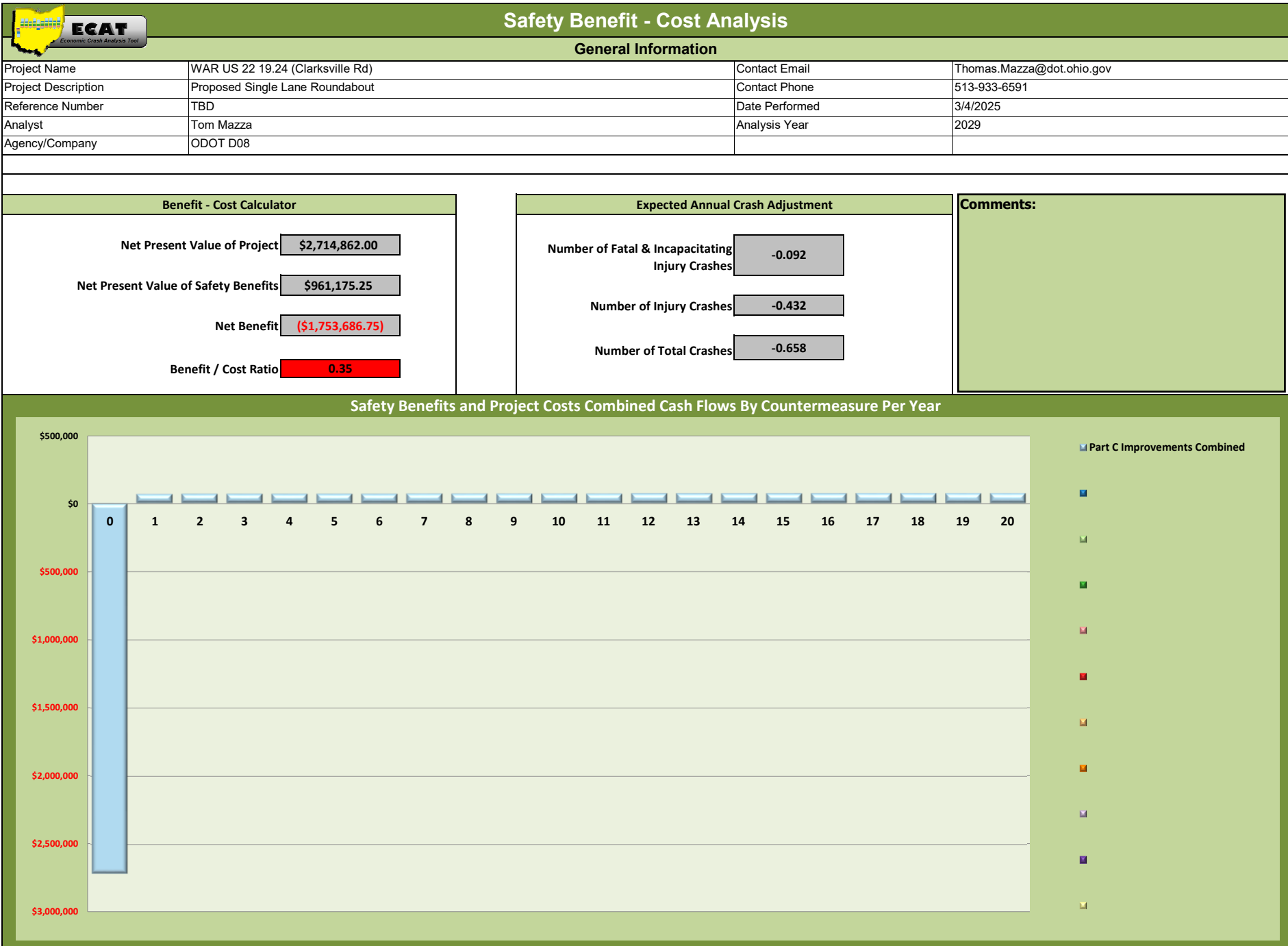
Select Site Types to be used in Benefit-Cost Analysis:

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
Single Lane Modern Roundabout	20	\$2,714,862.00			\$2,714,862.00	\$2,714,862.00	-0.658	\$961,175
		\$0.00			\$0.00	\$0.00		
		\$0.00			\$0.00	\$0.00		
		\$0.00			\$0.00	\$0.00		
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
Totals		\$2,714,862.00	\$0.00	\$0.00	\$2,714,862.00	\$2,714,862.00	-0.658	\$961,175





Safety Benefit - Cost Analysis

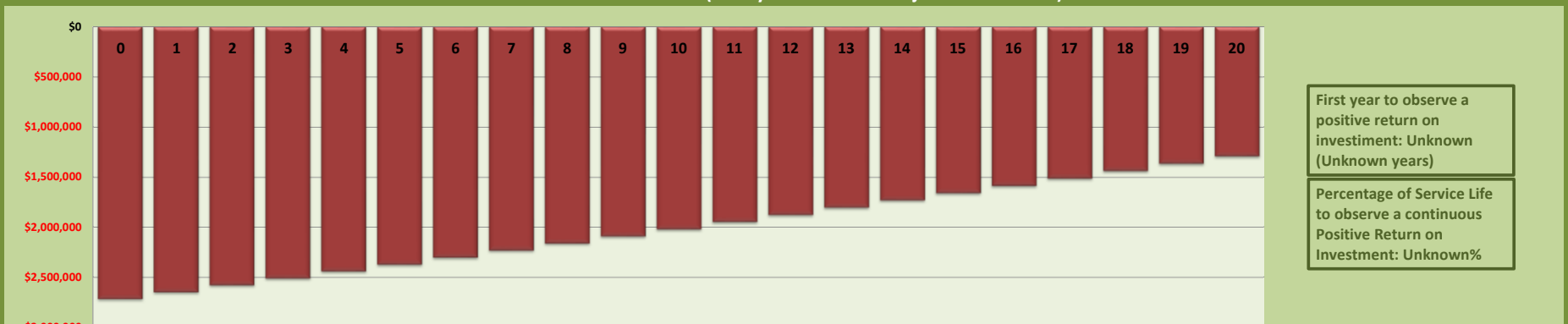
General Information

Project Name	WAR US 22 19.24 (Clarksville Rd)	Contact Email	Thomas.Mazza@dot.ohio.gov
Project Description	Proposed Single Lane Roundabout	Contact Phone	513-933-6591
Reference Number	TBD	Date Performed	3/4/2025
Analyst	Tom Mazza	Analysis Year	2029
Agency/Company	ODOT D08		

Project Costs Only Cash Flows By Countermeasure Per Year



Return on Investment (Safety Benefits and Project Investments)



WAR US 22 19.24 Preliminary Layout

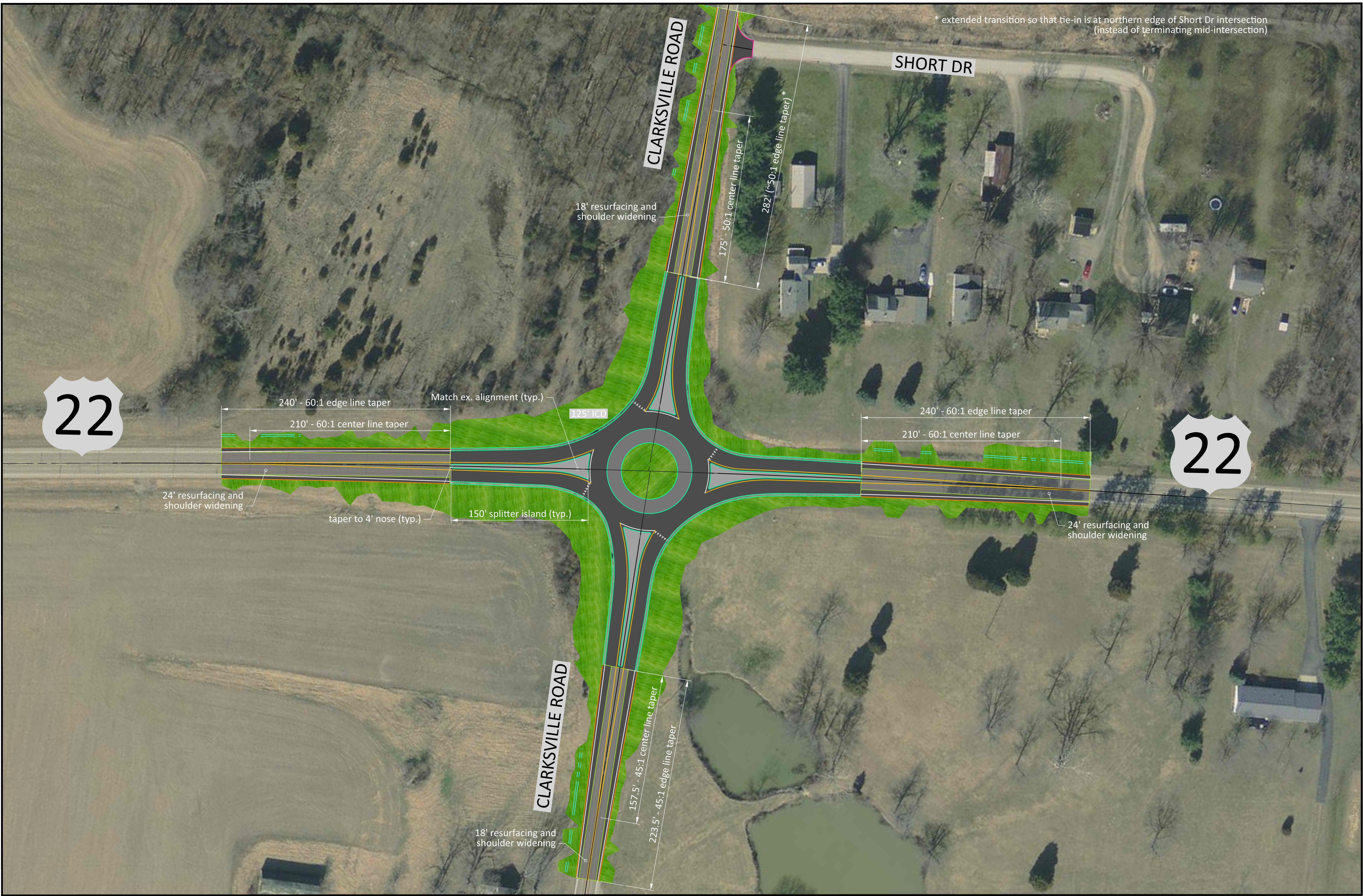
US-22 & CLARKSVILLE RD ROUNDABOUT - PRELIMINARY EXHIBIT



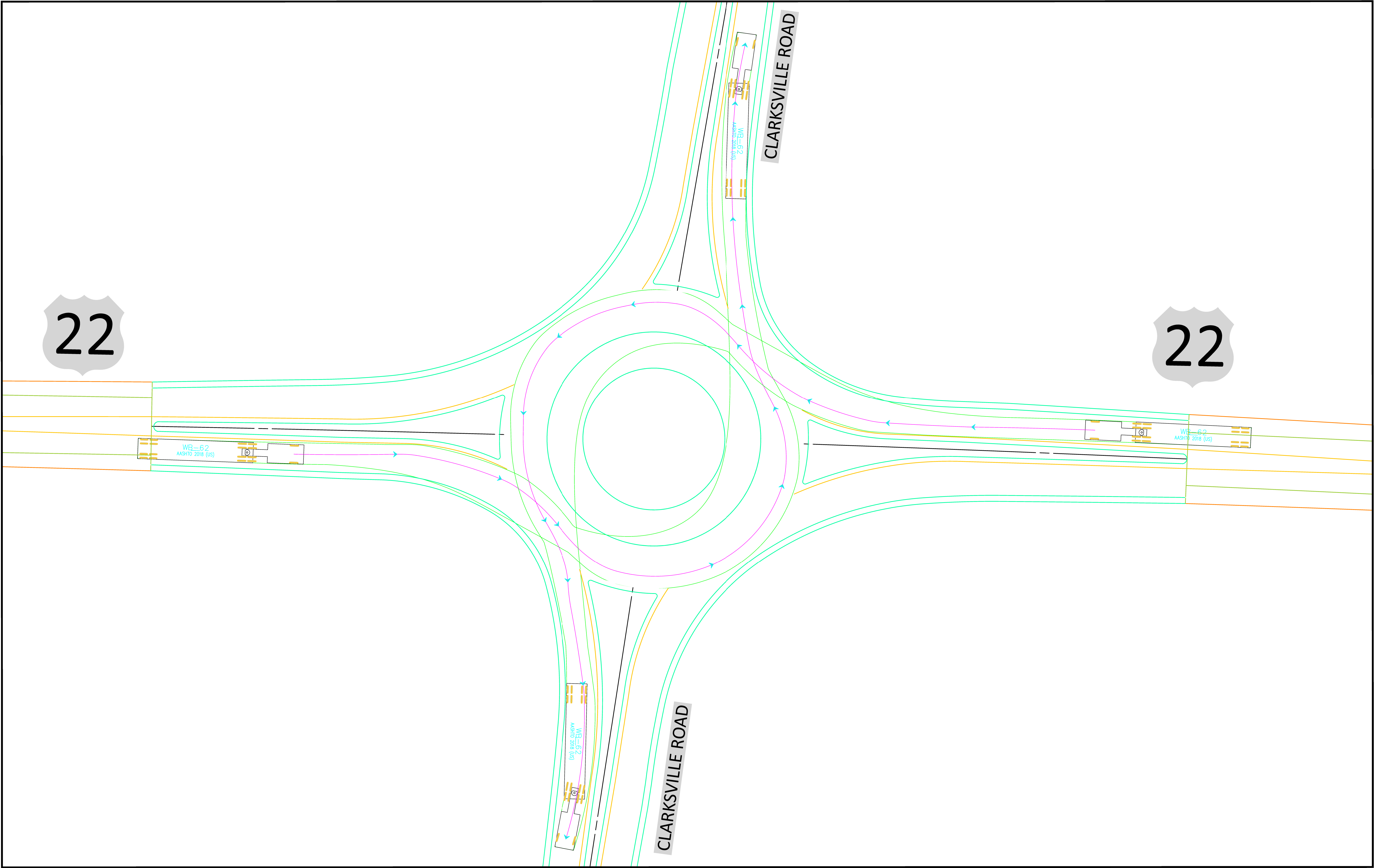
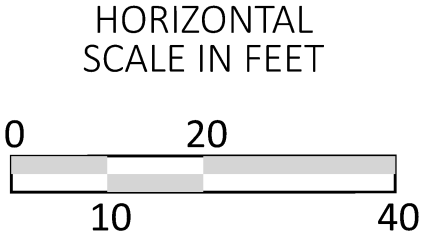
HORIZONTAL
SCALE IN FEET

0 50 100

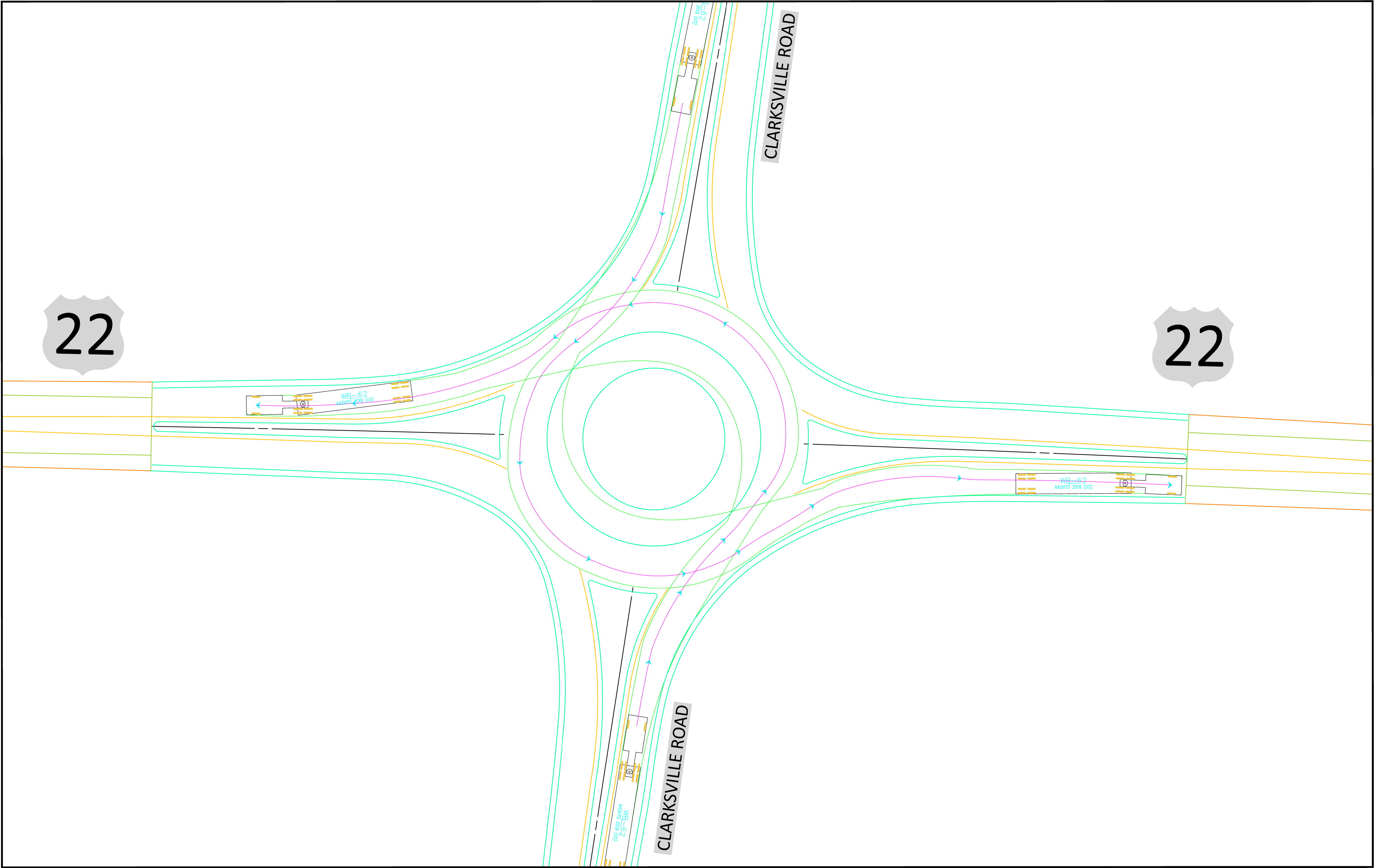
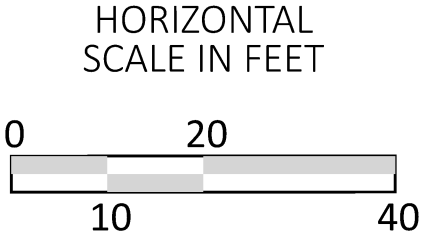
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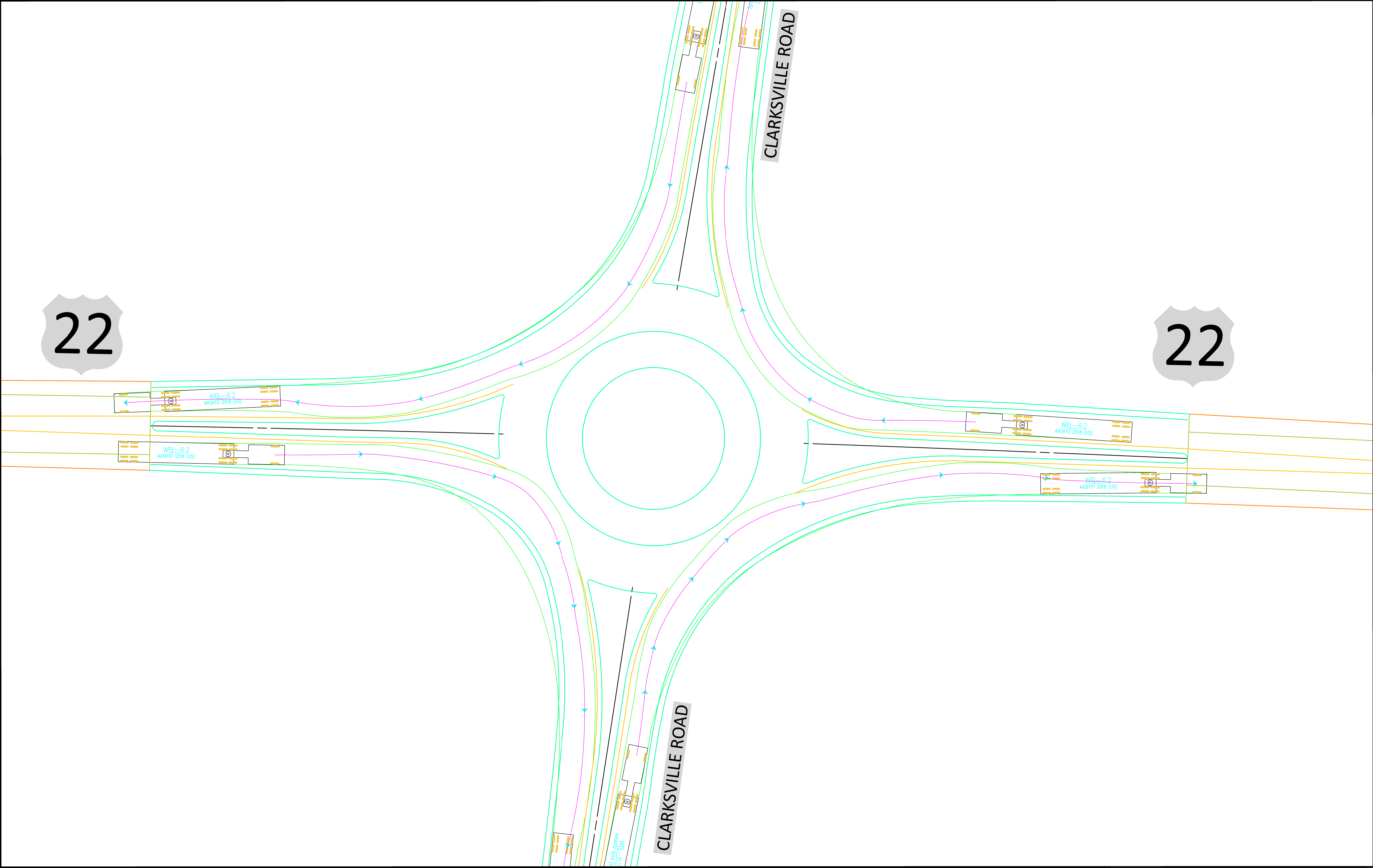
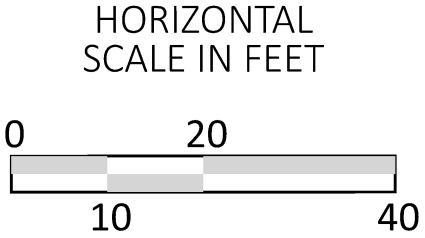
US-22 & CLARKSVILLE RD ROUNDABOUT (LEFTS #1)



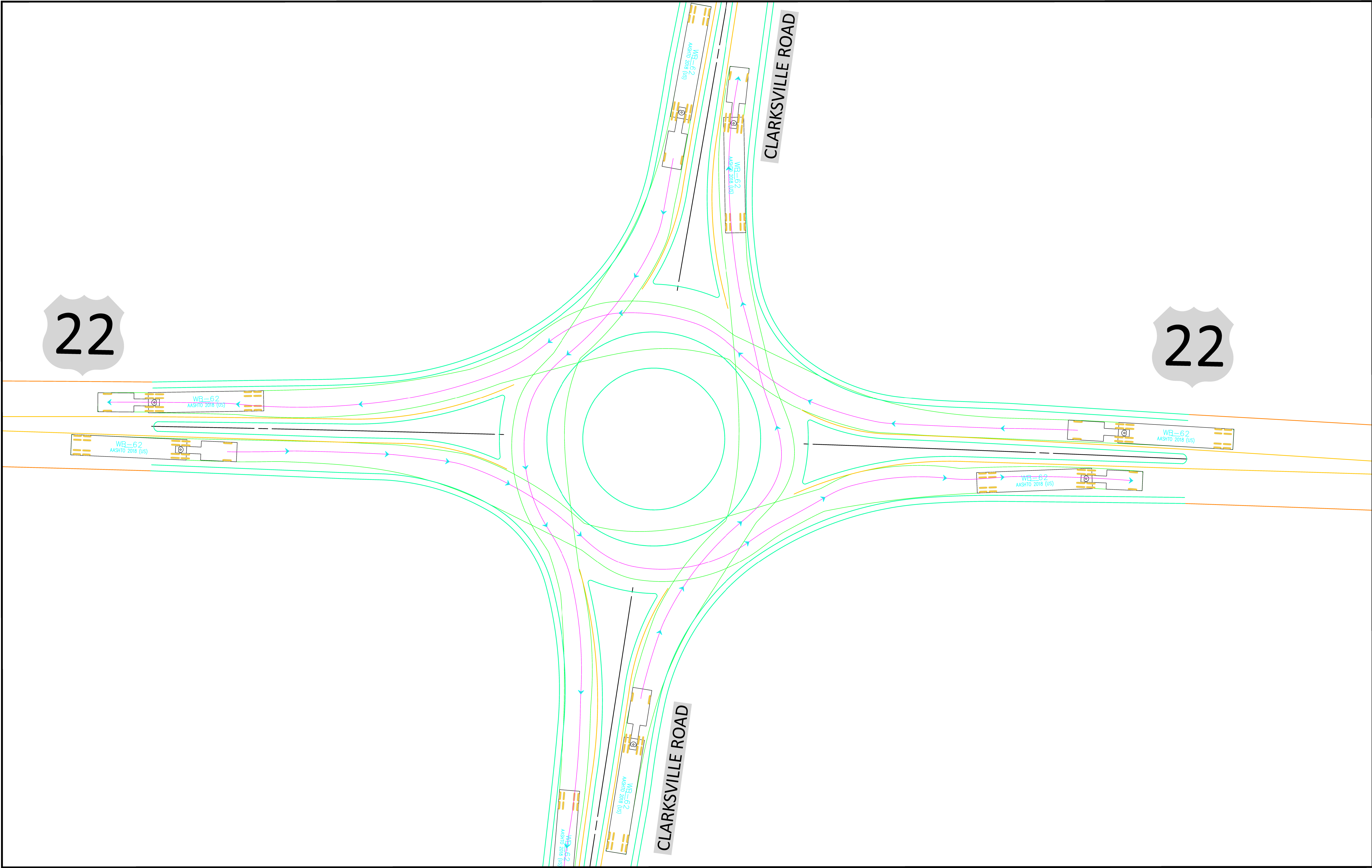
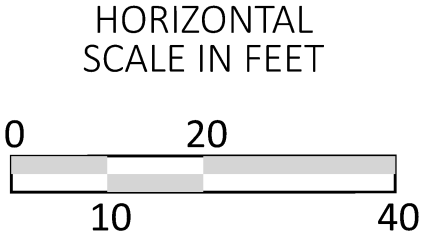
US-22 & CLARKSVILLE RD ROUNDABOUT (LEFTS #2)



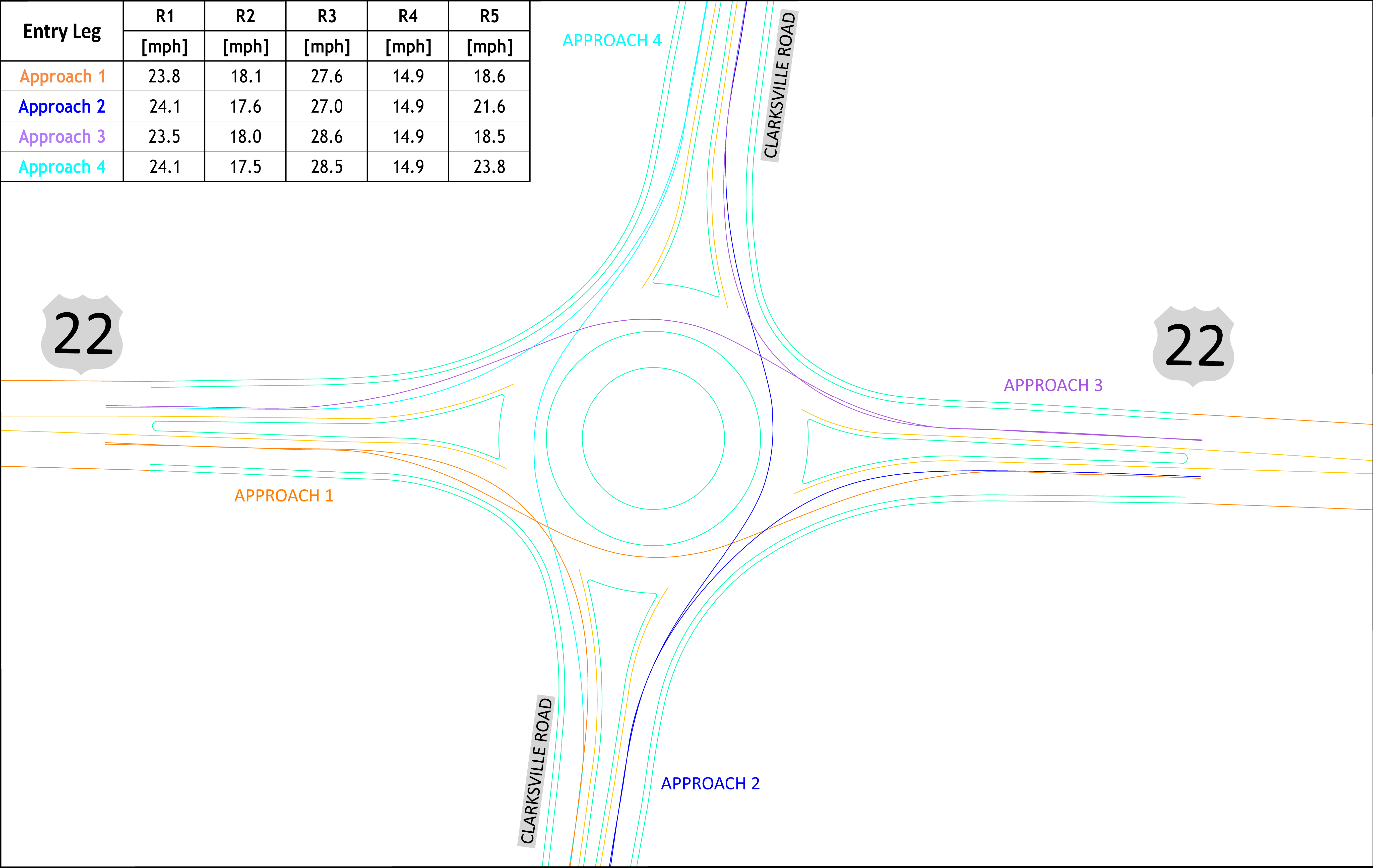
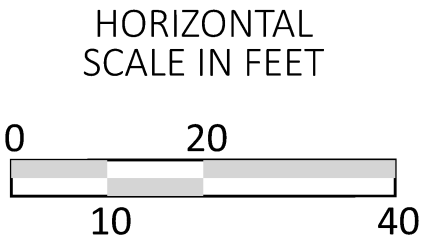
US-22 & CLARKSVILLE RD ROUNDABOUT (RIGHTS)



US-22 & CLARKSVILLE RD ROUNDABOUT (THRUS)



US-22 & CLARKSVILLE RD ROUNDABOUT - FASTSET PATH



WAR US 22 19.24

Preliminary Estimate

Planning/Preliminary Cost Estimate
Inflation Calculation

Preliminary Construction Estimate

WAR-22/Clarksville Roundabout

#	Category	Item	Quantity	Unit	Unit Cost	Total Cost
1	Roadway Pavement	9" Concrete Pavement	388	Sq. Yds.	\$135.00	\$52,380
		Asphalt Surface	293	Cu. Yds.	\$315.00	\$92,295
		Asphalt Intermediate	295	Cu. Yds.	\$290.00	\$85,550
		Asphalt Base	1023	Cu. Yds.	\$189.00	\$193,347
		Aggregate Base	1177	Cu. Yds.	\$74.60	\$87,804
2		Pavement Planing	2243	Sq. Yds.	\$6.50	\$14,580
		Pavement Removed	2905	Sq. Yds.	\$8.80	\$25,564
3	Earthwork	Excavation	1591	Cu. Yds.	\$30.00	\$47,730
4		Embankment	4071	Cu. Yds.	\$14.50	\$59,030
5	Curb		1385	Ft.	\$23.90	\$33,102
6	Curb and Gutter		1600	Ft.	\$33.00	\$52,800
7	Concrete Median		480	Sq. Yds.	\$107.00	\$51,360
8	Seeding and Mulching		7807	Sq. Yds.	\$1.50	\$11,711
					SUBTOTAL	\$807,251
9	Erosion Control		See Quantities Sheet			\$64,677
10	Drainage		See Quantities Sheet			\$224,382
11	Traffic Control		See Quantities Sheet			\$36,155
12	Maintenance of Traffic		≈ 8% Construction Cost			\$113,397
13	Lighting		\$155,000/RAB			\$155,000
14	Incidentals		See Quantities Sheet			\$130,000
					SUBTOTAL	\$723,611
TOTAL ROADWAY COSTS						\$1,530,862
15	Contingency		% of Items 1-14	30.0%		\$459,000
16	Inflation (CY2029)			19.3%		\$384,000
TOTAL CONSTRUCTION COST				\$2,373,862		

Date: March 31, 2025

CY 2025-2029 Business Plan Inflation Calculator:

[Not sure if you have the latest calculator? Click here.](#)

Last Modified: 1/27/2025

Today's Date:
March 5, 2025

Please Enter Values in the Yellow Areas Only:

Estimation Start Date:

Less than or Equal to Today's Date
(mm/dd/yyyy)

3/5/2025

Start Date:

Enter Construction Mid-Point Date:

(cannot exceed 03/05/2050)
(mm/dd/yyyy)

8/15/2029

Construction Mid-Point Date:

Present-Day Estimated Cost:

\$1.00

Estimated Dollar Amount:

Estimate Start Date to Construction Mid-Point Date:

53

Months

Inflation - Start to Mid-Point of Construction:

(compounded growth rate)

Inflated Dollar Amount:

Business Plan

19.3%

\$1.19

Estimator's Name:

County - Route - Section:

WAR US 22 19.24 (Clarksville Rd)

PID:

March 2025 HSIP Formal Safety Application

Estimator's Notes:

Preliminary Schedule: Construction in CY2029

WAR US 22 19.24 Initial Project Schedule

Initial Project Schedule - Q4 FY2029

	Milestone	Date	
	Project Initiation Package	10/2/2025	
	Initial Project Scope Complete	10/24/2025	
PE-ENV (FY2026)	Authorized Design Consultant	5/22/2026	4.5 months for consultant (Jan. 2026 programmatic)
	Stage 1 Plans - Submitted	1/25/2027	8 months for stage 1 design
	NEPA Start Date	2/8/2027	
	Stage 1 Plans - Complete	3/5/2027	
	Preliminary R/W Plans - Submitted	4/2/2027	
	Preliminary R/W Plans - Approved	5/3/2027	
	Stage 2 Plans - Submitted	8/6/2027	5 months for stage 2 design
	Compliance R/W Plans - Submitted	8/6/2027	
	Stage 2 Plans - Complete	9/17/2027	
	Compliance R/W Plans - Approved	9/17/2027	
	Environmental Document Submitted	10/4/2027	
	Final R/W Plan Submission - Approved	10/18/2027	
	Environmental Document Approved	11/5/2027	9 months to approve enviro doc
ROW (FY2028)	R/W Authorized	12/10/2027	
PE-DD (FY2028)	Stage 3 Plans - Submitted	6/16/2028	6 months for stage 3 design
	Stage 3 Plans - Complete	7/28/2028	
	Final Tracings - Submitted	10/27/2028	3 months to address stage 3 comments
	R/W Acquisition Complete	12/8/2028	12 months for R/W acquisition
	Final Tracings - Complete	12/11/2028	
	Utility Note Complete	12/20/2028	
	District R/W Certification	12/22/2029	
	Plan Package Submitted to C.O.	12/29/2028	
	Plan Package Received in C.O.	1/1/2029	
	Sale	4/1/2029	
CC/CE (FY2029)	Award	4/1/2029	
	Estimated Begin Construction	6/11/2029	
	Estimated End Construction	5/24/2030	

WAR US 22 19.24

Signal Warrant Analysis

STUDY AND ANALYSIS INFORMATION

Municipality:	Washington Township	Traffic Volumes Obtained By:	StreetLight Data
County:	Warren	Analysis Date:	3/27/2025
ODOT Engineering District:	8	Agency/ Company Name Performing Warrant Analysis:	ODOT D08
Google map link:	Map		

Analysis Information

Data Collection Date: 7/17/2024
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: US 22

Major Street Approach Direction: E-Bound
W-Bound

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

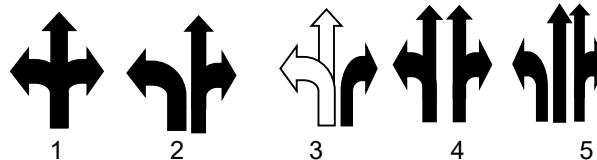
Speed Limit or 85th Percentile Speed on the Major Street*: 55 MPH

*Unknown assumes below 45 mph

Minor Street Information

Minor Street Name and Route Number: Clarksville Rd

Minor Street Approach Configuration: 1 N-Bound
1 S-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?	100% Warrant Satisfied?	Notes and Comments: *Known error: if Speed Limit < 45mph, it may not s passes at 70%.
Warrant 1, Eight-Hour Vehicular Volume	Yes	No	
Warrant 2, Four-Hour Vehicular Volume	Yes	No	
Warrant 3, Peak Hour	Yes	No	Signals installed under Warrant 3 should be traffic actuated.
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.
Warrant 5, School Crossing	No		N/A
Warrant 6, Coordinated Signal System	No		(Shall not be used as the sole warrant in the anal
Warrant 7, Crash Experience	Yes	No	If this is the sole warrant, signal must be semi-actuated devices which provide proper coordination if installed at a within a coordinated system and normally should be f actuated if installed at an isolated intersector
Warrant 8, Roadway Network	No		(Shall not be used as the sole warrant in the anal
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 wa satisfied.

**The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffi
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
may be used to justify a new signal installation or retention of an existing signal that otherwise does not meet th
published warrants. An example of such an instance is a traffic signal in proximity to a railroad crossing that ser
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 accep
use traffic volumes projected to the second year after project completion. The **Modeling and Forecasting Sec**
should provide the projected traffic volumes.
3. A pedestrian hybrid beacon may be considered for installation to facilitate pedestrian crossings at a location
not meet traffic signal warrants (see Chapter 4C of TEM) or at a location that meets traffic signal warrants unde
4C.05 and/or 4C.06 but a decision is made to not install a traffic control signal. **Please fill inputs on PHB Scoli**
and submit to ODOT.

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

Conclusion: **Do Not Install New Traffic Signal**

Notes:

TFMS - Segment Forecast Report

Username	Email	Script Import Date	Script Version	Model Version
Thomas.Mazza	Thomas.Mazza@dot.ohio.gov	4/14/2020 5:30:19 PM	2020.001	2024.1900

Forecast Summary

Project ID	Project Name	Opening Year	Design Year
	WAR US 22 19.24	2029	2049

Project Description

Formal safety application for a single lane roundabout

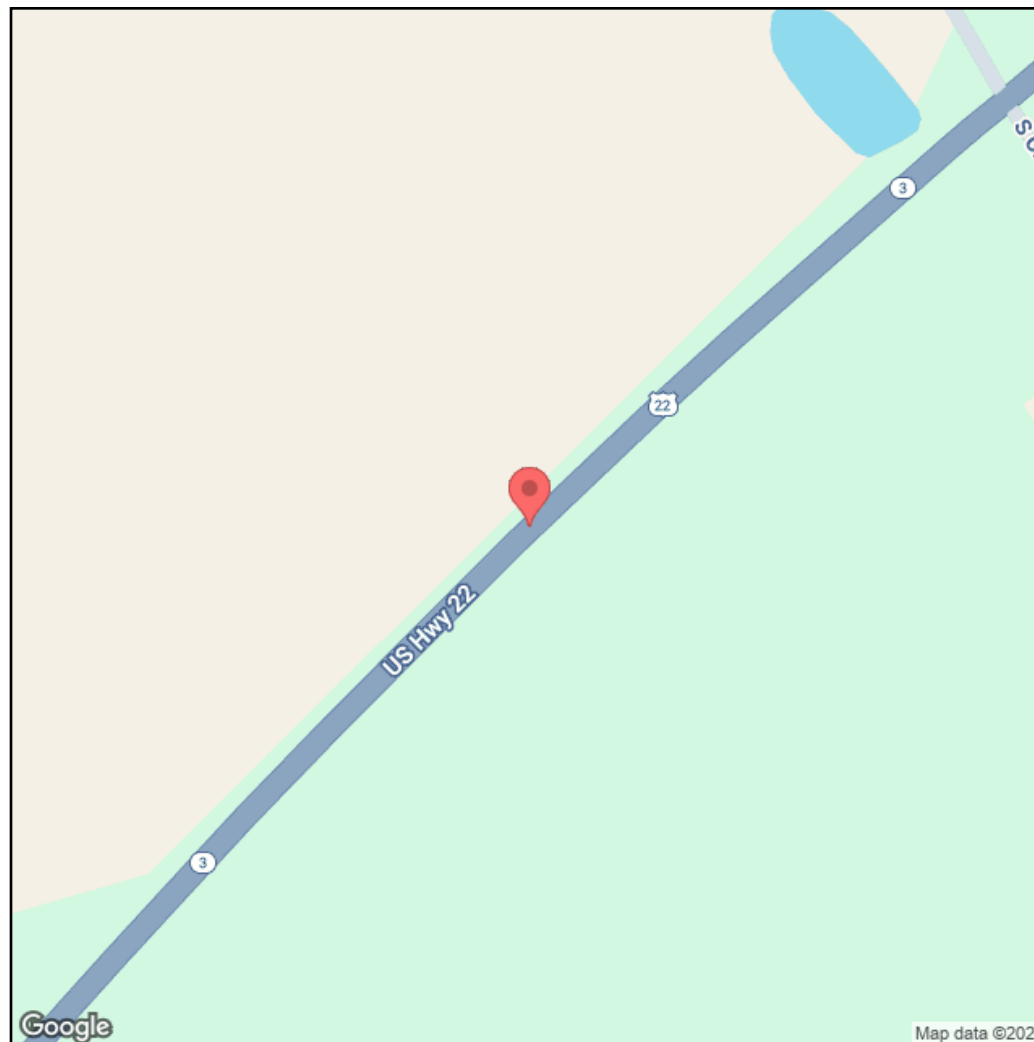
*Users of this data need to be aware that there are limitations to the forecasts generated by this product that make it suitable only for roadway design projects which are low risk.

Segment Information

Segment ID	LRS ID	BMP	EMP	Length	Latitude	Longitude
1957887	SWARUS00022**C	18.259	19.763	1.504	-84.0018339873675	39.415041380904

Forecast Information

Segment ID	2029 AADT	2049 AADT	DHV-30	K%	D%	T24%	TD%
1957887	2,200	2,400	300	12.0	56.3	9	3



Definitions:

- o AADT – Annual Average Daily Traffic
- o DHV30 – Design Hour Volume for 30th highest hour of the year
- o $DHV30 = K * AADT$
- o K % – Design Hour Factor
- o D % – Peak Direction Factor
- o T24 % – Percent Daily Trucks
- o TD % – Percent Design Hour Trucks

Forecast Segment ID	Route	BMP	EMP
1957887	SWARUS00022**C	18.259	19.763

Forecast

Year	K%	T24 % (Existing)	PA AADT	PA Method	PA Growth Rate %	PA Calculated Rate %
2050	◆ 12.0	9	2,200	Average	0.600	0.600
AADT	D%	TD % (Existing)	BC AADT	BC Method	BC Growth Rate %	BC Calculated Rate %
2,410	◆ 56.3	3	210	Model	0.500	0.500

◆ K/D factors from TCDS were used.

Regression

Method Number	PA AADT	BC AADT	AADT
2	2,416	309	2,725

95% Confidence Min/Max

PA Min	PA Max	BC Min	BC Max	Year
1573	3203	-16	630	2050

Method Number	PA Growth %	BC Growth %	PA Drop Count	BC Drop Count	PA AADT	BC AADT	PA Adjustment	PA Adjustment
1	0.85	1.62	0	0	2,377	235	2,392	266
2	0.90	2.48	4	5	2,429	296	2,416	309
3	0.71	1.96	0	0	2,294	254	2,319	283
4	0.67	2.90	4	5	2,296	321	2,297	330
5	0.86	2.70	0	0	2,379	294	2,397	320
6	0.61	3.52	4	5	2,263	354	2,266	361

Adjustment Info

ID	Adjustment Methods Name	Model vs Count AADT	Adjusted AADT	Model vs Count BC	Adjusted BC	PA Growth Rate %	BC Growth Rate %
1	DIF	133	2,266	46	207	0.22	0.44
2	RAT	1.07	2,275	1.33	214	0.22	0.58
3	MRAT	1.07	2,274	1.15	213	0.22	0.56
4	RAF		2,270		210	0.22	0.50
Adjust Method AADT		Adjust Method BC		Selected PA Growth Rate %		Selected BC Growth Rate %	
Average		Average		0.200		0.500	

Method 1 - 4 Volume

PA Min Volume	PA Max Volume	BC Min Volume	BC Max Volume	Total Min Volume	Total MaxVolume
2059	2061	207	214	2266	2275

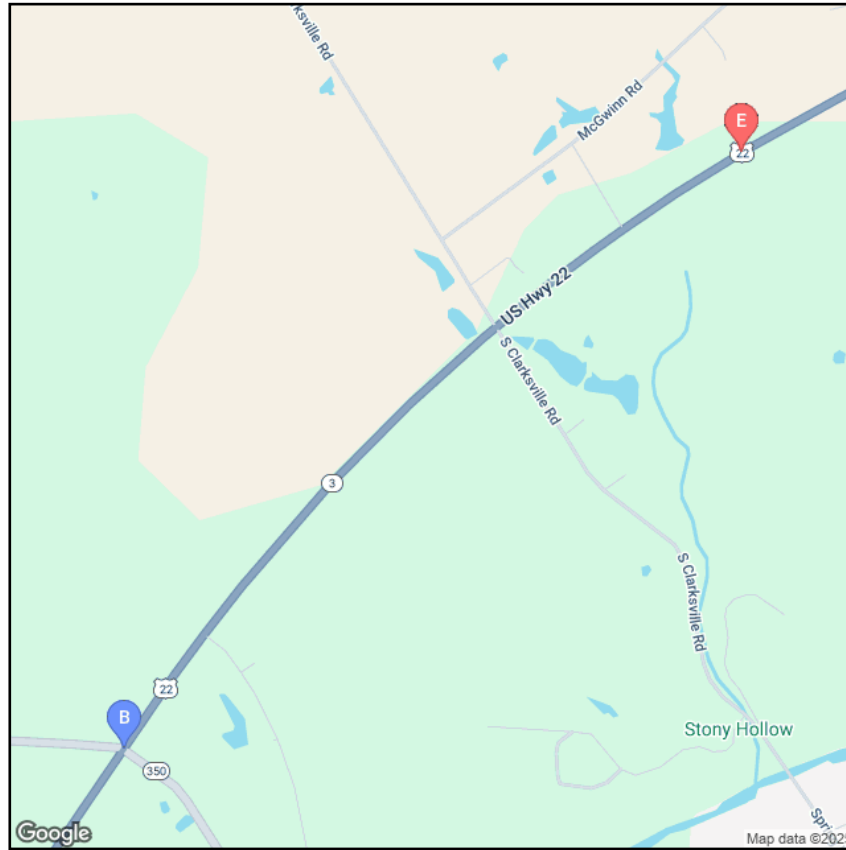
Process Flag: Adjusted model to counts with process per ODOT 255 spreadsheet

Comment: No Comment

Historical Count

Year	All	Cars	Trucks
2010	1,810	1,690	120
2013	1,937	1,805	131
2014	1,970	1,836	133
2017	1,845	1,726	118
2020	2,013	1,901	112
* 2023	2,130	1,945	185

* Pivot Point



Segment ID	LRS ID	BMP	EMP	Length	Yr 2029 AADT	Yr 2049 AADT	DHV30	K %	D %	T24 %	TD %
1957887	SWARUS00022**C	18.259	19.763	1.504	2,200	2,400	300	12.0	56.3	9	3