

THE MANNIK & SMITH GROUP, INC.

# SAFETY STUDY

## FT. AMANDA ROAD (BUCKEYE RD. TO ADGATE RD.)

Safety Study Funding By:



**COUNTY ENGINEERS  
ASSOCIATION OF OHIO**

"ALL TRAVEL STARTS AND ENDS ON A LOCAL ROAD"



### Districts



Ohio Department of Transportation



PREPARED FOR:  
**ALLEN COUNTY ENGINEER**  
1501 NORTH SUGAR STREET  
LIMA, OHIO 45801-3136  
SEPTEMBER 2023

*Professional Certification. I hereby certify that these documents were prepared and/or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Ohio, License No. 53480.*

Signed: Jean M. Hartline, PE, PTOE





# SAFETY PROJECT SUMMARY FT. AMANDA RD. CORRIDOR

Buckeye Rd. to Adgate Rd.

SAFETY STUDY (SEP 2022)  
ALLEN COUNTY ENGINEER

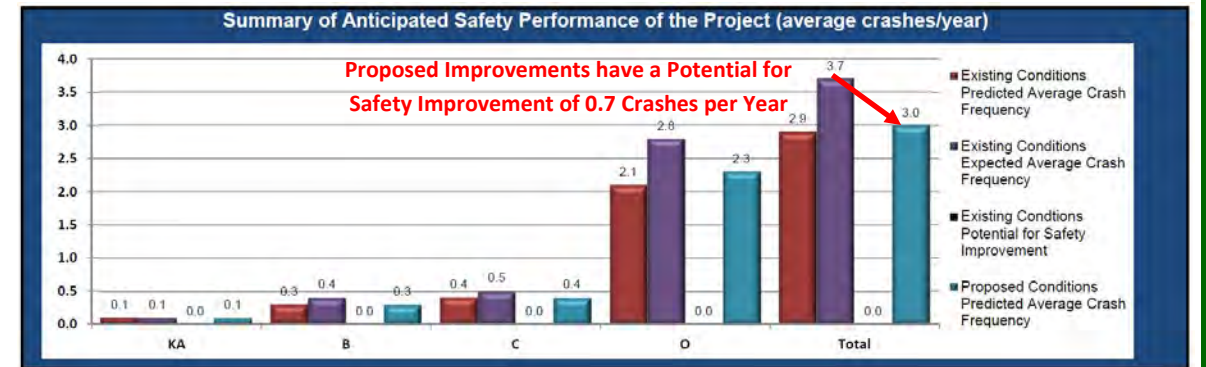


## Ft. Amanda Road Corridor Crash Data (2020-2022) (Buckeye Road to Adgate Road)

Crashes Per Year	10.00
Fatal and All Injury Crashes	9
Percent Injury	30.0%
Equivalent PDO Index Value	2.38

Intersection Related	Crashes	%
Yes	27	90.00%
No	3	10.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Crash Type	Crashes	%
Left Turn	10	33.33%
Fixed Object	5	16.67%
Angle	5	16.67%
Rear End	4	13.33%
Head On	4	13.33%
Overturning	1	3.33%
Other Non-Collision	1	3.33%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>



### Proposed Countermeasures

- Construct a roundabout at intersection of Buckeye Rd. & Ft. Amanda Rd.
- Construct a RRFB crossing just southwest of intersection at shared use path
- Improve signing and pavement markings

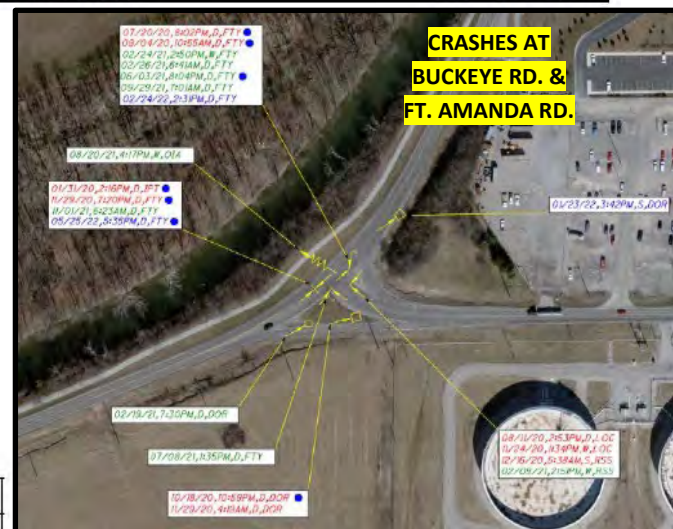
### Estimated Cost of Roundabout at Buckeye Rd. & Amanda Rd.:

(Includes roundabout at Buckeye; RRFB crossing at shared use path southwest of intersection, and signing & pavement markings)

**\$2,615,000** (2027 Construction)

### Existing Conditions

- Ft. Amanda Rd. corridor has narrow shoulders of less than 2-FT in width and travel lanes of 12-FT
- One intersection unsignalized (Buckeye Rd.) and on intersection signalized (Adgate Rd.)
- Ft. Amanda Rd. is Major Collector
- AADT of 7,450 on Ft. Amanda Road
- Speed limit is 45 MPH
- Some approaches to intersections have enhanced signing whereas some lack warning signs such as Stop Ahead and Intersection Ahead signs
- Roadway curve issues through the Buckeye Road intersection with Ft. Amanda Road



ODOT's County Road High Crash Locations  
Allen County (2022)



Crash Severity	Site Average		Statewide Average
	Total (2020-2022)	Total (%)	Total (%)
Fatal Crash	0	0.00%	0.95%
Serious Injury Suspected Crash	0	0.00%	3.98%
Minor Injury Suspected Crash	5	16.67%	14.38%
Injury Possible Crash	4	13.33%	7.43%
Property-Damage-Only	21	70.00%	73.26%
<b>Total</b>	<b>30</b>		

Crash Type	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Unknown	0.01%	0.28%	0.01%	0.08%
Head On	13.33%	2.67%	13.33%	5.60%
Rear End	13.33%	9.11%	13.33%	13.67%
Backing	0.00%	1.15%	0.00%	0.64%
Sideswipe - Meeting	0.00%	0.12%	0.00%	0.15%
Sideswipe - Passing	0.00%	3.93%	0.00%	4.29%
Angle	16.67%	3.13%	16.67%	5.47%
Parked Vehicle	0.00%	0.86%	0.00%	1.03%
Pedestrian	0.00%	0.27%	0.00%	0.96%
Animal	0.00%	32.25%	0.00%	5.65%
Train	0.00%	0.02%	0.00%	0.04%
Pedalcycles	0.00%	0.14%	0.00%	0.48%
Other Non-Vehicle	0.00%	0.01%	0.00%	0.02%
Fixed Object	16.67%	36.90%	16.67%	49.03%
Other Object	0.00%	0.68%	0.00%	0.18%
Falling From Or In Vehicle	0.00%	0.00%	0.00%	0.01%
Overturning	3.33%	2.55%	3.33%	5.98%
Other Non-Collision	3.33%	1.69%	3.33%	0.93%
Left Turn	33.33%	3.72%	33.33%	5.21%
Right Turn	0.00%	0.52%	0.00%	0.58%



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## 1.0 EXECUTIVE SUMMARY

### 1.1 Project Background

The project study limits includes the section of Ft. Amanda Road in southwestern Allen County (see Figure 1.1 – Study Limits) from Buckeye Road to Adgate Road, which is approximately 0.7 miles in length. The two intersections involved on this corridor are the unsignalized intersection of Buckeye Road and signalized intersection of Adgate Road. This corridor routinely shows up on the Ohio Department of Transportation (ODOT) County Road High Crash Locations listings, and in 2022, the intersection of Buckeye Road & Ft. Amanda Road and Adgate Road & Ft. Amanda Road were listed as high priority intersection crash locations. Additionally, the section of Ft. Amanda Road from Buckeye Road to Adgate Road is a high crash segment. The roadway curve on Ft. Amanda Road through the Buckeye Road intersection is listed on the CEAO 2023 Systematic Curve Program as a High Severity Group location. The Allen County Engineer applied for a grant from the County Engineers Association of Ohio (CEAO) to conduct a safety study. In 2022, the County was awarded funds from CEAO to conduct a safety study for the Ft. Amanda Road corridor in 2023. The Ft. Amanda Road corridor is a free-flow condition through the intersection with Buckeye Road being under Stop control. The intersection of Ft. Amanda Road and Adgate Road has a traffic signal for traffic control. The traffic counts conducted for the project revealed an AADT on Ft. Amanda Road of 7,450 AADT and on Buckeye Road 7,170 AADT. The speed limit on Ft. Amanda Road is posted at 45 MPH. The Ft. Amanda Road corridor experienced 30 crashes in the three-year period of 2020-2022, with 30% involving injury crashes. The predominant crash types were Left Turn (33%), Angle (17%), Fixed Object (17%), Rear-End (13%) and Head On (13%). This safety study evaluated existing traffic operations, existing physical conditions and crash frequencies to assist in developing specific improvements for addressing crash patterns on the corridor. The improvements were then evaluated based on their potential for reducing crash frequencies/severity.

Figure 1.1 Study Limits



## 1.2 Logical Termini and Independent Utility

The limits of the project include the nearly 0.7 mile segment of Ft. Amanda Road from a southern terminus of the intersection with Buckeye Road and the northern terminus is the intersection of Adgate Road in Allen County, Ohio. The proposed project has independent utility in that it will address the transportation needs to improve traffic safety and operations on the corridor. No other improvements outside of the corridor are necessary to address the purpose of the proposed project.

## 1.3 Project Purpose

The Allen County Engineer's Office had noticed frequent and higher than anticipated crashes on the Ft. Amanda Road corridor over the past several years on ODOT high crash listings for County Roads. The Ft. Amanda Road corridor in the period of 2020-2022 included 30 crashes with 30% being injury/fatal crashes. The predominance of crash types involved Left Turn, Angle, Fixed Object, Rear-End, and Head On, which accounted for 93% of all crashes.

The purpose of the Safety Study is to address identified crash problems of the corridor by proposing countermeasures to alleviate or reduce the likelihood of future crashes. The segment of Ft. Amanda Road under study is a priority segment for the Allen County Engineer as it is a high crash listing on the ODOT 2022 County Road High Crash Locations for Allen County. A crash analysis was performed for the corridor and it revealed that of the 30 crashes from 2020-2022, there were nine (9) injury crashes, 21 property damage only (PDO) crashes on the corridor. These crash severity numbers represent 30% of the total crashes being injury/fatal crashes, which is higher than the Statewide Average of 26.7% for a rural two-lane roadway segment. A review of the collision diagram for the corridor and the crash data from the Crash Analysis Module Tool (CAM-Tool) revealed that 93% (27) of the 30 crashes were intersection related. The collision diagram shows that 20 (67%) of the 30 crashes occurred at the intersection of Buckeye Road and Ft. Amanda Road. In regards to crash severity, 7 (78%) of the 9 injury crashes occurred at the intersection with Buckeye Road.

The identified Needs for improving the corridor include:

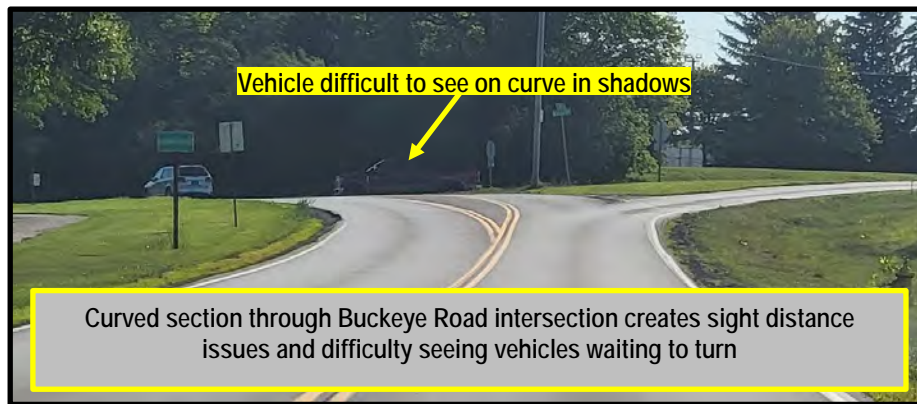
- **Crash History** – A review of the crash history from 2020-2022 revealed several key focus areas:
  - **Left Turn, Angle, and Rear-End Crashes:** Left Turn, Angle, and Rear-End crashes accounted for over 63% of all crashes on the corridor, with 67% of these intersection crash types occurring at the intersection of Buckeye Road and Ft. Amanda Road. This indicates safety countermeasures focused on intersection improvements would assist in reducing crash frequency and severity.
  - **Severity of Crashes** – The percentage of injury/fatal crashes was 30% on the corridor, which is higher than the statewide average of 26.7%. All injury crashes occurred at the two intersections involving Buckeye Road (7 of the 9 injury crashes) and Adgate Road (2 of the 9 injury crashes).
- **Fixed Objects and Head On** – In addition to the Left Turn, Angle, and Rear-End crashes, the corridor also experienced nearly 17% Fixed Object (5 crashes) and 13% Head On (4 crashes) types of crashes. These crashes are often related to narrow shoulders and curved sections of roadway. The existing shoulders on the Ft. Amanda Road corridor are narrow at about 2-FT or less in width, and provide little separation between the travel lanes and adjacent roadway fixed objects. Additionally, all four Head-On crashes occurred at the intersection of Buckeye Road and Ft. Amanda Road on the curved section of roadway.

## 1.4 Overview of Safety Issues and Possible Causes

Upon a review of crash types, crash patterns/locations, roadway conditions, and layout of the intersections, there are several contributing factors identified that are leading to higher than predicted crash frequencies:

- Curved section of roadway at Buckeye Road and Ft. Amanda Road intersection
- Complex geometric configuration at Buckeye Road and Ft. Amanda Road intersection
- Limited sight distances associated with curved section of roadway
- Narrow shoulders and fixed objects in close proximity to edge of roadway

The curved sections of roadway and complex intersection geometrics of the Ft. Amanda Road corridor, particularly at the intersection with Buckeye Road, are contributing to intersection related crashes, roadway departure fixed object crashes, and head-on crashes. The multiple approach lanes and intersection Stop signs on westbound Buckeye Road at Ft. Amanda Road creates driver confusion as well as sight distance issues as vehicles waiting to turn often block views of oncoming vehicles traveling on Ft. Amanda Road. The corridor was also found to have narrow shoulders that are typically 2-FT or less in width.



### 1.5 Previously Implemented Countermeasures

There are several previously implemented countermeasure visible on the Ft. Amanda Road corridor. There are intersection ahead warning signs for northbound Ft. Amanda Road on the approach to Buckeye Road. The westbound approach on Buckeye Road has Stop ahead warning signs in place. No other previously implemented safety countermeasures were visible on the corridor.





### 1.6 Summary of Short-Term and Long-Term Recommended Countermeasures

The recommended countermeasures for the Ft. Amanda Road corridor involve the following short-term (interim) improvements and long-term improvements to address the crash problems identified on the corridor:

#### SHORT-TERM (INTERIM) IMPROVEMENTS:

- Add "Intersection Ahead" warning signs on all approaches to intersections
- Provide larger sized (36"x36") "Stop" signs at intersection of Buckeye Road, or possibly install a solar powered LED Edge Lit Stop sign for added visibility
- Add reflective post strips to all signs
- Consider a signal timing review and revision at Adgate Road and Ft. Amanda Road
- Update guardrail end treatments to meet current standards

#### *Overall Corridor:*

- Maintain pavement markings
- Maintain signs in good reflective condition
- Keep vegetation trimmed along corridor that may be blocking views of oncoming traffic



W3-1



R1-1



W4-4P



W2-1

**LONG-TERM IMPROVEMENTS:**

The short-term improvements should be considered as low-cost interim improvements to enhance safety along the corridor until the recommended long-term safety countermeasures can be constructed. The short-term improvements would be implemented by the County given they are essentially lower cost maintenance items. Given that 27 of the 30 crashes (93%) of all crashes occurred at the two intersections of Adgate Road and at Buckeye Road, the primary focus of improvements are at the intersections. The long-term recommended improvements to the Ft. Amanda Road corridor involves the following:

**Ft. Amanda Road & Adgate Road Intersection:**

The County Engineer has indicated a future bridge project over the Ottawa River on the western leg of the Adgate Road intersection. Once this project is initiated, the intersection geometry on the western leg will likely incorporate improvements to the shared use path approaches and crossing of Adgate Road. Additionally, this would be a good opportunity to revise signal timing and to improve the existing guardrail at the intersection. A potential funding source to consider when this project takes place is the ODOT Systemic Pedestrian corridor program. This funding program could be applied to for assistance on funding the shared use path and pedestrian improvements at the intersection crossings to improve safety for non-motorized users.

**Ft. Amanda Road & Buckeye Road Intersection:**

- Construct a single lane roundabout at the intersection of Buckeye Road & Ft. Amanda Road that will:
  - Reduce crash frequency and severity
  - Calm traffic speeds through this intersection that is located on a curved section of roadway
  - Clean up the complex geometry located at the intersection
  - Designed to accommodate the large truck traffic passing through the intersection with a mountable truck apron
  - Reduce travel speeds to enhance safety of the shared use path crossing on Ft. Amanda Road located just southwest of the Buckeye Road intersection
  - There will be a need for additional right-of-way
- Install a RRFB crossing for the shared use path located just southwest of the intersection and install enhanced crosswalk pavement markings
- A schematic of the improvements at the Buckeye Road and Ft. Amanda Road intersections are provided below, and the full improvements figure is found in Figure 5.1.





## 2.0 EXISTING CONDITIONS

### 2.1 Background

The segment of Ft. Amanda Road from Buckeye Road to Adgate Road is listed on ODOT's 2022 County Road High Crash Locations, and the intersections of Buckeye Road and Adgate Road are all listed as high crash priority locations. Additionally, the CEAO high priority listings show the corridor as a priority segment as well as the intersections. The curved section of Ft. Amanda Road at Buckeye Road is listed on CEAO's 2023 Systematic Curve Program High Severity listing. Finally, the corridor is on ODOT's listing of Systemic priority segments for both Roadway Departure and Pedestrian systemic improvements from Buckeye Road to Adgate Road. A funding application was submitted in 2022 to CEAO by the Allen County Engineer for conducting a safety study of the Ft. Amanda Road corridor, which was successfully awarded funding to conduct this safety study in 2023.



### 2.2 Conditions Diagrams

The existing conditions of the Ft. Amanda Road corridor from Buckeye Road to Adgate Road are displayed on Figure 2.1 (Existing Conditions Diagram). Physical conditions of the corridor are discussed in Section 2.3.

### 2.3 Physical Conditions Write-up

Physical conditions of the Ft. Amanda Road corridor includes two key intersections located at Buckeye Road and at Adgate Road. The Buckeye Road intersection is unsignalized and the intersection of Adgate Road is signalized. The speed limit on Ft. Amanda Road is 45 MPH. The Ft. Amanda Road corridor is primarily a two-lane facility, with several additional turn lanes at Buckeye Road and at Adgate Road. The land uses adjacent to the corridor is primarily industrial land with some agricultural land as well. The industrial areas of the corridor create heavy truck traffic volumes on the corridor. The current AADT Ft. Amanda Road of 7,450 AADT and on Buckeye Road there is a 7,170 AADT based on a traffic count conducted for this safety study. Ft. Amanda Road has a Functional Class of Major Collector, as does Buckeye Road. Lane widths throughout the corridor are 12-FT, and shoulder widths are approximately 2-FT.

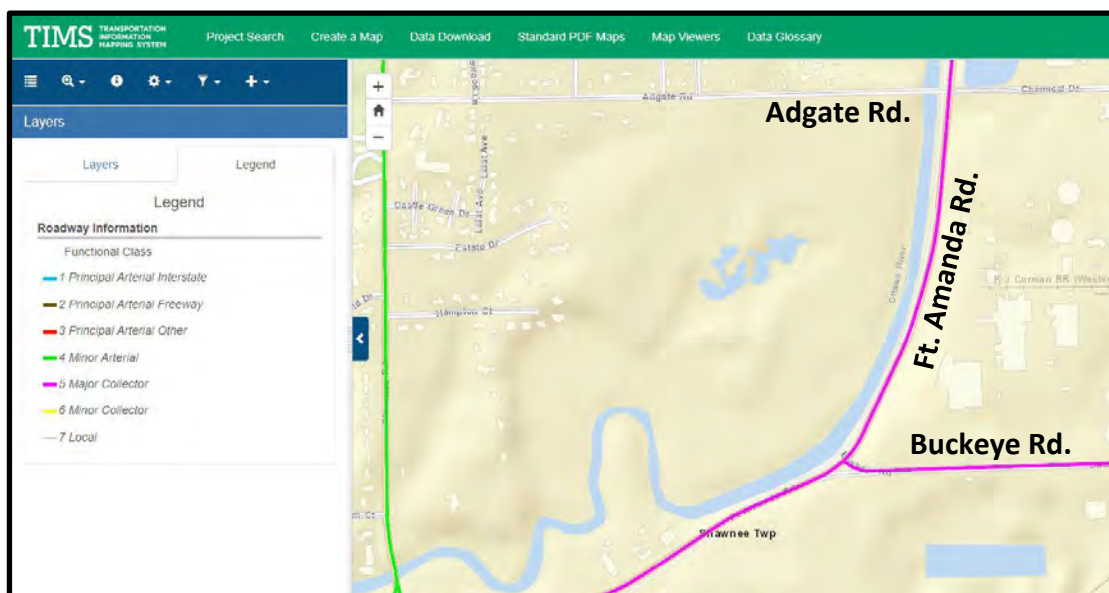
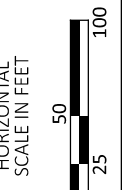




FIGURE 2.1 - EXISTING CONDITIONS DIAGRAM



FT AMANDA RD  
 EXISTING CONDITIONS DIAGRAM

DESIGN AGENCY



DESIGNER  
 RAM

REVIEWER

XXX MM-DD-YY

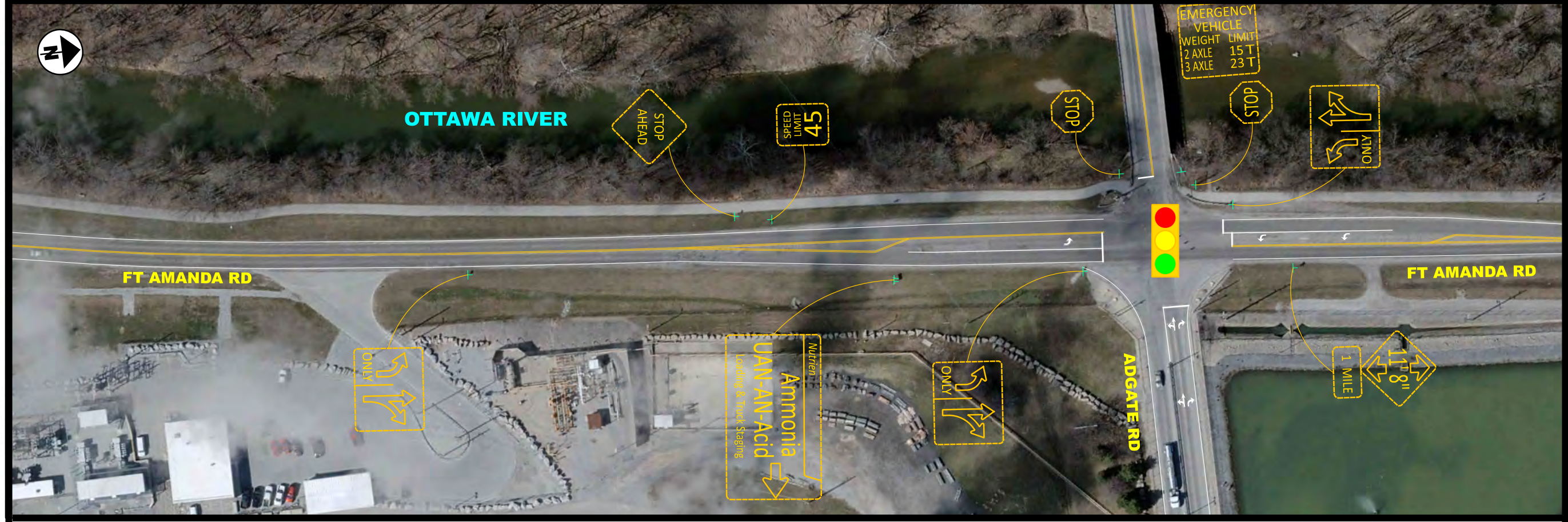
PROJECT ID

117252

SHEET TOTAL

P.1 2





DESIGN AGENCY



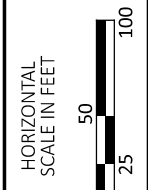
DESIGNER  
RAM

REVIEWER  
XXX MM-DD-YY

PROJECT ID  
117252

SHEET	TOTAL
P.2	2

FT AMANDA RD  
EXISTING CONDITIONS DIAGRAM





### 3.0 CRASH DATA & PROPOSED COUNTERMEASURES EVALUATION

#### 3.1 Crash Data Summaries and Tables

An analysis of the Ft. Amanda Road corridor revealed in the period from 2020-2022, there were 30 crashes on the corridor. The most common crash types were Left Turn (33.3%); Angle (16.7%), Fixed Object (16.7%), Head On (13.3%), and Rear-End (13.3%). There are minimal shoulders on the corridor that are typically 2-FT or less in width. The corridor experienced 30% (injury) crashes, which is above the Statewide Average of 26.74% for a rural 2-lane roadway facility. In regards to location of crashes on the corridor, the crash data indicates 93% of the crashes that occurred were intersection related. This indicates that intersection safety countermeasures on the corridor would assist in reducing the frequency and severity of crashes as a majority of the crashes are occurring at or near the two intersections found on the intersections.

Select Site Type	Seg/Rur; 2-lane			
	Site Average		Statewide Average	
Crash Severity	Total (2020-2022)	Total (%)	Total (%)	
Fatal Crash	0	0.00%	0.95%	
Serious Injury Suspected Crash	0	0.00%	3.98%	
Minor Injury Suspected Crash	5	16.67%	14.38%	
Injury Possible Crash	4	13.33%	7.43%	
Property-Damage-Only	21	70.00%	73.26%	
<b>Total</b>	<b>30</b>			

Crashes by Crash Type				
Crash Type	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Unknown	0.01%	0.28%	0.01%	0.08%
Head On	13.33%	2.67%	13.33%	5.60%
Rear End	13.33%	9.11%	13.33%	13.67%
Backing	0.00%	1.15%	0.00%	0.64%
Sideswipe - Meeting	0.00%	0.12%	0.00%	0.15%
Sideswipe - Passing	0.00%	3.93%	0.00%	4.29%
Angle	16.67%	3.13%	16.67%	5.47%
Parked Vehicle	0.00%	0.86%	0.00%	1.03%
Pedestrian	0.00%	0.27%	0.00%	0.96%
Animal	0.00%	32.25%	0.00%	5.65%
Train	0.00%	0.02%	0.00%	0.04%
Pedalcycles	0.00%	0.14%	0.00%	0.48%
Other Non-Vehicle	0.00%	0.01%	0.00%	0.02%
Fixed Object	16.67%	36.90%	16.67%	49.03%
Other Object	0.00%	0.68%	0.00%	0.18%
Falling From Or In Vehicle	0.00%	0.00%	0.00%	0.01%
Overturning	3.33%	2.55%	3.33%	5.98%
Other Non-Collision	3.33%	1.69%	3.33%	0.93%
Left Turn	33.33%	3.72%	33.33%	5.21%
Right Turn	0.00%	0.52%	0.00%	0.58%

The crash data shown above is for the Ft. Amanda Road corridor from Buckeye Road to Adgate Road. Upon a review of the corridor collision diagrams, the location with the most significant crash problem frequency/severity is the intersection of Buckeye Road and Ft. Amanda Road that experienced 20 of the 30 crashes on the corridor, and contained seven (7) of the nine (9) injury crashes. The three predominant crash types at this intersection are Left Turn (35%), Angle (25%) and Head On (20%), which are all above Statewide Averages.



### 3.2 Collision Diagram

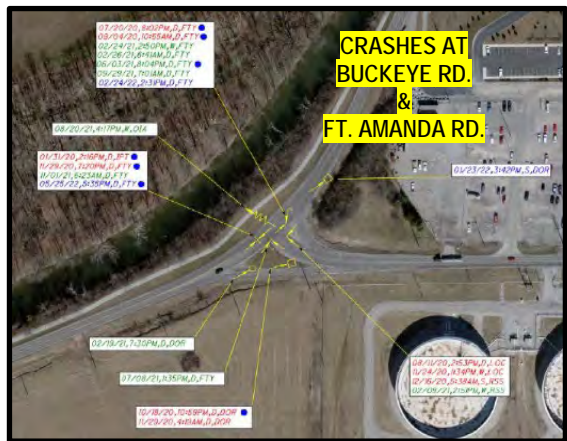
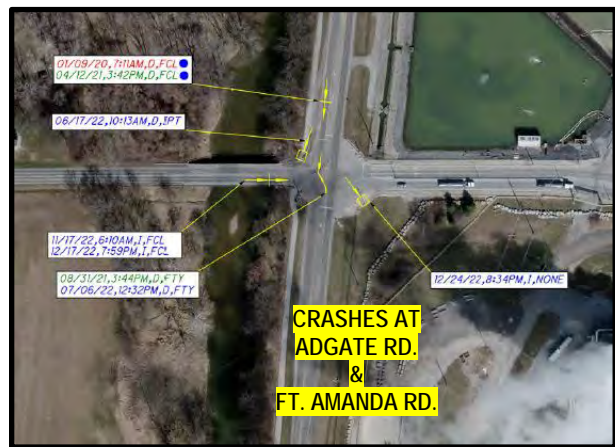
A collision diagram was developed (see Figure 3.1) for the corridor based on a review of OH-1 Crash Reports obtained from ODOT via their CAM-Tool spreadsheet. A review of the collision diagram revealed that the crash types of Turning, Angle, Head On and Rear End are occurring at the two intersections in the study limits at Buckeye Road and at Adgate Road. The intersection of Adgate Road is signalized and has a lower frequency of crashes and less severe crashes than the intersection of Buckeye Road, which is unsignalized and located on a curved section of roadway. This nearly 0.7 mile corridor averaged 10 crashes per year in the period from 2020-2022, with 30% of those crashes involving an injury. The predominance of crashes (90%) occurred at the two intersections on the study corridor.

### Ft. Amanda Road Corridor Crash Data (2020-2022) (Buckeye Road to Adgate Road)

<b>Crashes Per Year</b>	10.00
<b>Fatal and All Injury Crashes</b>	9
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Crash Type	Crashes	%
Left Turn	10	33.33%
Fixed Object	5	16.67%
Angle	5	16.67%
Rear End	4	13.33%
Head On	4	13.33%
Overtaking	1	3.33%
Other Non-Collision	1	3.33%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>





# FIGURE 3.1 - COLLISION DIAGRAM



FT. AMANDA RD.  
COLLISION DIAGRAM

ALLEN COUNTY  
SAFETY STUDY

**CRASH TYPES:**

- REAR-END
- HEAD ON
- ANGLE
- TURNING
- OTHER
- FIXED OBJECT
- OVERTURNING

**CONTRIBUTING FACTORS:**

- FTY = FAILURE TO YIELD
- FCL = FOLLOWED TOO CLOSELY
- IPT = IMPROPER TURN
- ILC = IMPROPER LANE CHANGE
- RRL = RAN RED LIGHT
- LOC = LEFT OF CENTER
- DOR = DROVE OFF ROAD
- OIA = OTHER IMPROPER ACTION
- RSS = RAN STOP SIGN
- USS = UNSAFE SPEED

**ROAD CONDITION:**

- D = DRY
- W = WET
- I = ICE
- S = SNOW
- U = UNKNOWN

**SEVERITY:**

- INJURY
- FATAL

**CRASH DESCRIPTION**

DATE, TIME, ROAD CONDITION, CONTRIBUTING FACTOR

RED = 2020  
GREEN = 2021  
BLUE = 2022

**PAGE SUMMARY**

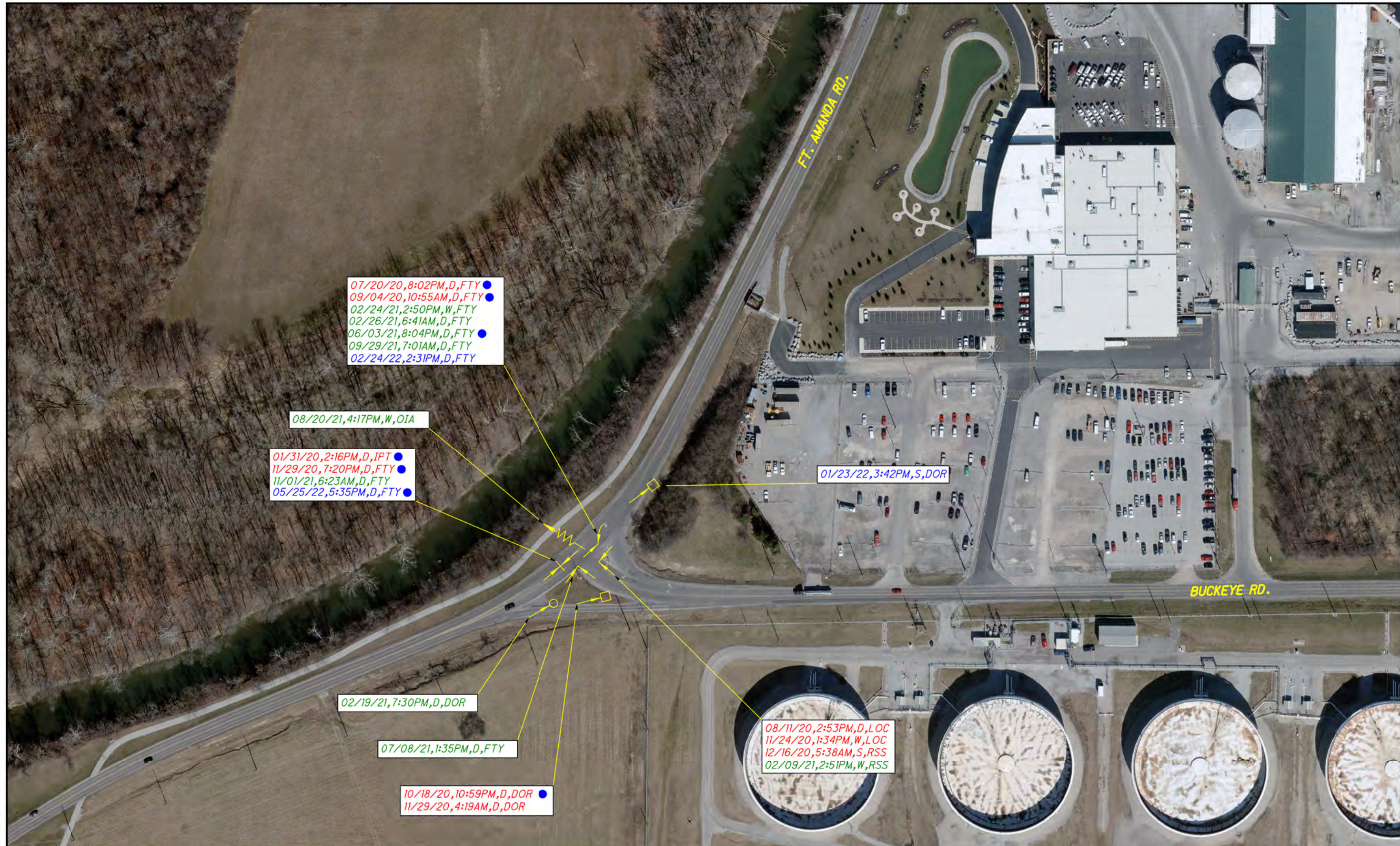
FREQUENCY		SEVERITY	
1	2020	6	PROPERTY DAMAGE ONLY (PDO)
2	2021	2	INJURY
5	2022	0	FATAL
		8	TOTAL CRASHES (CURRENT PAGE)





FT. AMANDA RD.  
COLLISION DIAGRAM

ALLEN COUNTY  
SAFETY STUDY



07/20/20, 8:02PM, D, FTY ●  
 09/04/20, 10:55AM, D, FTY ●  
 02/24/21, 2:50PM, W, FTY ●  
 02/26/21, 6:41AM, D, FTY ●  
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 09/29/21, 7:01AM, D, FTY ●  
 02/24/22, 2:31PM, D, FTY ●

08/20/21, 4:17PM, W, OIA

01/31/20, 2:16PM, D, IPT ●  
 11/29/20, 7:20PM, D, FTY ●  
 11/01/21, 6:23AM, D, FTY ●  
 05/25/22, 5:35PM, D, FTY ●

01/23/22, 3:42PM, S, DOR

02/19/21, 7:30PM, D, DOR

07/08/21, 1:35PM, D, FTY

10/18/20, 10:59PM, D, DOR ●  
 11/29/20, 4:19AM, D, DOR ●

08/11/20, 2:53PM, D, LOC ●  
 11/24/20, 1:34PM, W, LOC ●  
 12/16/20, 5:38AM, S, RSS ●  
 02/09/21, 2:51PM, W, RSS ●

CRASH TYPES:

- +→ REAR-END
- +→ HEAD ON
- ↙↘ ANGLE
- ↪ TURNING
- OTHER
- FIXED OBJECT
- ⚡ OVERTURNING

CONTRIBUTING FACTORS:

- FTY = FAILURE TO YIELD
- FCL = FOLLOWED TOO CLOSELY
- IPT = IMPROPER TURN
- ILC = IMPROPER LANE CHANGE
- RRL = RAN RED LIGHT
- LOC = LEFT OF CENTER
- DOR = DROVE OFF ROAD
- OIA = OTHER IMPROPER ACTION
- RSS = RAN STOP SIGN
- USS = UNSAFE SPEED

ROAD CONDITION:

- D = DRY
  - W = WET
  - I = ICE
  - S = SNOW
  - U = UNKNOWN
- SEVERITY:
- INJURY
  - FATAL

CRASH DESCRIPTION

DATE, TIME, ROAD CONDITION, CONTRIBUTING FACTOR

RED = 2020  
 GREEN = 2021  
 BLUE = 2022

PAGE SUMMARY

FREQUENCY		SEVERITY	
9	2020	14	PROPERTY DAMAGE ONLY (PDO)
9	2021	7	INJURY
3	2022	0	FATAL
		21	TOTAL CRASHES (CURRENT PAGE)



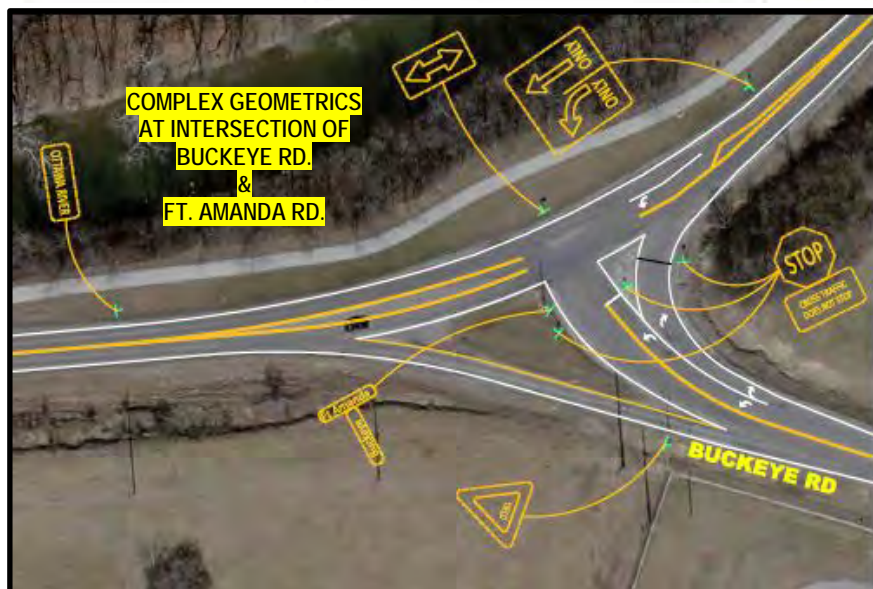
### 3.3 Crash Summary Narrative and Potential Countermeasures

As discussed previously, the predominant crash types of Left Turn, Angle, Fixed Object, Rear End, and Head On, all of which accounted for over 93% of the crashes on the Ft. Amanda Road corridor. The crash types of all 30 crashes are shown in Table 3.1. In addition to the crash types, the crash data revealed that 90% of all crashes were intersection related crashes, with those occurring primarily at the intersection of Buckeye Road & Ft. Amanda Road, and to a lesser extent at Adgate Road & Ft. Amanda Road. Given the predominance of crashes, 20 of 30 (or 66.7%), occurred at the intersection of Buckeye Road and Ft. Amanda Road. Additionally, seven of the nine (or 77.8%) injury crashes of the corridor occurred at the intersection of Buckeye Road and Ft. Amanda Road. Given that 90% of crashes were intersection related, and that majority of crashes occurred at Buckeye Road, the focus of safety countermeasures should focus on improving the safety of the Buckeye Road and Ft. Amanda Road intersection. Short term interim improvements involving signing enhancements, maintaining pavement markings, and keeping vegetation trimmed to allow adequate sight distance will assist in enhancing safety on the corridor until long term improvements can be implemented. Additional short-term improvements could include signal timing revisions at Adgate Road and Ft. Amanda Road, as well as upgrades to guardrail end treatments to bring them up to current standards.

Crash Type	Number of Crashes	% of Total Crashes	Statewide Average % of Crashes
Left Turn	10	33.33%	3.72%
Fixed Object	5	16.67%	36.90%
Angle	5	16.67%	3.13%
Rear End	4	13.33%	9.11%
Head On	4	13.33%	2.67%
Overtuning	1	3.33%	2.55%
Other Non-Collision	1	3.33%	1.69%
<b>Total Crashes</b>	<b>30</b>	<b>100%</b>	<b>N/A</b>

Note: Red text indicates crash types that are higher than statewide percentages.

Intersection Related	Crashes	%
Yes	27	90.00%
No	3	10.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>





### **3.4 Design Evaluation**

A site visit to the corridor; input from the Allen County Engineer; crash data analyses; traffic and capacity analyses; aerial views; right-of-way information from the County, and the inventory of existing signs and pavement markings assisted in the development of proposed countermeasures. Based on the evaluation of these criteria, it is apparent that geometric intersection improvements at Buckeye Road and Ft. Amanda Road are necessary to reduce crash frequency and severity on this curved section of roadway that includes a geometric complex unsignalized intersection. The speed limit on Ft. Amanda Road is 45 MPH, and based upon a site visit, traffic on the corridor appears to be traveling more than the speed limit. The intersection would benefit from geometric revisions to enforce traffic calming and reduce the curve related crashes that involved 19 of the 20 crashes at this intersection. Additional safety countermeasures on the corridor that would help address crash types and patterns would be potential signal timing revisions at the traffic signal at Adgate Road and Ft. Amanda Road.

### **3.5 Proposed Alternatives Evaluated**

#### *Ft. Amanda Road & Buckeye Road Intersection:*

The current (2023) AM peak hour capacity operations at this unsignalized intersection indicates the side street of Buckeye Road, which is under Stop control, operates at a LOS C in the AM Peak for the westbound approach (See Appendix B for capacity reports). In the PM Peak the westbound approach operates at a LOS E with the left turn movement operating at a LOS F. In 2027, the proposed Opening Year for improvements, the existing intersection conditions would reduce to a LOS F for the westbound approach. Given there are capacity constraints for the existing conditions of the unsignalized intersection, the initial thought considered was a traffic signal. However, this was ruled out primarily because of the significant roadway curvature that the intersection is located on. The sight distance of signal heads would have been difficult to see with the roadway curvature, so a major reconfiguration of the existing complex geometry would be needed to construct a traffic signal with adequate sight distance. Thus, if a significant geometric reconfiguration would be needed for a traffic signal, the thought shifted to a potential roundabout. The benefits of a roundabout would be improved capacity of the intersection in addition to providing traffic calming to reduce travel speeds for this curved section of roadway. The roundabout would provide geometric improvements to simplify the current complex geometric intersection that currently exists, and would be designed to accommodate large trucks that pass through this intersection routinely given the adjacent industrial facilities. The proposed single lane roundabout would provide LOS C or better on all movements through design year 2047. In addition to the roundabout proposed at Buckeye Road, there is a shared use path crossing of Ft. Amanda Road approximately 650-FT southwest of the intersection of Buckeye Road. It is proposed that as part of the roundabout project that this shared use path crossing be improved to include a RRFB crossing with enhance crosswalk markings.

#### *Ft. Amanda Road & Adgate Road Intersection:*

The current (2023) AM and PM peak hour capacity operations at this signalized intersection indicates the operations of the overall intersection is at a LOS D. Revising signal timing was found to improve the overall intersection operation to a LOS C through design year 2047 for both the AM and PM peak hours of operation. The Allen County Engineer has indicated that a bridge project is planned for the structure located on the west leg of this intersection that crosses the adjacent Ottawa River. It is recommended that the County incorporate signal timing revisions into the project, or they can initiate the signal timing revisions ahead of the project. The shared use path on the west side of the intersection is planned to have improved crossings of the roadway when the bridge project is constructed. There may be a potential to obtain ODOT Systemic Pedestrian Safety Program funds to assist the County fund the shared use path and other pedestrian improvements at this intersection.

#### *Recommended Alternative:*

##### **Buckeye Road & Ft. Amanda Road (\$2,615,000)**

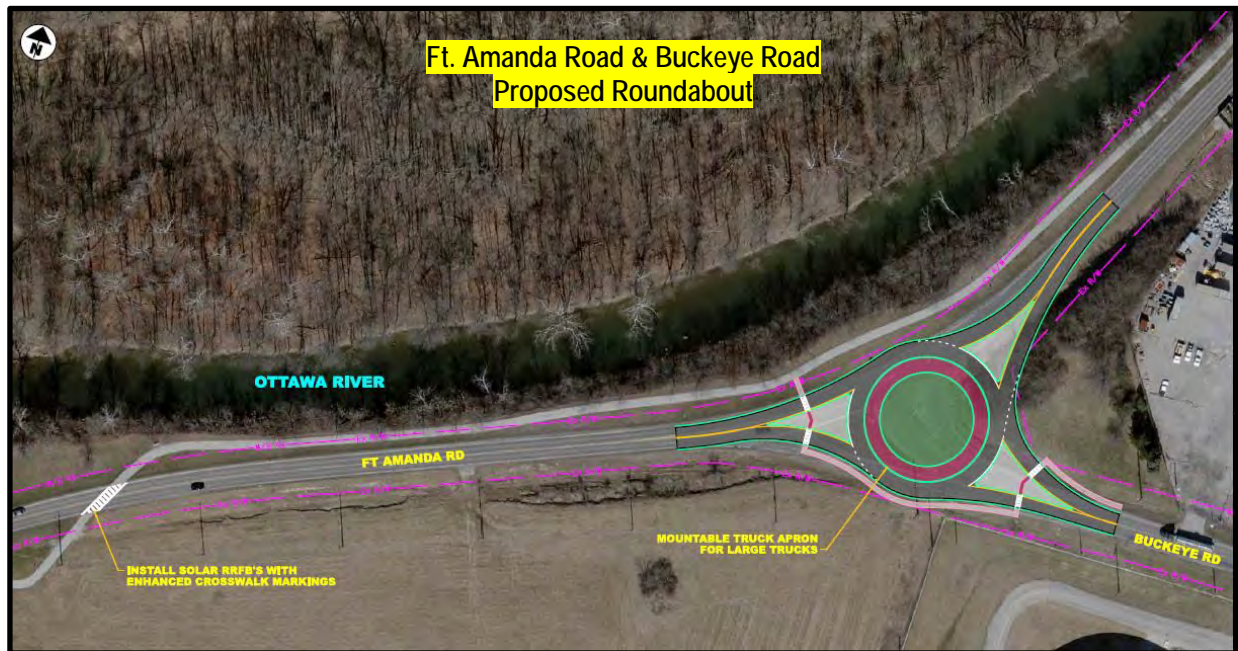
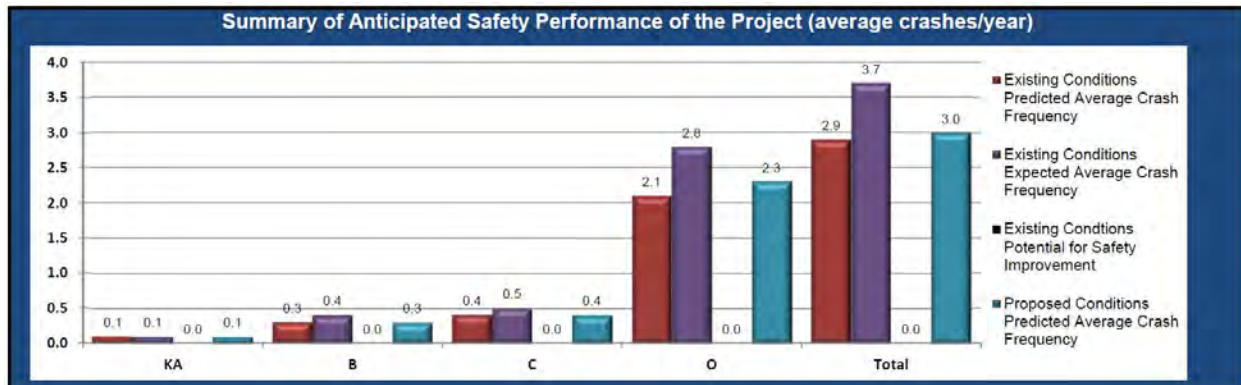
- Roundabout at Buckeye Rd. & Ft. Amanda Rd.
- RRFB crossing with enhanced pavement marking crosswalk
- Improved Signing and Pavement Markings



**Adgate Rd. & Ft. Amanda Road (Costs would be County Funded)**

- Signal timing revisions
- Improved shared use path crossing to be implemented when adjacent bridge project occurs
- Improved Signing and Pavement Markings

This recommended long term improvements includes constructing a roundabout at Buckeye Road & Ft. Amanda Road; install a RRFB crossing at shared use path crossing, and improved signing and pavement markings. The ECAT safety analyses revealed the proposed improvements would reduce crashes by 0.7 crashes per year from the Existing Conditions Predicted Average of 3.7 crashes per year down to 3.0 crashes per year for the Proposed Conditions Expected Average Crashes.



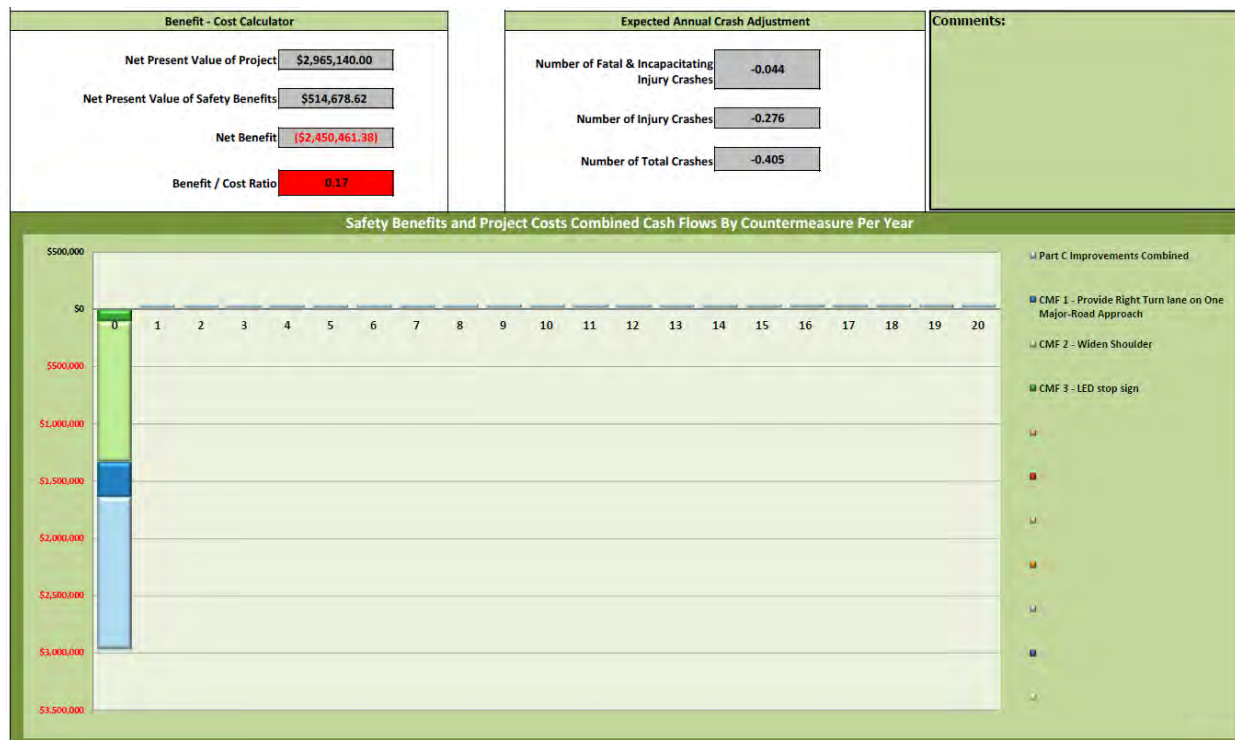


### 3.6 Emissions Reductions of Recommended Alternative

The CMAQ (Congestion Mitigation Air Quality) Emissions Calculator Toolkit for Roundabouts from USDOT was used to calculate emissions and delay reductions. Converting the unsignalized intersection of Buckeye Road and Ft. Amanda Road to a single lane roundabout will reduce Atmospheric Carbon Dioxide (CO<sub>2</sub>) emissions by 151.349 Kilograms/day and reduce total vehicular delay by 48.2 hours per day. A printout of the Emissions Reductions report from the CMAQ tool are provided in Appendix B.

### 3.7 Countermeasure Alternatives Conclusions

The ODOT’s Economic Crash Analysis Tool (ECAT) spreadsheet was used to evaluate the safety performance of the proposed countermeasures of the recommended long-term proposed improvements. The proposed improvements would provide a reduction of crash frequency of 0.7 crashes per year. The benefit/cost analysis of the ECAT spreadsheet resulted in a negative cost benefit of 0.17. The following tables and charts document the cost/benefit output of the ECAT analysis spreadsheets. The proposed ECAT reports are found in the appendices.



In summary, the proposed improvement of constructing a roundabout does result in a negative cost-benefit ratio; however, it provides a crash reduction frequency of 0.7 fewer crashes per year with the proposed countermeasures in place. The Ft. Amanda Road corridor from Buckeye Road to Adgate Road averaged 10 crashes per year with 30 crashes total from 2020-2022. The corridor had 30% of the crashes result in injury crashes. In regards to the intersection of Buckeye Road and Ft. Amanda Road, this intersection alone accounted for 20 of the 30 crashes on the corridor. This intersection averaged 6.67 crashes per year with 35% of those crashes involving an injury. Given that, the intersection of Buckeye Road and Ft. Amanda Road has 35% of the crashes involving an injury, it would qualify to apply to the ODOT Formal Safety Program. There are other potential funding programs that could be applied to for funding, which are outlined in Table 5.2 of Section 5.0 herein.



#### 4.0 SUMMARY OF TRAFFIC OPERATIONS

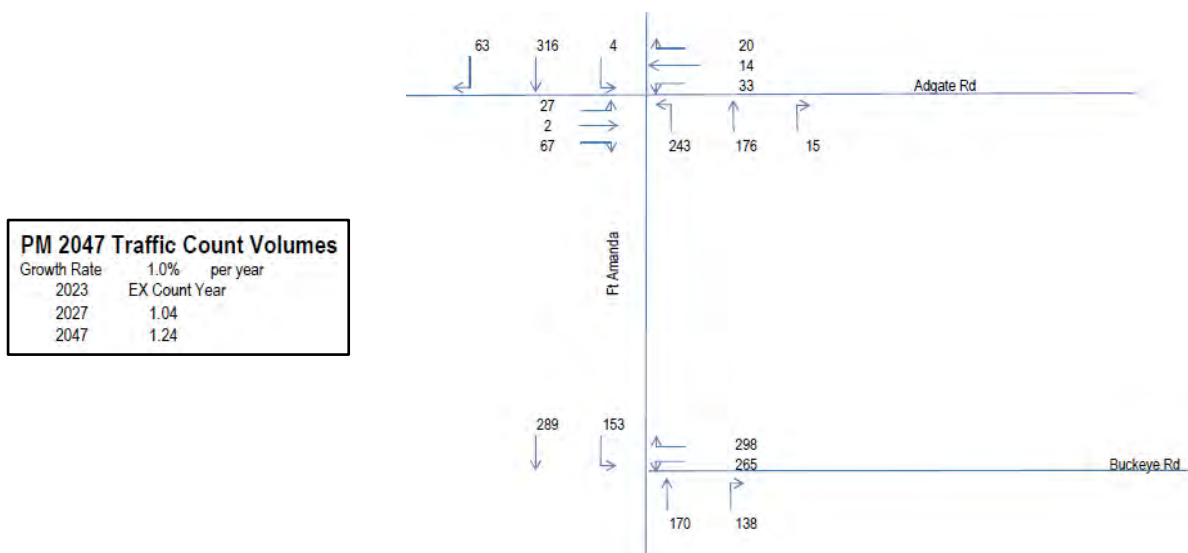
##### 4.1 Traffic Operations

The Ft. Amanda Road corridor from Buckeye Road to Adgate Road is located in a suburban area that includes adjacent industrial areas that utilize this corridor. A traffic count conducted for this safety study in 2023 found an existing Annual Average Daily Traffic (AADT) of 7,450 vehicles per day on Ft. Amanda Road. Traffic volumes were projected to 2027 (Opening Year) and 2047 (Horizon Design Year) using a positive 1% annual growth rate. The traffic volumes were then analyzed to determine if traffic operations would be adequate through the future 20-year horizon. Traffic data is found in Appendix A. Traffic operations were evaluated for the AM and PM peak hour at the two key intersections of Buckeye Road (unsignalized) and at Adgate Road (signalized) based on the turning movement counts that were conducted. The traffic counts can be found in Appendix A.

Traffic operations were evaluated using Highway Capacity Software (HCS). HCS provides several measures of effectiveness (MOEs) for traffic operations based on Highway Capacity Manual 2010 (HCM 2010) methodology. The primary MOE for this analysis will be level-of-service (LOS). Level-of-service provides a letter grade for traffic operations based on the amount of delay experienced at an intersection, along an intersection approach (i.e., eastbound, westbound), or for an intersection lane group (i.e., eastbound left, westbound through). LOS can range from A to F, with A representing the conditions that experience the least amount of delay, and F representing the conditions that experience the most delay. Typically, LOS values from A to D represent satisfactory traffic operations, while LOS values E and F represent unsatisfactory traffic operations. Unsatisfactory traffic operations generally necessitate changes to traffic control or roadway geometry to reduce delays for vehicles. LOS for this analysis will be evaluated at the intersection level. Delay thresholds for LOS are shown in Table 4.1

LOS	Delay in Seconds (Signalized)	Delay in Seconds (Un-Signalized)
A	0.0 – 10.0	0.0 – 10.0
B	10.1 – 20.0	10.1 – 15.0
C	20.1 – 35.0	15.1 – 25.0
D	35.1 – 55.0	25.1 – 35.0
E	55.0 – 80.0	35.1 – 50.0
F	>80.0	>50.0

The projected turning movement volumes for the horizon design year (2047) are shown below. These peak hour volumes were utilized to assess traffic operations in the No Build and Build scenarios.

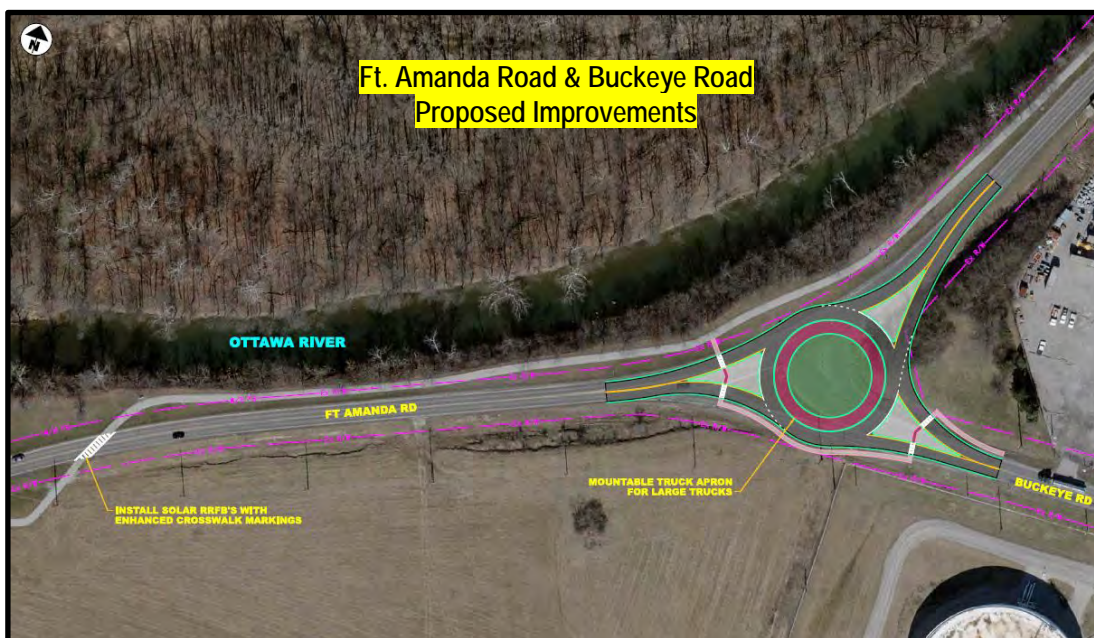




The peak hour AM and PM traffic volumes for 2027 and 2047 were evaluated for both the No Build conditions and Build conditions at the two intersections of Ft. Amanda Road & Adgate Road and at Ft. Amanda Road & Buckeye Road. Table 4.2 summarizes the levels of service for the AM and PM peak hours for the No Build condition (retain existing roadway facilities and Stop control) and compares this to the Build condition (roundabout at Buckeye Road and signal timing revisions at Adgate Road). Detailed capacity output reports are provided for reference in Appendix B. The capacity analyses revealed the intersection at Adgate under a No Build scenario would operate at a LOS D overall in 2027 for both the AM and PM peak hours under its signalized condition. This LOS drops to a LOS E in 2047 for both the AM and PM peak hours. Signal timing revisions improves the overall intersection to a LOS C in both 2027 and 2047 for both the AM and PM peak hours. The intersection of Buckeye Road & Ft. Amanda Road operates at a LOS F in the PM peak 2027 and 2047 for the unsignalized westbound approach. The proposed single lane roundabout at this intersection would improve the PM peak hour overall intersection operation to a LOS A in 2027 and to a LOS B in 2047.

Table 4.2 Capacity Analyses Results										
Intersection	Movement/ Approach		Opening Year (2027)				Horizon Year (2047)			
			AM No Build	PM No Build	AM Build	PM Build	AM No Build	PM No Build	AM Build	PM Build
Ft. Amanda & Adgate Rd (No Build = Ex. Signal Timing Build = Revised Signal Timing)	EB	App	D (53.8)	D (47.4)	D (43.5)	D (42.3)	E (61.5)	D (48.3)	D (50.7)	D (45.8)
		Left/Thru	D (44.2)	D (45.3)	D (46.7)	D (45.6)	D (44.3)	D (45.7)	D (46.9)	D (46.7)
	WB	Right	D (43.8)	D (44.4)	D (45.5)	D (43.6)	D (43.8)	D (44.6)	D (45.5)	D (44.0)
		App	D (44.1)	D (45.0)	D (46.4)	D (45.0)	D (44.2)	D (45.3)	D (46.7)	D (45.9)
	NB	Left	C (21.5)	C (31.5)	B (13.1)	B (13.4)	C (22.0)	E (60.9)	B (13.4)	B (17.5)
		Thru/Right	D (53.9)	D (37.0)	C (22.6)	B (15.2)	F (81.0)	D (38.1)	C (25.4)	B (15.6)
		App	D (48.2)	C (33.9)	C (20.9)	B (14.2)	E (70.5)	D (50.9)	C (23.3)	B (16.7)
	SB	Left	C (24.0)	C (20.6)	B (14.3)	B (10.2)	C (26.0)	C (20.9)	B (15.6)	B (10.4)
		Thru/Right	D (35.5)	D (48.6)	B (17.8)	B (18.5)	D (36.2)	E (64.0)	B (18.1)	C (20.2)
		App	C (34.7)	D (48.3)	B (17.5)	B (18.4)	D (35.5)	E (63.6)	B (17.9)	C (20.1)
	Intersection Overall		D (47.2)	D (41.6)	C (25.7)	C (20.7)	E (62.5)	E (55.2)	C (28.7)	C (22.8)
Ft. Amanda & Buckeye Rd (No Build-Stop Controlled Build Prop.-Roundabout)	WB	Left	C (22.6)	F (104.1)	-	-	E (35.4)	F (333.1)	-	-
		Right	B (12.3)	B (12.0)	-	-	B (13.8)	B (13.7)	-	-
		App	C (17.0)	F (55.4)	A (8.2)	B (10.8)	C (23.7)	F (164.0)	B (10.3)	C (15.6)
	NB	App	Free Flow Movement		A (9.8)	A (6.5)	Free Flow Movement		B (13.2)	A (7.7)
	SB	Left	A (8.6)	A (8.0)	-	-	A (9.0)	A (8.2)	-	-
		Thru	Free Flow Movement		-	-	Free Flow Movement		-	-
		App	A (5.3)	A (2.8)	A (5.1)	B (10.4)	A (5.5)	A (2.8)	A (5.7)	B (14.7)
	Intersection Overall		-*	-*	A (8.5)	A (9.7)	-	-	B (11.0)	B (13.5)

\*No intersection overall LOS is reported for Stop Controlled intersections.



## 5.0 RECOMMENDATIONS & IMPLEMENTATION

### 5.1 Countermeasure Recommendations and Implementation Plan

A summary of the proposed countermeasures for the Ft. Amanda Road are outlined in Table 5.1 below, as well as displayed on Figure 5.1. An analysis of crash data and the proposed countermeasures were performed using ODOT’s Economic Crash Analysis Tool (ECAT). The ECAT calculates predicted/expected crash frequencies using Safety Performance Functions (SPFs), Crash Modification Factors (CMFs), and ODOT calibration factors to evaluate site-specific conditions based on existing physical characteristics, traffic volumes, and crash history. The projected safety improvement for implementing the recommended long-term countermeasures, results in **0.7 fewer crashes per year**, as the countermeasures would reduce existing conditions predicted crashes from 3.7 to a proposed conditions prediction of 3.0 crashes per year.

<b>Time Frame</b>	<b>Description of Improvements</b>
<b>Short Term</b>	<ul style="list-style-type: none"> <li>• Add “Intersection Ahead” warning signs on all approaches to intersections</li> <li>• Provide larger sized (36”x36”) “Stop” signs at intersection of Buckeye Road, or possibly install a solar powered LED Edge Lit Stop sign for added visibility</li> <li>• Add reflective post strips to all signs</li> <li>• Consider a signal timing review and revision at Adgate Road and Ft. Amanda Road</li> <li>• Update guardrail end treatments to meet current standards</li> <li>• Maintain pavement markings throughout corridor</li> <li>• Maintain signs in good reflective condition throughout corridor</li> <li>• Keep vegetation trimmed along corridor that may be blocking views of oncoming traffic</li> </ul>
<b>Long Term</b>	<ul style="list-style-type: none"> <li>• Construct a roundabout at the intersection of Buckeye Road &amp; Ft. Amanda Road</li> <li>• Construct a RRFB crossing at adjacent shared use path crossing on Ft. Amanda Road</li> </ul>

### 5.2 Proposed Improvements

The proposed long-term recommended improvements are shown on Figure 5.1. The overall long-term planning level cost estimate is focused on improvements to the intersection of Buckeye Road & Ft. Amanda Road. The functional classification of both Ft. Amanda Road and Buckeye Road is Major Collector. The proposed improvements of a roundabout at Buckeye Road and Ft. Amanda Road and constructing a RRFB crossing just southwest of the intersection where the existing shared use path crosses Ft. Amanda Road are estimated to have a cost of \$2,615,000 for a FY27 construction year. A review of collision diagrams revealed that nearly 67% of all crashes on the Ft. Amanda Road corridor occurred at the intersection of Buckeye Road and Ft. Amanda Road. Additionally, seven of the nine injury crashes of the overall corridor occurred at this intersection. Therefore, the primary focus of long-term safety countermeasures should be focused on improvements at this intersection with Buckeye Road. The projected safety improvement for implementing the improvements results in 0.7 fewer crashes per year, as the countermeasures would reduce existing conditions predicted crashes from 3.7 to a proposed conditions prediction of 3.0 crashes per year. The predicted benefit-cost ratio results in a negative benefit of 0.17.



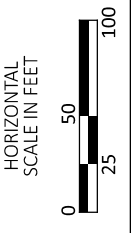
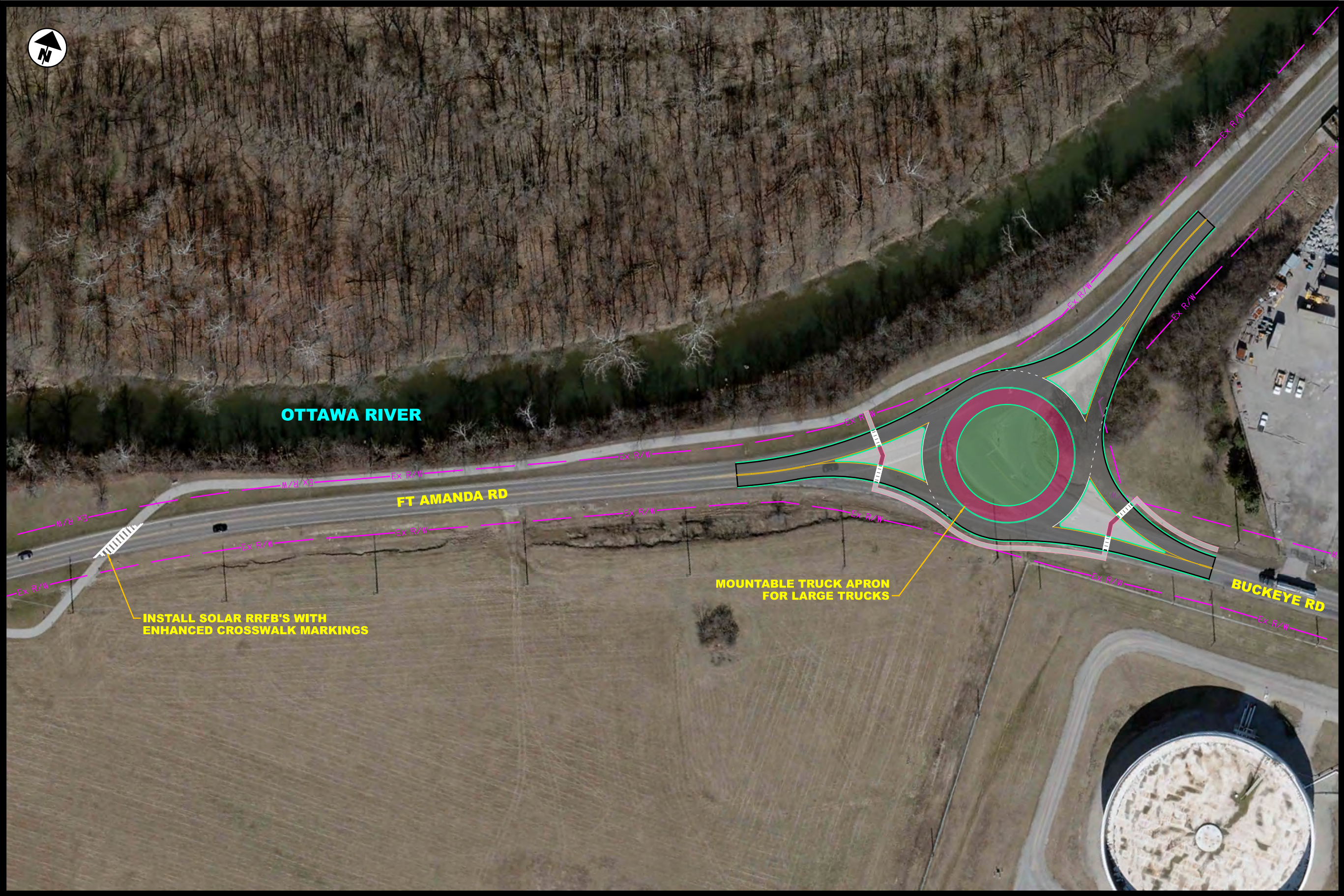
### 5.3 Project Implementation

In regards to the search for funding programs to assist the Allen County Engineer in funding the recommendations of this safety study, various funding programs can be considered. The Ft. Amanda Road corridor averaged 10 crashes per year, and had 30% of the crashes result in injury crashes. The intersection of Buckeye Road and Ft. Amanda Road averaged 6.7 crashes per year from 2020-2022 with 35% being injury crashes. It is recommended to apply to the Formal Safety Program for the Buckeye Road and Ft. Amanda Road roundabout and the RRFB crossing as it would be a competitive application with 35% of crashes being injury crashes. Additional LACRPC funding programs that could be applicable for assistance in funding the improvements could be the Surface Transportation Block Grant Program (STBGP) and the Transportation Alternatives Program (TAP). The CEAO is an option to apply for construction funds for the safety project. An auxiliary source of funding to help implement the corridor improvements may be the Ohio Public Works Commission (OPWC) as the project gets closer to being constructed. The table below summarizes the potential funding programs.

<b>Funding Program (Agency)</b>	<b>Funding Overview</b>	<b>Comments</b>
Formal Safety Program (ODOT)	<ul style="list-style-type: none"> <li>Typically up to 90% funding of all phases of costs with applications due 3/31 and 8/31</li> <li>Safety improvements</li> <li>Must have at least 30% injury crashes and average of 3 or more crashes/year</li> <li>Typically up to \$5M</li> </ul>	County should apply to the ODOT Formal Safety Program for the roundabout at Buckeye & Ft. Amanda, and also include the RRFB crossing for the shared use path
Congestion Mitigation and Air Quality (LACRPC)	<ul style="list-style-type: none"> <li>Typically 80% funding of construction costs</li> <li>Eligible projects are those that reduce emissions</li> </ul>	A second option to apply for funding is the CMAQ program through the LACRPC in a future round
CEAO Safety Program (CEAO)	<ul style="list-style-type: none"> <li>Typically 80% funding of construction costs with applications due August each year</li> <li>The CEAO oversees this Highway Safety Improvement Program (HSIP) that focuses safety funds for County Roadways</li> </ul>	This program could be applied to if the Safety Program or CMAQ funds are not obtained.
Systemic Pedestrian Safety Program (ODOT)	<ul style="list-style-type: none"> <li>Typically up to 90% funding of all phases of costs with applications due 1/31</li> <li>Safety improvements for pedestrians</li> <li>Typically up to \$2M</li> </ul>	This program can be applied to for funding the pedestrian aspects of projects such as shared use path crossings, crosswalks, sidewalks, curb ramps, countdown signal heads & pushbuttons, etc.
Systemic Roadway Departure Safety Program (ODOT)	<ul style="list-style-type: none"> <li>Typically up to 90% funding of all phases of costs with applications due 1/31</li> <li>Safety improvements for roadway departure safety improvements</li> <li>Typically up to \$5M</li> </ul>	This program can be applied to for funding safety countermeasures aimed at reducing roadway departure crashes such as shoulder widening, removal of fixed objects, etc.
Surface Transportation Block Grant (LACRPC)	<ul style="list-style-type: none"> <li>Typically 80% funding for project costs</li> <li>Submittal time frames vary as decided by LACRPC</li> </ul>	This program is another funding source that could be applied via LACRPC.
Transportation Alternatives Program (LACRPC)	<ul style="list-style-type: none"> <li>Typically 80% funding for project costs</li> <li>Submittal time frames vary as decided by LACRPC</li> <li>Typically for pedestrian and bicycle improvements</li> </ul>	This program is a potential funding sources for pedestrian and bicycle portions of projects.
Ohio Public Works Commission (OPWC)	<ul style="list-style-type: none"> <li>Funding is available through District 13 of OPWC for Allen County for various programs and applications typically due in October</li> </ul>	The OPWC is a funding source that local governments can apply to for infrastructure & roadway projects. This funding source is usually applied to the year before construction. It is a State funding source so it can typically be used as match towards federal funds.



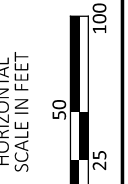
# FIGURE 5.1 - PROPOSED IMPROVEMENTS





ALLEN COUNTY ENGINEERING SAFETY STUDY

MODEL: Sheet 2 PAPER: 17x11 (in.) DATE: 8/31/2023 TIME: 2:04:06 PM USER: rmurray  
W:\Projects\Projects - A-E\ALL0002\CAD\SHEETS\Fort Amanda Rd Corridor\Ft Amanda Proposed Improvements SHEET.dgn



FT AMANDA RD  
PROPOSED IMPROVEMENTS

DESIGN AGENCY



DESIGNER  
RAM

REVIEWER  
XXX MM-DD-YY

PROJECT ID  
117252

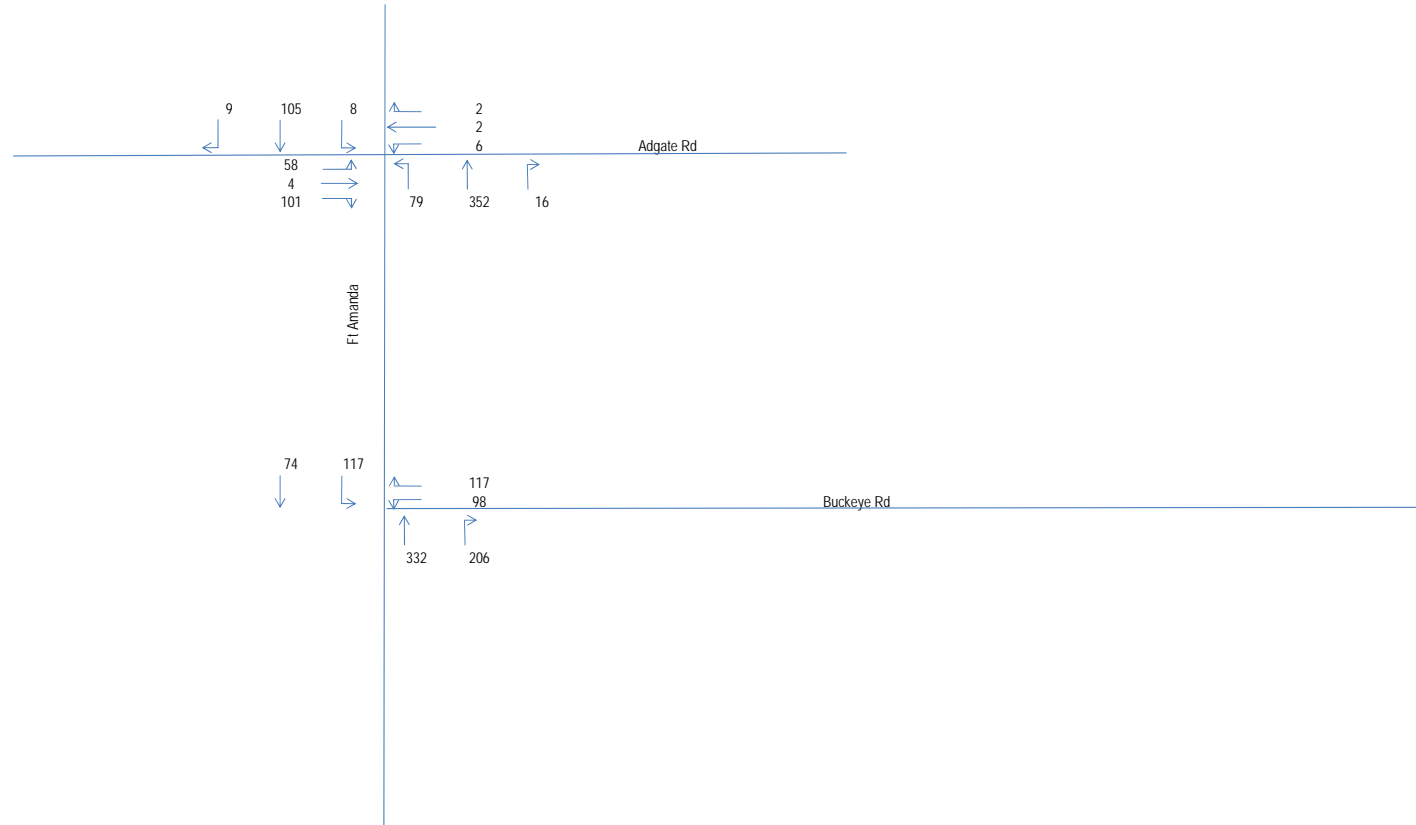
SHEET	TOTAL
P.2	2

APPENDIX A  
TRAFFIC & CRASH DATA/ANALYSES

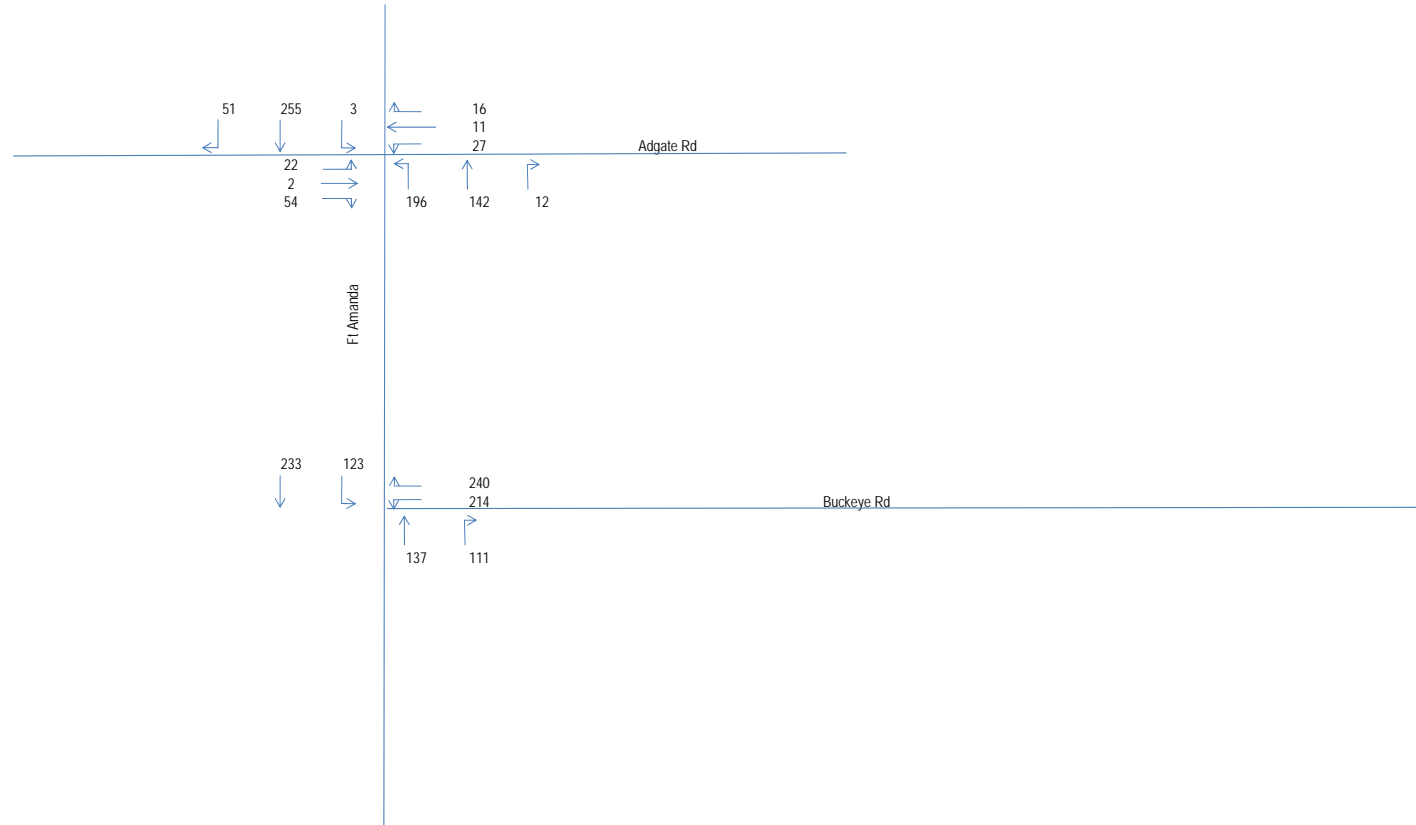




AM 2023 Traffic Count Volumes



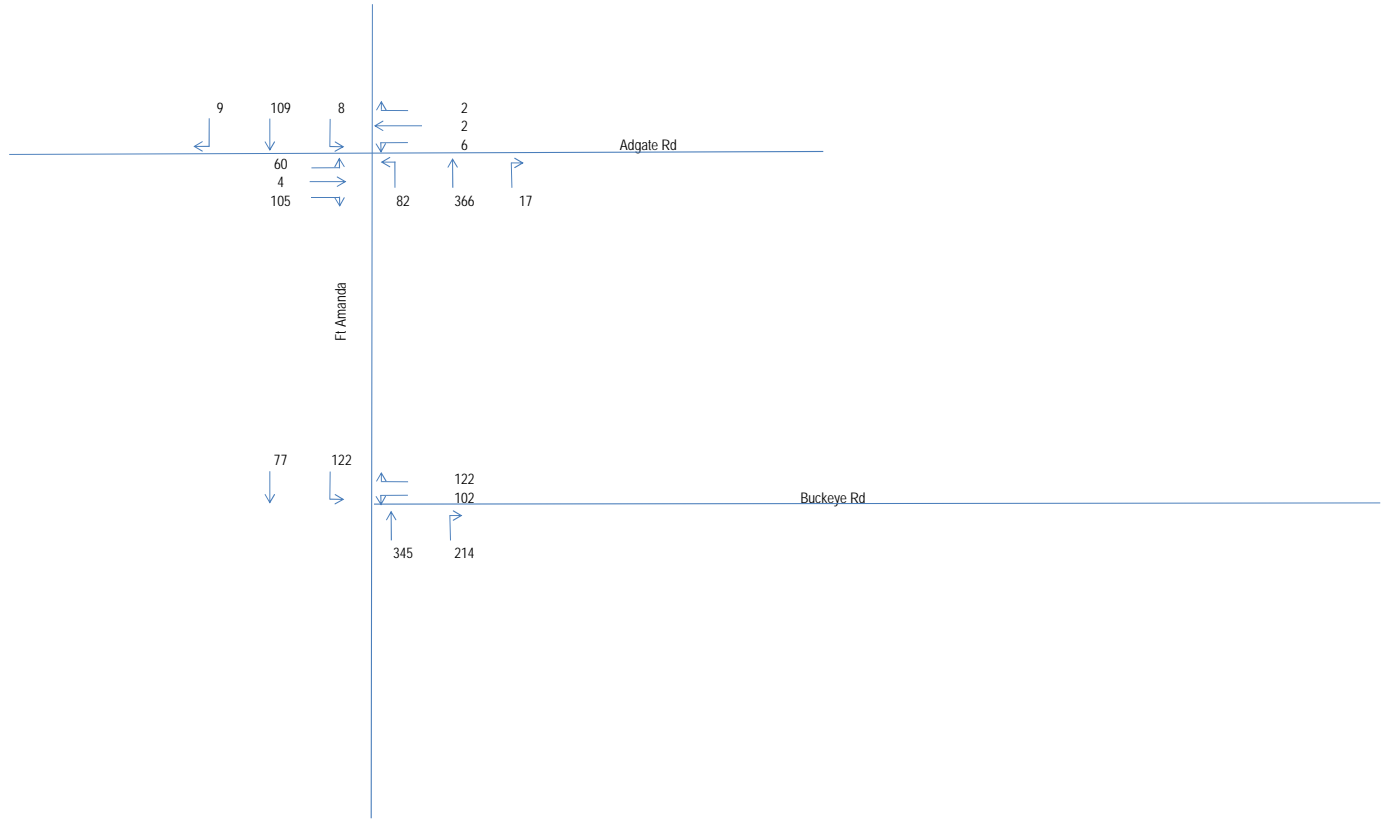
PM 2023 Traffic Count Volumes





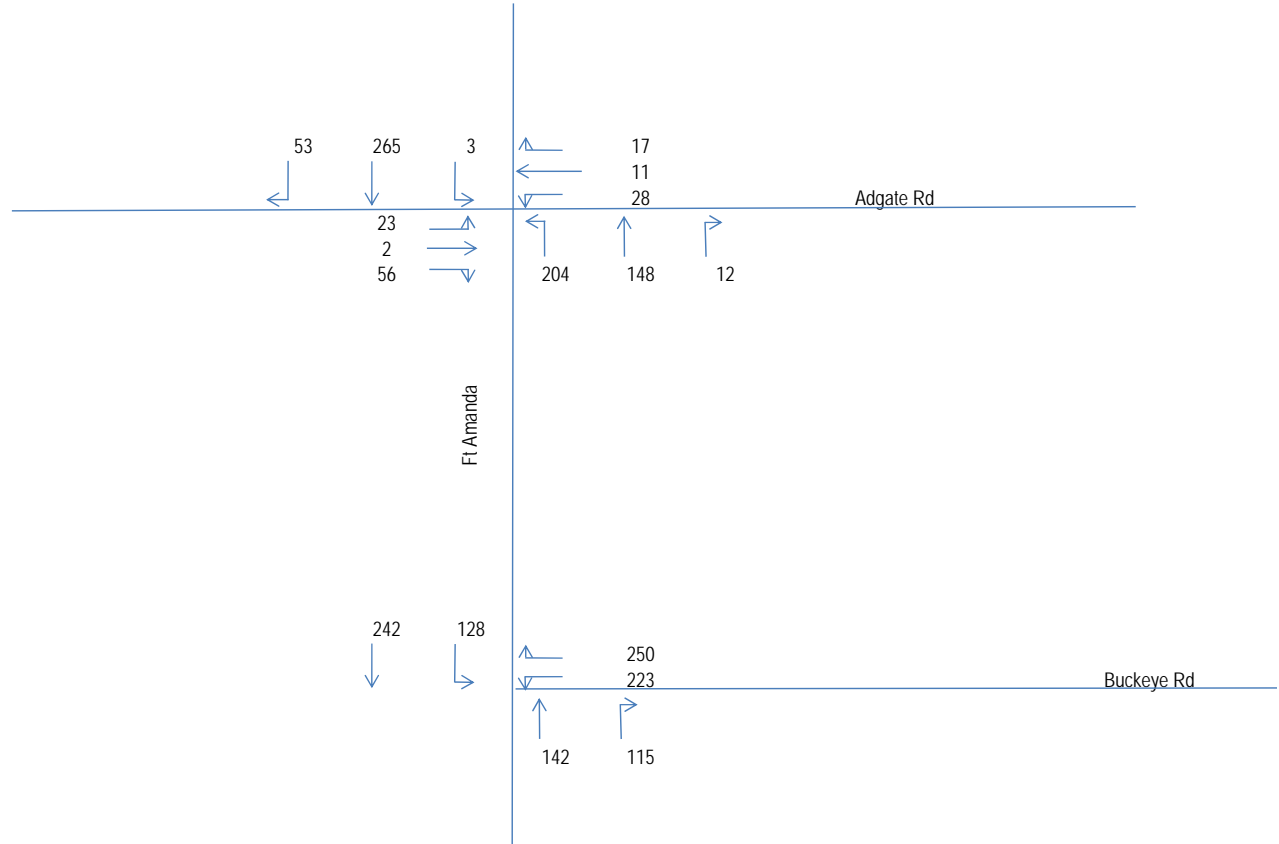
**AM 2027 Traffic Count Volumes**

Growth Rate	1.0%	per year
2023	EX Count Year	
2027	1.04	
2047	1.24	



# PM 2027 Traffic Count Volumes

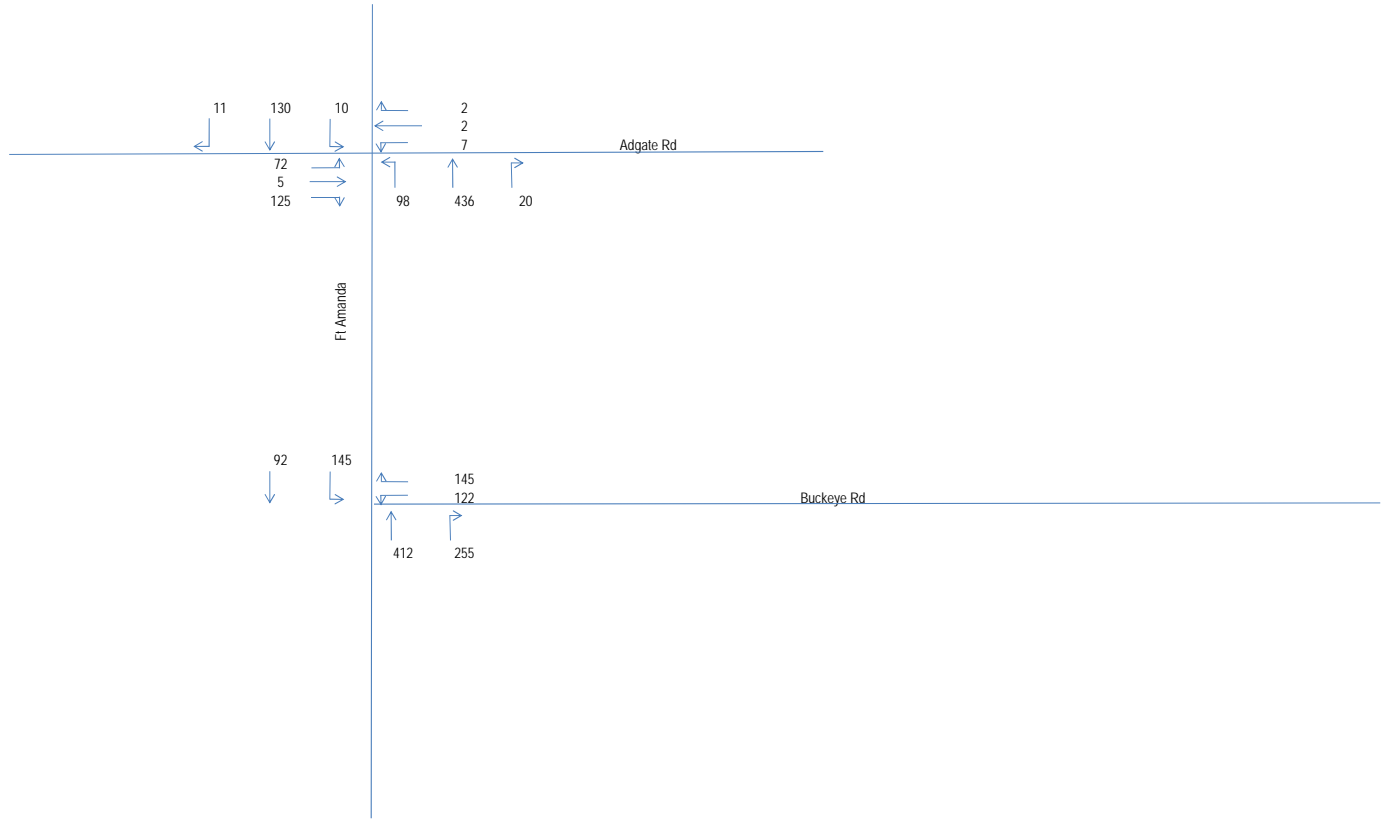
Growth Rate 1% per year  
 2023 EX Count Year  
 2027 1.04  
 2047 1.24





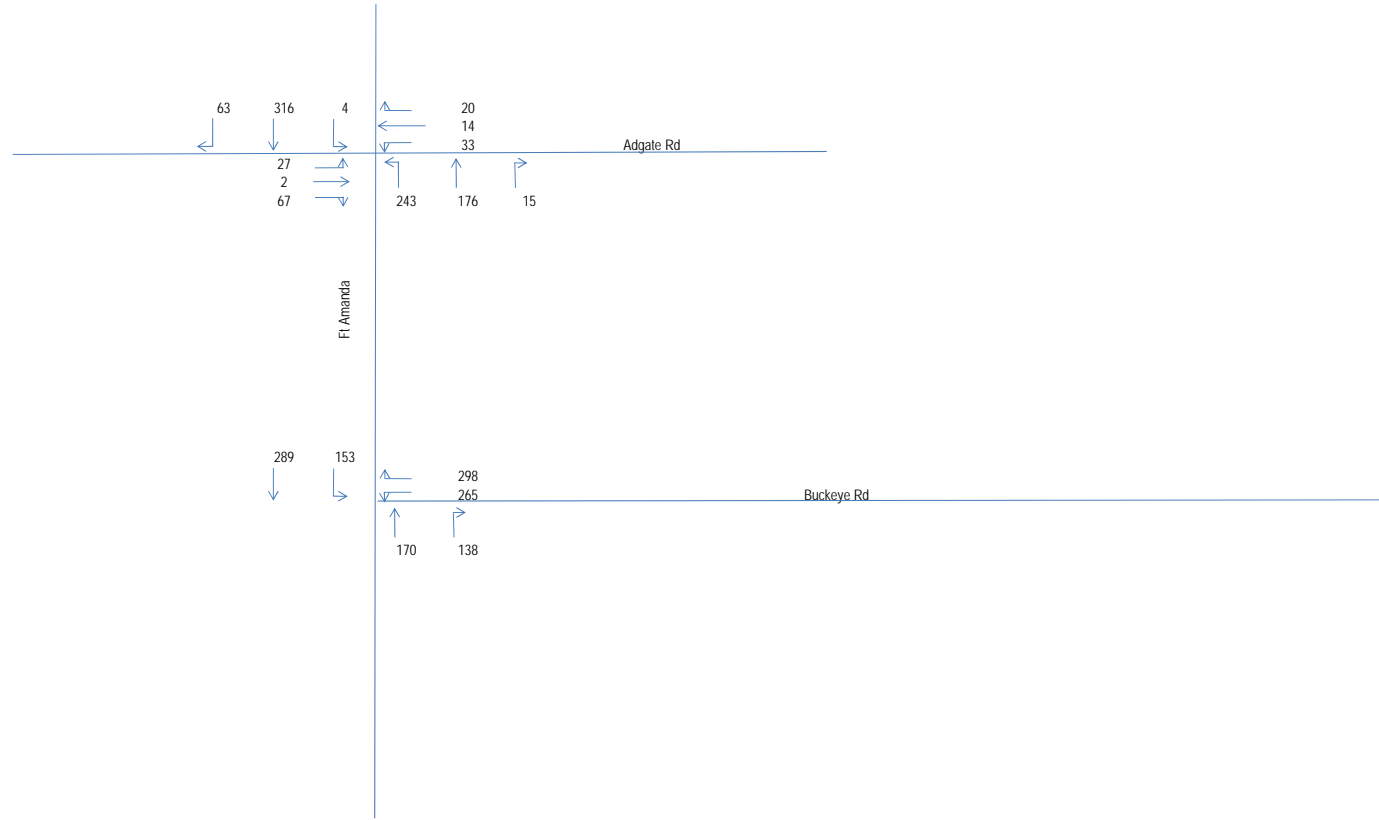
**AM 2027 Traffic Count Volumes**

Growth Rate	1.0%	per year
2023	EX Count Year	
2027	1.04	
2047	1.24	



**PM 2047 Traffic Count Volumes**

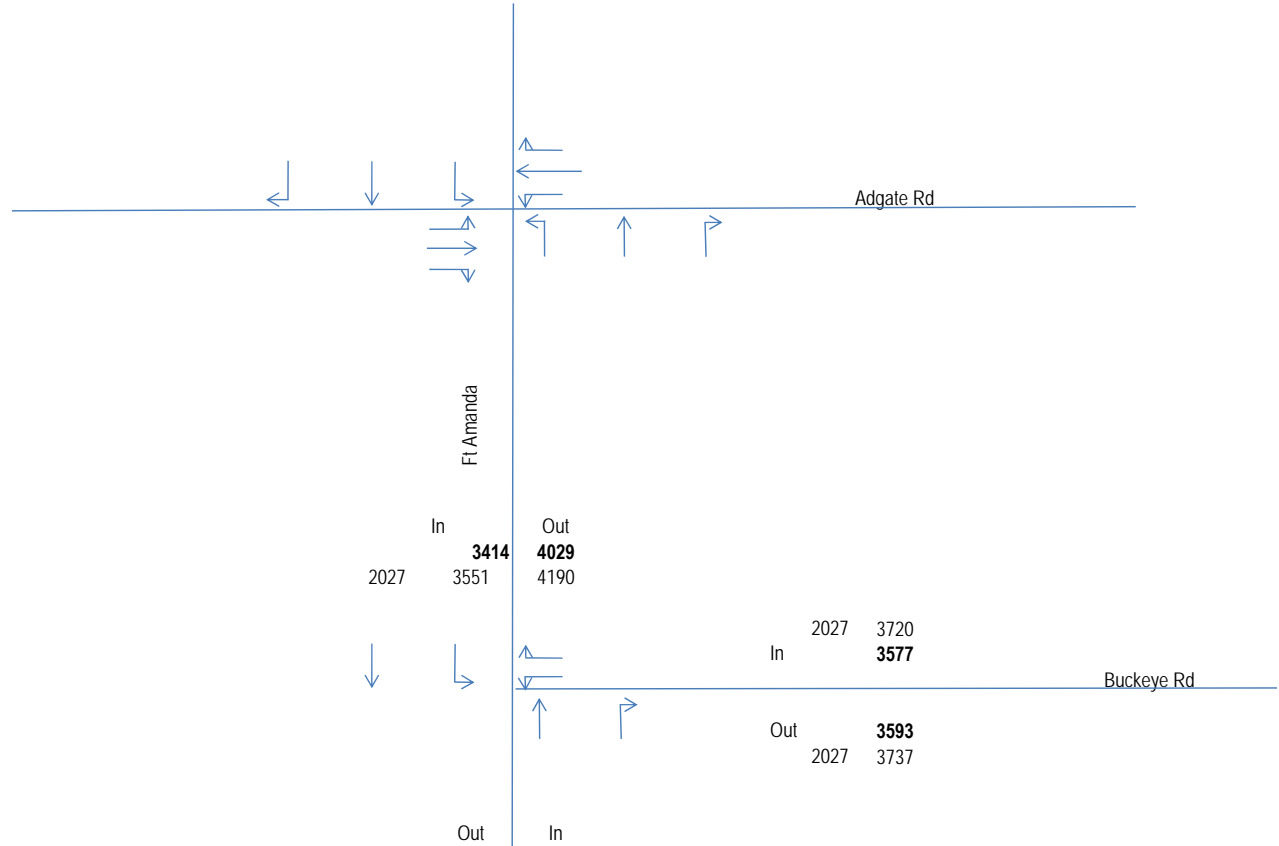
Growth Rate 1% per year  
 2023 EX Count Year  
 2027 1.04  
 2047 1.24





# AADTs

Growth Rate 1% per year  
 2023 EX Count Year  
 2027 1.04  
 2047 1.24





Mannik & Smith Group (OH)  
1800 Indian Wood Circle

Maumee, Ohio, United States 43537  
(419) 891-2222 ncarter@manniksmithgroup.com

Count Name: 8. Ft. Amanda Rd & Adgate Rd  
Site Code:  
Start Date: 04/12/2023  
Page No: 1

### Turning Movement Data

Start Time	Adgate Rd Westbound						Adgate Rd Eastbound						Ft. Amanda Rd Southbound						Ft. Amanda Rd Northbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	0	0	0	0	0	14	0	24	0	0	38	3	28	1	0	0	32	24	55	3	0	0	82	152
7:15 AM	3	0	1	0	0	4	8	2	27	0	0	37	1	26	3	0	0	30	23	93	4	0	0	120	191
7:30 AM	2	0	1	0	0	3	12	1	25	0	0	38	4	20	0	0	0	24	16	114	5	0	0	135	200
7:45 AM	1	2	0	0	0	3	24	1	25	0	2	50	0	31	5	0	0	36	16	90	4	0	0	110	199
Hourly Total	6	2	2	0	0	10	58	4	101	0	2	163	8	105	9	0	0	122	79	352	16	0	0	447	742
8:00 AM	0	0	1	0	0	1	6	0	11	0	0	17	2	18	5	0	0	25	6	42	4	0	0	52	95
8:15 AM	0	1	0	0	0	1	4	0	20	0	2	24	1	26	6	0	0	33	15	50	3	0	0	68	126
8:30 AM	3	0	0	0	0	3	9	3	8	0	0	20	0	22	7	0	0	29	15	37	1	0	0	53	105
8:45 AM	4	0	0	0	0	4	4	1	17	0	0	22	0	23	4	0	0	27	15	50	2	0	0	67	120
Hourly Total	7	1	1	0	0	9	23	4	56	0	2	83	3	89	22	0	0	114	51	179	10	0	0	240	446
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	9	4	6	0	0	19	4	0	17	0	0	21	0	50	17	0	0	67	59	43	0	0	0	102	209
4:15 PM	5	3	2	0	0	10	7	0	12	0	0	19	0	73	15	0	0	88	39	28	4	0	0	71	188
4:30 PM	11	4	6	0	0	21	7	1	13	0	0	21	2	77	10	0	0	89	66	39	2	0	0	107	238
4:45 PM	2	0	2	0	0	4	4	1	12	0	2	17	1	55	9	0	0	65	32	32	6	0	0	70	156
Hourly Total	27	11	16	0	0	54	22	2	54	0	2	78	3	255	51	0	0	309	196	142	12	0	0	350	791
5:00 PM	5	3	3	0	0	11	5	1	17	0	0	23	1	59	9	0	0	69	34	39	6	0	0	79	182
5:15 PM	4	2	2	0	0	8	7	1	19	0	1	27	0	62	8	0	0	70	33	30	3	0	0	66	171
5:30 PM	5	0	1	0	0	6	2	0	12	0	2	14	0	56	15	0	0	71	30	45	3	0	0	78	169
5:45 PM	6	0	0	0	0	6	3	0	24	0	0	27	0	33	5	0	0	38	26	36	4	0	0	66	137
Hourly Total	20	5	6	0	0	31	17	2	72	0	3	91	1	210	37	0	0	248	123	150	16	0	0	289	659
Grand Total	60	19	25	0	0	104	120	12	283	0	9	415	15	659	119	0	0	793	449	823	54	0	0	1326	2638
Approach %	57.7	18.3	24.0	0.0	-	-	28.9	2.9	68.2	0.0	-	-	1.9	83.1	15.0	0.0	-	-	33.9	62.1	4.1	0.0	-	-	-
Total %	2.3	0.7	0.9	0.0	-	3.9	4.5	0.5	10.7	0.0	-	15.7	0.6	25.0	4.5	0.0	-	30.1	17.0	31.2	2.0	0.0	-	50.3	-
Lights	33	16	24	0	-	73	113	5	279	0	-	397	15	626	112	0	-	753	438	780	29	0	-	1247	2470
% Lights	55.0	84.2	96.0	-	-	70.2	94.2	41.7	98.6	-	-	95.7	100.0	95.0	94.1	-	-	95.0	97.6	94.8	53.7	-	-	94.0	93.6
Other Vehicles	27	3	1	0	-	31	7	7	4	0	-	18	0	33	7	0	-	40	11	43	25	0	-	79	168
% Other Vehicles	45.0	15.8	4.0	-	-	29.8	5.8	58.3	1.4	-	-	4.3	0.0	5.0	5.9	-	-	5.0	2.4	5.2	46.3	-	-	6.0	6.4
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	44.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	55.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-

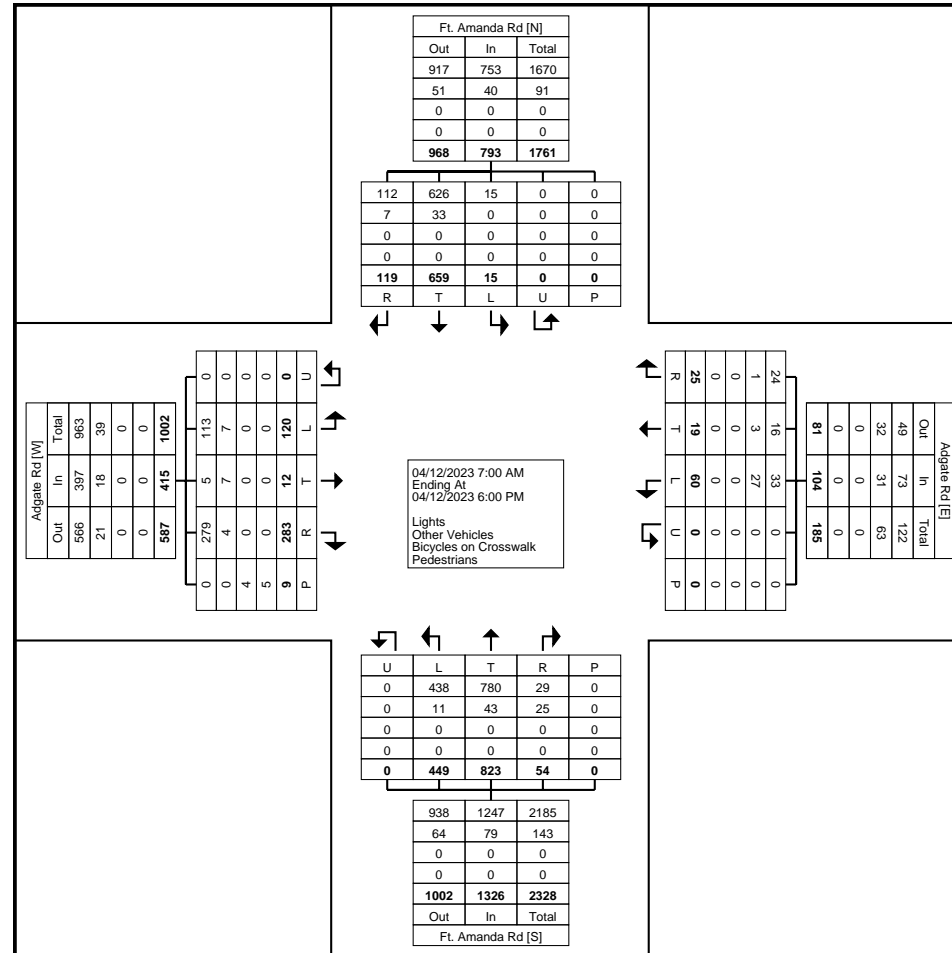




Mannik & Smith Group (OH)  
1800 Indian Wood Circle

Maumee, Ohio, United States 43537  
(419) 891-2222 ncarter@manna-smithgroup.com

Count Name: 8. Ft. Amanda Rd & Adgate Rd  
Site Code:  
Start Date: 04/12/2023  
Page No: 2



Turning Movement Data Plot



Mannik & Smith Group (OH)  
1800 Indian Wood Circle

Maumee, Ohio, United States 43537  
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Count Name: 8. Ft. Amanda Rd & Adgate Rd  
Site Code:  
Start Date: 04/12/2023  
Page No: 3

### Turning Movement Peak Hour Data (7:00 AM)

Start Time	Adgate Rd Westbound						Adgate Rd Eastbound						Ft. Amanda Rd Southbound						Ft. Amanda Rd Northbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	0	0	0	0	0	0	14	0	24	0	0	38	3	28	1	0	0	32	24	55	3	0	0	82	152
7:15 AM	3	0	1	0	0	4	8	2	27	0	0	37	1	26	3	0	0	30	23	93	4	0	0	120	191
7:30 AM	2	0	1	0	0	3	12	1	25	0	0	38	4	20	0	0	0	24	16	114	5	0	0	135	200
7:45 AM	1	2	0	0	0	3	24	1	25	0	2	50	0	31	5	0	0	36	16	90	4	0	0	110	199
Total	6	2	2	0	0	10	58	4	101	0	2	163	8	105	9	0	0	122	79	352	16	0	0	447	742
Approach %	60.0	20.0	20.0	0.0	-	-	35.6	2.5	62.0	0.0	-	-	6.6	86.1	7.4	0.0	-	-	17.7	78.7	3.6	0.0	-	-	-
Total %	0.8	0.3	0.3	0.0	-	1.3	7.8	0.5	13.6	0.0	-	22.0	1.1	14.2	1.2	0.0	-	16.4	10.6	47.4	2.2	0.0	-	60.2	-
PHF	0.500	0.250	0.500	0.000	-	0.625	0.604	0.500	0.935	0.000	-	0.815	0.500	0.847	0.450	0.000	-	0.847	0.823	0.772	0.800	0.000	-	0.828	0.928
Lights	0	1	2	0	-	3	58	2	100	0	-	160	8	94	6	0	-	108	76	334	12	0	-	422	693
% Lights	0.0	50.0	100.0	-	-	30.0	100.0	50.0	99.0	-	-	98.2	100.0	89.5	66.7	-	-	88.5	96.2	94.9	75.0	-	-	94.4	93.4
Other Vehicles	6	1	0	0	-	7	0	2	1	0	-	3	0	11	3	0	-	14	3	18	4	0	-	25	49
% Other Vehicles	100.0	50.0	0.0	-	-	70.0	0.0	50.0	1.0	-	-	1.8	0.0	10.5	33.3	-	-	11.5	3.8	5.1	25.0	-	-	5.6	6.6
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

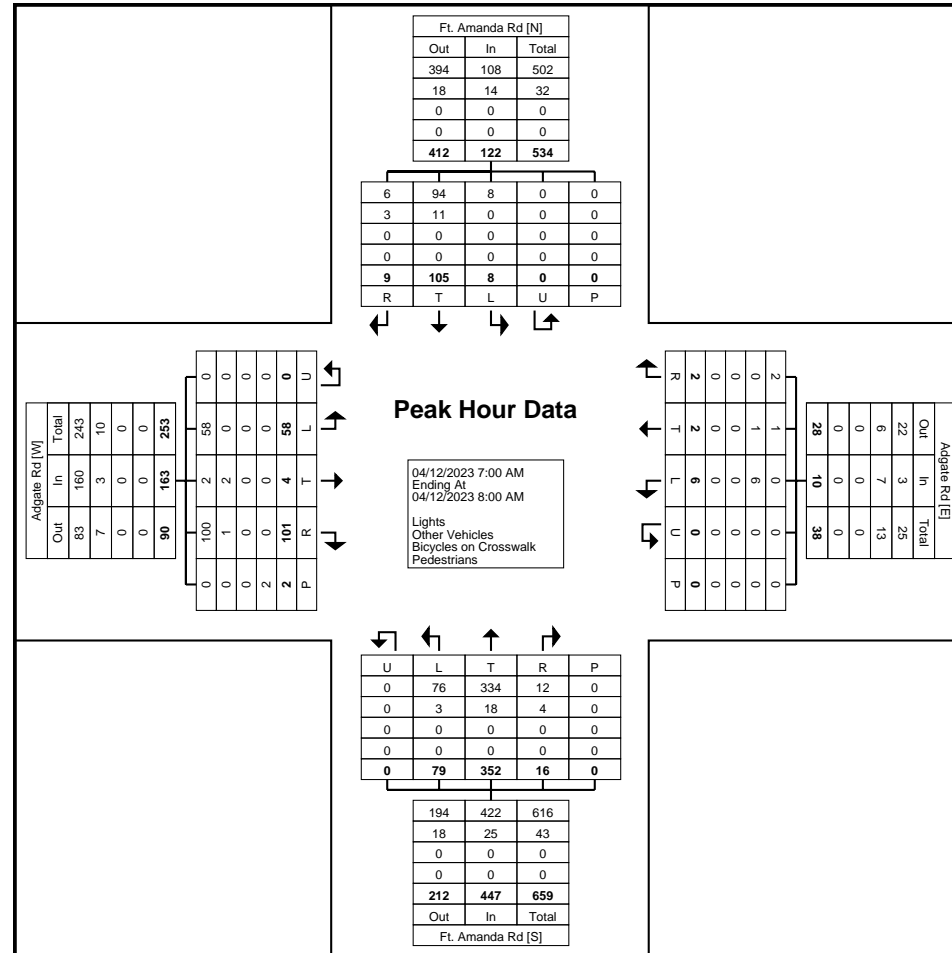




Mannik & Smith Group (OH)  
1800 Indian Wood Circle

Maumee, Ohio, United States 43537  
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Count Name: 8. Ft. Amanda Rd & Adgate Rd  
Site Code:  
Start Date: 04/12/2023  
Page No: 4



Turning Movement Peak Hour Data Plot (7:00 AM)



Mannik & Smith Group (OH)  
1800 Indian Wood Circle

Maumee, Ohio, United States 43537  
(419) 891-2222 ncarter@mannaismithgroup.com

Count Name: 8. Ft. Amanda Rd & Adgate Rd  
Site Code:  
Start Date: 04/12/2023  
Page No: 5

### Turning Movement Peak Hour Data (4:00 PM)

Start Time	Adgate Rd Westbound						Adgate Rd Eastbound						Ft. Amanda Rd Southbound						Ft. Amanda Rd Northbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:00 PM	9	4	6	0	0	19	4	0	17	0	0	21	0	50	17	0	0	67	59	43	0	0	0	102	209
4:15 PM	5	3	2	0	0	10	7	0	12	0	0	19	0	73	15	0	0	88	39	28	4	0	0	71	188
4:30 PM	11	4	6	0	0	21	7	1	13	0	0	21	2	77	10	0	0	89	66	39	2	0	0	107	238
4:45 PM	2	0	2	0	0	4	4	1	12	0	2	17	1	55	9	0	0	65	32	32	6	0	0	70	156
Total	27	11	16	0	0	54	22	2	54	0	2	78	3	255	51	0	0	309	196	142	12	0	0	350	791
Approach %	50.0	20.4	29.6	0.0	-	-	28.2	2.6	69.2	0.0	-	-	1.0	82.5	16.5	0.0	-	-	56.0	40.6	3.4	0.0	-	-	-
Total %	3.4	1.4	2.0	0.0	-	6.8	2.8	0.3	6.8	0.0	-	9.9	0.4	32.2	6.4	0.0	-	39.1	24.8	18.0	1.5	0.0	-	44.2	-
PHF	0.614	0.688	0.667	0.000	-	0.643	0.786	0.500	0.794	0.000	-	0.929	0.375	0.828	0.750	0.000	-	0.868	0.742	0.826	0.500	0.000	-	0.818	0.831
Lights	19	10	16	0	-	45	19	1	54	0	-	74	3	248	51	0	-	302	194	140	7	0	-	341	762
% Lights	70.4	90.9	100.0	-	-	83.3	86.4	50.0	100.0	-	-	94.9	100.0	97.3	100.0	-	-	97.7	99.0	98.6	58.3	-	-	97.4	96.3
Other Vehicles	8	1	0	0	-	9	3	1	0	0	-	4	0	7	0	0	-	7	2	2	5	0	-	9	29
% Other Vehicles	29.6	9.1	0.0	-	-	16.7	13.6	50.0	0.0	-	-	5.1	0.0	2.7	0.0	-	-	2.3	1.0	1.4	41.7	-	-	2.6	3.7
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-

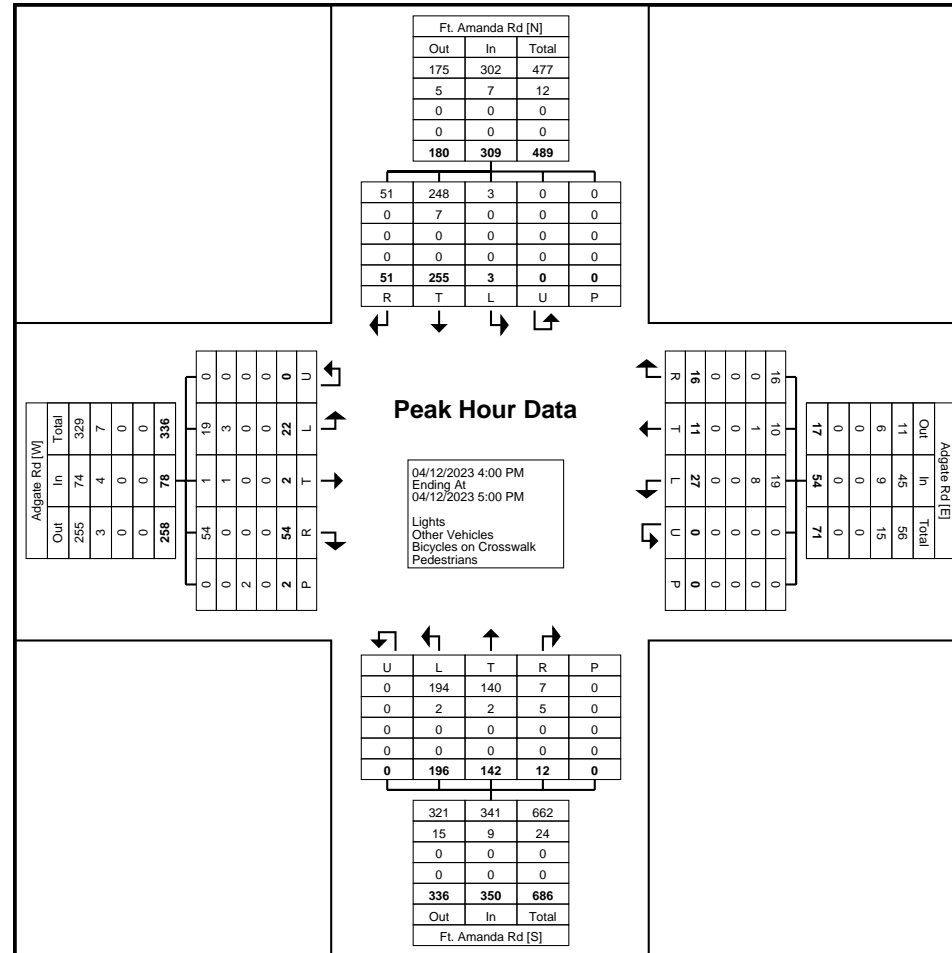




Mannik & Smith Group (OH)  
1800 Indian Wood Circle

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Count Name: 8. Ft. Amanda Rd & Adgate Rd  
Site Code:  
Start Date: 04/12/2023  
Page No: 6



Turning Movement Peak Hour Data Plot (4:00 PM)



Mannik & Smith Group (OH)  
1800 Indian Wood Circle

Maumee, Ohio, United States 43537  
(419) 891-2222 ncarter@manniksmithgroup.com

Count Name: 9. Ft. Amanda Rd & Buckeye Rd  
Site Code:  
Start Date: 04/12/2023  
Page No: 1

### Turning Movement Data

Start Time	Buckeye Rd Westbound					Ft. Amanda Rd Southbound					Ft. Amanda Rd Northbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
12:00 AM	7	4	0	0	11	3	1	0	0	4	5	0	0	0	5	20
12:15 AM	2	3	0	0	5	4	2	0	0	6	0	4	0	0	4	15
12:30 AM	1	5	0	0	6	3	3	0	0	6	0	1	0	0	1	13
12:45 AM	1	3	0	0	4	1	0	0	0	1	1	1	0	0	2	7
Hourly Total	11	15	0	0	26	11	6	0	0	17	6	6	0	0	12	55
1:00 AM	0	8	0	0	8	2	0	0	0	2	1	2	0	0	3	13
1:15 AM	3	3	0	0	6	3	0	0	0	3	4	1	0	0	5	14
1:30 AM	0	1	0	0	1	2	1	0	0	3	1	0	0	0	1	5
1:45 AM	1	3	0	0	4	5	1	0	0	6	2	0	0	0	2	12
Hourly Total	4	15	0	0	19	12	2	0	0	14	8	3	0	0	11	44
2:00 AM	1	0	0	0	1	3	1	0	0	4	0	1	0	0	1	6
2:15 AM	1	1	0	0	2	1	2	0	0	3	3	1	0	0	4	9
2:30 AM	3	1	0	0	4	1	1	0	0	2	1	2	0	0	3	9
2:45 AM	1	5	0	0	6	2	1	0	0	3	0	1	0	0	1	10
Hourly Total	6	7	0	0	13	7	5	0	0	12	4	5	0	0	9	34
3:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
3:15 AM	1	2	0	0	3	5	4	0	0	9	0	3	0	0	3	15
3:30 AM	1	4	0	0	5	6	0	0	0	6	2	8	0	0	10	21
3:45 AM	2	0	0	0	2	6	4	0	0	10	1	7	0	0	8	20
Hourly Total	4	6	0	0	10	17	8	0	0	25	4	18	0	0	22	57
4:00 AM	0	3	0	0	3	0	1	0	0	1	4	4	0	0	8	12
4:15 AM	4	0	0	0	4	1	2	0	0	3	3	5	0	0	8	15
4:30 AM	0	6	0	0	6	2	2	0	0	4	7	21	0	0	28	38
4:45 AM	1	5	0	0	6	11	1	0	0	12	12	19	0	0	31	49
Hourly Total	5	14	0	0	19	14	6	0	0	20	26	49	0	0	75	114
5:00 AM	2	9	0	0	11	11	2	0	0	13	9	14	0	0	23	47
5:15 AM	3	10	0	0	13	16	7	0	0	23	14	23	0	0	37	73
5:30 AM	9	19	0	0	28	27	8	0	0	35	22	36	0	0	58	121
5:45 AM	8	23	0	0	31	28	13	0	0	41	18	37	0	0	55	127
Hourly Total	22	61	0	0	83	82	30	0	0	112	63	110	0	0	173	368
6:00 AM	19	14	0	0	33	24	12	0	0	36	26	32	0	0	58	127
6:15 AM	8	27	0	0	35	30	15	0	0	45	43	68	0	0	111	191
6:30 AM	11	35	0	0	46	47	9	0	0	56	55	78	0	0	133	235
6:45 AM	9	28	0	0	37	35	14	0	0	49	59	93	0	0	152	238
Hourly Total	47	104	0	0	151	136	50	0	0	186	183	271	0	0	454	791
7:00 AM	33	34	0	0	67	19	19	0	0	38	50	39	0	0	89	194



7:15 AM	20	33	0	0	53	32	22	0	0	54	96	60	0	0	156	263
7:30 AM	18	27	0	0	45	30	16	0	0	46	106	51	0	0	157	248
7:45 AM	27	23	0	0	50	36	17	0	0	53	80	56	0	0	136	239
Hourly Total	98	117	0	0	215	117	74	0	0	191	332	206	0	0	538	944
8:00 AM	9	15	0	0	24	12	17	0	0	29	42	28	0	0	70	123
8:15 AM	19	22	0	0	41	20	19	0	0	39	42	21	0	0	63	143
8:30 AM	16	21	0	0	37	17	21	0	0	38	36	28	0	0	64	139
8:45 AM	22	24	0	0	46	22	20	0	0	42	45	23	0	0	68	156
Hourly Total	66	82	0	0	148	71	77	0	0	148	165	100	0	0	265	561
9:00 AM	18	16	0	0	34	18	24	0	0	42	30	22	0	0	52	128
9:15 AM	18	17	0	0	35	14	9	0	0	23	21	23	0	0	44	102
9:30 AM	30	21	0	0	51	20	20	0	0	40	24	30	0	0	54	145
9:45 AM	15	19	0	0	34	21	27	0	0	48	20	34	0	0	54	136
Hourly Total	81	73	0	0	154	73	80	0	0	153	95	109	0	0	204	511
10:00 AM	23	18	0	0	41	18	27	0	0	45	28	17	0	0	45	131
10:15 AM	21	18	0	0	39	26	19	0	0	45	33	20	0	0	53	137
10:30 AM	25	27	0	0	52	14	18	0	0	32	26	24	0	0	50	134
10:45 AM	30	16	0	0	46	10	34	0	0	44	25	26	0	0	51	141
Hourly Total	99	79	0	0	178	68	98	0	0	166	112	87	0	0	199	543
11:00 AM	33	21	0	0	54	25	33	0	0	58	34	27	0	0	61	173
11:15 AM	29	25	0	0	54	13	25	0	0	38	36	27	0	0	63	155
11:30 AM	41	22	0	0	63	19	39	0	0	58	41	32	0	0	73	194
11:45 AM	39	19	0	0	58	26	34	0	0	60	41	47	0	0	88	206
Hourly Total	142	87	0	0	229	83	131	0	0	214	152	133	0	0	285	728
12:00 PM	54	26	0	0	80	19	37	0	0	56	32	44	0	0	76	212
12:15 PM	27	24	0	0	51	12	29	0	0	41	37	51	0	0	88	180
12:30 PM	29	20	0	0	49	23	45	0	0	68	40	29	0	0	69	186
12:45 PM	20	20	0	0	40	29	26	0	0	55	29	42	0	0	71	166
Hourly Total	130	90	0	0	220	83	137	0	0	220	138	166	0	0	304	744
1:00 PM	25	21	0	0	46	15	34	0	0	49	40	35	0	0	75	170
1:15 PM	20	29	0	0	49	19	36	0	0	55	25	22	0	0	47	151
1:30 PM	26	24	0	0	50	16	24	0	0	40	31	35	0	0	66	156
1:45 PM	22	17	0	0	39	13	30	0	0	43	44	30	0	0	74	156
Hourly Total	93	91	0	0	184	63	124	0	0	187	140	122	0	0	262	633
2:00 PM	23	22	0	0	45	23	32	0	0	55	37	28	0	0	65	165
2:15 PM	35	21	0	0	56	19	32	0	0	51	27	33	0	0	60	167
2:30 PM	40	39	0	0	79	27	35	0	0	62	53	44	0	0	97	238
2:45 PM	32	27	0	0	59	27	21	0	0	48	38	24	0	0	62	169
Hourly Total	130	109	0	0	239	96	120	0	0	216	155	129	0	0	284	739
3:00 PM	50	47	0	0	97	32	45	0	0	77	35	27	0	0	62	236
3:15 PM	45	32	0	0	77	25	49	0	0	74	35	34	0	0	69	220
3:30 PM	65	97	0	0	162	42	69	0	0	111	45	35	0	0	80	353
3:45 PM	43	35	0	0	78	26	48	0	0	74	34	28	0	0	62	214
Hourly Total	203	211	0	0	414	125	211	0	0	336	149	124	0	0	273	1023
4:00 PM	57	66	0	0	123	28	54	0	0	82	36	25	0	0	61	266
4:15 PM	49	42	0	0	91	27	62	0	0	89	22	23	0	0	45	225
4:30 PM	67	55	0	0	122	32	69	0	0	101	29	28	0	0	57	280
4:45 PM	34	32	0	0	66	19	56	0	0	75	35	21	0	0	56	197
Hourly Total	207	195	0	0	402	106	241	0	0	347	122	97	0	0	219	968
5:00 PM	46	35	0	0	81	15	55	0	0	70	36	32	0	0	68	219
5:15 PM	44	46	0	0	90	25	64	0	0	89	31	22	0	0	53	232
5:30 PM	27	35	0	0	62	32	50	0	0	82	32	20	0	0	52	196



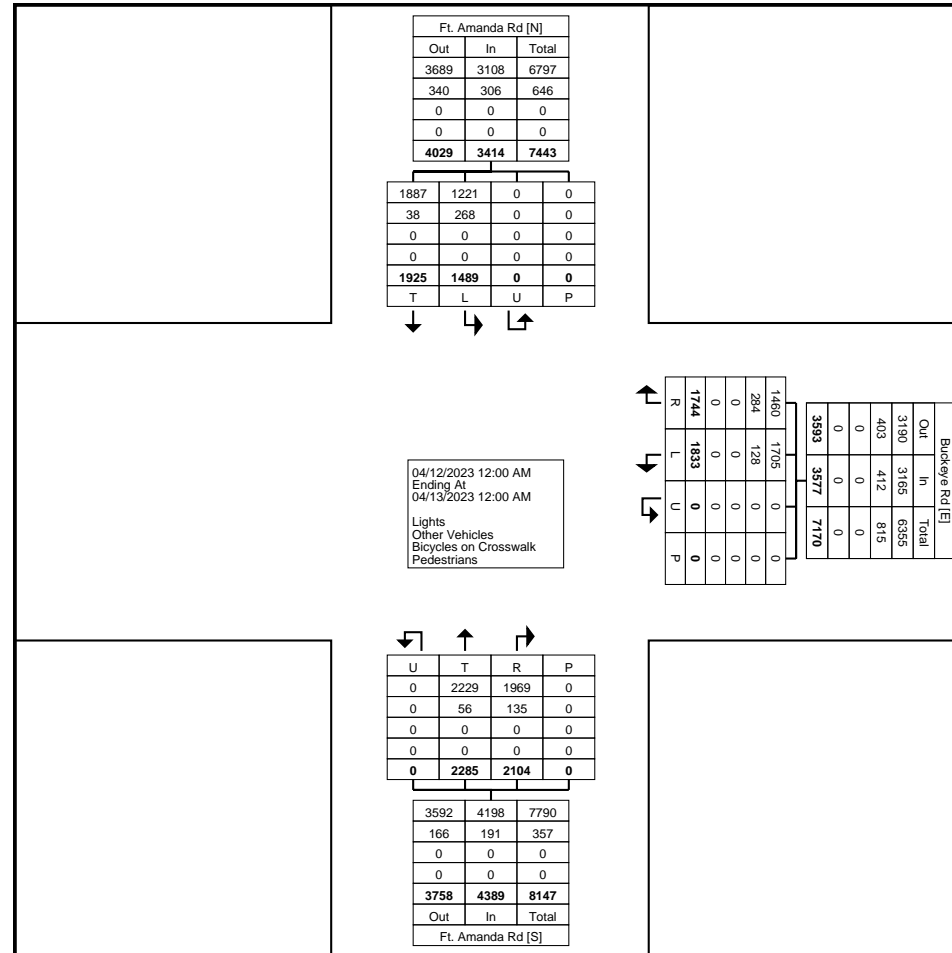




Mannik & Smith Group (OH)  
1800 Indian Wood Circle

Maumee, Ohio, United States 43537  
(419) 891-2222 ncarter@manniksmithgroup.com

Count Name: 9. Ft. Amanda Rd & Buckeye Rd  
Site Code:  
Start Date: 04/12/2023  
Page No: 4



Turning Movement Data Plot

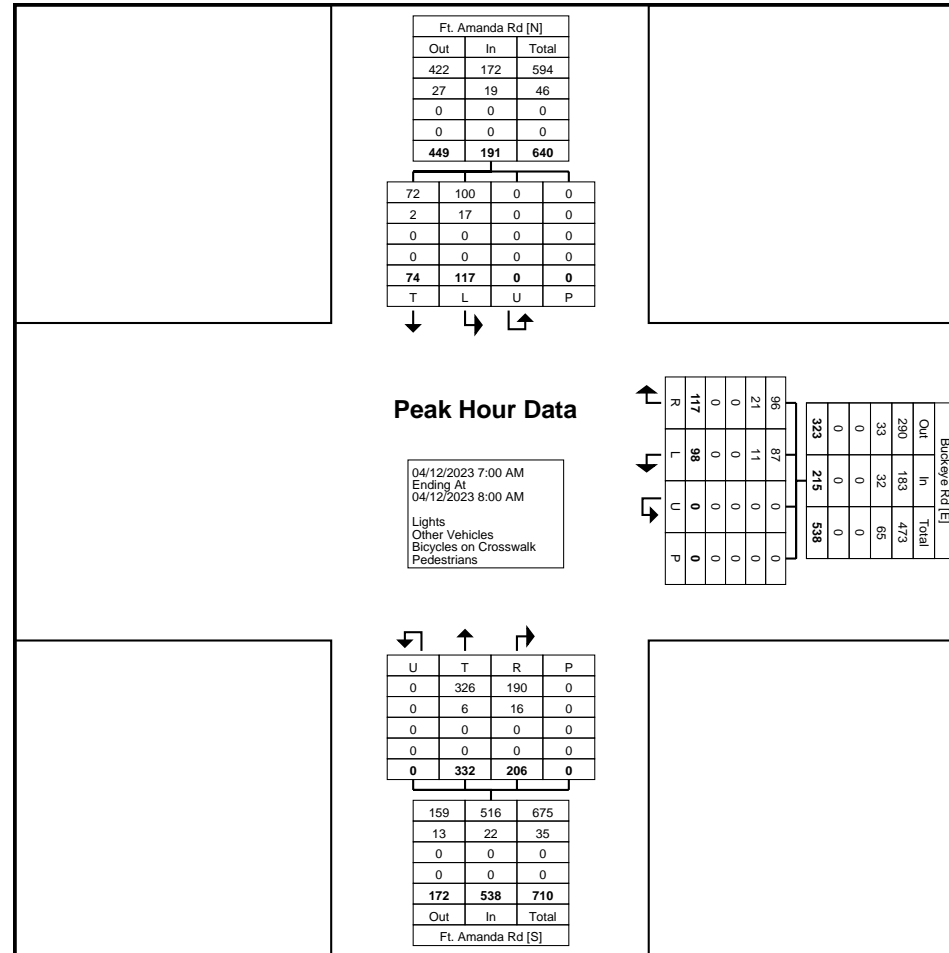




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Count Name: 9. Ft. Amanda Rd & Buckeye Rd  
Site Code:  
Start Date: 04/12/2023  
Page No: 6



Turning Movement Peak Hour Data Plot (7:00 AM)



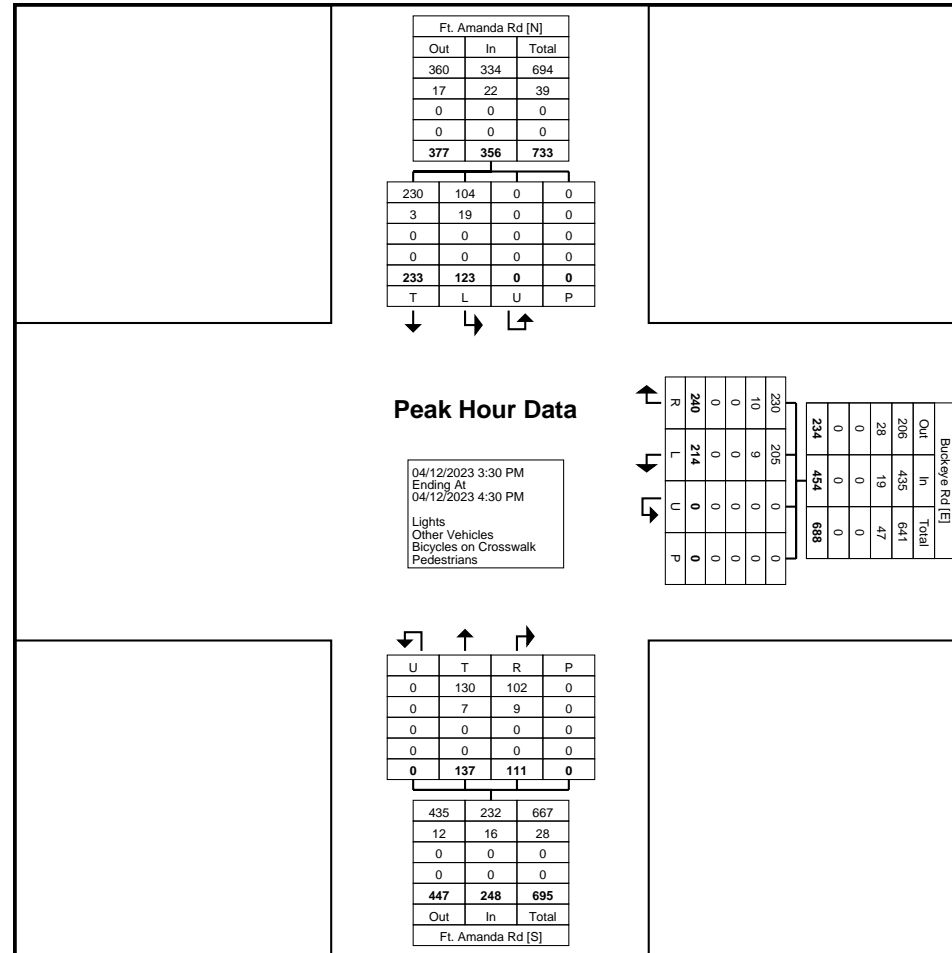




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Count Name: 9. Ft. Amanda Rd & Buckeye Rd  
Site Code:  
Start Date: 04/12/2023  
Page No: 8



Turning Movement Peak Hour Data Plot (3:30 PM)

## Fort Amanda Rd Corridor\_2020-2022

### Crash Summary Sheet

Fatalities	0
Serious Injuries	0
Other Injuries	14

Crash Severity	Crashes	%
(3) Minor Injury Suspected	5	16.67%
(4) Injury Possible	4	13.33%
(5) PDO/No Injury	21	70.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Day of Week	Crashes	%
(1) Sunday	4	13.33%
(2) Monday	3	10.00%
(3) Tuesday	4	13.33%
(4) Wednesday	6	20.00%
(5) Thursday	5	16.67%
(6) Friday	6	20.00%
(7) Saturday	2	6.67%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Hour of Day	Crashes	%
4	1	3.33%
5	1	3.33%
6	3	10.00%
7	2	6.67%
10	2	6.67%
12	1	3.33%
13	2	6.67%
14	6	20.00%
15	3	10.00%
16	1	3.33%
17	1	3.33%
19	3	10.00%
20	3	10.00%
22	1	3.33%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Crashes Per Year	10.00
Fatal and All Injury Crashes	9
Percent Injury	30.0%
Equivalent PDO Index Value	2.38

Year	Crashes	%
2020	11	36.67%
2021	11	36.67%
2022	8	26.67%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Crash Type	Crashes	%
Left Turn	10	33.33%
Fixed Object	5	16.67%
Angle	5	16.67%
Rear End	4	13.33%
Head On	4	13.33%
Overturning	1	3.33%
Other Non-Collision	1	3.33%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Month	Crashes	%
1	3	10.00%
2	5	16.67%
4	1	3.33%
5	1	3.33%
6	2	6.67%
7	3	10.00%
8	3	10.00%
9	2	6.67%
10	1	3.33%
11	6	20.00%
12	3	10.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>



## Fort Amanda Rd Corridor\_2020-2022

### Crash Summary Sheet

Weather Condition	Crashes	%
Clear	19	63.33%
Cloudy	5	16.67%
Snow	3	10.00%
Rain	2	6.67%
Other / Unknown	1	3.33%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Road Condition	Crashes	%
Dry	21	70.00%
Wet	4	13.33%
Ice	3	10.00%
Snow	2	6.67%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Light Condition	Crashes	%
Daylight	19	63.33%
Dark - Lighted Roadway	5	16.67%
Dark - Roadway Not Lighted	4	13.33%
Dawn/Dusk	2	6.67%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Number of Units	Crashes	%
2	21	70.00%
1	7	23.33%
3	2	6.67%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

ODOT Location	Crashes	%
T-Intersection	18	60.00%
Not An Intersection	4	13.33%
Data Not Valid or Not Provided	4	13.33%
Four-Way Intersection	4	13.33%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Work Zone Related	Crashes	%
No	30	100.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Alcohol Related	Crashes	%
No	30	100.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Drug Related (Inc. Marijuana)	Crashes	%
No	30	100.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Contour	Crashes	%
Curve Grade	9	30.00%
Curve Level	12	40.00%
Straight Level	9	30.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Marijuana Related	Crashes	%
No	30	100.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Roadway Departure	Crashes	%
No	23	76.67%
Yes	7	23.33%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Older Driver (65+)	Crashes	%
No	23	76.67%
Yes	7	23.33%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Intersection Related	Crashes	%
Yes	27	90.00%
No	3	10.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Young Driver (15-25)	Crashes	%
No	15	50.00%
Yes	15	50.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Speed Related	Crashes	%
No	27	90.00%
Yes	3	10.00%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Motorcycle Involved	Crashes	%
No	29	96.67%
Yes	1	3.33%
<b>Grand Total</b>	<b>30</b>	<b>100.00%</b>

Select Site Type	Seg/Rur; 2-lane
------------------	-----------------

Crash Severity	Site Average		Statewide Average
	Total (2020-2022)	Total (%)	Total (%)
Fatal Crash	0	0.00%	0.95%
Serious Injury Suspected Crash	0	0.00%	3.98%
Minor Injury Suspected Crash	5	16.67%	14.38%
Injury Possible Crash	4	13.33%	7.43%
Property-Damage-Only	21	70.00%	73.26%
<b>Total</b>	<b>30</b>		

Crashes by Crash Type				
Crash Type	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Unknown	0.01%	0.28%	0.01%	0.08%
Head On	13.33%	2.67%	13.33%	5.60%
Rear End	13.33%	9.11%	13.33%	13.67%
Backing	0.00%	1.15%	0.00%	0.64%
Sideswipe - Meeting	0.00%	0.12%	0.00%	0.15%
Sideswipe - Passing	0.00%	3.93%	0.00%	4.29%
Angle	16.67%	3.13%	16.67%	5.47%
Parked Vehicle	0.00%	0.86%	0.00%	1.03%
Pedestrian	0.00%	0.27%	0.00%	0.96%
Animal	0.00%	32.25%	0.00%	5.65%
Train	0.00%	0.02%	0.00%	0.04%
Pedalcycles	0.00%	0.14%	0.00%	0.48%
Other Non-Vehicle	0.00%	0.01%	0.00%	0.02%
Fixed Object	16.67%	36.90%	16.67%	49.03%
Other Object	0.00%	0.68%	0.00%	0.18%
Falling From Or In Vehicle	0.00%	0.00%	0.00%	0.01%
Overturning	3.33%	2.55%	3.33%	5.98%
Other Non-Collision	3.33%	1.69%	3.33%	0.93%
Left Turn	33.33%	3.72%	33.33%	5.21%
Right Turn	0.00%	0.52%	0.00%	0.58%

Crashes by Light Conditions				
Light Conditions	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Daylight	63.33%	48.09%	63.33%	61.94%
Dawn/Dusk	6.67%	0.00%	6.67%	0.00%
Dark - Lighted Roadway	16.67%	1.70%	16.67%	1.49%
Dark - Roadway Not Lighted	13.33%	42.11%	13.33%	30.87%
Dark - Unknown Roadway Lighting	0.00%	0.33%	0.00%	0.20%
Other / Unknown	0.00%	7.77%	0.00%	5.50%

Crashes by Road Conditions				
Road Conditions	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Dry	67.74%	72.14%	67.74%	73.20%
Wet	12.90%	18.64%	12.90%	18.95%
Snow	6.45%	5.78%	6.45%	4.63%
Ice	9.68%	2.48%	9.68%	2.42%
Sand, Mud, Dirt, Oil, Gravel	0.00%	0.08%	0.00%	0.13%
Water (Standing, Moving)	0.00%	0.12%	0.00%	0.09%
Slush	0.00%	0.53%	0.00%	0.51%
Other / Unknown	3.23%	0.23%	3.23%	0.07%

## Fort Amanda Rd. & Buckeye Rd. Crashes 2020-2022

### Crash Summary Sheet

Fatalities	0
Serious Injuries	0
Other Injuries	12

Crash Severity	Crashes	%
(3) Minor Injury Suspected	4	20.00%
(4) Injury Possible	3	15.00%
(5) PDO/No Injury	13	65.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Day of Week	Crashes	%
(1) Sunday	3	15.00%
(2) Monday	2	10.00%
(3) Tuesday	3	15.00%
(4) Wednesday	4	20.00%
(5) Thursday	3	15.00%
(6) Friday	5	25.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Hour of Day	Crashes	%
4	1	5.00%
5	1	5.00%
6	2	10.00%
7	1	5.00%
10	1	5.00%
13	2	10.00%
14	5	25.00%
16	1	5.00%
17	1	5.00%
19	2	10.00%
20	2	10.00%
22	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

<b>Crashes Per Year</b>	<b>6.67</b>
Fatal and All Injury Crashes	7
<b>Percent Injury</b>	<b>35.0%</b>
Equivalent PDO Index Value	2.63

Year	Crashes	%
2020	9	45.00%
2021	9	45.00%
2022	2	10.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Crash Type	Crashes	%
Left Turn	7	35.00%
Angle	5	25.00%
Head On	4	20.00%
Fixed Object	2	10.00%
Overturning	1	5.00%
Other Non-Collision	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Month	Crashes	%
1	1	5.00%
2	5	25.00%
5	1	5.00%
6	1	5.00%
7	2	10.00%
8	2	10.00%
9	2	10.00%
10	1	5.00%
11	4	20.00%
12	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>



## Fort Amanda Rd. & Buckeye Rd. Crashes 2020-2022

### Crash Summary Sheet

Weather Condition	Crashes	%
Clear	12	60.00%
Cloudy	5	25.00%
Rain	2	10.00%
Snow	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Road Condition	Crashes	%
Dry	15	75.00%
Wet	4	20.00%
Snow	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Light Condition	Crashes	%
Daylight	12	60.00%
Dark - Lighted Roadway	4	20.00%
Dawn/Dusk	2	10.00%
Dark - Roadway Not Lighted	2	10.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Number of Units	Crashes	%
2	14	70.00%
1	4	20.00%
3	2	10.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

ODOT Location	Crashes	%
T-Intersection	17	85.00%
Not An Intersection	2	10.00%
Data Not Valid or Not Provided	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Work Zone Related	Crashes	%
No	20	100.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Alcohol Related	Crashes	%
No	20	100.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Drug Related (Inc. Marijuana)	Crashes	%
No	20	100.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Contour	Crashes	%
Curve Grade	9	45.00%
Curve Level	10	50.00%
Straight Level	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Marijuana Related	Crashes	%
No	20	100.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Roadway Departure	Crashes	%
No	16	80.00%
Yes	4	20.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Older Driver (65+)	Crashes	%
No	16	80.00%
Yes	4	20.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Intersection Related	Crashes	%
Yes	19	95.00%
No	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Young Driver (15-25)	Crashes	%
No	9	45.00%
Yes	11	55.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Speed Related	Crashes	%
No	17	85.00%
Yes	3	15.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Motorcycle Involved	Crashes	%
No	19	95.00%
Yes	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

# Fort Amanda Rd. & Buckeye Rd. Crashes 2020-2022

## Crash Summary Sheet

### Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Making Left Turn	13	65.00%
Slowing or Stopped In Traffic	2	10.00%
Straight Ahead	2	10.00%
Negotiating a Curve	2	10.00%
Making Right Turn	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 1 Contributing Factor	Crashes	%
Failure to Yield	11	55.00%
Drove off Road	3	15.00%
Ran Stop Sign	2	10.00%
Left of Center	2	10.00%
Other Improper Action	1	5.00%
Improper Turn	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 1 Object Struck	Crashes	%
Nothing Struck	18	90.00%
Utility Pole	1	5.00%
Ditch	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 1 Traffic Control	Crashes	%
No Control	15	75.00%
Stop Sign	5	25.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 1 Posted Speed	Crashes	%
45	20	100.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 1 Direction From	Crashes	%
North	6	30.00%
Northeast	6	30.00%
East	4	20.00%
South	2	10.00%
West	1	5.00%
Southwest	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 1 Direction To	Crashes	%
East	12	60.00%
West	4	20.00%
Northeast	2	10.00%
Southeast	1	5.00%
South	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

## Fort Amanda Rd. & Buckeye Rd. Crashes 2020-2022

### Crash Summary Sheet

#### Unit 1 Summary

Unit 1 Type	Crashes	%
Passenger Car	9	45.00%
Sport Utility Vehicle	5	25.00%
Pick up	2	10.00%
Semi-Tractor	1	5.00%
Motorcycle 2 Wheeled	1	5.00%
Cargo Van	1	5.00%
Passenger Van (minivan)	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 1 Special Function	Crashes	%
None	19	95.00%
Other / Unknown	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>



# Fort Amanda Rd. & Buckeye Rd. Crashes 2020-2022

## Crash Summary Sheet

### Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Negotiating a Curve	8	40.00%
Straight Ahead	5	25.00%
	4	20.00%
Making Left Turn	2	10.00%
Slowing or Stopped In Traffic	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 2 Contributing Factor	Crashes	%
None	16	80.00%
	4	20.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 2 Direction From	Crashes	%
	4	20.00%
East	1	5.00%
North	2	10.00%
South	5	25.00%
Southeast	1	5.00%
Southwest	4	20.00%
West	3	15.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 2 Direction To	Crashes	%
	4	20.00%
East	3	15.00%
North	6	30.00%
Northeast	6	30.00%
South	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 2 Type	Crashes	%
Passenger Car	9	45.00%
Sport Utility Vehicle	4	20.00%
	4	20.00%
Semi-Tractor	2	10.00%
Passenger Van (minivan)	1	5.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Unit 2 Special Function	Crashes	%
None	16	80.00%
	4	20.00%
<b>Grand Total</b>	<b>20</b>	<b>100.00%</b>

Select Site Type	Seg/Rur; 2-lane
------------------	-----------------

Crash Severity	Site Average		Statewide Average
	Total (2020-2022)	Total (%)	Total (%)
Fatal Crash	0	0.00%	0.93%
Serious Injury Suspected Crash	0	0.00%	4.50%
Minor Injury Suspected Crash	4	20.00%	14.06%
Injury Possible Crash	3	15.00%	7.65%
Property-Damage-Only	13	65.00%	72.86%
<b>Total</b>	<b>20</b>		

Crashes by Crash Type				
Crash Type	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Unknown	0.00%	0.19%	0.00%	0.12%
Head On	20.00%	2.86%	20.00%	5.74%
Rear End	0.00%	10.26%	0.00%	15.40%
Backing	0.00%	1.12%	0.00%	0.56%
Sideswipe - Meeting	0.00%	2.30%	0.00%	3.00%
Sideswipe - Passing	0.00%	3.66%	0.00%	3.92%
Angle	25.00%	2.36%	25.00%	4.64%
Parked Vehicle	0.00%	0.81%	0.00%	0.79%
Pedestrian	0.00%	0.26%	0.00%	0.88%
Animal	0.00%	33.28%	0.00%	5.60%
Train	0.00%	0.02%	0.00%	0.03%
Pedalcycles	0.00%	0.14%	0.00%	0.48%
Other Non-Vehicle	0.00%	0.01%	0.00%	0.04%
Fixed Object	10.00%	34.58%	10.00%	47.05%
Other Object	0.00%	0.92%	0.00%	0.21%
Falling From Or In Vehicle	0.00%	0.00%	0.00%	0.00%
Overturning	5.00%	2.75%	5.00%	6.35%
Other Non-Collision	5.00%	1.30%	5.00%	0.54%
Left Turn	35.00%	2.66%	35.00%	4.09%
Right Turn	0.00%	0.52%	0.00%	0.56%

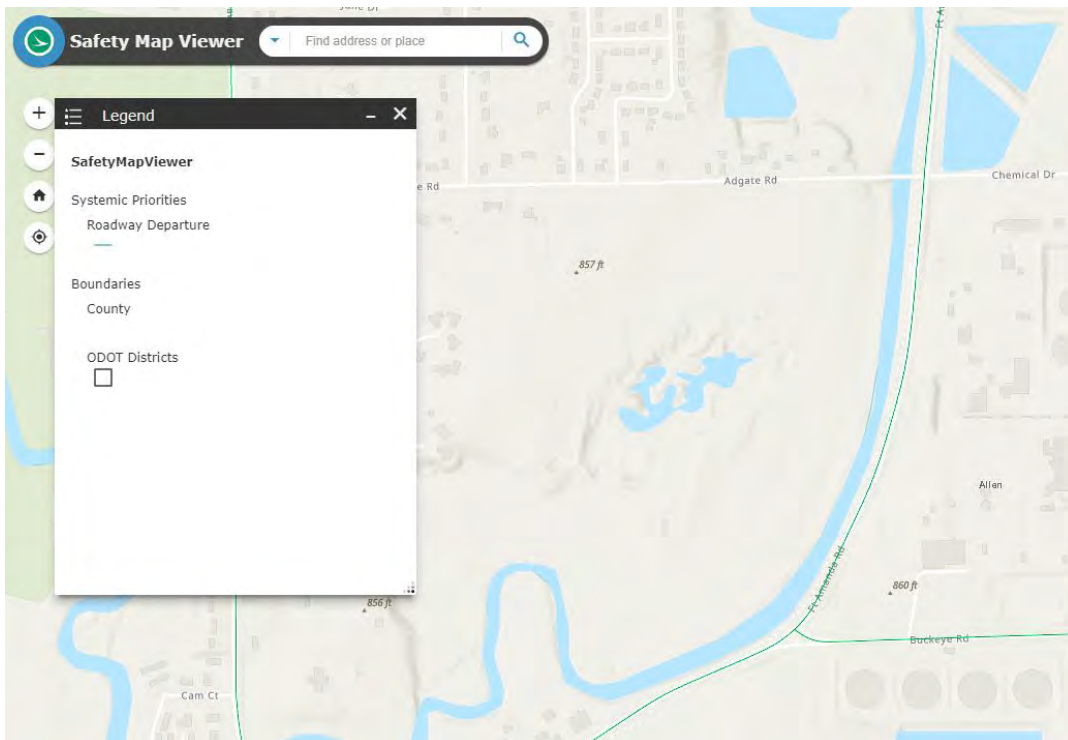
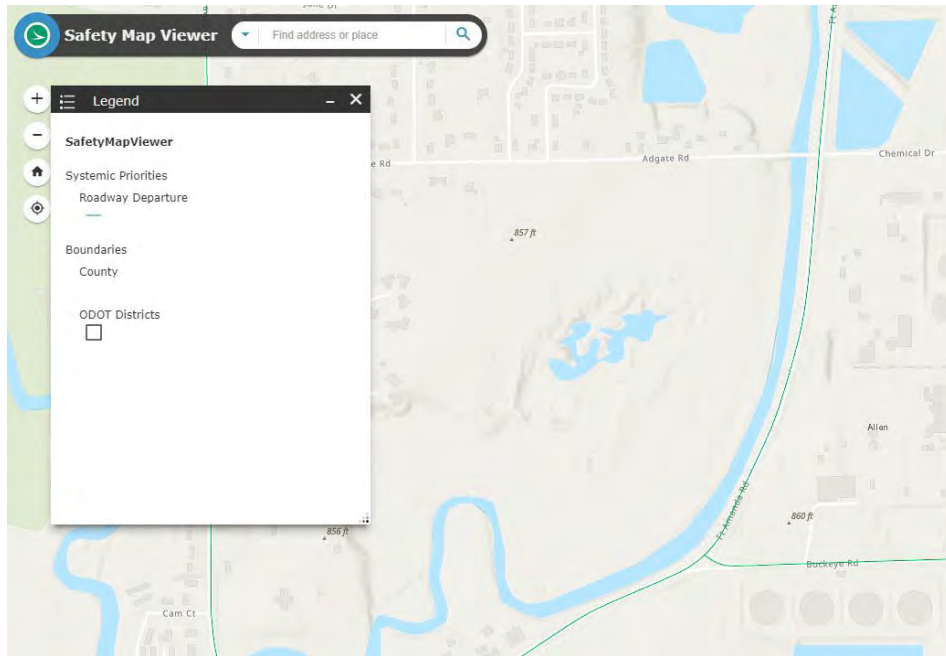
Crashes by Light Conditions				
Light Conditions	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Daylight	60.00%	48.48%	60.00%	63.03%
Dawn/Dusk	10.00%	6.46%	10.00%	4.79%
Dark - Lighted Roadway	20.00%	1.78%	20.00%	1.47%
Dark - Roadway Not Lighted	10.00%	42.57%	10.00%	30.27%
Dark - Unknown Roadway Lighting	0.00%	0.28%	0.00%	0.16%
Other / Unknown	0.00%	0.43%	0.00%	0.28%

Crashes by Road Conditions				
Road Conditions	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Dry	71.43%	69.75%	71.43%	69.58%
Wet	19.05%	18.12%	19.05%	19.13%
Snow	4.76%	8.08%	4.76%	7.31%
Ice	0.00%	3.11%	0.00%	3.16%
Sand, Mud, Dirt, Oil, Gravel	0.00%	0.04%	0.00%	0.06%
Water (Standing, Moving)	0.00%	0.10%	0.00%	0.08%
Slush	0.00%	0.54%	0.00%	0.55%
Other / Unknown	4.76%	0.26%	4.76%	0.13%

**ODOT 2022 County Road High  
Crash Listings (Allen County)**



**2023 CEAO Systematic Curve  
Program Curve Locations**

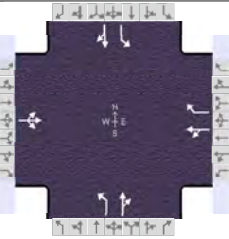




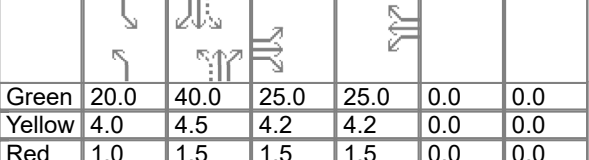
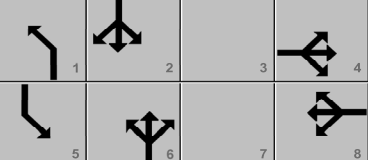
**APPENDIX B**  
**CAPACITY ANALYSES & EMISSIONS SPREADSHEET**



## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency		Duration, h	0.250				
Analyst		Analysis Date	7/25/2023				
Jurisdiction		Time Period					
Urban Street	Ft Amanda Rd	Analysis Year	2023				
Intersection	Ft Amanda Rd & Adgate...	File Name	Ft Amanda & Adgate_2023 AM.xus				
Project Description	2023 AM						

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand ( $v$ ), veh/h	58	4	101	6	2	2	79	352	16	8	105	9

Signal Information														
Cycle, s	132.4	Reference Phase	2											
Offset, s	0	Reference Point	End	Green	20.0	40.0	25.0	25.0	0.0	0.0				
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.5	4.2	4.2	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.5	1.5	1.5	0.0	0.0				

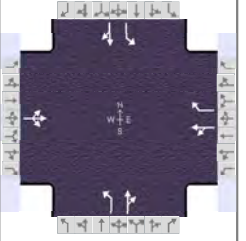
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	1	6	5	2
Case Number		12.0		11.0	1.1	4.0	1.1	4.0
Phase Duration, s		30.7		30.7	25.0	46.0	25.0	46.0
Change Period, ( $Y+R_c$ ), s		5.7		5.7	5.0	6.0	5.0	6.0
Max Allow Headway ( $MAH$ ), s		4.2		4.1	4.0	4.4	4.0	4.4
Queue Clearance Time ( $g_s$ ), s		15.9		3.2	6.1	31.0	2.4	9.9
Green Extension Time ( $g_e$ ), s		0.4		0.0	0.2	1.6	0.0	2.4
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.03		0.00	0.00	0.23	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	1	6	16	5	2	12
Adjusted Flow Rate ( $v$ ), veh/h	175			9 2			85 396			9 123		
Adjusted Saturation Flow Rate ( $s$ ), veh/h/ln	1525			766 673			1589 1655			1511 1564		
Queue Service Time ( $g_s$ ), s	13.9			1.2 0.3			4.1 29.0			0.4 7.9		
Cycle Queue Clearance Time ( $g_c$ ), s	13.9			1.2 0.3			4.1 29.0			0.4 7.9		
Green Ratio ( $g/C$ )	0.19			0.19 0.19			0.45 0.30			0.45 0.30		
Capacity ( $c$ ), veh/h	288			145 127			574 500			344 473		
Volume-to-Capacity Ratio ( $X$ )	0.609			0.059 0.017			0.148 0.791			0.025 0.259		
Back of Queue ( $Q$ ), ft/ln ( 95 th percentile)	237.2			16.5 4.1			70.7 485.8			7.2 147.2		
Back of Queue ( $Q$ ), veh/ln ( 95 th percentile)	9.3			0.4 0.1			2.7 18.5			0.3 5.4		
Queue Storage Ratio ( $RQ$ ) ( 95 th percentile)	0.00			0.00 0.01			0.39 0.00			0.04 0.00		
Uniform Delay ( $d_1$ ), s/veh	49.2			44.1 43.7			21.3 42.4			23.6 35.0		
Incremental Delay ( $d_2$ ), s/veh	3.7			0.2 0.1			0.1 8.6			0.0 0.3		
Initial Queue Delay ( $d_3$ ), s/veh	0.0			0.0 0.0			0.0 0.0			0.0 0.0		
Control Delay ( $d$ ), s/veh	52.9			44.2 43.8			21.4 51.0			23.6 35.3		
Level of Service (LOS)	D			D D			C D			C D		
Approach Delay, s/veh / LOS	52.9	D		44.1	D		45.8	D		34.6	C	
Intersection Delay, s/veh / LOS	45.5						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.97	B	1.94	B	1.71	B
Bicycle LOS Score / LOS	0.78	A	0.51	A	1.28	A	0.70	A

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency				Duration, h	0.250		
Analyst		Analysis Date	7/25/2023	Area Type	Other		
Jurisdiction		Time Period		PHF	0.83		
Urban Street	Ft Amanda Rd	Analysis Year	2023	Analysis Period	1 > 7:00		
Intersection	Ft Amanda Rd & Adgate...	File Name	Ft Amanda & Adgate_2023 PM.xus				
Project Description	2023 PM						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	22	2	54	27	11	16	196	142	12	3	255	51

Signal Information													
Cycle, s	132.4	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	20.0	40.0	25.0	25.0	0.0	0.0			
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.5	4.2	4.2	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	1.5	1.5	1.5	0.0	0.0			

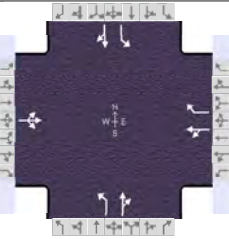
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	1	6	5	2
Case Number		12.0		11.0	1.1	4.0	1.1	4.0
Phase Duration, s		30.7		30.7	25.0	46.0	25.0	46.0
Change Period, ( Y+R <sub>c</sub> ), s		5.7		5.7	5.0	6.0	5.0	6.0
Max Allow Headway ( MAH ), s		4.2		4.1	4.0	4.5	4.0	4.5
Queue Clearance Time ( g <sub>s</sub> ), s		9.3		5.5	14.3	13.4	2.2	28.1
Green Extension Time ( g <sub>e</sub> ), s		0.2		0.1	0.4	2.5	0.0	2.0
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	0.33	0.00	0.00	0.10

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	1	6	16	5	2	12
Adjusted Flow Rate ( v ), veh/h		94			46	19	236	186		4	369	
Adjusted Saturation Flow Rate ( s ), veh/h/ln		1477			1466	1286	1628	1685		1641	1673	
Queue Service Time ( g <sub>s</sub> ), s		7.3			3.5	1.6	12.3	11.4		0.2	26.1	
Cycle Queue Clearance Time ( g <sub>c</sub> ), s		7.3			3.5	1.6	12.3	11.4		0.2	26.1	
Green Ratio ( g/C )		0.19			0.19	0.19	0.45	0.30		0.45	0.30	
Capacity ( c ), veh/h		279			277	243	390	509		543	505	
Volume-to-Capacity Ratio ( X )		0.337			0.165	0.079	0.605	0.364		0.007	0.730	
Back of Queue ( Q ), ft/ln ( 95 th percentile)		125.8			64.5	26.8	216.2	210.7		2.8	424.9	
Back of Queue ( Q ), veh/ln ( 95 th percentile)		4.8			2.3	0.9	8.4	8.2		0.1	16.7	
Queue Storage Ratio ( RQ ) ( 95 th percentile)		0.00			0.00	0.07	1.20	0.00		0.02	0.00	
Uniform Delay ( d <sub>1</sub> ), s/veh		46.5			45.0	44.2	27.1	36.2		20.5	41.4	
Incremental Delay ( d <sub>2</sub> ), s/veh		0.7			0.3	0.1	2.6	0.5		0.0	5.5	
Initial Queue Delay ( d <sub>3</sub> ), s/veh		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( d ), s/veh		47.2			45.2	44.4	29.7	36.8		20.5	46.9	
Level of Service ( LOS )		D			D	D	C	D		C	D	
Approach Delay, s/veh / LOS	47.2	D		45.0	D		32.8	C		46.6	D	
Intersection Delay, s/veh / LOS		40.5				D						

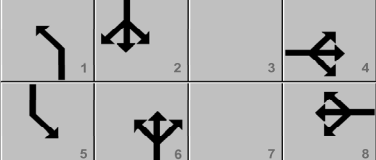
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.97	B	1.94	B	1.71	B
Bicycle LOS Score / LOS	0.64	A	0.59	A	1.18	A	1.10	A



## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency		Duration, h	0.250				
Analyst		Analysis Date	7/25/2023				
Jurisdiction		Time Period					
Urban Street	Ft Amanda Rd	Analysis Year	2023				
Intersection	Ft Amanda Rd & Adgate...	File Name	Ft Amanda & Adgate_2027 AM.xus				
Project Description	2027 AM						

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( $v$ ), veh/h	60	4	105	6	2	2	82	366	17	8	109	9

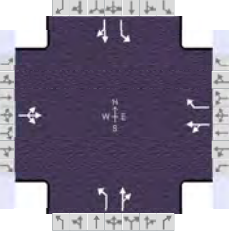
Signal Information												
Cycle, s	132.4	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	20.0	40.0	25.0	25.0	0.0	0.0				
		Yellow	4.0	4.5	4.2	4.2	0.0	0.0				
		Red	1.0	1.5	1.5	1.5	0.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	1	6	5	2
Case Number		12.0		11.0	1.1	4.0	1.1	4.0
Phase Duration, s		30.7		30.7	25.0	46.0	25.0	46.0
Change Period, ( $Y+R_c$ ), s		5.7		5.7	5.0	6.0	5.0	6.0
Max Allow Headway ( $MAH$ ), s		4.2		4.1	4.0	4.4	4.0	4.4
Queue Clearance Time ( $g_s$ ), s		16.5		3.2	6.3	32.6	2.4	10.2
Green Extension Time ( $g_e$ ), s		0.4		0.0	0.2	1.5	0.0	2.5
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.05		0.00	0.00	0.39	0.00	0.00

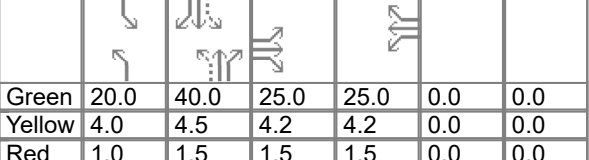
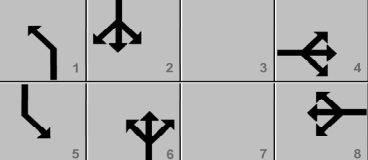
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	1	6	16	5	2	12
Adjusted Flow Rate ( $v$ ), veh/h	182			9 2			88 412			9 127		
Adjusted Saturation Flow Rate ( $s$ ), veh/h/ln	1525			766 673			1589 1655			1511 1565		
Queue Service Time ( $g_s$ ), s	14.5			1.2 0.3			4.3 30.6			0.4 8.2		
Cycle Queue Clearance Time ( $g_c$ ), s	14.5			1.2 0.3			4.3 30.6			0.4 8.2		
Green Ratio ( $g/C$ )	0.19			0.19 0.19			0.45 0.30			0.45 0.30		
Capacity ( $c$ ), veh/h	288			145 127			570 500			333 473		
Volume-to-Capacity Ratio ( $X$ )	0.631			0.059 0.017			0.155 0.824			0.026 0.268		
Back of Queue ( $Q$ ), ft/ln ( 95 th percentile)	246.5			16.5 4.1			73.5 515.8			7.2 152.7		
Back of Queue ( $Q$ ), veh/ln ( 95 th percentile)	9.7			0.4 0.1			2.8 19.7			0.3 5.6		
Queue Storage Ratio ( $RQ$ ) ( 95 th percentile)	0.00			0.00 0.01			0.41 0.00			0.04 0.00		
Uniform Delay ( $d_1$ ), s/veh	49.5			44.1 43.7			21.4 42.9			24.0 35.1		
Incremental Delay ( $d_2$ ), s/veh	4.4			0.2 0.1			0.1 10.9			0.0 0.4		
Initial Queue Delay ( $d_3$ ), s/veh	0.0			0.0 0.0			0.0 0.0			0.0 0.0		
Control Delay ( $d$ ), s/veh	53.8			44.2 43.8			21.5 53.9			24.0 35.5		
Level of Service (LOS)	D			D D			C D			C D		
Approach Delay, s/veh / LOS	53.8		D	44.1		D	48.2		D	34.7		C
Intersection Delay, s/veh / LOS	47.2						D					

Multimodal Results	EB		WB		NB		SB	
	Pedestrian LOS Score / LOS	1.95	B	1.97	B	1.94	B	1.71
Bicycle LOS Score / LOS	0.79	A	0.51	A	1.31	A	0.71	A

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency		Duration, h	0.250				
Analyst		Analysis Date	7/25/2023				
Jurisdiction		Time Period					
Urban Street	Ft Amanda Rd	Analysis Year	2023				
Intersection	Ft Amanda Rd & Adgate...	File Name	Ft Amanda & Adgate_2027 PM.xus				
Project Description	2027 PM						

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h	23	2	56	28	11	17	204	148	12	3	265	53

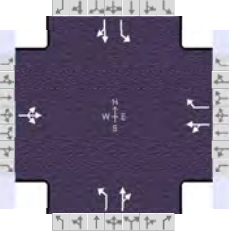
Signal Information												
Cycle, s	132.4	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	20.0	40.0	25.0	25.0	0.0	0.0				
		Yellow	4.0	4.5	4.2	4.2	0.0	0.0				
		Red	1.0	1.5	1.5	1.5	0.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	1	6	5	2
Case Number		12.0		11.0	1.1	4.0	1.1	4.0
Phase Duration, s		30.7		30.7	25.0	46.0	25.0	46.0
Change Period, ( Y+R <sub>c</sub> ), s		5.7		5.7	5.0	6.0	5.0	6.0
Max Allow Headway ( MAH ), s		4.2		4.1	4.0	4.5	4.0	4.5
Queue Clearance Time ( g <sub>s</sub> ), s		9.6		5.6	14.9	13.9	2.2	29.5
Green Extension Time ( g <sub>e</sub> ), s		0.2		0.1	0.4	2.6	0.0	2.0
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	0.49	0.00	0.00	0.16

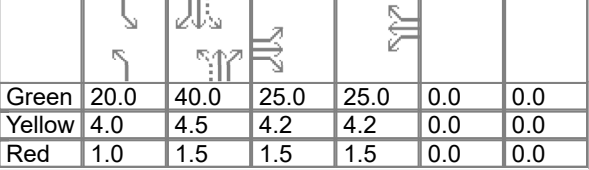
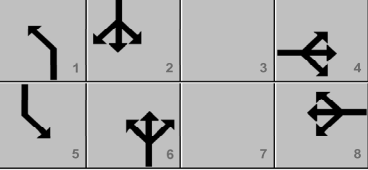
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	1	6	16	5	2	12
Adjusted Flow Rate ( v ), veh/h	98			47 20			246 193			4 383		
Adjusted Saturation Flow Rate ( s ), veh/h/ln	1477			1465 1286			1628 1686			1641 1673		
Queue Service Time ( g <sub>s</sub> ), s	7.6			3.6 1.7			12.9 11.9			0.2 27.5		
Cycle Queue Clearance Time ( g <sub>c</sub> ), s	7.6			3.6 1.7			12.9 11.9			0.2 27.5		
Green Ratio ( g/C )	0.19			0.19 0.19			0.45 0.30			0.45 0.30		
Capacity ( c ), veh/h	279			277 243			379 509			537 505		
Volume-to-Capacity Ratio ( X )	0.350			0.170 0.084			0.648 0.378			0.007 0.758		
Back of Queue ( Q ), ft/ln ( 95 th percentile)	131			66.3 28.5			228 217.9			2.8 446.6		
Back of Queue ( Q ), veh/ln ( 95 th percentile)	5.0			2.3 1.0			8.9 8.5			0.1 17.6		
Queue Storage Ratio ( RQ ) ( 95 th percentile)	0.00			0.00 0.08			1.27 0.00			0.02 0.00		
Uniform Delay ( d <sub>1</sub> ), s/veh	46.6			45.0 44.3			27.7 36.4			20.6 41.8		
Incremental Delay ( d <sub>2</sub> ), s/veh	0.7			0.3 0.1			3.8 0.6			0.0 6.8		
Initial Queue Delay ( d <sub>3</sub> ), s/veh	0.0			0.0 0.0			0.0 0.0			0.0 0.0		
Control Delay ( d ), s/veh	47.4			45.3 44.4			31.5 37.0			20.6 48.6		
Level of Service ( LOS )	D			D D			C D			C D		
Approach Delay, s/veh / LOS	47.4	D		45.0	D		33.9	C		48.3	D	
Intersection Delay, s/veh / LOS	41.6						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.97	B	1.94	B	1.71	B
Bicycle LOS Score / LOS	0.65	A	0.60	A	1.21	A	1.13	A

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency		Duration, h	0.250				
Analyst		Analysis Date	7/25/2023				
Jurisdiction		Time Period					
Urban Street	Ft Amanda Rd	Analysis Year	2023				
Intersection	Ft Amanda Rd & Adgate...	File Name	Ft Amanda & Adgate_2047 AM.xus				
Project Description	2047 AM						

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( $v$ ), veh/h	72	5	125	7	2	2	98	436	20	10	130	11

Signal Information												
Cycle, s	132.4	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	20.0	40.0	25.0	25.0	0.0	0.0				
		Yellow	4.0	4.5	4.2	4.2	0.0	0.0				
		Red	1.0	1.5	1.5	1.5	0.0	0.0				

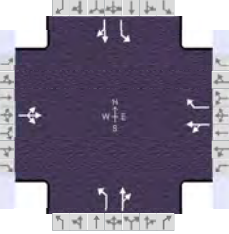
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	1	6	5	2
Case Number		12.0		11.0	1.1	4.0	1.1	4.0
Phase Duration, s		30.7		30.7	25.0	46.0	25.0	46.0
Change Period, ( $Y+R_c$ ), s		5.7		5.7	5.0	6.0	5.0	6.0
Max Allow Headway ( $MAH$ ), s		4.2		4.1	4.0	4.4	4.0	4.4
Queue Clearance Time ( $g_s$ ), s		19.8		3.4	7.1	40.9	2.5	11.9
Green Extension Time ( $g_e$ ), s		0.3		0.0	0.2	0.0	0.0	3.0
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.53		0.00	0.00	1.00	0.00	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	1	6	16	5	2	12
Adjusted Flow Rate ( $v$ ), veh/h		217			10	2	105	490		11	152	
Adjusted Saturation Flow Rate ( $s$ ), veh/h/ln		1526			765	673	1589	1655		1511	1564	
Queue Service Time ( $g_s$ ), s		17.8			1.4	0.3	5.1	38.9		0.5	9.9	
Cycle Queue Clearance Time ( $g_c$ ), s		17.8			1.4	0.3	5.1	38.9		0.5	9.9	
Green Ratio ( $g/C$ )		0.19			0.19	0.19	0.45	0.30		0.45	0.30	
Capacity ( $c$ ), veh/h		288			144	127	548	500		283	473	
Volume-to-Capacity Ratio ( $X$ )		0.754			0.067	0.017	0.192	0.981		0.038	0.321	
Back of Queue ( $Q$ ), ft/ln ( 95 th percentile)		304.8			18.6	4.1	89	725.1		9	186	
Back of Queue ( $Q$ ), veh/ln ( 95 th percentile)		12.0			0.5	0.1	3.4	27.7		0.3	6.8	
Queue Storage Ratio ( $RQ$ ) ( 95 th percentile)		0.00			0.00	0.01	0.49	0.00		0.05	0.00	
Uniform Delay ( $d_1$ ), s/veh		50.8			44.1	43.7	21.8	45.8		26.0	35.7	
Incremental Delay ( $d_2$ ), s/veh		10.7			0.2	0.1	0.2	35.2		0.1	0.5	
Initial Queue Delay ( $d_3$ ), s/veh		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( $d$ ), s/veh		61.5			44.3	43.8	22.0	81.0		26.0	36.2	
Level of Service (LOS)		E			D	D	C	F		C	D	
Approach Delay, s/veh / LOS	61.5	E		44.2	D		70.5	E		35.5	D	
Intersection Delay, s/veh / LOS				62.5						E		

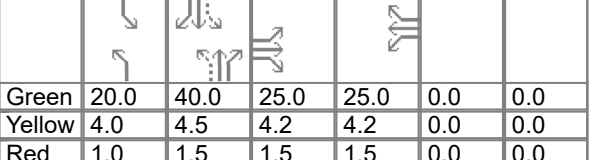
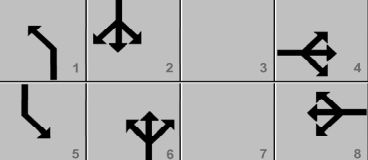
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.97	B	1.94	B	1.71	B
Bicycle LOS Score / LOS	0.85	A	0.51	A	1.47	A	0.76	A



## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency		Duration, h	0.250				
Analyst		Analysis Date	7/25/2023				
Jurisdiction		Time Period					
Urban Street	Ft Amanda Rd	Analysis Year	2023				
Intersection	Ft Amanda Rd & Adgate...	File Name	Ft Amanda & Adgate_2047 PM.xus				
Project Description	2047 PM						

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( $v$ ), veh/h	27	2	67	33	14	20	243	176	15	4	316	63

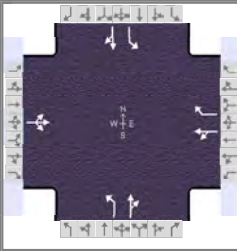
Signal Information												
Cycle, s	132.4	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	20.0	40.0	25.0	25.0	0.0	0.0				
		Yellow	4.0	4.5	4.2	4.2	0.0	0.0				
		Red	1.0	1.5	1.5	1.5	0.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	1	6	5	2
Case Number		12.0		11.0	1.1	4.0	1.1	4.0
Phase Duration, s		30.7		30.7	25.0	46.0	25.0	46.0
Change Period, ( $Y+R_c$ ), s		5.7		5.7	5.0	6.0	5.0	6.0
Max Allow Headway ( $MAH$ ), s		4.2		4.1	4.0	4.5	4.0	4.5
Queue Clearance Time ( $g_s$ ), s		11.1		6.3	19.0	16.6	2.2	36.7
Green Extension Time ( $g_e$ ), s		0.3		0.2	0.1	3.2	0.0	1.1
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.00		0.00	1.00	0.01	0.00	1.00

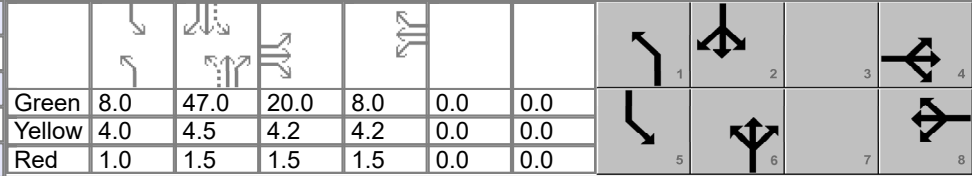
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	1	6	16	5	2	12
Adjusted Flow Rate ( $v$ ), veh/h		116			57	24	293	230		5	457	
Adjusted Saturation Flow Rate ( $s$ ), veh/h/ln		1476			1466	1286	1628	1685		1641	1673	
Queue Service Time ( $g_s$ ), s		9.1			4.3	2.1	17.0	14.6		0.2	34.7	
Cycle Queue Clearance Time ( $g_c$ ), s		9.1			4.3	2.1	17.0	14.6		0.2	34.7	
Green Ratio ( $g/C$ )		0.19			0.19	0.19	0.45	0.30		0.45	0.30	
Capacity ( $c$ ), veh/h		279			277	243	323	509		505	505	
Volume-to-Capacity Ratio ( $X$ )		0.415			0.205	0.099	0.905	0.452		0.010	0.904	
Back of Queue ( $Q$ ), ft/ln ( 95 th percentile)		157.8			80.5	33.6	335.4	256.3		3.7	592.6	
Back of Queue ( $Q$ ), veh/ln ( 95 th percentile)		6.1			2.8	1.2	13.1	10.0		0.1	23.3	
Queue Storage Ratio ( $RQ$ ) ( 95 th percentile)		0.00			0.00	0.09	1.86	0.00		0.02	0.00	
Uniform Delay ( $d_1$ ), s/veh		47.3			45.3	44.4	33.4	37.3		20.9	44.3	
Incremental Delay ( $d_2$ ), s/veh		1.0			0.4	0.2	27.5	0.8		0.0	19.7	
Initial Queue Delay ( $d_3$ ), s/veh		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( $d$ ), s/veh		48.3			45.7	44.6	60.9	38.1		20.9	64.0	
Level of Service (LOS)		D			D	D	E	D		C	E	
Approach Delay, s/veh / LOS	48.3	D		45.3	D		50.9	D		63.6	E	
Intersection Delay, s/veh / LOS	55.2						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.97	B	1.94	B	1.71	B
Bicycle LOS Score / LOS	0.68	A	0.62	A	1.35	A	1.25	A

## HCS Signalized Intersection Results Summary

General Information					Intersection Information							
Agency					Duration, h	0.250						
Analyst					Analysis Date	7/25/2023						
Jurisdiction					Area Type	Other						
Urban Street	Ft Amanda Rd		Time Period		PHF	0.93						
Intersection	Ft Amanda Rd & Adgate...		Analysis Year	2023	Analysis Period	1 > 7:00						
Project Description	2027 AM		File Name	Ft Amanda & Adgate_2027 AM_Prop.xus								

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( $v$ ), veh/h	60	4	105	6	2	2	82	366	17	8	109	9

Signal Information																								
Cycle, s	105.4	Reference Phase	2																					
Offset, s	0	Reference Point	End																					
Uncoordinated	Yes	Simult. Gap E/W	On																					
Force Mode	Fixed	Simult. Gap N/S	On	Green	8.0	47.0	20.0	8.0	0.0	0.0	Yellow	4.0	4.5	4.2	4.2	0.0	0.0	Red	1.0	1.5	1.5	1.5	0.0	0.0

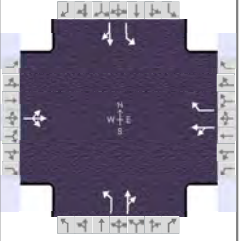
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	1	6	5	2
Case Number		12.0		11.0	1.1	4.0	1.1	4.0
Phase Duration, s		25.7		13.7	13.0	53.0	13.0	53.0
Change Period, ( $Y+R_c$ ), s		5.7		5.7	5.0	6.0	5.0	6.0
Max Allow Headway ( $MAH$ ), s		4.2		4.1	4.0	4.4	4.0	4.4
Queue Clearance Time ( $g_s$ ), s		13.6		3.1	5.0	21.3	2.3	7.2
Green Extension Time ( $g_e$ ), s		0.3		0.0	0.1	0.0	0.0	2.5
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.20		0.21	1.00	1.00	0.04	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	1	6	16	5	2	12
Adjusted Flow Rate ( $v$ ), veh/h	182			9 2			88 412			9 127		
Adjusted Saturation Flow Rate ( $s$ ), veh/h/ln	1525			766 673			1589 1655			1511 1565		
Queue Service Time ( $g_s$ ), s	11.6			1.1 0.3			3.0 19.3			0.3 5.2		
Cycle Queue Clearance Time ( $g_c$ ), s	11.6			1.1 0.3			3.0 19.3			0.3 5.2		
Green Ratio ( $g/C$ )	0.19			0.08 0.08			0.52 0.45			0.52 0.45		
Capacity ( $c$ ), veh/h	289			58 51			651 738			401 698		
Volume-to-Capacity Ratio ( $X$ )	0.628			0.148 0.042			0.135 0.558			0.021 0.182		
Back of Queue ( $Q$ ), ft/ln ( 95 th percentile)	202.6			15.7 3.9			46.7 303			4.5 87.5		
Back of Queue ( $Q$ ), veh/ln ( 95 th percentile)	8.0			0.4 0.1			1.8 11.6			0.2 3.2		
Queue Storage Ratio ( $RQ$ ) ( 95 th percentile)	0.00			0.00 0.01			0.26 0.00			0.03 0.00		
Uniform Delay ( $d_1$ ), s/veh	39.3			45.5 45.1			13.0 21.5			14.3 17.6		
Incremental Delay ( $d_2$ ), s/veh	4.3			1.2 0.3			0.1 1.1			0.0 0.1		
Initial Queue Delay ( $d_3$ ), s/veh	0.0			0.0 0.0			0.0 0.0			0.0 0.0		
Control Delay ( $d$ ), s/veh	43.5			46.7 45.5			13.1 22.6			14.3 17.8		
Level of Service (LOS)	D			D D			B C			B B		
Approach Delay, s/veh / LOS	43.5	D		46.4	D		20.9	C		17.5	B	
Intersection Delay, s/veh / LOS	25.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.96	B	1.91	B	1.68	B
Bicycle LOS Score / LOS	0.79	A	0.51	A	1.31	A	0.71	A

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency				Duration, h	0.250		
Analyst				Analysis Date	7/25/2023		
Jurisdiction				Area Type	Other		
Urban Street	Ft Amanda Rd	Time Period		PHF	0.83		
Intersection	Ft Amanda Rd & Adgate...	Analysis Year	2023	Analysis Period	1 > 7:00		
Project Description	2027 PM			File Name	Ft Amanda & Adgate_2027 PM_Prop.xus		



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( v ), veh/h	23	2	56	28	11	17	204	148	12	3	265	53

Signal Information				Signal Phases										
Cycle, s	99.4	Reference Phase	2											
Offset, s	0	Reference Point	End	Green	8.0	1.0	47.0	13.0	8.0	0.0				
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	0.0	4.5	4.2	4.2	0.0				
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	0.0	1.5	1.5	1.5	0.0				

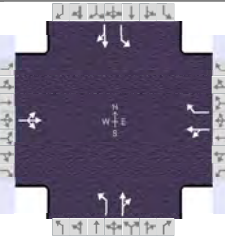
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	1	6	5	2
Case Number		12.0		11.0	1.1	4.0	1.1	4.0
Phase Duration, s		18.7		13.7	14.0	54.0	13.0	53.0
Change Period, ( Y+R <sub>c</sub> ), s		5.7		5.7	5.0	6.0	5.0	6.0
Max Allow Headway ( MAH ), s		4.2		4.1	4.0	4.5	4.0	4.5
Queue Clearance Time ( g <sub>s</sub> ), s		8.1		5.0	9.7	8.6	2.1	17.6
Green Extension Time ( g <sub>e</sub> ), s		0.1		0.0	0.0	2.7	0.0	0.0
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		0.53		1.00	1.00	0.00	0.01	1.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	1	6	16	5	2	12
Adjusted Flow Rate ( v ), veh/h	98			47 20			246 193			4 383		
Adjusted Saturation Flow Rate ( s ), veh/h/ln	1477			1465 1286			1628 1686			1641 1673		
Queue Service Time ( g <sub>s</sub> ), s	6.1			3.0 1.5			7.7 6.6			0.1 15.6		
Cycle Queue Clearance Time ( g <sub>c</sub> ), s	6.1			3.0 1.5			7.7 6.6			0.1 15.6		
Green Ratio ( g/C )	0.13			0.08 0.08			0.56 0.48			0.55 0.47		
Capacity ( c ), veh/h	193			118 104			533 814			676 791		
Volume-to-Capacity Ratio ( X )	0.505			0.398 0.198			0.461 0.237			0.005 0.484		
Back of Queue ( Q ), ft/ln ( 95 th percentile)	105.2			57.7 24.6			117.2 109.2			1.5 240.6		
Back of Queue ( Q ), veh/ln ( 95 th percentile)	4.0			2.0 0.9			4.6 4.3			0.1 9.5		
Queue Storage Ratio ( RQ ) ( 95 th percentile)	0.00			0.00 0.07			0.65 0.00			0.01 0.00		
Uniform Delay ( d <sub>1</sub> ), s/veh	40.2			43.4 42.7			12.8 15.0			10.2 17.9		
Incremental Delay ( d <sub>2</sub> ), s/veh	2.1			2.2 0.9			0.6 0.2			0.0 0.6		
Initial Queue Delay ( d <sub>3</sub> ), s/veh	0.0			0.0 0.0			0.0 0.0			0.0 0.0		
Control Delay ( d ), s/veh	42.3			45.6 43.6			13.4 15.2			10.2 18.5		
Level of Service ( LOS )	D			D D			B B			B B		
Approach Delay, s/veh / LOS	42.3	D		45.0	D		14.2	B		18.4	B	
Intersection Delay, s/veh / LOS	20.7						C					

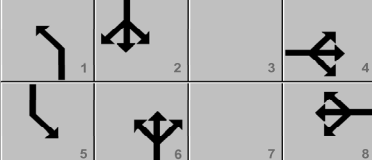
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.95	B	1.90	B	1.68	B
Bicycle LOS Score / LOS	0.65	A	0.60	A	1.21	A	1.13	A



## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency		Duration, h	0.250				
Analyst		Analysis Date	7/25/2023				
Jurisdiction		Time Period					
Urban Street	Ft Amanda Rd	Analysis Year	2023				
Intersection	Ft Amanda Rd & Adgate...	File Name	Ft Amanda & Adgate_2047 AM_Prop.xus				
Project Description	2047 AM						

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( $v$ ), veh/h	72	5	125	7	2	2	98	436	20	10	130	11

Signal Information												
Cycle, s	105.4	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	8.0	47.0	20.0	8.0	0.0	0.0				
		Yellow	4.0	4.5	4.2	4.2	0.0	0.0				
		Red	1.0	1.5	1.5	1.5	0.0	0.0				

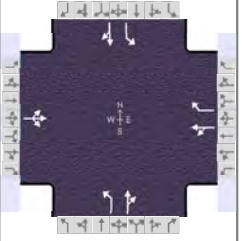
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	1	6	5	2
Case Number		12.0		11.0	1.1	4.0	1.1	4.0
Phase Duration, s		25.7		13.7	13.0	53.0	13.0	53.0
Change Period, ( $Y+R_c$ ), s		5.7		5.7	5.0	6.0	5.0	6.0
Max Allow Headway ( $MAH$ ), s		4.2		4.1	4.0	4.4	4.0	4.4
Queue Clearance Time ( $g_s$ ), s		16.2		3.2	5.6	26.6	2.4	8.3
Green Extension Time ( $g_e$ ), s		0.3		0.0	0.1	0.0	0.0	3.1
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		1.00		0.28	1.00	1.00	0.05	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	1	6	16	5	2	12
Adjusted Flow Rate ( $v$ ), veh/h		217			10	2	105	490		11	152	
Adjusted Saturation Flow Rate ( $s$ ), veh/h/ln		1526			765	673	1589	1655		1511	1564	
Queue Service Time ( $g_s$ ), s		14.2			1.2	0.3	3.6	24.6		0.4	6.3	
Cycle Queue Clearance Time ( $g_c$ ), s		14.2			1.2	0.3	3.6	24.6		0.4	6.3	
Green Ratio ( $g/C$ )		0.19			0.08	0.08	0.52	0.45		0.52	0.45	
Capacity ( $c$ ), veh/h		289			58	51	629	738		344	698	
Volume-to-Capacity Ratio ( $X$ )		0.750			0.167	0.042	0.168	0.664		0.031	0.217	
Back of Queue ( $Q$ ), ft/ln ( 95 th percentile)		252.2			17.7	3.9	56.4	375.7		5.7	106.5	
Back of Queue ( $Q$ ), veh/ln ( 95 th percentile)		9.9			0.5	0.1	2.2	14.3		0.2	3.9	
Queue Storage Ratio ( $RQ$ ) ( 95 th percentile)		0.00			0.00	0.01	0.31	0.00		0.03	0.00	
Uniform Delay ( $d_1$ ), s/veh		40.3			45.6	45.1	13.3	23.0		15.5	17.9	
Incremental Delay ( $d_2$ ), s/veh		10.4			1.3	0.3	0.1	2.4		0.0	0.2	
Initial Queue Delay ( $d_3$ ), s/veh		0.0			0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay ( $d$ ), s/veh		50.7			46.9	45.5	13.4	25.4		15.6	18.1	
Level of Service (LOS)		D			D	D	B	C		B	B	
Approach Delay, s/veh / LOS	50.7	D		46.7	D		23.3	C		17.9	B	
Intersection Delay, s/veh / LOS	28.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.96	B	1.91	B	1.68	B
Bicycle LOS Score / LOS	0.85	A	0.51	A	1.47	A	0.76	A

## HCS Signalized Intersection Results Summary

General Information				Intersection Information			
Agency				Duration, h	0.250		
Analyst				Analysis Date	7/25/2023		
Jurisdiction				Area Type	Other		
Urban Street	Ft Amanda Rd	Time Period		PHF	0.83		
Intersection	Ft Amanda Rd & Adgate...	Analysis Year	2023	Analysis Period	1 > 7:00		
Project Description	2047 PM			File Name	Ft Amanda & Adgate_2047 PM_Prop.xus		



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand ( $v$ ), veh/h	27	2	67	33	14	20	243	176	15	4	316	63

Signal Information				Signal Phases							
Cycle, s	99.4	Reference Phase	2								
Offset, s	0	Reference Point	End	Green	8.0	1.0	47.0	13.0	8.0	0.0	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	0.0	4.5	4.2	4.2	0.0	
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	0.0	1.5	1.5	1.5	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		4		8	1	6	5	2
Case Number		12.0		11.0	1.1	4.0	1.1	4.0
Phase Duration, s		18.7		13.7	14.0	54.0	13.0	53.0
Change Period, ( $Y+R_c$ ), s		5.7		5.7	5.0	6.0	5.0	6.0
Max Allow Headway ( $MAH$ ), s		4.2		4.1	4.0	4.5	4.0	4.5
Queue Clearance Time ( $g_s$ ), s		9.3		5.7	11.0	10.1	2.1	21.7
Green Extension Time ( $g_e$ ), s		0.1		0.0	0.0	3.4	0.0	0.0
Phase Call Probability		1.00		1.00	1.00	1.00	1.00	1.00
Max Out Probability		1.00		1.00	1.00	0.00	0.02	1.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	1	6	16	5	2	12
Adjusted Flow Rate ( $v$ ), veh/h	116			57 24			293 230			5 457		
Adjusted Saturation Flow Rate ( $s$ ), veh/h/ln	1476			1466 1286			1628 1685			1641 1673		
Queue Service Time ( $g_s$ ), s	7.3			3.7 1.7			9.0 8.1			0.1 19.7		
Cycle Queue Clearance Time ( $g_c$ ), s	7.3			3.7 1.7			9.0 8.1			0.1 19.7		
Green Ratio ( $g/C$ )	0.13			0.08 0.08			0.56 0.48			0.55 0.47		
Capacity ( $c$ ), veh/h	193			118 104			474 814			643 791		
Volume-to-Capacity Ratio ( $X$ )	0.599			0.480 0.233			0.617 0.283			0.007 0.577		
Back of Queue ( $Q$ ), ft/ln ( 95 th percentile)	132.5			70.6 29.1			153.7 134			2 294		
Back of Queue ( $Q$ ), veh/ln ( 95 th percentile)	5.1			2.5 1.0			6.0 5.2			0.1 11.6		
Queue Storage Ratio ( $RQ$ ) ( 95 th percentile)	0.00			0.00 0.08			0.85 0.00			0.01 0.00		
Uniform Delay ( $d_1$ ), s/veh	40.7			43.7 42.8			15.1 15.4			10.4 19.0		
Incremental Delay ( $d_2$ ), s/veh	5.0			3.0 1.1			2.4 0.2			0.0 1.2		
Initial Queue Delay ( $d_3$ ), s/veh	0.0			0.0 0.0			0.0 0.0			0.0 0.0		
Control Delay ( $d$ ), s/veh	45.8			46.7 44.0			17.5 15.6			10.4 20.2		
Level of Service (LOS)	D			D D			B B			B C		
Approach Delay, s/veh / LOS	45.8	D		45.9	D		16.7	B		20.1	C	
Intersection Delay, s/veh / LOS	22.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.95	B	1.95	B	1.90	B	1.68	B
Bicycle LOS Score / LOS	0.68	A	0.62	A	1.35	A	1.25	A

# HCS Two-Way Stop-Control Report

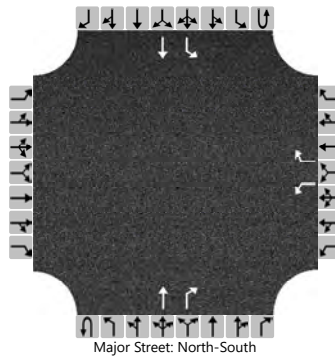
## General Information

Analyst	
Agency/Co.	
Date Performed	7/25/2023
Analysis Year	2023
Time Analyzed	2023 AM
Intersection Orientation	North-South
Project Description	Ft Amanda & Buckeye Rd

## Site Information

Intersection	Ft Amanda & Buckeye Rd
Jurisdiction	
East/West Street	Buckeye Rd
North/South Street	Ft Amanda Rd
Peak Hour Factor	0.89
Analysis Time Period (hrs)	0.25

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1		0	1	1		0	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						98		117			332	206		117	74	
Percent Heavy Vehicles (%)						15		15						10		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				Yes							
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.55		6.35						4.20		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.64		3.44						2.29		

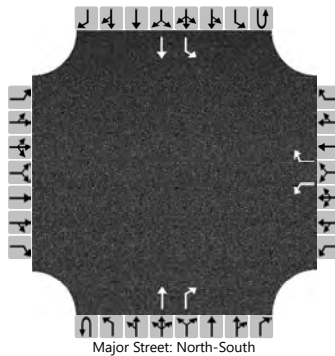
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						110		131						131		
Capacity, c (veh/h)						333		645						1143		
v/c Ratio						0.33		0.20						0.12		
95% Queue Length, Q <sub>95</sub> (veh)						1.4		0.8						0.4		
Control Delay (s/veh)						21.0		12.0						8.6		
Level of Service (LOS)						C		B						A		
Approach Delay (s/veh)					16.1								5.2			
Approach LOS					C								A			

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Ft Amanda & Buckeye Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Buckeye Rd				
Analysis Year	2023	North/South Street	Ft Amanda Rd				
Time Analyzed	2023 PM	Peak Hour Factor	0.75				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	Ft Amanda & Buckeye Rd						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						214		240			137	111		123	233	
Percent Heavy Vehicles (%)						4		4						6		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				Yes							
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2								4.1		
Critical Headway (sec)						6.44		6.24								4.16		
Base Follow-Up Headway (sec)						3.5		3.3								2.2		
Follow-Up Headway (sec)						3.54		3.34								2.25		

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						285		320								164		
Capacity, c (veh/h)						300		855								1369		
v/c Ratio						0.95		0.37								0.12		
95% Queue Length, Q <sub>95</sub> (veh)						9.4		1.7								0.4		
Control Delay (s/veh)						78.1		11.7								8.0		
Level of Service (LOS)						F		B								A		
Approach Delay (s/veh)					43.0								2.8					
Approach LOS					E								A					



# HCS Two-Way Stop-Control Report

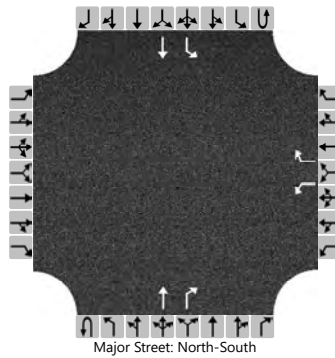
## General Information

Analyst	
Agency/Co.	
Date Performed	7/25/2023
Analysis Year	2027
Time Analyzed	2027 AM
Intersection Orientation	North-South
Project Description	Ft Amanda & Buckeye Rd

## Site Information

Intersection	Ft Amanda & Buckeye Rd
Jurisdiction	
East/West Street	Buckeye Rd
North/South Street	Ft Amanda Rd
Peak Hour Factor	0.89
Analysis Time Period (hrs)	0.25

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						102		122			345	214		122	77	
Percent Heavy Vehicles (%)						15		15						10		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				Yes							
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.55		6.35						4.20		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.64		3.44						2.29		

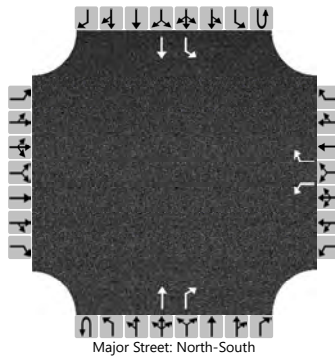
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						115		137						137		
Capacity, c (veh/h)						318		633						1129		
v/c Ratio						0.36		0.22						0.12		
95% Queue Length, Q <sub>95</sub> (veh)						1.6		0.8						0.4		
Control Delay (s/veh)						22.6		12.3						8.6		
Level of Service (LOS)						C		B						A		
Approach Delay (s/veh)					17.0								5.3			
Approach LOS					C								A			

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Ft Amanda & Buckeye Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Buckeye Rd				
Analysis Year	2027	North/South Street	Ft Amanda Rd				
Time Analyzed	2027 PM	Peak Hour Factor	0.75				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	Ft Amanda & Buckeye Rd						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						223		250			142	115		128	242	
Percent Heavy Vehicles (%)						4		4						6		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				Yes							
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.44		6.24							4.16		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.54		3.34							2.25		

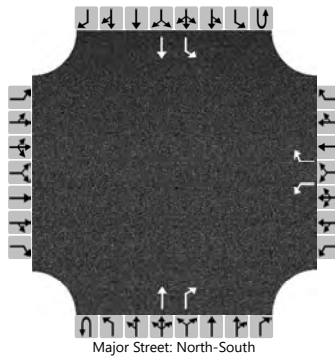
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						297		333							171		
Capacity, c (veh/h)						286		847							1361		
v/c Ratio						1.04		0.39							0.13		
95% Queue Length, Q <sub>95</sub> (veh)						11.3		1.9							0.4		
Control Delay (s/veh)						104.1		12.0							8.0		
Level of Service (LOS)						F		B							A		
Approach Delay (s/veh)					55.4								2.8				
Approach LOS					F								A				

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst				Intersection	Ft Amanda & Buckeye Rd		
Agency/Co.				Jurisdiction			
Date Performed	7/25/2023			East/West Street	Buckeye Rd		
Analysis Year	2047			North/South Street	Ft Amanda Rd		
Time Analyzed	2047 AM			Peak Hour Factor	0.89		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Ft Amanda & Buckeye Rd						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						122		145			412	255		145	92	
Percent Heavy Vehicles (%)						15		15						10		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				Yes							
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.55		6.35						4.20		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.64		3.44						2.29		

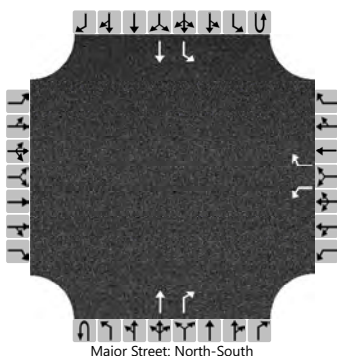
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						137		163						163		
Capacity, c (veh/h)						251		573						1058		
v/c Ratio						0.55		0.28						0.15		
95% Queue Length, Q <sub>95</sub> (veh)						3.0		1.2						0.5		
Control Delay (s/veh)						35.4		13.8						9.0		
Level of Service (LOS)						E		B						A		
Approach Delay (s/veh)					23.7								5.5			
Approach LOS					C								A			

# HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Ft Amanda & Buckeye Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Buckeye Rd				
Analysis Year	2047	North/South Street	Ft Amanda Rd				
Time Analyzed	2047 PM	Peak Hour Factor	0.75				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	Ft Amanda & Buckeye Rd						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		1	0	1	0	0	1	1	0	1	1	0
Configuration						L		R			T	R		L	T	
Volume (veh/h)						265		298			170	138		153	289	
Percent Heavy Vehicles (%)						4		4						6		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized					Yes				Yes							
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

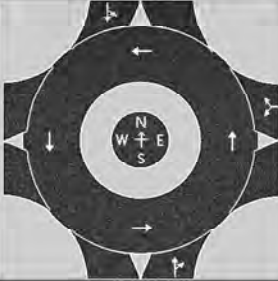
Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.44		6.24							4.16		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.54		3.34							2.25		

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						353		397							204		
Capacity, c (veh/h)						220		808							1318		
v/c Ratio						1.61		0.49							0.15		
95% Queue Length, Q <sub>95</sub> (veh)						22.6		2.8							0.5		
Control Delay (s/veh)						333.1		13.7							8.2		
Level of Service (LOS)						F		B							A		
Approach Delay (s/veh)					164.0								2.8				
Approach LOS					F								A				



# HCS Roundabouts Report

General Information				Site Information				
Analyst					Intersection	Ft Amanda & Buckeye Rd		
Agency or Co.					E/W Street Name	Buckeye Rd		
Date Performed	7/25/2023				N/S Street Name	Ft. Amanda Rd		
Analysis Year	2027				Analysis Time Period, hrs	0.25		
Time Analyzed	2027 AM				Peak Hour Factor	0.89		
Project Description	Ft Amanda & Buckeye Rd				Jurisdiction			

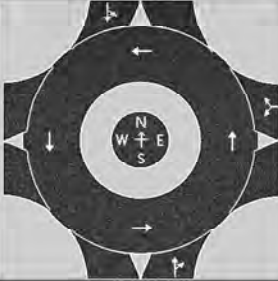
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment					LR				TR				LT			
Volume (V), veh/h					0	102		122	0		345	214	0	122	77	
Percent Heavy Vehicles, %					0	15		15	0		4	4	0	10	10	
Flow Rate (V <sub>PCE</sub> ), pc/h					0	132		158	0		403	250	0	151	95	
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes					1				1				1			
Pedestrians Crossing, p/h					0				0				0			
Proportion of CAVs	0															

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

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v <sub>e</sub> ), pc/h					290			653			246	
Entry Volume, veh/h					252			628			224	
Circulating Flow (v <sub>c</sub> ), pc/h	378			403			151			132		
Exiting Flow (v <sub>ex</sub> ), pc/h	401			0			561			227		
Capacity (C <sub>PCE</sub> ), pc/h					915			1183			1206	
Capacity (c), veh/h					796			1138			1097	
v/c Ratio (x)					0.32			0.55			0.20	

Delay and Level of Service															
Approach	EB			WB			NB			SB					
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass			
Lane Control Delay (d), s/veh					8.2			9.8			5.1				
Lane LOS					A			A			A				
95% Queue, veh					1.4			3.5			0.8				
Approach Delay, s/veh   LOS				8.2			A			9.8			A		
Intersection Delay, s/veh   LOS	8.5						A								

# HCS Roundabouts Report

General Information				Site Information				
Analyst					Intersection	Ft Amanda & Buckeye Rd		
Agency or Co.					E/W Street Name	Buckeye Rd		
Date Performed	7/25/2023				N/S Street Name	Ft. Amanda Rd		
Analysis Year	2027				Analysis Time Period, hrs	0.25		
Time Analyzed	2027 PM				Peak Hour Factor	0.75		
Project Description	Ft Amanda & Buckeye Rd				Jurisdiction			

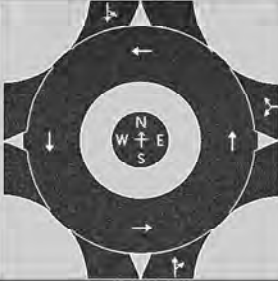
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment					LR				TR				LT			
Volume (V), veh/h					0	223		250	0		142	115	0	128	242	
Percent Heavy Vehicles, %					0	4		4	0		7	7	0	6	6	
Flow Rate (v <sub>PCE</sub> ), pc/h					0	309		347	0		203	164	0	181	342	
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes					1				1				1			
Pedestrians Crossing, p/h					0				0				0			
Proportion of CAVs	0															

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

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v <sub>e</sub> ), pc/h					656			367			523	
Entry Volume, veh/h					631			343			493	
Circulating Flow (v <sub>c</sub> ), pc/h	832			203			181			309		
Exiting Flow (v <sub>e</sub> ), pc/h	345			0			550			651		
Capacity (C <sub>PCE</sub> ), pc/h					1122			1147			1007	
Capacity (c), veh/h					1079			1072			950	
v/c Ratio (x)					0.58			0.32			0.52	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh					10.8			6.5			10.4	
Lane LOS					B			A			B	
95% Queue, veh					3.9			1.4			3.1	
Approach Delay, s/veh   LOS				10.8	B	6.5	A	10.4	B			
Intersection Delay, s/veh   LOS	9.7						A					

# HCS Roundabouts Report

General Information				Site Information				
Analyst					Intersection	Ft Amanda & Buckeye Rd		
Agency or Co.					E/W Street Name	Buckeye Rd		
Date Performed	7/25/2023				N/S Street Name	Ft. Amanda Rd		
Analysis Year	2047				Analysis Time Period, hrs	0.25		
Time Analyzed	2047 AM				Peak Hour Factor	0.89		
Project Description	Ft Amanda & Buckeye Rd				Jurisdiction			

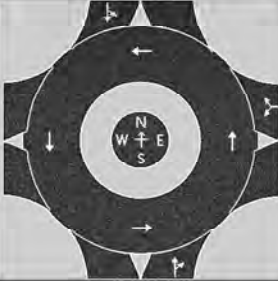
Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment					LR				TR				LT			
Volume (V), veh/h					0	122		145	0		412	255	0	145	92	
Percent Heavy Vehicles, %					0	15		15	0		4	4	0	10	10	
Flow Rate (v <sub>PCE</sub> ), pc/h					0	158		187	0		481	298	0	179	114	
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes					1				1				1			
Pedestrians Crossing, p/h					0				0				0			
Proportion of CAVs	0															

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

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v <sub>e</sub> ), pc/h					345			779			293	
Entry Volume, veh/h					300			749			266	
Circulating Flow (v <sub>c</sub> ), pc/h	451			481			179			158		
Exiting Flow (v <sub>e</sub> ), pc/h	477			0			668			272		
Capacity (C <sub>PCE</sub> ), pc/h					845			1150			1175	
Capacity (c), veh/h					735			1105			1068	
v/c Ratio (x)					0.41			0.68			0.25	

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			13.2			5.7	
Lane LOS					B			B			A	
95% Queue, veh					2.0			5.6			1.0	
Approach Delay, s/veh   LOS				10.3			B			5.7   A		
Intersection Delay, s/veh   LOS	11.0						B					

# HCS Roundabouts Report

General Information				Site Information				
Analyst					Intersection	Ft Amanda & Buckeye Rd		
Agency or Co.					E/W Street Name	Buckeye Rd		
Date Performed	7/25/2023				N/S Street Name	Ft. Amanda Rd		
Analysis Year	2047				Analysis Time Period, hrs	0.25		
Time Analyzed	2047 PM				Peak Hour Factor	0.75		
Project Description	Ft Amanda & Buckeye Rd				Jurisdiction			

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment					LR				TR				LT			
Volume (V), veh/h					0	265		298	0		170	138	0	153	289	
Percent Heavy Vehicles, %					0	4		4	0		7	7	0	6	6	
Flow Rate (v <sub>PCE</sub> ), pc/h					0	367		413	0		243	197	0	216	408	
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes					1				1				1			
Pedestrians Crossing, p/h					0				0				0			
Proportion of CAVs	0															

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

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v <sub>e</sub> ), pc/h					780			440			624	
Entry Volume, veh/h					750			411			589	
Circulating Flow (v <sub>c</sub> ), pc/h	991			243			216			367		
Exiting Flow (v <sub>ex</sub> ), pc/h	413			0			656			775		
Capacity (C <sub>PCE</sub> ), pc/h					1077			1107			949	
Capacity (c), veh/h					1036			1035			895	
v/c Ratio (x)					0.72			0.40			0.66	

Delay and Level of Service														
Approach	EB			WB			NB			SB				
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass		
Lane Control Delay (d), s/veh					15.6			7.7			14.7			
Lane LOS					C			A			B			
95% Queue, veh					6.6			1.9			5.1			
Approach Delay, s/veh   LOS				15.6			C	7.7			A	14.7		B
Intersection Delay, s/veh   LOS	13.5						B							



# Roundabouts

This calculator will estimate the emission reductions resulting from building a roundabout at an intersection

## Navigator

[Intersection Improvements](#)

[Traffic Signal Synchronization](#)

[Roundabouts](#)

[Two Way Left Turn Lanes](#)

## INPUT

### EXISTING CONDITIONS

Evaluation Year	2027
Area Type	Rural
Business District	No
Total peak hours per day(AM+PM)	4 hours
Existing intersection is	Un-signalized

Use the table below to estimate delay (HCM 2010, Exhibits 18-4, 19-1)

Level of Service Reference Table

LOS	Delay (s/veh)	
	Unsignalized Intersection	Signalized Intersection
A	0 - 10	0 - 10
B	>10 - 15	>10 - 20
C	>15 - 25	>20 - 35
D	>25 - 35	>35 - 55
E	>35 - 50	>55-80
F*	>50	>80

Please input approaches in COUNTERCLOCKWISE direction for existing intersection. If the intersection only has three approaches, put '0' for 'Average Annual Daily Traffic (AADT)' for Approach 4

	Approach 1	Approach 2	Approach 3	Approach 4	
Average Annual Daily Traffic volume (AADT)	7,800	8,500	7,500	0	
Peak-hour Volume	370	257	473		veh/hr
Truck Percentage	6%	7%	4%		
Existing Delay per Vehicle	5.3	0.1	55.4		sec/veh
Number of Lanes	2	2	2		
Existing Intersection % Left Turns	35%	0%	47%		
Existing Intersection % Right Turns	0%	45%	53%		

\*LOS F typically indicates that traffic demand has exceeded capacity

Number of Circulating Roundabout Lanes

## OUTPUT

Calculate Output

### PERFORMANCE

Approach	PEAK-HOUR				OFF-PEAK				
	1	2	3	4	1	2	3	4	
Proposed Capacity	1,692	1,427	1,868		1,859	1,511	1,744		veh/hr
Volume	370	257	473		316	374	280		veh/hr
Delay Reduction per vehicle	1	-4	52		4	4	4		sec/veh

Approach	1	2	3	4	
Approach Delay Reduction per day	7.9	6.7	33.6		hours
Total Roundabout Delay Reduction per day	48.2				hours

### EMISSION REDUCTIONS

Pollutant	Peak-hour Kilograms/day	Off-Peak Kilograms/day	Total Kilograms/day
Carbon Monoxide (CO)	0.125	0.109	0.233
Particulate Matter <2.5 µm (PM <sub>2.5</sub> )	0.002	0.002	0.005
Particulate Matter <10 µm (PM <sub>10</sub> )	0.002	0.003	0.005
Nitrogen Oxide (NOx)	0.059	0.066	0.125
Volatile Organic Compounds (VOC)	0.033	0.028	0.060
Atmospheric Carbon Dioxide (CO <sub>2</sub> )	82.627	68.722	151.349
Carbon Dioxide Equivalent (CO <sub>2</sub> e)	83.281	69.296	152.577
Total Energy Consumption (MMBTU)	1.087	0.904	1.991

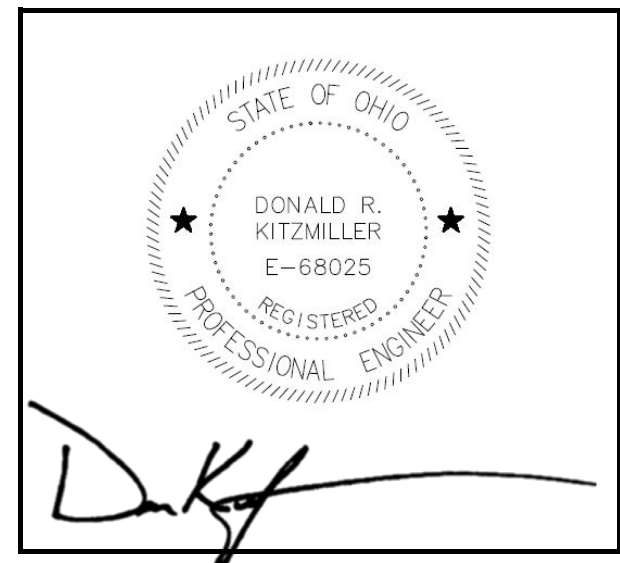
APPENDIX C  
COST ESTIMATES



Fort Amanda Road Roundabout and RRFB ESTIMATED COST						
Major Cost Drivers						* Extended Costs rounded to nearest \$1000.
Description	Est. Quantity	Unit	Unit Cost	Extended Cost *	Group Total	
<b>Roadway</b>					\$210,000	
Embankment	3615	CY	\$20	\$72,000		
Excavation	2410	CY	\$20	\$48,000		
Sidewalk & Ramps	2250	SF	\$8	\$18,000		
Curb and Gutter	2400	LF	\$30	\$72,000		
<b>Erosion Control</b>	<b>LUMP</b>		<b>\$35,000</b>		<b>\$35,000</b>	
<b>Drainage</b>					<b>\$274,000</b>	
Underdrains	2400	LF	\$14	\$34,000		
Enclosed Storm Sewer	1600	LF	\$150	\$240,000		
<b>Pavement</b>					<b>\$385,000</b>	
Splitter Island	710	SY	\$90	\$64,000		
Truck Apron	750	SY	\$120	\$90,000		
Full Depth Pavement	3300	SY	\$70	\$231,000		
<b>Traffic Control (Pavement Marking &amp; Signing)</b>					<b>\$80,000</b>	
RRFB Crossing	1	EA	\$30,000	\$30,000		
Signing & Marking	1	LUMP	\$50,000	\$50,000		
<b>Lighting</b>	<b>LUMP</b>		<b>\$100,000</b>		<b>\$100,000</b>	
<b>Subtotal Major Items</b>					<b>\$1,084,000</b>	
<b>Miscellaneous Costs</b>						
Maintenance of Traffic (12%)	<b>LUMP</b>		<b>\$131,000</b>		<b>\$131,000</b>	
Minor Items (20%)	<b>LUMP</b>		<b>\$217,000</b>		<b>\$217,000</b>	
<b>Subtotal Miscellaneous Costs</b>					<b>\$348,000</b>	
<b>Total Construction Cost Before Contingency &amp; Inflationary Factor</b>					<b>\$1,432,000</b>	
PDP Design Risk Contingency (15%-25%)			15%	\$215,000		
Inflation per ODOT Business Plan Inflation Calculator		CY: JULY 2027 - DECEMBER 2027	21.7%	\$311,000		
<b>Total Preliminary Roadway Construction Cost Estimate</b>					<b>\$1,958,000</b>	
Right-of-Way Budgetary Estimate					\$10,000	
Preliminary Engineering	20%		20%		\$392,000	
Final Engineering	5%		5%		\$98,000	
Construction Engineering	8%		8%		\$157,000	
<b>Total Project Cost Estimate</b>					<b>\$2,615,000</b>	

The estimated useful life of the project is 20 years.

I hereby certify this Engineer's Opinion of Planning Level of Projects Costs and Estimated of Weighted Useful Life to be reasonable and accurate to the best of my knowledge and based on current industry practices for such a calculation.



APPENDIX D  
EXISTING ECAT CONDITIONS





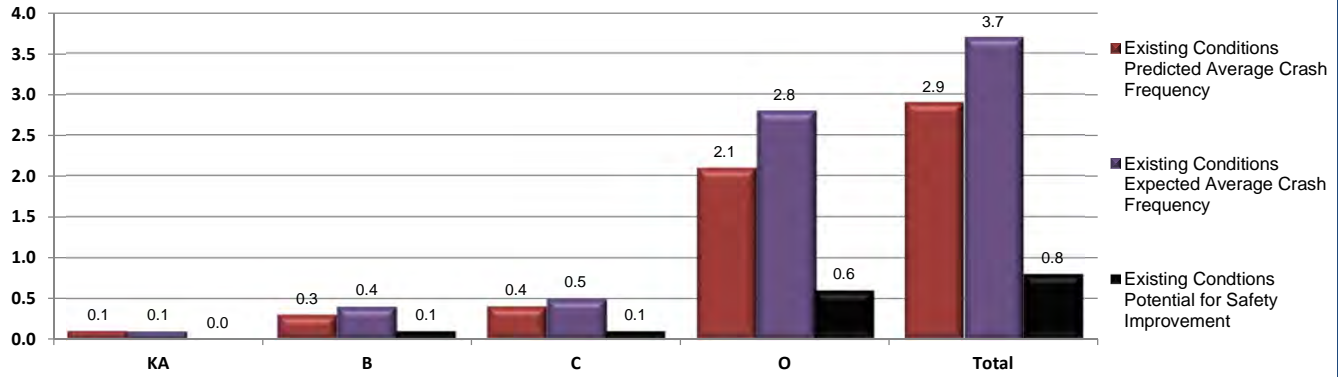


# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Existing
Agency/Company	The Mannik & Smith Group		

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



## Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
<b>N<sub>predicted</sub> - Existing Conditions</b>	0.0724	0.2972	0.4200	2.1113	2.9009
<b>N<sub>expected</sub> - Existing Conditions</b>	0.0855	0.3590	0.5113	2.7555	3.7113
<b>N<sub>potential for improvement</sub> - Existing Conditions</b>	0.0131	0.0618	0.0913	0.6442	0.8104



# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Existing
Agency/Company	The Mannik & Smith Group		

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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
<a href="#">CR11: 4.591-5.011</a>	Ft. Amanda Rd from Buckeye to Adgate	0.0225	0.0539	0.0604	0.2934	0.4302
<a href="#">CR11: 4.541</a>	Ft Amanda & Buckeye Rd	0.0145	0.0559	0.0714	0.3543	0.4961
<a href="#">CR11: 5.061</a>	Ft Amanda & Adgate Rd	0.0354	0.1874	0.2882	1.4636	1.9746



# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Existing
Agency/Company	The Mannik & Smith Group		

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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
<a href="#">CR11: 4.591-5.011</a>	Ft. Amanda Rd from Buckeye to Adgate	0.0219	0.0523	0.0584	0.2837	0.4163
<a href="#">CR11: 4.541</a>	Ft Amanda & Buckeye Rd	0.0264	0.1091	0.1461	1.0069	1.2885
<a href="#">CR11: 5.061</a>	Ft Amanda & Adgate Rd	0.0372	0.1976	0.3068	1.4649	2.0065



# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Existing
Agency/Company	The Mannik & Smith Group		

## 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
<a href="#">CR11: 4.591-5.011</a>	Ft. Amanda Rd from Buckeye to Adgate	-0.0006	-0.0016	-0.002	-0.0097	-0.0139
<a href="#">CR11: 4.541</a>	Ft Amanda & Buckeye Rd	0.0119	0.0532	0.0747	0.6526	0.7924
<a href="#">CR11: 5.061</a>	Ft Amanda & Adgate Rd	0.0018	0.0102	0.0186	0.0013	0.0319





# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Existing
Agency/Company	The Mannik & Smith Group		



# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Existing
Agency/Company	The Mannik & Smith Group		

## Summary by Crash Type

Crash Type	Existing		PSI	Proposed
	Predicted Crash Frequency	Expected Crash Frequency		Expected Crash Frequency
Unknown	0.0049	0.0064	0.0015	
Head On	0.0434	0.0580	0.0146	
Rear End	1.1482	1.4509	0.3027	
Backing	0.0874	0.1209	0.0335	
Sideswipe - Meeting	0.0153	0.0171	0.0018	
Sideswipe - Passing	0.3190	0.4308	0.1118	
Angle	0.4530	0.6089	0.1559	
Parked Vehicle	0.0984	0.1171	0.0187	
Pedestrian	0.0288	0.0288	0.0000	
Animal	0.1550	0.1243	-0.0307	
Train	0.0003	0.0005	0.0002	
Pedalcycles	0.0731	0.0731	0.0000	
Other Non-Vehicle	0.0001	0.0001	0.0000	
Fixed Object	0.2582	0.3254	0.0672	
Other Object	0.0100	0.0116	0.0016	
Overturning	0.0080	0.0093	0.0013	
Other Non-Collision	0.0178	0.0219	0.0042	
Left Turn	0.2164	0.2750	0.0586	
Right Turn	0.1184	0.1553	0.0369	

APPENDIX E  
PROPOSED ECAT CONDITIONS





## Safety Benefit - Cost Analysis

### General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Proposed
Agency/Company	The Mannik & Smith Group		

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

All Sites

**Comments:**

### Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Roundabout	20	\$2,083,860.00			\$2,083,860.00	\$2,083,860.00	0.146	\$138,742
Site Characteristic Improvements (i.e. Lighting)		\$0.00			\$0.00	\$0.00		
Site Characteristic Improvements (i.e. Signal Phasing)		\$0.00			\$0.00	\$0.00		
Site Characteristic Improvements (i.e. Added Right Turn Lane)		\$0.00			\$0.00	\$0.00		
CMF 1 - Install RRFB	20	\$122,400.00			\$122,400.00	\$122,400.00	0.000	\$280
		\$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
<b>Totals</b>		<b>\$2,206,260.00</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$2,206,260.00</b>	<b>\$2,206,260.00</b>	<b>0.145</b>	<b>\$139,021</b>





# Safety Benefit - Cost Analysis

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Proposed
Agency/Company	The Mannik & Smith Group		

### Benefit - Cost Calculator

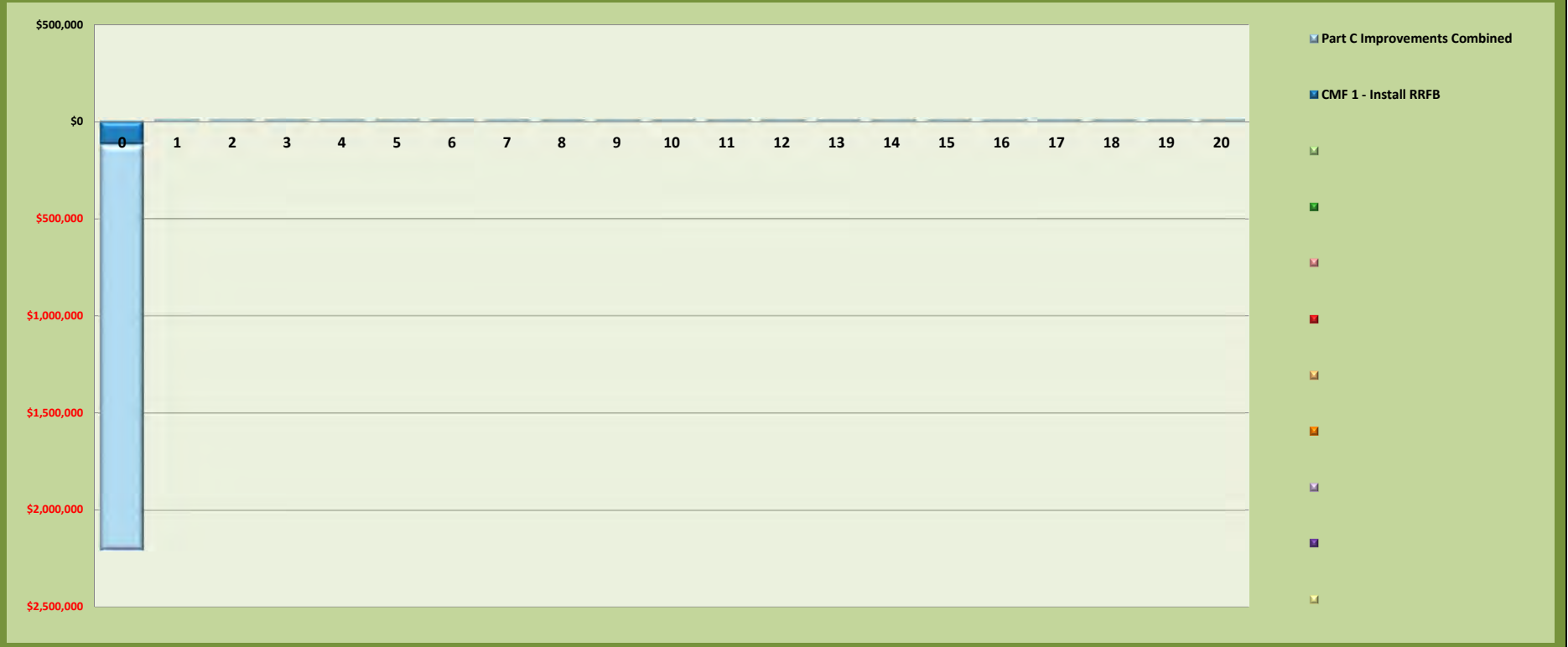
Net Present Value of Project	\$2,206,260.00
Net Present Value of Safety Benefits	\$139,021.24
Net Benefit	(\$2,067,238.76)
Benefit / Cost Ratio	0.06

### Expected Annual Crash Adjustment

Number of Fatal & Incapacitating Injury Crashes	-0.011
Number of Injury Crashes	-0.079
Number of Total Crashes	0.145

**Comments:**

Safety Benefits and Project Costs Combined Cash Flows By Countermeasure Per Year



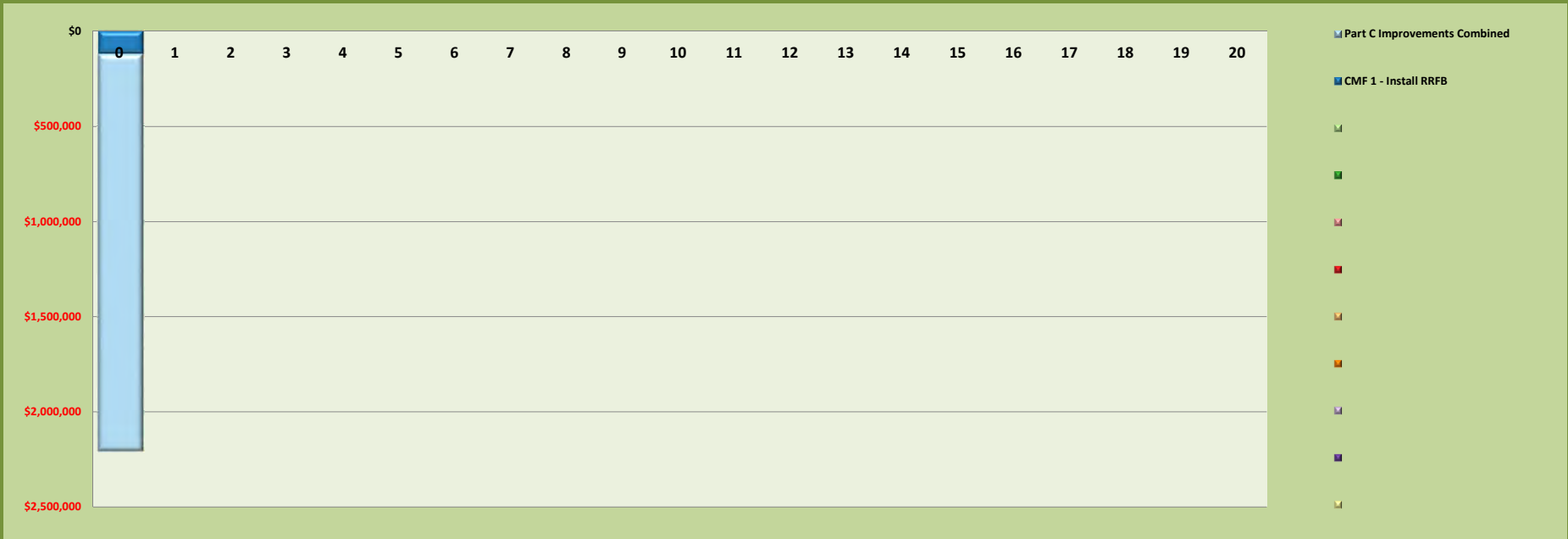


# Safety Benefit - Cost Analysis

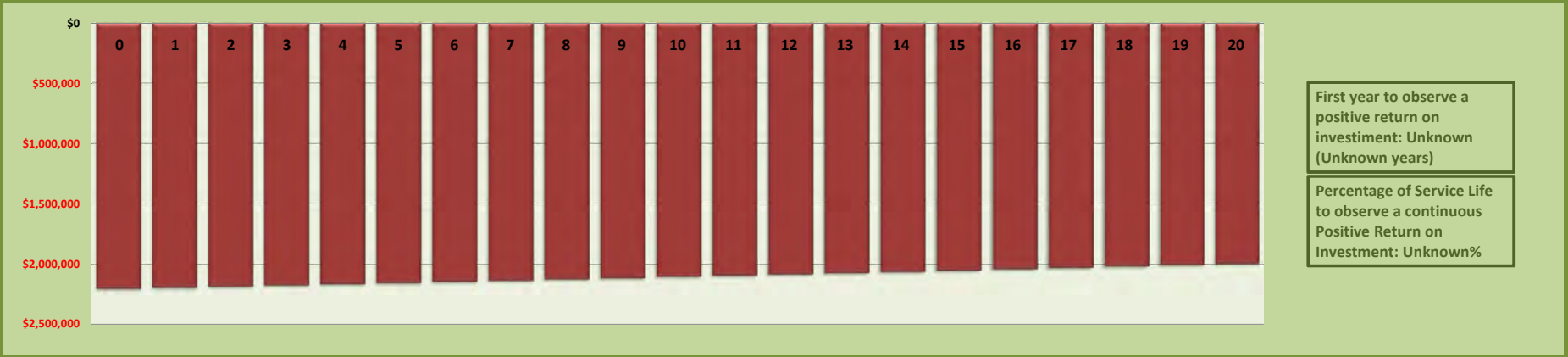
## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Proposed
Agency/Company	The Mannik & Smith Group		

## Project Costs Only Cash Flows By Countermeasure Per Year



## Return on Investment (Safety Benefits and Project Investments)



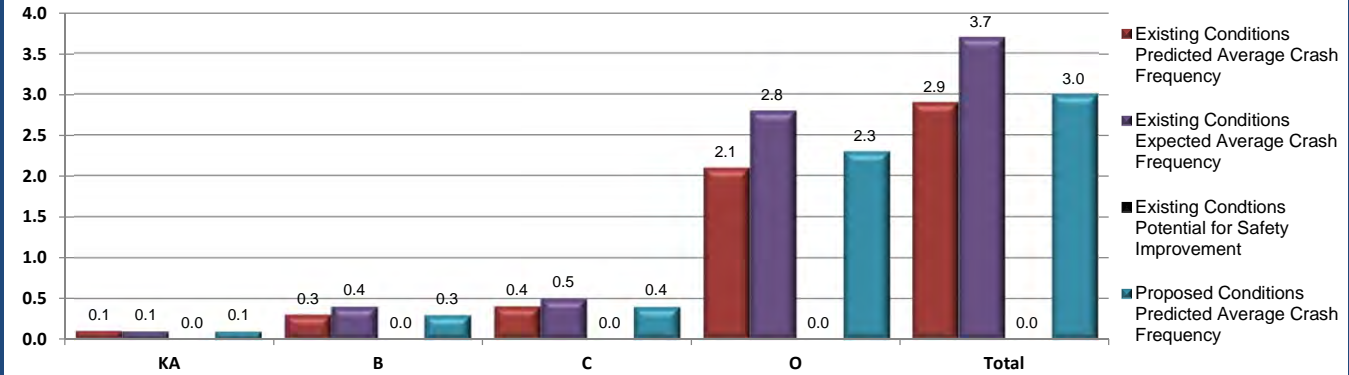


# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Proposed
Agency/Company	The Mannik & Smith Group		

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



## Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
<b>N<sub>predicted</sub> - Existing Conditions</b>	0.0724	0.2972	0.4200	2.1113	2.9009
<b>N<sub>expected</sub> - Existing Conditions</b>	0.0855	0.3590	0.5113	2.7555	3.7113
<b>N<sub>potential for improvement</sub> - Existing Conditions</b>	0.0000	0.0000	0.0000	0.0000	0.0000
<b>N<sub>expected</sub> - Proposed Conditions</b>	0.0610	0.2682	0.3818	2.3353	3.0463



# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Proposed
Agency/Company	The Mannik & Smith Group		

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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
<a href="#">CR11: 4.591-5.011</a>	Ft. Amanda Rd from Buckeye to Adgate	0.0225	0.0539	0.0604	0.2934	0.4302
<a href="#">CR11: 4.541</a>	Ft Amanda & Buckeye Rd	0.0145	0.0559	0.0714	0.3543	0.4961
<a href="#">CR11: 5.061</a>	Ft Amanda & Adgate Rd	0.0354	0.1874	0.2882	1.4636	1.9746





# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Proposed
Agency/Company	The Mannik & Smith Group		

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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
<a href="#">CR11: 4.591-5.011</a>	Ft. Amanda Rd from Buckeye to Adgate	0.0219	0.0523	0.0584	0.2837	0.4163
<a href="#">CR11: 4.541</a>	Ft Amanda & Buckeye Rd	0.0264	0.1091	0.1461	1.0069	1.2885
<a href="#">CR11: 5.061</a>	Ft Amanda & Adgate Rd	0.0372	0.1976	0.3068	1.4649	2.0065



# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Proposed
Agency/Company	The Mannik & Smith Group		

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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
<a href="#">CR11: 4.591-5.011</a>	Ft. Amanda Rd from Buckeye to Adgate	-0.0006	-0.0016	-0.002	-0.0097	-0.0139
<a href="#">CR11: 4.541</a>	Ft Amanda & Buckeye Rd	0.0119	0.0532	0.0747	0.6526	0.7924
<a href="#">CR11: 5.061</a>	Ft Amanda & Adgate Rd	0.0018	0.0102	0.0186	0.0013	0.0319



# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Proposed
Agency/Company	The Mannik & Smith Group		

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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
<a href="#">CR11: 4.591-5.011</a>	Ft. Amanda Rd from Buckeye to Adgate	0.0225	0.0539	0.0604	0.2934	0.4302
<a href="#">CR11: 4.541</a>	Ft Amanda & Buckeye Rd	0.0031	0.0269	0.0332	0.5783	0.6415
<a href="#">CR11: 5.061</a>	Ft Amanda & Adgate Rd	0.0354	0.1874	0.2882	1.4636	1.9746



# Project Safety Performance Report

## General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Ft. Amanda Rd Corridor	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Proposed
Agency/Company	The Mannik & Smith Group		

## Summary by Crash Type

Crash Type	Existing		PSI	Proposed
	Predicted Crash Frequency	Expected Crash Frequency		Predicted Crash Frequency
Unknown	0.0049	0.0064		0.0226
Head On	0.0434	0.0580		0.0352
Rear End	1.1482	1.4509		1.0863
Backing	0.0874	0.1209		0.0756
Sideswipe - Meeting	0.0153	0.0171		0.0147
Sideswipe - Passing	0.3190	0.4308		0.4634
Angle	0.4530	0.6089		0.5509
Parked Vehicle	0.0984	0.1171		0.0807
Pedestrian	0.0288	0.0288		0.0245
Animal	0.1550	0.1243		0.1616
Train	0.0003	0.0005		0.0002
Pedalcycles	0.0731	0.0731		0.0707
Other Non-Vehicle	0.0001	0.0001		0.0000
Fixed Object	0.2582	0.3254		0.2614
Other Object	0.0100	0.0116		0.0083
Overtuning	0.0080	0.0093		0.0070
Other Non-Collision	0.0178	0.0219		0.0264
Left Turn	0.2164	0.2750		0.1983
Right Turn	0.1184	0.1553		0.1420



APPENDIX F  
PHOTOS





Photo 1: Adjacent shared use path located along west side of Ft. Amanda Road along the Ottawa River



Photo 2: Shared use path crosses Ft. Amanda Road just west of Buckeye Road intersection and lacks signing to warn motorists



Photo 3: Frequent truck traffic is found on Ft. Amanda Road given the industrial facilities located adjacent to the corridor



Photo 4: Curved sections of roadway found on Ft. Amanda Road on the approach to Buckeye Road intersection





Photo 5: Confusing lane configuration on Buckeye Road approach to Ft. Amanda Road intersection has three Stop signs



Photo 6: Making a left turn from Buckeye Road to southbound Ft. Amanda Road creates sight distance issues because of roadway curves



Photo 7: Southbound Ft. Amanda Road approaching Buckeye Road where the curved roadway blocks views of vehicles

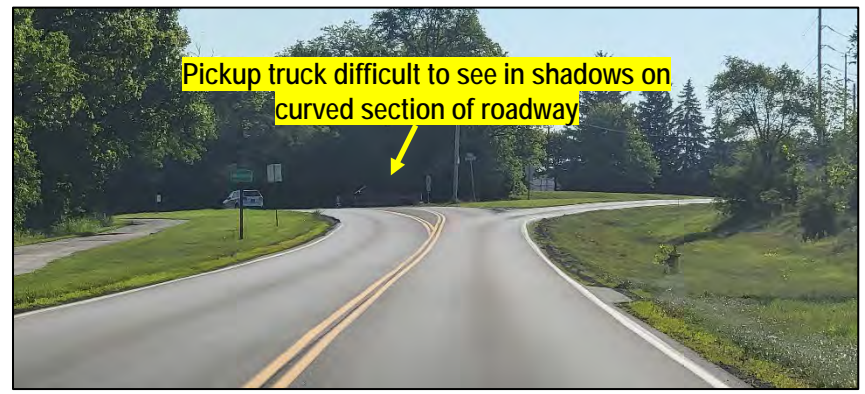


Photo 8: Curved roadway and shadows from trees make it difficult to see vehicles on Buckeye Road turning onto Ft. Amanda Road