

THE MANNIK & SMITH GROUP, INC.

SAFETY STUDY

BREESE RD. (BEELER RD. TO MCCLAIN RD.)
SHAWNEE RD. (BREESE RD. TO REED 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
NOVEMBER 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

BREESE RD. CORRIDOR

Beeler Rd. to McClain Rd.

SAFETY STUDY (NOV 2022)
ALLEN COUNTY ENGINEER

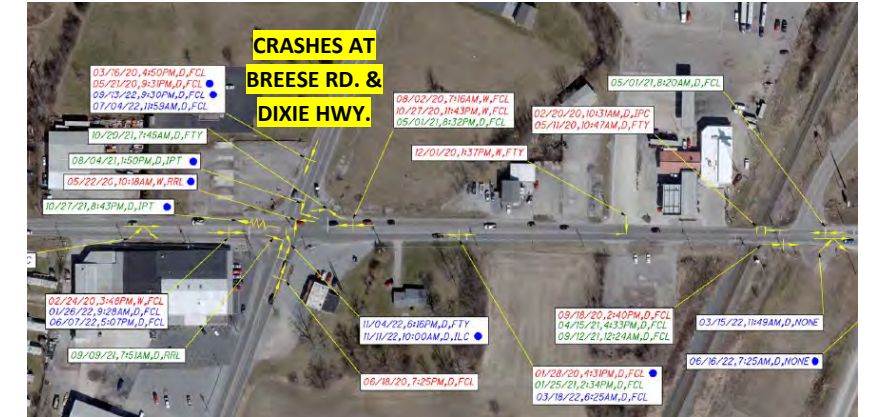
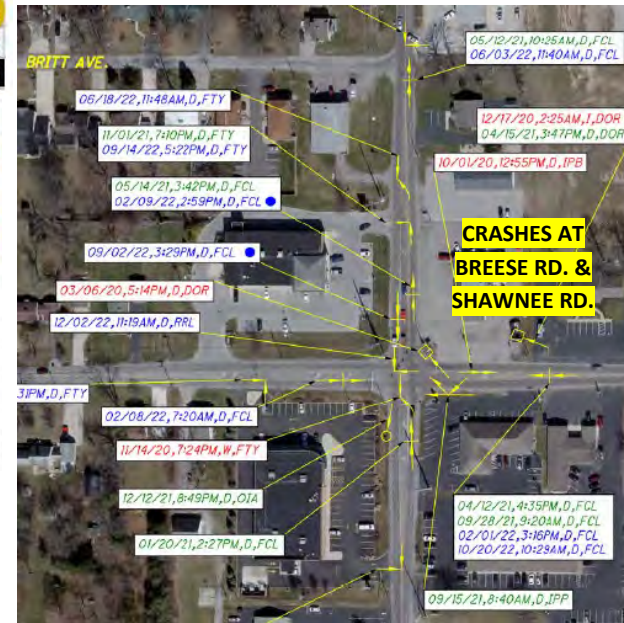
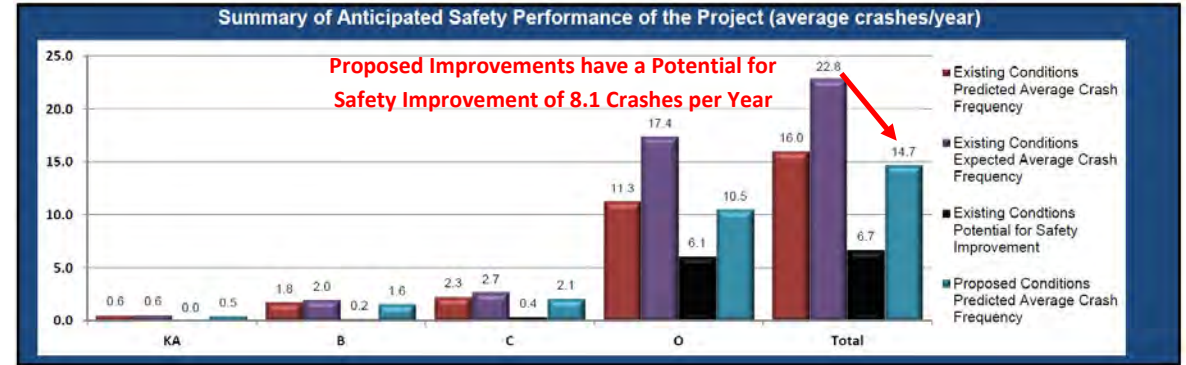


Breese Road Corridor Crash Data (2020-2022) (Beeler Road to McClain Road)

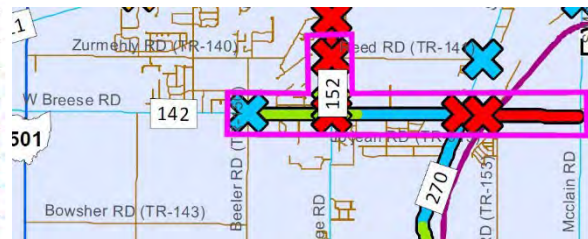
Crashes Per Year	30.33
Fatal and All Injury Crashes	17
Percent Injury	18.7%
Equivalent PDO Index Value	2.28

Intersection Related	Crashes	%
Yes	64	70.33%
No	27	29.67%
Grand Total	91	100.00%

Crash Type	Crashes	%
Rear End	46	50.55%
Angle	17	18.68%
Sideswipe - Passing	7	7.69%
Fixed Object	6	6.59%
Left Turn	4	4.40%
Backing	3	3.30%
Right Turn	3	3.30%
Unknown	3	3.30%
Overtaking	1	1.10%
Other Object	1	1.10%
Grand Total	91	100.00%



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%	0.93%
Serious Injury Suspected Crash	1	1.10%	4.50%
Minor Injury Suspected Crash	8	8.79%	14.06%
Injury Possible Crash	8	8.79%	7.65%
Property-Damage-Only	74	81.32%	72.86%
Total	91		

Crash Type	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Unknown	3.29%	0.19%	3.29%	0.12%
Head On	0.00%	2.86%	0.00%	5.74%
Rear End	50.55%	10.26%	50.55%	15.40%
Backing	3.30%	1.12%	3.30%	0.56%
Sideswipe - Meeting	0.00%	2.30%	0.00%	3.00%
Sideswipe - Passing	7.69%	3.66%	7.69%	3.92%
Angle	18.68%	2.36%	18.68%	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	6.59%	34.58%	6.59%	47.05%
Other Object	1.10%	0.92%	1.10%	0.21%
Falling From Or In Vehicle	0.00%	0.00%	0.00%	0.00%
Overtaking	1.10%	2.75%	1.10%	6.35%
Other Non-Collision	0.00%	1.30%	0.00%	0.54%
Left Turn	4.40%	2.66%	4.40%	4.09%
Right Turn	3.30%	0.52%	3.30%	0.56%

Proposed Countermeasures on Breese Road (\$2,243,000 with a 2027 Construction)

- Beeler Rd. & Breese Rd. – Turning radius improvement and signing improvements
- Breese Rd. & Shawnee Rd. – Full signal upgrade to mast arm signal; countdown pedestrian signal heads and pushbuttons; sidewalk landings & ADA curb ramps; high visibility crosswalk markings; add a westbound right turn lane; and radius improvements
- Breese Rd. & Dixie Hwy. – Full signal upgrade to mast arm signal; countdown pedestrian signal heads and pushbuttons; sidewalk landings & ADA curb ramps; high visibility crosswalk markings; replace southbound approach asphalt pavement with concrete pavement to prevent pavement damage from heavy truck traffic; and radius improvements
- Breese Rd. & Industrial Dr. – Add dual Stop Ahead and dual Stop signs to intersection
- Breese Rd. & McClain Rd. – Improve turning radii to accommodate truck movements

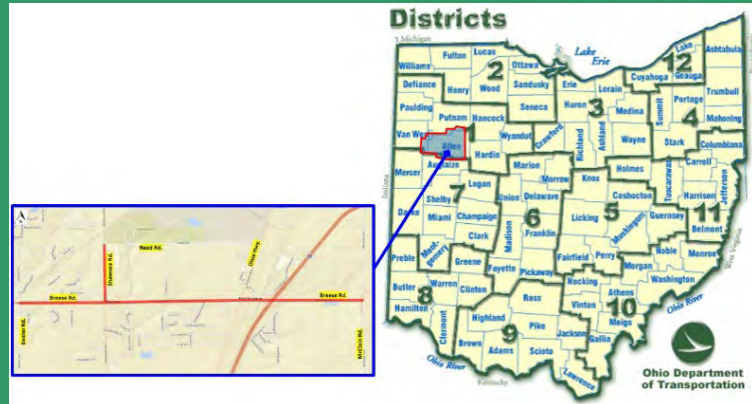
Existing Conditions (Breese Rd. from Beeler Rd. to McClain Rd.)

- Primarily a 2-Lane roadway with 12-FT lanes and shoulders of 2-FT or less
- Signalized intersections on Breese Road at Shawnee Road and at Dixie Highway
- Breese Road is Major Collector from Beeler Rd. to I-75 and Minor Collector from I-75 to McClain Rd.
- AADT of 7,990 from Beeler Rd. to I-75; and 2,100 from I-75 to McClain Rd.
- Speed limit is 45 MPH on Breese Road corridor
- Some approaches to intersections have enhanced signing whereas some lack enhanced warning signs
- Inadequate turning radii at several intersections along the Breese Road corridor

SAFETY PROJECT SUMMARY SHAWNEE RD. CORRIDOR

Breese Rd. to Reed Rd.

SAFETY STUDY (NOV 2022)
ALLEN COUNTY ENGINEER



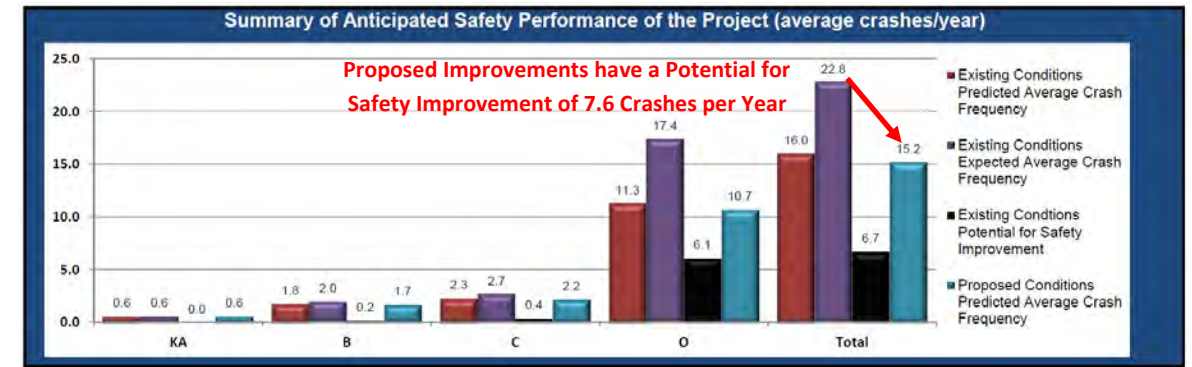
Shawnee Road Corridor Crash Data (2020-2022) (Breese Road to Reed Road)

Crashes Per Year	9.33
Fatal and All Injury Crashes	9
Percent Injury	32.1%
Equivalent PDO Index Value	5.14

Intersection Related	Crashes	%
Yes	8	28.57%
No	20	71.43%
Grand Total	28	100.00%

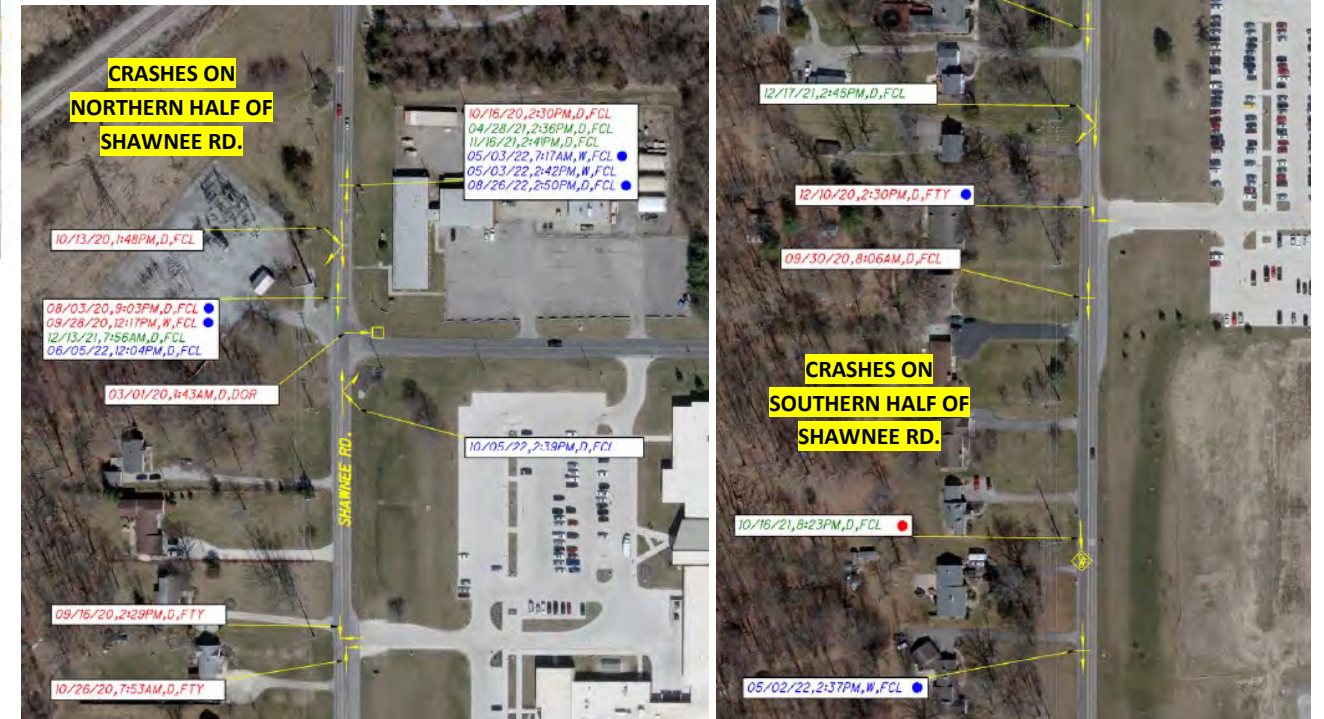
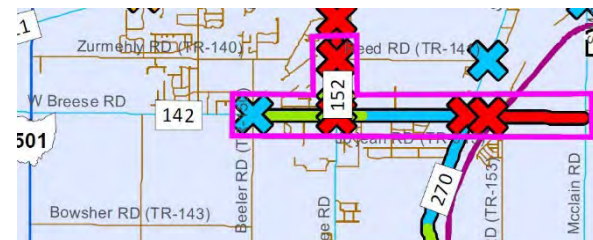
Crash Type	Crashes	%
Rear End	17	60.71%
Angle	5	17.86%
Sideswipe - Passing	3	10.71%
Fixed Object	1	3.57%
Pedalcycles	1	3.57%
Left Turn	1	3.57%
Grand Total	28	100.00%

Young Driver (15-25)	Crashes	%
No	11	39.29%
Yes	17	60.71%
Grand Total	28	100.00%



Crash Severity	Site Average		Statewide Average
	Total (2020-2022)	Total (%)	Total (%)
Fatal Crash	1	3.57%	0.93%
Serious Injury Suspected Crash	1	3.57%	4.50%
Minor Injury Suspected Crash	1	3.57%	14.06%
Injury Possible Crash	6	21.43%	7.65%
Property-Damage-Only	19	67.86%	72.86%
Total	28		

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



Crash Type	Crashes by Crash Type		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Unknown	0.01%	0.19%	0.01%	0.12%
Head On	0.00%	2.86%	0.00%	5.74%
Rear End	60.71%	10.26%	60.71%	15.40%
Backing	0.00%	1.12%	0.00%	0.56%
Sideswipe - Meeting	0.00%	2.30%	0.00%	3.00%
Sideswipe - Passing	10.71%	3.66%	10.71%	3.92%
Angle	17.86%	2.36%	17.86%	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	3.57%	0.14%	3.57%	0.48%
Other Non-Vehicle	0.00%	0.01%	0.00%	0.04%
Fixed Object	3.57%	34.58%	3.57%	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	0.00%	2.75%	0.00%	6.35%
Other Non-Collision	0.00%	1.30%	0.00%	0.54%
Left Turn	3.57%	2.66%	3.57%	4.09%
Right Turn	0.00%	0.52%	0.00%	0.56%

Proposed Countermeasures on Shawnee Road from Britt Ave. to Reed Rd. (\$1,811,000 for 2027 Construction)

- Widen roadway to provide a center two-way left turn lane for the corridor and add 4-FT shoulders
- Add a 10-FT wide shared use path (SUP) along east side of Shawnee Road from just north of Britt Avenue to north of Reed Road to connect to existing SUP at Heritage Park
- Shawnee Rd. & Reed Rd. - Add southbound left turn lane and improve turning radii

Existing Conditions (Shawnee Rd. from Britt Ave. to Reed Rd.)

- Predominately 2-Lane roadway with 12-FT lanes and shoulders 2-FT or less in width
- One intersection unsignalized (Buckeye Rd.) and on intersection signalized (Adgate Rd.)
- Shawnee Road is a Minor Arterial with an AADT of 9,580 and a speed limit of 45 MPH
- Land uses along the corridor are a mix of residential, commercial areas, and a large educational facility (Apollo Career Center)
- The roadway has numerous driveways and no center two-way left turn lane
- There are no sidewalks or shared use path (SUP) facilities along corridor, and there was one bicycle related crash that resulted in a fatality

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1.0 EXECUTIVE SUMMARY

1.1 Project Background

The project study limits include the sections of two roadway facilities in southern Allen County (see Figure 1.1 – Study Limits). These sections include approximately 3.0 miles of Breese Road (from Beeler Road to McClain Road) and 0.5 miles of Shawnee Road (from Breese Road to Reed Road). These two sections of roadway and several intersections located on them are listed on the Ohio Department of Transportation (ODOT) County Road High Crash Locations listings (most recently in 2022), as well as other safety listings such as the County Engineers Association of Ohio (CEAO). The Allen County Engineer applied for a grant from the CEAO to conduct a safety study. In 2022, the County was awarded funds from CEAO to conduct a safety study for the Breese Road and Shawnee Road sections as discussed above. Turn movement counts were conducted for the project at key intersections on both corridors. The AADT of Breese Road according to ODOT's TIMS data indicates 7,990 vehicles on Breese from Beeler Road to the I-75 interchange; and 2,100 from the interchange east to McClain Road. Shawnee Road is shown to have an AADT of 9,580 vehicles per day from Breese Road to Reed Road. The posted speed limit on Breese Road and on Shawnee Road are 45 MPH. The Breese Road corridor experienced 91 crashes in the three-year period of 2020-2022, with 18.7% involving injury crashes, including one serious injury crash. The predominant crash types on Breese Road were Rear-End (50.6%), Angle (18.7%), Sideswipe Passing (7.7%), and Fixed Object (6.6%). The Shawnee Road corridor experienced 28 crashes in the three-year period of 2020-2022, with 32.1% involving injury/fatal crashes, including one fatal crash (bicycle crash) and one serious injury crash. The predominant crash types on Shawnee Road were Rear-End (60.7%), Angle (17.9%), and Sideswipe Passing (10.7%). 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 three-mile segment of Breese Road from Beeler Road eastward to McClain Road for the Breese Road corridor. The limits of the half-mile segment of Shawnee Road involves the segment from just north of Breese at Britt Avenue to Reed Road. Both corridor segments are located in Allen County, Ohio. The proposed project limits of both corridors have independent utility in that both projects will address the transportation needs to

improve traffic safety and operations on the corridors. 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 a higher than anticipated crashes on both Breese Road and on Shawnee Road over the past several years on ODOT high crash listings for County Roads. As mentioned previously, the Breese Road corridor experienced 91 crashes in the three-year period of 2020-2022, with 18.7% involving injury crashes, including one serious injury crash. The Shawnee Road corridor experienced 28 crashes in the three-year period of 2020-2022, with 32.1% involving injury/fatal crashes, including one fatal crash (bicycle crash) and one serious injury crash.

The purpose of the Safety Study is to address identified crash problems on the corridors by proposing countermeasures to alleviate or reduce the likelihood of future crashes. A review of the collision diagram for the corridor and the crash data from the Crash Analysis Module Tool (CAM-Tool) revealed the following needs for improving each corridor:

Breese Road (Beeler Rd. to McClain Rd.) ~ 3.0 Miles in Length:

- **Crash History** – A review of the crash history from 2020-2022 revealed several key focus areas:
 - Rear-End, Angle, and Sideswipe Passing Crashes: These three types of crashes accounted for nearly 77% of all crashes on the corridor, with over 70% of those crashes occurring at intersections along the corridor. This indicates safety countermeasure improvements at key intersections along Breese Road would assist in reducing crash frequency. The percentage of injury crashes on the corridor was 18.7%, which is below the 27.1% Statewide Average. Given that the percent of injury crashes is below 30%, this project would not meet the criteria to apply to a Formal Safety Application, so it is recommended to pursue the CEO HSIP safety program for potential funds.
- **Intersection Related** – Crash data from the CAM-Tool indicates that 64 of the 91 corridor crashes (or over 70%) were intersection related crashes. This is supported by the three most frequent types of crashes on the corridor of Rear-End, Angle, and Sideswipe Passing which are typical intersection types of crashes. This crash data and a review of the Collision Diagram indicates countermeasures should focus on intersection improvements.

Shawnee Road (Breese Rd./Britt Ave. to Reed Rd.) ~ 0.5 Miles in Length:

- **Crash History** – A review of the crash history from 2020-2022 revealed several key focus areas:
 - Rear-End, Angle, and Sideswipe Passing Crashes: Rear-End, Angle, and Sideswipe Passing crashes accounted for over 89% of all crashes on the corridor. The crash data from the CAM-Tool indicates that over 71% of the crashes were not intersection related. Upon a review of the Collision Diagrams, the crashes occurred on sections of the corridor where vehicles turning into and out of residential and business driveways on this two-lane roadway that does not contain a center two-way left turn lane. This indicates safety countermeasure improvements on the corridor should focus on removing left turning vehicles out of the through traffic movements.
 - Severity of Crashes – The percentage of injury/fatal crashes was 32.1% on the corridor, which is higher than the statewide average of 27.1%. There was one fatal crash involving a bicycle crash, and one serious injury crash. The higher than Statewide Average percentage of crashes and with this corridor being over the 30% threshold to apply to the ODOT Formal Safety Program, it is recommended that an application pursue this type of funding.
- **Non-Intersection Related** – As mentioned previously, over 71% of the crashes on the Shawnee Road corridor were not intersection related. A site visit of the corridor revealed the traffic volumes (9,580 AADT) on the corridor and the 45 MPH posted speed creates limited adequate gaps in traffic to make left turns. This tends to increase the chance that drivers will take more chances of making turn movements, as they get impatient. The corridor lacks pedestrian and bicycle facilities as there are no sidewalks or on-street bike lanes on the roadway corridor. There was one fatal crash involving a bicycle, which indicates a need for non-motorized facilities. The presence of the Apollo Career Center along the east side of the corridor is a

non-motorized trip generator. It is recommended that non-motorized facilities be considered for the corridor, in addition to countermeasures to address left turning vehicles and driveway crashes.

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 crash frequencies of both corridors:

Breese Road (Beeler Rd. to McClain Rd.):

- Lack of advanced warning signs of approaching key intersection on some approaches
- Lack of advanced warning signs of “Stop Ahead” on some approaches at the key intersections
- Inadequate turning radii at the intersections of Beeler Road, Shawnee Road, Dixie Highway, and McClain Road for several right turn movements
- Spanwire traffic signals that do not provide optimized visibility of traffic signal heads, and intersection geometry that has inadequate turning radii for trucks and buses
- Large right turn movement at WB Breese Road to NB Shawnee Road lacks a right turn lane
- SB truck traffic on Dixie Highway at Breese Road intersection are creating pavement heaving that leads to water pooling on the roadway which can lead to hydroplaning during rain events, and ice buildup in winter

Shawnee Road (Breese Rd./Britt Ave. to Reed Rd.):

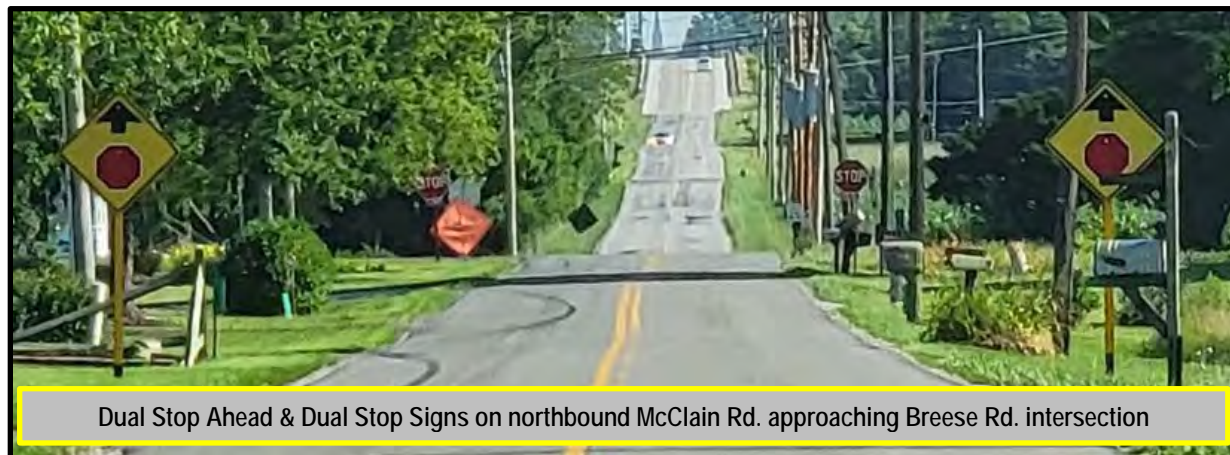
- Numerous driveways (residential and businesses) on this two-lane roadway that lacks a center two-way left turn lane to remove left turns from through traffic
- Corridor lacks non-motorized facilities (no sidewalks or bike facilities)
- Apollo Career Center educational complex on corridor creates need for non-motorized traffic as well as leads to additional truck traffic as the school trains truck drivers
- SB Shawnee Road at Reed Road lacks a dedicated left turn lane which can cause traffic to queue waiting on vehicles to turn left, which can back up to the railroad crossing located just north of the intersection
- Existing Shared Use Path (SUP) at Heritage Park does not have a link to Reed Road that is located less than 500-FT south of the park

Several locations at key intersections along Breese Road have **inadequate turning radii** for trucks and buses. These turning radii deficiencies are contributing to Fixed Object crashes as trucks have struck objects at the intersections in negotiating the tight turns. The most common types of fixed objects include utility poles, signal equipment utilities, and mailboxes. There is an inconsistency use of **advanced warning signs** on the Breese Road and Shawnee Road corridors to warn motorists of approaching intersections and stop control.



1.5 Previously Implemented Countermeasures

There are several previously implemented countermeasures visible on the Breese Road and Shawnee Road corridors. An example of this occurs at the intersection of Breese Road and McClain Road. The northbound approach on McClain Road has dual Stop Ahead warning signs as well as dual Stop Signs that were previously implemented. There is an inconsistency of advanced warning signs on the corridors.

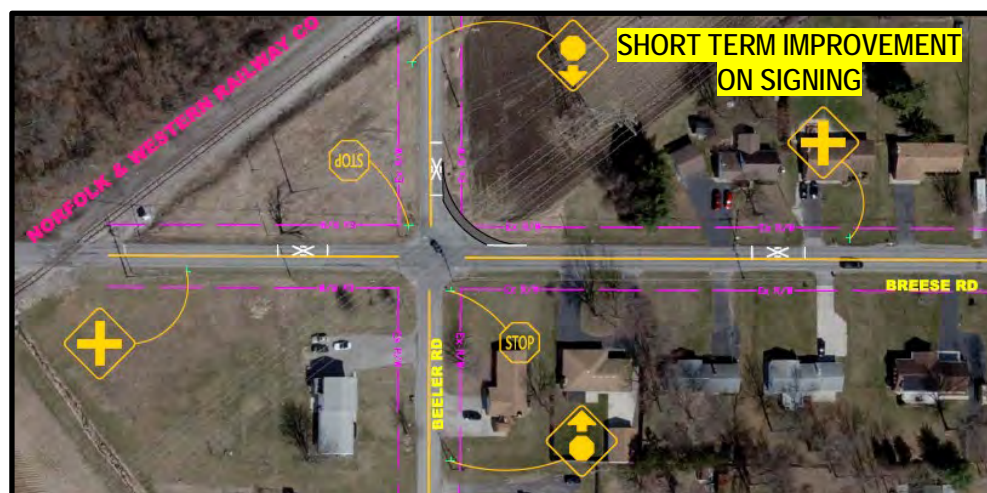


1.6 Summary of Short-Term and Long-Term Recommended Countermeasures

The recommended countermeasures for the Breese Road and Shawnee Road corridors involve the following short-term (interim) improvements and long-term improvements to address the crash problems identified on the corridors:

SHORT-TERM IMPROVEMENTS FOR BOTH BREESE ROAD AND SHAWNEE ROAD CORRIDROS:

- Provide large sized Stop signs (36"x36") and Stop Ahead warning signs at the following intersections:
 - Beeler Road & Breese Road
 - Industrial Drive & Breese Road
- Add reflective post strips to all signs that do not have them in place
- Maintain pavement markings through the corridors
- Maintain signs in good reflective condition
- Keep vegetation trimmed along corridor that may be blocking views of oncoming traffic



LONG-TERM IMPROVEMENTS FOR BREESE ROAD CORRIDOR:

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 lower cost maintenance items. The long-term recommended improvements to the Breese Road corridor involves the following:

- Construct an improved turning radius for the northeast corner of the Beeler Road and Breese Road intersection, as school buses have difficulty making this turn with the existing tight turning radius
- Upgrade the existing spanwire traffic signal to a mast arm design traffic signal at the intersection of Breese Road and Shawnee Road and provide countdown pedestrian signal heads and pushbuttons, enhanced pavement marking crosswalks, ADA curb ramps and sidewalk landings, and add a westbound right turn lane on Breese Road
- Improve the turning radii on the northeast and southeast corners of the Breese Road and Shawnee Road intersection to accommodate large trucks
- Upgrade the existing spanwire traffic signal to a mast arm design traffic signal at the intersection of Breese Road and Dixie Highway and provide countdown pedestrian signal heads and pushbuttons, enhanced pavement marking crosswalks, ADA curb ramps and sidewalk landings
- Improve the turning radii on the northeast and southeast corners of the Breese Road and Dixie Highway intersection to accommodate large trucks
- Replace the existing asphalt pavement on the southbound approach of Dixie Highway to Breese Road with concrete to alleviate the rapid deterioration of asphalt pavement by the heavy truck traffic on this approach of the intersection
- Improve the Breese Road and McClain Road intersection by adding pavement to accommodate trucks turning through this T-Intersection

LONG-TERM IMPROVEMENTS FOR SHAWNEE ROAD CORRIDOR:

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 lower cost maintenance items. The long-term recommended improvements to the Shawnee Road corridor involves the following:

- The intersection of Breese Road and Shawnee Road is proposed to be improved as part of the Breese Road corridor intersection improvements as listed above in the Breese Road long term improvements. Thus, the Shawnee Road corridor improvements would be from Britt Avenue (the intersection just north of Breese Road) northward to Reed Road.
- Construct a two-way center left turn lane and provide 4-FT shoulders on Shawnee Road from Britt Avenue to Reed Road to provide safer left turns for vehicles into residential and business driveways
- Construct a 10-FT wide Shared Use Path (SUP) along the east side of Shawnee Road from just north of Britt Avenue northward to the existing SUP found north of Reed Road at Heritage Park
- Construct a southbound left turn lane on Shawnee Road at Reed Road to alleviate traffic queuing that can back up to the nearby railroad crossing just north of Reed Road
- Enhanced signing along the corridor and pavement markings

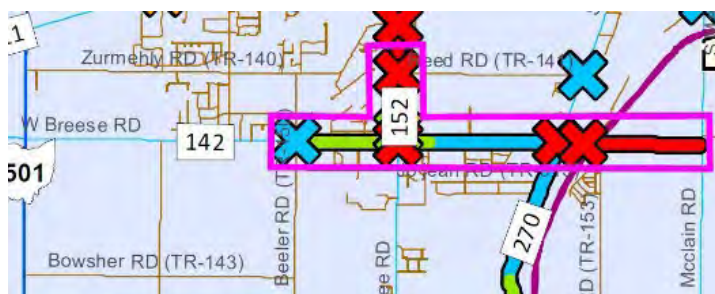
RECOMMENDED LONG-TERM IMPROVEMENTS SCHEMATIC:

A schematic of the long-term improvements for both the Breese Road and Shawnee Road corridors is provided in Section 5.0 (Recommendations & Implementation) on Figure 5.1.

2.0 EXISTING CONDITIONS

2.1 Background

The segment of Breese Road from Beeler Road to McClain Road is listed on ODOT’s 2022 County Road High Crash Locations, as well as several high crash intersections as represented by the “X’s” shown on the map insert. Shawnee Road from Breese Road to Reed Road is also listed as a high crash priority segment, along with several high crash intersection listings. Additionally, the CEAO high priority listings show both corridors as priority segments. The CEAO listings include the intersections on Breese Road at Beeler Road, Shawnee Road, Dixie Highway, and Industrial Drive as priority intersections. On Shawnee Road, the intersections with Britt Avenue and Reed Road are listed as high crash priority intersections. The segment of Breese Road from Beeler Road to the I-75 Interchange and the segment of Shawnee Road from Breese Road to Reed Road are both listed on ODOT’s Systemic priority segments for Pedestrian systemic improvements. A funding application was submitted in 2022 to CEAO by the Allen County Engineer for conducting a safety study of both the Breese Road and Shawnee Road corridors, which was successfully awarded funding to conduct this safety study in 2023.



The segment of Breese Road from Beeler Road to McClain Road is listed on ODOT’s 2022 County Road High Crash Locations, as well as several high crash intersections as represented by the “X’s” shown on the map insert. Shawnee Road from Breese Road to Reed Road is also listed as a high crash priority segment, along with several high crash intersection listings. Additionally, the CEAO high priority listings show both corridors as priority segments. The CEAO listings include the intersections on Breese Road at Beeler Road, Shawnee Road, Dixie Highway, and Industrial Drive as priority intersections. On Shawnee Road, the intersections with Britt Avenue and Reed Road are listed as high crash priority intersections. The segment of Breese Road from Beeler Road to the I-75 Interchange and the segment of Shawnee Road from Breese Road to Reed Road are both listed on ODOT’s Systemic priority segments for Pedestrian systemic improvements. A funding application was submitted in 2022 to CEAO by the Allen County Engineer for conducting a safety study of both the Breese Road and Shawnee Road corridors, which was successfully awarded funding to conduct this safety study in 2023.

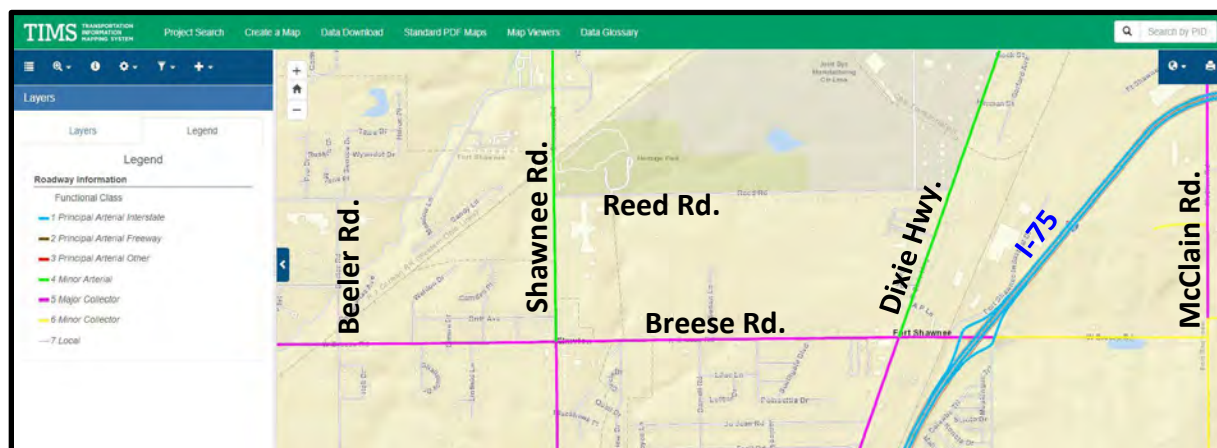
2.2 Conditions Diagrams

The existing conditions of the Breese Road and Shawnee Road corridors 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

Breese Road (Beeler Rd. to McClain Rd.):

The roadway is a predominately two-lane roadway with auxiliary left turn lanes at the intersections of Shawnee Road (signalized); Dixie Highway (signalized); and the I-75 interchange ramp intersections. Lane widths are 12-FT and shoulders are generally 2-FT or less. The posted speed limit on Breese Road is 45 MPH. The functional class of Breese Road is Major Collector from Beeler Road to I-75 with an AADT per ODOT’s TIMS data of 7,990; and a Minor Collector from I-75 to McClain Road with an AADT of 2,100. The land uses found along the corridor are a mix of residential, agricultural fields, pockets of commercial areas at key intersections, and industrial/manufacturing facilities located just north or south of the corridor.



Shawnee Road (Breese Rd. to Reed Rd.):

The roadway is a predominately two-lane roadway with auxiliary left turn lanes at the intersection of Breese Road (signalized). Lane widths are 12-FT and shoulders are generally 2-FT or less. The posted speed limit on Shawnee Road is 45 MPH. The functional class of Shawnee Road is Minor Arterial from Breese Road northward to Reed Road

with an AADT per ODOT's TIMS data of 9,580. The land uses found along the corridor are a mix of residential, pockets of commercial areas, and a large educational facility (Apollo Career Center). The corridor also experiences frequent truck traffic associated with nearby industrial/manufacturing facilities, as well as the Apollo Career Center that provides training on truck driving for students.

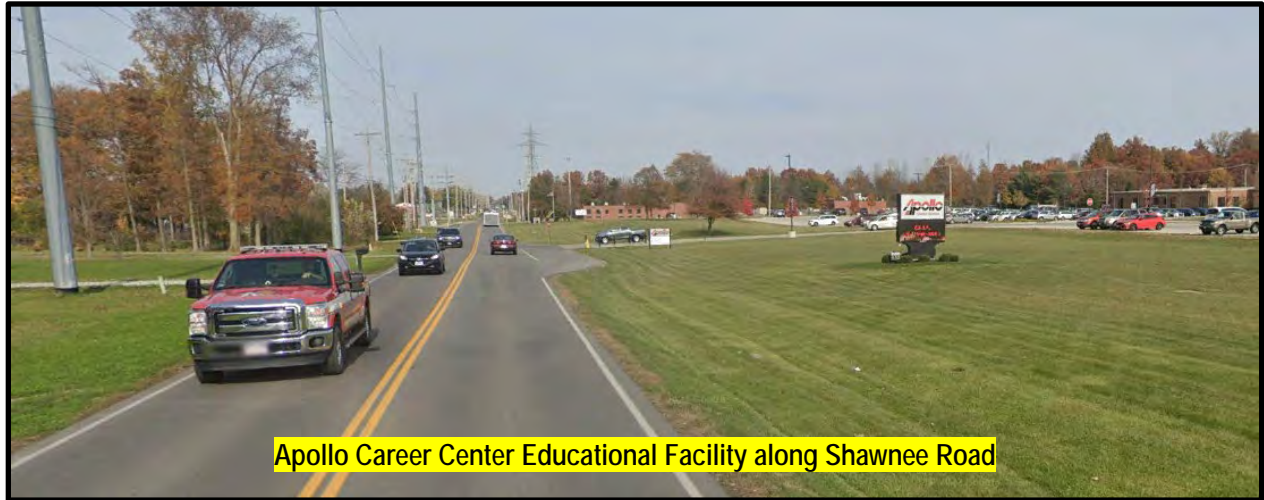
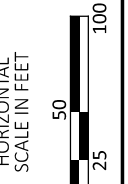


FIGURE 2.1 - EXISTING CONDITIONS DIAGRAM



BREESE RD & SHAWNEE RD
 EXISTING CONDITIONS DIAGRAM

DESIGN AGENCY



DESIGNER

RAM

REVIEWER

XXX MM-DD-YY

PROJECT ID

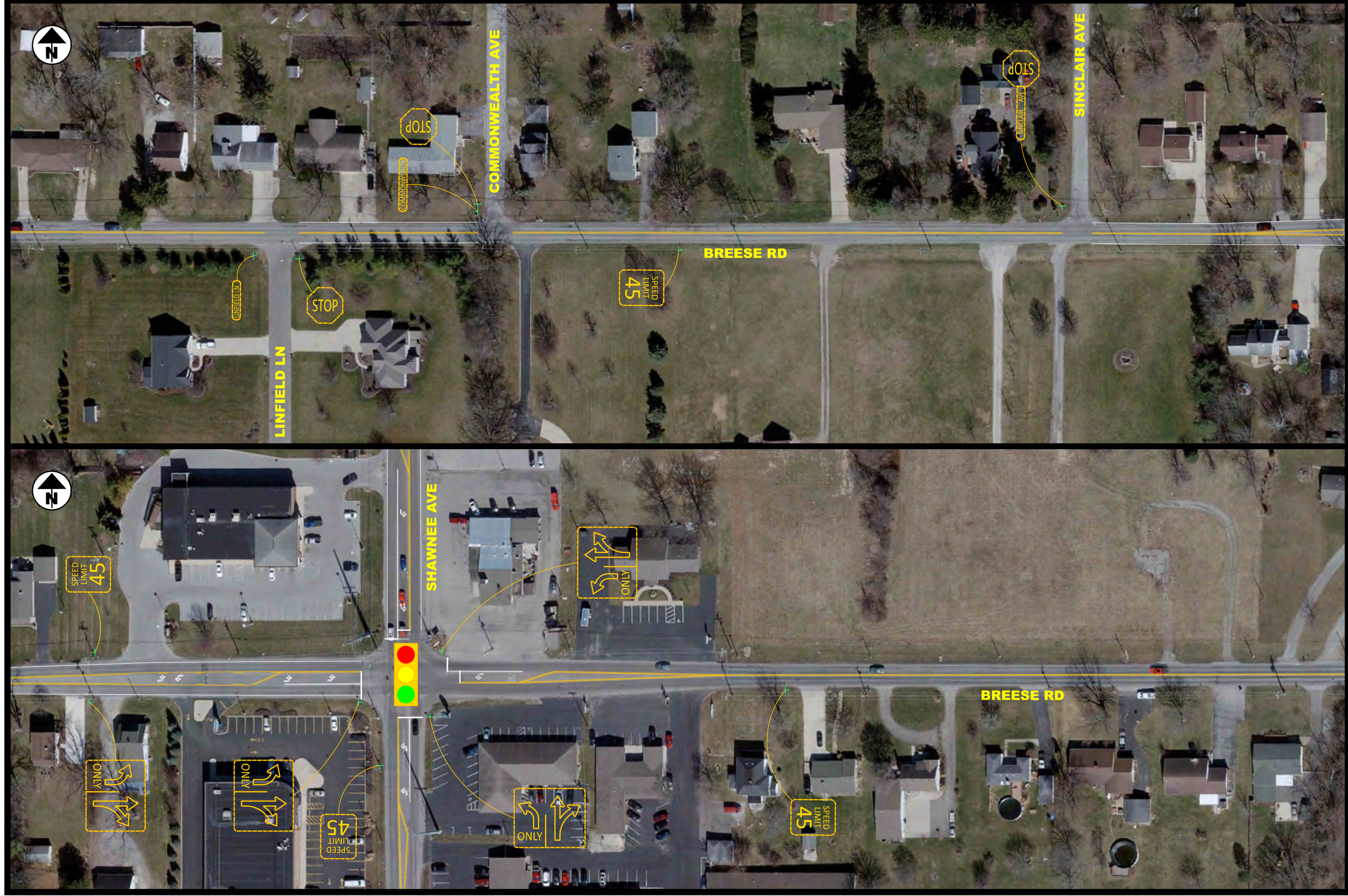
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SHEET TOTAL

P.1 7

ALLEN COUNTY ENGINEERING SAFETY STUDIES

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DESIGN AGENCY



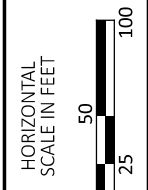
DESIGNER
RAM

REVIEWER
XXX MM-DD-YY

PROJECT ID
117252

SHEET	TOTAL
P.2	7

BREESE RD & SHAWNEE RD
EXISTING CONDITIONS DIAGRAM



ALLEN COUNTY ENGINEERING SAFETY STUDIES

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DESIGN AGENCY



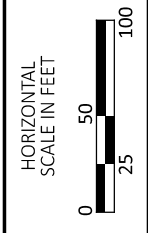
DESIGNER
RAM

REVIEWER
XXX MM-DD-YY

PROJECT ID
117252

SHEET	TOTAL
P.3	7

BREEZE RD & SHAWNEE RD
EXISTING CONDITIONS DIAGRAM





DESIGN AGENCY



DESIGNER
RAM

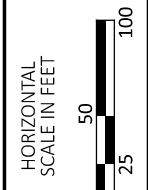
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XXX MM-DD-YY

PROJECT ID
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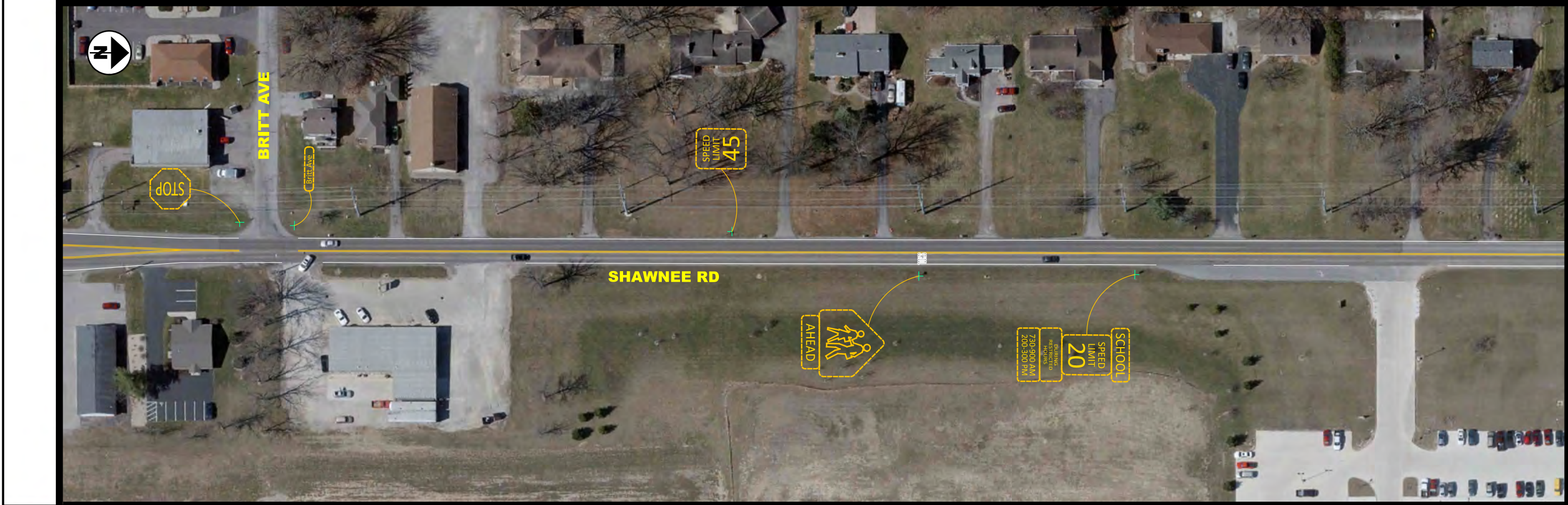
SHEET	TOTAL
P.5	7

BREESE RD & SHAWNEE RD
EXISTING CONDITIONS DIAGRAM



ALLEN COUNTY ENGINEERING SAFETY STUDIES

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DESIGN AGENCY



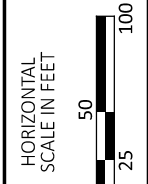
DESIGNER
RAM

REVIEWER
XXX MM-DD-YY

PROJECT ID
117252

SHEET	TOTAL
P.7	7

BREES RD & SHAWNEE RD
EXISTING CONDITIONS DIAGRAM



3.0 CRASH DATA & PROPOSED COUNTERMEASURES EVALUATION

3.1 Crash Data Summaries and Tables

An analysis of the Breese Road corridor and the Shawnee Road corridor crashes from 2020-2022, revealed the three most common types of crashes on both corridors were Rear-End, Angle, and Sideswipe-Passing. However, these three crash types were occurring for different reasons on the two corridors. On the **Breese Road corridor, over 70% of the crashes were intersection related.** On the **Shawnee Road corridor, over 71% of the crashes were not intersection related.** Given this, the focus of safety countermeasures on Breese Road will focus on ways to improve intersections, and on Shawnee Road, the focus would be improving the sections of the corridor. Following are two crash data tables (one for Breese Road and one for Shawnee Road) showing the crash severity of the corridors as well as the crash types occurring and how they compare to Statewide Averages for a similar 2-lane roadway facility.

Breese Road Crash Summary (2020-2022)

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	1	1.10%	4.50%
Minor Injury Suspected Crash	8	8.79%	14.06%
Injury Possible Crash	8	8.79%	7.65%
Property-Damage-Only	74	81.32%	72.86%
Total	91		

Crashes by Crash Type				
Crash Type	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Unknown	3.29%	0.19%	3.29%	0.12%
Head On	0.00%	2.86%	0.00%	5.74%
Rear End	50.55%	10.26%	50.55%	15.40%
Backing	3.30%	1.12%	3.30%	0.56%
Sideswipe - Meeting	0.00%	2.30%	0.00%	3.00%
Sideswipe - Passing	7.69%	3.66%	7.69%	3.92%
Angle	18.68%	2.36%	18.68%	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	6.59%	34.58%	6.59%	47.05%
Other Object	1.10%	0.92%	1.10%	0.21%
Falling From Or In Vehicle	0.00%	0.00%	0.00%	0.00%
Overturning	1.10%	2.75%	1.10%	6.35%
Other Non-Collision	0.00%	1.30%	0.00%	0.54%
Left Turn	4.40%	2.66%	4.40%	4.09%
Right Turn	3.30%	0.52%	3.30%	0.56%

Breese Road experienced one serious injury crash and the predominant types of crashes were Rear-End, Angle, and Sideswipe-Passing. All three types of crashes were above Statewide Averages. The percentage of injury/fatal crashes on the Breese Road corridor was 18.7%, which is below the Statewide Average of 27.1% and does not meet the threshold of 30% to apply to ODOT's Formal Safety Program. The CEO safety program would be a better fit to pursue funding on this corridor.

The Shawnee Road corridor experienced one fatal crash and one serious injury crash. The fatal crash involved a bicycle being hit on the corridor. The three most common types of crashes were Rear-End (60.71%), Angle (17.86%), and Sideswipe-Passing (10.71%), which are all above the Statewide Averages. The Shawnee Road corridor had 32.1% of the total crashes being injury/fatal crashes, which is above the Statewide Average of 27.1% and exceeds the 30% threshold to qualify for submitting a funding application to the ODOT Formal Safety Program.

Shawnee Road Crash Summary (2020-2022)

Select Site Type	Seg/Rur; 2-lane		
Crash Severity	Site Average		Statewide Average
	Total (2020-2022)	Total (%)	Total (%)
Fatal Crash	1	3.57%	0.93%
Serious Injury Suspected Crash	1	3.57%	4.50%
Minor Injury Suspected Crash	1	3.57%	14.06%
Injury Possible Crash	6	21.43%	7.65%
Property-Damage-Only	19	67.86%	72.86%
Total	28		

Crashes by Crash Type				
Crash Type	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Unknown	0.01%	0.19%	0.01%	0.12%
Head On	0.00%	2.86%	0.00%	5.74%
Rear End	60.71%	10.26%	60.71%	15.40%
Backing	0.00%	1.12%	0.00%	0.56%
Sideswipe - Meeting	0.00%	2.30%	0.00%	3.00%
Sideswipe - Passing	10.71%	3.66%	10.71%	3.92%
Angle	17.86%	2.36%	17.86%	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	3.57%	0.14%	3.57%	0.48%
Other Non-Vehicle	0.00%	0.01%	0.00%	0.04%
Fixed Object	3.57%	34.58%	3.57%	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	0.00%	2.75%	0.00%	6.35%
Other Non-Collision	0.00%	1.30%	0.00%	0.54%
Left Turn	3.57%	2.66%	3.57%	4.09%
Right Turn	0.00%	0.52%	0.00%	0.56%

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 the CAM-Tool spreadsheet. A review of the Breese Road corridor collision diagrams revealed that the majority of crashes were occurring at the key intersections of the corridor. The crash data shows that over 70% of the crashes on Breese Road were intersection related. The three primary areas of concentration of crashes on Breese Road were at the intersections of Shawnee Road, Dixie Highway, and at the I-75 interchange ramp intersections. It should be noted that recent improvements were made to the interchange area, and the crash data of 2020-2022 does not fully reflect the current conditions being in place for all three years, thus no improvements will be recommended for the interchange area. The intersections of Shawnee Road and Dixie Highway are signalized intersections with spanwire signal layouts. Countermeasures will be developed that focus on intersection improvements given the large percentage of crashes occurring at intersections.

Breese Road Corridor Crash Data (2020-2022)
(Beeler Road to McClain Road)

Crashes Per Year	30.33
Fatal and All Injury Crashes	17
Percent Injury	18.7%
Equivalent PDO Index Value	2.28

Fatalities	0
Serious Injuries	1
Other Injuries	31

Crash Type	Crashes	%
Rear End	46	50.55%
Angle	17	18.68%
Sideswipe - Passing	7	7.69%
Fixed Object	6	6.59%
Left Turn	4	4.40%
Backing	3	3.30%
Right Turn	3	3.30%
Unknown	3	3.30%
Overturning	1	1.10%
Other Object	1	1.10%
Grand Total	91	100.00%

Intersection Related	Crashes	%
Yes	64	70.33%
No	27	29.67%
Grand Total	91	100.00%

The crash data shows that over 71% of the crashes on Shawnee Road were non-intersection related. Shawnee Road is currently a two-lane roadway with no left turn lanes on the corridor except at Breese Road. There is not a particular concentration of crash locations on the Shawnee Road corridor, as the crashes are occurring throughout the limits of this 0.5-mile corridor. A review of the collision diagram reveals that many of the Rear-End, Angle, and Sideswipe crashes appear to be associated with turning vehicles into and out of the numerous residential and business driveways located along the corridor. The lack of left turn lanes on the corridor does not allow turning vehicles to be separated from the through traffic movements, which creates unexpected stops that is leading to the high percentage of Rear-end crashes. Countermeasures will be developed that focus on section improvements given the large percentage of crashes occurring at non-intersections.

**Shawnee Road Corridor Crash Data (2020-2022)
(Britt Avenue to Road to Reed Road)**

Crashes Per Year	9.33
Fatal and All Injury Crashes	9
Percent Injury	32.1%
Equivalent PDO Index Value	5.14

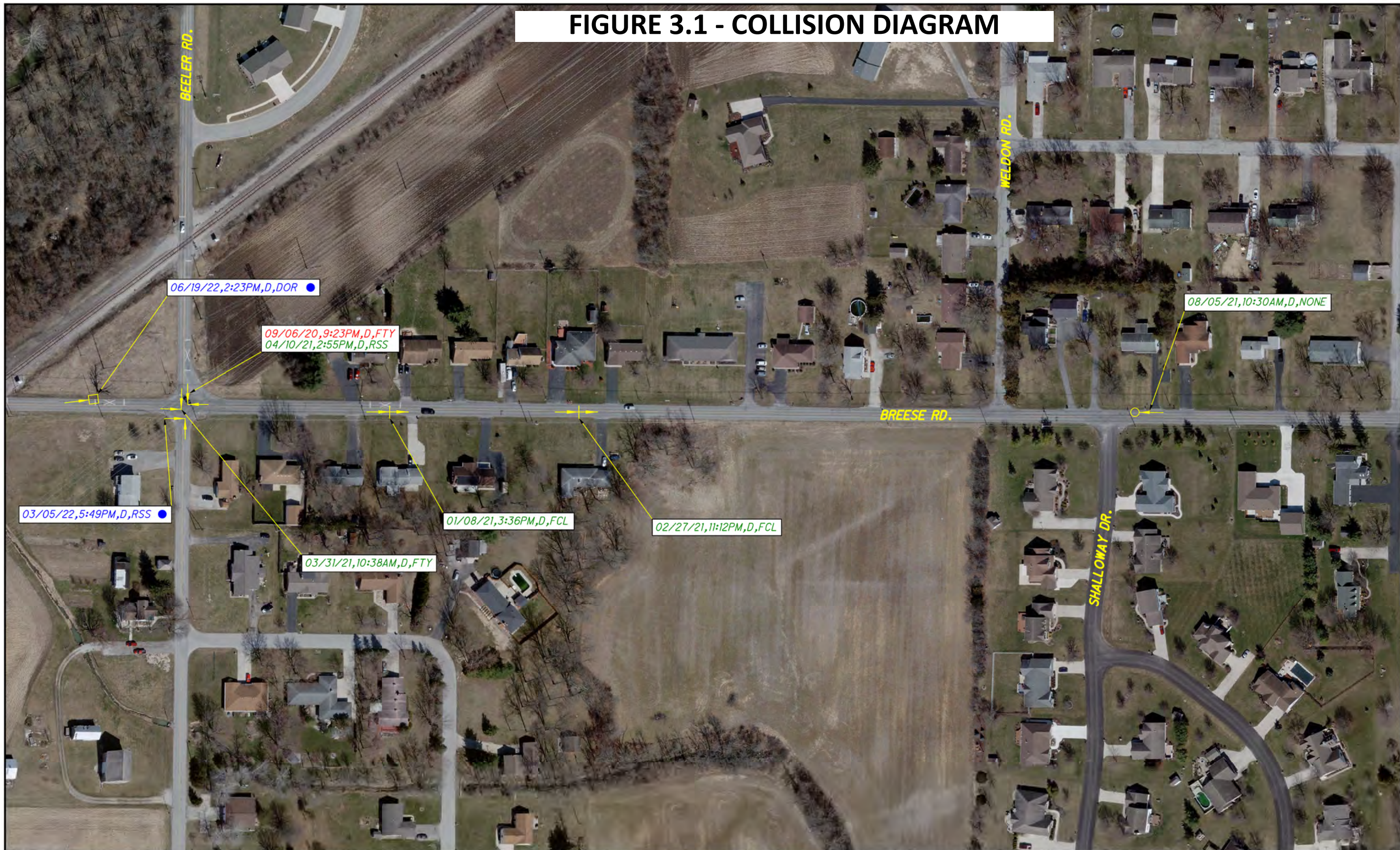
Fatalities	1
Serious Injuries	1
Other Injuries	9

Crash Type	Crashes	%
Rear End	17	60.71%
Angle	5	17.86%
Sideswipe - Passing	3	10.71%
Fixed Object	1	3.57%
Pedalcycles	1	3.57%
Left Turn	1	3.57%
Grand Total	28	100.00%

Intersection Related	Crashes	%
Yes	8	28.57%
No	20	71.43%
Grand Total	28	100.00%



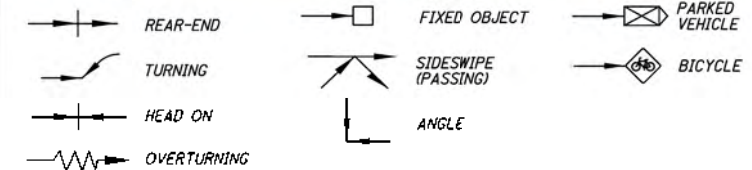
FIGURE 3.1 - COLLISION DIAGRAM



BREESE RD./SHAWNEE RD.
COLLISION DIAGRAM

ALLEN COUNTY
SAFETY STUDY

CRASH TYPES:



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
- ISP = IMPROPER START FROM A PARKED POSITION
- DOR = DROVE OFF ROAD
- OIA = OTHER IMPROPER ACTION
- ODE = OPERATING DEFECTIVE EQUIPMENT
- IPB = IMPROPER BACKING
- IPP = IMPROPER PASSING
- IPC = IMPROPER CROSSING

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

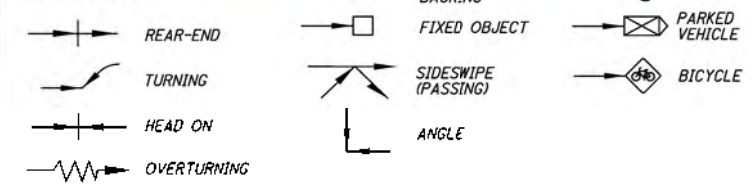
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1	2020	6	PROPERTY DAMAGE ONLY (PDO)
5	2021	2	INJURY
2	2022	0	FATAL
		8	TOTAL CRASHES (CURRENT PAGE)



BREESE RD. / SHAWNEE RD. COLLISION DIAGRAM

ALLEN COUNTY SAFETY STUDY

CRASH TYPES:



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
- ISP = IMPROPER START FROM A PARKED POSITION
- DOR = DROVE OFF ROAD
- OIA = OTHER IMPROPER ACTION
- ODE = OPERATING DEFECTIVE EQUIPMENT
- IPB = IMPROPER BACKING
- IPP = IMPROPER PASSING
- IPC = IMPROPER CROSSING

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	
4	2020	24	PROPERTY DAMAGE ONLY (PDO)
12	2021	3	INJURY
11	2022	0	FATAL
		27	TOTAL CRASHES (CURRENT PAGE)



BREESE RD./SHAWNEE RD.
COLLISION DIAGRAM

ALLEN COUNTY
SAFETY STUDY

CRASH TYPES:

- | | | | | | |
|--|-------------|--|---------------------|--|----------------------|
| | REAR-END | | BACKING | | OTHER PARKED VEHICLE |
| | TURNING | | FIXED OBJECT | | BICYCLE |
| | HEAD ON | | SIDESWIPE (PASSING) | | |
| | OVERTURNING | | ANGLE | | |

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
 ISP = IMPROPER START FROM A PARKED POSITION
 DOR = DROVE OFF ROAD
 OIA = OTHER IMPROPER ACTION
 ODE = OPERATING DEFECTIVE EQUIPMENT
 IPB = IMPROPER BACKING
 IPP = IMPROPER PASSING
 IPC = IMPROPER CROSSING

ROAD CONDITION:

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

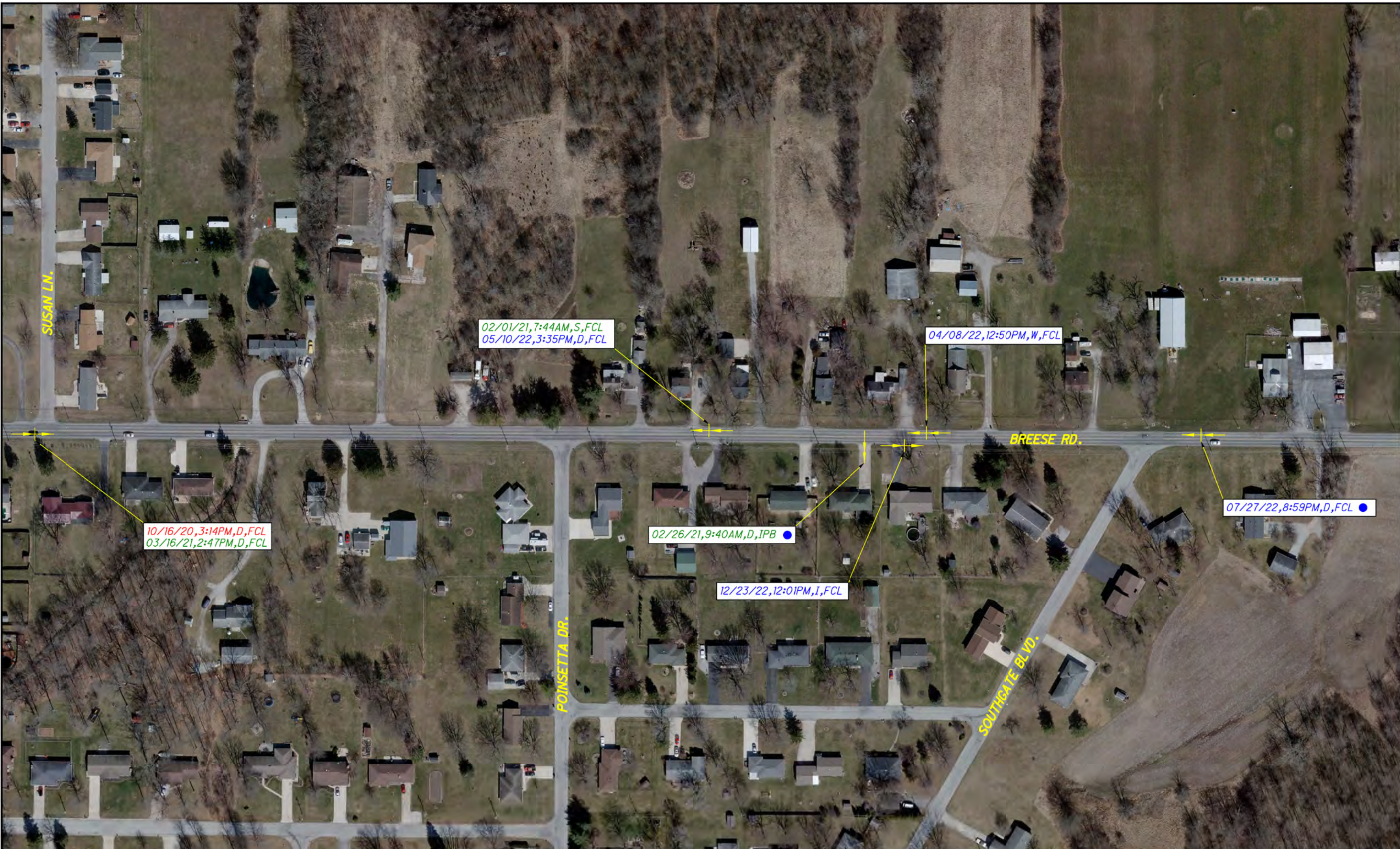
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DATE, TIME, ROAD CONDITION, CONTRIBUTING FACTOR

RED = 2020
 GREEN = 2021
 BLUE = 2022

PAGE SUMMARY

FREQUENCY		SEVERITY	
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4	2021	2	INJURY
1	2022	0	FATAL
		6	TOTAL CRASHES (CURRENT PAGE)



BREESE RD./SHAWNEE RD.
COLLISION DIAGRAM

ALLEN COUNTY
SAFETY STUDY

CRASH TYPES:

- +→ REAR-END
- ↘ TURNING
- +→ HEAD ON
- ⚡ OVERTURNING
- ←→ BACKING
- FIXED OBJECT
- ↔ SIDESWIPE (PASSING)
- ↙ ANGLE
- OTHER PARKED VEHICLE
- ⊠ BICYCLE

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
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- ODE = OPERATING DEFECTIVE EQUIPMENT
- IPB = IMPROPER BACKING
- IPP = IMPROPER PASSING
- IPC = IMPROPER CROSSING

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)
3	2021	2	INJURY
4	2022	0	FATAL
		8	TOTAL CRASHES (CURRENT PAGE)

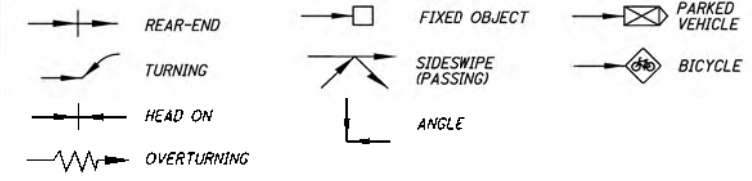


BREESE RD./SHAWNEE RD.
COLLISION DIAGRAM

ALLEN COUNTY
SAFETY STUDY



CRASH TYPES:



CONTRIBUTING FACTORS:

FTY = FAILURE TO YIELD
 FCL = FOLLOWED TOO CLOSELY
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 ODE = OPERATING DEFECTIVE EQUIPMENT
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 IPP = IMPROPER PASSING
 IPC = IMPROPER CROSSING

ROAD CONDITION:

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

CRASH DESCRIPTION

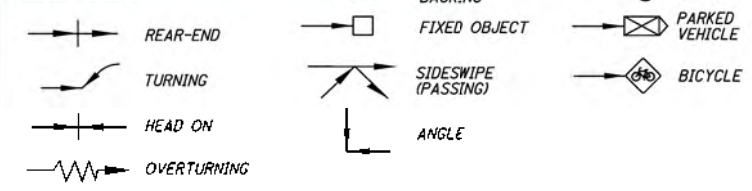
DATE, TIME, ROAD CONDITION, CONTRIBUTING FACTOR
 RED = 2020
 GREEN = 2021
 BLUE = 2022

PAGE SUMMARY

FREQUENCY		SEVERITY	
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9	2021	8	INJURY
10	2022	0	FATAL
		31	TOTAL CRASHES (CURRENT PAGE)



CRASH TYPES:



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
 ISP = IMPROPER START FROM A PARKED POSITION
 DOR = DROVE OFF ROAD
 OIA = OTHER IMPROPER ACTION
 ODE = OPERATING DEFECTIVE EQUIPMENT
 IPB = IMPROPER BACKING
 IPP = IMPROPER PASSING
 IPC = IMPROPER CROSSING

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
8 2020	16 PROPERTY DAMAGE ONLY (PDO)
6 2021	4 INJURY
6 2022	0 FATAL
	20 TOTAL CRASHES (CURRENT PAGE)



BREESE RD./SHAWNEE RD.
COLLISION DIAGRAM

ALLEN COUNTY
SAFETY STUDY

CRASH TYPES:

- | | | | | | |
|--|-------------|--|---------------------|--|----------------------|
| | REAR-END | | BACKING | | OTHER PARKED VEHICLE |
| | TURNING | | FIXED OBJECT | | BICYCLE |
| | HEAD ON | | SIDESWIPE (PASSING) | | |
| | OVERTURNING | | ANGLE | | |

CONTRIBUTING FACTORS:

- | | |
|----------------------------|---|
| FTY = FAILURE TO YIELD | ISP = IMPROPER START FROM A PARKED POSITION |
| FCL = FOLLOWED TOO CLOSELY | DOR = DROVE OFF ROAD |
| IPT = IMPROPER TURN | OIA = OTHER IMPROPER ACTION |
| ILC = IMPROPER LANE CHANGE | ODE = OPERATING DEFECTIVE EQUIPMENT |
| RRL = RAN RED LIGHT | IPB = IMPROPER BACKING |
| LOC = LEFT OF CENTER | IPP = IMPROPER PASSING |
| | IPC = IMPROPER CROSSING |

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	
2	2020	3	PROPERTY DAMAGE ONLY (PDO)
1	2021	0	INJURY
0	2022	0	FATAL
		3	TOTAL CRASHES (CURRENT PAGE)



BREESE RD./SHAWNEE RD.
COLLISION DIAGRAM

ALLEN COUNTY
SAFETY STUDY

CRASH TYPES:

- | | | | | | |
|--|-------------|--|---------------------|--|----------------------|
| | REAR-END | | BACKING | | OTHER PARKED VEHICLE |
| | TURNING | | FIXED OBJECT | | BICYCLE |
| | HEAD ON | | SIDESWIPE (PASSING) | | |
| | OVERTURNING | | ANGLE | | |

CONTRIBUTING FACTORS:

- | | |
|----------------------------|---|
| FTY = FAILURE TO YIELD | ISP = IMPROPER START FROM A PARKED POSITION |
| FCL = FOLLOWED TOO CLOSELY | DOR = DROVE OFF ROAD |
| IPT = IMPROPER TURN | OIA = OTHER IMPROPER ACTION |
| ILC = IMPROPER LANE CHANGE | ODE = OPERATING DEFECTIVE EQUIPMENT |
| RRL = RAN RED LIGHT | IPB = IMPROPER BACKING |
| LOC = LEFT OF CENTER | IPP = IMPROPER PASSING |
| | IPC = IMPROPER CROSSING |

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	
2	2020	2	PROPERTY DAMAGE ONLY (PDO)
3	2021	3	INJURY
1	2022	1	FATAL
		6	TOTAL CRASHES (CURRENT PAGE)



BREESE RD./SHAWNEE RD.
COLLISION DIAGRAM



ALLEN COUNTY
SAFETY STUDY

CRASH TYPES:

- | | | | | | |
|--|-------------|--|---------------------|--|----------------------|
| | REAR-END | | BACKING | | OTHER PARKED VEHICLE |
| | TURNING | | FIXED OBJECT | | BICYCLE |
| | HEAD ON | | SIDESWIPE (PASSING) | | |
| | OVERTURNING | | ANGLE | | |

CONTRIBUTING FACTORS:

- FTY = FAILURE TO YIELD
 DOR = DROVE OFF ROAD
 FCL = FOLLOWED TOO CLOSELY
 OIA = OTHER IMPROPER ACTION
 IPT = IMPROPER TURN
 ODE = OPERATING DEFECTIVE EQUIPMENT
 ILC = IMPROPER LANE CHANGE
 IPB = IMPROPER BACKING
 RRL = RAN RED LIGHT
 IPP = IMPROPER PASSING
 LOC = LEFT OF CENTER
 IPC = IMPROPER CROSSING

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
8 2020	12 PROPERTY DAMAGE ONLY (PDO)
3 2021	4 INJURY
5 2022	0 FATAL
	16 TOTAL CRASHES (CURRENT PAGE)

3.3 Crash Summary Narrative and Potential Countermeasures

Breese Road Corridor:

As discussed previously, the crash types of Rear-End, Angle, and Sideswipe-Passing are the predominant crash types on the Breese Road corridor. The crash types of all 91 crashes are shown in Table 3.1. The crash data also revealed that over 70% of all crashes occurred at intersections, with the key problematic intersections being Shawnee Road and Dixie Highway. A site review of the intersections revealed that truck traffic passing through these two intersections have difficulty making right turns as the existing turning radii do not accommodate a large truck making the turn. The existing traffic signals at these two intersections are spanwire installations. A mast arm signal would provide improved signal head placements to improve visibility to motorists. The long-term improvements will focus on enhancing intersection safety and operations. Potential long-term countermeasures that will be considered are mast arm signal installations to replace the antiquated existing spanwire signals; enhanced signing and pavement markings throughout the corridor; turning radius improvements; and, potential turn lane considerations at key locations.

Crash Type	Number of Crashes	% of Total Crashes	Statewide Average % of Crashes
Rear-End	46	50.55%	10.26%
Angle	17	18.68%	2.36%
Sideswipe-Passing	7	7.69%	3.66%
Fixed Object	6	6.59%	34.58%
Left Turn	4	4.40%	2.66%
Backing	3	3.30%	1.12%
Right Turn	3	3.30%	0.52%
Unknown	3	3.30%	0.19%
Overtaking	1	1.10%	2.75%
Other Object	1	1.10%	0.92%
Total Crashes	91	100%	N/A

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

Intersection Related	Crashes	%
Yes	64	70.33%
No	27	29.67%
Grand Total	91	100.00%

Shawnee Road Corridor:

The predominant crash types of Rear-End, Angle, and Sideswipe-Passing are the most frequent crash types on the Shawnee Road corridor. The crash types of all 28 crashes are shown in Table 3.2. In addition to the crash types, the crash data revealed that over 71% of all crashes on the corridor were not intersection related. A site review of the Shawnee Road corridor revealed truck traffic passing through the corridor, as well as student traffic being prevalent given that the Apollo Career Center is located on the corridor. The presence of young drivers appears to be a contributing factor for crashes, as over 60% of the crashes involved a young driver (age 15-25). The Long Term improvements will focus on enhancing corridor safety by separating the left turning vehicles on the corridor out of the through movements. There was a fatal crash on the corridor that involved a bicycle. The corridor currently has no pedestrian or bicycle facilities, despite the presence of residential areas and the Apollo Career Center. Potential long-term countermeasures that will be considered are adding a center two-way left turn lane; a left turn lane on Shawnee Road at Reed Road; and a shared use path along the corridor to provide safe travel for bikes and pedestrians.

Crash Type	Number of Crashes	% of Total Crashes	Statewide Average % of Crashes
Rear-End	17	60.71%	10.26%
Angle	5	17.86%	2.36%
Sideswipe-Passing	3	10.71%	3.66%
Fixed Object	1	3.57%	34.58%
Pedalcycles	1	3.57%	0.14%
Left Turn	1	3.57%	2.66%
Total Crashes	28	100%	N/A

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

Intersection Related	Crashes	%
Yes	8	28.57%
No	20	71.43%
Grand Total	28	100.00%

Young Driver (15-25)	Crashes	%
No	11	39.29%
Yes	17	60.71%
Grand Total	28	100.00%

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 intersection improvements at key intersections along the Breese Road corridor are necessary to reduce crash frequency and severity. In regards to the Breese Road corridor, the existing roadway has lane widths of 12-FT and shoulders are approximately 2-FT in width. The intersections on Breese Road at Shawnee Road and at Dixie Highway have existing spanwire traffic signals in place. Given that over 70% of the crashes occurred at intersections along Breese Road, the focus of improvements will be on intersection enhancements. The segments of the Breese Road corridor experienced only a few crashes that were widespread and primarily property damage only (PDO) crashes. Therefore no significant improvements are recommended on the segments of Breese Road and only maintenance type improvements of pavement markings, signing, and trimming vegetation are needed based on crash data. In regards to the Shawnee Road corridor, the crash issues were more segment focused, unlike the Breese Road corridor that was more intersection focused. On Shawnee Road, the crash data revealed that over 71% of the crashes were not intersection related. The proposed alternatives to enhance safety are discussed below.

3.5 Proposed Alternatives Evaluated

Breese Road & Beeler Road:

A site review of this intersection revealed that the northeast corner of the intersection does not have an adequate turning radius for the school buses making a right turn from westbound Breese Road to northbound Beeler Road. Thus, a radius improvement is recommended for the northeast corner of the intersection. Signing enhancements are also recommended that includes larger sized Stop Signs on Beeler Road, as well as Stop Ahead warning signs. On Breese Road, it is recommended to provide enhanced Intersection Ahead warning signs.

Breese Road & Shawnee Road Intersection:

The projected No Build traffic operations in 2027 reveal capacity constraints at the Breese Road & Shawnee Road intersection with LOS E in both the AM & PM. In 2047 (No Build) the AM has a LOS E and the PM has a LOS F. Crashes at the intersection from 2020-2022 revealed nearly 90% of the crashes were property damage only crashes and did not involve injuries. Initially a roundabout was a consideration, but it was determined early on that the footprint of a single lane roundabout would likely require total takes of at least two commercial properties (on NE and SE quadrants of the intersection), as well as relocation of at least one large metal transmission power pole. One of the key benefits of a roundabout is to reduce injury and fatal crashes. However, given that the recent three years of crash data shows that nearly 90% of the crashes are property damage only crashes, there would not be a large reduction in injury crashes since they are not occurring in the first place. Thus, the focus shifted to improvements on enhancing the traffic signal operations and improving turning movements. The proposed improvements include upgrading the traffic signal to a mast arm installation with the latest technology of vehicle detection; optimizing the signal timing/phasing; installing count down signal heads & pushbuttons; improving turning radii for heavy truck turning movements; and adding a westbound Breese Road right turn lane to northbound Shawnee Road. These improvements enhance traffic operations by bringing the LOS for the overall intersection up to a LOS D for both AM & PM conditions through the horizon year of 2027.

Breese Road & Dixie Highway Intersection:

The projected No Build traffic operations in 2027 reveal capacity constraints at the Breese Road & Dixie Highway intersection with LOS F in the AM and a LOS D in the PM of 2027. In 2047 (No Build) the AM LOS F degrades further, and in the PM a LOS E occurs. Crashes at the intersection from 2020-2022 revealed over 72% of the crashes were property damage only crashes and did not involve injuries. Initially a roundabout was considered, but given the skewed intersection, the roundabout alignment would most likely require a total take of one commercial property (likely the SE quadrant). Given that the recent three years of crash data shows that over 72% of the crashes were property damage only crashes, it was determined that less property impact improvements like signal upgrades and turning improvements

could just as effectively reduce crashes at a much less cost. The proposed improvements include upgrading the traffic signal to a mast arm installation with the latest technology of vehicle detection; optimizing the signal timing/phasing; installing count down signal heads & pushbuttons; improving turning radii for heavy truck turning movements; and using a concrete section of pavement on the southbound approach on Dixie Highway. This concrete section is needed for large volumes of heavy trucks that rapidly degrade the pavement with them stopping and starting on this approach. These improvements enhance traffic operations by bringing the LOS for the overall intersection up to a LOS C or D for both the AM & PM conditions through the horizon year of 2027, aside from the LOS E in the AM Build of 2047, which is only 6 seconds over a LOS D into the E category. This is 20 years into the future from opening day, so if traffic growth ends up being less than predicted, this could very well remain a LOS D through 2047.

Breese Road & Industrial Drive:

A site review of this intersection revealed that the curved approach heading into the intersection with Breese Road would benefit from enhanced signing to notify drivers of the approaching Stop sign. Dual Stop Ahead signs and Dual Stop signs are proposed to enhance safety at the intersection.

Breese Road & I-75 Interchange:

The interchange of I-75 with Breese Road was reconstructed recently (within past couple years), and crash data currently does not reflect the upgraded improvements. Given this, no improvements to the I-75 interchange area is proposed.

Breese Road from I-75 Interchange to McClain Road:

The County Engineer has indicated that the single lane bridge just east of the interchange located just east of Delong Road will be replaced in 2025, and that in 2027 a roadway reconstruction project of Breese Road will occur from the replaced bridge eastward to McClain Road that will be reconstructed to current County design standards. Given this, no recommendations are being made other than at the intersection of Breese Road and McClain Road.

Breese Road & McClain Road:

This intersection is under All-Way Stop control for this T-Type intersection. The site review noted that turning radii are too restricted at the intersection for trucks making turns through this intersection. The County indicated developments north of the intersection would lead to increased truck traffic passing through this intersection. Thus, minor widening to allow for improved turning radii is proposed for this intersection.

Recommended Build Alternative for Breese Road Corridor:

Beeler Rd. to McClain Rd. (\$2,243,000)

- Beeler Rd. & Breese Rd. – Turning radius improvement and signing improvements
- Breese Rd. & Shawnee Rd. – Full signal upgrade to mast arm signal; countdown pedestrian signal heads and pushbuttons; sidewalk landings & ADA curb ramps; high visibility crosswalk markings; add a westbound right turn lane; and radius improvements
- Breese Rd. & Dixie Hwy. – Full signal upgrade to mast arm signal; countdown pedestrian signal heads and pushbuttons; sidewalk landings & ADA curb ramps; high visibility crosswalk markings; replace southbound approach asphalt pavement with concrete pavement to prevent pavement damage from heavy truck traffic; and radius improvements
- Breese Rd. & Industrial Dr. – Add dual Stop Ahead and dual Stop signs to intersection
- Breese Rd. & McClain Rd. – Improve turning radii to accommodate truck movements

Recommended Build Alternative for Shawnee Road Corridor:

Britt Ave. to Reed Rd. (\$1,811,000)

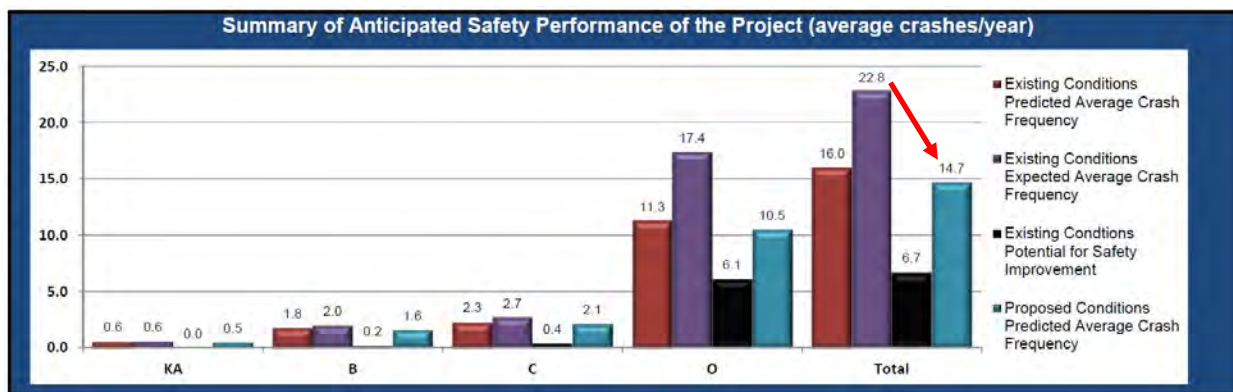
- Widen roadway to provide a center two-way left turn lane for the corridor and add 4-FT shoulders
- Add a 10-FT wide shared use path (SUP) along east side of Shawnee Road from just north of Britt Avenue to north of Reed Road to connect to existing SUP at Heritage Park

- Shawnee Rd. & Reed Rd. – Add southbound left turn lane and improve turning radii

The Breese Road improvements and Shawnee Road improvements were separated into two cost estimates. This was done to facilitate applications to various funding sources. The Shawnee Road corridor improvements from Britt Avenue to Reed Road meet the requirements to apply for a Formal Safety Program application to ODOT. The Breese Road corridor improvements does not meet the thresholds of at least 30% of the crashes being injury crashes, thus this project could apply instead to the CEAO safety program for funding. The cost estimates are projected to a FY27 construction year.

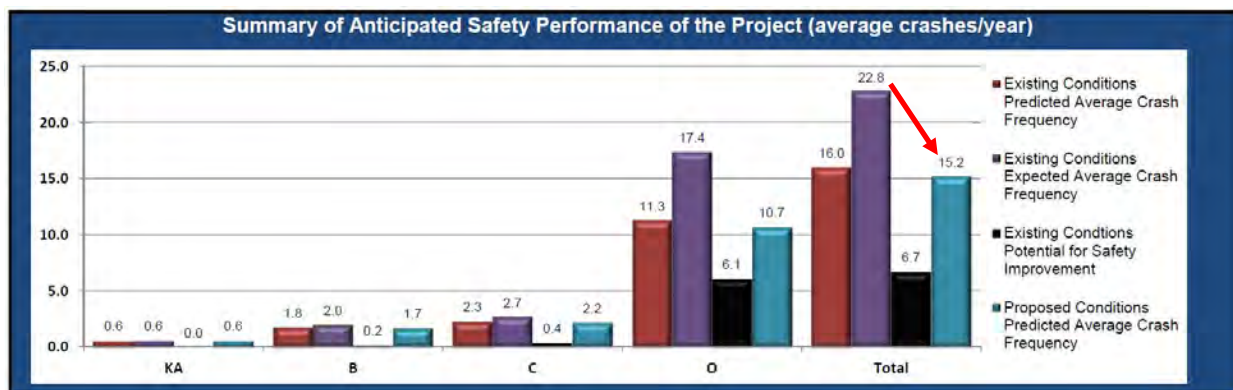
Breese Road ECAT Analyses Results:

This recommended Breese Road improvements focuses on constructing intersection improvements on the corridor including signal upgrades, signal-timing revisions, turning radii improvements, signing improvements, and pavement marking improvements. The ECAT safety analyses revealed the proposed improvements would reduce crashes by 8.1 crashes per year from the Existing Conditions Predicted Average of 22.8 crashes per year down to 14.7 crashes per year for the Proposed Conditions Expected Average Crashes.



Shawnee Road ECAT Analyses Results

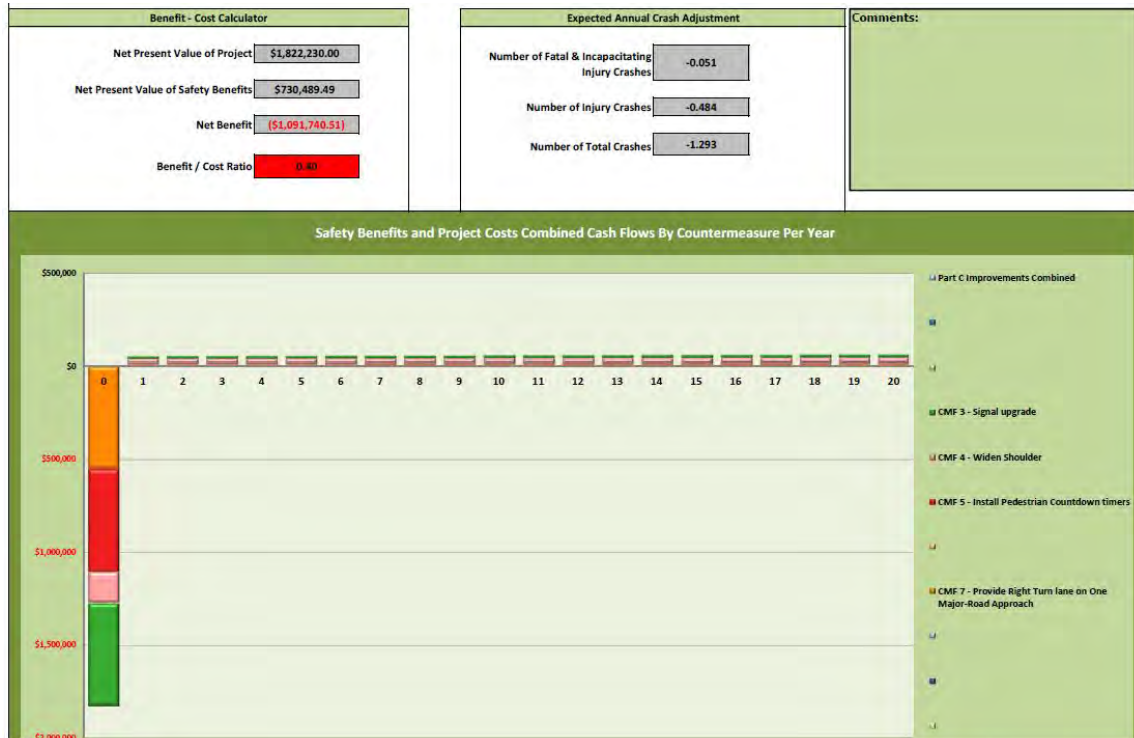
This recommended Shawnee Road improvements focuses on constructing at center two-way left turn lane on the corridor; constructing a shared use path; widening shoulders to 4-FT; and construct a southbound left turn lane on Shawnee Road at Reed Road. The ECAT safety analyses revealed the proposed improvements would reduce crashes by 7.6 crashes per year from the Existing Conditions Predicted Average of 22.8 crashes per year down to 15.2 crashes per year for the Proposed Conditions Expected Average Crashes.



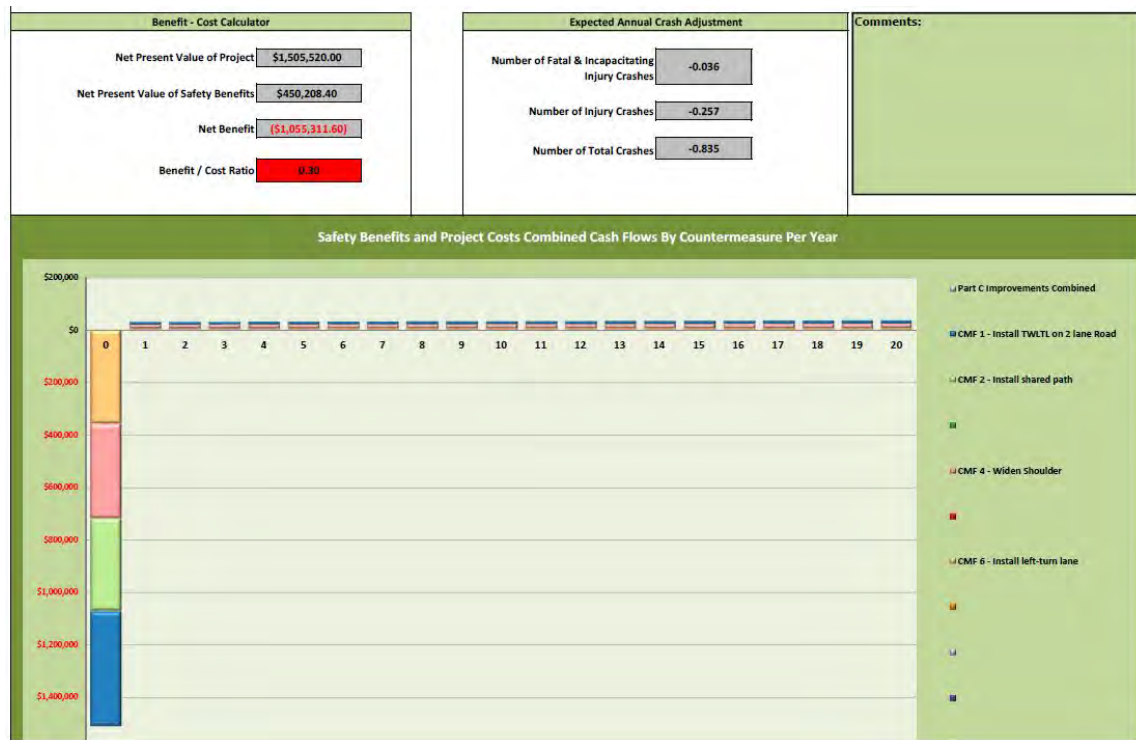
3.6 Countermeasure Alternatives Conclusions

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 on Breese Road would provide a reduction of crash frequency of 8.1 crashes per year, and reduce crash frequency by 7.6 crashes per year on Shawnee Road. The benefit/cost analysis of the ECAT spreadsheet resulted in a negative cost benefit of 0.40 for the Breese Road improvements, and a negative 0.30 for the Shawnee Road improvements. The following tables and charts document the cost/benefit output of the ECAT analysis spreadsheets. The proposed ECAT reports are found in the appendices.

Breese Road Corridor Benefit-Cost Analyses:



Shawnee Road Corridor Benefit-Cost Analyses:



In summary, the proposed improvements to both Breese Road corridor and the Shawnee Road corridor result in negative cost-benefit ratios; however, it the proposed improvements result in a crash reduction frequency of 8.1 fewer crashes per year for the Breese Road improvements and a reduction of 7.6 fewer crashes per year for the Shawnee Road corridor improvements. The Breese Road corridor averaged 30.33 crashes per year. The corridor had 18.7% of the crashes result in injury crashes. Given that, the Breese Road corridor has less than 30% of the crashes being injury crashes, it would not qualify to apply for a Formal Safety Program application; therefore, it is recommended to apply to the CEAO Safety Program funding application. There is also potential to apply to the ODOT Systemic Safety Program for pedestrian/bike related improvements. The LACRPC has several funding sources that can be applied to for roadway improvements. 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 Shawnee Road corridor improvements resulted in a predicted reduction of 7.6 fewer crashes per year. The Shawnee Road corridor experienced 9.33 crashes per year with 32.1% of all crashes being injury/fatal crashes (including one fatal crash and one serious injury crash). Thus, the Shawnee Road proposed improvements would qualify to submit a funding application to the ODOT Formal Safety Program. There is also potential to apply to the ODOT Systemic Safety Program for pedestrian/bike related improvements. The LACRPC has several funding sources that can be applied to for roadway improvements. 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.

4.0 SUMMARY OF TRAFFIC OPERATIONS

4.1 Traffic Operations

The Breese Road corridor from Beeler Road to McClain Road (3.0 miles) is a corridor that services residential areas, business areas, educational facilities, and industrial/manufacturing facilities of the area. The Shawnee Road corridor services the same land uses as cited for the Breese Road corridor. Breese Road includes an interchange with I-75 on the eastern end of the corridor. A review of ODOT’s TIMS data indicates an existing Annual Average Daily Traffic (AADT) of 7,990 vehicles per day west of I-75 on Breese Road and 2,100 vehicles per day east of the interchange. Traffic volumes on Shawnee Road show an AADT of 9,580 vehicles per day. Turning movement counts were conducted at the key intersections on Breese Road of Beeler Road, Shawnee Road, Dixie Highway, and McClain Road. On Shawnee Road, the intersection with Reed Road had a traffic count conducted. The interchange intersections on Breese Road did not have traffic counts conducted because the interchange was recently upgraded and no improvements were seen as necessary. The AM and PM peak hour volumes were projected to 2027 (Opening Year) and 2047 (Horizon Design Year) using a positive 0.5% annual growth rate. The traffic volumes were then analyzed to determine if traffic operations would show any restrictions in both the No Build and Build conditions. Traffic data is found in Appendix A and Capacity Reports are in Appendix B.

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 peak hour AM and PM traffic volumes for 2027 and 2047 were evaluated for both the No Build conditions and Build conditions. Table 4.2 summarizes the levels of service for the AM and PM peak hours for the No Build condition (retain existing conditions) and compares this to the Build condition (proposed improvements). Detailed capacity output reports are provided for reference in Appendix B. The capacity analyses revealed adequate LOS values of LOS C or better in both the No Build and Build scenarios in Opening Year (2027) and Design Year (2047) for the unsignalized intersections.

The signalized intersections of Breese Road & Shawnee Road and Breese Road & Dixie Highway have areas of capacity constraints in both 2027 and 2047 without any improvements being made. In the No Build conditions, the Shawnee Road intersection experiences an overall intersection LOS E in the 2027 AM & PM, and a LOS E in the 2047 AM and LOS F in the 2047 PM. Under the proposed Build conditions, all of the overall intersection operations improve to a LOS D in both 2027 and 2047. The intersection of Dixie Highway in the 2027 No Build condition has a LOS F in the AM. In the 2047 AM it is a LOS F and in the PM a LOS E. Under the Build condition, in both the 2027 and 2047 analysis years the overall intersection operations are either a LOS C or D, with the only exception being a LOS E in the 2047 AM Build (but only by 6 seconds, otherwise it would be a LOS D), but this is an improvement from the No Build LOS F.

The proposed improvements for both the signalized intersections involves upgrading the existing spanwire signals to newer technology and to mast arm signals. Additional enhancements include improved detection technology; optimization of signal timings/phasing, and the adding of a westbound right turn lane on Breese Road at Shawnee Road will improve operations. Turning radii improvements are also proposed at both intersections to accommodate heavy truck turning movements.

Table 4.2 Capacity Analyses Results

Intersection	Movement/Approach		Opening Year (2027)				Horizon Year (2047)			
			AM No Build	AM Build	PM No Build	PM Build	AM No Build	AM Build	PM No Build	PM Build
Breese Rd & Beeler Rd <i>(Stop Controlled)</i> (Build has No Changes to the existing configuration)	EB	App	A/0.5	No Changes	A/0.4	No Changes	A/0.5	No Changes	A/0.4	No Changes
	WB	App	A/0.5	No Changes	A/0.5	No Changes	A/0.5	No Changes	A/0.5	No Changes
	NB	App	B/14.8	No Changes	B/12.4	No Changes	C/16.0	No Changes	B/13.1	No Changes
	SB	App	C/17.7	No Changes	B/13.2	No Changes	C/20.3	No Changes	B/14.2	No Changes
	Total		N/A	No Changes	N/A	No Changes	N/A	No Changes	N/A	No Changes
Breese Rd & Shawnee Rd <i>(Signalized)</i> (Build condition upgrades signal to mast arm design; signal timing revs; and adds a WB right turn lane)	EB	App	D/40.7	D/39.2	D/38.9	D/38.2	D/42.4	D/40.9	D/39.6	D/39.0
	WB	App	F/102.9	D/46.6	F/144.6	D/44.3	F/136.7	D/50.5	F/185.9	D/46.8
	NB	App	D/41.1	D/41.1	D/45.8	D/45.8	D/42.3	D/42.3	D/50.0	D/50.0
	SB	App	C/30.7	C/30.7	D/38.9	D/38.9	C/31.3	C/31.3	D/42.2	D/42.2
	Total		E/58.0	D/40.1	E/72.9	D/42.0	E/69.4	D/42.1	F/87.6	D/44.8
Breese Rd & Dixie Hwy <i>(Signalized)</i> (Build condition upgrades signal to mast arm design; signal timing revs; and radius improvements)	EB	App	E/55.6	C/33.3	D/46.8	C/29.7	E/65.4	D/36.0	D/50.0	C/31.1
	WB	App	F/204.0	E/66.7	E/73.2	C/30.8	F/256.4	F/94.0	F/96.2	C/34.4
	NB	App	E/56.8	D/43.7	D/43.6	D/35.2	E/63.9	D/48.4	D/45.2	D/36.4
	SB	App	D/36.4	C/30.4	D/40.4	C/33.2	D/37.0	C/31.0	D/41.8	C/34.7
	Total		F/113.3	D/48.4	D/53.8	C/31.9	F/138.5	E/61.2	E/63.1	C/34.0
Breese Rd & McClain Rd <i>(Stop Controlled)</i> (Build has No Changes to the existing configuration)	EB	App	A/8.7	No Changes	A/8.0	No Changes	A/9.0	No Changes	A/8.2	No Changes
	NB	App	A/8.0	No Changes	A/7.7	No Changes	A/8.1	No Changes	A/7.8	No Changes
	SB	App	A/7.6	No Changes	A/7.6	No Changes	A/7.8	No Changes	A/7.8	No Changes
	Total		A/8.2	No Changes	A/7.8	No Changes	A/8.4	No Changes	A/7.9	No Changes
Shawnee Rd & Reed Rd <i>(Stop Controlled)</i> (Build condition adds a SB Left Turn Lane)	WB	App	B/12.3	B/12.2	B/13.1	B/13.1	B/13.3	B/13.1	B/14.2	C/14.1
	NB	App	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	SB	App	A/3.2	A/2.3	A/2.0	A/1.3	A/3.5	A/2.4	A/2.2	A/1.3
	Total		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

5.0 RECOMMENDATIONS & IMPLEMENTATION

5.1 Countermeasure Recommendations and Implementation Plan

A summary of the proposed countermeasures for the Breese Road and Shawnee Road corridors 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 **8.1 fewer crashes per year on Breese Road corridor and 7.6 fewer crashes per year on Shawnee Road corridor.**

Breese Road Corridor	
Time Frame	Description of Improvements
Short Term	<ul style="list-style-type: none"> • Provide large sized Stop signs (36"x36") and Stop Ahead warning signs at the following intersections: <ul style="list-style-type: none"> ○ Beeler Road & Breese Road ○ Industrial Drive & Breese Road • Add reflective post strips to all signs that do not have them in place • Maintain pavement markings through the corridors • Maintain signs in good reflective condition • Keep vegetation trimmed along corridor that may be blocking views of oncoming traffic
Long Term (\$2,243,000)	<ul style="list-style-type: none"> • Beeler Rd. & Breese Rd. – Turning radius improvement and signing improvements • Breese Rd. & Shawnee Rd. – Full signal upgrade to mast arm signal; countdown pedestrian signal heads and pushbuttons; sidewalk landings & ADA curb ramps; high visibility crosswalk markings; add a westbound right turn lane; and radius improvements • Breese Rd. & Dixie Hwy. – Full signal upgrade to mast arm signal; countdown pedestrian signal heads and pushbuttons; sidewalk landings & ADA curb ramps; high visibility crosswalk markings; replace southbound approach asphalt pavement with concrete pavement to prevent pavement damage from heavy truck traffic; and radius improvements • Breese Rd. & Industrial Dr. – Add dual Stop Ahead and dual Stop signs to intersection • Breese Rd. & McClain Rd. – Improve turning radii to accommodate truck movements
Shawnee Road Corridor	
Time Frame	Description of Improvements
Short Term	<ul style="list-style-type: none"> • Add reflective post strips to all signs that do not have them in place • Maintain pavement markings through the corridors • Maintain signs in good reflective condition • Keep vegetation trimmed along corridor that may be blocking views of oncoming traffic
Long Term (\$1,811,000)	<ul style="list-style-type: none"> • Widen roadway to provide a center two-way left turn lane for the corridor and add 4-FT shoulders • Add a 10-FT wide shared use path (SUP) along east side of Shawnee Road from just north of Britt Avenue to north of Reed Road to connect to existing SUP at Heritage Park • Shawnee Rd. & Reed Rd. – Add southbound left turn lane and improve turning radii

5.2 Proposed Improvements

The proposed long-term recommended improvements are shown on Figure 5.1. The overall long-term planning level cost estimates were separated into two cost estimates, one for Breese Road improvements and one for Shawnee Road improvements. This separation of the costs will facilitate submitting to various funding programs for funding requests to help implement the proposed improvements. The proposed intersection improvements on the Breese Road corridor

are estimated to cost \$2,243,000 for a FY27 construction. The Shawnee Road corridor improvements involving a center two-way left turn lane, a shared use path, and a left turn lane on Shawnee Road at Reed Road are estimated to cost \$1,811,000 for a FY27 construction. The potential funding programs that can be considered for each corridor are outlined in the next section.

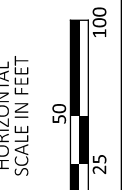
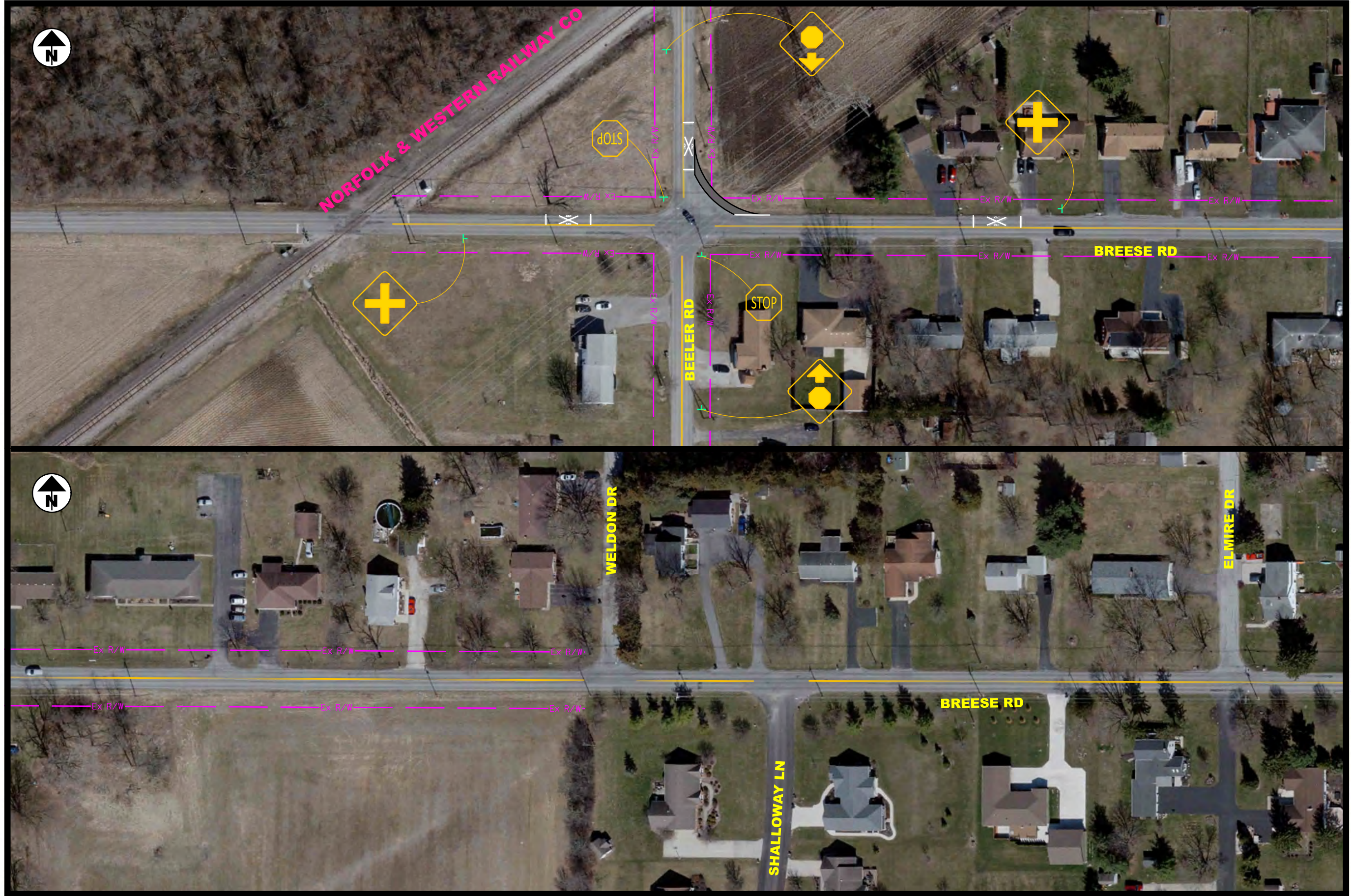
5.3 Project Implementation

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 Breese Road corridor did not have injury crashes reach the 30% threshold to apply for a Formal Safety Program, so it is recommended to apply to the CEAO Safety Program for funding or to the MPO (LACRPC) for funding sources. The Shawnee Road corridor exceeded 30% injury crashes on the corridor. Given this, it is qualified to apply to the ODOT Formal Safety Program for funding. These are the best funding programs for the two corridors for the safety improvements given the types of countermeasures.

Various other funding sources and programs are also potential funding for the improvements. The ODOT Systemic Safety Program for any pedestrian/bike related improvements is a potential funding program to consider. Additionally, LACRPC funding programs could be applied to for assistance in funding the improvements. The possible LACRPC programs could include the Surface Transportation Block Grant Program (STBGP) and the Transportation Alternatives Program (TAP). 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.

Funding Program (Agency)	Funding Overview	Comments
Formal Safety Program (ODOT)	<ul style="list-style-type: none"> Typically up to 90% funding of all phases of costs with applications due 3/31 and 8/31 Safety improvements Must have at least 30% injury crashes and average of 3 or more crashes/year Typically up to \$5M 	It is recommended that the County apply to the Formal Safety Program for the Shawnee Road improvements
Systemic Safety Program (ODOT)	<ul style="list-style-type: none"> Typically up to 90% funding for all phases of costs with applications due 1/31 Eligible for roads designated as Major Collector or higher Roadway Departure corridor improvements up to \$5M Pedestrian corridor improvements up to \$2M 	The County could apply to the ODOT Systemic Safety Program for pedestrian related improvement costs, including the shared use path on the Shawnee Road corridor
County Engineer's Safety Program (CEAO)	<ul style="list-style-type: none"> CEAO oversees a Highway Safety Improvement Program for County Road safety projects with applications typically due in August of each year Typically 80% of construction costs 	It is recommended that the County apply to the CEAO safety program for the proposed improvements on the Breese Road corridor
Surface Transportation Block Grant (LACRPC)	<ul style="list-style-type: none"> Typically 80% funding for project costs Submittal time frames vary as decided by LACRPC 	This program is another funding source that could be applied via LACRPC.
Transportation Alternatives Program (LACRPC)	<ul style="list-style-type: none"> Typically 80% funding for project costs Submittal time frames vary as decided by LACRPC Typically for pedestrian and bicycle improvements 	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"> Funding is available through District 13 of OPWC for Allen County for various programs and applications typically due in October 	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.

FIGURE 5.1 - PROPOSED IMPROVEMENTS



BREESE RD & SHAWNEE RD
 PROPOSED IMPROVEMENTS

DESIGN AGENCY



DESIGNER
 RAM

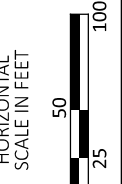
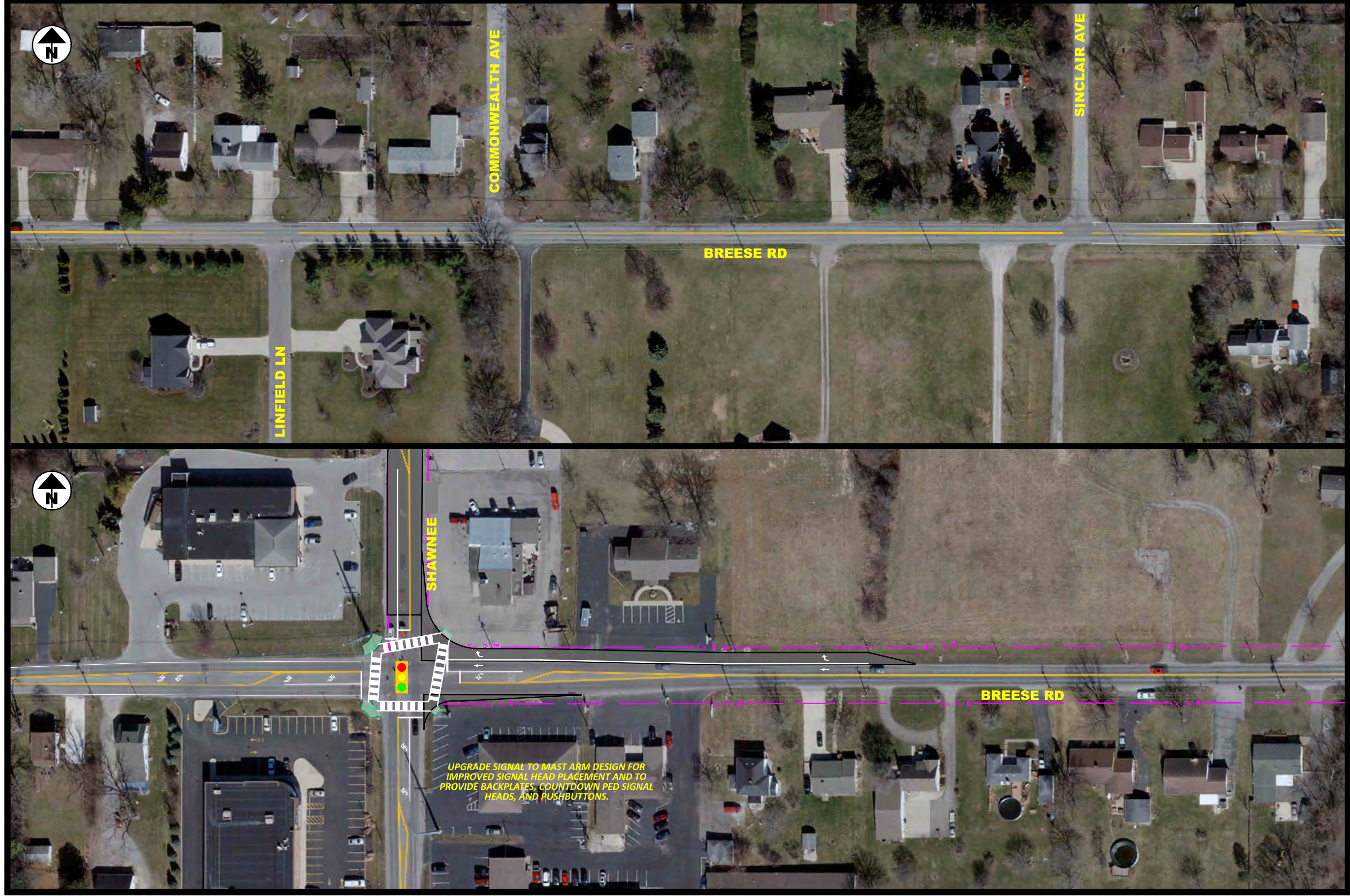
REVIEWER
 XXX MM-DD-YY

PROJECT ID
 117252

SHEET TOTAL
 P.1 7

ALLEN COUNTY ENGINEERING SAFETY STUDIES

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BREESE RD & SHAWNEE RD
 PROPOSED IMPROVEMENTS

DESIGN AGENCY



DESIGNER	RAM
REVIEWER	XXX MM-DD-YY
PROJECT ID	117252
SHEET	TOTAL
P.2	7

ALLEN COUNTY ENGINEERING SAFETY STUDIES

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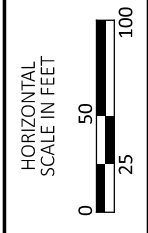
DESIGNER
RAM

REVIEWER
XXX MM-DD-YY

PROJECT ID
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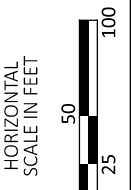
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BREESE RD & SHAWNEE RD
PROPOSED IMPROVEMENTS



ALLEN COUNTY ENGINEERING SAFETY STUDIES

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BREESE RD & SHAWNEE RD
 PROPOSED IMPROVEMENTS

DESIGN AGENCY



DESIGNER
 RAM

REVIEWER
 XXX MM-DD-YY

PROJECT ID
 117252

SHEET	TOTAL
P.4	7

ALLEN COUNTY ENGINEERING SAFETY STUDIES

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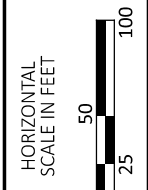
DESIGNER
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REVIEWER

XXX MM-DD-YY

PROJECT ID
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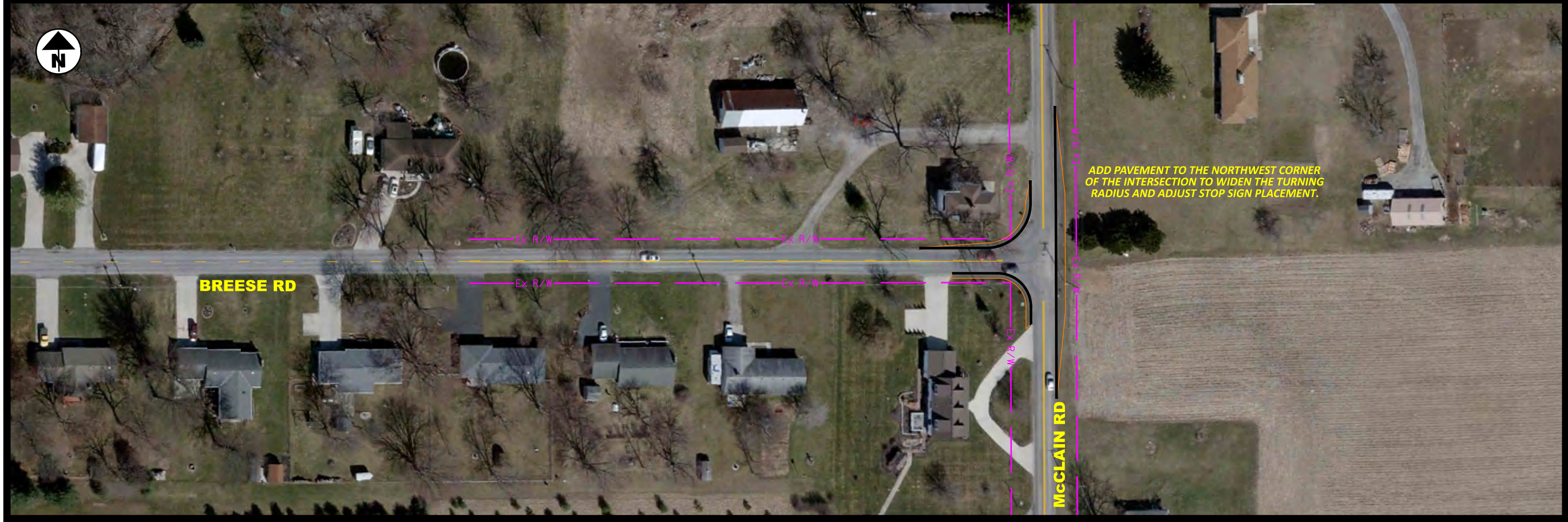
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P.5	7



BREESE RD & SHAWNEE RD
PROPOSED IMPROVEMENTS

ALLEN COUNTY ENGINEERING SAFETY STUDIES

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DESIGN AGENCY



DESIGNER

RAM

REVIEWER

XXX MM-DD-YY

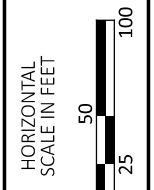
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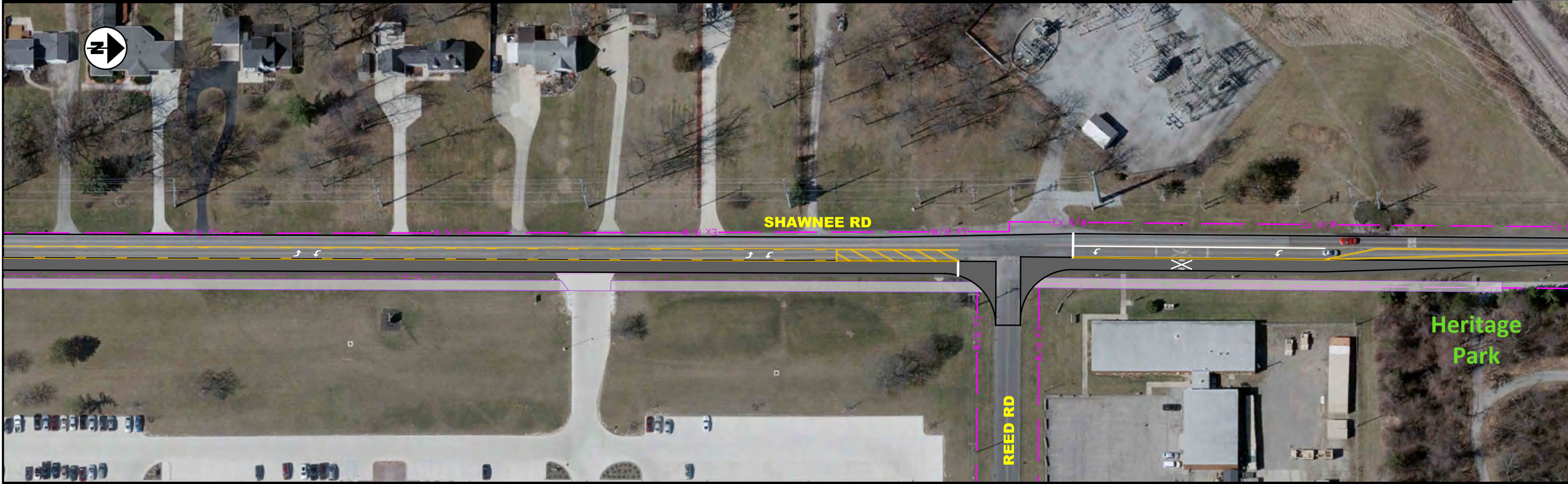
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SHEET TOTAL

P.6 7

BREESE RD & SHAWNEE RD
 PROPOSED IMPROVEMENTS





DESIGN AGENCY



DESIGNER
RAM

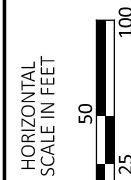
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PROJECT ID
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SHEET TOTAL
P.7 7

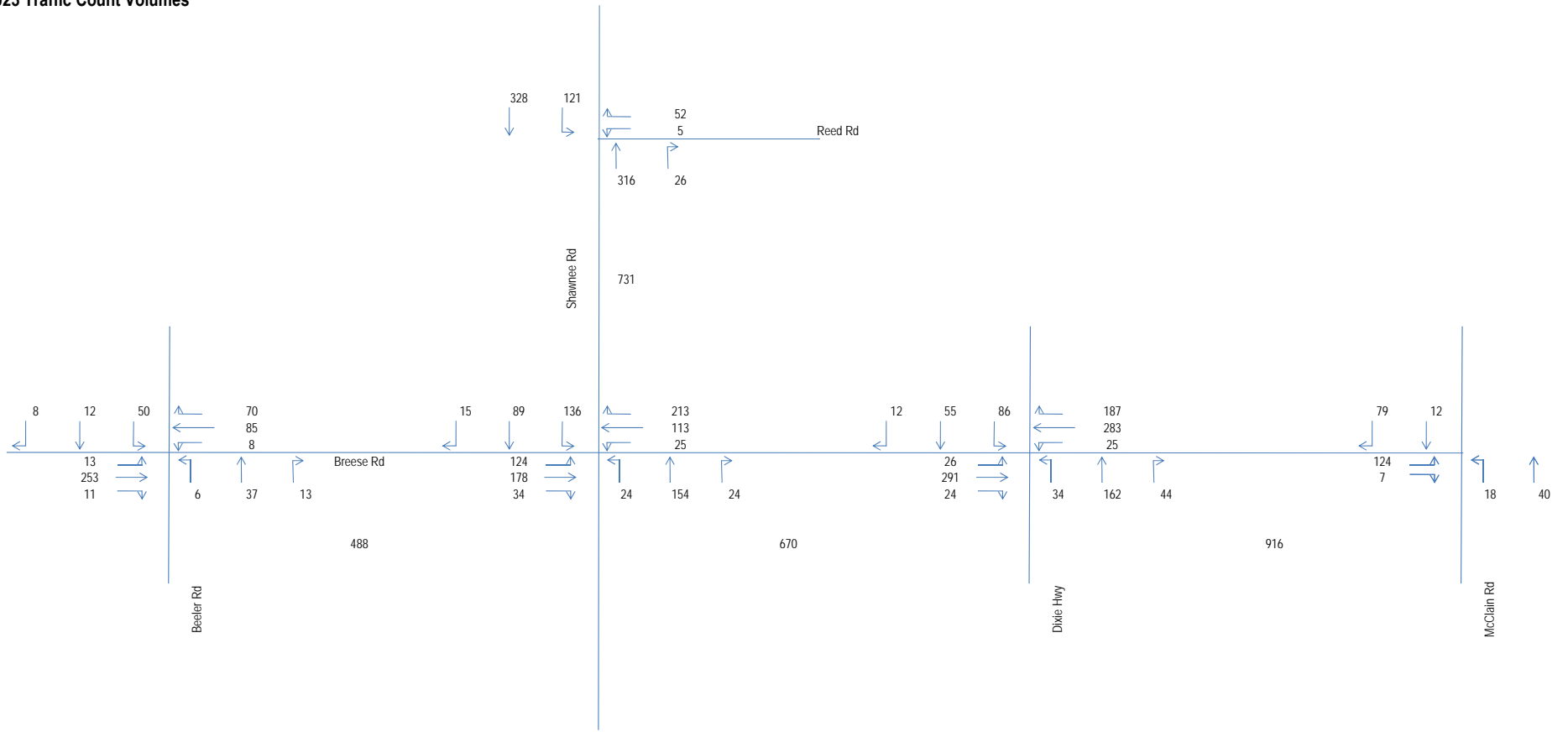
BREESE RD & SHAWNEE RD
PROPOSED IMPROVEMENTS



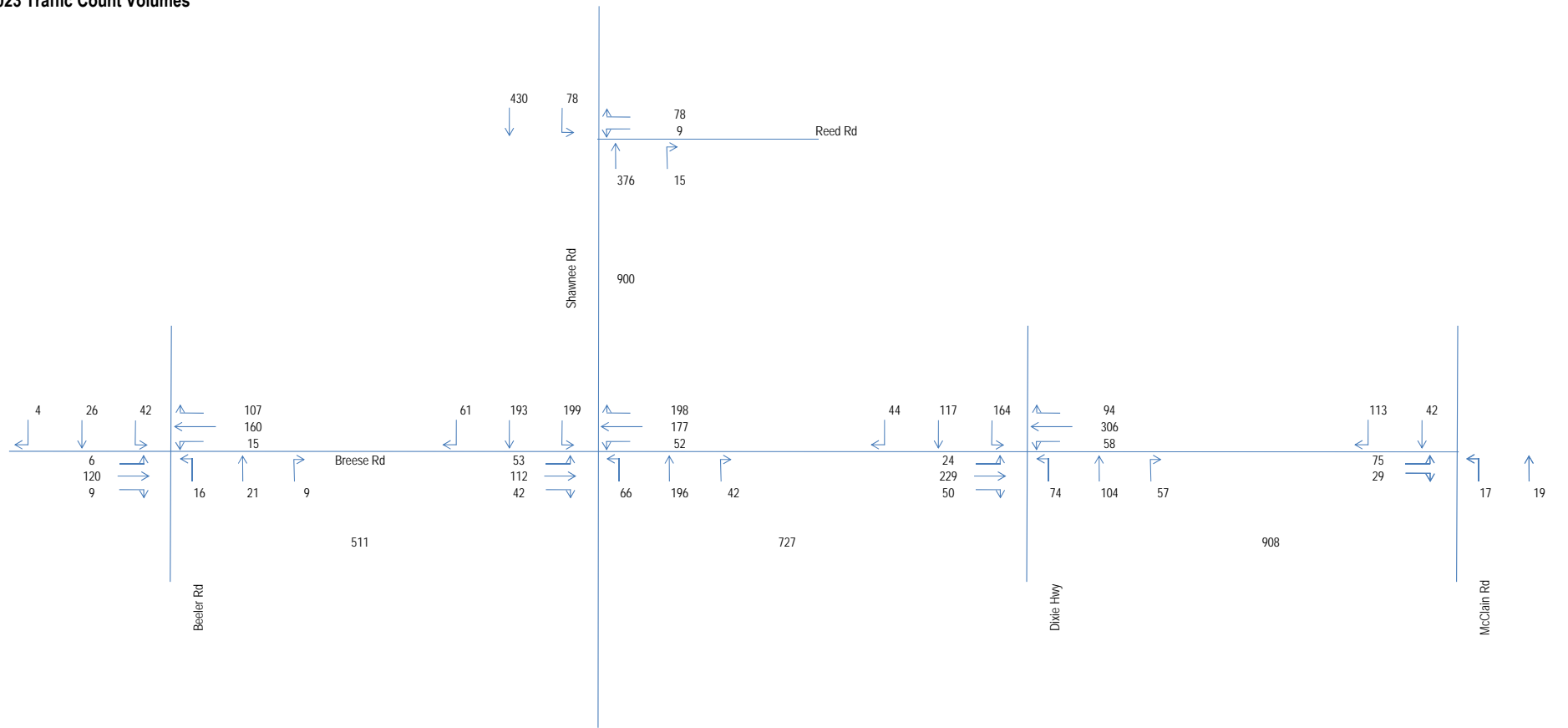
APPENDIX A
TRAFFIC & CRASH DATA/ANALYSES



AM 2023 Traffic Count Volumes

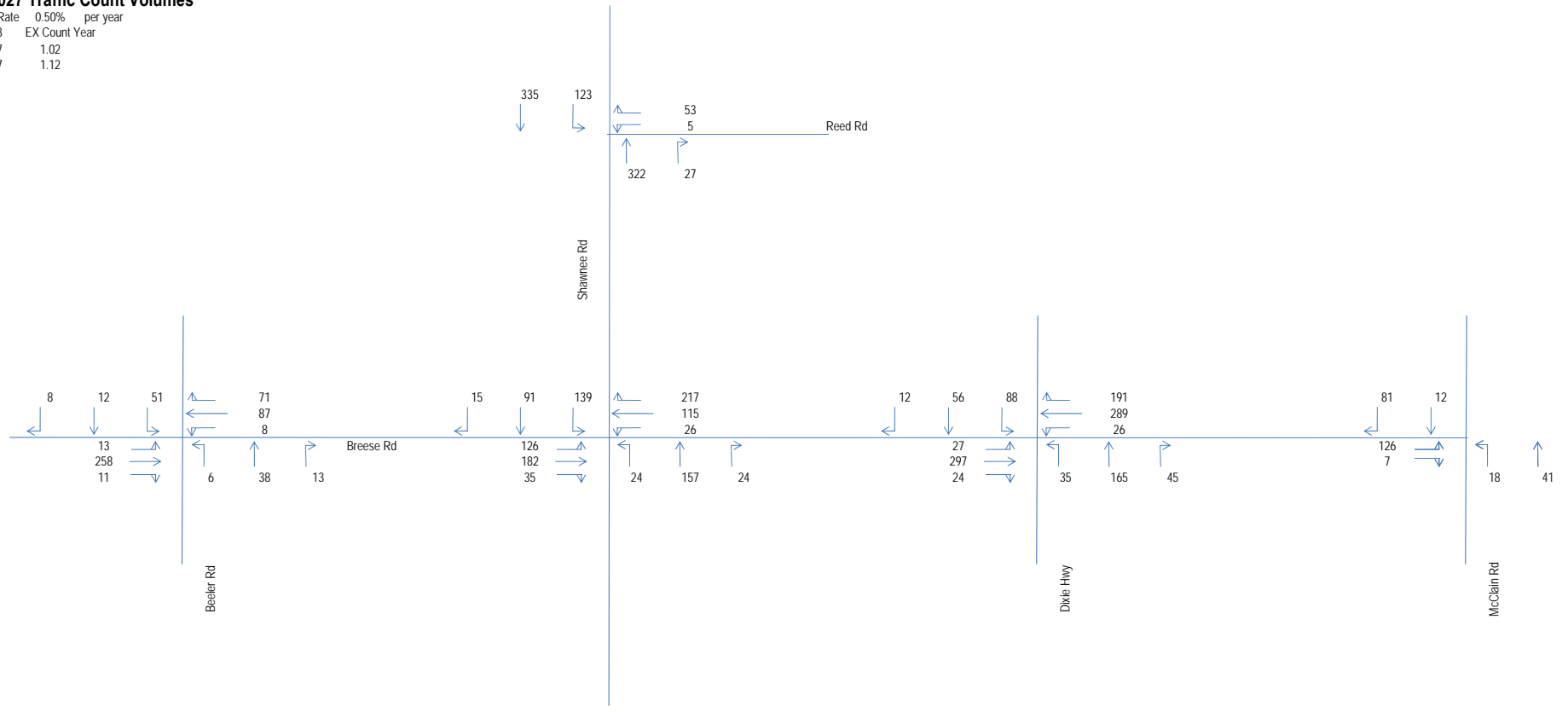


PM 2023 Traffic Count Volumes



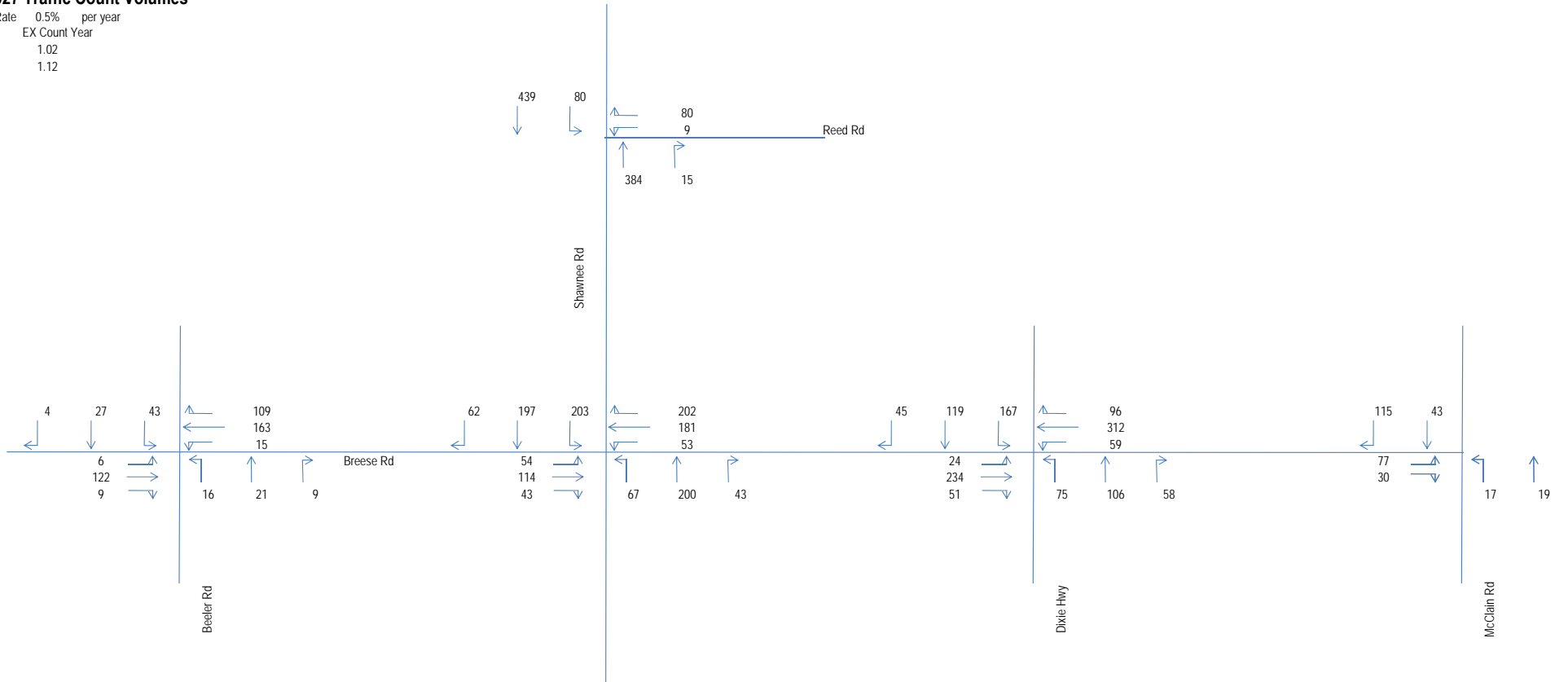
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Growth Rate 0.50% per year
 2023 EX Count Year
 2027 1.02
 2047 1.12



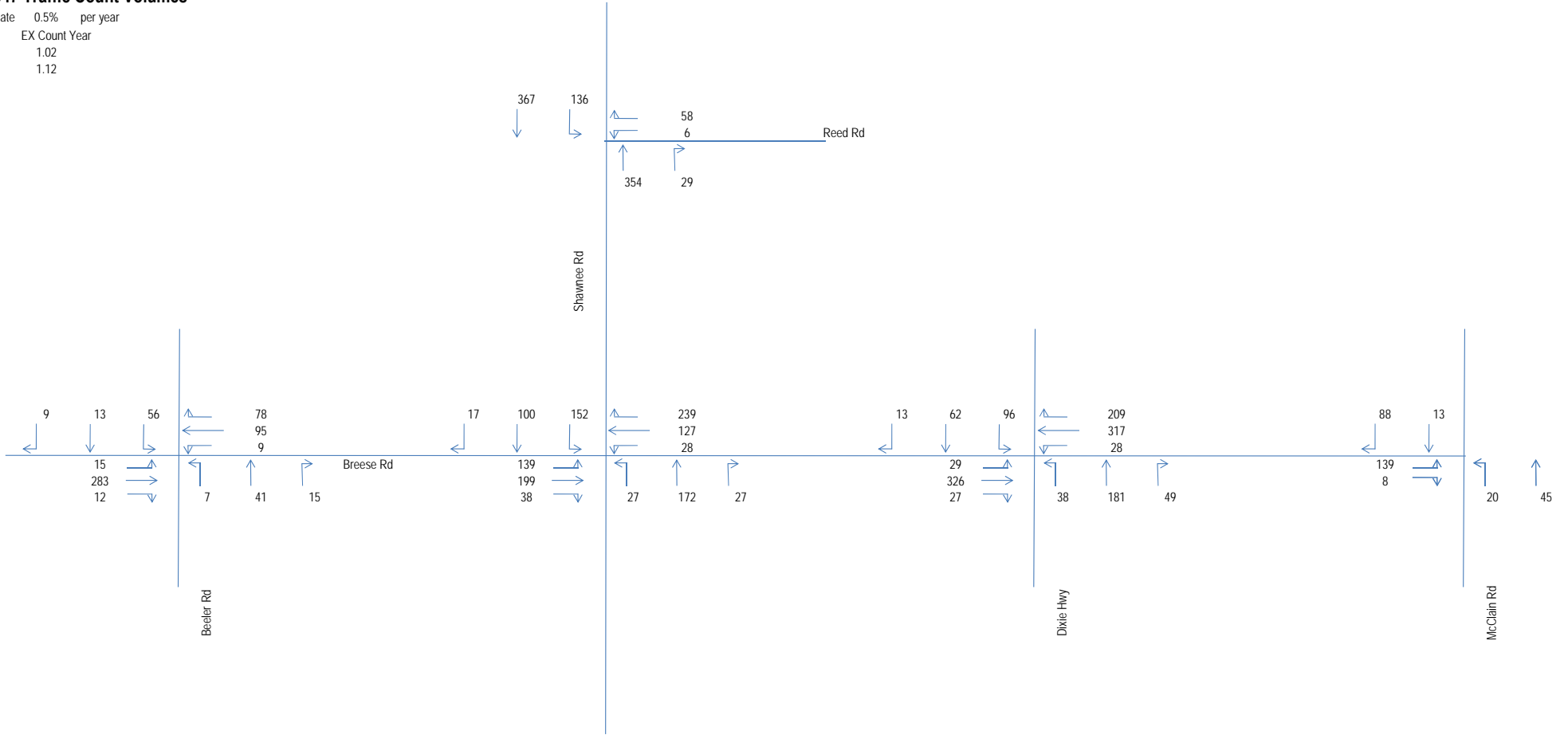
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Growth Rate 0.5% per year
 2023 EX Count Year
 2027 1.02
 2047 1.12



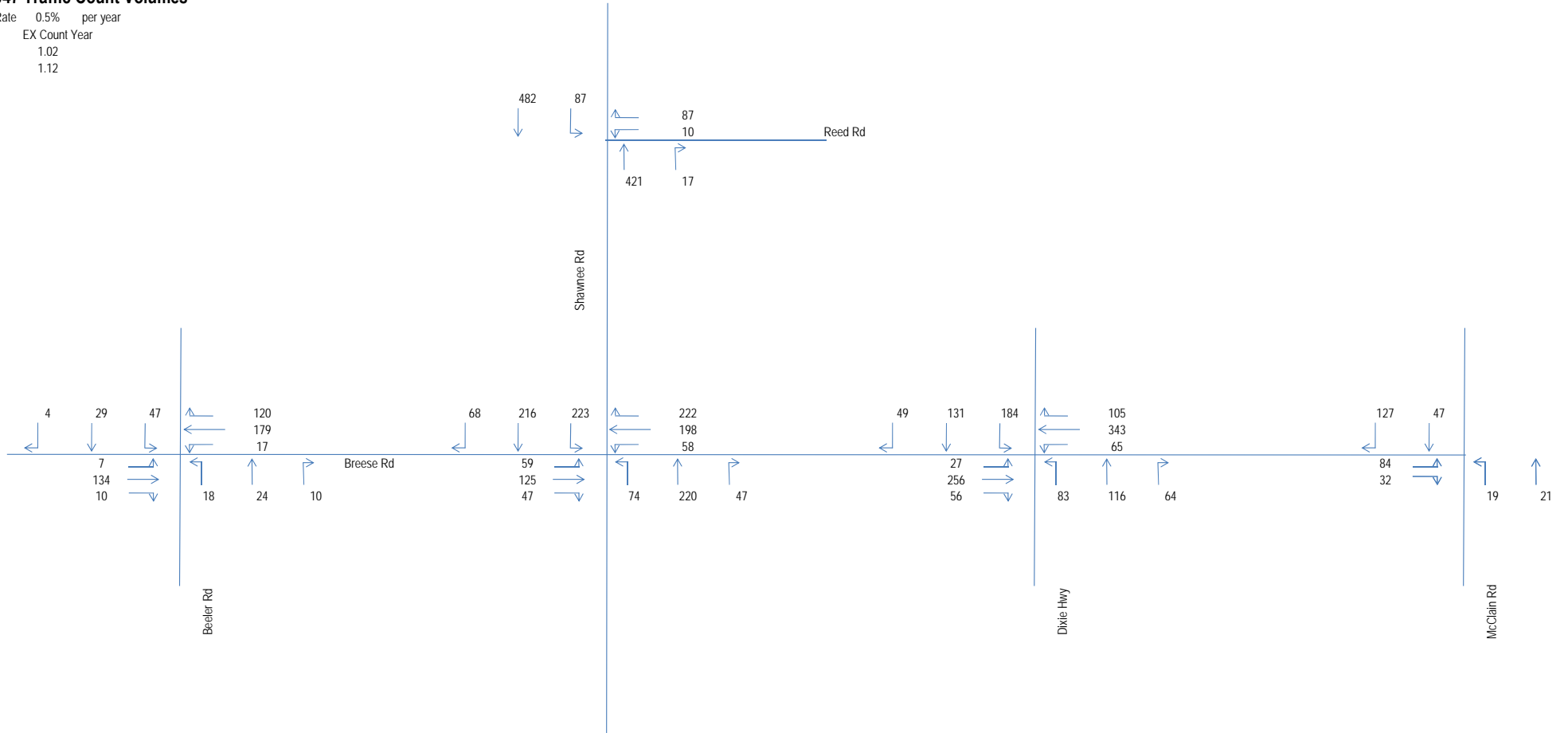
AM 2047 Traffic Count Volumes

Growth Rate 0.5% per year
 2023 EX Count Year
 2027 1.02
 2047 1.12



PM 2047 Traffic Count Volumes

Growth Rate 0.5% per year
 2023 EX Count Year
 2027 1.02
 2047 1.12





Mannik & Smith Group (OH)
1800 Indian Wood Circle

Maumee, Ohio, United States 43537
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Count Name: 1. Breese Rd & Beeler Rd
Site Code:
Start Date: 04/12/2023
Page No: 1

Turning Movement Data

Start Time	Breese Rd Westbound						Breese Rd Eastbound						Beeler Rd Southbound						Beeler 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	2	24	22	0	0	48	4	45	2	0	0	51	6	2	2	0	0	10	3	13	3	0	0	19	128
7:15 AM	1	25	42	0	0	68	7	50	4	0	0	61	27	6	3	0	0	36	1	16	3	0	0	20	185
7:30 AM	2	14	3	0	0	19	2	78	5	0	0	85	11	3	3	0	0	17	1	5	5	0	0	11	132
7:45 AM	3	22	3	0	0	28	0	80	0	0	0	80	6	1	0	0	0	7	1	3	2	0	0	6	121
Hourly Total	8	85	70	0	0	163	13	253	11	0	0	277	50	12	8	0	0	70	6	37	13	0	0	56	566
8:00 AM	5	17	2	0	0	24	0	33	4	0	0	37	6	1	0	0	0	7	6	1	4	0	0	11	79
8:15 AM	2	16	5	0	0	23	1	42	4	0	0	47	4	2	0	0	0	6	2	1	2	0	0	5	81
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8:45 AM	1	25	14	0	0	40	0	58	3	0	0	61	7	3	0	0	0	10	1	1	2	0	0	4	115
Hourly Total	9	94	23	0	0	126	1	179	11	0	0	191	25	6	0	0	0	31	12	4	10	0	0	26	374
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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Approach %	4.8	62.4	32.8	0.0	-	-	3.5	90.8	5.7	0.0	-	-	65.2	26.8	8.0	0.0	-	-	25.6	48.2	26.2	0.0	-	-	-
Total %	2.0	26.3	13.8	0.0	-	42.2	1.3	33.9	2.1	0.0	-	37.4	7.6	3.1	0.9	0.0	-	11.7	2.2	4.2	2.3	0.0	-	8.8	-
Lights	34	486	244	0	-	764	25	634	38	0	-	697	142	56	17	0	-	215	40	78	40	0	-	158	1834
% Lights	87.2	96.2	92.1	-	-	94.4	100.0	97.5	92.7	-	-	97.3	97.3	93.3	94.4	-	-	96.0	93.0	96.3	90.9	-	-	94.0	95.7
Other Vehicles	5	19	21	0	-	45	0	16	3	0	-	19	4	4	1	0	-	9	3	3	4	0	-	10	83
% Other Vehicles	12.8	3.8	7.9	-	-	5.6	0.0	2.5	7.3	-	-	2.7	2.7	6.7	5.6	-	-	4.0	7.0	3.7	9.1	-	-	6.0	4.3
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Mannik & Smith Group (OH)
1800 Indian Wood Circle

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Count Name: 1. Breese Rd & Beeler Rd
Site Code:
Start Date: 04/12/2023
Page No: 3

Turning Movement Peak Hour Data (7:00 AM)

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7:15 AM	1	25	42	0	0	68	7	50	4	0	0	61	27	6	3	0	0	36	1	16	3	0	0	20	185
7:30 AM	2	14	3	0	0	19	2	78	5	0	0	85	11	3	3	0	0	17	1	5	5	0	0	11	132
7:45 AM	3	22	3	0	0	28	0	80	0	0	0	80	6	1	0	0	0	7	1	3	2	0	0	6	121
Total	8	85	70	0	0	163	13	253	11	0	0	277	50	12	8	0	0	70	6	37	13	0	0	56	566
Approach %	4.9	52.1	42.9	0.0	-	-	4.7	91.3	4.0	0.0	-	-	71.4	17.1	11.4	0.0	-	-	10.7	66.1	23.2	0.0	-	-	-
Total %	1.4	15.0	12.4	0.0	-	28.8	2.3	44.7	1.9	0.0	-	48.9	8.8	2.1	1.4	0.0	-	12.4	1.1	6.5	2.3	0.0	-	9.9	-
PHF	0.667	0.850	0.417	0.000	-	0.599	0.464	0.791	0.550	0.000	-	0.815	0.463	0.500	0.667	0.000	-	0.486	0.500	0.578	0.650	0.000	-	0.700	0.765
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% Other Vehicles	50.0	4.7	2.9	-	-	6.1	0.0	2.0	9.1	-	-	2.2	4.0	16.7	12.5	-	-	7.1	0.0	0.0	7.7	-	-	1.8	3.9
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Mannik & Smith Group (OH)
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Maumee, Ohio, United States 43537
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Count Name: 1. Breese Rd & Beeler Rd
Site Code:
Start Date: 04/12/2023
Page No: 5

Turning Movement Peak Hour Data (4:30 PM)

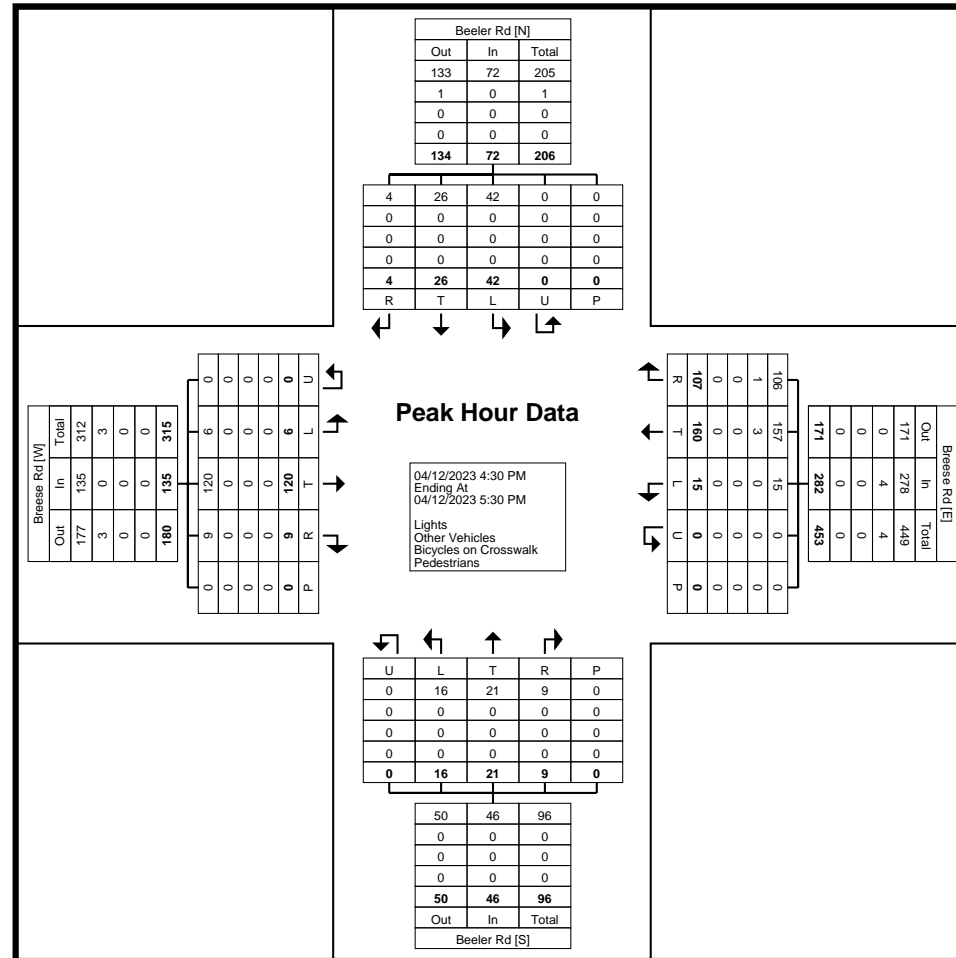
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4:45 PM	6	42	28	0	0	76	2	28	0	0	0	30	7	12	0	0	0	19	9	7	1	0	0	17	142
5:00 PM	5	41	33	0	0	79	0	31	1	0	0	32	12	6	1	0	0	19	4	9	1	0	0	14	144
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Total	15	160	107	0	0	282	6	120	9	0	0	135	42	26	4	0	0	72	16	21	9	0	0	46	535
Approach %	5.3	56.7	37.9	0.0	-	-	4.4	88.9	6.7	0.0	-	-	58.3	36.1	5.6	0.0	-	-	34.8	45.7	19.6	0.0	-	-	-
Total %	2.8	29.9	20.0	0.0	-	52.7	1.1	22.4	1.7	0.0	-	25.2	7.9	4.9	0.7	0.0	-	13.5	3.0	3.9	1.7	0.0	-	8.6	-
PHF	0.625	0.952	0.811	0.000	-	0.892	0.375	0.857	0.450	0.000	-	0.804	0.700	0.542	0.500	0.000	-	0.750	0.444	0.583	0.563	0.000	-	0.676	0.929
Lights	15	157	106	0	-	278	6	120	9	0	-	135	42	26	4	0	-	72	16	21	9	0	-	46	531
% Lights	100.0	98.1	99.1	-	-	98.6	100.0	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	99.3
Other Vehicles	0	3	1	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	4
% Other Vehicles	0.0	1.9	0.9	-	-	1.4	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.7
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Mannik & Smith Group (OH)
1800 Indian Wood Circle

Maumee, Ohio, United States 43537
(419) 891-2222 ncarte@mnniksmithgroup.com

Count Name: 1. Breese Rd & Beeler Rd
Site Code:
Start Date: 04/12/2023
Page No: 6



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



Mannik & Smith Group (OH)
1800 Indian Wood Circle

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

Count Name: 2. Breese Rd & Shawnee Rd
Site Code:
Start Date: 04/12/2023
Page No: 1

Turning Movement Data

Start Time	Breese Rd Westbound						Breese Rd Eastbound						Shawnee Rd Southbound						Shawnee 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	
12:00 AM	1	1	6	0	0	8	1	0	0	0	0	1	3	1	0	0	0	4	0	1	1	0	0	2	15
12:15 AM	0	1	5	0	0	6	0	1	0	0	0	1	2	2	0	0	0	4	0	0	0	0	0	0	11
12:30 AM	1	1	5	0	0	7	0	2	0	0	0	2	1	2	0	0	0	3	0	0	1	0	0	1	13
12:45 AM	0	3	1	0	0	4	0	0	1	0	0	1	0	1	1	0	0	2	0	1	0	0	0	1	8
Hourly Total	2	6	17	0	0	25	1	3	1	0	0	5	6	6	1	0	0	13	0	2	2	0	0	4	47
1:00 AM	0	1	8	0	0	9	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	11
1:15 AM	0	4	4	0	0	8	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	10
1:30 AM	0	0	8	0	0	8	0	1	0	0	0	1	0	1	0	0	0	1	1	2	0	0	0	3	13
1:45 AM	0	1	9	0	0	10	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	11
Hourly Total	0	6	29	0	0	35	1	3	0	0	0	4	0	2	0	0	0	2	1	3	0	0	0	4	45
2:00 AM	0	1	3	0	0	4	0	0	0	0	0	0	2	1	0	0	0	3	0	1	0	0	0	1	8
2:15 AM	0	0	4	0	0	4	0	0	0	0	0	0	1	0	1	0	0	2	0	0	0	0	0	0	6
2:30 AM	0	2	0	0	0	2	0	1	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	1	5
2:45 AM	0	1	3	0	0	4	1	3	0	0	0	4	1	0	1	0	0	2	0	0	1	0	0	1	11
Hourly Total	0	4	10	0	0	14	1	4	0	0	0	5	4	2	2	0	0	8	0	2	1	0	0	3	30
3:00 AM	1	0	3	0	0	4	0	3	0	0	0	3	3	2	0	0	0	5	1	0	1	0	0	2	14
3:15 AM	0	0	0	0	0	0	1	1	0	0	0	2	4	1	0	0	0	5	1	1	0	0	0	2	9
3:30 AM	0	1	2	0	0	3	1	2	0	0	0	3	4	1	0	0	0	5	0	1	0	0	0	1	12
3:45 AM	0	1	2	0	0	3	2	6	1	0	0	9	3	0	0	0	0	3	0	1	0	0	0	1	16
Hourly Total	1	2	7	0	0	10	4	12	1	0	0	17	14	4	0	0	0	18	2	3	1	0	0	6	51
4:00 AM	0	0	1	0	0	1	0	4	1	0	0	5	4	0	0	0	0	4	0	2	1	0	0	3	13
4:15 AM	1	2	2	0	0	5	0	5	0	0	0	5	3	0	0	0	0	3	0	1	2	0	0	3	16
4:30 AM	0	2	1	0	0	3	3	7	0	0	0	10	11	2	0	0	0	13	0	3	1	0	0	4	30
4:45 AM	0	0	2	0	0	2	3	14	0	0	0	17	20	2	0	0	0	22	0	5	1	0	0	6	47
Hourly Total	1	4	6	0	0	11	6	30	1	0	0	37	38	4	0	0	0	42	0	11	5	0	0	16	106
5:00 AM	0	2	4	0	0	6	0	15	1	0	0	16	23	1	0	0	0	24	0	3	2	0	0	5	51
5:15 AM	0	3	8	0	0	11	2	30	0	0	0	32	30	2	0	0	0	32	1	9	0	0	0	10	85
5:30 AM	0	6	4	0	0	10	3	21	0	0	0	24	22	10	0	0	0	32	0	9	1	0	0	10	76
5:45 AM	0	5	13	0	0	18	1	28	0	0	0	29	25	7	0	0	0	32	1	7	6	0	0	14	93
Hourly Total	0	16	29	0	0	45	6	94	1	0	0	101	100	20	0	0	0	120	2	28	9	0	0	39	305
6:00 AM	1	6	10	0	0	17	7	26	0	0	0	33	24	3	0	0	0	27	0	12	1	0	0	13	90
6:15 AM	0	10	13	0	0	23	8	27	0	0	0	35	19	2	0	0	0	21	0	12	2	0	0	14	93
6:30 AM	1	12	25	0	0	38	13	42	1	0	0	56	28	4	1	0	0	33	0	21	5	0	0	26	153
6:45 AM	1	20	43	0	0	64	17	35	0	0	0	52	23	6	0	0	0	29	2	26	3	0	0	31	176
Hourly Total	3	48	91	0	0	142	45	130	1	0	0	176	94	15	1	0	0	110	2	71	11	0	0	84	512

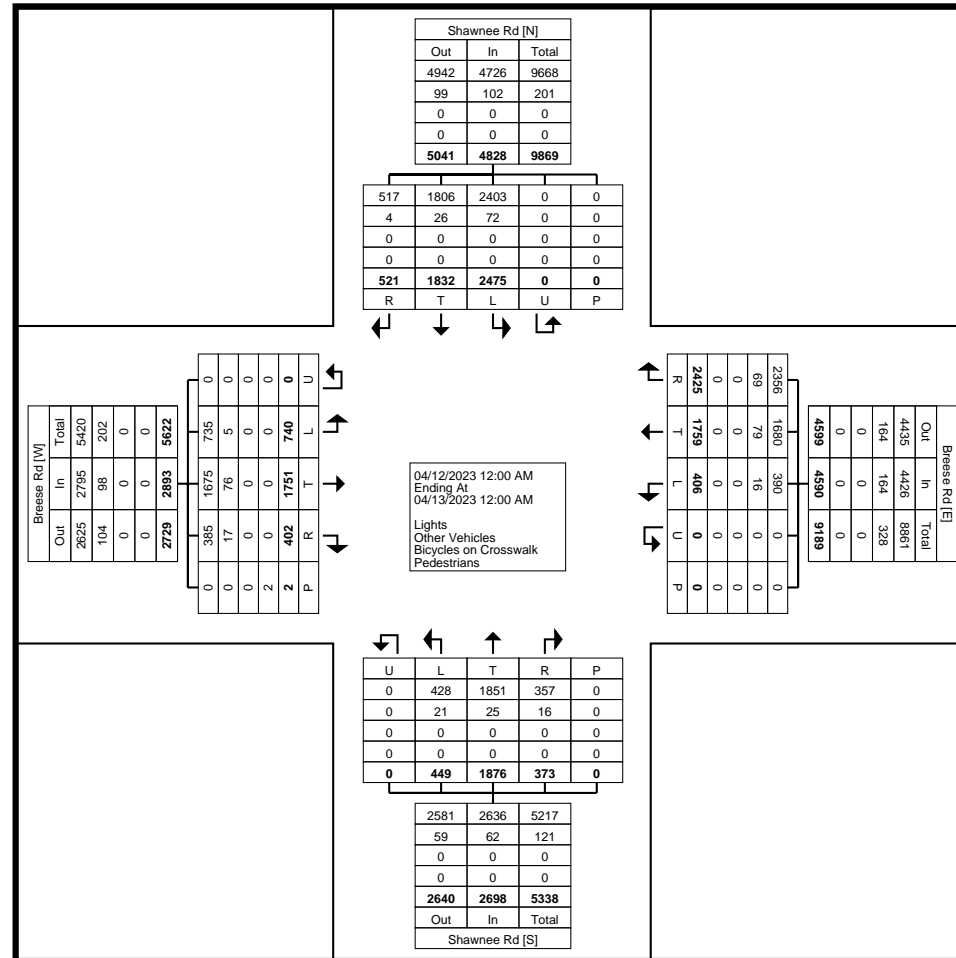
7:00 AM	2	39	42	0	0	83	16	45	0	0	0	61	25	14	2	0	0	41	6	32	3	0	0	41	226
7:15 AM	2	39	45	0	0	86	27	38	10	0	0	75	42	23	5	0	0	70	9	33	3	0	0	45	276
7:30 AM	8	16	57	0	0	81	46	47	6	0	0	99	39	24	4	0	0	67	3	48	9	0	0	60	307
7:45 AM	13	19	69	0	0	101	35	48	18	0	0	101	30	28	4	0	0	62	6	41	9	0	0	56	320
Hourly Total	25	113	213	0	0	351	124	178	34	0	0	336	136	89	15	0	0	240	24	154	24	0	0	202	1129
8:00 AM	12	20	35	0	0	67	9	19	15	0	0	43	21	21	0	0	0	42	5	28	6	0	0	39	191
8:15 AM	10	25	38	0	0	73	8	32	14	0	0	54	24	27	1	0	0	52	1	28	2	0	0	31	210
8:30 AM	5	13	48	0	0	66	11	40	17	0	0	68	27	44	2	0	0	73	24	47	8	0	0	79	286
8:45 AM	15	18	45	0	0	78	9	30	25	0	0	64	29	43	4	0	0	76	25	56	9	0	0	90	308
Hourly Total	42	76	166	0	0	284	37	121	71	0	0	229	101	135	7	0	0	243	55	159	25	0	0	239	995
9:00 AM	5	14	38	0	0	57	10	33	8	0	0	51	34	20	6	0	0	60	6	25	8	0	0	39	207
9:15 AM	1	8	31	0	0	40	6	22	1	0	0	29	21	24	5	0	0	50	7	19	6	0	0	32	151
9:30 AM	4	18	24	0	0	46	11	20	4	0	0	35	30	17	2	0	0	49	3	23	7	0	0	33	163
9:45 AM	4	18	37	0	0	59	16	26	3	0	0	45	27	22	9	0	0	58	3	28	2	0	0	33	195
Hourly Total	14	58	130	0	0	202	43	101	16	0	0	160	112	83	22	0	0	217	19	95	23	0	0	137	716
10:00 AM	3	14	40	0	0	57	9	28	2	0	0	39	30	23	5	0	0	58	4	25	3	0	0	32	186
10:15 AM	5	15	30	0	0	50	7	25	3	0	0	35	33	26	11	0	0	70	2	21	2	0	0	25	180
10:30 AM	3	21	27	0	0	51	14	27	5	0	0	46	32	33	9	0	0	74	5	29	7	0	0	41	212
10:45 AM	6	22	34	0	0	62	10	23	3	0	0	36	33	35	6	0	0	74	4	26	7	0	0	37	209
Hourly Total	17	72	131	0	0	220	40	103	13	0	0	156	128	117	31	0	0	276	15	101	19	0	0	135	787
11:00 AM	3	21	38	0	0	62	9	23	4	0	0	36	32	20	8	0	0	60	4	35	9	0	0	48	206
11:15 AM	2	12	20	0	0	34	7	21	4	0	0	32	41	12	11	0	0	64	5	38	6	0	0	49	179
11:30 AM	3	18	41	0	0	62	14	24	2	0	0	40	31	26	6	0	0	63	3	33	1	0	0	37	202
11:45 AM	5	20	24	0	0	49	9	18	5	0	0	32	40	32	8	0	0	80	5	18	4	0	0	27	188
Hourly Total	13	71	123	0	0	207	39	86	15	0	0	140	144	90	33	0	0	267	17	124	20	0	0	161	775
12:00 PM	4	22	33	0	0	59	14	17	7	0	0	38	27	32	11	0	0	70	9	29	6	0	0	44	211
12:15 PM	9	26	38	0	0	73	16	23	3	0	0	42	28	33	6	0	0	67	3	34	3	0	0	40	222
12:30 PM	6	19	34	0	0	59	12	18	6	0	0	36	45	19	9	0	0	73	2	38	4	0	0	44	212
12:45 PM	5	24	36	0	0	65	10	15	7	0	0	32	43	32	4	0	0	79	5	29	3	0	0	37	213
Hourly Total	24	91	141	0	0	256	52	73	23	0	0	148	143	116	30	0	0	289	19	130	16	0	0	165	858
1:00 PM	6	16	37	0	0	59	13	26	9	0	1	48	42	20	4	0	0	66	6	34	5	0	0	45	218
1:15 PM	6	27	28	0	0	61	11	17	8	0	1	36	50	40	7	0	0	97	5	25	3	0	0	33	227
1:30 PM	2	28	32	0	0	62	7	24	3	0	0	34	47	25	22	0	0	94	6	24	5	0	0	35	225
1:45 PM	7	23	39	0	0	69	6	23	5	0	0	34	53	32	10	0	0	95	4	30	6	0	0	40	238
Hourly Total	21	94	136	0	0	251	37	90	25	0	2	152	192	117	43	0	0	352	21	113	19	0	0	153	908
2:00 PM	7	30	40	0	0	77	9	19	7	0	0	35	29	25	9	0	0	63	4	28	5	0	0	37	212
2:15 PM	12	40	40	0	0	92	12	18	4	0	0	34	60	47	18	0	0	125	12	33	6	0	0	51	302
2:30 PM	7	39	28	0	0	74	19	27	4	0	0	50	78	54	41	0	0	173	11	35	7	0	0	53	350
2:45 PM	11	29	33	0	0	73	14	39	12	0	0	65	40	35	11	0	0	86	6	35	8	0	0	49	273
Hourly Total	37	138	141	0	0	316	54	103	27	0	0	184	207	161	79	0	0	447	33	131	26	0	0	190	1137
3:00 PM	12	44	36	0	0	92	11	29	15	0	0	55	50	60	20	0	0	130	9	30	6	0	0	45	322
3:15 PM	19	44	59	0	0	122	14	36	14	0	0	64	54	58	19	0	0	131	21	52	9	0	0	82	399
3:30 PM	11	36	50	0	0	97	14	21	9	0	0	44	47	38	13	0	0	98	23	70	17	0	0	110	349
3:45 PM	10	53	53	0	0	116	14	26	4	0	0	44	48	37	9	0	0	94	13	44	10	0	0	67	321
Hourly Total	52	177	198	0	0	427	53	112	42	0	0	207	199	193	61	0	0	453	66	196	42	0	0	304	1391
4:00 PM	10	42	46	0	0	98	12	28	9	0	0	49	39	40	10	0	0	89	10	37	6	0	0	53	289
4:15 PM	15	52	49	0	0	116	8	22	6	0	0	36	40	34	10	0	0	84	16	46	7	0	0	69	305
4:30 PM	11	46	52	0	0	109	18	30	4	0	0	52	47	51	10	0	0	108	11	46	9	0	0	66	335
4:45 PM	5	57	50	0	0	112	13	21	6	0	0	40	58	27	15	0	0	100	9	21	9	0	0	39	291
Hourly Total	41	197	197	0	0	435	51	101	25	0	0	177	184	152	45	0	0	381	46	150	31	0	0	227	1220
5:00 PM	7	55	54	0	0	116	16	34	6	0	0	56	54	35	12	0	0	101	20	33	9	0	0	62	335
5:15 PM	5	60	62	0	0	127	11	20	7	0	0	38	53	53	10	0	0	116	8	29	9	0	0	46	327



Mannik & Smith Group (OH)
1800 Indian Wood Circle

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

Count Name: 2. Breese Rd & Shawnee Rd
Site Code:
Start Date: 04/12/2023
Page No: 4



Turning Movement Data Plot



Mannik & Smith Group (OH)
1800 Indian Wood Circle

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

Count Name: 2. Breese Rd & Shawnee Rd
Site Code:
Start Date: 04/12/2023
Page No: 5

Turning Movement Peak Hour Data (7:00 AM)

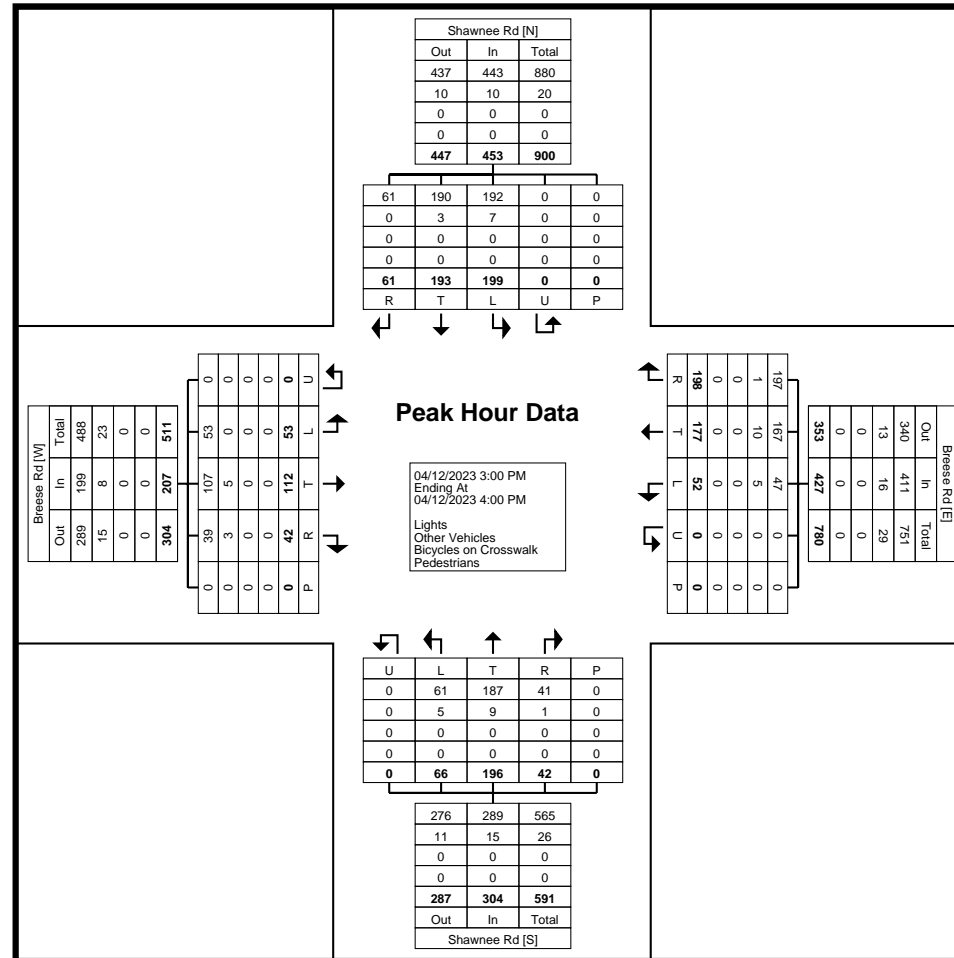
Start Time	Breese Rd Westbound						Breese Rd Eastbound						Shawnee Rd Southbound						Shawnee Rd Northbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	2	39	42	0	0	83	16	45	0	0	0	61	25	14	2	0	0	41	6	32	3	0	0	41	226
7:15 AM	2	39	45	0	0	86	27	38	10	0	0	75	42	23	5	0	0	70	9	33	3	0	0	45	276
7:30 AM	8	16	57	0	0	81	46	47	6	0	0	99	39	24	4	0	0	67	3	48	9	0	0	60	307
7:45 AM	13	19	69	0	0	101	35	48	18	0	0	101	30	28	4	0	0	62	6	41	9	0	0	56	320
Total	25	113	213	0	0	351	124	178	34	0	0	336	136	89	15	0	0	240	24	154	24	0	0	202	1129
Approach %	7.1	32.2	60.7	0.0	-	-	36.9	53.0	10.1	0.0	-	-	56.7	37.1	6.3	0.0	-	-	11.9	76.2	11.9	0.0	-	-	-
Total %	2.2	10.0	18.9	0.0	-	31.1	11.0	15.8	3.0	0.0	-	29.8	12.0	7.9	1.3	0.0	-	21.3	2.1	13.6	2.1	0.0	-	17.9	-
PHF	0.481	0.724	0.772	0.000	-	0.869	0.674	0.927	0.472	0.000	-	0.832	0.810	0.795	0.750	0.000	-	0.857	0.667	0.802	0.667	0.000	-	0.842	0.882
Lights	25	103	210	0	-	338	124	172	31	0	-	327	131	86	14	0	-	231	24	152	21	0	-	197	1093
% Lights	100.0	91.2	98.6	-	-	96.3	100.0	96.6	91.2	-	-	97.3	96.3	96.6	93.3	-	-	96.3	100.0	98.7	87.5	-	-	97.5	96.8
Other Vehicles	0	10	3	0	-	13	0	6	3	0	-	9	5	3	1	0	-	9	0	2	3	0	-	5	36
% Other Vehicles	0.0	8.8	1.4	-	-	3.7	0.0	3.4	8.8	-	-	2.7	3.7	3.4	6.7	-	-	3.8	0.0	1.3	12.5	-	-	2.5	3.2
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Mannik & Smith Group (OH)
1800 Indian Wood Circle

Maumee, Ohio, United States 43537
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Count Name: 2. Breese Rd & Shawnee Rd
Site Code:
Start Date: 04/12/2023
Page No: 8



Turning Movement Peak Hour Data Plot (3:00 PM)



Mannik & Smith Group (OH)
1800 Indian Wood Circle

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

Count Name: 3. Breese Rd & Dixie Hwy
Site Code:
Start Date: 04/12/2023
Page No: 1

Turning Movement Data

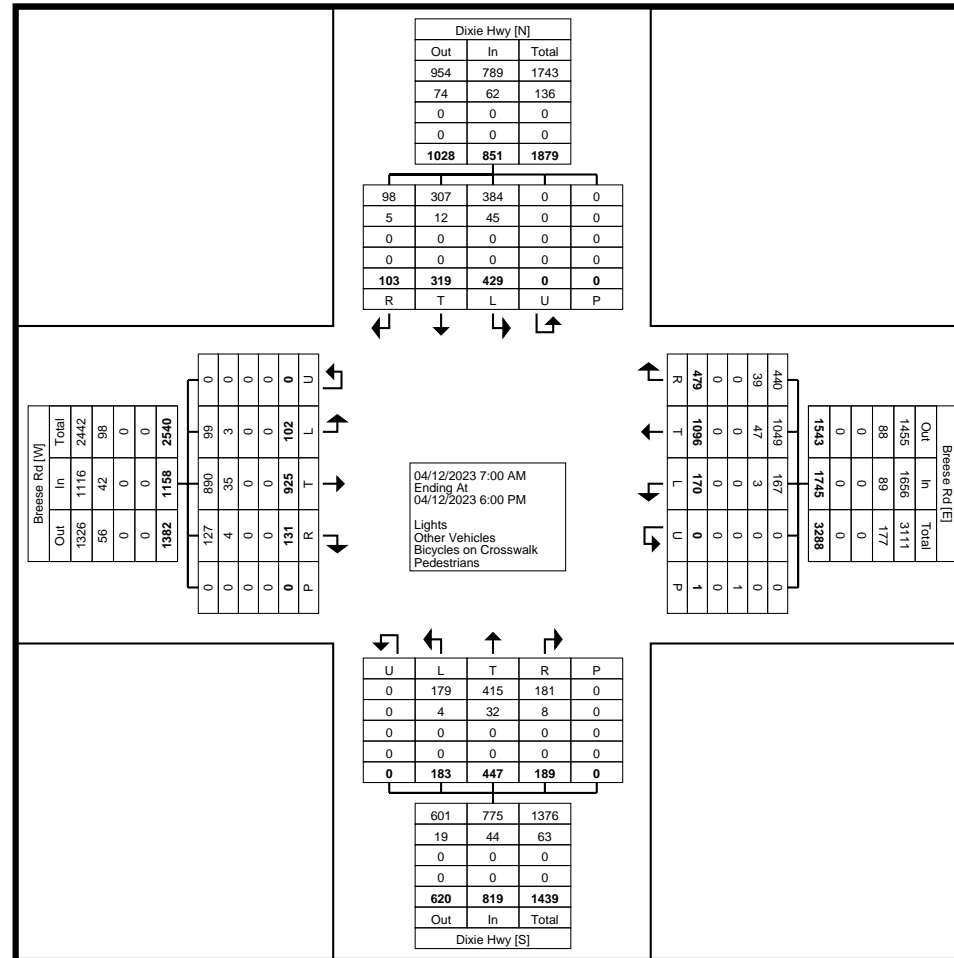
Start Time	Breese Rd Westbound						Breese Rd Eastbound						Dixie Hwy Southbound						Dixie Hwy Northbound						Int. Total	
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total		
7:00 AM	3	70	38	0	0	111	5	65	3	0	0	73	21	14	3	0	0	38	4	37	12	0	0	53	275	
7:15 AM	5	62	40	0	0	107	4	68	4	0	0	76	17	9	2	0	0	28	3	39	9	0	0	51	262	
7:30 AM	11	71	61	0	0	143	7	90	5	0	0	102	24	17	0	0	0	41	16	45	13	0	0	74	360	
7:45 AM	6	80	48	0	0	134	10	68	12	0	0	90	24	15	7	0	0	46	11	41	10	0	0	62	332	
Hourly Total	25	283	187	0	0	495	26	291	24	0	0	341	86	55	12	0	0	153	34	162	44	0	0	240	1229	
8:00 AM	5	40	29	0	0	74	8	48	4	0	0	60	19	14	7	0	0	40	9	26	15	0	0	50	224	
8:15 AM	5	60	31	0	0	96	8	47	6	0	0	61	21	10	6	0	0	37	9	23	13	0	0	45	239	
8:30 AM	6	50	25	0	0	81	13	50	5	0	0	68	12	18	3	0	0	33	2	27	9	0	0	38	220	
8:45 AM	8	45	18	0	0	71	6	59	6	0	0	71	12	12	5	0	0	29	8	20	8	0	0	36	207	
Hourly Total	24	195	103	0	0	322	35	204	21	0	0	260	64	54	21	0	0	139	28	96	45	0	0	169	890	
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	16	73	21	0	0	110	6	49	17	0	0	72	55	27	8	0	0	90	19	29	9	0	0	57	329	
4:15 PM	7	78	34	0	0	119	4	61	10	0	0	75	42	32	15	0	0	89	24	28	17	0	0	69	352	
4:30 PM	20	76	22	0	0	118	7	61	10	0	0	78	36	31	15	0	0	82	19	19	14	0	0	52	330	
4:45 PM	15	79	17	0	1	111	7	58	13	0	0	78	31	27	6	0	0	64	12	28	17	0	0	57	310	
Hourly Total	58	306	94	0	1	458	24	229	50	0	0	303	164	117	44	0	0	325	74	104	57	0	0	235	1321	
5:00 PM	14	96	28	0	0	138	2	53	13	0	0	68	40	26	7	0	0	73	20	16	14	0	0	50	329	
5:15 PM	22	85	26	0	0	133	4	63	8	0	0	75	20	25	6	0	0	51	14	26	13	0	0	53	312	
5:30 PM	13	67	19	0	0	99	7	41	10	0	0	58	33	24	5	0	0	62	8	17	5	0	0	30	249	
5:45 PM	14	64	22	0	0	100	4	44	5	0	0	53	22	18	8	0	0	48	5	26	11	0	0	42	243	
Hourly Total	63	312	95	0	0	470	17	201	36	0	0	254	115	93	26	0	0	234	47	85	43	0	0	175	1133	
Grand Total	170	1096	479	0	1	1745	102	925	131	0	0	1158	429	319	103	0	0	851	183	447	189	0	0	819	4573	
Approach %	9.7	62.8	27.4	0.0	-	-	8.8	79.9	11.3	0.0	-	-	50.4	37.5	12.1	0.0	-	-	22.3	54.6	23.1	0.0	-	-	-	
Total %	3.7	24.0	10.5	0.0	-	38.2	2.2	20.2	2.9	0.0	-	25.3	9.4	7.0	2.3	0.0	-	18.6	4.0	9.8	4.1	0.0	-	17.9	-	
Lights	167	1049	440	0	-	1656	99	890	127	0	-	1116	384	307	98	0	-	789	179	415	181	0	-	775	4336	
% Lights	98.2	95.7	91.9	-	-	94.9	97.1	96.2	96.9	-	-	96.4	89.5	96.2	95.1	-	-	92.7	97.8	92.8	95.8	-	-	94.6	94.8	
Other Vehicles	3	47	39	0	-	89	3	35	4	0	-	42	45	12	5	0	-	62	4	32	8	0	-	44	237	
% Other Vehicles	1.8	4.3	8.1	-	-	5.1	2.9	3.8	3.1	-	-	3.6	10.5	3.8	4.9	-	-	7.3	2.2	7.2	4.2	-	-	5.4	5.2	
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	
% Bicycles on Crosswalk	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	
% Pedestrians	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	



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Count Name: 3. Breese Rd & Dixie Hwy
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Turning Movement Data Plot



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Count Name: 3. Breese Rd & Dixie Hwy
Site Code:
Start Date: 04/12/2023
Page No: 3

Turning Movement Peak Hour Data (7:00 AM)

Start Time	Breese Rd Westbound						Breese Rd Eastbound						Dixie Hwy Southbound						Dixie Hwy 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	3	70	38	0	0	111	5	65	3	0	0	73	21	14	3	0	0	38	4	37	12	0	0	53	275
7:15 AM	5	62	40	0	0	107	4	68	4	0	0	76	17	9	2	0	0	28	3	39	9	0	0	51	262
7:30 AM	11	71	61	0	0	143	7	90	5	0	0	102	24	17	0	0	0	41	16	45	13	0	0	74	360
7:45 AM	6	80	48	0	0	134	10	68	12	0	0	90	24	15	7	0	0	46	11	41	10	0	0	62	332
Total	25	283	187	0	0	495	26	291	24	0	0	341	86	55	12	0	0	153	34	162	44	0	0	240	1229
Approach %	5.1	57.2	37.8	0.0	-	-	7.6	85.3	7.0	0.0	-	-	56.2	35.9	7.8	0.0	-	-	14.2	67.5	18.3	0.0	-	-	-
Total %	2.0	23.0	15.2	0.0	-	40.3	2.1	23.7	2.0	0.0	-	27.7	7.0	4.5	1.0	0.0	-	12.4	2.8	13.2	3.6	0.0	-	19.5	-
PHF	0.568	0.884	0.766	0.000	-	0.865	0.650	0.808	0.500	0.000	-	0.836	0.896	0.809	0.429	0.000	-	0.832	0.531	0.900	0.846	0.000	-	0.811	0.853
Lights	24	266	170	0	-	460	25	281	22	0	-	328	74	50	12	0	-	136	33	155	43	0	-	231	1155
% Lights	96.0	94.0	90.9	-	-	92.9	96.2	96.6	91.7	-	-	96.2	86.0	90.9	100.0	-	-	88.9	97.1	95.7	97.7	-	-	96.3	94.0
Other Vehicles	1	17	17	0	-	35	1	10	2	0	-	13	12	5	0	0	-	17	1	7	1	0	-	9	74
% Other Vehicles	4.0	6.0	9.1	-	-	7.1	3.8	3.4	8.3	-	-	3.8	14.0	9.1	0.0	-	-	11.1	2.9	4.3	2.3	-	-	3.8	6.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Count Name: 4. Breese Rd & McClain Rd
Site Code:
Start Date: 04/12/2023
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Turning Movement Data

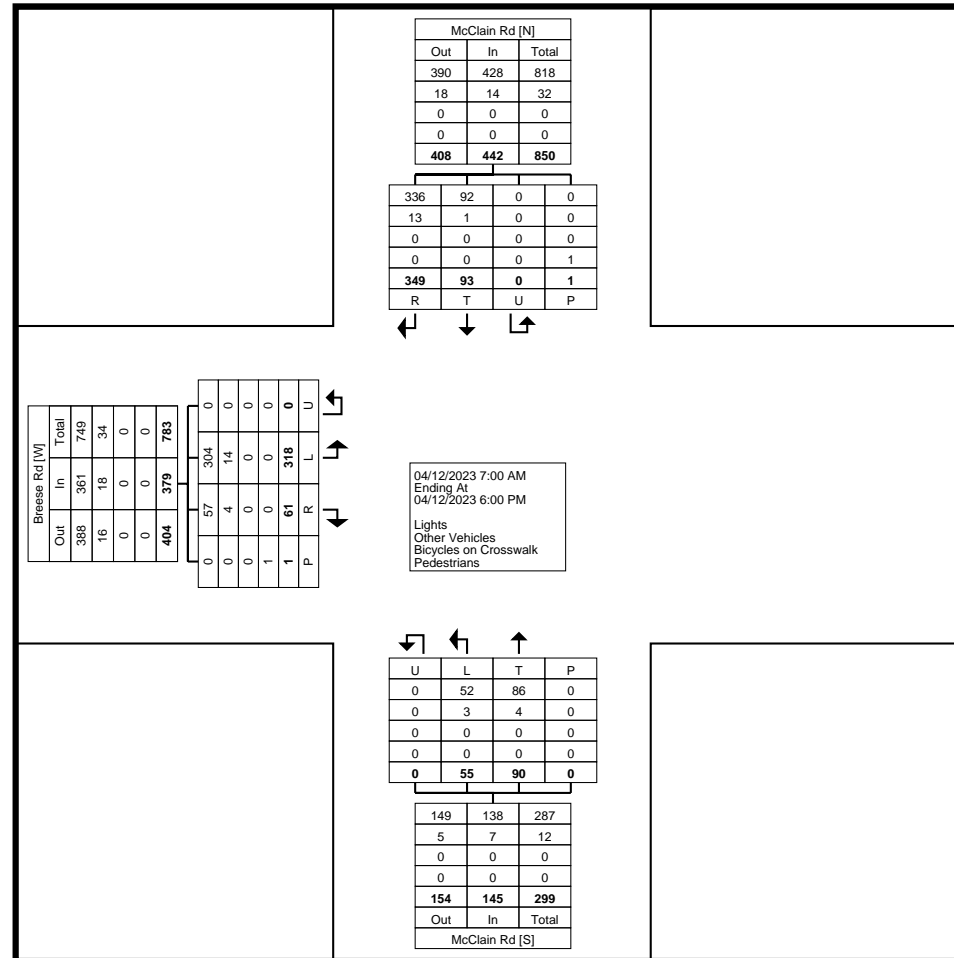
Start Time	Breese Rd Eastbound					McClain Rd Southbound					McClain Rd Northbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	
7:00 AM	18	1	0	0	19	4	22	0	0	26	6	9	0	0	15	60
7:15 AM	32	2	0	0	34	0	17	0	0	17	3	13	0	0	16	67
7:30 AM	29	1	0	0	30	4	21	0	0	25	4	9	0	0	13	68
7:45 AM	45	3	0	0	48	4	19	0	0	23	5	9	0	0	14	85
Hourly Total	124	7	0	0	131	12	79	0	0	91	18	40	0	0	58	280
8:00 AM	15	3	0	0	18	2	10	0	0	12	2	4	0	0	6	36
8:15 AM	14	0	0	0	14	3	13	0	0	16	1	3	0	0	4	34
8:30 AM	17	2	0	0	19	0	18	0	0	18	4	4	0	0	8	45
8:45 AM	14	6	0	1	20	2	17	0	1	19	2	3	0	0	5	44
Hourly Total	60	11	0	1	71	7	58	0	1	65	9	14	0	0	23	159
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	13	7	0	0	20	7	29	0	0	36	5	9	0	0	14	70
4:15 PM	19	6	0	0	25	11	20	0	0	31	6	6	0	0	12	68
4:30 PM	20	7	0	0	27	17	33	0	0	50	2	1	0	0	3	80
4:45 PM	23	9	0	0	32	7	31	0	0	38	4	3	0	0	7	77
Hourly Total	75	29	0	0	104	42	113	0	0	155	17	19	0	0	36	295
5:00 PM	17	4	0	0	21	8	31	0	0	39	4	4	0	0	8	68
5:15 PM	10	5	0	0	15	11	20	0	0	31	2	4	0	0	6	52
5:30 PM	16	3	0	0	19	8	25	0	0	33	3	3	0	0	6	58
5:45 PM	16	2	0	0	18	5	23	0	0	28	2	6	0	0	8	54
Hourly Total	59	14	0	0	73	32	99	0	0	131	11	17	0	0	28	232
Grand Total	318	61	0	1	379	93	349	0	1	442	55	90	0	0	145	966
Approach %	83.9	16.1	0.0	-	-	21.0	79.0	0.0	-	-	37.9	62.1	0.0	-	-	-
Total %	32.9	6.3	0.0	-	39.2	9.6	36.1	0.0	-	45.8	5.7	9.3	0.0	-	15.0	-
Lights	304	57	0	-	361	92	336	0	-	428	52	86	0	-	138	927
% Lights	95.6	93.4	-	-	95.3	98.9	96.3	-	-	96.8	94.5	95.6	-	-	95.2	96.0
Other Vehicles	14	4	0	-	18	1	13	0	-	14	3	4	0	-	7	39
% Other Vehicles	4.4	6.6	-	-	4.7	1.1	3.7	-	-	3.2	5.5	4.4	-	-	4.8	4.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	1	-	-	-	-	1	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-



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Count Name: 4. Breese Rd & McClain Rd
Site Code:
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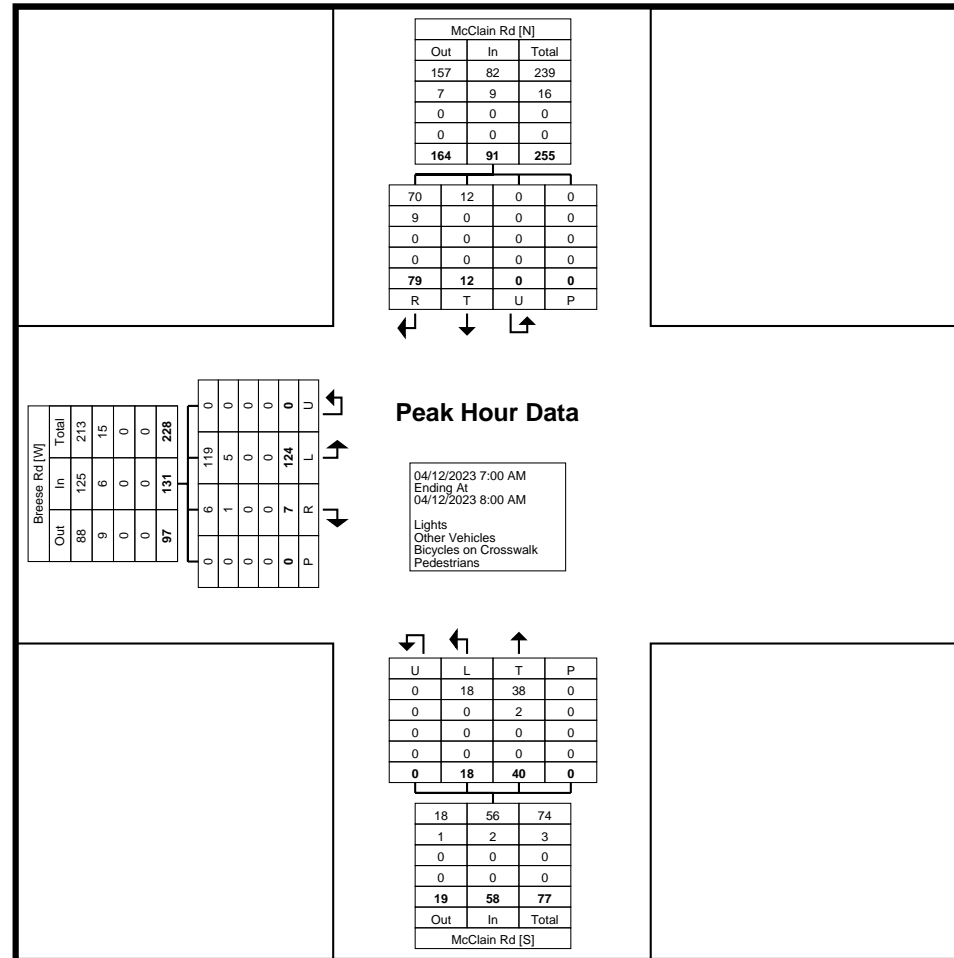
Turning Movement Data Plot



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Count Name: 4. Breese Rd & McClain Rd
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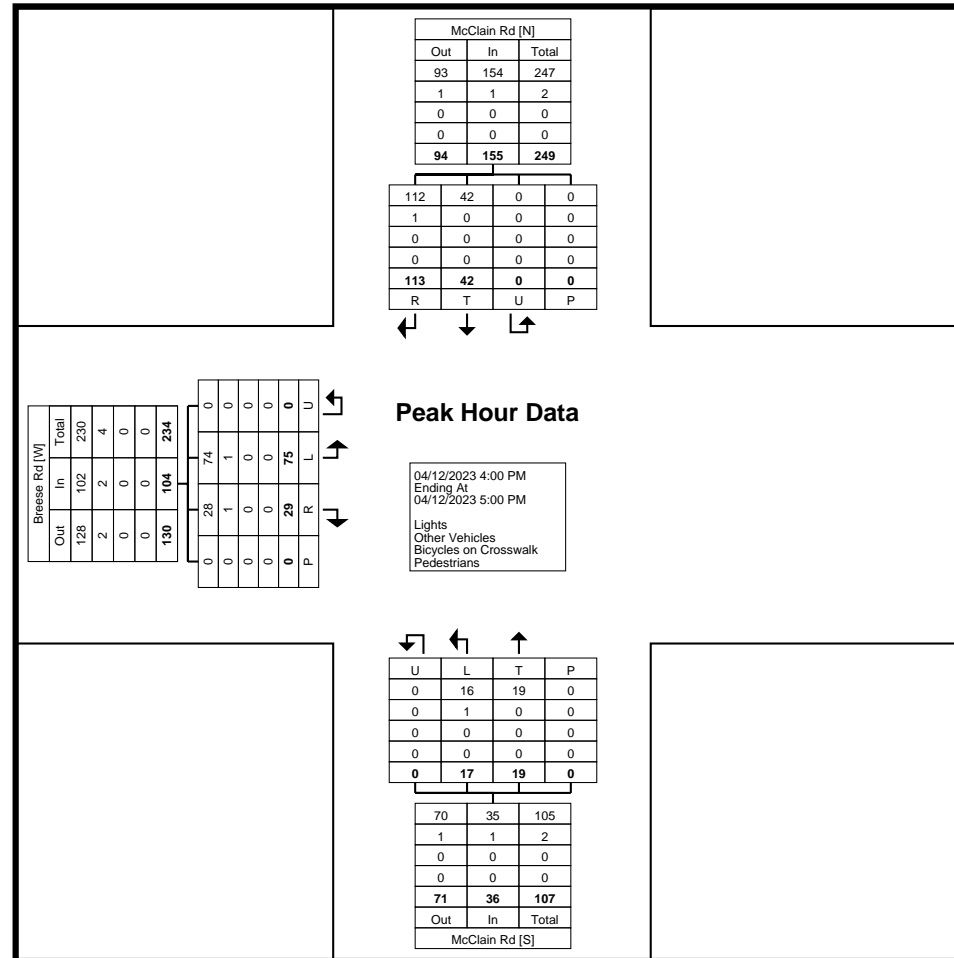
Turning Movement Peak Hour Data Plot (7:00 AM)



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Count Name: 4. Breese Rd & McClain Rd
Site Code:
Start Date: 04/12/2023
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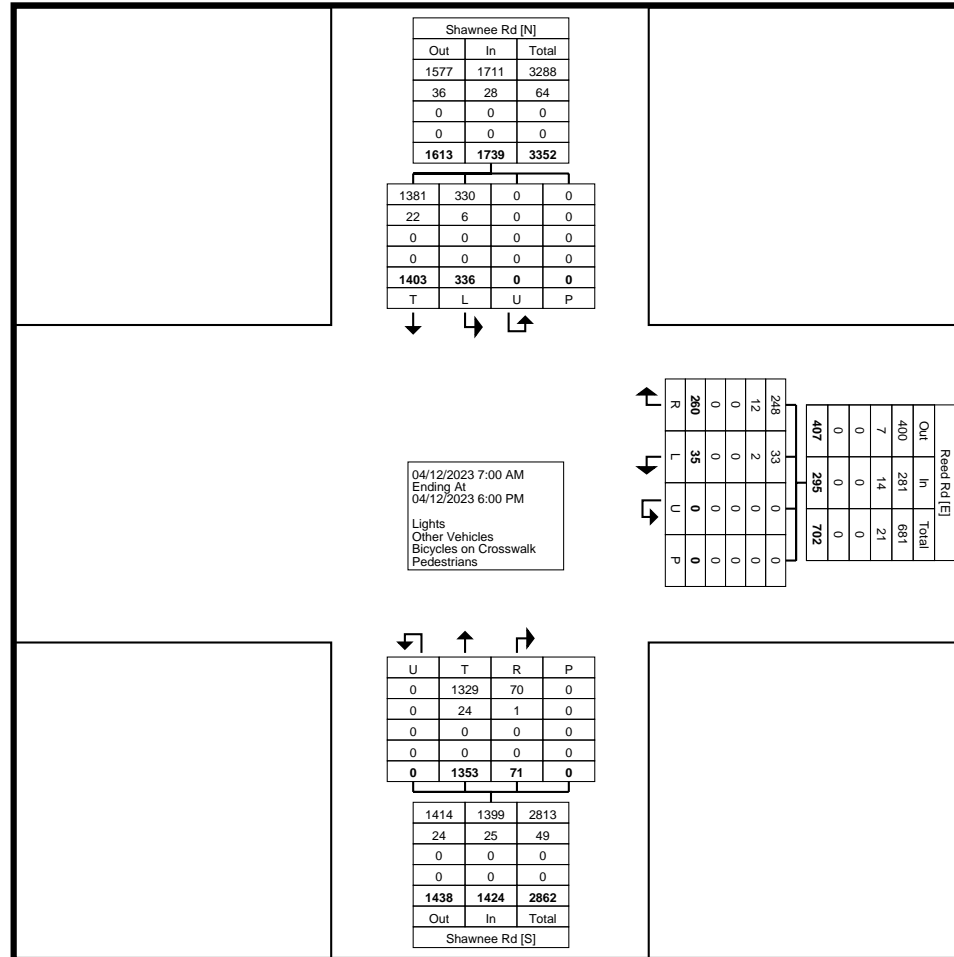
Turning Movement Peak Hour Data Plot (4:00 PM)



Mannik & Smith Group (OH)
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Count Name: 5. Shawnee Rd & Reed Rd
Site Code:
Start Date: 04/12/2023
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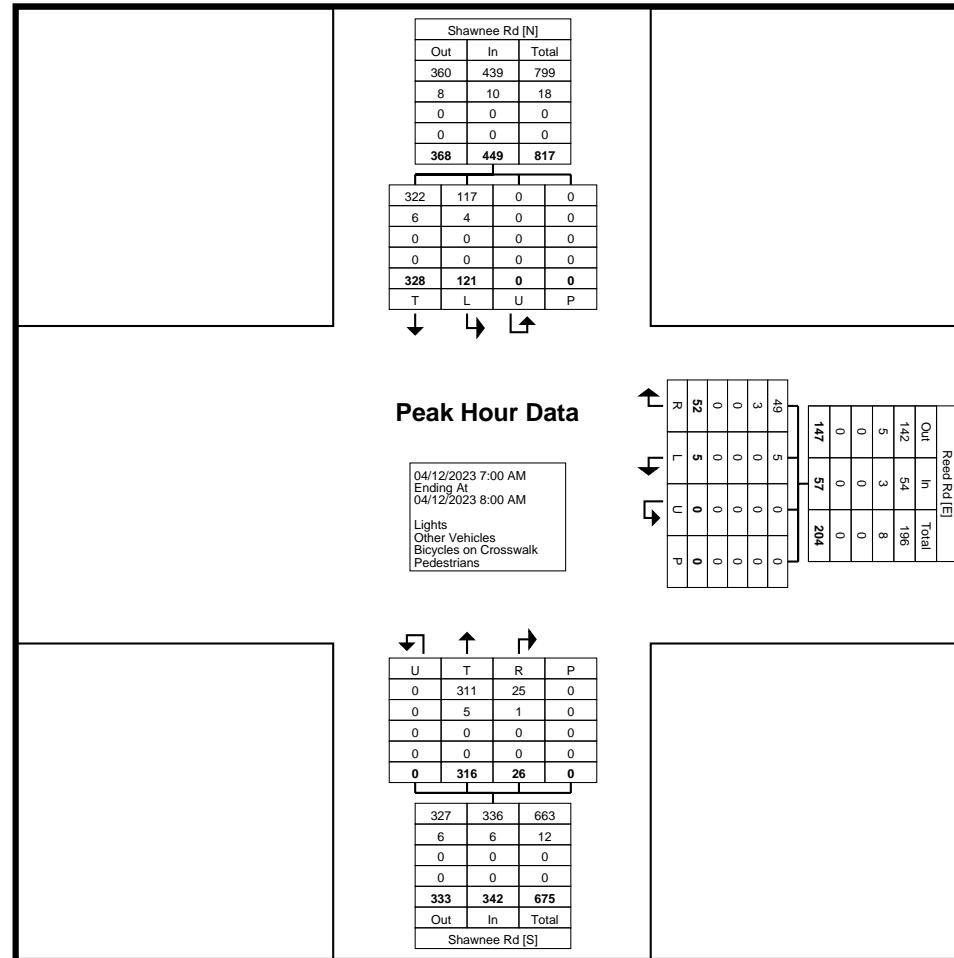
Turning Movement Data Plot



Mannik & Smith Group (OH)
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Count Name: 5. Shawnee Rd & Reed Rd
Site Code:
Start Date: 04/12/2023
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Turning Movement Peak Hour Data Plot (7:00 AM)

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	1	1.10%	4.50%
Minor Injury Suspected Crash	8	8.79%	14.06%
Injury Possible Crash	8	8.79%	7.65%
Property-Damage-Only	74	81.32%	72.86%
Total	91		

Crashes by Crash Type				
Crash Type	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Unknown	3.29%	0.19%	3.29%	0.12%
Head On	0.00%	2.86%	0.00%	5.74%
Rear End	50.55%	10.26%	50.55%	15.40%
Backing	3.30%	1.12%	3.30%	0.56%
Sideswipe - Meeting	0.00%	2.30%	0.00%	3.00%
Sideswipe - Passing	7.69%	3.66%	7.69%	3.92%
Angle	18.68%	2.36%	18.68%	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	6.59%	34.58%	6.59%	47.05%
Other Object	1.10%	0.92%	1.10%	0.21%
Falling From Or In Vehicle	0.00%	0.00%	0.00%	0.00%
Overturning	1.10%	2.75%	1.10%	6.35%
Other Non-Collision	0.00%	1.30%	0.00%	0.54%
Left Turn	4.40%	2.66%	4.40%	4.09%
Right Turn	3.30%	0.52%	3.30%	0.56%

Crashes by Light Conditions				
Light Conditions	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Daylight	78.02%	48.48%	78.02%	63.03%
Dawn/Dusk	7.69%	6.46%	7.69%	4.79%
Dark - Lighted Roadway	9.89%	1.78%	9.89%	1.47%
Dark - Roadway Not Lighted	4.40%	42.57%	4.40%	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	80.43%	69.75%	80.43%	69.58%
Wet	14.13%	18.12%	14.13%	19.13%
Snow	2.17%	8.08%	2.17%	7.31%
Ice	2.17%	3.11%	2.17%	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	1.10%	0.26%	1.10%	0.13%

Breese Rd from Beeler Rd to McClain Rd (2020-2022)

Crash Summary Sheet

Fatalities	0
Serious Injuries	1
Other Injuries	31

Crash Severity	Crashes	%
(2) Serious Injury Suspected	1	1.10%
(3) Minor Injury Suspected	8	8.79%
(4) Injury Possible	8	8.79%
(5) PDO/No Injury	74	81.32%
Grand Total	91	100.00%

Day of Week	Crashes	%
(1) Sunday	8	8.79%
(2) Monday	14	15.38%
(3) Tuesday	17	18.68%
(4) Wednesday	13	14.29%
(5) Thursday	15	16.48%
(6) Friday	15	16.48%
(7) Saturday	9	9.89%
Grand Total	91	100.00%

Hour of Day	Crashes	%
2	1	1.10%
6	1	1.10%
7	8	8.79%
8	2	2.20%
9	6	6.59%
10	7	7.69%
11	3	3.30%
12	6	6.59%
13	4	4.40%
14	7	7.69%
15	12	13.19%
16	8	8.79%
17	7	7.69%
18	3	3.30%
19	4	4.40%
20	5	5.49%
21	5	5.49%
23	2	2.20%
Grand Total	91	100.00%

Crashes Per Year	30.33
Fatal and All Injury Crashes	17
Percent Injury	18.7%
Equivalent PDO Index Value	2.28

Year	Crashes	%
2020	27	29.67%
2021	34	37.36%
2022	30	32.97%
Grand Total	91	100.00%

Crash Type	Crashes	%
Rear End	46	50.55%
Angle	17	18.68%
Sideswipe - Passing	7	7.69%
Fixed Object	6	6.59%
Left Turn	4	4.40%
Backing	3	3.30%
Right Turn	3	3.30%
Unknown	3	3.30%
Overturning	1	1.10%
Other Object	1	1.10%
Grand Total	91	100.00%

Month	Crashes	%
1	6	6.59%
2	8	8.79%
3	9	9.89%
4	7	7.69%
5	9	9.89%
6	6	6.59%
7	5	5.49%
8	6	6.59%
9	10	10.99%
10	8	8.79%
11	10	10.99%
12	7	7.69%
Grand Total	91	100.00%

Breese Rd from Beeler Rd to McClain Rd (2020-2022)

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	61	67.03%
Cloudy	20	21.98%
Rain	7	7.69%
Snow	3	3.30%
Grand Total	91	100.00%

Road Condition	Crashes	%
Dry	74	81.32%
Wet	13	14.29%
Snow	2	2.20%
Ice	2	2.20%
Grand Total	91	100.00%

Light Condition	Crashes	%
Daylight	71	78.02%
Dark - Lighted Roadway	9	9.89%
Dawn/Dusk	7	7.69%
Dark - Roadway Not Lighted	4	4.40%
Grand Total	91	100.00%

Number of Units	Crashes	%
2	75	82.42%
1	11	12.09%
3	5	5.49%
Grand Total	91	100.00%

ODOT Location	Crashes	%
Four-Way Intersection	36	39.56%
Not An Intersection	27	29.67%
T-Intersection	16	17.58%
Data Not Valid or Not Provided	6	6.59%
Off Ramp	5	5.49%
Railroad Grade Crossing	1	1.10%
Grand Total	91	100.00%

Work Zone Related	Crashes	%
No	91	100.00%
Grand Total	91	100.00%

Alcohol Related	Crashes	%
No	88	96.70%
Yes	3	3.30%
Grand Total	91	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	89	97.80%
Yes	2	2.20%
Grand Total	91	100.00%

Contour	Crashes	%
Curve Grade	2	2.20%
Straight Grade	9	9.89%
Straight Level	80	87.91%
Grand Total	91	100.00%

Marijuana Related	Crashes	%
No	89	97.80%
Yes	2	2.20%
Grand Total	91	100.00%

Roadway Departure	Crashes	%
No	79	86.81%
Yes	12	13.19%
Grand Total	91	100.00%

Older Driver (65+)	Crashes	%
No	71	78.02%
Yes	20	21.98%
Grand Total	91	100.00%

Intersection Related	Crashes	%
Yes	64	70.33%
No	27	29.67%
Grand Total	91	100.00%

Young Driver (15-25)	Crashes	%
No	50	54.95%
Yes	41	45.05%
Grand Total	91	100.00%

Speed Related	Crashes	%
No	90	98.90%
Yes	1	1.10%
Grand Total	91	100.00%

Motorcycle Involved	Crashes	%
No	88	96.70%
Yes	3	3.30%
Grand Total	91	100.00%

Breese Rd from Beeler Rd to McClain Rd (2020-2022)

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	52	57.14%
Making Left Turn	12	13.19%
Slowing or Stopped In Traffic	8	8.79%
Entering Traffic Lane	5	5.49%
Making Right Turn	4	4.40%
Other / Unknown	3	3.30%
Backing	3	3.30%
Overtaking/Passing	2	2.20%
Negotiating a Curve	1	1.10%
Making U-Turn	1	1.10%
Grand Total	91	100.00%

Unit 1 Contributing Factor	Crashes	%
Following Too Closely/ACDA	46	50.55%
Failure to Yield	15	16.48%
Drove off Road	5	5.49%
Ran Stop Sign	4	4.40%
Improper Turn	4	4.40%
Improper Backing	3	3.30%
Ran Red Light	3	3.30%
None	3	3.30%
Other Improper Action	2	2.20%
Improper Lane Change	2	2.20%
Left of Center	2	2.20%
Improper Passing	1	1.10%
Improper Crossing	1	1.10%
Grand Total	91	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	82	90.11%
Mailbox	2	2.20%
Utility Pole	2	2.20%
Tree	1	1.10%
Traffic Sign Post	1	1.10%
Fence	1	1.10%
Embankment	1	1.10%
Other Fixed Object	1	1.10%
Grand Total	91	100.00%

Unit 1 Traffic Control	Crashes	%
No Control	42	46.15%
Signal	32	35.16%
Stop Sign	17	18.68%
Grand Total	91	100.00%

Unit 1 Posted Speed	Crashes	%
0	1	1.10%
25	1	1.10%
35	2	2.20%
45	80	87.91%
55	1	1.10%
70	6	6.59%
Grand Total	91	100.00%

Unit 1 Direction From	Crashes	%
East	29	31.87%
West	26	28.57%
North	16	17.58%
South	15	16.48%
Northeast	3	3.30%
Southwest	1	1.10%
Unknown	1	1.10%
Grand Total	91	100.00%

Unit 1 Direction To	Crashes	%
West	32	35.16%
East	30	32.97%
North	12	13.19%
South	12	13.19%
Southwest	3	3.30%
Northeast	2	2.20%
Grand Total	91	100.00%

Breese Rd from Beeler Rd to McClain Rd (2020-2022)

Crash Summary Sheet

Unit 1 Summary

Unit 1 Type	Crashes	%
Passenger Car	32	35.16%
Pick up	25	27.47%
Sport Utility Vehicle	21	23.08%
Semi-Tractor	8	8.79%
Single Unit Truck	2	2.20%
Unknown or Hit/Skip	2	2.20%
Motorcycle 2 Wheeled	1	1.10%
Grand Total	91	100.00%

Unit 1 Special Function	Crashes	%
None	85	93.41%
Other / Unknown	5	5.49%
Towing	1	1.10%
Grand Total	91	100.00%

Breese Rd from Beeler Rd to McClain Rd (2020-2022)

Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Slowing or Stopped In Traffic	51	56.04%
Straight Ahead	24	26.37%
	11	12.09%
Making Right Turn	2	2.20%
Making Left Turn	2	2.20%
Changing Lanes	1	1.10%
Grand Total	91	100.00%

Unit 2 Contributing Factor	Crashes	%
None	78	85.71%
	11	12.09%
Following Too Closely/ACDA	1	1.10%
Swerving to Avoid	1	1.10%
Grand Total	91	100.00%

Unit 2 Direction From	Crashes	%
	11	12.09%
East	26	28.57%
North	11	12.09%
Northeast	3	3.30%
South	9	9.89%
Southwest	1	1.10%
West	30	32.97%
Grand Total	91	100.00%

Unit 2 Direction To	Crashes	%
	11	12.09%
East	31	34.07%
North	8	8.79%
Northeast	1	1.10%
South	9	9.89%
Southwest	3	3.30%
West	28	30.77%
Grand Total	91	100.00%

Unit 2 Type	Crashes	%
Sport Utility Vehicle	31	34.07%
Passenger Car	29	31.87%
	11	12.09%
Pick up	9	9.89%
Passenger Van (minivan)	4	4.40%
Motorcycle 2 Wheeled	2	2.20%
Cargo Van	2	2.20%
Single Unit Truck	1	1.10%
Other Vehicle	1	1.10%
Semi-Tractor	1	1.10%
Grand Total	91	100.00%

Unit 2 Special Function	Crashes	%
None	79	86.81%
	11	12.09%
Police	1	1.10%
Grand Total	91	100.00%

Select Site Type	Seg/Rur; 2-lane
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Crash Severity	Site Average		Statewide Average
	Total (2020-2022)	Total (%)	Total (%)
Fatal Crash	1	3.57%	0.93%
Serious Injury Suspected Crash	1	3.57%	4.50%
Minor Injury Suspected Crash	1	3.57%	14.06%
Injury Possible Crash	6	21.43%	7.65%
Property-Damage-Only	19	67.86%	72.86%
Total	28		

Crashes by Crash Type				
Crash Type	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Unknown	0.01%	0.19%	0.01%	0.12%
Head On	0.00%	2.86%	0.00%	5.74%
Rear End	60.71%	10.26%	60.71%	15.40%
Backing	0.00%	1.12%	0.00%	0.56%
Sideswipe - Meeting	0.00%	2.30%	0.00%	3.00%
Sideswipe - Passing	10.71%	3.66%	10.71%	3.92%
Angle	17.86%	2.36%	17.86%	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	3.57%	0.14%	3.57%	0.48%
Other Non-Vehicle	0.00%	0.01%	0.00%	0.04%
Fixed Object	3.57%	34.58%	3.57%	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	0.00%	2.75%	0.00%	6.35%
Other Non-Collision	0.00%	1.30%	0.00%	0.54%
Left Turn	3.57%	2.66%	3.57%	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	82.14%	48.48%	82.14%	63.03%
Dawn/Dusk	3.57%	6.46%	3.57%	4.79%
Dark - Lighted Roadway	7.14%	1.78%	7.14%	1.47%
Dark - Roadway Not Lighted	7.14%	42.57%	7.14%	30.27%
Dark - Unknown Roadway Lighting	0.00%	0.28%	0.00%	0.16%
Other / Unknown	0.01%	0.43%	0.01%	0.28%

Crashes by Road Conditions				
Road Conditions	Total (%)		Fatal & All Injury (%)	
	Site Average	Statewide Average	Site Average	Statewide Average
Dry	79.31%	69.75%	79.31%	69.58%
Wet	17.24%	18.12%	17.24%	19.13%
Snow	0.00%	8.08%	0.00%	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	3.45%	0.26%	3.45%	0.13%

Shawnee Rd. from Britt Ave. to Reed Rd. (2020-2022)

Crash Summary Sheet

Fatalities	1
Serious Injuries	1
Other Injuries	9

Crash Severity	Crashes	%
(1) Fatal	1	3.57%
(2) Serious Injury Suspected	1	3.57%
(3) Minor Injury Suspected	1	3.57%
(4) Injury Possible	6	21.43%
(5) PDO/No Injury	19	67.86%
Grand Total	28	100.00%

Day of Week	Crashes	%
(1) Sunday	1	3.57%
(2) Monday	6	21.43%
(3) Tuesday	5	17.86%
(4) Wednesday	7	25.00%
(5) Thursday	1	3.57%
(6) Friday	6	21.43%
(7) Saturday	2	7.14%
Grand Total	28	100.00%

Hour of Day	Crashes	%
5	1	3.57%
7	4	14.29%
8	2	7.14%
10	1	3.57%
11	2	7.14%
12	3	10.71%
13	1	3.57%
14	11	39.29%
19	1	3.57%
20	1	3.57%
21	1	3.57%
Grand Total	28	100.00%

Crashes Per Year	9.33
Fatal and All Injury Crashes	9
Percent Injury	32.1%
Equivalent PDO Index Value	5.14

Year	Crashes	%
2020	10	35.71%
2021	9	32.14%
2022	9	32.14%
Grand Total	28	100.00%

Crash Type	Crashes	%
Rear End	17	60.71%
Angle	5	17.86%
Sideswipe - Passing	3	10.71%
Fixed Object	1	3.57%
Pedalcycles	1	3.57%
Left Turn	1	3.57%
Grand Total	28	100.00%

Month	Crashes	%
1	1	3.57%
2	1	3.57%
4	1	3.57%
5	4	14.29%
6	3	10.71%
8	2	7.14%
9	4	14.29%
10	6	21.43%
11	3	10.71%
12	3	10.71%
Grand Total	28	100.00%

Shawnee Rd. from Britt Ave. to Reed Rd. (2020-2022)

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	20	71.43%
Cloudy	5	17.86%
Rain	3	10.71%
Grand Total	28	100.00%

Road Condition	Crashes	%
Dry	23	82.14%
Wet	5	17.86%
Grand Total	28	100.00%

Light Condition	Crashes	%
Daylight	23	82.14%
Dark - Lighted Roadway	2	7.14%
Dark - Roadway Not Lighted	2	7.14%
Dawn/Dusk	1	3.57%
Grand Total	28	100.00%

Number of Units	Crashes	%
2	22	78.57%
3	3	10.71%
4	2	7.14%
1	1	3.57%
Grand Total	28	100.00%

ODOT Location	Crashes	%
Not An Intersection	21	75.00%
T-Intersection	6	21.43%
Data Not Valid or Not Provided	1	3.57%
Grand Total	28	100.00%

Work Zone Related	Crashes	%
No	25	89.29%
Yes	3	10.71%
Grand Total	28	100.00%

Alcohol Related	Crashes	%
No	27	96.43%
Yes	1	3.57%
Grand Total	28	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	27	96.43%
Yes	1	3.57%
Grand Total	28	100.00%

Contour	Crashes	%
Straight Grade	1	3.57%
Straight Level	27	96.43%
Grand Total	28	100.00%

Marijuana Related	Crashes	%
No	28	100.00%
Grand Total	28	100.00%

Roadway Departure	Crashes	%
No	27	96.43%
Yes	1	3.57%
Grand Total	28	100.00%

Older Driver (65+)	Crashes	%
No	19	67.86%
Yes	9	32.14%
Grand Total	28	100.00%

Intersection Related	Crashes	%
Yes	8	28.57%
No	20	71.43%
Grand Total	28	100.00%

Young Driver (15-25)	Crashes	%
No	11	39.29%
Yes	17	60.71%
Grand Total	28	100.00%

Speed Related	Crashes	%
No	25	89.29%
Yes	3	10.71%
Grand Total	28	100.00%

Motorcycle Involved	Crashes	%
No	28	100.00%
Grand Total	28	100.00%

Shawnee Rd. from Britt Ave. to Reed Rd. (2020-2022)

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	16	57.14%
Entering Traffic Lane	5	17.86%
Slowing or Stopped In Traffic	4	14.29%
Making Left Turn	2	7.14%
Changing Lanes	1	3.57%
Grand Total	28	100.00%

Unit 1 Contributing Factor	Crashes	%
Following Too Closely/ACDA	21	75.00%
Failure to Yield	6	21.43%
Drove off Road	1	3.57%
Grand Total	28	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	27	96.43%
Ditch	1	3.57%
Grand Total	28	100.00%

Unit 1 Traffic Control	Crashes	%
No Control	25	89.29%
Stop Sign	3	10.71%
Grand Total	28	100.00%

Unit 1 Posted Speed	Crashes	%
20	4	14.29%
25	1	3.57%
45	23	82.14%
Grand Total	28	100.00%

Unit 1 Direction From	Crashes	%
North	12	42.86%
South	11	39.29%
East	4	14.29%
West	1	3.57%
Grand Total	28	100.00%

Unit 1 Direction To	Crashes	%
South	15	53.57%
North	11	39.29%
West	2	7.14%
Grand Total	28	100.00%

Shawnee Rd. from Britt Ave. to Reed Rd. (2020-2022)

Crash Summary Sheet

Unit 1 Summary

Unit 1 Type	Crashes	%
Passenger Car	11	39.29%
Sport Utility Vehicle	8	28.57%
Pick up	6	21.43%
Passenger Van (minivan)	2	7.14%
Cargo Van	1	3.57%
Grand Total	28	100.00%

Unit 1 Special Function	Crashes	%
None	28	100.00%
Grand Total	28	100.00%

Shawnee Rd. from Britt Ave. to Reed Rd. (2020-2022)

Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Slowing or Stopped In Traffic	16	57.14%
Straight Ahead	9	32.14%
	1	3.57%
Changing Lanes	1	3.57%
Making Right Turn	1	3.57%
Grand Total	28	100.00%

Unit 2 Contributing Factor	Crashes	%
None	27	96.43%
	1	3.57%
Grand Total	28	100.00%

Unit 2 Direction From	Crashes	%
	1	3.57%
North	14	50.00%
South	13	46.43%
Grand Total	28	100.00%

Unit 2 Direction To	Crashes	%
	1	3.57%
East	1	3.57%
North	13	46.43%
South	12	42.86%
Southwest	1	3.57%
Grand Total	28	100.00%

Unit 2 Type	Crashes	%
Passenger Car	11	39.29%
Pick up	8	28.57%
Sport Utility Vehicle	7	25.00%
Bicycle	1	3.57%
	1	3.57%
Grand Total	28	100.00%

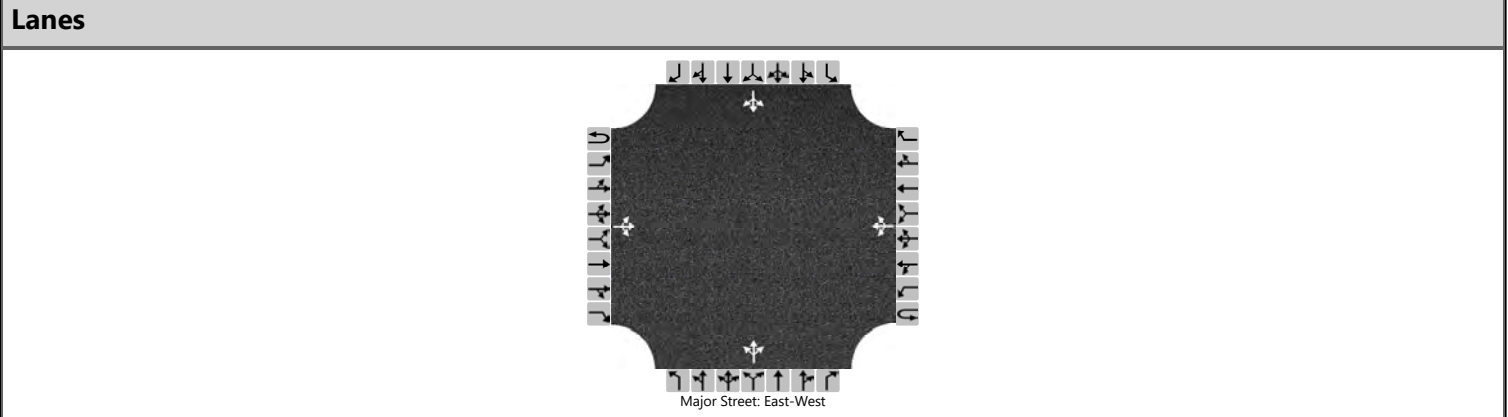
Unit 2 Special Function	Crashes	%
None	27	96.43%
	1	3.57%
Grand Total	28	100.00%

APPENDIX B
CAPACITY ANALYSES



HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Breese Rd & Beeler Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Breese Rd				
Analysis Year	2023	North/South Street	Beeler Rd				
Time Analyzed	2023 AM	Peak Hour Factor	0.76				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	Breese Rd & Beeler Rd						



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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		13	253	11		8	85	70		6	37	13		50	12	8
Percent Heavy Vehicles (%)		2				6				2	2	2		7	7	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.16				7.12	6.52	6.22		7.17	6.57	6.27
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.25				3.52	4.02	3.32		3.56	4.06	3.36

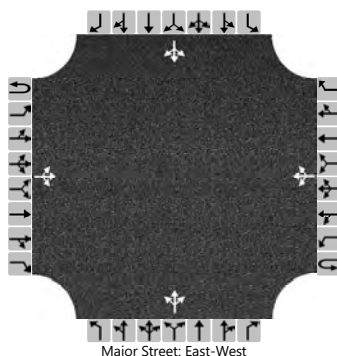
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		17				11					74					92
Capacity, c (veh/h)		1368				1190					448					385
v/c Ratio		0.01				0.01					0.16					0.24
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.6					0.9
Control Delay (s/veh)		7.7	0.1	0.1		8.1	0.1	0.1			14.6					17.3
Level of Service (LOS)		A	A	A		A	A	A			B					C
Approach Delay (s/veh)		0.5				0.5				14.6				17.3		
Approach LOS		A				A				B				C		

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Breese Rd & Beeler Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Breese Rd				
Analysis Year	2023	North/South Street	Beeler Rd				
Time Analyzed	2023 PM	Peak Hour Factor	0.93				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	Breese Rd & Beeler 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	1U	1	2	3	4U	4	5	6								
Priority																
Number of Lanes	0	0	1	0	0	0	1	0					0	1	0	
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		6	120	9		15	160	107					16	21	9	
Percent Heavy Vehicles (%)		0				1							0	0	0	
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.11				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.21				3.50	4.00	3.30		3.50	4.00	3.30

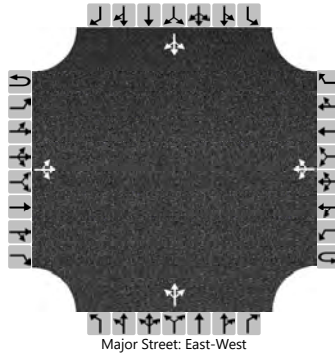
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		6				16					49					77	
Capacity, c (veh/h)		1287				1451					543					521	
v/c Ratio		0.01				0.01					0.09					0.15	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.3					0.5	
Control Delay (s/veh)		7.8	0.0	0.0		7.5	0.1	0.1			12.3					13.1	
Level of Service (LOS)		A	A	A		A	A	A			B					B	
Approach Delay (s/veh)	0.4				0.5				12.3				13.1				
Approach LOS	A				A				B				B				

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Breese Rd & Beeler Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Breese Rd				
Analysis Year	2027	North/South Street	Beeler Rd				
Time Analyzed	2027 AM	Peak Hour Factor	0.76				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	Breese Rd & Beeler 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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		13	258	11		8	87	71		6	38	13		51	12	8
Percent Heavy Vehicles (%)		2				6				2	2	2		7	7	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.16				7.12	6.52	6.22		7.17	6.57	6.27
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.25				3.52	4.02	3.32		3.56	4.06	3.36

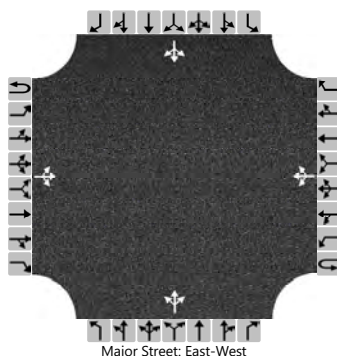
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		17				11					75					93
Capacity, c (veh/h)		1363				1183					442					377
v/c Ratio		0.01				0.01					0.17					0.25
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.6					1.0
Control Delay (s/veh)		7.7	0.1	0.1		8.1	0.1	0.1			14.8					17.7
Level of Service (LOS)		A	A	A		A	A	A			B					C
Approach Delay (s/veh)		0.5				0.5				14.8				17.7		
Approach LOS		A				A				B				C		

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Breese Rd & Beeler Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Breese Rd				
Analysis Year	2027	North/South Street	Beeler Rd				
Time Analyzed	2027 PM	Peak Hour Factor	0.93				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	Breese Rd & Beeler 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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		6	122	9		15	163	109		16	21	9		43	27	4
Percent Heavy Vehicles (%)		0				1				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.11				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.21				3.50	4.00	3.30		3.50	4.00	3.30

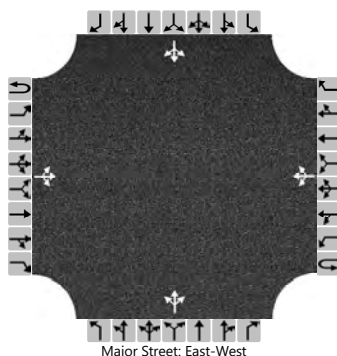
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		6				16				49				80		
Capacity, c (veh/h)		1281				1448				538				516		
v/c Ratio		0.01				0.01				0.09				0.15		
95% Queue Length, Q ₉₅ (veh)		0.0				0.0				0.3				0.5		
Control Delay (s/veh)		7.8	0.0	0.0		7.5	0.1	0.1		12.4				13.2		
Level of Service (LOS)		A	A	A		A	A	A		B				B		
Approach Delay (s/veh)	0.4				0.5				12.4				13.2			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Breese Rd & Beeler Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Breese Rd				
Analysis Year	2047	North/South Street	Beeler Rd				
Time Analyzed	2047 AM	Peak Hour Factor	0.76				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	Breese Rd & Beeler 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	1U	1	2	3	4U	4	5	6										
Priority																		
Number of Lanes	0	0	1	0	0	0	1	0										
Configuration			LTR				LTR				LTR				LTR			
Volume (veh/h)		15	283	12		9	95	78			7	41	15			56	13	9
Percent Heavy Vehicles (%)		2				6					2	2	2			7	7	7
Proportion Time Blocked																		
Percent Grade (%)									0				0					
Right Turn Channelized																		
Median Type Storage	Undivided																	

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.16				7.12	6.52	6.22		7.17	6.57	6.27
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.25				3.52	4.02	3.32		3.56	4.06	3.36

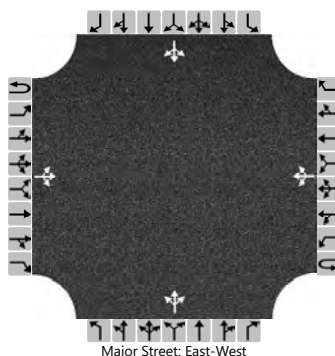
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		20				12					83					103	
Capacity, c (veh/h)		1341				1149					409					337	
v/c Ratio		0.01				0.01					0.20					0.30	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.7					1.3	
Control Delay (s/veh)		7.7	0.1	0.1		8.2	0.1	0.1			16.0					20.3	
Level of Service (LOS)		A	A	A		A	A	A			C					C	
Approach Delay (s/veh)	0.5				0.5				16.0				20.3				
Approach LOS	A				A				C				C				

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Breese Rd & Beeler Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Breese Rd				
Analysis Year	2047	North/South Street	Beeler Rd				
Time Analyzed	2047 PM	Peak Hour Factor	0.93				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	Breese Rd & Beeler 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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		7	134	10		17	179	120		18	24	10		47	29	4
Percent Heavy Vehicles (%)		0				1				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.11				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.21				3.50	4.00	3.30		3.50	4.00	3.30

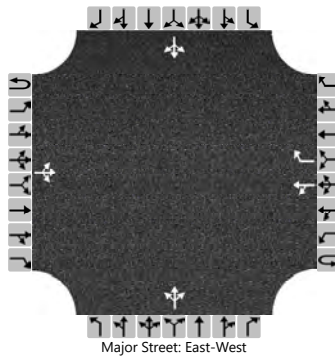
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		8				18					56				86	
Capacity, c (veh/h)		1250				1432					502				479	
v/c Ratio		0.01				0.01					0.11				0.18	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.4				0.6	
Control Delay (s/veh)		7.9	0.1	0.1		7.5	0.1	0.1			13.1				14.2	
Level of Service (LOS)		A	A	A		A	A	A			B				B	
Approach Delay (s/veh)		0.4			0.5			13.1			14.2					
Approach LOS		A			A			B			B					

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Breese Rd & Beeler Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Breese Rd				
Analysis Year	2027	North/South Street	Beeler Rd				
Time Analyzed	2027 AM	Peak Hour Factor	0.76				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	Breese Rd & Beeler 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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	0
Configuration			LTR			LT		R			LTR				LTR	
Volume (veh/h)		13	258	11		8	87	71		6	38	13		51	12	8
Percent Heavy Vehicles (%)		2				6				2	2	2		7	7	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.16				7.12	6.52	6.22		7.17	6.57	6.27
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.25				3.52	4.02	3.32		3.56	4.06	3.36

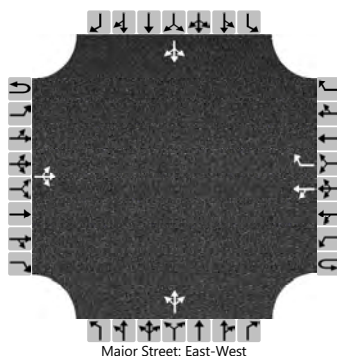
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		17				11					75					93
Capacity, c (veh/h)		1363				1183					442					377
v/c Ratio		0.01				0.01					0.17					0.25
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.6					1.0
Control Delay (s/veh)		7.7	0.1	0.1		8.1	0.1				14.8					17.6
Level of Service (LOS)		A	A	A		A	A				B					C
Approach Delay (s/veh)		0.5				0.4				14.8				17.6		
Approach LOS		A				A				B				C		

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Breese Rd & Beeler Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Breese Rd				
Analysis Year	2027	North/South Street	Beeler Rd				
Time Analyzed	2027 PM	Peak Hour Factor	0.93				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	Breese Rd & Beeler 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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	0
Configuration			LTR			LT		R			LTR				LTR	
Volume (veh/h)		6	122	9		15	163	109		16	21	9		43	27	4
Percent Heavy Vehicles (%)		0				1				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.11				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.21				3.50	4.00	3.30		3.50	4.00	3.30

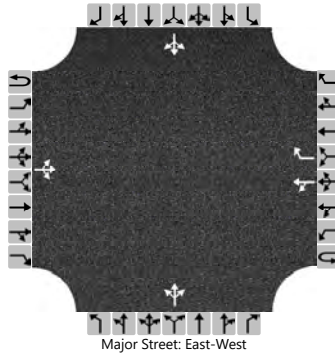
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		6				16				49				80		
Capacity, c (veh/h)		1281				1448				538				517		
v/c Ratio		0.01				0.01				0.09				0.15		
95% Queue Length, Q ₉₅ (veh)		0.0				0.0				0.3				0.5		
Control Delay (s/veh)		7.8	0.0	0.0		7.5	0.1			12.4				13.2		
Level of Service (LOS)		A	A	A		A	A			B				B		
Approach Delay (s/veh)	0.4				0.4				12.4				13.2			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst				Intersection	Breese Rd & Beeler Rd		
Agency/Co.				Jurisdiction			
Date Performed	7/25/2023			East/West Street	Breese Rd		
Analysis Year	2047			North/South Street	Beeler Rd		
Time Analyzed	2047 AM			Peak Hour Factor	0.76		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Breese Rd & Beeler 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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	0
Configuration			LTR			LT		R			LTR				LTR	
Volume (veh/h)		15	283	12		9	95	78		7	41	15		56	13	9
Percent Heavy Vehicles (%)		2				6				2	2	2		7	7	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.12				4.16				7.12	6.52	6.22		7.17	6.57	6.27
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.22				2.25				3.52	4.02	3.32		3.56	4.06	3.36

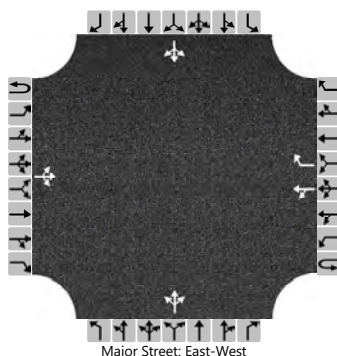
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		20				12					83					103	
Capacity, c (veh/h)		1341				1149					409					337	
v/c Ratio		0.01				0.01					0.20					0.30	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.7					1.3	
Control Delay (s/veh)		7.7	0.1	0.1		8.2	0.1				16.0					20.3	
Level of Service (LOS)		A	A	A		A	A				C					C	
Approach Delay (s/veh)	0.5				0.4				16.0				20.3				
Approach LOS	A				A				C				C				

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Breese Rd & Beeler Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Breese Rd				
Analysis Year	2047	North/South Street	Beeler Rd				
Time Analyzed	2047 PM	Peak Hour Factor	0.93				
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25				
Project Description	Breese Rd & Beeler 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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	0	1	1		0	1	0		0	1	0
Configuration			LTR			LT		R			LTR				LTR	
Volume (veh/h)		7	134	10		17	179	120		18	24	10		47	29	4
Percent Heavy Vehicles (%)		0				1				0	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

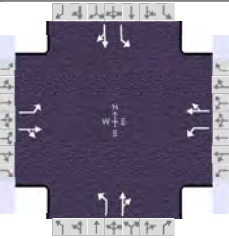
Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.11				7.10	6.50	6.20		7.10	6.50	6.20
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.20				2.21				3.50	4.00	3.30		3.50	4.00	3.30

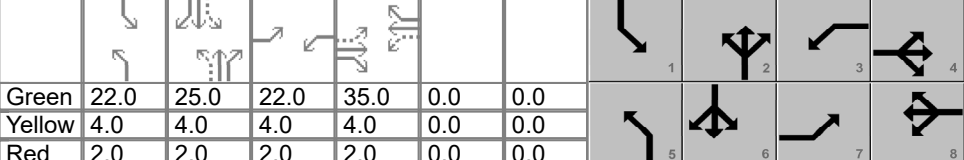
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		8				18					56					86	
Capacity, c (veh/h)		1250				1432					503					479	
v/c Ratio		0.01				0.01					0.11					0.18	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.4					0.6	
Control Delay (s/veh)		7.9	0.1	0.1		7.5	0.1				13.0					14.1	
Level of Service (LOS)		A	A	A		A	A				B					B	
Approach Delay (s/veh)	0.4				0.5				13.0				14.1				
Approach LOS	A				A				B				B				

HCS Signalized Intersection Results Summary

General Information					Intersection Information								
Agency					Duration, h	0.250							
Analyst					Analysis Date	7/26/2023					Area Type	Other	
Jurisdiction					Time Period						PHF	0.85	
Urban Street	Dixie Hwy		Analysis Year	2023		Analysis Period	1 > 7:00						
Intersection	Breese Rd & Dixie Hwy		File Name	Breese & Dixie_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	26	291	24	25	283	187	34	162	44	86	55	12

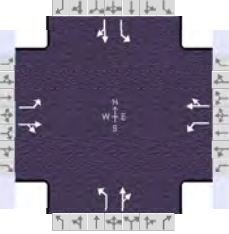
Signal Information																								
Cycle, s	128.0	Reference Phase	2	Green	22.0	25.0	22.0	35.0	0.0	0.0	Yellow	4.0	4.0	4.0	4.0	0.0	0.0	Red	2.0	2.0	2.0	2.0	0.0	0.0
Offset, s	0	Reference Point	End																					
Uncoordinated	Yes	Simult. Gap E/W	On																					
Force Mode	Fixed	Simult. Gap N/S	On																					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	28.0	41.0	28.0	41.0	28.0	31.0	28.0	31.0
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	5.1	6.5	5.1	6.5	5.1	6.1	5.1	6.1
Queue Clearance Time (g _s), s	3.4	28.5	3.4	37.0	4.1	20.0	7.8	7.5
Green Extension Time (g _e), s	0.1	4.0	0.1	0.0	0.1	1.0	0.3	2.2
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.04

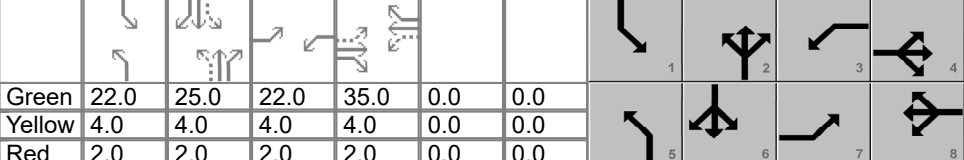
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	31	371		29	553		40	242		101	79	
Adjusted Saturation Flow Rate (s), veh/h/ln	1615	1672		1576	1544		1615	1633		1524	1550	
Queue Service Time (g _s), s	1.4	26.5		1.4	35.0		2.1	18.0		5.8	5.5	
Cycle Queue Clearance Time (g _c), s	1.4	26.5		1.4	35.0		2.1	18.0		5.8	5.5	
Green Ratio (g/C)	0.45	0.27		0.45	0.27		0.37	0.20		0.37	0.20	
Capacity (c), veh/h	334	457		377	422		511	319		360	303	
Volume-to-Capacity Ratio (X)	0.092	0.810		0.078	1.310		0.078	0.760		0.281	0.260	
Back of Queue (Q), ft/ln (95 th percentile)	24.7	472.3		24.2	1242.3		37.4	336.5		105.6	107.6	
Back of Queue (Q), veh/ln (95 th percentile)	1.0	18.3		0.9	47.1		1.5	13.0		3.9	4.0	
Queue Storage Ratio (RQ) (95 th percentile)	0.25	0.00		0.11	0.00		0.42	0.00		0.46	0.00	
Uniform Delay (d ₁), s/veh	24.9	43.4		23.3	46.5		26.5	48.7		29.2	43.7	
Incremental Delay (d ₂), s/veh	0.2	13.4		0.1	155.6		0.1	11.9		0.6	1.0	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	25.0	56.8		23.5	202.1		26.6	60.6		29.8	44.6	
Level of Service (LOS)	C	E		C	F		C	E		C	D	
Approach Delay, s/veh / LOS	54.3		D	193.0		F	55.8		E	36.3		D
Intersection Delay, s/veh / LOS	108.2						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.95	B	1.95	B
Bicycle LOS Score / LOS	1.15	A	1.45	A	0.95	A	0.78	A

HCS Signalized Intersection Results Summary

General Information					Intersection Information								
Agency					Duration, h	0.250							
Analyst					Analysis Date	7/26/2023					Area Type	Other	
Jurisdiction					Time Period						PHF	0.94	
Urban Street	Dixie Hwy		Analysis Year	2023		Analysis Period	1 > 7:00						
Intersection	Breese Rd & Dixie Hwy		File Name	Breese & Dixie_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	24	229	50	58	306	94	74	104	57	164	117	44

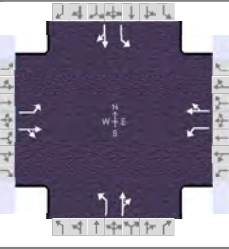
Signal Information													
Cycle, s	128.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	22.0	25.0	22.0	35.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	0.0	0.0			
				Red	2.0	2.0	2.0	2.0	0.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	28.0	41.0	28.0	41.0	28.0	31.0	28.0	31.0
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	5.1	6.5	5.1	6.5	5.1	6.1	5.1	6.1
Queue Clearance Time (g _s), s	3.2	22.7	4.8	34.6	6.2	14.6	11.9	14.3
Green Extension Time (g _e), s	0.1	5.1	0.2	0.0	0.3	1.8	0.6	1.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.54	0.00	1.00	0.00	0.32	0.06	0.29

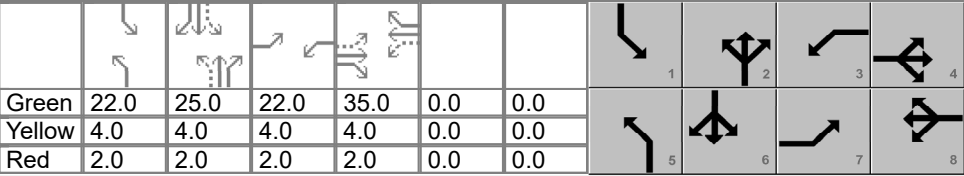
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	26	297		62	426		79	171		174	171	
Adjusted Saturation Flow Rate (s), veh/h/ln	1602	1629		1628	1640		1589	1568		1602	1603	
Queue Service Time (g _s), s	1.2	20.7		2.8	32.6		4.2	12.6		9.9	12.3	
Cycle Queue Clearance Time (g _c), s	1.2	20.7		2.8	32.6		4.2	12.6		9.9	12.3	
Green Ratio (g/C)	0.45	0.27		0.45	0.27		0.37	0.20		0.37	0.20	
Capacity (c), veh/h	334	445		439	448		427	306		428	313	
Volume-to-Capacity Ratio (X)	0.076	0.666		0.141	0.949		0.184	0.559		0.408	0.547	
Back of Queue (Q), ft/ln (95 th percentile)	20.7	364.1		50.1	604		77.2	235.2		182.3	232.1	
Back of Queue (Q), veh/ln (95 th percentile)	0.8	14.0		2.0	23.6		2.9	9.0		7.0	8.9	
Queue Storage Ratio (RQ) (95 th percentile)	0.21	0.00		0.23	0.00		0.86	0.00		0.79	0.00	
Uniform Delay (d ₁), s/veh	24.8	41.3		22.6	45.6		27.8	46.5		29.7	46.4	
Incremental Delay (d ₂), s/veh	0.1	6.6		0.2	30.4		0.3	3.8		0.9	3.5	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	24.9	47.9		22.8	76.0		28.1	50.4		30.6	49.9	
Level of Service (LOS)	C	D		C	E		C	D		C	D	
Approach Delay, s/veh / LOS	46.1		D	69.3		E	43.4		D	40.2		D
Intersection Delay, s/veh / LOS	52.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.95	B	1.95	B
Bicycle LOS Score / LOS	1.02	A	1.29	A	0.90	A	1.06	A

HCS Signalized Intersection Results Summary

General Information					Intersection Information								
Agency					Duration, h	0.250							
Analyst					Analysis Date	7/26/2023					Area Type	Other	
Jurisdiction					Time Period						PHF	0.85	
Urban Street	Dixie Hwy		Analysis Year	2023		Analysis Period	1 > 7:00						
Intersection	Breese Rd & Dixie Hwy		File Name	Breese & Dixie_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	27	297	24	26	289	191	35	165	45	88	56	12

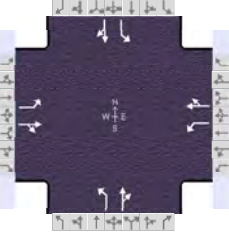
Signal Information														
Cycle, s	128.0	Reference Phase	2	Green	22.0	25.0	22.0	35.0	0.0	0.0	5	6	7	8
Offset, s	0	Reference Point	End	Yellow	4.0	4.0	4.0	4.0	0.0	0.0				
Uncoordinated	Yes	Simult. Gap E/W	On	Red	2.0	2.0	2.0	2.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	28.0	41.0	28.0	41.0	28.0	31.0	28.0	31.0
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	5.1	6.5	5.1	6.5	5.1	6.1	5.1	6.1
Queue Clearance Time (g _s), s	3.4	29.1	3.4	37.0	4.1	20.4	7.9	7.6
Green Extension Time (g _e), s	0.1	3.7	0.1	0.0	0.1	1.0	0.3	2.3
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.04

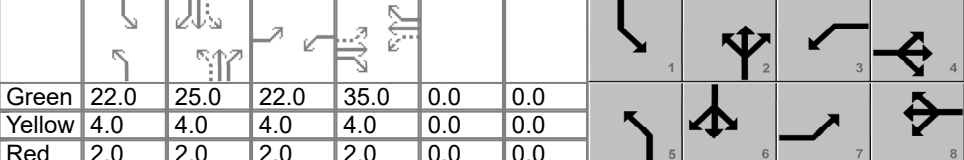
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	32	378		31	565		41	247		104	80	
Adjusted Saturation Flow Rate (s), veh/h/ln	1615	1673		1576	1544		1615	1632		1524	1551	
Queue Service Time (g _s), s	1.4	27.1		1.4	35.0		2.1	18.4		5.9	5.6	
Cycle Queue Clearance Time (g _c), s	1.4	27.1		1.4	35.0		2.1	18.4		5.9	5.6	
Green Ratio (g/C)	0.45	0.27		0.45	0.27		0.37	0.20		0.37	0.20	
Capacity (c), veh/h	334	457		371	422		510	319		356	303	
Volume-to-Capacity Ratio (X)	0.095	0.826		0.082	1.338		0.081	0.775		0.291	0.264	
Back of Queue (Q), ft/ln (95 th percentile)	25.6	485.6		25.2	1302.4		38.6	345.1		108.3	109.3	
Back of Queue (Q), veh/ln (95 th percentile)	1.0	18.8		1.0	49.3		1.5	13.4		4.0	4.0	
Queue Storage Ratio (RQ) (95 th percentile)	0.26	0.00		0.11	0.00		0.43	0.00		0.47	0.00	
Uniform Delay (d ₁), s/veh	24.9	43.6		23.5	46.5		26.5	48.8		29.3	43.7	
Incremental Delay (d ₂), s/veh	0.2	14.5		0.1	167.3		0.1	13.0		0.6	1.0	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	25.0	58.2		23.6	213.8		26.6	61.9		29.9	44.7	
Level of Service (LOS)	C	E		C	F		C	E		C	D	
Approach Delay, s/veh / LOS	55.6	E		204.0	F		56.8	E		36.4	D	
Intersection Delay, s/veh / LOS	113.3						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.95	B	1.95	B
Bicycle LOS Score / LOS	1.16	A	1.47	A	0.96	A	0.79	A

HCS Signalized Intersection Results Summary

General Information					Intersection Information								
Agency					Duration, h	0.250							
Analyst					Analysis Date	7/26/2023					Area Type	Other	
Jurisdiction					Time Period						PHF	0.94	
Urban Street	Dixie Hwy		Analysis Year	2023		Analysis Period	1 > 7:00						
Intersection	Breese Rd & Dixie Hwy		File Name	Breese & Dixie_2027 PM.xus									
Project Description	2027 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	24	234	51	59	312	96	75	106	58	167	119	45

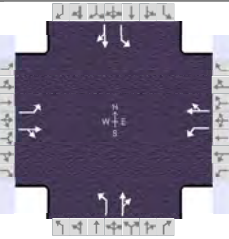
Signal Information												
Cycle, s	128.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	22.0	25.0	22.0	35.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	4.0	0.0	0.0		
				Red	2.0	2.0	2.0	2.0	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	28.0	41.0	28.0	41.0	28.0	31.0	28.0	31.0
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	5.1	6.5	5.1	6.5	5.1	6.1	5.1	6.1
Queue Clearance Time (g _s), s	3.2	23.3	4.8	35.5	6.3	14.9	12.1	14.6
Green Extension Time (g _e), s	0.1	5.0	0.2	0.0	0.3	1.8	0.6	1.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.58	0.00	1.00	0.00	0.35	0.07	0.32

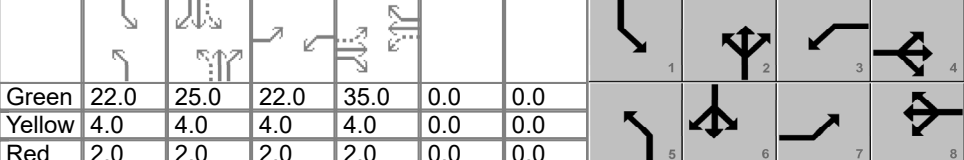
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	26	303		63	434		80	174		178	174	
Adjusted Saturation Flow Rate (s), veh/h/ln	1602	1629		1628	1640		1589	1568		1602	1603	
Queue Service Time (g _s), s	1.2	21.3		2.8	33.5		4.3	12.9		10.1	12.6	
Cycle Queue Clearance Time (g _c), s	1.2	21.3		2.8	33.5		4.3	12.9		10.1	12.6	
Green Ratio (g/C)	0.45	0.27		0.45	0.27		0.37	0.20		0.37	0.20	
Capacity (c), veh/h	332	446		434	448		425	306		425	313	
Volume-to-Capacity Ratio (X)	0.077	0.681		0.145	0.968		0.188	0.570		0.418	0.557	
Back of Queue (Q), ft/ln (95 th percentile)	20.7	373.2		51	630.4		78.3	239.5		186	236.5	
Back of Queue (Q), veh/ln (95 th percentile)	0.8	14.4		2.0	24.6		3.0	9.1		7.2	9.1	
Queue Storage Ratio (RQ) (95 th percentile)	0.21	0.00		0.23	0.00		0.87	0.00		0.81	0.00	
Uniform Delay (d ₁), s/veh	24.8	41.5		22.7	45.9		27.9	46.6		29.8	46.5	
Incremental Delay (d ₂), s/veh	0.1	7.1		0.2	34.6		0.3	4.1		0.9	3.7	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	24.9	48.6		22.9	80.5		28.2	50.7		30.8	50.2	
Level of Service (LOS)	C	D		C	F		C	D		C	D	
Approach Delay, s/veh / LOS	46.8		D	73.2		E	43.6		D	40.4		D
Intersection Delay, s/veh / LOS	53.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.95	B	1.95	B
Bicycle LOS Score / LOS	1.03	A	1.31	A	0.91	A	1.07	A

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency				Duration, h	0.250	
Analyst		Analysis Date	7/26/2023	Area Type	Other	
Jurisdiction		Time Period		PHF	0.85	
Urban Street	Dixie Hwy	Analysis Year	2023	Analysis Period	1 > 7:00	
Intersection	Breese Rd & Dixie Hwy		File Name	Breese & Dixie_2047 AM.xus		
Project Description	2047 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	29	326	27	28	317	209	38	181	49	96	62	13

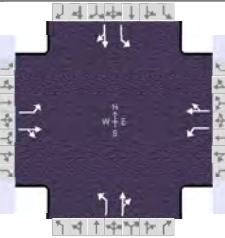
Signal Information																	
Cycle, s	128.0	Reference Phase	2	Green	22.0	25.0	22.0	35.0	0.0	0.0	Red	2.0	2.0	2.0	2.0	0.0	0.0
Offset, s	0	Reference Point	End	Yellow	4.0	4.0	4.0	4.0	0.0	0.0	Red	2.0	2.0	2.0	2.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Force Mode	Fixed	Simult. Gap N/S	On										

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	28.0	41.0	28.0	41.0	28.0	31.0	28.0	31.0
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	5.1	6.5	5.1	6.5	5.1	6.1	5.1	6.1
Queue Clearance Time (g _s), s	3.5	32.7	3.5	37.0	4.3	22.5	8.5	8.2
Green Extension Time (g _e), s	0.1	1.7	0.1	0.0	0.1	0.6	0.4	2.5
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.06

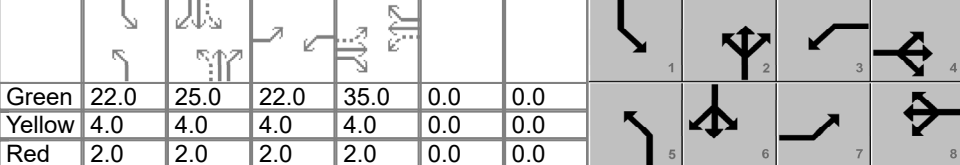
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	34	415		33	619		45	271		113	88	
Adjusted Saturation Flow Rate (s), veh/h/ln	1615	1672		1576	1544		1615	1633		1524	1551	
Queue Service Time (g _s), s	1.5	30.7		1.5	35.0		2.3	20.5		6.5	6.2	
Cycle Queue Clearance Time (g _c), s	1.5	30.7		1.5	35.0		2.3	20.5		6.5	6.2	
Green Ratio (g/C)	0.45	0.27		0.45	0.27		0.37	0.20		0.37	0.20	
Capacity (c), veh/h	334	457		344	422		503	319		339	303	
Volume-to-Capacity Ratio (X)	0.102	0.908		0.096	1.466		0.089	0.848		0.334	0.291	
Back of Queue (Q), ft/ln (95 th percentile)	27.6	568.6		27.3	1585.1		42	394.2		119.3	121.4	
Back of Queue (Q), veh/ln (95 th percentile)	1.1	22.0		1.0	60.0		1.6	15.3		4.4	4.5	
Queue Storage Ratio (RQ) (95 th percentile)	0.28	0.00		0.12	0.00		0.47	0.00		0.52	0.00	
Uniform Delay (d ₁), s/veh	24.9	44.9		24.4	46.5		26.6	49.7		29.9	43.9	
Incremental Delay (d ₂), s/veh	0.2	23.7		0.2	222.2		0.1	20.4		0.8	1.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	25.1	68.7		24.6	268.7		26.7	70.0		30.7	45.1	
Level of Service (LOS)	C	E		C	F		C	E		C	D	
Approach Delay, s/veh / LOS	65.4	E		256.4	F		63.9	E		37.0	D	
Intersection Delay, s/veh / LOS	138.5						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.95	B	1.95	B
Bicycle LOS Score / LOS	1.23	A	1.56	B	1.01	A	0.82	A

HCS Signalized Intersection Results Summary

General Information					Intersection Information								
Agency					Duration, h	0.250							
Analyst					Analysis Date	7/26/2023					Area Type	Other	
Jurisdiction					Time Period						PHF	0.94	
Urban Street	Dixie Hwy		Analysis Year	2023		Analysis Period	1 > 7:00						
Intersection	Breese Rd & Dixie Hwy		File Name	Breese & Dixie_2047 PM.xus									
Project Description	2047 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	27	256	56	65	343	105	83	116	64	184	131	49

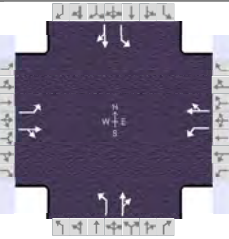
Signal Information																	
Cycle, s	128.0	Reference Phase	2	Green	22.0	25.0	22.0	35.0	0.0	0.0	Red	2.0	2.0	2.0	2.0	0.0	0.0
Offset, s	0	Reference Point	End	Yellow	4.0	4.0	4.0	4.0	0.0	0.0	Force Mode	Fixed	Simult. Gap N/S	On			
Uncoordinated	Yes	Simult. Gap E/W	On														

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	28.0	41.0	28.0	41.0	28.0	31.0	28.0	31.0
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	5.1	6.5	5.1	6.5	5.1	6.1	5.1	6.1
Queue Clearance Time (g _s), s	3.3	25.8	5.2	37.0	6.8	16.3	13.3	16.0
Green Extension Time (g _e), s	0.1	4.6	0.2	0.0	0.3	1.8	0.6	1.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.78	0.00	1.00	0.00	0.54	0.15	0.49

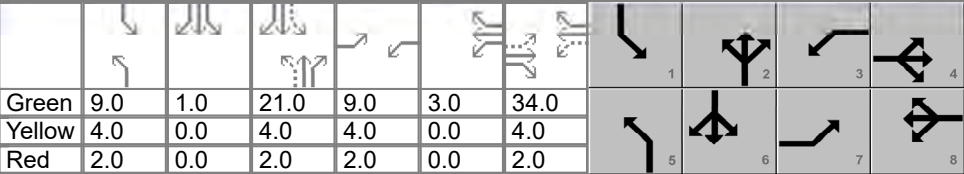
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	29	332		69	477		88	191		196	191	
Adjusted Saturation Flow Rate (s), veh/h/ln	1602	1629		1628	1640		1589	1568		1602	1603	
Queue Service Time (g _s), s	1.3	23.8		3.2	35.0		4.8	14.3		11.3	14.0	
Cycle Queue Clearance Time (g _c), s	1.3	23.8		3.2	35.0		4.8	14.3		11.3	14.0	
Green Ratio (g/C)	0.45	0.27		0.45	0.27		0.37	0.20		0.37	0.20	
Capacity (c), veh/h	332	445		411	448		411	306		410	313	
Volume-to-Capacity Ratio (X)	0.087	0.745		0.168	1.063		0.215	0.625		0.477	0.612	
Back of Queue (Q), ft/ln (95 th percentile)	23.3	416.7		56.6	774.8		87.4	263.9		205.9	260	
Back of Queue (Q), veh/ln (95 th percentile)	0.9	16.0		2.2	30.3		3.3	10.1		7.9	10.0	
Queue Storage Ratio (RQ) (95 th percentile)	0.23	0.00		0.26	0.00		0.97	0.00		0.90	0.00	
Uniform Delay (d ₁), s/veh	24.8	42.4		23.3	46.5		28.2	47.2		30.4	47.1	
Incremental Delay (d ₂), s/veh	0.2	9.7		0.3	60.2		0.4	5.7		1.2	5.1	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	25.0	52.1		23.6	106.7		28.6	52.9		31.7	52.2	
Level of Service (LOS)	C	D		C	F		C	D		C	D	
Approach Delay, s/veh / LOS	50.0		D	96.2		F	45.2		D	41.8		D
Intersection Delay, s/veh / LOS	63.1						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.95	B	1.95	B
Bicycle LOS Score / LOS	1.08	A	1.39	A	0.95	A	1.13	A

HCS Signalized Intersection Results Summary

General Information					Intersection Information								
Agency					Duration, h	0.250							
Analyst					Analysis Date	7/26/2023					Area Type	Other	
Jurisdiction					Time Period						PHF	0.85	
Urban Street	Dixie Hwy		Analysis Year	2023		Analysis Period	1 > 7:00						
Intersection	Breese Rd & Dixie Hwy		File Name	Breese & Dixie_2027 AM_Prop.xus									
Project Description	2027 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	27	297	24	26	289	191	35	165	45	88	56	12

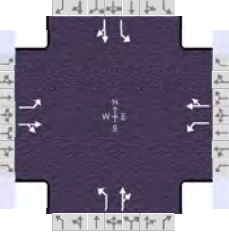
Signal Information															
Cycle, s	101.0	Reference Phase	2	Green	9.0	1.0	21.0	9.0	3.0	34.0	Yellow	4.0	0.0	4.0	4.0
Offset, s	0	Reference Point	End	Red	2.0	0.0	2.0	2.0	0.0	2.0	Uncoordinated	Yes	Simult. Gap E/W	On	
Force Mode	Fixed	Simult. Gap N/S	On												

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	40.0	18.0	43.0	15.0	27.0	16.0	28.0
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	5.1	6.5	5.1	6.5	5.1	6.1	5.1	6.1
Queue Clearance Time (g _s), s	3.2	21.5	3.1	38.9	3.9	16.3	7.1	6.3
Green Extension Time (g _e), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.2
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.46	1.00	0.01	1.00	0.99	1.00	1.00	0.07

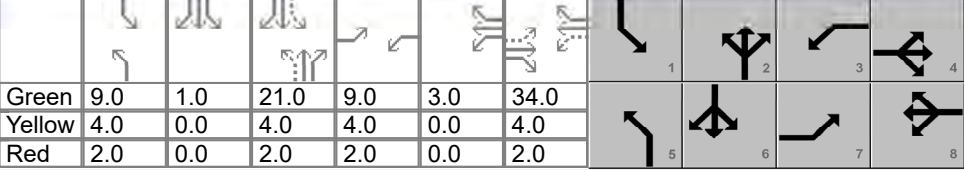
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	32	378		31	565		41	247		104	80	
Adjusted Saturation Flow Rate (s), veh/h/ln	1615	1673		1576	1544		1615	1632		1524	1551	
Queue Service Time (g _s), s	1.2	19.5		1.1	36.9		1.9	14.3		5.1	4.3	
Cycle Queue Clearance Time (g _c), s	1.2	19.5		1.1	36.9		1.9	14.3		5.1	4.3	
Green Ratio (g/C)	0.43	0.34		0.46	0.37		0.30	0.21		0.31	0.22	
Capacity (c), veh/h	215	563		397	566		417	339		292	338	
Volume-to-Capacity Ratio (X)	0.148	0.671		0.077	0.998		0.099	0.728		0.354	0.237	
Back of Queue (Q), ft/ln (95 th percentile)	20.7	339.6		18.6	688.2		33.3	273.7		92.7	81.2	
Back of Queue (Q), veh/ln (95 th percentile)	0.8	13.2		0.7	26.1		1.3	10.6		3.4	3.0	
Queue Storage Ratio (RQ) (95 th percentile)	0.21	0.00		0.08	0.00		0.37	0.00		0.40	0.00	
Uniform Delay (d ₁), s/veh	22.7	28.7		17.2	32.0		25.8	37.3		27.1	32.6	
Incremental Delay (d ₂), s/veh	0.4	5.4		0.1	37.4		0.1	9.3		1.0	0.8	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	23.2	34.1		17.3	69.4		25.9	46.7		28.2	33.3	
Level of Service (LOS)	C	C		B	E		C	D		C	C	
Approach Delay, s/veh / LOS	33.3	C		66.7	E		43.7	D		30.4	C	
Intersection Delay, s/veh / LOS	48.4						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.92	B	1.92	B	1.94	B	1.94	B
Bicycle LOS Score / LOS	1.16	A	1.47	A	0.96	A	0.79	A

HCS Signalized Intersection Results Summary

General Information					Intersection Information								
Agency					Duration, h	0.250							
Analyst					Analysis Date	7/26/2023					Area Type	Other	
Jurisdiction					Time Period						PHF	0.94	
Urban Street	Dixie Hwy		Analysis Year	2023		Analysis Period	1 > 7:00						
Intersection	Breese Rd & Dixie Hwy		File Name	Breese & Dixie_2027 PM_Prop.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	24	234	51	59	312	96	75	106	58	167	119	45

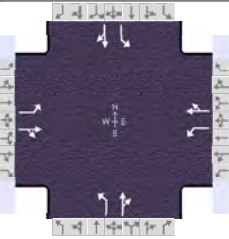
Signal Information																					
Cycle, s	101.0	Reference Phase	2	Green	9.0	1.0	21.0	9.0	3.0	34.0	Yellow	4.0	0.0	4.0	4.0	Red	2.0	0.0	2.0	2.0	2.0
Offset, s	0	Reference Point	End																		
Uncoordinated	Yes	Simult. Gap E/W	On																		
Force Mode	Fixed	Simult. Gap N/S	On																		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	40.0	18.0	43.0	15.0	27.0	16.0	28.0
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	5.1	6.5	5.1	6.5	5.1	6.1	5.1	6.1
Queue Clearance Time (g _s), s	2.9	17.3	4.2	25.0	5.8	12.0	10.7	11.7
Green Extension Time (g _e), s	0.0	0.0	0.1	5.1	0.1	0.0	0.0	1.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.34	1.00	0.10	0.57	1.00	1.00	1.00	0.33

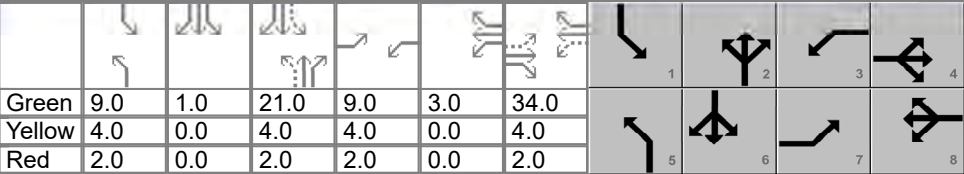
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	26	303		63	434		80	174		178	174	
Adjusted Saturation Flow Rate (s), veh/h/ln	1602	1629		1628	1640		1589	1568		1602	1603	
Queue Service Time (g _s), s	0.9	15.3		2.2	23.0		3.8	10.0		8.7	9.7	
Cycle Queue Clearance Time (g _c), s	0.9	15.3		2.2	23.0		3.8	10.0		8.7	9.7	
Green Ratio (g/C)	0.43	0.34		0.46	0.37		0.30	0.21		0.31	0.22	
Capacity (c), veh/h	324	548		462	601		333	326		358	349	
Volume-to-Capacity Ratio (X)	0.079	0.553		0.136	0.723		0.240	0.535		0.496	0.500	
Back of Queue (Q), ft/ln (95 th percentile)	16.3	269.8		37.6	373.7		67.9	190.5		159.5	183.1	
Back of Queue (Q), veh/ln (95 th percentile)	0.6	10.4		1.5	14.6		2.6	7.3		6.1	7.0	
Queue Storage Ratio (RQ) (95 th percentile)	0.16	0.00		0.17	0.00		0.75	0.00		0.69	0.00	
Uniform Delay (d ₁), s/veh	19.4	27.3		16.8	27.6		26.9	35.6		27.9	34.7	
Incremental Delay (d ₂), s/veh	0.1	3.2		0.2	5.3		0.5	3.1		1.5	2.4	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	19.5	30.5		17.0	32.8		27.4	38.8		29.4	37.0	
Level of Service (LOS)	B	C		B	C		C	D		C	D	
Approach Delay, s/veh / LOS	29.7	C		30.8	C		35.2	D		33.2	C	
Intersection Delay, s/veh / LOS	31.9			31.9			C			C		

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.92	B	1.92	B	1.94	B	1.94	B
Bicycle LOS Score / LOS	1.03	A	1.31	A	0.91	A	1.07	A

HCS Signalized Intersection Results Summary

General Information					Intersection Information								
Agency					Duration, h	0.250							
Analyst					Analysis Date	7/26/2023					Area Type	Other	
Jurisdiction					Time Period						PHF	0.85	
Urban Street	Dixie Hwy		Analysis Year	2023		Analysis Period	1 > 7:00						
Intersection	Breese Rd & Dixie Hwy		File Name	Breese & Dixie_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	29	326	27	28	317	209	38	181	49	96	62	13

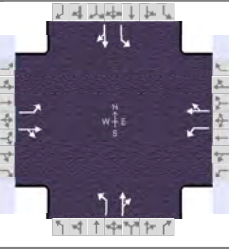
Signal Information													
Cycle, s	101.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	9.0	1.0	21.0	9.0	3.0	34.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	0.0	4.0			
				Red	2.0	0.0	2.0	2.0	0.0	2.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	40.0	18.0	43.0	15.0	27.0	16.0	28.0
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	5.1	6.5	5.1	6.5	5.1	6.1	5.1	6.1
Queue Clearance Time (g_s), s	3.3	24.1	3.2	39.0	4.0	17.9	7.6	6.8
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.0	0.1	2.4
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.51	1.00	0.02	1.00	1.00	1.00	1.00	0.09

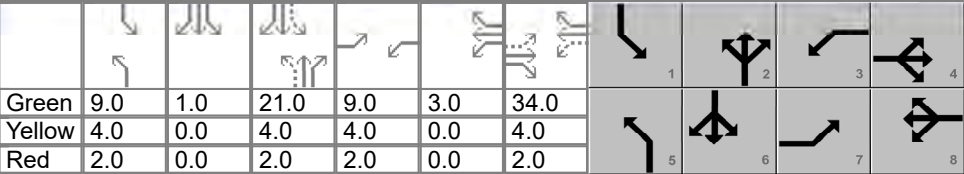
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	34	415		33	619		45	271		113	88	
Adjusted Saturation Flow Rate (s), veh/h/ln	1615	1672		1576	1544		1615	1633		1524	1551	
Queue Service Time (g_s), s	1.3	22.1		1.2	37.0		2.0	15.9		5.6	4.8	
Cycle Queue Clearance Time (g_c), s	1.3	22.1		1.2	37.0		2.0	15.9		5.6	4.8	
Green Ratio (g/C)	0.43	0.34		0.46	0.37		0.30	0.21		0.31	0.22	
Capacity (c), veh/h	215	563		368	566		409	339		274	338	
Volume-to-Capacity Ratio (X)	0.159	0.738		0.090	1.094		0.109	0.797		0.412	0.261	
Back of Queue (Q), ft/ln (95 th percentile)	22.3	383.5		20.1	880.7		36.3	310.4		102.5	90.2	
Back of Queue (Q), veh/ln (95 th percentile)	0.9	14.9		0.8	33.4		1.4	12.0		3.8	3.3	
Queue Storage Ratio (RQ) (95 th percentile)	0.22	0.00		0.09	0.00		0.40	0.00		0.45	0.00	
Uniform Delay (d_1), s/veh	22.7	29.6		17.8	32.0		25.8	38.0		27.6	32.8	
Incremental Delay (d_2), s/veh	0.5	7.5		0.1	66.0		0.2	14.1		1.4	0.9	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	23.2	37.1		18.0	98.0		26.0	52.1		29.0	33.6	
Level of Service (LOS)	C	D		B	F		C	D		C	C	
Approach Delay, s/veh / LOS	36.0		D	94.0		F	48.4		D	31.0		C
Intersection Delay, s/veh / LOS	61.2						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.92	B	1.92	B	1.94	B	1.94	B
Bicycle LOS Score / LOS	1.23	A	1.56	B	1.01	A	0.82	A

HCS Signalized Intersection Results Summary

General Information					Intersection Information								
Agency					Duration, h	0.250							
Analyst					Analysis Date	7/26/2023					Area Type	Other	
Jurisdiction					Time Period						PHF	0.94	
Urban Street	Dixie Hwy		Analysis Year	2023		Analysis Period	1 > 7:00						
Intersection	Breese Rd & Dixie Hwy		File Name	Breese & Dixie_2047 PM_Prop.xus									
Project Description	2047 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	27	256	56	65	343	105	83	116	64	184	131	49

Signal Information																							
Cycle, s	101.0	Reference Phase	2	Green	9.0	1.0	21.0	9.0	3.0	34.0	Yellow	4.0	0.0	4.0	4.0	4.0	Red	2.0	0.0	2.0	2.0	0.0	2.0
Offset, s	0	Reference Point	End	Uncoordinated		Yes	Simult. Gap E/W		On	Force Mode		Fixed	Simult. Gap N/S		On								

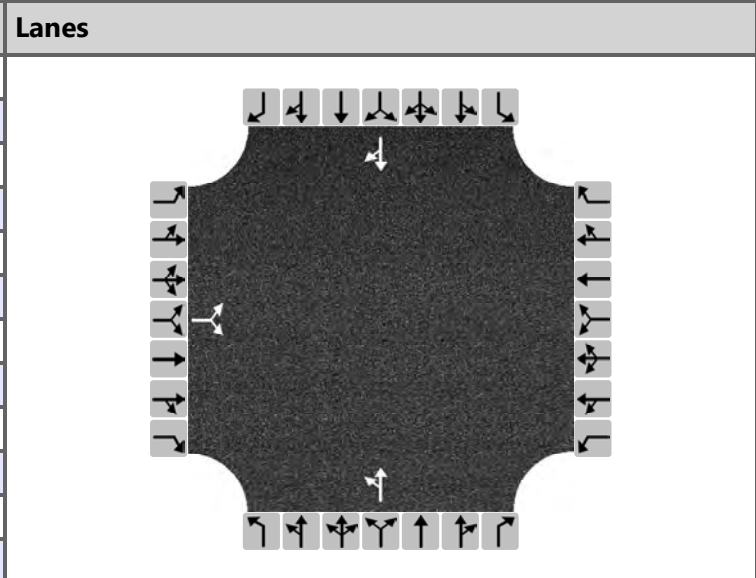
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	15.0	40.0	18.0	43.0	15.0	27.0	16.0	28.0
Change Period, (Y+R _c), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Allow Headway (MAH), s	5.1	6.5	5.1	6.5	5.1	6.1	5.1	6.1
Queue Clearance Time (g _s), s	3.1	19.1	4.4	28.2	6.2	13.1	11.7	12.7
Green Extension Time (g _e), s	0.0	0.0	0.1	4.5	0.1	0.0	0.0	1.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.40	1.00	0.13	0.81	1.00	1.00	1.00	0.46

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	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	29	332		69	477		88	191		196	191	
Adjusted Saturation Flow Rate (s), veh/h/ln	1602	1629		1628	1640		1589	1568		1602	1603	
Queue Service Time (g _s), s	1.1	17.1		2.4	26.2		4.2	11.1		9.7	10.7	
Cycle Queue Clearance Time (g _c), s	1.1	17.1		2.4	26.2		4.2	11.1		9.7	10.7	
Green Ratio (g/C)	0.43	0.34		0.46	0.37		0.30	0.21		0.31	0.22	
Capacity (c), veh/h	292	548		438	601		319	326		343	349	
Volume-to-Capacity Ratio (X)	0.098	0.605		0.158	0.793		0.277	0.587		0.570	0.548	
Back of Queue (Q), ft/ln (95 th percentile)	18.5	298.1		41.7	427.9		75.9	211.1		182.4	203.8	
Back of Queue (Q), veh/ln (95 th percentile)	0.7	11.5		1.6	16.7		2.9	8.1		7.0	7.8	
Queue Storage Ratio (RQ) (95 th percentile)	0.19	0.00		0.19	0.00		0.84	0.00		0.79	0.00	
Uniform Delay (d ₁), s/veh	20.2	27.9		17.2	28.6		27.2	36.1		28.4	35.1	
Incremental Delay (d ₂), s/veh	0.2	4.1		0.2	8.2		0.7	4.3		2.8	3.2	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	20.4	32.0		17.4	36.8		27.8	40.4		31.1	38.3	
Level of Service (LOS)	C	C		B	D		C	D		C	D	
Approach Delay, s/veh / LOS	31.1	C		34.4	C		36.4	D		34.7	C	
Intersection Delay, s/veh / LOS	34.0						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.92	B	1.92	B	1.94	B	1.94	B
Bicycle LOS Score / LOS	1.08	A	1.39	A	0.95	A	1.13	A

HCS All-Way Stop Control Report

General and Site Information	
Analyst	
Agency/Co.	
Date Performed	7/25/2023
Analysis Year	2023
Analysis Time Period (hrs)	0.25
Time Analyzed	2023 AM
Project Description	Breese Rd & McClain Rd
Intersection	Breese Rd & McClain Rd
Jurisdiction	
East/West Street	Breese Rd
North/South Street	McClain Rd
Peak Hour Factor	0.82



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume (veh/h)	124		7				18	40			12	79
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	160						71			111		
Percent Heavy Vehicles	5						3			10		
Initial Departure Headway, h_d (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.142						0.063			0.099		
Final Departure Headway, h_d (s)	4.54						4.51			4.02		
Final Degree of Utilization, x	0.202						0.089			0.124		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, t_s (s)	2.54						2.51			2.02		

Capacity, Delay and Level of Service

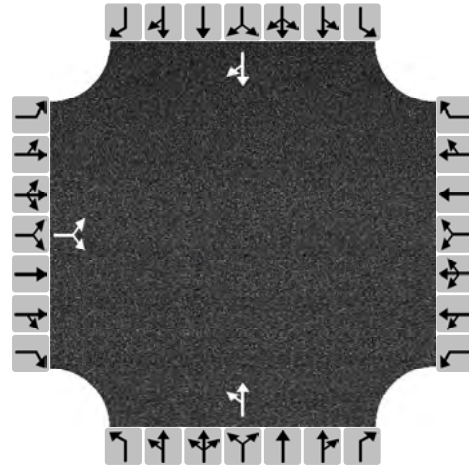
Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	160						71			111		
Capacity (veh/h)	792						797			896		
95% Queue Length, Q_{95} (veh)	0.8						0.3			0.4		
Control Delay (s/veh)	8.7						8.0			7.6		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh) LOS	8.7		A				8.0		A	7.6		A
Intersection Delay (s/veh) LOS	8.2						A					

HCS All-Way Stop Control Report

General and Site Information

Analyst	
Agency/Co.	
Date Performed	7/25/2023
Analysis Year	2023
Analysis Time Period (hrs)	0.25
Time Analyzed	2023 PM
Project Description	Breese Rd & McClain Rd
Intersection	Breese Rd & McClain Rd
Jurisdiction	
East/West Street	Breese Rd
North/South Street	McClain Rd
Peak Hour Factor	0.92

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume (veh/h)	75		29				17	19			42	113
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

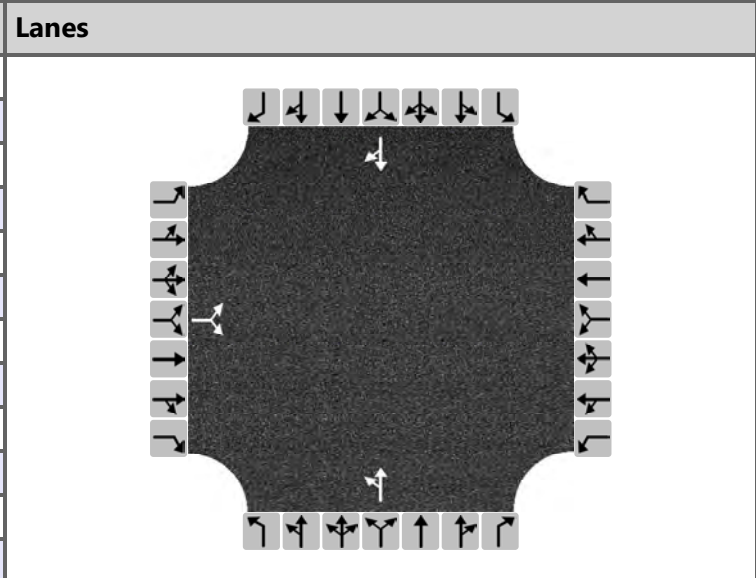
Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	113						39			168		
Percent Heavy Vehicles	2						3			1		
Initial Departure Headway, h_d (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.100						0.035			0.150		
Final Departure Headway, h_d (s)	4.33						4.46			3.78		
Final Degree of Utilization, x	0.136						0.049			0.177		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, t_s (s)	2.33						2.46			1.78		

Capacity, Delay and Level of Service

Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	113						39			168		
Capacity (veh/h)	831						807			952		
95% Queue Length, Q_{95} (veh)	0.5						0.2			0.6		
Control Delay (s/veh)	8.0						7.7			7.6		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh) LOS	8.0		A				7.7		A	7.6		A
Intersection Delay (s/veh) LOS	7.8						A					

HCS All-Way Stop Control Report

General and Site Information	
Analyst	
Agency/Co.	
Date Performed	7/25/2023
Analysis Year	2027
Analysis Time Period (hrs)	0.25
Time Analyzed	2027 AM
Project Description	Breese Rd & McClain Rd
Intersection	Breese Rd & McClain Rd
Jurisdiction	
East/West Street	Breese Rd
North/South Street	McClain Rd
Peak Hour Factor	0.82



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume (veh/h)	126		7				18	41			12	81
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	162						72			113		
Percent Heavy Vehicles	5						3			10		
Initial Departure Headway, h _d (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.144						0.064			0.101		
Final Departure Headway, h _d (s)	4.55						4.52			4.02		
Final Degree of Utilization, x	0.205						0.090			0.127		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, t _s (s)	2.55						2.52			2.02		

Capacity, Delay and Level of Service

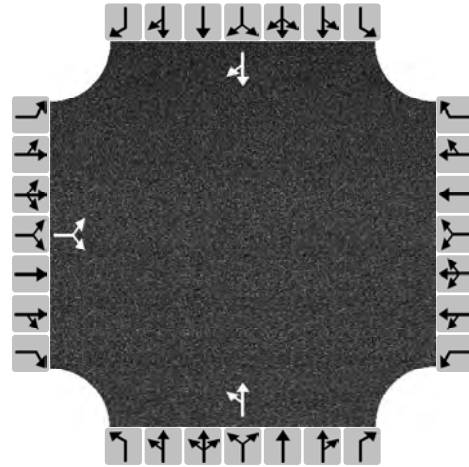
Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	162						72			113		
Capacity (veh/h)	791						796			895		
95% Queue Length, Q ₉₅ (veh)	0.8						0.3			0.4		
Control Delay (s/veh)	8.7						8.0			7.6		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh) LOS	8.7		A				8.0		A	7.6		A
Intersection Delay (s/veh) LOS	8.2						A					

HCS All-Way Stop Control Report

General and Site Information

Analyst	
Agency/Co.	
Date Performed	7/25/2023
Analysis Year	2027
Analysis Time Period (hrs)	0.25
Time Analyzed	2027 PM
Project Description	Breese Rd & McClain Rd
Intersection	Breese Rd & McClain Rd
Jurisdiction	
East/West Street	Breese Rd
North/South Street	McClain Rd
Peak Hour Factor	0.92

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume (veh/h)	77		30				17	19			43	115
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	116						39			172		
Percent Heavy Vehicles	2						3			1		
Initial Departure Headway, h _d (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.103						0.035			0.153		
Final Departure Headway, h _d (s)	4.34						4.47			3.79		
Final Degree of Utilization, x	0.140						0.049			0.181		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, t _s (s)	2.34						2.47			1.79		

Capacity, Delay and Level of Service

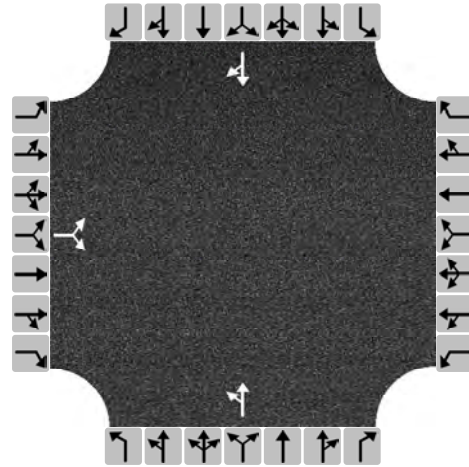
Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	116						39			172		
Capacity (veh/h)	830						805			949		
95% Queue Length, Q ₉₅ (veh)	0.5						0.2			0.7		
Control Delay (s/veh)	8.0						7.7			7.6		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh) LOS	8.0		A				7.7		A	7.6		A
Intersection Delay (s/veh) LOS	7.8						A					

HCS All-Way Stop Control Report

General and Site Information

Analyst	
Agency/Co.	
Date Performed	7/25/2023
Analysis Year	2047
Analysis Time Period (hrs)	0.25
Time Analyzed	2047 AM
Project Description	Breese Rd & McClain Rd
Intersection	Breese Rd & McClain Rd
Jurisdiction	
East/West Street	Breese Rd
North/South Street	McClain Rd
Peak Hour Factor	0.82

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume (veh/h)	139		8				20	45			13	88
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	179						79			123		
Percent Heavy Vehicles	5						3			10		
Initial Departure Headway, h_d (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.159						0.070			0.109		
Final Departure Headway, h_d (s)	4.59						4.59			4.09		
Final Degree of Utilization, x	0.229						0.101			0.140		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, t_s (s)	2.59						2.59			2.09		

Capacity, Delay and Level of Service

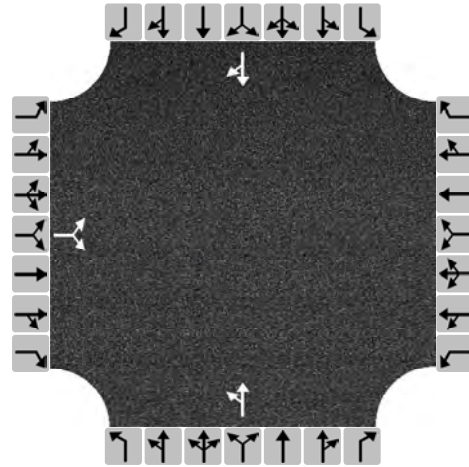
Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	179						79			123		
Capacity (veh/h)	784						784			881		
95% Queue Length, Q_{95} (veh)	0.9						0.3			0.5		
Control Delay (s/veh)	9.0						8.1			7.8		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh) LOS	9.0		A				8.1		A	7.8		A
Intersection Delay (s/veh) LOS	8.4						A					

HCS All-Way Stop Control Report

General and Site Information

Analyst	
Agency/Co.	
Date Performed	7/25/2023
Analysis Year	2047
Analysis Time Period (hrs)	0.25
Time Analyzed	2047 PM
Project Description	Breese Rd & McClain Rd
Intersection	Breese Rd & McClain Rd
Jurisdiction	
East/West Street	Breese Rd
North/South Street	McClain Rd
Peak Hour Factor	0.92

Lanes



Turning Movement Demand Volumes

Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Volume (veh/h)	84		32				19	21			47	127
% Thrus in Shared Lane												

Lane Flow Rate and Adjustments

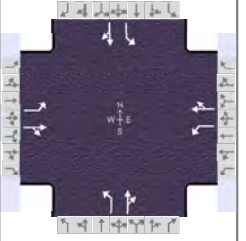
Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	126						43			189		
Percent Heavy Vehicles	2						3			1		
Initial Departure Headway, h_d (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.112						0.039			0.168		
Final Departure Headway, h_d (s)	4.39						4.52			3.82		
Final Degree of Utilization, x	0.154						0.055			0.201		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, t_s (s)	2.39						2.52			1.82		

Capacity, Delay and Level of Service

Approach	Eastbound			Westbound			Northbound			Southbound		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Lane												
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	126						43			189		
Capacity (veh/h)	821						797			942		
95% Queue Length, Q_{95} (veh)	0.5						0.2			0.7		
Control Delay (s/veh)	8.2						7.8			7.8		
Level of Service, LOS	A						A			A		
Approach Delay (s/veh) LOS	8.2		A				7.8		A	7.8		A
Intersection Delay (s/veh) LOS	7.9						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	Breese Rd	Time Period		PHF	0.88		
Intersection	Breese Rd & Shawnee Rd	Analysis Year	2023	Analysis Period	1 > 7:00		
Project Description	2023 AM			File Name	Breese & Shawnee_2023 AM.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	124	178	34	25	113	213	24	154	24	136	89	15

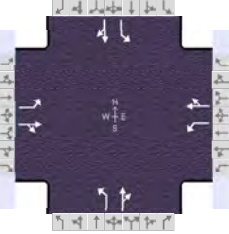
Signal Information				Signal Phases													
Cycle, s	126.5	Reference Phase	2														
Offset, s	0	Reference Point	End	Green	20.0	3.5	30.0	20.0	30.0	0.0	Yellow	3.5	0.0	5.0	3.5	5.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Red	1.0	0.0	2.0	1.0	2.0	0.0	Red	1.0	0.0	2.0	1.0	2.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On														

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	24.5	37.0	24.5	37.0	24.5	37.0	28.0	40.5
Change Period, (Y+R _c), s	4.5	7.0	4.5	7.0	4.5	7.0	6.0	7.0
Max Allow Headway (MAH), s	4.6	5.2	4.6	5.2	4.6	4.8	5.1	4.8
Queue Clearance Time (g _s), s	9.3	18.4	3.4	32.0	3.3	15.3	9.9	9.2
Green Extension Time (g _e), s	0.4	2.9	0.0	0.0	0.0	1.3	0.5	1.4
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.01	0.26	0.00	1.00	0.00	0.01	0.02	0.00

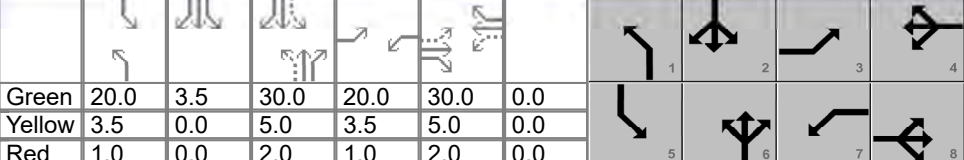
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	141	241		28	370		27	202		155	118	
Adjusted Saturation Flow Rate (s), veh/h/ln	1628	1661		1615	1517		1628	1669		1615	1652	
Queue Service Time (g _s), s	7.3	16.4		1.4	30.0		1.3	13.3		7.9	7.2	
Cycle Queue Clearance Time (g _c), s	7.3	16.4		1.4	30.0		1.3	13.3		7.9	7.2	
Green Ratio (g/C)	0.40	0.24		0.40	0.24		0.40	0.24		0.41	0.26	
Capacity (c), veh/h	314	394		415	360		557	396		491	438	
Volume-to-Capacity Ratio (X)	0.448	0.612		0.068	1.030		0.049	0.511		0.315	0.270	
Back of Queue (Q), ft/ln (95 th percentile)	133.5	291.3		24.7	614.2		23.5	242.5		142.4	137.1	
Back of Queue (Q), veh/ln (95 th percentile)	5.2	11.4		1.0	23.8		0.9	9.5		5.5	5.3	
Queue Storage Ratio (RQ) (95 th percentile)	1.67	0.00		0.35	0.00		0.26	0.00		0.89	0.00	
Uniform Delay (d ₁), s/veh	28.9	43.1		24.9	48.3		23.7	41.9		25.1	36.8	
Incremental Delay (d ₂), s/veh	1.2	3.3		0.1	55.3		0.0	1.3		0.5	0.5	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	30.1	46.3		25.0	103.5		23.7	43.2		25.6	37.3	
Level of Service (LOS)	C	D		C	F		C	D		C	D	
Approach Delay, s/veh / LOS	40.3		D	97.9		F	40.9		D	30.7		C
Intersection Delay, s/veh / LOS	56.3						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.94	B	1.94	B
Bicycle LOS Score / LOS	1.12	A	1.15	A	0.87	A	0.94	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	0.87	
Urban Street	Breese Rd		Analysis Year	2023		Analysis Period	1 > 7:00						
Intersection	Breese Rd & Shawnee Rd		File Name	Breese & Shawnee_2023 PM.xus									
Project Description	2023 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	53	112	42	52	177	198	66	196	42	199	193	61

Signal Information																								
Cycle, s	126.5	Reference Phase	2	Green	20.0	3.5	30.0	20.0	30.0	0.0	Yellow	3.5	0.0	5.0	3.5	5.0	0.0	Red	1.0	0.0	2.0	1.0	2.0	0.0
Offset, s	0	Reference Point	End																					
Uncoordinated	Yes	Simult. Gap E/W	On																					
Force Mode	Fixed	Simult. Gap N/S	On																					

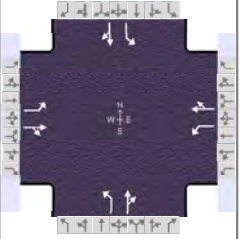
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	24.5	37.0	24.5	37.0	24.5	37.0	28.0	40.5
Change Period, (Y+R _c), s	4.5	7.0	4.5	7.0	4.5	7.0	6.0	7.0
Max Allow Headway (MAH), s	4.6	5.2	4.6	5.2	4.6	4.9	5.1	4.9
Queue Clearance Time (g _s), s	5.0	32.0	4.9	32.0	5.8	32.0	14.1	35.5
Green Extension Time (g _e), s	0.1	0.0	0.1	0.0	0.2	0.0	0.7	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	1.00	0.00	1.00	0.00	1.00	0.27	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	61	177		60	431		76	274		229	292	
Adjusted Saturation Flow Rate (s), veh/h/ln	1615	1616		1615	1548		1602	1630		1641	1651	
Queue Service Time (g _s), s	3.0	11.9		2.9	30.0		3.8	19.5		12.1	20.0	
Cycle Queue Clearance Time (g _c), s	3.0	11.9		2.9	30.0		3.8	19.5		12.1	20.0	
Green Ratio (g/C)	0.40	0.24		0.40	0.24		0.40	0.24		0.41	0.26	
Capacity (c), veh/h	312	383		312	367		310	387		342	437	
Volume-to-Capacity Ratio (X)	0.195	0.462		0.191	1.174		0.245	0.708		0.668	0.668	
Back of Queue (Q), ft/ln (95 th percentile)	54.7	217.9		53.6	834.1		69.4	343.5		226.7	340.2	
Back of Queue (Q), veh/ln (95 th percentile)	2.1	8.4		2.1	32.3		2.7	13.2		8.9	13.4	
Queue Storage Ratio (RQ) (95 th percentile)	0.68	0.00		0.77	0.00		0.77	0.00		1.42	0.00	
Uniform Delay (d ₁), s/veh	27.6	41.3		27.6	48.3		27.8	44.2		29.0	41.5	
Incremental Delay (d ₂), s/veh	0.4	1.2		0.4	103.3		0.5	6.1		5.5	4.3	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	28.0	42.6		27.9	151.6		28.3	50.3		34.6	45.9	
Level of Service (LOS)	C	D		C	F		C	D		C	D	
Approach Delay, s/veh / LOS	38.8	D		136.5	F		45.6	D		40.9	D	
Intersection Delay, s/veh / LOS	71.0						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.94	B	1.94	B
Bicycle LOS Score / LOS	0.88	A	1.30	A	1.06	A	1.35	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	Breese Rd	Time Period		PHF	0.88		
Intersection	Breese Rd & Shawnee Rd	Analysis Year	2023	Analysis Period	1 > 7:00		
Project Description	2027 AM			File Name	Breese & Shawnee_2027 AM.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	126	182	35	26	115	217	24	157	24	139	91	15

Signal Information														
Cycle, s	126.5	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	3.5	30.0	20.0	30.0	0.0				
				Yellow	3.5	0.0	5.0	3.5	5.0	0.0				
				Red	1.0	0.0	2.0	1.0	2.0	0.0				

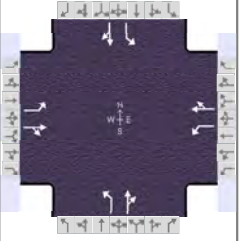
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	24.5	37.0	24.5	37.0	24.5	37.0	28.0	40.5
Change Period, (Y+R _c), s	4.5	7.0	4.5	7.0	4.5	7.0	6.0	7.0
Max Allow Headway (MAH), s	4.6	5.2	4.6	5.2	4.6	4.8	5.1	4.8
Queue Clearance Time (g _s), s	9.4	18.8	3.4	32.0	3.3	15.6	10.1	9.3
Green Extension Time (g _e), s	0.4	2.9	0.0	0.0	0.0	1.3	0.6	1.5
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.01	0.29	0.00	1.00	0.00	0.02	0.02	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	143	247		30	377		27	206		158	120	
Adjusted Saturation Flow Rate (s), veh/h/ln	1628	1661		1615	1517		1628	1669		1615	1653	
Queue Service Time (g _s), s	7.4	16.8		1.4	30.0		1.3	13.6		8.1	7.3	
Cycle Queue Clearance Time (g _c), s	7.4	16.8		1.4	30.0		1.3	13.6		8.1	7.3	
Green Ratio (g/C)	0.40	0.24		0.40	0.24		0.40	0.24		0.41	0.26	
Capacity (c), veh/h	314	394		411	360		555	396		488	438	
Volume-to-Capacity Ratio (X)	0.456	0.626		0.072	1.049		0.049	0.520		0.324	0.275	
Back of Queue (Q), ft/ln (95 th percentile)	135.9	298.7		25.8	638		23.5	246.5		146	139.9	
Back of Queue (Q), veh/ln (95 th percentile)	5.3	11.7		1.0	24.7		0.9	9.6		5.7	5.4	
Queue Storage Ratio (RQ) (95 th percentile)	1.70	0.00		0.37	0.00		0.26	0.00		0.91	0.00	
Uniform Delay (d ₁), s/veh	28.9	43.2		25.0	48.3		23.7	42.0		25.2	36.9	
Incremental Delay (d ₂), s/veh	1.2	3.6		0.1	60.8		0.0	1.4		0.5	0.5	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	30.2	46.8		25.1	109.0		23.7	43.4		25.7	37.4	
Level of Service (LOS)	C	D		C	F		C	D		C	D	
Approach Delay, s/veh / LOS	40.7		D	102.9		F	41.1		D	30.7		C
Intersection Delay, s/veh / LOS	58.0						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.94	B	1.94	B
Bicycle LOS Score / LOS	1.13	A	1.16	A	0.87	A	0.95	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	Breese Rd	Time Period		PHF	0.87		
Intersection	Breese Rd & Shawnee Rd	Analysis Year	2023	Analysis Period	1 > 7:00		
Project Description	2027 PM			File Name	Breese & Shawnee_2027 PM.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	54	114	43	53	181	202	67	200	43	203	197	62

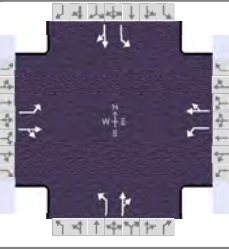
Signal Information													
Cycle, s	126.5	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	20.0	3.5	30.0	20.0	30.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	0.0	5.0	3.5	5.0	0.0			
				Red	1.0	0.0	2.0	1.0	2.0	0.0			

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	24.5	37.0	24.5	37.0	24.5	37.0	28.0	40.5
Change Period, (Y+R _c), s	4.5	7.0	4.5	7.0	4.5	7.0	6.0	7.0
Max Allow Headway (MAH), s	4.6	5.2	4.6	5.2	4.6	4.9	5.1	4.9
Queue Clearance Time (g _s), s	5.1	14.1	5.0	32.0	5.9	22.0	14.4	22.5
Green Extension Time (g _e), s	0.1	3.4	0.1	0.0	0.2	1.9	0.7	1.8
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.11	0.00	1.00	0.00	0.44	0.31	0.50

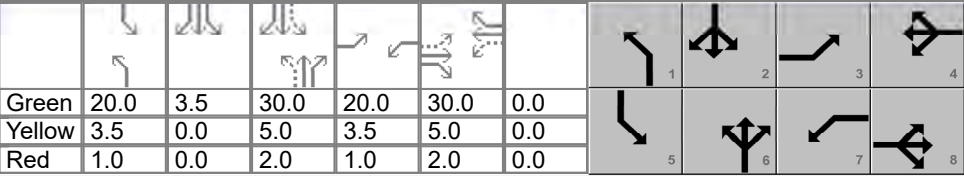
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	62	180		61	440		77	279		233	298	
Adjusted Saturation Flow Rate (s), veh/h/ln	1615	1616		1615	1548		1602	1630		1641	1652	
Queue Service Time (g _s), s	3.1	12.1		3.0	30.0		3.9	20.0		12.4	20.5	
Cycle Queue Clearance Time (g _c), s	3.1	12.1		3.0	30.0		3.9	20.0		12.4	20.5	
Green Ratio (g/C)	0.40	0.24		0.40	0.24		0.40	0.24		0.41	0.26	
Capacity (c), veh/h	312	383		461	367		402	387		430	437	
Volume-to-Capacity Ratio (X)	0.199	0.471		0.132	1.199		0.191	0.723		0.543	0.681	
Back of Queue (Q), ft/ln (95 th percentile)	55.8	221.8		54.1	875.4		69.9	352.4		219.7	348.3	
Back of Queue (Q), veh/ln (95 th percentile)	2.2	8.6		2.1	33.9		2.7	13.6		8.6	13.7	
Queue Storage Ratio (RQ) (95 th percentile)	0.70	0.00		0.77	0.00		0.78	0.00		1.37	0.00	
Uniform Delay (d ₁), s/veh	27.6	41.4		24.9	48.3		25.8	44.4		27.6	41.7	
Incremental Delay (d ₂), s/veh	0.4	1.3		0.2	112.9		0.3	6.8		1.8	4.7	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	28.0	42.7		25.0	161.1		26.1	51.2		29.4	46.4	
Level of Service (LOS)	C	D		C	F		C	D		C	D	
Approach Delay, s/veh / LOS	38.9	D		144.6	F		45.8	D		38.9	D	
Intersection Delay, s/veh / LOS	72.9						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.94	B	1.94	B
Bicycle LOS Score / LOS	0.89	A	1.31	A	1.08	A	1.36	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	0.88	
Urban Street	Breese Rd		Analysis Year	2023		Analysis Period	1 > 7:00						
Intersection	Breese Rd & Shawnee Rd		File Name	Breese & Shawnee_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	139	199	38	28	127	239	27	172	27	152	100	17

Signal Information													
Cycle, s	126.5	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	Yes	Simult. Gap E/W	On	Green	20.0	3.5	30.0	20.0	30.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	0.0	5.0	3.5	5.0	0.0			
				Red	1.0	0.0	2.0	1.0	2.0	0.0			

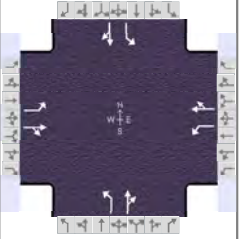
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	24.5	37.0	24.5	37.0	24.5	37.0	28.0	40.5
Change Period, (Y+R _c), s	4.5	7.0	4.5	7.0	4.5	7.0	6.0	7.0
Max Allow Headway (MAH), s	4.6	5.2	4.6	5.2	4.6	4.8	5.1	4.8
Queue Clearance Time (g _s), s	10.2	20.7	3.5	32.0	3.5	17.1	10.9	10.1
Green Extension Time (g _e), s	0.4	2.9	0.1	0.0	0.1	1.4	0.6	1.6
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.03	0.46	0.00	1.00	0.00	0.04	0.04	0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	158	269		32	416		31	226		173	133	
Adjusted Saturation Flow Rate (s), veh/h/ln	1628	1661		1615	1517		1628	1668		1615	1652	
Queue Service Time (g _s), s	8.2	18.7		1.5	30.0		1.5	15.1		8.9	8.1	
Cycle Queue Clearance Time (g _c), s	8.2	18.7		1.5	30.0		1.5	15.1		8.9	8.1	
Green Ratio (g/C)	0.40	0.24		0.40	0.24		0.40	0.24		0.41	0.26	
Capacity (c), veh/h	314	394		393	360		544	396		471	438	
Volume-to-Capacity Ratio (X)	0.503	0.684		0.081	1.156		0.056	0.572		0.367	0.304	
Back of Queue (Q), ft/ln (95 th percentile)	152.1	330.2		27.8	792.3		26.4	271.3		161.7	155.8	
Back of Queue (Q), veh/ln (95 th percentile)	5.9	12.9		1.1	30.7		1.0	10.6		6.3	6.0	
Queue Storage Ratio (RQ) (95 th percentile)	1.90	0.00		0.40	0.00		0.29	0.00		1.01	0.00	
Uniform Delay (d ₁), s/veh	29.2	43.9		25.3	48.3		23.8	42.6		25.6	37.2	
Incremental Delay (d ₂), s/veh	1.5	5.3		0.1	97.0		0.1	2.2		0.7	0.6	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	30.7	49.3		25.4	145.3		23.8	44.8		26.3	37.7	
Level of Service (LOS)	C	D		C	F		C	D		C	D	
Approach Delay, s/veh / LOS	42.4		D	136.7		F	42.3		D	31.3		C
Intersection Delay, s/veh / LOS	69.4						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.94	B	1.94	B
Bicycle LOS Score / LOS	1.19	A	1.23	A	0.91	A	0.99	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	Breese Rd	Time Period		PHF	0.87		
Intersection	Breese Rd & Shawnee Rd	Analysis Year	2023	Analysis Period	1 > 7:00		
Project Description	2047 PM			File Name	Breese & Shawnee_2047 PM.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	59	125	47	58	198	222	74	220	47	223	216	68

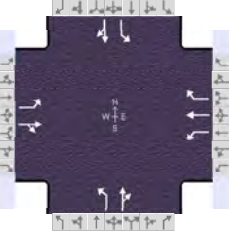
Signal Information				Signal Phases											
Cycle, s	126.5	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	20.0	3.5	30.0	20.0	30.0	0.0	Green	20.0	3.5	30.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.5	0.0	5.0	3.5	5.0	0.0	Yellow	3.5	0.0	5.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	0.0	2.0	1.0	2.0	0.0	Red	1.0	0.0	2.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	24.5	37.0	24.5	37.0	24.5	37.0	28.0	40.5
Change Period, (Y+R _c), s	4.5	7.0	4.5	7.0	4.5	7.0	6.0	7.0
Max Allow Headway (MAH), s	4.6	5.2	4.6	5.2	4.6	4.9	5.1	4.9
Queue Clearance Time (g _s), s	5.4	15.5	5.3	32.0	6.3	24.4	15.8	24.9
Green Extension Time (g _e), s	0.2	3.7	0.2	0.0	0.2	1.7	0.7	1.6
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.18	0.00	1.00	0.00	0.84	0.62	0.95

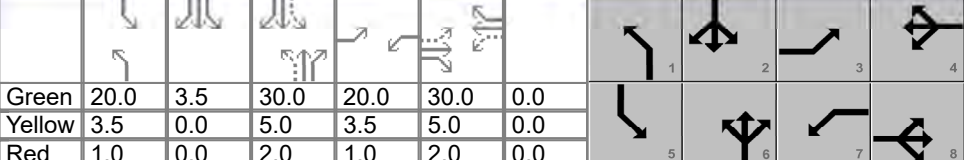
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	68	198		67	483		85	307		256	326	
Adjusted Saturation Flow Rate (s), veh/h/ln	1615	1616		1615	1548		1602	1630		1641	1652	
Queue Service Time (g _s), s	3.4	13.5		3.3	30.0		4.3	22.4		13.8	22.9	
Cycle Queue Clearance Time (g _c), s	3.4	13.5		3.3	30.0		4.3	22.4		13.8	22.9	
Green Ratio (g/C)	0.40	0.24		0.40	0.24		0.40	0.24		0.41	0.26	
Capacity (c), veh/h	312	383		446	367		380	387		407	437	
Volume-to-Capacity Ratio (X)	0.217	0.516		0.149	1.315		0.224	0.794		0.630	0.746	
Back of Queue (Q), ft/ln (95 th percentile)	61.2	241.4		59.5	1077.8		77.8	399.6		245.6	390.4	
Back of Queue (Q), veh/ln (95 th percentile)	2.4	9.4		2.3	41.8		3.0	15.4		9.7	15.4	
Queue Storage Ratio (RQ) (95 th percentile)	0.76	0.00		0.85	0.00		0.86	0.00		1.53	0.00	
Uniform Delay (d ₁), s/veh	27.7	41.9		25.1	48.3		26.4	45.3		28.6	42.6	
Incremental Delay (d ₂), s/veh	0.4	1.6		0.2	159.8		0.4	11.1		3.6	7.4	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	28.1	43.6		25.3	208.1		26.8	56.5		32.2	50.0	
Level of Service (LOS)	C	D		C	F		C	E		C	D	
Approach Delay, s/veh / LOS	39.6	D		185.9	F		50.0	D		42.2	D	
Intersection Delay, s/veh / LOS	87.6						F					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	1.94	B	1.94	B
Bicycle LOS Score / LOS	0.93	A	1.39	A	1.13	A	1.45	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	0.88		
Urban Street	Breese Rd		Analysis Year	2023		Analysis Period	1 > 7:00							
Intersection	Breese Rd & Shawnee Rd		File Name	Breese & Shawnee_2027 AM_wWBR.xus										
Project Description	2027 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	126	182	35	26	115	217	24	157	24	139	91	15

Signal Information																								
Cycle, s	126.5	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	3.5	30.0	20.0	30.0	0.0	Yellow	3.5	0.0	5.0	3.5	5.0	0.0	Red	1.0	0.0	2.0	1.0	2.0	0.0

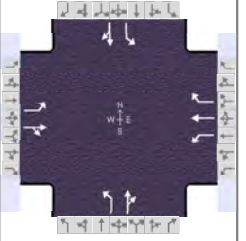
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	24.5	37.0	24.5	37.0	24.5	37.0	28.0	40.5
Change Period, (Y+R _c), s	4.5	7.0	4.5	7.0	4.5	7.0	6.0	7.0
Max Allow Headway (MAH), s	4.6	5.2	4.6	5.2	4.6	4.8	5.1	4.8
Queue Clearance Time (g _s), s	9.4	18.8	3.4	22.0	3.3	15.6	10.1	9.3
Green Extension Time (g _e), s	0.4	2.8	0.0	2.3	0.0	1.3	0.6	1.5
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.01	0.28	0.00	0.55	0.00	0.02	0.02	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	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	143	247		30	131	247	27	206		158	120	
Adjusted Saturation Flow Rate (s), veh/h/ln	1628	1661		1615	1695	1437	1628	1669		1615	1653	
Queue Service Time (g _s), s	7.4	16.8		1.4	8.1	20.0	1.3	13.6		8.1	7.3	
Cycle Queue Clearance Time (g _c), s	7.4	16.8		1.4	8.1	20.0	1.3	13.6		8.1	7.3	
Green Ratio (g/C)	0.40	0.24		0.40	0.24	0.24	0.40	0.24		0.41	0.26	
Capacity (c), veh/h	511	394		411	402	341	555	396		488	438	
Volume-to-Capacity Ratio (X)	0.280	0.626		0.072	0.325	0.724	0.049	0.520		0.324	0.275	
Back of Queue (Q), ft/ln (95 th percentile)	133.2	298.7		25.8	159.2	319.7	23.5	246.5		146	139.9	
Back of Queue (Q), veh/ln (95 th percentile)	5.2	11.7		1.0	6.2	12.4	0.9	9.6		5.7	5.4	
Queue Storage Ratio (RQ) (95 th percentile)	1.66	0.00		0.37	0.00	0.65	0.26	0.00		0.91	0.00	
Uniform Delay (d ₁), s/veh	25.8	43.2		25.0	39.9	44.4	23.7	42.0		25.2	36.9	
Incremental Delay (d ₂), s/veh	0.4	3.6		0.1	0.7	8.0	0.0	1.4		0.5	0.5	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	26.2	46.8		25.1	40.5	52.5	23.7	43.4		25.7	37.4	
Level of Service (LOS)	C	D		C	D	D	C	D		C	D	
Approach Delay, s/veh / LOS	39.2	D		46.6	D		41.1	D		30.7	C	
Intersection Delay, s/veh / LOS	40.1						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	2.13	B	1.94	B
Bicycle LOS Score / LOS	1.13	A	1.16	A	0.87	A	0.95	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	Breese Rd	Time Period		PHF	0.87		
Intersection	Breese Rd & Shawnee Rd	Analysis Year	2023	Analysis Period	1 > 7:00		
Project Description	2027 PM			File Name	Breese & Shawnee_2027 PM_wWBR.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	54	114	43	53	181	202	67	200	43	203	197	62

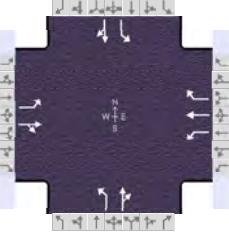
Signal Information				Signal Phases									
Cycle, s	126.5	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	20.0	3.5	30.0	20.0	30.0	0.0	0.0	0.0	0.0
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.5	0.0	5.0	3.5	5.0	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	0.0	2.0	1.0	2.0	0.0	0.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	24.5	37.0	24.5	37.0	24.5	37.0	28.0	40.5
Change Period, (Y+R _c), s	4.5	7.0	4.5	7.0	4.5	7.0	6.0	7.0
Max Allow Headway (MAH), s	4.6	5.2	4.6	5.2	4.6	4.9	5.1	4.9
Queue Clearance Time (g _s), s	5.1	14.1	5.0	20.6	5.9	22.0	14.4	22.5
Green Extension Time (g _e), s	0.1	3.3	0.1	2.5	0.2	1.9	0.7	1.8
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.10	0.00	0.41	0.00	0.44	0.31	0.50

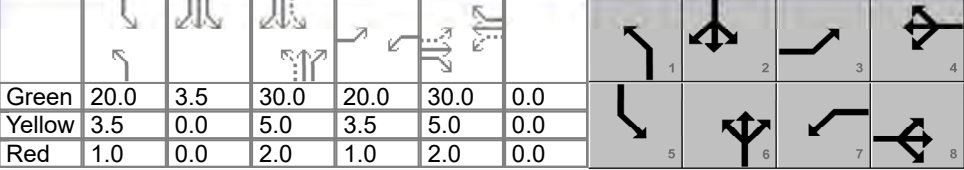
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	62	180		61	208	232	77	279		233	298	
Adjusted Saturation Flow Rate (s), veh/h/ln	1615	1616		1615	1695	1437	1602	1630		1641	1652	
Queue Service Time (g _s), s	3.1	12.1		3.0	13.5	18.6	3.9	20.0		12.4	20.5	
Cycle Queue Clearance Time (g _c), s	3.1	12.1		3.0	13.5	18.6	3.9	20.0		12.4	20.5	
Green Ratio (g/C)	0.40	0.24		0.40	0.24	0.24	0.40	0.24		0.41	0.26	
Capacity (c), veh/h	445	383		461	402	341	402	387		430	437	
Volume-to-Capacity Ratio (X)	0.140	0.471		0.132	0.517	0.681	0.191	0.723		0.543	0.681	
Back of Queue (Q), ft/ln (95 th percentile)	55.3	221.8		54.1	251.3	297	69.9	352.4		219.7	348.3	
Back of Queue (Q), veh/ln (95 th percentile)	2.1	8.6		2.1	9.7	11.5	2.7	13.6		8.6	13.7	
Queue Storage Ratio (RQ) (95 th percentile)	0.69	0.00		0.77	0.00	0.60	0.78	0.00		1.37	0.00	
Uniform Delay (d ₁), s/veh	25.1	41.4		24.9	42.0	43.9	25.8	44.4		27.6	41.7	
Incremental Delay (d ₂), s/veh	0.2	1.3		0.2	1.6	6.1	0.3	6.8		1.8	4.7	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	25.2	42.7		25.0	43.5	50.0	26.1	51.2		29.4	46.4	
Level of Service (LOS)	C	D		C	D	D	C	D		C	D	
Approach Delay, s/veh / LOS	38.2	D		44.3	D		45.8	D		38.9	D	
Intersection Delay, s/veh / LOS	42.0						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	2.13	B	1.94	B
Bicycle LOS Score / LOS	0.89	A	1.31	A	1.08	A	1.36	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	0.88		
Urban Street	Breese Rd		Analysis Year	2023		Analysis Period	1 > 7:00							
Intersection	Breese Rd & Shawnee Rd		File Name	Breese & Shawnee_2047 AM_wWBR.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	139	199	38	28	127	239	27	172	27	152	100	17

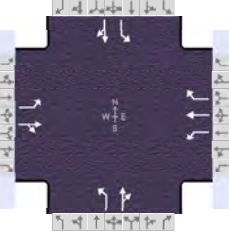
Signal Information																								
Cycle, s	126.5	Reference Phase	2																					
Offset, s	0	Reference Point	End																					
Uncoordinated	Yes	Simult. Gap E/W	On																					
Force Mode	Fixed	Simult. Gap N/S	On	Green	20.0	3.5	30.0	20.0	30.0	0.0	Yellow	3.5	0.0	5.0	3.5	5.0	0.0	Red	1.0	0.0	2.0	1.0	2.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	24.5	37.0	24.5	37.0	24.5	37.0	28.0	40.5
Change Period, (Y+R _c), s	4.5	7.0	4.5	7.0	4.5	7.0	6.0	7.0
Max Allow Headway (MAH), s	4.6	5.2	4.6	5.2	4.6	4.8	5.1	4.8
Queue Clearance Time (g _s), s	10.2	20.7	3.5	24.5	3.5	17.1	10.9	10.1
Green Extension Time (g _e), s	0.4	2.8	0.1	1.9	0.1	1.4	0.6	1.6
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.03	0.45	0.00	0.94	0.00	0.04	0.04	0.00

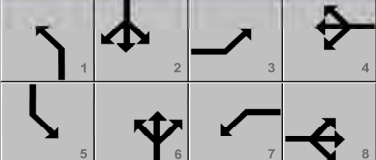
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	158	269		32	144	272	31	226		173	133	
Adjusted Saturation Flow Rate (s), veh/h/ln	1628	1661		1615	1695	1437	1628	1668		1615	1652	
Queue Service Time (g _s), s	8.2	18.7		1.5	9.0	22.5	1.5	15.1		8.9	8.1	
Cycle Queue Clearance Time (g _c), s	8.2	18.7		1.5	9.0	22.5	1.5	15.1		8.9	8.1	
Green Ratio (g/C)	0.40	0.24		0.40	0.24	0.24	0.40	0.24		0.41	0.26	
Capacity (c), veh/h	500	394		393	402	341	544	396		471	438	
Volume-to-Capacity Ratio (X)	0.316	0.684		0.081	0.359	0.797	0.056	0.572		0.367	0.304	
Back of Queue (Q), ft/ln (95 th percentile)	148.7	330.2		27.8	177.5	364.5	26.4	271.3		161.7	155.8	
Back of Queue (Q), veh/ln (95 th percentile)	5.8	12.9		1.1	6.9	14.1	1.0	10.6		6.3	6.0	
Queue Storage Ratio (RQ) (95 th percentile)	1.86	0.00		0.40	0.00	0.74	0.29	0.00		1.01	0.00	
Uniform Delay (d ₁), s/veh	26.2	43.9		25.3	40.2	45.4	23.8	42.6		25.6	37.2	
Incremental Delay (d ₂), s/veh	0.4	5.3		0.1	0.8	13.1	0.1	2.2		0.7	0.6	
Initial Queue Delay (d ₃), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	26.6	49.3		25.4	41.0	58.4	23.8	44.8		26.3	37.7	
Level of Service (LOS)	C	D		C	D	E	C	D		C	D	
Approach Delay, s/veh / LOS	40.9	D		50.5	D		42.3	D		31.3	C	
Intersection Delay, s/veh / LOS	42.1						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	2.13	B	1.94	B
Bicycle LOS Score / LOS	1.19	A	1.23	A	0.91	A	0.99	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	Breese Rd	Analysis Year	2023				
Intersection	Breese Rd & Shawnee Rd	File Name	Breese & Shawnee_2047 PM_wWBR.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	59	125	47	58	198	222	74	220	47	223	216	68

Signal Information												
Cycle, s	126.5	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	3.5	30.0	20.0	30.0	0.0				
		Yellow	3.5	0.0	5.0	3.5	5.0	0.0				
		Red	1.0	0.0	2.0	1.0	2.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	24.5	37.0	24.5	37.0	24.5	37.0	28.0	40.5
Change Period, ($Y+R_c$), s	4.5	7.0	4.5	7.0	4.5	7.0	6.0	7.0
Max Allow Headway (MAH), s	4.6	5.2	4.6	5.2	4.6	4.9	5.1	4.9
Queue Clearance Time (g_s), s	5.4	15.5	5.3	22.8	6.3	24.4	15.8	24.9
Green Extension Time (g_e), s	0.2	3.5	0.2	2.3	0.2	1.7	0.7	1.6
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.16	0.00	0.68	0.00	0.84	0.62	0.95

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h	68	198		67	228	255	85	307		256	326	
Adjusted Saturation Flow Rate (s), veh/h/ln	1615	1616		1615	1695	1437	1602	1630		1641	1652	
Queue Service Time (g_s), s	3.4	13.5		3.3	15.0	20.8	4.3	22.4		13.8	22.9	
Cycle Queue Clearance Time (g_c), s	3.4	13.5		3.3	15.0	20.8	4.3	22.4		13.8	22.9	
Green Ratio (g/C)	0.40	0.24		0.40	0.24	0.24	0.40	0.24		0.41	0.26	
Capacity (c), veh/h	429	383		446	402	341	380	387		407	437	
Volume-to-Capacity Ratio (X)	0.158	0.516		0.149	0.566	0.749	0.224	0.794		0.630	0.746	
Back of Queue (Q), ft/ln (95 th percentile)	60.6	241.4		59.5	275	334.3	77.8	399.6		245.6	390.4	
Back of Queue (Q), veh/ln (95 th percentile)	2.3	9.4		2.3	10.7	13.0	3.0	15.4		9.7	15.4	
Queue Storage Ratio (RQ) (95 th percentile)	0.76	0.00		0.85	0.00	0.68	0.86	0.00		1.53	0.00	
Uniform Delay (d_1), s/veh	25.4	41.9		25.1	42.5	44.8	26.4	45.3		28.6	42.6	
Incremental Delay (d_2), s/veh	0.2	1.6		0.2	2.3	9.5	0.4	11.1		3.6	7.4	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	25.6	43.6		25.3	44.8	54.2	26.8	56.5		32.2	50.0	
Level of Service (LOS)	C	D		C	D	D	C	E		C	D	
Approach Delay, s/veh / LOS	39.0		D	46.8		D	50.0		D	42.2		D
Intersection Delay, s/veh / LOS	44.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.94	B	1.94	B	2.13	B	1.94	B
Bicycle LOS Score / LOS	0.93	A	1.39	A	1.13	A	1.45	A

HCS Two-Way Stop-Control Report

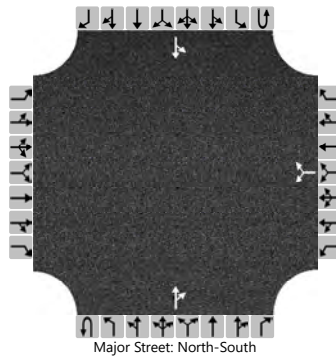
General Information

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

Site Information

Intersection	Shawnee Rd & Reed Rd
Jurisdiction	
East/West Street	Reed Rd
North/South Street	Shawnee Rd
Peak Hour Factor	0.88
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
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						5		52			316	26		121	328	
Percent Heavy Vehicles (%)						5		5						2		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.45		6.25							4.12		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.55		3.35							2.22		

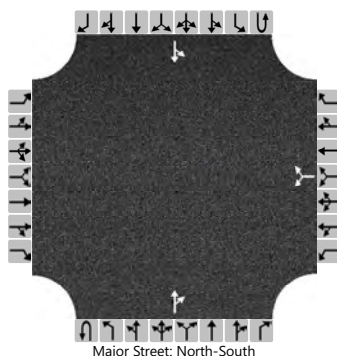
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						65									138		
Capacity, c (veh/h)						565									1170		
v/c Ratio						0.11									0.12		
95% Queue Length, Q ₉₅ (veh)						0.4									0.4		
Control Delay (s/veh)						12.2									8.5	1.3	
Level of Service (LOS)						B									A	A	
Approach Delay (s/veh)						12.2								3.2			
Approach LOS						B								A			

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Shawnee Rd & Reed Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Reed Rd				
Analysis Year	2023	North/South Street	Shawnee Rd				
Time Analyzed	2023 PM	Peak Hour Factor	0.94				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	Shawnee Rd & Reed 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		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						9		78			376	15		78	430	
Percent Heavy Vehicles (%)						2		2						1		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.42		6.22							4.11		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.52		3.32							2.21		

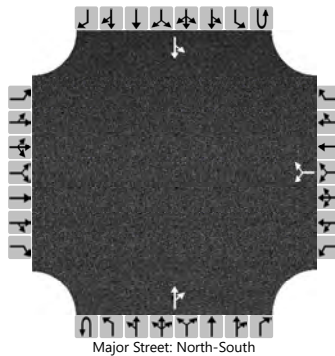
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						93								83		
Capacity, c (veh/h)						544								1148		
v/c Ratio						0.17								0.07		
95% Queue Length, Q ₉₅ (veh)						0.6								0.2		
Control Delay (s/veh)						13.0								8.4	0.8	
Level of Service (LOS)						B								A	A	
Approach Delay (s/veh)						13.0								2.0		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Shawnee Rd & Reed Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Reed Rd				
Analysis Year	2027	North/South Street	Shawnee Rd				
Time Analyzed	2027 AM	Peak Hour Factor	0.88				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	Shawnee Rd & Reed 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		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						5		53			322	27		123	335	
Percent Heavy Vehicles (%)						5		5						2		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.45		6.25							4.12		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.55		3.35							2.22		

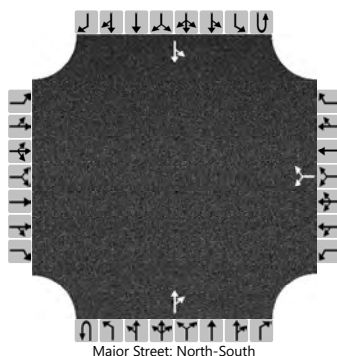
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						66								140		
Capacity, c (veh/h)						558								1162		
v/c Ratio						0.12								0.12		
95% Queue Length, Q ₉₅ (veh)						0.4								0.4		
Control Delay (s/veh)						12.3								8.5	1.3	
Level of Service (LOS)						B								A	A	
Approach Delay (s/veh)						12.3								3.2		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Shawnee Rd & Reed Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Reed Rd				
Analysis Year	2027	North/South Street	Shawnee Rd				
Time Analyzed	2027 PM	Peak Hour Factor	0.94				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	Shawnee Rd & Reed 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		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)							9		80			384	15		80	439
Percent Heavy Vehicles (%)							2		2						1	
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.42		6.22							4.11		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.52		3.32							2.21		

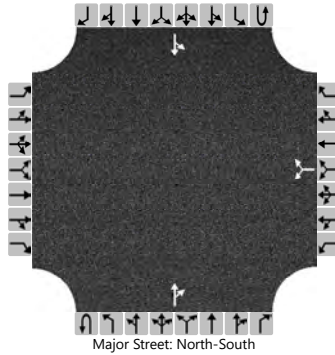
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						95									85		
Capacity, c (veh/h)						537									1140		
v/c Ratio						0.18									0.07		
95% Queue Length, Q ₉₅ (veh)						0.6									0.2		
Control Delay (s/veh)						13.1									8.4	0.9	
Level of Service (LOS)						B									A	A	
Approach Delay (s/veh)					13.1								2.0				
Approach LOS					B								A				

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst				Intersection	Shawnee Rd & Reed Rd		
Agency/Co.				Jurisdiction			
Date Performed	7/25/2023			East/West Street	Reed Rd		
Analysis Year	2047			North/South Street	Shawnee Rd		
Time Analyzed	2047 AM			Peak Hour Factor	0.88		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Shawnee Rd & Reed 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		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						6		58			354	29		136	367	
Percent Heavy Vehicles (%)						5		5						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.45		6.25						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.55		3.35						2.22		

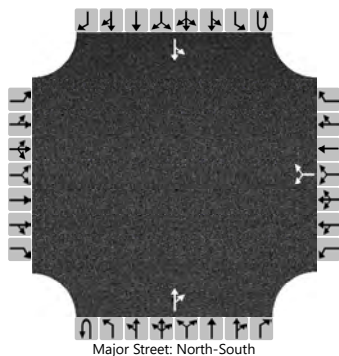
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						73								155		
Capacity, c (veh/h)						508								1124		
v/c Ratio						0.14								0.14		
95% Queue Length, Q ₉₅ (veh)						0.5								0.5		
Control Delay (s/veh)						13.3								8.7	1.6	
Level of Service (LOS)						B								A	A	
Approach Delay (s/veh)					13.3								3.5			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Shawnee Rd & Reed Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Reed Rd				
Analysis Year	2047	North/South Street	Shawnee Rd				
Time Analyzed	2047 PM	Peak Hour Factor	0.94				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	Shawnee Rd & Reed 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		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						10		87			421	17		87	482	
Percent Heavy Vehicles (%)						2		2						1		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.11		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.21		

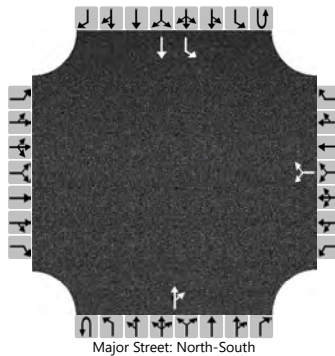
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						103								93		
Capacity, c (veh/h)						494								1101		
v/c Ratio						0.21								0.08		
95% Queue Length, Q ₉₅ (veh)						0.8								0.3		
Control Delay (s/veh)						14.2								8.6	1.0	
Level of Service (LOS)						B								A	A	
Approach Delay (s/veh)					14.2								2.2			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Shawnee Rd & Reed Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Reed Rd				
Analysis Year	2027	North/South Street	Shawnee Rd				
Time Analyzed	2027 AM	Peak Hour Factor	0.88				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	Shawnee Rd & Reed 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		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						5		53			322	27		123	335	
Percent Heavy Vehicles (%)						5		5						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.45		6.25						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.55		3.35						2.22		

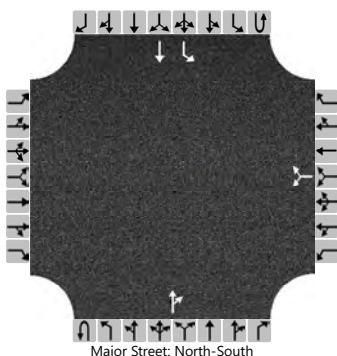
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						66								140		
Capacity, c (veh/h)						563								1162		
v/c Ratio						0.12								0.12		
95% Queue Length, Q ₉₅ (veh)						0.4								0.4		
Control Delay (s/veh)						12.2								8.5		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)					12.2								2.3			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Shawnee Rd & Reed Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Reed Rd				
Analysis Year	2027	North/South Street	Shawnee Rd				
Time Analyzed	2027 PM	Peak Hour Factor	0.94				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	Shawnee Rd & Reed 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		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						9		80			384	15		80	439	
Percent Heavy Vehicles (%)						2		2						1		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.11		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.21		

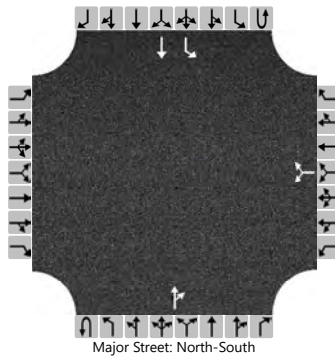
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						95								85		
Capacity, c (veh/h)						541								1140		
v/c Ratio						0.18								0.07		
95% Queue Length, Q ₉₅ (veh)						0.6								0.2		
Control Delay (s/veh)						13.1								8.4		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)					13.1								1.3			
Approach LOS					B								A			

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Shawnee Rd & Reed Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Reed Rd				
Analysis Year	2047	North/South Street	Shawnee Rd				
Time Analyzed	2047 AM	Peak Hour Factor	0.88				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	Shawnee Rd & Reed 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		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						6		58			354	29		136	367	
Percent Heavy Vehicles (%)						5		5						2		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.45		6.25							4.12		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.55		3.35							2.22		

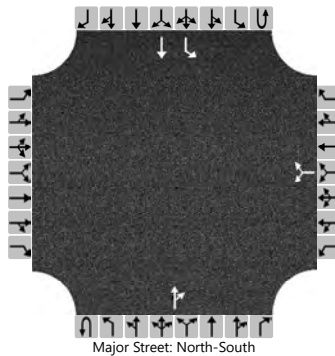
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						73									155		
Capacity, c (veh/h)						515									1124		
v/c Ratio						0.14									0.14		
95% Queue Length, Q ₉₅ (veh)						0.5									0.5		
Control Delay (s/veh)						13.1									8.7		
Level of Service (LOS)						B									A		
Approach Delay (s/veh)					13.1								2.4				
Approach LOS					B								A				

HCS Two-Way Stop-Control Report

General Information				Site Information			
Analyst		Intersection	Shawnee Rd & Reed Rd				
Agency/Co.		Jurisdiction					
Date Performed	7/25/2023	East/West Street	Reed Rd				
Analysis Year	2047	North/South Street	Shawnee Rd				
Time Analyzed	2047 PM	Peak Hour Factor	0.94				
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25				
Project Description	Shawnee Rd & Reed 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		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						10		87			421	17		87	482	
Percent Heavy Vehicles (%)						2		2						1		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1		
Critical Headway (sec)						6.42		6.22							4.11		
Base Follow-Up Headway (sec)						3.5		3.3							2.2		
Follow-Up Headway (sec)						3.52		3.32							2.21		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						103								93		
Capacity, c (veh/h)						499								1101		
v/c Ratio						0.21								0.08		
95% Queue Length, Q ₉₅ (veh)						0.8								0.3		
Control Delay (s/veh)						14.1								8.6		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)						14.1								1.3		
Approach LOS						B								A		

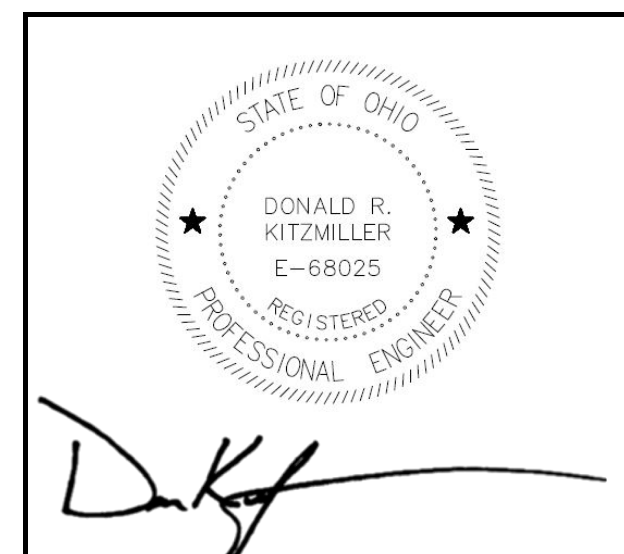
APPENDIX C
COST ESTIMATES



Breese Road Corridor Improvements ESTIMATED COST					
Major Cost Drivers					* Extended Costs rounded to nearest \$1000.
Description	Est. Quantity	Unit	Unit Cost	Extended Cost	Group Total
Beeler Intersection					\$41,100
Embankment	50	CY	\$35	\$2,000	
Excavation	50	CY	\$35	\$2,000	
Erosion Control	1	LUMP		\$10,000	
Underdrains	140	LF	\$14	\$2,000	
Full Depth Pavement	100	SY	\$65	\$7,000	
Sign flat sheet	100	SF	\$25	\$2,500	
Sign Posts	6	EA	\$25	\$200	
Sign reflectors	2	EA	\$100	\$200	
Sign removal & disposal	2	EA	\$100	\$200	
Right of Way	1	LUMP		\$15,000	
Breese-Shawnee Intersection					\$326,000
Embankment	110	CY	\$35	\$4,000	
Excavation	110	CY	\$35	\$4,000	
Sidewalk & Ramps	450	SF	\$8	\$4,000	
Erosion Control	1	LUMP		\$10,000	
Underdrains	610	LF	\$14	\$9,000	
Storm system replacement	1	LUMP		\$30,000	
Full Depth Pavement	100	SY	\$65	\$7,000	
Pavement Marking	1	LUMP		\$8,000	
Mast Arm Traffic Signal	1	LUMP		\$230,000	
Right of Way	1	LUMP		\$20,000	
Dixie Highway					\$465,000
Embankment	650	CY	\$35	\$23,000	
Excavation	650	CY	\$35	\$23,000	
Sidewalk & Ramps	450	SF	\$8	\$4,000	
Erosion Control	1	LUMP		\$10,000	
Underdrains	800	LF	\$14	\$11,000	
Full Depth Asph Pavement	672	SY	\$65	\$44,000	
Concrete Pavement	615	SY	\$100	\$62,000	
Pavement Marking	1	LUMP		\$8,000	
Mast Arm Traffic Signal	1	LUMP		\$230,000	
Right of Way	1	LUMP		\$50,000	
Industrial Drive					\$2,900
Sign flat sheet	100	SF	\$25	\$2,500	
Sign Posts	4	EA	\$25	\$100	
Sign reflectors	2	EA	\$100	\$200	
Sign removal & disposal	1	EA	\$100	\$100	
McClain Road					\$66,000
Embankment	160	CY	\$35	\$6,000	
Excavation	160	CY	\$35	\$6,000	
Erosion Control	1	LUMP		\$10,000	
Underdrains	515	LF	\$14	\$7,000	
Full Depth Pavement	315	SY	\$65	\$20,000	
Remove/Reerect Signs	8	EA	\$250	\$2,000	
Right of Way	1	LUMP		\$15,000	
Subtotal Major Items					\$901,000
Miscellaneous Costs					
Maintenance of Traffic (12%)		LUMP	\$109,000		\$109,000
Minor Items (20%)		LUMP	\$181,000		\$181,000
Subtotal Miscellaneous Costs					\$290,000
Total Construction Cost Before Contingency & Inflationary Factor					\$1,191,000
PDP Design Risk Contingency (15%-25%)			20%		\$238,000
Inflation per ODOT Business Plan Inflation Calculator		CY: APR 2027 - DEC 2027	21.7%		\$258,000
Total Preliminary Roadway Construction Cost Estimate					\$1,687,000
Preliminary Engineering		20%	20%		\$337,000
Final Engineering		5%	5%		\$84,000
Construction Engineering		8%	8%		\$135,000
Total Project Cost Estimate					\$2,243,000

The estimated useful life of the project is 20 years.

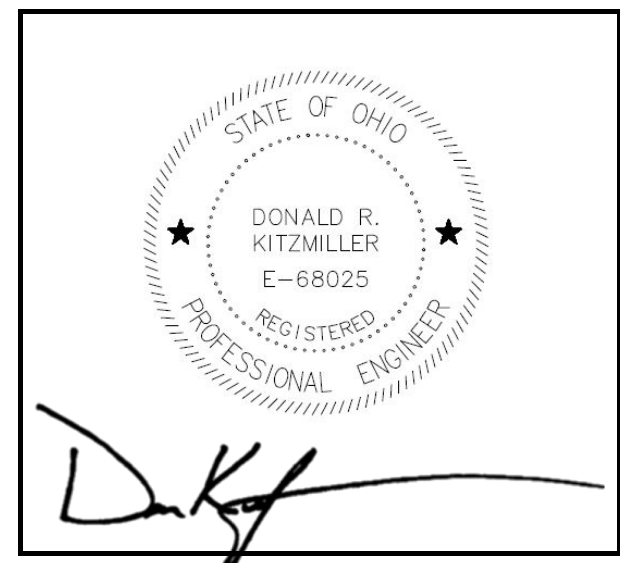
I hereby certify this Engineer's Opinion of Planning Level of Projects Costs and Estimated of Weighted Useful Life to be reasonable and accurate to the best of my knowledge and based on current industry practices for such a calculation.



Shawnee Road Corridor Improvements ESTIMATED COST						
Major Cost Drivers						* Extended Costs rounded to nearest \$1000.
Description	Est. Quantity	Unit	Unit Cost	Extended Cost *	Group Total	
Roadway					\$211,000	
Embankment	2010	CY	\$35	\$70,000		
Excavation	4020	CY	\$35	\$141,000		
Erosion Control	LUMP		\$35,000		\$35,000	
Drainage					\$45,000	
Underdrains	3229	LF	\$14	\$45,000		
Pavement					\$386,000	
Full Depth Pavement	4150	SY	\$65	\$270,000		
Driveway Pavement	200	SY	\$30	\$6,000		
Shoulders	1100	SY	\$30	\$33,000		
Shared Use Path	2575	SY	\$30	\$77,000		
Traffic Control (Pavement Marking & Signing)					\$30,000	
Signing & Marking	1	LUMP	\$30,000	\$30,000		
Subtotal Major Items					\$707,000	
Miscellaneous Costs						
Maintenance of Traffic (12%)	LUMP		\$85,000		\$85,000	
Minor Items (20%)	LUMP		\$142,000		\$142,000	
Subtotal Miscellaneous Costs					\$227,000	
Total Construction Cost Before Contingency & Inflationary Factor					\$934,000	
PDP Design Risk Contingency (15%-25%)				20%	\$187,000	
Inflation per ODOT Business Plan Inflation Calculator				CY: APR 2027 - DEC 2027 21.7%	\$203,000	
Total Preliminary Roadway Construction Cost Estimate					\$1,324,000	
Right-of-Way Budgetary Estimate					\$50,000	
Preliminary Engineering	20%		20%		\$265,000	
Final Engineering	5%		5%		\$66,000	
Construction Engineering	8%		8%		\$106,000	
Total Project Cost Estimate					\$1,811,000	

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



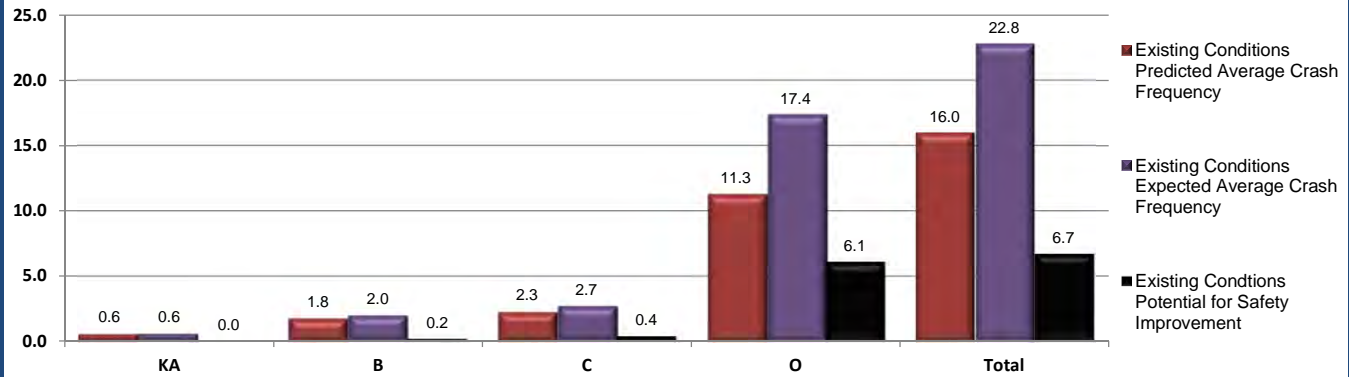


Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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
N_{predicted} - Existing Conditions	0.5889	1.7912	2.3155	11.3235	16.0191
N_{expected} - Existing Conditions	0.6224	2.0090	2.6860	17.4451	22.7625
N_{potential for improvement} - Existing Conditions	0.0335	0.2178	0.3705	6.1216	6.7434



Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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	
CR142: 3-3.725	Breese Rd (Beeler to Shawnee)	0.0778	0.1808	0.1874	0.911	1.357
CR142: 3.775-4.915	Breese Rd (Shawnee to Dixie Hwy)	0.1368	0.3268	0.3641	1.7578	2.5855
CR142: 4.965-5.985	Breese Rd (Dixie to McClain)	0.1526	0.3727	0.4353	2.0782	3.0388
CR152: 2.036-2.536	Shawnee Rd (Breese to Reed)	0.0425	0.1029	0.1192	0.5654	0.83
CR142: 3	Breese Rd & Beeler Rd	0.0253	0.078	0.0893	0.5307	0.7233
CR142: 3.75	Breese Rd & Shawnee Rd	0.057	0.2993	0.4584	2.3436	3.1583
CR142: 4.94	Breese Rd & Dixie Hwy	0.0601	0.3181	0.4897	2.4682	3.3361
CR142: 6.021	Breese Rd & McClain Rd	0.0194	0.0427	0.08	0.3177	0.4598
CR152: 2.011	Shawnee Rd & Reed Rd	0.0174	0.0699	0.0921	0.3509	0.5303



Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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	
CR142: 3-3.725	Breese Rd (Beeler to Shawnee)	0.0713	0.1654	0.1706	1.0355	1.4428
CR142: 3.775-4.915	Breese Rd (Shawnee to Dixie Hwy)	0.1446	0.3707	0.4539	2.7378	3.707
CR142: 4.965-5.985	Breese Rd (Dixie to McClain)	0.174	0.4434	0.5274	4.78	5.9248
CR152: 2.036-2.536	Shawnee Rd (Breese to Reed)	0.0568	0.1551	0.2027	1.4036	1.8182
CR142: 3	Breese Rd & Beeler Rd	0.0276	0.0855	0.0981	0.6249	0.8361
CR142: 3.75	Breese Rd & Shawnee Rd	0.0538	0.2809	0.4249	2.1025	2.8621
CR142: 4.94	Breese Rd & Dixie Hwy	0.0707	0.3791	0.6007	3.6424	4.6929
CR142: 6.021	Breese Rd & McClain Rd	0	0.0295	0.073	0.2475	0.35
CR152: 2.011	Shawnee Rd & Reed Rd	0.0236	0.0994	0.1347	0.8709	1.1286



Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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				Total
		KA	B	C	O	
CR142: 3-3.725	Breese Rd (Beeler to Shawnee)	-0.0065	-0.0154	-0.0168	0.1245	0.0858
CR142: 3.775-4.915	Breese Rd (Shawnee to Dixie Hwy)	0.0078	0.0439	0.0898	0.98	1.1215
CR142: 4.965-5.985	Breese Rd (Dixie to McClain)	0.0214	0.0707	0.0921	2.7018	2.886
CR152: 2.036-2.536	Shawnee Rd (Breese to Reed)	0.0143	0.0522	0.0835	0.8382	0.9882
CR142: 3	Breese Rd & Beeler Rd	0.0023	0.0075	0.0088	0.0942	0.1128
CR142: 3.75	Breese Rd & Shawnee Rd	-0.0032	-0.0184	-0.0335	-0.2411	-0.2962
CR142: 4.94	Breese Rd & Dixie Hwy	0.0106	0.061	0.111	1.1742	1.3568
CR142: 6.021	Breese Rd & McClain Rd	-0.0194	-0.0132	-0.007	-0.0702	-0.1098
CR152: 2.011	Shawnee Rd & Reed Rd	0.0062	0.0295	0.0426	0.52	0.5983



Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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	Breese Rd & Shawnee Rd Corridors	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	0.0356	0.0347	-0.0009	
Head On	0.1730	0.2292	0.0562	
Rear End	5.8381	10.4024	4.5643	
Backing	0.4214	0.7668	0.3454	
Sideswipe - Meeting	0.2457	0.5477	0.3020	
Sideswipe - Passing	1.4890	2.6356	1.1465	
Angle	1.9110	2.6759	0.7649	
Parked Vehicle	1.0815	0.8568	-0.2247	
Pedestrian	0.3610	0.3610	0.0000	
Animal	2.7057	2.0123	-0.6935	
Train	0.0009	0.0010	0.0001	
Pedalcycles	0.3232	0.3232	0.0000	
Other Non-Vehicle	0.0002	0.0002	0.0000	
Fixed Object	2.5663	2.1280	-0.4383	
Other Object	0.1167	0.0915	-0.0252	
Overtuning	0.0745	0.0641	-0.0104	
Other Non-Collision	0.1766	0.1457	-0.0309	
Left Turn	0.7635	0.9915	0.2280	
Right Turn	0.4100	0.5073	0.0973	

APPENDIX E
PROPOSED ECAT CONDITIONS



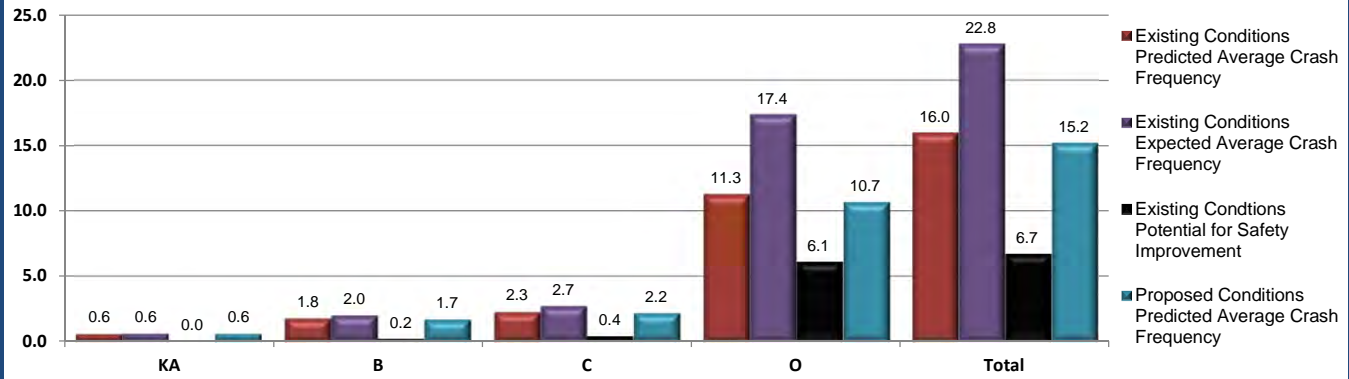


Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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
$N_{\text{predicted}}$ - Existing Conditions	0.5889	1.7912	2.3155	11.3235	16.0191
N_{expected} - Existing Conditions	0.6224	2.0090	2.6860	17.4451	22.7625
$N_{\text{potential for improvement}}$ - Existing Conditions	0.0335	0.2178	0.3705	6.1216	6.7434
$N_{\text{predicted}}$ - Proposed Conditions	0.5526	1.6899	2.1963	10.7453	15.1841



Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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	
CR142: 3-3.725	Breese Rd (Beeler to Shawnee)	0.0778	0.1808	0.1874	0.911	1.357
CR142: 3.775-4.915	Breese Rd (Shawnee to Dixie Hwy)	0.1368	0.3268	0.3641	1.7578	2.5855
CR142: 4.965-5.985	Breese Rd (Dixie to McClain)	0.1526	0.3727	0.4353	2.0782	3.0388
CR152: 2.036-2.536	Shawnee Rd (Breese to Reed)	0.0425	0.1029	0.1192	0.5654	0.83
CR142: 3	Breese Rd & Beeler Rd	0.0253	0.078	0.0893	0.5307	0.7233
CR142: 3.75	Breese Rd & Shawnee Rd	0.057	0.2993	0.4584	2.3436	3.1583
CR142: 4.94	Breese Rd & Dixie Hwy	0.0601	0.3181	0.4897	2.4682	3.3361
CR142: 6.021	Breese Rd & McClain Rd	0.0194	0.0427	0.08	0.3177	0.4598
CR152: 2.011	Shawnee Rd & Reed Rd	0.0174	0.0699	0.0921	0.3509	0.5303



Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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	
CR142: 3-3.725	Breese Rd (Beeler to Shawnee)	0.0713	0.1654	0.1706	1.0355	1.4428
CR142: 3.775-4.915	Breese Rd (Shawnee to Dixie Hwy)	0.1446	0.3707	0.4539	2.7378	3.707
CR142: 4.965-5.985	Breese Rd (Dixie to McClain)	0.174	0.4434	0.5274	4.78	5.9248
CR152: 2.036-2.536	Shawnee Rd (Breese to Reed)	0.0568	0.1551	0.2027	1.4036	1.8182
CR142: 3	Breese Rd & Beeler Rd	0.0276	0.0855	0.0981	0.6249	0.8361
CR142: 3.75	Breese Rd & Shawnee Rd	0.0538	0.2809	0.4249	2.1025	2.8621
CR142: 4.94	Breese Rd & Dixie Hwy	0.0707	0.3791	0.6007	3.6424	4.6929
CR142: 6.021	Breese Rd & McClain Rd	0	0.0295	0.073	0.2475	0.35
CR152: 2.011	Shawnee Rd & Reed Rd	0.0236	0.0994	0.1347	0.8709	1.1286



Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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		
CR142: 3-3.725	Breese Rd (Beeler to Shawnee)	-0.0065	-0.0154	-0.0168	0.1245	0.0858	
CR142: 3.775-4.915	Breese Rd (Shawnee to Dixie Hwy)	0.0078	0.0439	0.0898	0.98	1.1215	
CR142: 4.965-5.985	Breese Rd (Dixie to McClain)	0.0214	0.0707	0.0921	2.7018	2.886	
CR152: 2.036-2.536	Shawnee Rd (Breese to Reed)	0.0143	0.0522	0.0835	0.8382	0.9882	
CR142: 3	Breese Rd & Beeler Rd	0.0023	0.0075	0.0088	0.0942	0.1128	
CR142: 3.75	Breese Rd & Shawnee Rd	-0.0032	-0.0184	-0.0335	-0.2411	-0.2962	
CR142: 4.94	Breese Rd & Dixie Hwy	0.0106	0.061	0.111	1.1742	1.3568	
CR142: 6.021	Breese Rd & McClain Rd	-0.0194	-0.0132	-0.007	-0.0702	-0.1098	
CR152: 2.011	Shawnee Rd & Reed Rd	0.0062	0.0295	0.0426	0.52	0.5983	



Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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	
CR142: 3-3.725	Breese Rd (Beeler to Shawnee)	0.0778	0.1808	0.1874	0.911	1.357
CR142: 3.775-4.915	Breese Rd (Shawnee to Dixie Hwy)	0.1368	0.3268	0.3641	1.7578	2.5855
CR142: 4.965-5.985	Breese Rd (Dixie to McClain)	0.1526	0.3727	0.4353	2.0782	3.0388
CR152: 2.036-2.536	Shawnee Rd (Breese to Reed)	0.0192	0.0457	0.0536	0.256	0.3745
CR142: 3	Breese Rd & Beeler Rd	0.0167	0.0515	0.0589	0.3503	0.4774
CR142: 3.75	Breese Rd & Shawnee Rd	0.057	0.2993	0.4584	2.3436	3.1583
CR142: 4.94	Breese Rd & Dixie Hwy	0.0601	0.3181	0.4897	2.4682	3.3361
CR142: 6.021	Breese Rd & McClain Rd	0.0194	0.0427	0.08	0.3177	0.4598
CR152: 2.011	Shawnee Rd & Reed Rd	0.013	0.0523	0.0689	0.2625	0.3967



Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Predicted Crash Frequency
Unknown	0.0356	0.0347	-0.0009	0.0336
Head On	0.1730	0.2292	0.0562	0.1639
Rear End	5.8381	10.4024	4.5643	5.5696
Backing	0.4214	0.7668	0.3454	0.3948
Sideswipe - Meeting	0.2457	0.5477	0.3020	0.2305
Sideswipe - Passing	1.4890	2.6356	1.1465	1.4133
Angle	1.9110	2.6759	0.7649	1.7843
Parked Vehicle	1.0815	0.8568	-0.2247	1.0199
Pedestrian	0.3610	0.3610	0.0000	0.3669
Animal	2.7057	2.0123	-0.6935	2.5650
Train	0.0009	0.0010	0.0001	0.0008
Pedalcycles	0.3232	0.3232	0.0000	0.3125
Other Non-Vehicle	0.0002	0.0002	0.0000	0.0001
Fixed Object	2.5663	2.1280	-0.4383	2.4203
Other Object	0.1167	0.0915	-0.0252	0.1100
Overtuning	0.0745	0.0641	-0.0104	0.0705
Other Non-Collision	0.1766	0.1457	-0.0309	0.1664
Left Turn	0.7635	0.9915	0.2280	0.7326
Right Turn	0.4100	0.5073	0.0973	0.3943



Safety Benefit - Cost Analysis

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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
Site Characteristic Improvements (i.e. Lane widening)		\$0.00			\$0.00	\$0.00	0.000	\$0
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 TWLTL on 2 lane Road	20	\$433,755.00			\$433,755.00	\$433,755.00	-0.261	\$155,670
CMF 2 - Install shared path	20	\$357,255.00			\$357,255.00	\$357,255.00	-0.002	\$3,066
		\$0.00			\$0.00	\$0.00	0.000	\$0
CMF 4 - Widen Shoulder	20	\$357,255.00			\$357,255.00	\$357,255.00	-0.439	\$225,295
		\$0.00			\$0.00	\$0.00	0.000	\$0
CMF 6 - Install left-turn lane	20	\$357,255.00			\$357,255.00	\$357,255.00	-0.134	\$66,177
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
Totals		\$1,505,520.00	\$0.00	\$0.00	\$1,505,520.00	\$1,505,520.00	-0.835	\$450,208



Safety Benefit - Cost Analysis

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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

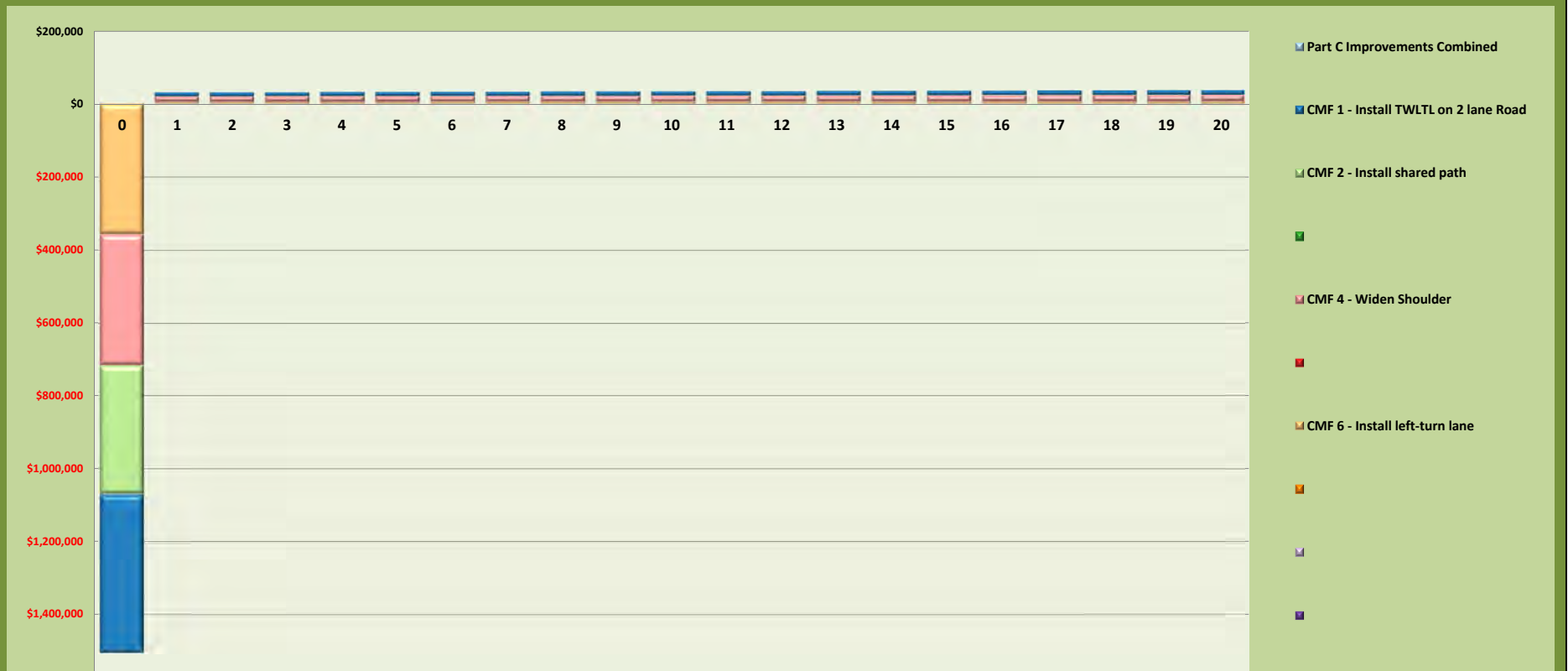
Net Present Value of Project	\$1,505,520.00
Net Present Value of Safety Benefits	\$450,208.40
Net Benefit	(\$1,055,311.60)
Benefit / Cost Ratio	0.30

Expected Annual Crash Adjustment

Number of Fatal & Incapacitating Injury Crashes	-0.036
Number of Injury Crashes	-0.257
Number of Total Crashes	-0.835

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	Breese Rd & Shawnee Rd Corridors	Contact Phone	(419) 891-2222
Reference Number	ALLC0002	Date Performed	8/18/2023
Analyst		Analysis Year	Proposed
Agency/Company	The Mannik & Smith Group		

\$1,600,000

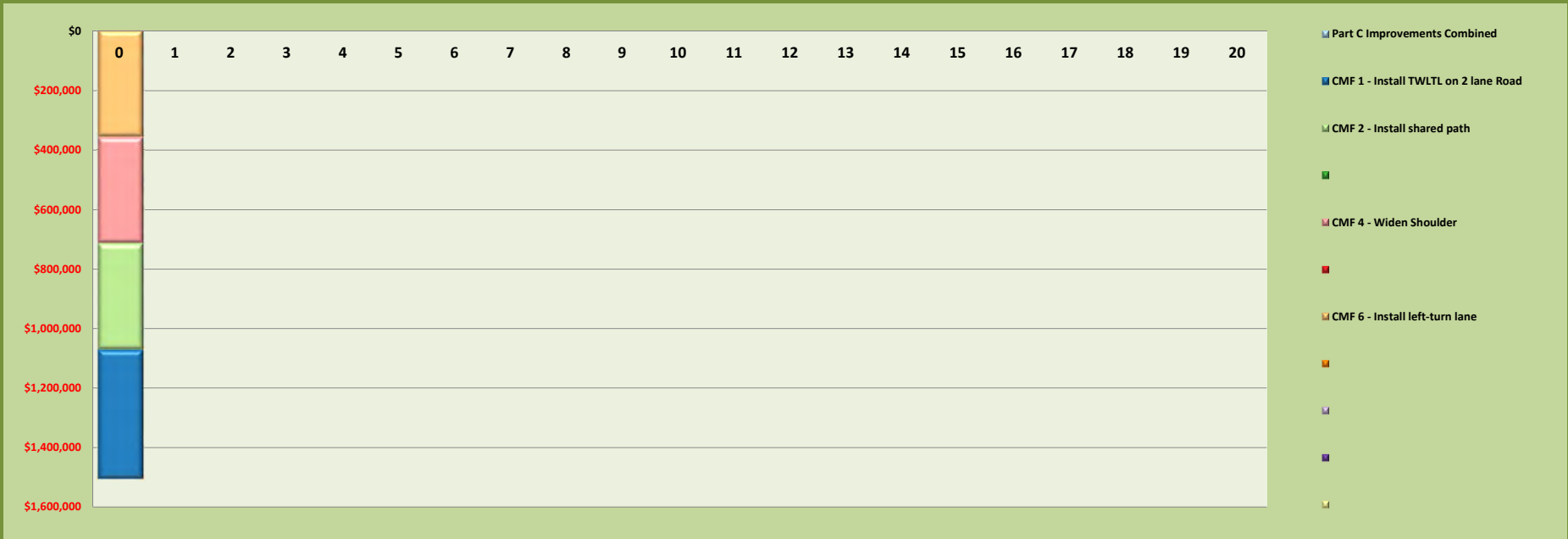


Safety Benefit - Cost Analysis

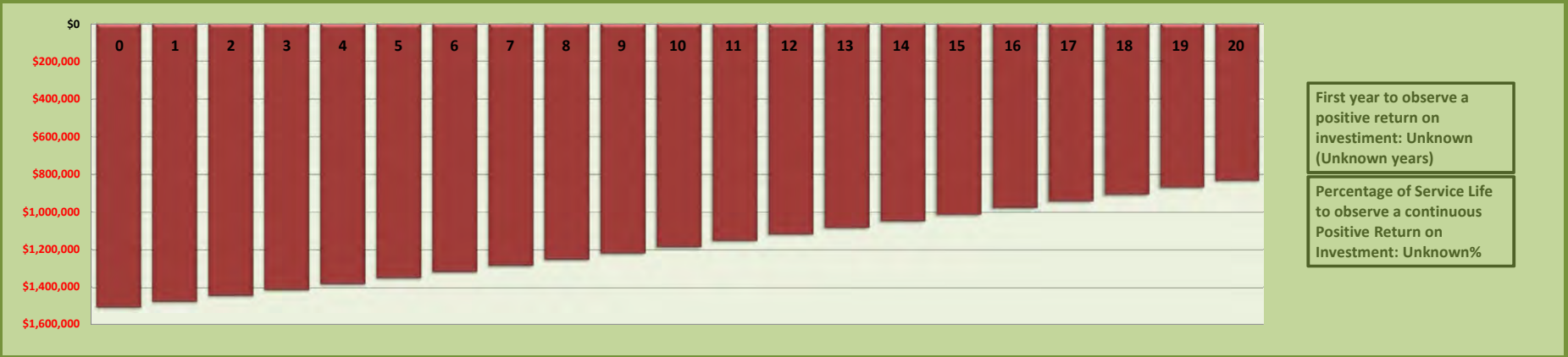
General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	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)



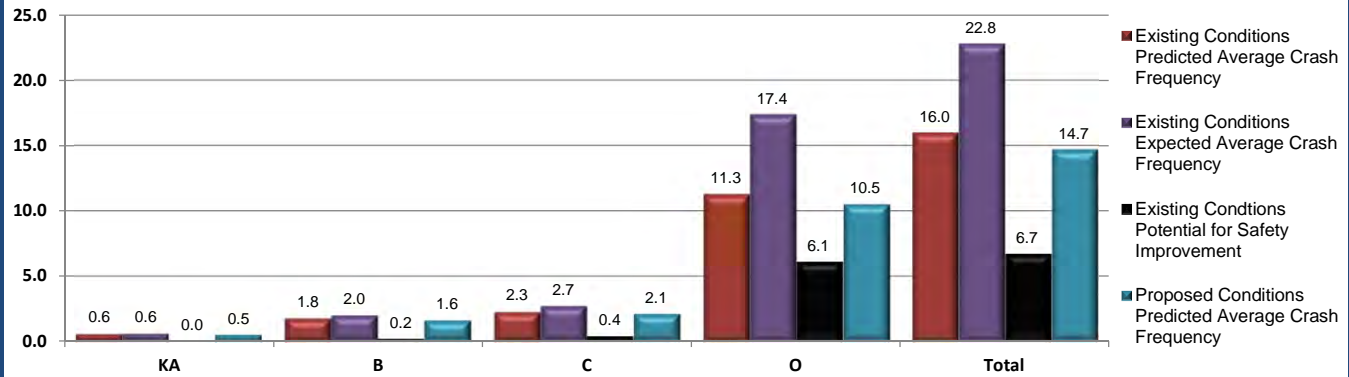


Project Safety Performance Report

General Information

Project Name	Allen County Safety Studies	Contact Email	
Project Description	Breese Rd & Shawnee Rd Corridors	Contact Phone	(419) 891-2222
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Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
N_{predicted} - Existing Conditions	0.5889	1.7912	2.3155	11.3235	16.0191
N_{expected} - Existing Conditions	0.6224	2.0090	2.6860	17.4451	22.7625
N_{potential for improvement} - Existing Conditions	0.0335	0.2178	0.3705	6.1216	6.7434
N_{predicted} - Proposed Conditions	0.5380	1.6113	2.0623	10.5148	14.7264



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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
CR142: 3-3.725	Breese Rd (Beeler to Shawnee)	0.0778	0.1808	0.1874	0.911	1.357
CR142: 3.775-4.915	Breese Rd (Shawnee to Dixie Hwy)	0.1368	0.3268	0.3641	1.7578	2.5855
CR142: 4.965-5.985	Breese Rd (Dixie to McClain)	0.1526	0.3727	0.4353	2.0782	3.0388
CR152: 2.036-2.536	Shawnee Rd (Breese to Reed)	0.0425	0.1029	0.1192	0.5654	0.83
CR142: 3	Breese Rd & Beeler Rd	0.0253	0.078	0.0893	0.5307	0.7233
CR142: 3.75	Breese Rd & Shawnee Rd	0.057	0.2993	0.4584	2.3436	3.1583
CR142: 4.94	Breese Rd & Dixie Hwy	0.0601	0.3181	0.4897	2.4682	3.3361
CR142: 6.021	Breese Rd & McClain Rd	0.0194	0.0427	0.08	0.3177	0.4598
CR152: 2.011	Shawnee Rd & Reed Rd	0.0174	0.0699	0.0921	0.3509	0.5303



Project Safety Performance Report

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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
CR142: 3-3.725	Breese Rd (Beeler to Shawnee)	0.0713	0.1654	0.1706	1.0355	1.4428
CR142: 3.775-4.915	Breese Rd (Shawnee to Dixie Hwy)	0.1446	0.3707	0.4539	2.7378	3.707
CR142: 4.965-5.985	Breese Rd (Dixie to McClain)	0.174	0.4434	0.5274	4.78	5.9248
CR152: 2.036-2.536	Shawnee Rd (Breese to Reed)	0.0568	0.1551	0.2027	1.4036	1.8182
CR142: 3	Breese Rd & Beeler Rd	0.0276	0.0855	0.0981	0.6249	0.8361
CR142: 3.75	Breese Rd & Shawnee Rd	0.0538	0.2809	0.4249	2.1025	2.8621
CR142: 4.94	Breese Rd & Dixie Hwy	0.0707	0.3791	0.6007	3.6424	4.6929
CR142: 6.021	Breese Rd & McClain Rd	0	0.0295	0.073	0.2475	0.35
CR152: 2.011	Shawnee Rd & Reed Rd	0.0236	0.0994	0.1347	0.8709	1.1286



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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		
CR142: 3-3.725	Breese Rd (Beeler to Shawnee)	-0.0065	-0.0154	-0.0168	0.1245	0.0858	
CR142: 3.775-4.915	Breese Rd (Shawnee to Dixie Hwy)	0.0078	0.0439	0.0898	0.98	1.1215	
CR142: 4.965-5.985	Breese Rd (Dixie to McClain)	0.0214	0.0707	0.0921	2.7018	2.886	
CR152: 2.036-2.536	Shawnee Rd (Breese to Reed)	0.0143	0.0522	0.0835	0.8382	0.9882	
CR142: 3	Breese Rd & Beeler Rd	0.0023	0.0075	0.0088	0.0942	0.1128	
CR142: 3.75	Breese Rd & Shawnee Rd	-0.0032	-0.0184	-0.0335	-0.2411	-0.2962	
CR142: 4.94	Breese Rd & Dixie Hwy	0.0106	0.061	0.111	1.1742	1.3568	
CR142: 6.021	Breese Rd & McClain Rd	-0.0194	-0.0132	-0.007	-0.0702	-0.1098	
CR152: 2.011	Shawnee Rd & Reed Rd	0.0062	0.0295	0.0426	0.52	0.5983	



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

Project Element ID	Common Name	Crash Severity Level				Total
		KA	B	C	O	
CR142: 3-3.725	Breese Rd (Beeler to Shawnee)	0.0778	0.1808	0.1874	0.911	1.357
CR142: 3.775-4.915	Breese Rd (Shawnee to Dixie Hwy)	0.1368	0.3268	0.3641	1.7578	2.5855
CR142: 4.965-5.985	Breese Rd (Dixie to McClain)	0.1526	0.3727	0.4353	2.0782	3.0388
CR152: 2.036-2.536	Shawnee Rd (Breese to Reed)	0.0281	0.0679	0.0786	0.3732	0.5478
CR142: 3	Breese Rd & Beeler Rd	0.0167	0.0515	0.0589	0.3503	0.4774
CR142: 3.75	Breese Rd & Shawnee Rd	0.0429	0.2295	0.3536	2.0155	2.6415
CR142: 4.94	Breese Rd & Dixie Hwy	0.0529	0.284	0.4395	2.4682	3.2446
CR142: 6.021	Breese Rd & McClain Rd	0.0128	0.0282	0.0528	0.2097	0.3035
CR152: 2.011	Shawnee Rd & Reed Rd	0.0174	0.0699	0.0921	0.3509	0.5303



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Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Predicted Crash Frequency
Unknown	0.0356	0.0347	-0.0009	0.0335
Head On	0.1730	0.2292	0.0562	0.1562
Rear End	5.8381	10.4024	4.5643	5.3805
Backing	0.4214	0.7668	0.3454	0.3863
Sideswipe - Meeting	0.2457	0.5477	0.3020	0.2359
Sideswipe - Passing	1.4890	2.6356	1.1465	1.3613
Angle	1.9110	2.6759	0.7649	1.6873
Parked Vehicle	1.0815	0.8568	-0.2247	1.0325
Pedestrian	0.3610	0.3610	0.0000	0.3577
Animal	2.7057	2.0123	-0.6935	2.6183
Train	0.0009	0.0010	0.0001	0.0008
Pedalcycles	0.3232	0.3232	0.0000	0.2811
Other Non-Vehicle	0.0002	0.0002	0.0000	0.0001
Fixed Object	2.5663	2.1280	-0.4383	2.4181
Other Object	0.1167	0.0915	-0.0252	0.1119
Overturning	0.0745	0.0641	-0.0104	0.0684
Other Non-Collision	0.1766	0.1457	-0.0309	0.1686
Left Turn	0.7635	0.9915	0.2280	0.6843
Right Turn	0.4100	0.5073	0.0973	0.3619



Safety Benefit - Cost Analysis

General Information

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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
Site Characteristic Improvements (i.e. Lane widening)		\$0.00			\$0.00	\$0.00	0.000	\$0
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		
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
CMF 3 - Signal upgrade	20	\$552,330.00			\$552,330.00	\$552,330.00	-0.165	\$210,472
CMF 4 - Widen Shoulder	20	\$165,240.00			\$165,240.00	\$165,240.00	-0.684	\$361,002
CMF 5 - Install Pedestrian Countdown timers	20	\$552,330.00			\$552,330.00	\$552,330.00	-0.014	\$29,747
		\$0.00			\$0.00	\$0.00	0.000	\$0
CMF 7 - Provide Right Turn lane on One Major-Road Approach	20	\$552,330.00			\$552,330.00	\$552,330.00	-0.430	\$129,268
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
		\$0.00			\$0.00	\$0.00	0.000	\$0
Totals		\$1,822,230.00	\$0.00	\$0.00	\$1,822,230.00	\$1,822,230.00	-1.293	\$730,489



Safety Benefit - Cost Analysis

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Benefit - Cost Calculator

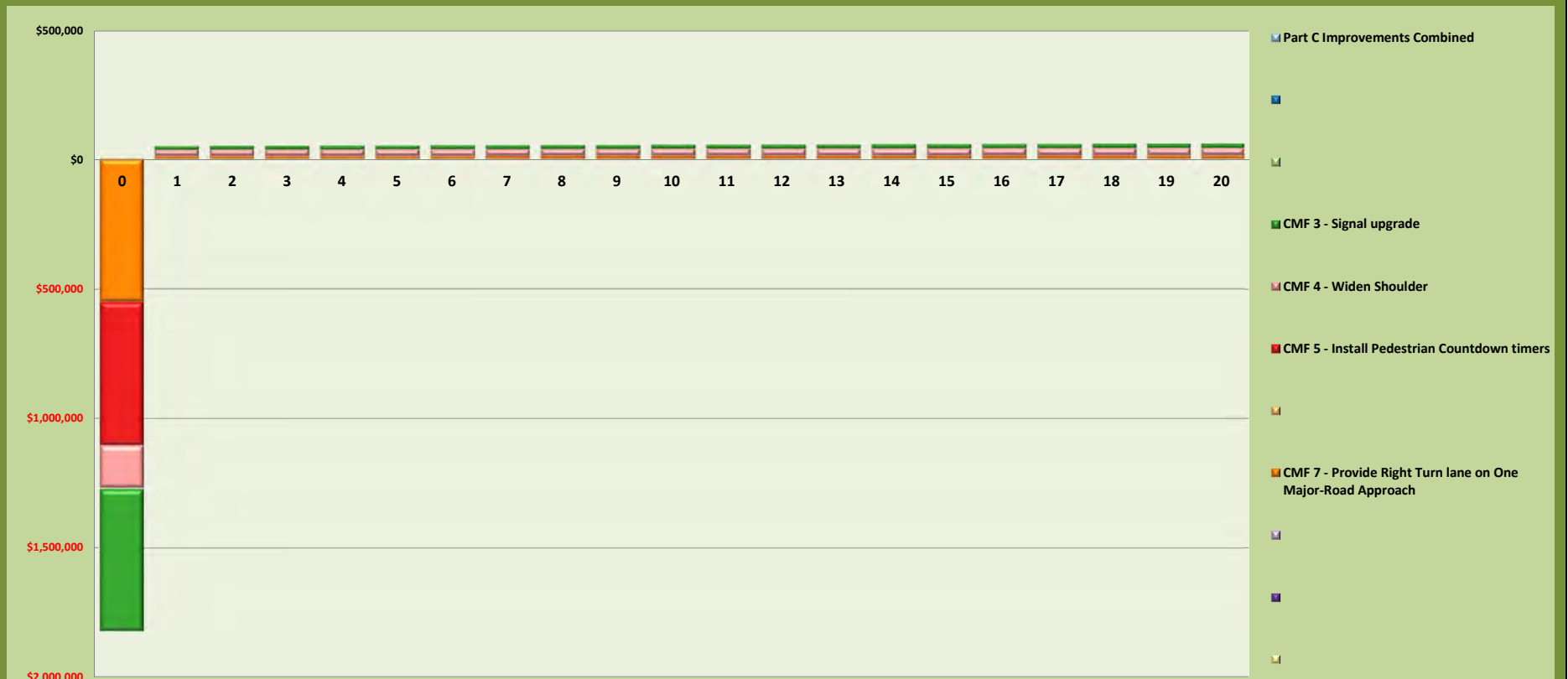
Net Present Value of Project	\$1,822,230.00
Net Present Value of Safety Benefits	\$730,489.49
Net Benefit	(\$1,091,740.51)
Benefit / Cost Ratio	0.40

Expected Annual Crash Adjustment

Number of Fatal & Incapacitating Injury Crashes	-0.051
Number of Injury Crashes	-0.484
Number of Total Crashes	-1.293

Comments:

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





Safety Benefit - Cost Analysis

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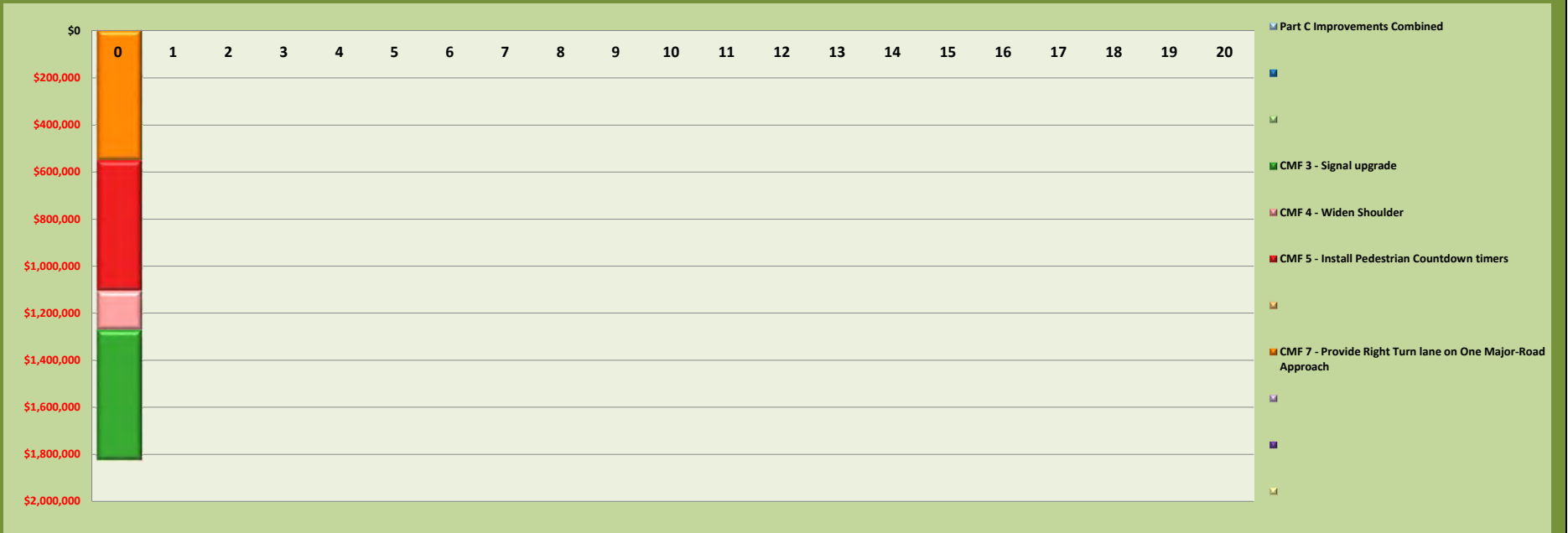


Safety Benefit - Cost Analysis

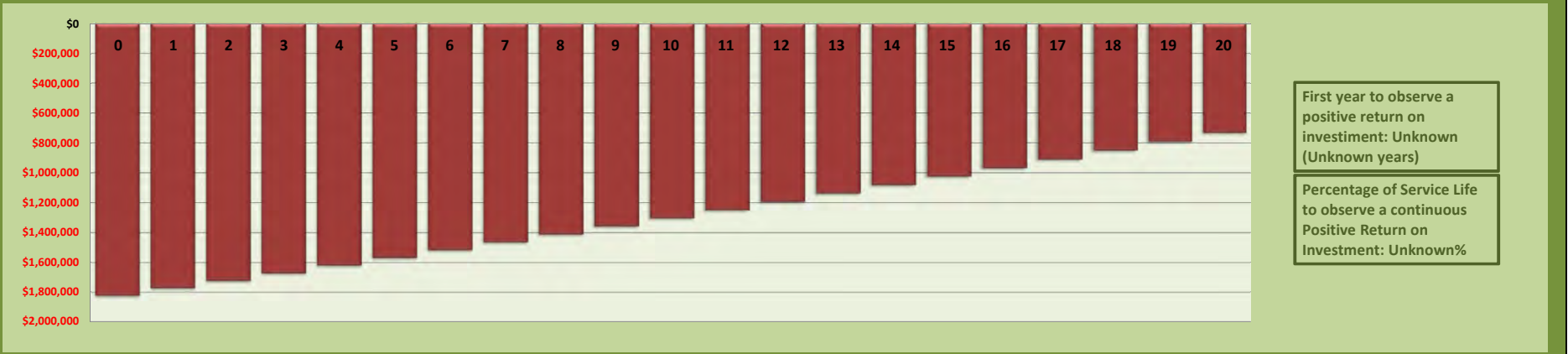
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Project Costs Only Cash Flows By Countermeasure Per Year



Return on Investment (Safety Benefits and Project Investments)



APPENDIX F
PHOTOS





Photo 1: Looking northward on Beeler Rd. at Breese Rd. where the NE corner has tight turning radius for school bus movements



Photo 2: Large trucks have difficulty making right turns from westbound Breese to northbound Shawnee and swing into opposing lanes



Photo 3: The Breese Road corridor experiences both large trucks and buses throughout the corridor



Photo 4: Traffic queuing at the signalized intersection for westbound Breese Rd. at Dixie Hwy.



Photo 5: Traffic congestion between Dixie Highway and I-75 interchange on Breese Road



Photo 6: One lane bridge found just east of I-75 interchange on Breese Road that is programmed for a future widening project



Photo 7: Inadequate turning radius on northwest corner of Breese Road and McClain Road intersection

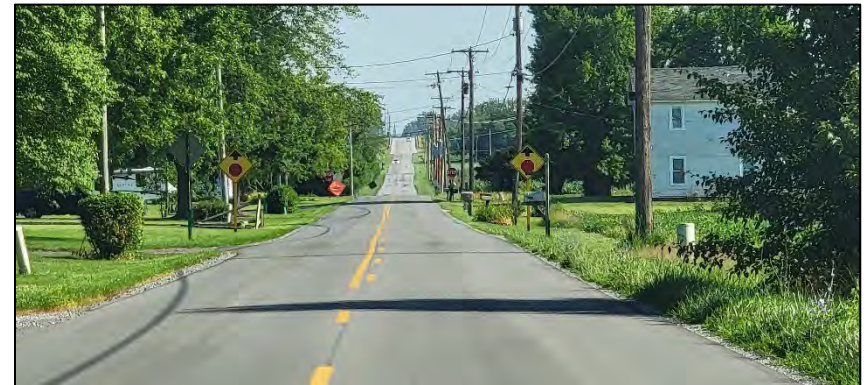


Photo 8: Dual Stop Ahead and Stop Signs on northbound McClain Road approaching Breese Road



Photo 1: Heritage Park Shared Use Path located just north of Reed Road along Shawnee Road



Photo 2: School zone warning sign approaching Reed Road on Shawnee Road for southbound traffic

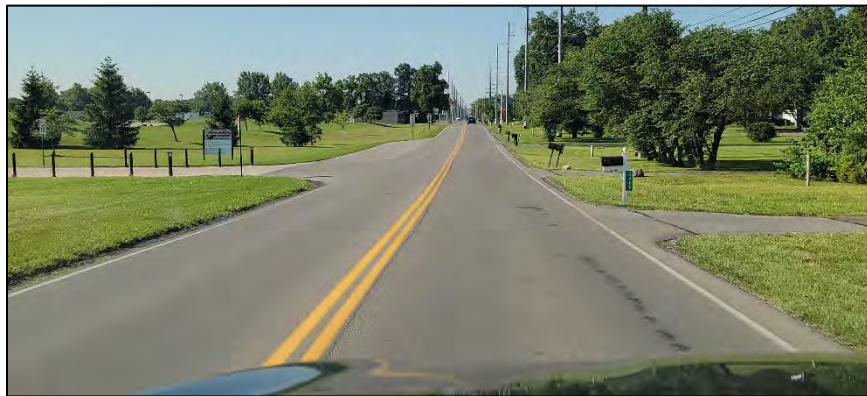


Photo 3: Apollo Career Center driveway, with not center two-way left turn lane to help remove turning vehicles from through traffic

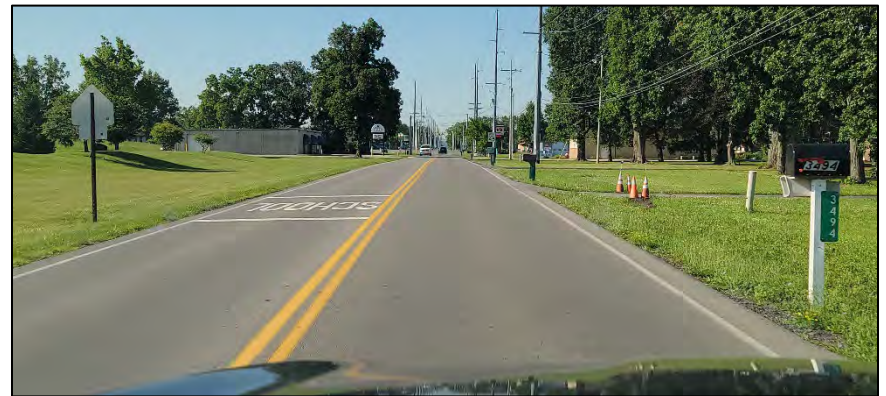


Photo 4: Narrow shoulders along Shawnee Road corridor and no sidewalks

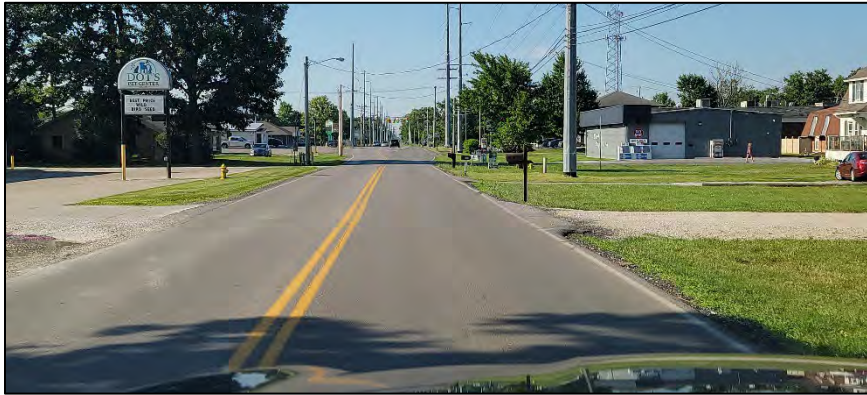


Photo 5: Southbound Shawnee Road approaching Breese Road



Photo 6: Northbound Shawnee Road approaching one of the Apollo Career Center driveways that has a right turn lane



Photo 7: Northbound Shawnee Road approaching Reed Road intersection



Photo 8: Looking northward from Reed Road side street at Shawnee Road at the railroad crossing located just north of the intersection