The Ohio LTAP Center and the ODOT Office of Highway Safety present:

Ohio Safety Project Processes and Funding Course: A 4-part webinar series
Presenters:

- Raymond Brushart, Safety Circuit Rider
- Ohio LTAP Center

- Jeremy Thompson, Highway Safety Engineer
- ODOT Office of Program Management
Ohio Safety Project Processes and Funding Course

- PART 1: ODOT’s Highway Safety Improvement Program and Safety Project Process
  - Traditional Spot Projects
  - Systemic Improvements
  - Targeted and Mixed Projects
- PART 2: Traditional Safety Projects & their application process (with examples)
- Part 3: Systemic Safety Projects & their application process (with examples)
- Part 4: Pedestrian Safety Improvement Program (PSIP) Projects & their application process (with examples)
HSIP Program Requirements
HIGHWAY SAFETY IMPROVEMENT PROGRAM

Purpose:
Federally required program to reduce traffic deaths and serious injuries on all public roads.

Funding:
$158M Annually
- 90% Federal/State - Requires 10% match
  Signs, signals, pavement markings and guardrail 100%

Funding Committee - Sept. 19th, 2017
Eligibility:
- Any public road with a minimum of 10 crashes over a three year period
  - Requirement can be waived for severe or fatal injury crashes
- Any activity consistent with SHSP and corrects or improves a highway safety problem.
- In-eligible activities:
  - Education and Enforcement
Multi-Disciplinary Review Committee

- Highway Safety Program Staff
- Office of Roadway Engineering
- Office of Traffic Operations
- Office of Local Programs
- At least 2 District Safety Review Team Representatives
Polling Question

- If a location does not meet the requirement of having 10 crashes within a 3-year period, it is officially denied to receive any HSIP Funding.

- True or False.
TODAY’S LEARNING OBJECTIVES

After today’s session, you will be able to:

- Understand the HSIP application process
- Discuss what the Review Committee looks for as they decide which projects get funded
- Appreciate the differences between rural and urban Spot Improvement projects
- Realize that a wide range of projects can get funded
Safety Project Application
Up to $10M Available Per Project
Project #1 - City of Newark

Intersection Safety Improvement Project

4th Street (SR 13) & W. Main Street

How did this project begin?

- Locally known Crash “Hot Spot”
- Met the criteria for having a crash history of 10 or more crashes in a 3-year period
- These type of projects don’t necessarily need to be on a Priority Ranking List
- Funding has been allocated, but project is not built yet
Spot Safety Improvement
Newark - 4th Street and W. Main Street
Safety Study Content

- Existing Conditions
- Crash Data & Analysis
- Probably Causes
- Discussion of Potential Countermeasures
  - Signalized Intersection Improvements versus Roundabout Construction
- Proposed Countermeasure Evaluation
- Conclusions
Existing Conditions

- Intersection of OH 13 (4th Street) and W Main Street
- City of Newark, Licking County, within ODOT District 5
- Downtown Commercial Zoning District
- 4th Street is classified as an urban principal arterial, W Main Street is urban minor arterial.
- Both streets have posted speed limits of 25 miles per hour.
Existing Conditions

- In the northbound and southbound directions at the intersection, 4th Street has a left-turn lane, a shared through / right-turn lane, and one receiving lane.
- Westbound W Main Street has a left-turn lane, a shared through / right turn lane and two westbound receiving lanes.
- Eastbound W Main Street has a right-turn lane, a through lane, and left-turn lane with one eastbound receiving lane.
- There is angle parking on the curbs and in the median on W Main Street and parallel parking on 4th Street.
- There are bike lanes on 4th Street that run from W Church Street to W Canal Street.
- Sidewalks are present on both sides of the street on all approaches to the intersection.
Turning Movement Counts
Crash Data & Analysis

- From **2013-2017, 53 crashes occurred in the study area.**
- In 2013 there were 15 crashes; in 2014 there were 11 crashes; in 2015 there were 9 crashes; in 2016 there were 10 crashes; and in 2017 there were 8 crashes.
- Of these crashes, **16 crashes or 30% resulted in injury** while 37 or 70% resulted in property damage only (PDO).
- The most predominant crash type on the corridor was rear end crashes which accounted for 30% of the total number of crashes.
- This crash type was followed by **angle, sideswipe – passing, and backing crashes accounting for 17%, 13%,** and 7% of the total, respectively.
Based on the detailed crash reports, sixteen crashes, or 30% of all crashes, involved a driver in the process of parking or leaving a parking spot.

Two crashes involved pedestrians and two crashes involves bicyclists.

Three out of the four pedestrian and bicycle crashes resulted in injury.

This intersection was identified as the highest pedestrian crash location in the County.
Crash Data & Analysis (continued)

- The majority of crashes, 74%, occurred at an estimated speed of 25 miles per hour and under.
- Crashes occurred predominantly on Wednesday’s followed by Monday’s and Friday’s accounting for 30%, 23%, and 21% of the total, respectively.
- Sixty-three percent of crashes occurred between the hours of 12:00PM and 5:00PM.
- The highest contributing factor to crashes in the study area was ‘followed too closely/assured clear distance ahead (ACDA)’ in 26% of crashes followed by ‘failure to yield’ in 21% of crashes.
- In 77% of cases the second vehicle was traveling straight ahead or was slowing or stopped in traffic.
RECENT CONSTRUCTION in Downtown Newark

- Traffic operations around the Courthouse Square in downtown Newark were recently converted from one-way in the counterclockwise direction to two-way.
- The previous square operated with three or four travel lanes and angle parking along the majority of the square.
- The square, which surrounds the Licking County Courthouse, underwent construction between 2015 and 2018 and now operates as two-way with one lane in each direction and roundabouts at the four corners of the square.
- Before the project, the block of Main Street between the square and 4th Street had two lanes in each direction with angle parking on the edges of the road and in the median.
- After the project, there is one lane in each direction.
PROBABLE CAUSES

- Based on the existing conditions investigation and the crash analysis, specific safety concerns have been identified at the intersection of 4th Street and W Main Street.
- These concerns include items under the categories of traffic operations, geometric features, and parking.
Drivers turning left were observed navigating the turns at relatively high speeds, often cutting the corner of the turn, creating a larger conflict zone through the crosswalk and encroaching on the opposing left turn lane.

Drivers were observed accelerating during the yellow indication or running red lights to avoid stopping at the intersection.

During the peak period, queues from the through traffic on eastbound and westbound W Main Street extend beyond the entrance to the left-turn lanes.

Queues from the left-turning vehicles on W Main Street also extend beyond the length of the turn lanes, blocking the through lanes on W Main Street.
GEOMETRIC FEATURES & PARKING

- The large intersection footprint makes navigating the intersection more difficult for pedestrians and drivers.
- The angle parking on W Main Street begins close to the intersection and is difficult to back out of due to the proximity to the intersection and limited visibility.
- Crash reports detail sixteen crashes, or 30% of crashes at the intersection, related to the angled parking in the median and on the curbsides along W Main Street, particularly on the section between 4\textsuperscript{th} Street and 5\textsuperscript{th} Street.
CAM Tool - Newark

<table>
<thead>
<tr>
<th>Number</th>
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<th>TRAFFIC_CRASH_YEAR</th>
<th>Number</th>
<th>%</th>
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<td>30.2%</td>
<td>2013</td>
<td>15</td>
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<td></td>
<td>2017</td>
<td>8</td>
<td>15.1%</td>
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<tr>
<td></td>
<td></td>
<td>Grand Total</td>
<td>53</td>
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</tr>
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POTENTIAL COUNTERMEASURES

- The 4th Street Sewer Separation project along 4th Street, expected to be completed in 2020, provides an opportunity to implement significant changes at the intersection of 4th Street and W Main Street.

- The countermeasures include two scenarios: a roundabout at 4th Street and W Main Street and a signalized intersection with safety improvements.

- A roundabout would operate at Level of Service (LOS) A during both peaks with queues under 90 feet for all approaches.

- The conventional intersection would operate at LOS C during both peaks with the countermeasures below incorporated into the Synchro traffic models.
POTENTIAL COUNTERMEASURES

ROUNDABOUT

- Convert the intersection of 4th Street and W Main Street to a single-lane roundabout.
- Implement a road diet and install streetscaping to the block of W Main Street between 4th Street and 5th Street.
- Increase enforcement related to motorist yielding in marked crosswalks combined with a public education campaign.
- Review the bicycle network; remove bicycle lanes from 4th Street and create a bicycle route connection using low volume streets that are not state routes.
POTENTIAL COUNTERMEASURES

- SIGNALIZED INTERSECTION
  - Reinstall the traffic signal at the intersection
  - Implement a road diet and install streetscaping to the block of W Main Street between 4th Street and 5th Street.
  - Increase enforcement related to motorist yielding in marked crosswalks combined with a public education campaign.
  - Review the bicycle network; remove bicycle lanes from 4th Street and create a bicycle route connection using low volume streets that are not state routes.
CONCLUSIONS

- The intersection of 4th Street and W Main Street that was analyzed in this safety study was identified as the highest pedestrian crash location in Licking County.

- Based on a field visit on the corridor, crash analysis, and engineering evaluation, a combination of traffic operations, geometric factors, and the parking configuration were determined to contribute to crashes on the corridor.

- The 4th Street Sewer Separation project provides an opportunity to implement countermeasures that may otherwise have not been considered without the intersection reconstruction taking place as part of the sewer separation project.
CONCLUSIONS

- The impending intersection reconstruction that will occur was considered in this analysis.
- and the total costs for intersection reconstruction were considered in the scenarios.
- Based on the predicted average crash frequency for each scenario and the resulting benefit-cost ratios,
- the countermeasures included in the ROUNDABOUT scenario are recommended at this intersection.
Which type of intersection improvement would YOU prefer in this situation?

- A. Roundabout
- B. Signalized Intersection Improvements
SPOT IMPROVEMENT PROJECT #2

TUS-CR82-2.92/6.58 SAFETY STUDY

COUNTY ROAD 82 (DOVER-ZOAR RD NE) FROM

SCHNEIDERS CROSSING RD NW (CR80)/ FROMAN HILL ROAD (TR378) TO
MIDDLE RUN ROAD/CANAL ROAD NE (CR81)
PROJECT PURPOSE & BACKGROUND

- Mitigate safety issues at the intersection of CR82 (Dover-Zoar Rd) and Schneiders Crossing/Froman Road
- 1 fatal and 4 injury crashes in 5 years
- Meets Ohio Emphasis Area: Serious Crash Types
- Meets FHWA Emphasis Area - improving the design and operation of intersections
SAFETY STUDY CONTENT

- INTRODUCTION
- EXISTING CONDITIONS
- CRASH ANALYSIS
- MULTI-WAY STOP WARRANT
- SHORT & MEDIUM-TERM COUNTERMEASURES
- APPENDICES CONTAINING
  - TRAFFIC DATA
  - CRASH DIAGRAMS
  - CURVE STUDY
  - SAFETY DATA SUMMARY
  - CONCEPTUAL TRAFFIC CONTROL PLAN
  - SAMPLE CONSTRUCTION PLAN SET
INTRODUCTION

- The purpose of this study is to evaluate the existing safety performance and to identify potential countermeasures to reduce traffic crashes on Dover-Zoar Road (CR 82).

- The Dover-Zoar Road NE corridor is a top 5 ranked location on the Ohio Mid-Eastern Governments Association (OMEGA) high crash locations for 2018. The safety priority ranking takes into consideration crash severity and frequency.

- The crash data shows that the percentage of fatal and injury crashes were equal to 4.8% and 42.9%, respectively.

- The statewide average for similar roadways is 0.3% for fatal crashes and 23.5% for injury crashes.
INTRODUCTION

- Two fatal crashes occurred within the study area:
  - A fixed object crash occurred 1,900 feet north of Blacksnake Hill Road NE (TR380). A single vehicle rolled over on the east side of the roadway around 4:15 AM on 9/16/2017 (Saturday).
  - An angle crash occurred at the Schneiders Crossing Road NW (CR80) and Dover-Zoar Road (CR82) intersection. An eastbound vehicle ran the stop sign and struck a southbound vehicle on Dover-Zoar Road around 2:00 PM on 12/27/17 (Wednesday).
EXISTING CONDITIONS

- Dover-Zoar Road (CR 82) is classified as a Rural Major Collector.
- CR82 is a north-south county route connecting the City of Dover and the Village of Zoar. The Zoar Village Golf Course is located near the north end of the study area.
- The Tuscarawas County Engineer maintains the 2-lane roadway having a pavement width of 22 feet.
- An 85%ile speed of 47.6 MPH was measured at a location north of the Schneiders Crossing Road intersection.
WB CANAL ROAD APPROACH
EB MIDDLE RUN APPROACH
INTERSECTION SIGHT DISTANCE - SCHNEIDER
CRASH ANALYSIS

- Crash data was obtained from the ODOT TIMS database which consisted of a total of 42 crashes.
- The OH-1 crash report for each documented crash was reviewed to confirm accuracy and to locate crashes properly within the study limits.
- Fatal crashes – 2 crashes or 4.8%
- Injury crashes – 18 crashes or 42.9%
- Fixed object crashes -- 22 crashes or 52.4%
- Dark – 21 crashes or 50.0%
CRASH ANALYSIS

FIGURE 3: FREQUENCY OF CRASHES BY YEAR AND SEVERITY

- **Injury Crash**
- **Property Damage Crash**
- **Fatal Crash**
CRASH ANALYSIS

- Locations having 3 or more crashes are:
  - Middle Run NE/Canal Road NE intersection
  - Curve at STA 240. - one of the fatal crashes occurred here.
  - Curves between STA 213 and 221
  - Curves between STA 164 and STA 175
  - Scheiders Crossing Road (CR 80)/ Froman Hill Road (TR 378). – the other fatal crash occurred here.
  - Curve at STA 125.
Multi-way stop control was evaluated at the Schneiders Crossing and Dover-Zoar Road intersection as a potential, short term countermeasure. The following criteria from the Ohio Manual of Uniform
Ohio Manual of Traffic Control Devices (OMUTCD), latest edition, was used to evaluate the intersection for a multiway STOP sign installation.

The justification for 4-way stop control at the subject intersection warrant includes the following volume-based criteria:

- *The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day.*

The existing volumes on the major street approaches (CR 82) are equal to 134 vehicles in the PM peak hour and 79 vehicles in the AM peak hour.

The minimum volume threshold of 300 vehicles per hour for an 8-hour period is not met if the peak hour volumes cannot be met.
MULTI-WAY STOP WARRANT ANALYSIS

- The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same hours with an average delay to minor street vehicular traffic of at least 30 seconds per vehicle during the highest hour.

- The Schneiders Crossing Road NW (CR80) and Dover-Zoar Road (CR82) intersection does NOT meet criteria for a 4-way stop sign in accordance with minimum volume thresholds defined in the OMUTCD.

- Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation is NOT applicable to the subject intersection.
# CAM Tool and Curve Study Data Review

## TUS-CR82-2.10/5.85

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<th>Crash Severity</th>
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<tr>
<td>Property Damage Crash</td>
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<td>52.4%</td>
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<table>
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<td>2015</td>
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<table>
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<tr>
<td><strong>Grand Total</strong></td>
<td><strong>42</strong></td>
<td><strong>100.0%</strong></td>
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COUNTERMEASURES

- Reprofile of Dover-Zoar Road (CR 82) for a distance of 950 feet to mitigate 4 crashes (4 injury, 1 fatal).
- Reprofile of Schneiders Crossing (CR 80) for a distance of 450 feet to mitigate 2 fixed object crashes (PDO only).
- Increase shoulder widths on Dover-Zoar Road (CR 82) from 1-2 ft to 4-6 feet.
- Curve warning signs funded by CEAO safety program.
PROPOSED IMPROVEMENT OF INTERSECTION OF CR-82 & CR-80
PROPOSED IMPROVEMENT OF INTERSECTION OF CR-82 & CR-80

- EXCAVATION FOR VERTICAL ALIGNMENT REVISIONS. DITCHES ALSO CONSIDERED (TO IMPROVE SIGHT DISTANCE)
- EMBANKMENT FOR FILL AREAS FOR VERTICAL ALIGNMENT REVISIONS
- PROPOSED SIGN REPLACEMENTS. ASSUME 4 FT x 4 FT SIGNS FOR 20 SIGNS (BETTER ADVANCE WARNING)
- DOUBLE YELLOW CENTERLINE ON FOUR APPROACHES: 2*(460+950) = 2820
- DRAINAGE PIPES/CULVERTS PROTECTION AND DITCH CHECKS
OTHER IMPROVEMENTS THROUGH CR-82 CORRIDOR

- SHOULDER WIDENING
- IMPROVED CURVE SIGNAGE THROUGHOUT CORRIDOR THAT MEETS THE REQUIREMENTS OF THE OMUTCD
  - BETTER ADVANCE WARNING
  - BETTER GUIDANCE THROUGHOUT THE CURVES, FROM BEGINNING OF CURVATURE TO THE END OF CURVATURE
  - ADVISORY SPEED PLAQUES FOR THE CURVES, IF WARRANTED
- PAVEMENT MARKINGS - EDGE LINES AND CENTER LINES
WHY DID WE SELECT THESE 2 PROJECTS FOR TODAY’S COURSE?

- We feel that these 2 HSIP projects were good projects to discuss today because:
  - They were quite different from each other in that one was rural and one was urban.
  - One met the crash criteria, while the other didn’t; however, it was allowed due to the crash severity.