



Transportation Systems Management & Operations

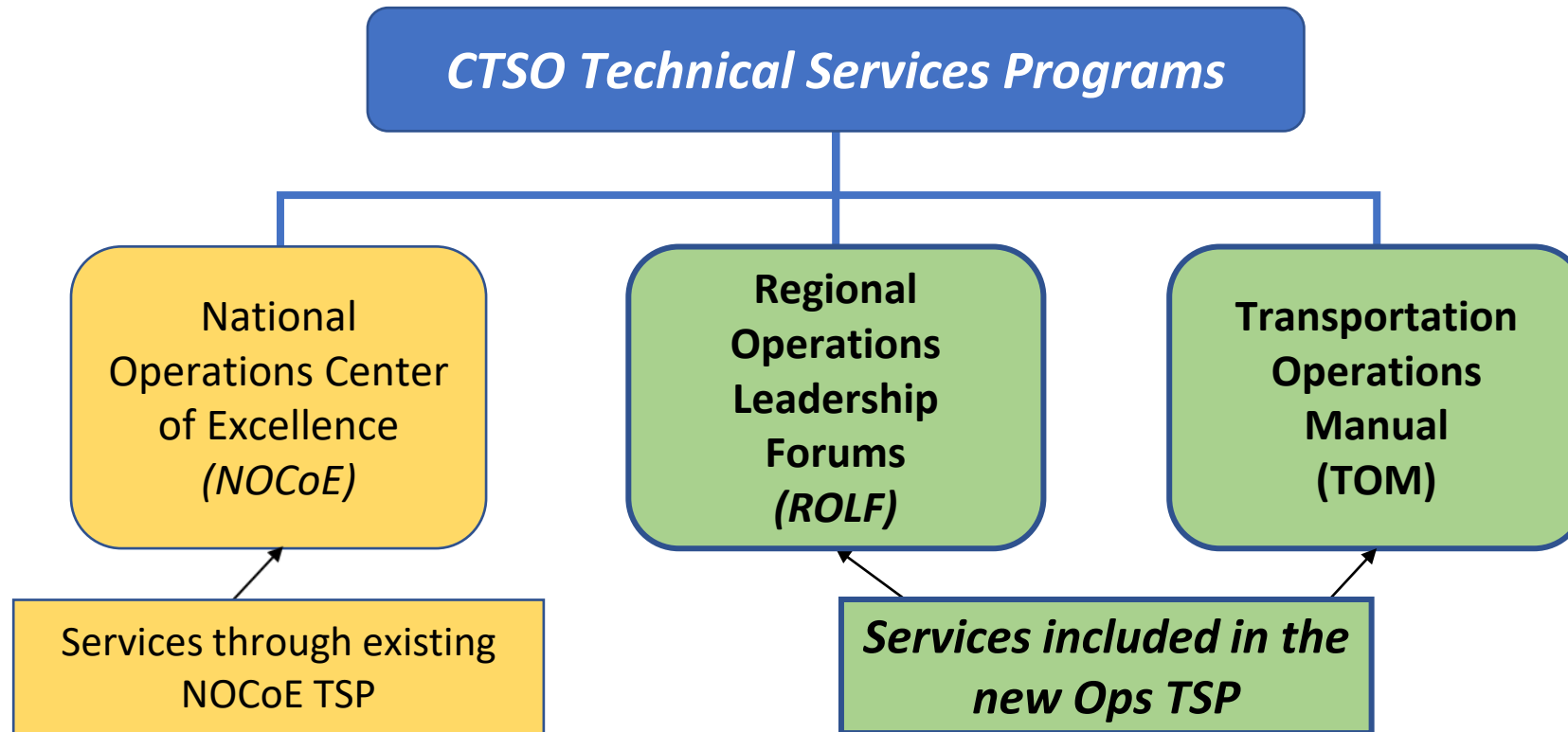
MAY 24, 2022

TONY KRATOFIL, PE

CHIEF OPERATING OFFICER & CHIEF ENGINEER

MICHIGAN DEPARTMENT OF TRANSPORTATION

Moving State DOTs Ahead for TSMO: Ops TSP



The new Ops TSP will complete the three pillars of CTSO's Technical Services Programs.

National Operations Center of Excellence

Director Faisal Saleem

- NOCoE is a partnership of AASHTO, ITE and ITS America supported by FHWA. NOCoE provides centralized services to support the transportation industry through workforce readiness, deployment of technology and practices, and mainstreaming of TSMO solutions through education, networking, communication, and knowledge transfer.
- In January this year Faisal Saleem joined as new NOCoE director. Prior to joining NOCoE Faisal served the Maricopa County Department of Transportation as ITS Branch Manager and MCDOT SMARTDrive Program Manager. In his role as NOCoE director Faisal looks forward to fulfill the strategic direction of the Center by serving and engaging broad TSMO community of professional practitioners to advance the TSMO practice through NOCoE's suite of products and services.
- To learn more about NOCoE please visit the Center's website www.transportationops.org



Prioritizing Safety

The Safe System Approach

- Seeking **safety** through the aggressive use of **roadway design and operational changes**.
- Fully integrating the **needs of all users** (pedestrians, bicyclists, older, younger, disabled, etc.) of the transportation system.



Safe Systems In Practice

Anticipating Human Error

- **Separating Users in Space**
- **Separating Users in Time**
- **Increasing Attentiveness and Awareness**

Accommodating Human Injury Tolerance

- **Reducing Speeds**
- **Reducing Impact Forces**

Artificial Intelligence (AI) Applications For Roadway Safety

East Jefferson and Randolph Street in Detroit, MI



- 90% prediction accuracy
- With this **connected vehicle technology**, we could have **avoided** at least 33 of the 37 collisions in 2019

JEFFERSON & RANDOLPH TRAFFIC VIOLATIONS (JUNE 24, 2019 – JULY 21, 2019)



JAY WALKING VIOLATIONS

Total counts:
Pedestrians: 693
Bicycles: 57



RED LIGHT VIOLATION WARNING

Total counts:
Violations: 12,303
Average Speed: 49 mph



CRASHES AND NEAR-MISSES

Total counts:
Low Severity: 2,100
High Severity: 181



6 Cameras with Thermal Imaging



1 RSU



Software AI to analyze video

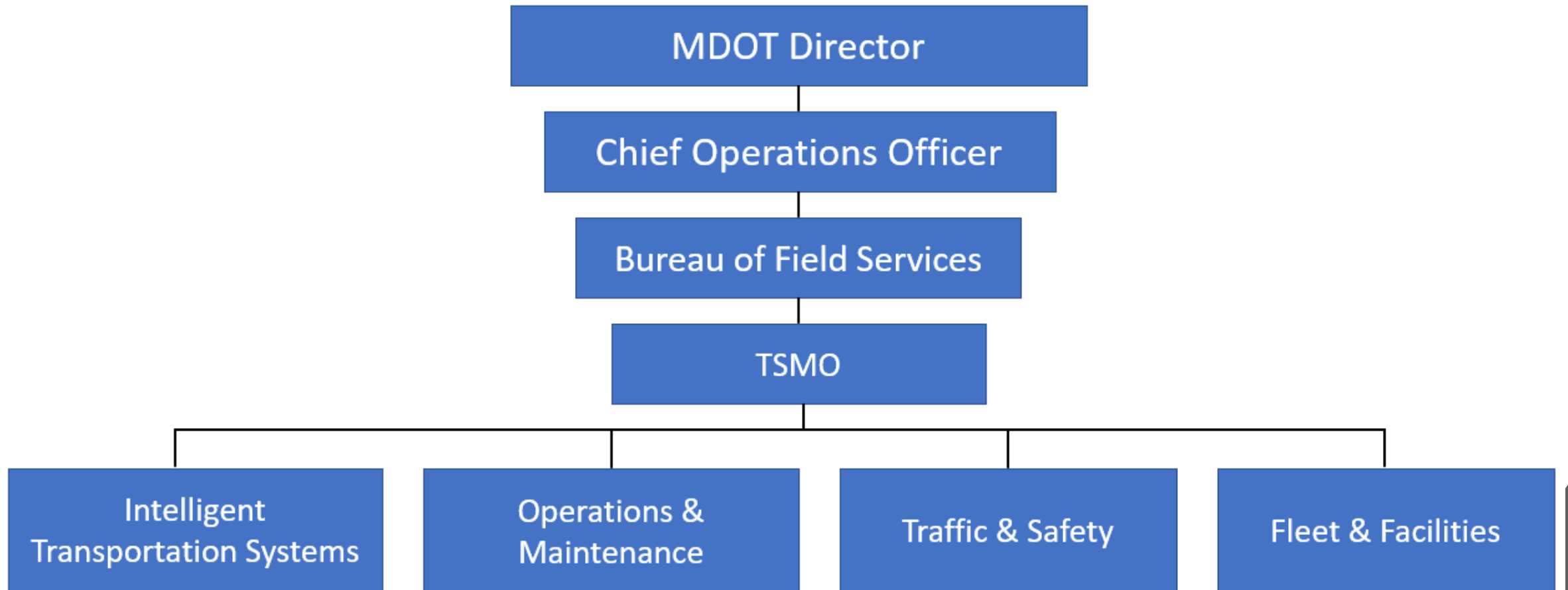
MACOMB CO. PED-X & SIGNAL PROJECT W/ GM



M1 GRANT - VIDEO ANALYTICS & WRONG WAY DRIVING



Transportation Systems Management & Operations



TSMO Division Director

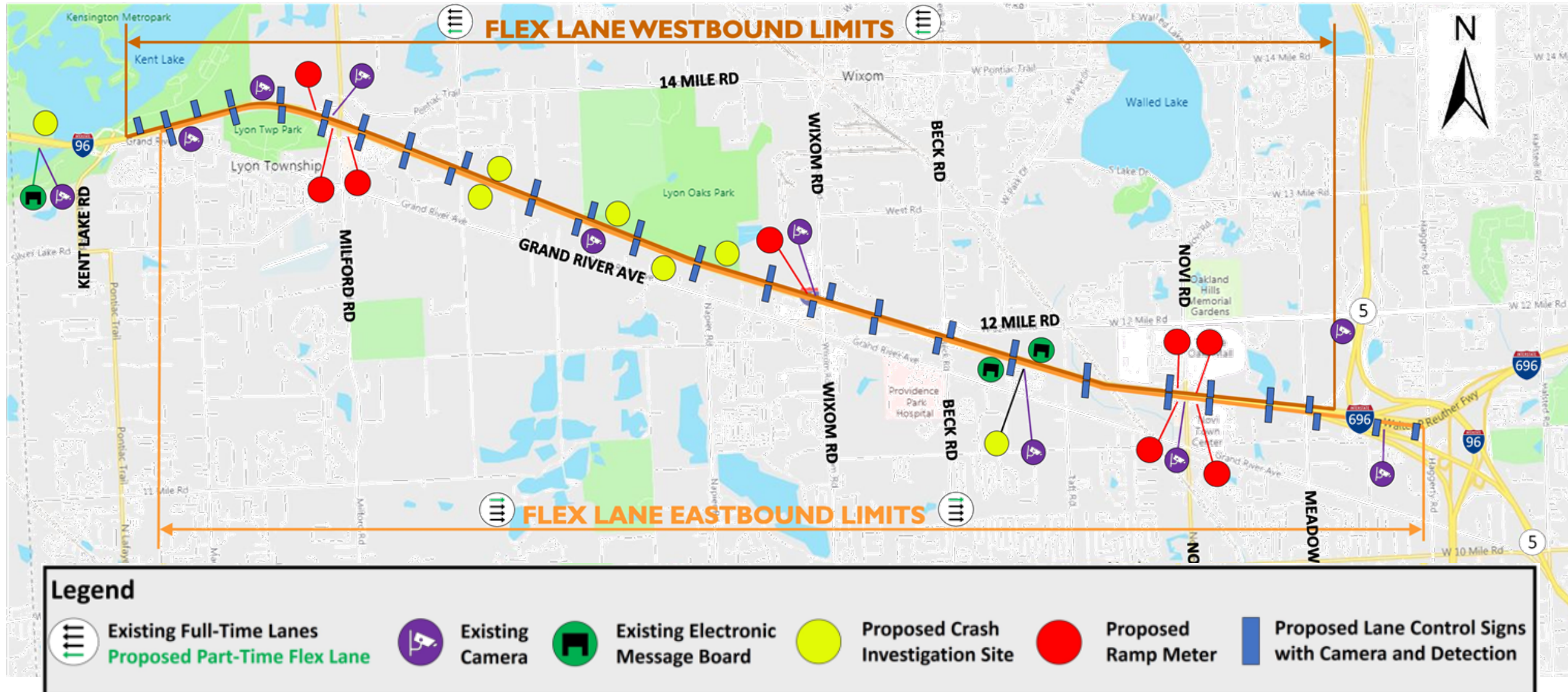
Kim Zimmer, P.E.

Kimberly Zimmer was appointed MDOT TSMO Division Administrator, effective February 7, 2022. Kimberly brings over 25 years' experience to the position and was previously the Bay Region Associate Region Engineer - Operations. Prior to her current position, Kimberly's MDOT experience includes working as Davison TSC Manager, Bay Region's Traffic, Safety, & Operations Engineer, Bay City TSC Cost and Schedule Engineer, and Design Engineer at the Mt. Pleasant TSC. Prior to coming to MDOT she worked three years with a consulting firm. She earned a bachelor's of science degree in Civil Engineering from Michigan Technological University and a Master's degree in Business Administration in Marketing and Human Resources from Central Michigan University. Over the many years in Bay Region, she has built strong partnerships with local partners and state agencies. She spends her free time with her family and volunteering at school, with athletics and community organizations.

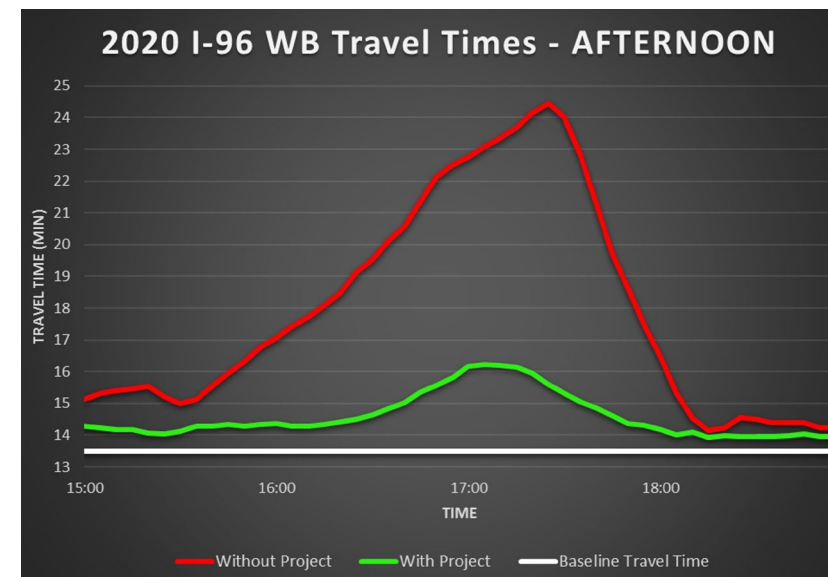
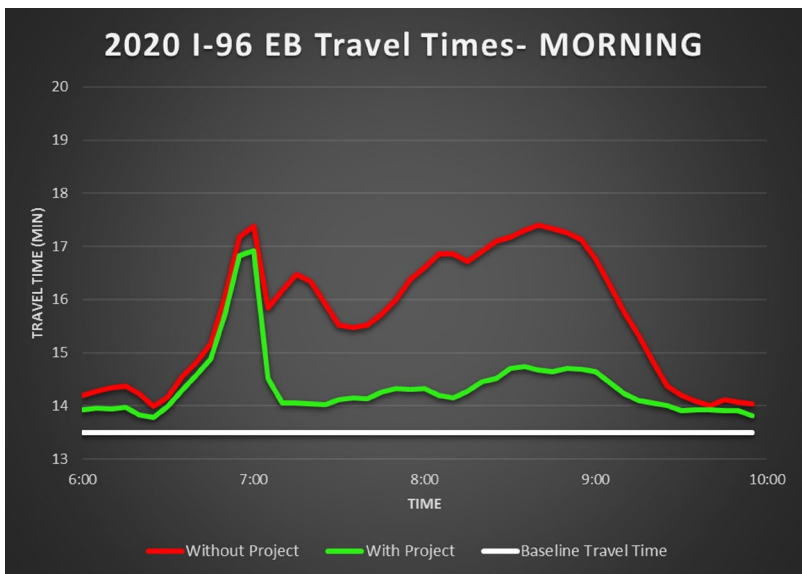




Kent Lake Road to I-275 Oakland County



- Installation of Active Traffic Management System from Kent Lake Road to I-275
 - Gantries, lane controls signs, message boards, cameras and detection to allow part-time median shoulder use, provide queue warning and variable speed advisories, and facilitate incident management
 - **Ramp metering** at 8 entrance ramps to reduce congestion and improve safety by breaking up entering traffic platoons
 - **7 crash investigation** sites along outside shoulders to facilitate clearance of incidents
- Project is expected to improve morning and afternoon travel times and increase travel time reliability throughout the corridor



Arterial Operational Improvements

- **Signal Performance Measures (SPM)**

- New signals along M-3 and US-12 in Detroit to mitigate congestion related to I-94 Modernization
- Advanced detection and integration into MDOT Central Signal Control System to provide real-time timing adjustments
- Additional routes planned: Grand River, Randolph, Jefferson

- **QLine Operation Improvements**

- Transit-only lane along M-1 adjacent to Little Caesars Arena in Detroit
- Transit Signal Priority system in development to improve schedule reliability

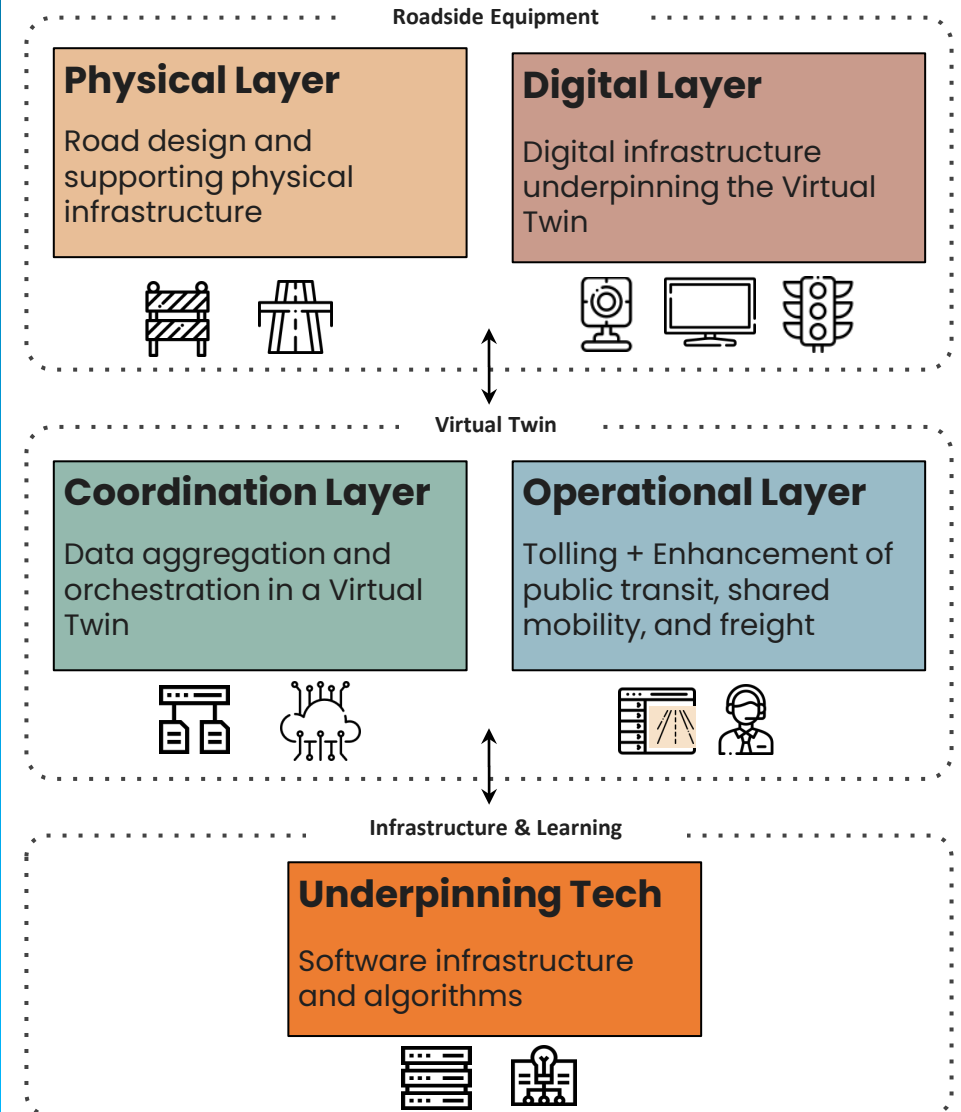
- **Signal Optimization**

- Recent optimization of **11 Corridors, 281 signals** in Metro Region
- New signal timing reflects post-pandemic traffic patterns

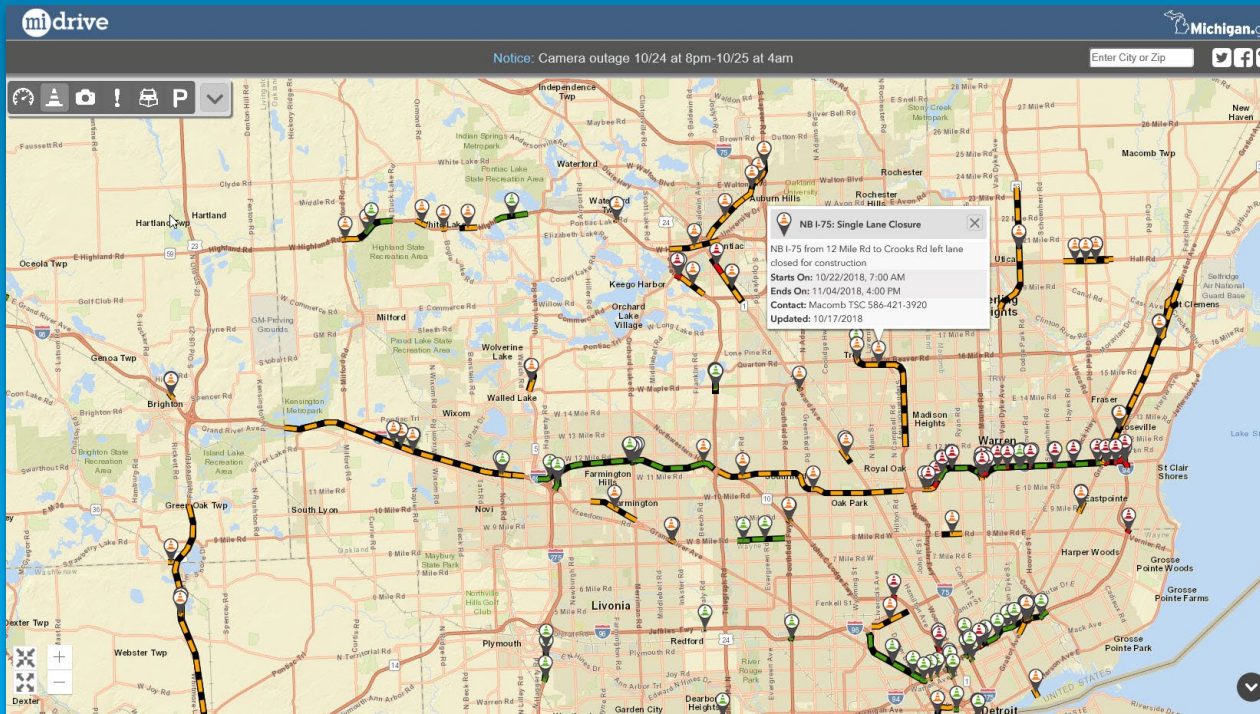


CAV-Corridor Technology Platform

Cavnue is integrating hardware and software to develop a proprietary road mobility solution



Work Zone Application Highlight



- Improve Work Zone Data Collection
- WZDx Compliant Software
- Upcoming efforts focused on improved workers presence

- Newly developed system to support:
 - Data Collection
 - Data Management
 - Data Distribution
 - Mi Drive Website
 - 3rd Party Traveler Info Providers
 - CV Messages



Marc VanTil, Give 'em A Brake
Craig Innis, MDOT



Kim Webb, MDOT
Rob Coppersmith, MITA



Aden Shea, PK Contracting
Steve Brink, MDOT



Mike Malloure, CA Hull
Tom Fox, MDOT



Brian Morley, Great Lakes Eng.
Chris Brookes, MDOT
Deven Rau, Cadillac Asphalt
John Osika, Operating Engineers
Daryl Gallant, Laborers



Lindsey Renner, MDOT
Mike DeFinis, lafrate



Ryan O'Donnell, Anlaan
Craig Heidelberg, MDOT

Higher Urgency on Key Themes



Positive Protection



Night Work



High Risk Operations
(e.g. Set-ups & Stage Changes)



Enforcement



Temporary Rumble Strips

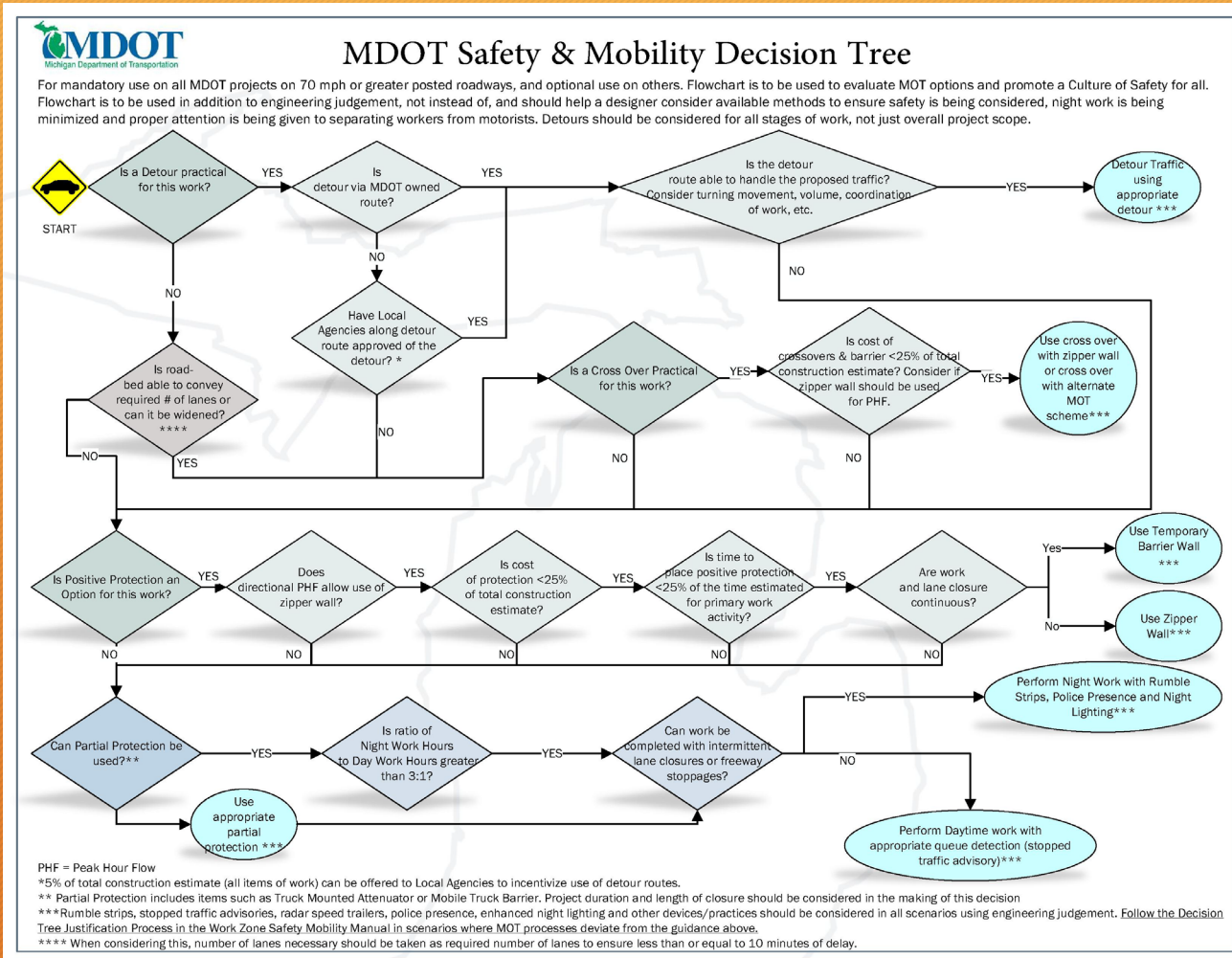


Truck Mounted Attenuators



Worker Training

Work Zone Safety & Mobility Policy & Manual Changes



➤ High Speed Routes

➤ Positive Protection First

➤ Closure & Detours

➤ Barrier Separation

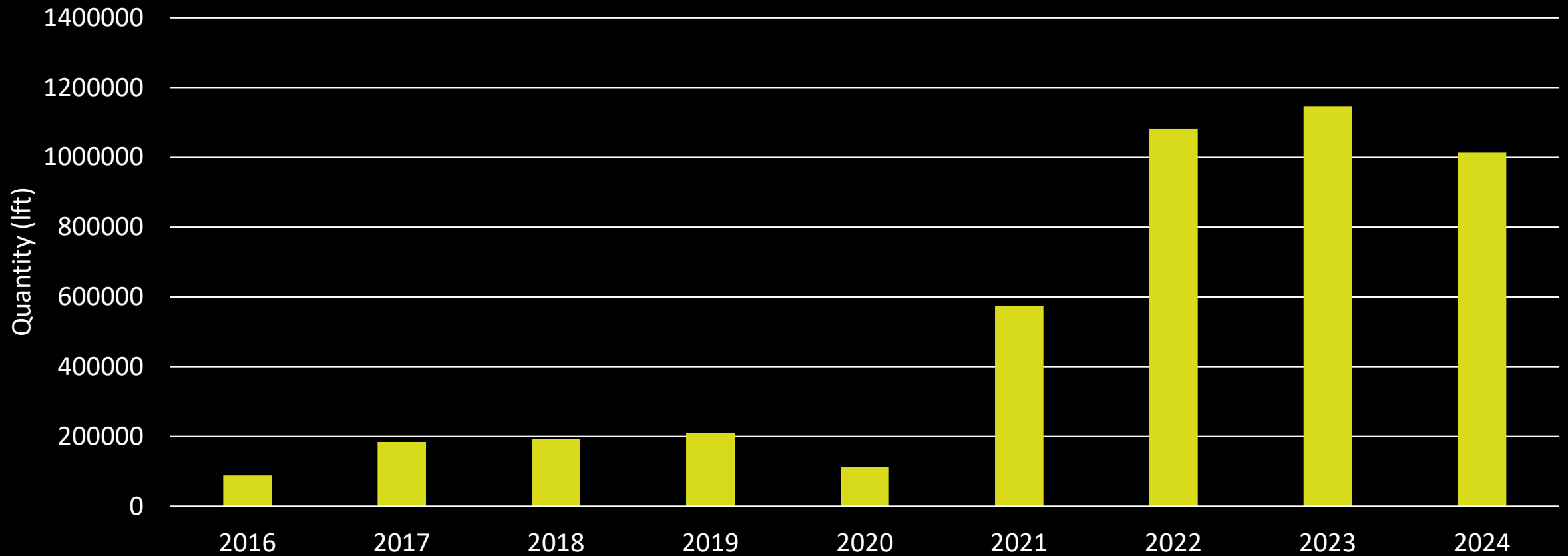
➤ Minimizing Night Work without Positive Protection

➤ Menu of Best Practices



Work Zone Safety & Mobility Policy & Manual Changes

Temporary Concrete Barrier Usage



Work Zone Safety & Mobility Policy & Manual Changes

Example:

I-96 Monroe Ave to Leonard St (Grand Rapids)
5.0 miles Mill & Resurfacing w/detail 7s & 8s

WAS:

45-50 night-time lane closures

NOW:

Complete weekend closures for Detail 7s & 8s
Friday 7 pm to Monday 5 am

Full directional closure (9 ½ days) for Resurfacing

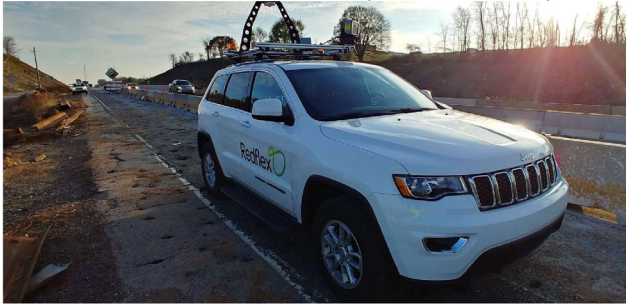
- ✓ Positive separation with full closure
- ✓ Reduce poor visibility exposure
- ✓ Reduce days of exposure



Automated WZ Speed Enforcement



Automated Work Zone Speed Enforcement (AWZSE)



Field Deployment Guide

Pub. 824
04/20

- ✓ Peer Exchanges with Pennsylvania DOT, Illinois DOT & Maryland DOT to learn about their successful pilot and the challenges they overcame to get there.
- ✓ Engagement with Legislators to gain their appreciation for work zone safety and commitment to help.



Pilot Initiatives - 2021



Early industry review on constructability & safety



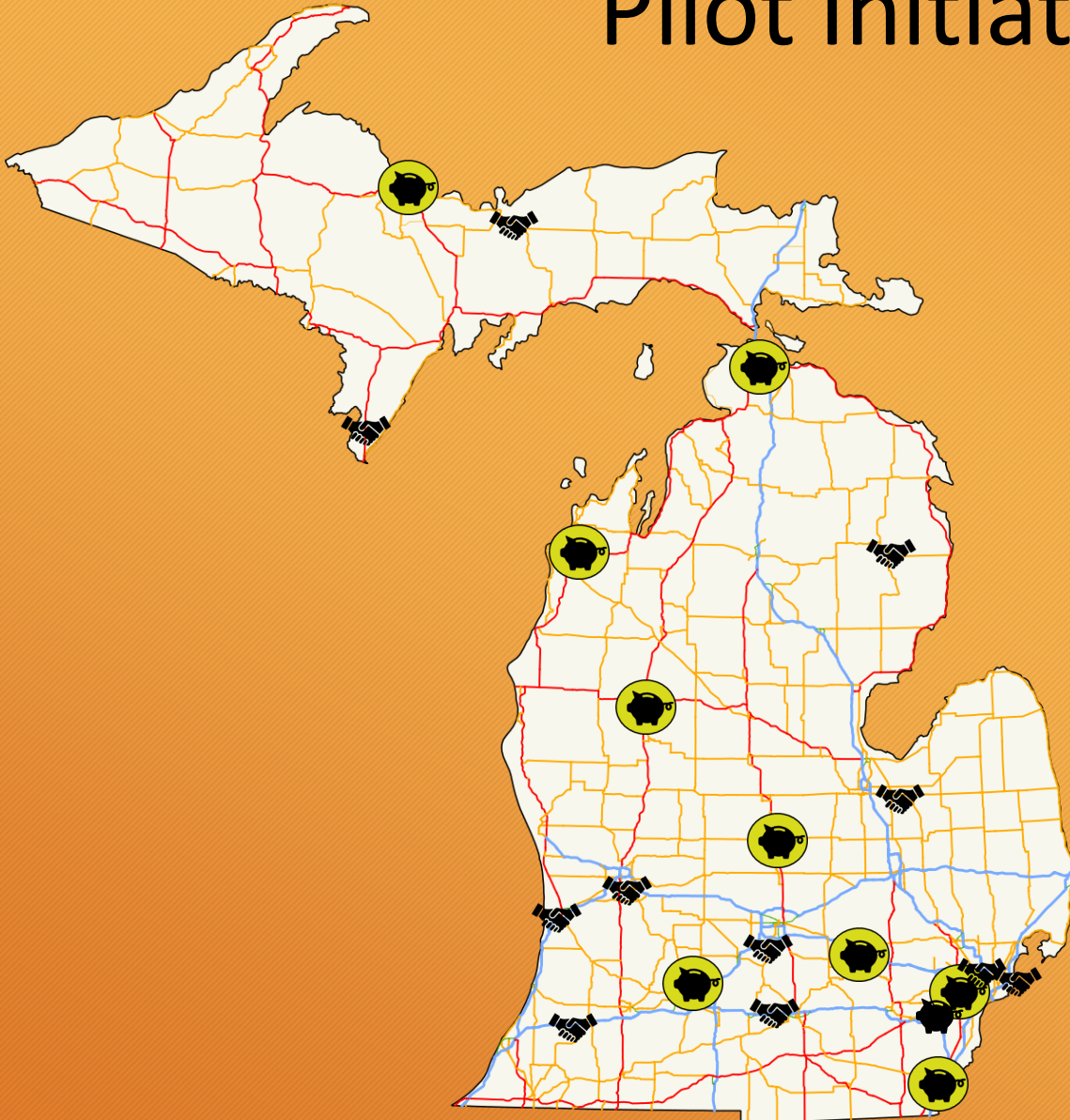
WZ Safety Collaboration



WZ Safety Contingency Fund



Pilot Initiatives - 2022



WZ Safety Collaboration



WZ Safety Contingency Fund



**BOTH WZ Safety Contingency &
WZ Safety Collaboration**



Work Zone Safety Technology



“Where Workers Present”
Variable Speed Display



Automated Flagger
Assistance Devices (AFAD)



Mobile Barrier Trailers



Work Zone Safety & Mobility Culture

POSITIVE PROJECT SAFETY COLLABORATION AWARD





An award aimed at recognizing and celebrating the uniting of all parties on a Michigan highway construction project to achieve a positive safety culture.

Award Details

The award will be presented by the Work Zone Safety Task Force to one or more project teams (MDOT, contractors, designers) that demonstrate a remarkable partnership to achieve the safest work environment possible for workers, motorists, and other stakeholders.

Criteria for Consideration

- Collaboration amongst all parties involved in the project.
- Innovation/implementation of new ideas and techniques for work zone safety.
- Responsiveness to change in the work zone to promote safety.
- Effective communication to maintain positive results.
- Demonstration of a collective and positive project safety culture.

ABOUT THE WZSTF

The Michigan Work Zone Safety Task Force launched in October 2018 as a collaborative effort between the Michigan Department of Transportation (MDOT) and Michigan's heavy/highway construction industry. It is the goal of the task force to reduce and eliminate work zone injuries and deaths of construction workers and motorists.

OUR MISSION

Working together, MDOT and the heavy construction industry are advancing our culture and practices to put safety first in Michigan's work zones.

For more information, visit our website: Michigan.gov/WorkzoneSafety |  MichiganWZSTF

- ✓ **Collaboration** amongst all parties involved in the project.
- ✓ **Innovation** / implementation of new ideas and techniques for work zone safety.
- ✓ **Responsiveness to change** in the work zone to promote safety.
- ✓ **Effective communication** to maintain positive results.
- ✓ Demonstration of a collective and positive project **safety culture**.



PROTECTMIWORKZONES.COM



As a Worker...

It is my responsibility to work safely in Michigan work zones and to ensure the safety of my coworkers, road users, and myself.

I pledge to:

- Make safety my number one priority.
- Be responsible for my personal safety as well as those around me.
- Drive safely and distraction-free through all work zones.
- Lead by example. Work safely and responsibly without distractions.

As a Road User...

It is my responsibility to drive, walk and/or ride safely through all Michigan work zones, and to ensure the safety of workers, other road users, and myself.

I pledge to:

- Give work zones my full attention and eliminate distractions – no tailgating, texting, phone calls, eating, or other distracting behaviors.
- Reduce my speed and obey all signs and instructions.
- Be patient, remain calm, and respect Michigan workers and the work they do.