



Improving Work Zone Safety with the Work Zone Data Exchange (WZDx)

April 27, 2023

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U.S. Department of Transportation



The WZDx Story

- Established in 2018 to serve ADS, but transitioned to a wider audience
- Developed through an open, iterative process
- Notable for collaboration between data consumers and producers
- A model for developing data exchanges through open collaboration and partnership



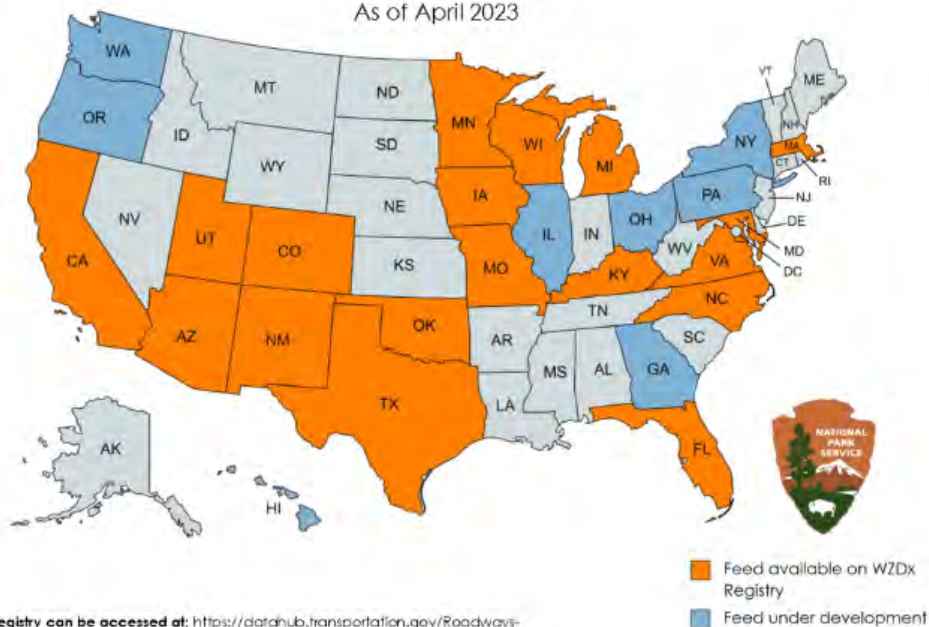
WZDx: Specifications for 4 data feeds

GitHub site	<u>WZDx</u>	<u>WZDx</u>	<u>TDx</u>	<u>TDx</u>
Feed	Device Feed	Work Zone Feed	Road Restriction Feed	Road Incident Feed
Features	<i>Devices</i>	<i>Road Events</i>	<i>Road Events</i>	<i>Road Events</i>
Feature types	Arrow boards, cameras, dynamic message signs, flashing beacons, hybrid signs, location markers, traffic sensors, traffic signals	Work zones and detours	Restrictions, such as bridge heights	Incidents and detours
Producer	Work zone equipment manufacturers or vendors.	Transportation Authorities like Tribal, Local, County, State, or Federal Agencies.		
Consumer	Transportation agencies. Mapping & Navigation companies and CAVs may also be interested.	Traveling public via third parties such as mapping and navigation applications and CAVs.		

WZDx Continues to Grow

WZDx Activity

As of April 2023



Feed Registry can be accessed at: <https://datahub.transportation.gov/Roadways-and-Bridges/Work-Zone-Data-Exchange-WZDx-Feed-Registry/69qe-ytl>

WZDx Statistics

400

Contributors

185

Unique
Organizations

19

Active Feeds

Why WZDx?

- Enable integration of planned and real-time closure data across systems and vendors
- Improve work zone data quality across internal systems
- Support worker presence data sharing for safety benefit
- Integrate work zone data sharing across overlapping jurisdictions
- Automate sharing with mapping and navigation providers

Planned + Real-Time Data Integration

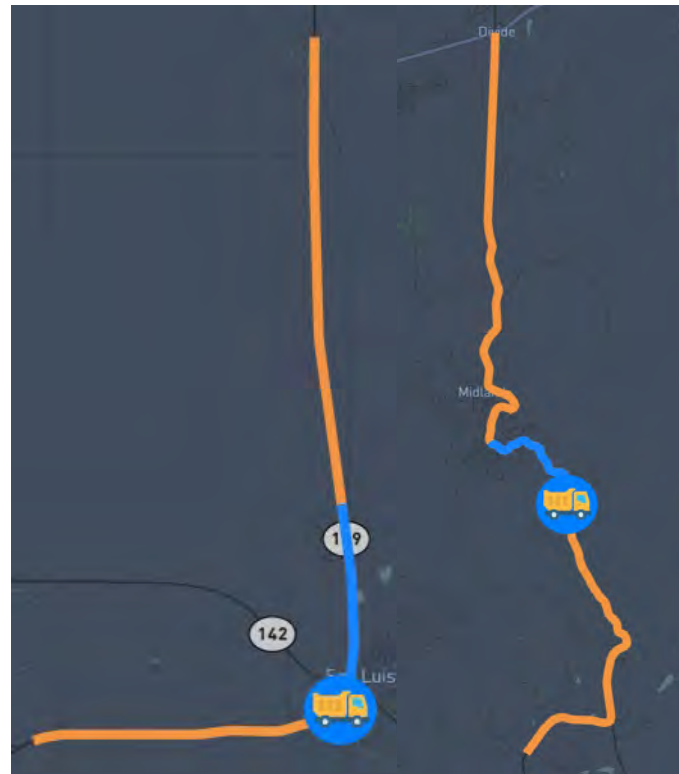
Colorado DOT: Merging of planned and real-time work information to more accurately communicate the real-time, dynamic nature of our work zone.

Leveraging WZDx and hooks to real-time hub to update maintenance and work zones based on work zone vehicle positioning

Orange line = planned work zone

Blue line = actively present work zone vehicle and workers

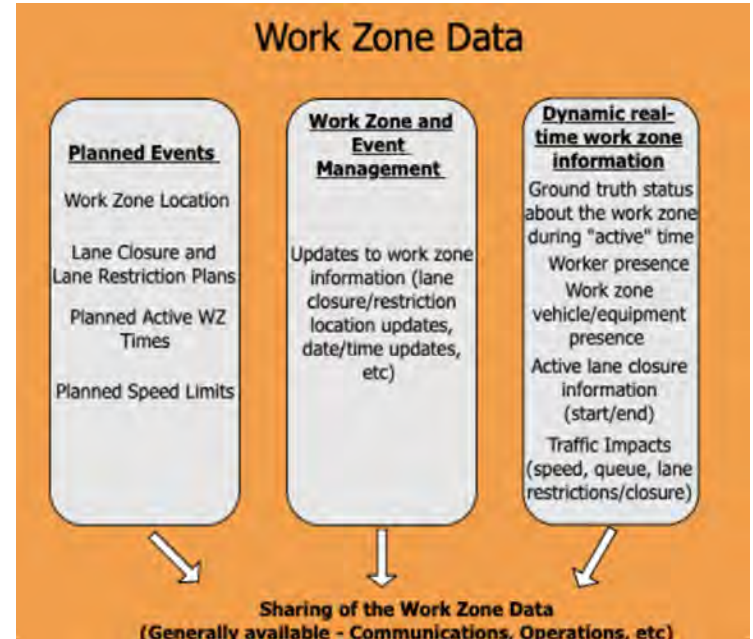
This information is published, in real-time and communicated back out via our traveler information system and roadway management system



Work Zone Data Quality

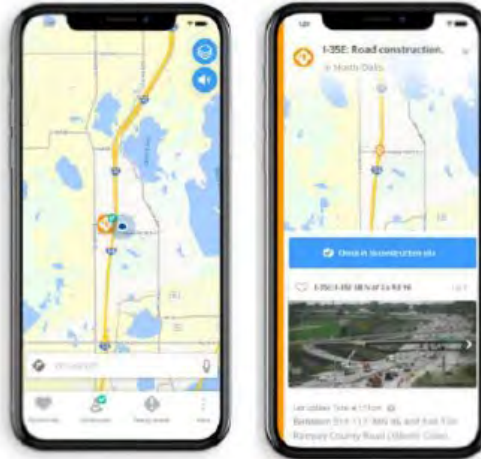
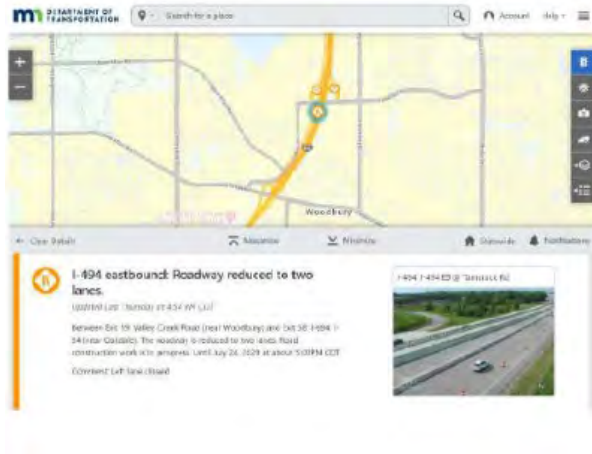
Colorado DOT: Substantial, on-going **quality** improvement of our work zone data and understanding the full work zone data lifecycle

- Directionality issues
- Road event issues
- Mismatching data (appears in COtrip, but not in WZDx and vice versa)
- Data error message (could not be posted to CARS)



Worker Presence

Minnesota DOT Worker Presence Pilot



<https://youtu.be/w4milSHq0ks>

Michigan DOT Demonstration
with Ver-Mac & GM

What's Next for WZDx: Part 1

- Development of the WZDx **Work Zone Feed** and **Device Feed** is complete as of v4.2
- A consortium led by ITE (w/ AASHTO & NEMA) and SAE is developing a standard based on WZDx: “Connected Work Zones”
 - This group previously conducted the Connected Intersections project
 - The resulting standard is not expected to significantly deviate from WZDx v4.2
 - Development is expected to take 12-18 months
 - Resulting standard will be free to use and download

What's Next for WZDx: Part 2

- U.S. DOT is exploring the WZDx model for data exchanges on other roadway disruptions
- Assessing the feasibility and use cases for developing a specification to enable access and exchange of real-time incidents



Incidents



Weather



Emergency Response



Special Events



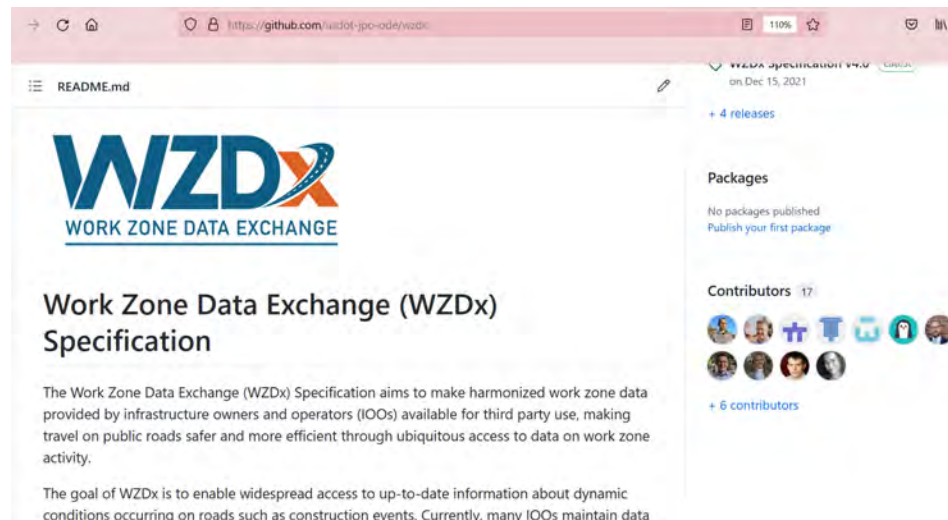
Evacuations

Questions?

For other questions, more information, or to join the mailing list email AVDX@dot.gov.

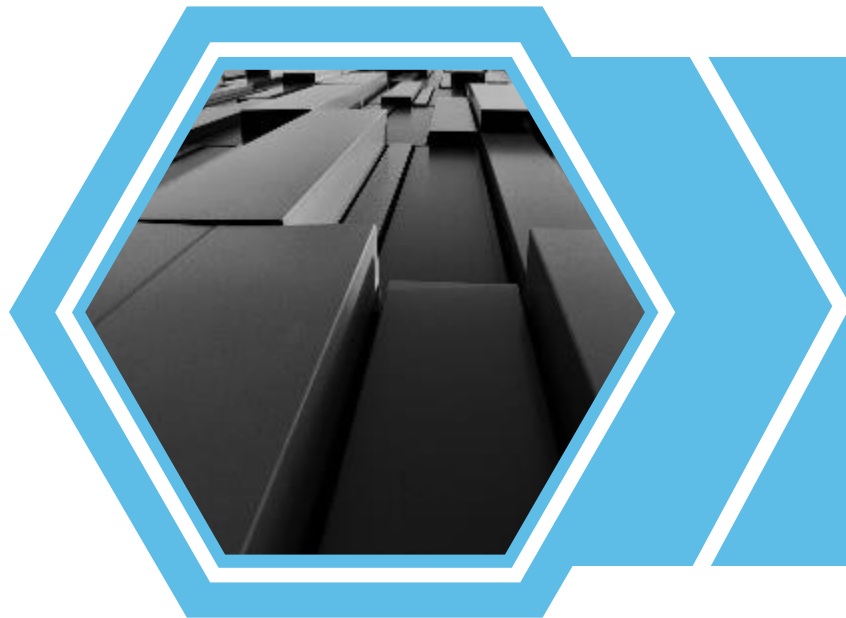
WZDx Resources for Adoption & Use

- [WZDx Example feeds](#) based on common road construction closure scenarios
- [WZDx data feed visualizations](#) and archives
- [JSON Schema for validating WZDx conformity](#)
- [.NET frameworks for building WZDx feeds](#)
- [Guidance documents](#) for data producers and consumers created by the WZDx community



- All WZDx resources and the WZDx specification are open and free for all to use at <https://github.com/usdot-jpo-ode/wzdx>

payver™
BY BLYNCSY

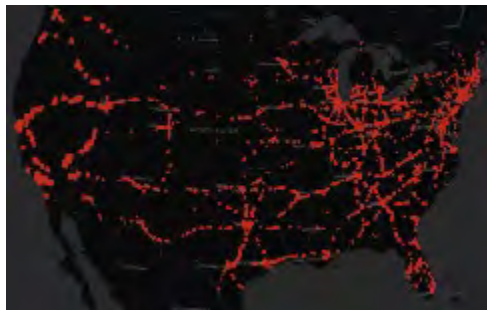


How Payver Detects Work Zones



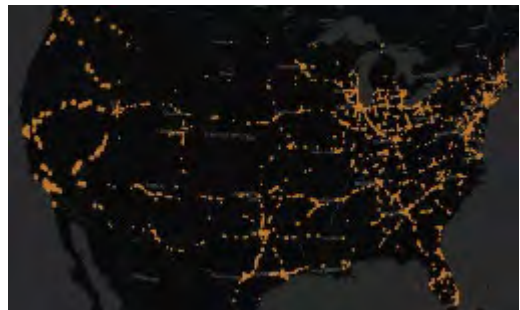
Detect and Inspect Work Zones

Using dashcam imagery and AI, Payver automatically detects barrels, signs, trucks, and other related equipment in order to detect work zones.



Put Work Zones on the Map

Payver uploads detected work zones to a GIS map, along with safety critical information, allowing for remote safety inspections.

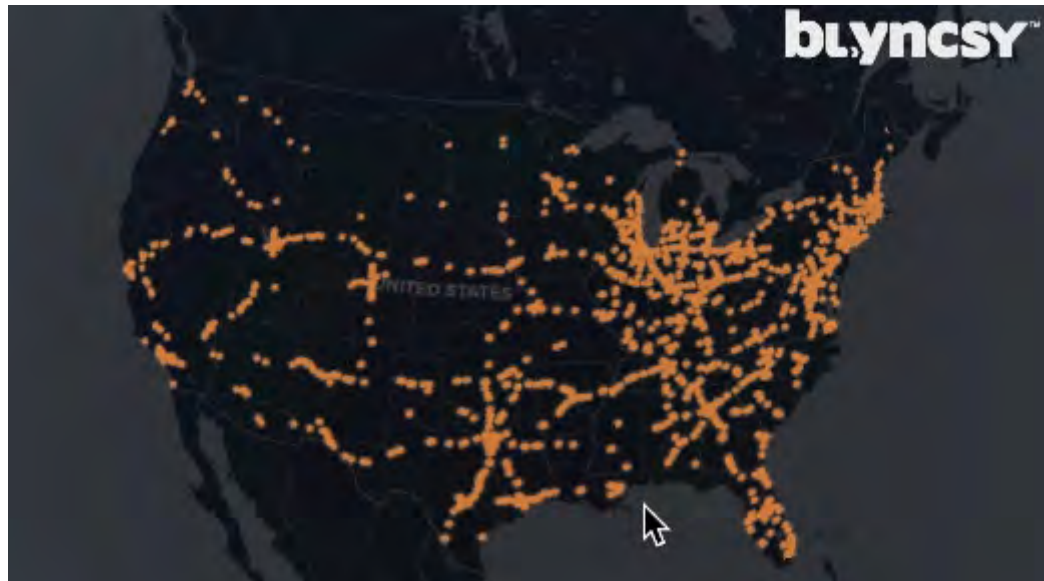


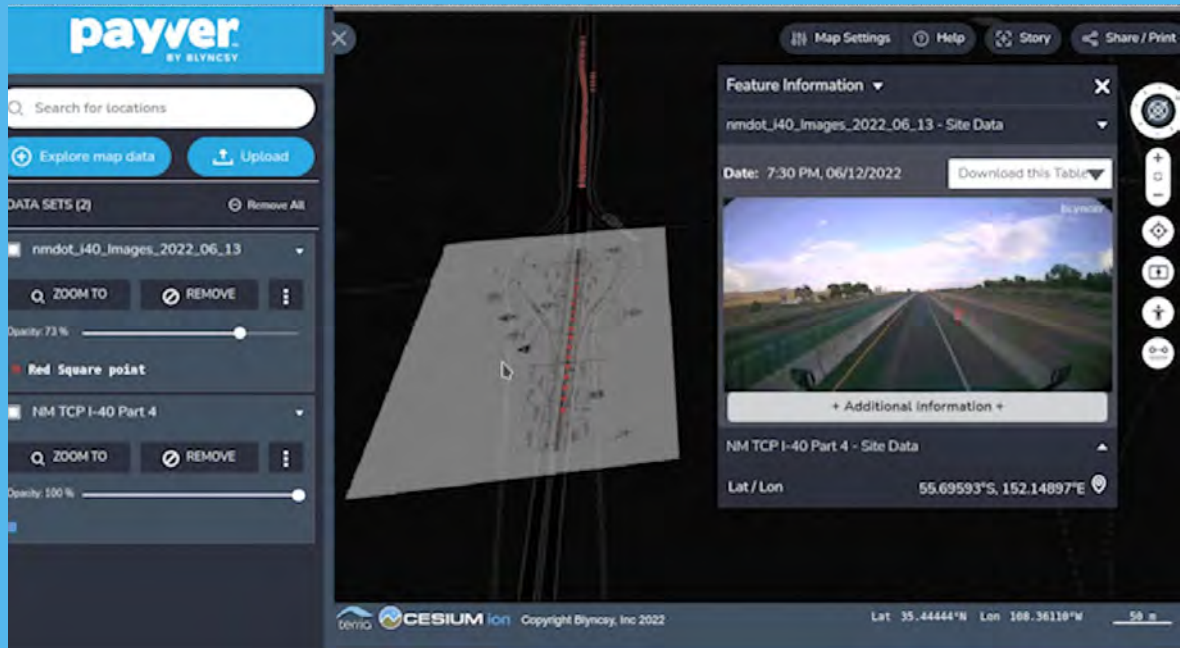
Upload Data to WZDx Feed

Payver can automatically upload work zone data to the federal WZDx feed. By making work zone data accessible to everybody, we can increase work zone safety for drivers of today and autonomous vehicles of tomorrow.

Automatically Upload to WZDx

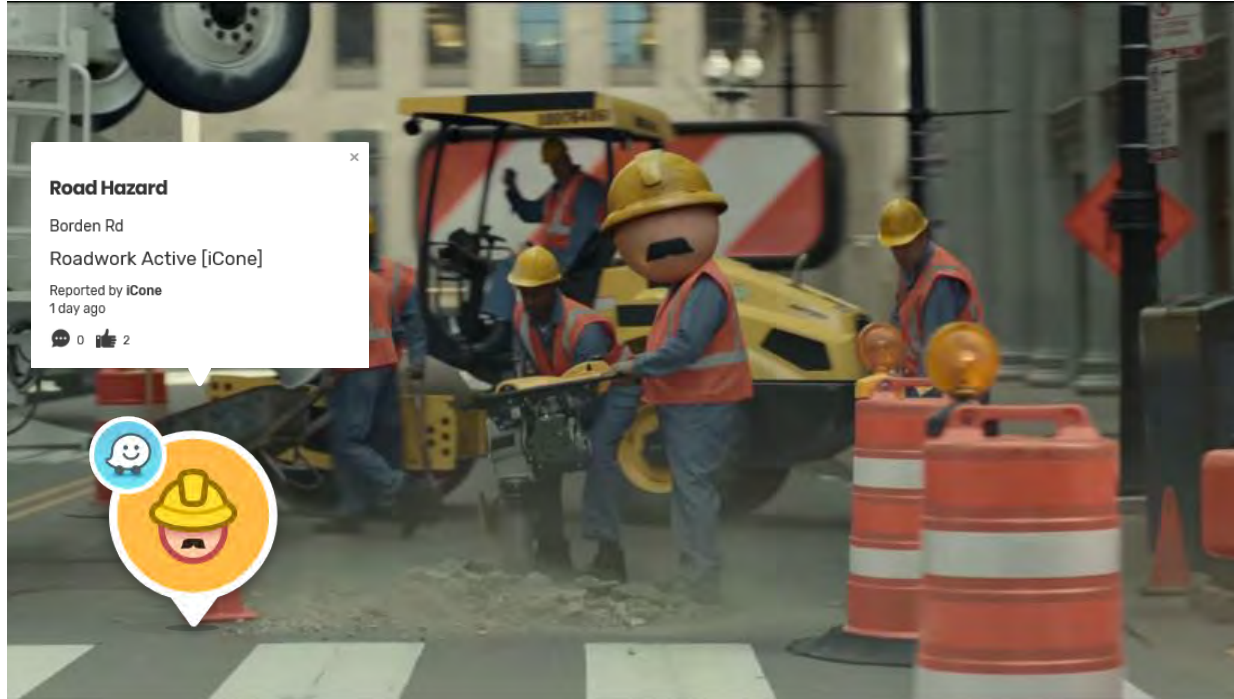
- Detect Work Zones
- Upload Realtime data
- Democratize data
- Better *infrastructure to vehicle*
and *infrastructure to driver*
communication
- Compare to Permits automatically





More Use Cases

The World of Work Zones:



How Does It Happen?

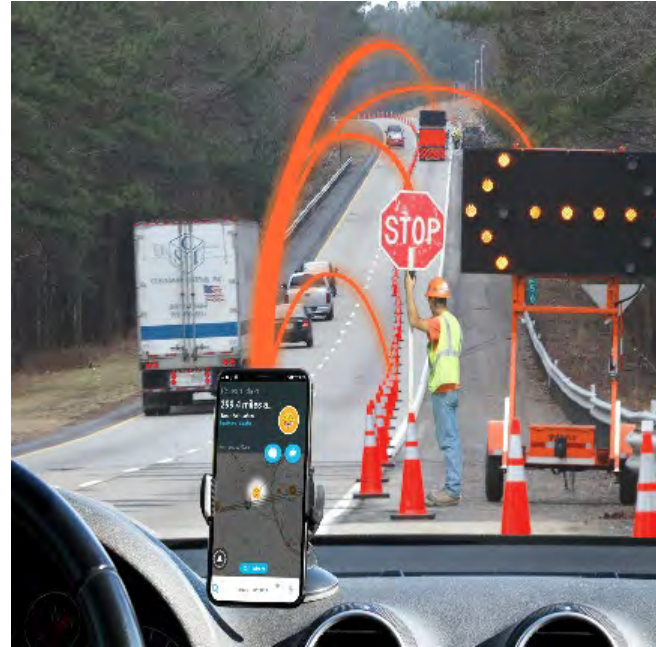


ConnectedTech Portfolio Examples

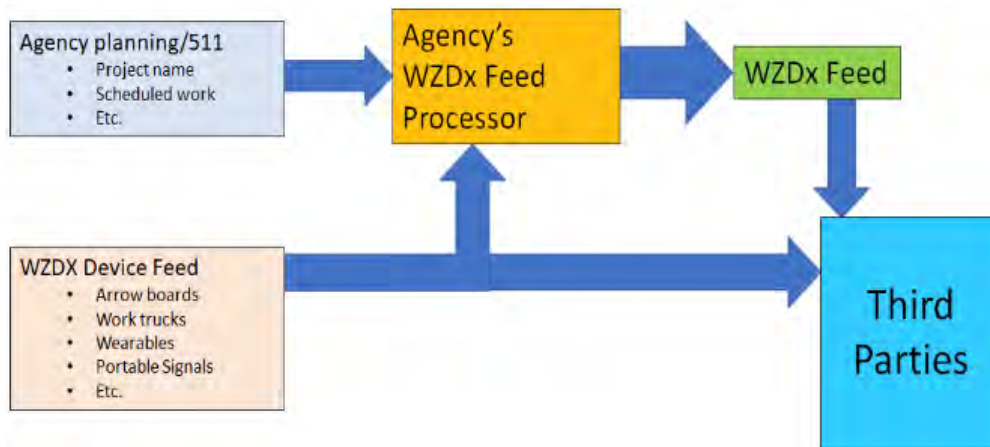
- Tow Trucks
- Utility Trucks
- Road Rangers
- Paint Striping
- TMA Trucks
- Plow Trucks
- Arrow Boards



iCone Work Zone Tools!

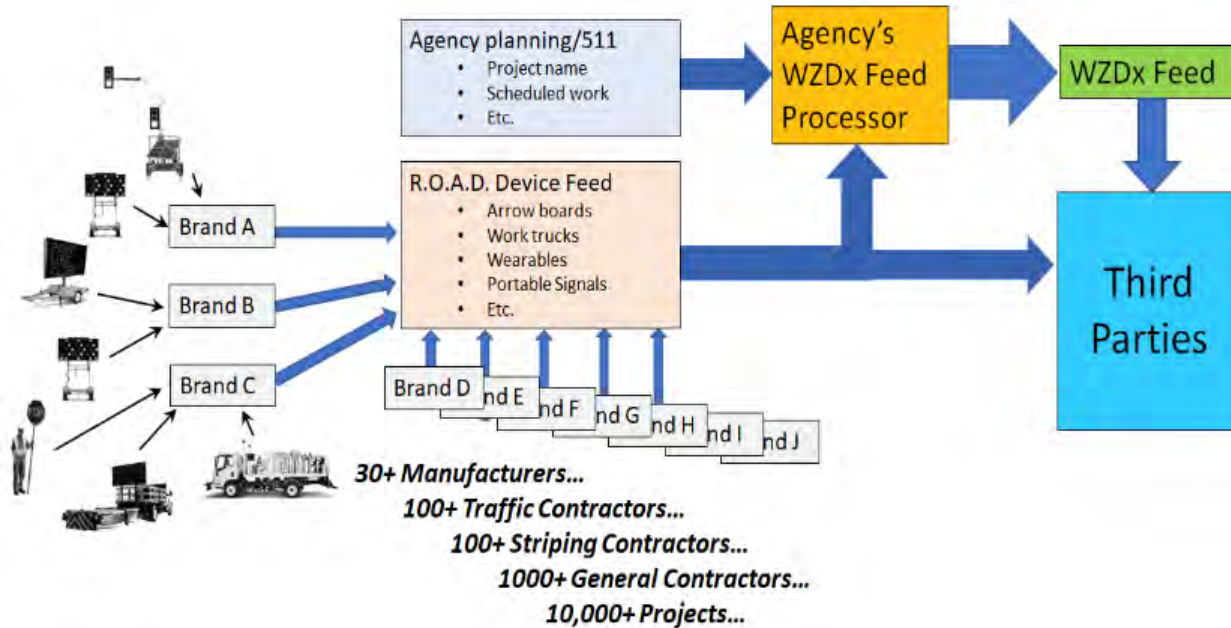


Work Zone Data Exchange (WZDx)



WZDx: Public Sector Delivers 10% of Work Zone Date.

WZDx + WZDi = R.O.A.D. Initiative



NCTCOG Work Zone Data Roundtable

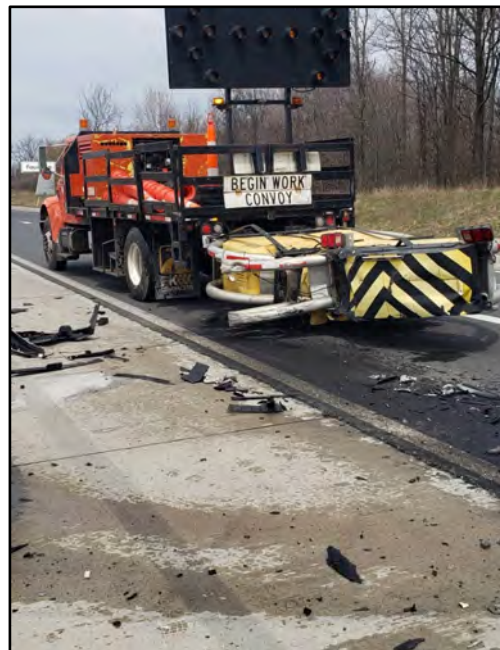
Christopher Poe, Ph.D., P.E.
Lee Mixon, P.E.

Mixon Hill

April 28, 2023

The Problem

- **Local agencies** do not have comprehensive knowledge of all their work zones
- Agencies need to **share work zone information** internally, with each other, and with the traveling public
- Distracted or unaware **drivers need real-time information** of work zones, lane closures, and workers present to improve safety
- **Too many crashes** resulting in damaged equipment, injured workers, and fatalities.



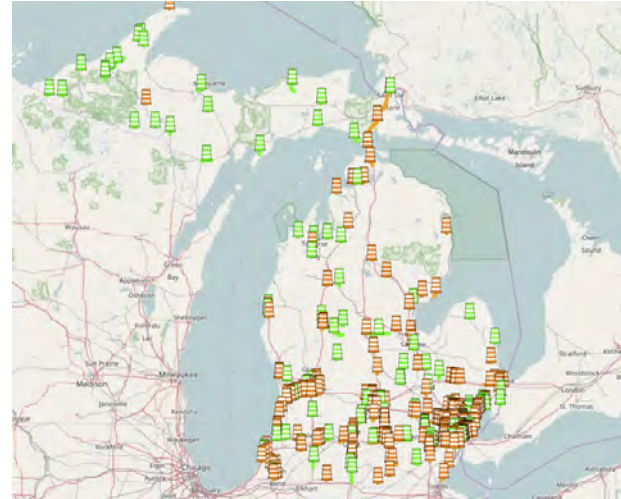
What is Needed to Help Solve the Problem?

- **Comprehensive situational awareness** of work zones
 - Planned and active work activities
 - Vehicles, equipment, workers
- A Platform to monitor, quality check, manage, and disseminate
 - **Internally for greater efficiency**
 - **Externally to coordinate** with other contractors, and other agencies
 - **To anywhere** – e.g., drivers, automotive companies, and 3rd party data providers



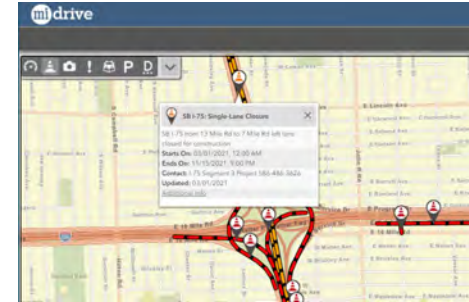
TerraForm Manager – Transportation Flow Restrictions Application

- TFM is a Software-as-a-Service (SaaS) solution
- TFM is a cloud solution where all data and applications are hosted
- Users (agencies or contractors) just need computer, common browser, and internet connection
- Deployed statewide in Michigan for over 5 years



Work Zone Information Dissemination

- Once captured and continually validated for quality, then work zone data can be used for many purposes
 - Automatic WZDx Specification compliant
 - Internal agency coordination
 - Regional work zone coordination
 - Traveler Information Websites
 - 3rd party data providers (Google Maps, Apple Maps, WAZE, etc.)
 - OEMs
 - Advanced Driver Assistance Systems (ADAS) / Driver alerts
 - Vehicle Control



PRESENTATION FOR NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS



**North Central Texas
Council of Governments**



CHALLENGES WITH WORKZONE DATA

- Lack of regional or statewide approach
- WZDx but WAZE uses CIFS
- Person in the field has more critical duties
- Lack holistic view

NUEGOV PLATFORM

- Allows for State, Regional, and local licensing models
- Support both WZDx and CIFS feed
- Built-in automation
- Allow API integrations
- **Cost Effective & Quick to Implement**

NUEGOV PLATFORM MODULES

- Asset Management
- Asset Data Collection & Assessments
- Work Zone Information Management
- Temporary Speed Reduction Request Management/TXDOT Form 1204
- Situational Awareness

HOW IT WORKS

NueGOV Work Zone Software

Easy, Simple, and Cost-Effective



DEMO

Michigan Department of Transportation 2022 Smart Work Zones Demonstration Video

The video below was mentioned by Daren Lynch
and Chris Poe at the WZDx Roundtable

<https://youtu.be/w4milSHq0ks>



NCTCOG WZDx Forum

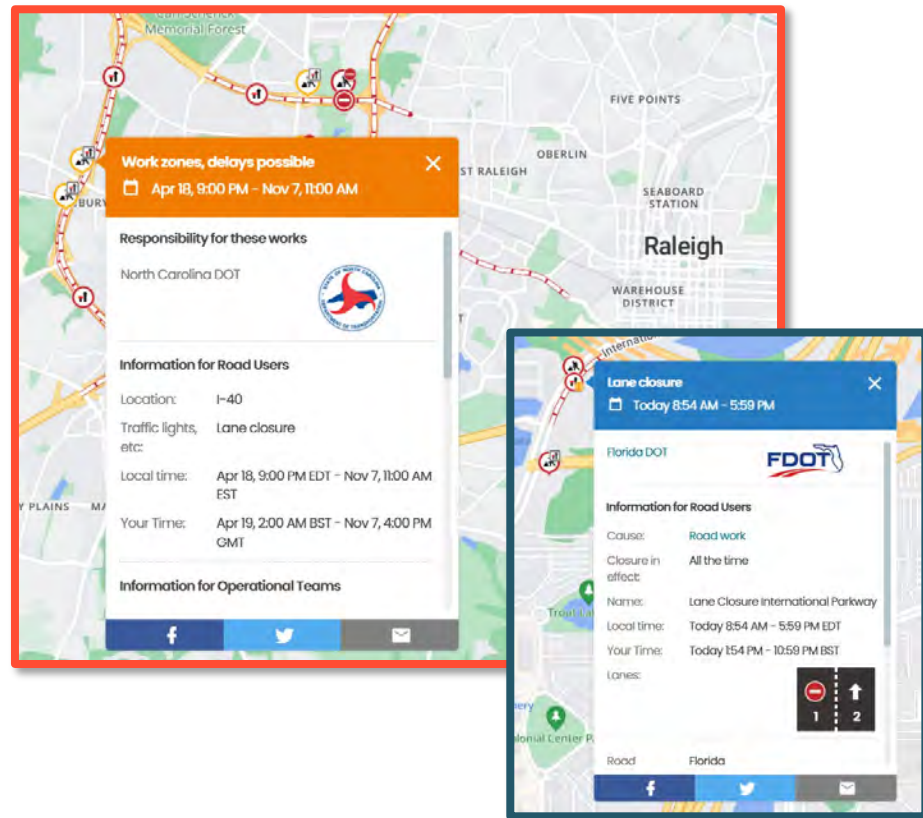
Rob Foster

rob.foster@one.network



Trusted by over 200 road agencies around the world

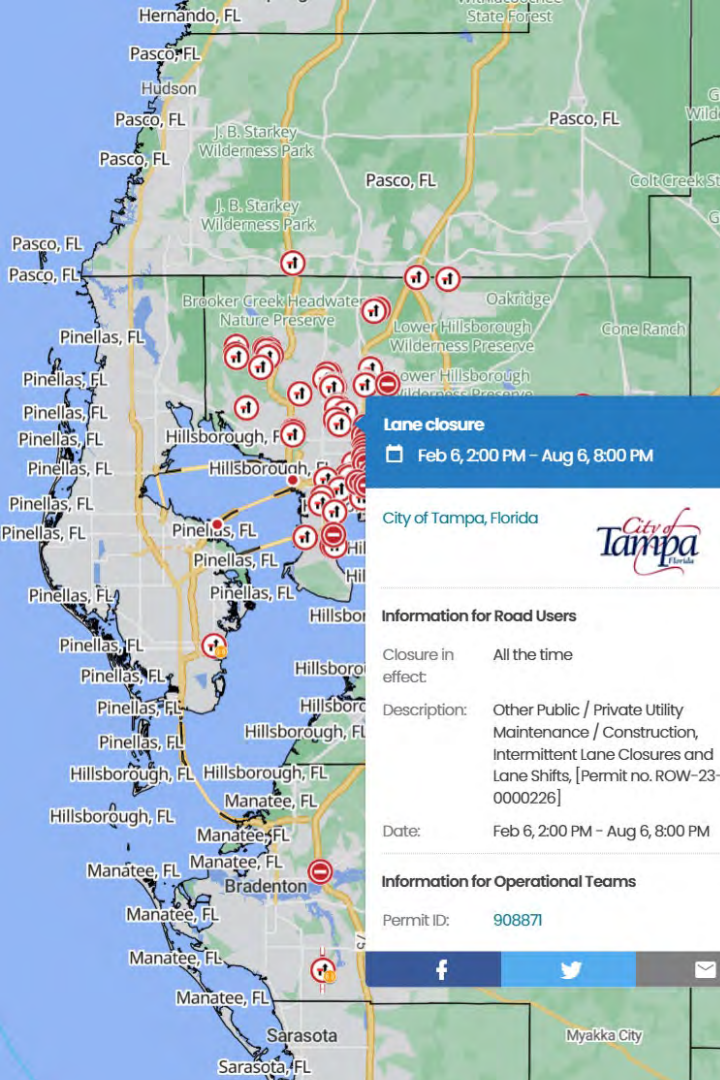
Our platform is market-proven by over 200 road agencies across the UK and US, enabling our data partners, including Google Maps, Waze, Drivewyze, Apple Maps and TomTom to auto-trust our direct integrations.





Why one.network?

We help agencies, counties and cities make work zones safer and easier to manage with a platform that's built for collaboration



Lane closure

Feb 6, 2:00 PM - Aug 6, 8:00 PM

City of Tampa, Florida



Information for Road Users

Closure in effect: All the time
Description: Other Public / Private Utility Maintenance / Construction, Intermittent Lane Closures and Lane Shifts, [Permit no. ROW-23-0000226]
Date: Feb 6, 2:00 PM - Aug 6, 8:00 PM

Information for Operational Teams

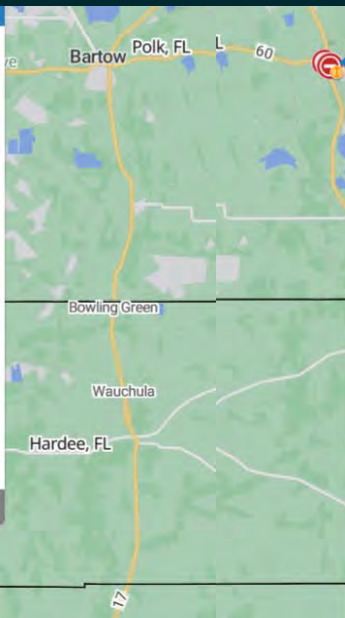
Permit ID: 908871



One platform that can enable cross jurisdictional collaboration and data sharing for work zones and traffic management across North Central Texas



Hillsborough County Florida



Lane closure

Apr 14, 5:50 AM - Apr 28, 5:00 PM

Florida DOT



Information for Road Users

Cause: Road work
Closure in effect: All the time
Name: Lane Closure FL 60
Date: Apr 14, 5:50 AM - Apr 28, 5:00 PM
Lanes:



Road agency: Florida



What benefits can you unlock for your jurisdiction?

1 Solve your work zone and road event data challenges



2 Simplify your workflows to boost efficiency



3 Influence driver behavior via direct navigation integrations



Register your interest

Dedicated solutions webinar for agencies, cities and counties in Texas

Register your interest below:

info.one.network/texas-cwz-webinar

Or email:

rob.foster@one.network

 one.network | WEBINAR

Taking action in Texas:
An introduction to
Connected Work Zones

Join the discussion

In partnership with **iteris**



LET US DO THE WORK FOR YOU!

TXShare
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Share

Sector Solutions Center



The TXShare Cooperative Purchasing Program is the direct outcome of municipal governments partnering together to identify common needs for public entities across and beyond the state of Texas.

No longer must you shop cooperative programs and hope that you'll find a suitable solution to your purchasing needs, come to TXShare and let us build it, instead!

WHY TXShare?

- Participating Organizations can confidently utilize our offerings knowing that each contract was competitively procured under strict **Uniform Guidance (2 CFR 200)** and **Texas Local Government Code** procurement policies and procedures.
- Each contract is **competitively sourced** in a sealed-proposal method independently evaluated by subject matter experts.

TXShare
Your Public Sector Solutions Center

Leverage the staff of TXShare to professionally manage your solicitation

- Not enough subject matter experts in your organization to evaluate a technical proposal?
 - ✓ TXShare assembles evaluation teams of highly knowledgeable individuals from within our Participating Member Entities.
- Have you only a scope of deliverables that you must solve, but don't know how?
 - ✓ TXShare can help fine-tune your specifications, and get an RFP issued for you.



Highlighted Contract –Roadway Workzone Data Reporting Services

Work zones are a common occurrence on roadways.

A critical component to maintaining and upgrading our Nation's roadways, work zones unfortunately require changes in traffic patterns, narrowed rights-of-way, and other construction activities that, in connection with work zones, often create a combination of factors resulting in crashes, injuries, and fatalities.

As the need for accurate and real-time reporting in these conditions become more prevalent, TXShare is pleased to announce we have recently awarded 5 vendors for our new Roadway Workzone Data Reporting Services.

The awarded vendors are enabled to market their contract to any public sector entity within the United States that joins the TXShare Program.

CURRENT CONTRACTS:



Services available under this contract include three categories of deliverable:

1. Provide/implement a service whereby the Respondent captures work zone information in the possession of a TxSHARE Entity (referred to as the Supplier in this scenario) and
 - (a) converts that information into the WZDx specification, and;
 - (b) publishes that information in WZDx format to:
 - (i) 511DFW or as otherwise designated by NCTCOG,
 - (ii) back to the Supplier, and
 - (iii) to other data portals designated by the Supplier, such as an open data portal maintained by the Supplier or to the DOT.
2. Provide/implement a service whereby participating roadway operators will be enabled to report their work zone data in WZDx format without the need for processing by the Respondent
3. Provide/implement WZDx-related consulting services. Such services would consist of providing advice and other services to help roadway operators improve their reporting of work zones.