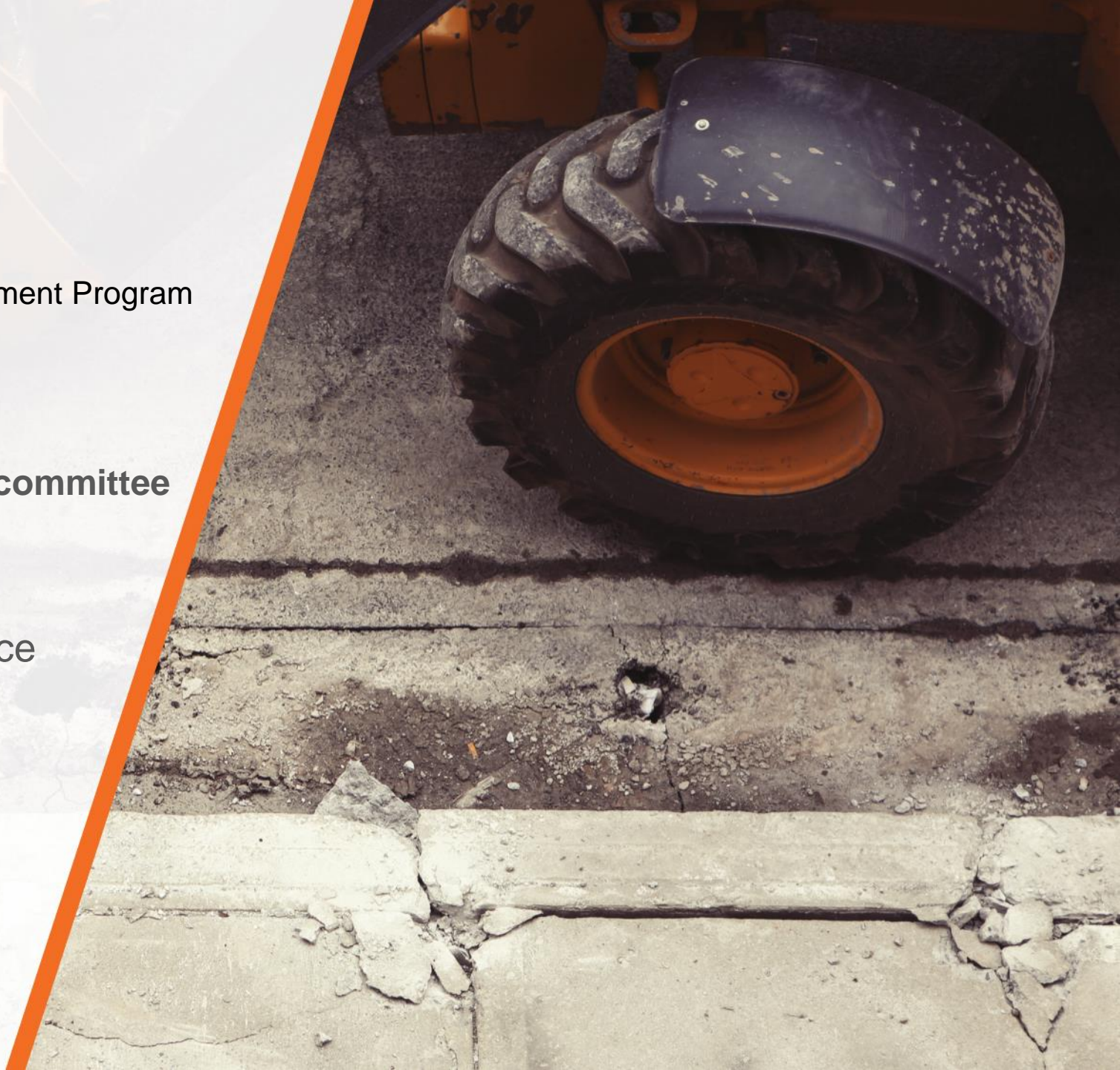


# WORK ZONE DATA INITIATIVE

FHWA Office of Operations Work Zone Management Program

**Presentation to AASHTO Technical Subcommittee  
on Safety, Environment, and Workforce  
Development**

AASHTO Construction 2018 Conference  
Pittsburgh, PA - August 16, 2018



# Motivation for WZDI

»» ***Lack of consistent, standardized information on work zone events***

Many infrastructure owners and operators (IOOs) maintain data on work zone activity, but lack of common data standards and convening mechanisms makes it difficult and costly for third parties – including original equipment manufacturers (OEMs) and navigation applications – to access and use these data across various jurisdictions.

# Work Zone Data Challenges

Implications for:

- Project coordination (intra- and inter-jurisdictional)
- Construction / Maintenance contract monitoring
- Traveler information
- Law enforcement
- Freight management
- Post-construction analytics
- Automated Vehicle (AV) readiness

# Work Zone Data Initiative

## Purpose

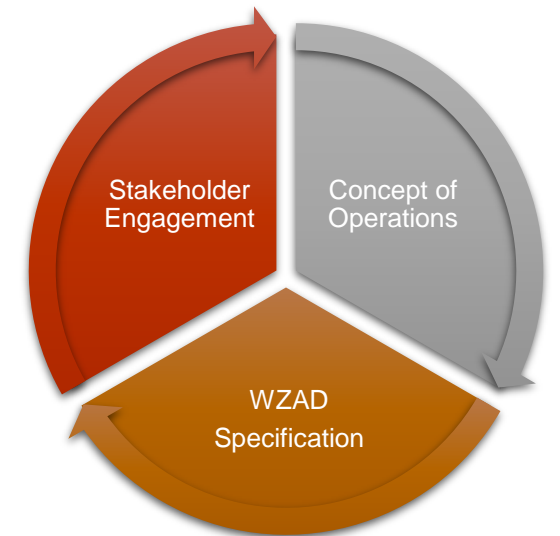
- ›› Define **Work Zone Activity Data (WZAD)** through development of a platform-independent specification and concept of operations

## Outcomes

- ›› WZAD **State-of-the-Practice**
- ›› WZAD **Concept of Operations**
- ›› WZAD **Data Definition**
- ›› Agency-focused **Implementation Guide** for a work zone data management program
- ›› Pilot participation in a **Work Zone Data Environment**

## Big Picture Outcome

- ›› Encourage broad-based institutionalization of next-generation work zone data management serving multiple use cases throughout project delivery life cycle.



# WZDI Use Case Themes

1. WORK ZONE PLANNING AND PROJECT COORDINATION
2. WORK ZONE IMPACT ANALYZES
3. CONSTRUCTION AND MAINTENANCE CONTRACT MONITORING
4. REAL-TIME SYSTEM MANAGEMENT/TRAVELER INFORMATION PROVISION
5. SAFETY AND MOBILITY PERFORMANCE MEASUREMENT
6. LAW ENFORCEMENT AND EMERGENCY SERVICE PROVIDERS
7. CAV HARDWARE NEEDS AND SYSTEM READINESS

# Work Zone Data Use Case Themes (1/2)

NO.	TITLE	DESCRIPTION
<b>CATEGORY #1 - WORK ZONE PLANNING AND PROJECT COORDINATION</b>		
	Sub-Category 1.1 - Strategic Coordination during Planning/Design (Agency)	
	Sub-Category 1.2 - Strategic Coordination during Planning/Design (Regional)	
	Sub-Category 1.3 - Strategic Coordination during Project Delivery	
	Sub-Category 1.4 - Avoiding Multiple Capacity Restrictions at the Same Time	
	Sub-Category 1.5 - Reducing Number of Lane Closure Disruptions over Time on a Roadway Segment	
	Sub-Category 1.6 - Permitting Office Coordination of Oversize Vehicle Approvals	
<b>CATEGORY #2 – WORK ZONE IMPACT ANALYZES</b>		
	Sub-Category 2.1 - Estimating Expected Impacts for a Single Work Zone	
	Sub-Category 2.2 - Estimating Expected Combined Impacts of Multiple Work Zones	
	Sub-Category 2.3 - Assessing Impacts during WZ Operations	
<b>CATEGORY #3 – CONSTRUCTION AND MAINTENANCE CONTRACT MONITORING</b>		
	Sub-Category 3.1 - Monitor Compliance with Contractual WZAD-Related Requirements	
	Sub-Category 3.2 - Monitor Compliance to Performance-Based Safety and Mobility Specifications	
	Sub-Category 3.3 - Identifying Field Modifications to Project Plans	
	Sub-Category 3.4 - Document Changes in Infrastructure Asset Location, Availability Due to Work Activities	

# Work Zone Data Use Case Themes (2/2)

NO.	TITLE	DESCRIPTION
<b>CATEGORY #4 – REAL-TIME SYSTEM MANAGEMENT/TRAVELER INFORMATION PROVISION</b>		
	Sub-Category 4.1 - Use by TMCs/Agencies to Manage Facility Operations	
	Sub-Category 4.2 - 3rd Party Dissemination of Information to Travelers and Others	
<b>CATEGORY #5 – SAFETY AND MOBILITY PERFORMANCE MEASUREMENT</b>		
	Sub-Category 5.1 - Computing/Monitoring Performance Measures at a Project Level	
	Sub-Category 5.2 - Computing/Monitoring Performance Measures at a Regional/Programmatic Level	
	Sub-Category 5.3 - Assessing and Enhancing Performance at the National Level	
<b>CATEGORY #6 – LAW ENFORCEMENT AND EMERGENCY SERVICE PROVIDERS</b>		
	Sub-Category 6.1 - Validate Cited Condition(s) of Traffic Violation	
	Sub-Category 6.2 - Enforcement of Lane Closure/Right-of-Way Access Approval Process	
	Sub-Category 6.3 - Monitor and Document LE Use on Projects	
	Sub-Category 6.4 - Monitor Work Zone LE Needs	
	Sub-Category 6.5 - LE Monitor Activity at Work Site (to deter theft)	
	Sub-Category 6.6 – First Responder Access to Incidents	
<b>CATEGORY #7 – CAV HARDWARE NEEDS AND SYSTEM READINESS</b>		
	Sub-Category 7.1 - Alert/Inform CAV of Presence of Work Zones	
	Sub-Category 7.2 - CAV Navigation (Information to plan and execute trip)	
	Sub-Category 7.3 - CAV Lane Guidance (safe speed and travel path guidance)	

# Work Zone Data Stakeholders (1/2)

Stakeholder Group	Type of WZAD Needed
<b>Internal Stakeholder Functions</b>	
<b>Agency Work Zone Planning</b>	Location and schedule for construction and work zone
<b>Agency Design and Engineering</b>	Detailed description of construction and traffic management (maintenance of traffic plan)
<b>Agency Construction Operations</b>	Daily update on Work Zone configuration
<b>Agency Traffic Management Center Operations (includes ATMS, ITS, RCRS)</b>	Near real-time details of Work Zone roadway geometry and configuration
<b>Agency Traveler Information Systems</b>	Near real-time details of Work Zone roadway geometry and configuration
<b>Agency Work Zone Performance and Impact Analysis</b>	Traffic and Safety Impacts of past and planned work zones
<b>Agency Work Zone Data Systems Integrator</b>	Support and manage systems which store and share WZAD during work zone life cycle. This would sit in a TSMO enterprise that include work zone.
<b>Agency Utilities, Construction, Maintenance and Law Enforcement Coordination</b>	These staff will enter, manage and maintain WZAD relevant to Utility, Construction, Maintenance and Law Enforcement work impacting roadways.



# Work Zone Data Stakeholders (2/2)

Stakeholder Group	Type of WZAD Needed
<b>External Stakeholder Functions</b>	
<b>Construction and Maintenance Contractors</b>	Both contribute and use detailed WZAD during Work Zone Operations
<b>MPOs and Regional Partner Agencies</b>	Planned and actual schedule and location of construction and work zones
<b>Regional utilities</b>	Location and schedule for utility construction and work zone
<b>Law Enforcement</b>	Planned and actual schedule and location of construction and work zones
<b>Federal agencies</b>	Traffic and Safety Impacts of past and planned work zones
<b>Third-Party Traveler Info Systems (incl Itegis, Google, etc.)</b>	Near real-time details of Work Zone roadway geometry and configuration
<b>Connected/Autonomous Vehicles</b>	Near real-time details of Work Zone roadway geometry and configuration
<b>Travelers and Freight Haulers</b>	Indirect Users of WZAD

# Important finding regarding “ownership” of work zone data systems

»» *There does not appear to be a natural home within conventional agency structures for the Work Zone Data Systems*

- Nor is there a natural home for the budget for WZAD and WZDS development and management

»» Potential integration in TSMO Enterprise?

# Schedule

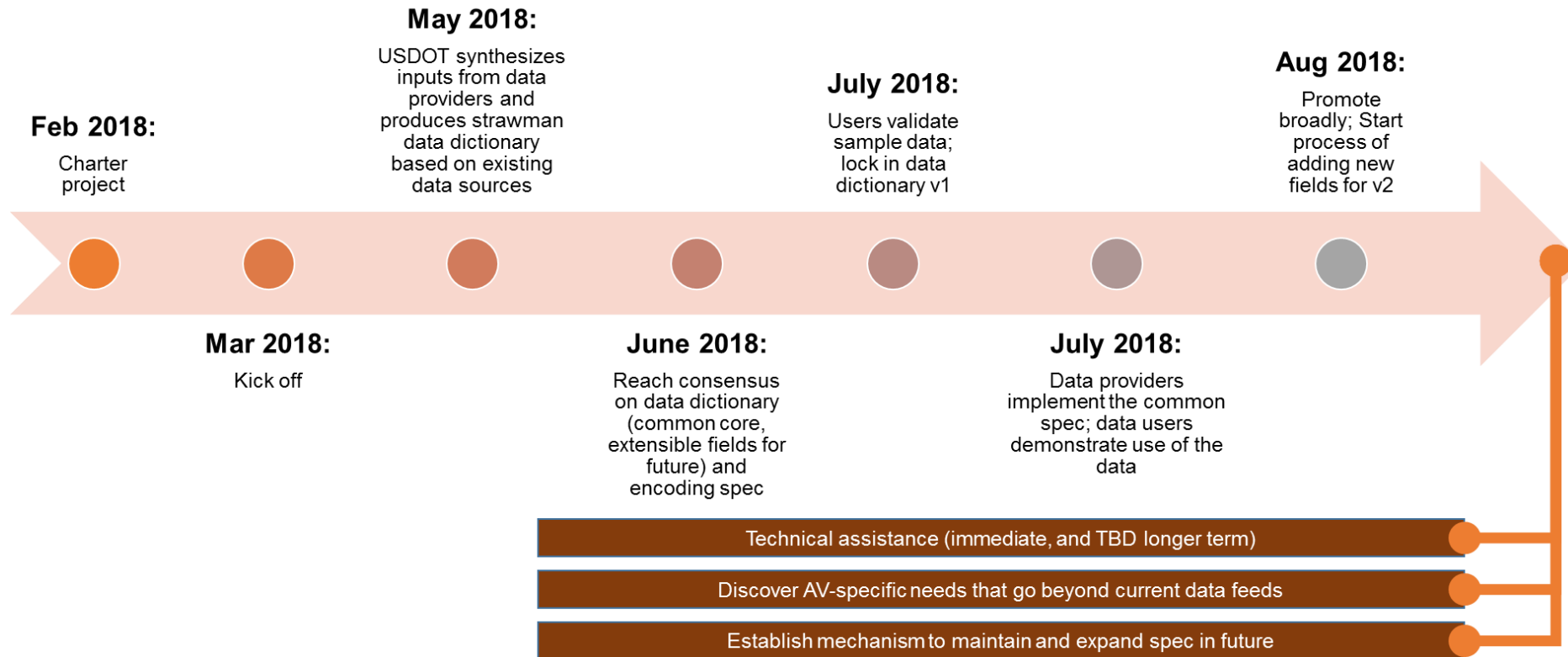
## Deliverables

## v1 Delivery

- State of the Practice review Complete
- Concept of Operations (~60 specific use cases, 7 use case themes) DRAFT
- WZAD Data Specification DRAFT
- **WZDI Symposium** **9/11/2018**
- Work Zone Activity Data Implementation Guide March 2019
- Work Zone Data System Pilot ongoing through September 2020

# Work Zone Data Exchange (WZDX)

»» Objective: Establish repeatable mechanism for rapid adoption of WZAD specification



# Related Initiatives

**Multiple USDOT supported efforts in progress to support development and promotion of:**

- ›› Core WZAD requirements
- ›› Identification and buildout of WZAD use cases including CAV
- ›› Business processes for incorporating WZAD management in CAV readiness
- ›› Development of functional applications

## V2I Safety Apps Deployment Guidance

- Updating Reduced Speed Zone / Lane Closure Warning Application
- Developing Work Zone Maps from connected vehicle input.

## WZAD Record Keeping Guidance Document

- Determining state-of-practice, identifying recommendations for WZAD collection and use cases, and creating guidance document

## Work Zone Mobility Audits using CAV Data

- Guidelines for using CAV data for real-time mobility dashboards serving work zone mobility performance measurement

## Autonomous Maintenance Technology PFS

- TPF-5(380); support collaborative adoption and research of automated vehicles used in maintenance and construction

# Work Zone Data – Broader Implications

- »» **Work Zones are a model for other operational events**
- »» Data considerations in organizational Capability Maturity Frameworks
- »» Implications for National Digital Infrastructure
- »» Integration into Federal AV policy

# WZDI Next Steps

- »» Release draft ConOps and Data Dictionary to collaboration site (<http://collaboration.fhwa.gov/wzmp/wzdi>) – August 2018
- »» Work Zone Data Symposium – September 11, 2018
- »» Release of Work Zone Data Exchange v1 specification – September 2018
- »» Solicit participants for v2 Work Zone Data Exchange – Fall/Winter 2018
- »» Ongoing stakeholder engagement, public outreach

# Get Involved:

- »» To provide input, to get more information or to participate in Work Zone Data Exchange pilots, contact Work Zone Data Initiative Project Manager  
Todd Peterson  
FHWA Office of Operations Work Zone Management Team  
[todd.peterson@dot.gov](mailto:todd.peterson@dot.gov)
- »» Attend Work Zone Data Symposium – September 11, 2018  
(<http://workzonesafetyconference.org/>)
- »» Stay in the loop with USDOT transportation data management efforts at  
<https://www.transportation.gov/data>