Work Zone Data Initiative

JEREMY L. SCHROEDER, PH.D., P.E.

ITS ALASKA ANNUAL MEETING - NOVEMBER 20, 2019

Overview

National Work Zone Data Management Efforts

Work Zone Data Initiative Pilot Sites

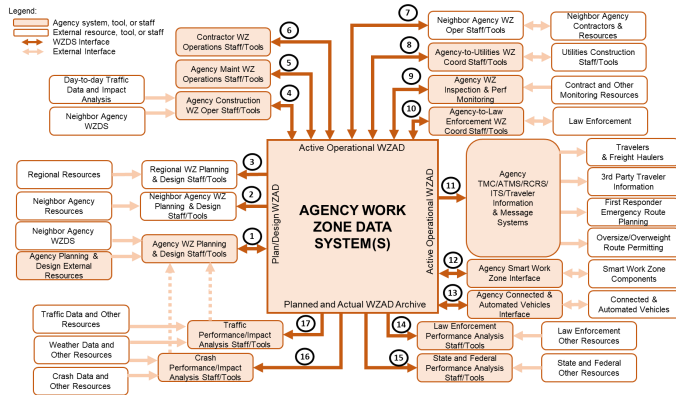# Big Picture of National Work Zone Data Management Efforts

Work Zone Activity Data (WZAD)

Digital data on **when, where,** and **how** work zones are deployed

FHWA's Work Zone Data Initiative (WZDI)

USDOT's Work Zone Data Exchange (WZDx)

Creating a **framework for agencies** to utilize a consistent language for communicating WZAD across jurisdictional boundaries

Creating a **basic work zone data specification** to jump-staring voluntary adoption by data producers and users across the country
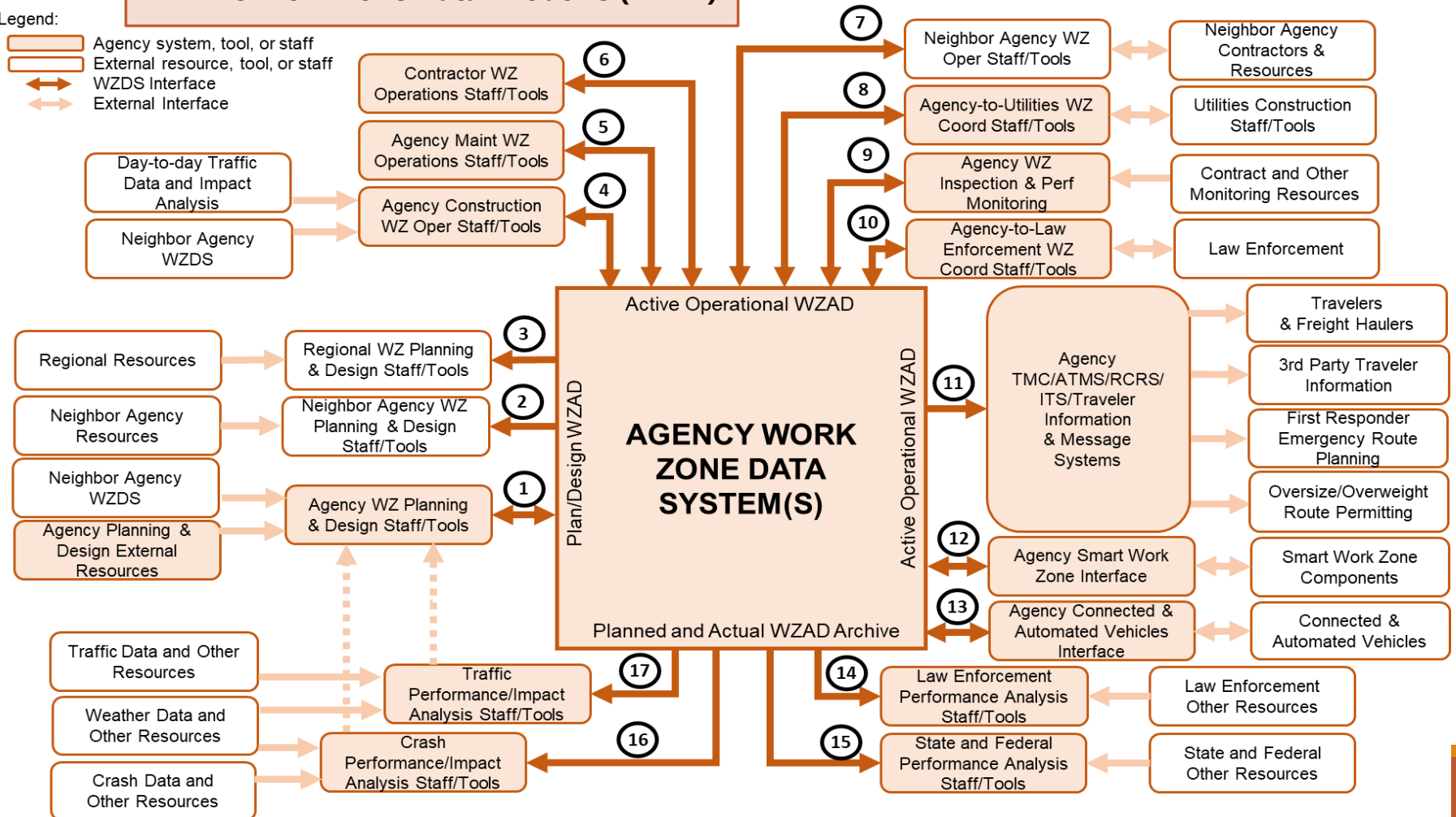

1 Simple, Open Specification

2 Broadly Adopted

3 Saves Lives

National Work Zone Data Management Efforts

FHWA's Work Zone Data Initiative (WZDI)

National Work Zone Data Management Efforts

Work Zone Data Initiative (WZDI)

◦ **Purpose - Creating a consistent language for communicating WZAD across organizational boundaries and throughout project life cycles**
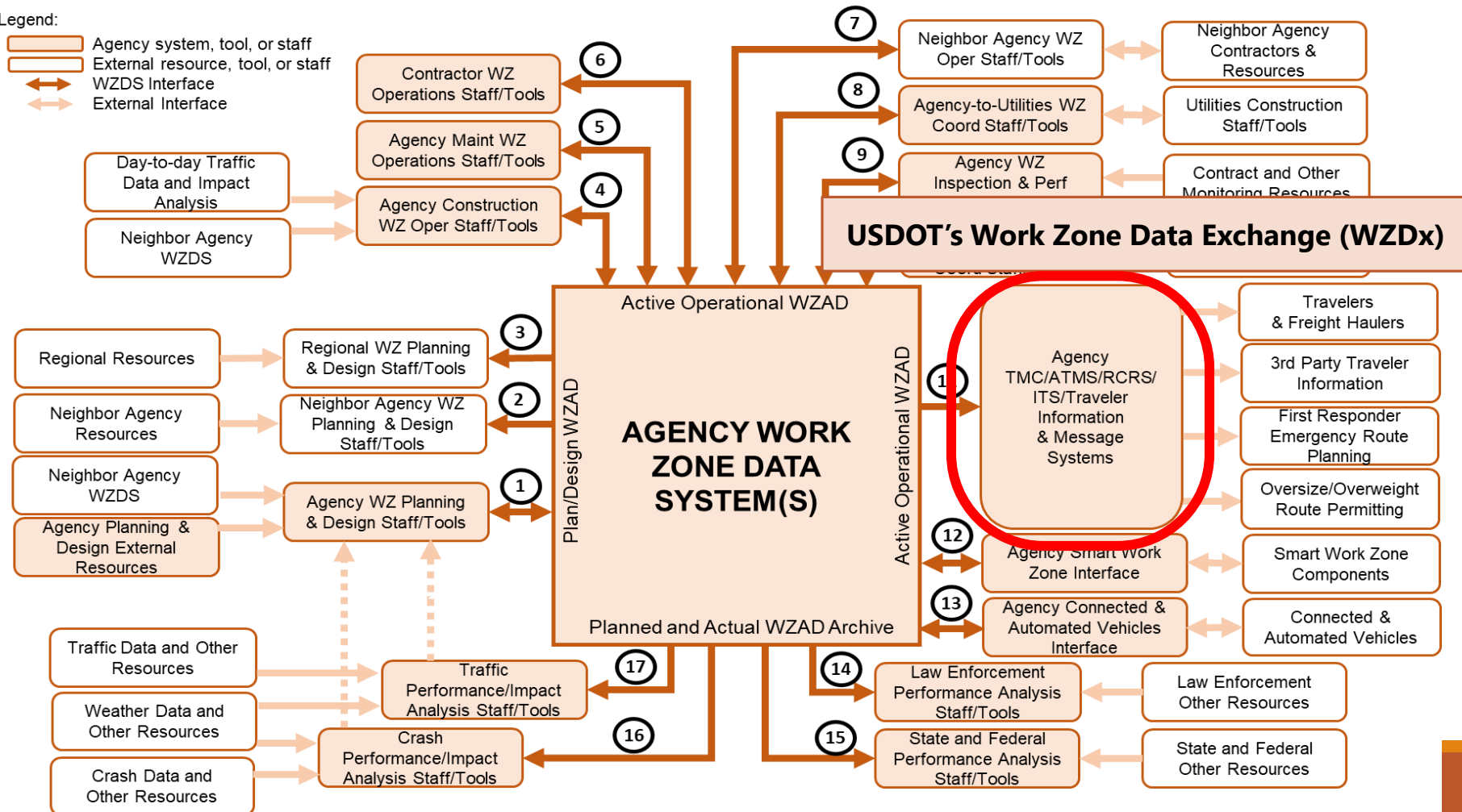
Planning/ Design	→ "first cone down"	Active Operations	→ "last cone up"	Post- Construction

◦ WZAD -> information about when, where, and how work zones are occurring

◦ Data producers (i.e., public agencies)

◦ All data applications

◦ Guidance documents for agency planning and implementation

◦ Piloting standard data feed

National Work Zone Data Management Efforts

Legend:
- Agency system, tool, or staff
- External resource, tool, or staff
- WZDS Interface
- External Interface

USDOT's Work Zone Data Exchange (WZDx)

National Work Zone Data Management Efforts

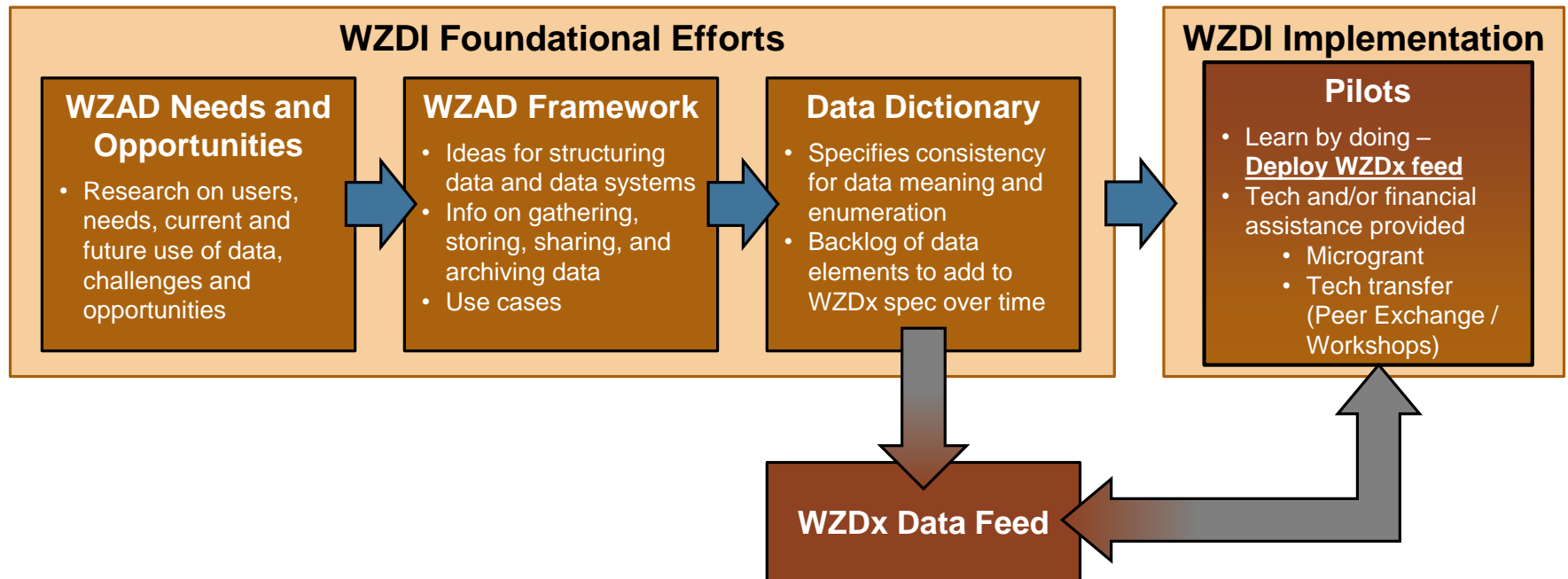**Work Zone Data Exchange (WZDx)**

◦ Deploys data standard for WZAD by participating organizations

◦ One application/use case of WZDI

◦ Includes elements from WZDI data dictionary

◦ WZDx v1.1 is currently available/in use

◦ Work Zone Data Working Group responsible for maintaining and updating the feed specification

  ◦ Publishing incremental updates to refine features, attributes, vocabulary

  ◦ Working on v2 (publication date of 12/20)

National Work Zone Data Management Efforts

How it all fits together…

WZDI Foundational Efforts

WZAD Needs and Opportunities
- Research on users, needs, current and future use of data, challenges and opportunities

WZAD Framework
- Ideas for structuring data and data systems
- Info on gathering, storing, sharing, and archiving data
- Use cases

Data Dictionary
- Specifies consistency for data meaning and enumeration
- Backlog of data elements to add to WZDx spec over time

WZDI Implementation

Pilots
- Learn by doing – **Deploy WZDx feed**
- Tech and/or financial assistance provided
  - Microgrant
  - Tech transfer (Peer Exchange / Workshops)

WZDx Data Feed

Resources from National Work Zone Data Management Efforts
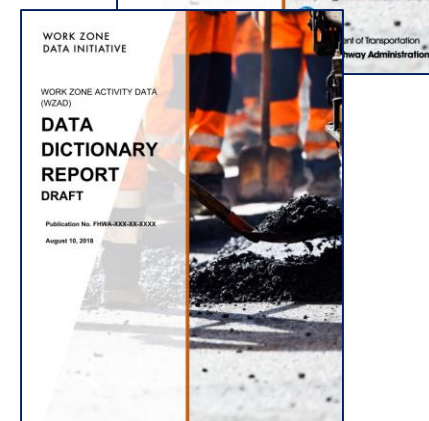
Work Zone Data Exchange (WZDx) Specification
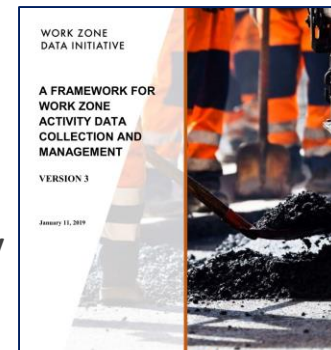- ◦ Facilitates collaboration with data producers (agencies) and data users (like 3rd party vendors) using a standard data specification

Framework for Work Zone Activity Data (WZAD) Collection and Management
- ◦ Understand how users may communicate and use WZAD effectively
- ◦ Key concepts for structuring WZAD and system to support agency needs
- ◦ Provides a "menu of resources" agencies can pick and choose from to create a work zone data system

Work Zone Activity Data (WZAD) Dictionary
- ◦ Includes many data elements to add to the WZDx specification over time

Resources from National Work Zone Data Management Efforts

WZDI Collaboration Site with Resources

- https://collaboration.fhwa.dot.gov/wzmp/wzdi/Forms/AllItems.aspx

WZDx Github

- https://github.com/18F/usdot-jpo-ode-workzone-data-exchange/wiki

USDOT funding opportunity for agencies to publish or expand WZDx-compliant feeds

- Solicitation expected early 2020
- Watch the presentation | View the presentation slides
- New info will be posted here: https://www.transportation.gov/av/data/wzdx

Ongoing WZDI Pilot Efforts

The two major parts of a WZDI Pilot are:

1. Modifying data systems to the standard
2. Automating and increasing quality data collection efforts

WZDI Pilot efforts mostly focus on modifying data systems, but those agencies also tend to advance data collection efforts

Every pilot is specific to the agency based on their current state

Ongoing WZDI Pilot Efforts

Many agencies are engaging with the FHWA Work Zone Data Initiative (WZDI) in a variety of ways

Formal WZDI Pilot Sites
- Maricopa County DOT
- Colorado DOT
- Iowa DOT
- Massachusetts DOT
- Minnesota DOT
- Texas DOT

Independently assessing and/or updating agency practices with WZDI
- Oregon DOT
- Virginia DOT

WZDx Grant Recipients that are not a formal WZDI Pilot Site
- *Not yet announced*

Ongoing WZDI Pilot Efforts

Agencies are committed to an FHWA-supported WZDI pilot

Working to prioritize agency needs and develop a work plan for adopting an agency-specific USDOT aligned work zone data specification

- Minnesota DOT
- Colorado DOT
- Maryland DOT

Agencies are working to enhance their existing WZ data specifications

Focused on furthering existing work zone data specifications via FHWA's WZDI guidance and the ITS JPO's WZDx specification

- Massachusetts DOT
- Virginia DOT
- Oregon DOT
- Texas DOT
- *WZDx Grant Recipients*

Agencies are publishing an open WZ data feed using WZDx specification

Currently publishing an open API data feed of work zone activity data using the USDOT's data specification

- Iowa DOT
- Maricopa County DOT

Iowa DOT

Iowa State University has led development of a Work Zone Data Hub with focus on data integration and collection

◦ Mapped available Iowa DOT data to the WZDx and WZDI specifications

◦ WZDx data sources include 511 Traveler Information and Roadway Asset Management System

◦ Prioritized use cases and developed a roadmap to expand Work Zone Data Hub

◦ Developed specifications for vendor devices to provide work zone activity data to Iowa DOT

Publishing a real-time WZDx-compliant feed of events with active "devices" that correspond to a planned event based on spatial and temporal extents

◦ https://public-iowadot.opendata.arcgis.com/datasets/iowa-work-zone-data-exchange-wzdx

AZTech Partnership (Phoenix metro area)

Includes Maricopa County DOT, Arizona DOT, and Maricopa Association of Governments

Already publishing a WZDx-compliant feed for two active work zones

Two-phase approach:
- Phase 1 – Assessment
  - Examine feasibility of converting existing regional TMDD data from 10 agencies to expand the current WZDx-compliant feed
  - Conduct quality assessment of available work zone data
  - Develop timeline and roadmap for implementation
- Phase 2 – Deployment
  - Proceed with implementation, pending funding

Minnesota DOT

Conducting a 2-phase pilot

Phase 1 involves a systems engineering process with ConOps development
- ◦ Develop vision for work zone technologies and data practices for Minnesota

Phase 1 findings will inform a decision about how to implement WZDI in Minnesota for Phase 2

Colorado DOT

Working to understand current data collection and management processes, and prioritize WZDI use cases

- ◦ Manual vs. automated collection
- ◦ "Owners" of the data and how it is shared, if at all

Massachusetts DOT

Used the WZDI Data Dictionary to compare to their existing work zone data specifications

Identified some data elements that are critical to agency processes, challenging to modify, or missing from the Data Dictionary

Awaiting updates to WZDx specification before modifying existing agency work zone data practices

Texas DOT

A lane closure data feed for major I-35 reconstruction effort since 2011 powers all downstream processes for assessment, traveler information, and distribution with knowledge of lane closures being a foundational piece

Existing Connected Work Zone project funded by FHWA and TxDOT will map these data elements to WZDx to understand how to construct a complementary WZDx feed that includes things not currently available or not in WZDx spec

A work zone warning application used in different project will build on this effort
◦ Collaborate with CAMP and SWRI to test the MAP that used the lane closure information from I-35 and look at how this could be incorporated with Lonestar

The I-35 closure database has about 12,500 closure events to date, which could be mapped into the WZDI Data Dictionary structure to create an archive

Next Steps

Continue to support WZDI Pilot Sites and WZDx Grant Recipients

Continued outreach to expand adoption of data specification

Next version of WZDx specification expected in December 2019

Findings and lessons learned from Pilot Sites will inform revisions and development of new WZDI resources

Jeremy Schroeder
Athey Creek Consultants
WZDI Support Team
Schroeder@acconsultants.org
202.809.1900

Todd Peterson
FHWA Work Zone Team
WZDI Lead
Todd.Peterson@dot.gov
202.366.1988