USDOT Roundtable on Data for Automated Vehicle Safety: What's Next

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#ITSDetroit2018

Session Agenda

Purpose:
- To share USDOT's multimodal activities related to AV Data
- To tee up discussion on Data for AV Principles, Framework, and approach to enabling voluntary data exchanges
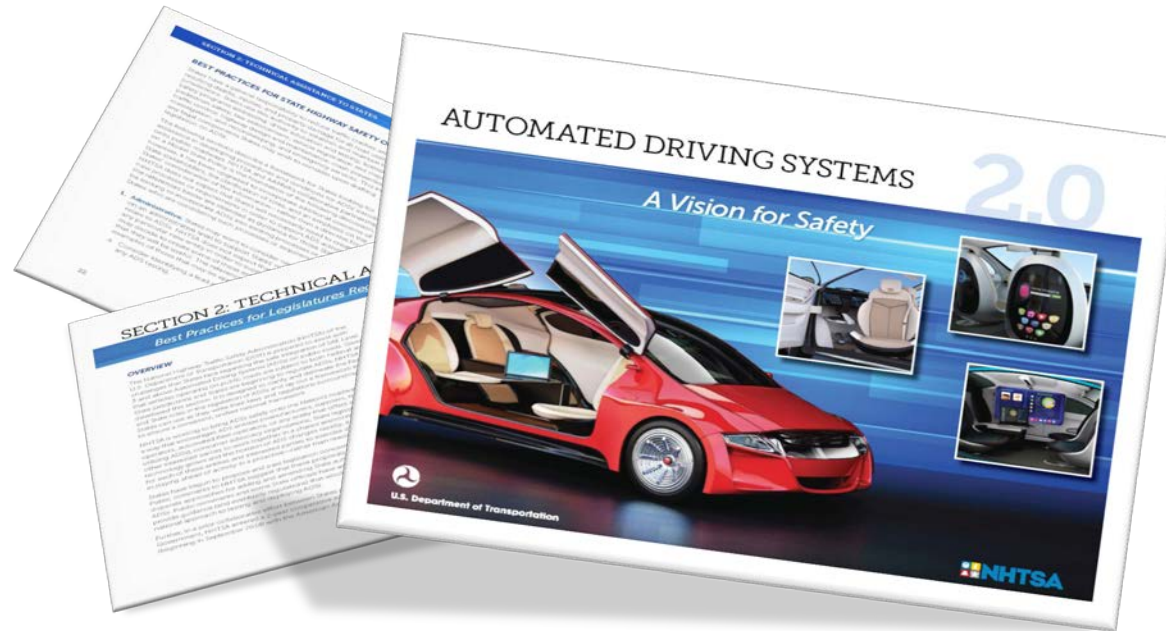
Agenda:
- Overview of the USDOT *Data for Automated Vehicle Safety* Initiative and Roundtable
- Overview of the resulting Work Zone Data Exchange project
- Panel Discussion
- Q&A

What is the *Data for Automated Vehicle Safety* Initiative?

Finch Fulton

Deputy Assistant Secretary for
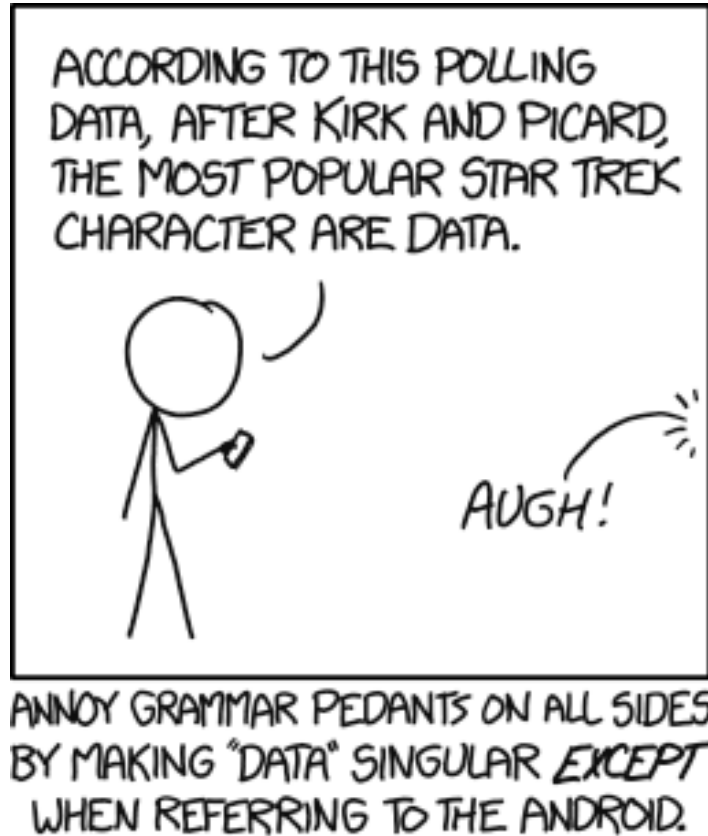Transportation Policy, USDOT

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USDOT AUTOMATED VEHICLES ACTIVITIES

Learn more about USDOT Automated Vehicles (AV) activities at:
https://www.transportation.gov/AV

HOW TO TAKE ON A CROSS-CUTTING ISSUE LIKE DATA?

ACCORDING TO THIS POLLING DATA, AFTER KIRK AND PICARD, THE MOST POPULAR STAR TREK CHARACTER ARE DATA.

AUGH!

ANNOY GRAMMAR PEDANTS ON ALL SIDES BY MAKING "DATA" SINGULAR *EXCEPT* WHEN REFERRING TO THE ANDROID.

Graphic credit:
https://xkcd.com/1429/

Access to data is a limiting factor for AV deployment. (It's also a sensitive topic.) One solution: *data exchanges.*

USDOT is using our *convening power* to understand critical use cases for data exchange and the appropriate federal role to enable them.

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Bringing Stakeholders Together for Meaningful Conversations

(IT'S REALLY HARD TO DO)

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AV DATA GUIDING PRINCIPLES (BETA)

1 Promote proactive, data-driven safety, cybersecurity, and privacy-protection practices.

2 Act as a facilitator to inspire and enable voluntary data exchanges.

3 Start small to demonstrate value, and scale what works toward a bigger vision.

4 Coordinate across modes to reduce costs, reduce industry burden, and accelerate action.

https://www.transportation.gov/AV/Data

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AV DATA FRAMEWORK (BETA)

Category*	Goals
Business-to-Business (B2B)	• Mitigate known and emerging cyberthreats • Improve industry-wide safety through shared learning • Inform future insurance policies
Business-to-Government (B2G)	• Understand performance of rapidly evolving tech • Inform policies and investments to improve system
Business-to-Infrastructure (B2I)	• Help vehicles navigate safely around obstacles • Reduce system congestion • Help optimize infrastructure maintenance
Open Training Data (X2X)	• Improve performance in common scenarios • Support basic research and education

*represents two-way data exchange

https://www.transportation.gov/AV/Data

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AV DATA FRAMEWORK (BETA)

Category*	Specific Data to Exchange	Real-World Examples
Business-to-Business (B2B)	• Cybersecurity incidents • Edge cases • Near-miss events • Performance in safety-critical scenarios	• Automotive Information Sharing and Analysis Center • ClinicalStudyDataRequest.com (CSDR)
Business-to-Government (B2G)	• Cybersecurity incidents • Near-miss events • Performance in safety-critical scenarios • Crash reconstruction	• Aviation Safety Information Analysis and Sharing • Voluntary Safety Self-Assessments (Part of ADS 2.0)
Business-to-Infrastructure (B2I)	• Work zone activities and geometrics • Road weather information • Missing signage or broken infrastructure • Curb use rules and availability	• National Transit Map • Waze Connected Citizens Program • Meteorological Assimilation Data Ingest System
Open Training Data (X2X)	• Road, signage, and other infrastructure imagery • Edge cases	• ImageNet • Multimedia Commons • Nexar NEXET

*represents two-way data exchange

https://www.transportation.gov/AV/Data

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ROUNDTABLE ON DATA FOR AV SAFETY (BETA)

Outcomes

- Clarity on value of federal government as convener and facilitator

- Priority use cases for data exchange: work zones, scenarios, cybersecurity, others

Next Steps

- Enable voluntary data exchanges as "One DOT" via pilot projects

- Incorporate into AV policies

- Continue conversations

Photo credit: Dan Morgan

Summary Report available via:
https://www.transportation.gov/AV/Data

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Work Zone Data Exchange Project

THE LOCAL DATA CHALLENGE

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THE LOCAL DATA CHALLENGE

Up-to-date information about dynamic conditions occurring on the roads – such as construction events – can help AVs navigate safely and efficiently.

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.

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LEARNING FROM THE OPEN TRANSIT DATA STORY

A **simple** specification…
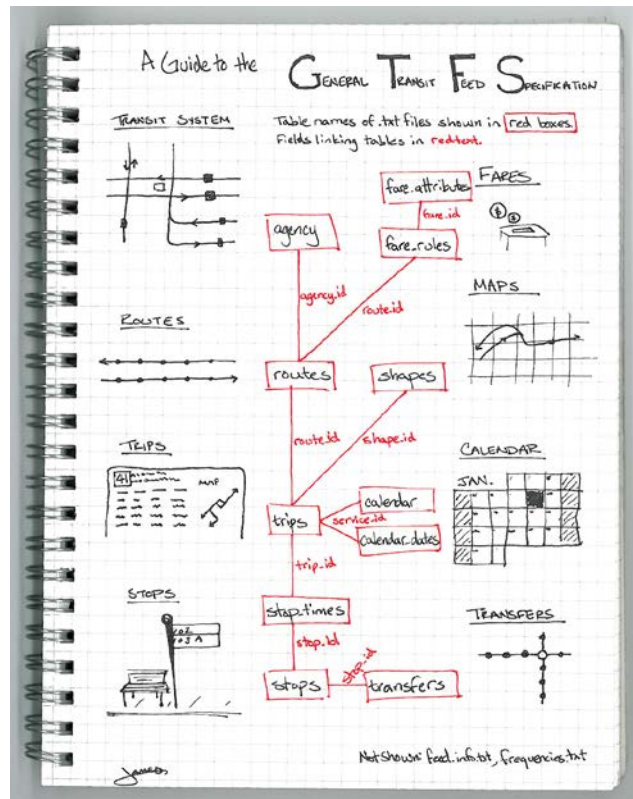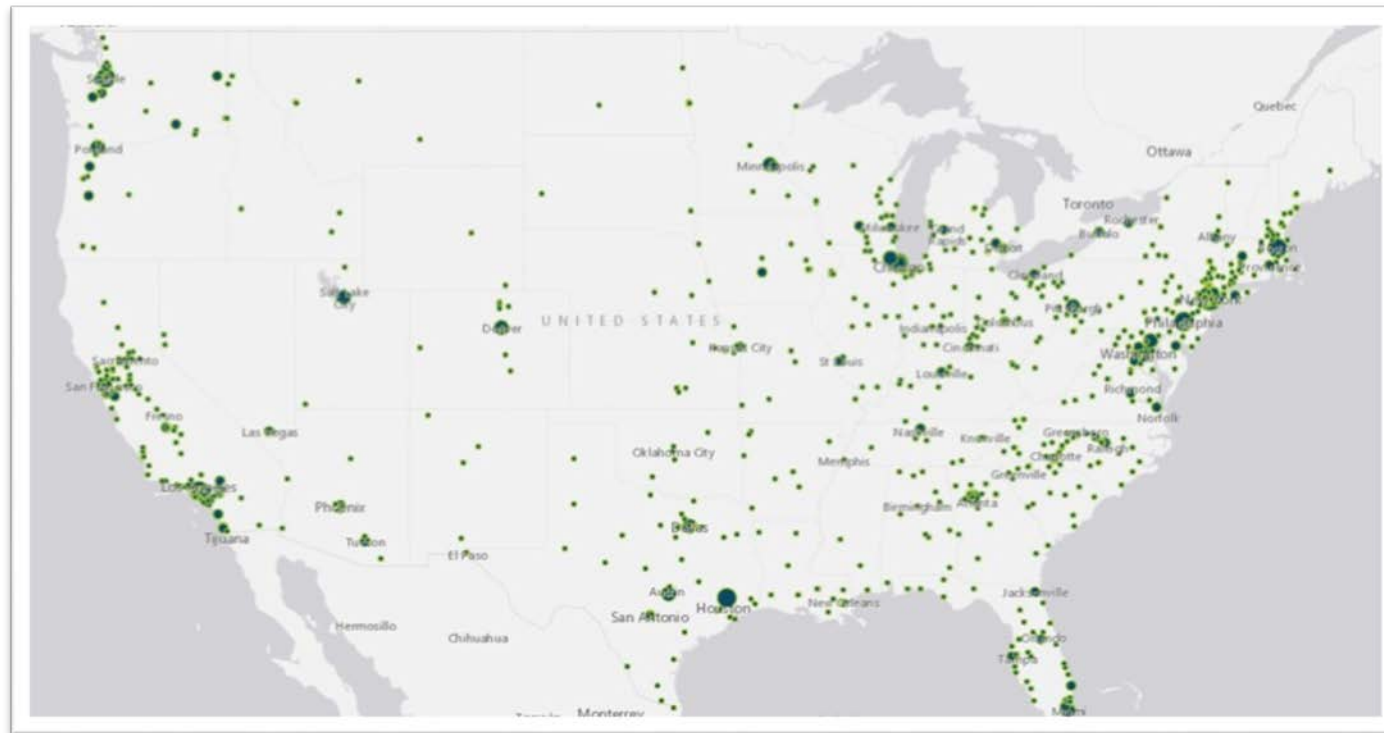
…with a **wide range** of uses
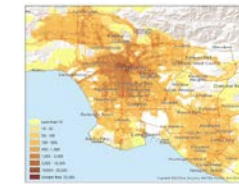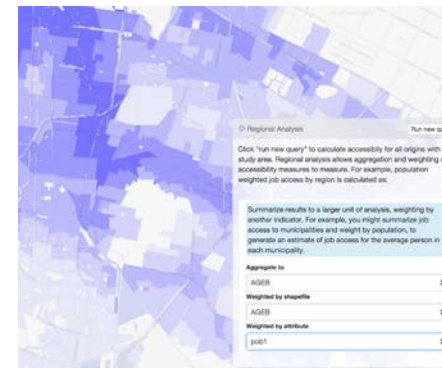
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A FEDERATED "FRONT DOOR" TO TRANSIT DATA

Now, **basic transit data** is easy to **find and use nationwide;**
transit agencies and their users **continue to collaborate** on the spec

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WORK ZONE DATA EXCHANGE PROJECT (OVERVIEW)

Purpose
- To jumpstart voluntary adoption of a basic work zone data specification
- To enable collaborative maintenance and expansion of the spec

Outcomes within 6 months
- **Data producers** make available an active work zone data feed using a common, non-proprietary specification
- **Non-government developers** use that data in a meaningful way – thus establishing an MVP of voluntary data exchange for work zone data

Big Picture Outcome
- Repeatable approach to accelerate harmonization of local data sources

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WORK ZONE DATA EXCHANGE PROJECT (OVERVIEW)

Approach

- Data producers and users:
  - Agree on common data specification that meets their minimal needs
  - Leverage existing published and *de facto* standards
  - Work collaboratively and in the open using an agile process
- USDOT:
  - Facilitates and convenes
  - Provides technical inputs
  - Sets up to scale after 6-month mark

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WORK ZONE DATA EXCHANGE PROJECT (OVERVIEW)

May 2018:

USDOT synthesizes inputs from data providers and produces strawman data dictionary based on existing data sources

Feb 2018:

Charter project

July 2018:

Users validate sample data; lock in data dictionary v1

Aug 2018:

Promote broadly; Start process of adding new fields for v2

Mar 2018:

Kick off

June 2018:

Reach consensus on data dictionary (common core, extensible fields for future) and encoding spec
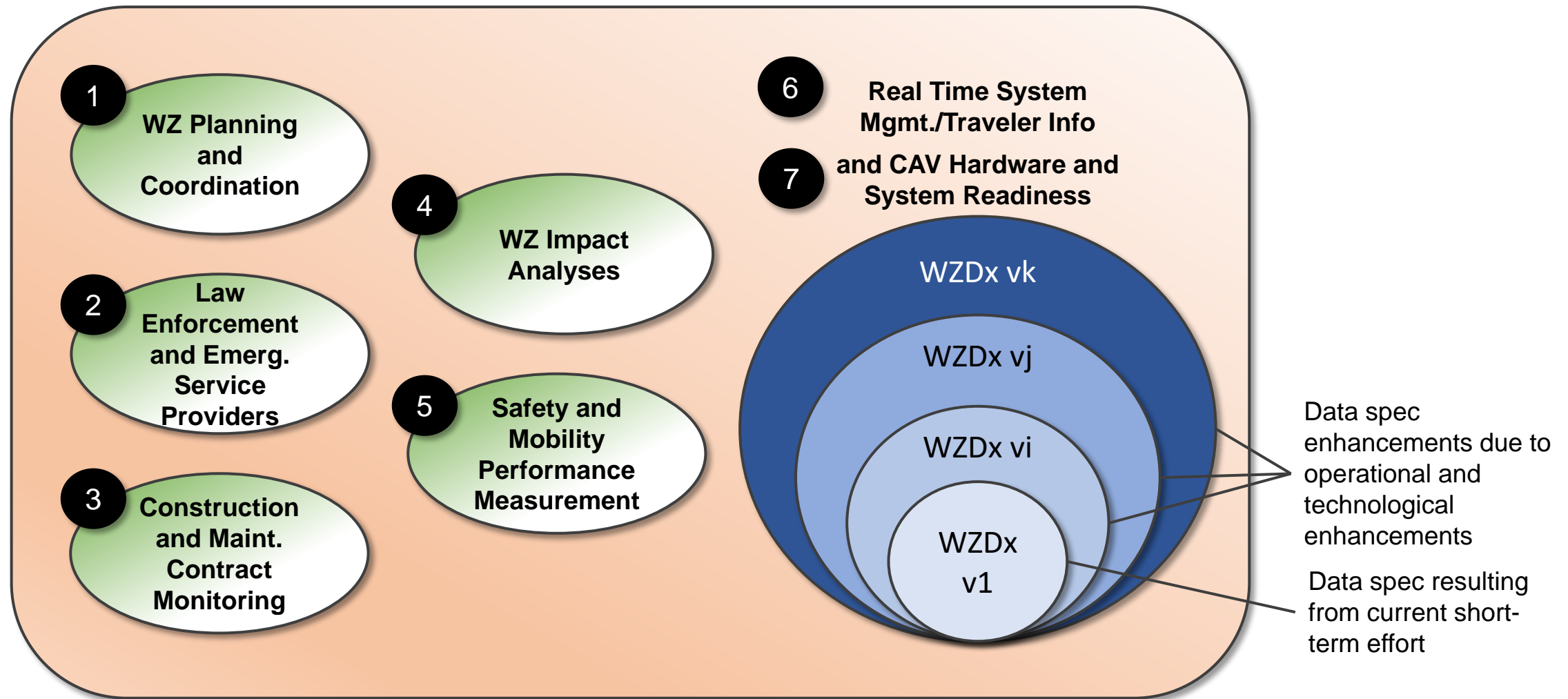
July 2018:

Data providers implement the common spec; data users demonstrate use of the data

Technical assistance (immediate, and TBD longer term)

Discover AV-specific needs that go beyond current data feeds

Establish mechanism to maintain and expand spec in future

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LONGER-TERM NEEDS DISCOVERY (FHWA WORK ZONE DATA INITIATIVE)

1 WZ Planning and Coordination

2 Law Enforcement and Emerg. Service Providers

3 Construction and Maint. Contract Monitoring

4 WZ Impact Analyses

5 Safety and Mobility Performance Measurement

6 Real Time System Mgmt./Traveler Info

7 and CAV Hardware and System Readiness

WZDx vk

WZDx vj

WZDx vi

WZDx v1

Data spec enhancements due to operational and technological enhancements

Data spec resulting from current short-term effort

Panel Discussion

PERSPECTIVES ON AV DATA EXCHANGE

Monali Shah

Director of Intelligent Transportation
HERE

Peter Kozinski

Director, RoadX Program
Colorado DOT

Valerie Briggs

Director, Office of Transportation
Management
Federal Highway Administration

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Questions?

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