The U.S. DOT Data for Automated Vehicle Integration (DAVI)
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Purpose of Today’s Session

• Provide an update on lessons learned through U.S. DOT’s *Data for Automated Vehicle Integration* (DAVI) initiative, including:
  • Priorities for data exchange
  • Federal and non-federal roles
  • Progress on increasing access to work zone data

• Help identify uses cases and priorities for data exchange

• Explore the local government perspective
AV 3.0 & Data

- Provides new multimodal safety guidance, clarifies policy and roles, and outlines how to work with U.S. DOT as automation technology evolves
- Calls on stakeholders to identify opportunities for voluntary data exchanges
- Features efforts aimed at enabling voluntary data exchanges

Automation Principles and Implementation Strategies

**PRINCIPLES**

- Stakeholder engagement
- Best practices
- Voluntary standards
- Targeted research
- Regulatory modernization

https://www.transportation.gov/av/data
Roundtable on Data for AV Safety

[Image of a roundtable discussion with a screen displaying information about the roundtable and a diagram of autonomous vehicles.]
U.S. DOT’s Data for AV Integration (DAVI) Initiative

1. Identify needs for data exchange
2. Prioritize data exchanges
3. Address barriers or market failures preventing priority data exchanges
4. Monitor emergence of market-based solutions

https://www.transportation.gov/av/data
U.S. DOT’s Guiding Principles on Data for Automated Vehicle Safety

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.
U.S. DOT’s Data for Automated Vehicle Integration Framework

1. Identify Needs for data exchange
2. Prioritize Data exchanges
3. Address Barriers or market failures preventing priority data exchanges
4. Monitor Emergence of market-based solutions

U.S. Department of Transportation Data for Automated Vehicles Integration (DAVI) Framework

<table>
<thead>
<tr>
<th>Category</th>
<th>Goals</th>
<th>Data-Generators &amp; Users Participating in the Exchange</th>
<th>Specific Data to Exchange</th>
<th>Real-World Examples</th>
</tr>
</thead>
</table>
| Business-to-Business (B2B) | - Mitigate known and emerging cyberthreats  
|                    | - Improve industry-wide safety through shared learning in safety-critical and edge-case scenarios  
|                    | - Share future policy changes  
|                    | - Accelerate the resolution of legal liability claims | - Heavy- and light-duty original equipment manufacturers (OEMs)  
|                    | - Transportation network components (TNCs) and fleet operators  
|                    | - Insurance companies | - Cybersecurity incidents  
|                    | - Edge cases  
|                    | - Near-miss events  
|                    | - Performance in safety-critical scenarios  
|                    | - Post-accident data | - Automatic Information Sharing and Analysis Center  
|                    | - CrashNet/Disrupt/Disrupt.com  
|                    | - RESCUE  
|                    | - TNO/Robo Elves  
|                    | - TRA MRA Data Exchange |  
| Business-to-Government (B2G) | - Understand performance of industry-wide regulations during testing phases  
|                    | - Share policies and investments to improve system safety and efficiency | - Heavy- and light-duty OEMs  
|                    | - TNCs and fleet operators  
|                    | - Insurance companies  
|                    | - Non-federal government (state, county, municipal)  
|                    | - Federal government (FHWA, NHTSA, TIGER, MTO) | - Cybersecurity incidents  
|                    | - Near-miss events  
|                    | - Performance in safety-critical scenarios  
|                    | - Crash reconstruction  
|                    | - Connected vehicle pilot data  
|                    | - Robust inventory of infrastructure assets | - Aviation Safety Information Analysis and Reporting  
|                    | - Voluntary Safety Self-Assessments |  
| Infrastructure-to-Business (I2B) | - Help vehicles navigate safety-critical scenarios and adverse weather conditions  
|                    | - Reduce system congestion  
|                    | - Improve infrastructure maintenance  | - Infrastructure owners & operators (state, county, municipal, federal, academic)  
|                    | - Infrastructure tech companies  
|                    | - In vehicle & automated vehicle services  
|                    | - Heavy- and light-duty OEMs  
|                    | - TNCs and fleet operators | - Work zone and traffic management  
|                    | - Road infrastructure data  
|                    | - Weather forecast or traffic infrastructure  
|                    | - Truck operational data | - National Transit Valve  
|                    | - Loop Connection Observer Program  
|                    | - Meteorological Airflow, Displacement System |  
| Open-Source Data | - Improve ADAS performance in common safety-critical scenarios  
|                    | - Support basic research and education | - Government  
|                    | - Industry  
|                    | - Academia  
|                    | - Individuals | - Road, signpost, and other infrastructure imagery  
|                    | - Edge cases  
|                    | - BIM/3D realizations  
|                    | - Truck platooning, pilot data | - Integr8s  
|                    | - Zebra/Cameras  
|                    | - New REEIT  
|                    | - BusAway.org  
|                    | - Transit Planning/ODC |  

Last updated 11/5/2018

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What is the local data challenge?

• Up-to-date information about dynamic conditions occurring on roads—such as construction events—can help automated driving systems (ADS) and humans navigate safely and efficiently.

• Many Infrastructure Owners and Operators (IOOs) maintain data on work zone activity. However, a 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 sets across various jurisdictions.
What can we learn from the open transit data story?

A simple specification… …with a wide range of uses
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 specifications.

*Figure 4: Map identifying the different locations where basic transit data can be found and used*
Can this be replicated?

1. Simple, Open Specification
2. Broadly Adopted
3. Saves Lives
The Work Zone Data eXchange (WZDx)

Work Zone Data Data Exchange (WZDx)

What is the WZDx Specification?

The Work Zone Data Exchange (WZDx) Specification enables infrastructure owners and operators (IOOs) to make harmonized work zone data available for third party use. The intent is to make travel on public roads safer and more efficient through ubiquitous access to data on work zone activity. Specifically, the project aims to get data on work zones in to vehicles to help automated driving systems (ADS) and human drivers navigate more safely.

Why is WZDx being developed?

Improving access to work zone data is one of the top needs identified through the U.S. Department of Transportation (USDOT) Data for Automated Vehicle Integration (DAII) effort.

Up-to-date information about dynamic conditions occurring on roads – such as construction events – can help ADS and humans navigate safely and efficiently. Many IOOs maintain data on work zone activity. However, a lack of common data standards and conveying 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.

Thus, inspired by GTFS, USDOT launched WZDx to jumpstart the voluntary adoption of a basic work zone data specification through collaboration with data producers and data users. Longer term, the goal is to enable collaborative maintenance and expansion of the specification to meet the emerging needs of ADS.

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Work Zone Activity Data Lifecycle

**PLANNING / DESIGN**
“Estimated” work zone activity
Data is dynamic, ephemeral
*Uses:*
- Project coordination/scheduling of closures
- Predictive travel times
- Fleet routing
- Anticipated capacity reduction
- Less detail regarding work zone configuration

**CURRENT**
“Actual” work zone activity
Data is dynamic, ephemeral
*Uses:*
- Traveler information
- Work zone management
- Situational awareness
- Inspection
- Asset management
- Contract monitoring
- Automated vehicle navigation

**POST-CONSTRUCTION**
“Historical” work zone activity
Data is static, persistent (“read-only”)
*Uses:*
- Permanent record of prior activity, serving:
  - Performance management
  - Contract monitoring
- May be overlaid with other historical information (e.g., crashes, traffic probe data, etc.) to establish correlation between work zone activity and other operational information.

https://www.transportation.gov/av/data
Q & A
Resources

To learn more and access available resources, please visit:

- DAVI Website
- Automated Vehicles 3.0
- AV Data Roundtable Summary Report
- City of Austin Smart Mobility Roadmap
- General Transit Feed Specification
- WZDx Version 1.1. Common Core Data Specification
- WZDx Project Repo
- Work Zone Data Initiative

For information on the WZDx project or anything else related to the DAVI initiative, contact avdx@dot.gov
Join U.S. DOT at ITSA 2019

U.S. DOT Booth #601

Thursday, June 6

11:00 am – 12:00 pm
- New York City Connected Vehicle Pilot
- Tampa Connected Vehicle Pilot
- Wyoming Connected Vehicle Pilot

12:00 pm – 2:00 pm
- New York City Connected Vehicle Pilot
- Tampa Connected Vehicle Pilot
- Wyoming Connected Vehicle Pilot
- Work Zone Data Exchange
- CARMA

2:00 pm – 4:00 pm
- New York City Connected Vehicle Pilot
- Tampa Connected Vehicle Pilot
- Wyoming Connected Vehicle Pilot

PLENARY SESSION

Friday, June 7    11:45am to 1:00pm    Room 206

Representatives across the U.S. DOT modal agencies will participate in a plenary session at this year’s ITS America Annual Meeting. DOT administrators and deputy administrators will share insights and discuss their ITS research goals and program.

Diana Furchtgott-Roth
(Moderator)
Deputy Assistant Secretary for Research and Technology

K. Jane Williams
Acting Administrator, Federal Transit Administration

Brandye Hendrickson
Deputy Administrator, Federal Highway Administration

Richard Balzano
Deputy Administrator, Maritime Administration

Raymond Martinez
Administrator, Federal Motor Carrier Safety Administration

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