Data Exchanges to Enable Automated Vehicle Integration

November 8, 2018

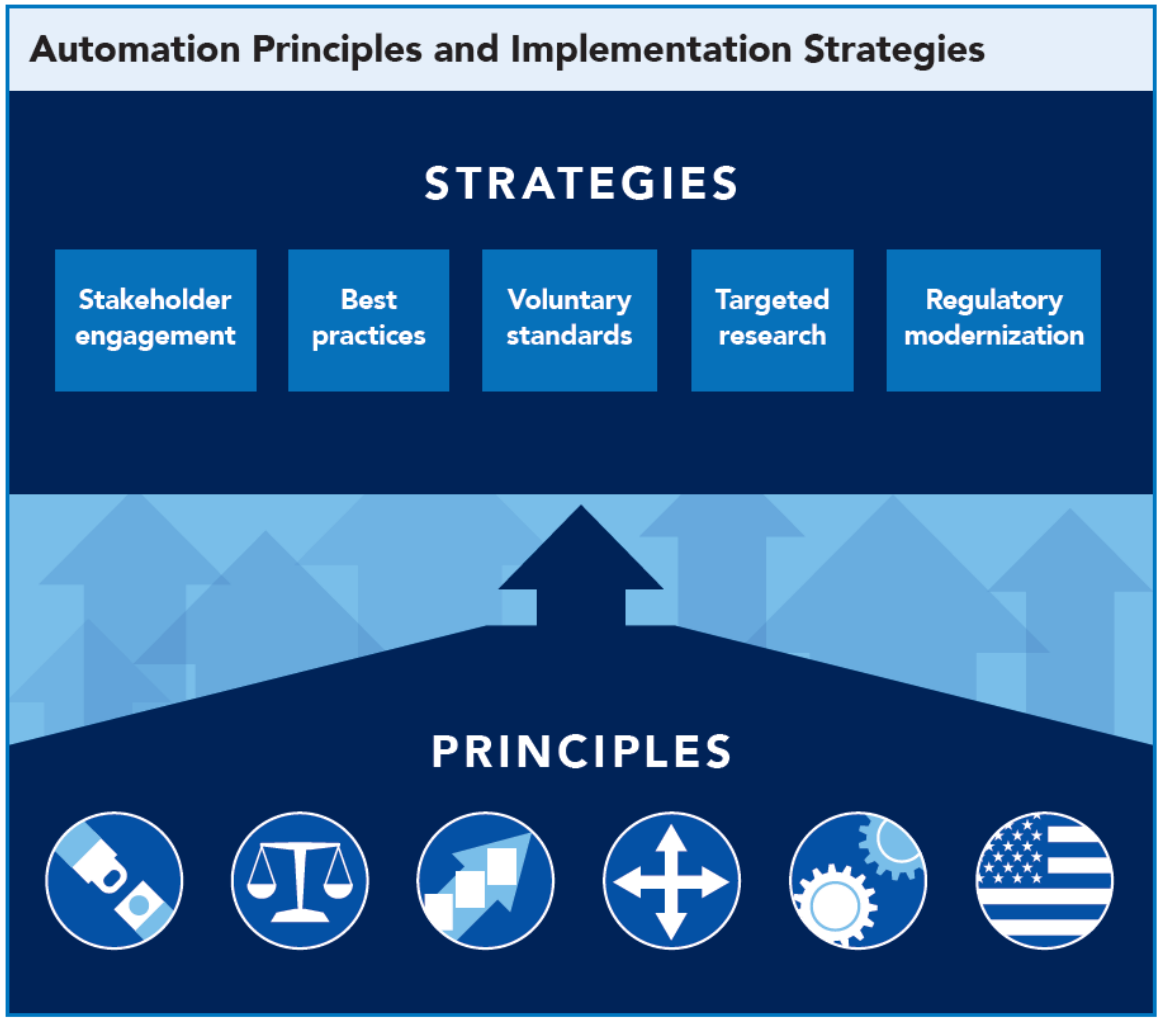
Ariel Gold
Data Program Manager
ITS Joint Program Office
U.S. Department of Transportation

Today's Webinar

- ✓ *Purpose & Target Audience*
- ✓ *Agenda*
  - AV 3.0 & Data
  - Roundtable on Data for Automated Vehicle (AV) Safety
  - Data for Automated Vehicle Integration (DAVI)
  - Work Zone Data Exchange (WZDx) Project
  - Q & A
  - Resources

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



https://www.transportation.gov/av/data

Roundtable on Data for AV Safety

https://www.transportation.gov/av/data

U.S. DOT's Data for AV Integration (DAVI) Initiative

- USDOT launched DAVI to identify, prioritize, monitor, and – where necessary – address data exchange needs for AV integration across the modes of transportation.

- Access to data is a critical enabler for the safe, efficient, and accessible integration of AVs into the transportation system. A lack of access to data could impede actions to accommodate AVs and delay their introduction.

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.

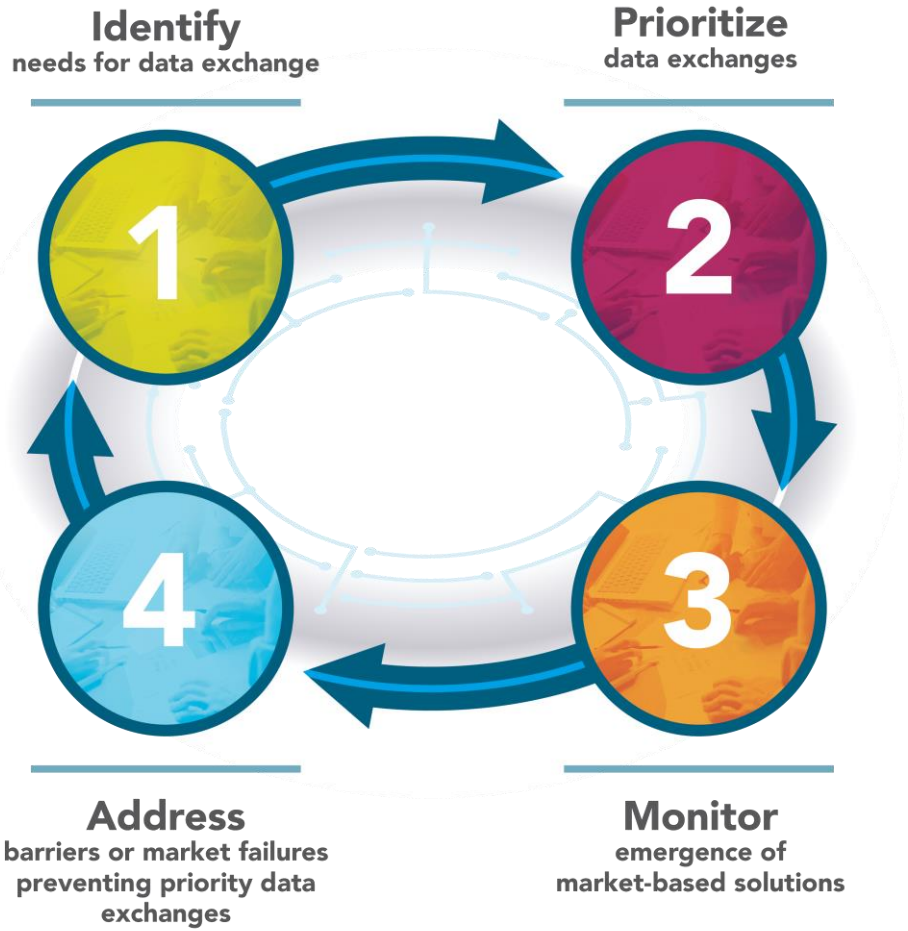
4. Coordinate across modes to reduce costs, reduce industry burden, and accelerate action.

U.S. DOT's Data for Automated Vehicle Integration **Framework**

Category	Goals	Data Generators & Users Participating in the Exchange	Specific Data to Exchange	Real-World Examples
Business-to-Business (B2B)	▪ Mitigate known and emerging cyberthreats ▪ Improve industry-wide safety through shared learning in safety-critical and edge case scenarios ▪ Inform future insurance policies ▪ Accelerate the resolution of legal liability claims	▪ Heavy- and light-duty original equipment manufacturers (OEMs) ▪ Transportation network companies (TNCs) and fleet operators ▪ Insurance companies	▪ Cybersecurity incidents ▪ Edge cases ▪ Near-miss events ▪ Performance in safety-critical scenarios ▪ Post-accident data	▪ Automotive Information Sharing and Analysis Center ▪ ClinicalStudyDataRequest.com ▪ PEGASUS ▪ TNO Streetwise ▪ TS America Data Exchange
Business-to-Government (B2G) …and/or G2B	▪ Understand performance of rapidly evolving technology during testing phases ▪ Inform 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, FMCSA, FTA, NHTSA)	▪ 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 Sharing ▪ Voluntary Safety Self-Assessments
Infrastructure-to-Business (I2B) …and/or B2I	▪ Help vehicles navigate safely around obstacles and in adverse weather conditions ▪ Reduce system congestion ▪ Help optimize infrastructure maintenance	▪ Infrastructure owners & operators (state, county, municipal, federal, academic) ▪ Infrastructure tech companies ▪ In-vehicle & aftermarket services ▪ Heavy- and light-duty OEMs ▪ TNCs and fleet operators	▪ 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	▪ Improve ADS performance in common safety-critical scenarios ▪ Support basic research and education	▪ Government ▪ Industry ▪ Academia ▪ Individuals	▪ Road, signage, and other infrastructure imagery ▪ Edge cases ▪ Bike/ped near misses ▪ Truck platooning pilot data	▪ ImageNet ▪ Multimedia Commons ▪ Nexar NEXET ▪ BikeMaps.org ▪ FHWA Platooning POC

Last updated 11/5/2018

Operationalizing the DAVI Framework



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

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Work Zone Data Exchange (WZDx) Project

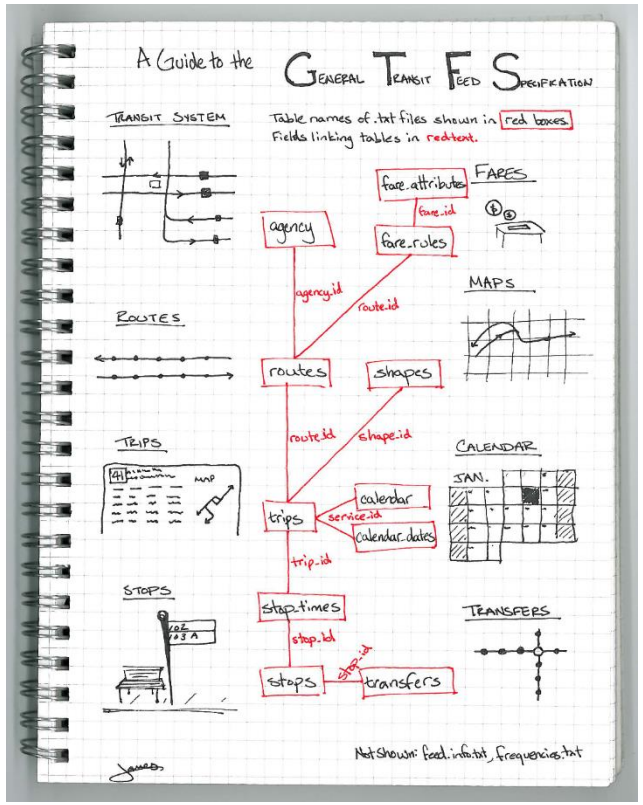
The Local Data Challenge

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

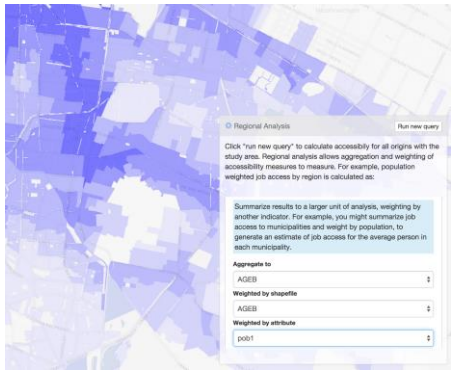
- Many infrastructure owners and operators (IOOs) maintain data on work zone activity, but a lack of common data standards and convening mechanisms makes it difficult and costly for third parties—including original equipment manufacturers (OEMs) and navigation applications—to access and use these data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

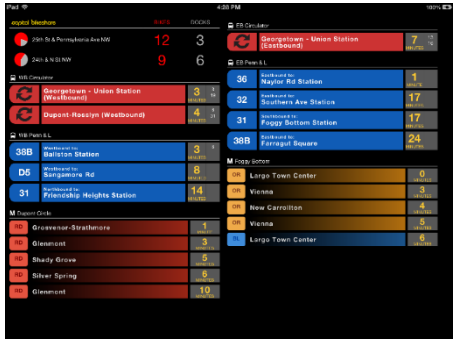
Learning from the Open Transit Data Story

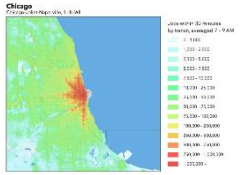
A **simple** specification…



…with a **wide range** of uses







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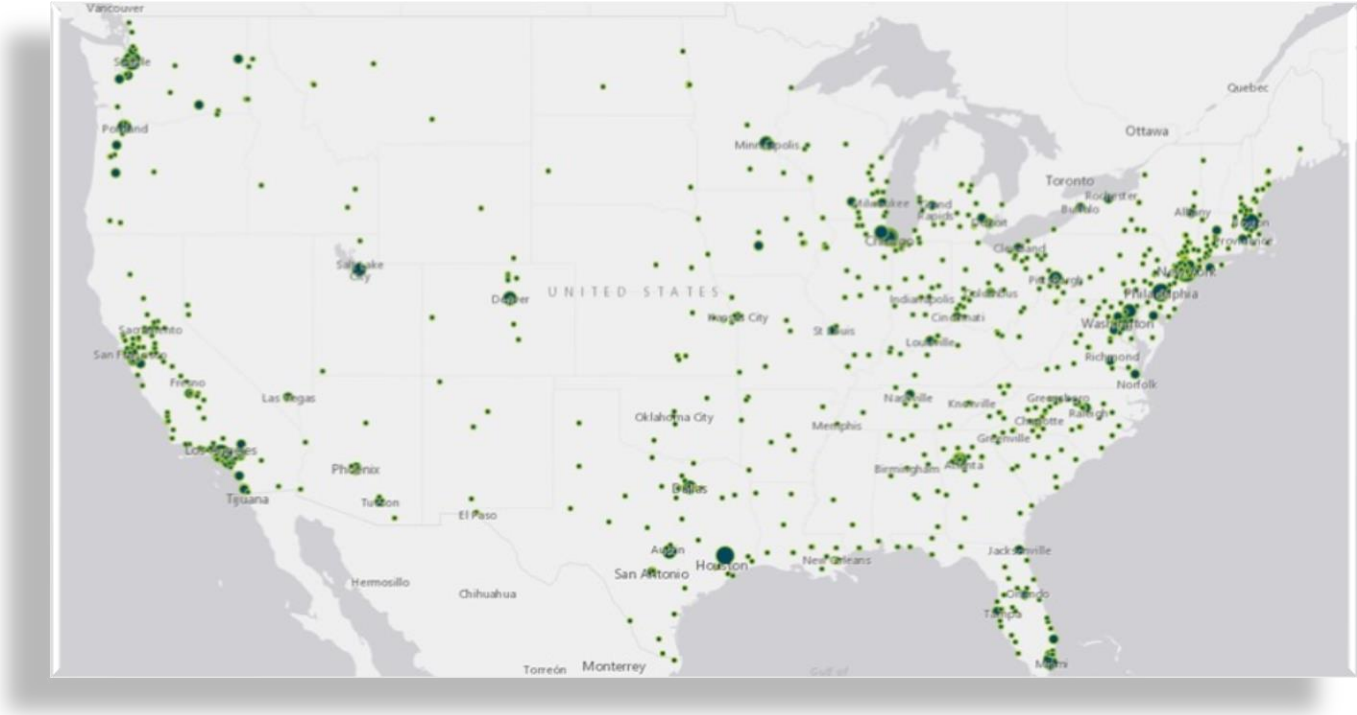
A Federated Front Door to Transit Data

- Now, **basic transit data** is easy to **find and use nationwide.**
- Transit agencies and their users **continue to collaborate** on the specifications.



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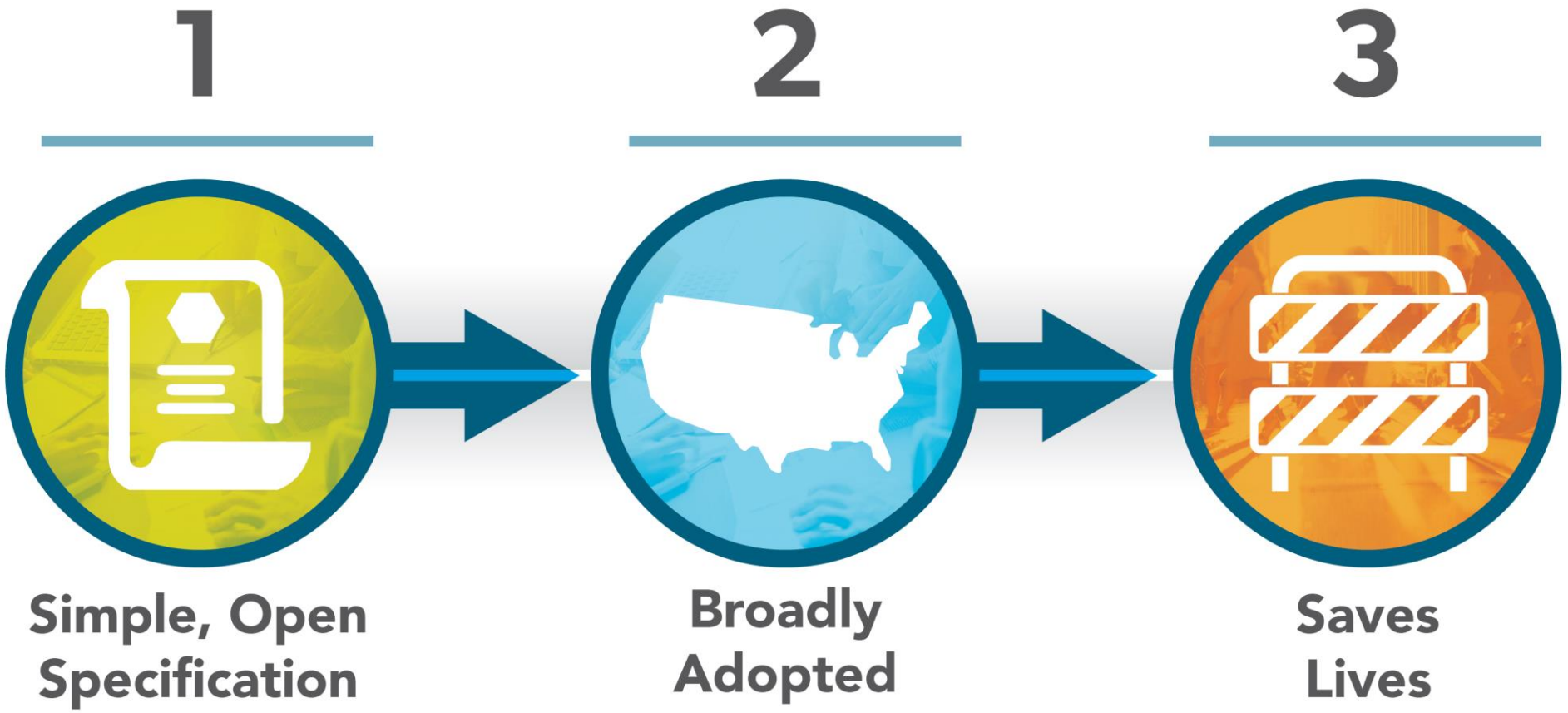
Can This Be Replicated?



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Work Zone Data Exchange (WZDx) Project

Work Zone Data Exchanges

The Work Zone Data Exchange project responds to priorities identified by public and private sector stakeholders. The goal is to develop a harmonized specification for work zone data that infrastructure owners and operators can make available as open feeds that automated vehicles and others can use.

Accurate and up-to-date information about dynamic conditions occurring on the roads—such as work zones—can help automated vehicles navigate safely and efficiently. Many infrastructure owners and operators maintain data on work zone activity, but a common specification for this type of data does not currently exist.

This makes it difficult and costly for third parties—including vehicle manufacturers and makers of navigation applications—to access and use work zone data across various jurisdictions.

Several State DOT agencies and private companies are voluntarily participating in the project, with U.S. DOT acting as a technical facilitator. U.S. DOT has been working with these partners to help define the core data elements that should be included in an initial work zone specification and to determine what types of technical assistance the data producers will need to implement it, expand it over time, and address broader work zone data management challenges.

Purpose

- To jump-start voluntary adoption of a basic work zone data specification
- To enable collaborative maintenance and expansion of the specification

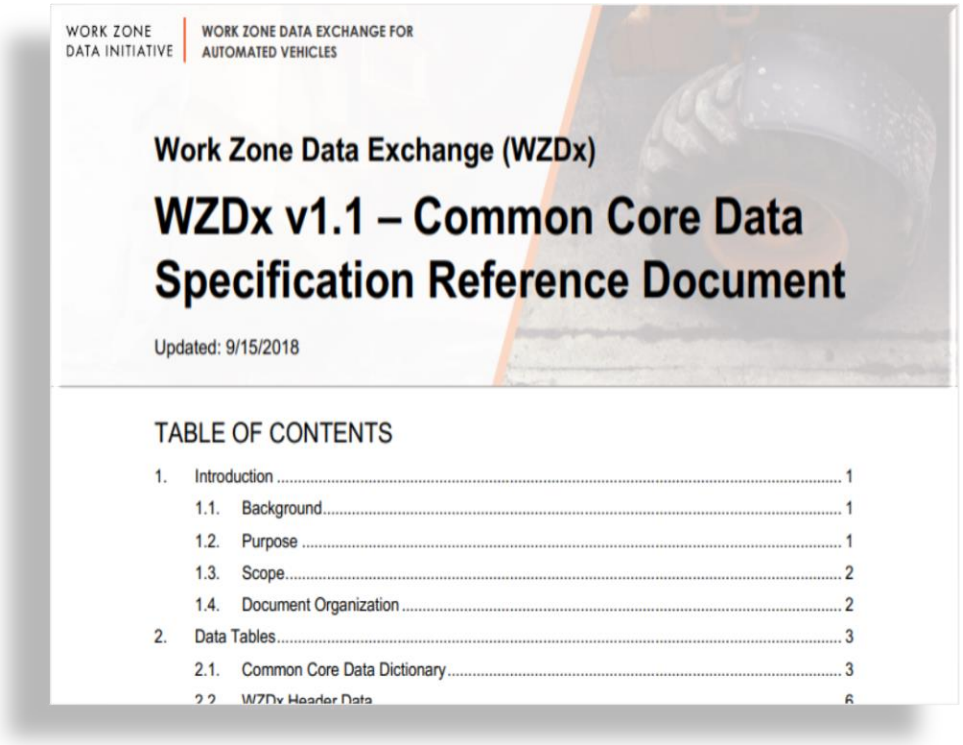
Outcomes Within Six Months

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

Big Picture Outcome

- Repeatable approach to accelerate harmonization of local data sources

Work Zone Data Exchange (WZDx) Project (Cont.)



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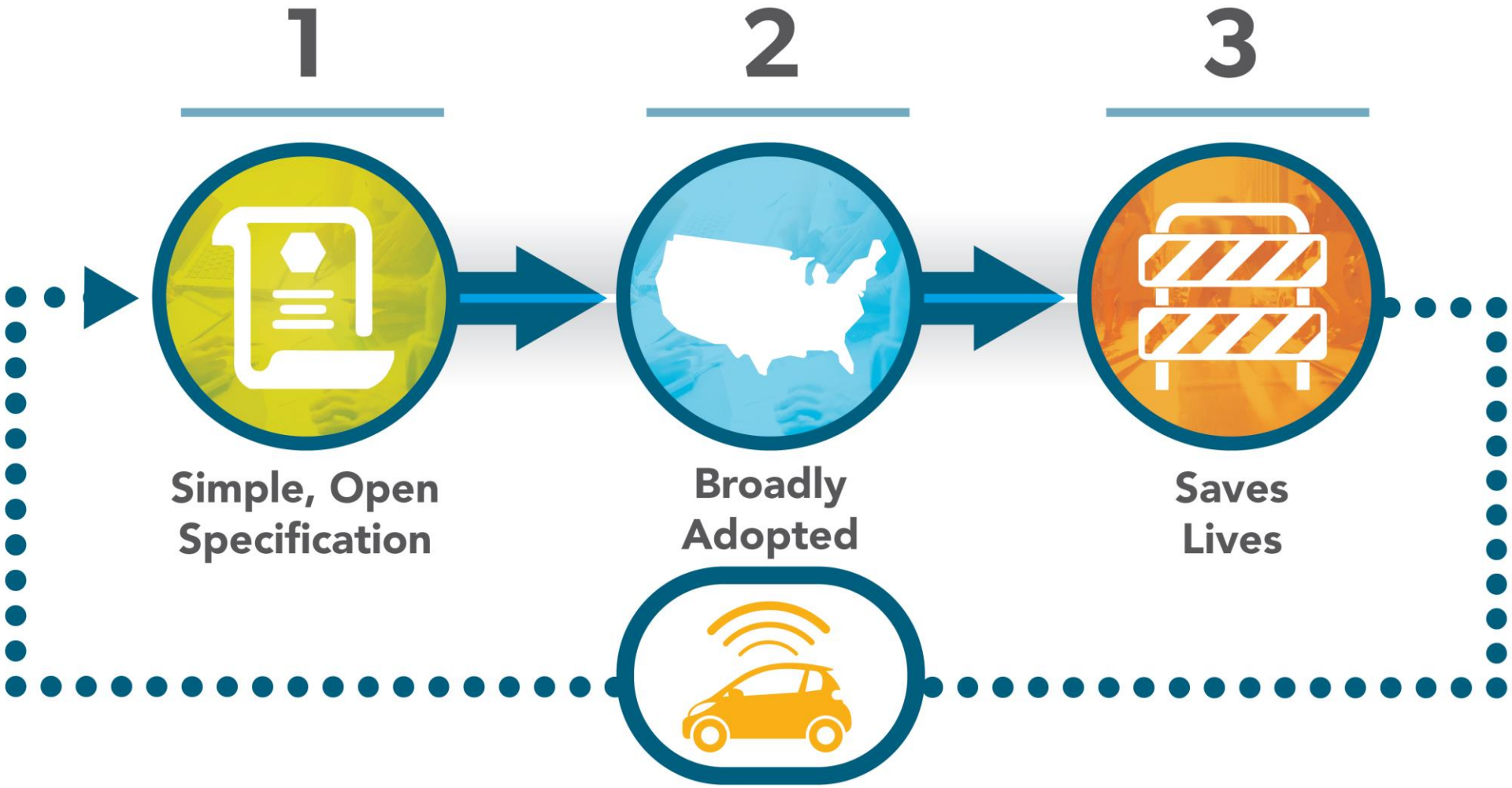
Can This Be Extended – Iteratively?



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Your Contributions

- How can we make the Framework on Data for Automated Vehicle Integration a useful tool to clarify data exchange needs and how they are – or aren't – being addressed?
- What are the highest priority data exchanges?
- What market-based solutions are already emerging?

Find out about events and requests for information at
www.transportation.gov/av

Q & A

Resources

To learn more about the DAVI initiative and access available resources, please visit:

- Data for Automated Vehicle Integration Website
- Automated Vehicles 3.0
- AV Data Framework
- AV Data Roundtable Summary Report
- B2B Example: Automotive ISAC
- B2G Example: Voluntary Safety Self-Assessment
- General Transit Feed Specification
- I2B Example: National Transit Map
- National Dialogue on Highway Automation
- Open Example: Platooning Data
- USDOT AV Events & Public Notices
- Work Zone Data Exchange v1.1 Spec

Contact me: Ariel.Gold@dot.gov

Thank you!

A feedback form will be emailed to all participants following the webinar. We appreciate your response and value your input.