# Big Data and Artificial Intelligence

## For Road Safety

presented by:
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U.S. Department of Transportation
Intelligent Transportation Systems Joint Program Office

# Intelligent Transportation Systems and the Safe System Approach

## ITS and Safe Road Users

- Bike & Pedestrian Safety Systems
  - Rectangular Rapid Flashing Beacon - ***PSC**
  - Leading Pedestrian Interval - ***PSC**
  - Pedestrian Hybrid Beacon - ***PSC**

***PSC**=Proven Safety Countermeasure

Source: Federal Highway Administration

## ITS and Post-Crash Care

- Traffic Incident Management (TIM)
- Emergency Vehicle Preemption
- UAS for Crash Reconstruction

## ITS and Safe Vehicles

- Connected Vehicles (CV)
- Advanced Driver Assistance Systems (ADAS)
- Automated Vehicles (AV)

## ITS and Safe Roads

- Active Traffic Management (ATM)
- Smart Work Zone Technologies
- Road Geometry Warnings
- Highway-Rail Crossing Safety Systems
- Intersection Collision Warning Systems
- Road Weather Warning Systems
- Wrong Way Driving Warning Systems


## ITS and Safe Speeds

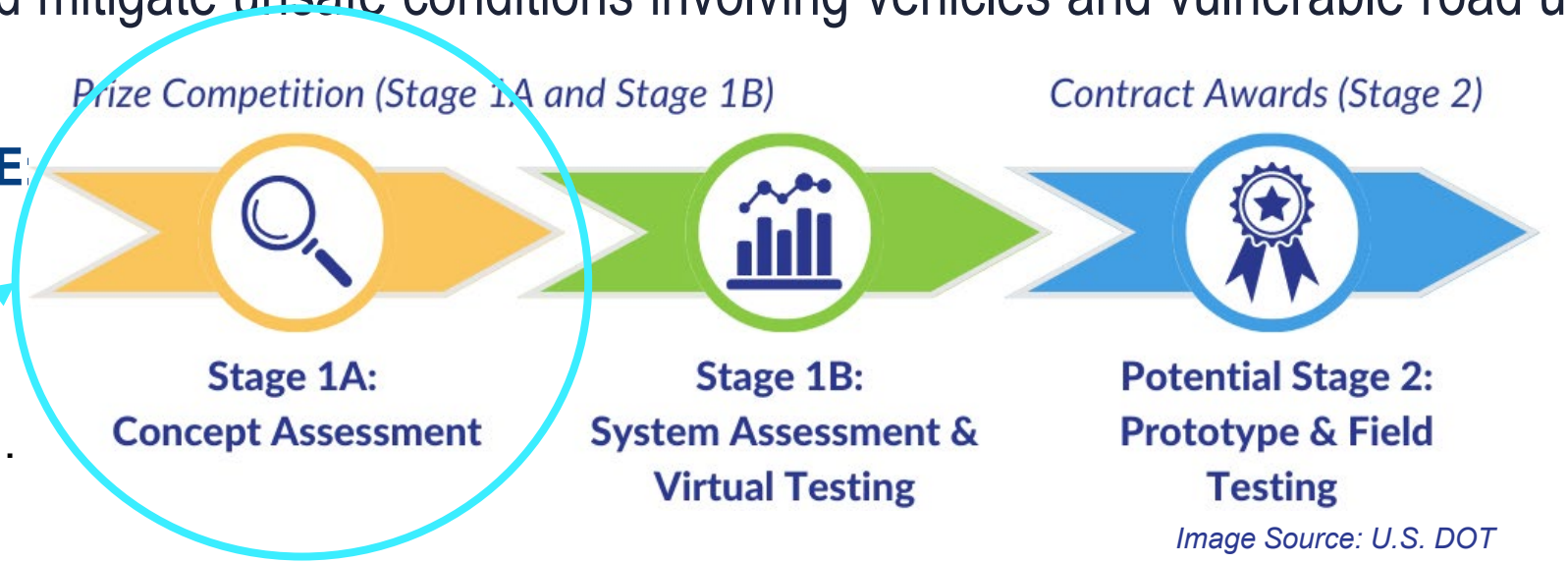
- Speed Safety Cameras - ***PSC**
- Variable Speed Limits - ***PSC**
- Curve Speed Warnings
- Reduced Speed Warnings
- Automated Work Zone Speed Enforcement

# The Artificial Intelligence (AI) Executive Order advances an urgent and coordinated, Federal Government-wide approach to development and use of safe, secure, and trustworthy AI

**Safe, Secure, Trustworthy**

# U.S. DOT Intersection Safety Challenge Program

- **VISION: Transform intersection safety** through the innovative application of emerging technologies including machine vision, sensor fusion, and real-time decision-making to identify and mitigate unsafe conditions involving vehicles and vulnerable road users.
- **PROGRAM STRUCTURE:**



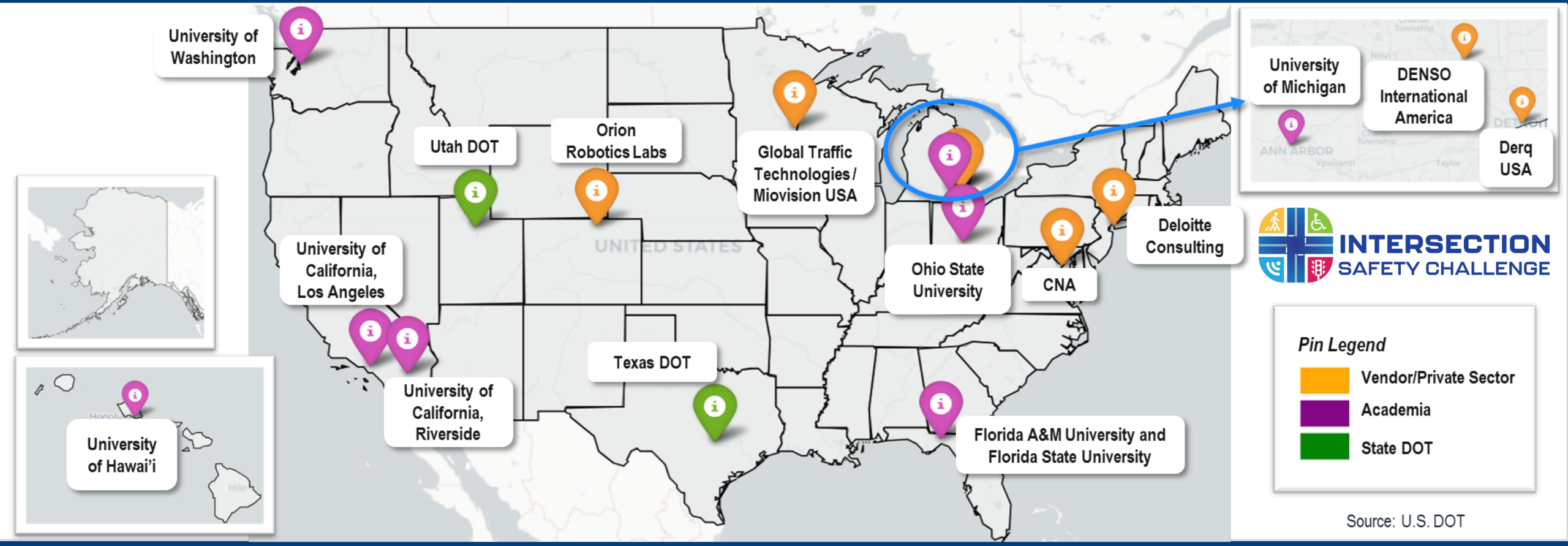

Just completed.

*Image Source: U.S. DOT*

- **PRIZE COMPETITION:** Encourage teams of innovators and end-users to develop and virtually test their intersection safety systems to compete for prizes.

# Intersection Safety Challenge Stage 1A Winners*

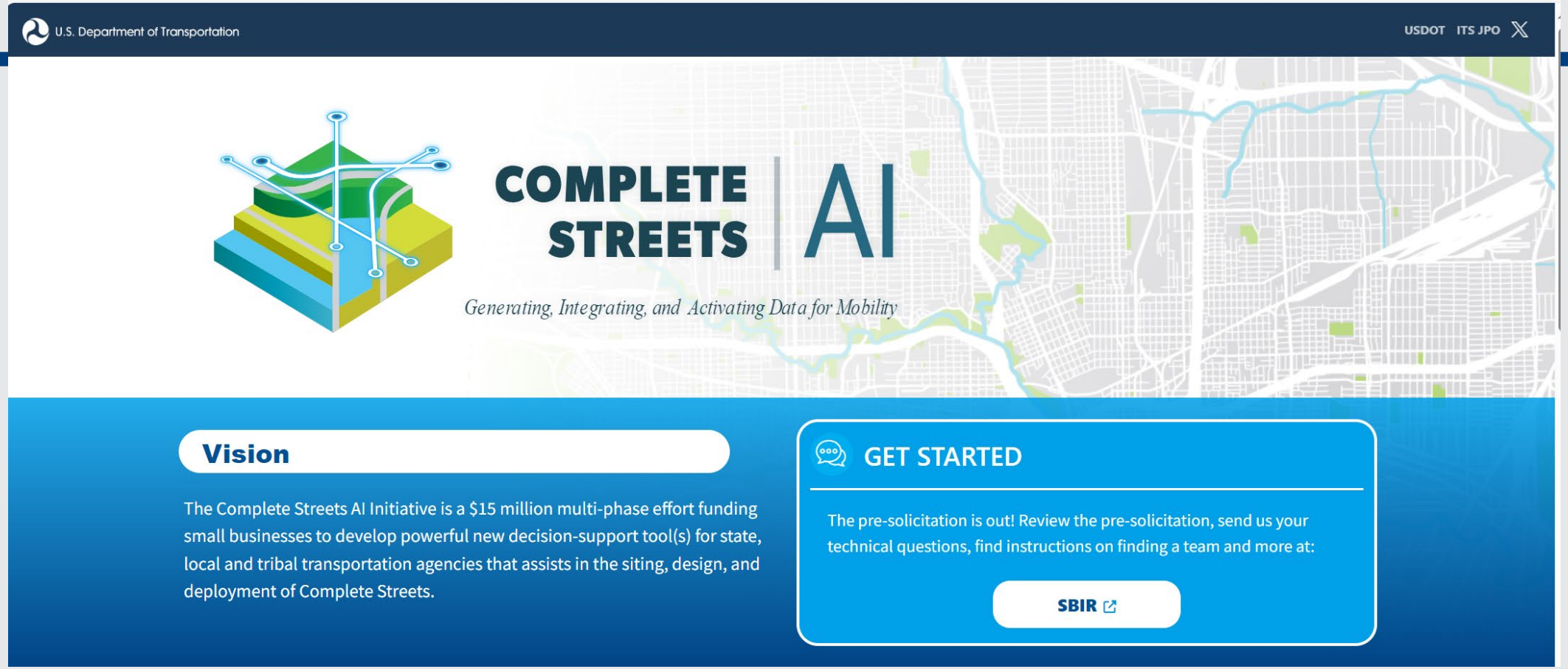
** Names represent Concept Paper submission Lead Entities that may be part of a larger team*



# Detecting VRU is Critical Step in Research


Source: FHWA.

# AI and Complete Streets

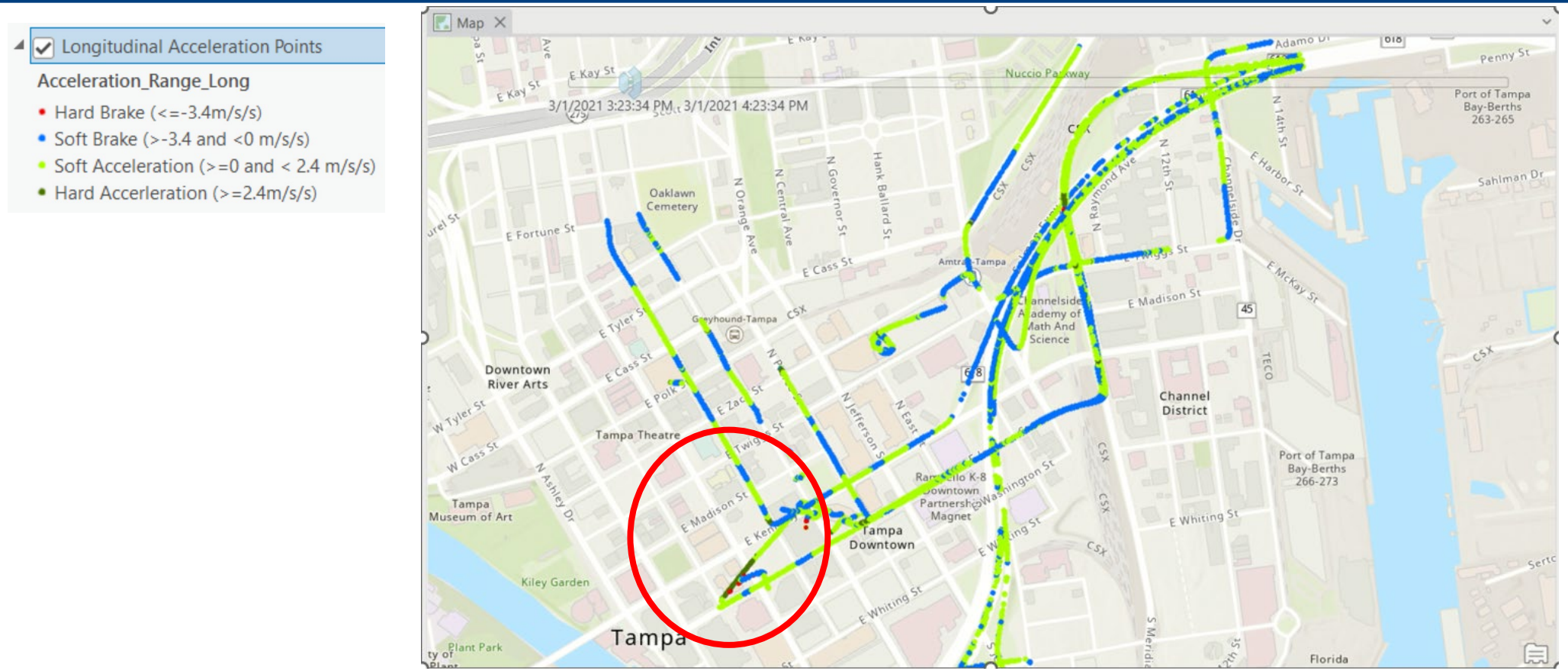



*Video Credit: Federal Highway Administration*

# Connected Vehicle (CV) Pilot Analysis

- Examining Basic Safety Messages (BSM) and traveler information messages recorded in a 3-yr period in Wyoming and the Tampa Bay area.
- Exploring the safety effects of CV responses to traveler information.
- Exploring cloud computing of data hosted in Amazon Web Services®.

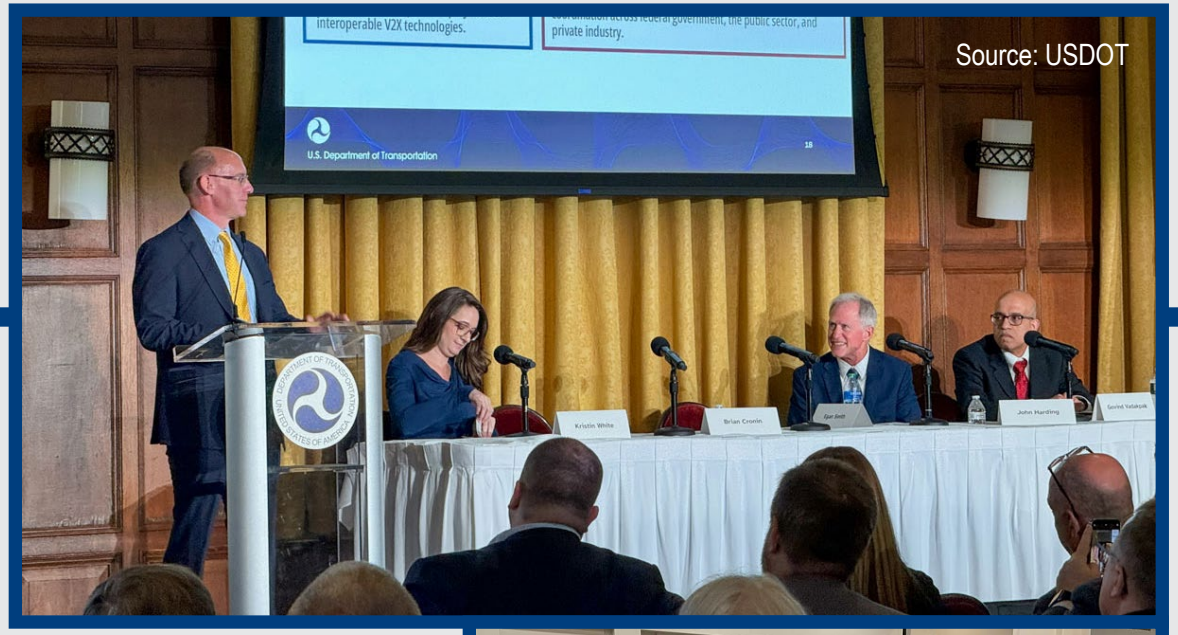
# BSM-Enabling the Identification of What and Where Different Longitudinal (Forwarding) Maneuvers Are




*All images:* © Esri. Created using ArcGIS ® software. Map overlay modifications: FHWA.[11]

# Our Vision

- Innovation Through Collaboration
- Deliver Equitable Deployment
- Engage Externally and Internally



Source: USDOT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