

# Cooperative Automation Research in the United States

**SIP-adus Workshop 2019**

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# Cooperative Automation Research Program



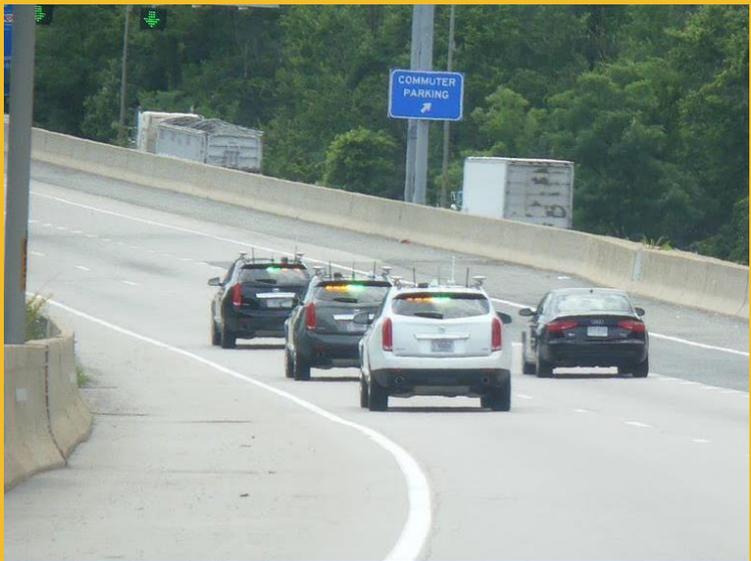
Icon source: FHWA.

RESEARCH FOCUSES ON **AUTOMATED VEHICLES WORKING TOGETHER AND WITH ROADWAY INFRASTRUCTURE** TO INCREASE SAFETY AND IMPROVE OPERATIONAL EFFICIENCY.



Source: FHWA.

**Reduce fuel consumption at intersections by 20 percent.**



Source: FHWA.

**Double capacity of existing lanes.**



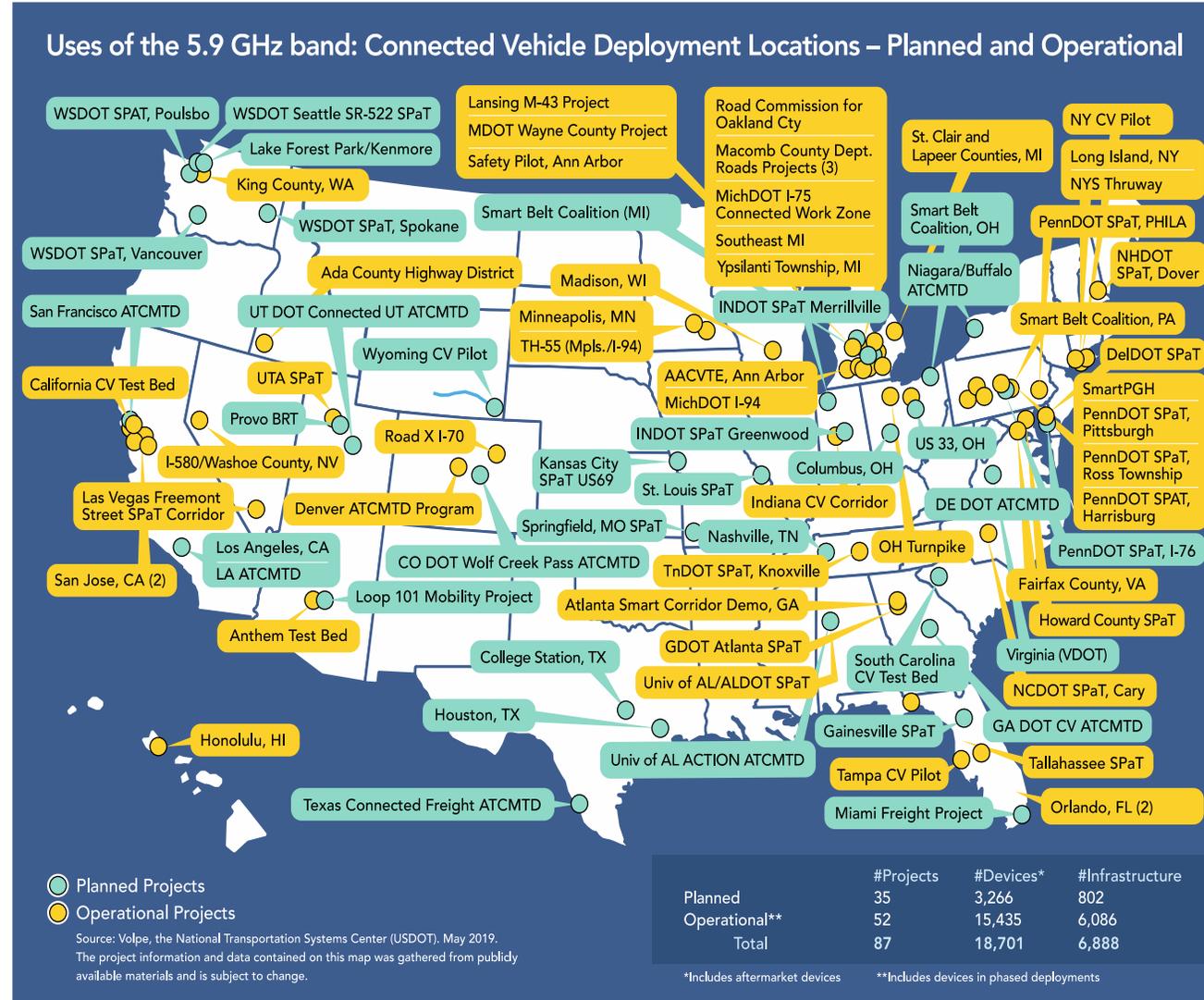
Source: FHWA.

**Fuel savings of 10 percent.**



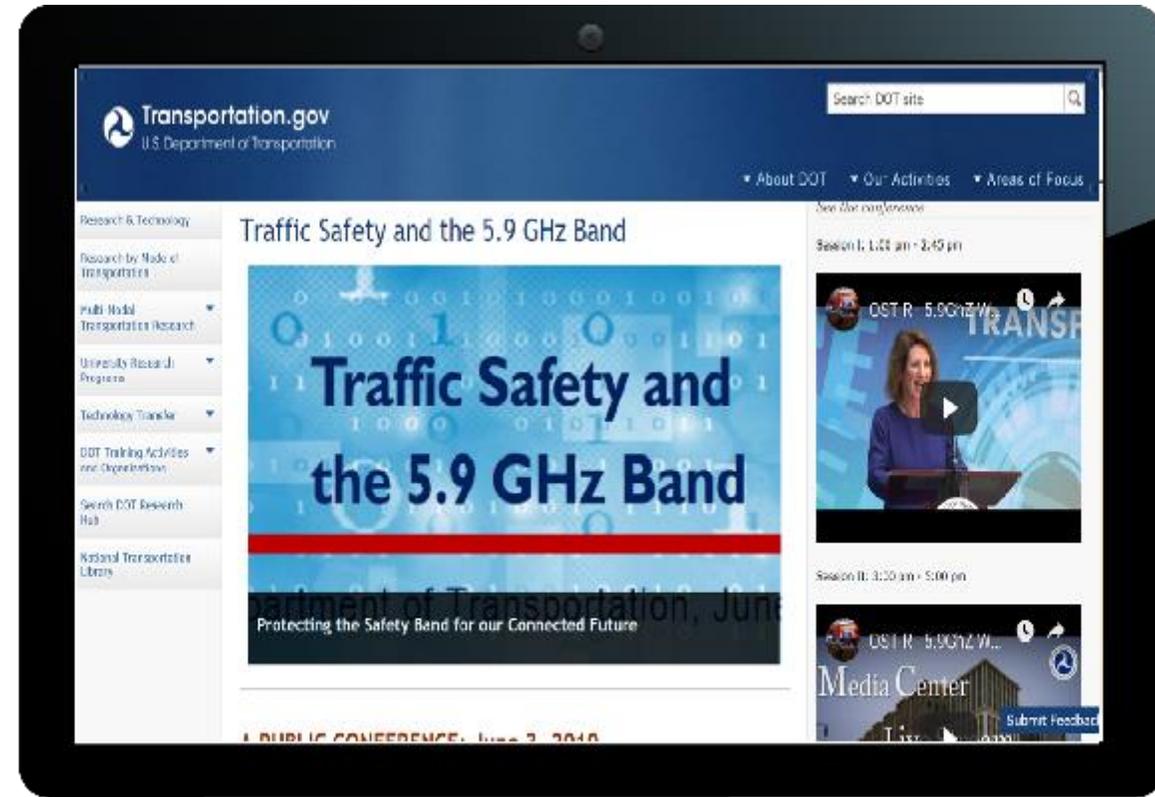
# Cooperative Automation and Connectivity

- 5.9 GHz *Safety Band* use across the U.S.
- 89 operational and ready-to-deploy locations.
- 40,000 vehicles and 7,000 roadside transponders equipped with V2X technology in 25 states.



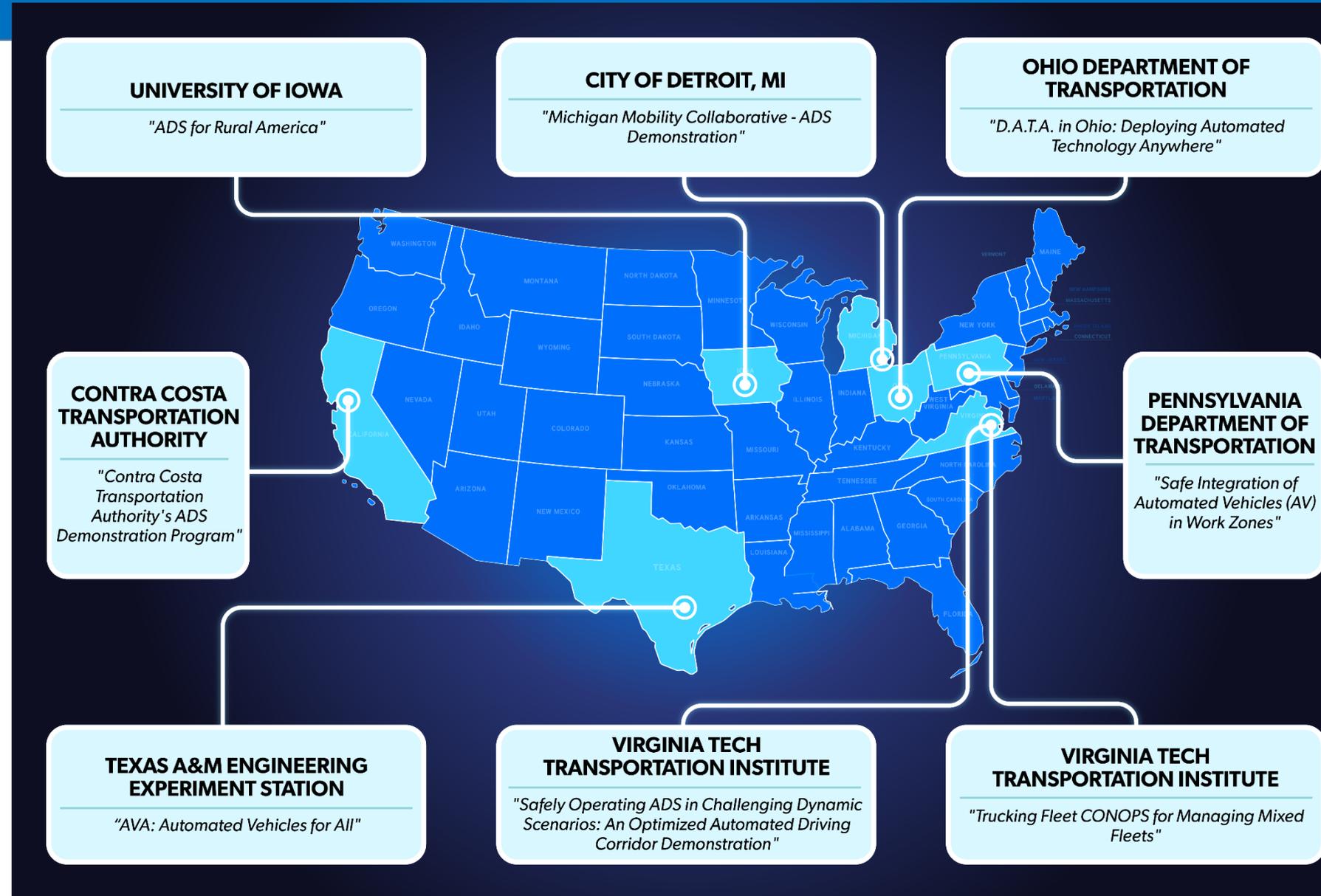
# Communications Research

- USDOT Is actively characterizing and testing V2X technology
- USDOT is conducting 5.9GHz spectrum interference testing
- FCC published interference test plan
- USDOT supported FCC phase 1 testing



# ADS Grants

- \$60 million for 8 projects in 7 states.
- Test the safe integration of ADS on our public roadways.



# Cooperative Automation Research

CARMA, an FHWA initiative, achieves the benefits of cooperative automation through collaboration using open source tools.



## FHWA Automated Research Vehicles

- Utilize industry's AV technology.
- Are based on existing AV Open Source Software.

## CARMA Platform<sup>SM</sup>

- Adds V2X communications.
- Enables AVs to cooperate.
- Facilitates participation and collaboration.

Four Automated Cars



Four Automated Trucks



TSMO USE CASES

4

Automated Cars

6

Use Cases

4

Automated Trucks

4

Use Cases



U.S. Department of Transportation  
Federal Highway Administration

**FHWA**

**1**



**Freeway Basic Travel**

**2**



**Traffic Incident Management**

**3**



**Work Zones**

**4**



**Weather**

**5**



**Intersections**

**6**



**Arterial Management**

**FMCSA**

**1**



**Truck Platooning**

**2**



**Roadside Inspection / Enforcement**

**3**



**Work Zones**

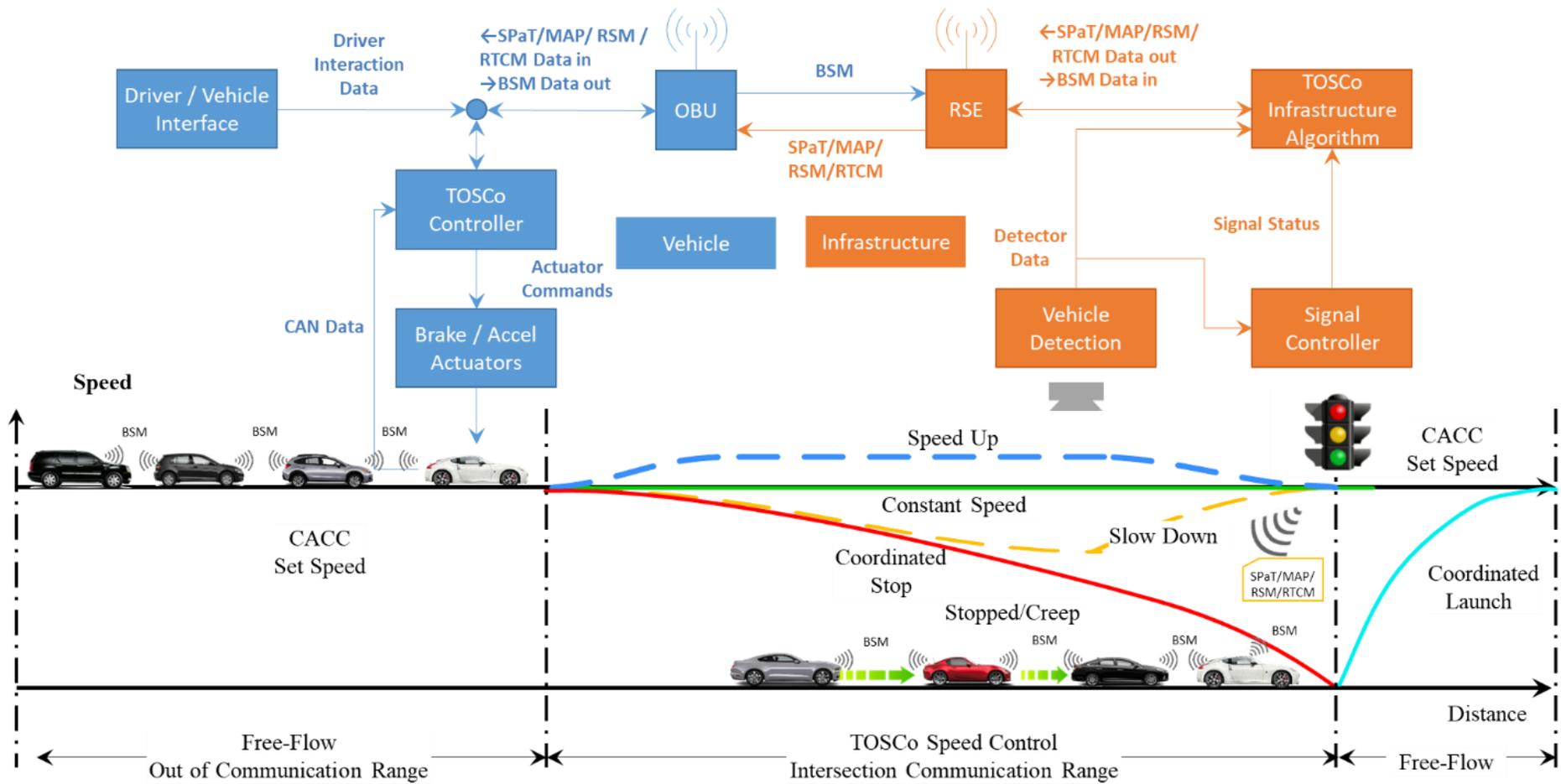
**MARAD**

**1**



**Port Drayage**

# Traffic Optimization for Signalized Corridors (TOSCo)



# TOSCo Project Overview

- Sponsored by FHWA and CAMP V2I Consortium
- University Partners:
  - University of Michigan Transportation Research Institute (UMTRI)
  - Texas A&M Transportation Institute (TTI)
  - University of California at Riverside (UCR)
- Phase 1: Simulation Modeling & Analysis
  - Define TOSCo functionality and implement in simulation at both the vehicle and traffic levels
  - Assess traffic-level benefits regarding improved mobility, fuel economy and emissions reduction
  - Two corridors with different characteristics (SH105, TX; Plymouth, MI)
- Phase 2: Real world deployment & testing (in plan)

# Truck Platooning Early Deployment Assessment – Two Phases

- **Phase 1 – Concept Development**

Three teams funded to develop detailed plans and proposals for an operational test. Proposals due December 2019

- **Phase 2 – Field Operational Test and Evaluation**

One or more teams to be selected for Phase 2 by Spring 2020.



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