Cooperative Automated Transportation (CAT)

What is CAT and How does it align with TSMO?

Ted Bailey, PE, Cooperative Automated Transportation Program Manager

ITS WA Annual Conference & Exhibition, December 10th, 2018
Transportation Systems Management and Operations (TSMO) Training

Version: 12-9-18, 9pm

How do we align CAT with TSMO?

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What is CAT?

Cooperative: **Deploying technology to encourage all modes of transportation to work in concert**

Automated: **Automating functions** *(traffic management systems, fare collection, trip planning and scheduling, etc.)*

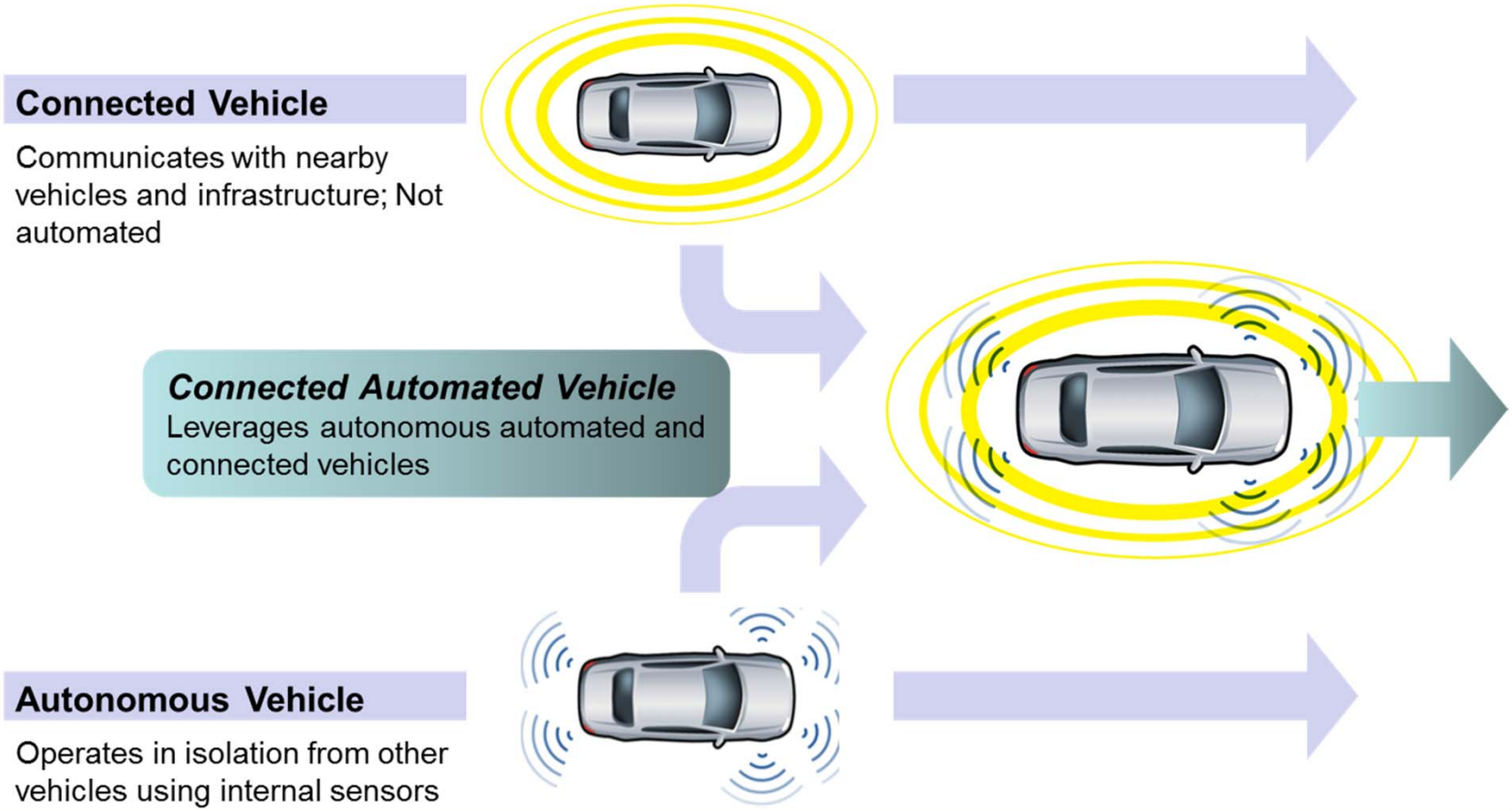
or access to various vehicle types *(automobile, van, plane, truck, bus, rail, ferry, bicycle, scooter, etc.)*

Transportation: **The entire transportation system working together** *(vehicles, infrastructure, modes, services, etc.)*

CAT is much more than CAV

Preparing for “Autonomous” or Connected and Automated Vehicles requires a broader perspective

Connected Automated Vehicle



Vehicles with Automation

LEVEL	0 None	1 Assistance	2 Partial	3 Conditional	4 High	5 Full
What car does 	**Nothing**	**Assists:** Accelerate, brake, or steer	**Assists:** Accelerate, brake, and steer	**Everything** for short periods of time	**Everything** restricted operating environment	**Everything**
What driver does 	**Everything**	**Everything** with some assistance	**Everything** with more assistance	**Remain alert** ready to resume control	**Nothing** restricted operating environment	**Nothing**
Where to Find	Your (grand) parents car	Present fleet	**Today**	Tesla Autopilot	**2019 - 2022**	Sometime in the future

Source: Johanna Zmud, Senior Research Scientist, Texas A&M Transportation Institute, Nov. 13, 2018

Vehicles with Connectivity

Types of Connectivity

1. Safety
2. Infotainment
3. Navigation
4. Diagnostics
5. Convenience

Industry push for 22% of all vehicles on road to have “Connectivity” by 2020

Source: Johanna Zmud, Senior Research Scientist, Texas A&M Transportation Institute, Nov. 13, 2018

Barriers to implementing TSMO / CAT?

Barriers to implementing TSMO / CAT

1. Dedicated Staff / Champions / Ambassadors
2. Flexibility to realign planned and funded projects
3. Focused Decision Making Forums
4. Willingness to identify and remove barriers
5. Willingness to accepting and/or relinquishing control of long standing roles and responsibilities

Current Efforts and Near-Term Pilot Opportunities

Machine Readable Signing & Striping

"Good for human drivers today …

Prepares for Automated Vehicles tomorrow"

Traffic Signal Operations

Communicating with the transportation infrastructure

centralized system

AASHTO Signal Phase and Timing (SPaT) Challenge

- **4 locations across WA**
  - **23 intersections**

DSRC

Autonomous Truck Mounted Attenuator (ATMA)

Work Zone Safety

Low-speed striping operations

Driver - Assistive Truck Platooning

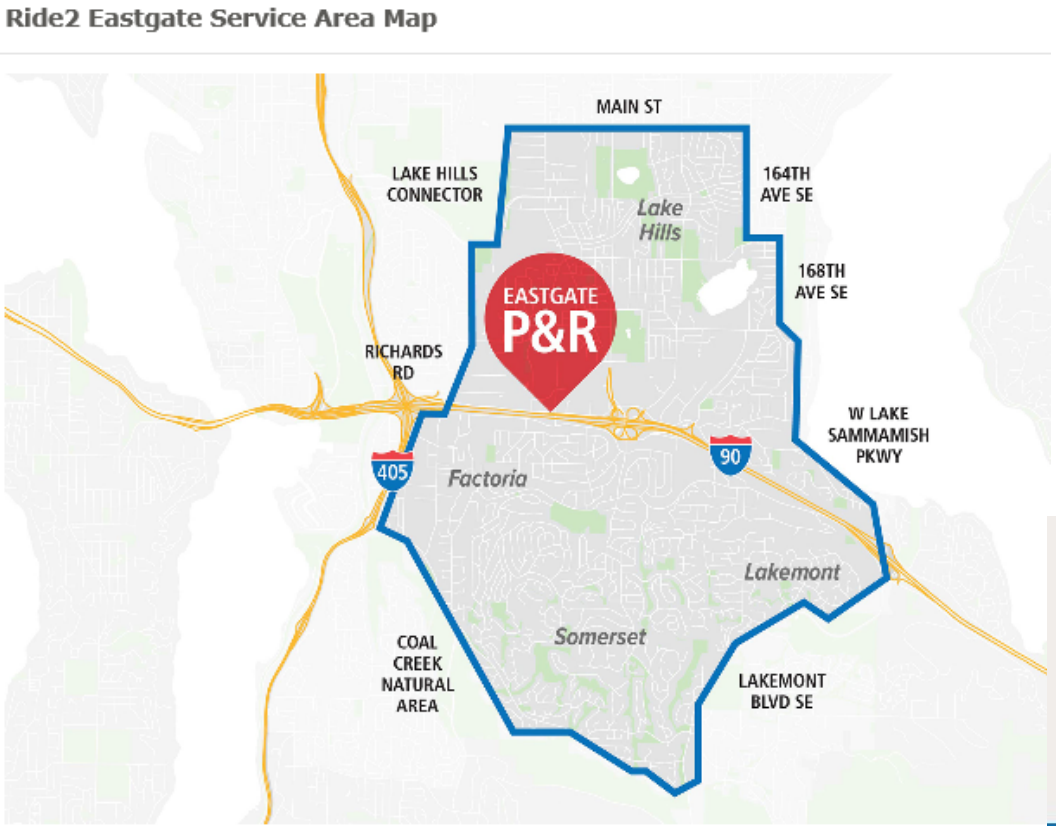
As of September 2018:

- **17 states have made allowance for commercial deployment of driver-assistive truck platooning**.
  - **16** states have passed legislation (AL, AR, GA, IN, KY, LA, MI, MS, NV, NC, OR, SC, TN, TX, UT, and WI)
  - **1** state has acted administratively (OH)
- **4 states allow limited commercial deployments** (AR, CO, FL, NM)
- **3 states allow for testing** (CA,NY, VA)
- **2 states have legislation pending which would allow full commercial deployment** (IL, PA)

Photo credit: WSDOT


Photo credit: WSDOT

Mobility as a Service / Mobility on Demand



On Demand first / last mile

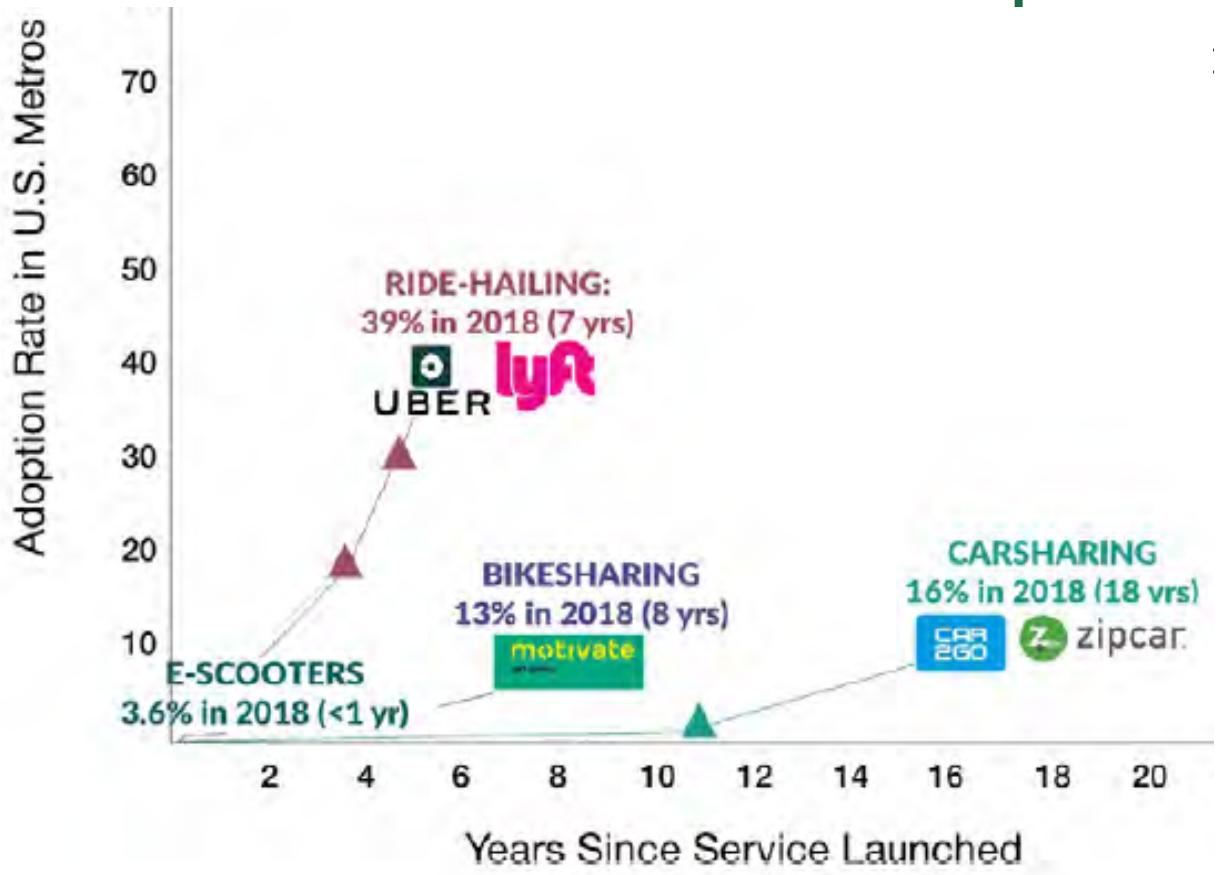
King County METRO

Source: https://www.kingcounty.gov/elected/executive/constantine/news/release/2018/October/17-metro-shuttle-app.aspx

Microtransit shuttles / Flexible Vanpools

- Automated
- Connected
- Electric
- Shared
- Flexible
- First / Last Mile
- Urban / Rural

Active Transportation



- E-Scooters
- Bike-sharing
- First / Last Mile Mobility

Active Transportation

Lyft and Baltimore Bike Share together at a "transportation hub."

- Ride Hailing / Bike-Share Hub
- Protected / Separated Infrastructure

Automated Bus Braking and Pedestrian Detection

Pierce County, Wash., Transit Deploys System to Help Buses Avoid Collisions with Pedestrians, Bicyclists

Researchers at the University of Washington are compiling data on the system to help determine whether it is "as effective as claimed."

BY ADAM LYNN, THE NEWS TRIBUNE (TACOMA, WASH.) / OCTOBER 18, 2016

FLICKR/SOUNDERBRUCE

Photo credit: Pierce Tra

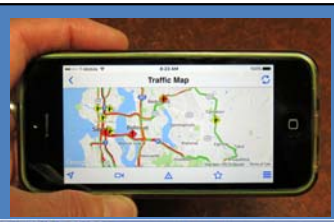
Pierce Transit has been piloting: Automated pedestrian detection which has reduced pedestrian-related crashes

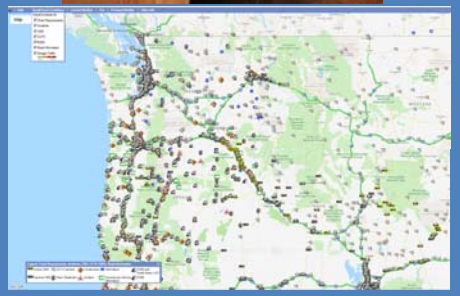
Winter Roadway Operations

Fleet Data

Data Processing & Integration

Traveler Information





Basic Safety Message Data

Roadside Weather Data

Informing the public: "Snow Plow Operations Ahead"

Social Media Data

Alerts

3rd Party Data Integrators

Leveraging the Public Right of Way Asset

- Telecom Partnerships (Long Term Lease Agreements)
  - 5G small cell nodes
  - Fiber optic trunk lines
  - Smart City Applications

Unmanned Aerial Systems (sUAS)

- Vegetation management
- Stockpile management
- Inspection
- Documenting Operations for Training

Multimodal Connection Hub

Planning for shared mobility and CAVs in Future Projects

- Transit Connectivity
- Vehicle drop-off / pickup locations
- Separated Active Transportation

Photo credit: WSDOT

How are we organizing and engaging?

Capability & Capacity Building / Engagement

Internal

Secretary of Transportation

Assistant Secretary
Multimodal Development & Delivery

External

Governor's Autonomous Vehicle Work Group

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

AASHTO CAT Coalition

Policy, Legislative, and Regulatory Workgroup

ITS AMERICA

Washington State AV Workgroup

- Roadway infrastructure
- Traffic management
- Transit service & vehicles
- Advertising
- Right of way
- Multi-modal transportation
- Mobility as a service

- Governor
- Insurance Commissioner
- Department of Licensing
- Department of Transportation
- Washington State Patrol
- Traffic Safety
- Commission
- State Chief Information Officer
- WSTC Chair
- Four members from Senate
- Four members from House

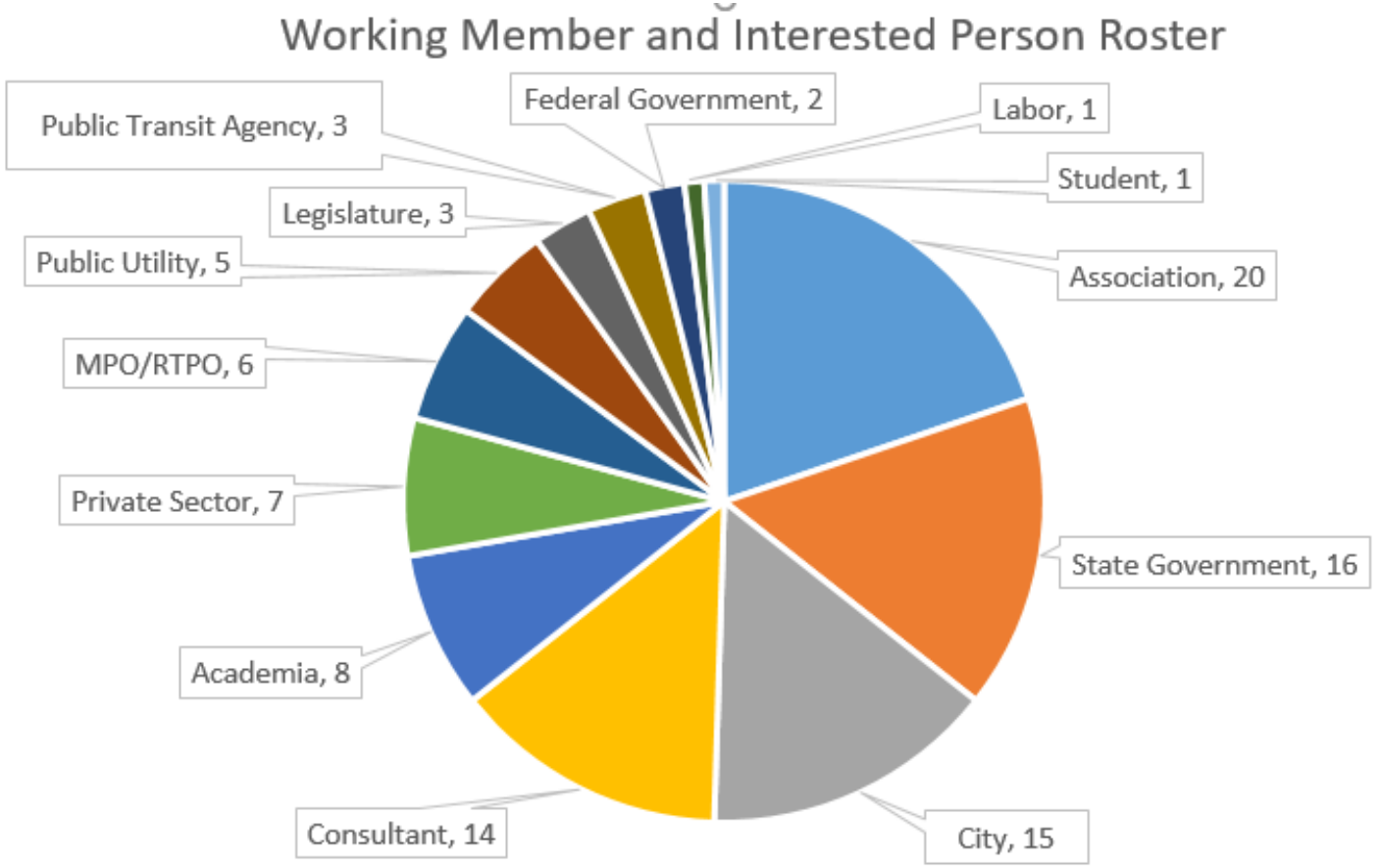
WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

www.wstc.wa.gov/Meetings/AVAgenda/AutonomousVehicleWorkGroup.html

Subcommittees

- Licensing
- Infrastructure and Systems
- Liability
- Safety
- System Tech and Data Security

Infrastructure & Systems Subcommittee



What is our top priority?

Developing a Guiding Policy Framework

Goals

1. Organizing for innovation
2. Shared mobility
3. Economic vitality and livability
4. Infrastructure & Context Sensitive street design
5. Land use
6. Equity
7. Safety
8. Environment

Washington State Department of Transportation

Cooperative Automated Transportation (CAT) Draft Policy Framework

DRAFT

Working Document

November 26, 2018

For questions or suggestions, please contact WSDOT's CAT Working Group Members or WSDOT's CAT Program

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Questions?

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