WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

Washington State AV Work Group Update

WSTC Meeting
May 18, 2021

Washington State Transportation Commission

Overview of Work Group in 2021

- **Building on progress to date, an opportunity to reset**
- **A need to respond to a shift in pace and focus from the industry**
  - » Companies have shifted towards road testing in strategic locations to advance the technology in real world environments
  - » Priority has been on locations that push the limits of the technology
- **An opportunity to set the direction for subcommittees moving forward**

CAV Readiness is a Complex Issue

- No national standards for readiness
- Different starting point for different agencies
- Lack of national vision makes it even harder

Planning & Policy

Outreach/ Public Education

Testing & Early Deployment

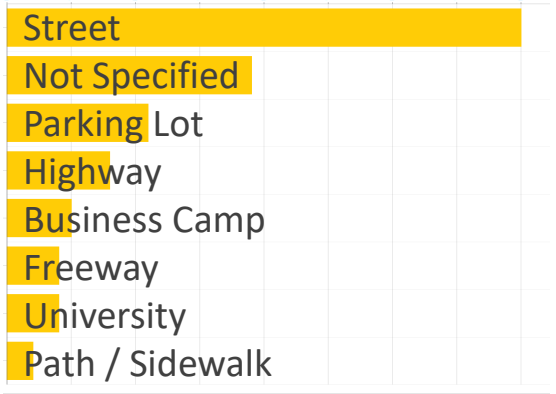
Infrastructure

Workforce/ Training

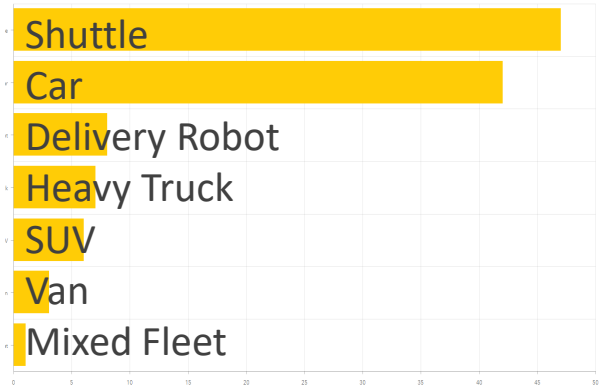
AV Testing – the where, what, when, why, and how

- **Types of testing and demonstrations occurring:**
  - » Testing at controlled test sites
  - » Demonstrations in dedicated areas or protected corridors
  - » On-road driver testing
  - » On-road driverless testing
  - » Service deployment

Testing Sites by Road Type



Testing sites by Vehicle Type



Key Testing Market: California

- **Early investment in GoMentum Station CAV test site**
  - » Previously owned by Contra Costa Transportation Authority (CCTA), now owned by AAA
  - » Located on 5,000 acre former naval weapons station
- **Permit programs for AV testing**
  - » Testing with a driver (since 2014) – 56 permit holders
  - » Driverless Testing (since 2018) - 7 permit holders
  - » Deployment (since 2020) – only Nuro is authorized
- **Deployment program that allows for service provision, shared rides, and monetary fares**

Driving Factors:

- ✓ Established industry for AV technology development and home to major AV developers
- ✓ Regulations that provide a relatively clear path towards deployment (including the ability to collect fares)
- ✓ Upfront investment on test site location
- ✓ Diverse terrain (both flat and hilly)
- ✓ Mix of development patterns, including dense urban
- ✓ Relatively temperate climate and consistent weather

Key Testing Market: Michigan

- **Historic home of legacy automotive industry**
- **Investment in two major test sites and in on-road connectivity (both State and Federal)**
  - M-City at the University of Michigan
  - American Center for Mobility
  - Mound Road
  - M12
- **Permissive testing regulations**
  - Human operator is not required to operate a fully autonomous vehicle
- **Ecosystem of industry, government and researchers through "Planet M" initiative.**
  - Led by the Michigan Economic Development Corporation
- **Ongoing initiative for a CAV corridor**
  - Innovative P3 relationship between MDOT and Cavnue to develop AV-supportive infrastructure

Driving Factors:

- ✓ Legacy automotive industry and existing talent pool
- ✓ Major investments in test sites
- ✓ State initiated projects to advance research and testing of specific use cases in real-world environments
- ✓ Collaborative ecosystem across industry, research, and government
- ✓ Mix of weather conditions, including periods with snow and ice
- ✓ Mix of urban and suburban conditions

Key Testing Market: Arizona

- **2015 Executive Order outlined early process for safe vehicle testing in Arizona, and instructed the state to eliminate all unnecessary regulations and hurdles**
- **Early focus on unique and robust partnerships across industry, government, and research community**
  - Among the nation's first active data sharing programs for transportation (AzTech)
  - Among the earliest CV test beds in the nation (Anthem)
  - Test facility established by Institute for Automated Mobility (IAM), established in 2018 and overseen by the Arizona Commerce Authority.
- **First state to allow for operation of a commercial self-driving taxi service**
  - Waymo self-driving services (with and without a back-up operator)
  - Regulations permit charging of fares for services

Driving Factors:

- ✓ Permissive regulations implemented early on intended to clear barriers and hurdles for testing
- ✓ Regulations that provide a relatively clear path towards deployment (including the ability to collect fares)
- ✓ Ecosystem of industry, government, and research partnerships
- ✓ Growing local tech sector
- ✓ Relatively simple and consistent suburban form
- ✓ Consistently clear weather year-round

Key Testing Market: Ohio

- **Significant investments by public and private sectors**
  - » Investment driven by significant Federal grants ($40M Smart Cities and ATCMTD)
  - » Over $500 million by public and private sectors towards development and testing of CAV technologies
- **Investment in test sites and roadways**
  - » Four roads, covering 164 miles prepared by the State for CAV testing
  - » $45 million SMARTCenter test site at the Transportation Research Center provides 540 acres of various environments for testing
- **Environment for public and private collaboration through DriveOhio**
  - » State led initiative to bring public and private organizations together to overcome barriers and advance development
- **Influence from legacy automotive industry and research community**
  - » Honda and Ohio State University serve as key drivers for testing

Driving Factors:

- ✓ Strategic collaborations with Michigan and Pennsylvania
- ✓ Major investment by the State and other partners towards creating a variety of test environments
- ✓ Legacy auto industry leaders
- ✓ Mix of weather conditions, including periods with snow and ice
- ✓ Mix of urban, suburban and rural conditions

Key Testing Market: Florida

- **Significant public investments towards transportation**
  - Major investment in SunTrax vehicle testing facility
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  - Significant Federal grant for Tampa CAV pilot program
  - Investment in AV shuttle pilots from multiple transit agencies
- **Permissive testing regulations**
  - Human operator is not required to operate a fully autonomous vehicle
  - On-demand AVs allowed to operate under laws that govern TNCs
  - Uniformity of laws at state level prevent local governments from imposing additional taxes and or fees for AVs operating as for-hire vehicles
- **Autonomous Florida Program led by the Florida Chamber of Commerce**
- **Tech openness associated with tourism**
  - Opportunity for global showcase as key tourist destination
  - Willing environment of tech-friendly enablers and participants

Driving Factors:

- ✓ Permissive and sweeping regulations
- ✓ Economic development program focused on automation
- ✓ Tech-friendly tourism sector
- ✓ Major investment in test site
- ✓ Rapid growth and construction of sprawling developments requiring mobility solutions
- ✓ Large aging population with specific mobility needs
- ✓ Warm-weather environment for year-round testing

Driving Factors for Key Test Markets

	Established Industry and Talent Pool	Clear and Permissive Testing Regulations	Major Government Investment in Creating Test Environment	Favorable and/or Test-worthy Weather Conditions	Favorable and/or Test-Worthy Geography/ Urban Form
California	○	○	○	○	○
Michigan	○	○	○	○	○
Arizona		○	○	○	○
Ohio		○	○	○	○
Florida		○	○	○	○

The Case of Utah

Major Goals

1. Increase Public Exposure
2. Assess First Mile/Last Mile Opportunity
3. Understand Operational Characteristics
4. Assess Public Opinions and Attitudes
5. Test Connected Vehicle Capabilities (V2I)
6. Understand Public Trust in AVs

The Case of Utah

- Deployments at 11 different sites for approximately 6 hours a day
- Pilot cost <$1 million (including additional studies, and one time costs)
- Estimated O&M Cost for actual deployment is approximately $627k

Item	Approximate Actual Cost
Set-Up and Documentation	$22,000
Shuttle Lease	$400,000
Outreach, Site Planning, Operations, and Engineering Support	$232,000
Public Trust Research	$197,000
Signage and Miscellaneous Charges	$21,000
Lessons Learned Final Report	$25,000
Operations and Logistics	$90,000
Total	**$987,000**

Questions for Commission Discussion

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

Washington State Transportation Commission

In your view, what is the principal objective of the AV Work Group?

A) Enable and encourage testing of the technology

B) Regulate to address near-term technology deployment

C) Regulate to address long-term technology deployment

D) Advance public awareness, communication and understanding of technology

E) Direct organizational changes needed to prepare for a CAT future

F) Other?

When it comes to AV testing, what do you view as the primary objective?

A) Support agency readiness

B) Enable policy-making

C) Support economic development

D) Improve public awareness and exposure

Do you think the state should invest in AV testing?

What should the emphasis of regulatory action be?

A) Focus on early technologies (those available today or expected in the near-term)?

B) Focus on long-term technologies (full automation, etc.) and the potential impacts?

Who should be taking the lead in investing in the infrastructure and systems needed to enable AVs?

A) Federal

B) State

C) Private Sector / Industry

D) Combination?

Discussion and Next Steps