WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

Washington State Transportation Commission

AV Work Group Executive Committee Meeting

September 23, 2020

Washington State Transportation Commission

Agenda

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

TIME	DESCRIPTION	
9:30	**Welcome, Introductions & Overview of Virtual Meeting Operations**	**Jim Restucci**, Interim Chair, *AV Work Group Executive Committee* **Ara Swanson**, Senior Associate, *EnviroIssues*
9:40	**AVs in the COVID-19 Era** **Future Path Polling Results and Next Steps**	**Scott Shogan**, Vice President, *WSP USA*
10:20	**AV Subcommittee Updates & Recommendations**	**Dr. Andrew Dannenberg**, Co-Chair, *Health & Equity Subcommittee* **Beau Perschbacher & Drew Wilder**, Co-Chairs, *Licensing Subcommittee*
11:00	**National Developments in Cooperative Automated Transportation**	**Roger Millar**, Secretary, *Washington State Department of Transportation*
11:30	***BREAK***	***30 MINUTES***
12:00	**AV Industry Panel**	**Cesar Diaz**, Government Relations Senior Manager, *Aurora* **Sharad Agarwal**, Senior Vice President, *EasyMile* **Ariel Wolf**, Counsel, *Self-Driving Coalition for Safer Streets*
1:05	**The Future of Mobility & AV Policy - Automaker's Perspective**	**Dr. Anne Marie Lewis**, Senior Director for Technology, Innovation, and Harmonization, *Alliance for Automotive Innovation*
1:30	**Arizona's AV Regulatory Framework**	**Kevin Biesty**, Deputy Director for Policy, *Arizona Department of Transportation*
2:15	**Executive Committee Member Items**	*Open forum for members*
2:25	**Closing Remarks**	**Jim Restucci**, Interim Chair, *AV Work Group Executive Committee*
2:30	**ADJOURN**	

Overview of Virtual Meeting Operations

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

Washington State Transportation Commission

Virtual Meeting Operations – Zoom Webinar

Executive Committee Members & Presenters

- You have the ability to **mute/unmute yourself**, please stay on mute unless wishing to speak
- You are encouraged to **turn on your video**, especially during discussion periods
- You can **use the "Chat" box** to communicate with "panelists" - meeting hosts, committee members, and presenters
  - » NOTE: You do have the ability to send a chat to ALL ATTENDEES, *please do not use this feature*

The meeting controls bar may be on top, bottom, or sides of your screen

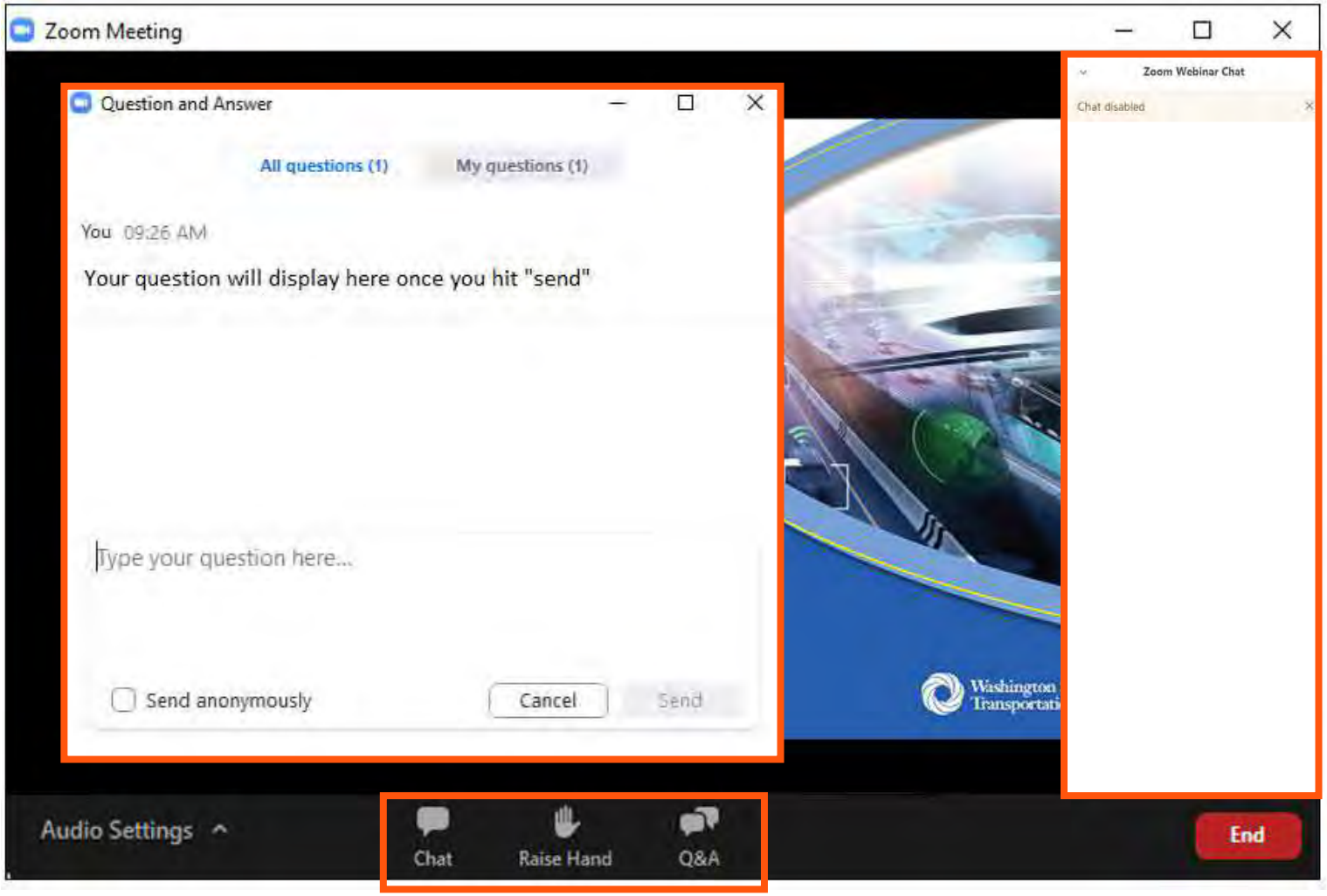
Virtual Meeting Operations – Zoom Webinar

Executive Committee Members & Presenters

(continued)

- During discussion and Q&A periods:
  - Physically **raise your hand on your video**
  - OR
  - Pose a question in the **"Chat" box**
  - *Note you will not have the "Raise Hand" feature*
- You will be able to see questions in the Q&A box, but may not be able to pose a question – please physically raise your hand or use the "Chat" feature

Virtual Meeting Operations – Zoom Webinar



Other Attendees

- You will be **muted with no video capabilities** when you join
- The “Chat” feature is disabled
- **Use the “Raise Hand” feature** to request to be unmuted
- You can **use the “Q&A” box** to pose questions
  - » Organizers will read questions aloud during the Q&A period of each presentation

Virtual Meeting Operations – Zoom Webinar

Other Attendees

- Call-in participants **can still access the Q&A box,** if viewing the presentation online
- For those only calling in, you can **mute/unmute by pressing *6**
  - » When not speaking, please ensure phone line is muted
- For those only calling in, you can **“Raise Hand” by pressing *9**

Impact of COVID-19 on the Development of AV Technology

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Washington State
Transportation Commission

Immediate AV Development Impacts

Courtesy: Cruise

- Suspension of most passenger-carrying services
- Passenger-carrying AVs repurposed for delivery purposes
- Accelerated advancement of delivery-based AV form factors

Opportunities:

Healthcare Access and Campus Transportation

Mayo Clinic, Jacksonville, FL

Opportunities:

Contactless Delivery

Courtesy: Nuro

Opportunities:

Contactless Delivery

Courtesy: Kiwibot

Opportunities:

Driverless Freight

Courtesy: TuSimple

Long-Term Impact of COVID-19 on AV and Mobility

What do the trendlines tell us today?

What trends are likely to stick?

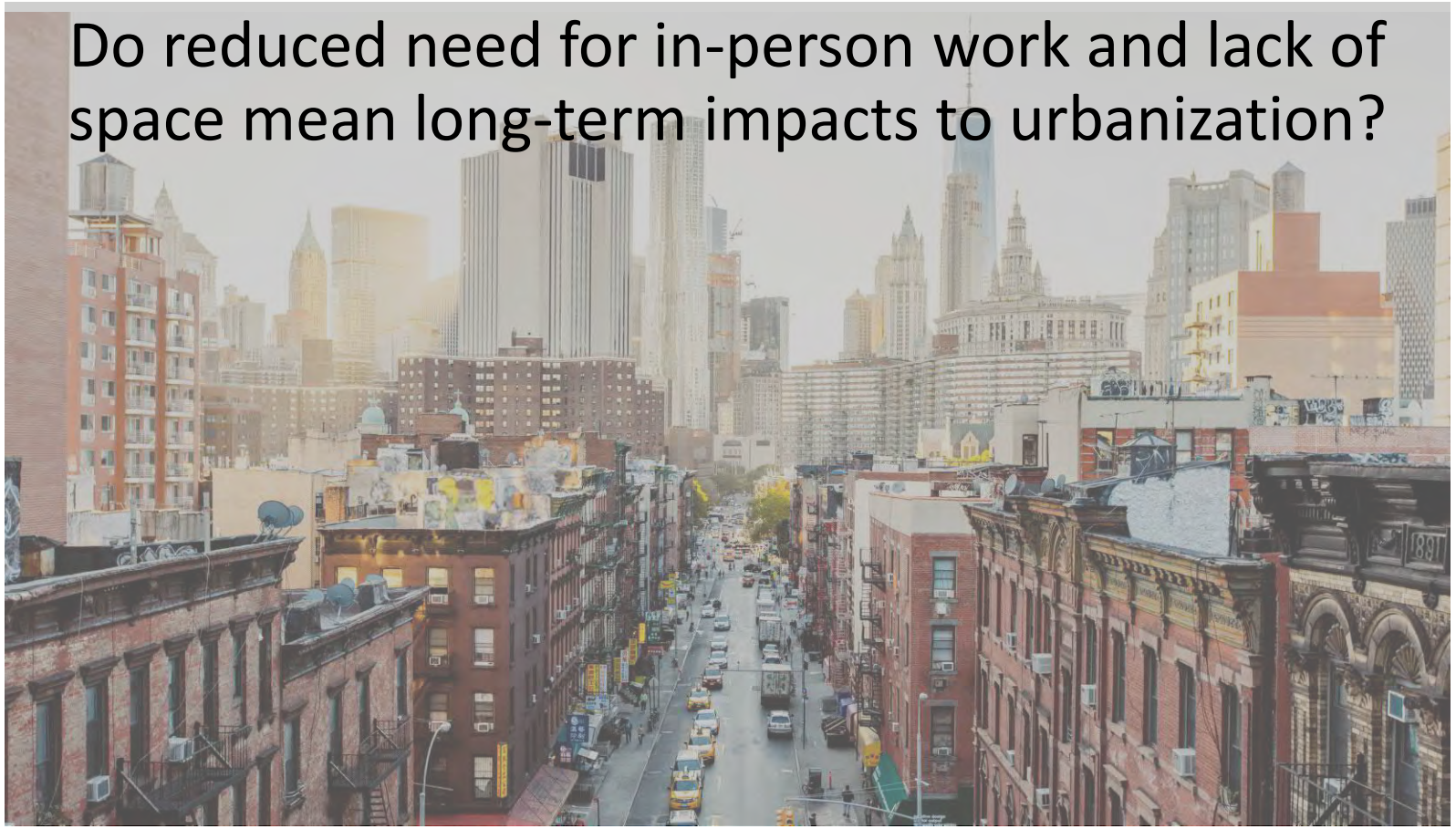
What are the impacts of the economic damage?

Overarching Questions:
Long-Term Impact on Travel Demand and Modality

- Long-term/ permanent decrease in commuter traffic
- Reduced transit/ shared mobility desirability

- Trends towards SOV travel
- Increases in e-commerce/ delivery traffic

Overarching Questions:
Urbanization Trends



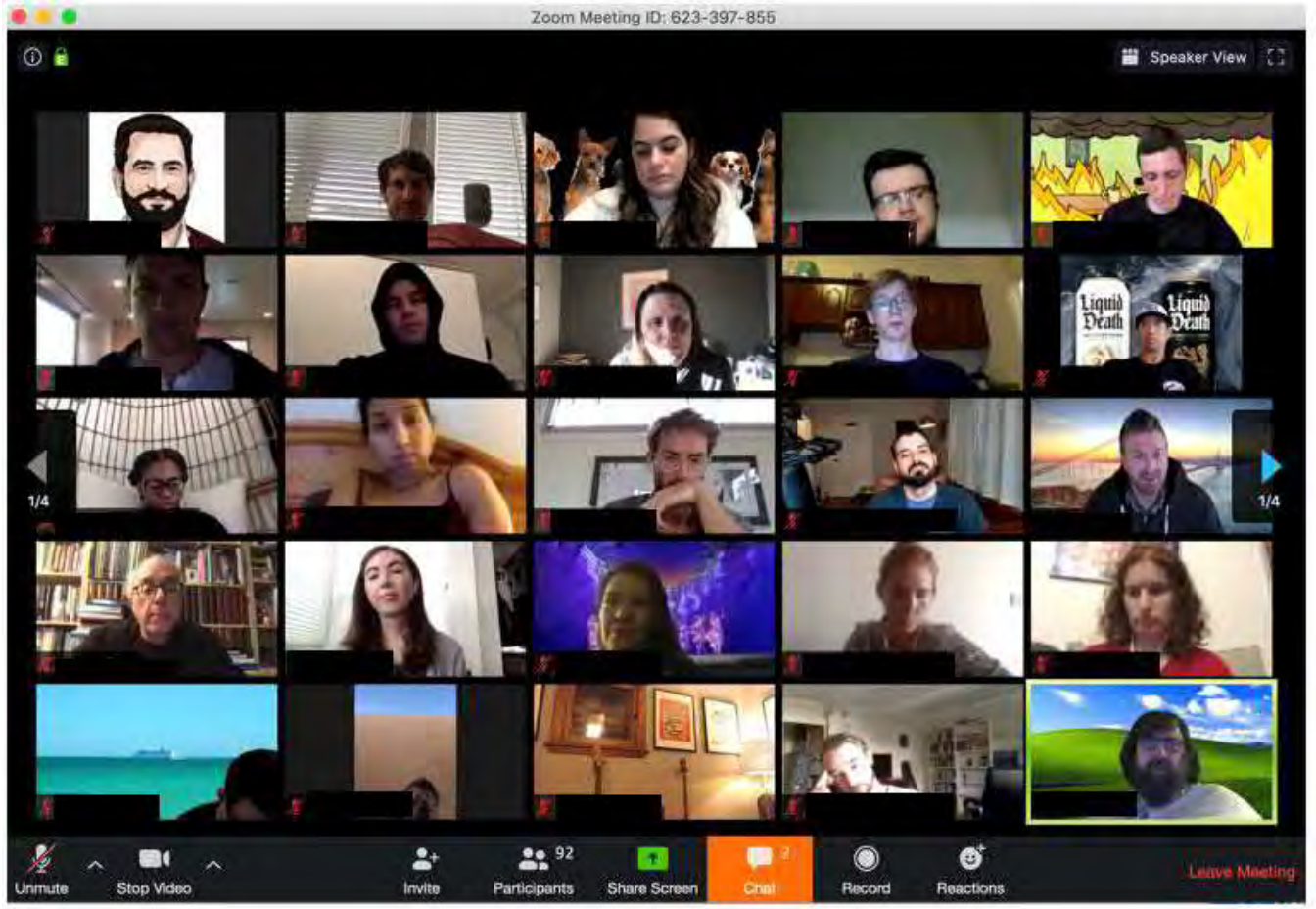
July 2020, New York City*

- 87% increase in home listings in Manhattan
- 37% fewer homes in contract
- Largest gap between asking and selling price ever recorded

*Source: StreetEasy, August 2020

Overarching Questions:
Changes in Technology Acceptance

Will increased reliance on technology during the pandemic accelerate acceptance of driverless technology?



"About 1 in 5 people we talked to (19%) were more interested in experiencing driverless technology than they were pre-pandemic."

Karl Iagnemma, Motional, August 12, 2020

Overarching Questions:
Impact of Economic Damage on AV Development

Could the economic strain on the automotive sector reduce R&D investments?

What will be the biggest impact of COVID-19 on autonomous vehicles?

	Number of Votes	Percentage
Deployment of Level 3 and upwards will be delayed	261	31.5
Global financial instability will cause AV plans to be shelved	217	26.2
Consumer acceptance of AVs will improve	103	12.4
Investment in AV tech will increase once lockdown is eased	74	8.9
Timelines for AV arrival will shorten	60	7.2
AV testing will increase its reliance on software solutions	57	6.9
More AVs will hit the road to increase real-world data	39	4.7
Increased surveillance will reduce demand for AVs	18	2.2
	Total 829	**Total 100**

Source: audience survey, Autonomous Vehicles Online, Automotive IQ, May 2020

How AV May Help Address DOT Revenue Impacts

In August 2020 Cavnue launches P3 project in Southeast Michigan to accelerate AV deployment through dedicated lanes

Courtesy: Cavnue

Take-Aways

- **Delivery use cases more likely to be here to stay**
  - » COVID accelerating use case that is not COVID-dependent
  - » Opportunity for increased policy focus
- **COVID likely to delay AV service launches**
  - » Economic impact on development
  - » Concerns on multiple passengers/vehicle cleaning
- **Uncertain impact on long-term fundamentals**

Future Path Polling Results and Next Steps

Scott Shogan, *WSP USA*

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

Washington State Transportation Commission

Overview of June 24th Meeting

- **Overarching questions posed to the Executive Committee (EC):**
  - What should the focus of the Work Group be through to the sunset date of 2023?
  - What role the Cooperative Automated Transportation (CAT) policy goals adopted by the EC play in guiding that direction?
- **Proposal put forward on use of CAT policy goals as a framework for action**
- **Live-polling exercise used to identify priorities and direction for the Work Group's path moving forward**

Adopted CAT Policy Goals

- **#1 Organize for Innovation:** Enable organizational change that empowers officials to be flexible, accelerate decision-making, and adapt to changing technology.
- **#2 Shared Mobility:** Encourage and incentivize shared mobility, including an emphasis on high occupancy and shared modes for moving people and goods.
- **#3 Economic Vitality and Livability:** Create resilient and efficient regional networks and empower local agencies to create resilient, multimodal local networks.
- **#4 Infrastructure and Context Sensitive Street Design:** Promote durable, physical and digital networks that accommodate the movement of people and goods in ways that are appropriate for the context.

(continued) Adopted CAT Policy Goals

(continued)

- **#5 Land Use:** Encourage land use development patterns that support multimodal connectivity to efficient local and regional networks.
- **#6 Equity:** Work with marginalized communities to increase access to desirable mobility options.
- **#7 Safety:** Increase the safety of transportation systems and infrastructure to support the safe movement of people and goods.
- **#8 Environment:** Reduce the local and cumulative environmental impacts of mobility to improve air and water quality, energy conservation and mitigate climate change.

Re-cap of Questions from the Live Polling Exercise

Part 1 Rank in Order of Priority

- Broad Work Group focus areas
- Near-term testing activities
- Deployment-oriented activities
- CAT-oriented activities

Used to establish prioritization of key actions

Part 2 Free-form Questions:

- What action or focus area did you not see that you feel should be prioritized?
- In a few words, what single outcome do you see as the most critical to the success of this group?

Used to provide context for contributing or supplementary actions

RANKING QUESTION #1:

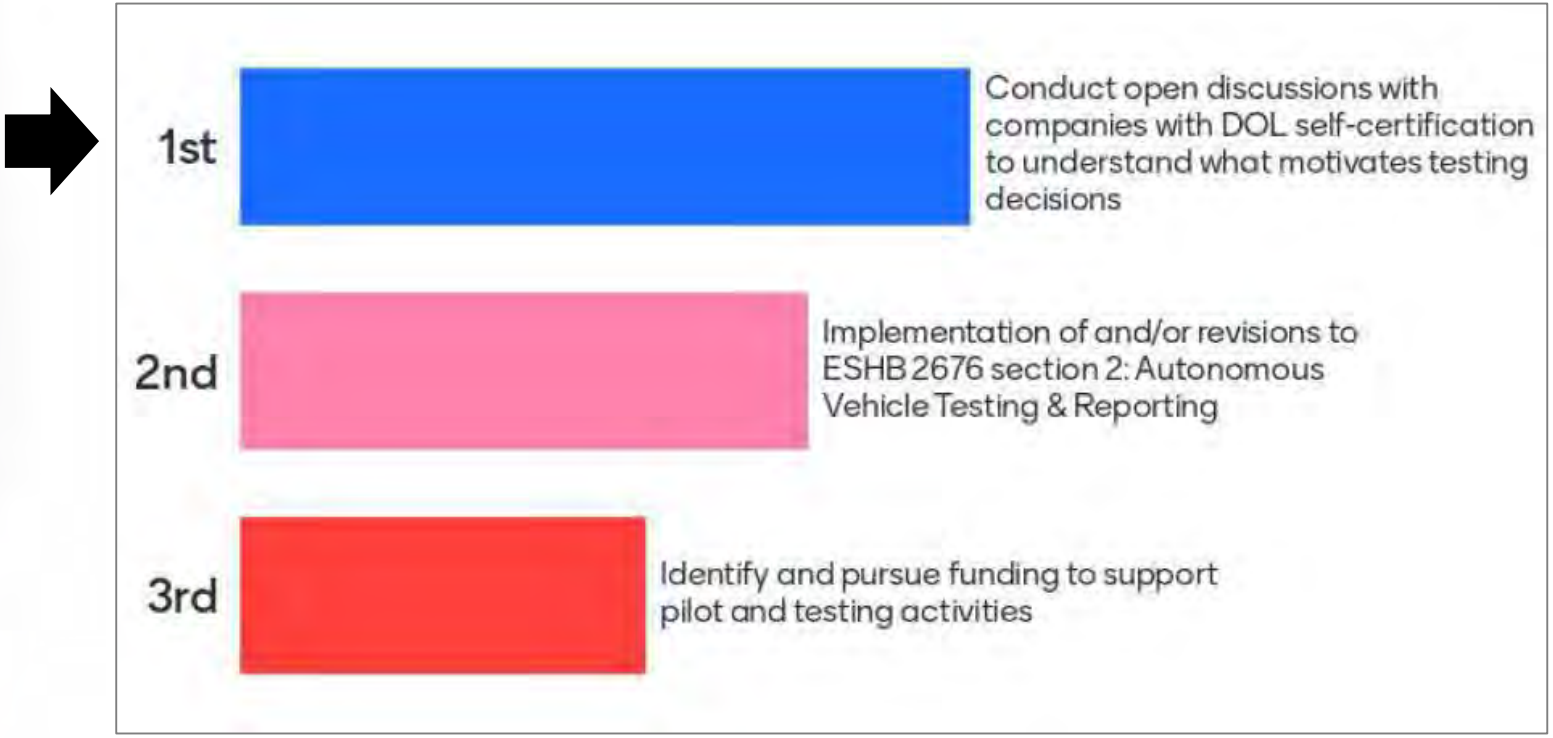
Broad Work Group Focus Areas

- Results showed no strong preference on how to prioritize broad Work Group focus areas
- Split outcomes possibly due to a balance of differing perspectives across the EC on Work Group priorities

RANKING QUESTION #2:

Near-term testing activities

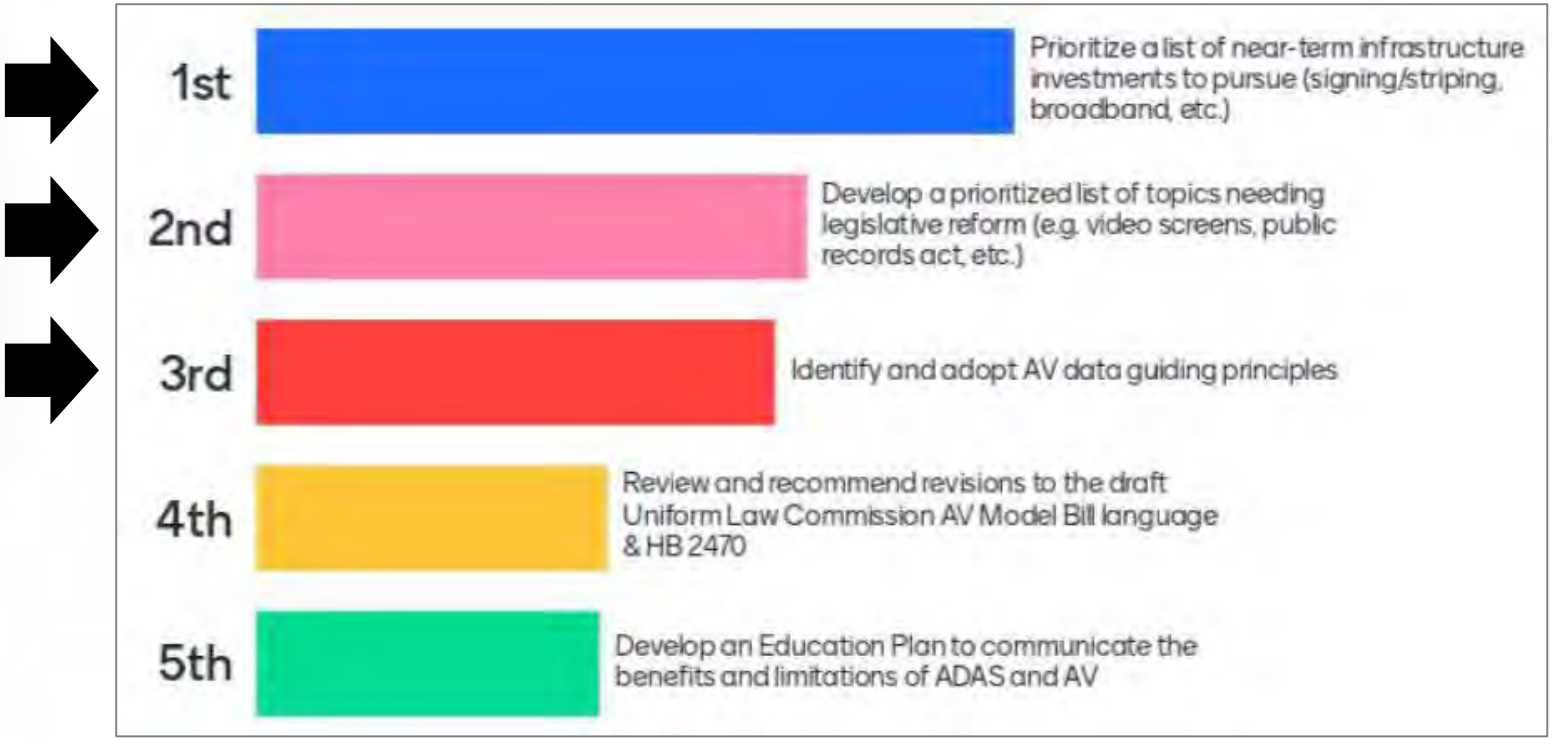
- Results showed clear interest in having open discussions with companies undergoing testing
- Understanding of motivations for testing may help to inform further policy revisions and implementation



RANKING QUESTION #3:

Deployment-oriented activities

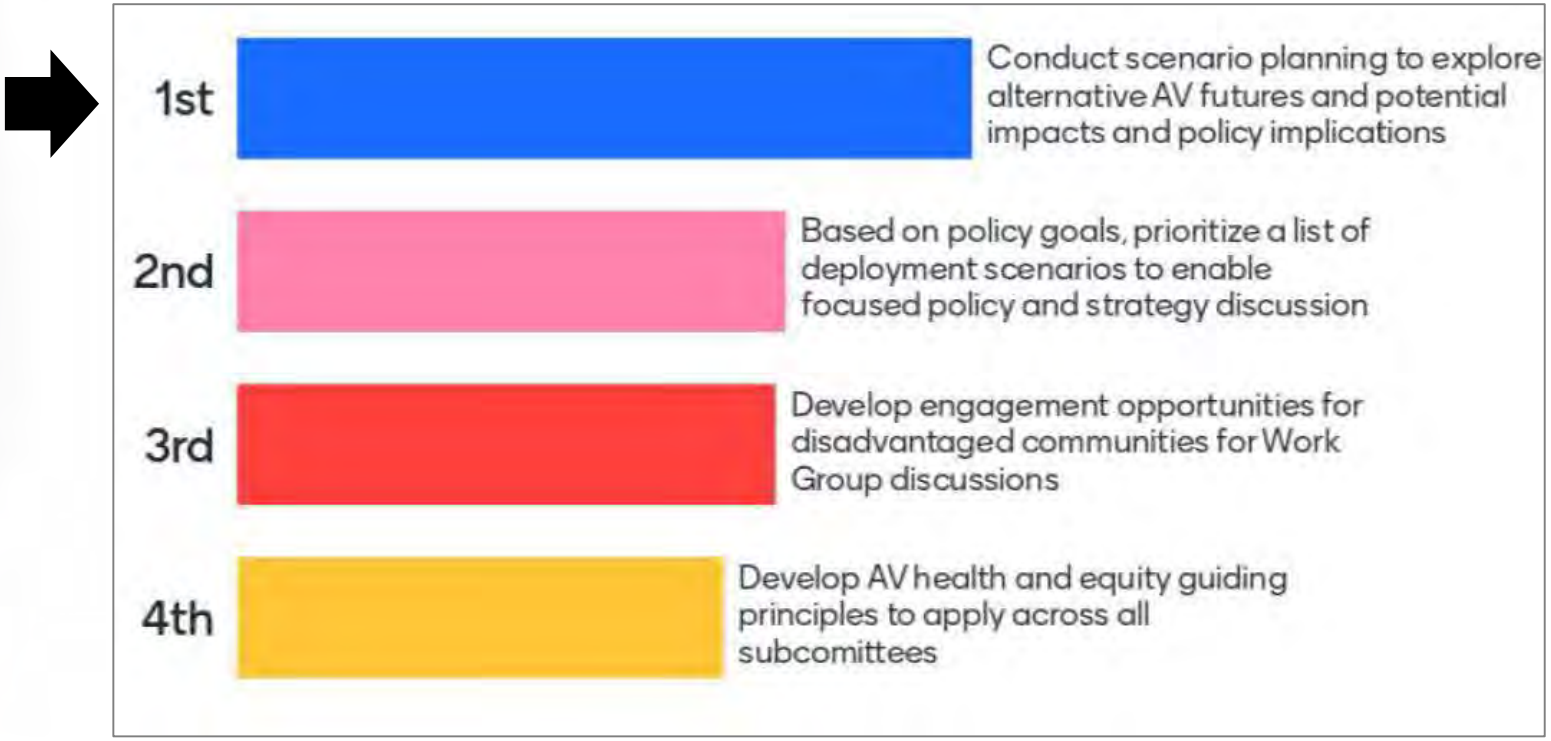
- Results signal particular interest in actions that help lay the groundwork for deployment, including:
  - » Near-term infrastructure investments
  - » Topics requiring legislative reform
  - » AV data guiding principles



RANKING QUESTION #4:

CAT-oriented activities

- Results suggest continued interest in conducting scenario planning to explore alternative AV futures
- This may point to a potential interest/need for better understanding of impacts and policy implications



Matrix of Contributing Actions

- Prioritizes actions and outlines potential contributing actions for each subcommittee
- These are suggestions/recommendations, not a mandate/must
- Meant to start discussion and help subcommittees see how they fit in the bigger picture of each action
- Provides context for the priorities identified for each focus area/action

					Work Group Subcommittee	…
					Description of Subcommittee	…
Broad Focus Area	**Rank**	**Action**	**Description**	**Workgroup Roles**	*contributing action*	..
Broad focus area grouping	Priority of Action	**Overarching Action**	*Description of the action*	*Overview of Roles*	Description of contribution actions	…
					Examples	…

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Washington State Department of Health

AUTONOMOUS VEHICLE –
HEALTH AND EQUITY SUBCOMMITTEE

PRESENTED AT
AUTONOMOUS VEHICLE EXECUTIVE COMMITTEE
SEPTEMBER 23, 2020

Dr. Andrew Dannenberg, UW School of Public Health

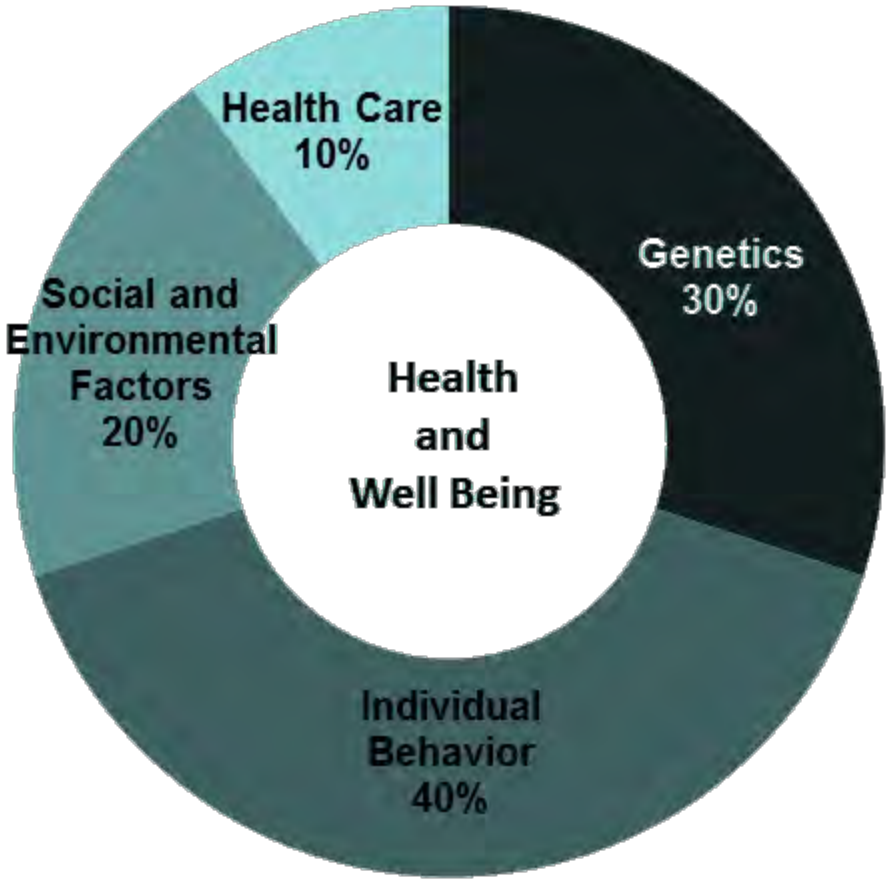
AV Health & Equity Subcommittee Update

Goal: Ensure the health benefits of automated mobility are equitably distributed and that negative impacts are not disproportionately borne by traditionally marginalized communities.

Established by WSTC on **July 2019**

Holding Monthly Microsoft Teams Meetings & Work Group Meetings

Determinants of Health



SOURCE: Schroeder, SA. (2007). We Can Do Better — Improving the Health of the American People. *NEJM*. 357:1221-8.

Key Topics to Address

AV Health & Equity Impacts to:

- Access to transportation for all income levels
- Costs of AV transportation
- Equitable distribution of AV services
- Accessibility and mobility for vulnerable populations
  communities of color, people with disabilities, the young and the aging, rural populations, and other historically marginalized populations
- Job losses from automation
- Exposure to traffic and related impacts

Health and Equity Subcommittee Recommendations
#1 Conduct Structured Public Outreach

Background

- **Traditionally marginalized communities including people of color and people in disinvested areas may suffer from inequitable impacts when AVs are tested and implemented in Washington**
- **Such communities are not well represented among decision-makers who are setting AV policies**
- **Outreach to such communities is essential to better understand their access, mobility, and health needs**

Health and Equity Subcommittee Recommendations
#1 Conduct Structured Public Outreach

Proposal #1

- **Conduct a structured public engagement process to better understand the health, equity, and access needs of traditionally marginalized communities in relation to AVs**
- **Outreach would include education about AVs, presentation of scenarios involving AV use, and feedback from community participants**
- **Report findings and recommendations would be provided to WSTC to inform decisions**
- **Estimated cost: $30,000**

Health and Equity Subcommittee Recommendations
#1 Conduct Structured Public Outreach

Impact

- **With robust public engagement, it may be possible to prevent or reduce inequitable consequences that may be associated with the testing and deployment of AVs**
- **Results would assist policy makers and industry to meet the mobility and access needs of traditionally marginalized communities**

Health and Equity Subcommittee Recommendations
#2 Conduct Testing Location Assessments

Background

- **Current law RCW 46.30 requires only provision of (a) AV company contact info, (b) name of city/county where testing to be done, (c) vehicle ID numbers, and (d) proof of insurance, prior to pilot testing AVs on Washington streets and highways**
- **Depending on locations selected, pilot testing may have inequitable health and safety impacts on traditionally marginalized communities**

Health and Equity Subcommittee Recommendations
#2 Conduct Testing Location Assessments

Proposal #2

- **Amend RCW 46.30 to require that Testing Location Assessments be provided to the state prior to pilot testing on Washington streets and roadways**
- **Content of Testing Location Assessments would focus on topics such as demographics, traffic safety, and area characteristics**
- **Public-private partnership with AV companies would develop and conduct these assessments which would be informed by the structured public outreach in proposal #1**

Health and Equity Subcommittee Recommendations
#2 Conduct Testing Location Assessments

Impact

- **Testing Location Assessments would help facilitate equitable distribution of benefits to all populations and reduce potential adverse impacts of AV testing in marginalized communities**
- **Assessments would not be regulatory, but results would be used to inform future decision-making about state AV policies**
- **Need for assessments is consistent with National Transportation Safety Board and other national transportation safety organizations**

Questions?

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Autonomous Vehicles Licensing Subcommittee

Beau Perschbacher, Policy and Legislative Director, DOL

Drew Wilder, Vicarious Liability Risk Management LLC

WASHINGTON STATE DEPARTMENT OF LICENSING

Overview of presentation

- **Engrossed Substitute House Bill 2676**:
  (Establishing minimum requirements for the testing of autonomous vehicles):
  - Implementation efforts/next steps
  - Current program participants
  - Discussion on section 2 of the bill
- **Subcommittee feedback on House Bill 2470**
  (Addressing the automated operation of vehicles)
- **Research on AV models**: California and Arizona
- **Key takeaways from the subcommittee**

Engrossed Substitute House Bill 2676

2020 legislation that established minimum requirements for the testing of autonomous vehicles:

Section 1 (*effective June 11, 2020*)

- Entities must maintain a $5 million insurance policy and provide proof to DOL.

Section 2 (*effective October 1, 2021*)

- Testing entities must submit the following information to DOL: contact information, local jurisdictions where they plan to test vehicles, the vehicle identification numbers (VIN or other identifying numbers).
- Testing entities must provide notice to law enforcement before testing on public roadways and to report annually to DOL any infractions and collisions that occur when the vehicle is in automation mode.
- Requires DOL to make information available to the public that the entities submit to the agency and report annually to the Legislature.

Engrossed Substitute House Bill 2676 (continued)

Implementation efforts:

1. Updated the self-certification form to include new insurance requirements.
2. Licensing subcommittee co-chair; Drew Wilder and DOL staff met with Liability subcommittee chairs regarding types of insurance documentation needed to meet this requirement.
3. Notified all current participants of the new insurance requirements and communicated what acceptable documents needed to be provided.
4. Removed all companies from the self-certified list on dol.wa.gov that did not provide the required insurance or didn't wish to continue the program.
   - 6 companies continued in the program; including one new company
   - 5 companies asked to be removed from program, no longer testing in WA.
   - 7 companies did not return insurance certificate.

Engrossed Substitute House Bill 2676 (continued)

Current participants of self-certification testing program:

BMW of North America, LLC (based in New Jersey)

LM Industries Group, Inc. (based in Arizona)

NVIDIA Corporation (based in California)

Optimus Ride Inc. (based in Massachusetts)

Waymo LLC. (based in California)

Zoox, Inc. (based in California)

Engrossed Substitute House Bill 2676 (continued)

Feedback on Section 2 of the bill

- Difficult for testing entities to know which law enforcement entities they would need to notify when testing goes throughout the state.
- Discussion on the right amount of data for collision reporting:
  - Only when the AV is at fault?
  - Only when the AV system is engaged?
  - Some raised concerns that we'd lose important data
- Discussed benefits of developing a law enforcement protocol for how to interact with AVs being tested in the state.

Uniform Law Commission Bill 2470

Feedback on the bill

- Overall, a lot of industry concerns about the proposal.
- Central discussion was the role of the federal vs. state government in regulating the ability of a vehicle to perform safely:
  - Traditionally, vehicle standards regulated by the federal government through Federal Motor Vehicle Safety Standards.
  - DOL does not have the in-house expertise to technically evaluate AV safety. Option to license a thirty-party?
  - Challenge in finding an impartial third-party with enough expertise to evaluate the technology.
  - Potential to adopt the standards of another state (e.g. CA).
  - Level of risk the state assumes under the proposal.

California AV Regulations

Summary:

- $5 million insurance policy or equivalent
- Must apply to CA DMV for test permit (valid 2 years) – cost: $3,600
- Specific requirements for test drivers
- Must report location of testing and vehicles involved
- Manufacturers must report collisions within 10 days and disengagements annually

Status:

- 71 testing permits issued
- 3,000 test drivers certified
- 256 accidents reported (majority in San Francisco and Palo Alto)

California AV Regulations

Discussion:

- Potential for WA to develop law enforcement AV interaction plan, something to work on with the Safety Subcommittee
  - Don’t need all the details on the vehicle, but who to contact if something goes wrong on the roads, how to shut it off, tow it, etc.
  - Some industry concerns about requiring too much information as part of this process, could reveal proprietary information.
- Potential for WA to define what SAE levels are required to complete self-certification
  - Most participants thought SAE level 4 & 5 were appropriate for self-certification.
  - CA was statutorily required to use SAE level 3 and above.

California AV Regulations

Discussion:

- What is the value of self-certification vs. the state reviewing and approving applications?
  - CA model provides a closed loop – companies receive positive confirmation of approved testing permit.
  - Having WA approve an AV testing plan (vs. self certification) exposes the state to additional risk.
- What is the value in requiring the reporting of disengagements?
  - Concerns about requiring the reporting of more data that may not be beneficial since the primary interest is understanding how the vehicles behave in autonomous mode.
  - Reporting disengagements could help us understand if the transition points from AV mode to regular mode are linked to collisions.

Arizona AV Regulations

Summary:

- Self-certification process
- Law enforcement AV interaction protocol required
- Allows operation (picking up riders), not just testing
- Overall, appears to be a “light touch” regulatory environment

Discussion:

- The law enforcement protocol seems to be a common theme and something we should explore
- Need to start shifting our discussion to licensing/regulatory issues related to the operational deployment of AVs, not just testing

Key Takeaways

Items we are pursuing:

- Need to define what SAE level of AVs are subject to self-certification
- May want to create an AV law enforcement interaction plan – something to work on with the Safety Subcommittee

Future meetings:

- AV licensing/regulatory models in other countries
- AV licensing issues for agricultural equipment

National Developments in Cooperative Automated Transportation

Preparing for AV requires a CAT perspective

Roger Millar, Secretary
Washington State Department of Transportation

Washington State Autonomous Vehicle Work Group Executive Committee Meeting
September 23, 2020

Presentation Overview

1. CAT vs AV Perspective
2. CAT Policy Development in WA state
3. National CAT Initiatives
4. How WSDOT is Preparing: Some Examples
5. Conclusion

How Does AV Relate to CAT?

What is a Connected Automated Vehicle?

Connected Vehicle

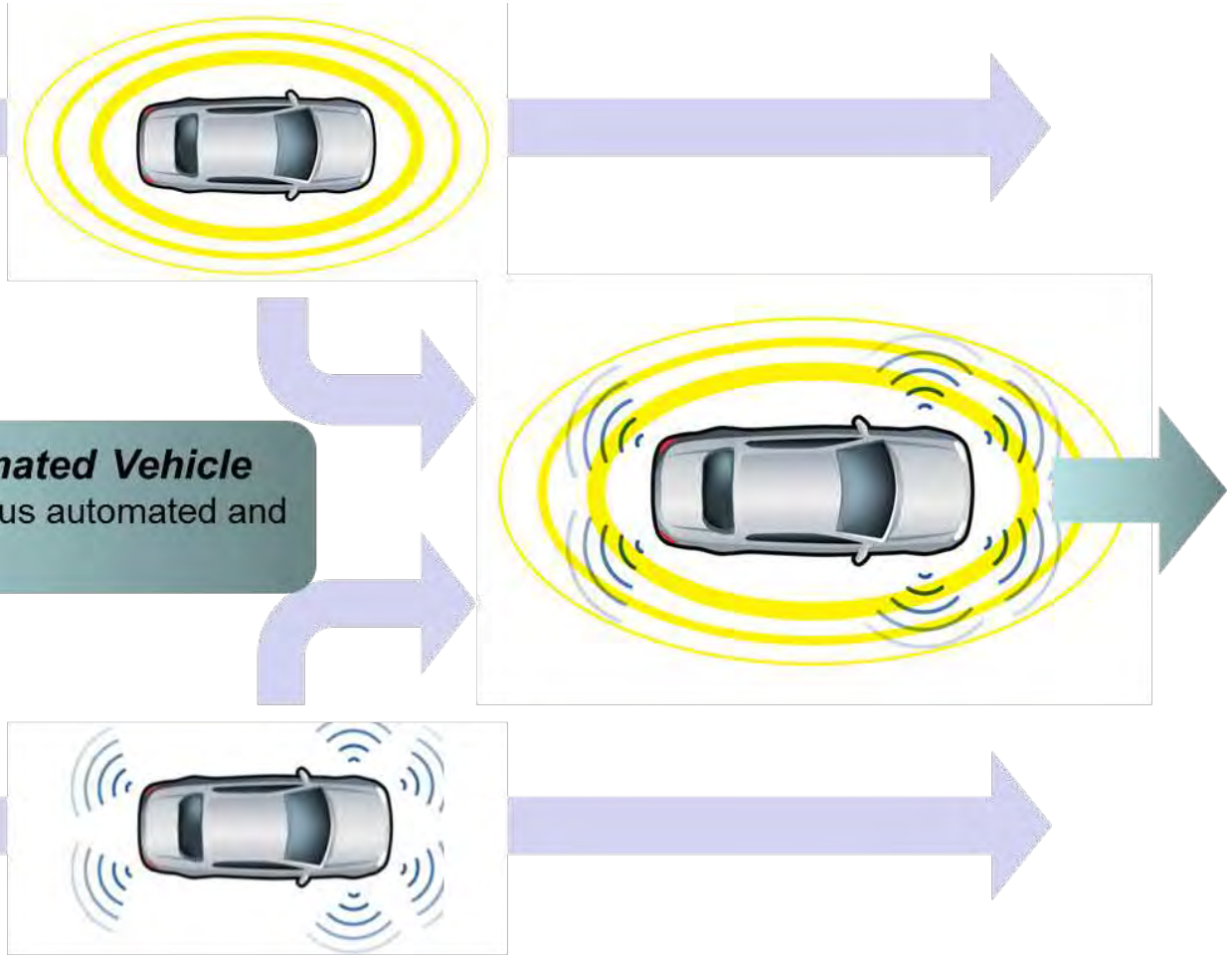
Communicates with nearby vehicles and infrastructure; Not automated

Connected Automated Vehicle

Leverages autonomous automated and connected vehicles

Autonomous Vehicle

Operates in isolation from other vehicles using internal sensors



What is Cooperative Automated Transportation (CAT)?

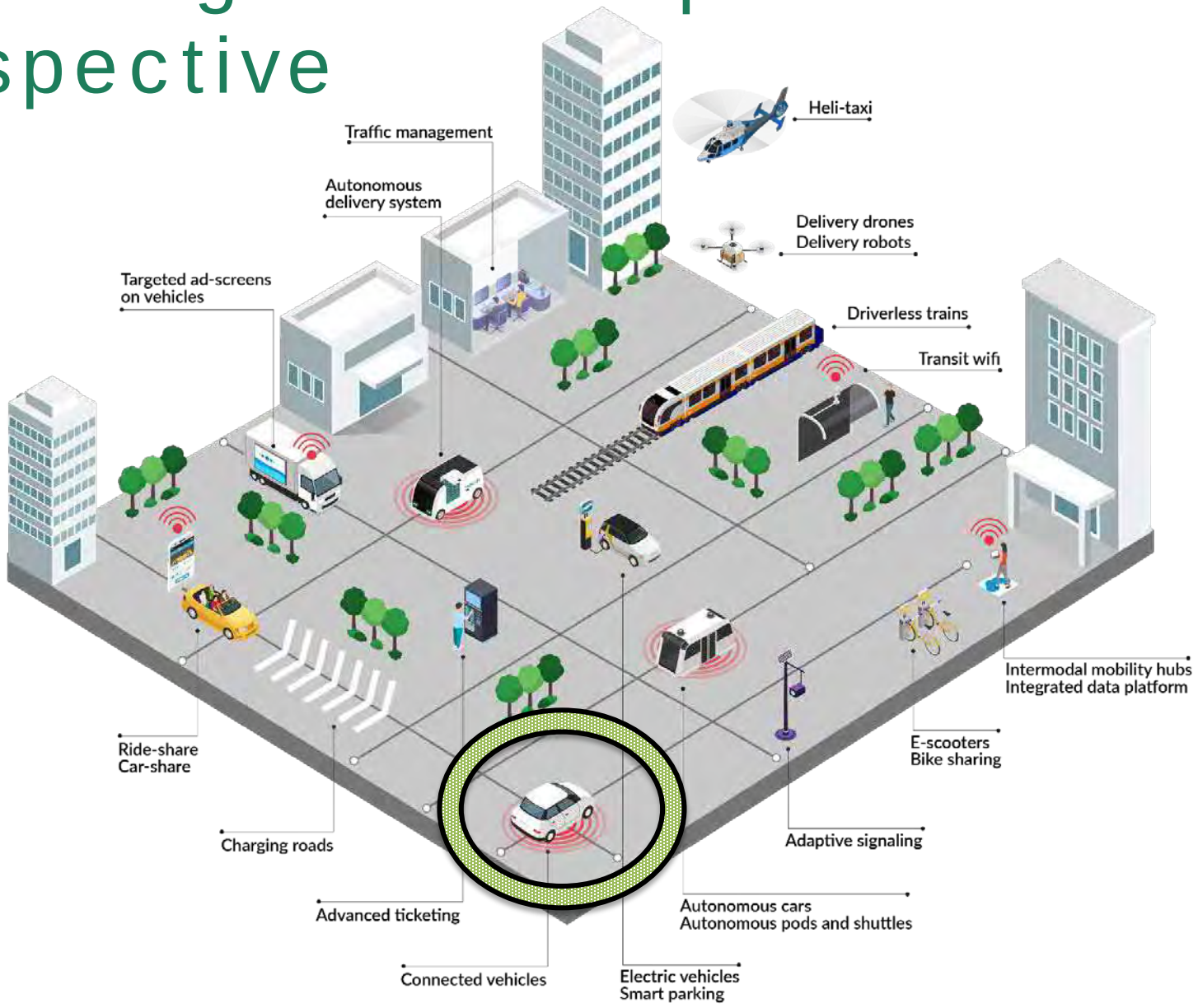
Cooperative: **Deploying technology to encourage all modes of transportation to work in concert**

Automated: **Automating functions** *(traffic management systems, user fees, 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.)*

Preparing for AV requires a CAT Perspective



CAT Policy Development in Washington state

8 CAT Policy Goals Endorsed by the WSTC in October 2019

#1 Organize for Innovation: Enable organizational change that empowers officials to be flexible, accelerate decision-making, and adapt to changing technology.

#2 Shared Mobility: Encourage and incentivize shared mobility, including an emphasis on high occupancy and shared modes for moving people and goods.

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#4 Infrastructure and Context Sensitive Street Design: Promote durable, physical and digital networks that accommodate the movement of people and goods in ways that are appropriate for the context.

#5 Land Use: Encourage land use development patterns that support multimodal connectivity to efficient local and regional networks.

#6 Equity: Work with marginalized communities to increase access to desirable mobility options.

#7 Safety: Increase the safety of transportation systems and infrastructure to support the safe movement of people and goods.

#8 Environment: Reduce the local and cumulative environmental impacts of mobility to improve air and water quality, energy conservation and mitigate climate change.

Using the 8 CAT Policy Goals as the Framework for Action

WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

AV Work Group Executive Committee

- Governor
- Four members from Senate
- Four members from House
- Insurance Commissioner
- DOL Director
- WSDOT Secretary
- WSP Chief
- Traffic Safety Commission Director
- State Chief Information Officer
- Transportation Commission Member

Government and Private Sector Representatives from:

- Data, Technology & AV Testing
- Shared, Electric, TNC & Transit
- Automakers
- Local Governments
- Consumers/Traveling Public
- Environment
- Academic
- Underrepresented Communities
- Freight
- Labor

Subcommittees

Licensing	Safety	Infrastructure & Systems	System Tech & Data Security	Liability	Health & Equity	Workforce
2 Co-Chairs DOL Support Lead	2 Co-Chairs WTSC and WSP Support Lead	2 Co-Chairs WSDOT Support Lead	2 Co-Chairs State CIO Support Lead	2 Co-Chairs Insurance Comm. Support Lead	2 Co-Chairs DOH Support Lead	2 Co-Chairs ESD and L&I Support Lead

National CAT Coalition

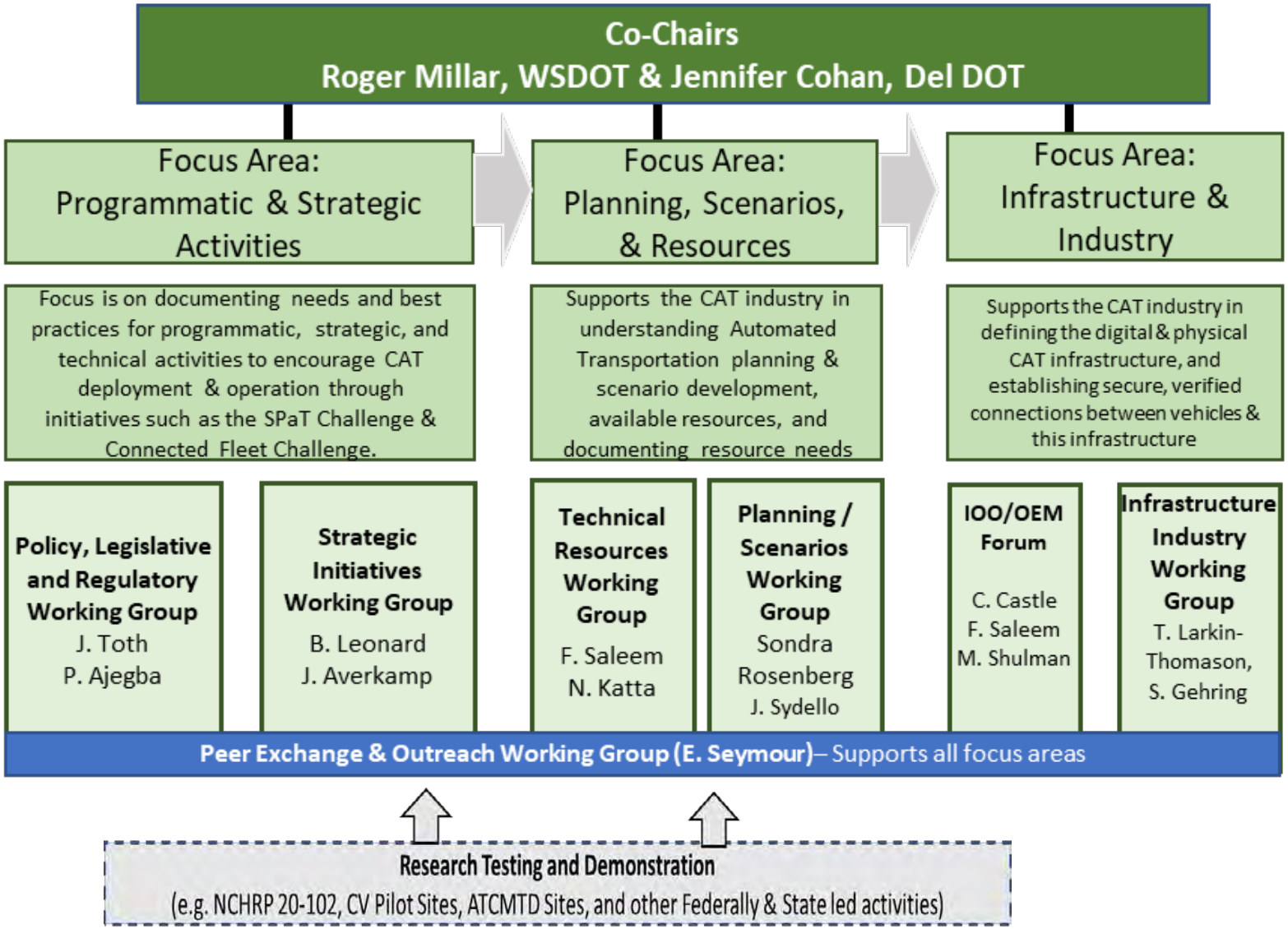
CAT Coalition
AASHTO, USDOT, ITE, ITS America
Purpose and Membership

Joint Cooperative Effort between USDOT and AASHTO, ITE and ITS America

Formed to serve as a collaborative focal point for federal, state and local government officials, academia, industry and their related associations to address critical program and technical issues associated with the nationwide deployment of CVs and AVs.

Coalition membership includes representation from infrastructure owners and operators (IOOs), original equipment manufacturers (OEMs), technology and service providers, academic researchers, consultants, and internet of things (IOT) suppliers.

CAT Coalition – Organization



AASHTO ITS AMERICA ite

Infrastructure Owner Operators' Guiding Principles for Connected Infrastructure Supporting Cooperative Automated Transportation (AASHTO, ITE, ITS America)

GP1—Automation: Support increased vehicle automation to improve traveler safety, mobility, equity, and efficiency.

GP2—Data: Achieve a connected vehicle ecosystem that enables reliable, secure V2I data exchanges in order to support cooperative automated transportation to improve traveler safety, mobility, equity, and efficiency.

GP3—Telecommunications: Protect and utilize the 5.9 Gigahertz (GHz) spectrum designated for "operations related to the improvement of traffic flow, traffic safety, and other intelligent transportation service applications." (FCC)

GP4—Operations: Develop CAT strategies that enhance existing transportation system operational capabilities to improve traveler safety, mobility, equity, and efficiency.

GP5—Collaboration: Collaborate and communicate with OEMs and mobility service providers in the planning, testing, and demonstrations of CAT applications to support eventual interoperability and to achieve positive impacts.

New Supporting Technical Concepts Document

- **Overview of CAT** (Stakeholders and Their Objectives, Applicable Modes, Vehicle Automation, Roadway Automation, Technology and Communications, Applications)
- **IOO Guiding Principles (GP) for CAT Infrastructure**
  - The Need and Basis for GPs
  - Objective of the GPs
  - GPs and Concepts (Automation, Data, Telecommunications, Operations, Collaboration)
- **Applying the CAT Infrastructure GPs**
  - CAT and IOO Processes
  - Preparing for CAT Infrastructure
  - Future Efforts

https://systemoperations.transportation.org/ioo-guiding-principles-for-cat/

ITS America: FAST ACT Reauthorization Policy Platform

Moving People, Data, and Freight: Safer

1. Increase Investments in Research and Deployment of Intelligent Transportation Technologies
2. Safeguard Critical Transportation Infrastructure from Cybersecurity Threats
3. Prioritize the 5.9 GHz Spectrum for Vehicle-to-Everything (V2X) Public Safety Transportation Communications and Grow Investments in Vehicle-to-Infrastructure (V2I) and V2P Technologies
4. Expand Investments in Advanced Mobility Improvements
5. Plan for Transformative Transportation Technologies
6. Deploy Broadband to Support Intelligent Transportation Technologies

Moving People, Data, and Freight: Greener

7. Increase Buildout of Alternative Fuel Vehicle Infrastructure to Support Zero Emission Vehicles
8. Build Transformative and Adaptive Infrastructure for Deployment of Intelligent Transportation Technologies to Mitigate Climate Change

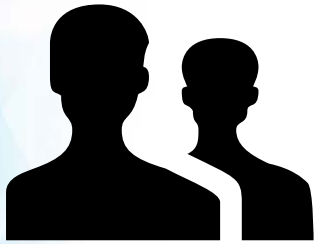
Moving People, Data, and Freight: Smarter

9. Establish A Mobility-on-Demand Program for the New World of Mobility
10. Invigorate the ITS Program Advisory Committee
11. Strengthen the University Transportation Centers Program

ITS America: Mobility on Demand (MOD) Alliance

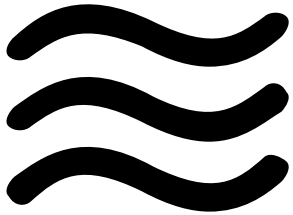
MOD Supply & Demand

Treats transportation supply and demand as commodities



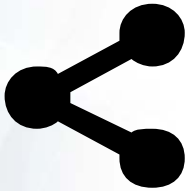
CONSUMER-DRIVEN

Focused on traveler and personal choice



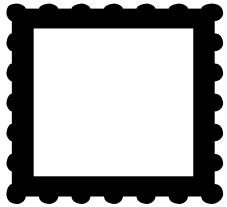
MULTI-MODAL

Mode agnostic and focused on trip satisfaction



DATA-DRIVEN

Depends on connected data rather than on a particular technology



MANAGEMENT FRAMEWORK

Framework for aggregating and managing supply and demand

ALLIANCE FOCUS AREAS

Mobility on Demand Alliance

- **POLICY | Federal Reauthorization**
  - MOD definition and amendments in code - Transit, STBG, CMAQ
    - Shared mobility program such as bicycles, micromobility, microtransit, ridesourcing, shared automated services
- **PARTNERSHIPS | MOD/MaaS Alliance Partnership**
  - MOD/MaaS Markets – Bookend events discussing key MOD/MaaS issues
    - Insurance (2019/2020)
    - Infrastructure Services (TBD)
- **PROGRAMS | State of MOD Study**
  - Public and Practitioners annual national surveys to assess awareness of mobility on demand, customer understanding and adoption of MOD and its elements

MOD Around the US

Open Mobility Foundation

Open Mobility Foundation

THE FUTURE OF MOBILITY

Municipalities across the country have joined together to create a new global non-profit organization called the Open Mobility Foundation to support the development of open-sourced software that provides scalable mobility solutions for cities.

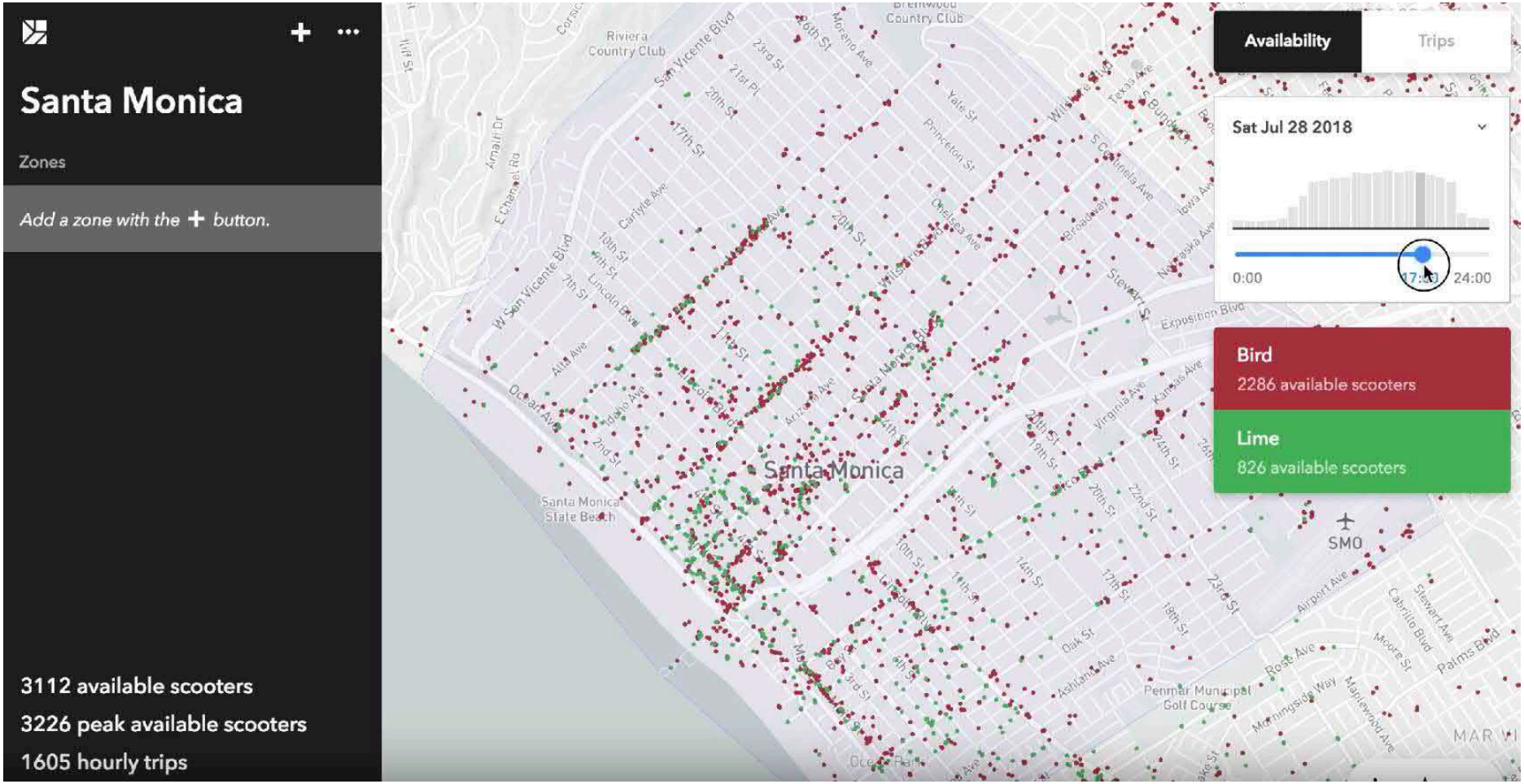
LEARN MORE

OMF OPEN MOBILITY FOUNDATION

Governed by cities, the Open Mobility Foundation develops and promotes technology used in commercial products that either use the right-of-way or that help government entities manage the public right-of-way.

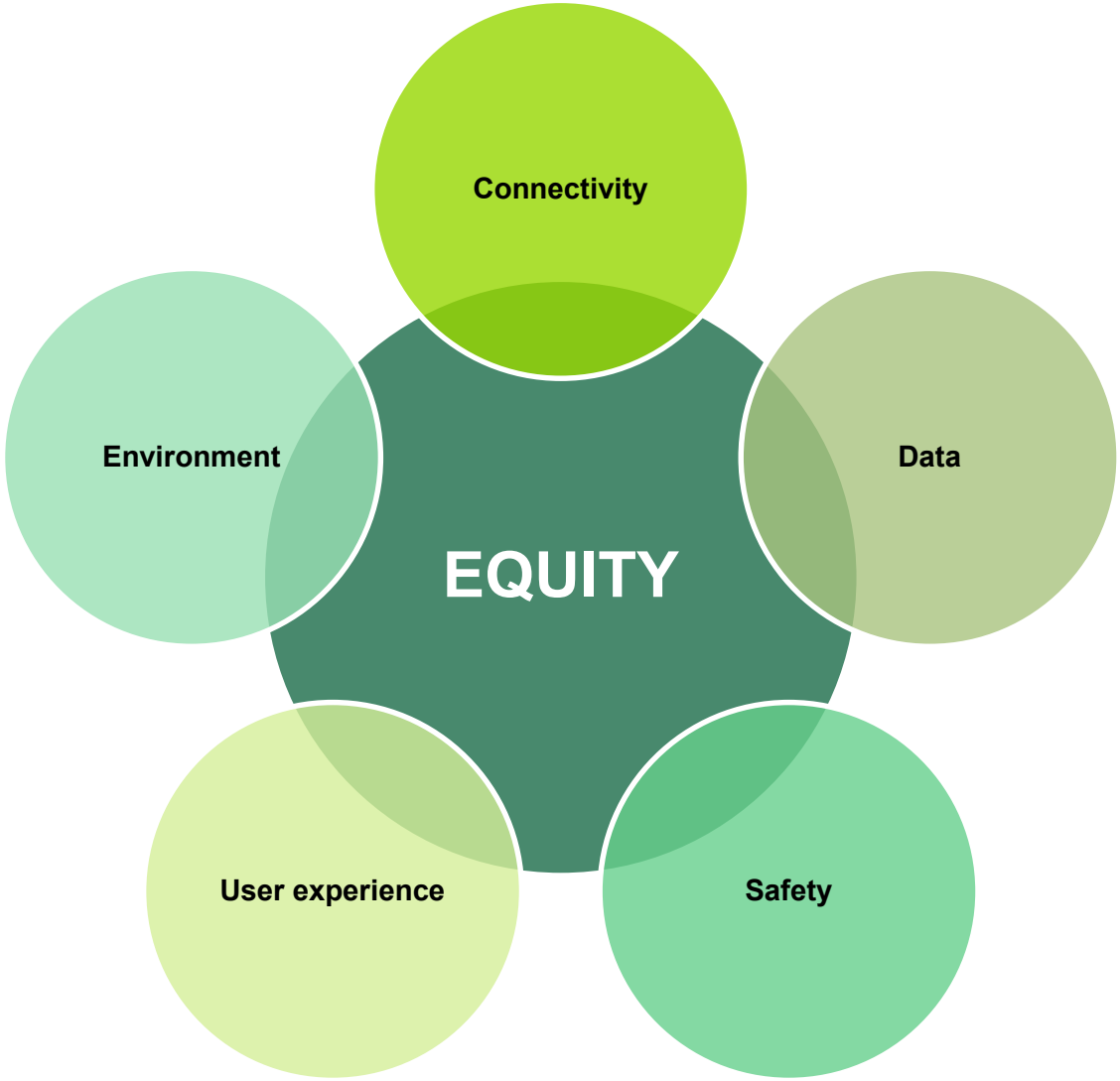
Open Mobility Foundation

Establishes data standards that encourage data sharing, fare payment integration and competition



WSDOT - Mobility on Demand (MOD)

Policy Development: Mobility on Demand core principles and emphasis areas



Ongoing MOD efforts

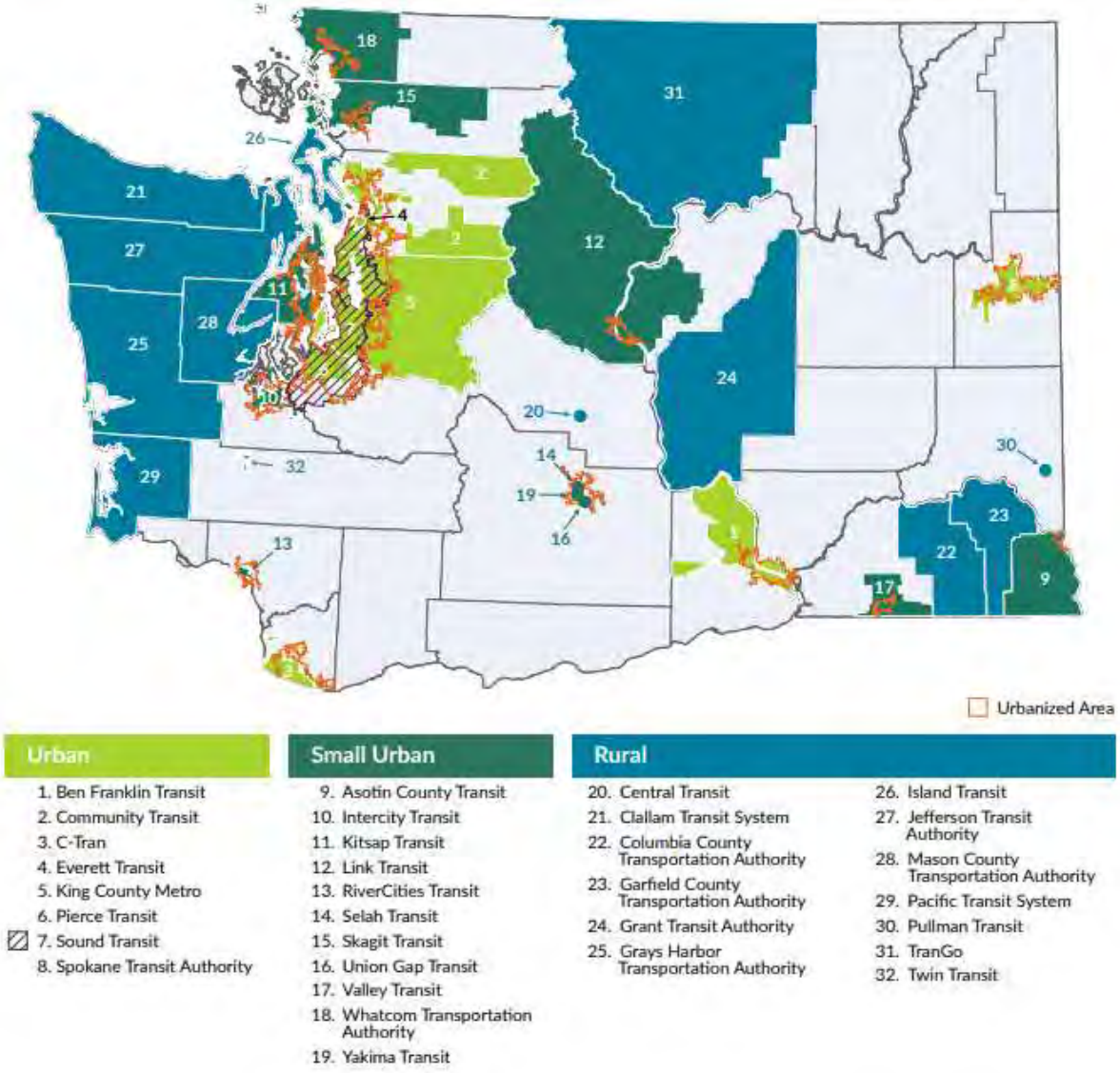
- Establish data standards that encourage data sharing, fare payment integration and competition
- Regulate, support and pay for GTFS (General Transit Feed Specification) -Flex adoption
- Test and pilot first and last mile program

Regulate, support and pay for GTFS-Flex adoption

Flexible transit service in Washington State

- 8 urban
  11 small urban
  13 rural
- 31 have flexible service

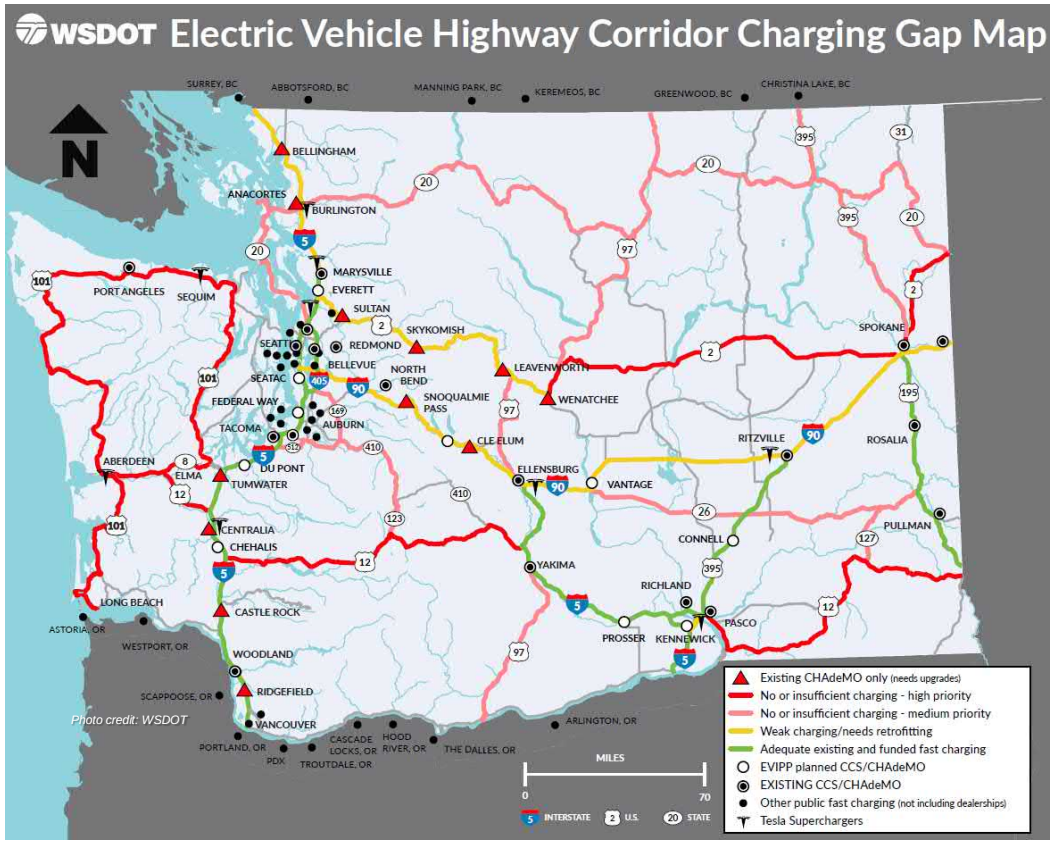
WSDOT is partnering with UW, Oregon State University, and King County Metro to advance the adoption of this standard in Washington state.



WSDOT – Electric Vehicle Charging Infrastructure

Electric vehicle charging infrastructure

- Uses a portion of the annual electric vehicle registration fee to provide matching grants
- $1 million in state funding used to encourage private sector investment for 15 new locations totaling $2.5 million
- $100M would complete the gap map with charging stations every 70 miles



Electric vehicle charging infrastructure

Additional Efforts Underway

- **Coordination with other states (OR, CA) and province (BC)** on the West Coast Electric Highway
- **FHWA Designation of EV corridors:** I-5 and sections of I-82, I-90, US 101
- **Coordination with other organizations on EV charging investments**
  - Joint OR/WA Pacific Northwest ZEV Investment proposals to Electrify America
  - Ecology VW Settlement Investments in EV charging
  - Commerce Electrification of Transportation Systems Program - Clean Energy Fund (CEF)
- **Research with UW to prioritize investments in highway corridor charging**
  - Built an Electric Vehicle Infrastructure – Decision Support System (EVI-DSS)

WSDOT – Broadband Accommodation

Department of Commerce

Washington State's

Broadband Office

Broadband Goals

- **The legislation established aggressive goals:**

2024

- All residences and businesses will have 25/3 Mpbs service

2026

- All anchor institutions will be served with a 1 Gbps connection

2028

- All residences and businesses will have symmetrical service at 150/150 Mpbs

CHOOSE Washington STATE

Broadband infrastructure accommodation: current policies

Utility Accommodation

- RCW 47.44
- Permits and Franchises

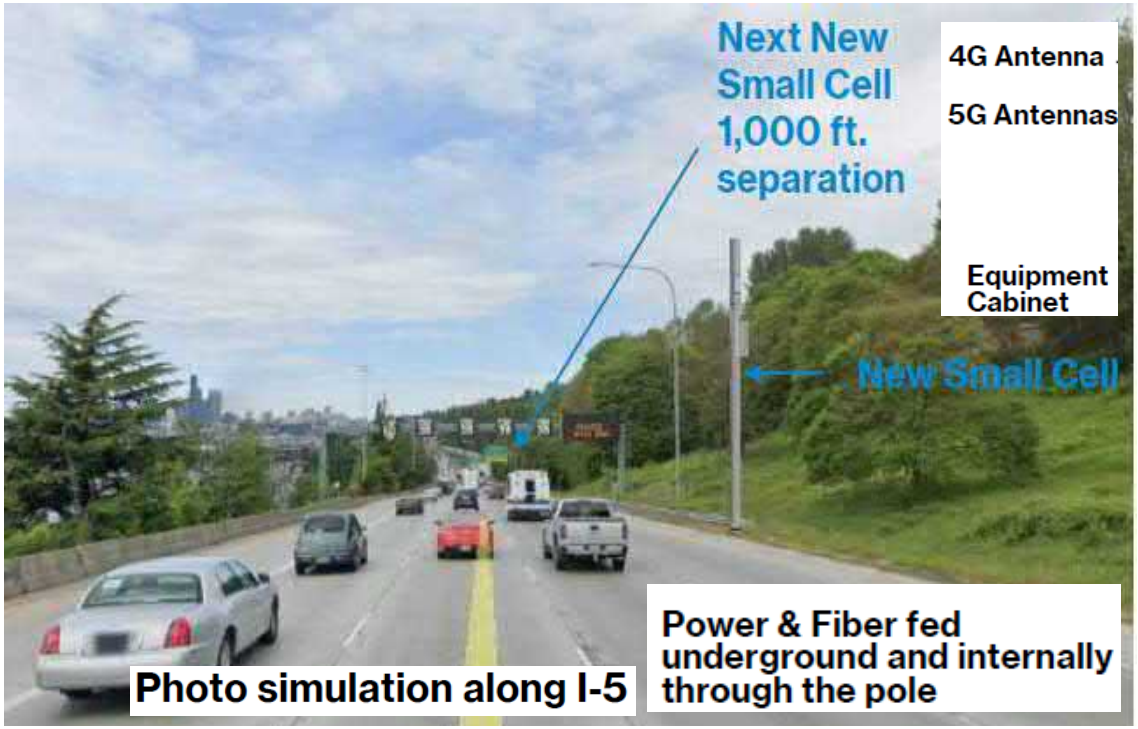
Wireless Leasing

- RCW 47.04
- Special Wireless Facility Leases and Access Permits

General Leasing Authority

- RCW 47.12
- Highway Land or Airspace Lease

Example: Providing access to public rights of way for 4G / 5G small cells



WSDOT's current efforts

Evaluating WSDOT policies

- Collaboration with the Department of Commerce Broadband Office to align state broadband policy goals

Exploring opportunities with public agency broadband providers

- Ports
- Public Utility Districts
- Tribes

Focused on partnerships and collaboration rather than traditional permitting or leasing.

Examples

- Installing conduit for fiber as part of roadway and bridge projects
- Access to services in lieu of Fair Market Rent
- Road Weather Information Systems
- Access to Public Rights of Way for 4G / 5G Small cells

WSDOT – Roadway Striping and Pavement Markings

Roadway striping and pavement markings

Striping and marking investments are the least cost / highest return investments for keeping driven and automated vehicles safely on the road.

With aging drivers and automated systems, higher quality striping is now an operational need rather than a simple maintenance or preservation task.

WSDOT – Automated Work Zone Safety/ Data Sharing Partnerships

Current WSDOT pilot: Transmit work zone data through roadside devices to WAZE

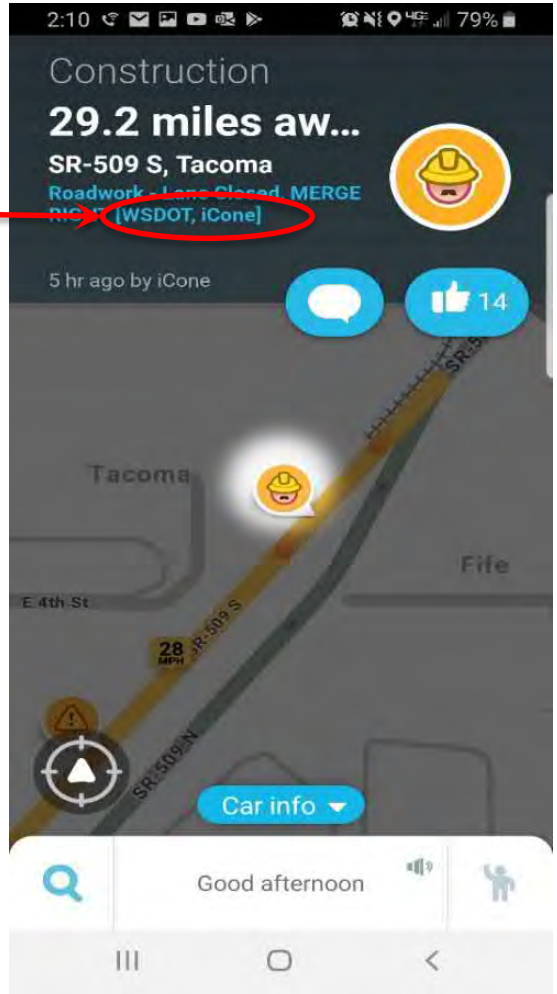
Connected Arrow Board Kit:

Two Each for Olympic and Southwest Region Dedicated Work Zone Crews

WSDOT Credited Work Zone in WAZE

"iPin"

Marks End of Work Zone



Courtesy: iCone Products/Waze App

WSDOT's Work Zone database

Planning level data input:

What is the work?

When is it scheduled?

Who is responsible?

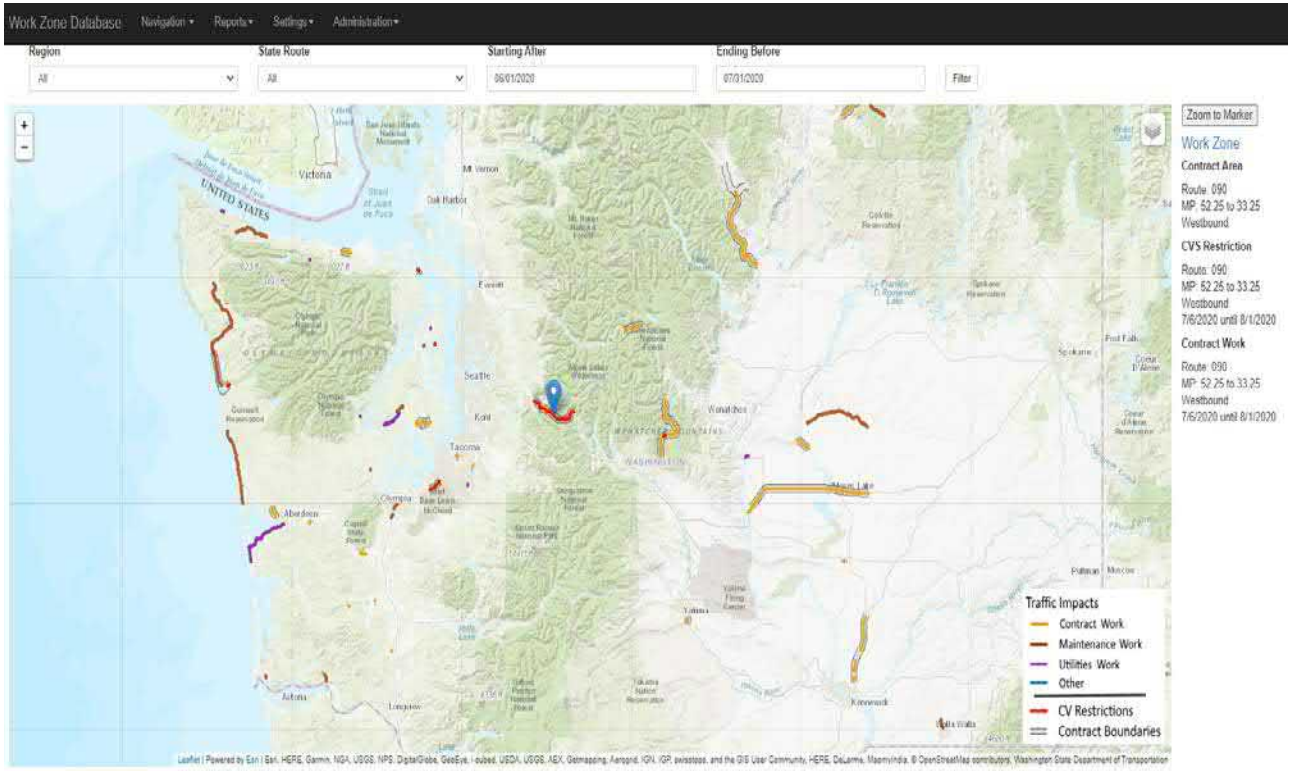
- Construction
- Maintenance
- Utilities
- Special Events, etc.

How can we contact them?

- Avoid conflicts
- Combine multiple
- Work zone activities?

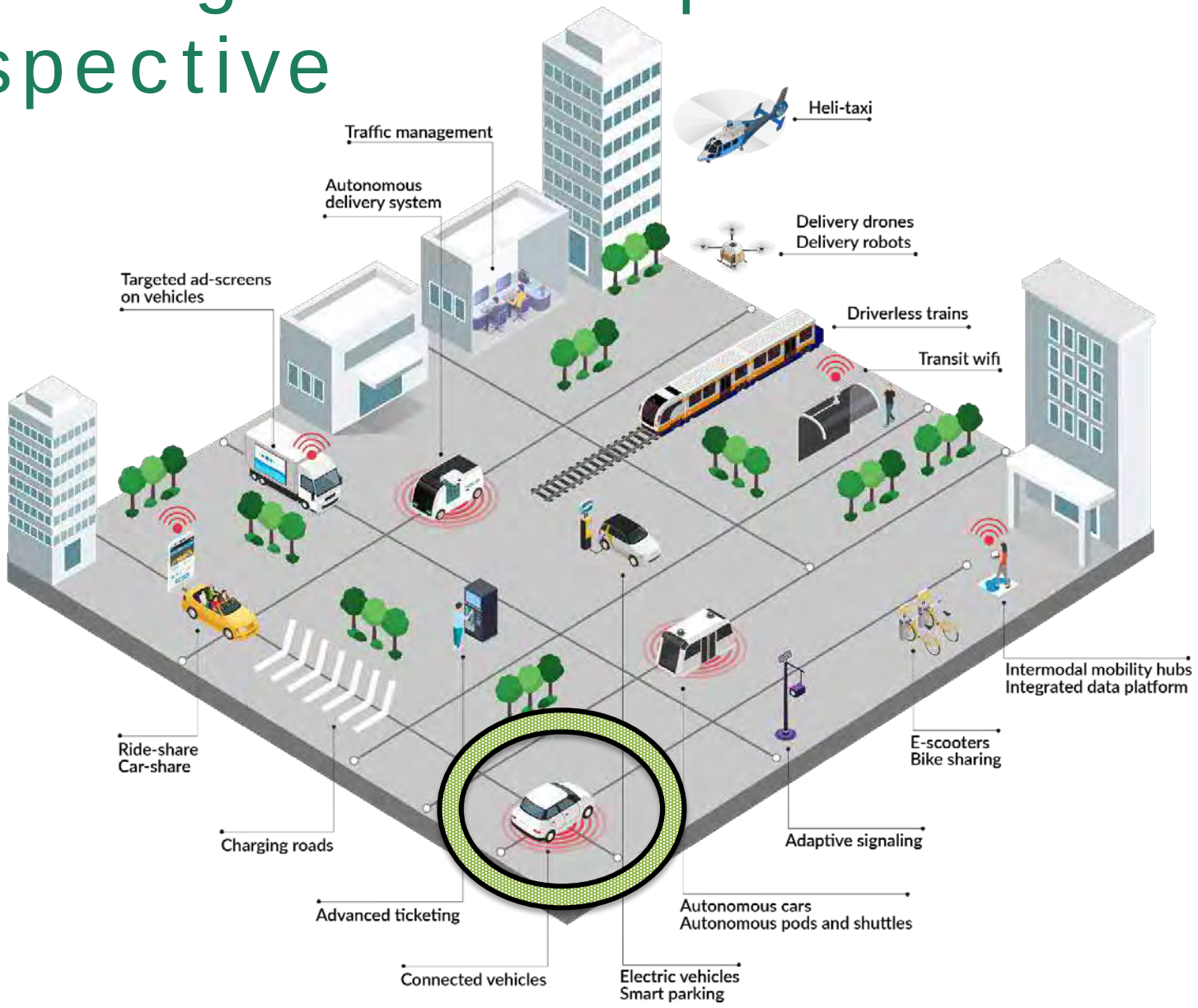
Deployment underway

- 4 of 6 regions to date



Conclusion

Preparing for AV requires a CAT Perspective



8 CAT Policy Goals Endorsed by the WSTC in October 2019

#1 Organize for Innovation

#2 Shared Mobility

#3 Economic Vitality and Livability

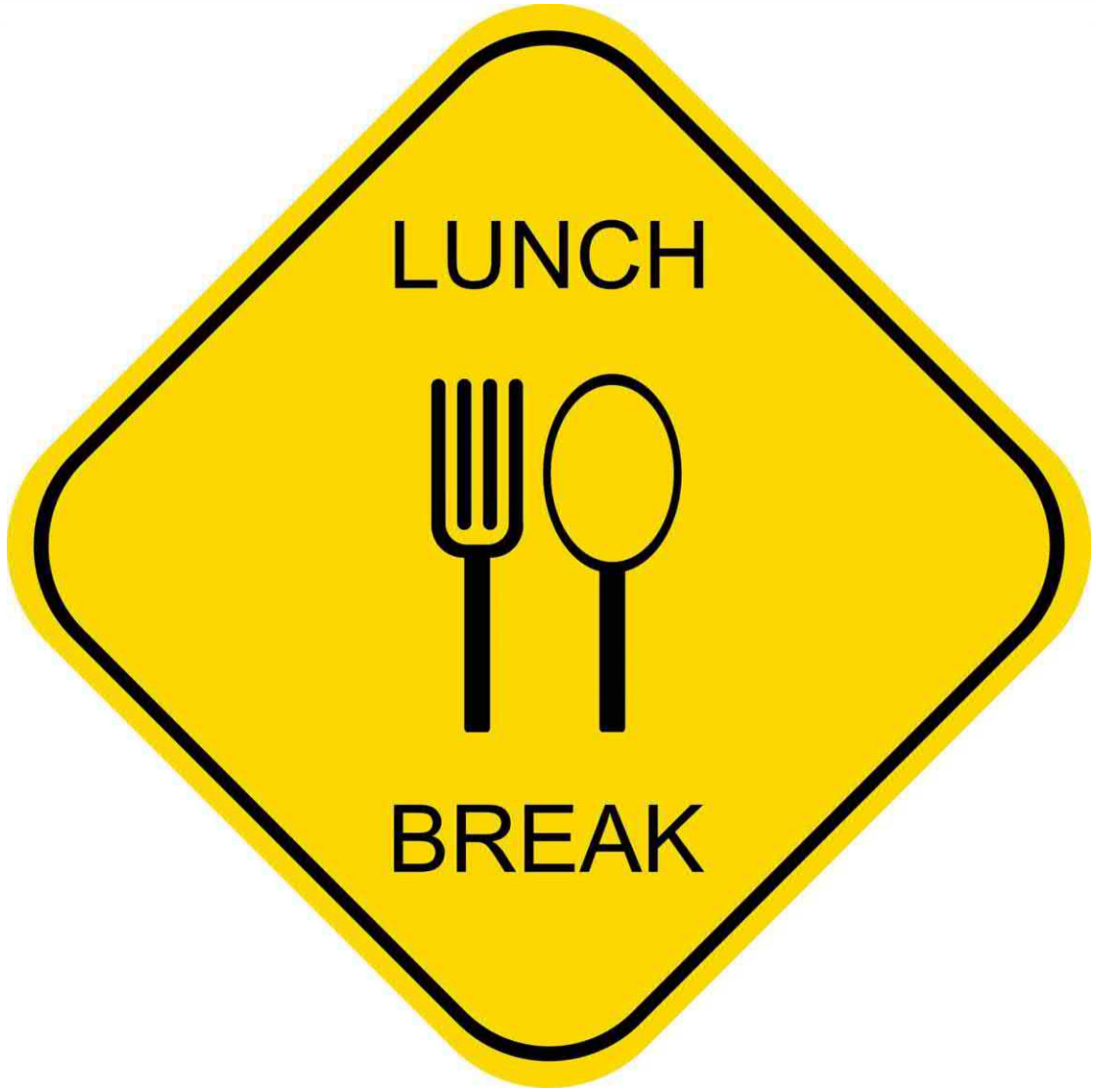
#4 Infrastructure and Context Sensitive Street Design

#5 Land Use

#6 Equity

#7 Safety

#8 Environment



Be back at…

12:00 p.m. PT

AV Industry Panel

Cesar Diaz, *Aurora*
Sharad Agarwal, *EasyMile*
Ariel Wolf, *Self-Driving Coalition for Safer Streets*

WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

Washington State
Transportation Commission

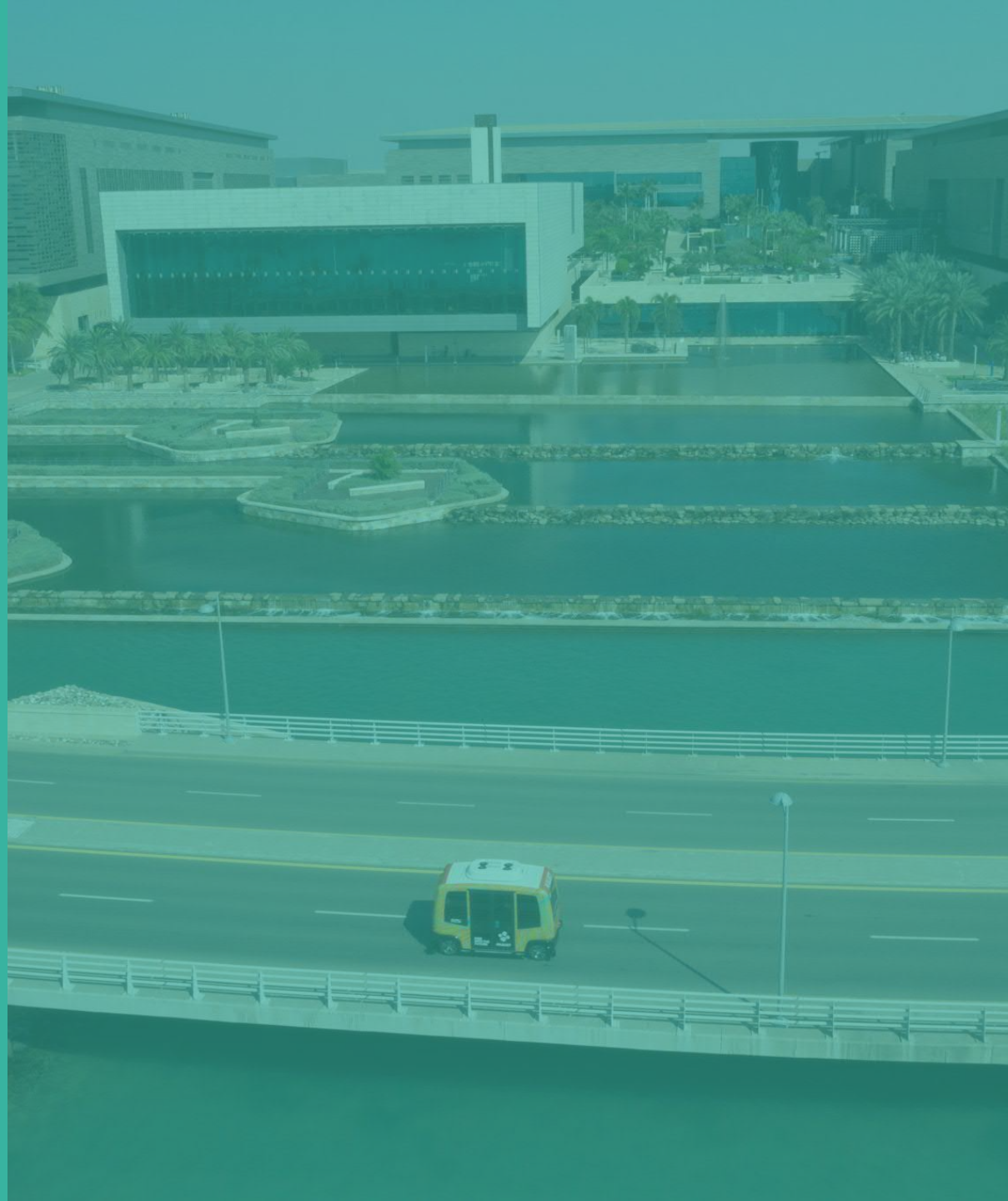
Aurora's presentation materials will be presented live during the September 23rd Executive Committee meeting only.

AUTONOMOUS FUTURE, **TODAY**

If Autonomous Vehicles were ready today, are we?

Agenda

1. Introduction
2. Who is EasyMile?
3. State of Autonomous Technology
4. Are cities ready for AV?



Sharad Agarwal

Senior Vice President - EasyMile

sharad.agarwal@easymile.com
(206) 483 6098

- Denver, CO based
- 15 years of transportation experience within bus manufacturing, charter sales, limo business, and transit
- Senior Executive at First Transit/First Group for 5.5 years including overseeing King County Paratransit Call Center for 3 years.
- Seattle resident for 4 years
- Strategic Advisor for Spare Labs (Vancouver)
- Leader in Mobility innovation on how to adapt traditional business models to prepare for the future

EasyMile

Since
2014

30+ PhDs

220+

Leader
in R&D

32 vehicles in the US
(150 worldwide)

7
locations

22
nationalities

60+ projects in the US
(350+ worldwide)

Shareholders

Founders, Continental, Alstom, and Bpifrance

Linden LEAP, Columbus, Ohio

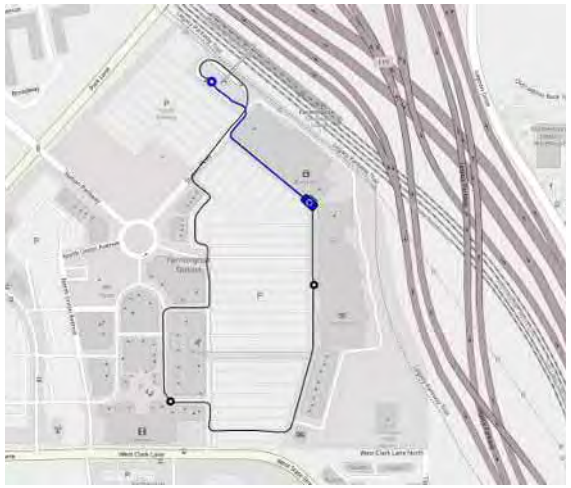
Featuring two EasyMile EZ10 Gen3s, this is the first residential deployment of EZ10's in a residential neighborhood. This route provides transportation from Linden Transit Center to St. Stephens Community Center. Post-Covid the shuttles are delivering food from the Community Center to the neighborhood.

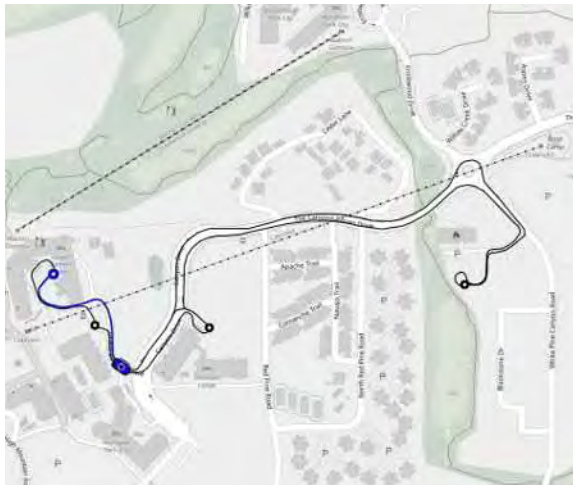
Project Lead:	City of Columbus, OH - https://smart.columbus.gov/
Environment	Public Road
Description of the project scope	Mixed Traffic with Pedestrians, Bikes and Motorized Vehicles
Route length / Number of stops	2.7 miles
Make, Model and # of shuttles used	(2)EasyMile EZ10 Gen-3s
Project Duration, hours of service	14 months 6am to 7pm Monday to Sunday
Average temperatures and weather encountered	Temperatures in Columbus OH can range from a high 105° to a low of -22°. Weather conditions included wind, rain, snow, and fog.
Goal of Project	To provide a transportation service between a transit hub and the community center that provides food. Demonstrate the reliability of the technology

Project Example: Utah Department of Transportation

10 venues around Salt Lake City with different use cases and customer types: skiing resorts, business parks, university campus, hospital, malls.

Place	Various Locations Around the State of Utah, USA
Customer and Client URL	Utah Department of Transportation. http://www.avshuttleutah.com/
Environment	Understand requirements associated with controlled and uncontrolled intersections, introducing DSRC, and CV2X, warnings for pedestrians and other road users.
Description of the project scope	Mixed Traffic with Pedestrians, Bikes and Motorized Vehicles
Route length	Average 1 mile
Make, Model and Number of shuttles used	One EasyMile EZ10 Gen-2
Project Duration - including passengers carried	18 months project, has been ongoing since March 2019. 750 riders per month.
Average temperatures and weather encountered	The highest average temperature is 89.4° and the lowest average temperature is 17.1°F. Weather includes snow, rain, wind, fog, hail
Goal of the Project	To test the feasibility of AV's in numerous different environments. Com





Verizon, Basking Ridge Campus, New Jersey

The EZ10 shuttle services Verizon employees from the Verizon Employee Hotel to the Corporate Campus working with their current shuttle service provided on the campus. This project is an exciting R&D opportunity of between Verizon and EasyMile, using the EZ10 as a mobile 5G test bed.

Customers and Client URL	Verizon - www.verizon.com
Environment	Private campus
Description of the project scope	Mixed Traffic with Pedestrians, Bikes and Motorized Vehicles
Route length / Number of stops	1.1 mile with 3 stops
Make, Model and Number of shuttles used	One EasyMile EZ10 Gen-3
Project Duration, hours of service	Long term relationship Monday to Friday, 10am to 3pm.
Average temperatures and weather encountered	The highest average temperature is 85° and the lowest average temperature is 19°F. Weather includes rain, wind, fog, hail, snow.
Goal of the Project	Provide a transportation service between HQ and campus hotel. Test vehicle for future 5G services

State of Autonomous Technology

Two Types of Autonomous Passenger Vehicles

Homologated Vehicles with Autonomous Technology

- AV Technology applied to existing car make and model
- 1-5 Passengers
- Approved for city roads in most states due to vehicle meeting FMVSS standards
- Not practical for quick load and upload scenarios
- Ability to travel at posted speed limits
- Traditional OEMs, Parts suppliers, and technology companies focused in this space.
- Expectation is vehicles will not be available for sale, but used for mobility services

Shared Autonomous Vehicles (SAV's)

- Custom built vehicle with integrated technology
- 6 - 15 Passengers
- Requires special approval to operate on public roads as vehicles have not met FMVSS standards yet
- Ideal for quick load and unload and ADA accessible
- Travel between 10-15 mph
- New startups filling this space

Why do cities invest in SAV projects?

1. Opportunity to learn about passenger acceptance
2. Evaluate the maturity of the technology
3. Understand battery life and charging options
4. Connect to infrastructure i.e traffic lights
5. Determine limitations of the technology
6. Provide ridership
7. Be seen as an innovator
8. Awarded a Federal Grant

What is missing with SAV's to be commercially viable?

Requirements

Vehicle should be able to be driven in manual mode for dual utilization and ability to park at single depot

Average speed is 12.7 mph so a top speed of 20 mph should be adequate to meet schedules

Ability to detect no passengers at a stop and continue moving

TeleOperation to improve depot utilization

Challenges

Regulations require FMVSS vehicles for mass deployment

Balance cost of technology with ODD/capabilities of vehicle

Interaction with pedestrians and other cars is required

Existing fleets last up to 15 years and is not cost effective to retrofit existing fleet

How do we get ready for AVs?

What is required to prepare for commercial autonomous deployments?

What type of Infrastructure changes will be required?

Determine the advantages/disadvantages in public transit

What level of stakeholder engagement will be required?

How real is the threat from cybersecurity?

What outreach will be needed to gain acceptance from the community?

What type of weather conditions can the AV operate in? How many overall days will they not operate?

What is the job transition plan?

Who owns the data? How will it be shared?

Are all AV companies the same? What type of safety testing is available?

Will there really be a cost benefit provided by autonomous vehicles?

Who is liable in an accident? City, AV technology, operator, infrastructure?

Are state and local laws ready to allow for autonomous vehicles on the roads? Licensing and permitting?

Zoom: Regulations

Do regulations apply to private roads? What is definition of private roads?

- **Colorado:** No
- **California**: No
- **North Carolina**: Yes

Who is going to regulate the Autonomous Vehicles?

- **Colorado:** AV Task Force with DMV, Department of Revenue, CDOT, HIghway Patrol
- **California**: DMV on public roads and Public Utilities Commission on passenger carrying
- **North Carolina**: NCDOT, DMV

Will the state require test criteria?

- **California:** Yes full process and application
- **Colorado:** Presentation to AV Task Force
- **North Carolina**: Team review amongst government stakeholders

Will registration and titling be required for AV Projects? Yes for all states thus far on public road

Zoom: Risk & Insurance

What level of insurance would be required for autonomous vehicle? Should there be different levels for different speeds?

Private versus public roads?

- $5M in Auto-liability
- $10M in General Liability
- Worker's Compensation $1M

Who is at fault if an autonomous vehicle hits a lampost?

- Is it the safety operator (remote or on board) that did not react in time to prevent accident
- Autonomous Software provider
- Manufacturer of the vehicle
- Infrastructure Provider or sensors communicating to the AV
- Local Government for permitted vehicle on the road

What additional risk is the government taking once they approve the AV for the road?

Thank you

Connect with us:

#EasyMile

Self-Driving Coalition for Safer Streets:

Washington Autonomous Vehicle Working Group Executive Committee Presentation

September 23, 2020

Ariel S. Wolf
Counsel, Self-Driving Coalition for Safer Streets | Counsel, Venable LLP | +1 202.344.4013 | aswolf@Venable.com

VENABLE LLP

SELF-DRIVING COALITION FOR SAFER STREETS

Agenda

1. The Self-Driving Coalition for Safer Streets: Who We Are
2. Coalition Approach to AV Policymaking
3. Overview of Various State Approaches

SELF-DRIVING COALITION FOR SAFER STREETS

The Self-Driving Coalition for Safer Streets: Who We Are

SELF-DRIVING COALITION FOR SAFER STREETS

Self-Driving Coalition for Safer Streets

Our Mission

The Self-Driving Coalition works collaboratively with lawmakers, regulators, and the public to accomplish the following:

- Develop and promote policies that safely and thoughtfully advance fully self-driving vehicles in order for the technology to realize its full safety and mobility benefits; and

- Work with stakeholders to understand the broader societal and economic opportunities of self-driving vehicles.

State and local governments have an essential role to play in this process

SELF-DRIVING COALITION FOR SAFER STREETS

Benefits of AV Technology

IN 2015, MORE THAN **35,000 PEOPLE DIED** ON U.S. ROADS IN CRASHES

THAT'S NEARLY 100 PEOPLE EVERY DAY

OVER **90% OF MOTOR VEHICLE CRASHES** ARE CAUSED BY **HUMAN ERROR**

Fully self-driving vehicles have the potential to **DRAMATICALLY IMPROVE PUBLIC SAFETY** on U.S. roads and highways

Fully self-driving vehicles can lead to safer roads for:

Other important potential benefits of fully self-driving vehicles:

SELF-DRIVING COALITION FOR SAFER STREETS

AV Activity

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition Approach to AV Policymaking

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Approach to AV Policymaking

Core Principles

I. Expanding testing and deployment of fully self-driving vehicles

II. Preserving traditional state and federal roles

III. Maintaining the existing liability regime

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Approach to State Legislation

- Support state efforts to facilitate AV testing and deployment of fully self-driving vehicles
- Majority of states already have existing statutory and regulatory motor vehicle frameworks that permit AV testing and deployment
- Coalition seeks to be a resource for state regulators and lawmakers

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Model Legislation

The Self-Driving Coalition's model legislation would:

- provide for the deployment of SAE Level 4/5 AV technology in a way that would promote safety while allowing innovation to flourish;
- promote competition; and
- avoid unnecessary restrictions on AV technology.

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Model Legislation

The model legislation addresses key issues, including:

- Definitions
- Safety
- Insurance
- Accident reporting
- Registration and titling

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Model Legislation: Definitions

AUTOMATED DRIVING SYSTEM. The hardware and software that are collectively capable of performing the entire dynamic driving task on a sustained basis, regardless of whether it is limited to a specific operational design domain.

DYNAMIC DRIVING TASK (DDT). All of the real-time operational and tactical functions, as further defined in SAE J3016, required to operate a vehicle in on-road traffic, excluding the strategic functions such as trip scheduling and selection of destinations and waypoints.

FULLY AUTONOMOUS VEHICLE. A vehicle equipped with an automated driving system designed to function without a human driver as a level 4 or 5 system under SAE J3016.

MINIMAL RISK CONDITION. A low-risk operating mode in which a fully autonomous vehicle operating without a human driver achieves a reasonably safe state, such as bringing the vehicle to a complete stop, upon experiencing a failure of the vehicle's automated driving system that renders the vehicle unable to perform the entire dynamic driving task.

OPERATIONAL DESIGN DOMAIN (ODD). A description of the specific operating domain(s) in which an automated driving system is designed to properly operate, including but not limited to roadway types, speed range, environmental conditions (weather, daytime/nighttime, etc.), and other domain constraints.

SAE J3016. The Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles published by SAE International in September 2016.

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Model Legislation: Safety & Compliance

Section 2 would authorize the operation of AV technology without a human driver.

SECTION 2. Operation of Fully Autonomous Vehicles Without a Human Driver
A person [as defined in (INSERT cross-reference to state definition if appropriate)] may operate a fully autonomous vehicle on the public roads of this state without a human driver provided that the automated driving system is engaged and the vehicle meets the following conditions:

1. if a failure of the automated driving system occurs that renders that system unable to perform the entire dynamic driving task relevant to its intended operational design domain, the fully autonomous vehicle will achieve a minimal risk condition;
2. the fully autonomous vehicle is capable of operating in compliance with the applicable traffic and motor vehicle safety laws and regulations of this state when reasonable to do so, unless an exemption has been granted by [RELEVANT AGENCY]*; and*
3. the vehicle bears the required manufacturer's certification label indicating that at the time of its manufacture it has been certified to be in compliance with all applicable Federal Motor Vehicle Safety Standards.

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Model Legislation: Licensing

Section 3 would establish the automated driving system as the licensed "operator" of the vehicle.

SECTION 3. Licensing
[INSERT cross-reference to state licensing section] Is amended as follows:
When an automated driving system installed on a motor vehicle is engaged:

1. The automated driving system is considered the driver or operator, for the purpose of assessing compliance with applicable traffic or motor vehicle laws and shall be deemed to satisfy electronically all physical acts required by a driver or operator of the vehicle; and
2. The automated driving system is considered to be licensed to operate the vehicle.

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Model Legislation: Insurance

Section 4 would require the submission of proof of insurance in compliance with state law as a precondition to the operation of AV technology.

SECTION 4. Insurance.
Before operating a fully autonomous vehicle on public roads in this state without a human driver, a person shall submit proof of financial responsibility satisfactory to the [RELEVANT AGENCY] that the fully autonomous vehicle is covered by insurance or proof of self-insurance that satisfies the requirements of applicable [INSERT cross-reference to state motor vehicle financial responsibility laws, (e.g. the respective state laws for personal vehicle ownership, transportation network companies, leasing, vehicle rental, vehicle-for-hire, etc.)].

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Model Legislation: Duties Following Crashes

Section 5 would require AVs to remain on the scene following a crash and report crashes consistent with other state laws.

SECTION 5. Duties following crashes involving fully autonomous vehicles.
In the event of a crash:

1. The fully autonomous vehicle shall remain on the scene of the crash when required by [cross-reference to state laws pertaining to duties following crashes], consistent with its capability under Section 2(1).
2. The owner of the fully autonomous vehicle, or a person on behalf of the vehicle owner, shall report any crashes or collisions consistent with [cross-reference to state laws pertaining to crash reporting].

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Model Legislation: On-Demand AV Networks

Section 6 would authorize the operation of on-demand AV networks.

SECTION 6. On-demand autonomous vehicle network.
An on-demand autonomous vehicle network shall be permitted to operate pursuant to state laws governing the operation of transportation network companies, taxis, or any other ground transportation for-hire of passengers [or other relevant law governing transportation of goods, etc.], with the exception that any provision of [the cross-referenced state laws] that reasonably applies only to a human driver would not apply to the operation of fully autonomous vehicles with the automated driving system engaged on an on-demand autonomous vehicle network.

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Model Legislation: Registration and Titling

Section 7 would require the submission of proper registration and titling for AVs in accordance with state law, as a condition of AV technology deployment.

SECTION 7. Registration and title.

a) A fully autonomous vehicle shall be properly registered in accordance with [INSERT cross-reference to background laws re: vehicle registration]. If a fully autonomous vehicle is registered in this state, the vehicle shall be identified on the registration as a fully autonomous vehicle.

b) A fully autonomous vehicle shall be properly titled in accordance with [INSERT cross-reference to background law re: vehicle titles]. If a fully autonomous vehicle is titled in this state, the vehicle shall be identified on the title as a fully autonomous vehicle.

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Model Legislation: Controlling Authority

Section 8 would ensure that authority over AVs is vested in a single state agency to ensure that AVs are subject to a uniform regulatory framework across the state.

SECTION 8. Controlling authority.

a) Unless otherwise provided in this chapter and notwithstanding any other provision of law, fully autonomous vehicles and automated driving systems are governed exclusively by this [Act]. [RELEVANT AGENCY] is the sole and exclusive state agency that may implement the provisions of this [Act].

b) No state agency, political subdivision, municipality, or local entity may prohibit the operation of fully autonomous vehicles, automated driving systems, or on-demand autonomous vehicle networks, or otherwise enact or keep in force rules or ordinances that would impose taxes, fees, or other requirements (including performance standards), specific to the operation of fully autonomous vehicles, automated driving systems, or on-demand autonomous vehicle networks in addition to the requirements of this [Act].

SELF-DRIVING COALITION FOR SAFER STREETS

Coalition's Model Legislation: Human Driver Operation

Section 9 would allow a human driver to operate a vehicle equipped with an ADS that is not fully autonomous and clarifies that human drivers may operate fully autonomous vehicles as well.

SECTION 9. Operation of a motor vehicle with an automated driving system by a human driver.

a) A human driver may operate a motor vehicle equipped with an automated driving system capable of performing the entire dynamic driving task but that is not a fully autonomous vehicle if --
   i. such automated driving system is designed with the expectation that the human driver will respond appropriately to a request to intervene and to issue such a request whenever the automated driving system is not capable of performing the entire dynamic driving task; and
   ii. the automated driving system is capable of being operated in compliance with [INSERT cross-reference to background law re: rules of the road] when reasonable to do so unless an exemption has been granted by [relevant Agency].

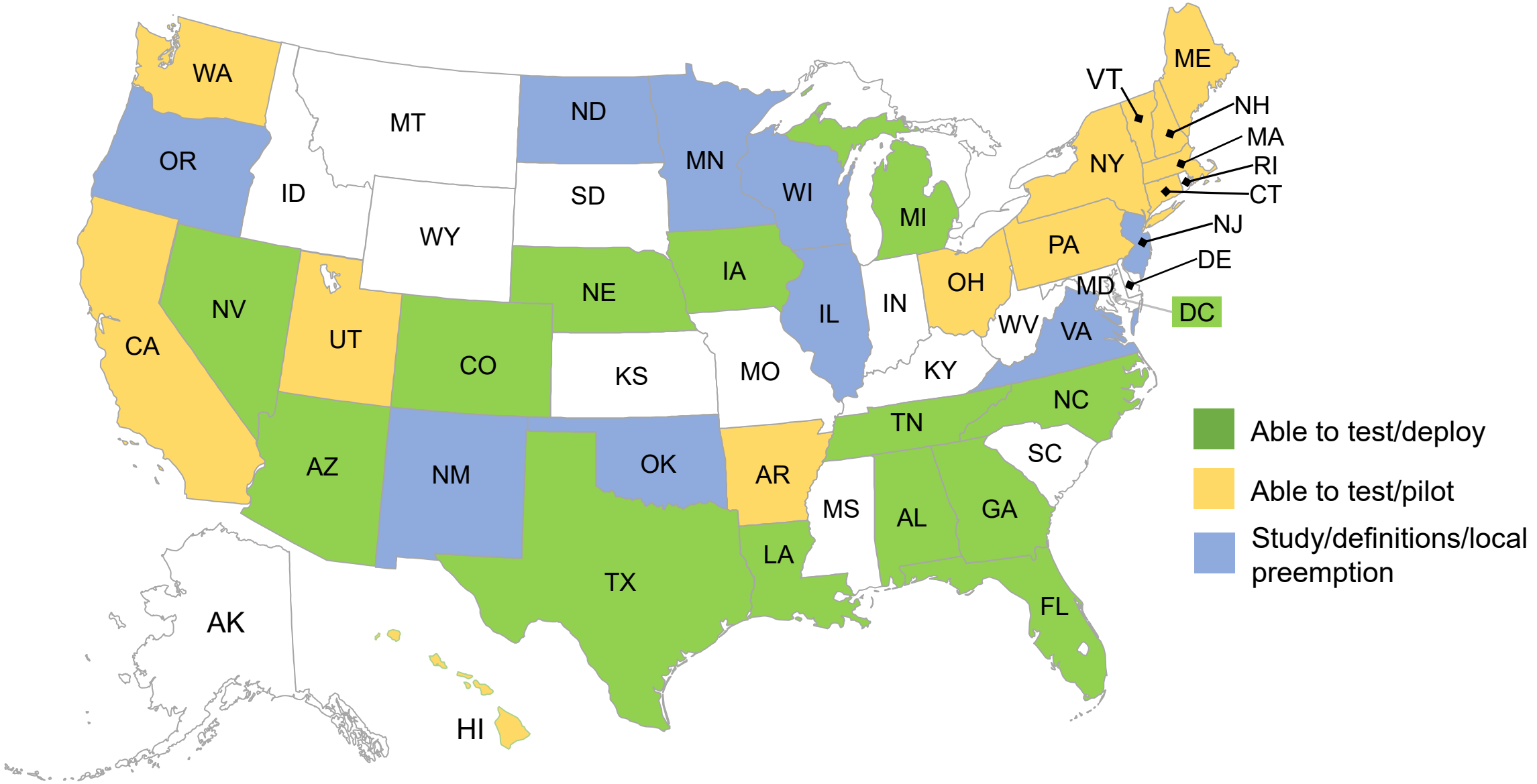
b) Nothing in this Act prohibits or restricts a human driver from operating a fully autonomous vehicle equipped with controls that allow for the human driver to control all or part of the dynamic driving task.

SELF-DRIVING COALITION FOR SAFER STREETS

State Approaches to AV Policymaking

SELF-DRIVING COALITION FOR SAFER STREETS

State Approaches to AV Regulation



State Approaches to AV Regulation

- Closest to Self-Driving Coalition Model Bill:
    - Florida
    - Arizona
- Test/Pilot Approach:
    - Washington D.C.
    - Pennsylvania
- Restrictive Requirements:
    - New York
    - Vermont
    - Hawaii

SELF-DRIVING COALITION FOR SAFER STREETS

Effect of State Approaches on AV Operations

- States with significant AV testing:
  - Texas
  - Arizona
  - Pennsylvania
  - D.C.
  - California

SELF-DRIVING COALITION FOR SAFER STREETS

Questions?

SELF-DRIVING COALITION FOR SAFER STREETS

The Future of Mobility & AV Policy

Anne Marie Lewis, PhD

Senior Director of Technology & Innovation Policy, Alliance for Automotive Innovation

ALLIANCE FOR AUTOMOTIVE INNOVATION

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ALLIANCE FOR AUTOMOTIVE INNOVATION

Recommended Legislative Approach: **OVERVIEW**

- **SAE J3016** definitions should be used in order to maintain consistency with other states, federal guidance and international standards.
- **AV Operation**:
  - AVs operating on public roads in the state should be designed to operate in compliance with the state's applicable traffic and motor vehicle safety laws and regulations.
  - AVs should be certified to be in compliance with all applicable Federal Motor Vehicle Safety Standards, except to the extent an exemption has been granted under applicable federal law and regulation.
  - If an AV is capable of operating without a human driver present in the vehicle, the vehicle must be capable of automatically achieving a Minimal Risk Condition if appropriate.
  - If an AV is capable of operating with a Conventional Human Driver, such operation is lawful and the human driver must hold the appropriate license.
- **Liability, vehicle registration and insurance requirements should be consistent with the existing Washington state approach.**
- Operation of an **"On-Demand Driverless Capable Vehicle Network"** should be permitted to connect passengers or goods.
- ADS-Equipped Vehicles are governed **exclusively** by an **identified state agency**.

Recommended Legislative Approach: **DEFINITIONS**

- **AUTOMATED DRIVING SYSTEM (ADS).** The hardware and software that are collectively capable of performing the entire Dynamic Driving Task on a sustained basis regardless of whether it is limited to a specific Operational Design Domain, if any.
- **ADS-EQUIPPED VEHICLE.** A vehicle equipped with an ADS.
- **CONVENTIONAL HUMAN DRIVER.** A human [natural] person who manually exercises in-vehicle braking, accelerating, steering, and transmission gear selection input devices in order to operate a vehicle. [reference state statute]
- **DRIVERLESS CAPABLE VEHICLE.** A vehicle equipped with an ADS capable of performing all aspects of the dynamic driving task within its operational design domain, if any, as well as achieving a minimal risk condition, without any intervention or supervision by a Conventional Human Driver.
- **DYNAMIC DRIVING TASK (DDT).** All of the real-time operational and tactical functions required to operate a vehicle in on-road traffic within its specific Operational Design Domain, if any, excluding the strategic functions such as trip scheduling and selection of destinations and waypoints.

Recommended Legislative Approach: **DEFINITIONS**

- **MINIMAL RISK CONDITION.** A reasonably safe state to which an ADS brings an ADS-Equipped Vehicle upon experiencing a performance-relevant failure of the vehicle's ADS that renders the ADS unable to perform the entire DDT, such as bringing the vehicle to a complete stop and activating the hazard lamps.
- **ON-DEMAND DRIVERLESS CAPABLE VEHICLE NETWORK.** A transportation service network that uses a software application or other digital means to dispatch Driverless Capable Vehicles for purposes of transporting persons or goods, including but not limited to for-hire transportation, transportation for multiple passengers who agree to share the ride in whole or in part, or public transportation.
- **OPERATIONAL DESIGN DOMAIN (ODD).** Operating conditions under which a given ADS or feature thereof is specifically designed to function, including, but not limited to, environmental, geographical, and time-of-day restrictions, and/or the requisite presence or absence of certain traffic or roadway characteristics
- **REMOTE OPERATOR.** A remote operator is either a human who is able to provide remote assistance to an ADS-equipped vehicle in driverless operation or a human who is not seated in a position to manually exercise in-vehicle braking, accelerating, steering, and transmission gear selection input devices, if any, but is able to operate the vehicle in near-real time.

Recommended Legislative Approach: **AV OPERATION**

Driverless Operation of ADS-Equipped Vehicles

- the vehicle must be capable of automatically achieving a **Minimal Risk Condition** if a malfunction of the ADS occurs that renders the system unable to perform the entire dynamic driving task, or in the event that the vehicle leaves its operational design domain.
- the vehicle is subject to applicable **traffic and motor vehicle safety laws and regulations** of this state that govern the performance of the Dynamic Driving Task, unless an exemption has been granted
- the vehicle has been certified to be **in compliance with all applicable Federal Motor Vehicle Safety Standards, except to the extent an exemption has been granted**

Operation of ADS-Equipped Vehicles with a Conventional Human Driver

- operation on the public roads of this state of an ADS-Equipped Vehicle that is capable of performing the entire Dynamic Driving Task during part of a given trip within its Operational Design Domain **while a Conventional Human Driver is present is lawful** under the [state's Vehicle Code], and subject to the provisions of [Vehicle Code], including [requirement that driver be licensed].
- the ADS, while engaged within its prescribed ODD, is subject to applicable **traffic and motor vehicle safety laws and regulations** of this state that specifically govern the performance of the DDT, unless an exemption has been granted

ULC Model Legislation

- The creation of an “automated-driving provider” (ADP) is unnecessary, creates confusion, and is inconsistent with approaches that are working well in other states.
- States should defer to existing state policies concerning liability, vehicle registration and insurance laws.
  - Current tort law already has recognized principles for establishing liability and allocating fault among parties.
  - The system has adapted to significant new technologies in the past and there is no reason to believe that these well-established principles cannot be applied in cases involving automated vehicles.
- No state has yet adopted the ULC model bill.
- The ULC model approach would likely deter AV testing and deployment.
- The ULC model does not address other important elements, e.g. On Demand Vehicle Network

Additional Recommendations

- Harmonization of state laws/regulations is extremely helpful:
  - AV-specific policies
  - Traffic laws that apply directly or indirectly to the operation of AVs on public roads

Bringing Autonomous Mobility Technology to Arizona

Kevin Biesty
Deputy Director
Arizona Department of Transportation

History

- **2012** — Arizona Legislature introduces HB 2679, but bill fails to move forward.
- **2013** — Legislature introduces HB 2167. Again, bill doesn't move forward
- **2015** — Governor Ducey signs Executive Order outlining Arizona's process for the safe testing and deployment of autonomous vehicles.
- **2017** — HB 2159: allows for the demonstration of truck platooning technology on Arizona highways.

Recent Progress

- **2018** — Governor issues two additional executive order to reflect advancements in technology and testing.
- **2018** — HB 2422 passes allowing for “personal delivery devices” to operate in Arizona.
- **2019** — HB 2132 passes allowing for the operation of “personal mobile cargo carrying devices.”

Governor Ducey's two 2018 executive orders:

- Directed DPS to collaborate with local law enforcement partners to develop the nations first **Law Enforcement Protocols**.
- Created the **Institute for Automated Mobility**, which will help Arizona provide the knowledge and leadership necessary to integrate these technologies into the world's transportation systems.

Where we are now

- Testing everything from small delivery vehicles to commercial motor vehicles.

Image: TuSimple

Image: Nuro

- Arizona municipalities are actively involved in the safe development of these innovations.

Companies

- Waymo
- TuSimple
- GM Cruise
- Imagry
- Udelv
- Nuro
- Navya
- Local Motors
- Beep

Contact Information

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Executive Committee Member Items

Open Forum

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

Washington State Transportation Commission

Closing Remarks

WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

Washington State
Transportation Commission

Closing Remarks

- **Recap Today's Meeting:**
  - » Action Items
  - » Agreements / Decisions

- **Important Dates:**
  - » November 12, 2020 – Executive Committee meeting
  - » January 8, 2021 – Annual Report to the Legislature due

Thank You!

WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

Washington State
Transportation Commission