The ACES Revolution
Charting a Course for Sustainable Transportation in the Pacific Northwest

Puget Sound Regional Council
Regional Traffic Operations Committee
06 September 2018
## Program

**Seattle**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenter</th>
<th>Time</th>
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<tr>
<td>Registration</td>
<td></td>
<td>8:00-9:00am</td>
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<tr>
<td>Welcome and Introduction</td>
<td>Kevin Wallace</td>
<td>ACES</td>
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<tr>
<td>Framing the Discussion: Overview of AV Planning and Policy Issues</td>
<td>Ryan Snyder</td>
<td>Transpo Group</td>
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<tr>
<td>The Big Picture</td>
<td>David Dixon</td>
<td>Stantec</td>
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<td>Transportation as a Service</td>
<td>Calli Cenizal</td>
<td>Lyft</td>
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<td>Break</td>
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<td>10:35-10:50am</td>
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<tr>
<td>Local Issues: Land Use Planning, Curb Management, Parking Codes, Fiscal Issues</td>
<td>Anne Brown</td>
<td>University of Oregon</td>
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<tr>
<td>Lunch with Open Discussion</td>
<td>Bruce Haldors</td>
<td>Transpo Group</td>
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TODAY’S PRESENTATION

ACES northwest network
Automated • Connected • Electric • Shared

ROAD ASSESSMENT SYSTEM
for Self-Driving Transport Operations

FHWA National Dialogue on Highway Automation
Launch Webinar
May 8, 2018
1:00 PM ET

Reading the Road Ahead:
Traffic Control Devices and
Machine Vision Interactions

Automated Vehicles Symposium
TRB and AUVSI
Monday, July 9th, 2018
1:30 PM to 5:30 PM
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ROAD ASSESSMENT SYSTEM
for Self-Driving Transport Operations
A PROPOSAL FOR PROVIDING INFORMATION TO SELF-DRIVING VEHICLES REGARDING ROADWAY STATE

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Bruce Agnew
Director of the ACES Northwest Network

Scott O. Kuznicki
Director, Safety and Mobility Technology Solutions
Bruce Agnew
Director of the ACES Northwest Network
“The ACES Northwest Network is a unique collective working to bring Automated, Connected, Electric, and Shared vehicle technologies to the Puget Sound region.”

Tom Alberg  
Madrona Venture Group

Bryan Mistele  
INRIX

CO-CHAIRS  
ACES Northwest Network
• **Accelerate** and integrate technology into our transportation system

• **Remove** barriers to transportation innovation at federal, state, and local levels

• **Promote** region as international “Center of Excellence” for ACES adoption

• **Increase** mobility for lower-income and underserved travelers
AUTOMATION LEADS TO AUTONOMY
Top mounted LiDAR beams 1.4 million laser points per second to create a 3D map of the car’s surroundings.

There are 20 cameras looking for braking vehicles, pedestrians, and other obstacles.

A colored camera puts LiDAR map into color so the car can see traffic light changes.

Antennae on the roof rack let the car position itself via GPS.

LiDAR modules on the front, rear, and sides help detect obstacles in blind spots.

A cooling system in the car makes sure everything runs without overheating.

SOURCE: Uber
SELF-DRIVING TRUCK WITH FULL AUTONOMOUS CAPABILITIES
“More than 30,000 people die on our roads every year and we can tie 94 percent of crashes to human choice”

National Highway Traffic Safety Administration
(U.S. Dept of Transportation)
EXECUTIVE ORDER 17-02

AUTONOMOUS VEHICLE TESTING & TECHNOLOGY IN WASHINGTON STATE AND AUTONOMOUS VEHICLE WORK GROUP
“Achieve superior competence in your strategic areas of focus and obtain confidence from manufacturers for deployment here in Washington State.”
EXIT 26
NORTH TO
Selah
821
823
WSDOT’s profiled markings are LIDAR-compliant and benefit human drivers, too.

Pavement markings are key information for visual-light machine vision systems.
Programs
Demonstration Corridor
The ACES Northwest Network is a unique collective working to bring Automated, Connected, Electric, and Shared vehicle technologies to the Puget Sound region.

Tom Alberg
Madrona Venture Group
Bryan Mistele
INRIX
CO-CHAIRS
ACES Northwest Network

Urban Design Studio
62,000 Chrysler Pacificas
TODAY’S PRESENTATION
National Dialogue Objectives

1. **LISTEN: Gather input** from a broad group of stakeholders on key issues, challenges, and concerns in highway automation.

2. **ENGAGE: Facilitate information sharing** among industry, public agencies, and others.

3. **EVOLVE: Update institutional structures** for working with existing and new stakeholders.

4. **INFORM: Raise awareness** of FHWA and USDOT activities in automation and emerging technologies.
## National Dialogue Focus Areas

<table>
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<tr>
<th>Focus Area</th>
<th>Topics of Interest</th>
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| Planning and Policy              | • Travel demand changes  
 • Land use implications  
 • Right-of-way Use  
 • Regulatory/Policy Barriers |
| Digital Infrastructure and Data  | • Data requirements and needs (e.g., digital work zone maps, road closures)  
 • Partnerships for data sharing and safety |
| Freight                          | • Truck platooning application  
 • Automated truck freight delivery issues  
 • Implications on traffic patterns and operations |
| Operations                       | • Identification of further research necessary to address operations challenges  
 • Transportation Systems Management and Operations  
 • Incident management  
 • System Efficiency  
 • Implications on traffic patterns and roadway capacity |
| Infrastructure Design and Safety | • Infrastructure needs  
 • Ensuring safety for road users, including drivers, pedestrians, bicyclists, and motorcyclists  
 • Consistency  
 • Collaboration to plan for locations where existing roadway infrastructure could lead to safety hazards |
## USDOT Activities in Automation (continued)

<table>
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<tr>
<th>Event</th>
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<th>Summary / Outcomes</th>
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• More information on ADS 2.0 is available on the NHTSA website: [https://www.nhtsa.gov/technology-innovation/automated-vehicles](https://www.nhtsa.gov/technology-innovation/automated-vehicles). |
| Roundtable on Data for Automated Vehicle Safety | December 7, 2017 | • Demonstrated multimodal alignment around “One DOT” approach to Federal automated vehicle policy.  
• Brought together over 60 participants from government, private sector, nonprofit organizations, universities, and research centers.  
• Gathered feedback on USDOT’s Guiding Principles and Draft Framework. |
| Automated Vehicles 3.0 announced          | January 10, 2018 | • Secretary Chao announced work on a follow-up Automated Vehicles 3.0 document, with a possible release date in 2018.                                                                                           |
| Public Listening Summit on Automated Vehicle Policy | March 1, 2018    | • Stakeholder engagement summit with senior leadership at USDOT.  
• Focused on key cross-modal issues important to successful integration of automated vehicles.                                                                                                         |
| National Dialogue Launch Webinar          | May 8, 2018      | • Introductory webinar introducing the National Dialogue.  
• 360+ attendees.  
• Recording: [https://connectdot.connectsolutions.com/p52h2c59wp92/](https://connectdot.connectsolutions.com/p52h2c59wp92/)                                                                 |
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• More information on ADS 2.0 is available on the NHTSA website: [https://www.nhtsa.gov/technology-innovation/automated-vehicles](https://www.nhtsa.gov/technology-innovation/automated-vehicles). |
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PART III

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ROAD ASSESSMENT SYSTEM for Self-Driving Transport Operations
A PROPOSAL FOR PROVIDING INFORMATION TO SELF-DRIVING VEHICLES REGARDING ROADWAY STATE

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SESSION 1
Reading the Road Ahead: Traffic Control Devices and Machine Vision Interactions
Automated Vehicles Symposium
TRB and AUVSI
Monday, July 9th, 2018
1:30 PM to 5:30 PM
ROAD ASSESSMENT SYSTEM for Self-Driving Transport Operations

A PROPOSAL FOR PROVIDING INFORMATION TO SELF-DRIVING VEHICLES REGARDING ROADWAY STATE
ROADWAY ASSESSMENT OUTPUTS

2.1.1.4.A.B.3.D

- Pavement Markings
- Roadside Delineation
- Regulatory and Warning Signing
- Guide Signing
- SDT Failsafe Zone Availability
- Responsiveness Priority
- Reliability Grade/Weather Maintenance
- Reliability Grade/Asset Maintenance
• In partnership with SDT manufacturers, we can obtain data on SDT interactions with TCDs at micro- and macro-scopic levels.

• This data is the foundation of what will essentially be a massive naturalistic driving study with information on the roadway and roadside.

• We will help the industry and the SDT manufacturers know what works.
PART IV
Reading the Road Ahead: Traffic Control Devices and Machine Vision Interactions

Automated Vehicles Symposium
TRB AND AUVSI

Monday, July 9th, 2018
1:30 PM TO 5:30 PM
ISSUES

• MAINTAINING INTEROPERABILITY WITH HUMANS

• OPERATIONAL DESIGN DOMAIN DEFINITION

• LIMITED CORRELATION WITH SAE LEVELS OF AUTOMATION

• MULTI-FACETED CRITERIA WITH NO SINGLE GRADE

• FUNDING AND P Priorities

• CHANGING CAPABILITIES

•
Sound Transit settlement will subsidize Uber and Lyft rides to Mercer Island transit center

Mercer Island will spend up to $226,900 in taxpayer funds to provide discounted Uber and Lyft rides from its wooded neighborhoods to the island’s often-packed transit center.

Some of the Sound Transit taxes paid by Eastside residents will subsidize Lyft and Uber rides to the Mercer Island transit center.

The six-month test project is meant to take pressure off the island’s 447-stall park-and-ride garage, which often fills before 7 a.m. as people arrive to meet I-90 express buses.

The program is funded by up to $226,900 that’s earmarked for “first-last mile solutions” to move people between transit and their final destinations. At least 26 other park-and-ride facilities in King County are chronically full, so these kinds of arrangements might spread.