Infrastructure and Systems Subcommittee Report

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October 16th, 2019
Subcommittee Structure and Membership

• Subcommittee Co-Chairs:
  » Roger Millar, Secretary, WSDOT
  » Michael Ennis, Government Affairs Director, AWB

• Membership
  » 74 working members, representing 58 organizations
  » In addition, 48 interested parties
  » Open membership structure
  » Following the Operating Policies & Procedures established by the Transportation Commission through the Feb 27th, 2019 memo

PARTICIPANTS BY SECTOR

- State Government: 20%
- City: 13%
- Consultant: 15%
- Association: 17%
- MPO/RTPO: 6%
- Private Sector: 7%
- Academic: 7%
- Public Utility: 4%
- Legislature: 4%
- Public Transit: 2%
- Federal Government: 2%
- Student: 1%
- Port: 1%
- Labor: 1%
- Student: 1%

Meetings to Date / Future Meetings Planned

• Meeting #1, October 2, 2018
• Meeting #2, February 8, 2018
• Meeting #3, April 26, 2019
• Meeting #4, June 14, 2019
• Meeting #5, August 12, 2019
• Meeting #6, September 9, 2019
• Planned Meeting #7, December 6, 2019

All meeting materials & minutes available online  
https://wstc.wa.gov/Meetings/AVAgenda/Documents/InfrastructureSystemsSubcommittee.htm
Subcommittee 2019 Action Plan Overview

3 Activities

11 Actions

4 Target Outcomes

Action Plan Activity #1
» Develop policy goals, strategies and illustrative actions based on local, regional and national “best practice” policy examples.

Action Plan Activity #2
» Develop project selection criteria and discuss potential funding approaches to enable the selection of near-term pilot deployment proposals and projects.

Action Plan Activity #3
» Partnership and Collaboration discussions with the private sector companies who are self-certified to test autonomous vehicles in WA State via the Department of Licensing process as of June 1, 2019.
Activity #1: Overview
Develop policy goals, strategies and illustrative actions based on local, regional and national “best practice” policy examples. The goals, strategies and sample actions should be measurable.

1st Step: develop policy goals to guide the framework

Target Outcome:
WA State Cooperative Automated Transportation Policy Framework (Infrastructure & Systems)

Initial Deliverable Date
September, 2019
2019 Action Plan

Activity 1

Policy Goal Development Process

Initial Deliverable Date
September, 2019

Gather and Screen Documents

<table>
<thead>
<tr>
<th>Agency / Organization</th>
<th>Content</th>
<th>Summary of Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>CAT Program</td>
<td>Includes mission, purpose, issues, objectives, priorities, and risks associated with the Connected and Autonomous Technology in Colorado.</td>
</tr>
<tr>
<td>Oregon</td>
<td>State of Oregon Task Force on Automated Vehicles</td>
<td>Describes:</td>
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<tr>
<td></td>
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<td>- Overview of automated vehicle technology and considerations that prompted the creation of the task force</td>
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<tr>
<td></td>
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<td>- Task force membership, structure, and process</td>
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<td></td>
<td></td>
<td>- Elements of a permitting process for testing highly automated vehicles in the state and additional policy recommendations in each of the subcommittee areas</td>
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<tr>
<td></td>
<td></td>
<td>- Topics for further consideration identified by the task force</td>
</tr>
<tr>
<td>Washington State DOT (WSDOT)</td>
<td>Cooperative Automated Transportation (CAT) Policy Framework</td>
<td>To achieve this vision, this policy framework sets shared expectations to guide and monitor technology implementation. The framework is intended to spur innovation and investment while improving safety, mobility, and transportation system efficiency.</td>
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</tbody>
</table>
Lots of work...Lots of Volunteers...Progress by the numbers

Product:
8 Policy Goal Statements

16 Volunteers
(11 Active)

41 Documents
(25 Reviewed)

2,104 Pages
(1,013 Reviewed)

4 Months
(4 Down)
Activity 1:

Policy Goals

Voting Process and Results

Process:
- All members had the opportunity to comment and engage in the development of the policy goals
- All members were provided easy access to an electronic voting tool, that enabled everyone to participate, regardless of location or time constraints
- Members were asked to cast one vote per organization

Results:
- Of the 23 organizations that voted on the 09-09-2019 version, 20 organizations supported the adoption of the proposed policy goals, specifically:
  - 7 organizations supported the goals (concur)
  - 13 organizations accepted/can live with the general direction of the goals (consent)
  - 3 organizations could not support the 09-09-2019 version of several goals

Documentation:
- All votes and comments (as written) were recorded and are available (see summary document)
Activity 1: Post Vote

Policy Goal-Refinements

• Based on the vote and comments received, some policy goals were refined
  » Four policy goals were adopted as proposed
  » Two policy goals reverted back to an earlier version as proposed by a majority of those responding
  » Two policy goals were edited to reflect additional emphasis areas proposed by a majority of those responding

• This enabled the subcommittee to advance a set of policy goals that was supported by most of the organizations that voted.
Activity 1:

Next Steps towards a CAT Policy Framework

• The proposed policy goals will be the basis of the CAT Policy Framework under development by the subcommittee

• Next steps include developing a set of strategies
  » Strategies aim to implement the intent and direction of the policy goals
  » Development of the strategies may lead to further policy goal refinements if needed
  » The development of the CAT Policy Framework is a dynamic process as it needs to reflect emerging technology applications, insights gained from deployments, system impacts and performance results, customer experiences and evolving private sector partnerships
Activity 1: Recommendations

CAT Policy Goals Proposed for Adoption by the Executive Committee

- **#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.
CAT Policy Goals Proposed for Adoption by the Executive Committee (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.
Activity 1: Recommendations

Actions requested of the Executive Committee

- **Adopt these policy goals** to enable the Infrastructure and Systems Subcommittee to continue the work on the CAT policy framework and, as a next step, develop specific strategies.

- **Adopt these policy goals** and encourage the development of a state CAT/AV policy framework that would integrate these policy goals along with policy goals developed by other subcommittees.

Update:

- Both recommendations and the policy goals were adopted by the executive committee on September 26, 2019
Activity #2 Overview:

» Develop project selection criteria and discuss potential funding approaches to enable the selection of near-term pilot deployment proposals and projects.

• Activity #2 has four actions items:

» Evaluate and build upon the Pilot Evaluation Scorecard criteria developed by

» Evaluate grant criteria from existing Federal, State and WSDOT grant programs

» Incorporate recommendations from Activity #1

» Assess the feasibility of the new criteria against deployment scenario priorities identified by the subcommittee

• Activity #2 Target Outcome

» Develop new project selection criteria recommendations for consideration by existing grant programs to enable near-term pilot deployments.
Activity 2:

Action 1

Develop project selection criteria to enable near-term pilot deployments

Progress to Date

- Developing a “Funding and State Requirements Inventory” that identifies how the other states are guiding CAV/CAT investments:
  » FL, VA PA, MN and CO have been reviewed

**Inventory of high level categories from selected states**

1. Accelerate the CAV Program
2. Safety
3. Mobility
4. Efficiency and Reliability
5. Feasibility
6. Funds
7. Benefit/Cost
8. Data and Security
9. Operations and Maintenance
10. Project Evaluation
11. Reduced Infrastructure Investments
12. Enhanced Traveler Information
13. Capital Investments
14. Research and Development
15. Partnerships
16. Regulation and Policy Strategic
17. Staffing & Prepared Workforce
18. Communications
19. Long Range Planning
20. Economic Competitiveness
21. Emissions
Activity 2:

Action 2
Discuss (Identify) potential funding approaches (sources) and approaches to enable near-term pilot deployments

Progress to Date

Evaluating grant criteria from existing Federal, State and WSDOT grant programs
(32 funding sources identified)

- WSDOT – 19 grant programs
- Federal – 11 grant programs
- Department of Energy – 1 program
- Department of Commerce – 1 program

Information tabulated and organized for each funding source includes:
- Short Description and Awardee Type
- Funding Match, Match %, Max Award and Criteria
- Link to reference

Next Steps:
1. Have we identified a comprehensive list? Finish review and documentation.
2. Are the CAV / CAT near-term deployments that align with the CAT Policy Goal Strategies eligible for funding and will they compete competitively?
3. Are new grant programs/funding sources needed to fill gaps? Why?
4. How can the new criteria developed in Action 1 be applied to existing grant programs and what would be the impact?
Activity #3 Overview:
» Partnership and Collaboration discussions with the private sector companies who are self-certified to test autonomous vehicles in WA State via the Department of Licensing process as of June 1, 2019.

Activity #3 has two action items
Action 1: Engage in collaborative discussions: Contact all companies who are self-certified to test autonomous vehicles in WA State via the Department of Licensing process.
» Knowledge gained will inform Activities #1 and #2
» Target Outcome Action 1: Summary of information gathered

Action 2: Compile a Year-end report on SAE Level 1 and 2 Driver Assistive Truck Platooning Testing and Pilot Deployment Activity in WA during 2019
» Target Outcome Action 2: Produce a year-end 2019 report
Activity 3: Action 1- “Open Dialogue Discussion” with Self-Certified Companies

Progress to Date
* self certified as of June 2019

Contacted all (12*) companies self-certified to test AVs in WA state

**Group 1: The team received responses from 7 companies**

- Local Motors (LM Industries Group) Developer / manufacturer of a 3D printed AV Shuttle
- Navya Inc French robotaxi developer / AV Shuttle
- May Mobility Michigan-based startup focused on self-driving shuttle fleets
- Waymo LLC Self-driving car subsidiary of Alphabet, Inc.
- TORC Robotics Blacksburg, Virginia-based.
- PACCAR Inc. Trucks, DAF, Peterbuilt, Kenworth
- Peloton Technology, Inc. Technologies added to trucks

**Group 2: The following 5 companies did not respond despite multiple emails or phone contacts**

- NVIDIA Corporation Deep Learning, Artificial Intelligence, Tier 1 Supplier
- Drivent LLC is a self-driving technology company overcoming the non-collision barriers to the widespread adoption of autonomous vehicles.
- Simple Solutions California-based computer networking company
- Dooblai LLC Self-driving car software company in Redmond/Bellevue, Washington
- Galilei Small company in Bellevue – Driver in the Vehicle
Question 1.) What prompted your decision to complete the self-certification application?

• Gain exposure in WA State to conduct and/or be prepared to conduct testing.
• Interested in the climate and terrain to test vehicles
• Interested in the “regulatory light” environment
• WA State offers a strong, competitive technical workforce with significant technology, cloud computing, and software companies alongside multiple academic institutions to conduct research and prepare the future workforce.
Activity 3:

Action 1
Interview Self - Certified Companies

Lessons Learned (continued)

Question 2.) What type of real world testing and/or operation of autonomous vehicles is your company involved in?

- All of the companies in Group 1 are testing and/or deploying in some capacity within the United States and/or Internationally.

Question 3.) Are you currently testing and/or operating in Washington state? If so, Where?

- As of Sept 23, 2019 Waymo, Torc Robotics and Peloton are the only companies to have conducted any on public road testing in WA State.
  - Torc Robotics conducted a cross-country AV trip and planned to pass through Washington back in 2017.
  - Waymo completed some limited testing in Kirkland, WA back in 2017.

- As of September 1, 2019, with the exception of PACCAR & Peloton none of the other companies listed in Groups 1 and 2 above have any stated or known plans to conduct further testing in WA State.
Question 4.) What can the Washington State Autonomous Vehicle Work Group do to support your efforts?

- Work regionally and nationally toward uniform policies and regulation.
- Establishing corridors where AVs are allowed / not allowed based on SAE level is problematic.
- Encourage minimal disclosure requirements to maintain a competitive marketplace.
- Establish a best practice process that would encourage coordination with companies before, during and after their decision to self-certify to conduct AV testing on public roads in Washington State while incorporating a public education and awareness component.
- Maintaining a regulatory light environment is important.
  ➢ In addition to the current DOL self-certification process, consider creating a path for public sector endorsement of specific scenarios / use cases to increase private sector confidence that the public sector (regulators) are committed to the regulatory light environment long-term.
Activity 3:

Action 1
Interview Self - Certified Companies

Lessons Learned (continued)

Question 4.) What can the Washington State Autonomous Vehicle Work Group do to support your efforts? (continued)

• Dedicated Public Sector investment toward partnerships and infrastructure investment are needed. Examples
  - DSRC / C-V2X at Traffic Signals and other roadside locations.
  - Maintaining consistent, uniform roadway signing and striping (pavement markings).
  - AV Shuttle Pilot Projects require match funding for grants and/or partnership agreements; public sector project management.
  - Consider grants/incentive programs to encourage public/private partnerships centered around specific use cases.
    - Identify funding sources and criteria
### Activity 3:
#### Action 2
**SAE Level 1 and 2 Truck Platooning Report**

**Progress to Date**

**Action 2 Task:** Compile a Year-end report on SAE Level 1 and 2 Driver Assistive Truck Platooning Testing and Pilot Deployment Activity in WA during 2019

<table>
<thead>
<tr>
<th>Date</th>
<th>Peloton Technology/PACCAR Engagement and Testing Activity Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec. 2017</td>
<td>Peloton Initiated meetings with WSDOT and WSP regarding possible SAE Level 1 platooning testing opportunities.</td>
</tr>
<tr>
<td>Oct. 2018</td>
<td>Peloton began PACCAR driver track training. PACCAR participated in track testing at PACCAR Technical Center related to vehicle integration.</td>
</tr>
<tr>
<td>Oct.-Dec. 2018</td>
<td>Peloton held meetings with and presentations to the WSTC, WSDOT, WSP, DOL, and Gov. Inslee’s policy team regarding DOL self-certification under E.O. 17</td>
</tr>
<tr>
<td>Dec. 2018</td>
<td>Peloton self-certified to conduct testing and communicated plans for testing along a short rural segment of I-5.</td>
</tr>
<tr>
<td>Dec. 2018</td>
<td>Peloton (in coordination with PACCAR) held a one-day I-5 demo that included a ride-along for WSP. Goal of the demo was to show how the system works, PlatoonPro’s safety features, and the engagement level of each driver when operating the DATP system.</td>
</tr>
<tr>
<td>Jan. 2019</td>
<td>PACCAR did several days of testing on I-5 from Arlington to Linden using PlatoonPro system that had been previously safety-validated and road tested in Texas and California. Goal of testing was to improve the quality of platooning for a specific PACCAR truck model. Testing occurred in suitable weather and during non-peak traffic hours.</td>
</tr>
<tr>
<td>June-Aug. 2019</td>
<td>Peloton and PACCAR actively participated in multiple WA AV working group subcommittees to advance policy recommendations for AV testing legislation.</td>
</tr>
<tr>
<td>Dec. 2019</td>
<td>Peloton is developing an end of year report for the AV Executive Committee on platooning testing and deployment in the U.S including activity in WA to date.</td>
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Summary and Next Steps

• **Activity #1**
  » Obtained AV EC approval of the 8 CAT Policy Goals
  » Development of strategies for each CAT Policy Goal

• **Activity #2**
  » Finish evaluating project selection criteria and reviewing existing Federal, State and WSDOT grant funding programs

• **Activity #3**
  » Action 1: “Open Dialogue” Complete
    – Continue “Open Dialogue” approach as needed, when new companies self-certify and/or existing companies begin on-road testing.

• Significant amount of complex work has been accomplished since April 2019
  » Volunteers have completed many heavy lifts
  » To sustain effort resources will be needed

• The subcommittee’s 2020 work plan will be developed during the December 6, 2019 subcommittee meeting