Activity #3

Partnership and Collaboration discussions with private sector companies
September 9th, 2019 Subcommittee Meeting

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Support:

- Jason Campos, Transportation Technology Specialist, IBI Group
- Robert Acevedo, Traffic Design Lead, HDR Engineering
- Brian Brooke, Deputy Director of Innovation and Performance, Sound Transit
- Joey Yang, National Director, Transportation Technology, HDR Engineering

12 Self-certified companies

Group 1: Contact complete, responses received

1. **Local Motors (LM Industries Group)** Developer / manufacturer of a 3D printed AV Shuttle
2. **Navya Inc** French robotaxi developer / AV Shuttle
3. **May Mobility** Michigan-based startup focused on self-driving shuttle fleets
4. **Waymo LLC** Self-driving car subsidiary of Alphabet, Inc.
5. **TORC Robotics** Blacksburg, Virginia-based company with significant defense contracting revenues, Virginia-based Torc Robotics posted pictures on its website from a cross-country road trip using a Lexus SUV equipped with its software and multi-sensor self-driving system. Torc focuses on the Level 4 software stack to enable autonomous driving. They primarily focus on trucks and shuttles.
6. **PACCAR Inc.** Trucks, DAF, Peterbuilt, Kenworth
7. **Peloton Technology, Inc.** Technologies added to trucks

Group 2: Multiple email/Phone Contacts complete, nonresponsive

1. **NVIDIA Corporation** Deep Learning, Artificial Intelligence, Tier 1 Supplier
2. **Drivent LLC** is a self-driving technology company overcoming the *non-collision barriers* to the widespread adoption of autonomous vehicles.
3. **Simple Solutions** California-based computer networking company
4. **Dooblai LLC** Self-driving car software company in Redmond/Bellevue, Washington
5. **Galilei** Small company in Bellevue – Driver in the Vehicle

Open Dialogue
Outreach to companies that have self-certified to conduct autonomous vehicle testing in Washington state

The purpose of this document is to facilitate open, collaborative discussion with the companies that have self-certified through the Department of Licensing to conduct testing, and operation of autonomous vehicles on the roads of Washington state. The questions below are a general guide for this dialogue which is intended to support the efforts of the Washington State Autonomous Vehicle Work Group (WSAVWG). A high level written summary of the dialogue will be shared with the WSAVWG members.

Questions

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 significate technology, could computing, and software companies alongside multiple academic institutions to conduct research and prepare the future workforce.

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.

    Here are a few initial thoughts:

    - **Peloton / PACCAR:** Working in a number of venues across the country, for example they are testing at a large 8-mile track in Northern Texas. Testing is also occurring at the PACCAR Technical Center track in Mount Vernon.

    - **Waymo:** Conducted some limited testing in the Kirkland area back in 2017, but are not currently testing in Washington State. Arizona is their active testing ground today, running AV taxi service in a geo-fenced area.

    - **Torc Robotics:** Focuses on the SAE Level 4 software stack to enable autonomous driving. They primarily work with trucks and shuttles. One of their working partners is Daimler Trucks, also known as Freightliner in the US. They do most of their testing in Virginia where they are based and do some work down in Portland, Oregon with Freightliner. They also work closely with Transdev in the bus/shuttle market place and are working on further developments in this area. They are very focused on highway truck driving at the moment. Some additional areas of focus for them are around public education, figuring out how to make consumers more aware of this technology. They are also working closely with first responders in Virginia to develop clear protocols about how to handle emergencies when something does happen in an AV incident. They are trying to develop a clear communication path for responders to take action as needed. They are taking first responders out and showing them the technology while working collaboratively to establish protocol.

- Local Motors, Navya, May Mobility (see table below)

Question	Local Motors	Navya	May Mobility
1: Why self-certify?	To confirm ability to test in WA	WA is a priority state	Looking at commercial opportunities in WA
2: Test/operations?	Atlanta, Sacramento, DC, etc.	26 countries; Las Vegas	Detroit, Columbus, Providence, Grand Rapids
3: WA testing?	no	No	No
4: WA testing info?	PNW Challenge	WA is easy to work with so far	We are evaluating
5a: Infrastructure needs?	Military-grade GPS (LMI can provide building-mounted antenna); DSRC in future	DSRC RSUs, high-accuracy NTRIP networks (avoids need for dedicated GNSS)	Partnerships w/local jurisdictions for use of infrastructure nodes
5b: Regulation/rule needs?	Domestic FMVSS exemption or new NHTSA exemptions	None	Vehicle are already street-legal and FMVSS-compliant
5c: Liability needs?	Mutual indemnification (details under NDA)	No objections to existing liability guidelines	We have comprehensive coverage
5d: Other needs?	None noted	Funding	None noted
6: Info for WSAVWG?	Happy to work with you	Public education and outreach are key	Happy to work with you
7: Info/data needs?	Data on congestion, underserved communities, first-/last-mile gaps would help prioritize.	Provided case studies provide many data points of interest.	WA changes to AV regulations or relevant initiatives.
8: Info/data to share?	Data would be shared upon pilot completions.	Provided case studies provide many data points of interest.	We can bring insights based on prior projects
9: WSAVWG support?	ID potential pilot locations	Funding; organizing public education events/forums	WA changes to AV regulations or relevant initiatives.

3. Are you currently testing and/or operating in Washington state? If so, Where?
   - As of Sept 1, 2019 Waymo and Torc Robotics 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 (as noted below) 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.

4. If you are not yet testing and/or operating in Washington state, do you have anything you would like to share relative to your efforts within Washington state and/or beyond?
   - PACCAR/Peloton are still interested in conducting some SAE Level 1 Driver Assistive Truck Platooning in 2019/2020, but no firm testing dates have been established.
   - Peloton: Near-Term they are not planning to roll out their recently released "Auto-Follow" technology in WA State.

5. Is there anything you need that would make testing and/or operating in in Washington more effective?
   - Infrastructure?
   - Regulation/Rules?
   - Liability?
   - Other?
   - See table above and responses under question 9 below.

6. Anything you would like to share that would assist the Washington State Autonomous Vehicle Work Group?
    - See table above and responses under question 9 below.

7. Is there information and/or data that could support your implementation?
    - See table above and responses under question 9 below.

8. Is there any information and/or data that you would like to share?
    - See table above and responses under question 9 below.

9. Anything else the Washington State Autonomous Vehicle Work Group could do to support your efforts?
10.
    a) Continue to work regionally and nationally toward uniform policies and regulation.
    b) Maintaining a regulatory light environment is important.
        i. 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.
    b) Establishing corridors where AVs are allowed / not allowed based on SAE level is problematic. (Note: This approach was tried in CA)
    c) Encourage minimal disclosure requirements to maintain a competitive marketplace. Disclosure of proprietary information when comparing companies that are competing in this space can be problematic when certain things are taking out of context and misinterpreted.
    d) Many companies are reassessing/pressure testing the market place to assess the level and direction of public sector investment. It would be helpful if the public sector would more clearly state and focus the intended level of investment toward specific types of strategies.
    e) Some AV Shuttle companies are looking for the ability to install military grade GPS antennas on top of buildings near deployment sites.
    f) Review state statues that inhibit the use of video screens for blind spot monitoring, and other uses.
        i. There are a variety of aftermarket products that are already in place and being used for this purpose.
    g) Dedicated Public Sector investment toward partnerships and infrastructure investment are needed. For Example:
        i. DSRC / C-V2X at Traffic Signals and other roadside locations
        ii. Maintaining consistent, uniform roadway signing and striping (pavement markings)
        iii. AV Shuttle Pilot Projects require match funding for grants and/or partnership agreements; public sector project management.
        iv. Incentives and pilot programs to encourage public/private partnerships
        v. Identify funding sources and criteria for innovative technology deployments
        vi. Consider grants/incentive programs centered around specific use cases.
            i. For example, a freight use case focused around the ports, I-5 and I-90.

ii. Formulate a program with grants and/or incentives that considers the following criteria – Uptime, trip time, goods delivered per unit time, congestion.
iii. Programs should encourage automation and associated investments.

h) Increase clarity and communication relative to AV policy development / recommendation process in WA state.
   i. Review and clarify the relationship, communication and structure of the WA State AV Work Group Executive Committee, 7 Subcommittees, Transportation Commission, and relative Legislative Committees, etc..
i) PACCAR Issues List (see copy of letter below)

PACCAR Inc

In preparation for the meeting with the Washington State Autonomous Vehicle Working Group meeting on September 25th at the PACCAR Technical Center in Mount Vernon, WA, PACCAR has assembled a list of priorities as it pertains to Autonomous Vehicle operation in the State of Washington.

1. PACCAR would like to see state legislators cooperate with federal legislators in the establishment of uniform standards and regulations across state and local jurisdictional lines for heavy vehicle automation, connectivity, traffic laws (e.g. following distance) and emissions.

2. PACCAR and the trucking industry as a whole would benefit from investments in modern highway infrastructure to support vehicle automation including clear, standardized road markings, signage, traffic signals and data, dedicated lanes for ADS-equipped heavy trucks, and automated truck and freight corridors.

3. State support of testing of ADS technologies, such as platooning and highway pilot on state roads and highways, will promote the development of technologies improving safety and transportation efficiency.

4. State to establish effective incentives for the deployment of charging and fueling infrastructure for hydrogen fuel cell-powered, hybrid, and battery-electric trucks.

5. Establish/expand weight allowance increases for zero emissions vehicles, including both battery and fuel-electric vehicles.

6. Support the establishment of a national NO_x standard that improves localized air quality without sacrificing on-highway CO2 performance and productivity.

7. Establish/expand grants and incentives to support industry-collaborative post-secondary research and student development in the areas of electrification, ADS, and system engineering

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