WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

MEETING SUMMARY

Meeting: Licensing

Location: Highways Licenses Building (HLB), 1125 Washington St SE, Room 430, Olympia, WA

Date: December 7, 2018

Attendees:

Name	Organization	Executive Committee Member? (Y/N)
Tandy Alexander	Department of Licensing	N
Jason Beloso	WSDOT	N
Debi Besser	Washington Traffic Safety Commission	N
Stephen Boyd	Peloton	N
Jennifer Cook	AAA Washington	N
Jeff DeVere	DeVere Public Affairs	N
Matthew Eng	Port of Seattle	N
Adam Healy	Peloton	N
Rob Hodgman	WSDOT	N
Mark Matteson	WA Legislature	N
Tom McBride	CompTIA	N
Meg McCann	Department of Licensing	N
Beau Perschbacher	Department of Licensing	N
Charles Pierson	WA Society of Professional Engineers (WSPE)	N
Stephanie Sams	Department of Licensing	N
Courtney Scott	WSP USA	N
Tony Sermonti	Sermonti Public Affairs	N
Brenda Wiest	Teamsters 117	N
Drew Wilder	University of Washington, law student	N

Welcome and Introductions

Meg McCann and Beau Perschbacher

- Meeting attendees captured.

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Presentation: Peloton Technology on Platooning

Peloton, Stephen Boyd and Adam Healy

(*see PowerPoint*)

- Connected vehicle solution (Driver assisted)
- Commercial Platooning builds on decades of Research & Development
    - EU government backed platooning; had some challenges
        - All over Europe and routed to Port of Rotterdam
    - EU (Sweden) – SARTRE 2009 - present
    - Germany - KONVOI 2005 – 2009
    - Canada – PIT 2009
    - US – PATH, NREL, etc. '90s and ongoing.
        - Illinois based Navistar in IN - 2015
- Global Activity Accelerating
  (See "Global Activity Accelerating" attachment)
    - Various providers are doing various systems
    - Closest to commercial platooning deployment (bolded)
        - Freightliner – Portland, Level 1, 2018
        - Peloton – Silicon Valley, Level 1, 2018
        - MAN – Germany, Level 1 and 2, 2018-2019
        - Volvo and Scania – Sweden, Level 1 and 2, 2019
- Driver Assistive Truck Platooning Market Overview
    - Many companies in US, Europe and Asia testing or bringing truck platooning to market
        - Peloton
        - Continental
        - Delphi
        - DAF
        - Navistar
        - Daimler
        - Scania
        - MAN
        - Iveco
        - DENSO
        - Bendix
        - Wabco
        - Peterbilt
        - Kenworth
        - Volvo
        - NXP
        - Hino
        - Cummins

- Peloton PlatoonPro: Driver Teamwork, Safety, Efficiency
    - Platooning
        - Unified
        - Electronically coordinated
        - Close following
    - V2V Connection
        - Connected braking
        - Video Link
        - Enhanced push-to-talk
    - Real time cloud supervision
        - Platooning only occurs where it makes sense
        - Multi-lane, right weather
- Investor base supports and reflects pragmatic approach
    - Key leaders
        - Trucking & Transportation
            - Bunge
            - B37
            - UPS
            - Denso
            - Lytx
            - Magna
            - Volvo
            - Omnitracs
        - Energy & Industrial
            - BP
            - Breakthrough fuel
            - Schlumberger
            - Mitsui & Co.
            - Okaya
            - US Venture
        - Technology
            - Intel Capital
            - Lockheed Martin
            - NGP
    - Financial investors
        - BAND of angels
        - Birchmere Ventures
        - Sand Hill Angels
    - Valued Private Investors
        - Peloton

- Start by requiring best-available safety systems on each truck – Trucks and Drivers working together
    - Vehicle-to-cloud connectivity
    - Vehicle-to-vehicle (V2V) communications
    - Safety monitoring
    - Air disc brakes, electronic stability control (ESC), lane departure warning (LDW)
    - Active safety & collision avoidance systems always on
    - Predictive maintenance
    - Improved driver awareness with radio and video
- PlatoonPro: Driver Assistance
    - Monitored Driving – Driver engaged at all times
    - Low Automation Policy concerns
        - State: Following distance
        - Federal: None, apply to level 3 vehicles and up
    - Level 0
        - Eyes on, hands on
        - Drive is continuously exercising longitudinal and lateral control
    - Level 1
        - Driver is continuously exercising longitudinal or lateral control
        - Lateral or longitudinal control is accomplished by the system
    - Level 2
        - Temporary hands off
        - Driver has to monitor the system at all times
        - System has longitudinal and lateral control in a specific use case
        - Non-monitored driving
    - Level 3
        - Driver does not have to monitor the system at all times; must always be in a position to resume control
        - System has longitudinal and lateral control in a specific use case. System recognizes the performance limits and requests driver to resume control within a sufficient time margin
    - Level 4
        - Eyes off, hands off
        - Driver is not required during a defined use case
        - System can cope with all situations automatically in a defined use case
    - Level 5
        - System can cope with all situations automatically during the entire journey.
        - No driver required
- Pairs of Trucks, both drivers steering at all times
    - Cooperative between vehicles and drivers - Fully engaged at all times
    - Front driver

        - Hands on
        - Feet on (Adaptive Cruise Control (ACC) possible)
        - Eyes/mind on
    - Rear driver
        - Hands on
        - Feet off
        - Eyes/mind on
- Peloton System: Driver Teamwork, Not "Self-Driving" Trucks
    - Foundational to the system – drivers steering at all times
    - Integrating with OEMs
    - 2-truck deployment initially; potential for 3-truck platooning in future
    - Joint and integrated delivery
    - Active safety systems
    - Improved Driver teamwork
        - Radio link
        - Shared real-time video and linked safety
- Safety: Handling Vehicle Cut-Ins
    - Driver sees car cutting in and backs off
    - If driver does not respond, system radar detects cut-in vehicle and automatically begins to back off the rear "follow" truck
    - Follow truck will continue to back off to safe manual following distance (100+ ft) and then give full manual control back to follow driver
- Safety: Suitable Roads & Conditions
    - Network Operations Cloud (NOC) & Driver Procedures will limit platooning to:
        - Multi-lane, divided, limited access highways
        - Moderate or low traffic conditions
        - Suitable traction conditions
        - Appropriate topography
        - Geofencing can provide further limits to exclude certain bridges, roadway types, and other areas
- No New Infrastructure Required; Operations can adapt to existing infrastructure
    - Only requires onboard systems; no towers/communication systems
- Benefits: Improved Fuel Savings, Safety, Fleet Management
    - Platooning reduces fuel costs
        - 4.5% fuel savings for the lead truck
        - 10% fuel savings for the follow truck
        - Verified combined fuel savings of 7.25% savings at 40-foot gap at 65 mph (North American Council on Freight Efficiency (NACFE) Confidence Report)
    - Peloton Provides Value to Fleets
        - Economically viable with less than 1-year payback
        - High-quality data and improved analytics for fleets

        - $700 billion U.S. trucking industry benefits by saving on fuel and enhancing individual truck safety
- Making Close Following Safe: V2V
    - Constant communication
    - Linked active safety systems
    - Immediate knowledge of required braking
    - Gap set to support safety
    - It takes many hundreds of feet for manually driven trucks to stop
    - Radar: air brake lag is when it activates stopping
    - Instantaneous for linked trucks
- *Video – Examples of hard breaking*
- Enhancing teamwork – Teamed drivers, trucks, and systems
- Drivers are key
    - Driver-informed design
    - Trained, CDL-certified driver in both trucks
    - Both drivers fully engaged at all times
    - Peloton driver training program for each fleet
- Development & Safety Validation working with OEMS
    - ISO 26262
        - Know when to dissolve a platoon
        - Manage and maintain a safe following distance
        - Exceed automotive grade safety standards
        - Listen and address our customer's safety concerns
        - Continue to test for edge cases
        - Continuous improvement process
    - Partners
        - PACCAR
        - Navistar
        - Cummins
        - Peloton
- Top use case: single-fleet, hub-to-hub routes
    - Best concentration on hub-to-hub routes
    - Higher density
    - Other use cases are possible
- Operational Domain: Multi-lane, Divided, Limited Access Highways
    - Map showing national highway network systems
        - US interstates
        - State highways
        - Major corridors (where most trucking freight volume flows through)
        - Approval by many states in the US
- National Context: No Federal Barrier

  - No federal rules
  - Working with federal government entities
  - No mandate on safety systems
    - Can prevent many accidents
      - EU mandated that new trucks have lane departure warning (LDW)
  - Federal guidance "Preparing for the Future of Transportation: Automated Vehicles 3.0" (AV 3.0) released 2018 – Review of and changes to traffic laws especially for truck platooning
- National Context: Platooning Allowance Clarified
  (See "National Context Map" attachment)
  - Clarification on truck platooning allowance for each U.S. state
  - State Following Distance Laws:
    - Orange states have minimum following distance
      - A defined numeric minimum following distance in 24 states
      - Platooning requires change in law
    - Grey states have "Reasonable and prudent" following distance
      - A flexible, discretionary standard in 26 states
      - Platooning can be legal under current law
  - Arizona, Ohio, Iowa, and Colorado moved to allow truck platooning
- Platooning allowance: Washington
  - Washington RCW 46.61.145 (4): This section does not apply to the operation of a non-lead vehicle in a Platoon, defined as a group of motor vehicles utilizing vehicle-to-vehicle communication to travel in a unified manner at following distances that are closer than otherwise permitted under subsection one
    - Change to the code that would allow platooning to model other states
    - 22 states allow platooning
  - Washington RCW 46.37.480 - Television views: No person shall drive any motor vehicle equipped with any television viewer, screen, or other means of visually receiving a television broadcast when the moving images are visible to the driver while operating the motor vehicle on a public road, except for live video of the motor vehicle backing up or in connection with operation of a Platoon, as defined under RCW 46.61.145(4)
    - Requires change to code for real time view of the road exemption
- *Videos –Recent Peloton Platooning Demos*
- *Video - View of the follow driver* (Coordinating driving between lead and follow driver)
- Growing US and Global activity using Driver Assistance Truck Platooning Solutions:
  - United States:
    - Peloton bringing driver-assistive truck platooning into commercial operations with selected fleets, 2018-2019
    - DTNA/Freightliner also indicates testing continues

  - Global:
    - MAN Trucks and Scania beginning commercial test programs with fleets in Germany and Scandinavia
    - EU multi-brand platooning project: Platooning by the 6 European Truck OEMs, 2019-2020+
    - Platooning commercial demonstration planned in UK, Australia, Asia
- Peloton Technology key activities ahead:
  - Robust activity continues in California as Peloton continues joint integration and validation work with OEMs
  - Commercial freight platooning activity over the coming months in Texas with major fleets
  - Activity expanding into other states over next quarters in coordination with major fleets
  - Ongoing work with allies to explore platooning allowance in additional states and international markets
  - Florida testing (Orlando to Jupiter): Dusk/morning – Showed AASHTO and other officials how it is beneficial
  - Exploring opportunities in Washington

Presentation: Federal Conversations Related to AV in Freight

Tandy Alexander and Stephanie Sams

- No big changes at this time
- Conversations on freight at federal level
  - FMCSA -> U.S. DOT, AAMVA
    - How to license AVs
    - How to test AVs
      - What is the driver responsible for?
    - Should there be signage?
    - Skills testing of driver in level 3 & up
      - AVs currently tested require a CDL-holding driver in order to take control of vehicle
  - AV implications unique to freight
    - Possibility of changing future of freight in relation to interstate commerce
    - Help with challenges freight industry currently facing
      - Driver shortage
      - Increase in demand for goods
      - Increase awareness of needs for driver safety/health
  - AVs deployed/tested in freight/construction
    - Truck mounted attenuator – Colorado
    - Autonomous dump truck fleet – Norway (Volvo)
    - T-Pod, autonomous semi – Sweden (DB Schenker & Einride)

Licensing Subcommittee 2019 Workplan and Roadmap for 2019

Meg McCann and Drew Wilder

- AV 3.0 provides best practices and guidance for state, local, and tribal governments
  - Review laws and regulations that may create barriers to testing and deploying automated vehicles
  - Adapt policies and procedures, such as licensing and registration, to account for automated vehicles
  - Assess infrastructure elements, such as road markings and signage, so that they are conducive to the operation of automated vehicles
  - Provide guidance, information, and training to prepare the transportation workforce and the general public
- Governors Highway Safety Association research and recommendations for state governments
  - Seek to encourage responsible automated driving systems (ADS) testing and deployment while protecting public safety
  - Review all traffic laws for changes needed to accommodate AV testing, both with and without a test driver, and ADS deployment
  - Encourage ADS testing while retaining enough control and oversight to protect the public
  - Prepare for ADS deployment
- AV Licensing Subcommittee Body of Work
  - Rules of the road
  - Pilot certification
  - Manufacturer vehicle testing
  - Driver's licensing
  - Driver training/education
  - Vehicle registration
  - TNC fleets
  - Commercial vehicles
  - Personal vehicles
- AV Licensing Subcommittee Prioritization
  - Urgency/timeliness/What is happening now?
    - Recommendations on platooning
      - What would make you comfortable with commercial platooning
  - Risk to public
  - Most likely requiring change to law
    - Commercial versus general driver license
    - Review of infrastructure
      - Don't "gold plate" the roads/upgrade
  - AV Steering Committee's interest/need for recommendation

    - Does this conflict with another subcommittee's work?
        - Done in conjunction with another subcommittee?
            - Keep focusing on licensing and regulatory side of it
- 2019 AV Licensing Subcommittee Work Plan
    - April 2019:
        - Freight/Platooning (outside research/self-education) – Use "National Context Map" *Testing Allowed* states as starting point
        - Bring in WA State Patrol
        - Impacts to jobs in driving sector/overall economy – potential for a Labor and Workforce Subcommittee
        - Deployment versus testing
        - Licensing of platooning
        - Common terminology – Potential to Adopt SAE standards
        - Review laws for barriers
        - Recommend AAMVA technical assistance
    - July 2019: *To be determined at future subcommittee meeting*
    - September 2019: *To be determined at future subcommittee meeting*
    - November 2019: *To be determined at future subcommittee meeting*

Wrap Up and Next Steps

Beau Perschbacher and Stephanie Sams

- Need uniformity and consistency with regulations; Limited Federal government involvement
    - Monitor what other government/lawmaking bodies are doing in AV policies to avoid conflicting policy, issues for WA citizens, or impediments to technology innovation
- Aviation/FAA conducting same type of research and policy considerations efforts
- **ACTION ITEM**: Subcommittee members to conduct independent research in preparation for next subcommittee meeting(s) – Use April 2019 Workplan topics as starting point
- **ACTION ITEM**: Subcommittee to consider proposal of a Labor and Workforce Subcommittee for the AV Executive Committee
- ***NEXT MEETING:*** The next meeting date is tentatively scheduled for April 2019.
    - *Note:* There was some concern from attendees that the next meeting was scheduled too far out, and may not be getting in front/ahead of legislation.