WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

MEETING SUMMARY

Meeting: Safety Subcommittee

Location: Helen Sommers Building | 106 11th Ave. SW, Olympia WA | Room #G015A&B

Date: September 11, 2019

Attendees:

First Name	Last Name	Organization	Executive Committee Member? (Y/N)
Alex	Alston	Washington Bikes	N
Ted	Bailey	Washington State Department of Transportation (WSDOT)	N
Debi	Besser	Washington Traffic Safety Commission (WTSC)	N
Daniela	Bremmer	Washington State Department of Transportation (WSDOT)	N
Kenton	Brine	NW Insurance Council	N
Brian	Chandler	DKS Associates	N
Tim	Coley	Washington State Patrol	N
Doug	Dahl	TransitLab Consulting	N
Mandie	Dell	WTSC	N
John	Flanagan	Office of the Governor	N
David	Forte	Washington State Office of the Insurance Commissioner	N
Dan	Hall	Washington State Patrol	N
Bryan	Clenna	Seattle Police Department	N
Sheri	Call	Washington Trucking Association	N
Chris	Old	Washington State Patrol	N
Kim	Johnson	Washington State Senate Committee Services	N
Francois	Larrivee	Hopelink	N
Mi Ae	Lipe	Driving in the Real World	N
Kimberly	Mathis	Washington State Patrol	N
John	Milbrath	AAA Washington	Y
Kyle	Miller	WSDOT	N
John	Milton	WSDOT	N
Markell	Moffett	WSP USA	N
Alexandra	Mueller	Insurance Institute for Highway Safety	N
Paul	Parker	WA State Transportation Commission (WSTC)	N
David	Putnam	Washington State Patrol	N
Paula	Reeves	Washington Department of Health	N
Warren	Stanley	WSDOT	N
Shannon	Walker	Seattle DOT	N
Alan	Werner	Washington Society of Professional Engineers (WSPE)	N
Bryce	Yadon	Futurewise	Y

WELCOME AND INTRODUCTIONS
Kenton Brine & Captain Dan Hall

- Introductions
- Review agenda

Topic closed.

REMOTE PRESENTATION – <u>INSURANCE INSTITUTE FOR HIGHWAY SAFETY</u>
Alexandra Mueller, Ph.D.

- Advanced Driver Assistive Systems (ADAS) are shaping driving and traffic safety
- Insurance Institute for Highway Safety (IIHS) and Highway Loss Data Institute (HLDI) conducted research, comparing functionality and crashes of vehicles with and without ADAS
- Research found that ADAS were effective in preventing crashes they were designed to prevent
- IIHS developed rating programs for front, rear and pedestrian crash prevention
- Crash prevention systems are becoming more prevalent in new vehicles, auto manufacturers making these systems more available each year
- Crash warning systems, such as Forward Crash Warning "FCW" may improve driving behavior, encouraging drivers to change behavior from visual and audio warning alerts
- IIHS/HLDI conducted drive tests to evaluate different ADAS safety capabilities
    - *Drive test videos provided in presentation deck*
    - Two phases of study
        - 1) Four-week baseline collection period
            - Telematics devices installed to record warnings/alerts
            - Warnings were silent to driver
        - 2) Eight-week treatment period when warnings/alerts were turned on – Large reduction in warning rates during treatment phase
            - Lane departures reduced by 60%
            - Headway monitoring reduced by 40%
            - Forward collision reduced by 35%
- Level 2 Driving Automation
    - Level 2 includes controlling speed and distance, centering vehicle in lane
    - Requires driver to be in full control at all times
    - Systems cannot handle all situations
    - Driver opinion varies between manufacturers
    - Driver experience program
        - Drivers tried multiple Level 2 vehicles

- Opinion varied based on whether systems behaved as expected
- Learned some road and traffic situations where drivers had issues using Level 2
- Conducted functional performance testing of adaptive cruise control "ACC"
  - On a test track, approach stationary target with ACC on
  - Vehicle slowed down as expected
  - Test track represents ideal circumstances
  - Test track activity was not replicated in real world conditions
    - FCW alert without slowing vehicle down
    - Driver had to take over and apply rakes
    - Initially detects vehicle then loses it until driver takes over and uses brakes
- Less common hazards may or may not be detected on road testing
  - Shape or angle, where located on road
  - May not recognize and perform necessary maneuvers
  - Issues with lane centering in curves
  - Systems vary behavior in challenging driving situations such as on hills and curves
    - Rely on forward mounted cameras, need line of sight
    - Lane keeping system performance not the same across manufacturers when navigating curves
- Issues with lane centering on hills
  - Forward mounted cameras point upwards from road
  - Hard to stay in lane lines
- Important that drivers are able to react at a moment's notice
  - What vehicle/system is communicating
    - System communications are not intuitive to naive drivers
    - Drivers trained for study on how different ADAS communicates better at recognizing when system goes inactive and manual intervention is required
    - Many drivers don't have the opportunity to learn before using these systems – such as when renting a vehicle
  - System naming inconsistent across manufacturers, sometimes misleading
    - Name of system changes driver expectations, can lead consumers to think the vehicle is more autonomous then it really is
    - *Video asking people if they were in a vehicle that had "auto pilot" what could I do?*
      - Have a conversation
      - Eat a sandwich
      - Have a cup of coffee
      - Read more books
      - Get work done

- - - Automation in today's vehicles still require the driver's full attention
- System behavior, notifications, names and driver distraction
    - Drivers are not vigilant when systems are on
    - Unsure at this time whether we will see more crashes as this technology becomes more widespread, or less because people may start to learn how these systems truly work
- Where do we go from here?
    - New vehicle series with front crash prevention are becoming more prevalent, but still make up a small amount of total vehicles on the road
        - Vehicle turnover is slow
        - Slow uptake in overall fleet for ADAS
    - Rearview cameras are expected to have a higher uptake than other ADAS, as they become mandatory in the U.S. in 2018
    - Level 2 systems are less common than automatic braking, adaptive headlights, rear camera, etc.
- When will self-driving cars be in the market?
    - Even with a mixed fleet, crashes will not be zero
    - Waymo (Google) AVs have fewer crashes, and all crashes they have had were someone else's fault
    - Still expect others to crash *into* AVs on the road
    - Expect many decades of a mixed fleet
    - Need more data to continue research
        - Crash avoidance systems are not identified in the vehicle identification number (VIN) now
        - Looking for a VIN-searchable database to be established to flag vehicles with Level 2 automation
        - Exploring "black box"-like data recording in the event of a crash
            - Retrievable with publicly available tool for use by researchers, insurers, law enforcement
            - Status of each automated system, last actions including take over request by system, speed, location, etc.
        - Testing of automated driving on public roads – data on crashes, disengagements and mileage
- Summary
    - Crash avoidance systems *are* reducing crashes
    - Driver behavior may be changing in response to these systems
    - More advanced systems are challenging for drivers to understand what to expect and how to react to system behavior, especially when it behaves unexpectedly
    - Need more data to better understand the impact ADAS and higher automation have on traffic safety
- Questions / Discussion
    - Are you (Alex) aware of efforts/interactions between policymakers, auto manufacturers and industry are the issue of access to crash data?

- - Conversations are happening at various levels – private industry, law enforcement, government
  - Not sure how much traction the efforts have gained thus far
  - IIHS is making efforts to push for a publicly available VIN searchable database
- Primary mission for Safety subcommittee is around public safety, and figuring how to provide safety-related information to the traveling public and other interested/affected parties. Do you (Alex) have suggestions on what we should focus on first?
  - Target audiences and messages vary based on what level of automation you are addressing
    - Need real world data, real world events/testing to understand better
    - Vehicle designs differ – some have more intuitive communications / interfaces
      - Language can be confusing, ambiguous
      - Often use legalese, engineering language that is not easy to understand
      - Owner's manuals do not convey what the system should be doing
    - Need more common sense advertising, intuitive system names and communications
  - Companies testing AVs should be required to report data when testing on public roads
    - Right now, reporting is voluntary, very few companies take advantage.
- Are auto manufacturers educating the public on how systems work? Are there rating programs?
  - Various organizations are developing training and education programs, such as AARP
  - Education programs have a novelty effect, are historically short-lived
    - Drivers develop an over-reliance, over trust of the systems
    - Higher levels of ADAS can be dangerous to those that have a little bit of knowledge vs. those that have no knowledge at all
  - Different demographics have different communications and education needs
  - IIHS/HLDI looking at developing a Level 2 rating program in some capacity
- For lane keeping and lane departures, have specific pavement marking types, widths, retroreflectivity been evaluated?
  - Not by the study conducted by IIHS/HLDI
    - Based on experience in other testing and manufacturer information:
      - Variability in how vehicles respond white lane markings vs. yellow
      - Solid vs. dashed/dotted
- There is a lot of information about forward and rear crash prevention, but not a lot on pedestrian detection and crash prevention, please provide more information on IIHS' rating program
  - Forward automatic braking does not detect pedestrians, only large objects (e.g. a vehicle)
  - Pedestrian crash prevention systems specifically look for pedestrians
    - Pedestrian crash prevention systems may not detect a small child

Topic closed.

MEETING SUMMARY

SAE LEVELS OF AUTOMATION MATRIX DISCUSSION
Debi Besser & Alan Werner

- There is confusion on the differences between the levels of automation (levels 0 through 5)
- At last subcommittee meeting, action item to develop a matrix on the different levels of automation to provide more information on what the driver is responsible for vs. the vehicle/systems, examples
- SAE has a matrix on the levels of automation, matrix developed for this effort varies mainly on level 0 (zero)
  - Level 0 should represent how vehicles functioned 30 years ago, no technology/systems/automation, driver has full responsibility and control
  - Suggest WA AV Work Group reach out to SAE to discuss and request more information on the justification for how SAE portrays level 0
  - Automatic emergency braking should be a Level 1 function rather than Level 0 as shown on the SAE matrix, suggest requesting clarification from SAE specifically on automatic emergency braking
  - **ACTION ITEM**: Debi Besser contacting SAE to discuss justifications of AV levels matrix
- Is there a more widely adopted standard than the SAE matrix?
  - No. Others define different levels, but SAE is the widely adopted standard
- Auto manufacturers are not officially labeling vehicles as levels 1 or 2, using a passive system that references specific ADAS functionality instead
- Education programs about specific ADAS functionality will likely serve the public better than educating on levels of automation
- Matrix developed for this subcommittee – When looking at what functionality/systems are in a vehicle, how do they relate with a human driver?
  - Levels 1 and 2: Vehicle is starting to provide backup warnings and take over some parts of the systems, driver still has responsibility and needs to be able to take control at any moment
  - As levels increase, driver has decreasing responsibility
- **ACTION ITEM**: Alan Werner to provide matrix to group for review before November subcommittee meeting
- Washington State has a simpler version of the SAE graphic in the Target Zero chapter of the (upcoming) Washington State Strategic Highway Safety Plan update (not published as of September 30, 2019)

Topic closed.

UPDATES FROM SUBGROUPS
Data Access – Steve Marshall

- Steve Marshall unavailable to provide update on subgroup
- Licensing and System Technology & Data Security subcommittee holding joint session on September 17 to discuss related topic(s) of data

Education – Kenton Brine

- Draft vision statement to address issues and (known) problems
- Process subgroup is working through
  - Identify near term goals
  - Identify target audiences (those that communicate to public – such as educators, legislators and insurers)
  - Identify available and necessary resources for reaching out to target audiences
  - Define methods of communications and messaging for each audience and topic
  - Subgroup discussing use of survey to assist in prioritizing issues
  - Many audiences, to be reached with differing messages and methods of communications
    - Identifying how to accomplish, cost estimates and available resources will take time
  - Subgroup focusing on actionable, near-term projects first, then expand
  - Anticipate near-term targets to be identified and presented at November subcommittee meeting

Screen RCW – Michael Transue

- Michael Transue unavailable to provide update on subgroup, provided information prior to meeting
- Subgroup looking to recommend repeal of RCW 46.37.480
  - Old statute, no longer enforceable
  - Old statute conflicting with recent legislation
  - Newer distracted driving RCWs are adequate to enforce TV screen viewing without interfering with technology used for ADAS and/or AVs
- Formal subcommittee voting process will be followed, anticipated at November subcommittee meeting
- **ACTION ITEM:** Subgroup to draft formal recommendation to bring to November subcommittee meeting
- **ACTION ITEM:** Debi Besser to reach out to Michael Transue to provide recommendation form and process

Crash Data Analysis – Debi Besser

- Not a formal subgroup of this subcommittee, but a topic the subcommittee has been discussing
- Currently good data on ADAS/AV vehicle crashes is not available – how systems may or may not have contributed to a crash
  - Unable to identify whether vehicles have ADAS/AV technology/systems or not
  - No concrete data on crash reports
- Washington Traffic Safety Commission (WTSC) establishing a work group to explore crash data analysis further
  - October 2019 through September 2020
  - Goal: Create a plan of what crash data could be gathered, such as:
    - By officer
    - By other methods
    - By VIN searchable database
  - Identify roadblocks and opportunities to obtaining better crash data

- o WTSC hiring a consultant to facilitate work group
- o Stakeholder list / work group members:
    - Department of Licensing
    - Department of Transportation
    - Washington State Patrol
    - WTSC
    - Insurance groups
    - Representatives from other AV subcommittees (Data, Liability, Licensing)
- o Requesting permission from subcommittee members to add this as an official subgroup
    - No objections.
- o **ACTION ITEM**: If any subcommittee member / meeting attendee is interested in participating in crash data analysis work group, contact Debi Besser.

Topic closed.

INTRODUCE UNIFORM LAW COMMISSION'S AUTOMATED OPERATIONS OF VEHICLES ACT AND DISCUSS FEEDBACK APPROACH
Kenton Brine

- Uniform Law Commission (ULC) drafted the Automated Operations of Vehicles Act, which provides suggestion legislation and definitions for automated vehicles
- Suggestion to add this as a topic of discussion on the November subcommittee meeting agenda, giving meeting attendees / subcommittee members time to review between now and the November meeting
- Looking to receive feedback at November meeting that can be incorporated into recommended revisions to the Act, to put forth to the Executive Committee in 2020
- What was the ULC and Washington State Transportation Commission's intent for subcommittee review and feedback – What is the intent to improve this document or simply comment on it as-is? Is this a formal review?
    - o Informal review by subcommittees
    - o Each subcommittee was asked to look at the document through their respective lens and provide input to the Executive Committee on what portions (if any) of the Act should be adopted in the State of Washington
    - o No lobbying entity currently bringing this forward to the Washington State Legislature, it is expected that the WA AV Work Group and subcommittees can fill that role
    - o **ACTION ITEM:** Interested parties may provide feedback on Act in writing to Debi Besser prior to the November 8th subcommittee meeting, and/or be prepared to discuss in the meeting.

REVIEW AND UPDATE SUBCOMMITTEE WORK PLAN
Debi Besser

- A Safety Subcommittee Work Plan was established earlier this year to capture actionable items the subcommittee wants to / is exploring
- What are the elements that should be included in the Work Plan?
  - Currently includes Guiding Principles, Definitions and Primary Focus that describes subgroup efforts
  - Need to make sure we are strategic in our efforts and recommendations – too big, too broad, too expensive won't get approved.
  - What can actually be accomplished?
    - Need high degree of prioritization
    - Subgroup efforts are covered under the Primary Focus section
    - Suggestion to have subgroup leads provide input into the Primary Focus section to provide more detail
  - Primary Focus section – suggestions to add:
    - Subgroup/activity goal(s)
    - Timeframe/timeline for each subgroup/activity
    - Identify what resources are in each subgroup
    - Subgroup ownership/leads
    - Target action steps
    - *Changes made live during meeting*
  - Guiding Principles section
    - *All changes to Work Plan made live during meeting*
    - First goal statement:
      - Change "accelerate" to "advance" – Potential for end result to not move forward with AVs if they are found to not be safer
      - Change "in order to increase overall road safety" to "when they work to increase overall road safety" – Understanding that technology is anticipated to increase safety, not proven yet
    - Second and Third goal statement:
      - Seems to align more with Health & Equity subcommittee
        - Document was created when health and equity topics were covered under Safety subcommittee
        - Agreed to leave statement in work plan to address health and equity as they relate to safety
          - Health & Equity subcommittee encourages other subcommittees to leave health and equity related goals and related information in their

subcommittee documents and efforts to continue to remind the subcommittee to consider health and equity in all of their efforts

- Suggestion made to evolve statement or adjust another goal statement for Safety subcommittee to collaborate with other subcommittees at the intersection of safety and their focus areas
- Do not want language to indicate that disadvantaged populations are receiving more focus on safety than others – no one should have more or less safety benefits
  - Suggest changing "particularly" to "including"
  - Adjust language to clearly indicate this goal is focusing on *safety* benefits
  - Fourth goal statement:
    - No comments / edits
  - Fifth (final) goal statement:
    - Add Washington State Strategic Highway Safety Plan
    - Add ULC Automated Vehicles Act
    - Suggestion to refine specific documents referred to under NHTSA guidance and regulations
- **ACTION ITEM**: Debi Besser will send out an updated version of the Work Plan. Subcommittee members / meeting attendees to review the updated document prior to November subcommittee meeting and provide to Debi Besser in writing prior to meeting.

Topic closed.

RECAP, ACTION ITEMS AND UPCOMING MEETINGS
Kenton Brine & Captain Dan Hall

- Request for public comment
  - No public comment
  - Reminder that public comment is welcome at all subcommittee meetings
- Oregon AV Task Force finalizing annual report and recommendations, expected to be final next week
- Health & Equity subcommittee holding first meeting on November 19th
  - Speaker from Urbanism Next
  - **ACTION ITEM**: If any subcommittee member / meeting attendee is interested in joining the Health & Equity subcommittee and/or attending the November 19th meeting, contact Debi Besser.
  - **ACTION ITEM**: Paula Reeves to send November 19th meeting information to Debi Besser.
- Reminder to subcommittee members / meeting attendees to review work plan prior to November meeting
- Reminder to subcommittee members / meeting attendees to review ULC Automated Operations of Vehicles Act prior to November meeting
- Subcommittee update and recommendations to Executive Committee on September 26th

- Subcommittee update to Washington State Transportation Commission on October 16th
- **ACTION ITEM:** If any subgroup intends to put forth a recommendation at November subcommittee meeting, provide to Debi Besser in writing prior to meeting.

NEXT MEETING: November 8th, Helen Sommers Building

MEETING ADJOURNED.