WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

Washington State Transportation Commission

AV Work Group Executive Committee Meeting

September 26, 2019

Washington State Transportation Commission

Agenda

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

TIME	DESCRIPTION	
9:00	**Welcome & Introductions**	**Darrin Grondel**, Chair, AV Work Group Executive Committee
9:05	**AV Subcommittee Updates & Recommendations** – **ACTION**	**Lonnie Johns-Brown & Harris Clarke**, Liability Subcommittee **Debi Besser & Captain Dan Hall**, Safety Subcommittee **Maggie Leland**, Labor & Workforce Subcommittee **Dr. Andrew Dannenberg**, Health & Equity Subcommittee **Beau Perschbacher**, Licensing Subcommittee **Will Saunders & Beau Perschbacher**, Joint Presentation – Licensing & Data Security **Will Saunders & Michael Schutzler**, System Technology & Data Security Subcommittee **Roger Millar & Mike Ennis**, Infrastructure & Systems Subcommittee
11:25	**AV Work Group Website**	**Ara Swanson**, Senior Associate, EnviroIssues
11:45	**LUNCH BREAK**	
12:00	***How Driver Assistance Features are Shaping Our Driving and Traffic Safety***	**Dr. Alexandra Mueller**, Research Scientist, Insurance Institute for Highway Safety
12:45	**Executive Committee 2020 Meeting Schedule**	**Reema Griffith**, Executive Director, WSTC
1:00	**BREAK**	
1:05	**Work Session: AV Executive Committee Areas for Consideration**	**Darrin Grondel**, Chair, AV Work Group Executive Committee **Scott Shogan**, WSP USA
2:15	**Executive Committee Member Items**	*Open forum for members*
2:25	**Closing Remarks**	**Darrin Grondel**, Chair, AV Work Group Executive Committee
2:30	**ADJOURN**	

AV Subcommittee Updates & Recommendations

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

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Liability Subcommittee

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Introduction

- Co-chairs
  - Lonnie Johns- Brown – OIC
  - Harris Clarke – PEMCO Mutual Insurance Company

- 22 Subcommittee Members representing diverse interests

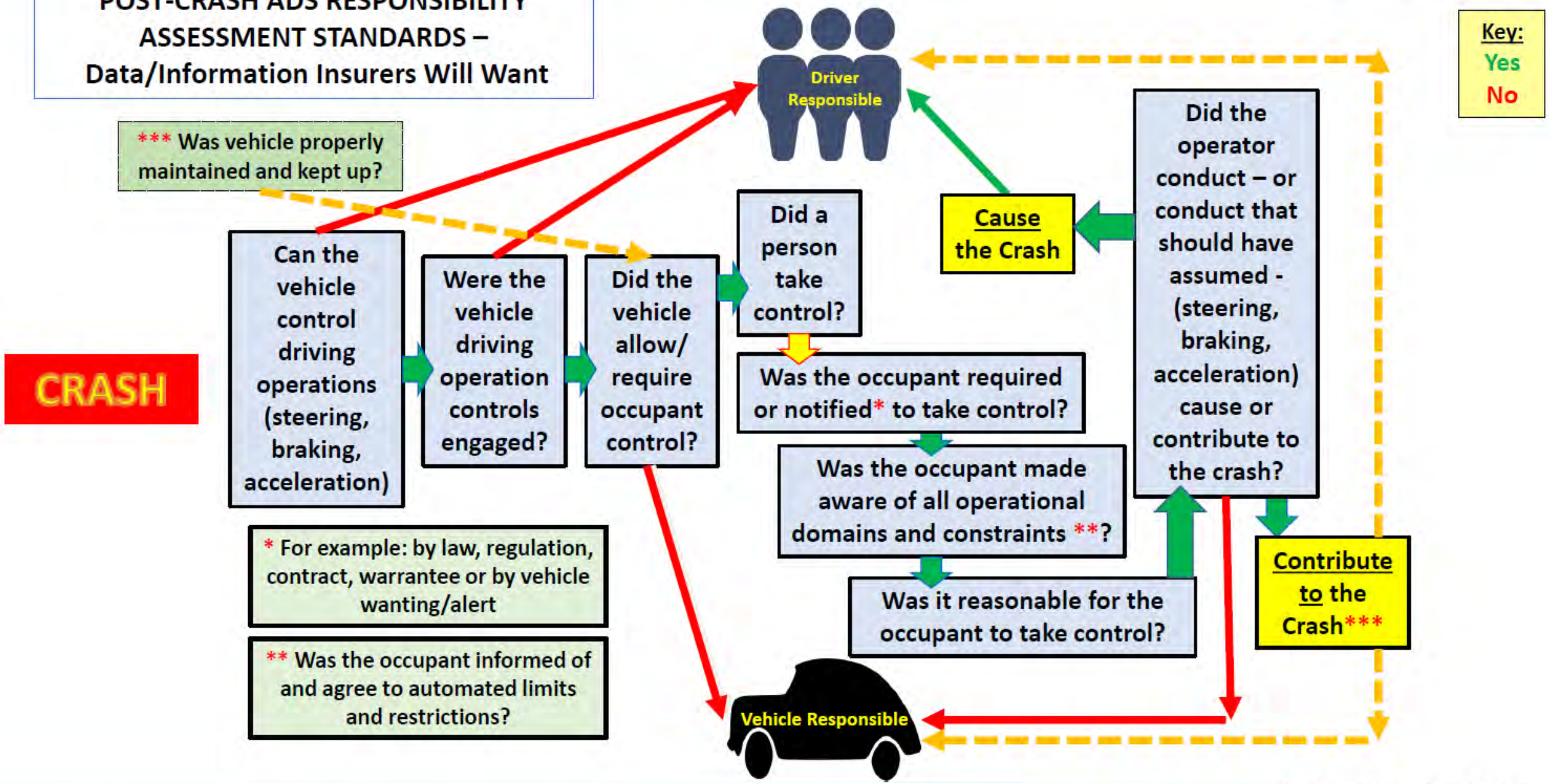
Agenda

- Key Issues
- Work in Progress
- Recommendations
- Next Steps
- Questions

Key Issues

- Insurance for self-certification
- Assigning liability
  - Access to **data** post-incident
  - Personal v. Commercial
- Assigning Liability can be a challenge now
  - Assisted Driving System present?
  - Assisted Driving System in use at time of incident?
- Truck Platooning

POST-CRASH ADS RESPONSIBILITY ASSESSMENT STANDARDS – Data/Information Insurers Will Want



Work in Progress

- We have initiated discussions with DOL regarding possible ways to create a verification process (proof of insurance)
- We are beginning discussions with the Data Subcommittee regarding what data would be needed by consumers/issuers/law enforcement in the case of an accident involving an AV
- PACCAR and Peloton representatives have introduced many questions for the subcommittee to explore relative to our recommendation on insurance as part of self-certification

Recommendation

The Liability Subcommittee recommends the legislature consider enacting legislation that requires that persons or entities testing autonomous vehicles or autonomous vehicle technology equipment under the Department of Licensing's Self-Certification Pilot Project shall maintain with the Department of Licensing proof of an umbrella liability insurance policy in an amount not less than five million dollars per occurrence for damages by reason of bodily injury, death, or property damage in addition to the financial responsibility requirements in accordance with RCW 46.30.020.

Next Steps

- Continued Discovery
  - How other jurisdictions determine liability for AV
  - How the technology works and its implications relative to liability
- Research/formulate recommendations as appropriate around:
  - Data requirements for liability determination
  - Speed of legislation and components
  - Truck Platooning

Questions?

Appendix

What is Platooning?

Liability Subcommittee Members

- Brady Horenstein, *Administrative Office of the Courts*
- Brenda Weist, *Teamsters*
- Brian Hockaday*, Lyft*
- Drew Wilder, *University of Washington*
- Harris Clarke, *PEMCO*
- Jean Leonard, *Association of Washington Business (AWB)*
- Kenton Brine, *Northwest Insurance Council (NWIC)*
- Lonnie Johns-Brown, *OIC*
- Logan Bahr, *Association of Washington Cities (AWC)*
- Melanie Smith, *Liberty Mutual*
- Paul Feenstra, *PACCAR*
- Patrick Conner, *National Federation of Independent Business (NFIB)*
- Veronica Van Slyke, *Progressive & USAA*
- Armikka Bryant, *Dolly*
- Luke Simon, *General Motors*
- Christian Rataj, *National Association of Mutual Insurance Companies*
- Joe Kendo, *Washington State Labor Council*
- Larry Shannon, *Washington State Association for Justice*
- Steve Marshall, *City of Bellevue*
- Steven Boyd, *Peloton*
- Melissa Crawford, *Nationwide*
- Michael Transue, *Global Automaker*

Peloton And PACCAR Questions

- Will the licensing/registration/self-certification process be amended to apply to companies engaged in other than Level 4-Level 5 testing?
- What is the consequence of not registering or self-certifying with the state?
- Are there any inducements associated with registration that the state is considering
- Does the registration requirement apply to the AV system manufacturer who may be using a third party's vehicle as the platform (using lidar, radar, cameras, etc.), the manufacturer of the vehicle being used as a platform (providing braking, steering, etc.), or simply the entity conducting the testing?
- How does registration/certification apply to vehicles that might be transiting through the state, but are not domiciled in the state?
- Should there be a requirement for a registered agent in the state?
- Should there be some reporting of accidents, disengagements, or other data to the state? Would mandates regarding reporting prove to be a disincentive in light of state sunshine laws?
- For autonomous vehicles which are being operated in the state and not being tested, will there be a registration requirement?
- How does the state know what vehicles are equipped with AV technology (VIN designator if original equipment, but this will not capture the aftermarket)? Who is responsible for notifying the state of AV capability (owner, manufacturer, upfitter)?
- In the event of an accident involving an AV, what data must be provided to the state? Many states have laws which expressly provide that vehicle "black box" data belongs to the owner of the vehicle and cannot be accessed by the manufacturer without the owner's express written consent or government order. What data should/must the manufacturer have access to in order to determine whether it is properly liable for the accident? What data should/must the manufacturer have access to in order to determine whether there needs to be a recall/fix?
- Will the $5 million umbrella apply only to Level 4-5 AV testing and operation or will it apply to lower AV levels? If it applies to lower levels (such as with the testing contemplated by PACCAR and Peloton, which is Level 1), how low?
- Will the $5 million umbrella apply only to entities which self-certify/register to test? If registration is not mandatory, how will the state verify compliance by non-registered testing entities? Will the umbrella requirement prove a disincentive to registration, or to the testing of AV's in the state?
- Will the umbrella apply to both the companies testing the autonomous vehicle and the companies testing the AV technology equipment?
- Will the umbrella requirement apply to companies whose vehicles are simply transiting through the state? If not, does this put companies domiciled in the state at a comparative disadvantage?
- Will the $5 million umbrella eventually apply to any vehicle in operation with AV capability?
- Must the umbrella be written on an occurrence basis or can it be claims-made?
- Does the umbrella requirement put WA at a comparative disadvantage for attracting automated vehicle testing, particularly smaller AV companies or technology developers?
- What liability principles will apply in the event of an accident where an AV system is engaged (strict liability, burden of proof, presumptions)? Will the same liability principles apply when a vehicle has a human operator present that can have/does have operational control? Is a manufacturer liable if the AV is added in the aftermarket? Is the manufacturer liable if the accident cause is related to inadequate maintenance of or damage to the sensors, cameras, etc.? Is the manufacturer liable if the accident cause is related to negligent repairs on the AV systems by third parties?

Safety Subcommittee

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AV Safety Subcommittee Update

- Met in July and September
- Current Co-chairs
  - » Kenton Brine, NWIC
  - » Captain Dan Hall, WSP
- Three primary focus areas
  - » Public Education
  - » RCW 46.37.480 Television viewers—Earphones
  - » Vehicle Crash Data for Safety Analysis

Public Education

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Challenges

Lack of understanding

Confusing driver assistance
with “self-driving”

Public Education Plan

- Audience groups
- Key messages
- Existing resources and channels
- Prioritization
- Action plan

RCW 46.37.480 Television viewers—Earphones

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RCW 46.37.480 Television viewers—Earphones

(1) 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. This subsection does not apply to law enforcement vehicles communicating with mobile computer networks.

(2) No person shall operate any motor vehicle on a public highway while wearing any headset or earphones connected to any electronic device capable of receiving a radio broadcast or playing a sound recording for the purpose of transmitting a sound to the human auditory senses and which headset or earphones muffle or exclude other sounds. This subsection does not apply to students and instructors participating in a Washington state motorcycle safety program.

(3) This section does not apply to authorized emergency vehicles, motorcyclists wearing a helmet with built-in headsets or earphones as approved by the Washington state patrol, or motorists using hands-free, wireless communications systems, as approved by the equipment section of the Washington state patrol.

Vehicle Crash Data for Safety Analysis

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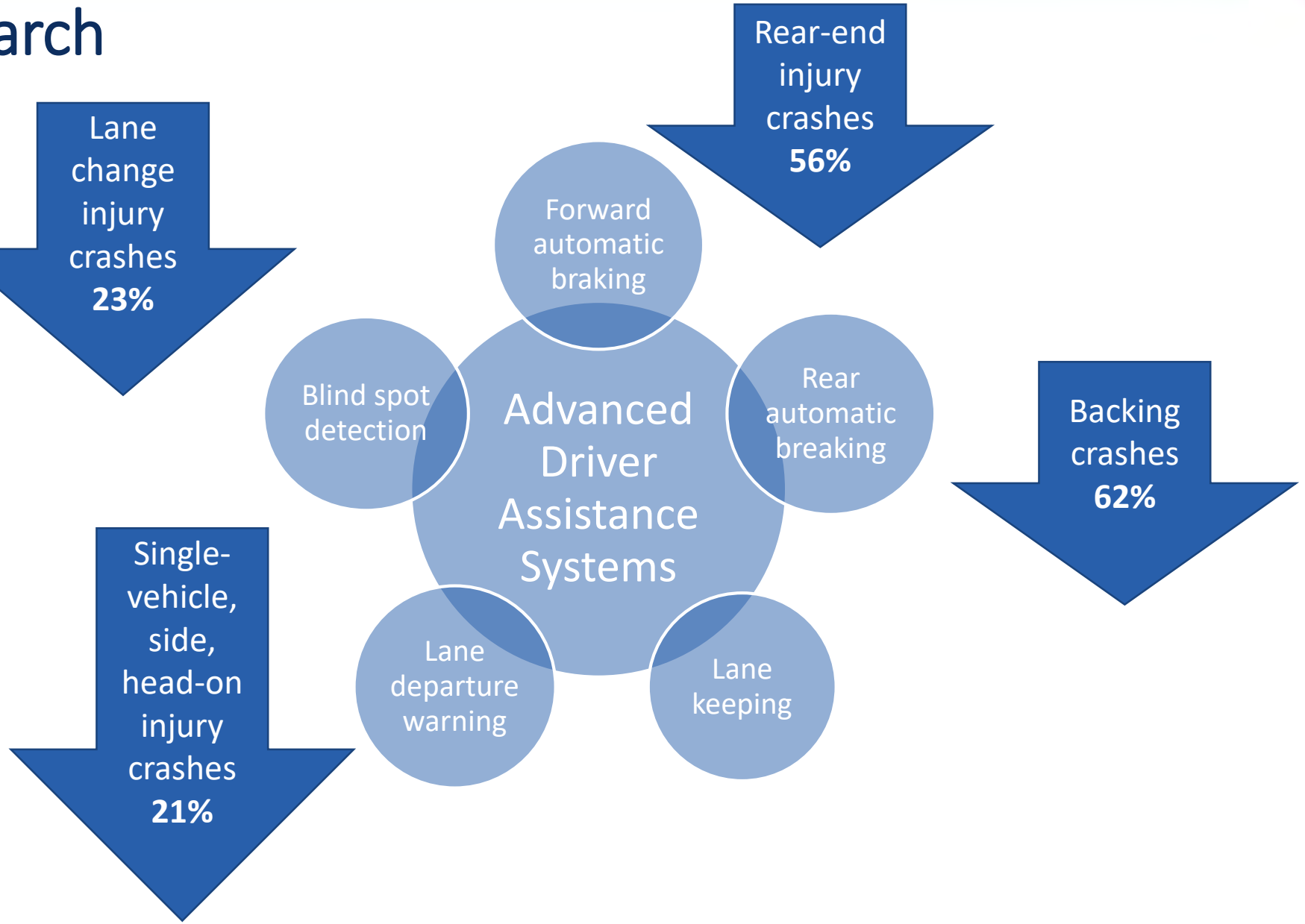
New Data

- To measure the safety effects of ADAS and AV's requires gathering a completely new set of data

- Questions:
  - What automated technology did the vehicle have?
  - Were any automated systems engaged at the time of the crash?
  - Was the system being used in an area where it was designed to be used (operational design domain)?

- How will this information be obtained?

IIHS Research



Data Project

Goals:

- Develop safety performance measures for ADAS and AVs
- Identify the data needed to measure the safety effects of ADAS and AVs on crashes, injuries and fatalities
- Explore the various possible methods of obtaining this data, and potential challenges and opportunities

Questions?

Captain Dan Hall, WSP
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Debi Besser, Program Manager, WTSC
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Labor & Workforce Subcommittee

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

Washington State Transportation Commission

Subcommittee Structure and Membership

- Lead agencies
  - » Employment Security Department and Department of Labor & Industries
- Membership
  - Interested parties have signed up for email update list
  - Soliciting interested parties to serve as subcommittee members
    - » Private Sector Co-Chair: Brenda Wiest, teamsters Local 117, Legislative Director
    - » Other members to include Labor, auto manufacturers, commercial vehicle manufacturers, transportation network companies, for hire transportation/drivers, transit operators and agencies, cities and counties (urban and rural), freight drivers, ports, business, and community & technical colleges

Upcoming Meeting

- First meeting scheduled

October 28, 2019, 1:30 pm to 3:30 pm

L&I Tukwila Service Location, Room C30

SCHOOL OF PUBLIC HEALTH
UNIVERSITY of WASHINGTON

Washington State Department of Health

AUTONOMOUS VEHICLE –
HEALTH AND EQUITY SUBCOMMITTEE

PRESENTED AT
WSTC EXEC COMMITTEE ON AUTONOMOUS VEHICLES
SEATAC INTERNATIONAL AIRPORT
SEPTEMBER 26, 2019

Dr. Andrew Dannenberg, UW School of Public Health

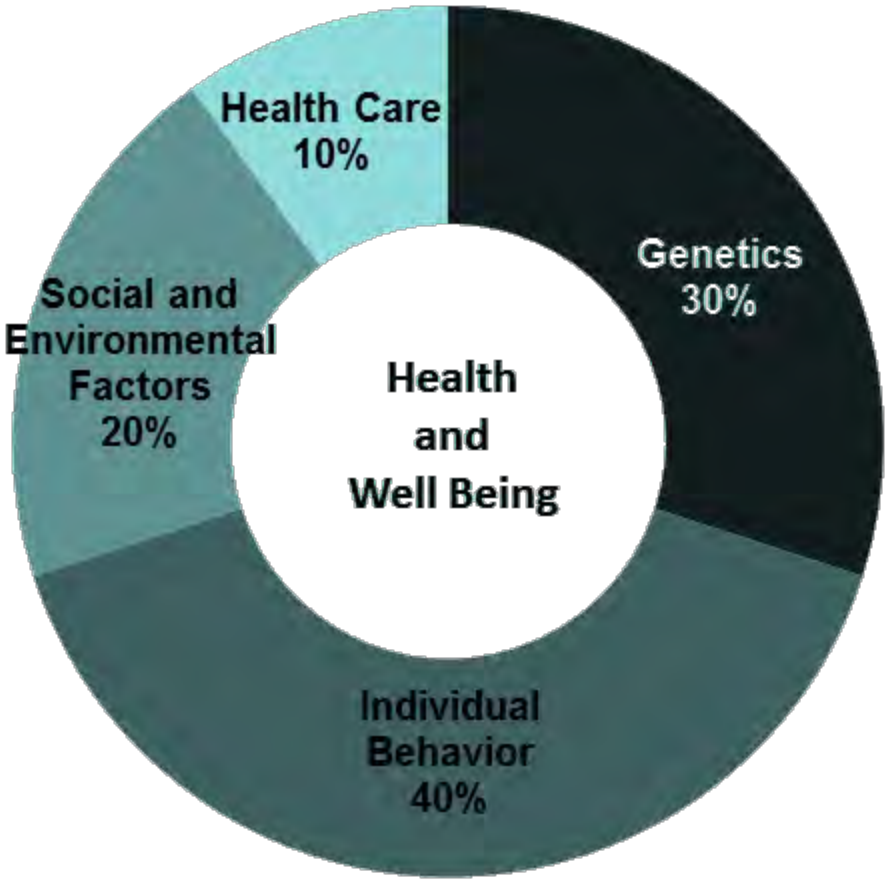
Health & Equity Subcommittee Update

Goal: Ensure the health benefits of automated mobility are equitably distributed and that negative impacts are not disproportionately borne by traditionally marginalized communities.

Established by WSTC on **July 2019**

1st Meeting **November 19th, 2019** @ City of Seattle

Social Determinants of Health



SOURCE: Schroeder, SA. (2007). We Can Do Better — Improving the Health of the American People. *NEJM*. 357:1221-8.

Some Key Topics to Address

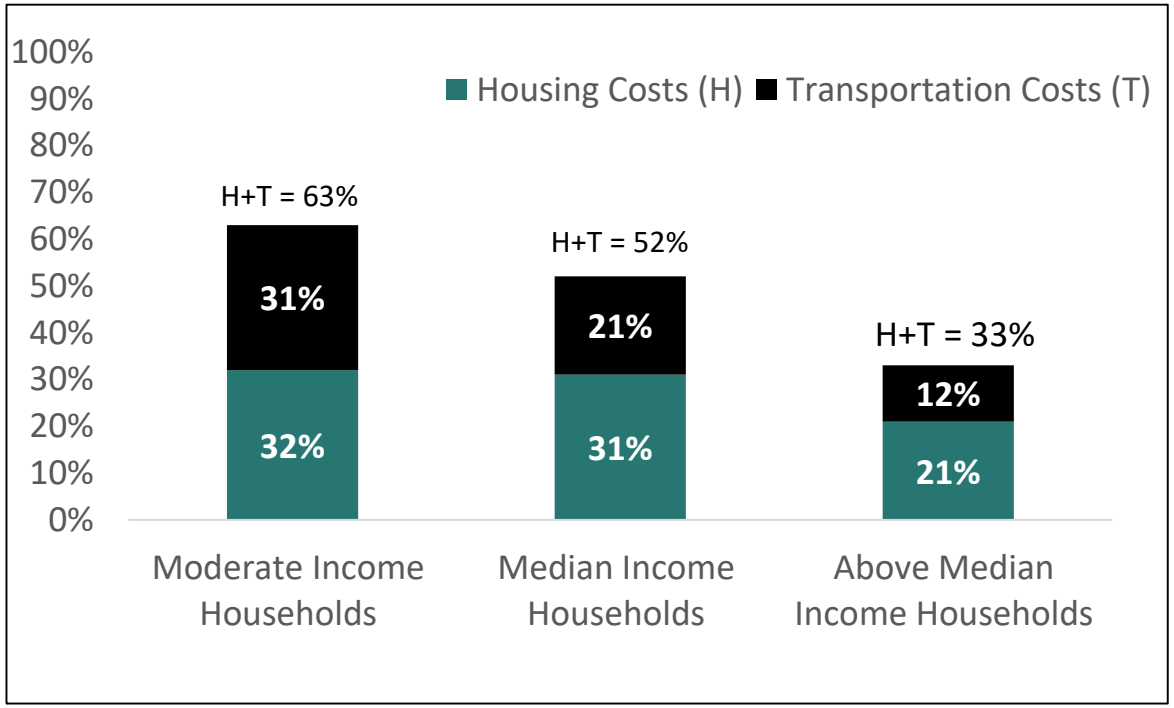
AV Health & Equity Impacts to:

- Access to transportation for all income levels
- Costs of AV transportation
- Distribution of AV services
- Accessibility and mobility for vulnerable populations
  communities of color, people with disabilities, the young and the aging, rural populations, and other historically marginalized populations
- Job losses from automation
- Exposure to traffic and related impacts

How will AVs impact transportation costs?

- Washington residents spend **52% of their monthly income on** housing and transportation on average.

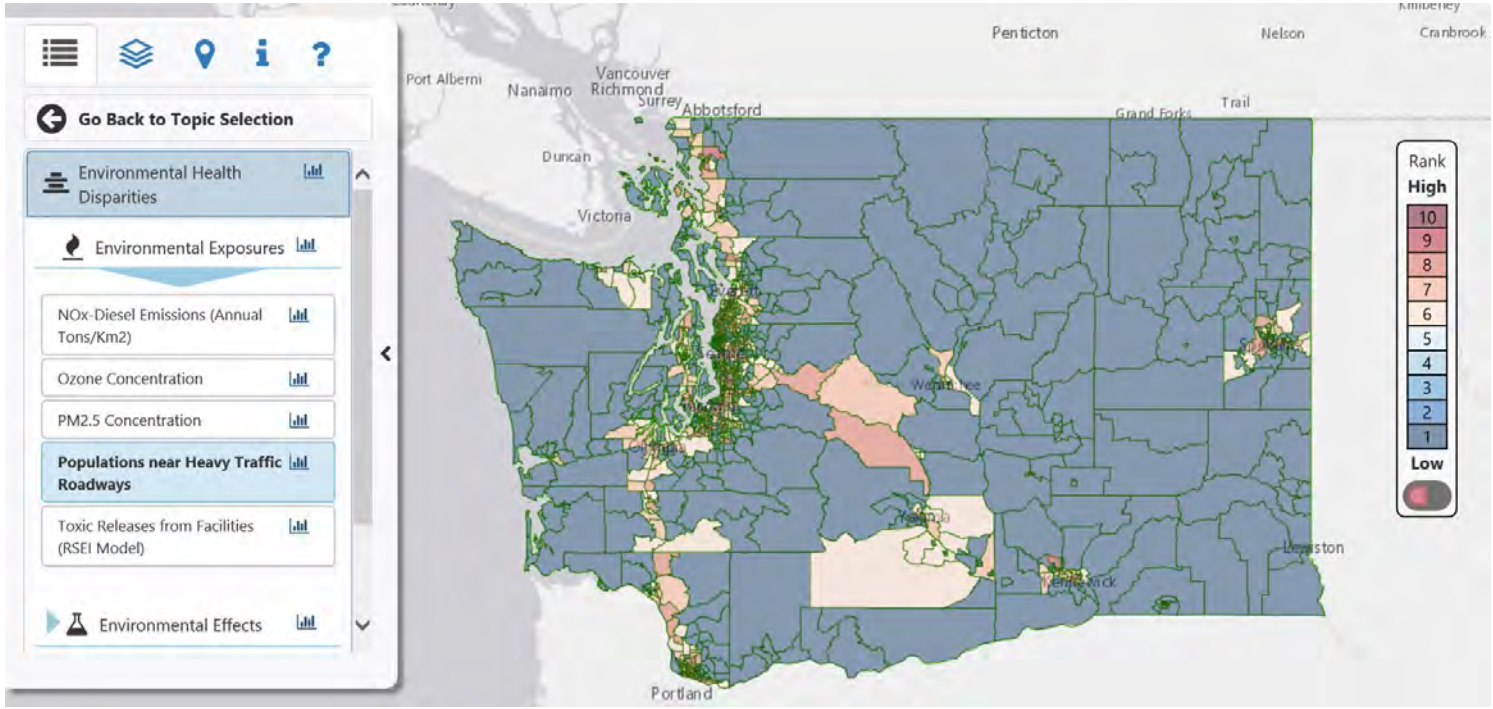
Note: HUD established **45% of monthly income** as baseline for housing & transportation costs.



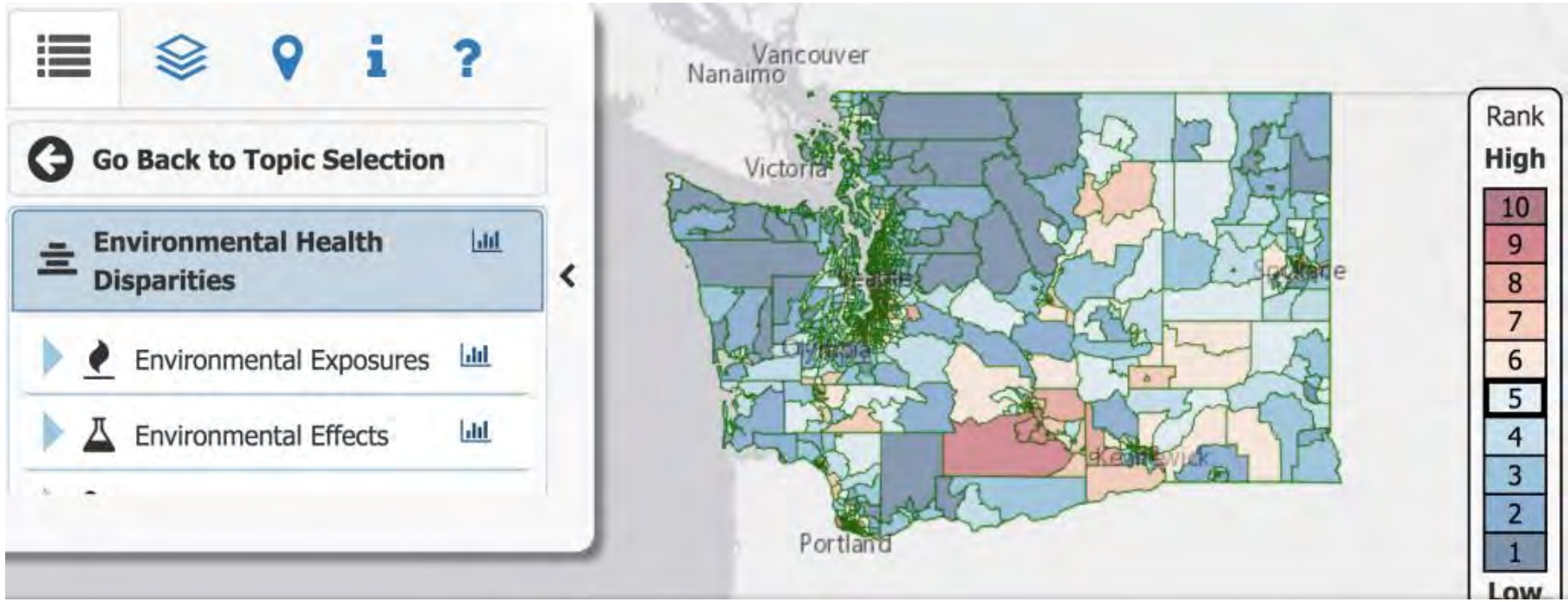
Source: Washington Tracking Network, Washington State DOH

How will AVs impact air pollution exposures?

- **High poverty neighborhoods:**
  - more likely to be located near major roads;
  - higher rates of asthma, cardiovascular disease;
  - higher pre-term and low-birthweight infants;
  - more childhood leukemia;
  - more premature death.



How will AVs impact existing health disparities?



www.doh.wa.gov/ibl

Subcommittee Recommendation – Assessment of Health Impacts

- Similar Recommendation in WSTC 2018 Report to the Legislature
- Consistent with *Washington's Transportation Plan 2035:*

  "Develop a Transportation Equity Analysis toolkit for use in evaluating the benefits and impacts of transportation policies and investments on historically marginalized populations in Washington."

- Consistent with the Clean Energy Transformation Act
- Consistent with Washington's public health goals

Some Questions to be Addressed:

- Would AV be more willing to go into some areas at night than the current taxi system?
- What health & equity issues are communities experiencing now, and how might AV improve that situation, or make it worse?
- How might testing AV technology on public roads disproportionately impact disadvantaged or vulnerable populations?

Some Questions to be Addressed (Continued):

- If less land is used for parking, what would happen to that land?
  - Would communities create more park land?
- Will more AV transportation mean less walking, and could that increase obesity?
  - Will AVs lead to less use of public transit?
- How might AVs impact bicyclists and pedestrians?
- How might AVs impact access to health care?

Questions?

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Licensing Subcommittee

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Subcommittee Structure and Membership

- Subcommittee Co-Chairs:
  - Beau Perschbacher, Department of Licensing
  - Drew Wilder, Vicarious Liability Risk Mgt. LLC
- Membership
  - 25 voting members
  - 10 non-voting participants
  - Includes: Auto dealers and manufacturers, Tech industry representatives, Sub-agents and County auditors, Trucking, engineers, labor, and local government.

Meetings to Date

- 2018
  - » August 23 – discussed charter, subcommittee membership, co-chair and future topics
  - » October 5 – UW presentation on certification in other states followed by discussion
  - » December 7 – Presentation from Peloton and discussion on AV implications in freight
- 2019
  - » April 18 – Discussed two potential recommendations to the working committee
  - » July 11 – Discussed UW recommendations (provided feedback), policy issues with licensing AVs, and coordination with other subcommittees
  - » September 17 – Joint Licensing and System Technology & Data Security Subcommittee meeting, discussed data questions pertaining to both groups

Upcoming Policy Items

- Vehicle registration
  - » Registration requirements for AVs
- Driver licensing
  - » Knowledge and skills test criteria specific to AVs
  - » Driver licensing requirements for level 5 AVs
- Rules of the road
  - » Updates to driver laws and guides needed to address AVs on the road

JOINT PRESENTATION

System Technology & Data Security and Licensing Subcommittees

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

Washington State Transportation Commission

Activity Report – System Technology & Data Security Subcommittee

Autonomous Vehicle Executive Committee meeting

September 26, 2019

Office of Privacy & Data Protection
Washington State

WaTech
Washington Technology Solutions
Washington's Consolidated Technology Services Agency

June Recommendations:

- Tabled for more research and discussion on:
  - Ohio framework
  - California framework
  - Uniform law
  - Available data

Topics on our Radar

- Data needs for understanding AV (joint meeting with Licensing)
- Other states' regulations
- Data systems for mobility as a service
- Transparency framework for testing programs
- Auto-ISAC best practices for vehicle cybersecurity
- Event recorders and data access (with Safety)

Work agenda for Fall 2019

- How to find, use and understand existing reported data
  - NTSB
  - NHTSA

WASHINGTON STATE
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Infrastructure and Systems Subcommittee Report

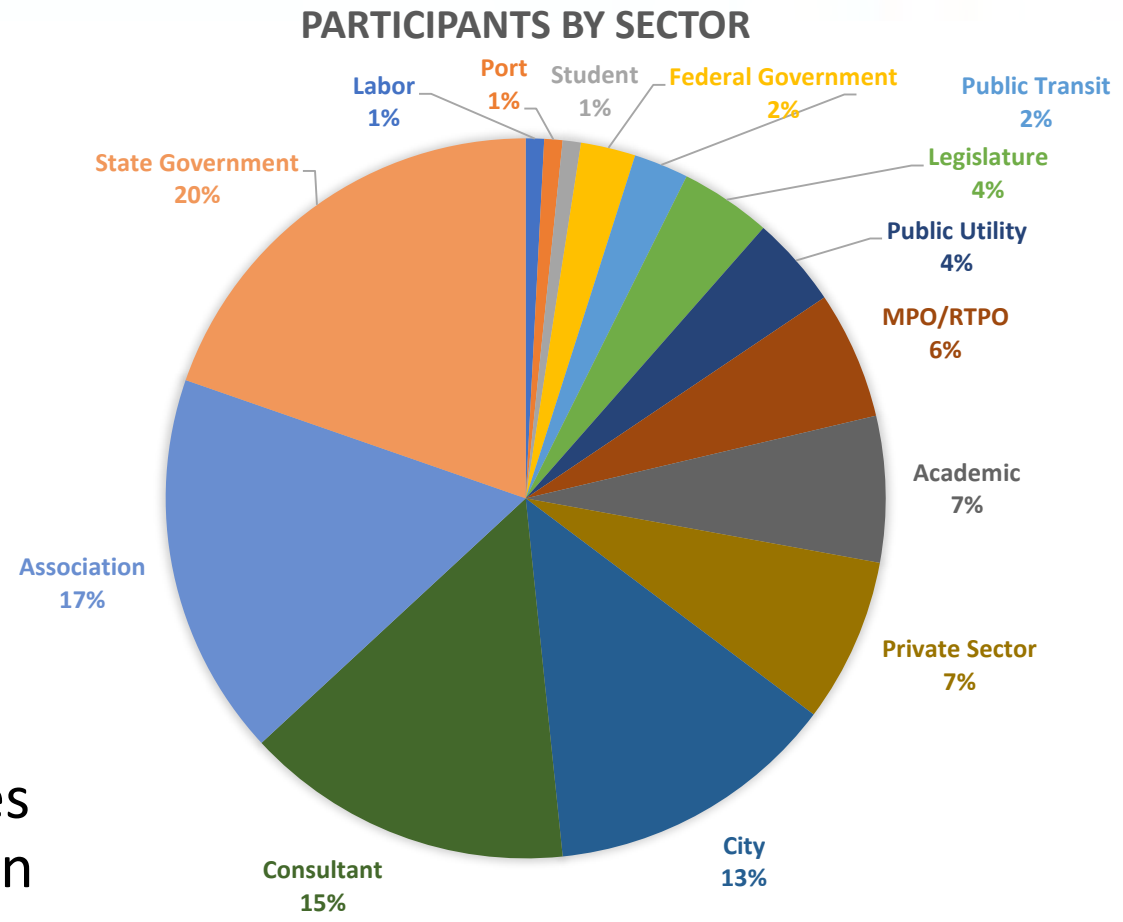
Roger Millar, Secretary, WSDOT
Michael Ennis, Government Affairs Director, AWB

September 26, 2019

Washington State Transportation Commission

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



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.

2019 Action Plan

Activity 1

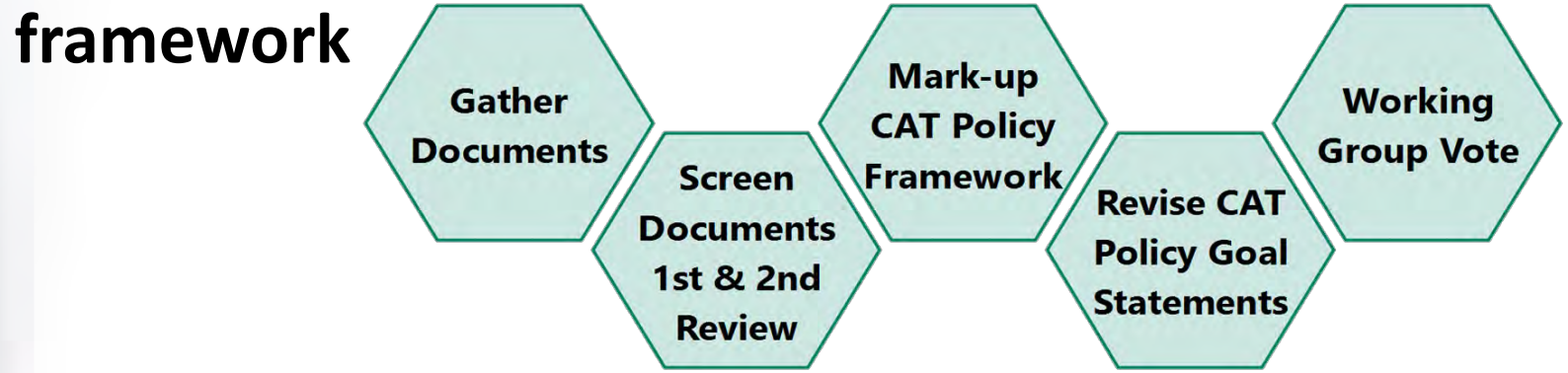
Policy Goal Development Process

Initial Deliverable Date
September, 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 measureable.

- **1st Step : develop policy goals to guide the framework**



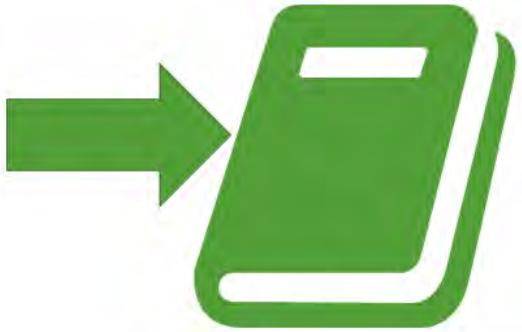
- **Target Outocme:**


Washington State Department of Transportation

Cooperative Automated Transportation (CAT) Draft Policy Framework

DRAFT

Working Document
November 26, 2018



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

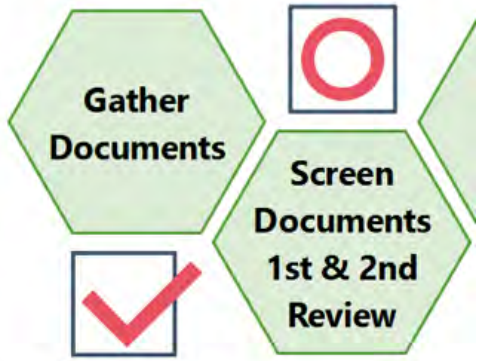
2019 Action Plan

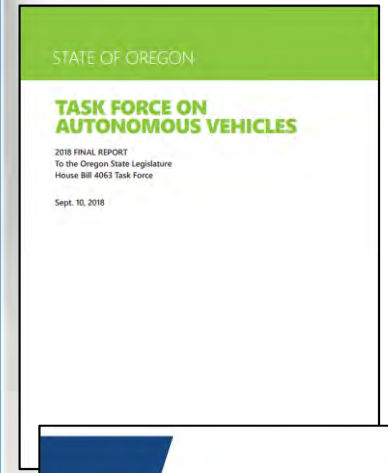
Activity 1

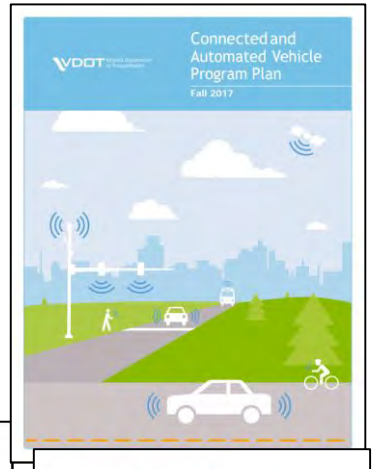
Policy Goal Development Process

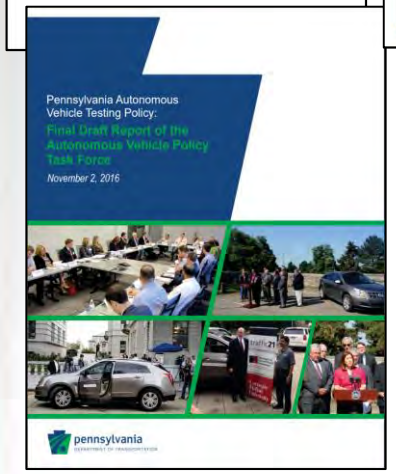
Initial Deliverable Date
September, 2019

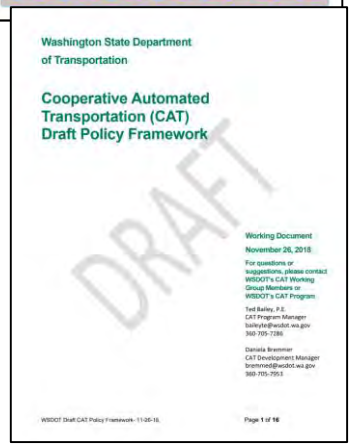
Gather and Screen Documents











Agency / Organization	Content	Summary of Content
Colorado	CAT Program	Includes mission, purpose, issues, objectives, priorities, and risks associated with the Connected and Autonomous Technology in Colorado.
Oregon	State of Oregon Task Force on Automated Vehicles	Describes: • Overview of automated vehicle technology and considerations that prompted the creation of the task force • Task force membership, structure, and process • Elements of a permitting process for testing highly automated vehicles in the state and additional policy recommendations in each of the subcommittee areas • Topics for further consideration identified by the task force
Washington State DOT (WSDOT)	Cooperative Automated Transportation (CAT) Policy Framework	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.

Lots of work…Lots of Volunteers…Progress by the numbers

16
Volunteers
(11 Active)

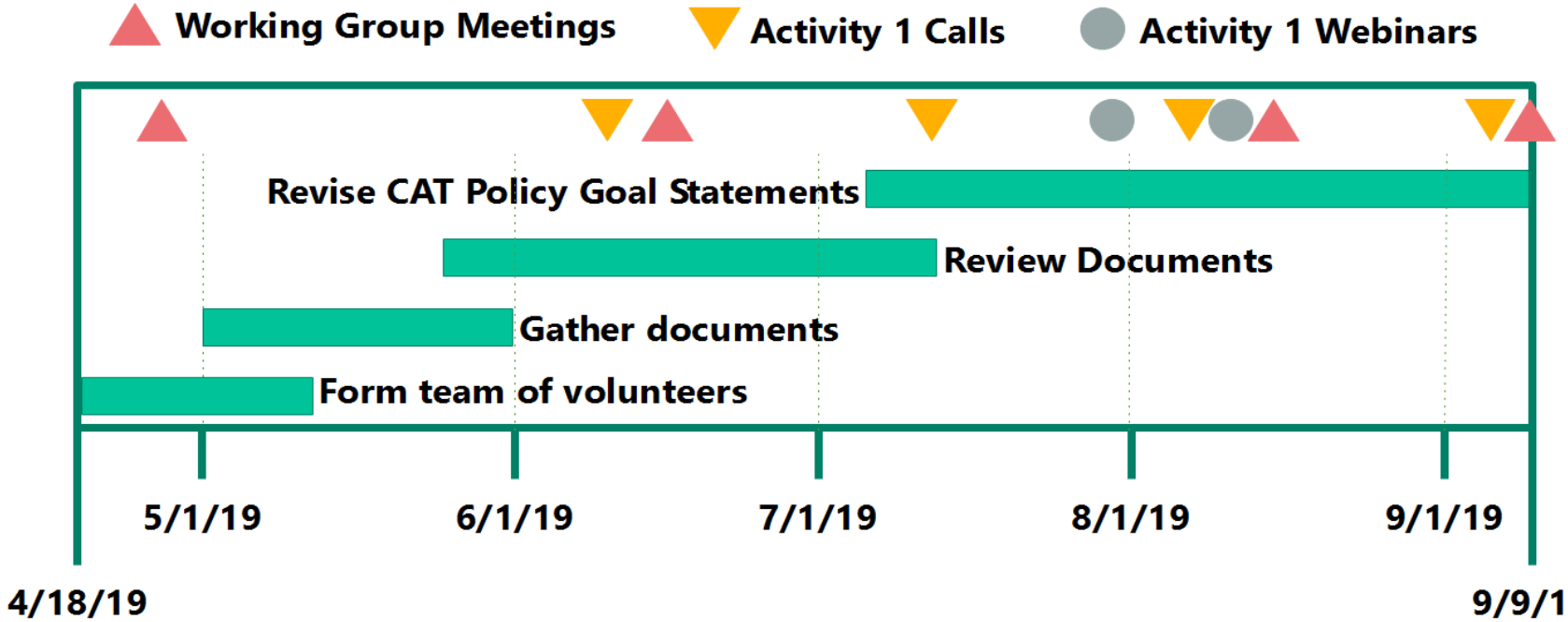
41
Documents
(25 Reviewed)

2,104
Pages
(1,013 Reviewed)

4
Months
(4 Down)

Product:

8 Policy Goal Statements



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.

Recommendations

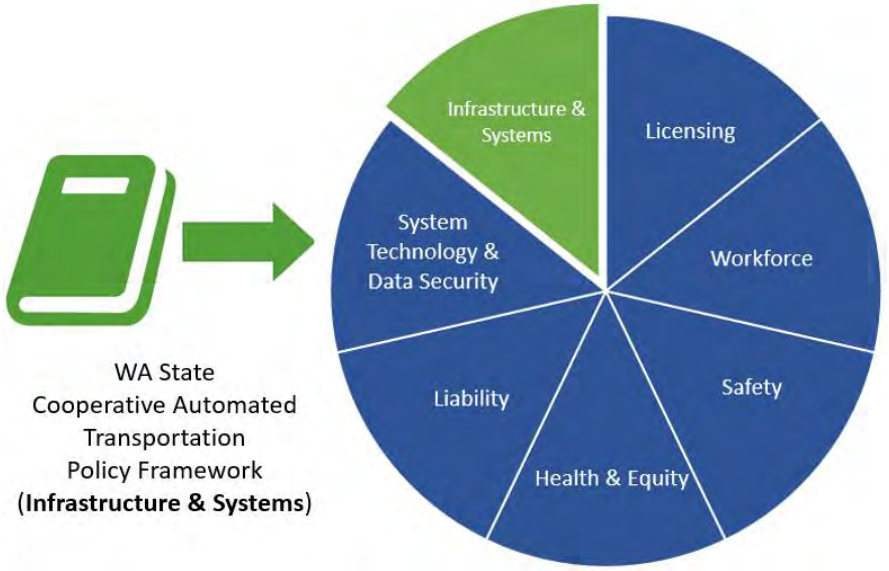
CAT Policy Goals Proposed for Adoption by the Executive Committee (continued)

- **#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.



2019 Action Plan

Activity 2 Overview

Initial Deliverable Date

September, 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 Seattle Department of Transportation, SoundTransit, King County METRO
  - 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

- 22 funding sources reviewed and documented to date

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?

2019 Action Plan

Activity 3 Overview

Initial deliverable Dates
Action 1, September, 2019
Action 2, December, 2019

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 a collaborate 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

<u>Group 1</u>: 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

<u>Group 2</u>: 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

Activity 3:

Action 1 Interview Self - Certified Companies

Lessons Learned

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 significate technology, could 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.
  - Peloton (in coordination with PACCAR) held a highway demo for WSP in Dec. 2018. PACCAR performed additional I-5 highway testing with Peloton's road-ready, safety validated driver-assistive platooning technology along I-5 from Arlington to Linden, Washington in Jan. 2019.
- 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.

Activity 3:

Action 1 Interview Self - Certified Companies

Lessons Learned (continued)

Question 4.) What can the Washington State Autonomous Vehicle Work Group could 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 could 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

Date	Peloton Technology/PACCAR Engagement and Testing Activity Summary
Dec. 2017	Peloton Initiated meetings with WSDOT and WSP regarding possible SAE Level 1 platooning testing opportunities.
Oct. 2018	Peloton began PACCAR driver track training. PACCAR participated in track testing at PACCAR Technical Center related to vehicle integration.
Oct.-Dec. 2018	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
Dec. 2018	Peloton self-certified to conduct testing and communicated plans for testing along a short rural segment of I-5.
Dec. 2018	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.
Jan. 2019	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.
June-Aug. 2019	Peloton and PACCAR actively participated in multiple WA AV working group subcommittees to advance policy recommendations for AV testing legislation.
Dec. 2019	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.

Summary and Next Steps

- **Activity #1**
  - » Obtain AV EC approval of the recommended 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 6th, 2019 subcommittee meeting

WEBSITE UPDATE

Led by EnviroIssues

WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

Washington State
Transportation Commission

Purpose and overview

- The AV workgroup website will serve as a clearinghouse for general AV information in Washington, AV workgroup meeting materials and the topics discussed by the workgroup and its subcommittees
  - » Subcommittee members will be able to find past and upcoming meeting materials and dates on the website
  - » Interested stakeholders will be able to use the website as an introductory resource to AVs in WA
  - » The website will redirect stakeholders to agency-specific resources

Schedule

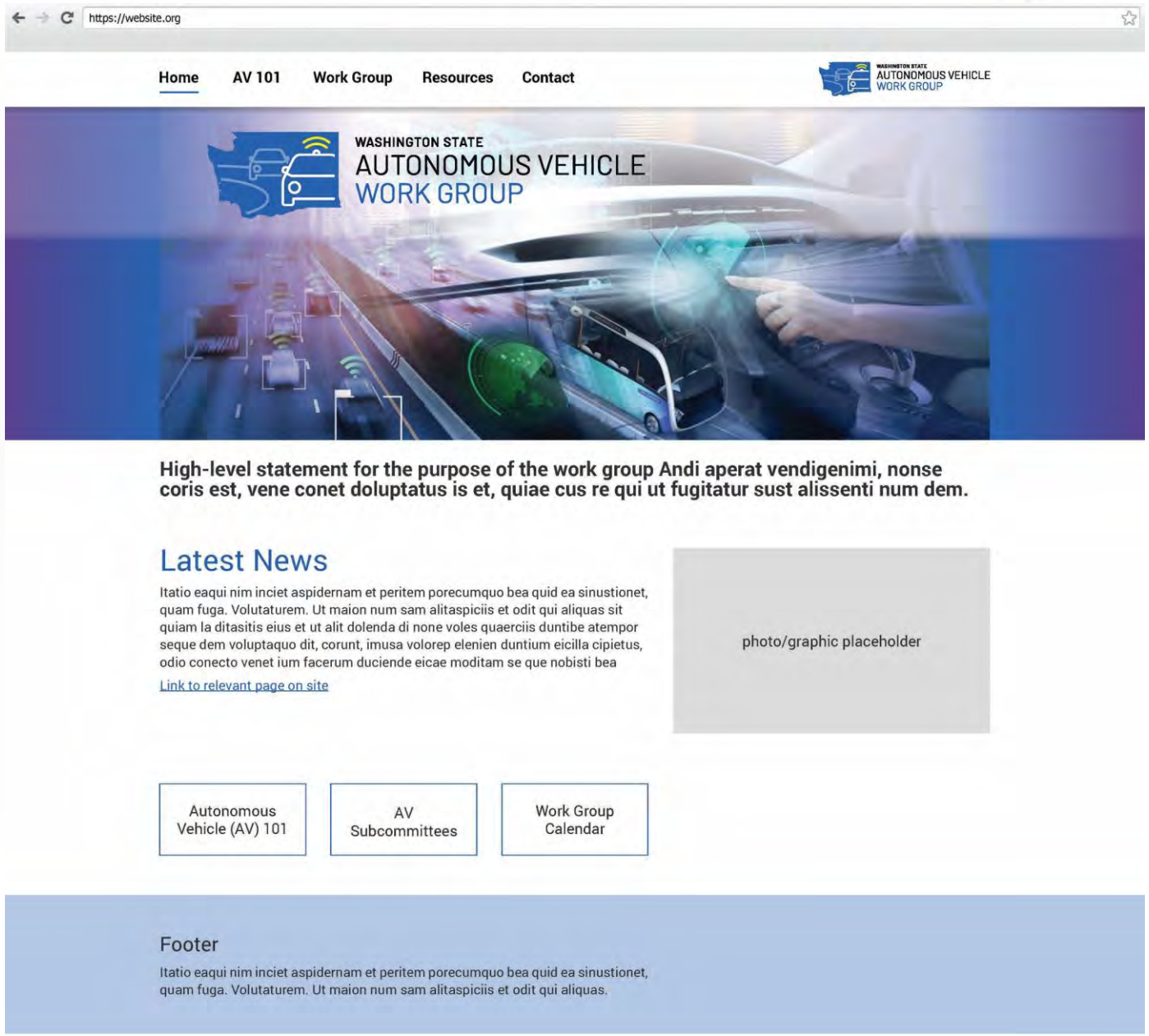
- September 2019
  - » Develop sitemap, wireframe and look-and feel
  - » Finalize sitemap, wireframe and look-and feel
  - » Begin developing site content
- October 2019
  - » Continue developing and finalizing site content
  - » Begin developing draft website
- November 2019
  - » New website is launched

Website wireframe

WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

Washington State
Transportation Commission

Homepage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AV 101
Work Group
Resources
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AUTONOMOUS VEHICLE
WORK GROUP
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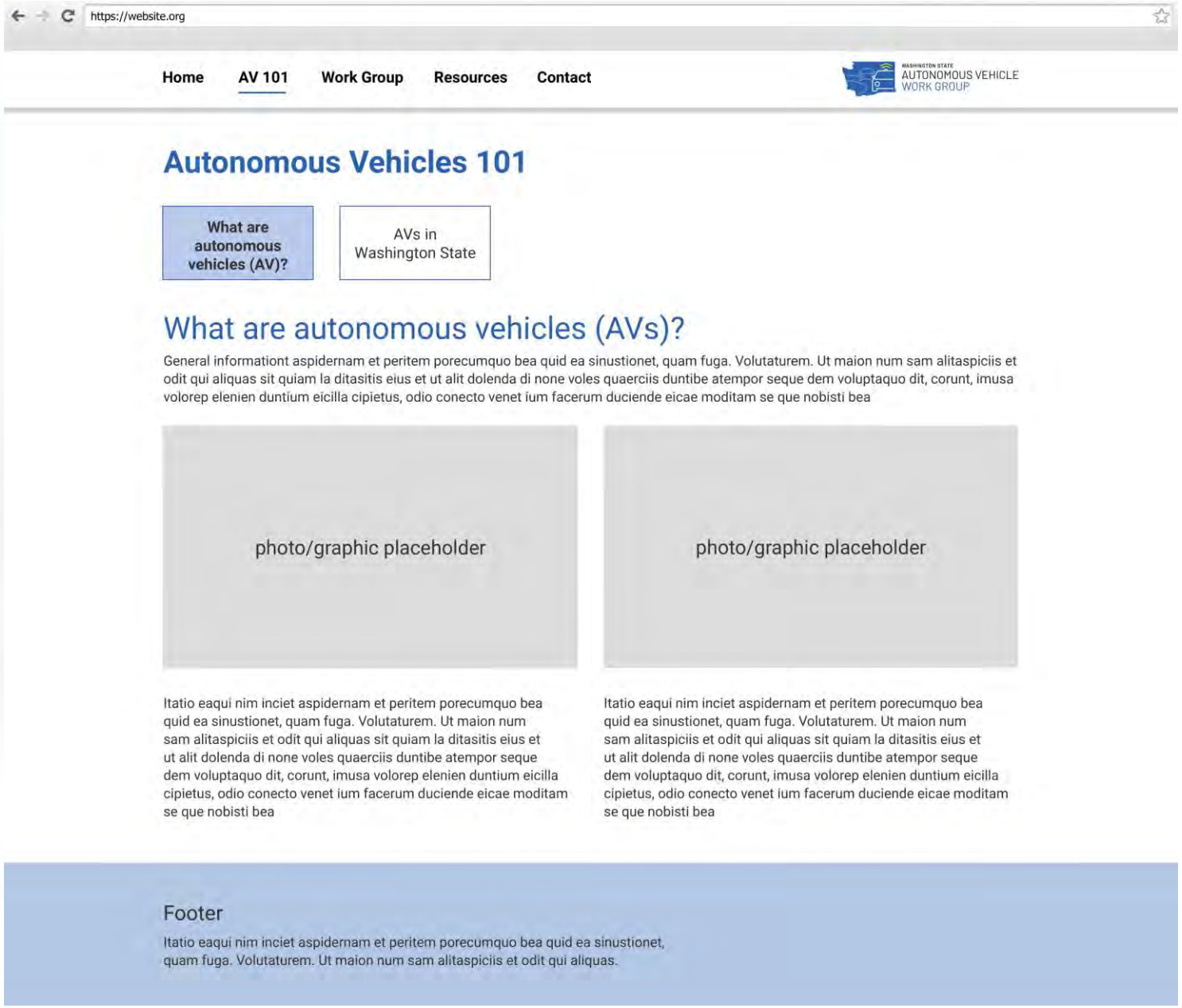
AV 101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Autonomous Vehicles 101
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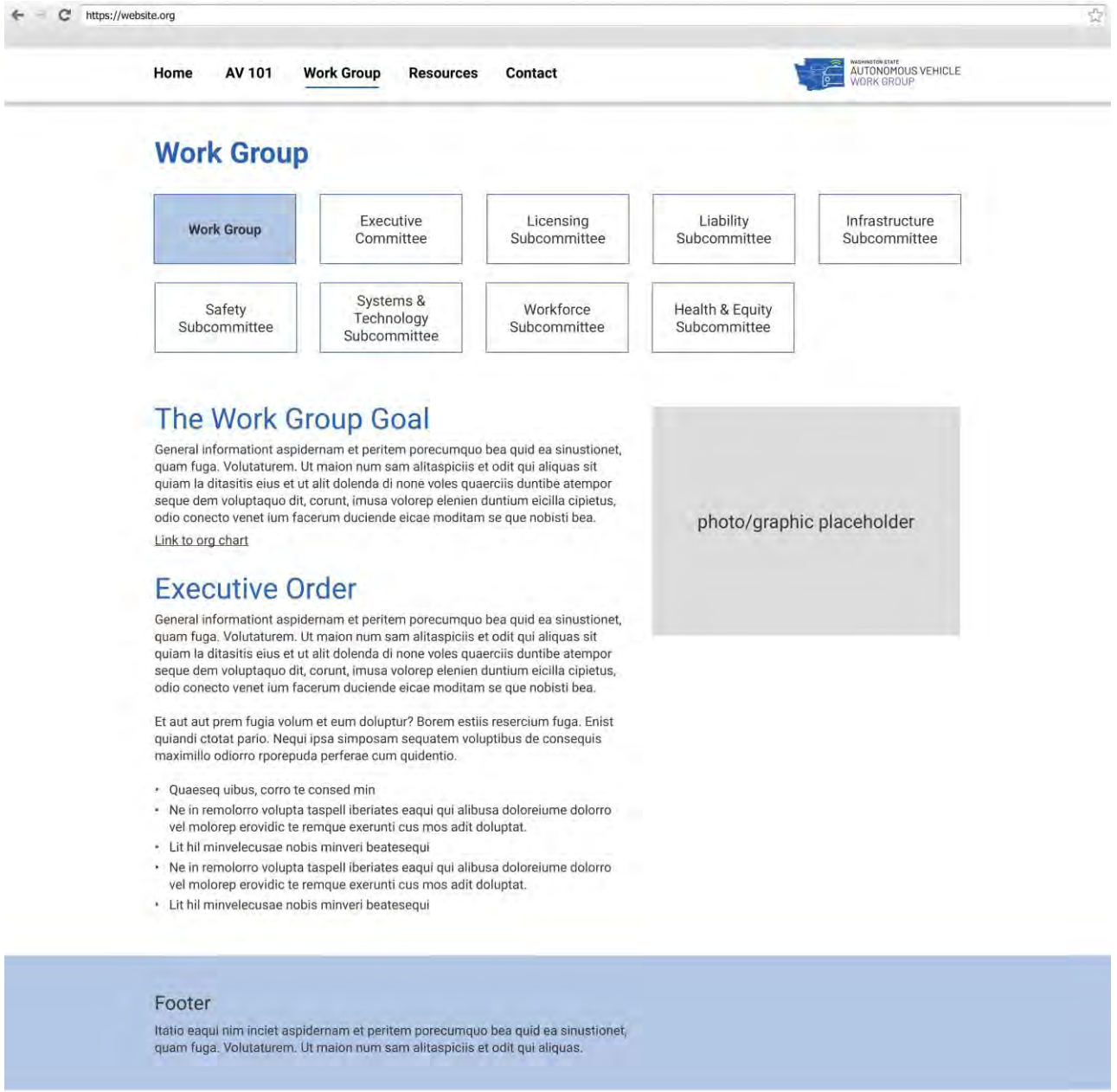
Work Group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Licensing Subcommittee
Liability Subcommittee
Infrastructure Subcommittee
Safety Subcommittee
Systems & Technology Subcommittee
Workforce Subcommittee
Health & Equity Subcommittee
The Work Group Goal
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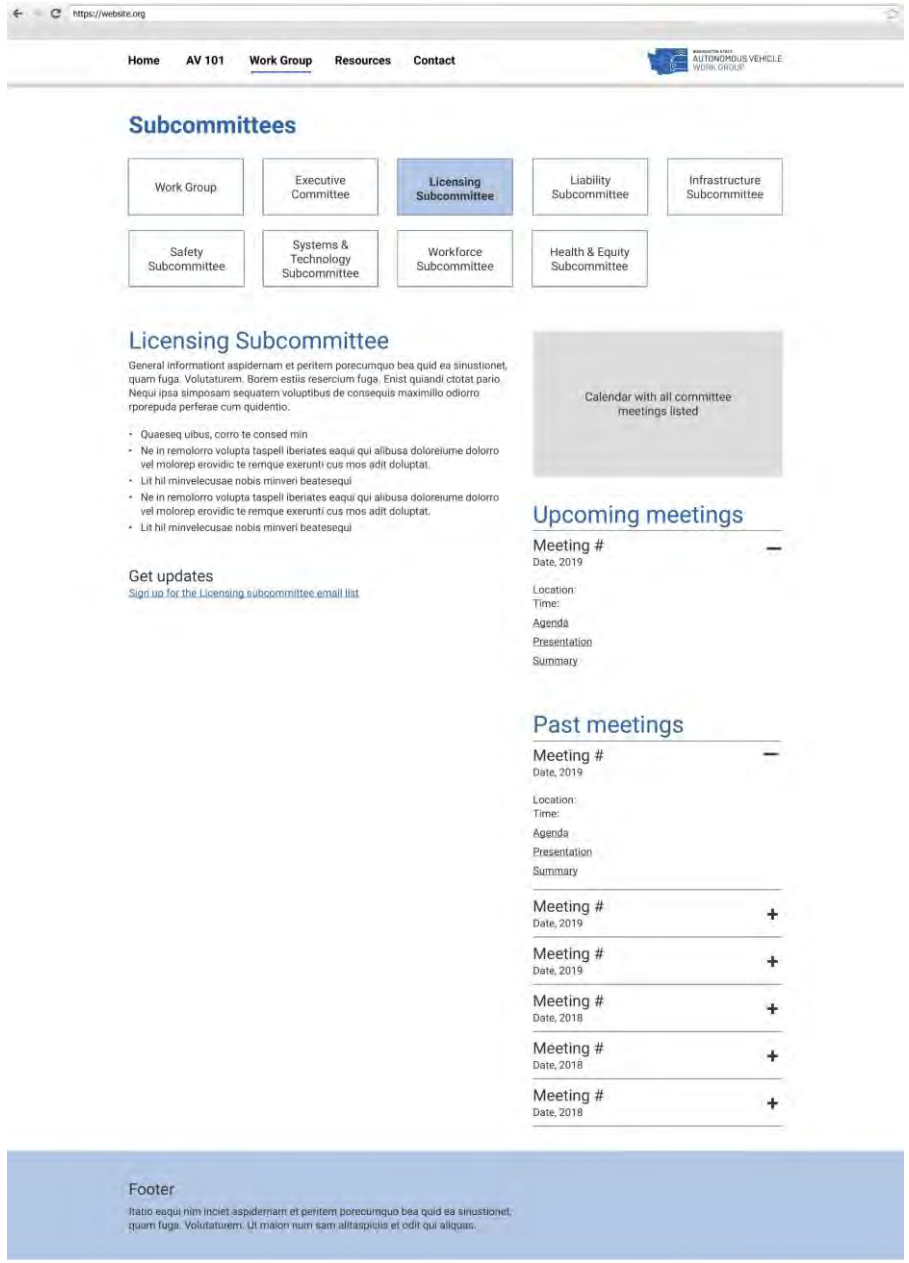
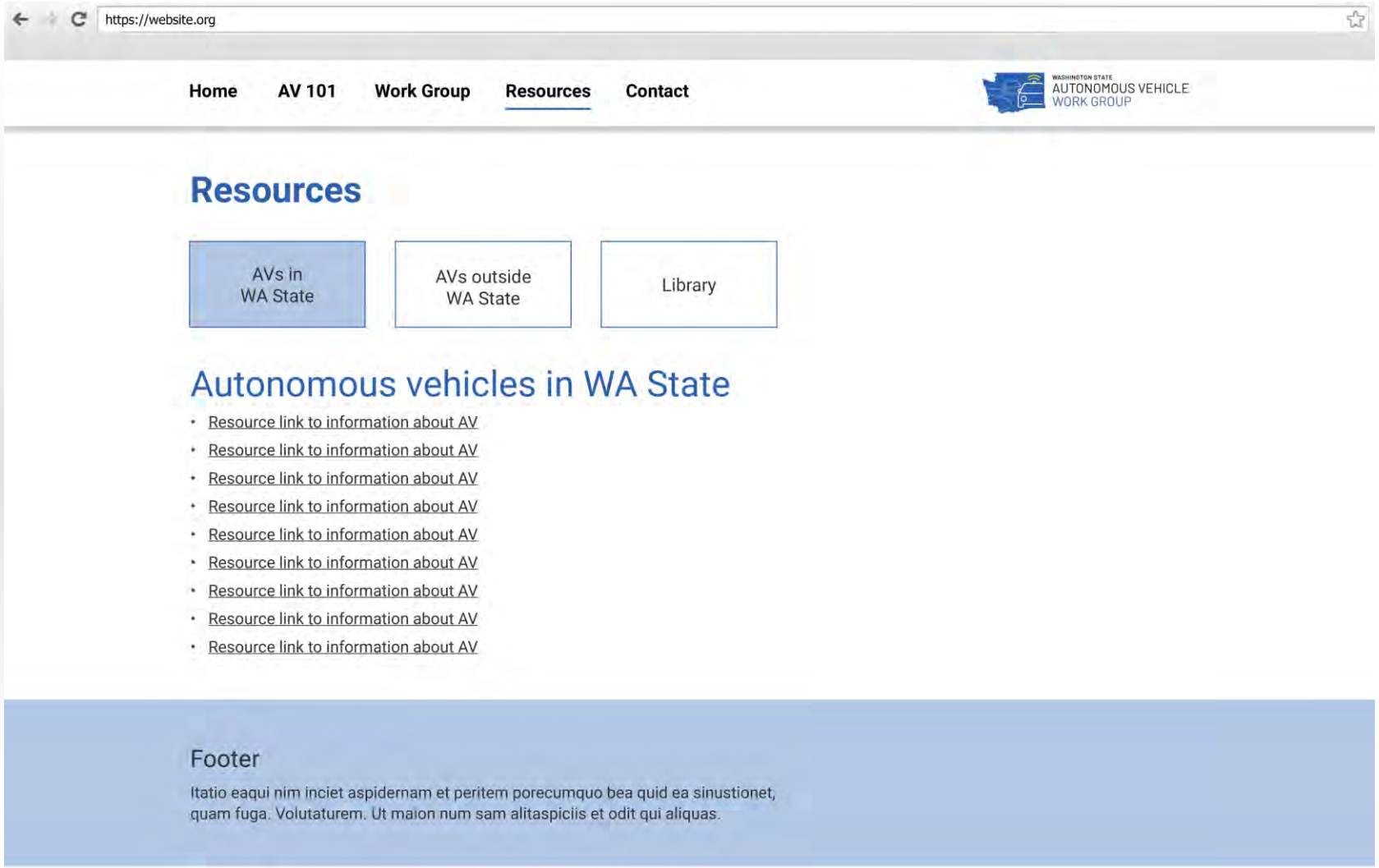
Subcommittees



Resources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Next steps

- Finalize wireframe and look-and-feel
- Draft, review and finalize site content
- Fully develop and beta test website.
- Launch site in November 2019.

Questions?

WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

Washington State
Transportation Commission

BREAK

WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

Washington State
Transportation Commission

Insurance Institute for Highway Safety
Highway Loss Data Institute

How driver assistance features are shaping our driving and traffic safety

Washington AV Work Group
Executive Committee

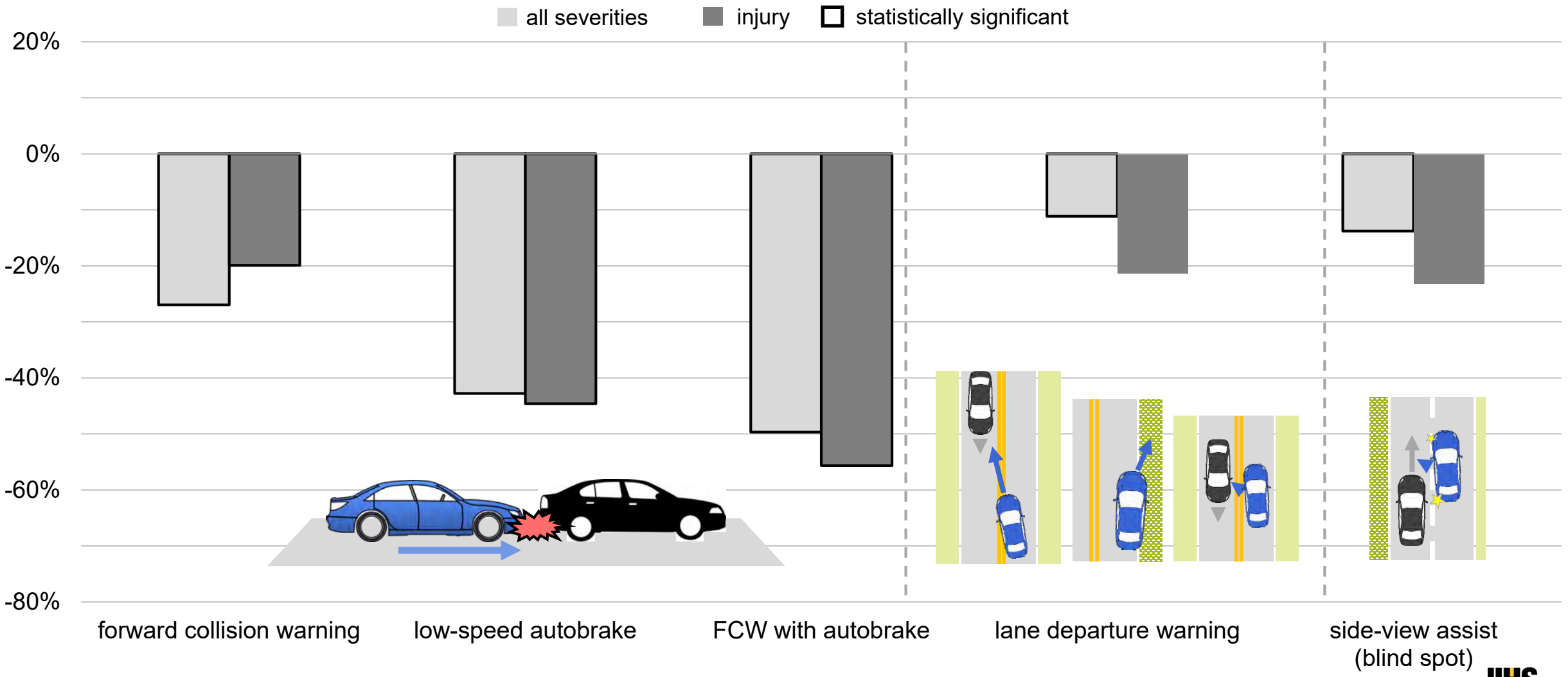
Alexandra Mueller

iihs.org

Safety benefits of crash avoidance features

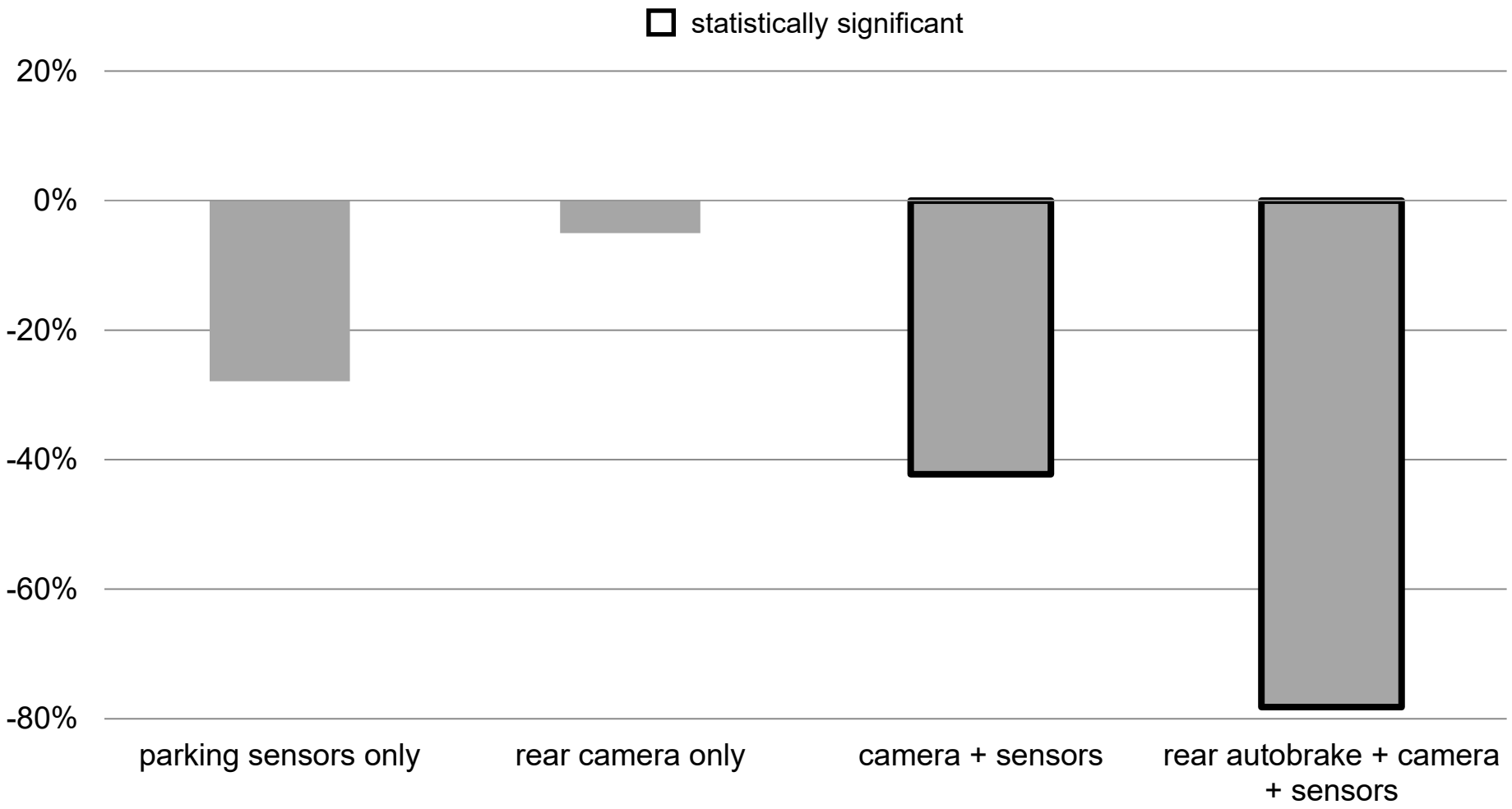
Systems reduce crashes for scenarios they were designed to prevent

Effects on relevant police-reported crash types



Rear autobrake increases effectiveness

Percent difference in police-reported backing crash rates for GM vehicles



IIHS ratings promote effective technologies

front
crash prevention

pedestrian
crash prevention

rear
crash prevention

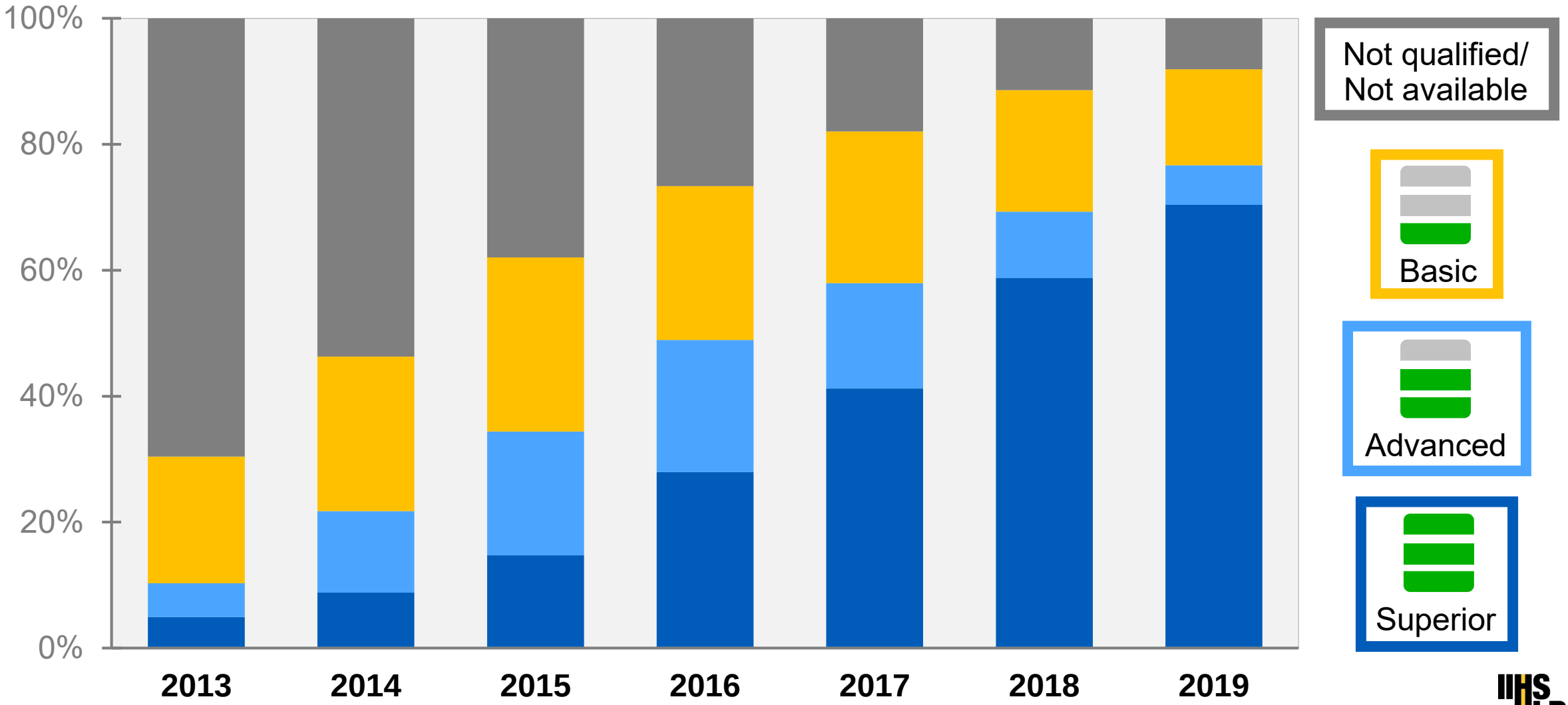
Speed reduction in 12 and 25 mph tests

Volvo S60 2 point advanced	Dodge Durango 3 point advanced	Subaru Outback 6 point superior

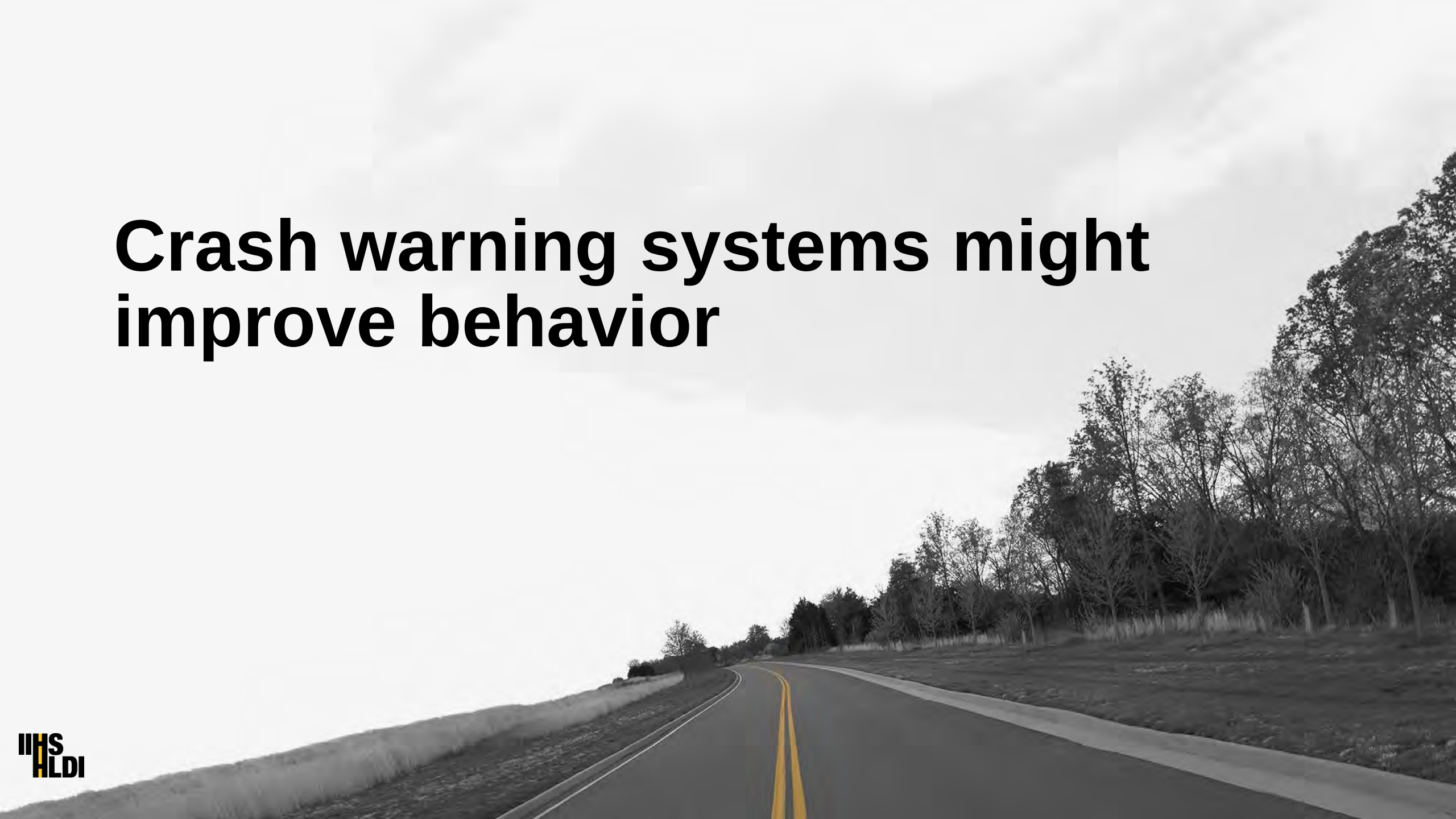
EMBEDDED VIDEO

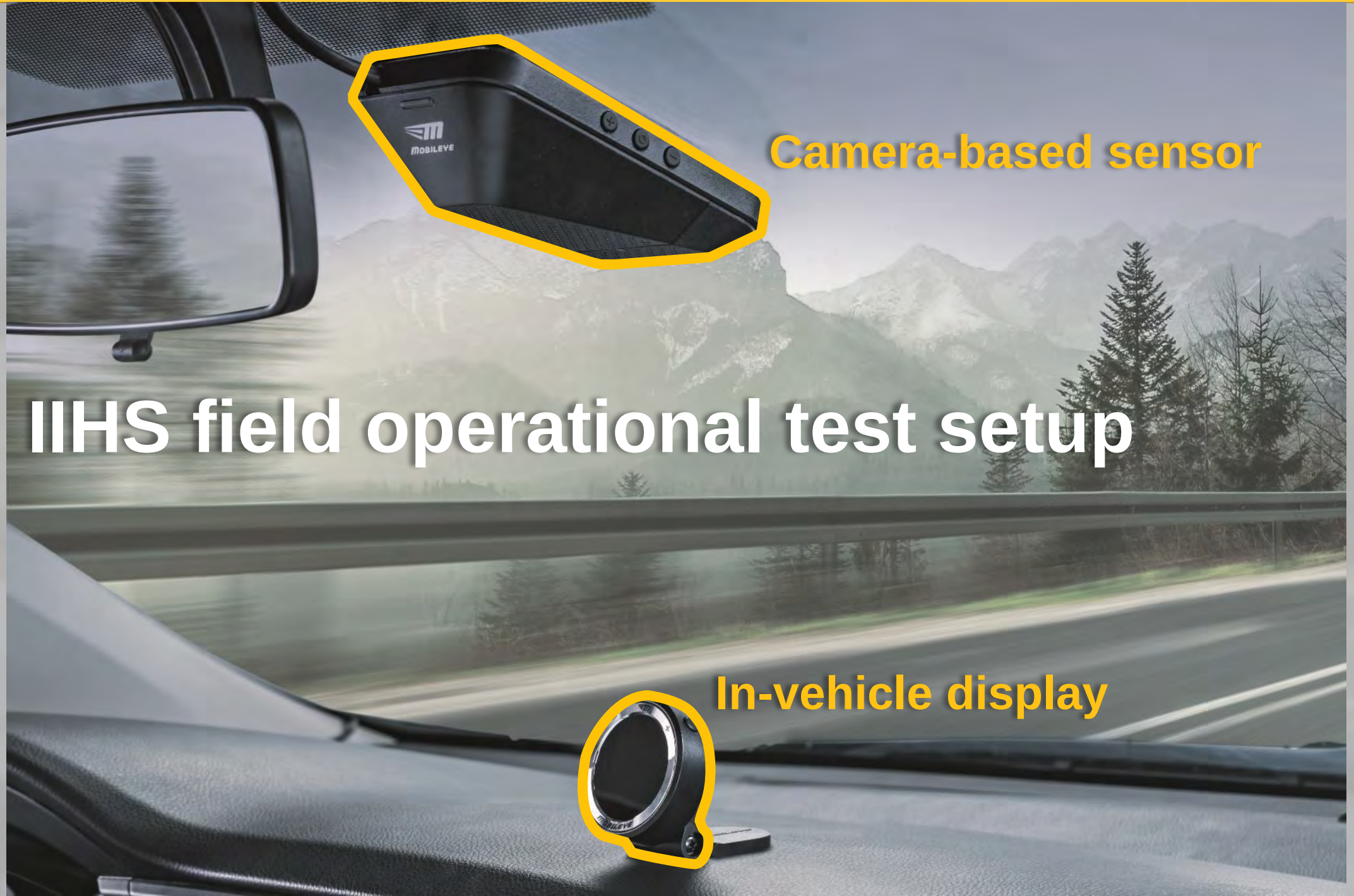
Automakers respond to IIHS ratings

Front crash prevention ratings by model year



Crash warning systems might improve behavior




Camera-based sensor
IIHS field operational test setup
In-vehicle display

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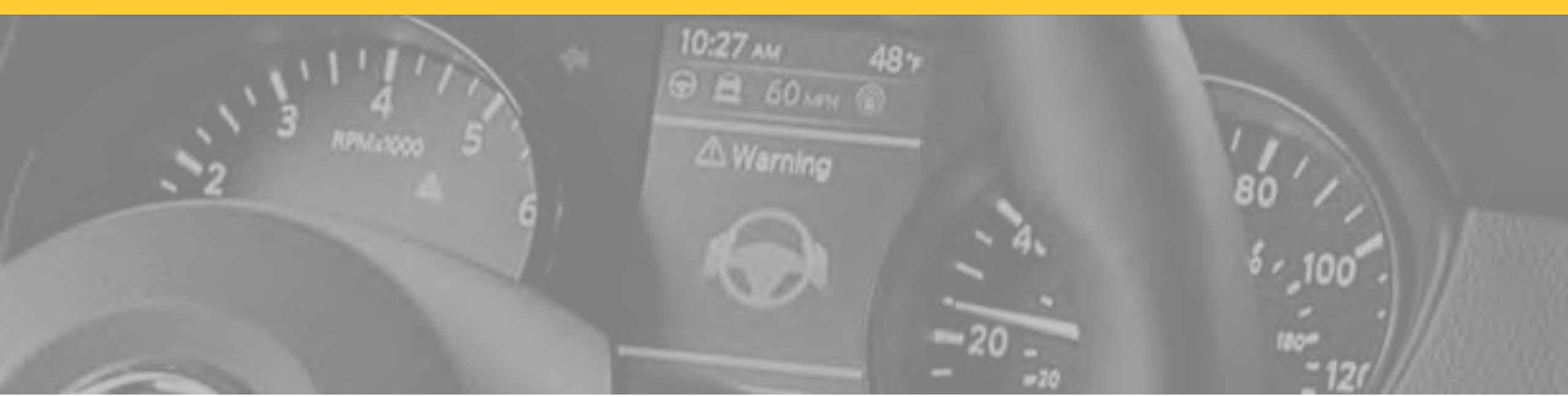


Field study timeline and analysis plan

4-week baseline, warnings silent

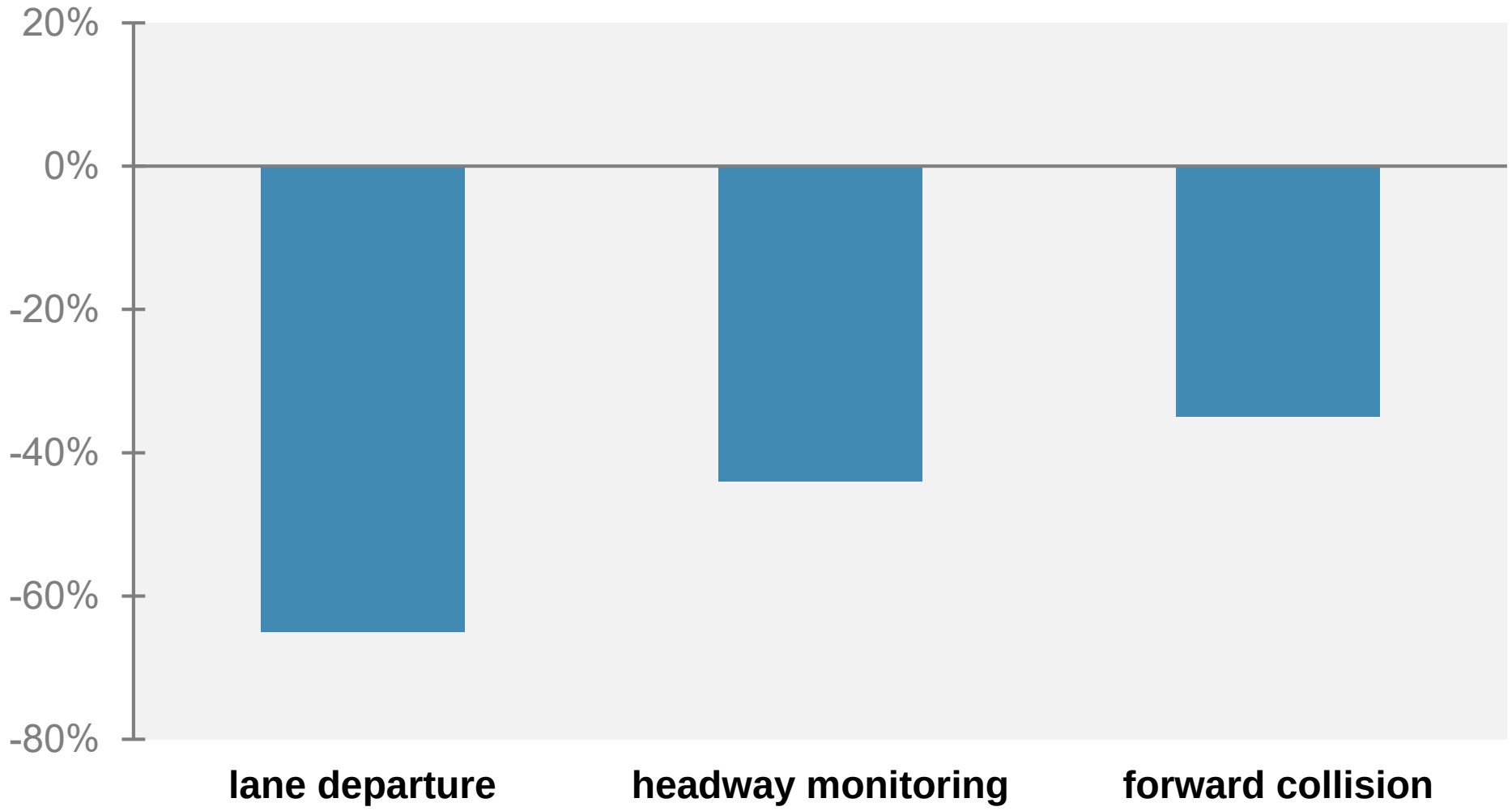
8-week treatment, warnings active

installations
May 2017

warnings activated

Large reduction in warning rates during treatment phase

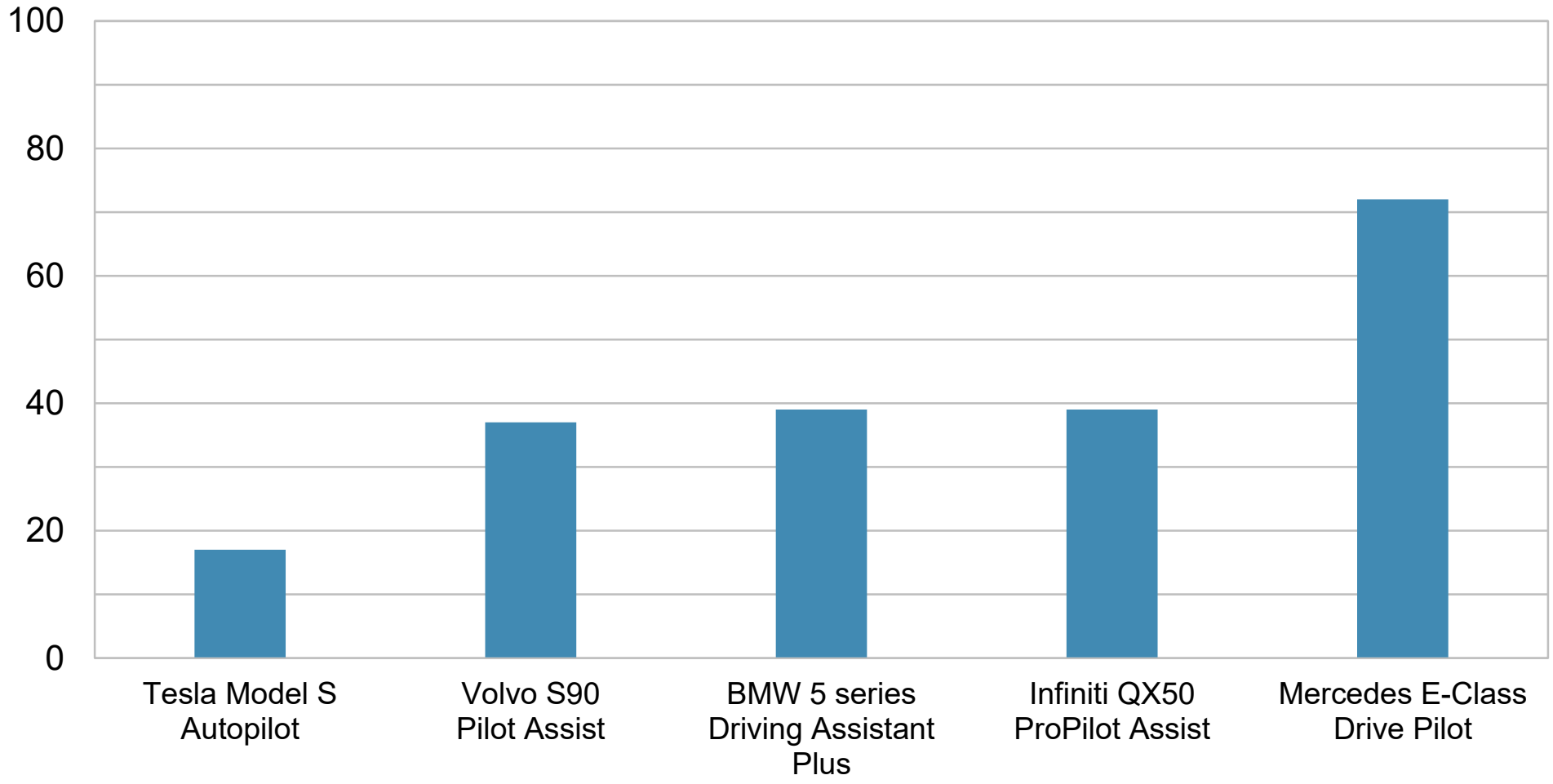
Percent change from baseline



Level 2 driving automation

Driver opinion varies between manufacturers

Percent of drivers who agreed or strongly agreed that the system improved their driving experience



Functional performance testing of adaptive cruise control

2016 Tesla Model S with Autopilot software ver. 7.1

2017 BMW 5 series with Driving Assistant Plus

2017 Mercedes E-Class with Drive Pilot

2018 Volvo S90 with Pilot Assist

2018 Tesla Model 3 with Autopilot software ver. 8.1

Approach stationary target with ACC on

EMBEDDED VIDEO

Test track performance was not necessarily replicated on road

On-road testing – approaching stationary vehicles

EMBEDDED VIDEO

Less common hazards may or may not be detected

On-road testing

EMBEDDED VIDEO

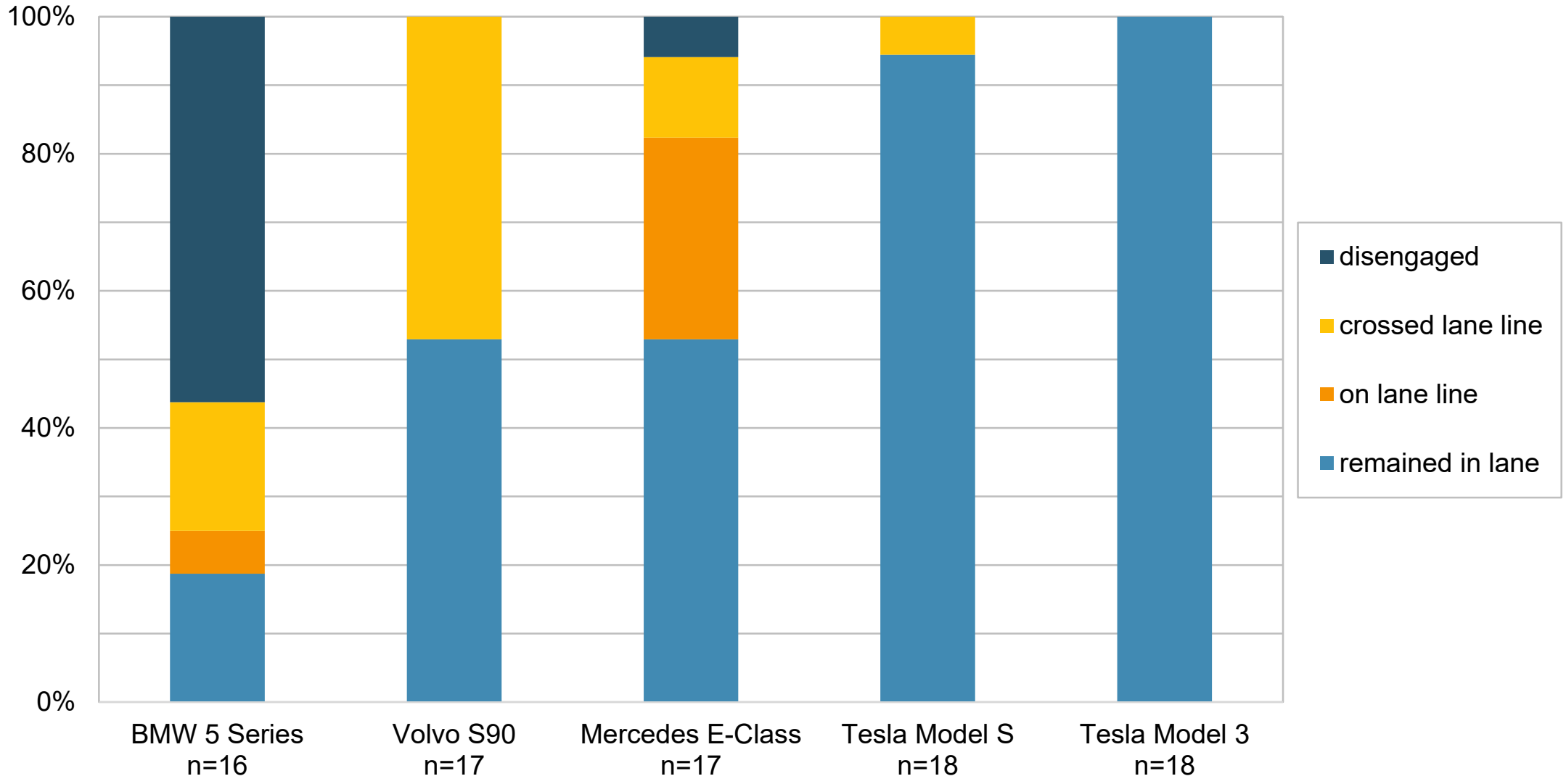
On-road performance of Level 2 systems

Issues with lane centering in curves

EMBEDDED VIDEO

System performance is not the same across manufacturers

Lane centering in curves



On-road performance of Level 2 systems

Issues with lane centering on hills

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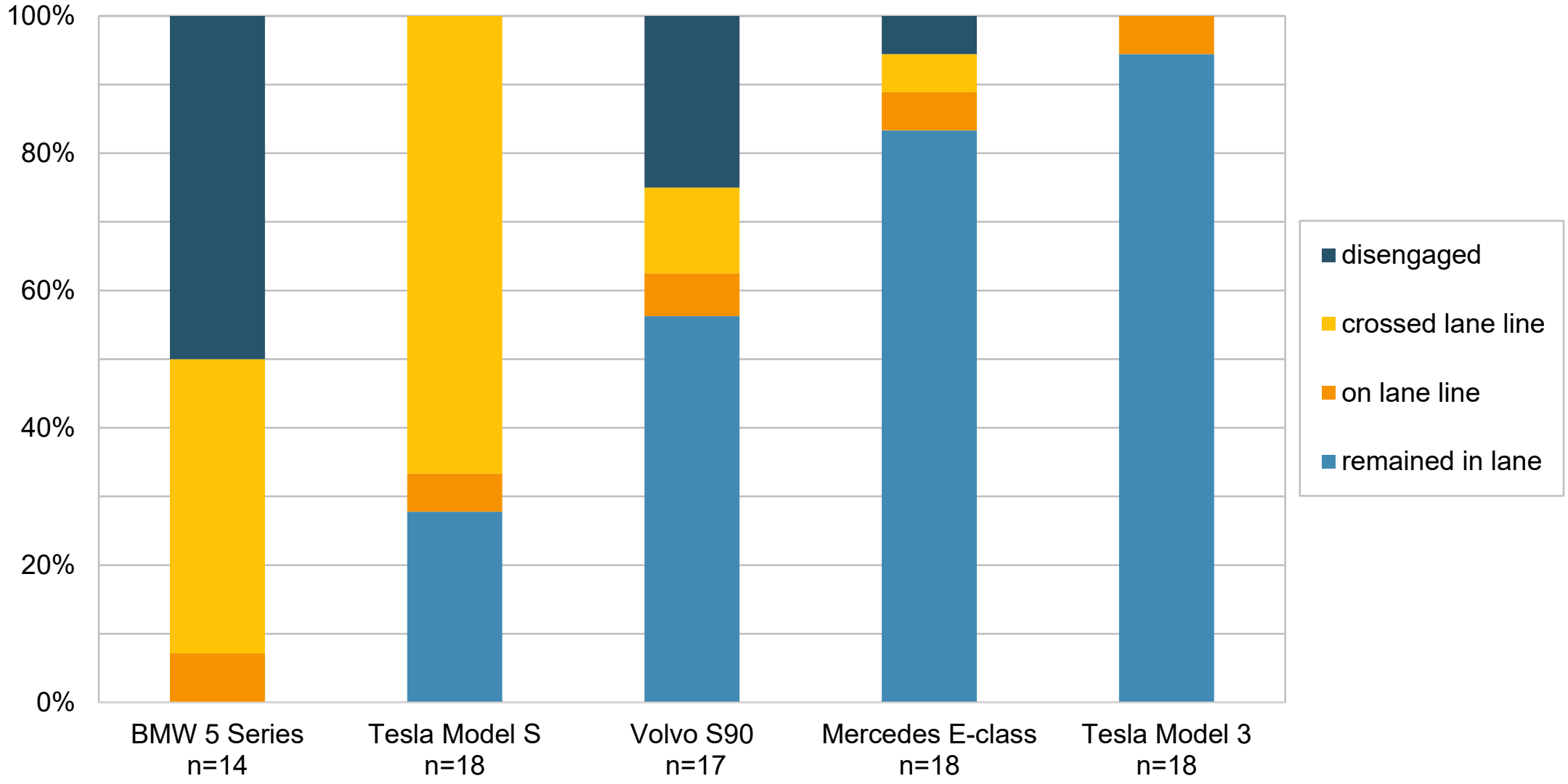
System performance is not the same across manufacturers

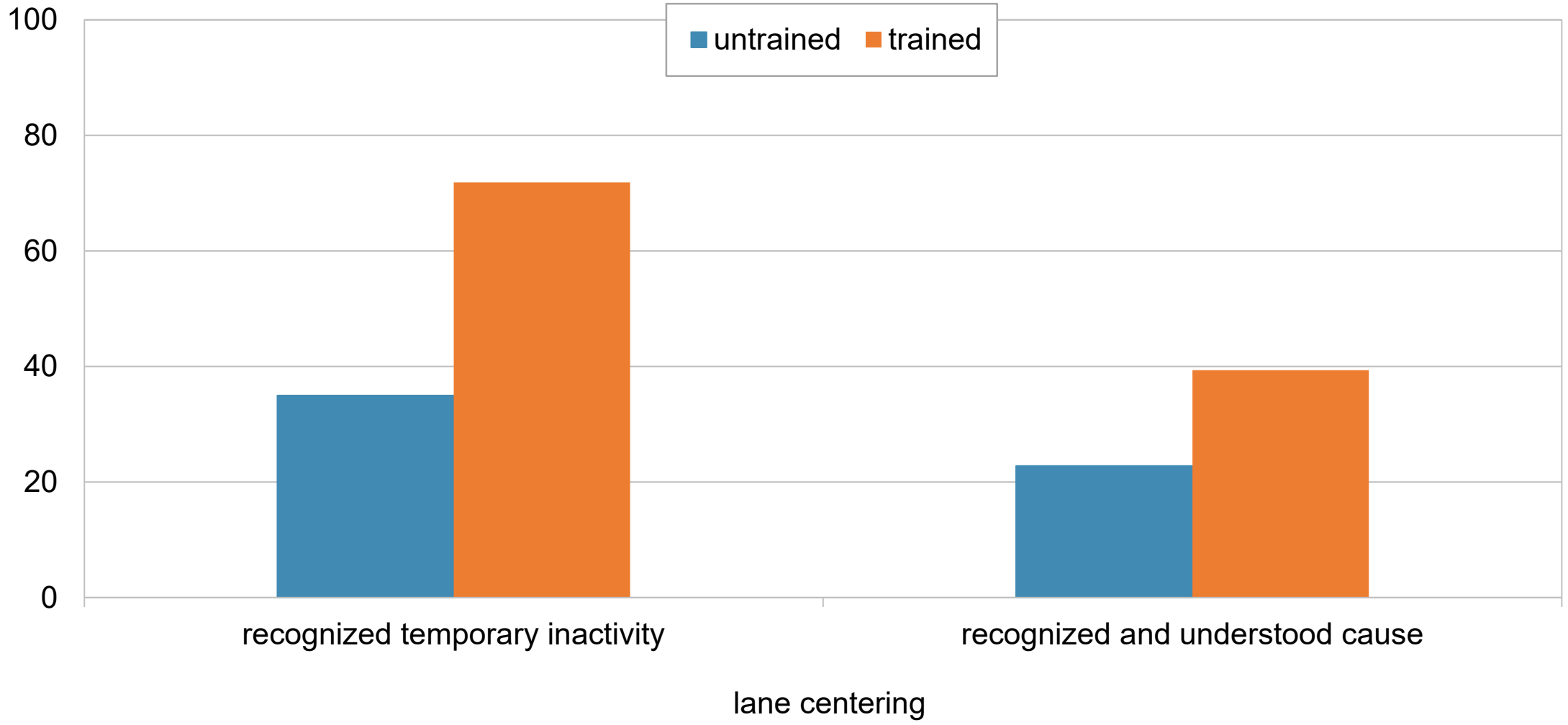
Lane centering on hills




77°F
R
N P
02:12
60 mph
C D8
mph
x1000r/min

System communication is not intuitive to naïve drivers

Accuracy (percent)

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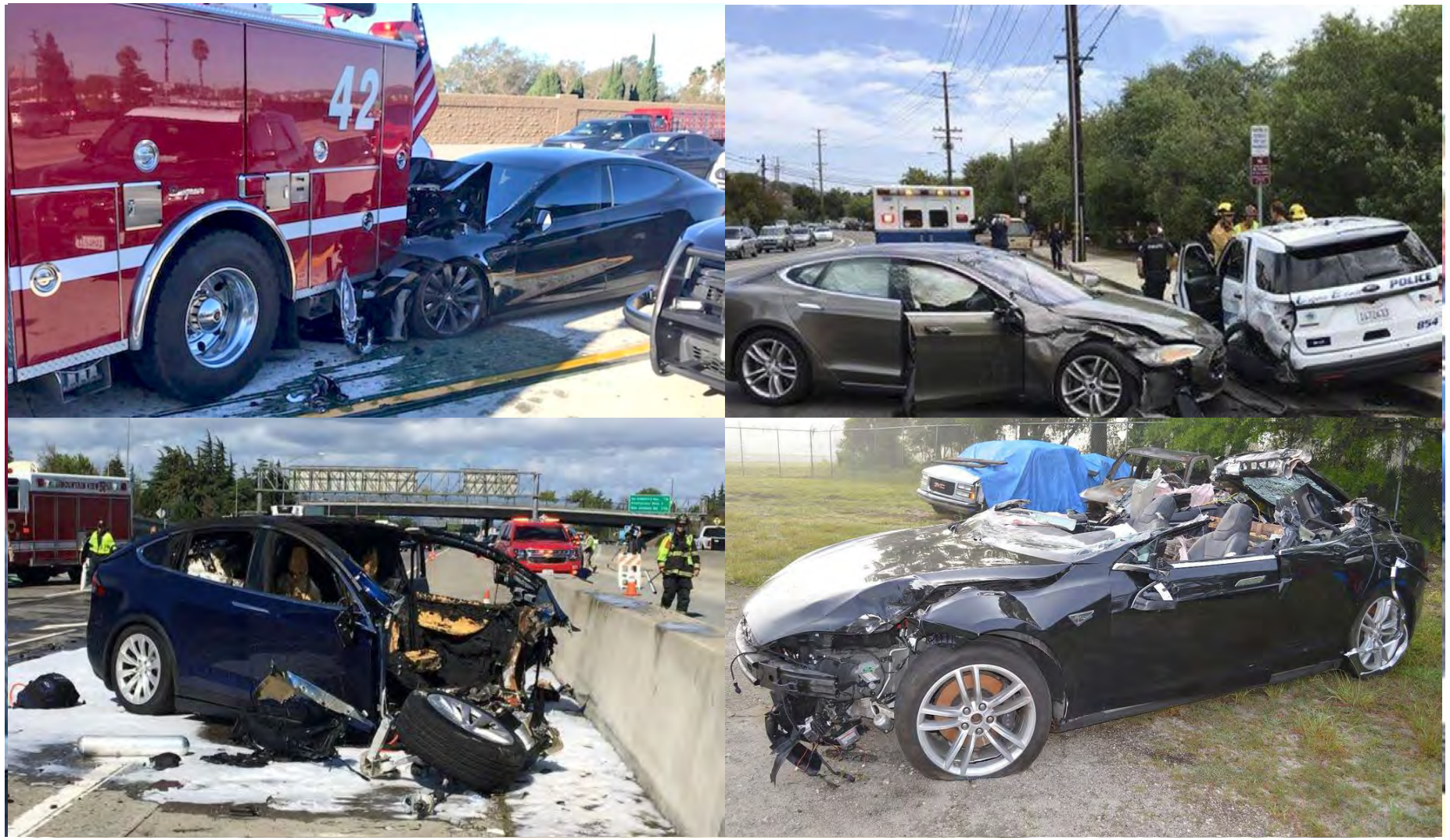
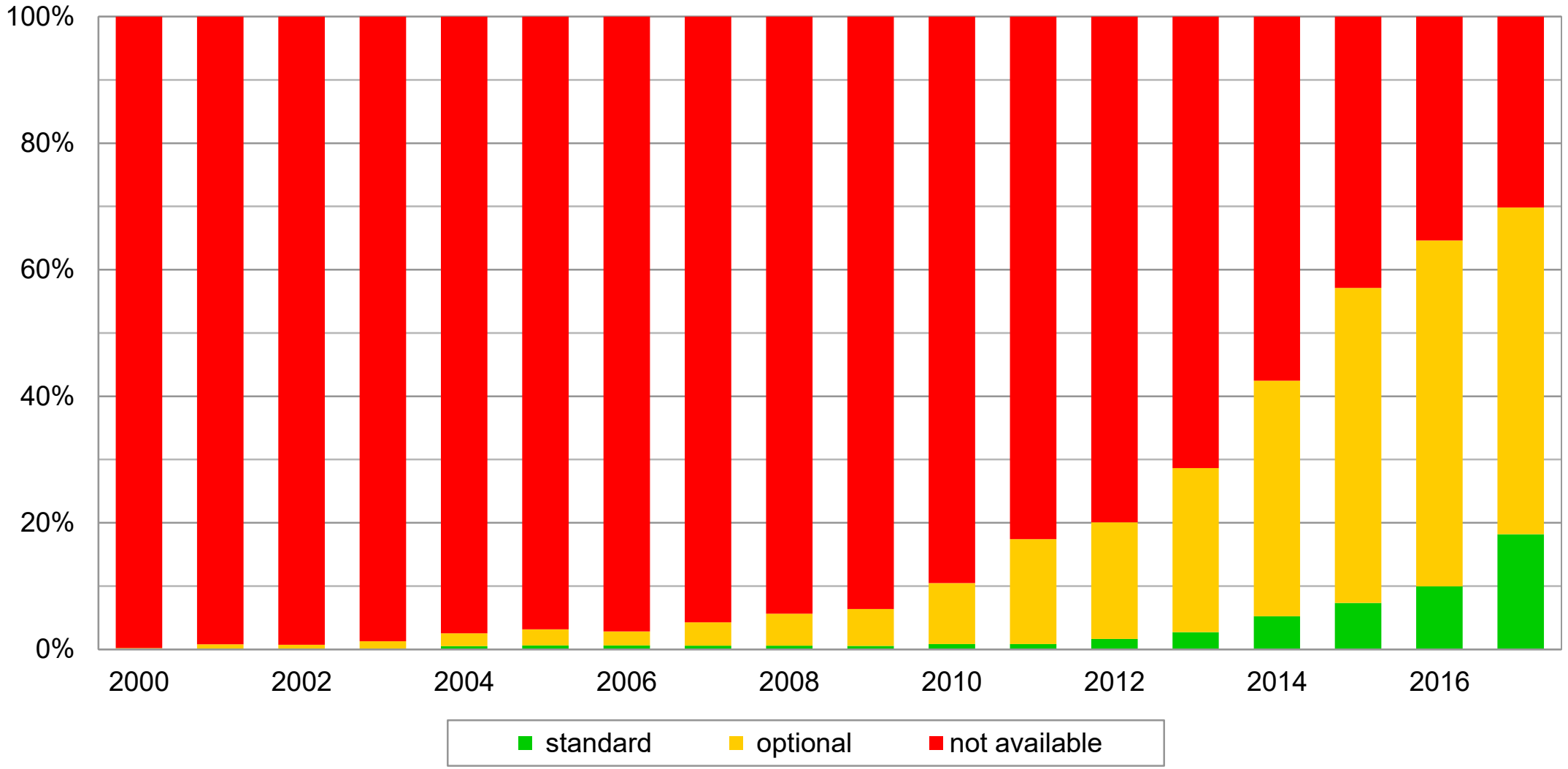
System behavior, notifications, names, and driver distraction



Where do we go from here?

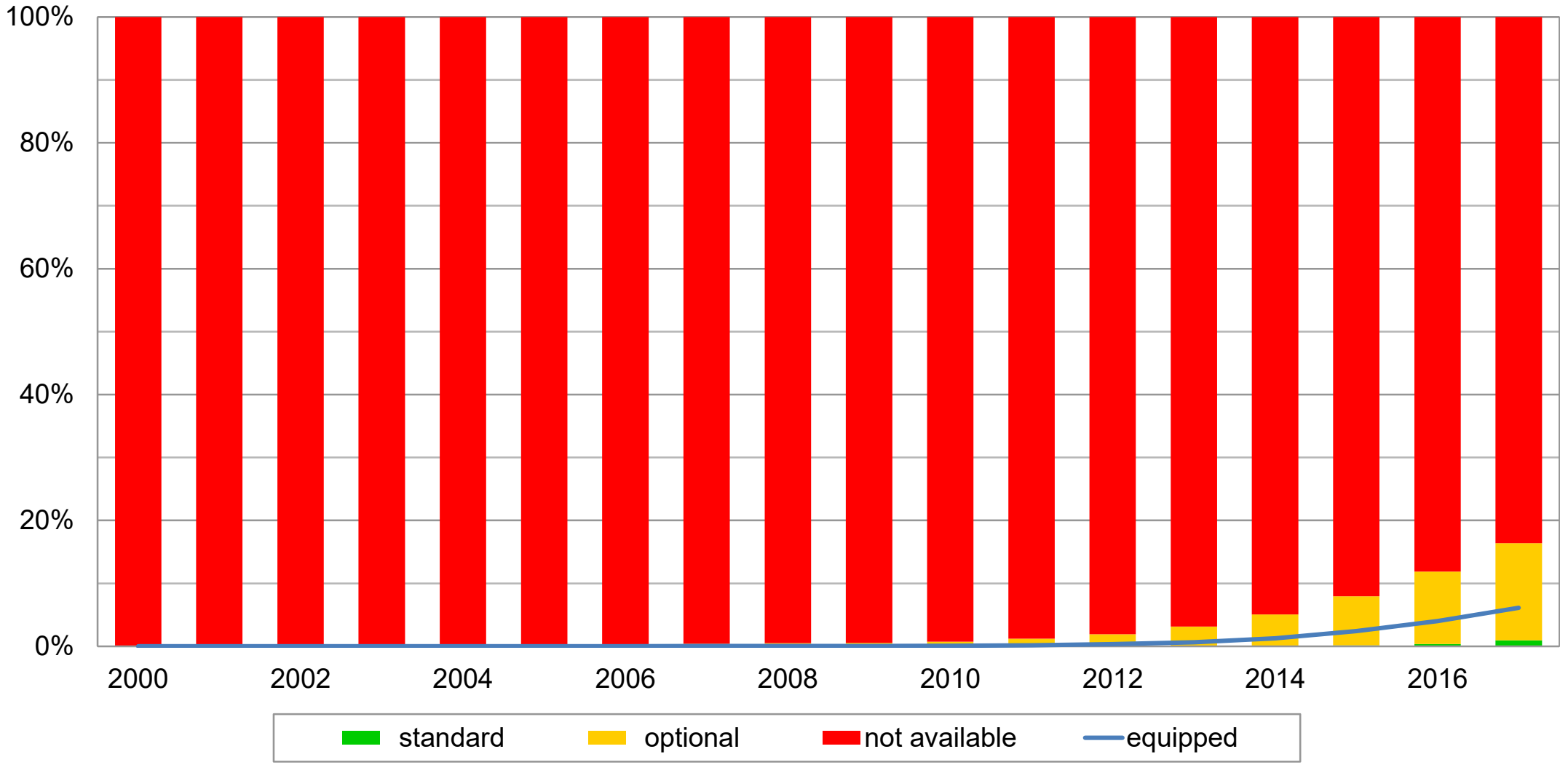
New vehicle series with front crash prevention

By model year

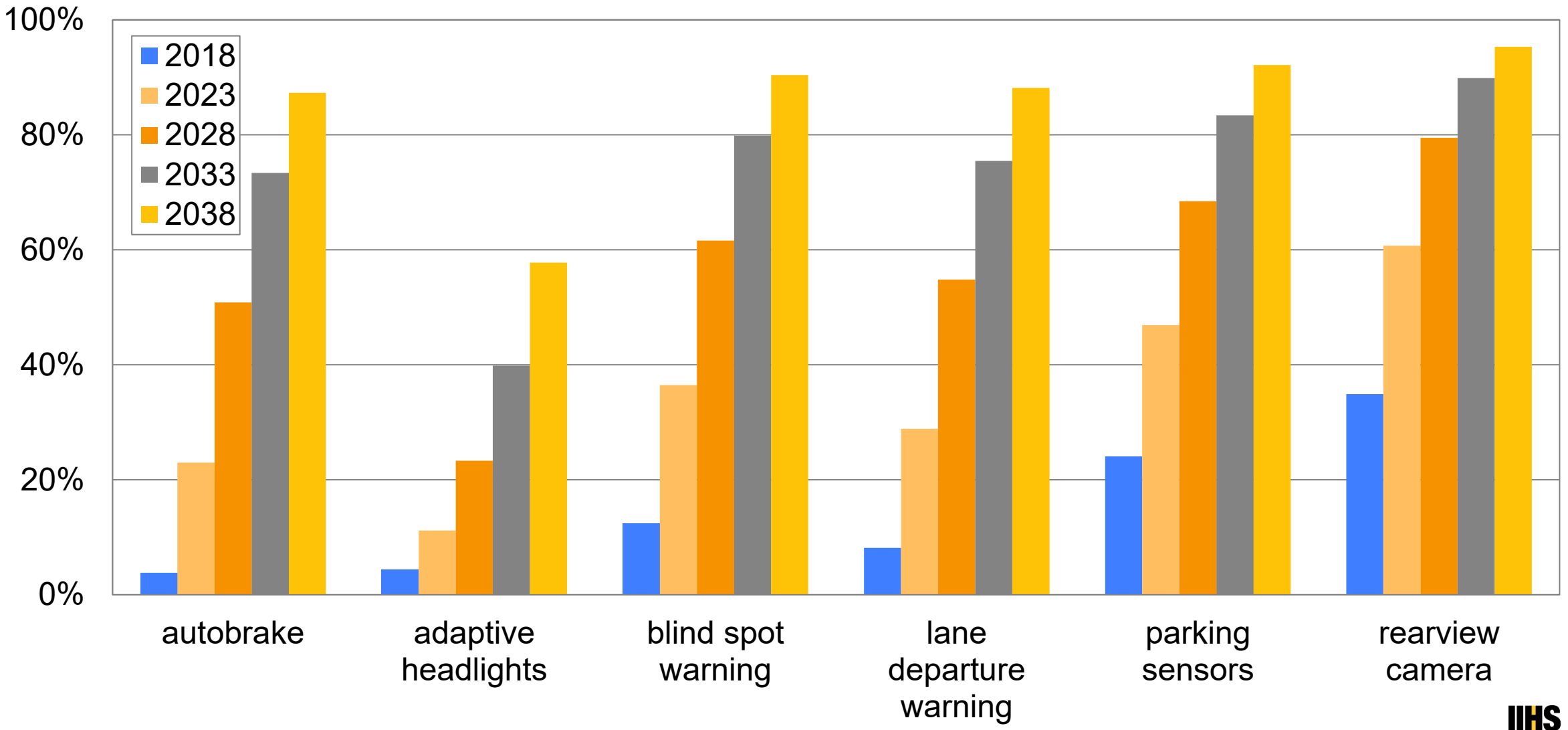


Registered vehicles with front crash prevention

By calendar year



Predicted registered vehicles by feature by calendar year



Waymo: Google self-driving car testing program

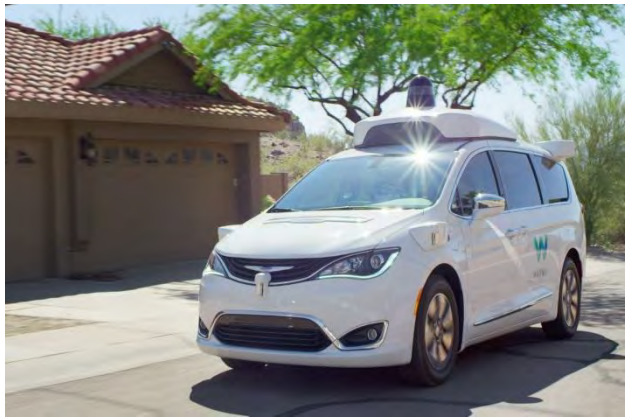
2009-present

- Supervised testing on public roads in Mountain View, CA, and later expanded to Austin, TX; Kirkland, WA; and metro Phoenix, AZ
- Involved in 1/3 as many police-reportable crashes as human drivers per mile traveled in Mountain View, CA
- Vast majority of crashes involved Google car rear-ended by another vehicle (driven by a human)
- So, even if autonomous vehicles are operated extremely safely, there will still be crashes when they are struck by other vehicles driven by humans. Expected crash rate reduction is about two-thirds.

modified Toyota Prius

modified Lexus RX450h

Waymo Firefly prototype low-speed vehicle



modified Chrysler Pacifica

Data are key

Independent objective research is needed to foster public confidence in automated driving

- Deployment for public use of automated driving systems
  - Publicly available VIN-searchable database for all vehicles with level 2 automation and above
    - Listing of all driver assistance and crash avoidance features; level of automation (2+), operational design domains, etc. for each applicable feature
    - All FMVSS exemptions granted by DOT
  - Automatically recorded data in the event of a crash (black-box)
    - 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 might 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
- We need more data to better understand the impact ADAS and higher automation have on traffic safety

Insurance Institute for Highway Safety
Highway Loss Data Institute

More information at iihs.org and on our social channels:

/iihs.org

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IIHS

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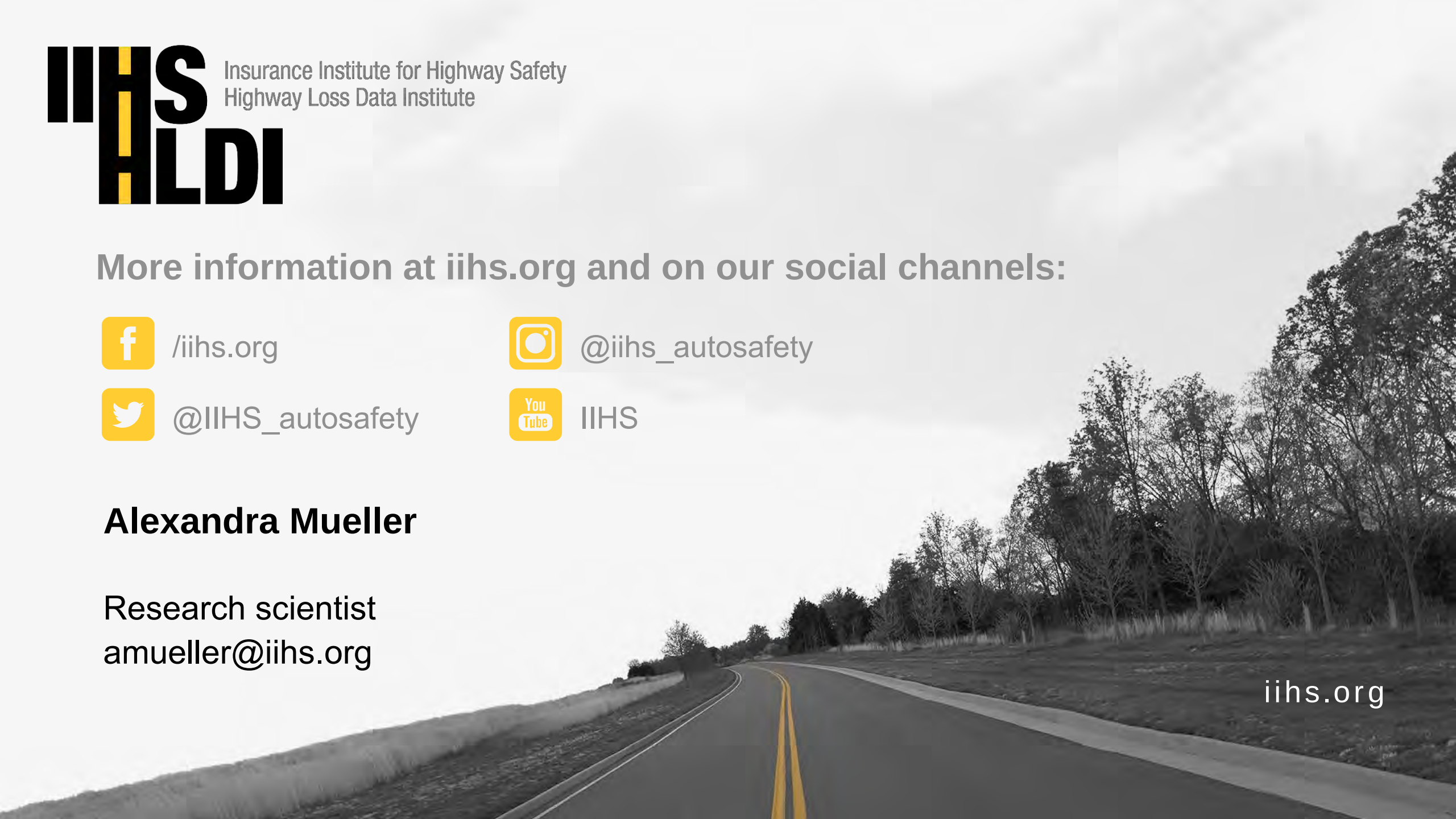

Executive Committee 2020 Meeting Schedule

Reema Griffith, WSTC

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

Washington State Transportation Commission

Executive Committee 2020 Meeting Schedule

- Possible Meeting Dates:
  - **Week of April 20** – possibly Thursday, April 23
  - **Week of June 22** – possibly Thursday, June 25
  - **Week of Sept. 21** – possibly Thursday, September 24

BREAK

WASHINGTON STATE
AUTONOMOUS VEHICLE
WORK GROUP

Washington State
Transportation Commission

Work Session

Executive Committee Areas for Consideration

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

Washington State Transportation Commission

AV Executive Committee Areas for Consideration

HOUSE BILL 2970 (enrolled 2018) – Structure

- Work Group established for ***FIVE YEARS*** – Sunsets **December 31, 2023**
- **Transportation Commission to convene** AV Work Group, consisting of agency heads, legislators, private sector and local jurisdictions
- Transportation Commission is the **lead/responsible entity**, to make recommendations **with input from** AV Work Group
- Transportation Commission to **make recommendations annually** to WA State Legislature and report on progress made by the work group

AV Executive Committee Areas for Consideration

HOUSE BILL 2970 (enrolled 2018) – Direction

- Develop **policy recommendations** to address the **operation** of autonomous vehicles on public roadways in the state
- Modification of **state policy, rules, and laws** to further **public safety** and prepare the state for the **emergence and deployment** of AV technology
- Follow **federal developments**, including recommendations and regulatory rules for the regulation of AVs

AV Executive Committee Areas for Consideration

HOUSE BILL 2970 (enrolled 2018) – Direction

Take into account Transportation System Policy Goals (RCW 47.04.280)

- *Economic Viability*
- *Preservation*
- *Safety*
- *Mobility*
- *Environment*
- *Stewardship*

AV Executive Committee Areas for Consideration

HOUSE BILL 2970 (enrolled 2018) – Areas for Consideration

- Registration and Titling
- Licensing
- Rules of the Road
- Roadway Infrastructure
- Traffic Management
- Transit
- Equity*
- Testing
- Vehicle Insurance
- Tort Liability
- Criminal Law
- Advertising
- Cybersecurity
- Privacy
- Impacts to Social Services
- Impacts to Labor and Small Business

* *Additional area for consideration added by AV Executive Committee as of June 2019*

AV Executive Committee Areas for Consideration

MOVING FORWARD…

- Work Group established in June 2018
- Since that time:
  - 3 Executive Committee meetings
  - 34 Subcommittee meetings
  - 29 expert presentations
  - Continual industry change for deployment challenges, timelines, early use cases, etc.
- ***Knowing what we know now…***
  - ***Are the current areas for consideration the right ones?***
  - ***Are there others the Executive Committee needs to address going forward?***

AV Executive Committee Areas for Consideration

MOVING FORWARD…

- **Actionable:** Of the legislative areas for consideration, which are most actionable in the timeframe of the Work Group?
  - » Enough known to form recommendations
  - » Appropriate to regulate/address within the lifespan of the Work Group
- **Prioritized:** Of the actionable areas for consideration, which are the most critical to safe, responsible AV deployment in Washington State?
- **Missing:** Are there other areas for consideration not envisioned by the legislature which are actionable and critical to success?

AV Executive Committee Areas for Consideration

NEXT STEPS

- **Survey/feedback**
  - » How would the Executive Committee prefer to provide feedback?
- **Summarize and interpret feedback**
  - » Which areas for consideration are the priority of the Executive Committee?
  - » Which subcommittee(s) is most appropriate to address each area for consideration?
- **Provide direction to subcommittees**
  - » Goal: Provide initial direction by 10/31/19

Executive Committee Member Items

Open Forum

WASHINGTON STATE AUTONOMOUS VEHICLE WORK GROUP

Washington State Transportation Commission

Closing Remarks

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Closing Remarks

- **Recap Today's Meeting:**
  - » Action Items
  - » Agreements / Decisions

- **Next Meeting:**
  - » October 15th & 16th – Transportation Commission Meeting
  - » *TBD 2020* – Executive Committee meeting

Thank You!

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