Vehicle Automation, Users, and Safety Benefits

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SIP-adus Workshop 2019

Tokyo, Japan
November 12, 2019

EMERGING TECHNOLOGIES

Research Topics

- User Expectation
- User Acceptance
- User Experience
- Safety Benefits

Technical Documents

Collaboration

https://www.orioninfosolutions.com/

Cultivating Connection

Assessing innovation beyond the dashboard

Traffic Safety Culture Index & Emerging Transportation Technologies (TSCI-ETT)

Survey included items on automated vehicles (AV):

- Understand role of AV in today's traffic safety culture & future
- Characterize users' expectations & acceptance of AV in relation to other factors
- Explore relationship between traditional traffic safety and AV-related beliefs & perception

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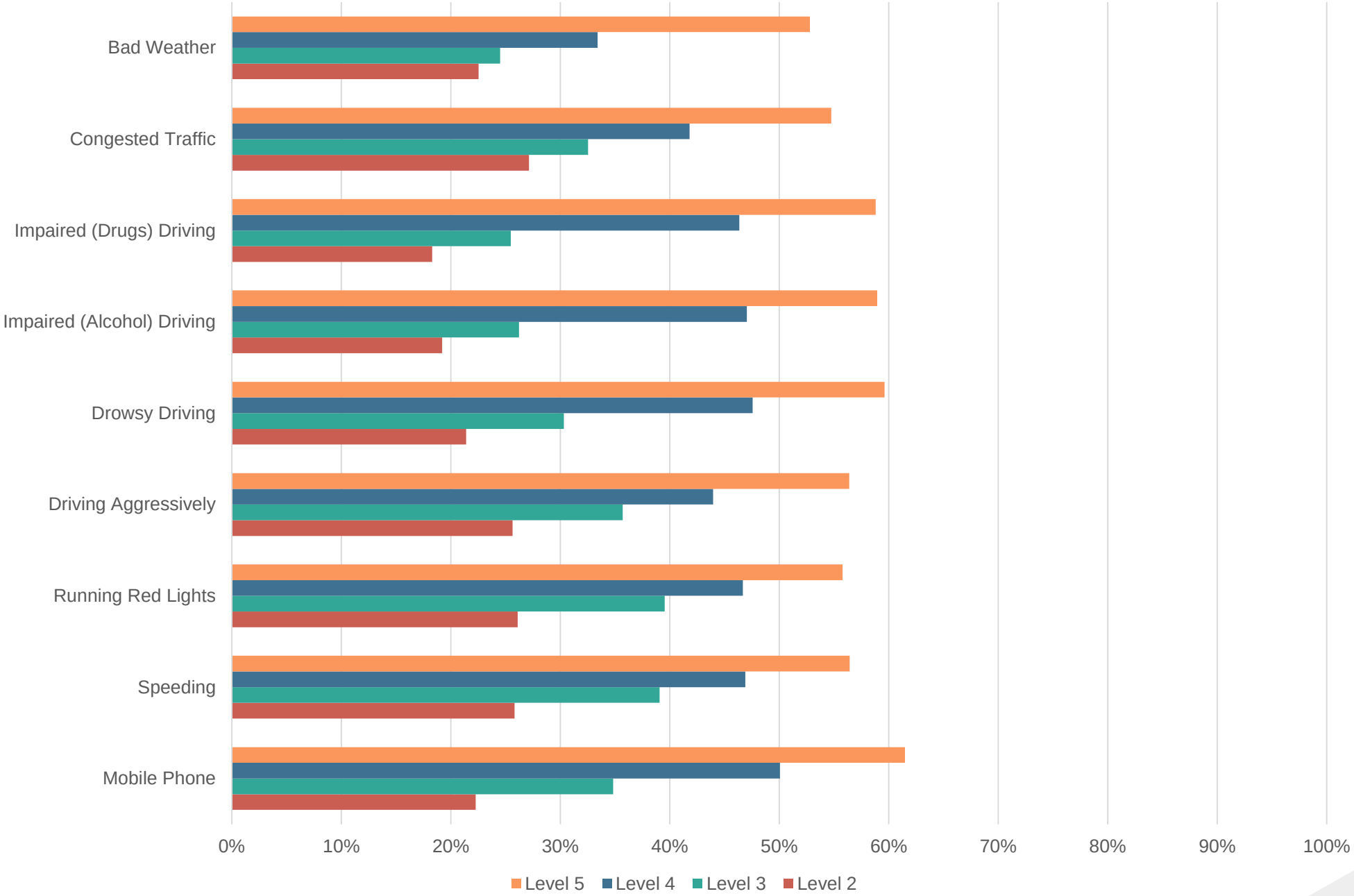
Trust in AV Levels to Prevent Crashes due to Certain Factors



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Evaluating Advanced Technologies' Impact on Driver Workload

- Evaluate impact of AV technology on drivers' workload, arousal, trust, & performance
  - Driver monitoring strategies for maintaining adequate attention to driving
  - Age-related differences when using L2 automation

Study Approach

- On road, controlled study/naturalistic driving study (NDS)
  - Controlled sessions (primary, secondary, survey/subjective, and physiological measures)
  - NDS (surveys, driver behaviors/activities, video data)
- 45 drivers in 5 different vehicles
- Each participant with a vehicle for 8 weeks

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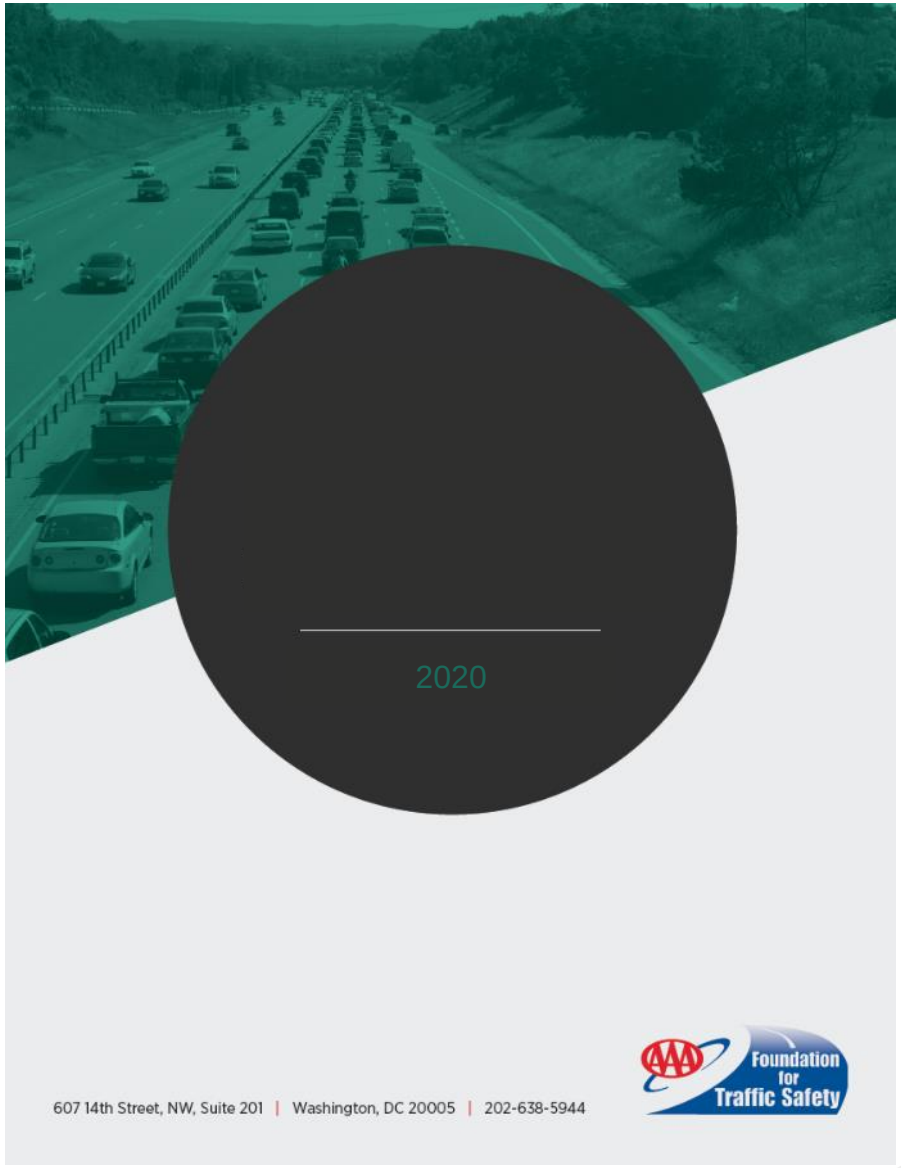
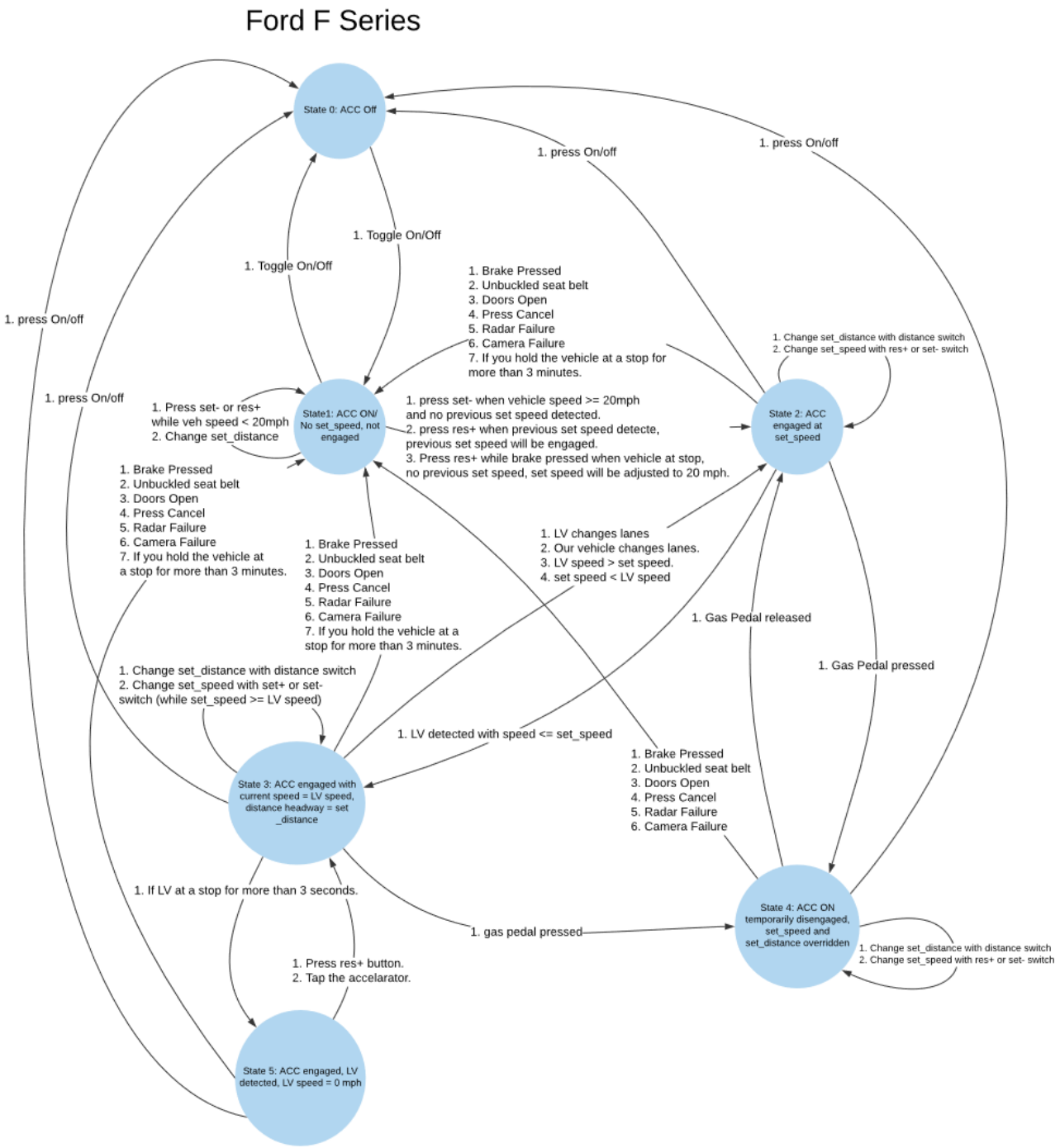
Impact of Drivers' Mental Models of Advanced Vehicle Technologies on Safety and Performance

- Examine how errors in drivers' understanding (mental models) of automated systems impact their in-vehicle behaviors, safety & performance





Review and development of error taxonomy

- Task analysis for ADS and ADAS errors

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Driving simulator study

- Measure and differentiate drivers with good, moderate and poor mental models
- Examine driver performance and safety in critical “edge case” scenarios
- 108 subjects

SAFER SIM

SAFETY RESEARCH USING SIMULATION

UNIVERSITY TRANSPORTATION CENTER

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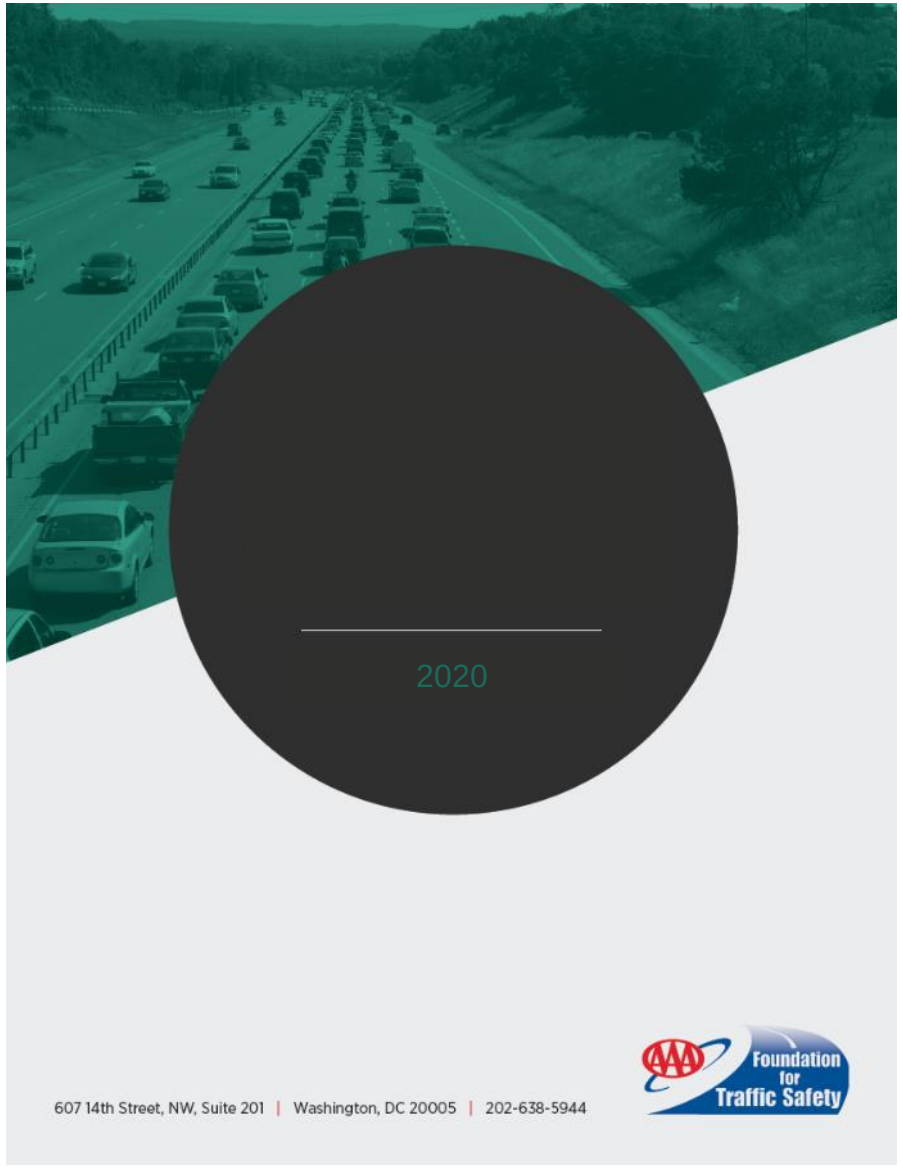

Impact of Information Sources on Consumer Understanding of Automated Driving Systems

- Many drivers do not understand limitations of advanced vehicle technologies
- Names not standardized, may contribute to confusion
- Consumer information vs. understanding & behavior

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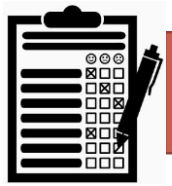
6 experimental conditions

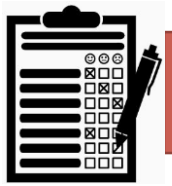
15 participants per information type and marketing approach

	Training Method		
Marketing / Branding	Quick-start guide	Video	In-person demo
AutonoDrive (emphasize capability)	15	15	15
DriveAssist (emphasize limitations)	15	15	15



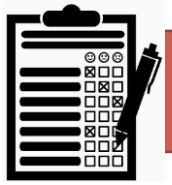
1. Initial questionnaire
demographics, driving habits, personal characteristics

2. Vehicle feature training



3. Post-training questionnaire
mental model of system capabilities, functions, expectations

4. On-road drive using L2 feature
~40 minutes on freeway



5. Final questionnaire
mental model of system capabilities, functions, performance assessment

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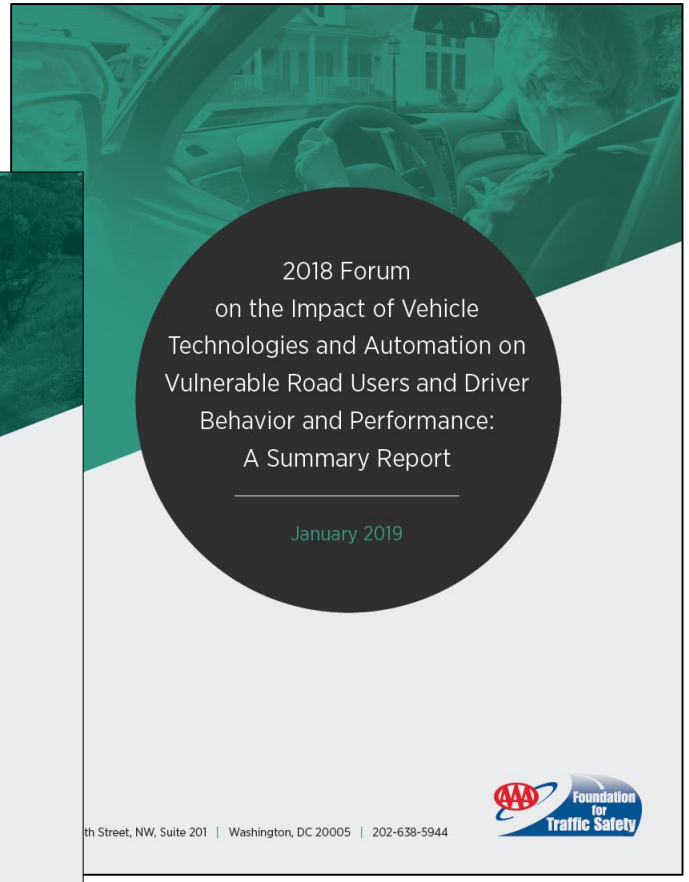
Impact of Vehicle Technologies & Automation Forums



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https://quotefancy.com/quote/5393/Helen-Keller-Alone-we-can-do-so-little-together-we-can-do-so-much

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