Mixed-Function Automation Naturalistic Driving Study

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Methods
- Naturalistic driving study
- 120 high-mileage drivers from the Northern Virginia/Washington, DC region
- Each participating for 4 weeks
- Divided equally between males and females
- Younger drivers: 25 - 38 years old
- Older drivers: 40 - 54 years old

Mixed-Function Automation
- Ability to simultaneously activate automated lateral and longitudinal controls
- Operated by drivers with hands off wheel and feet off pedals; however, drivers need to be prepared to intervene if needed
- Alerts notify drivers to intervene

Purpose
- Explore how drivers interact with market-ready MFA in a real-world setting
- Explore drivers' overall use of the MFA systems in mixed traffic under a variety of roadway types, driving conditions, and speeds
- Explore the types, durations, and frequencies of non-driving tasks performed when an MFA system is activated
- Explore how drivers' interactions (e.g., sequence of events when regaining control, non-driving task engagement) change over time

Participants receive training designed to mimic that offered by dealerships with purchase of a new vehicle with MFA.
- Data collected with VTTI's NextGen and MiniDas data acquisition systems
- Subjective data gathered pre- and post-participation and weekly during the study

GPS traces of MFA usage in the Washington, DC Area

Areas to be Explored
- Driver engagement
- Driver performance
- System performance
- Driver-system interaction
- Driver interface design
- Unintended use
- Unintended consequences
- Safety and security
- System failures
- Licensing and training

Longer Drive Substudy
- Participants will drive a Tesla Model S 4-5 hours in a circuitous route out of VTTI campus in Blacksburg, VA
- What driver behaviors are observed when the MFA systems are active during longer duration drives?
- Is there a greater prevalence of non-driving tasks near the end of a long drive, compared to the beginning of the drive?

Stakeholders and International Collaboration
Industry stakeholders from the U.S. and the international community representing original equipment manufacturers, Tier 1 suppliers, and research organizations are providing input to this project.

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