HUMAN FACTORS TEAM | biannual highlights

FAST LANE

Exploring Human Behavior

Turner-Fairbank
Highway Research Center

Safety R&D Program

SUMMER 2021 | VOLUME 14

Hot Off the Press

Roldan, S. M., T. B. Gonzalez, and M. Arnold. 2021. *Effective Indicators of Partially Automated Truck Platooning*. Report No. FHWA-HRT-21-016. Washington, DC: Federal Highway Administration.

Weaver, S. M., S. M. Roldan, T. B. Gonzalez, and B. H. Philips. 2021. *The Effects of Vehicle Automation on Driver Engagement: The Case of Adaptive Cruise Control and Mind Wandering*. Report No. FHWA-HRT-21-017. Washington, DC: Federal Highway Administration.

Meet the Team

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Source: FHWA.

TRAVEL LANE

Current Research:

- **Return to Data Collection –** Summer of 2021 marked a return to data collection for several human factors research projects.

  - Data collection is underway in the Highway Driving Simulator (HDS) at Federal Highway Administration's (FHWA's) Turner-Fairbank Highway Research Center (TFHRC) under the joint project, **Driver Interaction With Partial Driving Automation Technology When Passing Bicyclists in a Shared Use Lane**, and **Response to Emergency Vehicles When Driving in a Mixed-Vehicle Fleet**. The studies are being led by Michelle Arnold and Jesse Eisert.

Source: FHWA.

  - FHWA staff are being recruited to drive the National Advanced Driving Simulator miniSim™ at TFHRC to investigate **Human Factors Issues Related to Truck Platooning**, a study led by Michelle Arnold.

  - The Office of Safety Research and Development (R&D) Human Factors Team's field research vehicles were modified to allow remote interactions between a participant and a researcher to support data collection for the project, **Exploring the Effects of Vehicle Automation and Cooperative Messaging on Mixed Fleet Eco-Drive**, led by Jesse Eisert.

Source: FHWA.

  - The study, **Guidelines on Variable Message Sign Messaging During Non-Recurring Events**, led by Michelle Arnold, was adapted to collect data remotely using web conferencing software. Data collection is underway.

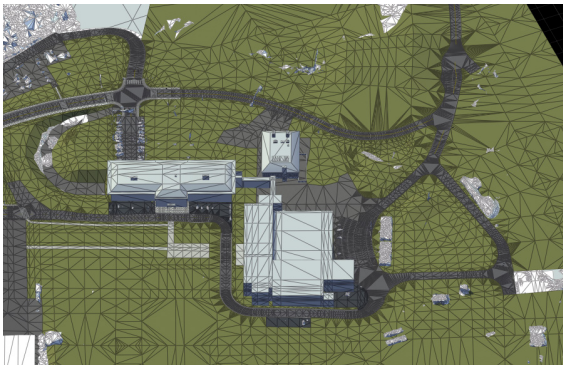
  - FHWA staff are being invited to TFHRC Human Factors Sign Design and Research Facility to collect data for the project, **Evaluation of Additional Alternatives of, and Arrow Sizes for, Overhead Arrow-per-Lane Guide Signs**, led by Laura Mero.

  - Data collection for the project, **Evaluation of Aesthetically Treated Crosswalks**, led by Jesse Eisert, is being conducted offsite. The driving portion was completed and the pedestrian portion of the study is currently underway.

  - Data collection for the project, **Enhancing Conspicuity for Standard Signs and Retroreflectivity Strips on Posts**, led by Laura Mero was completed.

TRAVEL LANE Current Research *(continued)*

- **HDS – CARMA℠ Integration.** The Office of Safety R&D's Human Factors Team is working with members of the Office of Operations R&D's Cooperative Automation Research Program to integrate the CARMA platform into the HDS. The team's first step is to create a common scene simulation environment by developing a virtual replica of TFHRC campus that can be driven using the HDS. The goal is to combine road- and simulation-based testing scenarios using cooperative-automated driving system (C-ADS) behaviors as defined in CARMA. These scenarios also allow Human Factors testing of these features through simulation and improve simulation of C-ADS with real world, model verification. Contact Brian Philips for more information on this effort.



Source: FHWA.

THE ROAD AHEAD

Looking forward

- **HDS Visual Upgrade.** The Human Factors Team is excited to announce the visual upgrade of FHWA's HDS at TFHRC. The new, state-of-the art system will feature seven vertically mounted 4K high-resolution dynamic range projectors. The simulator will use the latest upgraded hardware and software to produce world-class realistic simulation scenes to enable the next generation of human factors driving research. Contact Brian Philips for more information on this project.
- **Intersection Crossing Behavior of Human Drivers and Automated Vehicles Below and Above 15 mph.** The Human Factors Team is preparing to collect data for this study led by Jesse Eisert. Researchers will assess how driver behavior is affected by information about the duration of an upcoming green traffic signal. The Team will also look at how the behavior of pedestrians approaching an intersection compares with automated vehicles approaching the same signalized intersection.

MILEPOSTS

Recent activity

- **FHWA Safety Discipline Meeting.** On April 21, 2021, Laura Mero and Jesse Eisert presented research on aesthetically treated crosswalks on the FHWA Safety Discipline monthly call.
- **2021 National Association of County Engineers' Annual Conference.** On April 22, 2021, Laura Mero and Jesse Eisert presented updates on bicycle and pedestrian research and on the Traffic Control Device Consortium Pooled Fund Study (TCD PFS) at this virtual conference.
- **Transportation Association of Canada's Spring Technical Meeting.** On April 27, 2021, Michelle Arnold presented on the ongoing project, "Human Factors Issues Related to Truck Platooning Operations," at this virtual meeting. The presentation included an overview of the project and results from the recently published TechBrief, *Effective Indicators of Partially Automated Truck Platooning*.
- **FHWA Human Factors Team Meet with National Highway Traffic Safety Administration (NHTSA) on Research in the Biden Administration's Priority Areas.** In May 2021, members of the Human Factors Team met with NHTSA's Human Factors and Engineering Integration Office to discuss human factors, pedestrian, and automated vehicle research that aligns with President Joseph R. Biden's priority areas of safety, economic recovery, and climate change. FHWA staff shared their current and planned research and the research tools at TFHRC.
- **Ensuring Cooperative Driving Automation (CDA) Vehicles and Vulnerable Road Users (VRU's) Safety Through Infrastructure.** This project, led by Jesse Eisert, kicked off in May 2021. It will seek to identify potential infrastructure solutions, countermeasures, and strategies to facilitate safe interactions between CDA equipped vehicles and VRU.
- **TCD PFS 2021.** The TCD PFS 2021 Annual Meeting was held virtually in early August 2021. Laura Mero is the lead for the PFS.

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