



FAST LANE

Exploring Human Behavior

Turner-Fairbank

Highway Research Center

Safety R&D Program

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Meet the Team

Brian Philips – Human Factors Team Lead
brian.philips@dot.gov • 202-493-3468

Michelle Arnold michelle.arnold@dot.gov
202-493-3990

Ann Do ann.do@dot.gov
202-493-3319

Jesse Eisert jesse.eisert@dot.gov
202-493-3284

Laura Mero laura.mero@dot.gov
202-493-3377

Leidos – Human Factors on-site support

TRU Simulation + Training – Highway Driving Simulator on-site support



Figure 1. FLIR Camera at an intersection at the TFHRC.

Source: FHWA



Figure 2. Image of the CARMA-HDS integration project.

Source: FHWA

TRAVEL LANE

Current Research:

- **Guidelines on Variable Message Sign (VMS) Messaging During Nonrecurring Events** has concluded the data collection process. This project, led by [Michelle Arnold](#), is investigating drivers' responses to VMS signs that display unique messages describing events such as inclement weather or traffic incidents.
- **Exploring the Effects of Vehicle Automation and Cooperative Messaging on Mixed Fleet Eco-drive** has begun offsite data collection. This study aims to evaluate interactions between drivers, automated driving systems, and in-vehicle cooperative messages displayed at signalized intersections. For more information, contact [Jesse Eisert](#).
- **Enhancing Vulnerable Road User (VRU) Detection and Volume Data Through Advanced Imaging Techniques** held its kickoff meeting on October 6, 2021. The objectives of this study are to test the capabilities of commercially available forward-looking infrared (FLIR)-integrated thermal sensors to detect VRUs and evaluate the appropriateness of the associated count data for measuring exposure. Data collection for this project, led by [Laura Mero](#), will begin soon.
- **Highway Driving Simulator—CARMA Integration** has begun with the Human Factors Team releasing the first version of the Turner-Fairbank Highway Research Center (TFHRC) Digital Twin project, the common simulation scene environment to be used as a common database between the Highway Driving Simulator (HDS) and CARMA platform tools. The CARMA Everything-in-the-Loop (XiL) Team has begun testing the Digital Twin scene successfully by demonstrating a CARMA Sim vehicle running in the CARMA simulation program around the TFHRC campus roads. Contact [Brian Philips](#) for more information on this project.

New FHWA Web Resource Features Human Factors Projects

The new [Federal Highway Administration \(FHWA\) Research and Technology \(R&T\) Program Portfolio](#) web pages are one-stop shop resources that highlight select FHWA R&T activities, initiatives, and projects—including human factors research. To learn more about the Human Factors program and its projects, which are focused on automation, driver behavior, pedestrians, and bicyclists, please visit <https://highways.dot.gov/research/rtportfolio/safety-human-factors>.



Source: FHWA

<https://highways.dot.gov/research>

THE ROAD AHEAD

Looking forward:

■ Development of Pedestrian-Intersection Crash Modification Factors.

The tech brief and technical report are to be published for the Development of Pedestrian-Intersection Crash Modification Factors project. For more information, contact [Ann Do](#), [Laura Mero](#), and [Jeff Shaw](#).

■ Driver Acceptance of Vehicle Automation—Function-Specific Automation Applications.

The project has completed its data collection. The goal of this research, led by [Brian Philips](#), is to investigate key driver acceptance and safety issues of vehicles with low levels of automation. The final two technical reports are currently being written.

■ TFHRC Virtual Reality Lab Renovation and Upgrades.

Work continues on development and updates to TFHRC's onsite virtual reality lab. The Human Factors Team will furnish the room with advanced virtual reality compatible equipment such as headsets, bicycles, and treadmills. The team has completed installation of a simulated sidewalk and crossing space in the lab for future simulated VRU projects.

■ Transportation Research Board Annual Meeting.

The 101st Annual Transportation Research Board Meeting will be held from January 9 to January 13, 2022, in Washington, DC. The Human Factors Team will be presenting and exhibiting recent research.

MILEPOSTS

Recent activity:

■ VRU Research Update to Human Factors Coordinating Committee.

[Laura Mero](#) presented an overview of the Human Factors VRU research at the Human Factors Coordinating Committee meeting on October 27, 2021.

■ Pedestrian Dummy Test.

The Human Factors Team tested advanced adult, child, and bicyclist dummies for use with automated vehicles testing on November 3–4, 2021, at TFHRC. The team plans to utilize these dummies for VRU research applications.

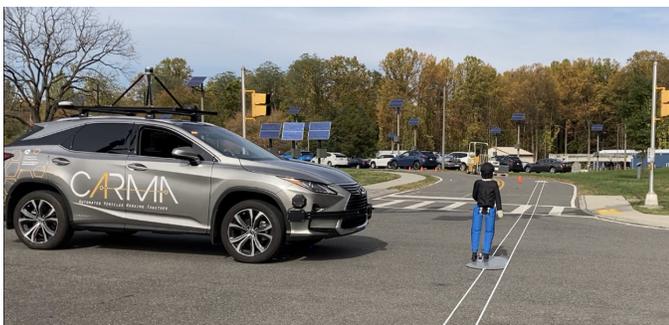


Figure 3. The Human Factors Team testing detection of an articulated child pedestrian dummy. Source: FHWA

■ Human Factors Truck Platooning Twinning with European Commission (EC) Ensemble Project.

A quarterly virtual meeting held in September for the **Human Factors Truck Platooning Twinning** project was led by [Michelle Arnold](#). The project is an international collaboration between the U.S. Department of Transportation and the EC to share information, such as project progress between teams,

and to address challenges of truck platooning prior to early deployment. Member organizations in attendance included FHWA, Leidos, the Netherlands Organisation for Applied Scientific Research, and the Gustave Eiffel University.

■ Impact of Roadway Lighting on Nighttime Crash Performance and Driver Behavior Briefing.

[Michelle Arnold](#) held a project briefing on September 28, 2021, for the second **Strategic Highway Research Program Implementation Assistance Program (IAP) phase 3** project, Impact of Roadway Lighting on Nighttime Crash Performance and Driver Behavior. The Virginia Tech Transportation Institute shared some results of phase 3 of this IAP project. The State lead for the project is Washington State Department of Transportation.

■ Traffic Control Device (TCD) Consortium Pooled Fund Study (PFS).

The TCD PFS 2021 fourth-quarter meeting was held virtually on November 1, 2021. [Laura Mero](#) is the lead for this PFS.

■ InterchangeSE: A Federated Multimodal Simulation Environment for Studying Interactions Between Different Modes of Travel.

On September 27, 2021, Iowa State University demonstrated to FHWA the architecture that they developed to incorporate different types of simulators, such as pedestrian, bike, or vehicle, into one simultaneous, shared simulation experience. FHWA plans to leverage the results of the researchers' work and apply it toward future in-house research tools. Contact [Jesse Eisert](#) for further information.

