



NHTSA Research Project: Development of Simulation for Verifying Highly Automated Vehicle Safety

*Research Performed by the Transportation Research Center Inc. (TRC)
for the NHTSA*

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AGENDA

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- 1) Project Overview**
- 2) Objectives and Tasks**
- 3) Deliverables**

Project Overview

Motivation: Objective methods and an open simulation framework could benefit the process of validating performance of highly Automated Driving Systems

- Project was initiated in October of 2018
- Focus: Scenarios encountered in the United States ground transportation system
- History with simulation:
 - Used in prior research dating back several decades for both light and Heavy Vehicles
 - Primarily used in a supporting role
 - Used in research areas of crashworthiness, crash avoidance, human factors
 - Involved in modeling: vehicles, drivers, SiL and HiL

Project Objectives and Tasks

- Objective: An open source method for sharing simulation data amongst simulators
- Tasks:
 - Identify state-of-the-art in simulation for exchanging world object data, sensor models, and intelligent actors within a unified scenario
 - Develop or adopt an open source simulation framework to share ADS scenarios
 - Contains data for initial ADS scenario conditions, localization, sensor models, roadway information, and other
 - Develop five scenarios to demonstrate simulation framework and share publicly
 - Scenarios researched from traffic data and crash scenarios
 - Scenarios should be challenging for an ADS
 - Traffic, signaling, and other actors behaviors shall all be modifiable to vary the degree of scenario challenge
 - Develop API or middleware interface that can be used to validate the scenario data
 - Demonstrate how the code executes and interfaces with a minimum of two simulation packages

Deliverables

- Paper introducing initial framework concept and review of applicable research and standards
- Identify applications that can be used to share the scenario data
- Draft 5 or more open formatted driving scenarios encountered in the United States