

Research Project Title: Research on Connected and Automated Vehicles Investment and Smart Infrastructure in Tennessee

Purpose of the Project: The purpose of the project is to develop a framework for planning, and practices needed in Tennessee for safely testing and deploying “high-impact” Connected and Automated Vehicle (CAV) technologies. The project will establish testbeds for exploring CAV impacts in urban, suburban, and rural settings in Tennessee.

Scope and Significance: The scope of the research project includes the development of plans for creating a Tennessee-based network of research & development-oriented CAV testbeds, both virtual and real. Critical aspects of the project are for the academic units in Tennessee to work collaboratively with the Tennessee Department of Transportation and private sector companies to test innovative technologies that can support automation and connectivity in the automotive industry. The testbeds established with the help of this grant will be used to explore the latest and high-impact smart infrastructure technologies. The research group has identified several locations on UT campuses and the ETSU campus to represent varying degrees of urban and rural settings in Tennessee. The initial studies will focus on the use of DSRC (Dedicated Short-Range Communication) technologies to provide vehicle drivers with traffic signal advisories; exploration of the potential of 5G technologies; and simulation-based testing of automated technologies. A final report will provide recommendations to TDOT on smart infrastructure development and deployment based on technologies' ease of use, cost effectiveness, and performance and their applicability in Tennessee. Moreover, the CAV testbeds will provide a resource for future testing of high-impact CAV technologies customized to Tennessee.

Expected Outcomes: The benefit to TDOT will include 1) the capability to integrate, field-test, and analyze CAV technology impacts; 2) the development of modeling and simulation tools will help TDOT determine the future direction of CAVs in Tennessee; 3) the use of these tools to support an "integrate-analyze-build" paradigm for technology development, a unique and critical part of this approach that will provide the best way of testing smart infrastructure and ensuring that they are safe before they are deployed widely; and 4) the testing of diverse technologies, including DSRC and 5G, and the ability to make informed decisions about the value of DSRC and automation technologies at a system-wide level.

The results from this project will provide valuable information for Tennessee cities and MPOs in their project evaluation efforts on smart infrastructure and CAVs. The testbed will further provide the basis for developing statewide detailed project evaluation capabilities, including the testing of new alternatives. At the project's conclusion a detailed implementation and technology transfer plan will be developed in coordination with TDOT staff. These outcomes will significantly enhance TDOT’s and other agencies’ ability to deploy high-impact smart infrastructure technologies.

Time Period: The time period for the project is 2 years from the start date of the project.

Contact Information

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