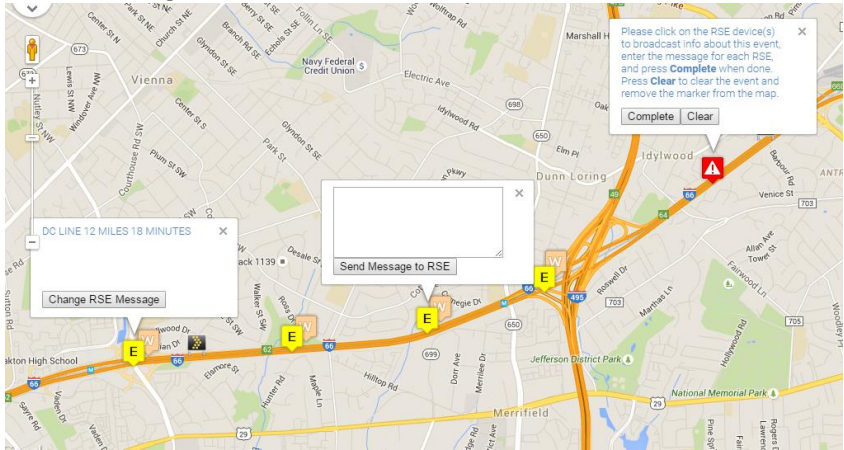# CVI-UTC Project Information

Project Title	A Connected Vehicle-Enabled Virtual Dynamic Message Sign System Demonstration and Evaluation on the Virginia Connected Vehicle Testbed
University	University of Virginia (UVA)
Principal Investigator	Brian Lee Smith
PI Contact Information	briansmith@virginia.edu
Funding Agencies	CVI-UTC (Tier 1 UTC)
Agency ID or Contract Number	DTRT12-G-UTC20
Project Cost	$149,852
Start and End Dates	November 15, 2014 – December 31, 2015
Project Duration	13.5 months
Brief Description of Research Project	Dynamic Message Signs (DMSs) are widely used to deliver traveler information and have proven to be very effective for Departments of Transportation (DOTs). However, key limitations exist: 1) existing DMSs are limited in managing dynamic situations given that DMSs are only available at relatively sparsely spaced fixed locations, 2) reading DMS messages is distracting to drivers, and 3) installation and maintenance of DMSs is expensive.

To address these limitations, a smartphone-based virtual DMS application was developed in the first round of CVI-UTC projects. This application uses smartphones to provide audible "reading" of the current DMS messages to drivers when they enter a geographic zone in the proximity of the fixed sign. In addition, the project used extensive driving simulator testing to prove that virtual DMSs are less distracting and more informative than traditional physical DMSs.

Building upon this completed work, the University of Virginia Center for Transportation Studies (UVA CTS) team aims to develop a more advanced, second generation of the Virtual Dynamic Message Sign (VDMS) system that is fully integrated in the DSRC environment of the Virginia Connected Vehicle Testbed, suitable for demonstration and evaluation. To provide more specifics, highlights of the enhancement of the VDMS system include: 1) this system utilizes four DSRC-based Roadside |

	Equipment (RSE) for communications, 2) the VDMS manager software application has the capability to virtually "build" (or create) new DMSs as opposed to only using the geographic zones corresponding to fixed existing DMSs, and 3) the information to be presented can be customized to provide more details.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	The VDMS system was developed by UVA CTS with support from VTTI. The UVA CTS team worked closely with VTTI and also the McConnell Public Safety and Traffic Operation Center (PSTOC) in Fairfax, VA, to make sure that the developed system is usable for the actual operators at the PSTOC. A summary of the accomplishments is provided below: • UVA CTS has developed the UVA server program and the VDMS manager program, based on the initial feedback obtained from the meeting with VDOT personnel at PSTOC. • VTTI has developed programs for the VTTI server, RSEs, and OBEs, based on the system requirements agreed on at the joint meeting of UVA CTS and VTTI. Snapshots of the VDMS manager program and the OBE application are provided below [VDMS Manager] [VDMS OBE Application]
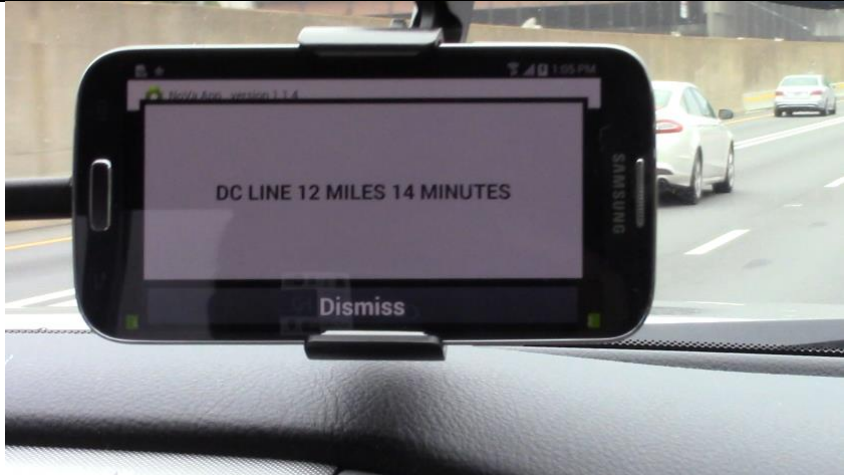
The VDMS system is intended to be used by TOC operators. With that, currently the operational testing of the VDMS system is being conducted, with actual operators at PSTOC. The goal of this operational testing is to evaluate the VDMS system as a tool to support TOC's efforts to manage traffic. More specifically, it is to gain feedback from TOC operators on the usability, and the effectiveness of the VDMS system as an information dissemination tool to support advanced traffic management.

Impacts/Benefits of Implementation (actual, not anticipated)	This study is still in progress, actual impacts and benefits of implementation will be determined in December 2015 when the study is completed. This page will be resubmitted in the next round of reporting to state these actual impacts and benefits.
Web Links • Reports • Project Website	None