UTC Project Information

Project Title	Prototyping and Evaluating a Smartphone Dynamic Message Sign (DMS) Application in the CVI-UTC Testbed
University	University of Virginia
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Funding Agencies	CVI-UTC (Tier 1 UTC)
Agency ID or Contract Number	TBD
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Start and End Dates	February 1, 2013 – January 31, 2014
Project Duration	1 year
Brief Description of Research Project	Dynamic message signs (DMSs) have been used by VDOT and other transportation agencies for many years to provide traveler information on freeways and arterials. While DMSs are widely used, many factors limit their effectiveness. First, the very task of reading a DMS is distracting to drivers. Evidence of this is apparent at many locations, where traffic monitoring sensors report a reduction in speed due to drivers braking to read DMS messages. Such distraction also forces DOTs to use short messages on DMSs – hampering the ability to fully inform travelers. Another key concern is that DMSs are fixed assets. They are expensive and can only inform travelers at the location where they are installed. Finally, DMSs are useless in situations in which a driver's view is occluded by other vehicles (such as large trucks), or when the driver is unable to read English. The purpose of this proposed project is to prototype and evaluate a smart phone application that provides the functionality of a DMS. When a traveler is in range of a physical DMS (i.e. the traveler can see it), the information presented on the sign may be read by the traveler. In the prototype application, a traveler's location is monitored using the phone's internal GPS. When the traveler is in range of a DMS (i.e. in a range of latitude/longitudes) the information is presented to the traveler via an audible message. In the first version of the application, ranges

	will simply correspond to existing DMS locations, and the audible messages will be the same as the current DMS message. A key advantage of such a smart phone application is its scalability. New DMSs can be "built" by defining new latitude/longitude zones. Also – messages may be presented in English, Spanish, and other languages based on settings selected by the user. Finally, more detailed information may be presented since it is not line-of-sight dependent. The application will not require "active" driver participation. The driver will simply enable the application at the beginning of a trip. Location data will be passed to a DOT server on a regular basis, when the location is in a DMS zone, the DOT server will transmit the message to be presented to the driver. The concept behind this prototype application is to provide traffic operations centers (TOC) with a simple new tool that enables true infrastructure/vehicle integration. A strength of this tool is that it is not dependent on a DSRC infrastructure – it may be immediately implemented and reach the vast majority of travelers. It is also a true "mobile" application – meant to be used while a driver is traveling. This distinguishes it from current 511 applications that explicitly state they are to be used only when the vehicle is not in motion.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	The objectives of this project are to develop a prototype and conduct a field test of the smart phone "virtual" DMS system. The UTC Virginia test bed will be used to support this work and evaluate the effectiveness of the proposed smart phone Virtual DMS System. Specific objectives of this study can be summarized as follows: 1. Examine the feasibility of such a mobile application by creating a prototype system, using the commercial cellular network to distribute traffic information generated by TOC. The smart phone application in this study will provides the same functionality as a DMS. 2. Demonstrate a connected vehicle application with direct benefit to TOC operations. 3. Evaluate the potential benefit of the proposed system by testing the effectiveness in the CVI-UTC test bed.

Impacts/Benefits of Implementation (actual, not anticipated)	This study is still in progress, actual impacts and benefits of implementation will be determined in Winter 2014 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	http://www.connectedvehicleinfrastructure-utc.org/?q=node/21 https://rip.trb.org/browse/dproject.asp?n=33465