



Connected and Automated Vehicles in Virginia

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Introduction

- **VDOT's efforts to-date on Connected and Automated Vehicles**
- **Connected Vehicle Program Plan / Connected Vehicle RFI**
- **New Initiatives**

VDOT's Mission and Goals for Operations

- **VDOT Mission:** VDOT will plan, deliver, operate and maintain a transportation system that is safe, enables easy movement of people and goods, enhances the economy and improves our quality of life.
- **Operations Goals that can be addressed by CV:**
 - Reduce travel lane clearance time for incidents > 30 minute duration, based on all vehicle and tractor-trailer incidents
 - Reduce number of traffic crash injuries and deaths on Virginia highways
 - Ensure efficient use and provide capacity solutions to the existing transportation system and services to meet customer demand and expectations of a system that is safe and reliable and to enable the easy movement of goods and people.

Virginia established the Virginia Connected Corridor

- In 2014, VDOT and VTTI introduced the Virginia Connected Corridors (VCC) initiative
 - CV deployments along one of the most congested corridors in the U.S. (I-66, I-495, U.S. 29, and U.S. 50) and the Smart Road in Blacksburg
 - 47 Roadside equipment units (RSEs) installed
- Multiple challenges
 - High levels of recurring and non-recurring congestion
 - HOV configurations
 - Changeable dynamic message signs
 - ATM gantry speed management system

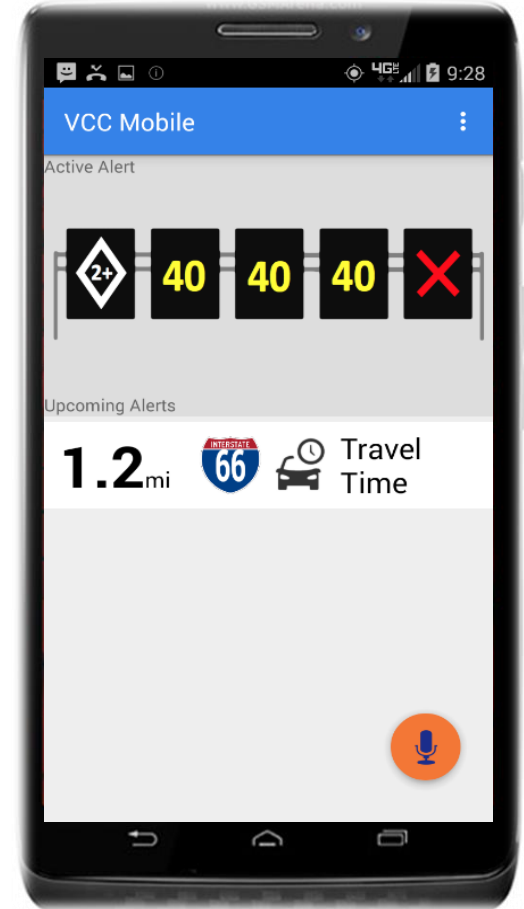
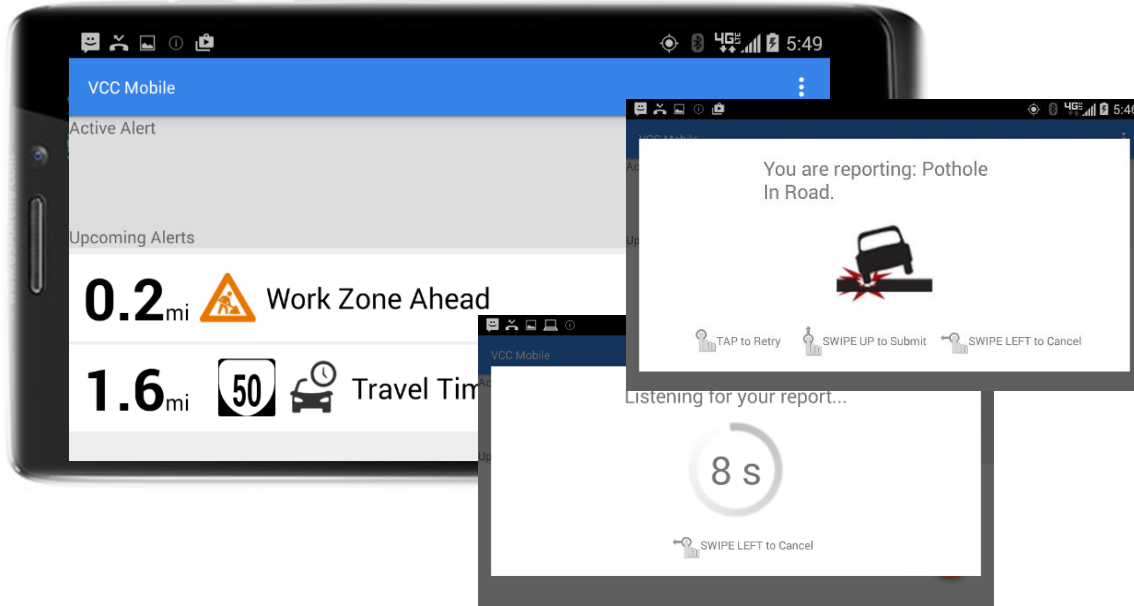


Virginia Connected Corridors is an Opportunity to Accelerate Deployment

- The VCC is focused on addressing several transportation challenges and providing opportunities to the CV industry
- The VCC environment includes:
 - CV technology on both closed and live roadways in Virginia
 - Support for third-party application development
 - Data services, Application Program Interfaces (APIs) and reference applications
 - Corridor visualization application
- The VCC will facilitate deployment and integration of connected vehicle data and applications into VDOT Operations

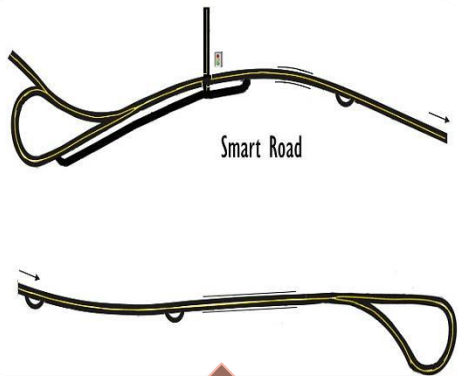
VDOT is piloting a Traveler Information Message App

- DSRC or Cellular only option
- Statewide deployment for cellular users
- Speech recognition and reporting



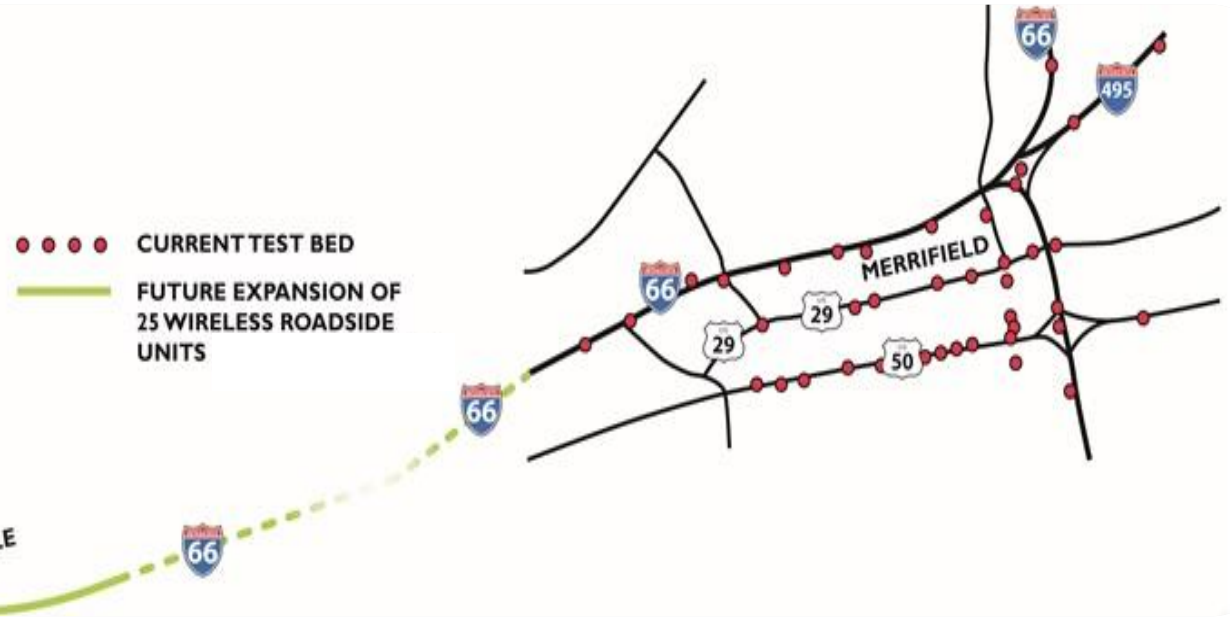
Virginia Connected Corridor Leverages Smart Road for Testing Prior to Deployment on I-66

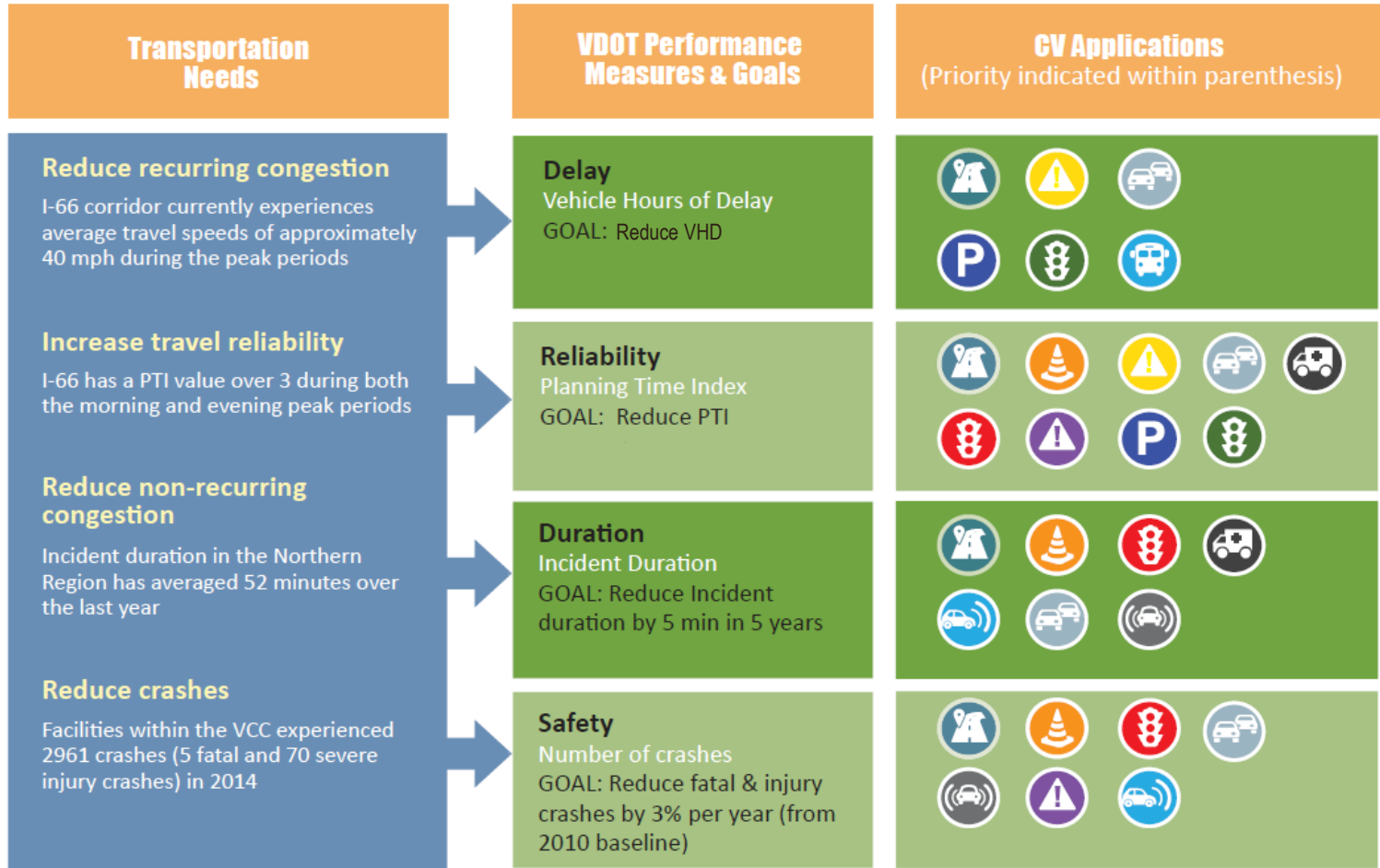
Design & Test



Deploy & Evaluate

CV Applications

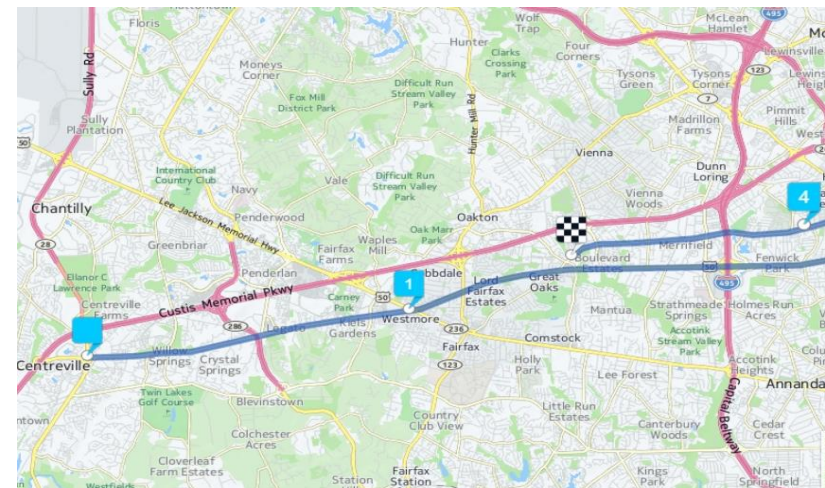
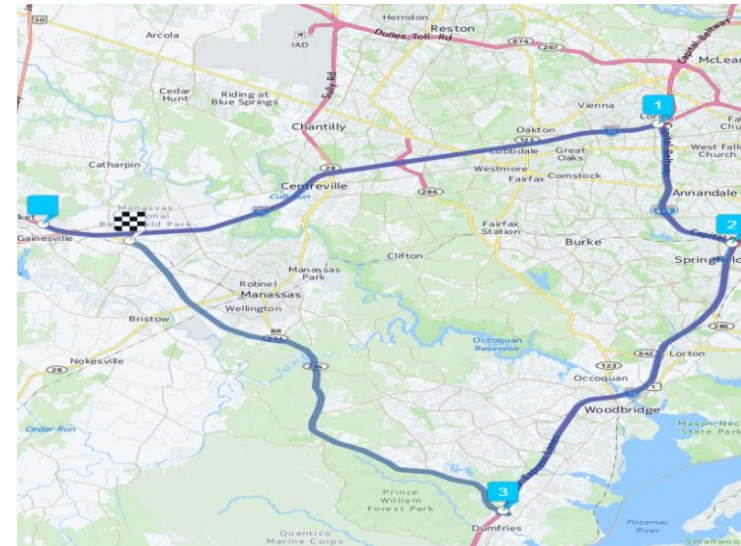




(1) Advanced Traveler Information	(2) Work Zone Alerts for Drivers and Workers	(3) Incident Scene Alerts for Drivers	(4) Red Light Violation Warning System	(5) Queue Warning	(6) V2V – Forward Collision Warning
(7) V2V – Emergency Electronic Brake Light	(8) Parking Availability	(9) Probe Enabled Traffic Monitoring	(10) Integrated Traffic Signal System	(11) Transit Signal Priority	(12) Emergency Vehicle Preemption

Virginia's Automated Corridor

- Partnership between VDOT, DMV, Here, Transurban and led by VTTI to enable advanced automated vehicle technologies in Virginia
- VDOT has committed to maintaining standards for completeness of marking and retro-reflectivity properties
- Automated Vehicle Demo held Oct 19-20



Connected Vehicle Program Plan

- VDOT’s FY16 Business Plan calls for the development of a Statewide Connected Vehicle Program Plan
- Business Plan Item 3.2.2 (under Goal 3 – Operate):

Develop a statewide connected vehicle program plan to maximize the safety and operational benefits of these emerging technologies.

The capability of vehicles to communicate is here; vehicles can communicate with each other, with technology supporting infrastructure and ancillary assets (like signs and stoplights) and with other types of mobility devices like wheelchairs and bicycles. VDOT leadership will outline the department’s vision of the future state of connected vehicle technologies, the impact of that future state on transportation within the commonwealth and define strategies that VDOT will plan to utilize to take advantage of the technology.



Connected Vehicle Program Plan

- **CV Program Plan – Expected Outcomes:**
 - **Clear vision of future state of connected vehicle technologies**
 - **Impact of that vision on transportation in the Commonwealth**
 - **Identification of strategies that VDOT will undertake to leverage CV technologies**
 - **Improved readiness to address changes in CV industry, such as proposed federal rulemaking and advances in private sector CV products and services**

Connected Vehicles Provide Opportunity to Reduce Infrastructure

- VDOT wants to understand feasibility of eliminating certain high-dollar infrastructure through connected vehicle applications.
 - Overhead Guide Signs
 - 1,000 signs x \$100,000 per sign structure = \$100 M
 - Overhead Changeable Message Signs
 - 550 signs x \$200,000 per sign = \$110 M
 - Traffic Signals
 - 3,200 signals x \$250,000 per signal = \$800 M
- VDOT issued an RFI for innovative and cost effective strategies to transition from traditional assets and infrastructure to CV technology and applications
 - Key milestones and timelines

Virginia is Leveraging New Initiatives to Accelerate Connected and Automated Vehicles

- **CTB stood up the Innovation and Technology Subcommittee**
- **Future of Transportation Initiative**
- **Automated Vehicle Committee**
- **FAST Act Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Grant**
- **Establishing a new position for Connected and Automated Vehicle Program Manager**

Questions?