

Connected and Automated Vehicle Implementation Activity in Northern Virginia

TIA Vehicle Connectivity Workshop
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TRANSPORTATION
INSTITUTE

Dr. Michael A. Mollenhauer
Director
Center for Technology Implementation
Virginia Tech Transportation Institute

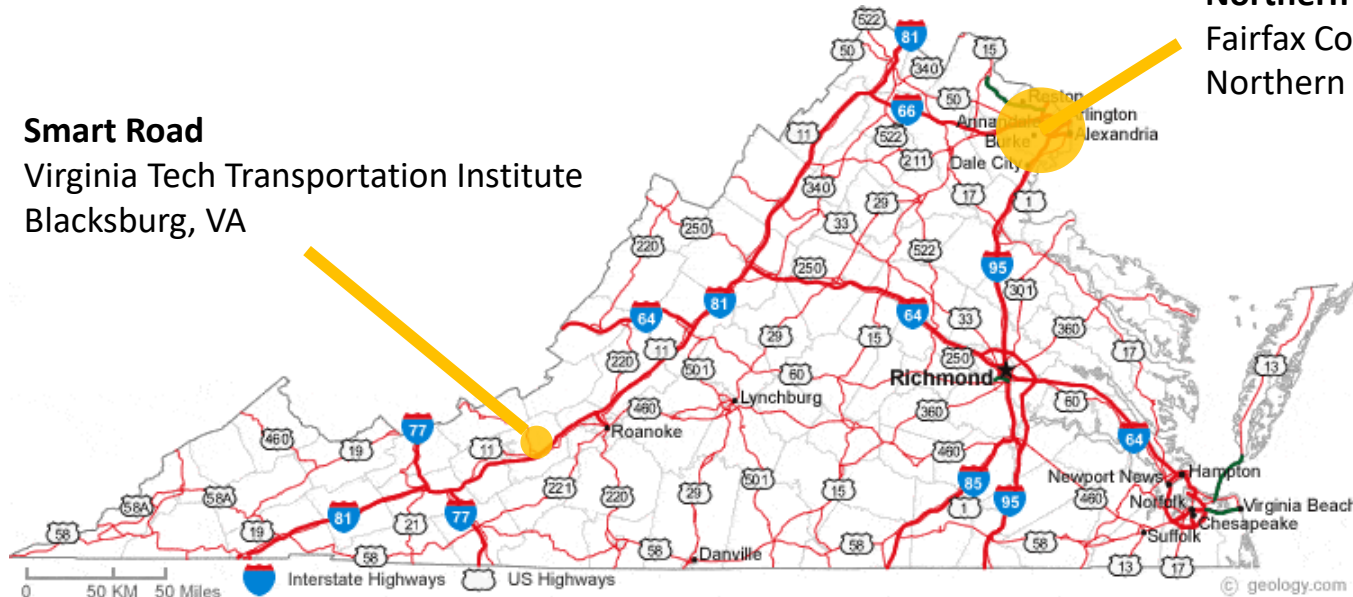
Virginia Connected Corridors

Mission: Provide an open connected vehicle environment where concepts can be developed, tested, deployed, and evaluated in real world operating environments.

Smart Road

Virginia Tech Transportation Institute
Blacksburg, VA

Northern Virginia Test Bed
Fairfax County, VA
Northern Virginia



VTTI officially opened the Smart Road in
2000 partnership with VDOT

22,000+ hours of groundbreaking
research



photo by Michael Kiernan

Northern VA Challenges



Prototype and Proof of Concept

Real World Challenges

Design & Test

Smart Road

- 2.5 mile Test Track Facility
- Intersection, Ramps, Bridge
- Controlled Weather and Lighting
- 8 RSU's

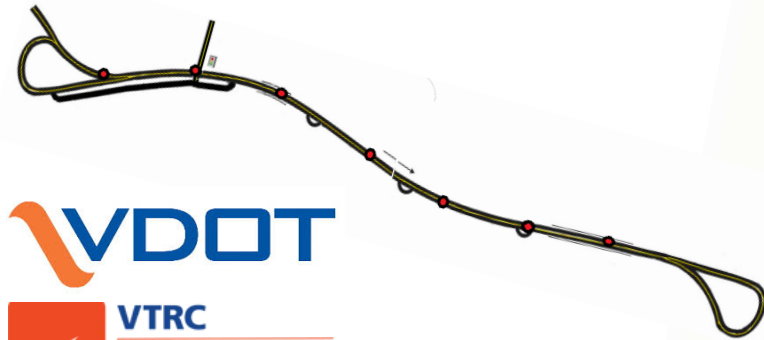
VCC Cloud

- Application Processing
- Data Management
- Interfaces
- DSRC and Cellular Comms

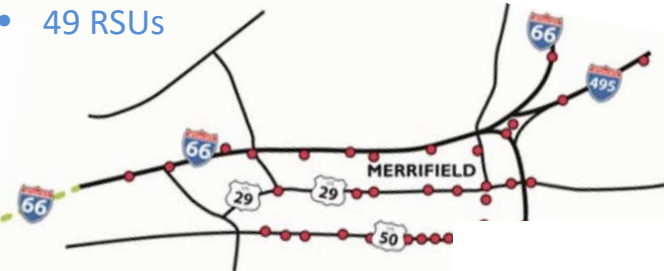
Deploy & Evaluate

Northern VA Test Bed

- Heavily Congested Arterials and Freeways
- Interface to VDOT Northern Region TOC
- ATM, VDMS, HOVs, Toll Lanes, Ramp Meters
- 49 RSUs

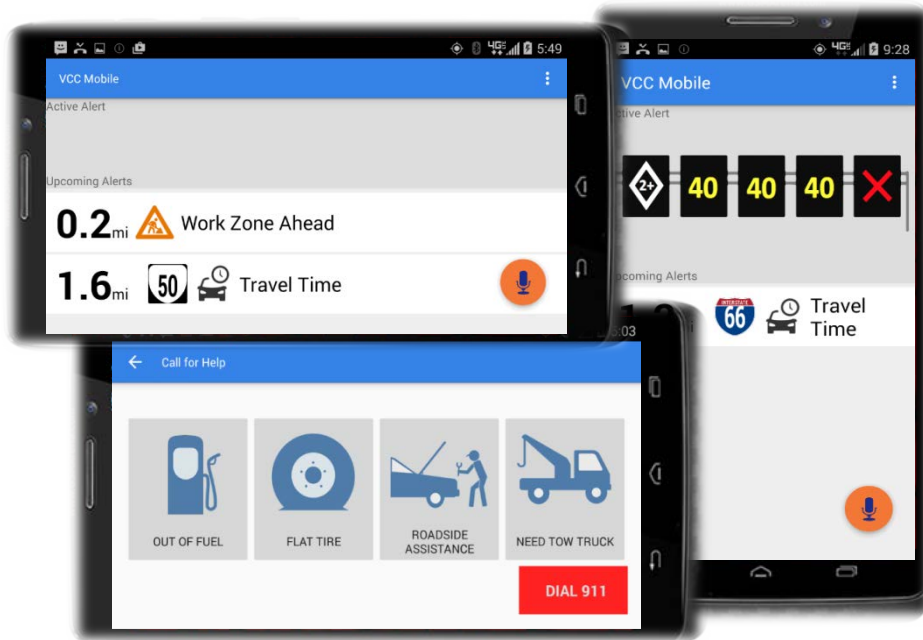


GAINESVILLE



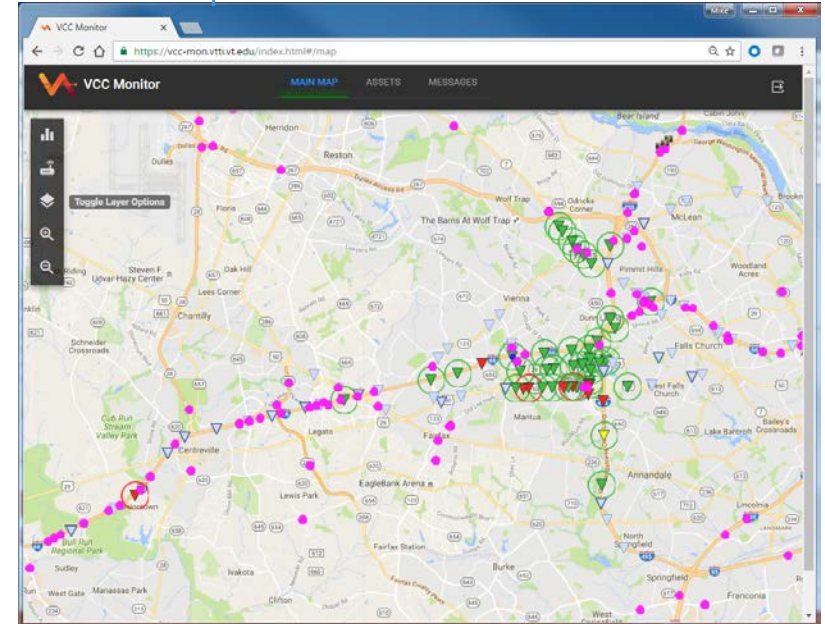
VCC Mobile

- Cellular or DSRC/OBE
- Dynamic Driver Messaging
- Work Zone Alerts
- Weather Advisories
- Traffic Incidents
- ATM/HOV Status and Alerts
- Driver Reporting and Call for Help



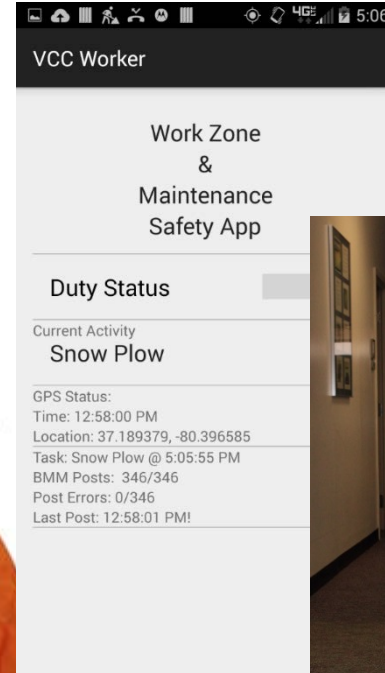
VCC Monitor

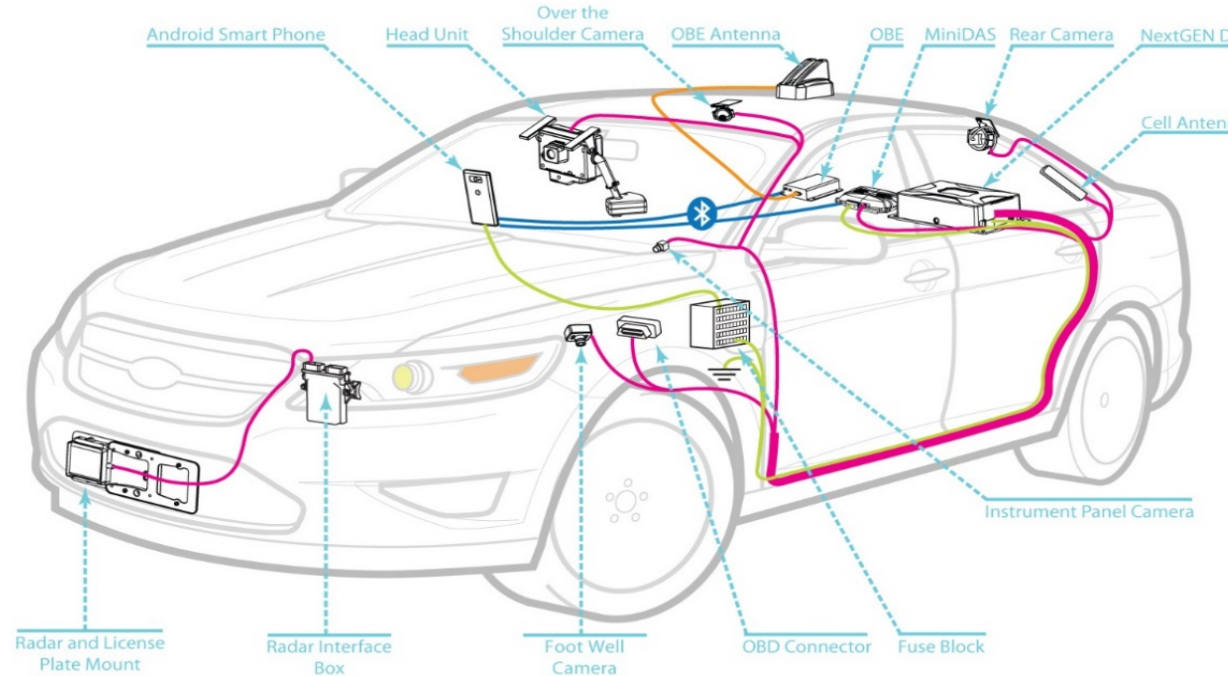
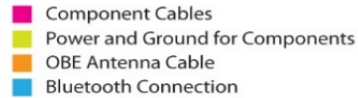
- Situation Awareness Tool
- RSU Status and Performance Monitoring
- Message Flow Monitoring (BSM, BMM, PDM, TIM, etc.)
- Control Message Management
- Traveler Information Message Management
- Driver Report Location



Connected Worker Solutions

- Cell phone app that registers the worker into the connected environment
- Provides location and activity info, log workers into and out of active zones
- Warnings sent to drivers through mobile apps
- Warnings provided to workers via flashing LEDs and/or haptic cues



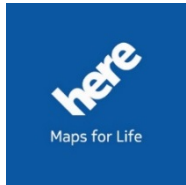


Proactive Safety Evaluation

- Address concerns over driver distraction
- 12 Month pilot deployment in 50 camera equipped cars
- Evaluate safety through surrogate safety measures
- Provides proactive assessment of risk
- L2 equipped vehicles support assessment of connected / automated interaction



Virginia Automated Corridors



- **Mission:** Provide an automation-friendly but challenging environment to test and evaluate automated vehicles
- **Allows users to develop test and certification protocols**
 - Migration path from test-track to real-world operating environments
 - Operational environment that features myriad transportation challenges
 - Provide realistic and modern CV infrastructure environment
- **Progress is rapid, efficient, and achieved at a reasonable cost**
 - No “partnership fees,” no bond required
 - Strictly fee for service model
 - Licensing and insurance provided through the state
 - IRB process provided for human subjects
 - Can be completely proprietary