



## Virginia Automated Corridors

Vehicle automation is progressing at a rapid pace, with numerous automobile manufacturers and suppliers creating and testing prototype technologies. Pre-deployment testing of automated vehicles requires complex scenarios for vehicle interaction and real roadway environments. However, the availability of such resources is limited due to reliability and safety concerns.

The Virginia Automated Corridors (VAC) is a new initiative that will provide an automation-friendly environment, which government agencies, original equipment manufacturers, and suppliers can use to test and certify their systems via a system-migration path from test-track to real-world operating environments. The VAC will leverage extensive experience in on-road safety research to provide efficient solutions to automated-vehicle testing.

During March 2015, the governor of Virginia issued a proclamation (<http://1.usa.gov/1DydwLi>) declaring the state “open for business” in the realm of automated vehicles and clearing the way for development of the VAC. The proclamation allows the testing of any automated vehicle on Virginia roads under the guidance of the Virginia Tech Transportation Institute (VTTI). The Virginia Department of Motor Vehicles (DMV) will support research efforts performed by VTTI in accordance with the proclamation.

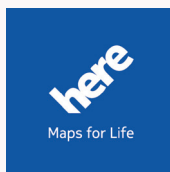
With assistance from the Commonwealth of Virginia, the VAC will advance the development, testing, and deployment of automated-vehicle technology, with the ultimate goal of helping stakeholders create robust automated and autonomous vehicles.

**Providing real-world testing environments for the development and deployment of automated vehicles**

### VAC Features

- Multiple testing environments, including more than 70 miles of urban interstates and rural arterials in the Northern Virginia area, the Virginia Smart Road and Virginia International Raceway test tracks, and roadways in the Town of Blacksburg
- Access to dedicated high-occupancy toll (HOT) lanes in conjunction with Transurban, which develops and manages more than 40 miles of express lanes located along the VAC
- Pavement markings implemented in conjunction with the Virginia Department of Transportation (VDOT), which will maintain standards for both completeness of markings and retroreflectivity properties
- High-definition mapping, real-time traffic and incidents, intelligent routing, and location cloud technology for automated and connected vehicles supported by HERE, a high-definition mapping business
- Ubiquitous one-centimeter accurate localization facilitated by a multi-channel, high-precision global navigation satellite system with real-time kinematic corrections, an inertial navigation system providing dead-reckoning, and an update rate up to 100 Hz
- Sophisticated, unobtrusive data acquisition systems that record time-synchronized data to the nearest millisecond using multiple (i.e., two to six) cameras and sensors
- Remote monitoring and data streaming
- Existing connected-vehicle infrastructure and systems installed along the Virginia Connected Corridors (VCC)
- No bond required for automation testing in Virginia; licensing and insurance provided through the Commonwealth, with Institutional Review Board approval and certification for safe human research involvement facilitated via VTTI

Created through a partnership between



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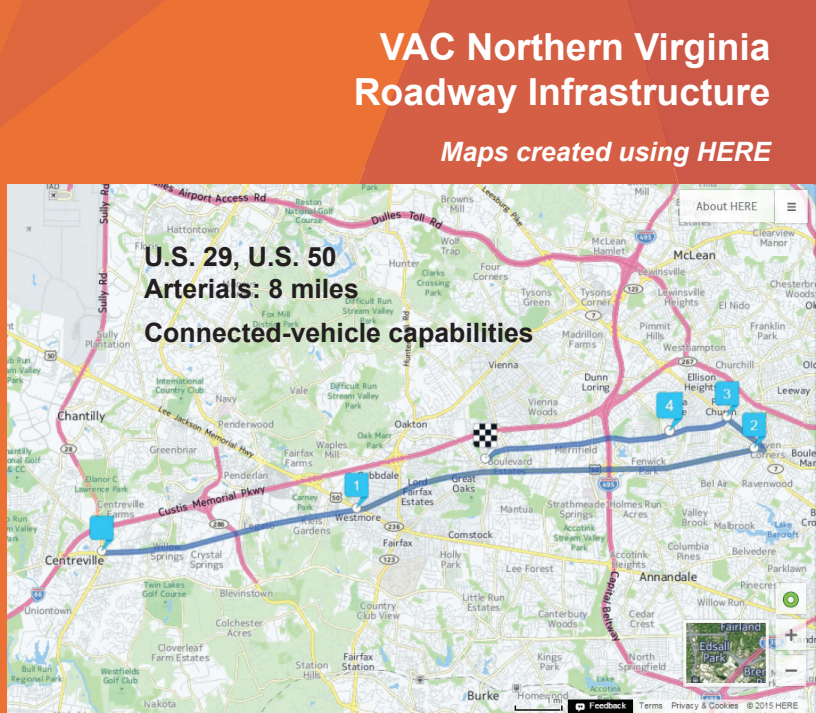
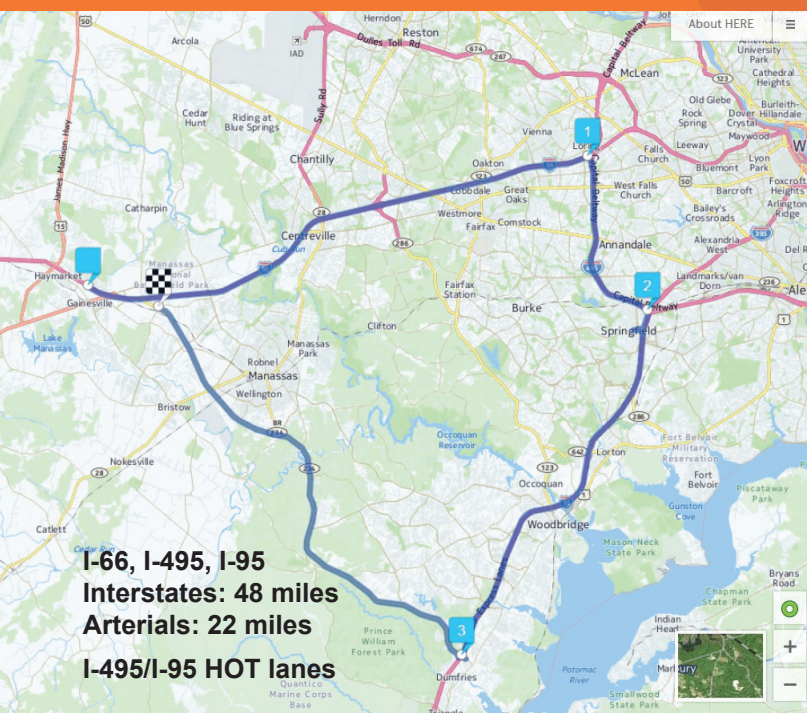


## Highways on Purpose: VAC User Options

The varying roadway environments of the VAC promote multiple use-case scenarios, including the testing of automated cars, trucks, and buses on freeways and express highways, as well as testing along urban routes. Automated capabilities can also be developed and deployed in two test-track environments that feature intersections, connected-vehicle communications, operations at higher speeds, a reconfigurable track, complex curves, and markings.

The distribution of the roadways that compose the VAC were designed to be representative of the nation's highway systems, as described in the Federal Highway Administration (FHWA) report to Congress titled "2013 Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance." The percentage of road miles in the VAC is consistent with the percentage of national road miles. Specific roadways of the VAC also were selected that had existing naturalistic driving data available to support comparative research.

VAC Roadway Environment	Use Case(s)	SAE Level(s) of Automation	Connected via DSRC, Cellular, and HD Mapping
Northern Virginia Highways and Arterials	Freeway Platooning Highway Autopilot Operation in Urban Setting	2-3	Yes
Town of Blacksburg	Urban Chauffeur Automated Taxi	4	No
Virginia's Smart Road	Closed Test Track	1-5	Yes
Virginia International Raceway	Closed Test Track	1-5	No
All Virginia Roads	Many	1-5	No



## VAC Northern Virginia Roadway Infrastructure

Maps created using [HERE](#)