



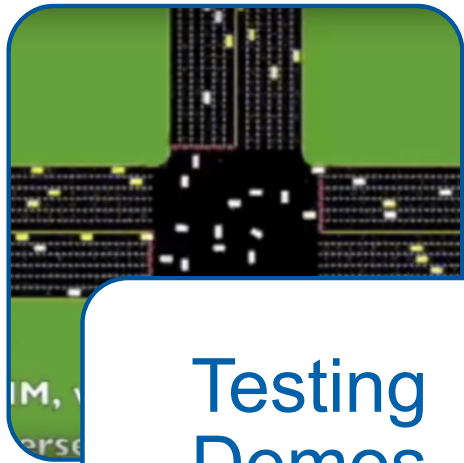
# Connected and Automated Vehicles Landscape and Activities in the Commonwealth

Cathy McGhee, Virginia Transportation Research Council  
Virginia Lingham, Office of Strategic Innovation

Virginia Department of Transportation

CTB IT Subcommittee  
October 29, 2018

# Overview



Testing  
Demos  
and Pilots  
in Virginia



Technology  
Trends



Next Steps



# *Testing, Demos, and Pilots are Active in Virginia*

**Virginia Tech Transportation Institute  
Fall 2017**



More info at  
<https://www.youtube.com/watch?v=EwujR1ARsog>



# Testing, Demos, and Pilots are Active in Virginia

Virginia Tech Transportation Institute  
Fall 2017



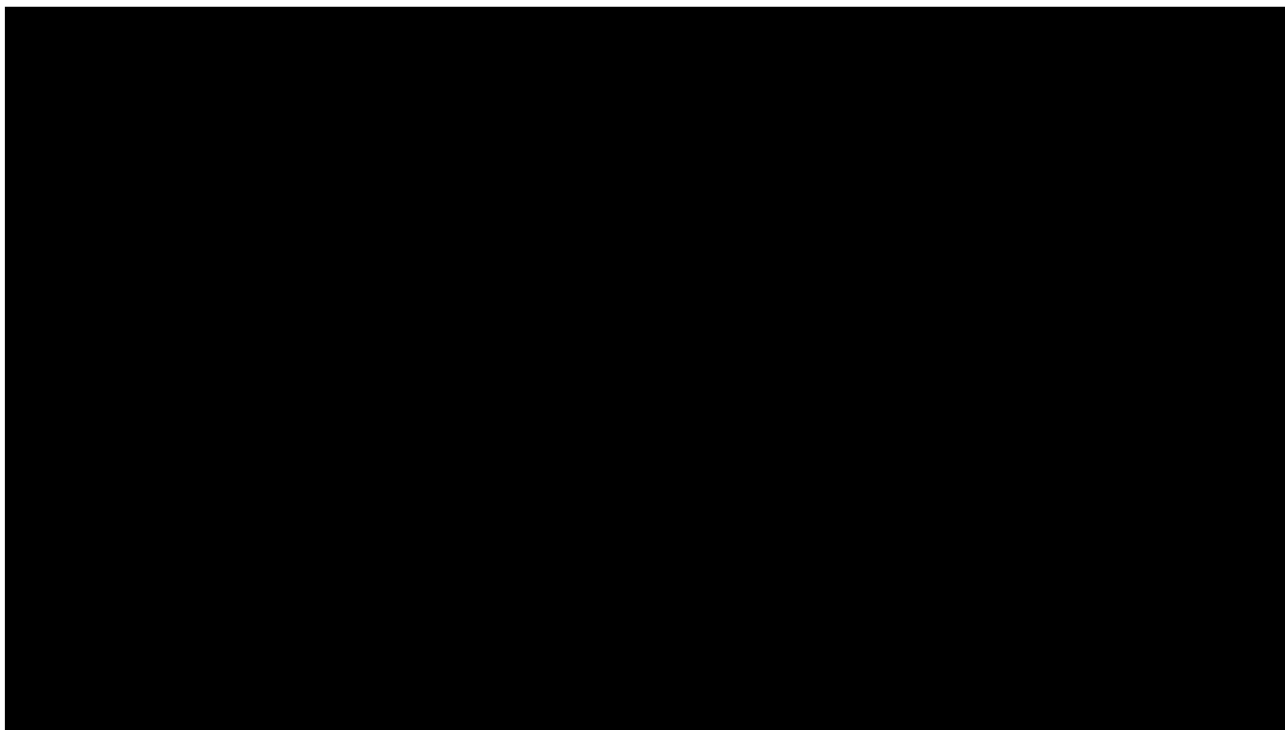
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## FHWA Truck Platooning Demonstration on I-66 September 13-15, 2017



More info at <https://www.youtube.com/watch?v=iNTKqh7i5jQ>

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# *Testing, Demos, and Pilots are Active in Virginia (cont.)*

## **FHWA Connected Vehicle Testing on I-95 Express Lanes June 2018**

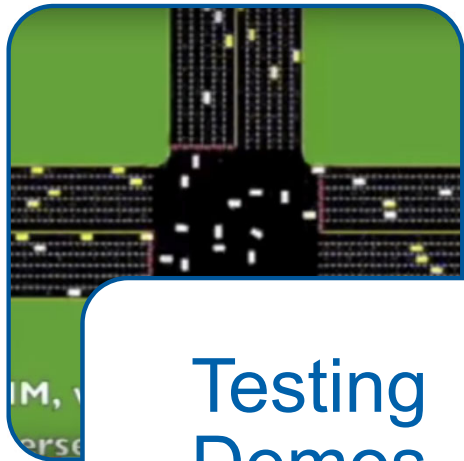


Source: USDOT

More info at <https://www.youtube.com/watch?v=EwujR1ARsog>



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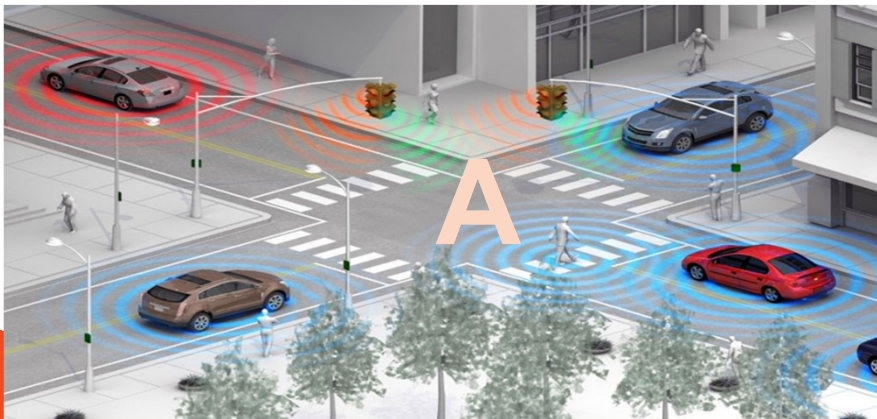
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# Quiz Time!

- **Connected Vehicle Environment**
- **Autonomous Vehicle (Self-Driving)**
- **Automated Vehicles**



**Automated Driving Systems (ADS)**

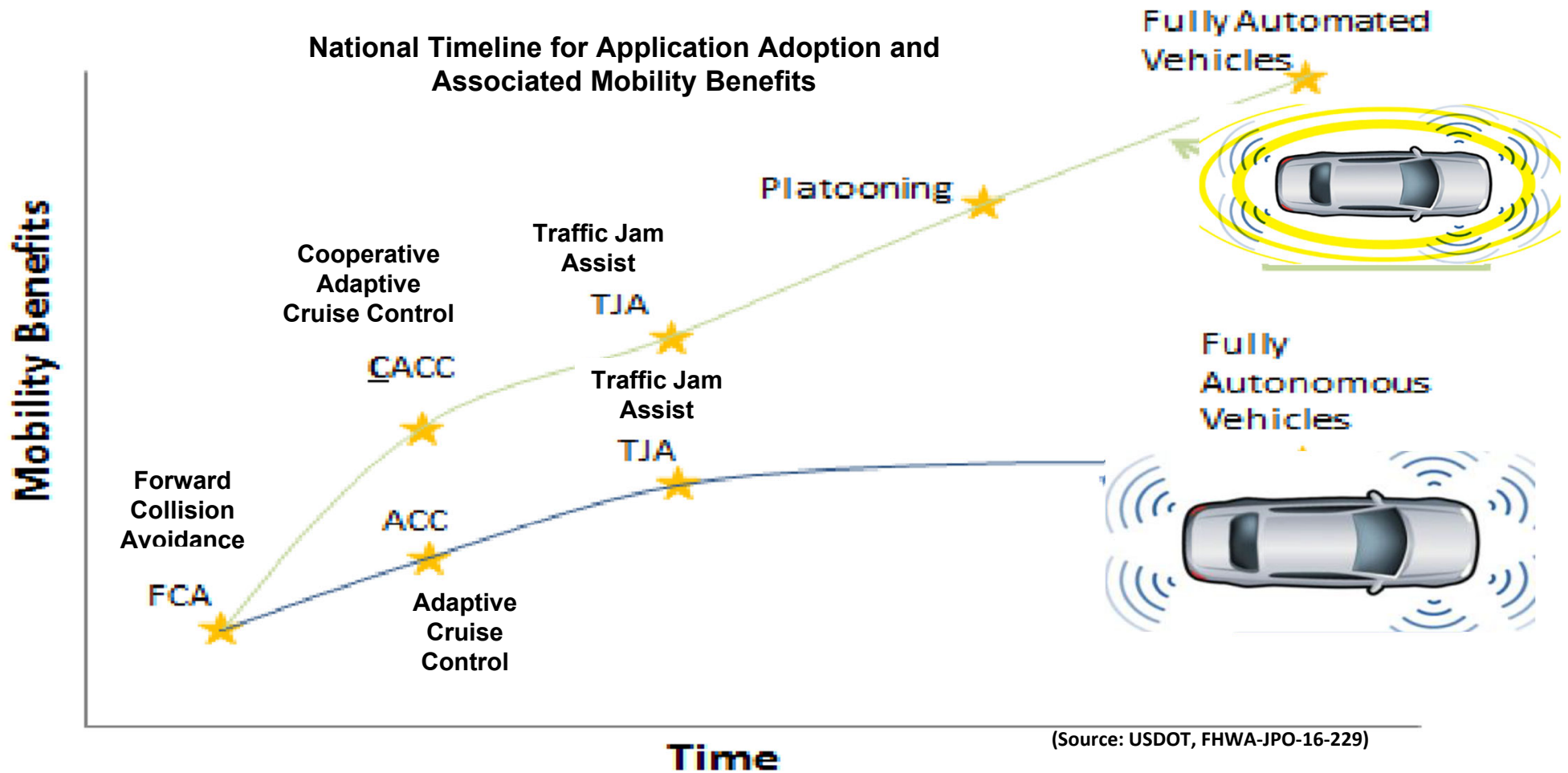
	<b>Level 0 No Automation</b>	<b>Level 1 Driver assistance</b>	<b>Level 2 Partial automation</b>	<b>Level 3 Limited self-driving (conditional automation)</b>	<b>Level 4 Full self-driving under certain conditions (high automation)</b>	<b>Level 5 Full self-driving under all conditions (full automation)</b>
<b>Vehicle</b>	No automation.	Can assist driver in some situations.	Can take control of speed and lane position in certain conditions.	Can be in full control in certain conditions and will inform the driver to take control.	Can be in full control for the entire trip in these conditions and can operate without a driver.	Can operate without a human driver and need not have human occupants.
<b>Driver</b>	In complete control at all times.	Must monitor, engage controls, and be ready to take over control quickly at any moment.	Must monitor and be ready to take over control quickly at any moment.	Must be ready to take control quickly when informed.	Not needed	Not needed

Source: GHSA



# Why Connect?

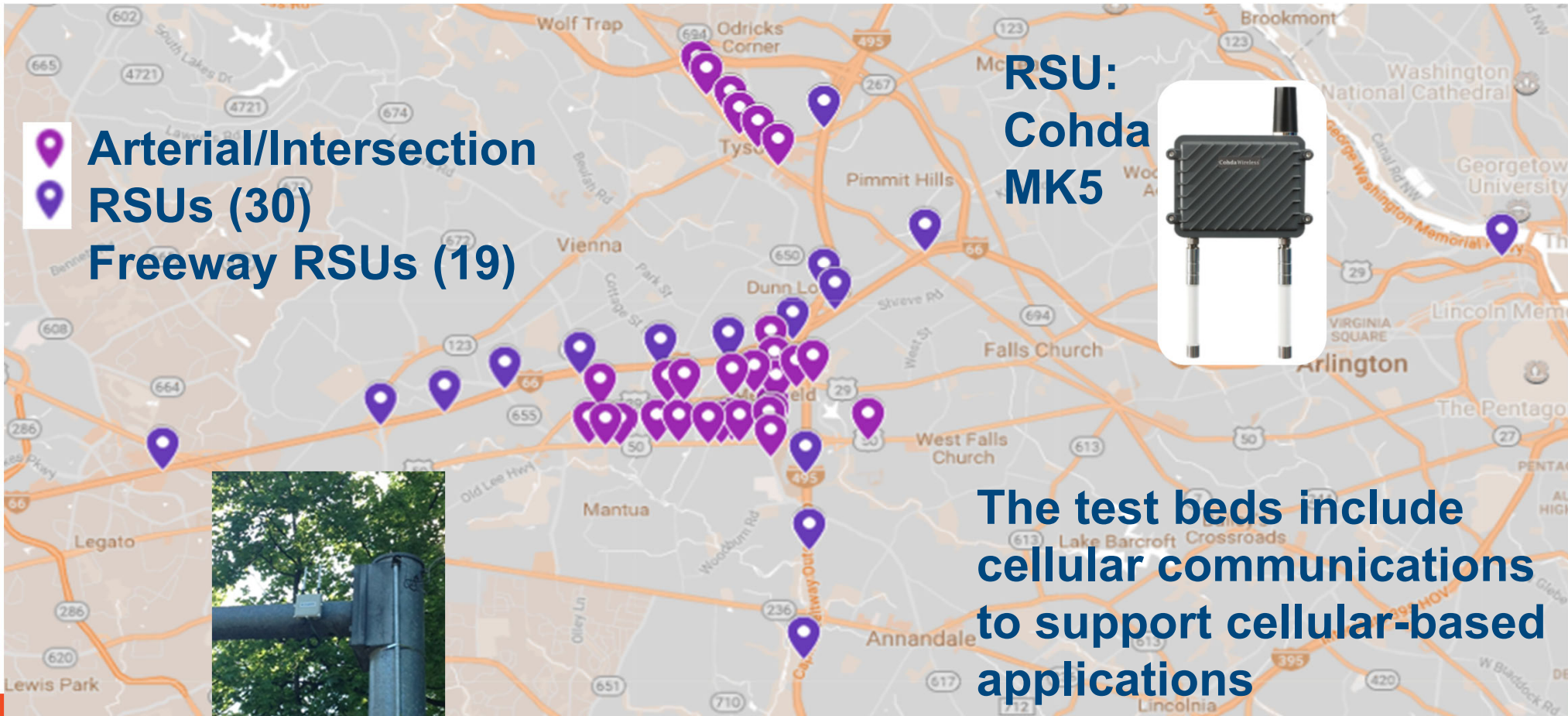
## What Benefits Can We Expect?




## Soooo, what's really happening out there?



# Northern Virginia Test Bed: DSRC Deployments



 Arterial/Intersection  
RSUs (30)  
 Freeway RSUs (19)

**RSU:  
Cohda  
MK5**



The test beds include cellular communications to support cellular-based applications



# Northern Virginia Challenges



# National SPaT Challenge

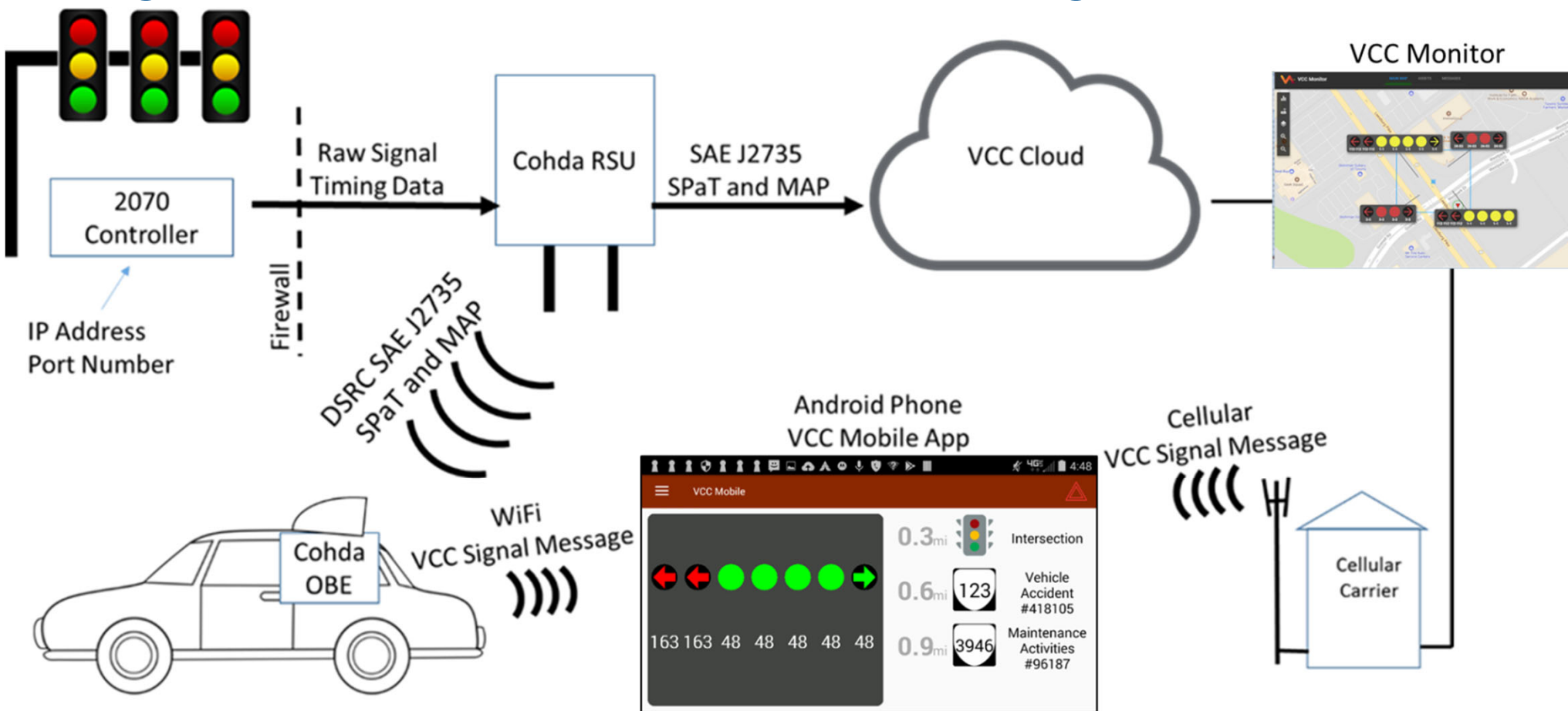
## What is the Challenge?

To challenge state and local public sector transportation IOOs to cooperate together to achieve deployment of DSRC infrastructure with SPaT broadcasts in at least one corridor or network (approximately 20 signalized intersections) in each state by January 2020.

## What is SPaT?

A Signal Phase and Timing (SPaT) message defines the current intersection signal light phases. The current state of all lanes at intersection are provided, as well as any active pre-emption or priority. SPaT message defined by the SAE J2735 standard.

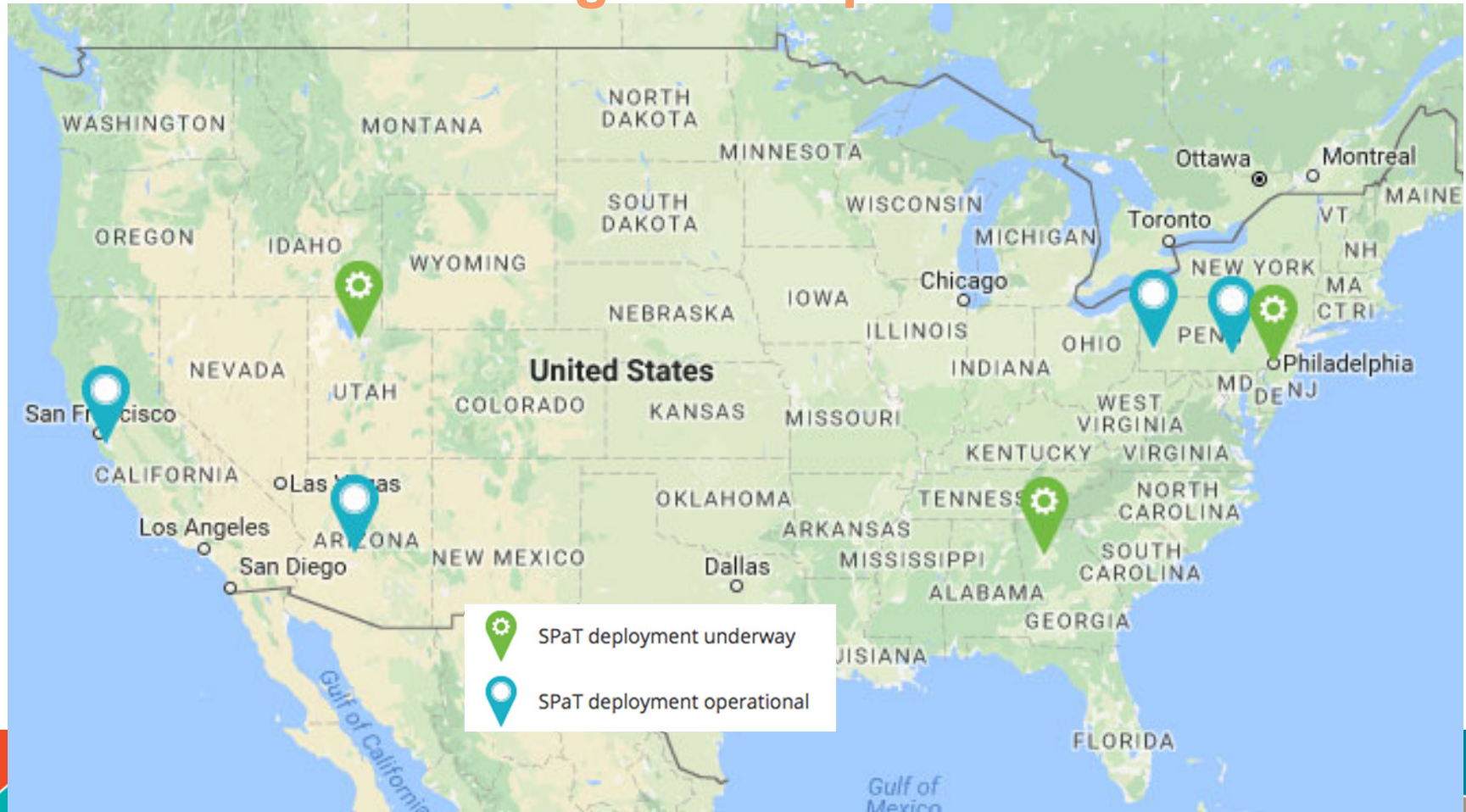
# Virginia Connected Corridor's SPaT Challenge Architecture





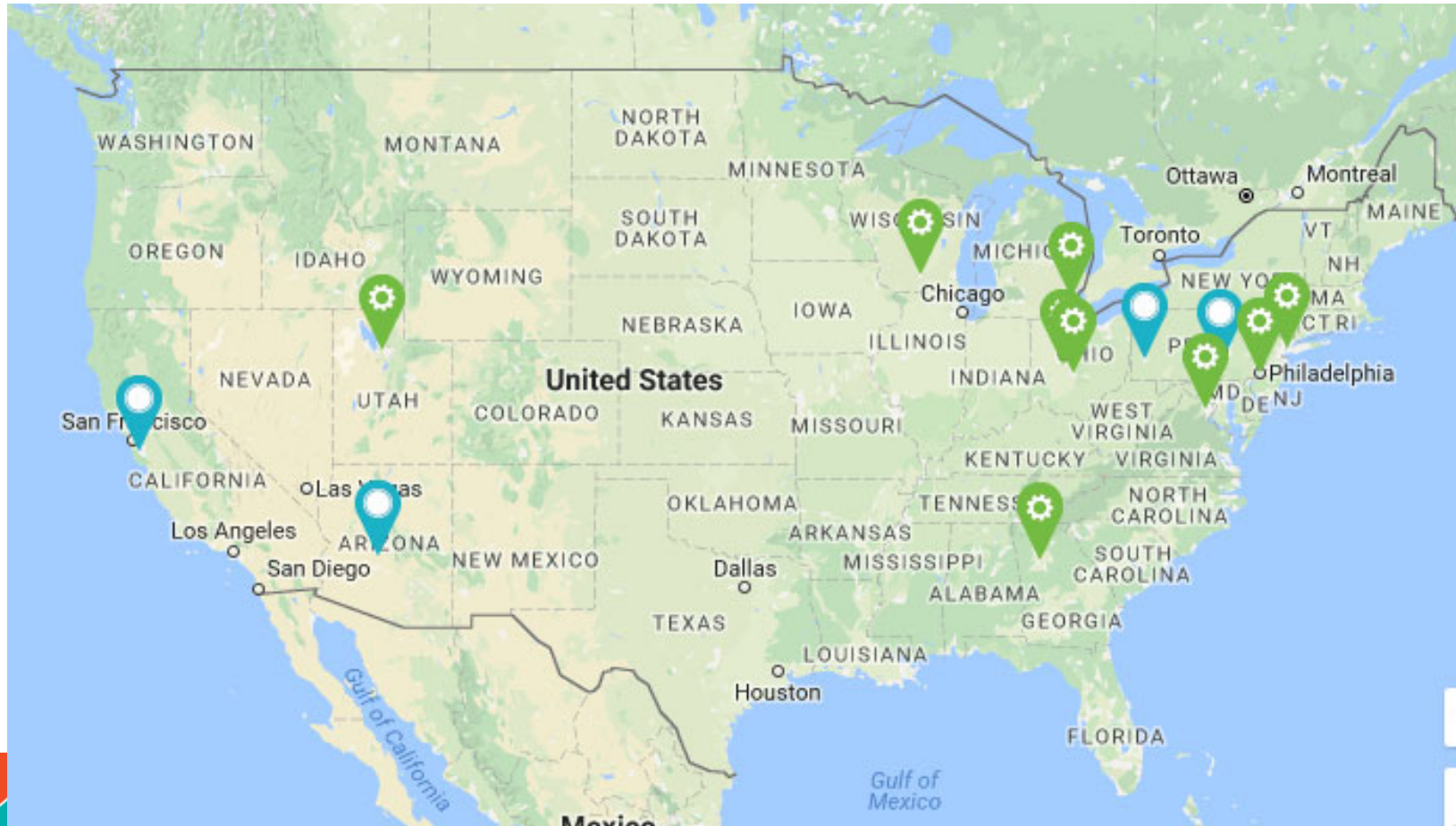
# National SPaT Challenge Deployment Map

## SPaT Challenge Participants - Mar 2017



# National SPaT Challenge Deployment Map

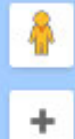
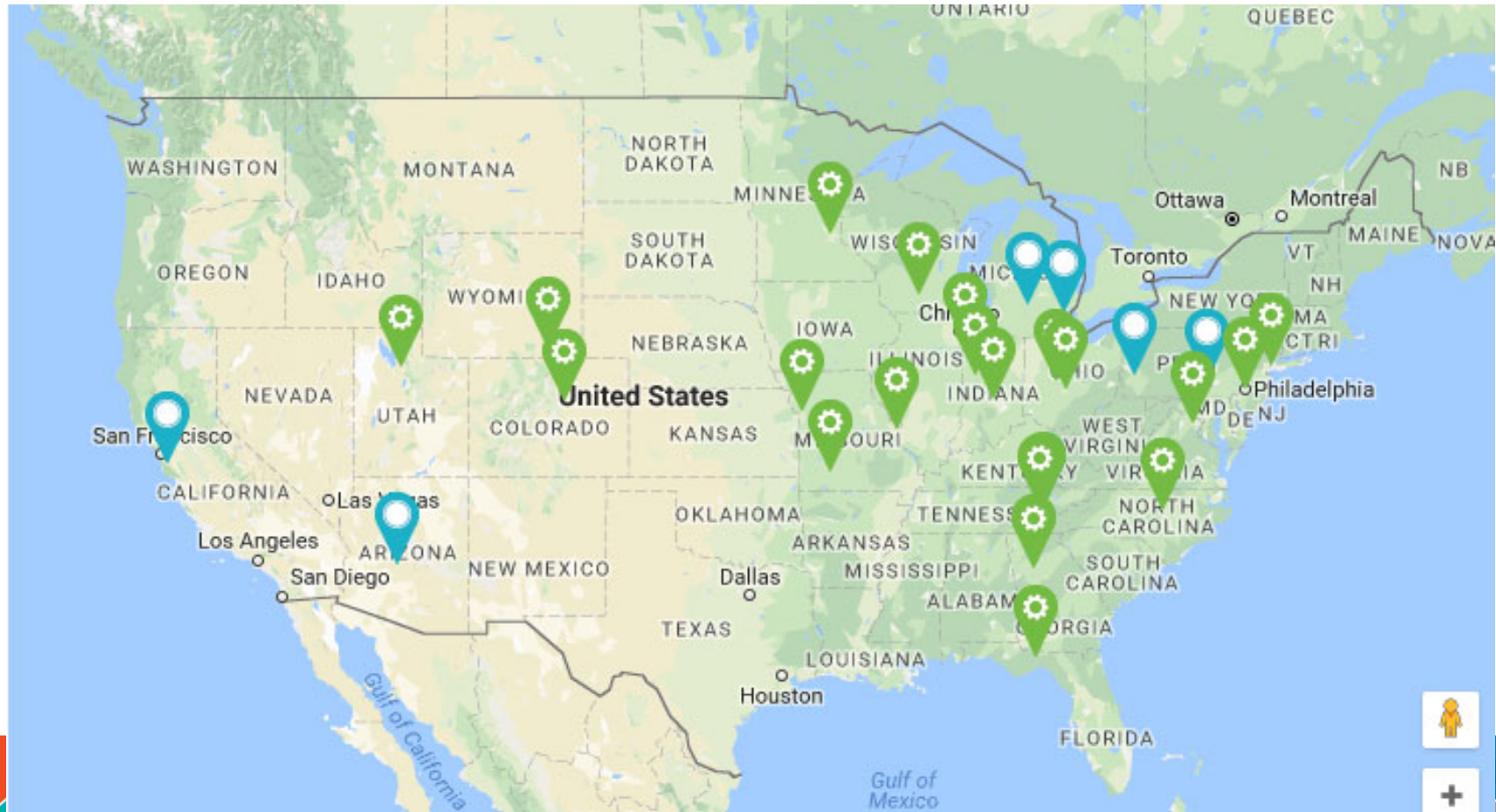
## SPaT Challenge Participants - May 2017





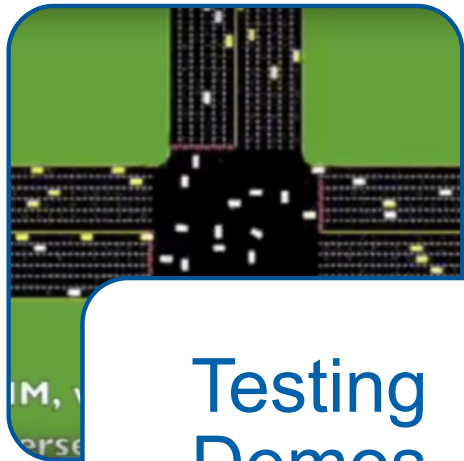
# National SPaT Challenge Deployment Map

## SPaT Challenge Participants - Nov 2017





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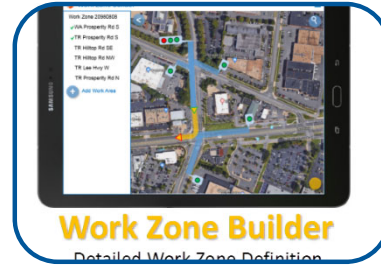




# Next Steps



**Automated  
Maintenance  
Vehicles**



**Work Zone  
Information**



**First and Last Mile  
Solutions**



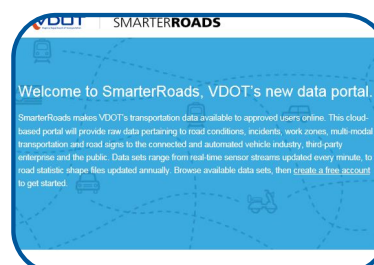
**Work Force  
Development**



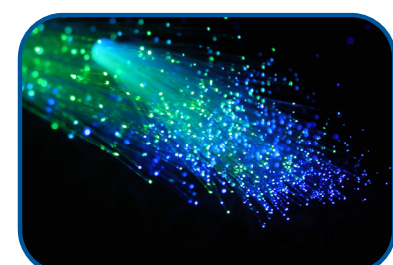
**Fleet Challenge**



**Industry  
Coordination**



**Data Management  
and Security**



**Leveraging  
Broadband**

