Connected and Automated Vehicles

Kimley»Horn

Why are we fascinated?

No more car accidents

Use the commute for personal time

Freight able to drive non-stop vs. regulated stop times

No more bumper-to-bumper traffic

Reduced transportation costs improve entire economy

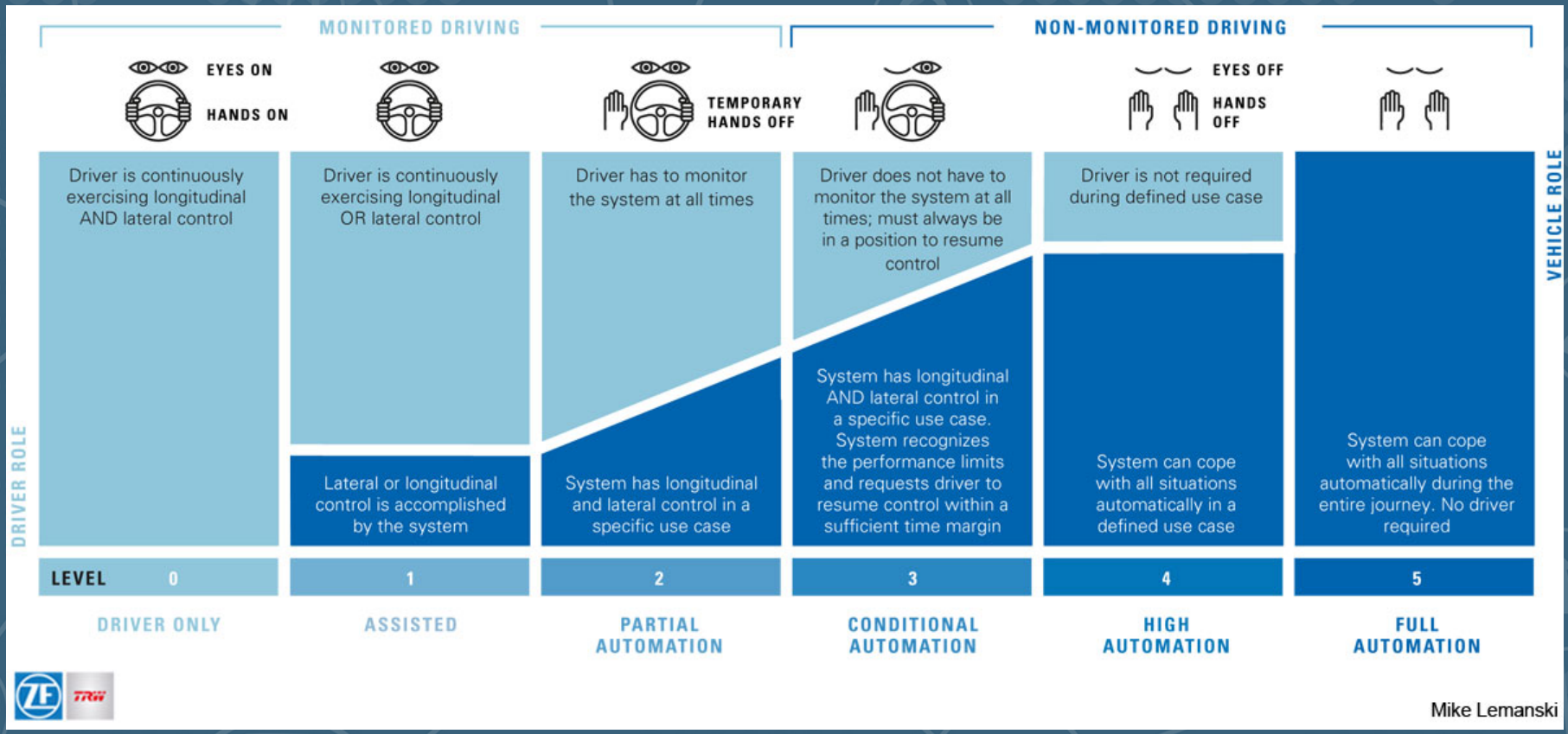
More city core b/c parking lots are not needed

No need to worry about parking

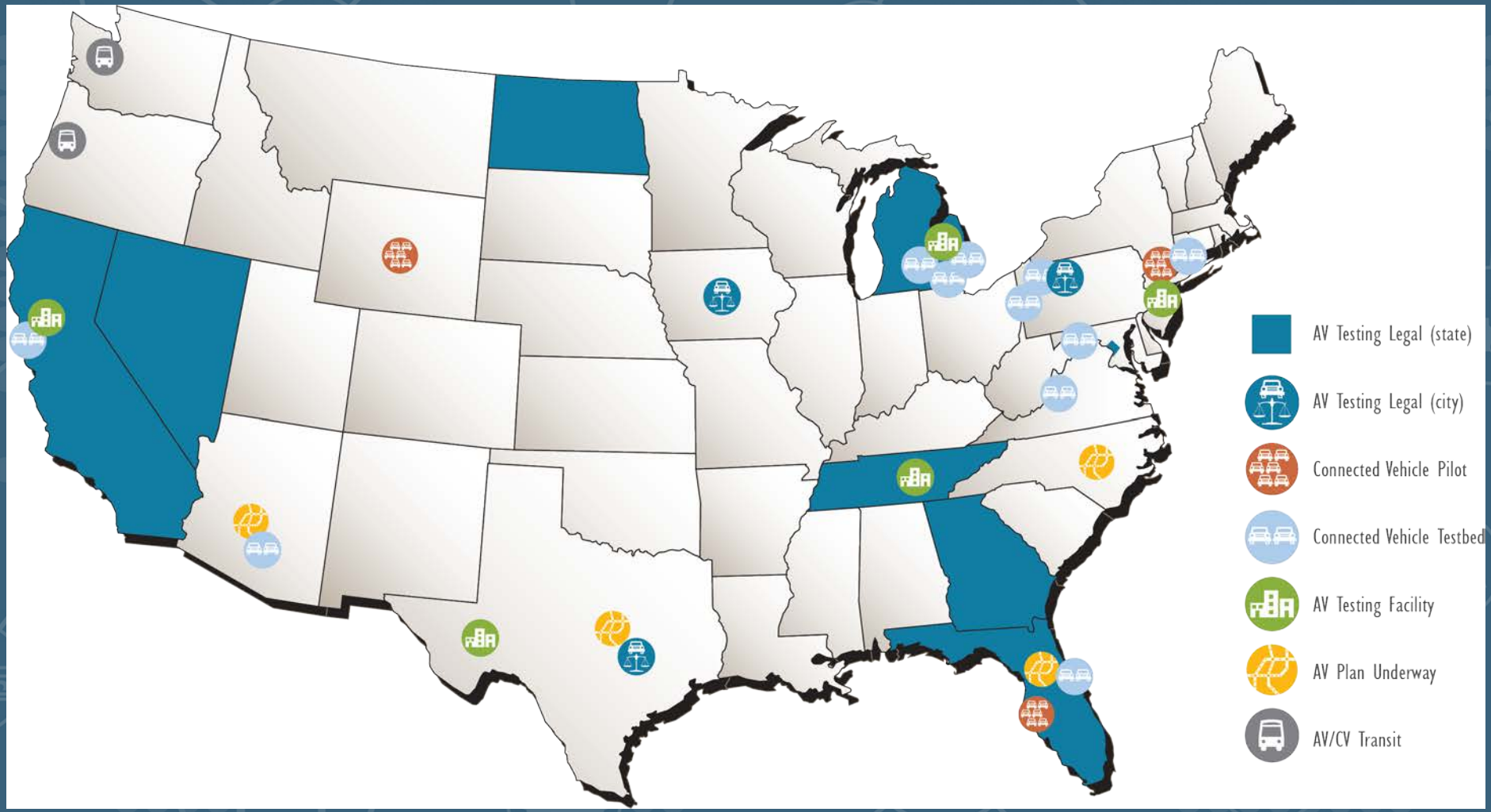
Reduced cost for transportation *(cost per mile decreased to less then $0.25)*


#1 Driving Factor is SAFETY

Levels of Autonomous



What is happening? (*January 2016*)



Simple Solution to Traffic

https://www.youtube.com/watch?v=iHzzSao6ypE

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Predictions?

Today		AV Capabilities with software download
2016		Releases Super Cruise on Cadillacs
2018	 	Google driverless car on the market with Ford; Connected Vehicle Pilots go live
2020	 	Toyota and Nissan autonomous vehicles; second wave of Connected Vehicle Pilots live
2025		Autonomous vehicles available worldwide
2030		UBER fleet driverless – inexpensive, owning vehicles might not make financial sense
2040		75% of all vehicles will be automated

Current Events

- Tesla Crash
- Tesla Fatality
- Fiat/Chrysler to snag Samsung (for technology)
- Uber to deploy ‘within weeks’
- Self-driving cars and the future of the auto sector
- Auto suppliers team up to deliver autonomous-vehicle system by 2019
- +many more every day

State Representation

Michigan, Virginia, North Carolina

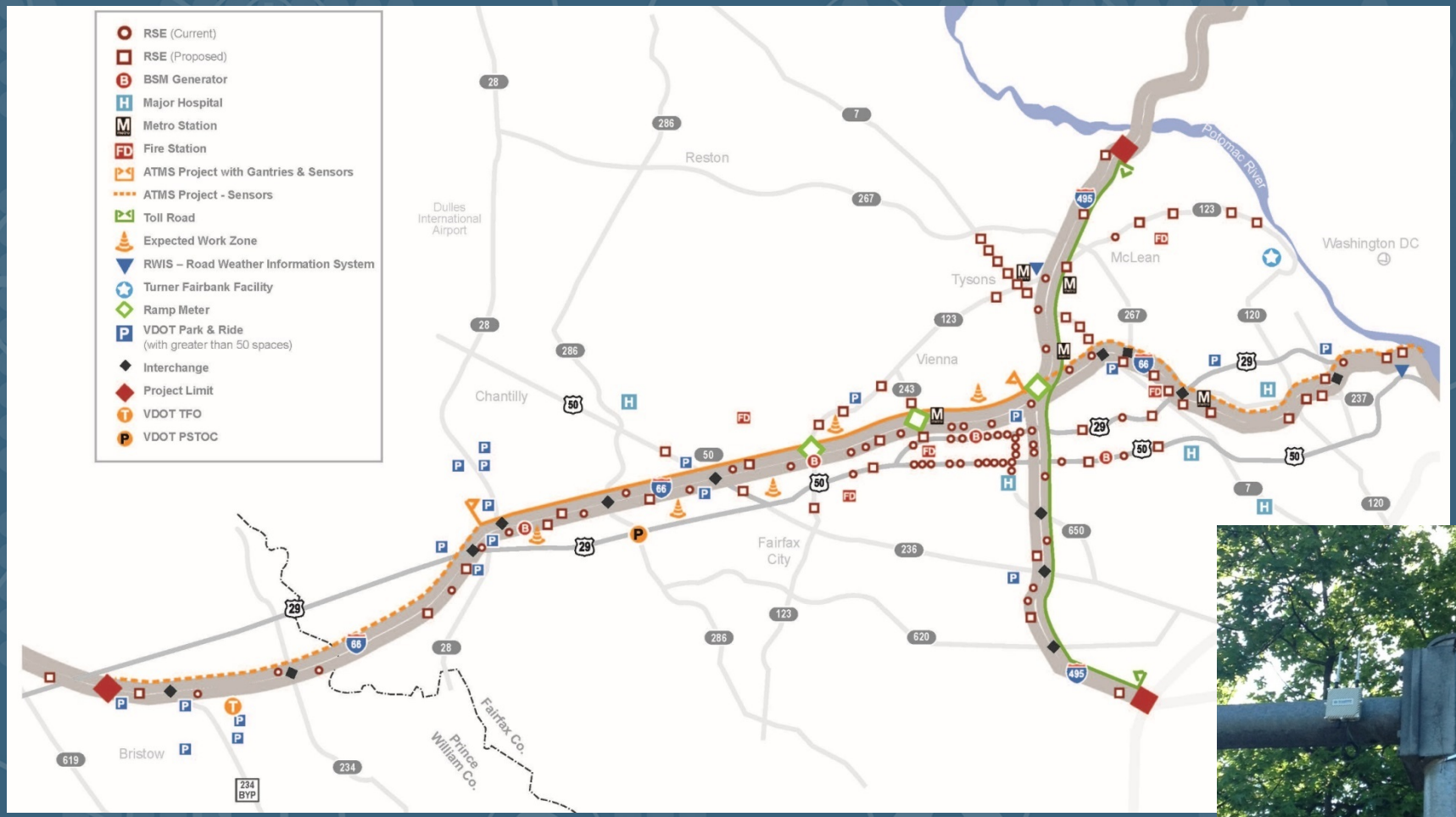
Michigan DOT *(Automated Vehicle Legislation)*

- Previously expanded ability of entities to use “experimental automotive technology” on public roads in Michigan through legislation
- Currently several follow-up bills in front of state legislature.

Michigan DOT *(Connected Vehicles)*

- Continue to jointly operate “legacy” DSRC test beds
- Work with third parties on identifying vehicle fleets that could be equipped
- Install new DSRC infrastructure in areas where equipped vehicle fleets are expected
- Developed and implemented “back office” data processing system that fuses connected vehicle data with “legacy” agency data
- **Equipped state vehicle fleet with CV technology and platforms**
- Work with partner agencies (local agencies) on equipping their fleet vehicles with CV technology and platforms
- Working on jointly developing V2I applications with automobile industry.
- **Identified 5-year deployment plan**
- Incorporated 5-year deployment plan into ITS budget
- **Merged MDOT Connected Vehicle Strategic Plan into ITS and TSM&O strategic plans.**
- Continued active involvement with USDOT and AASHTO on coordinated national deployment of technology
- Work with Institutional and Private Industry in jointly researching and deploying additional applications (Mobility Transformation Center, American Center for Mobility)

Virginia Connected Corridors



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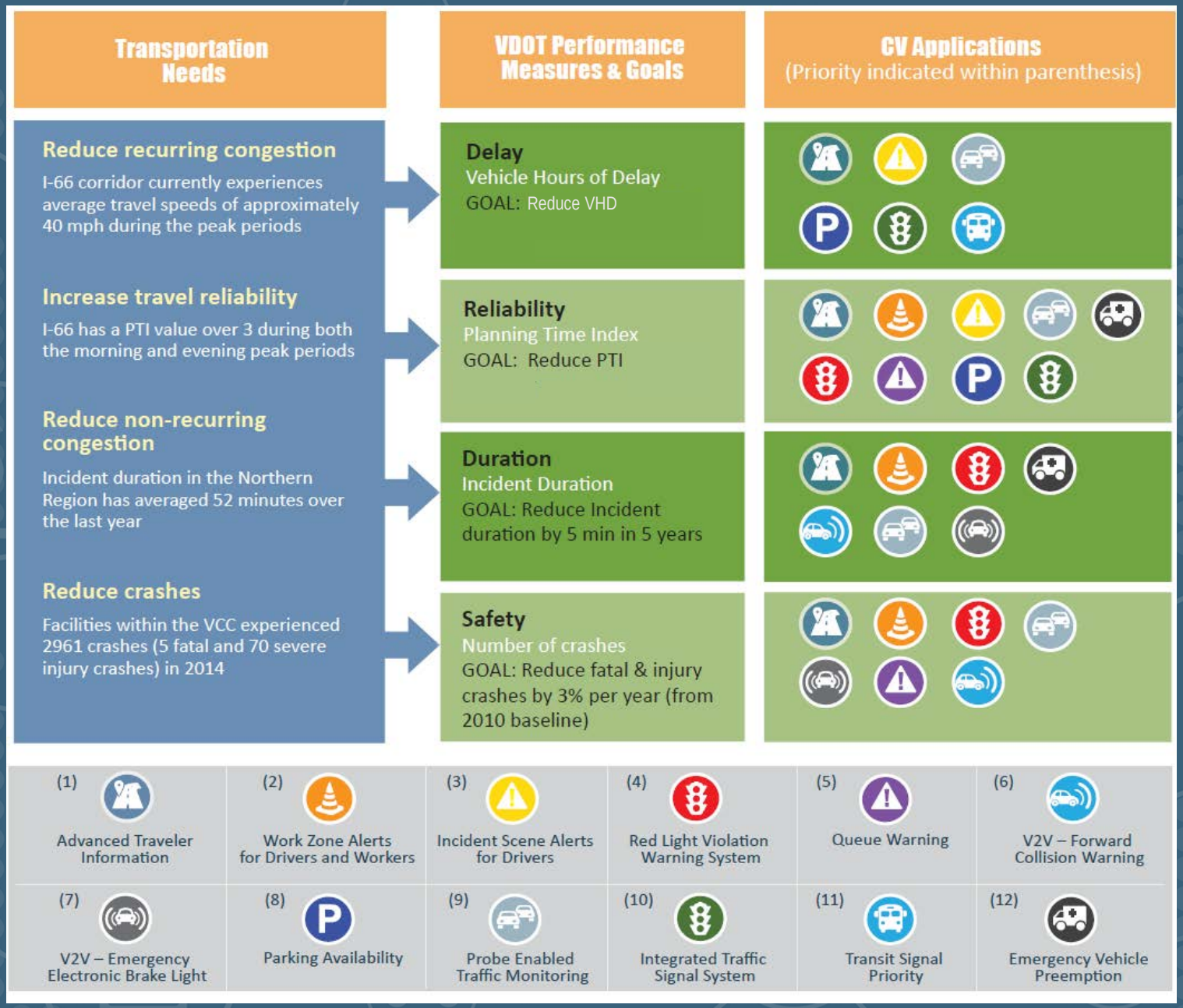
Transportation Needs
VDOT Performance Measures & Goals
CV Applications
(Priority indicated within parenthesis)
Reduce recurring congestion
I-66 corridor currently experiences average travel speeds of approximately 40 mph during the peak periods
Increase travel reliability
I-66 has a PTI value over 3 during both the morning and evening peak periods
Reduce non-recurring congestion
Incident duration in the Northern Region has averaged 52 minutes over the last year
Reduce crashes
Facilities within the VCC experienced 2961 crashes (5 fatal and 70 severe injury crashes) in 2014
Delay
Vehicle Hours of Delay
GOAL: Reduce VHD
Reliability
Planning Time Index
GOAL: Reduce PTI
Duration
Incident Duration
GOAL: Reduce Incident duration by 5 min in 5 years
Safety
Number of crashes
GOAL: Reduce fatal & injury crashes by 3% per year (from 2010 baseline)
(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

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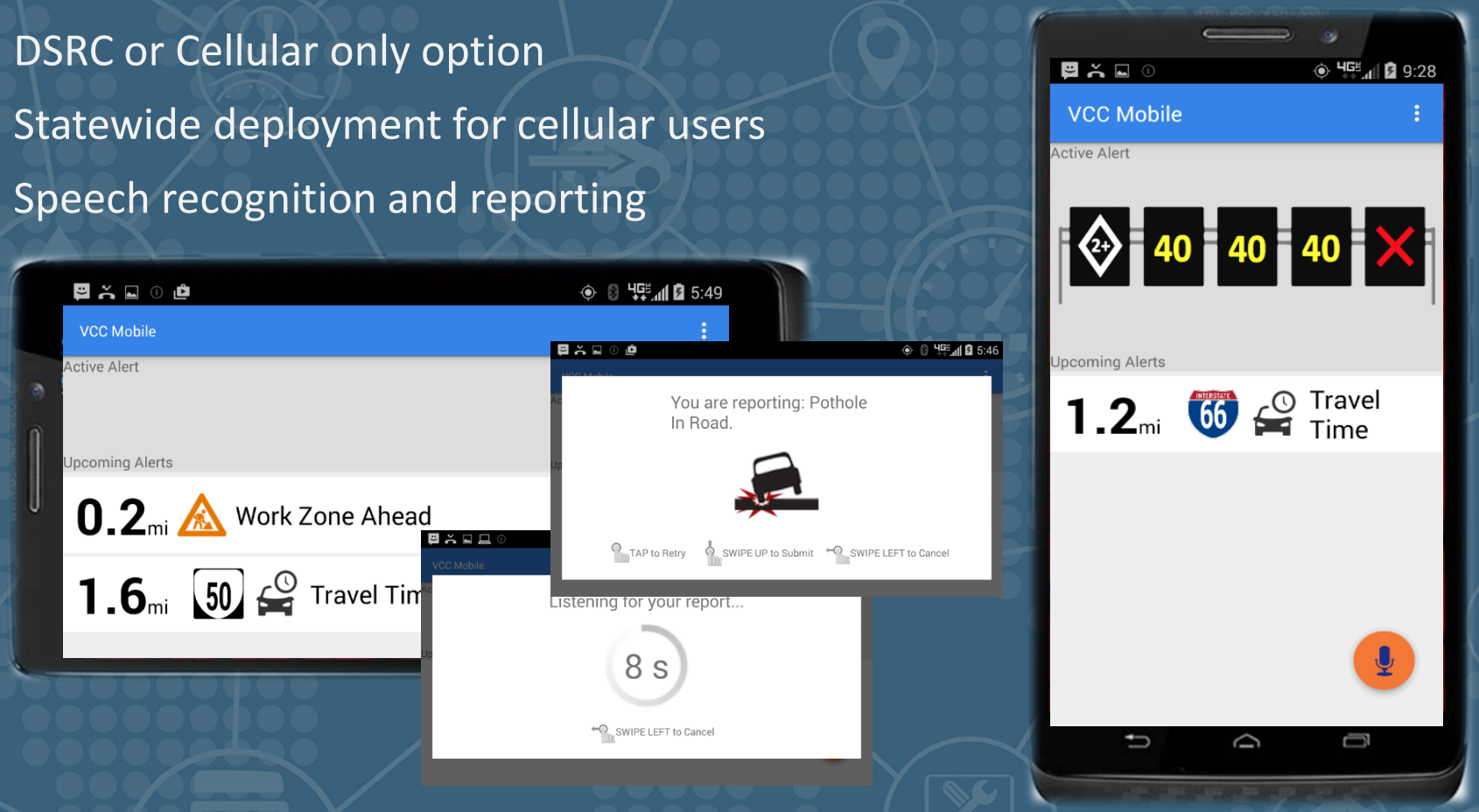
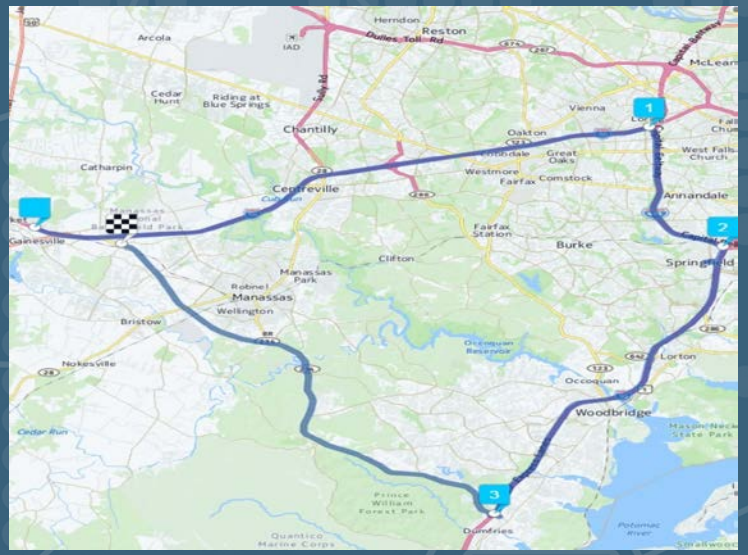
Traveler Information Message App

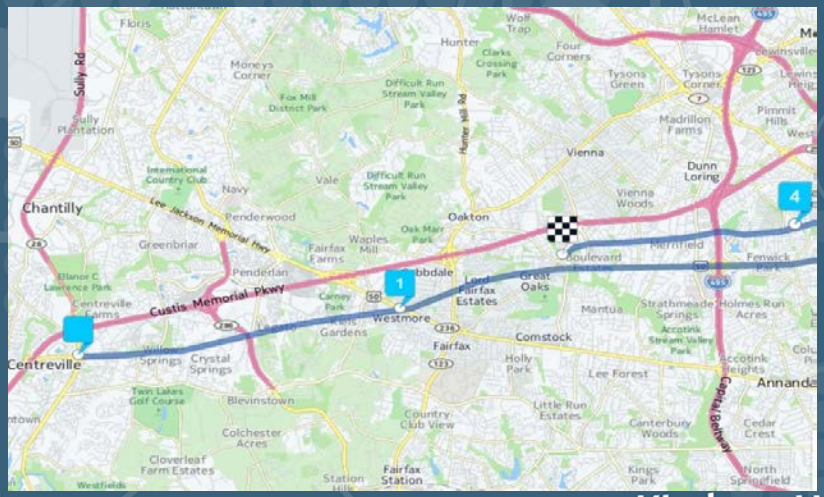
- DSRC or Cellular only option
- Statewide deployment for cellular users
- Speech recognition and reporting



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





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North Carolina DOT

- CAV Readiness Plan
- Identified location for deployment of SPaT applications
- Identified locations for deployment of RWIS applications