



Transportation Operations Data Portal

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VDOT Innovation and Technology Implementation Plan

- 1. Improve safety to the goal of ZERO Annual fatalities.**
- 2. Improve Operations, providing increased mobility and reduced congestion; connecting people and moving goods in a more timely and efficient manner.**
- 3. Concurrently reduce infrastructure costs and improve State of Good Repair in order to repurpose spending from obsolete assets to core needs and innovative approaches.**
- 4. Drive the implementation toward significantly reduced overall public sector transportation infrastructure investment.**

Implementation Plan is focused on Quick Wins

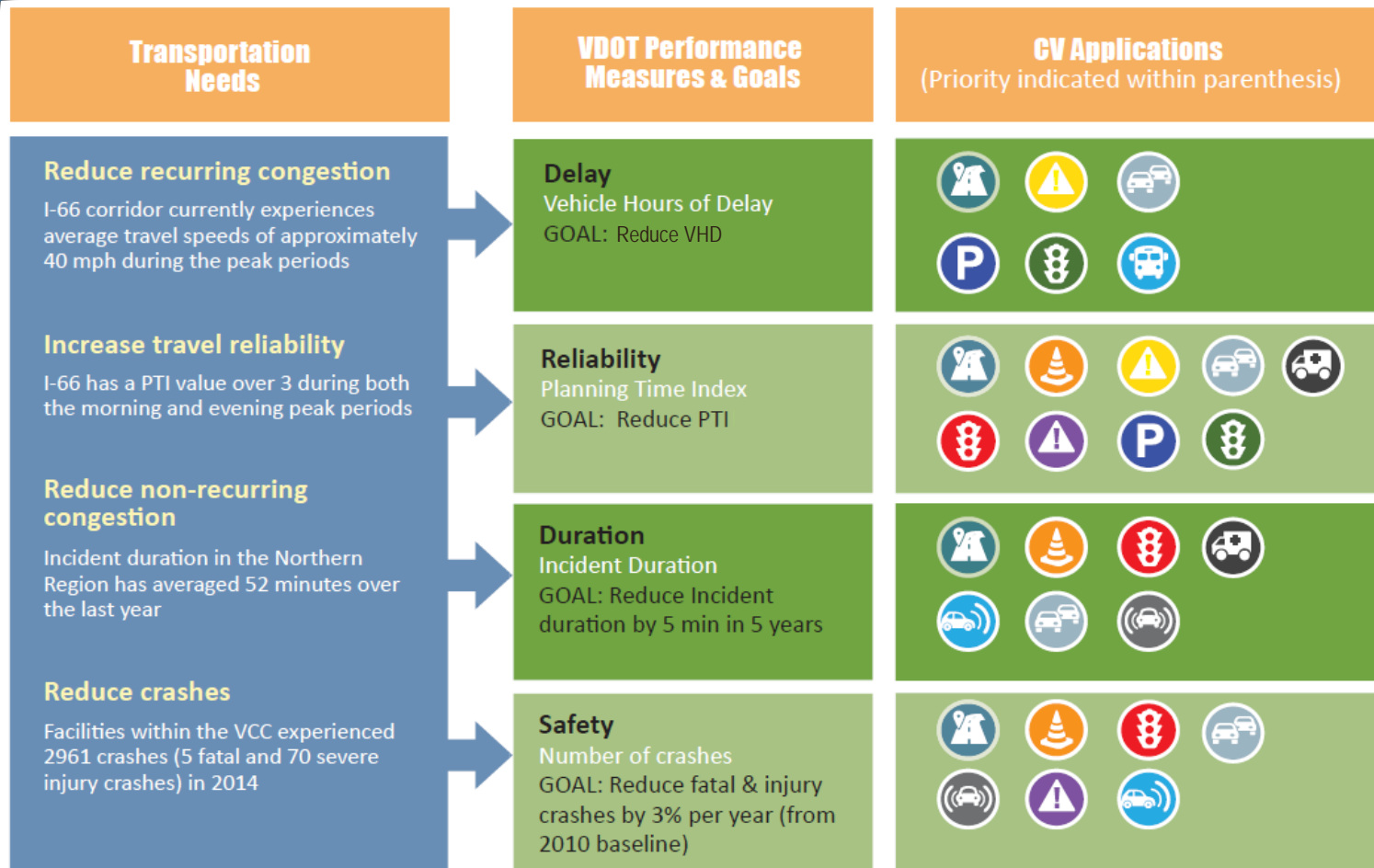
1. **Develop the roadway of the future by beginning the ultimate replacement of traffic signals with connected vehicle technology in coordination with the automotive industry.**
 - **Target of 10 years for full implementation.**

2. **Begin deployment of enhanced edge of pavement and other lane markings in coordination with the automotive industry to eliminate road and lane departure crashes.**
 - **Target of 10 years for full implementation.**

3. **Implement a cloud-based data portal to provide road condition, traffic incident, work zone, multimodal traffic data, and roadside signage information for connected and automated vehicle consumption.**
 - **Target 1 year for full implementation.**

Cloud Data Portal Objectives

- **Accelerate the CAV technology development** by exchanging transportation data and video with private sector CAV business, application developers, and university partners.
- Provide all relevant VDOT data beyond current traffic operations data in one portal site.
- **Encourage auto manufacturer device, application, and business development** to increase the frequency, quality, and accuracy of data shared with private sector in Virginia.
- Improve 2-way data exchange for VDOT to publish and obtain data for internal use.
- **Simplify the process** to add new users and manage existing users.
- Serve as a national model for other state DOT's.



(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

VDOT Top Priority V2I Applications

Application	VDOT Data
1. Adv. Traveler Info	Traffic Incidents, Winter Road Conditions, Work Zone Info, Travel Time Info, Managed Lane/HOV Data
2. Work Zone Alerts for Drivers	Work Zone Info (location, type, lanes)
3. Incident Scene Alerts for Drivers	Traffic Incidents (lane closures, speed reductions, queue length and delay info)
4. Red Light Violation Warning System	Signal, Phase and Timing (SPaT)
5. Queue End Warning	Traffic Incidents, Congestion Data
8. Parking Availability	Truck Parking, Commuter Park N Ride
9. Probe enabled Traffic Monitoring	Travel Time, HPMS data, CV data from vehicles
10. Integrated Traffic Signal System	Signal Location, SPaT/MAP, location correction
11. Transit Signal Priority System	Signal Location, SPaT/MAP, location correction
12. Emergency Vehicle Preemption	Signal Location, SPaT/MAP, location correction

Possible applications for other VDOT data

VDOT Data	Potential Applications/Benefits
13. Speed Zones	Vehicle navigation without road signs
14. Structure Exclusion Data	Truck navigation to eliminate bridge hits and damage
15. Snow Plow locations	Vehicle navigation to reduce crashes
16. Future Bridge and Paving Schedules	Predictive travel time planning
17. CV Data collected from vehicles	Pavement condition monitoring
18. Managed Lane Info	Vehicle navigation and Predictive travel time planning
19. Congestion Heat Map	Predictive travel time planning

Automate existing data sources

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VIRGINIA ROADS

- Interactive Maps
- Map Publications
- Websites
- Travel and Commute
- Recreation
- All**
- Projects
- Pavement Condition and Paving Schedules
- Crashes
- Traffic Volumes
- Bridges
- Speed Limits
- 511 Traffic Information System
- VDOT Holiday Travel Trends
- Snow Maps
- Mega Projects Northern Virginia
- VDOT Structure Exclusion Map
- Park and Ride Lots
- National Geographic Maps
- 95 Express Lanes
- 495 Express Lanes
- VDOT Structure Exclusion Map
- LANE CLOSED
- VDOT Structure Exclusion Map
- VDOT Structure Exclusion Map
- VDOT Structure Exclusion Map

Executive Directive #6 – Cyber Security Requirements

- **Determination of sensitivity and criticality of systems**
 - VDOT has a business impact assessment that supports designation of sensitivity and criticality of systems
- **Risk prioritization and scope of systems and data**
 - Systems and data risk profiles have been completed for sensitive systems
- **Development of a risk-based approach to enhance protection of systems and data**
 - COV Sec 501 requirements have been implemented supporting risk based classification of systems and data
- **Completion of security audits**
 - Audit of Sensitive Systems is on track
- **Development of risk mitigation and resilience plans**
 - Risk mitigation plans have been developed for each sensitive system
- **Plans for remediation with completion dates.**
 - Audit findings are being addressed with Action items and dates

Executive Directive #7 – Data Sharing Requirements

- A comprehensive review of all legal, privacy, and governance concerns as they relate to data sharing
 - VITA is leading this effort
 - VDOT has written MOUs with media and other organizations receiving data
- Recommendations on how to make data generated by state agencies more accessible and usable by state government and the public as “open” data
 - VDOT has completed a VITA survey of all systems and their data
- Recommendations for data sharing governance, ethical use, and authority
 - VITA is leading this effort
- Recommendations of key projects providing the highest likelihood of realizing value of data and analytics in new ways that will demonstrate cost savings and support the New Virginia Economy
 - VITA is leading this effort.

Portal Implementation Strategy

Governance Implementation and Support Services

- Develop data and portal governance policy and guidance documents
- Develop project scope, deliverables, schedules and budget details
- Define data collection, aggregation, and dissemination approaches based on use cases
- Define data quality assurance plan
- Develop portal concept of operations

Design & Implementation

- Issue task order with existing service providers, such as Iteris and Q-Free
- Identify data sets and use cases for quick win implementation
- Design secure cloud data portal technology
- Develop and test data portal in lab and real world environments
- Launch portal with initial capability per the defined concept of operations

Constraints and Challenges

- **Cyber Security requirements will be significant and influence system architecture**
- **Data quality, reliability, and governance will have to be defined early**
- **Secure portal deployment will offer initial data services by June 30, 2017, and expand incrementally over time**
- **Budget and funding need to be established to move the initiative forward**
- **VITA's review of cloud services may impact schedule**



Data Portal Milestones & Status

FY17 Milestones	Target	Status
Complete inventory of current and planned VDOT data available for exchange	10/2016	On schedule
Assess impact of Executive Directive #6 (Security) and #7 & (data sharing); Develop detailed project scope and budget	10/2016	On schedule
Develop data broadcast schema, security, & quality assurance protocol	11/2016	Slightly behind schedule
Assess VDOT data quality and conduct market analysis for other data needs	12/2016	
Develop cloud-based data broadcast and security architecture	12/2016	
Develop governance policy, business and administrative framework	12/2016	
Implement and pilot data broadcast environment	4/2017	
Release data portal to broadcast operations data	6/2017	
Implement lessons learned, add new datasets and features	6/2018	