Emerging Trends in Interstate Operations and Management in Virginia

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Virginia’s Interstate Network

• VDOT operates 1,118 miles of interstate, ranging from congested urban facilities to rural, mountainous interstates.
• 5 Traffic Operations Centers cover entire system
• VDOT also operates 56,416 miles of primary and secondary roads.
Using Operations and Management to Address Interstate Congestion

- Primary focus is on mitigating non-recurring events
- Improve reliability of trips under unusual conditions

Source: Cambridge Systematics and TTI, 2004
Trends in Interstate Operations in Virginia

- Improved data and analytics
- Improved incident response
- Active traffic management
- Pricing as a management tool
- Integrated corridor management
- Connected and automated vehicle applications
Improving Data and Analytics

• DOTs have historically been restricted to data generated by point sensors
• Partnerships with crowd sourced data providers have increased coverage
  – Probe travel time data (INRIX)
  – Incident data (Waze)
  – New cloud data portal for app providers
• New Big Data analytical tools
• Emerging connected vehicle data sets
Improving Rural Incident Management

- Rural areas have lower levels of monitoring, fewer parallel routes
- Implemented first responder pilot using VDOT to provide coordination with first responders on lane blocking incidents at known rural hotspots
- 20% reduction in lane clearance time, 14% reduction in incident duration

5/25/2017
I-66 Active Traffic Management

• Major commuting corridor with frequent recurring and nonrecurring congestion

• In September 2015, VDOT activated ATM system that included:
  – Advisory Variable Speed Limits
  – Lane Control Signals
  – Dynamic Hard Shoulder (previously a static time of day system)
I-66 Active Traffic Management

- Travel times improved 4 to 10% during weekday off peak periods, 7 to 15% on weekends
- Up to 25% reduction in crashes
I-77 Variable Speed Limits

- Rural mountainous area prone to severe fog events
- Significant unsafe driving behavior during fog
- Implemented VSL system to dynamically reduce speeds based on visibility data
- System active in October 2016
I-77 Variable Speed Limits

- Real time VSL feedback has reduced speed and improved compliance
Priced Managed Lane Projects

- Pricing has been used to manage demand and encourage HOV utilization
- Open facilities:
  - I-95 Express Lanes
  - I-495 Express Lanes
  - Elizabeth River Tunnels
- Planned facilities
  - I-64 in Hampton Roads
  - I-66 Inside the Beltway
  - I-66 Outside the Beltway
Priced Managed Lane Projects

5/25/2017
Integrated Corridor Management

- Planning initiatives underway to look at multimodal mobility on I-95 and I-66
- Connection with freeways, arterials, transit, and parking
Planning for Connected and Automated Vehicles

• VDOT has been active in connected and automated vehicles for many years
  – Lead state in connected vehicle pooled fund study
  – Developed Virginia Connected Corridor and Virginia Automated Corridor for testing
  – Key partnerships with state universities
  – Moving towards integration with TOCs
Virginia Connected Corridors

**Transportation Needs**

- **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 2963 crashes (5 fatal and 70 severe injury crashes) in 2014.

**VDOT Performance Measures & Goals**

- **Delay**
  Vehicle Hours of Delay
  GOAL: Reduce PTI

- **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)

**CV Applications**

(Priority indicated within parenthesis)

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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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
Themes Moving into the Future

• Continued emphasis on real-time management of facilities, including active traffic control
• Continued improvement in availability, diversity, and analysis of data
• Increased coordination in operations between freeways, arterials, and transit
• Integration with future connected and automated vehicle applications
Questions?

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