



COMMONWEALTH *of* VIRGINIA
Office of the
SECRETARY *of* TRANSPORTATION

Innovation and Technology Transportation Fund

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Innovation and Technology Transportation Fund

- The ITTF provides funding specifically for the purposes of funding pilot programs and fully developed initiatives pertaining to high-tech infrastructure improvements with a focus on:
 - Reducing congestion
 - Improving mobility
 - Improving safety
 - Providing up-to-date travel data
 - Improving emergency response

Proposed Projects

- **Thirteen projects are proposed that provide a mix of:**
 - **Interstate vs. arterial**
 - **Multimodal approaches**
 - **Demonstrations of proven technology and piloting of experimental approaches**
- **All projects will be evaluated to enable deployment in other regions**

Northern Virginia Regional Multi-Modal Mobility Program (RM3P)

- Builds off an Integrated Corridor Management planning grant
- Includes four distinct but inter-related tasks
 - Enhance commuter parking data
 - Develop a Mobility as a Service (MaaS) Dynamic Service Gap Dashboard
 - Implement an AI-based decision support system with prediction
 - Deploy a data driven tool to incentivize customer mode and route choice

RM3P – Task 1: Enhance Commuter Parking Data

- Focus on parking facilities in the I-66, Dulles Toll Road, Rt. 7, and I-95 corridors
- Leverage crowdsourcing data to communicate real-time parking availability
- Use artificial intelligence with historical parking trends and current status to predict parking availability for trip planning
- Goal – decrease single occupant vehicle use
- Total cost: \$4.6 million

RM3P – Task 2: Develop MaaS Dynamic Service Dashboard

- Include traditional and non-traditional Origin-Destination data, fixed route transit routes and schedules into data store
- Overlay O-D data with fixed transit routes to identify service gaps
- Incentivize service providers to meet unmet needs dynamically
- Goal – Encourage transit use
- Total cost: \$2.9 million

RM3P – Task 3: Implement an AI-based decision support system

- Leverage existing data on incidents, crashes, weather, demand with artificial intelligence to predict potential events
 - Reduce impact by prepositioning assets in “likely” locations, preparing alternate routes
- Total cost: \$6.5 million

RM3P – Task 4: Deploy a Data-driven Tool to Incentivize Traveler Choice

- Incentive program will be developed to change traveler behavior in response to traffic conditions
- Incentives will be targeted at changing time of travel or route or mode choice
- Partnerships with the private sector and large employers will be key
- Changing the behavior of 5-10% of travelers can be very beneficial
- Total cost: \$1 million

Performance Parking Deployment in Commercial Corridors

- **Focus on Arlington County's two Metrorail corridors to provide data-driven variable pricing coupled with real-time information**
- **Goal is to reduce congestion as travelers search for available parking (balance demand geographically)**
- **Similar program in San Francisco showed decreases in time to find a parking spot, reduced emissions, and lower vehicle miles traveled**
- **Total cost: \$5.4 million**

SFpark Evaluation Results

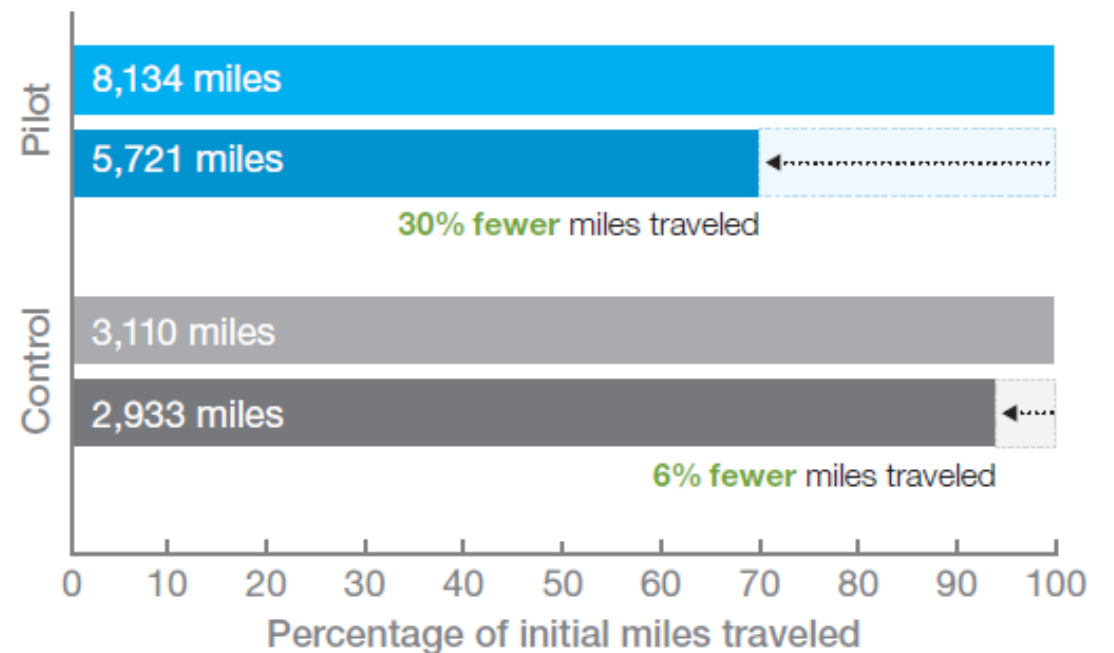
Hourly parking rates in SFpark areas

Before vs. after (10 rate changes)
On- and off-street rates



Daily vehicle miles traveled

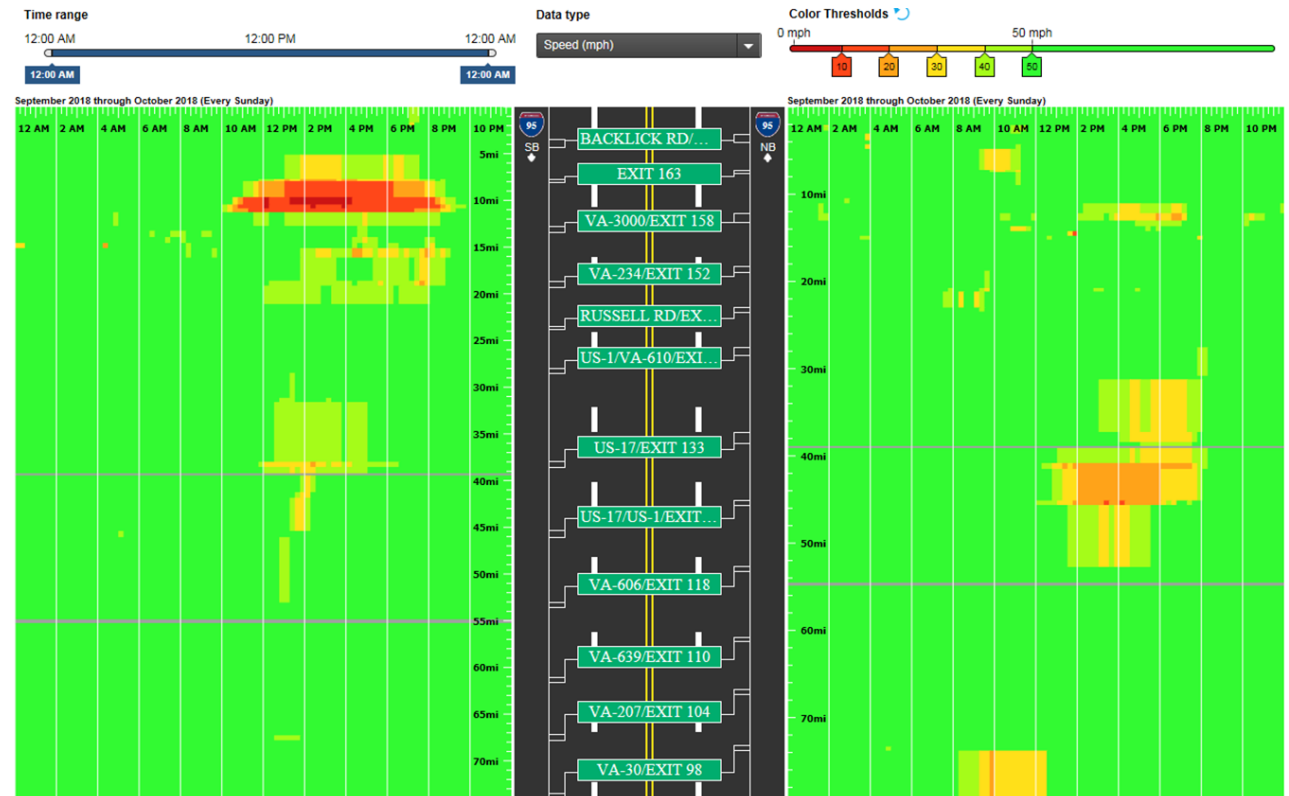
Before vs. after
Pilot vs. control areas | Weekdays 9am to 6pm



I-95 Operational Improvements



Sept./Oct. Weekdays



Sept./Oct. Sundays

I-95 Operational Improvements

- **Differences in geometry, travel patterns (commute vs. non-commute), and congestion intensity will require a range of solutions**
 - **Ramp metering – previous ITTF project has identified 7 ramp locations where metering would be beneficial**
 - **Active traffic management – experience internationally has shown VSL/speed harmonization to be effective in reducing congestion**
 - **Other strategies to include improved incident response, traveler information, etc.**
 - **Total cost: \$ 30 million**

I-64 Afton Mountain Safety Improvements

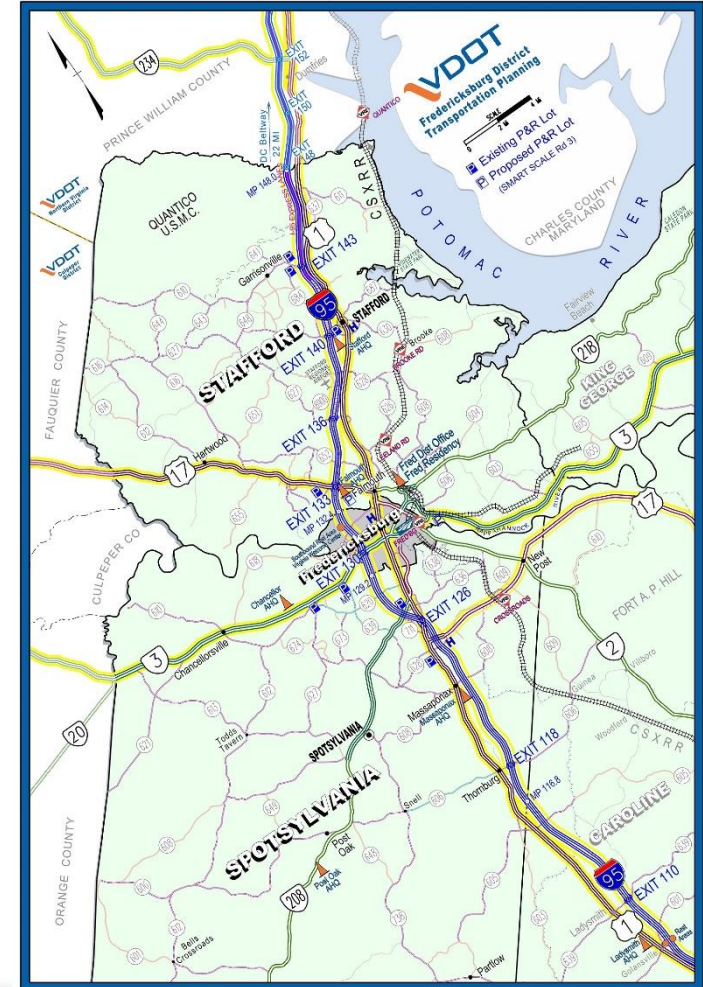
- Safety during the PM peak travel westbound is the biggest single concern
- Evaluating a range of potential strategies:
 - ATM designed to mitigate high speeds and speed differentials at the top of the mountain where fog is most likely
 - Speed feedback signs
 - Dynamic signing to alert trucks to travel in the right lane during the PM peak
 - Flashing chevrons, enhanced signs and markings, modified operation of existing fog lights
- Total cost: \$5 million

Innovative Transit Pilots

- **Hanover County Specialized Transit Program**
 - Target ambulatory and non-ambulatory services in rural and suburban areas through partnerships with reservation companies and TNCs to provide services
- **Hampton Roads Microtransit**
 - Provide mobility-on-demand rideshare services using small to medium sized vehicles operating within pre-defined zones
- **Total cost: \$300,000 (\$150,000 each)**

Parking Demand Management System

- Provide real-time parking information for 8 park & ride lots on I-95 that support VRE
- Sensors at entry and exit
- Real-time information display and publication to portal for further dissemination
- Total Cost: \$1,950,000



Parking Demand Management System



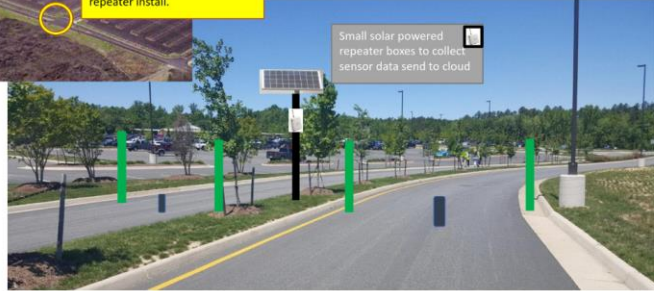
Updated location of sensors and repeater to simplify repeater install.

Installation Requirements:

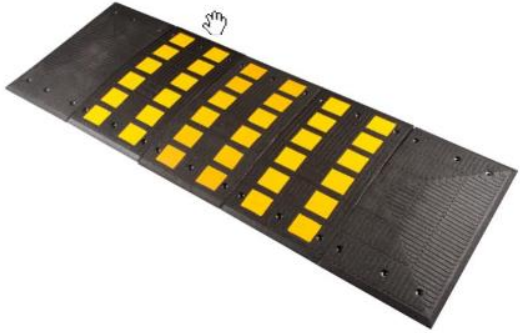
- Install u channel pole for repeater placement
- Assemble & attach repeater and solar panel to pole
- Drill 2 sensor holes & embed sensors
- Diagnostics & testing

Sensors are installed flush with the pavement at entry and exit lanes to count car traffic.

Rubber bendable delineators are installed 12 - 14ft apart to leave room for snow plows and funnel traffic over sensors



Small solar powered repeater boxes to collect sensor data send to cloud



Data Platform for Safety

- Integrate a variety of data (crash, weather, event, pavement condition, traffic/congestion, etc.) in a data platform to which artificial intelligence tools can be applied.
- Extension of the decision support tool developed in the RM3P project to address a wider range of safety challenges
- Nevada pilot indicated a 17% reduction in crashes
- Total cost: \$2 million

Pilot Program for Innovation

- **Pilot program in partnership with the Center for Innovative Technology can bridge the gap between VDOT-identified transportation challenges and entrepreneurs who have potential solutions**
- **CTB Subcommittee for Innovation and Technology will help to identify high priority issues to put forward as problem statements**
- **Total cost: \$1.5 million**

Innovation Program for Localities

- Initiative to fund locally identified innovative strategies that meet the goals of the ITTF program
- Working group of VDOT and DRPT staff will prioritize submitted projects on the basis of congestion relief, safety improvement, innovation, and potential for widespread deployment
- Total cost: \$2 million

Statewide Technology for Operations

- There are a number of strategies that have been tested or piloted that could result in significant operational improvement statewide
 - Customer service bots – handle routine or low-priority calls during high volume events to free customer service agents for higher priority issues
 - Worker alert system – emergency responders on the roadside are at high risk. Alert system would provide a geo-fenced presence alert through 3rd party apps or agency developed systems
 - Virtual ATM – provides benefits of an ATM without the heavy infrastructure investment
- Total cost: \$2 million

Arterial Operations Dashboard

- Leverage ongoing efforts to upgrade signal controllers and a central signal system
- Dashboard will provide metrics on signal performance and travel time reliability
- Initial deployment on 70 corridor segments (1,128 intersections) including corridors through about 50 localities and towns
- Three to five corridors will combine automated signal performance metrics and travel time metrics to improve real-time operations
- Total cost: \$1.25 million

High-Speed Communications Upgrades for Signalized Intersections

- Real-time monitoring and operations of traffic signals requires reliable communications between the field controllers and the central system
- Currently, approximately 35% of signals statewide have substandard communications
- Effort will leverage a variety of approaches (VDOT fiber, resource sharing, leased lines, etc) to facilitate effective communications with all intersections
- Total cost: \$4.7 million

I-81 Operational Improvements

- The I-81 Corridor Improvement Study identified a number of operational strategies targeted at the non-recurring congestion that is common throughout the corridor
- Signal enhancements to facilitate detours when incidents occur is a key element of the operational improvement plan
 - Real-time signal timing modifications to address diverting traffic patterns
 - Real-time monitoring of conditions for operational improvement and traveler information
- Total cost: \$10 million



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