



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

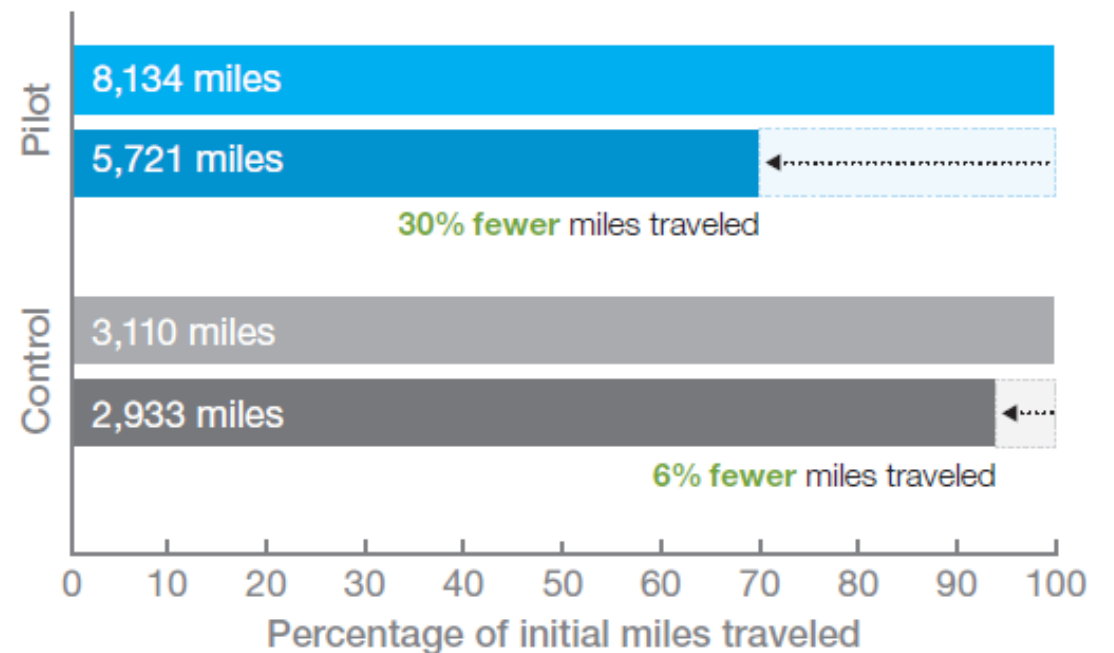
Hourly parking rates in SFpark areas

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



Daily vehicle miles traveled

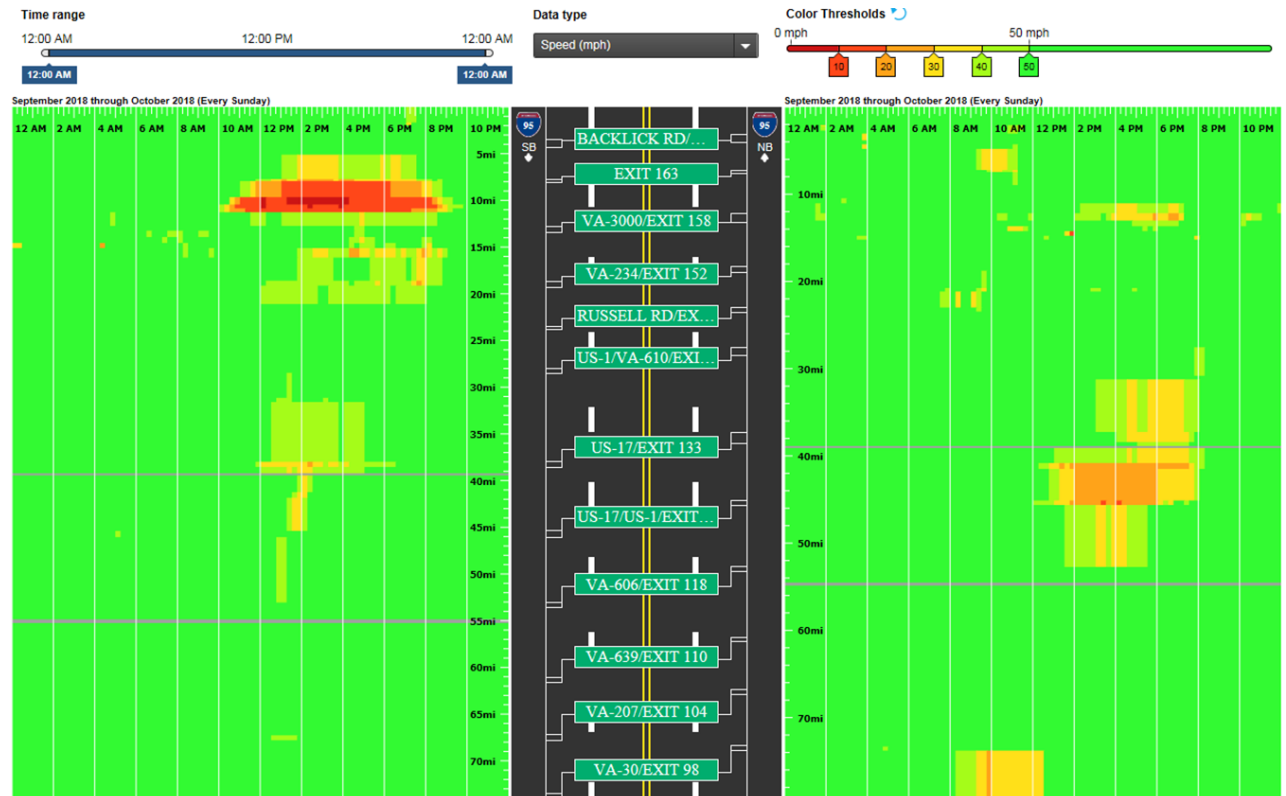
Before vs. after
Pilot vs. control areas | Weekdays 9am to 6pm



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

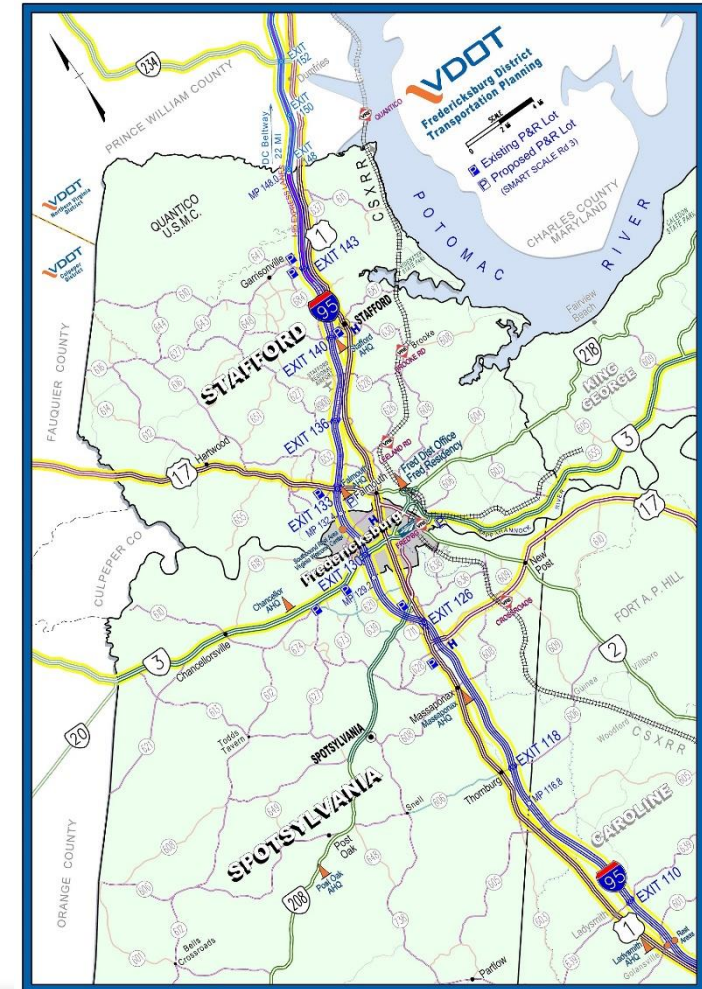
- Safety during the PM peak travel westbound is the biggest single concern
- Evaluating a range of potential strategies:
 - ATM designed to mitigate high speeds and speed differentials at the top of the mountain where fog is most likely
 - Speed feedback signs
 - Dynamic signing to alert trucks to travel 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

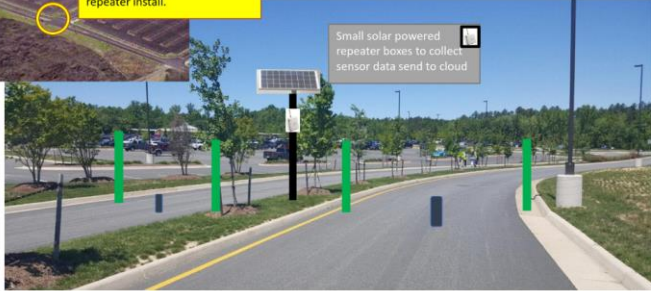


Parking Demand Management System



Updated location of sensors and repeater to simplify repeater install.

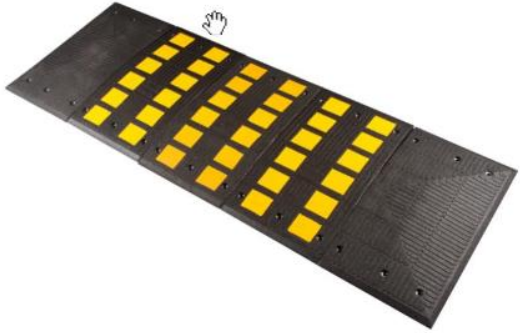
- Installation Requirements:
- Install u channel pole for repeater placement
 - Assemble & attach repeater and solar panel to pole
 - Drill 2 sensor holes & embed sensors
 - Diagnostics & testing



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

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



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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