



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION

Stephen C. Brich, P.E.
Commissioner

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March 27, 2024

The Honorable Governor Glenn Youngkin
Members of the Virginia General Assembly

Dear Ladies and Gentlemen:

Section 33.2-1531 of the *Code of Virginia* directs the Commissioner of Highways to report annually on the use of moneys in the Innovation and Technology Transportation Fund (ITTF). ITTF monies are to be used solely for the purposes of funding pilot programs and fully developed initiatives related to high-tech infrastructure improvements. The term "high-tech infrastructure improvements" pertains to projects or programs that reduce congestion, improve mobility, improve safety, provide up-to-date travel data, or improve emergency response.

In accordance with § 33.2-1531 of the *Code of Virginia*, I am submitting the attached report to you which serves to report on the use of the moneys in the ITTF over the past year. If you have any questions, please do not hesitate to contact E. Kevin Gregg, Chief of Maintenance and Operations, at (757) 620-3691 or me.

Sincerely,

A handwritten signature in blue ink, appearing to read "Stephen C. Brich".

Stephen C. Brich, P.E.
Commissioner of Highways

c: The Honorable W. Sheppard Miller III
G. Michael Fitch, Ph.D.
E. Kevin Gregg

Attachment



Innovation and Technology Transportation Fund (ITTF)

Report to the
General Assembly

2023

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WHAT IS THE ITTF?

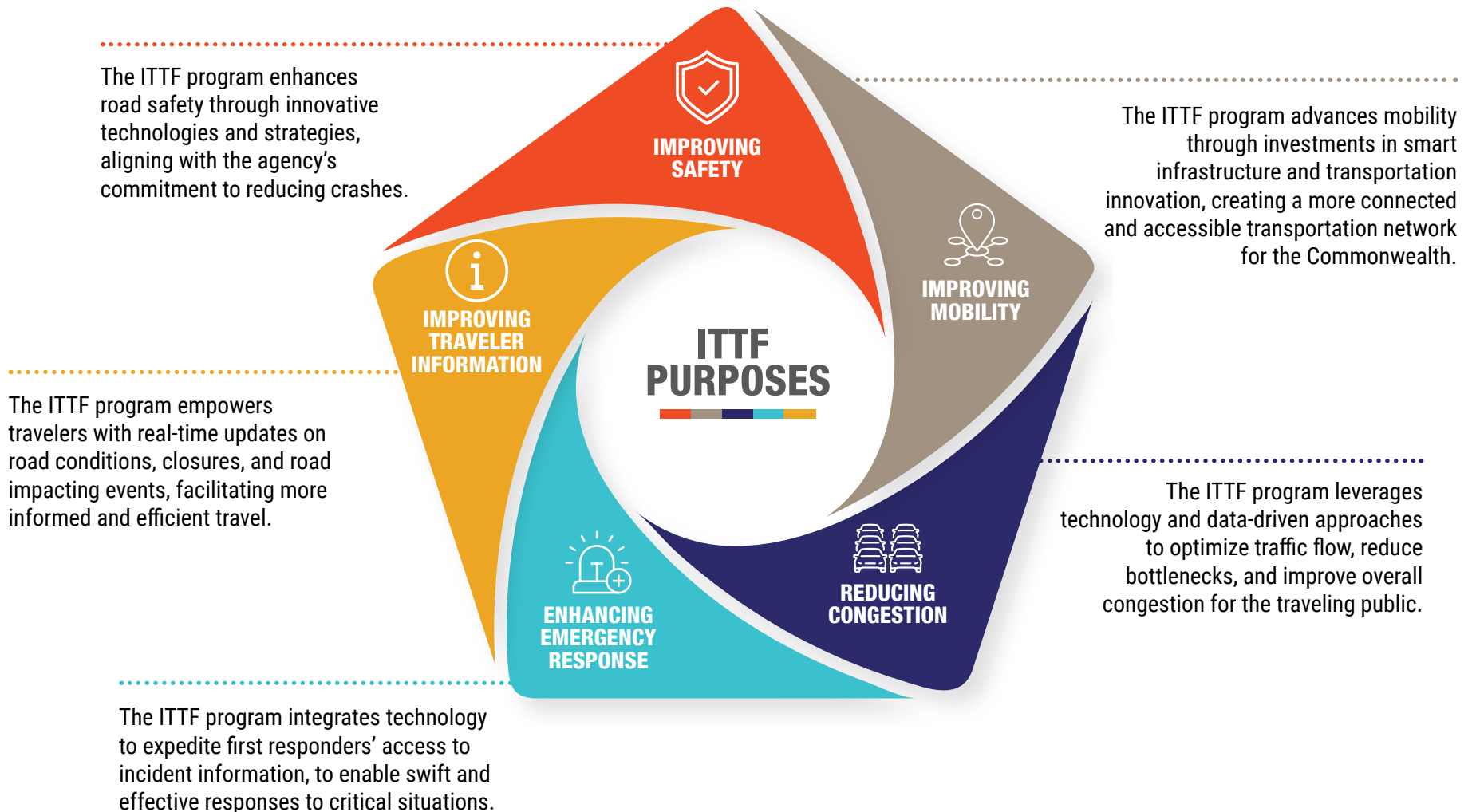
Section 33.2-1531 created the Innovation and Technology Transportation Fund. ITTF monies are to be used solely for the purposes of funding pilot programs and fully developed initiatives pertaining to high-tech infrastructure improvements. “High-tech infrastructure improvements” relate to projects or programs that reduce congestion, improve mobility, improve safety, provide up-to-date travel data, or improve emergency response.

Section 33.2-1531 of the Code of Virginia directs the Commissioner of Highways to report annually on the use of moneys in the Innovation and Technology Transportation Fund (ITTF).

ITTF Focuses

Per Code of Virginia Section 33.2-1531, ITTF projects must address one or more goals: reduce congestion, improve mobility, improve safety, provide up-to-date travel data, and improve emergency response.

The ITTF provides funding specifically for the purposes of funding pilot programs and fully developed initiatives pertaining to high-tech infrastructure improvements:



Prior to the establishment of the ITTF in 2014, the Virginia Department of Transportation (VDOT) developed a Transportation Technology Plan as a separate, one-time General Assembly report. The Transportation Technology Plan was developed to improve the efficiency, safety, and convenience of all modes of transportation throughout the Commonwealth. This plan identified eight broad technology strategies. These strategies defined projects that were later incorporated in the original ITTF project list.

When the ITTF program was incorporated into the Code of Virginia, the language stated that the fund would support advancing pilot programs and fully developed initiatives. The alignment of eight Transportation Technology Plan strategies to the ITTF focus areas is shown below:

2014 Transportation Technology Plan Strategy	Current Code of Virginia ITTF Focus Areas	
Enhanced Operations Traffic Management	Reduce Congestion Improve Mobility	Improve Safety Improve Emergency Response
Manage Arterials	Reduce Congestion Improve Mobility	Improve Safety
Support Multimodal Travel Promotion	Reduce Congestion Improve Mobility	
Furnish Travel Information	Provide Up-to-Date Travel Data	
Strengthen Incident and Emergency Response	Improve Emergency Response	
Support Commercial Vehicle Freight	Reduce Congestion Improve Mobility	Improve Safety
Conduct Emerging Technology Research	(1) The results of ITTF projects to reduce congestion, improve mobility, improve safety, provide up-to date travel data, and improve emergency response can support emerging technology research. (2) The Virginia Transportation Research Council can also conduct such research using other funding sources.	
Enhance Enabling Technology Infrastructure	All ITTF projects may have an opportunity to include enabling technology infrastructure in the project scope.	

PROJECTS STATUS

Active Projects as of October 31, 2023

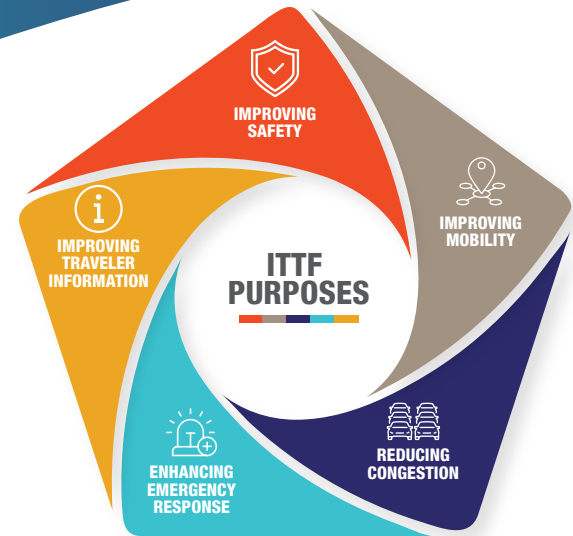
53
Active
Projects

\$147M
Active
Projects Value

Completed Projects January 2023 – October 2023

20
Completed
Projects

ITTF Focus Areas



Project Status Summary

The duration of each project varies based on its complexity. A simple ITTF project may be completed within a year. Complex projects may take multiple years to complete.



SELECT PROJECT FACT SHEETS

These projects that have either:

- Completed scoping studies
- Completed the design phase
- Finished the installation

ITTF PURPOSES



Project Purpose

VDOT has installed variable speed limits on the I-95 northbound corridor between mile markers 115 and 130 in Caroline and Spotsylvania counties. This is to address crashes caused by unexpected speed differentials when encountering congestion or lane impacting events. LED signs displaying variable speed limits between 35 mph and 65-70 mph, along with dynamic message boards, provide real-time information to drivers. The speed limits are reduced only when necessary based on traffic speed and volume data collected by vehicle detectors. Enforcement authorities have access to real-time changes in the posted speed limits.

Description (ITTF Funded Portion for I-95 VSL)

- Develop the algorithms for the I-95 Variable Speed Limit technology.
- From 115 to 130 (15 miles), VSL is located on I-95 NB. It includes:
 - Algorithm Enhancements for Work Zones
 - Automated Detector Monitoring and Alerts
 - Active System Management
 - System Evaluation Support

Description (Other Funding Sources for I-95 VSL)

- System integration
- I-95 VSL Infrastructure (detectors, signs, cameras)

Overview

Location	I-95 in Spotsylvania County/City of Fredericksburg
VDOT District	Fredericksburg
Route	I-95
City/County	Fredericksburg, Spotsylvania, Caroline
Category	Advanced Roadway Technology
Project Cost	\$2,404,000 (ITTF Funding for the I-95 VSL Algorithm)
2023 Milestones	Construction complete. System operational, June 2022. Evaluations completed, 2023.

Roadway Characteristics

Metric	2021 Pre-Implementation	2023 Post-Implementation
Annual Vehicle Hours of Delay	775K	764K
Annual Vehicle Hours Cost of Delay	\$29.9M	\$29.5M
All Crashes	291	286
Fatal+Injury Crashes	67	58
Daily Traffic Volumes	47K – 57K (2021)	49K – 57K (2022) 2023 data not available
Weekend Days with Speeds Below 20 MPH	63	51

Benefits

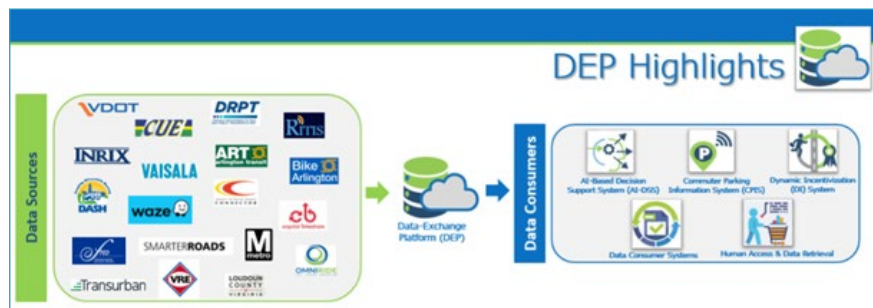
Focus	Metrics	Results
Safety	Reduction in crashes	Fatal + Injury Crashes: 13.6% Reduction Rear-End Crashes: 10.7% Reduction Sideswipe Crashes: 2.7% Reduction
Mobility	Travel Time Index	Sunday travel times declined by 8.2% and reliability improved by 14.4%
Congestion	Vehicle Hours of Delay (VHD)	Continuing evaluation

ITTF PURPOSES



Description

- The Data Exchange Platform is a key component of Regional Multimodal Mobility Program (RM3P), a program to improve mobility in the Northern Virginia and Metropolitan Fredericksburg area. The Data Exchange Platform will support the AI-Decision Support, Dynamic Incentivization, and Commuter Parking Information System which form the RM3P effort.
- RM3P’s mission is to use real-time data to improve safety, reliability, and mobility; as well as to give the public effective tools to make better-informed travel choices.
- RM3P will ultimately improve mobility by using a new AI-based decision support system to manage major incidents, and by providing greater information for motorists about travel and parking resources and incentives for travelers to consider alternate travel routes, modes, and schedules during congestion events. These tools are dependent on obtaining real-time data.
- The Data Exchange Platform is a continuously updated, cloud-based data storage and exchange system that will support the RM3P program.



Overview

Location	Greater Northern Virginia, Fredericksburg
VDOT District	Northern Virginia, Fredericksburg
Route	Multiple Routes
City/County	Northern Virginia and Metropolitan Fredericksburg area
Category	Advanced Multimodal Traffic Management
Project Cost	\$2,775,000
2023 Milestones	Installation completed, June 2023.

Roadway Characteristics

Annual Vehicle Hours of Delay	8.3M
Annual Vehicle Hours Cost of Delay	\$224.5M
Total # Incidents (4-year)	15,113
Median Incident Duration	28 minutes
Daily Traffic Volume	Vary by road

Projected Benefits

Additional benefits will be part of other RM3P efforts, including the AI-Decision Support System. The data exchange platform project is the core foundation project for the larger RM3P program.

- The larger RM3P program has the ability to:
- Reduce incident durations by promoting a coordinated response to travel disruptions
 - Improve safety by removing hazards more rapidly (20% potential)
 - Promote collaborative planning with access to better data
 - Enable more reliable commutes with greater information to make informed travel choices and connections
 - Develop an incentive program for travels to make travel choices that will help reduce congestion

Benefits

Focus	Metrics	Results
Information	Data Request	Additional 60K requests

ITTF PURPOSES



Description

- The Arlington County managed project is implementing a data-driven, variable-pricing system and a traveler information system for parking on metered blocks in Arlington County’s two Metrorail corridors (Rosslyn-Ballston and Pentagon City/Crystal City) and in up to three County-owned, off-street parking areas within those corridors that are regulated using parking meters.
- The system includes technology to detect parking space occupancy, integrate with the existing payment methods, and apply dynamic pricing for 4,563 metered on-street spaces and three off-street paid-parking facilities in the two major Metrorail corridors in Arlington.
- The project’s purpose is to improve the user experience with metered parking.



Overview

Location	Arlington County
VDOT District	Northern Virginia
Route	Multiple Routes
City/County	Arlington County
Category	Advanced Mobility Technology
Project Cost	\$4,694,000
2023 Milestones	Installation completed 10/2023. System operational 3/2024. Evaluation underway to be completed 3/2025.

Roadway Characteristics

N/A for transit projects

Benefits

Focus	Metrics	Anticipated Results
Congestion	Vehicle Miles Driven	Fewer repeated trips looking for parking
Congestion	Increasing Road Capacity	Reduced double parking
Information	Increased Parking Information	Public can access Arlington County website about parking cost and availability

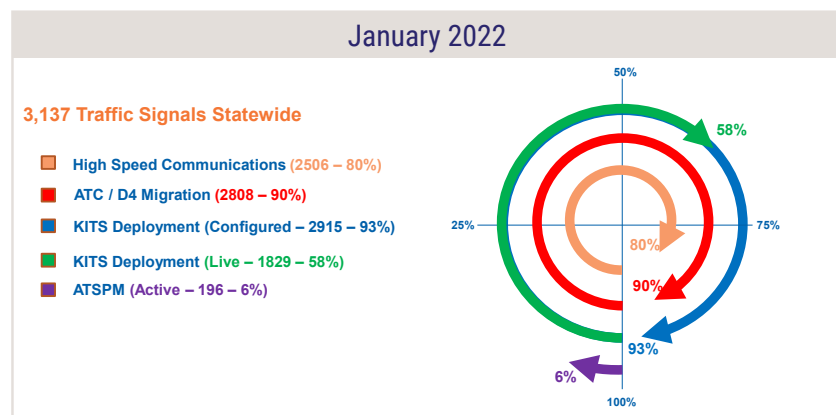
ITTF PURPOSES



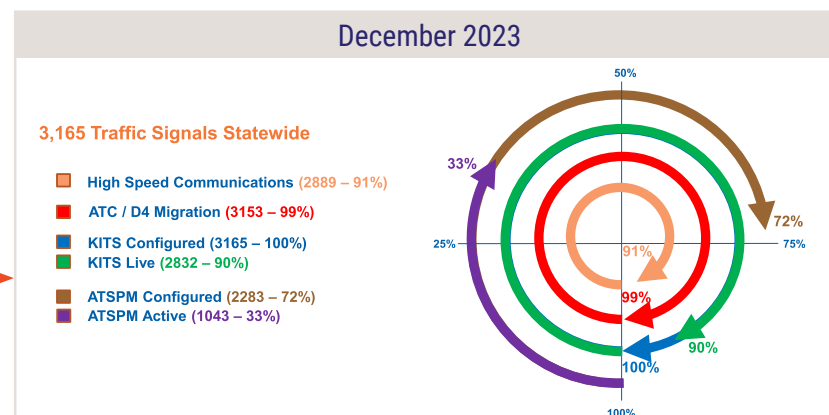
Description

- VDOT has a master plan to implement advanced technologies based on the Automated Traffic Signal Performance Measures (ATSPM).
- ATSPM will offer VDOT the ability to manage its traffic signal program proactively by updating signal retimings based on performance and data.
- In order to advance ATSPM, VDOT must provide high-speed communications to the signals, advanced traffic controllers, and ATSPM Software. These are the foundation projects.
- VDOT established multiple projects to advance the ATSPM. The following table defines the foundational projects completed in 2023.
- The ATSPM's full deployment is funded by multiple funding sources.
- The VDOT Central Signal System will benefit from these real-time data communication projects.

Benefits - for the foundation projects



With ITTF and Other Funding



Overview

Location	Statewide
Category	Signal Detection Upgrades
Foundation Projects Cost	\$8,131,000
2023 Milestones	Eight foundation projects completed

Roadway Characteristics

N/A - multiple roadways are associated with this page

Benefits - for the complete ATSPM Program

Focus	Metrics	Anticipated Results
Safety	Collisions	Reduced number and reduce severity
Mobility	Travel Time Reliability	Improved reliability with vehicle detection
Congestion	Vehicle Hours of Delay	Less delay waiting for traffic lights
Emergency Response	Incident Duration	First responders able to reach incidents faster with emergency vehicle pre-emption
Information	Information for Connected Vehicles	Increased real-time intersection operation data without additional cost

2023 ATSPM Program - Foundation Projects

#	Project Name	Description	Date Completed
1	High-Speed Communication for Signals	High-speed communications for multiple arterial routes in VDOT's Fredericksburg, Hampton Roads, Northern Virginia, Salem, and Staunton Districts.	Multiple subprojects throughout 2023
2	I-64 Corridor Arterials - Routes 60, 143, 199 Signal Communication Newport News to New Kent	Installation of approx. 3.8 miles of new fiber along Rt 143 and US 60 in James City County. Design and install Fiber Optic Signal Communications along Rt 199.	March 2023
3	High-Speed Communications Arterials Northern Virginia	High-speed communications to Northern Virginia traffic signals to help eliminate third-party circuits servicing. Routes 234 Bypass, 28, and 50.	April 2023
4	17 Signal Communication Cameras	Signal/arterial technology on alternative routes to I-95 in Stafford, Spotsylvania, and Caroline Counties, including: signal controller upgrades and alternative/backup power sources.	April 2023
5	Salem Signal Communication	Installed signal communications infrastructure (i.e., conduit, fiber optic cable, and junction boxes) at nine intersections districtwide.	June 2023
6	Statewide Community-wide Adaptive Signal Systems	Installed adaptive signal control systems across the Commonwealth on key arterial corridors.	June 2023
7	High-Speed Communications for Signals Route 134	Installation of approx. 3.4 miles of new fiber along Rt 134 and Rt 171 in York County. Providing high-speed communications and a redundant fiber path for future US 17 fiber.	August 2023
8	Route 17 Business - Communications Project and ITS Upgrades	Upgraded communications and traffic signal equipment, including the installation of Intelligent Transportation System (ITS) conduit and fiber optic cable reaper stations, 5.8 GHz wireless broadband radios, and ATC signal cabinets with controllers.	September 2023

ITTF PURPOSES



Description

- The Department of Rail and Public Transportation (DRPT) applied for and received an Integrated Mobility Innovation Demonstration Research Program Grant to plan and implement microtransit in two rural areas in the Commonwealth.
- DRPT collaborated with two rural transit providers, Bay Transit and Mountain Empire Older Citizens, to procure and operate microtransit using a Software-as-a-Service model.
- The performance of the two microtransit demonstrations was evaluated over the course of 18 months. The findings were summarized and used to develop an operational sustainability strategy and prepare an implementation toolkit for other interested rural transit agencies.



Overview

Location	Statewide Locations
VDOT District	Fredericksburg, Bristol
Route	Multiple Routes
City/County	State-wide Middle Peninsula
Category	Advanced Transit Technology Solution
Project Cost	\$68,970
2023 Milestones	Project completed, June 2023.



Transit Community Characteristics

Bay Transit provided public transportation services in the counties of Charles City, Essex, Gloucester, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northumberland, Richmond, and Westmoreland.

Mountain Empire Older Citizens (MEOC) provides demand response services for Wise, Lee, and Scott Counties in southwest Virginia.

Both microtransit pilots operating in rural, non-metropolitan areas with service zone size of less than 50 square miles and total population and employment within zones, combined, of less than 100,000 residents and jobs.

Benefits

Focus	Metrics	Results
 Mobility	Reliable Travel Route Provided	Ridership increased over 18-month period. MEOC provided 38,996 trips in the 18-month study. Bay Transit provided 9,039 trips in the 18-month study.
 Congestion	Reduce # of Drivers	Return riders increased 63%

ITTF PURPOSES



Description

- The Department of Rail and Public Transportation (DRPT) partnered with Hampton Roads Transit (HRT) to plan, deploy, and comparatively evaluate performance for on-demand microtransit services in two unique use cases over a six-month period.
- The deployed service provided shared rides in small and medium-sized vehicles for short-distance trips, created a reservation and fare-collection system, and offered a center for customer comments and complaints.
- This deployment allowed the Hampton Roads region to determine the effectiveness of microtransit and if microtransit is a feasible alternative and complement to existing fixed-route transit. The project also helped explore new markets for transit and enhance organizational capacities.

Overview

Location	Hampton Roads
VDOT District	Hampton Roads
Route	Multiple Routes
City/County	Multiple cities in Hampton Roads
Category	Transit
Project Cost	\$1,558,000
2023 Milestones	Project completed, September 2023.

Transit Community Characteristics

Hampton Roads Transit provides fixed-route, paratransit, light rail, and ferry services for the Cities of Newport News, Norfolk, Virginia Beach, Hampton, Portsmouth, and Chesapeake.

Service zones were in the Cities of Virginia Beach and Newport News.



Benefits

Focus	Metrics	Anticipated Results
Mobility	Increase Use of Microtransit vs. Personal Vehicles	Total Ridership = 23,300 60% of riders used microtransit for commuting

ITTF PURPOSES



Description

- The Department of Rail and Public Transportation (DRPT) partnered with local commuter assistance programs throughout Virginia to create a new statewide ride-matching and rewards program.
- DRPT created the Commute!VA app and website (now ConnectingVA) which allowed commuters to discover all of the multimodal transportation options available in the Commonwealth, including all forms of transit, carpool and vanpool options. The app helped users find rides based on mode (carpool, vanpool, bus), trip origin and destination, time, day of the week, and more. The app also provided trip planning, showed park-and-ride locations, electric vehicle charging locations, bike paths, bike share locations, and traffic conditions. Commuters who used the app earned points for recording trips made by carpool, vanpool, transit, or bike and could redeem them for rewards such as discounts at select retailers, restaurants, attractions, and more. DRPT added a Ride Home Rewards feature to provide free rides home or to a park-and-ride lot when a person emergency happens on a day the commuter used transit, carpool, or vanpool.



Ways To Get Around Virginia

Overview

Location	Statewide
VDOT District	Statewide
Route	Multiple Routes
City/County	Statewide
Category	Advanced Transit Technology Solution
Project Cost	\$350,000
2023 Milestones	Project completed, September 2023.

Transit Community Characteristics

Implemented for the regions of: Central Shenandoah, Charlottesville, Hampton Roads, Lynchburg, Middle Peninsula, New River Valley, Northern Neck, Richmond, Roanoke/Alleghany Valley, and West Piedmont, ConnectingVA was expanded to serve the regions of Fredericksburg, Culpeper/Rappahannock, Northern Shenandoah

Benefits

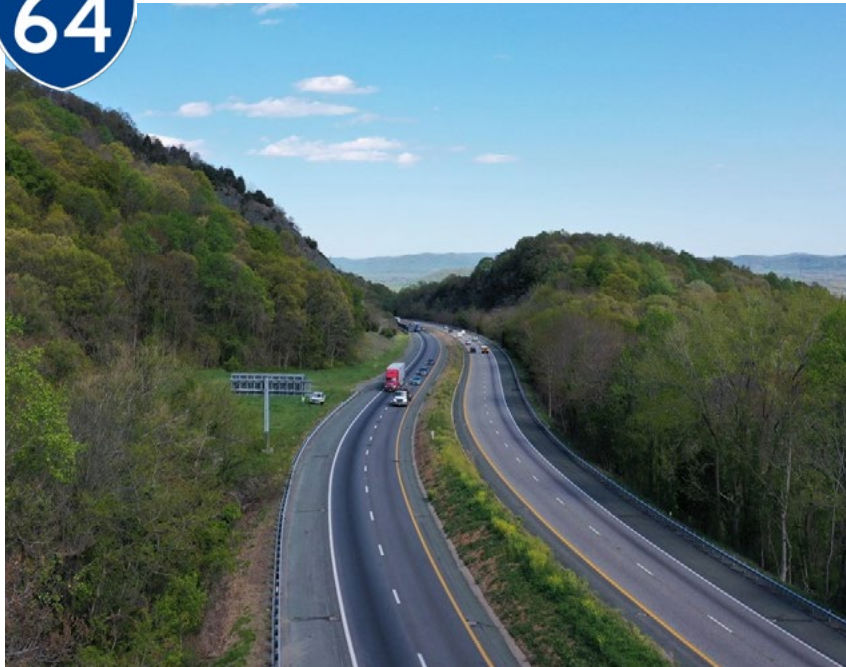
Focus	Metrics	Results
Mobility	Increase Usage of Transit	Trips increased 33% to 344K
Congestion	Miles Not Driven	6.4M
Travel Time Information	# Participants	Enrollment increased 8% to 30.4K users

ITTF PURPOSES



Description

- Use by-lane traffic sensors to detect and notify travelers of periods of congestion.
- Develop new Congestion Warning System (CWS) that will analyze data from existing and new detector stations, notify Transportation Operations Center staff, and disseminate messaging to sign infrastructure.
- Integrate CWS with Advanced Traffic Management System (ATMS) to automate detection and messaging.



Overview

Location	Afton Mountain
VDOT District	Culpeper, Staunton
Route	I-64
City/County	Albemarle, Nelson, Augusta
Category	Advanced Roadway Technology
Project Cost	\$2,500,000
2023 Milestones	Design plans completed. Awarded installation contract, May 2023. Current phase: under construction.
Delivery Date	April 2025

Roadway Characteristics

Total # Incidents	119
Median Incident Duration	40 minutes
Daily Traffic Volume	17K - 19K
Estimated Reduction in Associated Crashes	16%

Benefits

Focus	Metrics	Anticipated Results
Safety	Rear End Collisions	Reduction
Safety	Secondary Collisions	Reduction due to fewer primary collisions
Congestion	Vehicle Hours of Delay (VHD)	Reduction in few incidents to clear

ITTF PURPOSES



Description

- Deployment of Intelligent Transportation System (ITS) infrastructure and necessary pavement improvements to implement the use of Hard Shoulder Running (HSR) on State Route 288 northbound between Rt 711 (Huguenot Trail) in Powhatan County and Rt 6 (Patterson Avenue), in Goochland County.
- Technologies include lane control, traffic detectors, message signs, automated incident detection cameras, and changeable speed limit signage.
- The HSR will provide additional capacity during peak travel periods.



Overview





Location	Greater Richmond
VDOT District	Richmond
Route	288
City/County	Goochland, Powhatan
Category	Advanced Roadway Technology
Project Cost	\$31,561,735 ITTF & \$8,000,000 CVTA funds
2023 Milestones	Preliminary scoping completed. Concept of operations completed, May 2023.
Delivery Date	Early 2027

Roadway Characteristics

(From State Route 288 to Rt 6 to Robious Rd)

Annual Vehicle Hours of Delay	16K
Annual Vehicle Hours Cost of Delay	\$477K
Median Incident Duration	44 minutes
Daily Traffic Volume	52,724

Benefits

Focus	Metrics	Anticipated Results
 Safety	Secondary Incidents Crash Rates	Fewer events Fewer events
 Mobility	Travel Time Index	Improved Travel Time Index
 Congestion	Vehicle Hours of Delay (VHD)	Reduction in VHD
 Emergency Response	Incident Detection Time Incident Response Time	Faster Incident Detection Time Shorter Incident Response Time

ITTF PURPOSES



Description

- At the I-64 Westbound Hampton Roads Bridge Tunnel (HRBT), there is a continued need to alert over height vehicles to turn around before approaching the bridge trestles. The westbound tunnel, opened in 1957, only has a 13' 6" clearance. As a result, the facility is vulnerable to strikes and has detections systems to prevent such events. While vehicle strikes are rare, traffic stops are not uncommon to turn around over height vehicles. Short traffic stoppages impact mobility and increase congestion on this vital corridor.
- Advanced technologies including Lidar (light based radar) to supplement existing detectors are desired to aid in taking a picture of over height vehicles. The picture image of the violating vehicle would be displayed on approaching message signs with beacons to alert drivers to exit I-64 before approaching the trestles.
- Increasing compliance will result in fewer stoppages on I-64 which will ease congestion.






Overview

Location	I-64 Hampton Roads Bridge Tunnel Westbound
VDOT District	Hampton Roads
Route	64
City/County	Norfolk
Category	Advanced Roadway Technology
Project Cost	\$10,000,000
2023 Milestones	Preliminary scoping completed.
Delivery Date	July 2026

Roadway Characteristics

Number of Over Height Detection Events	5,354 / year
Annual Vehicle Hours Cost of Delay	\$3.1M
Annual Vehicle Hours of Delay Due to Over Height Detection Events.	807K hours
Daily Traffic Volume at the I-64 WB HRBT	42K

Benefits

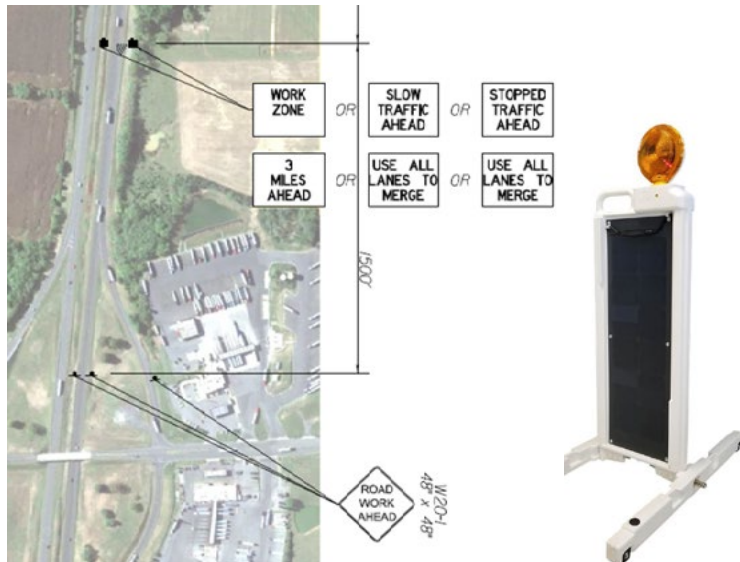
Focus	Metrics	Anticipated Results
 Safety	Secondary Collisions	Fewer secondary collisions due to unplanned traffic stoppages to turn around vehicles
 Mobility	Travel Time Reliability	Improved reliability
 Congestion	Vehicle Hours of Delay (VHD)	Reduction in VHD due to fewer over height vehicle turn arounds

ITTF PURPOSES



Description

- The Connected Work Zone project is a demonstration and evaluation project regarding advanced technologies to improve work zone safety. According to the FHWA, traffic incidents can account for 25% of congestion and work zones can account for 10% of congestion.
- The project goals are to reduce collisions at and prior to work zones as well as improve traffic flow.
- Advanced technologies include:
 - Queue Detection and Warning Systems
 - Zipper / Dynamic Late Merge
 - Zipper / Dynamic Merge and Queue Warning System
 - Truck Entering Highway Alerts
- Pilot work zones were chosen on the I-81 Corridor



Overview

Location	Statewide Application
VDOT District	Bristol, Culpeper, Staunton
Routes	Pilot sites are located at: <ul style="list-style-type: none"> • I-81 SB MM 288 – bridge rehabilitation southbound lanes south of the Tom’s Brook interchange at MM 291 • I-81 NB MM 287 – bridge rehabilitation northbound lanes south of the Tom’s Brook interchange at MM 291 • I-81 SB MM 8.16 to MM 9.77 – widen from 2 lanes to 3 lanes • I-66 WB MM 32 – bridge rehabilitation westbound lanes
City/County	Fauquier, Shenandoah, and Washington Counties
Category	Advanced Roadway Technology
Project Cost	\$600,000
2023 Milestones	Scoping completed. Established pilot locations and schedule.
Delivery Date	August 2024

Roadway Characteristic for all I-81 (2023)

Average Annual Vehicle Hours of Delay at Work Zone Sites	200K
Annual Vehicle Hours Cost of Delay	\$10.5M
Incidents in Work Zones	2,500

Benefits

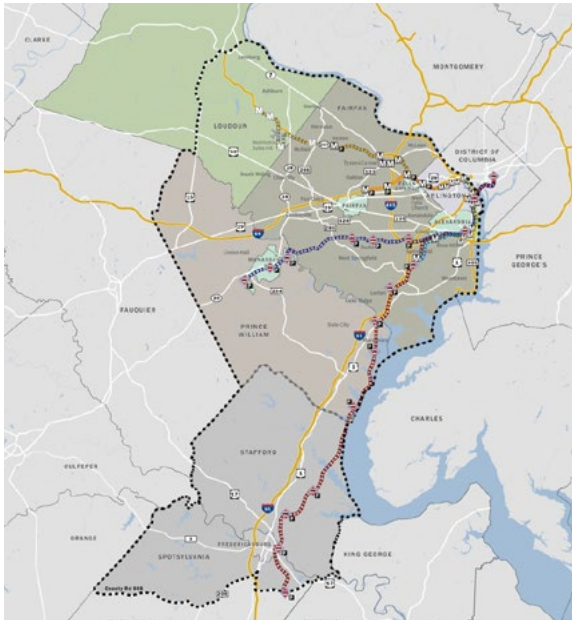
Focus	Metrics	Anticipated Results
Safety	Collisions	Reduction in rear end collisions in queues, reduction in merging collisions, queue reduction

ITTF PURPOSES



Description

- The Artificial Intelligence-Decision Support System (AI-DSS) is a tool that will predict the impact of disruptions to the transportation network and provide coordinated response recommendations to VDOT and other multimodal agencies.
- The tool will use data to monitor emerging conditions and recommend plans for coordinated, multi-agency responses to congestion, incidents, and events.
- The project is part of the larger Regional Multimodal Mobility Program, including separate UPCs and elements such as the Data Exchange Platform, Commuter Parking Information System, Dynamic Incentivization, etc. It also includes grant funding (for Fredericksburg) from the 2019 ATCMTD grant.



Overview

Location	Greater Northern Virginia, Fredericksburg
VDOT District	Northern Virginia, Fredericksburg
Route	Multiple Routes
City/County	District Wide
Category	AI Application, Advanced Multimodal Traffic Management
Project Cost	\$7,890,000
2023 Milestones	Scoping completed. Awarded contract, October 2023.
Delivery Date	November 2025 (includes evaluations)

Roadway Characteristics

Annual Vehicle Hours of Delay	8.3M
Annual Vehicle Hours Cost of Delay	\$224.5M
Total # Incidents/Year	3,778
Median Incident Duration	28 minutes
Daily Traffic Volume	Varies by road

Benefits

Focus	Metrics	Anticipated Results
Safety	Collisions	Potential 20% reduction in collisions
Mobility	Travel Time Index	May provide a 3% - 10% improvement in reliability
Congestion	Vehicle Hours of Delay (VHD)	May be reduced from 132K – 700K hours per year
Emergency Response	Response Time Clearance Time	AI-DSS may improve incident clearance time as an indirect element. AI-DSS promotes mitigation.
Travel Data	# Response Plans # Notifications	Improved situational awareness

APPENDIX

Appendix

#	UPC	VDOT District	Description	\$	Current Phase	Tentative Delivery Date
1	105388	Hampton Roads	Improved Communications for I-664 Monitor Merrimac Memorial Bridge Tunnel (Design only)	\$620,448	Design	N/A – Design
2	107058	Hampton Roads	Newport News Citywide Signal Retiming	\$1,676,585	Scoping	5/2028
3	111892	Statewide	Active Traffic Management System Enhancements (Releases 1, 2, 3, & 4)	\$11,223,789	Scoping Release 4	TBD upon completing scoping
4	119404	Hampton Roads	Tunnel Speed Guide Lights (Scoping and Design)	\$1,000,000	Scoping	N/A – Design
5	120783	Northern Virginia	High Speed Communications for Signals	\$274,480	Installation	4/2024
6	120846	Fredericksburg	High Speed Communications for Signals (Design only)	\$80,000	Design	N/A – Design
7	120862	Northern Virginia	High Speed Communications for Signals	\$212,129	Installation	6/2024
8	120862	NOVA	High Speed Communications for Signals Route 50	\$454,118	Installation	6/2024
9	121822	Statewide	Statewide Fiber Network Stability Enhancements	\$2,987,095	Installation	12/2024
10	121653	Statewide	Cooperative Freeway Management	\$3,000,000	Scoping	8/2026
11	121356	Fredericksburg	Fiber Communications for Route 1 at Route 608 – Spotsylvania	\$225,819	Installation	4/2024
12	121564	Statewide	Leveraging Connected Car Data for Improved Safety	\$500,000	Design	12/2024
13	121655	Statewide	Implement AI-Based Integrated Security Threat Prediction	\$1,000,000	Scoping	3/2026
14	121654	Statewide	Develop and Implement New Traffic Operations Support Center	\$1,000,000	Installation	2/2024
15	121777	Hampton Roads	ITS Integration Route 17 Multi-Jurisdictional Design	\$275,000	Scoping	N/A – Design

Appendix

#	UPC	VDOT District	Description	\$	Current Phase	Tentative Delivery Date
16	122904	Statewide	Connected Work Zone Technologies	\$2,987,095	Design	5/2024
17	105380	Bristol	Corridor Congestion Improvement Big Walker Mountain Tunnel Tunnel Lane Control Improvement Design	\$368,233	Design	N/A – Design
18	105381	Bristol	Corridor Congestion Improvement East River Mountain Tunnel Tunnel Lane Control Design	\$588,233	Design	N/A – Design
19	109506	Statewide	Community Wide Adaptive Signal Systems	\$3,168,399	Installation	7/2024
20	108666	Hampton Road	Monitor Merrimac Memorial Bridge Tunnel Traffic & Safety Improvements	\$7,013,664	Installation	12/2024
21	112895	Statewide	Statewide Advanced Traffic Signal Controllers	\$3,000,000	Installation	7/2024
22	115854	Statewide	Arterial Operations Program Management Dashboard	\$1,250,000	Installation	12/2024
23	115832	Northern Virginia	Performance Parking Deployment in Commercial Corridors	\$4,694,284	Installation	12/2025
24	115855	Statewide	High Speed Communications Design for Arterials – Statewide	\$749,110	Design	N/A – Design
25	115856	Statewide	Parking Demand Management System	\$1,950,000	Installation	11/2025
26	116036	Statewide	RM3P Management & Solution Design	\$3,310,000	Design	N/A – Design
27	116803	Statewide	High Speed Communication Arterials	\$490,000	Installation	7/2024
28	116811	Statewide	High Speed Communication Arterials	\$300,000	Installation	6/2024
29	117222	Statewide	Transportation Data Analytics Statewide	\$3,000,000	Scoping	8/2024

Appendix

#	UPC	VDOT District	Description	\$	Current Phase	Tentative Delivery Date
30	117436	Culpeper	I-64 Afton Mountain Safety Improvements	\$3,350,586	Installation	4/2025
31	121723	NOVA	I-95 Ramp Metering Route 123	\$2,447,000	Scoping	10/2027
32	118795	Richmond	High Speed Communications Arterials - Richmond	\$427,000	Installation	6/2024
33	119199	Statewide	Smarter Lighting Initiative	\$500,000	Scoping	12/2025
34	119332	Statewide	Data Driven Management Program for Pavement	\$300,000	Scoping	1/2025
35	119406	Statewide	Automated Speed Enforcement Pilot	\$600,000	Installation	9/2025
36	119408	Lynchburg	High-Water Monitoring System – Lynchburg	\$666,219	Scoping	8/2025
37	119720	Statewide	RM3P Decision Support System & AI Tool	\$7,890,000	Installation	11/2027
38	119721	Statewide	RM3P Dynamic Incentivization	\$3,200,000	Installation	9/2026
39	119993	Statewide	Identity & Access Management Solution	\$1,350,000	Installation	6/2024
40	120369	Statewide	Smart Parking Data Collection, Validation & Outreach	\$2,850,000	Scoping	11/2027
41	120820	Staunton	High Speed Communications for Signals	\$750,000	Installation	12/2024
42	121024	Bristol	Feasibility for Animal Detection Warning System - Route 460	\$200,000	Scoping	7/2024
43	121712	Statewide	Resiliency Improvements for Timely Travel Data Systems – Network Operation Center	\$650,000	Installation	8/2024
44	121670	Statewide	Advanced Road Weather Information Systems Study	\$500,000	Scoping	9/2027

Appendix

#	UPC	VDOT District	Description	\$	Current Phase	Tentative Delivery Date
45	121643	Statewide	Smart Intersection Deployment Support	\$1,000,000	Design	5/2026
46	121667	Statewide	RM3P Supporting Data Services	\$5,000,000	Installation	9/2028
47	121668	Statewide	Real-Time Information Dissemination for CMVs	\$2,500,000	Installation	3/2025
48	121648	Culpeper	Interchange Lighting at Exit 99	\$2,700,000	Scoping	10/2026
49	121698	NOVA	Dynamic Ramp Metering I-66 & I-395	\$1,100,000	Scoping	8/2025
50	121775	Lynchburg	ATSPM Technical Upgrades and Enhancements	\$1,200,000	Scoping	4/2025
51	122145		Route 288 Hard Shoulder Running (HSR) Technology Feasibility Study (UPC 122145) and Design & Implementation (UPC 122147) Partially funded ITTF; Majority of funding CVTA & Smart Scale	\$39,561,735	Scoping	2/2027
52	122451	Statewide	High Speed Communications for Signals	\$475,000	Installation	12/2024
53	122764	Hampton Roads	Hampton Roads Bridge Tunnel Over-Height Technology	\$10,000,000	Design	7/2026



Innovation and Technology Transportation Fund (ITTF)

Report to the General Assembly

2023