MEETING NOTES: ***CTB Innovation Subcommittee***

DATE: Tuesday, October 19, 2021

TIME: 8:30 a.m.

The meeting of the Commonwealth Transportation Board (CTB) Innovation Subcommittee was held at the Virginia Department of Transportation Central Office Old Highway Building Computer Lab, 1221 East Broad Street, Richmond, VA 23219. Director of Transportation Research and Innovation Cathy McGhee presided and called the meeting to order at 8:35 a.m. on October 19, 2021.

Present: Mr. Rucker, Mr. Yates, Ms. DeTuncq, Mr. Stant and Ms. McGhee.

Absent: None.

Approval of September 2021 minutes - *Mr. Rucker moved that the minutes be approved, Mr. Yates seconded. The minutes were approved unanimously.*

Unmanned Aerial Systems Use in VDOT – Mr. Keith Paquin, VDOT UAS Section Manager provided an update on UAS activities in VDOT. His position was created to be the point person on this topic for the agency. He has a background in aviation and is a licensed pilot. Mr. Paquin told the committee that there are currently between 25 and 50 UAS flights per month being flown on behalf of the Department by contractors. Recent flights include the Rappahannock River Bridge project, deployment of VSL on I-95, and construction monitoring of the various projects on I-81. Mr. Paquin was asked where he sees future expansion with respect to UAS and he stated that air cargo deliveries will increase over the coming years and deconfliction of the airspace will be critical. He stated that he believes we are likely still 15 years out for widespread deployment. Mr. Rucker commented that technology often moves faster than policy so it will be important to stay in front.

Micro Transit Pilots – Jennifer DeBruhl, Chief of Public Transportation at DRPT, provided an update on the Micro Transit pilots underway at Mountain Empire Transit and Bay Transit. Slides from her presentation are attached. Both pilots were focused on the deployment of technology to aid in meeting the mobility needs of rural and underserved communities. The pilots have been successful to date.

Safety, Operations, and Traffic Engineering Research Update – Dr. Mike Fontaine, Associate Director of Research at the Virginia Transportation Research Council (VTRC), VDOT's Research Division, provided an update of recent projects and their impact on VDOT. Projects included the variable speed limits on I-77 deployed to manage speeds in foggy conditions, evaluation of a bus collision avoidance warning system in partnership with DRPT, the Richmond Towing and Recovery Incentive Program (TRIP), an analysis of roadway departure crashes on rural roads, and travel time reliability prediction. Dr. Fontaine's slides are attached.

Public Comments – There were no public comments.

ADJOURNMENT: The meeting adjourned at 9:45 a.m. on October 19, 2021. The next CTB Innovation Subcommittee meeting will be held on Tuesday, December 7, 2021, beginning at

8:30 a.m. in the Computer Lab of the Virginia Department of Transportation Central Office Old Highway Building located at 1221 East Broad Street, Richmond, Virginia 23219.

DRPT Microtransit Pilot Program

CTB Innovation Committee – October 19, 2021

Jennifer DeBruhl, Chief of Public Transportation
Department of Rail and Public Transportation

Virginia Department of Rail and Public Transportation

DRPT Efforts

- Statewide Integrated Mobility Plan from DRPT (2019)
  - The changing landscape of shared and integrated mobility services and solutions
  - Current and planned technology deployments of Virginia transit agencies
  - Recommendations for both DRPT and transit agencies to consider to support future technology deployments

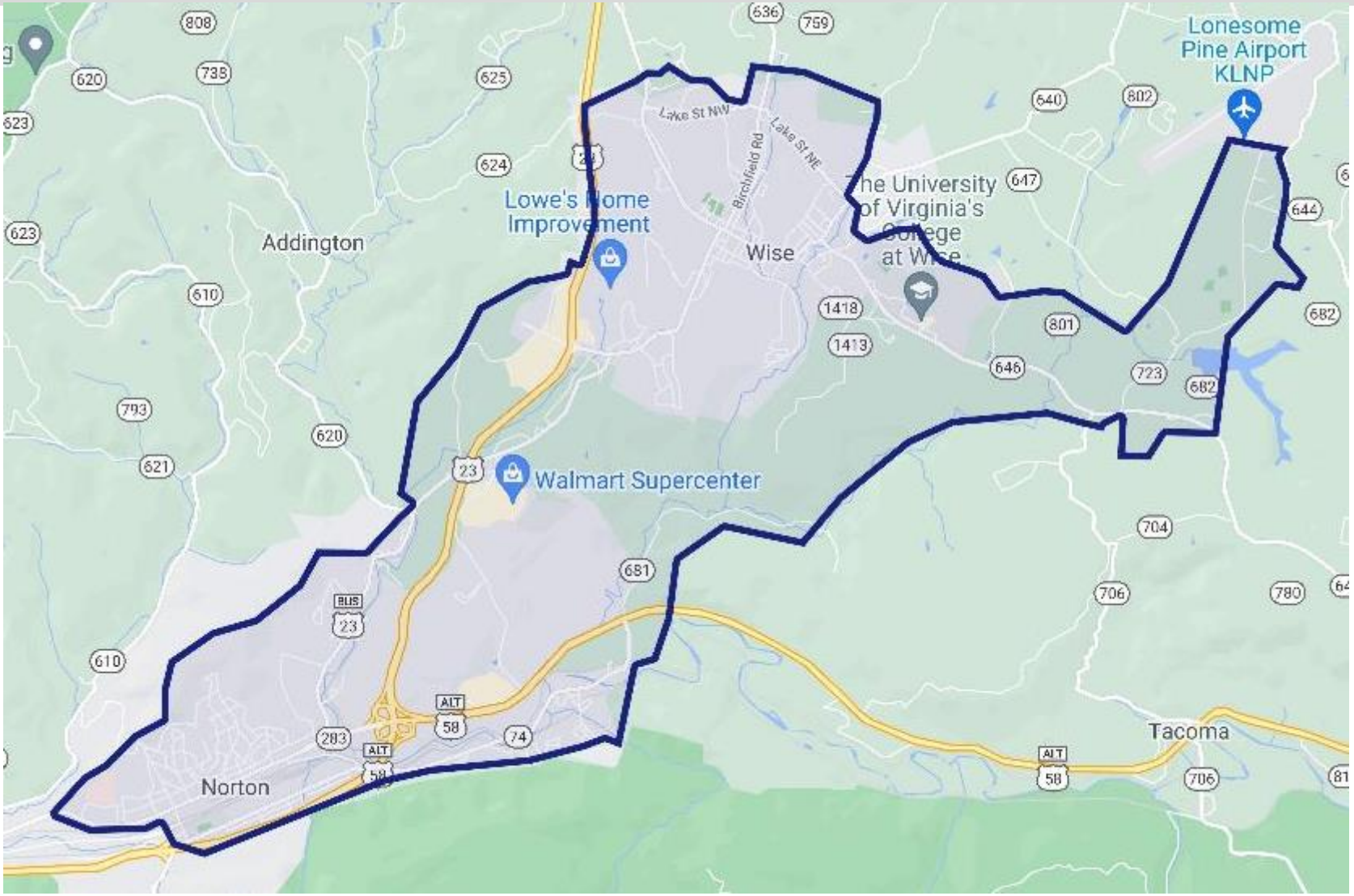
- Virginia Rural Microtransit Deployment Initiative
  - Funded in part through the Federal Transit Administration (FTA) Integrated Mobility Innovation (IMI) Grant and the Commonwealth's Innovation Technology Transportation Fund (ITTF)
  - Understanding how microtransit solutions can be scaled and deployed effectively to meet mobility needs of rural and underserved communities in Virginia
  - Focus on Software-as-a-Service (SaaS) technologies within existing framework of transit services

Mountain Empire Older Citizens (MEOC)

- Public Transportation Provider for Wise, Lee, and Scott Counties and the City of Norton (Mountain Empire Transit)
- Demand Response Service – Curb-to-Curb
- Buses Operate Monday through Friday, 7AM-5PM

DRPT

MEOC Service Zone



What is METGo!

How METGo! Works

① SKYES Enterprises
② Health Wagon
③ UVA Wise
④ Walmart
⑤ Post Office
⑥ Norton Community Hospital

The basics.

MetGo! works like a minibus that comes when you want, where you want. Book rides in seconds, get picked up steps from your front door, and get to work or run errands without needing a car.

Service hours:
Weekdays 7am-5pm.

Price: Free!

Download the **MetGo! app** or call **(276)-523-7433** to get started.

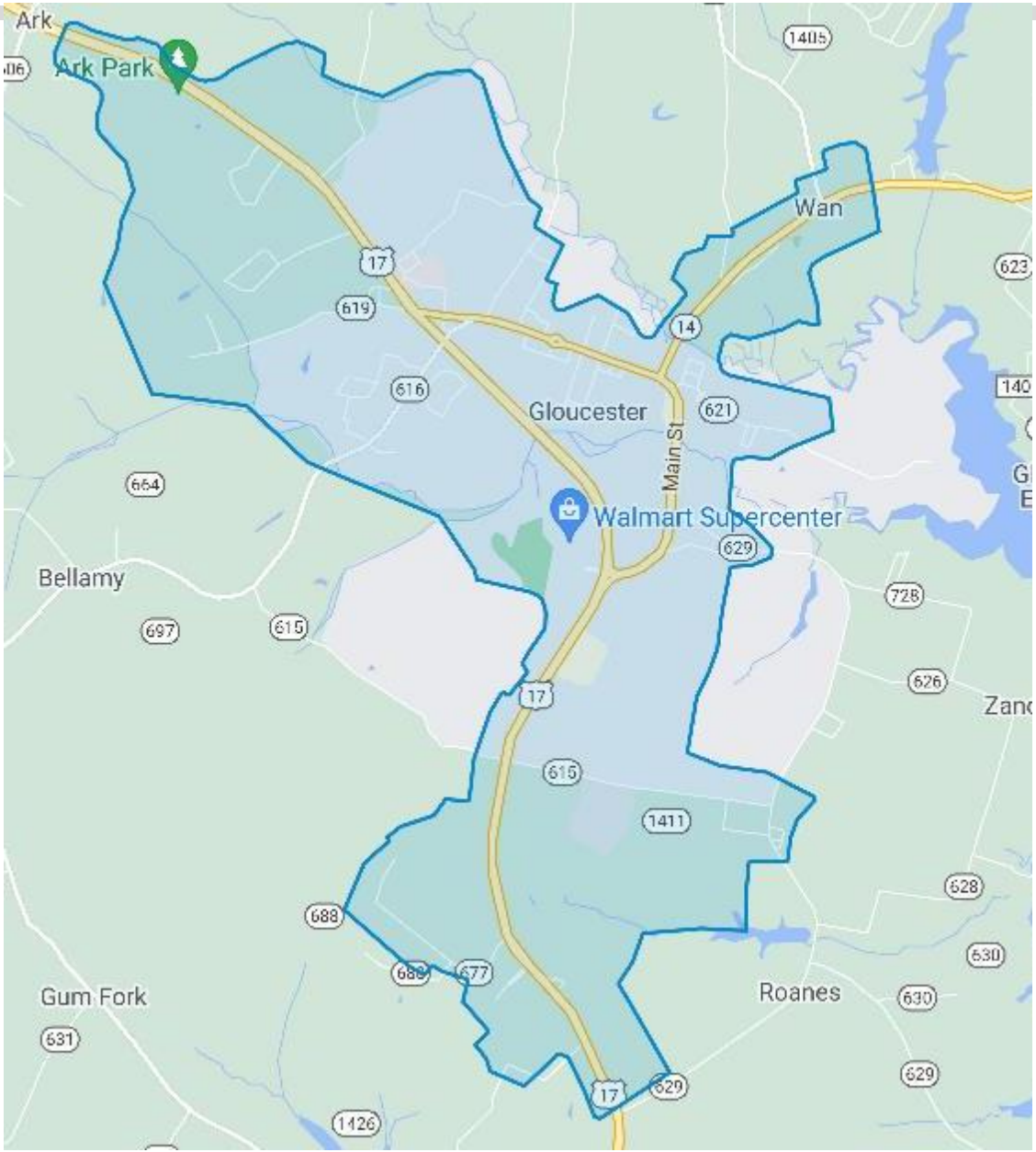
Download on the App Store GET IT ON Google Play

METGo! Launch – June 30, 2021

Bay Transit

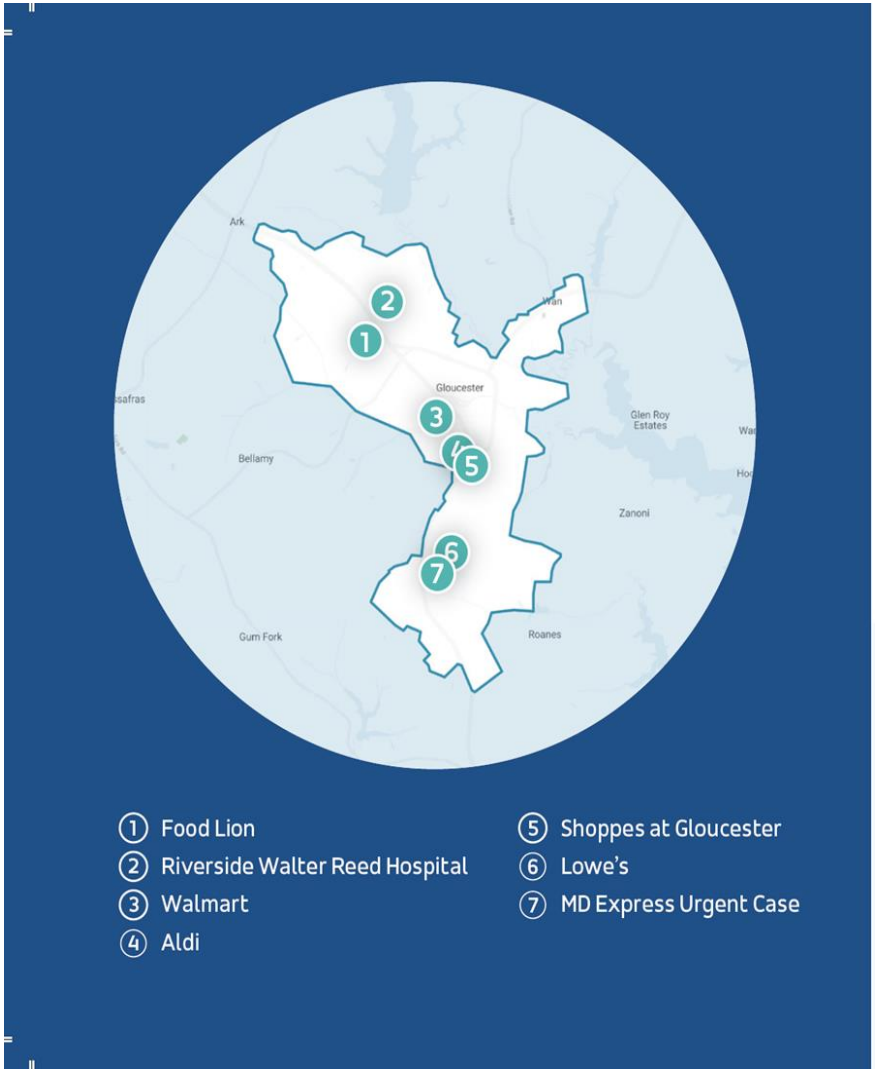
- Public Transportation Provider for Middle Peninsula, Northern Neck, and Charles City and New Kent Counties (link website)
- Three Fixed Route Lines
- Mobility Manager
- Three Seasonal Trolleys
- In 2020, 3,222 people in the Northern Neck/Middle Peninsula accessed over 140,000 rides
  - 41% for people commuting to work
  - 20% for health care service access
  - 27% for other consumer services, businesses, county and town government offices and more

Bay Transit Service Zone



What is Bay Transit Express?

How Bay Transit Express Works



The basics.

Bay Transit Express is a fast, easy, affordable way to get around – book rides straight from your phone, get picked up in minutes, and get to work or run your errands without needing a car.

Service hours:
Weekdays 8am-5pm

Price: $2 per ride

Two easy ways to pay.

Add your credit or debit card information to your account in the app.

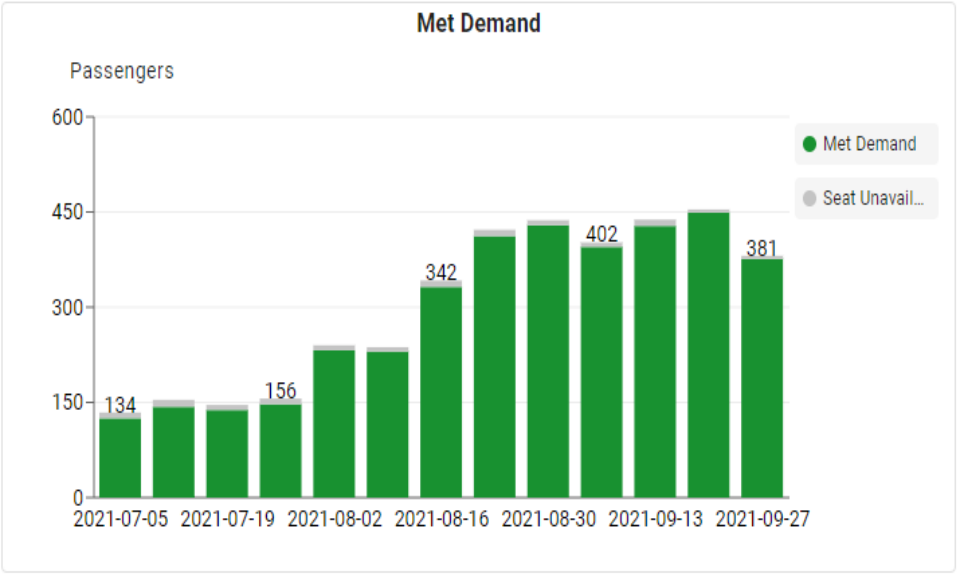
Pay in cash on board. Exact change required.

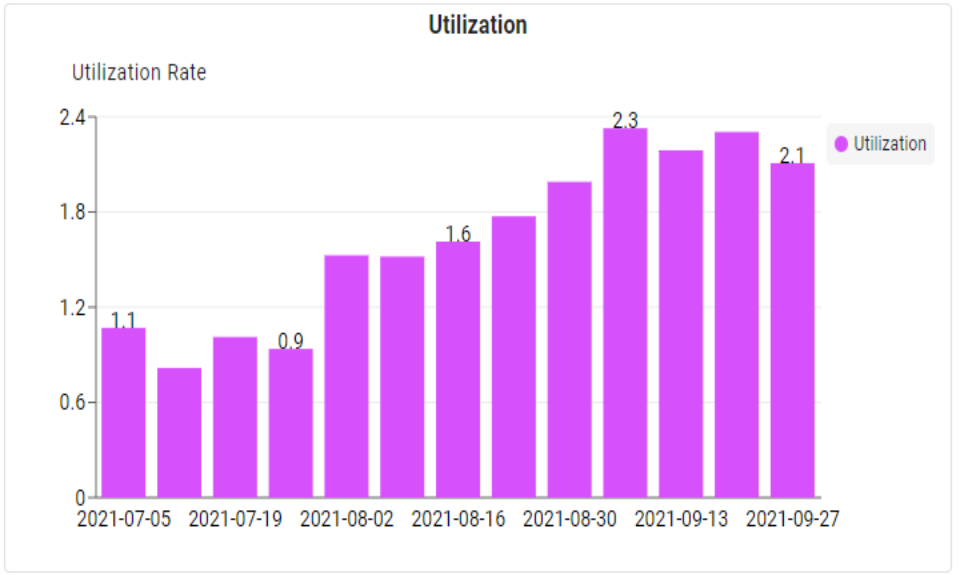
Bay Transit Express Launch – June 28, 2021

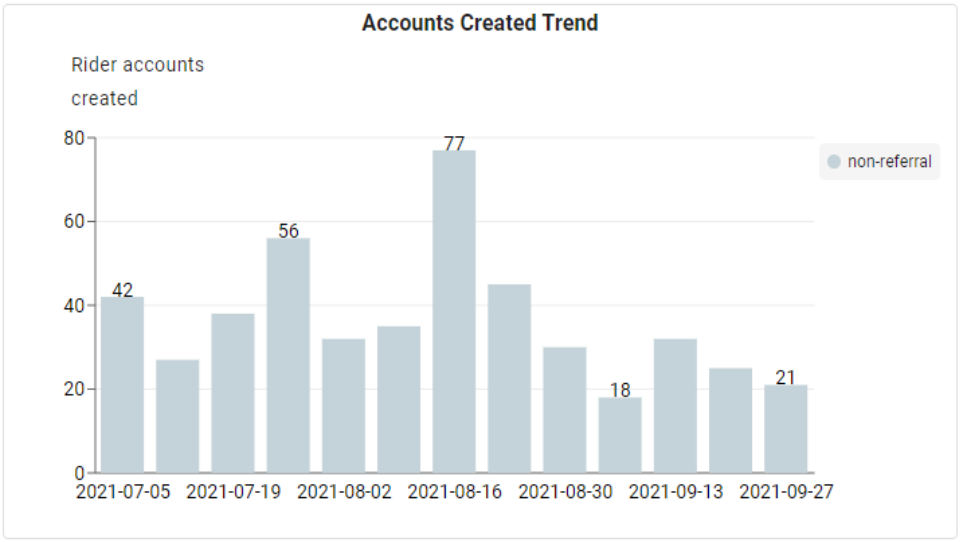
Statistics to Date

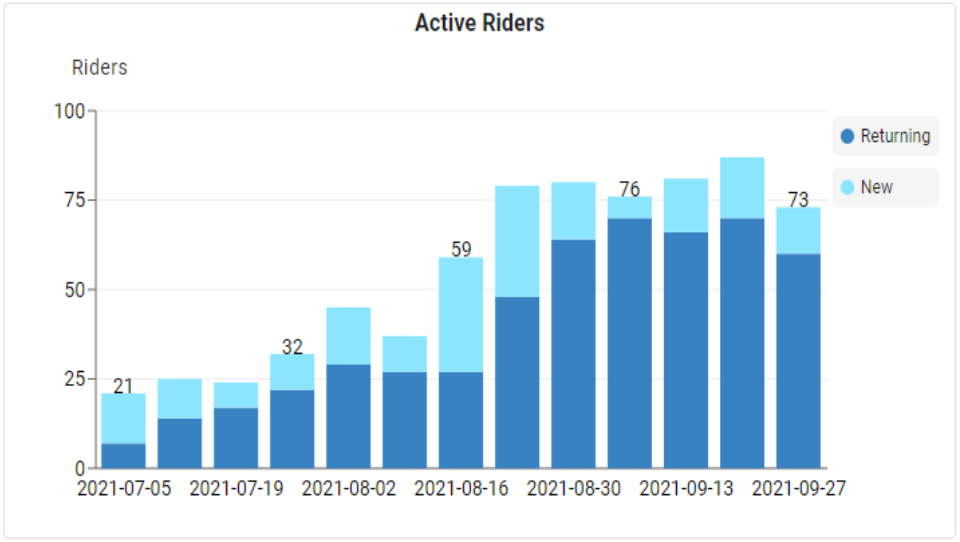
- Bay Transit
  - 201 accounts created
  - 82 riders have taken at least one ride
  - 70 riders have taken more than one ride
  - 36 riders have taken 5 plus rides
  - 65 active riders
  - 845 total rides requested (90.3% resulted in completed rides)
- MEOC
  - 694 accounts created
  - 336 riders have taken at least one ride
  - 255 riders have taken more than 1 ride
  - 127 riders have taken 5 plus rides
  - 229 active riders
  - 4,464 total ride requests (70.1% resulted in completed rides)
  - Requests by source
    - 3,325- requested via the METGo! app
    - 1,139 – Requested through other means

Statistics to Date – METGo!

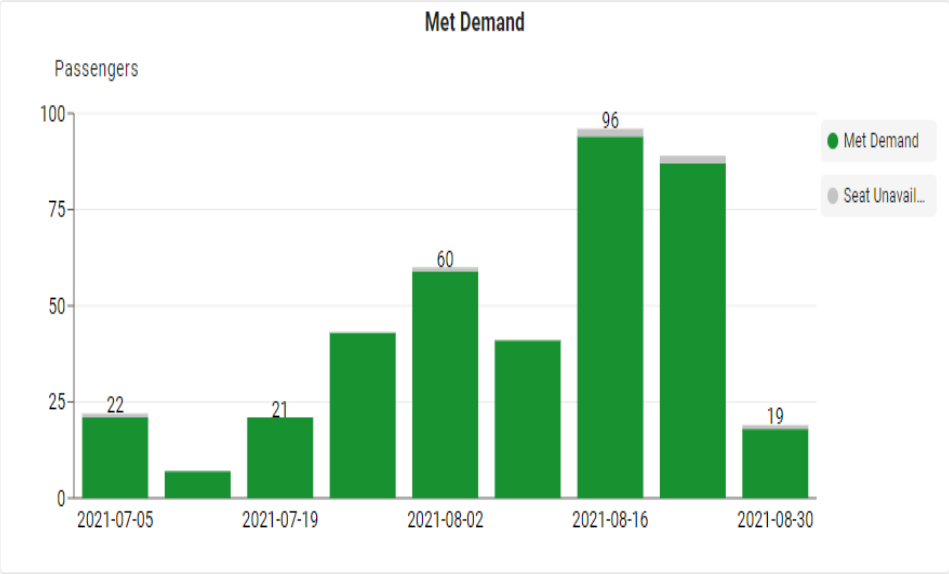


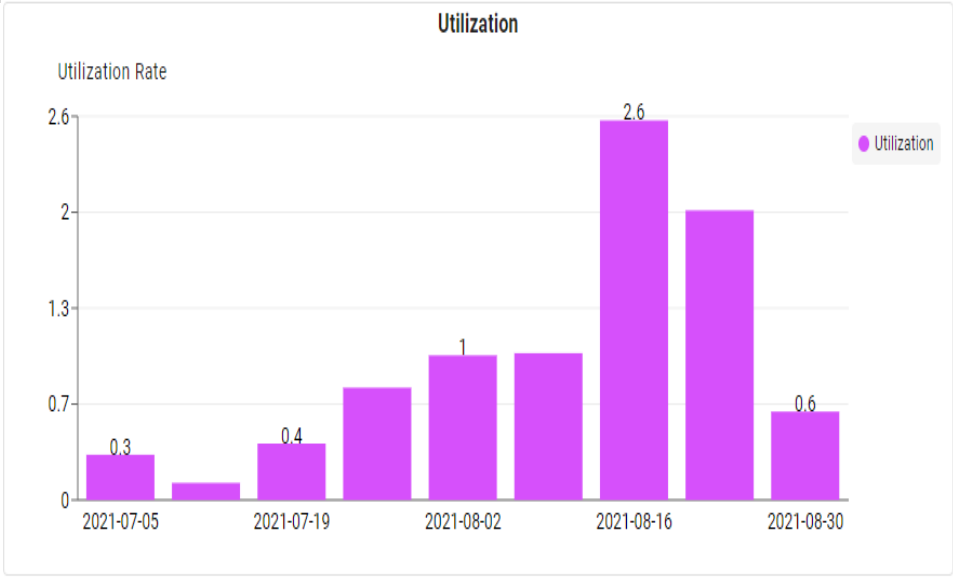


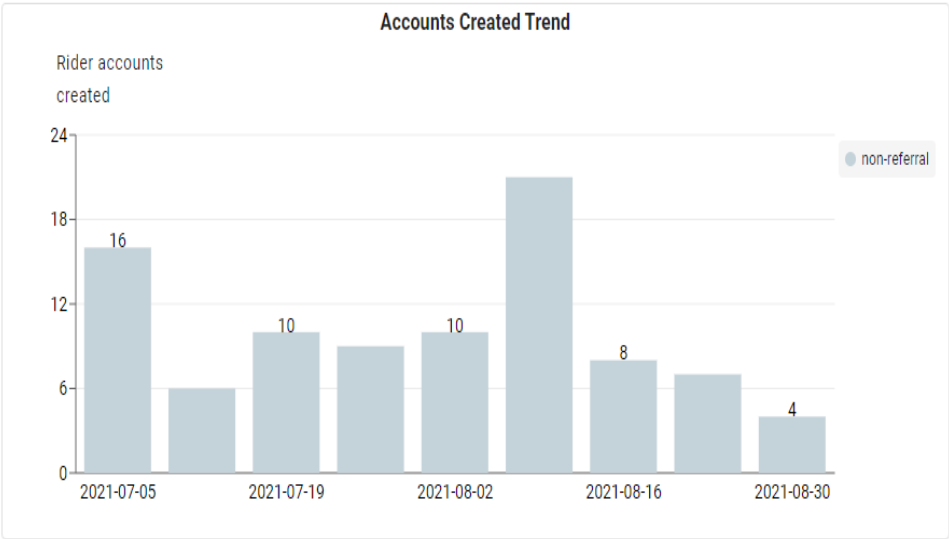


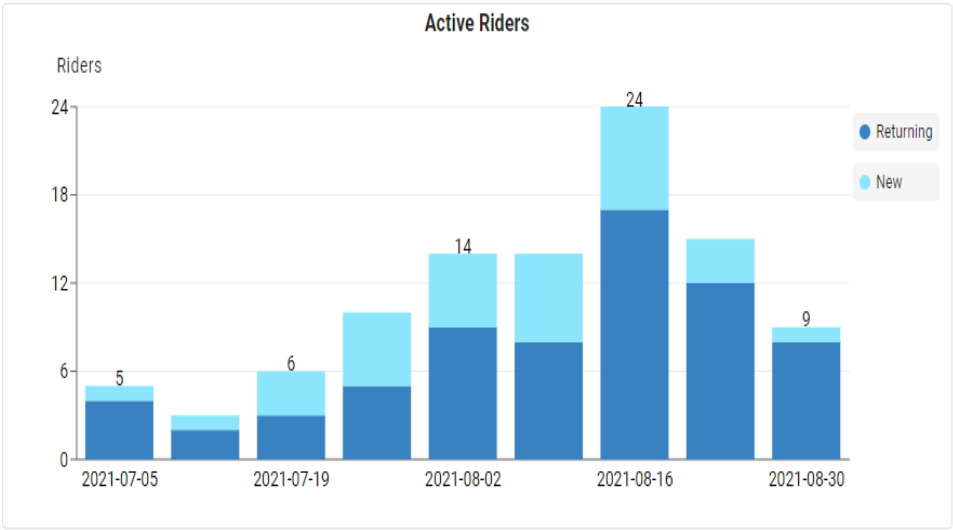


Statistics to Date – Bay Transit Express









Questions?

- Contact Information
  - Wood Hudson, Statewide Transit Planner
  - Tiffany Dubinsky, AICP, Statewide Transit Planning Manager

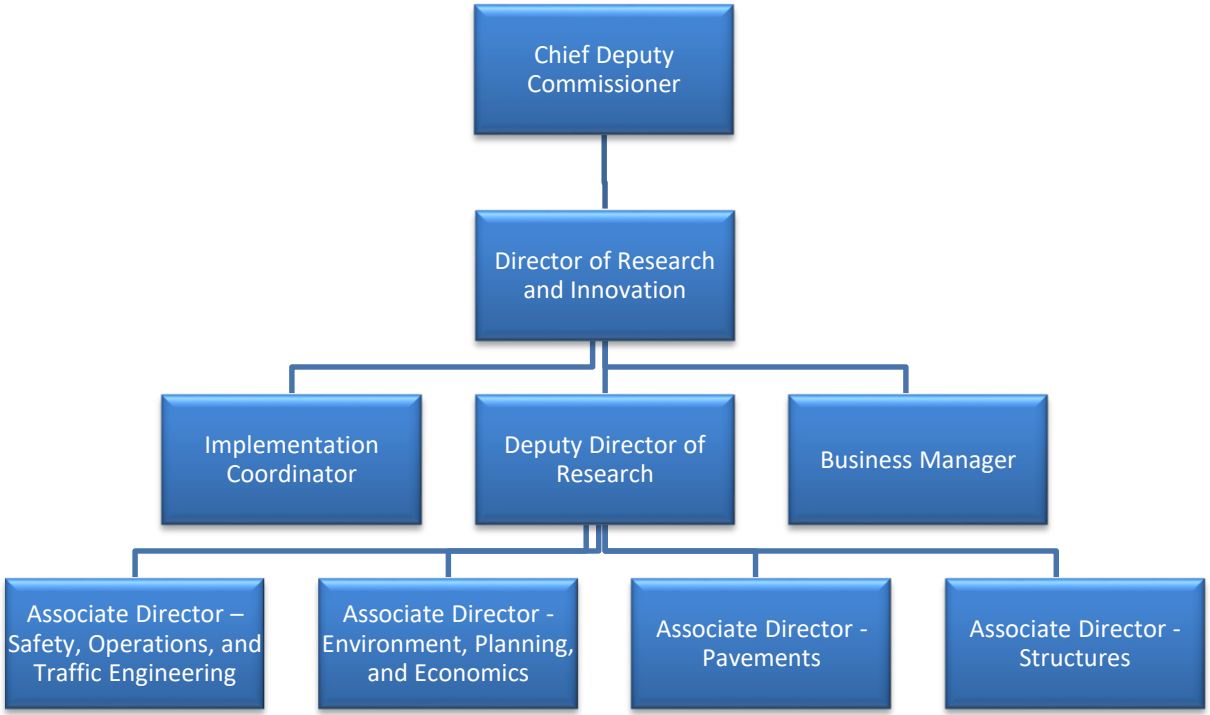
VTRC
Virginia Transportation Research Council

We Bring Innovation to Transportation

Safety, Operations, and Traffic Research Initiatives at VTRC

Michael D. Fontaine, P.E., Ph.D.
Associate Director
VTRC Safety, Operations and Traffic Engineering Team

VTRC Organization



Safety, Operations, and Traffic Engineering (SOTE) Focus Areas

- Connected and automated vehicles
- Intelligent transportation systems
- Highway safety
- Performance measurement and data analytics
- Big data and emerging data sources
- Arterial and freeway operations
- Traffic control devices and human factors
- Emergency response and incident management

SOTE Team Major Research Themes

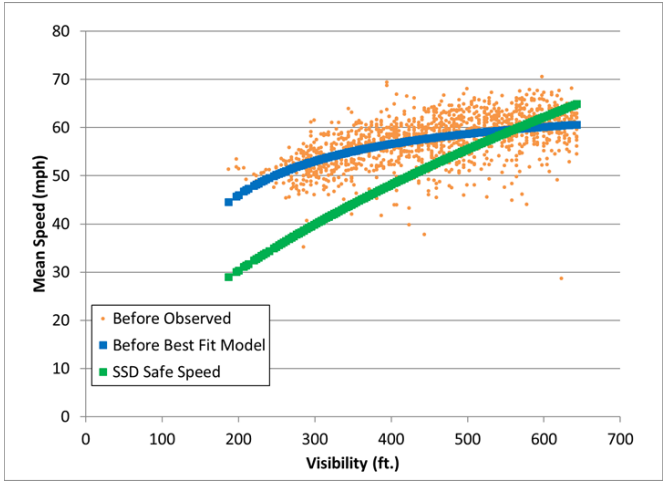
- Improving safety and mobility on Virginia's roads using technology
  - I-77 Fancy Gap Variable Speed Limits
  - Bus Collision Avoidance Warning System Evaluations
- Leveraging data to improve safety and mobility decision making
  - Richmond Towing and Recovery Incentive Program
  - Roadway Departure Crash Analysis for Rural Roads
  - Travel Time Reliability Prediction

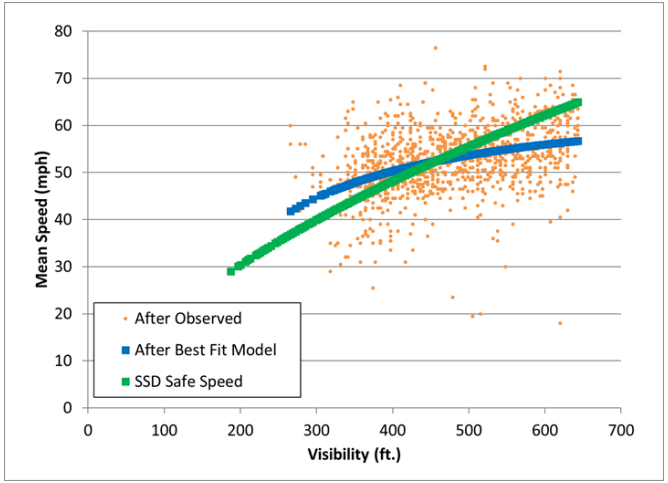
I-77 Fancy Gap Variable Speed Limits

- I-77 in Fancy Gap is a rural mountainous area prone to severe fog events.
- Traditional countermeasures did not solve safety issues.
- VTRC team worked with VDOT Southwest Region and consultants to develop a control algorithm for a VSL that was activated in October 2016.
  - Examined visibility data, speed data, and crash data at the site
  - Algorithm accounted for traffic and visibility to set safe speed limit

I-77 Variable Speed Limits

- VSL reduced speeds by around 5 mph during severe fog
- **Fog crashes declined by over 76% and fatal/injury crashes during fog declined by over 83% in the 3 years after activation.**



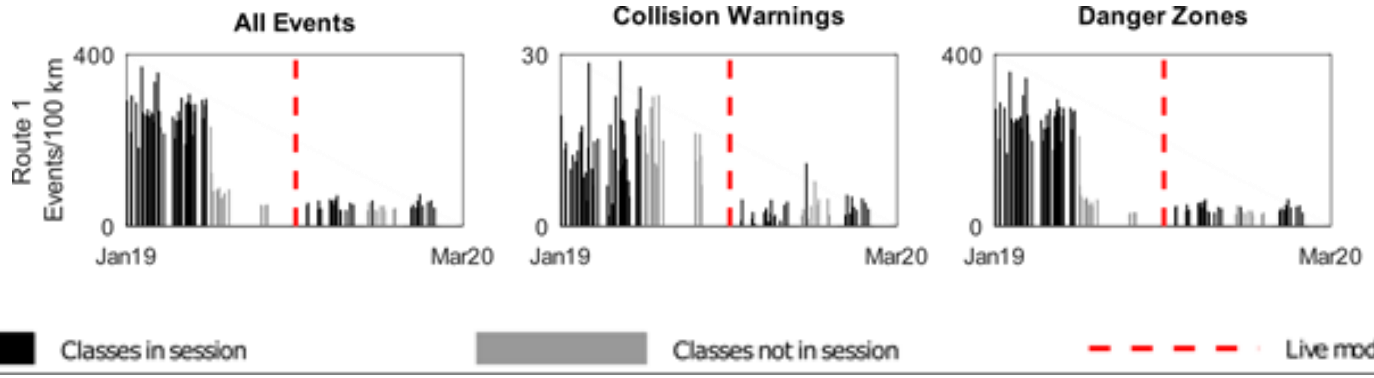


Bus Collision Avoidance Warning System (CAWs) Evaluation

- DRPT initiated a demonstration project to deploy the Mobileye® Shield+ Advanced Driver Assistance System on transit buses.
- VTRC initially compared data with and without system active on buses in Lynchburg, Harrisonburg, and Blacksburg to test effectiveness.

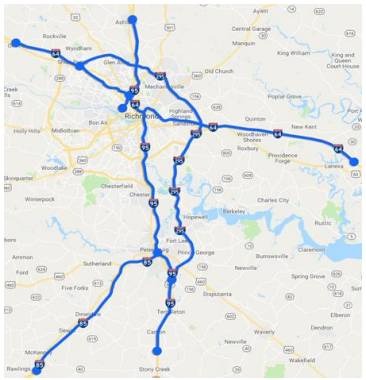
Bus CAWs Evaluation

- The rate of events per 100 km almost always declined when system was active.
- Driver opinions were more mixed.



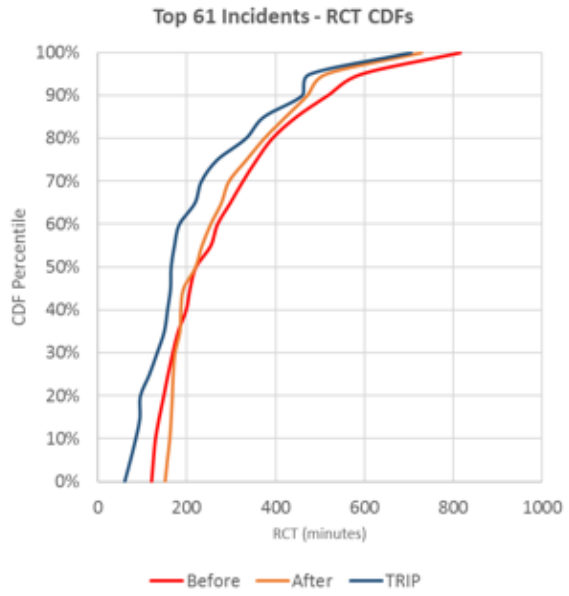
Evaluation of Richmond Towing and Recovery Incentive Program (TRIP)

- High impact, heavy vehicle crashes are the source of many large roadway delays.
- The TRIP program seeks to improve clearance by replacing the rotation list for high impact, heavy vehicle crashes with zone-based towing; trained staff; proper, standard equipment; and incentives.
  - Started Dec 17, 2017 on nearly 200 miles of Interstate
  - Towers must meet equipment, staff, training, inspection requirements to apply
  - Tower must arrive at scene within 45 min of call (60 min during off peak), clear incident from lanes within 90 min of notice-to-proceed, wear safe attire for incentive eligibility



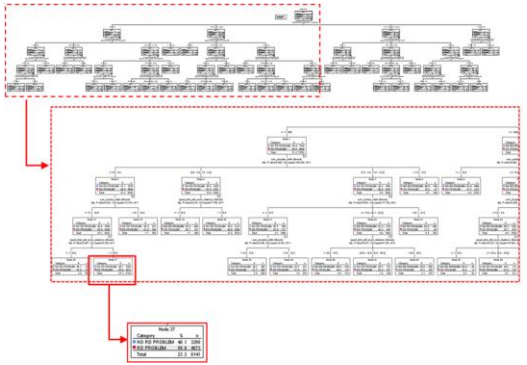
TRIP Effectiveness

- Evaluation used incident logs, traffic volume, crowdsourced probe data to evaluate program.
- Average roadway clearance improved by 50.4 - 65.8 minutes
- B/C ratio for 10-year horizon: 9.2 - 12.0
- All responders energized by the program; seeing benefits to both TRIP and non-TRIP crashes.
- Expanding program to I-81 corridor now.
- Winner of AASHTO “Sweet 16” Award in 2020.



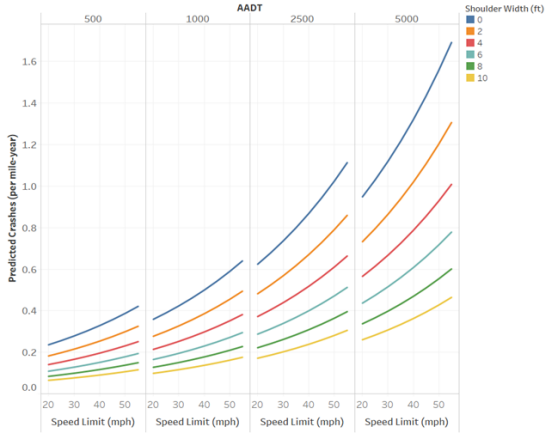
Roadway Departure Crash Analysis for Rural Roads

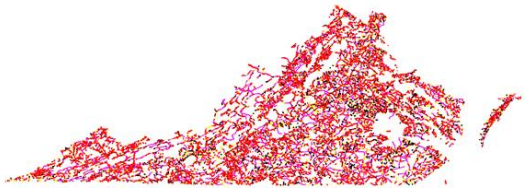
- About 58% of crashes on two lane rural roads are roadway departures in VA.
- Objective: Understand rural Roadway Departure (RD) crash influencing factors to identify and implement appropriate countermeasures
- Combined non-traditional data sets and applied machine learning approaches to understand factors and develop targeted improvement plan.



Roadway Departure Crash Analysis for Rural Roads

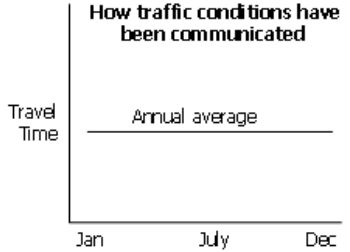
- Analysis identified important factor interactions that play a disproportionate role in safety.
- Safety improvement plan developed to target broad implementation of proven countermeasures to address these issues.
- B/C of between 10 and 30 estimated; working to implement in Districts
- Research was selected as an AASHTO High Value Research Project (Safety Category) in 2021.





Travel Time Reliability Prediction

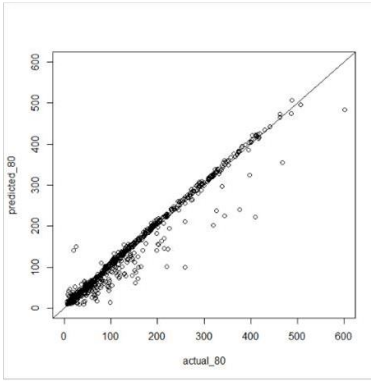
- Examining travel time variability in travel times has gained greater prominence in both Federal performance monitoring and Virginia project prioritization.
- While methods exist to estimate average travel times, no methods exist to predict variability.
- Data volume and variety is a major challenge in creating these models.

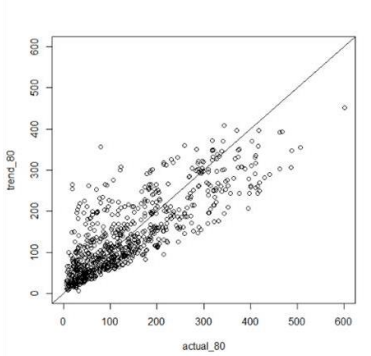


(FHWA, 2005)

Travel Time Reliability Prediction

- Used speed, volume, weather, work zone, crash, managed lane, and incident data from VDOT and private sources
- Leveraged machine learning methods using cloud computing and a high speed cluster to develop robust prediction models that could be used to assess project impacts.
- Improved prediction performance by over 70% from simple trend line methods currently in use. Currently exploring implementation with OIPI.





Other Active VTRC Safety, Operations, and Traffic Projects

- Traffic and Safety
  - Low cost delineation measures
  - Methods to reduce truck mounted attenuator crashes
  - Methods to reduce vehicle intrusions into work zones
  - Implementation of low cost safety countermeasures on the secondary system
  - Examining socioeconomic inequality's impact on safety
  - Assessment of innovative marking materials
- Operations
  - Unmanned aerial vehicles for operations applications
  - Methods to improve identification and assessment of travel time reliability issues
  - Methods to quantify incident congestion costs
  - Using innovative technology to improve work zone safety
  - Automated Hazmat placard readers
  - Improving safety service patrol scheduling

Contact Information

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