TRANSPORTATION TECHNOLOGY COMMITTEE
Wednesday, April 13, 2022
8:30 AM
(In-person meeting and livestreamed via YouTube)

AGENDA

I.	**Call to Order/Welcome**	Chairman Snyder

Action

II.	**Summary Notes of October 10th, 2021 Meeting** *Recommended action: Approve meeting notes*	Chairman Snyder

Discussion/Information

III.	**Transportation Technology Strategic Plan (TTSP) Update**	Mackenzie Love, Regional Transportation Planner
IV.	**Presentation: VDOT's Connected and Automated Vehicle Program**	Amanda Hamm, Connected and Automated Vehicle Program Manager, VDOT
V.	**TTSP candidate topic overview and discussion**	Mackenzie Love, Regional Transportation Planner
VI.	**7th Annual Northern Virginia Transportation Roundtable Recap**	Mackenzie Love, Regional Transportation Planner
VII.	**NVTA Updates**	Ms. Monica Backmon, CEO
VIII.	**Member Updates**	

Adjournment

IX.	**Adjourn**

Next Meeting
8:30am on Wednesday, July 6th, 2022 at the NVTA Office.

TRANSPORTATION TECHNOLOGY COMMITTEE
Wednesday, October 27, 2021, 8:30 am
Electronic meeting and livestreamed on YouTube

MEETING SUMMARY

I.   **Call to Order/Welcome**
- Chairman Snyder called the meeting to order at 8:32 am.
- Attendees:
  o **TTC Members:** Councilmember/Chairman David Snyder (City of Falls Church and Authority Member); Mayor Jeanette Rishell (City of Manassas Park and Authority Member); Hari Sripathi (VDOT); Dr. Richard Mudge (Compass); Mike Garcia (FCDOT); Sean Schweitzer (FCDOT); and Jana Lynott (AARP)
  o **NVTA Staff:** Monica Backmon (Chief Executive Officer); Keith Jasper (Principal, Transportation Planning and Programming); Mackenzie Love (Regional Transportation Planner).
  o **Others:** Cindy Mester (City of Falls Church) and Mike Mollenhauer (Virginia Tech Transportation Institute).

Action

II.   **Summary Notes of April 21st, 2021 Meeting**
The meeting summary was approved unanimously, with abstention from members not present.

Discussion/Information

III.   **Presentation of the Connected Infrastructure Demonstration Project**
- Ms. Mester introduced the Falls Church Smart Communities project, which involves implementation of connected infrastructure as part of the West Falls Church revitalization project to establish a "living lab" environment.
  o She indicated that the COVID pandemic had created some difficulties in scoping the project, but that with management by the Virginia Tech Transportation Institute (VTTI) and partnership with Virginia Department of Transportation (VDOT) the project was progressing.
  o The project will involve a blend of city and VDOT roads near a Metro Station and include innovative technology aimed at mitigating impacts on the environment and air quality.
- Mr. Mollenhauer provided background on the genesis of the Falls Church Smart Communities project. He also explained how VTTI's experience with other projects could translate to this context. Relevant initiatives include: The Virginia

Connected Corridor Living Lab and Northern Virginia Testbed; smart intersection evaluations; smart adaptive lighting deployments; low-speed Automated Vehicle (AV) deployment like the Relay Shuttle in Fairfax County; e-scooter research and more.

- o The project will be part of a Transit Oriented Development (TOD) envisioned for a parcel of land situated between I-66 and its trail, Route 7, and Haycock Road.
- o Major components of the project include: A Smart Cities Data Exchange Management System; adaptive lighting; smart parking and payment; smart intersections; data access and evaluation tools; and roadway and infrastructure development to include incorporation of sensors. Other Smart Cities applications will also be explored.
- o Phase 1 of the project was expected to begin in the second quarter of 2022.
- The Committee then discussed the content of the presentation and asked questions of Ms. Mester and Mr. Mollenhauer.
  - o Dr. Mudge offered to share best practices and research he and his client have done on autonomous buses, including things that can be accomplished with automation, before full autonomy is achieved.
  - o Chairman Snyder indicated that he hoped this project would be a testbed for microtransit as well.
  - o Mayor Rishell asked if low-speed AV circulators are crash tested. Mr. Mollenhauer responded that they are not and instead they operate under an exception granted by National Highway Traffic Safety Administration (NHTSA) after a review of risk mitigation plans.
  - o Mayor Rishell asked if there would be sensors in recycling receptacles, and if so, if the sensors could also help improve sorting. Mr. Mollenhauer indicated that some providers offer this, but use in this project is to be determined. Additionally, separation technologies may still need to be proven.
  - o Ms. Lynott asked when VTTI expected to release their study and recommendations on scooter safety. Mr. Mollenhauer indicated that the study would conclude in May of 2022, but results from other initiatives may be released in advance. VTTI intends to publish three technical papers in the coming spring, with final reports expected in mid-summer.

IV. **Transportation Technology Strategic Plan (TTSP) Update**

- Ms. Love provided a recap of the history of the development of the Transportation Technology Strategic Plan (TTSP). She also shared an overview of deliverables that were completed in the first six months of implementation. These include: introduction of a technology-related section to NVTA's annual Legislative Program (pending Authority action); outreach activities via TransAction; a whitepaper on emissions; evaluations of two emerging technologies; creation of a template for developing transportation policies; and minor updates to the TTSP itself.
  - o The current draft of NVTA's 2022 Legislative Program included a new TTSP-related section that would be updated each year. For 2022, the proposed focuses were electric vehicles and support for continued funding of pilot programs and research initiatives throughout the Commonwealth.

- Ms. Love then shared the next steps proposed for implementation of the TTSP including: evaluating additional transportation technologies as appropriate; further integration of the TTSP into TransAction; conducting additional technology-related outreach; development of additional whitepapers as appropriate; identification of technology-related refinements to future NVTA Six Year Program (SYP) selection process after the TransAction update is completed; and considering if additional topics should be added to the TTSP and its Action Plan.
- The Committee then discussed the TTSP and relevant future actions.
  - Mr. Sripathi indicated that it is possible to address/mitigate equity concerns around electric and autonomous vehicles (EV AVs).
  - Dr. Mudge indicated that shared mobility may be a focus for automated vehicle manufacturers, as opposed to private ownership.
  - Chairman Snyder highlighted the potential benefits of microtransit, particularly in regards to providing an attractive alternative to private vehicle use.
  - Mayor Rishell highlighted the topic of platooning (driving more closely together than is possible with human operators) for both public and private vehicles.

V. **TransAction Survey Results**
- Mr. Jasper shared results of the TransAction survey. He noted that it was important to disaggregate these results to see sub-regional variations in certain preferences. For example, in outer jurisdictions the survey showed an emphasis on roadway projects but also a desire for more travel options. Key technology-related takeaways include:
  - Respondents indicated they would be more likely to consider using an EV once there is more readily available infrastructure (64%) and once the price is similar or lower than the price of a gasoline-powered car (58%)
  - Respondents indicated they would be more likely to use an AV once they had confidence that AVs were safe (61%).
- Chairman Snyder recommended that NVTA look beyond preferences and perceptions to determine what fact-based treatments would best to address needs in terms of NVTA's Core Values. For example, he noted that respondents in inner jurisdictions indicated a preference for more bike lanes, but perhaps providing options like microtransit would be a more effective option for motivating or enabling drives to leave their personal vehicles.

VI. **Member Updates**
- Ms. Backmon informed the Committee that NVTA received 27 applications for its FY 2022-2027 Six Year Program (SYP) totaling $1.3 billion in requests, which was more than the amount of funding available. She committed to keeping the Committee apprised of developments.

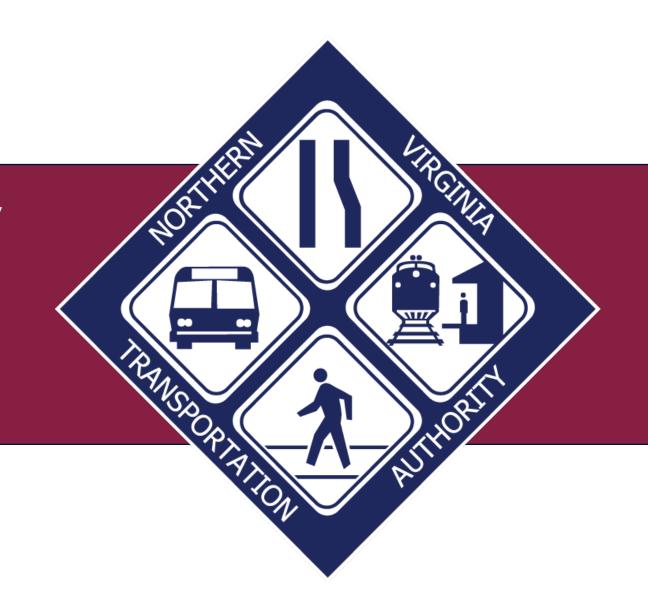## <u>Adjournment</u>
- The meeting adjourned at approximately 10:10 am.

Transportation Technology Strategic Plan (TTSP): Implementation Update

April 13th, 2022

Mackenzie Love, AICP
Regional Transportation Planner

History of the Transportation Technology Strategic Plan (TTSP)

The TTSP describes **strategies** for advancing the beneficial use of technology in transportation, in **alignment with NVTA Core Values**, and identified **roles the NVTA can take** in pursuit of them.

It also recognizes that the objectives of the TTSP cannot be achieved by NVTA alone, and relies on the **strong coordination and partnerships** that are foundational to NVTA's work in the region.

Year	Month	Milestone
2017		• Transportation Technology Committee (TTC) established by the NVTA CEO
2019	October	• TTC began development of the TTSP
2020	December	• Draft TTSP "core content" (8 strategies, 9 NVTA roles and 3 core values) shared with the TTC
2021	January	• Draft structure for the TTSP (minus Action Plan) proposed to the TTC
	February/ March	• First full draft of the TTSP and draft structure for the Action Plan presented to the TTC • Draft structure for the TTSP shared with TAC, PCAC and PPC • TTSP mini-session at the 6th annual NoVA Transportation Roundtable
	April	• TTC, PCAC and PPC all recommend the Authority adopt the 8 strategies and Action Plans of the TTSP
	May	• The Authority adopted the inaugural NVTA Transportation Technology Strategic Plan's Action Plan and 8 Strategies within
	Summer	• TTSP-related topics included in TransAction outreach and survey
	October	• TTC receives an update on the first six months of implementation of the TTSP
	November	• The Authority receives an update on the first six months of implementation of the TTSP
	December	• The Authority unanimously adopted the 2022 State and Federal Legislative Program and Legislative Priorities, which included a new position to "Support use of effective transportation technology"
2022	February	• The format of NVTA's Driven By InNoVation was updated and now includes monthly features of TTSP-related content.

Update on TTSP Strategies

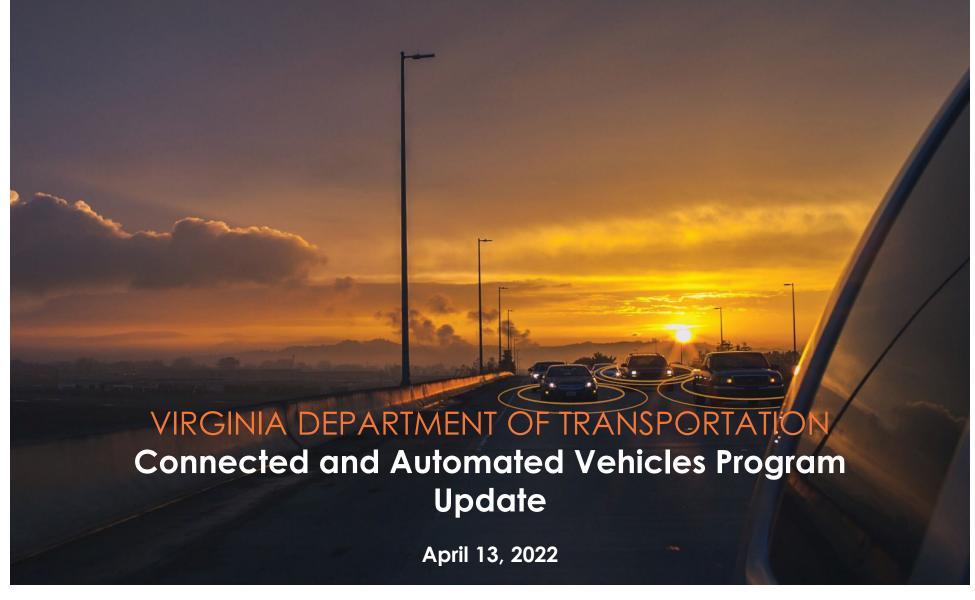| Strategy		Status Update
Number	**Name**	
1	Reduce congestion and increase throughput	• Traffic in the region has returned to near pre-pandemic levels, but there has been a shift in peak commute times. NVTA is monitoring commute trends through its analysis of Travel Trends, as reported to the Authority in June, July, September and November of 2021, and March, 2022. • "Reduce Congestion and Delay" has been established as an objective in the ongoing update of TransAction, which maps to two of 10 performance measures that will be used to evaluate projects included in the plan.
2	Maximize access to jobs, employees and housing	• The Metropolitan Washington Council of Governments (MWCOG) long-range Cooperative Forecasts estimate that the population of Northern Virginia will grow by 23% between now and 2045, and employment will grow by 33%. These figures were used in conducting analysis equity and access within the region, for the purposes of the TransAction update. In that process it was determined that even "[a]reas in the region with the highest job access by transit still had over 2 times more jobs accessible by driving within 45 minutes than by transit." • "Accessibility" has been established as one of the three goals for implantation of TransAction 2045, which is currently being updated. This goal maps to two objectives; "improve access to jobs" and "reduce dependence on driving alone by improving conditions for people accessing transit and using other modes". These, in turn, relate to three performance measures; "access to jobs by car, transit and bike", "access to jobs by car, transit and bike for Equity Emphasis Areas (EEA) populations" and, "quality of access to transit and the walk/bike network".
3	Maximize cybersecurity and privacy for members of the public	
4	Minimize potential for Zero Occupancy passenger Vehicles	• One of the scenarios selected for analysis as part of the update of TransAction focuses on Technology, and will consider changes to trip generation precipitated by Connected/ Automated/ Shared/ Electric vehicles (CASEs). These changes will be evaluated specifically for passenger vehicles.
5	Develop pricing mechanisms that manage travel demand and provide sustainable travel options	• NVTA is cosponsor of the Regional Multimodal Mobility Program, or RM3P. "The RM3P's mission is to leverage the collaborative use of real-time data by Virginia's public and private sectors to improve travel safety, reliability, and mobility, and to give the public the tools to make more informed travel choices" and one element of accomplishing this vision is through Dynamic Incentivization. Some procurement activities have already been completed and more are anticipated in the near future.

Update on TTSP Strategies, continued

Strategy		Status Update
Number	**Name**	
6	Maximize the potential of physical and communication infrastructure to serve existing and emerging modes	• NVTA is in the process of developing top-down and bottom-up project lists for inclusion in the update of TransAction.
7	Enhance regional coordination and encourage interoperability in the transportation system	• NVTA is cosponsor of the Regional Multimodal Mobility Program, or RM3P, which hinges on effective regional coordination across the public and private sectors. • NVTA has established a regional (and extra-regional) Bus Rapid Transit (BRT) Working Group to discuss interjurisdictional coordination and planning.
8	Advance decarbonization of the transportation system	• "Resiliency" has been established as one of the three goals for implantation of TransAction 2045, which is currently being updated. This goal maps to three objectives, one of which is directly relevant to decarbonization; "Reduce transportation related emissions." The performance measure for this objective is "vehicle emissions." • Sustainability is one of NVTA's three Core Values, each of which is addressed in the TTSP and are being incorporated into the update of TransAction.

Additional Updates:

- OmniRide is considering implementing Microtransit service in the Manassas Park area.
- NHSTA has finalized its first occupant protection safety standards for autonomous vehicles.
- VDOT has recently finalized its Connected and Automated Vehicle (CAV) Investment Roadmap

VIRGINIA DEPARTMENT OF TRANSPORTATION

Connected and Automated Vehicles Program Update

April 13, 2022

Amanda Hamm,
CAV Program Manager, Office of Strategic Innovations

VDOT

CAVs defined

Automated vehicle (AV) – a vehicle that is capable of conducting some or all of the driving task without needing a human driver.

Technology – sensors, onboard computer

Connected vehicle (CV) – a vehicle that is capable of sharing data to and receiving data from an external source, such as other vehicles, infrastructure, or smart devices.

Technology – onboard units, external devices

Connected and automated vehicle (CAV) – a vehicle that shares and receives data from external sources and is capable of conducting some or all of the driving task.

Technology – all of the above

CAVs on the road today

Vehicles

Tesla AutoPilot/ Full Self-Driving Beta (AV)

Audi Traffic Light Information System (CV)

Sample Features

Adaptive Cruise Control

Adaptive Headlights

Anti-Lock Braking System

Automatic Emergency Braking

Automatic Parallel Parking

Automatic Reverse Braking

Recent CAV news

GM's Cruise subsidiary has petitioned NHTSA for permission to put the driverless Cruise Origin into commercial service. Cruise announced the filing of its petition for approval on Friday, saying the car is "a zero-emission, shared, electric vehicle that has been purposefully designed from the ground up to operate without a human driver.

TuSimple, an autonomous driving technology company, announced it completed 'the world's first fully autonomous semi-truck run on open public roads without a human in the vehicle and without human intervention;' a driverless tractor–trailer completed a nighttime 80-mile trip from a Tucson, Ariz., rail yard to a Phoenix metro area distribution center.

NHTSA, the National Highway Transportation Safety Administration, recently released their final rule for "Occupant Safety in ADS," which changes the crash worthiness Federal Motor Vehicle Safety Standards to account for vehicles with standard seating design, but without manual controls.

Nuro, the autonomous delivery company, announced its third-generation autonomous vehicle with a host of new improvements, including a bizarre-looking external airbag for pedestrians.
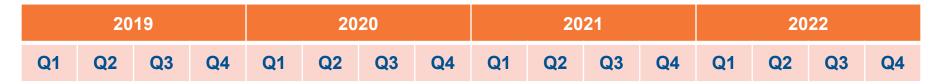
VDOT's role in CAVs

- VDOT is responsible for ensuring the safe, accessible, and efficient movement of people, goods, and services across the Commonwealth.

- CAVs are on our roadways today, and more will be on our roadways tomorrow.

- CAVs could beneficially or adversely impact safe, accessible, and efficient travel in the Commonwealth:

  a. **Possible Beneficial Impact:** A CAV could receive information of a crash five miles ahead and then re-route to avoid it.
  b. **Possible Adverse Impact:** An empty CAV could circle downtown all day while waiting for a pick-up request.

The CAV Program assists VDOT in preparing for and taking advantage of the deployment of CAVs.

VDOT CAV Program Background

2019				2020				2021				2022			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Highway Automation Workshops

2020 VDOT CAV Program Plan

Integrating CAVs into VDOT Functions Report

CAV Readiness Project

2022 VDOT CAV Program Plan

Systems Mapping Project

CAV Readiness Project Overview

Task 1 – Literature Review, CAV Readiness Assessment

- Reviewed what other CAV stakeholders were doing to prepare for the rollout of CAVs
- Developed the CAV readiness assessment framework
- **Outcome:** An understanding of the state of readiness

Task 2 – Use Case Identification and Review, Investment Roadmap

- Reviewed which CAV Use Cases were available and made sense for VDOT to explore further
- Developed a roadmap of investments
- **Outcome:** An understanding of milestones and success gates

Task 3 – Education Strategy

- Produced an education strategy to ensure that VDOT's workforce is ready for CAVs
- **Outcome:** An increased workforce awareness and professional capacity

Task 4 – Business Strategy

- Developed a business strategy to mainstream CAVs into day-to-day activities of VDOT personnel
- **Outcome:** An understanding of how to test, prepare, and integrate CAV-related technologies

CAV Readiness Assessment: Readiness Factors and Readiness Levels

The project team identified a total of **495 discrete readiness factors,** distributed across the four dimensions (Infrastructure, People, Processes and Technology) that were included in the Readiness Assessment. Factors were drawn from various sources ranging from FHWA to state DOT studies to international studies. Many factors, especially those tailored to VDOT business functions, were based on recent VDOT studies.

An example of the various Readiness levels assigned to each Readiness Factor is provided below:

	VDOT CAV READINESS LEVELS				
	0	1	2	3	4
DESCRIPTION	No activity in this area.	Needs upgrade & maintenance	Meets current best practices	Meets emerging market (1-5 yrs.)	Meets next decade market (10 yrs.)
EXAMPLE READINESS FACTOR	No discussion or research regarding improving communications in the corridor	Limited or no fiber installed in the corridor	Fiber installed along the roadway with access points	DSRC or C-V2X nodes tied into fiber	Small cells deployed along the roadway with 5G coverage

Use Case Selection Process

- **15 use cases were selected from a list of 80 use cases**
- **Selections were based on**
    - **Technology maturity**
    - **CV/AV penetration**
    - **Input from VDOT**
    - **Ongoing and required VDOT investments**
- **CAV Use Case Report**
    - **Provides details on and an overall assessment (using the Readiness Assessment Scale (RAS)) of each use case**
    - **Organizes use cases into 8 different categories:**

Driver Mobility	Freight Management	Pedestrian	Planning and Unplanned Events
Safety	Traffic Planning	Transit	Weather

CAV Investments Outlined in Investment Roadmap

Infrastructure

• Upgrade Communications Network and Roadside Units	2022
• Upgrade Signal Infrastructure	2022
• Develop CAV Testing Capability	2025
• Upgrade Signing and Pavement	2025

Process

• Develop CAV Procurement Policies	2022
• Develop CAV Investment Guidance on Construction Standards	2022
• Develop Equity Policy for Technology and Investments	2022
• Establish Cybersecurity Policy	2022
• Establish Data Format, Accuracy, Accessibility, and Transfer Standards	2022
• Establish Data Security and Privacy Policies	2022
• Establish Third-Party Coordination Policies	2024
• Develop Performance Measures for CAV Data	2025
• Develop RSU Standards	2025
• Upgrade Signing and Pavement Markings Specifications	2025
• Develop Local and Virginia Agency CAV Guidance	2026

People

• Implement CAV Integration/Business Strategy	2022
• Increase CAV Education Opportunities	2022
• Increase CAV Industry Outreach and CAV Public Relations	2022

Technology

• Upgrade Data Lake for CAVs	2022
• Upgrade for CAV Cybersecurity	2022
• Integrate ATMS/Signal with Data Lake	2023
• Upgrade Data Portal for CAVs	2023
• Enhance Data Analytics for CAVs	2025
• Implement Security Credential Management System	2026

VDOT

CAV Systems Mapping Project

- **Objective:** To identify internal and external CAV data needs
  - What CAV data is available for VDOT to consume?
  - What systems within VDOT should consume CAV data?
  - Are the systems capable of ingesting, analyzing, and sharing CAV data?
  - What VDOT data is needed by CAVs?
  - What systems within VDOT can provide data needed by CAVs?

- **Status:** Vendor selected

- **Next Steps:** Issue PO and kick-off

CAV Efforts in VA – Work Zone Safety, Connected Intersections, and Transit

- VDOT has partnered with multiple entities to deploy CAV technologies.

C-V2X Deployment
- Involved VDOT, Audi, Qualcomm, American Towers, and VTTI
- Partnered to test and develop two connected technology use cases: work zone and traffic light information
- Completed two filmed demos: Blacksburg (9/21); NoVA (7/29)
- Built on previous VDOT work – development of Smart Vest and Virginia Connected Corridors
- Involved use of direct CV2X communication from the Smart Vest to an Audi vehicle and cellular communications from VTTI network to an Audi vehicle for work zone use case
- Involved CV2X communications from RSUs to Audi vehicle for Traffic Light Information use case

Fairfax County Automated Shuttle Deployment
- Developed through a partnership between Fairfax County, Dominion, and Dept. Rail and Public Transportation with support from VDOT, DMV, and others
- Performs a transit service by circulating between Dunn Loring Metrorail Station & the Mosaic District
- Involves a 100% electric, autonomous shuttle
- Approved to carry passengers since October 2020
- Providing data to VTTI from multiple cameras and on-board sensors for in-depth review of shuttle actions

CAV Efforts in VA – Work Zone Safety

Work Zone Builder App

Problem – Need for accurate digital map of work zones to enable improved sharing of work zone information within agency and to third parties

Solution – Develop an application that allows for efficient, easy input of work zone design details that can be uploaded and shared

Current Status – Developed and field tested work zone builder application

Next Steps – Broaden pilot testing; expand security and user administration, integrate into work zone data exchange

Connected Smart Vest

Problem – Need for improved real-time communications within the work zone and between work zone and traffic

Solution – Develop a connected "Smart" vest that can broadcast messages to connected vehicles (oncoming traffic and connected work zone equipment), and that can receive information in order to alert worker of potential safety risks

Current Status – Developed and demonstrated 1 prototype connected smart vest

Next Steps – Develop 10 connected smart vests along with base station; Conduct 2 pilot demonstrations in live work zones

CAV Efforts in VA – Work Zone Safety

Automated Truck Mounted Attenuator (ATMA) Program Overview

Problem – Safety risk when TMAs are involved in incidents, which have been increasing in recent years

Solution – Develop an ATMA such that a worker drives a lead vehicle and the ATMA follows, acting as a buffer between work zone personnel and oncoming traffic

Program Details –

- Consortia formed in 2018 (VDOT, VTTI, Transurban, DBI Services, and SAFE-D)
- Local design goals: Freeway operations, HMI, robust safety features
- Multi-phase program

CAV Efforts in VA – Understanding Automation

CARMA Testing
- FHWA's CARMA effort focuses on testing automated vehicle features and cooperative automated vehicle features, and conducts on-road testing in Virginia, Maryland, and Washington, D.C.

Daimler Testing
- Testing automated trucks on I-81

Potential Routes: West Coast to East Coast

ADS Trucking Fleet Concept of Operations (CONOPS) for Managing Mixed Fleets
- This USDOT-granted funded project led by VTTI, with VDOT as a partner, will provide the trucking industry with clear information on how to safely implement and benefit from trucks equipped with an Automated Driving System (ADS)
- This project is focusing on the port truck queuing demo, which will take place in California, with a cross-country demo to follow

Safely Operating ADS in Challenging Dynamic Scenarios: An Optimized Automated Driving Corridor Demonstration
- This USDOT granted-funded project led by VTTI with VDOT as a partner will demonstrate how SAE L4 ADS-equipped vehicles can interact safely in challenging dynamic scenarios (e.g., encounters with public safety providers, public services)
- This project is currently identifying a series of scenarios with live demos anticipated later this year

Questions?

Amanda Hamm, Esq.
Connected and Automated Vehicle Program Manager
Office of Strategic Innovation

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Candidate Topics for addition to the TTSP

- Autonomous Vehicles (AVs)
- Transit Innovations
- Other?

Candidate Topics: Autonomous Vehicles

Definition (taken form the TTSP Glossary): Fully autonomous vehicles will be able to drive themselves without human intervention. No such vehicle currently exists but progress is being made towards achieving this. The Society of Automotive Engineers (SAE) recognizes five levels of automation, starting with 0 - No Automation ("the driver performs all driving tasks"), to 5 - Full Automation ("The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.")

Recent Developments:

- National Highway Traffic Safety Administration (NHSTA) Finalizes First Occupant Protection Safety. Standards for Autonomous Vehicles.

- VDOT recently finalized an Investment Roadmap, as part of its Connected and Automated Vehicle(CAV) Program.

- In January, 2022, the Metropolitan Washington Council of Governments approved ACV Regional Principles, for the "deployment, use or operation" of CAVs.

Candidate Topics: Autonomous Vehicles, continued

Considerations:

If additional content were to be added to the TTSP to address this topic:

- Should it be incorporated into an existing strategy, or should a new strategy be created?

- What scope would best synergize with the Commonwealth's work on CAVs?

- Should autonomy be addressed as an overarching concept, or mode-specific?

Candidate Topics: Transit Innovations

Definitions:

Term	Definition	Prop. for topic area?	Source
Demand Responsive Transit (DRT)	""Demand response" is any non-fixed route system of transporting individuals that requires advanced scheduling by the customer, including services provided by public entities, nonprofits, and private providers."	Yes	Federal Transit Administration.
Microtransit	"A privately owned and operated shared transportation system that can offer fixed routes and schedules, as well as flexible routes and on-demand scheduling. The vehicles generally include vans and buses." An example of a company that provide microtransit services is Via. It may also be possible to have publicly offered microtransit.	Yes	TTSP Glossary.
Bus Rapid Transit (BRT)	"Bus Rapid Transit (BRT) is a high-quality public transportation system designed to be fast, reliable, and more convenient than traditional bus routes. It operates much like rail service but uses rubber tire bus vehicles. "Key components/features of a BRT system include frequent and efficient service, dedicated lanes and traffic signal priority, information technology systems (like real-time bus tracking and innovative fare collection methods), enhanced stations and specially designed, high-capacity buses.	Yes	TTSP Glossary.
Transit Signal Priority (TSP)	"Transit Signal Priority (TSP) tools modify traffic signal timing or phasing when transit vehicles are present either conditionally for late runs or unconditionally for all arriving transit. TSP can be a powerful tool to improve both reliability and travel time, especially on corridor streets with long signal cycles and distances between signals."	Yes	TTSP Glossary.
Paratransit	"In general, ADA complementary paratransit service must be provided within 3/4 of a mile of a bus route or rail station, at the same hours and days, for no more than twice the regular fixed route fare."	No	National Aging and Disability Transportation Center.
Transportation Network Companies (TNC)	"A transportation network company (TNC) provides prearranged rides for compensation using a digital platform that connects passengers with drivers using a personal vehicle." Examples include Lyft and Uber.	No	TTSP Glossary.
Micromobility	Micromobility "refers to a range of small, lightweight devices operating at speeds typically below 15 mph, and is ideal for trips up to [approximately 6 miles.]" These devices can be human-powered or electric and can be privately owned or shared. Examples include bikes, scooter and skateboards	No	TTSP Glossary.

Candidate Topics: Transit Innovations, continued

Recent Developments:

- NVTA has hosted a series of meetings to coordinate development of BRT systems in the region.

- The Virginia Department of Rail and Public Transportation (DRPT) is partnering with Bay Transit on the Virginia Microtransit Deployment Initiative, to conduct two 18-month pilots to test proof of concept of microtransit in rural areas. Additionally, DRPT is partnering with Hampton Roads Transit and Blacksburg Transit to test microtransit in urban contexts.

- OmniRide is considering implementing Microtransit service in the Manassas Park area.

Considerations:

If additional content were to be added to the TTSP to address this topic:

- Should it focus on a specific type of transit innovation (like microtransit), or aspire to be flexible enough to cover multiple?

Candidate Topics for addition to the TTSP

Topics

- Autonomous Vehicles (AVs)
- Transit Innovations
- Other?

Options for Next Steps

- New strategy(s)
- Expansion of existing strategies
- Watch-and-wait
- Take no action

7th Annual Northern Virginia Transportation Roundtable Recap

The 7th Annual Northern Virginia Transportation Roundtable, hosted by the **Northern Virginia Transportation Authority (NVTA)** and the **Intelligent Transportation Society of Virginia (ITSVA)**, and sponsored by **Cambridge Systematics**, was held on **Wednesday March 30, 2022**.

Nearly 120 attendees participated across WebEx and YouTube. All attendees were encouraged to submit questions throughout the event via chat boxes on each platform and in **live polling**.

What innovative transportation solution would you personally be most interested in seeing Northern Virginia explore further? (Please use a single word, acronym or hyphenated word.)

7th Annual Northern Virginia Transportation Roundtable Recap, continued

The event was comprised of two panels:

- **Power Panel** - The speakers focused on **electrification** and also touched on other propulsion options like **hydrogen**. Both the content of the panel and the subsequent moderated discussion **were highly relevant to TTSP strategy #8 to "Advance decarbonization of the transportation system"**

- **NoVa InNoVates** – In this panel speakers presented on an array of innovations being developed in the transportation sector, in the Northern Virginia region and beyond.
  - **TransAction scenario analysis and how the TTSP is informing that process**, were discussed.
  - There was a presentation on **New York's Central Business District Tolling Program**, which is relevant to TTSP Strategy **#5 to** *"Develop pricing mechanisms that manage travel demand and provide sustainable travel options"*
  - An update on the **Regional Multi-Modal Mobility Program (RM3P)** was provided. RM3P is relevant to several TTSP strategies, most notably **#5 to** *"Develop pricing mechanisms that manage travel demand and provide sustainable travel options"* and **#7 to** *"Enhance regional coordination and encourage interoperability in the transportation system"*
  - There was a presentation on use of AVs for local deliveries, which is relevant to TTSP Strategy **#4 to** *"Minimize potential for Zero Occupancy passenger Vehicles"*, **and today's discussion of potential topics to add to the TTSP.**

Thank you!

Supplementary Slides

	Strategy		NVTA Roles								
			Authority Roles			Shared Roles			Staff Roles		
Number	Name		Funding	Policy	Advocate	Champion	Facilitate	Stakeholder	Planning	Outreach/ Education	Observer
1	Reduce congestion and increase throughput		✓		✓	✓	✓		✓	✓	
2	Maximize access to jobs, employees and housing		✓			✓	✓		✓	✓	
3	Maximize cybersecurity and privacy for members of the public		✓					✓			✓
4	Minimize potential for Zero Occupancy passenger Vehicles			✓	✓	✓	✓		✓	✓	
5	Develop pricing mechanisms that manage travel demand and provide sustainable travel options			✓	✓			✓	✓	✓	
6	Maximize the potential of physical and communication infrastructure to serve existing and		✓			✓	✓		✓	✓	
7	Enhance regional coordination and encourage interoperability in the transportation system		✓			✓	✓		✓	✓	
8	Advance decarbonization of the transportation system		✓	✓	✓	✓	✓		✓	✓	
Candidates for Addition — Autonomous Vehicles (AVs)	Maximize the potential of automation and connectivity to enhance mobility and increase accessibility		✓	✓	✓	✓	✓	✓	✓	✓	✓
Candidates for Addition — Microtransit	Maximize potential for innovation to increase attractiveness of transit		✓	✓	✓	✓	✓	✓	✓	✓	

What is the Transportation Technology Strategic Plan (TTSP)?

- Tool that will inform a proactive approach to adoption of transportation technology;

- TTSP considers how transportation technologies support the region's vision, i.e. needs-driven NOT technology-driven;

- Includes eight strategies, and up to nine NVTA roles for each strategy;

- TTSP is a living document that will be updated as transportation technologies evolve;

- TTSP Action Plan enables NVTA to think big, start small, and build momentum with respect to adoption of transportation technologies in the region.

Adopted Strategies

	Recommended Strategies	Intent of Strategy (long term)
1	Reduce congestion and increase throughput	Support deployment of transportation technologies that improve performance and optimize efficiency of the regional multimodal transportation system
2	Maximize access to jobs, employees and housing	Support deployment of transportation technologies that increase travel options and awareness of them
3	Maximize cybersecurity and privacy for members of the public	Monitor concerns on behalf of Northern Virginians, and leverage NVTA processes where appropriate and feasible
4	Minimize potential for Zero Occupancy passenger Vehicles	Identify measures to address avoidable increases in passenger vehicle miles traveled
5	Develop pricing mechanisms that manage travel demand and provide sustainable travel options	Identify technology-related measures at a regional scale to dynamically address congestion, including incentives; revenues will be re-invested in equitable solutions
6	Maximize the potential of physical and communication infrastructure to serve existing and emerging modes	Support adaptation of existing resources to support desirable technologies such as CASE vehicles, travel apps, micro modes and robust data collection
7	Enhance regional coordination and encourage interoperability in the transportation system	Leverage regional synergies in the deployment of transportation technologies
8	Advance decarbonization of the transportation system	Support deployment of transportation technologies that reduce greenhouse gas emissions

TTSP Strategies and NVTA Roles

Strategy		NVTA Roles								
		Authority Roles			Shared Roles			Staff Roles		
Number	Name	Funding	Policy	Advocate	Champion	Facilitate	Stakeholder	Planning	Outreach/ Education	Observer
1	Reduce congestion and increase throughput	✔		✔	✔	✔		✔	✔	
2	Maximize access to jobs, employees and housing	✔			✔	✔		✔	✔	
3	Maximize cybersecurity and privacy for members of the public	✔					✔			✔
4	Minimize potential for Zero Occupancy passenger Vehicles		✔	✔	✔	✔		✔	✔	
5	Develop pricing mechanisms that manage travel demand and provide sustainable travel options		✔	✔			✔	✔	✔	
6	Maximize the potential of physical and communication infrastructure to serve existing and emerging modes	✔			✔	✔		✔	✔	
7	Enhance regional coordination and encourage interoperability in the transportation system	✔			✔	✔		✔	✔	
8	Advance decarbonization of the transportation system	✔	✔	✔	✔	✔		✔	✔	

TTSP Draft Action Plan
Consolidated Actions Table

Roles										Immediate				Near Term					Mid Term	Long Term
Title	Applicable Strategies									Jan - March, 2021	April - June, 2021	July - Sept, 2021	Oct - Dec, 2021	Jan - March, 2022	April - June, 2022	July - Sept, 2022	Oct - Dec, 2022	2023 - 2025	2026 - 2029	2030 and Beyond
										TransAction kick-off			Completion of TransAction Phase 1		TransAction adoption		Development of legislative program			
	1	2	3	4	5	6	7	8					Development of legislative program		Six Year Program Update FY2022-2027					
Funding	1A, 1B	2A	3A, 3B			6A, 6B	7A	8A												
Policy				4B	5A			8B												
Advocate	1C			4C, 4D, 4E	5A			8C												
Champion	✔	✔		✔		✔	✔	✔												
Facilitate	✔	✔		✔		✔	7B	✔												
Stakeholder			✔		✔															
Planning	1A	2A	3A	4A	5B	6A	7A	8A												
Outreach/ Education	✔	✔		✔	✔	✔	✔	✔												
Observer			✔																		

Key

Preparatory Action	Potential Direct Action	Direct Action	Follow Up Action	Continual/ Serendipitously

Bold text indicates this Role is a focus of the Strategy-Specific mini-action plans.

Technologies Mapped to TTSP Strategies

Key

Symbol	Meaning
●	Will definitely be helpful
◕	Potential to be helpful
◑	Equal potential to be helpful or detrimental
◔	Potential to be detrimental
○	Likely to be detrimental
(blank)	Not applicable or Insufficient Information Available

Number	Name	Automated/ Autonomous vehicles	Shared Mobility Devices (SMDs)	Signal technologies	Apps	System optimization	Drones	Changes to delivery and freight systems	Surveillance/ monitoring (including telematics)	Data generation/ collection/ sharing	Improvements to mass transit (including BRT)	Smart technologies/ cities and IoT
1	Reduce congestion and increase throughput	◑	◕	●	◑	◕	◑	◕	◕	●	●	◕
2	Maximize access to jobs, employees and housing		◕	◔	◕	●	◔	◔	◑	●	●	●
3	Maximize cybersecurity and privacy for members of the public	◔	◔	◑	◔	◑			◔	◑		◑
4	Minimize potential for Zero Occupancy passenger Vehicles	◑	◕	●	◑	◕	◑	◕	◕	●	●	◕
5	Develop pricing mechanisms that manage travel demand and provide sustainable travel options	◑	◕		◑	●	◑	◕	◕	●	●	●
6	Maximize the potential of physical and communication infrastructure to serve existing and emerging modes	●	●	●		◕	◕	◑			●	●
7	Enhance regional coordination and encourage interoperability in the transportation system	●	◑	◕	◑	◕	●	◑	◑	●	●	◕
8	Advance decarbonization of the transportation system	●	◑		◑							