Transportation Technology Strategic Plan (TTSP) Update

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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	October	• An update to TransAction was adopted, which contained the genesis of the Transportation Technology Committee (TTC)
2018	October	• TTC established by the NVTA CEO
2019	January	• First meeting of the NVTA Transportation Technology Committee
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.

Updates to TTSP Technology Timeline

- The TTSP Timeline is typically updated retrospectively, to allow time for the full impacts of any development to be fully realized.

- Here are a few developments that could be added to the timeline in this update:

Year	Technology Milestone	
	Event	**Description**
2017	Internal Combustion Engine (ICE) vehicles hit peak global sales	*"Most importantly, the market is shifting from being driven primarily by policy, to one where organic consumer demand is the most important factor,'*
2020	VDOT issued its Connect and Automated Vehicle Program Plan	"This document provides direction to Virginia Department of Transportation (VDOT) in preparing for the deployment of connected and automated vehicle (CAV) technologies and solutions, which are expected to bring transformative change to the safety and efficiency of surface transportation."
2021	The Biden-Harris Electric Vehicle Charging Action Plan	"President Biden has united automakers and autoworkers to drive American leadership forward on clean cars, and he set an ambitious target of 50% of electric vehicle (EV) sale shares in the U.S. by 2030."

Updates to TTSP Technology Timeline, continued

Year	Technology Milestone	
	Event	**Description**
2022	TPB adopts CAV Principles	These ten principles will be incorporated into Visualize 2045.
2022	Connected DMV issued the "DMV Hydrogen Greenprint"	"The DMV Hydrogen Greenprint is a better kind of blueprint. In addition to a conceptual plan for deploying infrastructure, it provides a data-driven analysis that quantifies potential hydrogen supply and demand across the DMV over the next ten years."
2022	NHTSA issues first occupant protection safety standards for AVs	This is a first-of-its-kind rule regarding AVs. Additional rulemaking is anticipated.
2022	President Biden invokes Defense Production Act for EV battery production	"President Joe Biden will invoke the Defense Production Act to encourage domestic production of minerals required to make batteries for electric vehicles and long-term energy storage."

Other updates to watch:

- 2022 - "Now after a decade and some bumpy starts, it's robotaxis, robot-driven deliveries, and autonomous trucks that are emerging as the most promising money-makers in the market."

- 2022 - Passage of SB 575 in Virginia, that requires state fleet managers for to use Total Cost of Ownership in evaluating procurements.

- 2022 – SCOTUS ruling in EPA vs. West Virginia said that the Clean Air Act does not provide authority to regulate GHG from power plants.

- Ongoing - Developments in Advanced Air Mobility (AAM).

| Strategy | | NVTA Roles | | | | | | | | |
| Number | Name | Authority Roles | | | Shared Roles | | | Staff Roles | | |
		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	○	◔	◕	◕	◑		◕	◑	

Key	
	No role identified for NVTA
○	Role identified for NVTA
◔	Some progress has been made
◑	Moderate progress has been made
◕	Substantial progress has been made
●	Task has been completed

Watch this space:

- NVTA's NoVA Gateway

Staff Recommendations for integrating topics into the TTSP

Topic for which TTC requested Staff Recommendations	Staff Recommendation
Connected and Automated Vehicles, and Related Infrastructure	Incorporate this topic into the existing TTSP strategy #4 (Minimize Potential for Zero Occupancy passenger Vehicles) and rename the strategy.
Hydrogen propulsion systems	Incorporate this topic into the existing TTSP strategy #8 (Advance Decarbonization of the Transportation System) and retain the strategy name.
Transit Innovations, like Microtransit	Create an entirely new strategy.

Staff Recommendations for updates to TTSP strategy #4

Expand from a focus on reducing the potential negatives of Zero passenger Occupancy Vehicles (ZOVs), to include efforts to maximize the potential benefits of Connected and Autonomous Vehicles.

Recommendation for the title of this strategy:

1. Maximize the benefits and minimize the negatives of connectivity and automation

2. **Enhance operations of the multimodal transportation system through connectivity and automation** (Recommended)

3. Maximize safe and efficient operation of the transportation system while minimizing environmental impacts

Staff Recommendations for updates to TTSP strategy #8

Expand focus on EVs to include other low/Zero Emissions technologies like hydrogen. Also add content on synergistic technologies that could improve resiliency, like Vehicle to Grid (V2G) technology.

Recommendation for the title of this strategy:

- **Retain: Advance Decarbonization of the Transportation System**

Staff Recommendations for creation of a new TTSP strategy

Create a strategy that focuses on transit innovations like microtransit and BRT but is also flexible enough to include other forthcoming transit technologies that are as yet unknown.

Recommendations for the title of this strategy:

1. Enhance transit through innovation and emerging technologies

2. Support the critical functions of transit through innovation

3. **Enhance mobility in the region through transit** (Recommended)

Staff Recommendations for integrating topics into the TTSP

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	✔					✔			✔
Candidate for Expansion of Focus	4	Minimize potential for Zero Occupancy passenger Vehicles Enhance operations of the multimodal transportation system through connectivity and automation		✔	✔	✔	✔		✔	✔	
	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	✔			✔	✔		✔	✔	
Candidate for Expansion of Focus	8	Advance decarbonization of the transportation system	✔	✔	✔	✔	✔		✔	✔	
Candidate for Addition	X	Enhance Mobility in the Region through Transit	✔		✔	✔	✔		✔	✔	

Action Item: Committee Vote on Potential additions to the TTSP

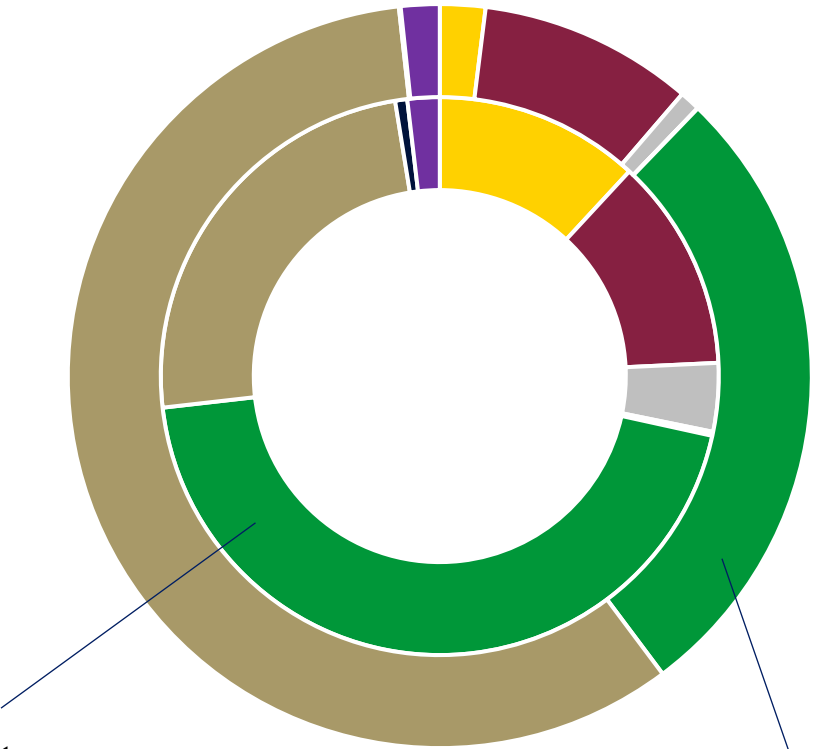| Topic	Recommendation	Recommended Title	Vote
Connected and Automated Vehicles, and Related Infrastructure	Incorporate this topic into the existing TTSP strategy #4 (Minimize Potential for Zero Occupancy passenger Vehicles) and rename the strategy.	Enhance operations of the multimodal transportation system through connectivity and automation	
Hydrogen propulsion systems	Incorporate this topic into the existing TTSP strategy #8 (Advance Decarbonization of the Transportation System) and retain the strategy name.	Retain: Advance Decarbonization of the Transportation System	
Transit Innovations, like Microtransit	Create an entirely new strategy.	Enhance mobility in the region through transit	

TransAction Updates

Project Costs by Project Type

Inner circle is # projects

Outer circle is total cost of projects

Average Cost	
Bike-Ped	$ 27.9M
Interchange/ Intersection	$125.1M
ITS	$ 37.3M
Parking	$ 10.0M
Roadway	$102.1M
Transit	$399.8M
TDM	$ 18.3M
HOV/HOT	$149.5M

Legend:
- Bike-Ped
- Interchange/Intersection
- ITS
- Parking
- Roadway
- Transit
- TDM
- HOV/HOT

Initial Scenario Results

What could happen to transportation in Northern Virginia by 2045?

Change in No-Build Results Under Each Scenario

Measure	New Normal	Technology	Incentives/ Pricing
Motorized Person Trips	-4.5%	-3%	-4.5%
Transit Trips	-11%	-13%	+12%
VMT	-4%	-1.4%	-9%
Person-Hours of Delay	-14%	-25%	-20%
Duration of Severe Congestion	-21%	-37%	-25%
Job Accessibility	+8.3%	+6.1%	+6.5%
Emissions	-3.5%	-28%	-7.9%

NVTA's
TransAction

Thank you!

Supplementary Slides

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.

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 Action Plan
Consolidated Actions Table

Roles										Immediate				Near Term					Mid Term	Long Term
										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
Title	Applicable Strategies									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 description	
Will definitely be helpful	●
Potential to be helpful	◕
Equal potential to be helpful or detrimental	◐
Potential to be detrimental	◔
Likely to be detrimental	○
Not applicable or Insuffecient Information Available	(blank)

	Strategies	Technologies										
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	●	◐			◐						

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