Transportation Technology Strategic Plan (TTSP): Recommendations

May 3, 2021

Topics

1. Why did we develop the Transportation Technology Strategic Plan (TTSP)?

2. What is the TTSP?

   - Recommended Strategies

3. What are the expected benefits of the TTSP?

4. How does the TTSP fit with NVTA's primary responsibilities?

5. How will we use the TTSP?

6. What are the possible outcomes of the TTSP Action Plan?

7. When will we update the TTSP and report back?

8. Recommendations

Why did we develop the Transportation Technology Strategic Plan (TTSP)?

2004/5 – Apple begins product development on a computer that uses a touch screen instead of a physical keyboard/mouse or stylus

July 2002 – NVTA created by General Assembly

September 2006 – TransAction 2030 adopted

January 2007 – Launch of iPhone 2G

November 2012 – TransAction 2040 adopted

July 2013 – NVTA revenue stream begins

January 2017 – 2.2M apps in App Store

October 2017 – TransAction update adopted

October 2020 – Launch of iPhone 12

April 2021 – draft TTSP/Action Plan

2035 – Which version of the iPhone?

2035 – Where should NVTA be?

What is the TTSP?

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

- Provides a rational, consistent approach to identify 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;

- Living document that will be updated as transportation technologies evolve;

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

TTSP – Recommended 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

What are the Expected Benefits of the TTSP?

1. Leverage transportation technologies that support NVTA's vision, and mitigate those that do not, through planning, policy, advocacy, funding, and other means;

2. Support data-driven decision making by the Authority with respect to development of TransAction and subsequent project selection during future funding programs. The TTSP will guide the development of technology-related scenarios;

3. Enable a consistent approach to NVTA's transportation technology investments, increasing synergies and maximizing return on investments and taxpayer dollars;

4. Enhance multimodal travel choices and contribute to a more seamless travel experience for Northern Virginians, through coordinated planning, deployment and operations, especially enabled by secure, real time information;

5. Inform Northern Virginians about the features, benefits, costs, and appropriateness of deploying such technologies in the region, by raising awareness and understanding of transportation technologies;

6. Strengthen the regional approach to transportation technologies, through open and regular exchange of ideas between NVTA staff and jurisdiction/agency staff.

How does the TTSP fit with NVTA's Primary Responsibilities? – Vision

Integrated TransAction/TTSP Vision:

"Northern Virginia will plan for, and invest in, a **safe, equitable, sustainable, and integrated** multimodal transportation system that enhances quality of life, strengthens the economy, and **builds resilience**"

Approved by NVTA on December 17th, 2020

How does the TTSP fit with NVTA's Primary Responsibilities? – Core Values

1. **Equity**
   - Fairness in mobility and accessibility to meet needs of the region/sub-regions/communities
   - Facilitate social and economic opportunities by providing equitable levels of access to affordable and reliable transportation options to serve the needs of all and in particular underserved populations (low-income, minority, elderly, children, people with Limited English Proficiency (LEP), and/or people with disabilities)

2. **Sustainability**
   - Focus on meeting the needs of the present without compromising the ability of future generations to meet their needs.
   - Concept of sustainability is composed of three pillars: economic, environmental, and social

3. **Safety**
   - Minimize transportation system fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all.

How will we use the TTSP?

Two examples demonstrating our approach to evaluating technologies, and potential actions that could follow:

1. Electric, Autonomous Transit Shuttle;
2. Personal, Electric Autonomous Autos.

Note: these examples provide a high-level outline of our approach, and the evaluation ratings are illustrative only.

Example 1: Electric, Autonomous Transit Shuttle

Features

- Not reliant on infrastructure type
- ADA accessible
- Can operate in inclement weather and in mixed traffic

Assumptions

- There have already been successful pilot(s) of the technology in the region
- Public acceptance of the technology is growing
- The shuttles have been determined to be a sound investment and/or market is nearing price parity

Ratings

Key		
🟠	🟡	🟢
(Red)	(Yellow)	(Green)
Intervention needed	Proceed with caution	Embrace

Electric, Autonomous Shuttles

Vision Statement	🟢 (Green)	This type of shuttle has the potential to provide a **safe** first/last mile connection when **integrated** with transit. This would encourage use of **sustainable** mass transportation, and contribute to an **equitable** system through improved access.

Core Values			**Description**	**Action**
	Equity	🟢 (Green)	• Potential first/last mile connection • Improved access • Reduced congestion and more reliable travel times	• Encourage/conduct diverse public outreach that starts with needs identification through listening • Develop white paper(s) to analyze feedback received and research, and identify best practices and/or deployment guidance • Conduct public education initiatives, to dispel myths and encourage adoption
	Sustainability	🟢 (Green)	• Reduce congestion and increase throughput through mass travel options. • Reduce tailpipe emissions.	• Identify potential additions to NVTA's Legislative Program
	Safety	🟡 (Yellow)	• Fewer fallible drivers on the road • Potential reduction in crashes • Slow speeds may not be harmonious with traffic • Object detection/differentiation abilities are an important consideration	• Develop white paper(s) to analyze state of the field and research, and identify best practices and/or project/vendor selection guidance

Strategies			**Sub-Actions**
	1	✓	
	2	✓	• Increase consideration of EV, AV shuttles and pricing mechanisms in TransAction and/or SYP project selection process
	3	✓	• Consider EV, AV shuttles and data/analysis needs and cybersecurity and/or privacy measures in NVTA procurements
	4		• Advocate for jurisdictional policies that support deployment of EV, AV shuttles
	5	✓	• Develop and support policy(s) regarding EV charging infrastructure and/or support technology-based pricing mechanisms and investment of revenues
	6	✓	• Advocate for Commonwealth policies that contribute to/support creation of a network of EV charging infrastructure
	7	✓	
	8	✓	

Example 2: Personal, Electric Autonomous Autos

Features
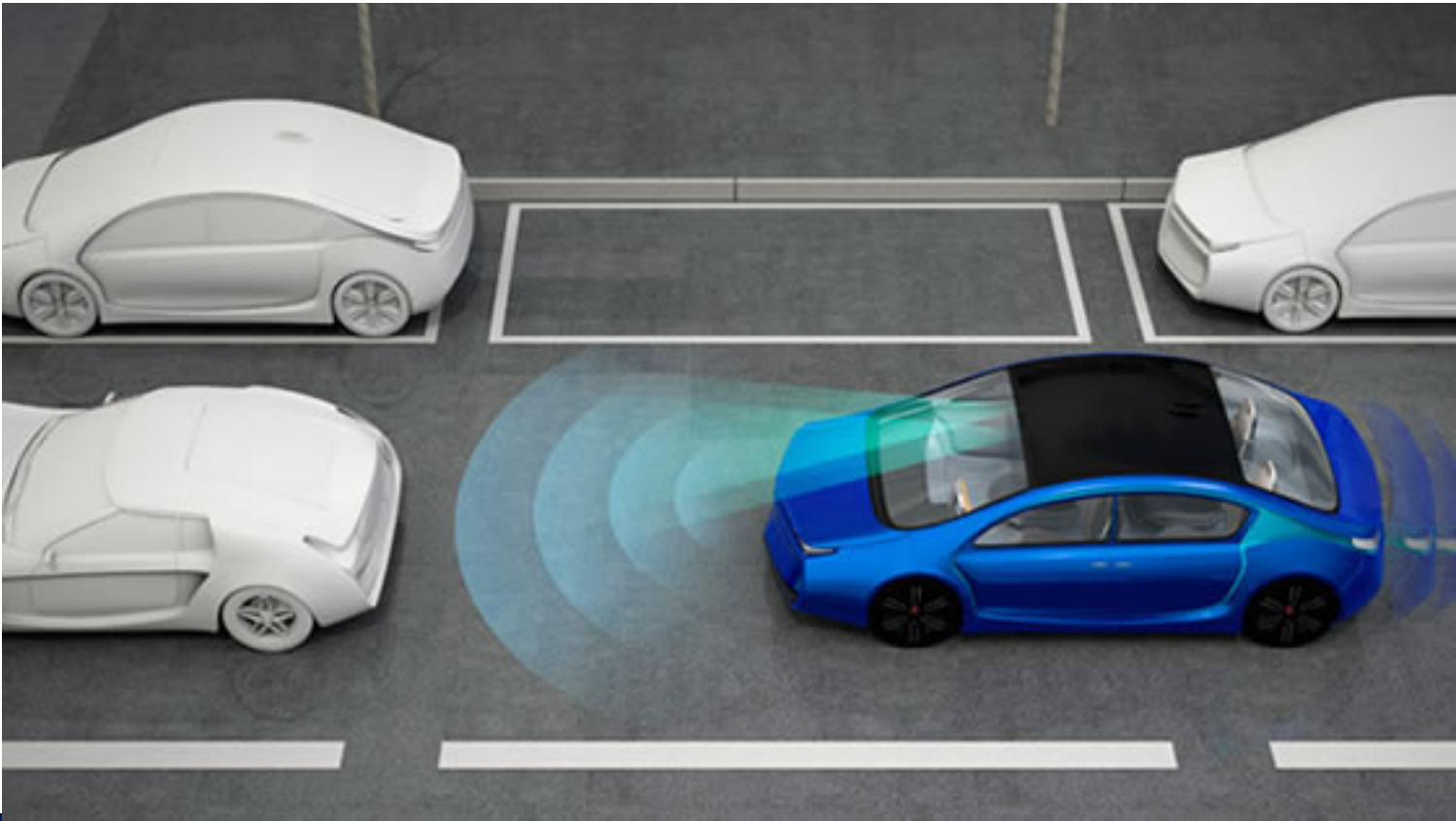
- SAE Level 5 vehicles can operate autonomously under all conditions
- May not have steering wheel or pedals

Assumptions

- Public acceptance of the technology is growing
- Fully autonomous vehicle have or are nearing entry to the public marketplace

Ratings

Key		
🔴 (Red)	🟡 (Yellow)	🟢 (Green)
Intervention needed	Proceed with caution	Embrace

Personal Electric, Autonomous Vehicles

Vision Statement	⬤ (Yellow)	Personal use of electric, autonomous vehicles have the potential to improve **safety,** and improve **sustainability** of the transportation system by reducing congestion. However, proactive steps will be necessary to ensure they are well integrated with existing modes and the cost of these vehicles **may create inequities,** if use is dependent on personal ownership.

Core Values			Description	Action
	Equity	⬤ (Red)	• Shared ownership or subscription based usage could contribute to equitable access to personal electric, autonomous vehicles • Any revenues generated from personal use of EV AVs could be reinvested in programs, infrastructure or services that support equitable access to the transportation network • AVs may contribute to more reliable travel times in the region and increased safety	• Encourage/conduct diverse public outreach that starts with needs identification through listening • Develop white paper(s) to analyze feedback received and research, and identify best practices to accommodate this mode in a manner consistent with NVTA core values
	Sustainability	⬤ (Green)	• Reduce congestion and increase throughput through efficiencies of automation • Zero Occupancy passenger Vehicles may increase VMT and congestion • Reduce tailpipe emissions	• Identify potential additions to NVTA's Legislative Program • Conduct public education initiatives, to dispel myths and encourage shared usage and/or occupancy
	Safety	⬤ (Yellow)	• Fewer fallible drivers on the road • Potential reduction in crashes • Object detection/differentiation abilities are an important consideration	• Develop white paper(s) to analyze state of the field and research, and identify best practices to accommodate this mode in a manner consistent with NVTA core values

Strategies		Sub-Actions
	1 ✓	
	2 ✓	• Increase consideration of EV, AVs, pricing mechanisms and minimization of ZOV miles traveled in TransAction and/or SYP project selection process
	3 ✓	• Consider EV, AVs and data/analysis needs and cybersecurity and/or privacy measures in NVTA procurements
	4 ✓	• Advocate for jurisdictional policies that support equitable use of EV, AVs
	5 ✓	• Develop and support policy(s) regarding EV charging infrastructure, support technology-based pricing mechanisms and investment of revenues or discourage ZOV miles traveled
	6 ✓	• Advocate for Commonwealth policies that contribute to/support creation of a network of EV charging infrastructure
	7 ✓	• Advocate for state provision/funding of pilots and research efforts
	8 ✓	

What are the Possible Outcomes of the TTSP Action Plan?

Planned Actions (May thru October 2021)

- Transportation technology evaluation ratings
- TransAction
  - Integration of technology-related strategies into the TransAction scenario analysis work
  - Public engagement under the TransAction umbrella
- Technology-related Outreach
  - Development of a more comprehensive approach to technology-related outreach and education that builds upon the 'Driven by Innovation' eblast
  - Ongoing monitoring of market trends and trigger points
- Identify potential technology-related additions to NVTA's Legislative Program
- White Paper development
  - Collaborate on a process for development of future regional transportation policies
  - Identify and prioritize topics for potential future regional transportation policies
- Identify potential technology-related refinements to future NVTA SYP project selection process (post-TransAction update)

When will we Update the TTSP and Report Back?

TTSP Updates:

- Routine updates will occur continuously as the TTSP is a living document
- Significant updates will be undertaken in conjunction with Committees and the Authority, including:
  - changes to the methodology for the project selection process associated with NVTA's Six Year Program
  - changes/additions to NVTA's annual legislative program
  - development of regional transportation policies

Report back using the Executive Director's monthly report:

- Progress against specific measures;
- Citizen and stakeholder feedback;
- Trigger points observed or anticipated;
- Relevant TransAction analyses;
- Revisions to the TTSP living document to reflect changing circumstances; and
- Upcoming TTSP-related activities.

Recommendations of NVTA Committees

- April 21, 2021: Transportation Technology Committee (TTC)
  - Unanimously approved the following: 1) Forward the full TTSP to the Authority for their information; 2) Recommend Authority approval of the eight Strategies included in the TTSP; and recommend Authority approval of the TTSP Action Plan.

- April 27, 2021: Technical Advisory Committee (TAC)
  - Unanimously approved the following: Recommend Authority approval of the eight Strategies included in the TTSP; and recommend Authority approval of the TTSP Action Plan.

- April 28, 2021: Planning Coordination Advisory Committee (PCAC)
  - Unanimously approved the following: Recommend Authority approval of the eight Strategies included in the TTSP; and recommend Authority approval of the TTSP Action Plan.

Recommendations

Recommended action:

Recommend the Authority adopt the eight strategies (in the Transportation Technology Strategic Plan) and Action Plan.

Note: NVTA staff is not seeking NVTA approval of the TTSP document

Supplementary Slides

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
										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	
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	

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	●	◐		◐							