



# Northern Virginia Transportation Authority

*The Authority for Transportation in Northern Virginia*

## PLANNING COORDINATION ADVISORY COMMITTEE

Wednesday, April 28, 2021, 6:30 pm

**ELECTRONIC MEETING ONLY**

Meeting link will be sent to the members prior to the meeting  
All others will be able to view proceedings live on [NVTA's YouTube Channel](#)

### AGENDA

- I. Call to Order/Welcome Chair

#### Action

- II. Resolution finding need to conduct meeting electronically  
*Recommended action: Adopt resolution*
- III. Summary Notes of March 24, 2021 Meeting  
*Recommended action: Approve meeting notes*

#### Action

- IV. Transportation Technology Strategic Plan & Action Plan  
Mr. Jasper, Principal  
Transportation Planning and Programming  
*Recommended action: Recommend the Authority adopt the eight strategies (in the Transportation Technology Strategic Plan) and Action Plan*

### Discussion/Information

- V. TransAction Update Mr. Jasper, Principal,  
Transportation Planning and Programming
- VI. NVTA Update Ms. Backmon, Executive Director

### Adjournment

- VII. Adjourn

**Next Meeting: May 26, 2021.**  
**Location: Electronic meeting**

**NORTHERN VIRGINIA TRANSPORTATION AUTHORITY**

**PLANNING COORDINATION ADVISORY COMMITTEE**

**RESOLUTION FINDING NEED TO CONDUCT MEETING BY ELECTRONIC  
COMMUNICATION MEANS DURING GOVERNOR'S DECLARED STATE OF  
EMERGENCY DURING COVID – 19 PANDEMIC**

**April 28, 2021 MEETING ELECTRONICALLY**

April 28, 2021

**WHEREAS**, on March 12, 2020, the Governor of Virginia declared a state of emergency in Virginia in response to the spread of novel coronavirus, or COVID-19, a communicable disease of public health threat as so declared by the State Health Commissioner on February 7, 2020 (“COVID-19”); and

**WHEREAS**, in subsequent Executive Orders, particularly Executive Order Nos. 53 and 55, as amended, the Governor of Virginia, among other measures designed to ensure safe physical distancing between individuals, prohibited public and private in person gatherings of 10 or more individuals and ordered all individuals in Virginia to remain at their place of residence, with limited exceptions, to mitigate the impacts of COVID-19 and prevent its spread; and

**WHEREAS**, the Northern Virginia Transportation Authority (Authority) – Planning Coordination Advisory Committee (Committee) finds that it has a responsibility to demonstrate to the public, through the Authority’s conduct, the importance of maintaining proper physical distance from others and to avoid gathering in public where the risks of infection are highest, and to take measures that promote physical distancing in order to protect the public health and mitigate the impacts and spread of COVID-19, including, among others, conducting meetings electronically whenever possible; and

**WHEREAS**, on April 22, 2020, the Virginia General Assembly adopted, and the Governor signed, budget bill amendments to HB 29 that expressly authorize “any public body, including any state, local, [or] regional body” to “meet by electronic communication means without a quorum of the public body . . . physically assembled at one location when the Governor has declared a state of emergency . . . , provided that (i) the nature of the declared emergency makes it impracticable or unsafe for the public body . . . to assemble in a single location; (ii) the purpose of the meeting is to discuss or transact the business statutorily required or necessary to continue operations of the public body . . . and the discharge of its lawful purposes, duties, and responsibilities” among other provisions; and

**WHEREAS**, member jurisdictions of the Northern Virginia Transportation Authority have adopted continuity of government ordinances pursuant to Va. Code Ann. § 15.2-1413 which ordinances, among other provisions, contemplate regional bodies of which the locality is a member meeting electronically to transact business to assure the continuity of government; and

**NOW, THEREFORE, BE IT RESOLVED**, that the Northern Virginia Transportation Authority Planning Coordination Advisory Committee hereby finds that meeting by electronic means is authorized because the nature of the declared emergency makes it both impracticable and unsafe for the Committee to assemble in a single location on April 28, 2021, to discuss and transact the business of the Authority listed on the April 28, 2021 Committee Meeting Agenda; and

**BE IT FURTHER RESOLVED**, that the Committee hereby finds that meeting by electronic means is authorized because the items on the April 28, 2021 Committee Meeting Agenda are statutorily required or necessary to continue operations of the Authority and the discharge of the Authority's lawful purposes, duties, and responsibilities; and

**BE IT FURTHER RESOLVED**, that the items on the April 28, 2021 Committee Meeting Agenda are encompassed within the continuity of operations ordinances adopted by member localities of the Northern Virginia Transportation Authority to assure the continued operation of the government during the disaster posed by the public health emergency resulting from COVID-19.

Adopted the 28th day of April, 2021.



## Northern Virginia Transportation Authority

*The Authority for Transportation in Northern Virginia*

### PLANNING COORDINATION ADVISORY COMMITTEE Wednesday, March 24, 2021, 6:30 pm **(Electronic meeting only)** Northern Virginia Transportation Authority

#### SUMMARY NOTES

#### **I. Call to Order/Welcome**

Chair Colbert

- Chair Colbert welcomed Committee members and called the meeting to order at 6:40 p.m.
- Attendees:
  - **PCAC Members:** Chair and Mayor Linda Colbert (Town of Vienna); Board Member Libby Garvey (Arlington County); Supervisor Walter Alcorn (Fairfax County); Supervisor Margaret Angela Franklin (Prince William County); Vice-Mayor Elizabeth Bennett-Parker (City of Alexandria); Council Member Phil Duncan (City of Falls Church); Council Member Jon Stehle (City of Fairfax); Vice-Mayor Preston Banks (City of Manassas Park); Vice-Mayor Marty Martinez (Town of Leesburg).
  - **NVTa Staff:** Monica Backmon (Executive Director); Keith Jasper (Principal, Transportation Planning and Programming); Harun Rashid (Transportation Planner), Mackenzie Love (Regional Transportation Planner).

#### Action

#### **II. Resolution to Conduct March 24, 2021, Meeting Electronically**

- Chair Colbert read a summary excerpt of the resolution on the need for this PCAC meeting to be held electronically, and its permissibility under the recent passage of the amendments to the HB 29 – the FOIA Bill.  
The resolution was unanimously adopted.

#### **III. Summary Notes of February 24, 2021 Meeting**

- The February 24, 2021, meeting summary was approved, with abstentions from members who did not attend the February 24 meeting.

## **Discussion/Information**

### **IV. Transportation Technology Strategic Plan**

Mr. Jasper/Ms. Love

- In the February Committee meeting, NVTa staff introduced the Draft Transportation Technology Strategic Plan (TTSP), covering its background and purpose, and its linkage to TransAction, the upcoming long range transportation plan update. In this meeting, Mr. Jasper laid out the outline of the Action Plan for the TTSP. The objective is to present a tangible set of steps to realize the strategies set in the plan, and solicit members' inputs.

His presentation covered the following topics;

- Recaps of TTSP approval timeline,
  - Authority's vision for NVTa long range transportation plan TransAction,
  - TTSP contents in Northern Virginia Transportation Roundtable;
  - Feedback received on the draft TTSP from the PCAC and other NVTa standing/statutory committees.
- This section of the presentation was followed by a detailed overview of the structure and contents of the Action Plan, presented by Ms. Love. The crux of this presentation is a consolidated actions table, which displays the relationship between TTSP strategies, potential NVTa staff roles, and a broad timeline of such actions. Adoption of the draft TTSP, and its associated Action Plan, may support or trigger the following:
    - TransAction scenario (sensitivity) analysis
    - Outreach/education
    - Potential additions to NVTa's Legislative Program
    - Potential refinements to future NVTa SYP project selection process (post-TransAction update)
    - Funding
    - Development of White Papers identifying potential topics for future regional transportation policy

Mr. Jasper also highlighted a progress monitoring and update cycle of this plan, anticipating an approval from Authority in its May 2021 meeting.

- Committee members appreciated staff work on the overall organization and clarity of the proposed actions, and suggested a few topical enhancements, e.g., the issues of climate change, livable communities, and transportation safety. Mr. Jasper stated that staff would consider these issues but most will also be addressed in TransAction, in addition to technological aspects that are identified in the TTSP/Action Plan. Staff also clarified some of the verbiage/nomenclature questions by members on the eight strategies in this plan.

### **V. NVTa Update**

Ms. Backmon

- Ms. Backmon expressed her gratitude to Committee members for their participation and comments, and highly appreciated staff work on the draft plans. She stated the intent to recommendation approval of the TTSP/Action Plan in May Authority meeting, so that the plan strategies can be incorporated into ongoing work related to

TransAction. Ms. Backmon noted that a project can only be funded using NVTAs regional revenues if it is included in TransAction's final project list.

**VI. Adjourn**

- Chair Colbert also reminded the April 1<sup>st</sup> deadline for feedback comments, and the next meeting on April 28. She then adjourned the meeting at 7:45 pm.

DRAFT

# Transportation Technology Strategic Plan (TTSP): Recommendations

*April 21, 2021*





## NVTA's Vision for TransAction

"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 17<sup>th</sup>, 2020*





# Three Core Values - Overarching Principles

## 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.



## Timeline – Technology versus NVTA

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

January 2007 – Launch of iPhone 2G

January 2017 – 2.2M apps in App Store

October 2020 – Launch of iPhone 12

2035 – Which version of the iPhone?

July 2002 – NVTA created by General Assembly

September 2006 – TransAction 2030 adopted

November 2012 – TransAction 2040 adopted

July 2013 – NVTA revenue stream begins

October 2017 – TransAction update adopted

April 2021 – draft TTSP/Action Plan

2035 – Where should NVTA be?



# 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.



## Expected Benefits of the TTSP

1. Proactive approach will leverage transportation technologies that support NVTA's vision, and mitigate those that do not, through planning, policy, advocacy, funding, and other means;
2. TransAction scenario (sensitivity) analysis will support data-driven decision making by the Authority with respect to development of TransAction and subsequent project selection during future funding programs. While scenarios could reflect a range of external considerations, the TTSP will guide the development of technology-related scenarios;
3. Consistent approach to NVTA's transportation technology investments will increase synergies and maximize return on investments and taxpayer dollars;
4. Coordinated planning, deployment and operations, especially enabled by secure, real time information, will enhance multimodal travel choices and contribute to a more seamless travel experience for Northern Virginians;
5. By raising awareness and understanding of transportation technologies, NVTA will inform Northern Virginians about the features, benefits, costs, and appropriateness of deploying such technologies in the region.
6. Open and regular exchange of ideas between NVTA staff and jurisdiction/agency staff will strengthen the regional approach to transportation technologies.



# 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 <b>in the transportation system</b>	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 NVRTA Roles

Strategy		NVRTA 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	✓	✓	✓	✓	✓		✓	✓	





# 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 <b>safe</b> first/last mile connection when <b>integrated</b> with transit. This would encourage use of <b>sustainable</b> mass transportation, and contribute to an <b>equitable</b> system through improved access.	
			Description	Action
Core Values	Equity	 (Green)	<ul style="list-style-type: none"><li>• Potential first/last mile connection</li><li>• Improved access</li><li>• Reduced congestion and more reliable travel times</li></ul>	<ul style="list-style-type: none"><li>• Encourage/conduct diverse public outreach that starts with needs identification through listening</li><li>• Develop white paper(s) to analyze feedback received and research, and identify best practices and/or deployment guidance</li><li>• Conduct public education initiatives, to dispel myths and encourage adoption</li></ul>
	Sustainability	 (Green)	<ul style="list-style-type: none"><li>• Reduce congestion and increase throughput through mass travel options.</li><li>• Reduce tailpipe emissions.</li></ul>	<ul style="list-style-type: none"><li>• Identify potential additions to NVTAs Legislative Program</li></ul>
	Safety	 (Yellow)	<ul style="list-style-type: none"><li>• Fewer fallible drivers on the road</li><li>• Potential reduction in crashes</li><li>• Slow speeds may not be harmonious with traffic</li><li>• Object detection/differentiation abilities are an important consideration</li></ul>	<ul style="list-style-type: none"><li>• Develop white paper(s) to analyze state of the field and research, and identify best practices and/or project/vendor selection guidance</li></ul>
			Sub-Actions	
Strategies	1	✓	<ul style="list-style-type: none"><li>• Increase consideration of EV, AV shuttles and pricing mechanisms in TransAction and/or SYP project selection process</li><li>• Consider EV, AV shuttles and data/analysis needs and cybersecurity and/or privacy measures in NVTAs procurements</li><li>• Advocate for jurisdictional policies that support deployment of EV, AV shuttles</li><li>• Develop and support policy(s) regarding EV charging infrastructure and/or support technology-based pricing mechanisms and investment of revenues</li><li>• Advocate for Commonwealth policies that contribute to/support creation of a network of EV charging infrastructure</li></ul>	
	2	✓		
	3	✓		
	4			
	5	✓		
	6	✓		
	7	✓		
	8	✓		





# Example 2: Personal, Electric Autonomous Autos




## Features

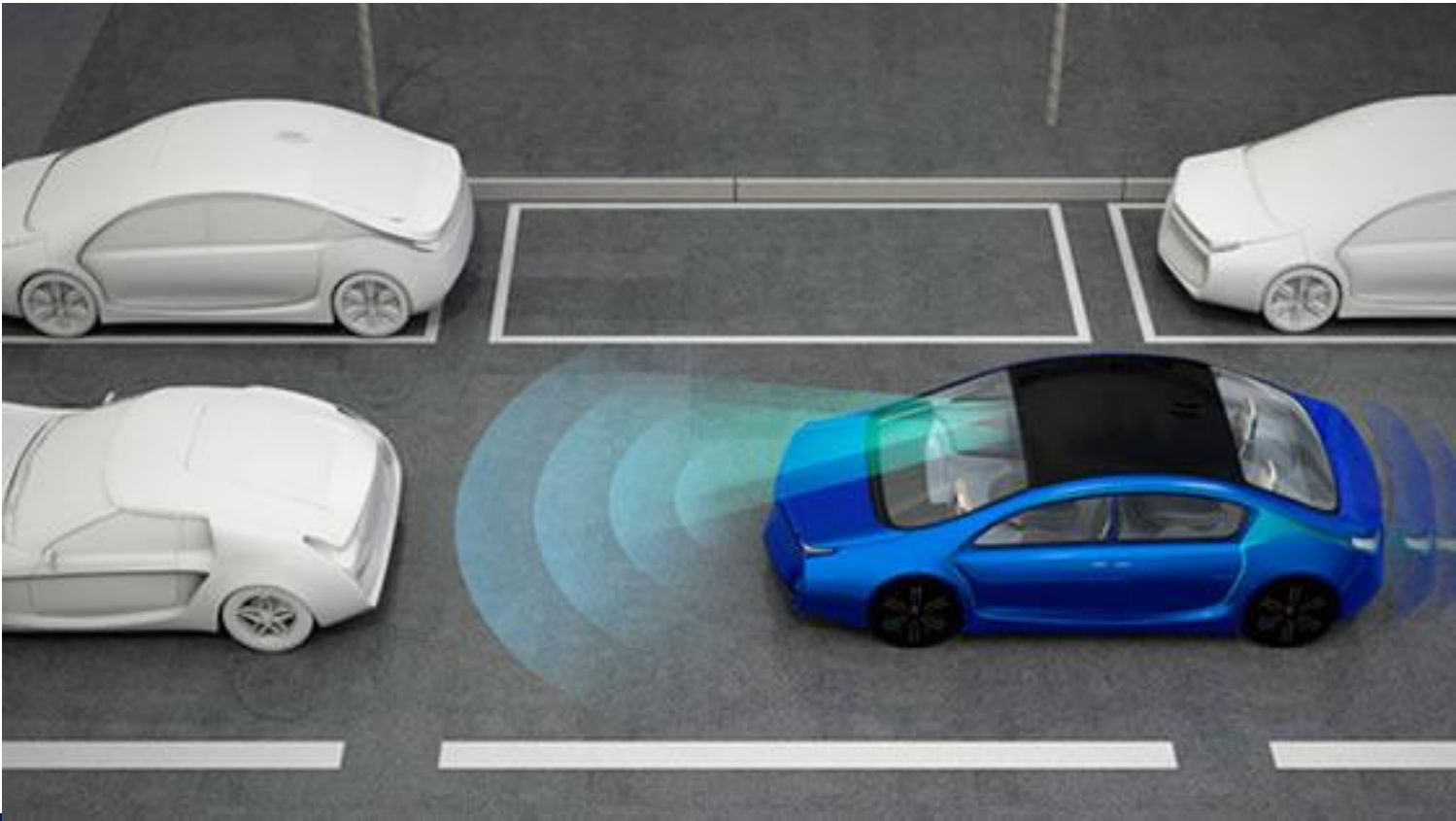
- SAE Level 5 vehicles can operate autonomously under all conditions
- May not have steering wheel or pedals













## 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 <b>safety</b> , and improve <b>sustainability</b> 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 <b>may create inequities</b> , if use is dependent on personal ownership.	
		Description		Action
Core Values	Equity	 (Red)	<ul style="list-style-type: none"> <li>• Shared ownership or subscription based usage could contribute to equitable access to personal electric, autonomous vehicles</li> <li>• 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</li> <li>• AVs may contribute to more reliable travel times in the region and increased safety</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage/conduct diverse public outreach that starts with needs identification through listening</li> <li>• Develop white paper(s) to analyze feedback received and research, and identify best practices to accommodate this mode in a manner consistent with NVTAs core values</li> </ul>
	Sustainability	 (Yellow)	<ul style="list-style-type: none"> <li>• Reduce congestion and increase throughput through efficiencies of automation</li> <li>• Zero Occupancy passenger Vehicles may increase VMT and congestion</li> <li>• Reduce tailpipe emissions</li> </ul>	<ul style="list-style-type: none"> <li>• Identify potential additions to NVTAs Legislative Program</li> <li>• Conduct public education initiatives, to dispel myths and encourage shared usage and/or occupancy</li> </ul>
	Safety	 (Green)	<ul style="list-style-type: none"> <li>• Fewer fallible drivers on the road</li> <li>• Potential reduction in crashes</li> <li>• Object detection/differentiation abilities are an important consideration</li> </ul>	<ul style="list-style-type: none"> <li>• 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 NVTAs core values</li> </ul>
		Sub-Actions		
Strategies	1		<ul style="list-style-type: none"> <li>• Increase consideration of EV, AVs, pricing mechanisms and minimization of ZOV miles traveled in TransAction and/or SYP project selection process</li> <li>• Consider EV, AVs and data/analysis needs and cybersecurity and/or privacy measures in NVTAs procurements</li> <li>• Advocate for jurisdictional policies that support equitable use of EV, AVs</li> <li>• Develop and support policy(s) regarding EV charging infrastructure, support technology-based pricing mechanisms and investment of revenues or discourage ZOV miles traveled</li> <li>• Advocate for Commonwealth policies that contribute to/support creation of a network of EV charging infrastructure</li> <li>• Advocate for state provision/funding of pilots and research efforts</li> </ul>	
	2			
	3			
	4			
	5			
	6			
	7			
	8			



# Recommendations

1. Approve the eight TTSP strategies, as described in the TTSP document\*
2. Approve the TTSP Action Plan, subject to:
  - No significant TTSP changes/additions, as determined by the NVTA Executive Director, will occur without prior Authority approval. Examples of significant changes include:
    - 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

Note (\*): NVTA staff is not seeking NVTA approval of the TTSP document (see next slide for details)



## Recommendations – Note (\*)

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

- The TTSP will be maintained as a living document to reflect the continued evolution of transportation technologies;
- NVTA staff requires flexibility to update the TTSP and, where necessary, refine the strategies and action plan, as new technologies emerge or approach market thresholds that may trigger big shifts in travel demand or behavior; and
- New federal/state legislation, or initiatives undertaken by the federal/state government or the region and its partners, may also trigger refinements to the strategies and the action plan.



## TTSP Action Plan: Possible Outcomes

- Development of technology-related scenarios for TransAction scenario (sensitivity) analysis, potentially on the following:
  - Incentives and pricing mechanisms to reduce car dependency
  - Climate change and resiliency of regional transportation system
  - Pandemic 'new normal' implications of increased work-from-home and e-commerce
- Technology-related outreach/education
  - Facts and Myths: Connected, Autonomous, Shared, and Electric (CASE) vehicles
- Identify potential technology-related additions to NVRTA's Legislative Program, these may include:
  - Support EV infrastructure
  - Support Zero Emission Vehicles
  - Concern regarding Zero Occupancy passenger Vehicles





# TTSP Action Plan: Possible Outcomes

- Identify potential technology-related refinements to TransAction and future NVTA SYP project selection process (post-TransAction update)
  - Funding commitments could be made to be contingent on TTSP related criteria, to be identified and approved through the process laid out in the Action Plan.
  - Projects selected for future funding could be required to participate in standardization of things like transit signal priority communications
- Funding
  - TransAction Project List is the first filter for projects that can be funded using NVTA regional revenues
  - NVTA staff is currently coordinating with jurisdiction/agency staff to create the projects list(s)
- Develop a process for, and White Papers to help prioritize, future regional transportation policy, potentially on the following topics:
  - Shared mobility devices
  - Autonomous transit shuttles
  - Zero Occupancy passenger Vehicles
- Human Services transportation



## Planned Actions (May thru October 2021)

- Integration of technology-related strategies into the TransAction scenario analysis work
- Public engagement under the TransAction umbrella
- Ongoing monitoring of market trends and trigger points
- Development of a more comprehensive approach to technology-related outreach and education that builds upon the 'Driven by Innovation' eblast
- Collaborate on a process for development of future regional transportation policies
- Develop White Papers to prioritize potential future regional transportation policies



## Review and Reporting

Using the Executive Director's monthly report, summarize status on topics such as:

- 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;
- Upcoming TTSP-related activities; and
- Consideration of significant changes/additions to the strategies or Action Plan (requiring future Authority action).





# Supplementary Slides



# 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 Insufficient 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	●	◑			◑						