Northern Virginia Transportation Authority
The Authority for Transportation in Northern Virginia

TRANSPORTATION TECHNOLOGY COMMITTEE
Wednesday, October 27, 2021
8:30 AM
(In-person meeting and livestreamed via YouTube)

AGENDA

I. Call to Order/Welcome — Chairman Snyder

Action

II. Summary Notes of April 21st, 2021 Meeting — Chairman Snyder
Recommended action: Approve meeting notes

Discussion/Information

III. Presentation: Connected Infrastructure Demonstration Project — Cindy Mester, City of Falls Church and Mike Mollenhauer, VTTI

IV. Transportation Technology Strategic Plan Update — Mackenzie Love, Regional Transportation Planner

V. TransAction Survey Results — Keith Jasper, Principal, Transportation Planning and Programming

VI. NVTA Updates — Ms. Monica Backmon, CEO

VII. Member Updates

Adjournment

VIII. Adjourn

Next Meeting
TBD

Northern Virginia Transportation Authority
The Authority for Transportation in Northern Virginia

TRANSPORTATION TECHNOLOGY COMMITTEE
Wednesday, April 21, 2021, 8:30 am
Electronic meeting and livestreamed on YouTube

SUMMARY NOTES

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

- Chairman Snyder called the meeting to order at 8:30 am.
- Attendees:
  - **TTC Members:** Councilmember/Chairman David Snyder (City of Falls Church and Authority Member); Mayor Jeanette Rishell (City of Manassas Park and Authority Member); Jim Kolb (Summit Strategies and Authority Member); Cathy McGhee (Virginia Transportation Research Council); Hari Sripathi (VDOT); Dr. Richard Mudge (Compass); Mike Garcia (FCDOT); Sean Schweitzer (FCDOT) and; Greg Rogers (Nuro).
  - **NVTA Staff:** Monica Backmon (Executive Director); Keith Jasper (Principal, Transportation Planning and Programming); Mackenzie (Jarvis) Love (Regional Transportation Planner).
  - **Others:** On YouTube livestream.

Action

II. **Resolution finding the need to conduct meetings electronically**
Chairman Snyder noted that as a result of the COVID-19 and Governor Northam's declaration of a State of Emergency, the Transportation Technology Committee Meeting was being held electronically. He noted that the passage of the amendments to HB 29 (the FOIA Bill) allowed regional bodies such as the Authority, and their committees to conduct business meetings electronically. He added that the meeting by electronic means is authorized because the items on the Committee Meeting Agenda are statutorily required or necessary to continue operations of the Authority. The resolution was approved unanimously.

III. **Approval of March 24th, 2021 meeting minutes.**
The meeting summary was approved unanimously, with abstention from members not present.

Discussion/Information

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

- During this presentation Mr. Jasper and Mrs. Love answered five key questions about the Transportation Technology Strategic Plan, or TTSP.

i. Why develop the TTSP? Examples of the speed and frequency with which new technologies enter the market were provided, and compared it to the growth of NVTA. A strategic plan is necessary to keep pace.
ii. What is the TTSP? It is a tool for a proactive approach to innovation that identified nine potential roles for NVTA and its staff to undertake.
iii. What are the potential benefits of the TTSP? It could generate reliable data that could be used by NVTA to contribute to a more seamless travel experience for the community, through technology.
iv. How could the TTSP be used? Two examples of how the TTSP could be used to evaluate technologies as they enter the region were provided. The technologies used in these examples - electric and autonomous shuttles and electric and autonomous personal vehicles - were selected because they are widely familiar and closely related to one another, but with some key distinctions, and thus demonstrate the ability of the TTSP to address nuance.
v. How does the fit with NVTA's primary objectives and responsibilities? The TTSP was designed to complement and synergize with NVTA's primary objectives and responsibilities, and this close relationship was evident in the possible outcomes of the TTSP Action Plan, which include:
    1. Informing TransAction scenario (sensitivity) analysis
    2. Informing/expanding upon ongoing outreach and education efforts
    3. Identification of potential additions to NVTA's legislative program
    4. Identification of potential refinements to future NVTA Six Year Program selection process (post-TransAction update)
    5. Informing the development of future TransAction project list(s)
    6. Development of white papers for future regional transportation policy

- Chairman Snyder suggested that the full draft TTSP document be sent to the Authority in advance of their upcoming meeting. Mayor Rishell agreed and made a motion to this effect, which passed unanimously.
- Dr. Dick Mudge moved to recommend the Authority adopt the eight strategies that comprise the TTSP. Mayor Rishell seconded this and it passed unanimously.
- Mayor Rishell moved to recommend the Authority adopt the TTSP Action Plan. Dr. Dick Mudge seconded this and it passed unanimously.
- After the Committee action was concluded, the members expressed gratitude to each other and NVTA staff on the work that has gone into the TTSP thus far.
    i. Mrs. Monica Backmon thanked the committee members for their contributions to this effort and noted that NVTA staff would likely seek action from the Authority in their May meeting.
    ii. Hairi Sripathi asked if VDOT could adopt or share TTSP materials, not only within VDOT, but also with other MPOs and agencies across the state, saying it was good work done in a cohesive and comprehensive manner. Mrs. Backmon thanked him and approved.

V. **NVTA Updates**

No additional updates were provided.

Adjournment

The meeting adjourned at approximately 9:45 am.

Falls Church Smart Communities

Northern Virginia Transportation Authority
Transportation Technology Committee Meeting

VIRGINIA TECH TRANSPORTATION INSTITUTE

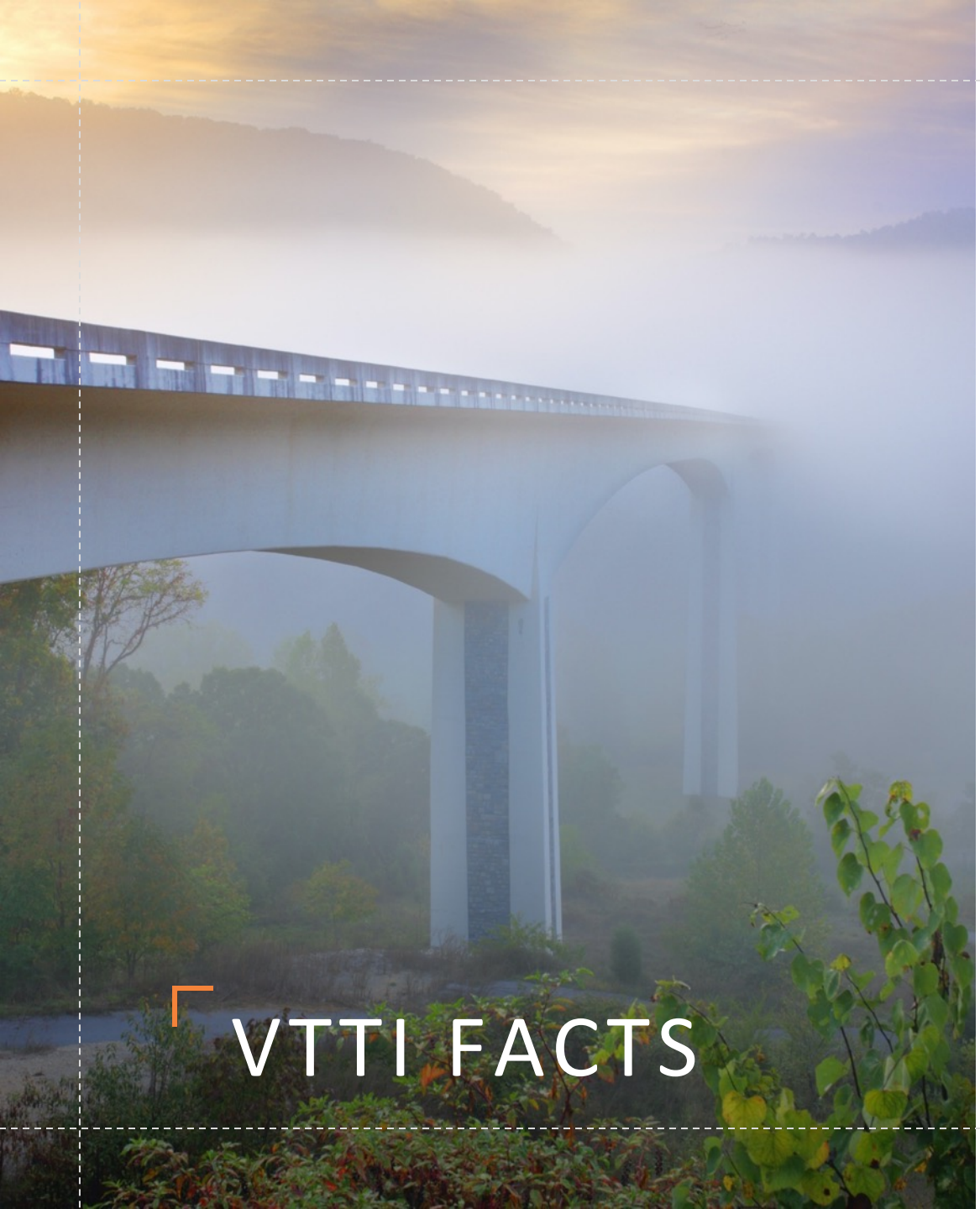
OCTOBER 21, 2021

VIRGINIA TECH TRANSPORTATION INSTITUTE

Background

ABOUT US

The Virginia Tech Transportation Institute (VTTI) conducts research to save lives, time, money, and protect the environment.

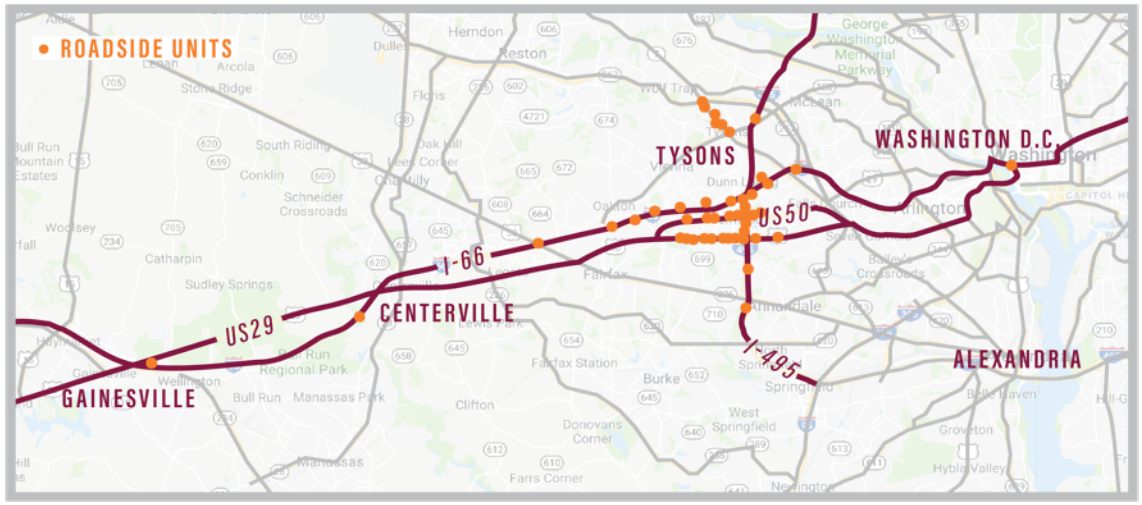


VTTI FACTS

- Top three transportation institute globally
- Largest group of driving safety researchers worldwide
- Pioneers of the naturalistic driving study research method (70M miles of data, 4,000 instrumented vehicles)
- 300 active projects and collaborations with more than 100 sponsors across the private and public sectors
- $46M annual sponsored program research expenditures (pre-pandemic)
- Over $60M in externally-sponsored awards in FY20/Q1 of FY 21
- 500 employed or partnering with VTTI, including graduate and undergraduate students
- ~12-15% of the Virginia Tech SPRE Portfolio
- Infrastructure worth more than $150M

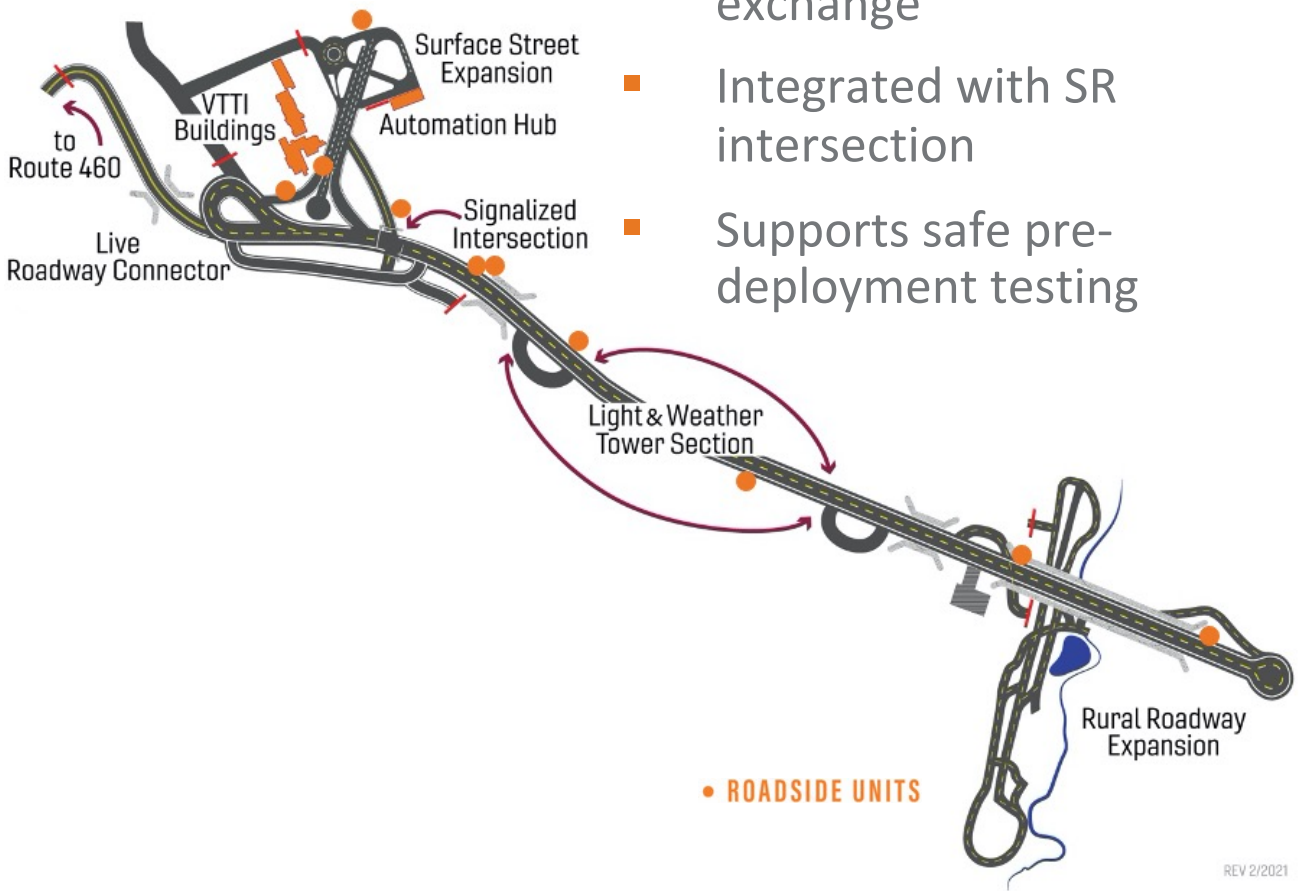
VTTI FACILITIES

VTTI's Virginia Connected Corridor Living Lab



Virginia Smart Roads

- 8 DSRC and 4 C-V2X / 5G RSUs
- Integrated with VCC data exchange
- Integrated with SR intersection
- Supports safe pre-deployment testing



Northern Virginia Testbed

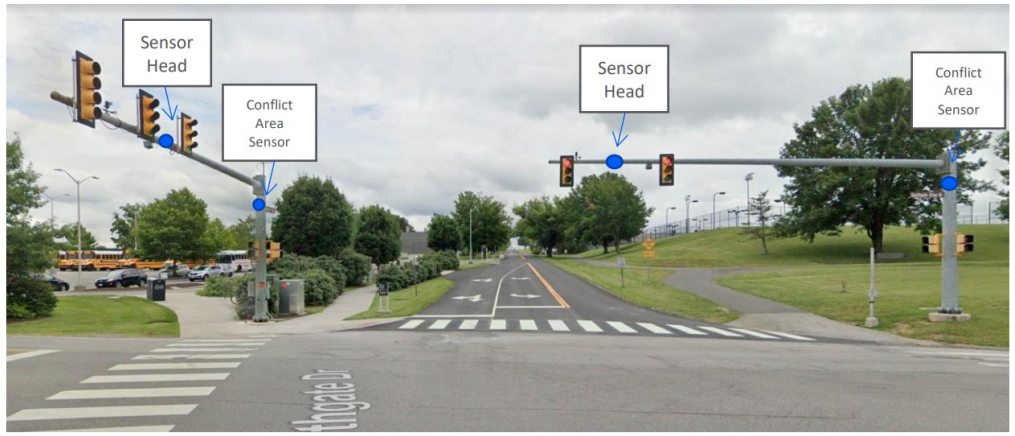
- 38 DSRC and 11 C-V2X / 5G RSUs
- Live operational environment
- Integrated into 30 intersections
- Supports on-road application testing and evaluation

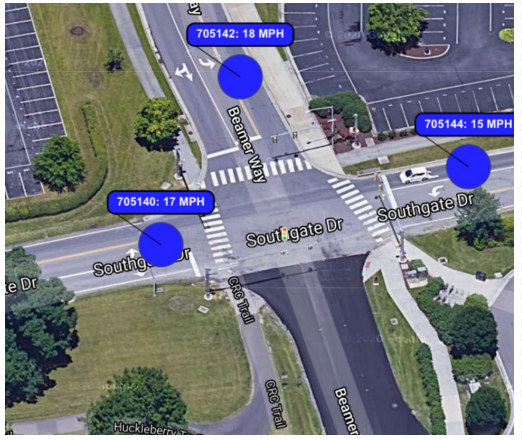
Smart Intersection Evaluation

Sponsor: Virginia DOT

Focus:

- Deploy smart intersection technologies on test track and in live operations
- Evaluate data quality, reliability, accuracy, latency
- Assess application requirements and align to available solutions
- Make recommendations for future deployments





Smart Adaptive Lighting

Sponsor: FHWA, Department of Energy, Virginia DOT

Impact:

- Developing approaches to lighting where lighting is dimmed or turned off when it is not needed
- Balancing the positive effects of lighting (safety/comfort) against the potential negative effects (health, environment, energy usage)
- Technology and standard development

Safety Monitoring of the Relay Low-Speed Automated Vehicle Deployment

Sponsor: VTRC / Fairfax County

Impact: Safety monitoring of SAE Level 4 shuttle in Fairfax County, VA.

- Providing traffic signal information to shuttle to support safe intersection operations
- Operations in mixed traffic on an urban circulator route (most complex route to date)
- 360-degree video with near real time evaluation
- First of its kind data reduction protocol to assess impact on direct and indirect traffic conflicts
- Facilitating NHTSA disengagement reporting requirements

eScooter Research Project

- Collaboration between Spin, Ford, and VTTI
- Co-funded by Spin and VTTI's Safe-D UTC Program
- Exclusive operation for one year with 200+ eScooters
- VTTI manages the research aspects of the program
- Goal: Assess impact of eScooter deployment on campus and provide data for policymaking
- Multiple safety issues identified and countermeasures deployed
- Overall – well received and safer than average deployment

Consortia Facilitation Examples

Automated Mobility Partnership
OEM's that fund and collaboratively solve challenging pre-competitive ADS issues through member-directed research program

Automated Truck Mounted Attenuator
Work zone safety stakeholders that co-funded the development of an automated TMA truck leading to a commercializable technology package

eScooter Research at Virginia Tech
Administrators, local government, public safety, risk management, and mobility researchers study deployment of scooters on VT's campus

National Surface Transportation Safety Center for Excellence
Program funded by GM, FMCSA, NSC, VDOT, VTTI, and insurance companies to develop and disseminate advanced transportation safety techniques and innovations in both rural and urban communities

Relay Safety Monitoring
A group of transportation stakeholders working together to address policy, legal, technology, safety, and mobility related challenges to develop an electric AV transit service on public roads

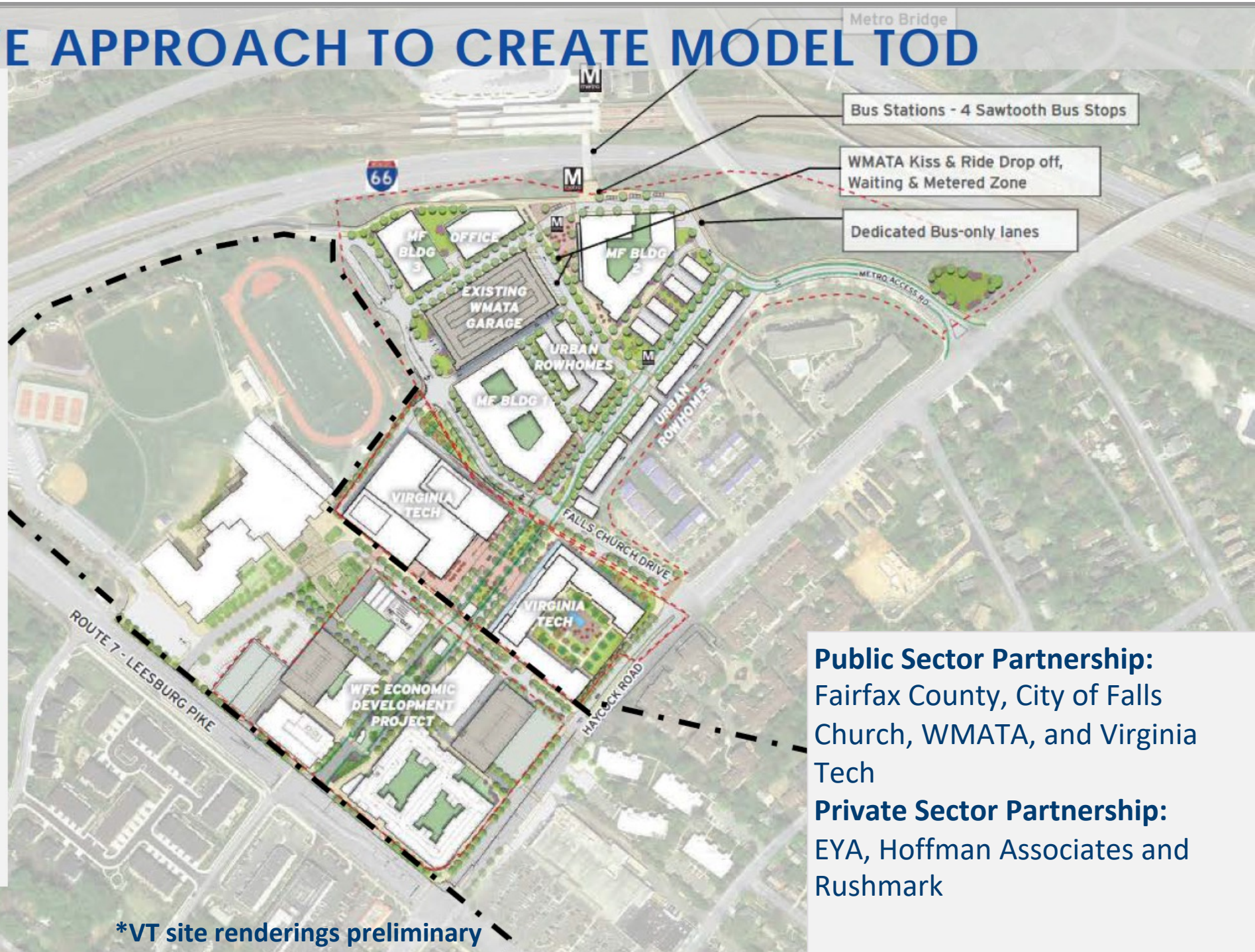
Falls Church Smart Cities

- VTTI to lead stakeholders in Smart Cities technology implementation in West Falls Church revitalization project
- Establish a sustained “living lab” environment
- $2M allocated to support road construction
- $8M allocated to select and deploy applications
- Public sector partners:
  - Virginia Tech
  - City of Falls Church
  - Fairfax County
  - WMATA
  - VDOT/VTRC

COLLABORATIVE APPROACH TO CREATE MODEL TOD

PROJECT BENEFITS:

- **40 Acre** Model TOD
- **$1.2 Billion** of investment
- **3 Million SF** of Development
- **Significant Tax Benefit** to the City, State and County
- Anchors:
  - 200K SF of Retail
  - Virginia Tech
  - 125K SF MOB
- Approximately 8,000 linear feet of **new and upgraded roads** to relieve regional traffic congestion
- 24 Acres of **open space** and 6 acres of parks
- 10% affordable housing relative to 8% elsewhere in Fairfax (Approx. 140 units).



*VT site renderings preliminary

Public Sector Partnership:
Fairfax County, City of Falls Church, WMATA, and Virginia Tech

Private Sector Partnership:
EYA, Hoffman Associates and Rushmark


The LANE
COMMONS CREAMERY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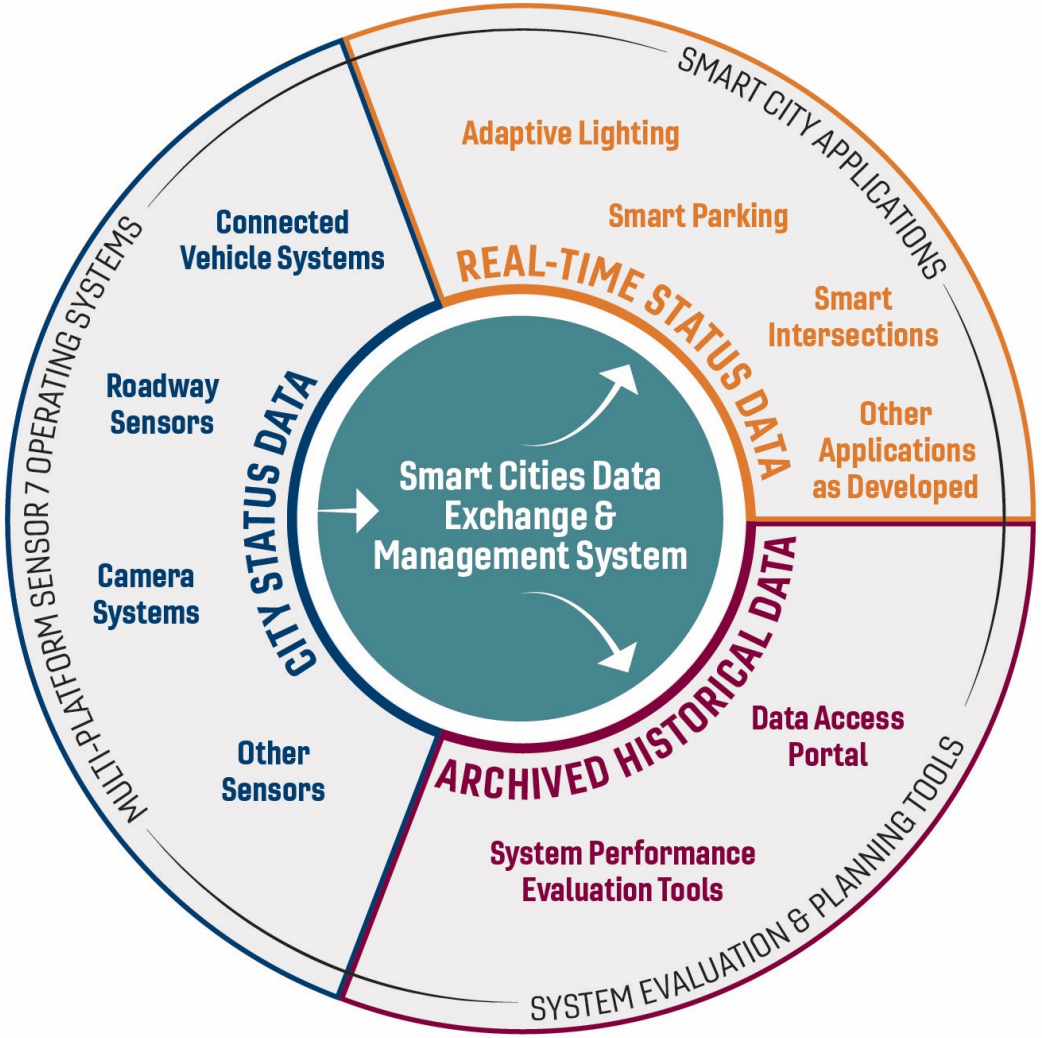
After a decade of trial and error, municipal leaders are realizing that smart-city strategies start with people, not technology. "Smartness" is not just about installing digital interfaces in traditional infrastructure or streamlining city operations. It is also about using technology and data purposefully to make better decisions and deliver a better quality of life.

McKinsey and Company. "Smart cities: Digital solutions for a more livable future", June 5, 2018



VIRGINIA TECH TRANSPORTATION INSTITUTE

Proposed Smart Cities Applications

Smart Cities Data Exchange and Management System ($2M)

- Real-time and archive data integrated from all city resources to support application of algorithm an AI For active and planning and decision making. This system is the basis of all Smart City applications.

Adaptive Lighting ($2M)

- An adaptive lighting system reduces energy consumption and the potential negative aspects of lighting such as an impact on sleep, safety, crime, and the environment.

Smart Parking and Payment ($1M)

- Provides information on the availability of parking spaces while reducing the need to hunt and seek for parking options. Information can be provided through signage and/or connected applications. Also provides a convenient payment while ensuring compliance.

Proposed Smart Cities Applications (cont'd)

Smart Intersections ($1M)

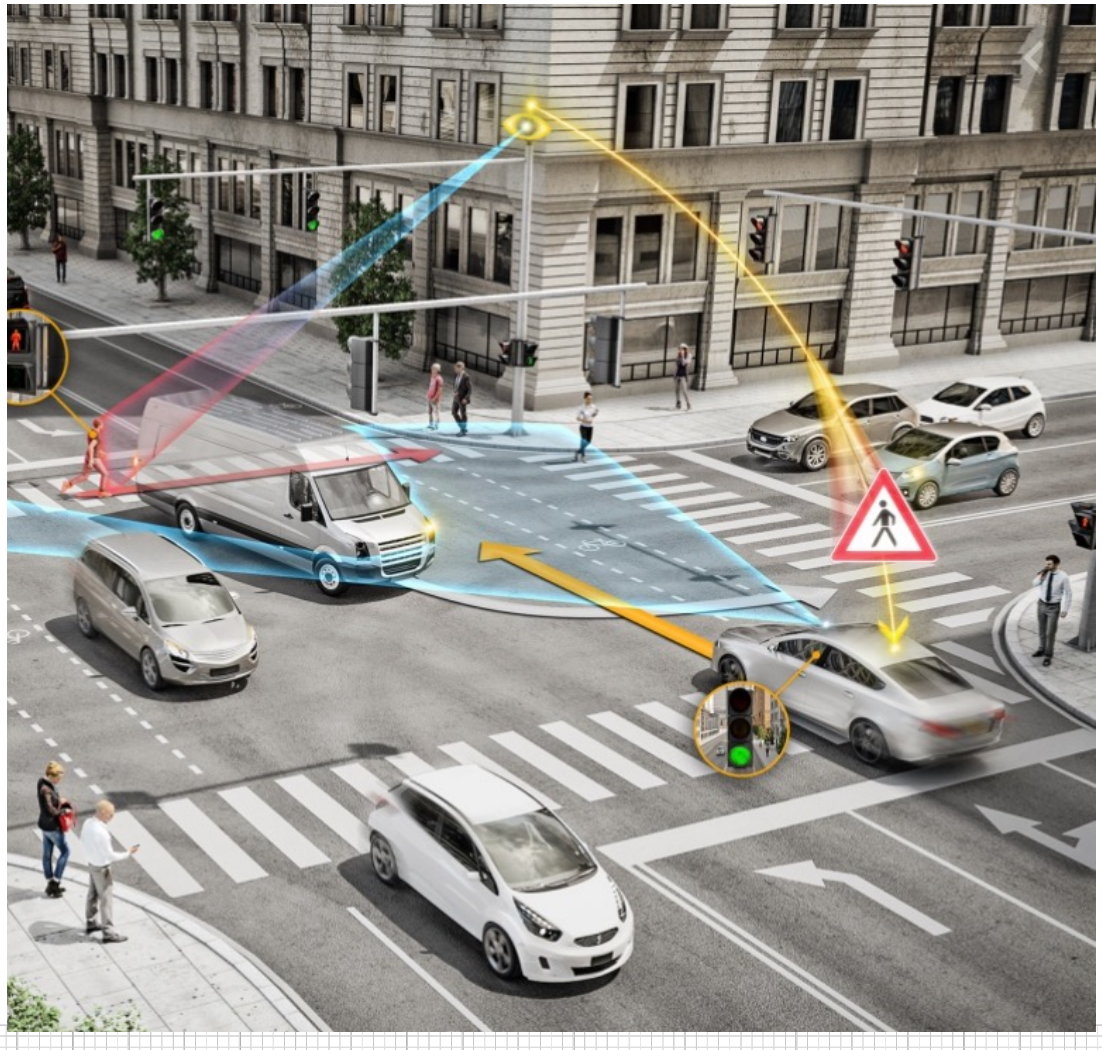
- Sensors provide presence of vehicle and pedestrians to adjust signal behavior, optimizing vehicle flow to reduce potential for delays and vehicle stoppage. Data about the signal behavior can also be provided to an automated or connected vehicle to allow for safety warnings, conflict detection, and vehicle speed optimization.

Data Access & Evaluation Tools ($2M)

- Provides historical and longitudinal data to allow informed and efficient placement, maintenance, and purchase of city resources. This is the analysis and audit system of the Smart City applications which will also provide data for expansion.

Roadway & Infrastructure Development ($2M)

- Build roadway and coordinate sensors with infrastructure (for example, type of roadway and/or building materials to avoid impacting sensor signals) to adequately house and protect the sensors.



Other Smart Cities Applications of Interest

Automated Shuttle and/or Package Delivery

- A variety of platforms and pilot services are becoming available. We'd could assess the local transport and delivery needs to identify and test the best option. On-demand, microtransit and how it interfaces with traditional transit to provide more convenience using less energy, etc.

Smart Waste Management

- Trash cans can be outfitted with sensors and compactors allowing for on-demand servicing. These programs have been shown to reduce garbage truck trips by more than 80% in pilot deployments.

Unique Embedded Sensing Systems

- Fiber sensing for temperature, sound, strain can provide information about road freezing, traffic flow, fires, crowds, etc.

Key Elements to Success

Technology Base

- A wide variety of sensors deployed with high speed, high bandwidth connectivity feeding their data to a common storage and compute system. A large number of users with access driven by ubiquitous connectivity.

Applications

- Applications that can tap into a wide variety of data sources and take unique approaches to solving life's challenges. Mobility, health, security, waste management, air quality, safety. Applications must connect users to their communities and community leaders.

User Engagement

- Engagement and adoption by a wide range of connected, motivated users fuels the fire of success. Ideation, context, and feedback are key elements of the process.

Current Program Status

Pre-award Kickoff held at VTTI in Blacksburg July ‘21

- Established governance structure and initial working groups
- Group charters and meeting invites to distributed post award

Latest Information – Planning Project

- Initial 4 mo Planning Project between VTTI and VTRC expected award October 15, 2021
- Collaborative effort led by VTTI to develop a Phase 1 project plan
  - Establish Steering Committee, Working Groups, and Key Subgroups
  - Determine immediate needs and priorities
  - Propose a community engagement plan

Phase 1 Project

- TBD, expected beginning Q2 ‘22

Questions?

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Transportation Technology Strategic Plan (TTSP): Implementation Update

October 27th, 2021

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 eight strategies and Action Plans of the TTSP
	May	• The Authority adopted the inaugural NVTA Transportation Technology Strategic Plan's Action Plan and Eight 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

TTSP Deliverables in the First Six Months

- Introduction of a technology-related section to NVTA's annual Legislative Program (pending Authority action)
- Outreach activities, including via TransAction
- Whitepaper on Emissions
- Evaluations of two emerging technologies
  - Autonomous and Electric Shuttles
  - Personal Autonomous Vehicles
- Transportation Policy Template
- Minor updates to the TTSP, including the addition of a technology timeline

TTSP in the Legislative Program

- Each year, the Authority develops a legislative program to communicate to the Virginia General Assembly. This helps us convey our **priorities** and advocate for things that **support NVTA's objectives and core values**.
  - NVTA's Legislative Liaison has been drafting a program that is **under review by the Governance and Personnel Committee**. The Authority will have their first official review of the draft program in November, with a second review and **Authority action anticipated in December**.

- The role of technology in transportation is becoming more and more significant, and this have policy and budget implications. For this reason, a **new TTSP-related section has been proposed for addition to the NVTA legislative program**.
  - Each year the focus of this section could be updated. All topics would be derived from/supported by the TTSP.
  - This year the proposed focuses are: **electric vehicles**, and **support for continued funding of pilot programs and research initiatives** throughout the Commonwealth.

Whitepaper on Emissions

- In the US, there was a **48% increase in VMT** between 1990 and 2019
  - Transportation accounts for 29% of emissions, nationwide
    - Light-duty vehicles contributed 58% of that
- In Virginia, transportation accounts for 32.3% of energy consumption, but **48.6% of emissions**
  - Virginia generated the 11th most VMT of any state in 2019
- In general, all types of EVs generate less emissions than conventional vehicles
  - The **composition of sources** used in the energy grid used to charge them has a significant impact
  - In Virginia, the most consumed energy source is Natural Gas (33.9%), and coal accounts for 4% of consumption

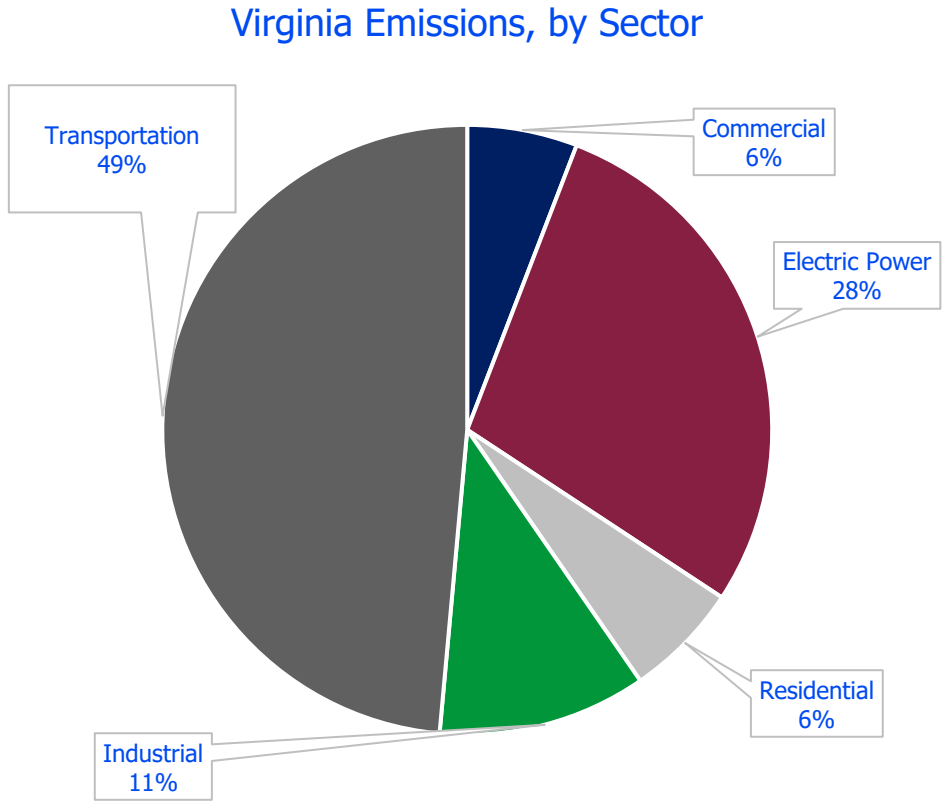


Chart data from the U.S. Energy Information Administration: https://www.eia.gov/environment/emissions/state/

Evaluation of Emerging Technology: AV, EV Shuttles

Rating	Topic	Reasoning
(Green)	Relevance to NVTA Responsibilities	• The prevailing edition of **TransAction** recognized the importance ad timeliness of planning for innovation, which lead to creation of the Transportation Technology Committee that was charged with development of the TTSP. In the ongoing update of TransAction, the TTSP is being used to inform scenario modeling; outreach and education efforts and; the development of the top-down project list. • Electric and autonomous shuttles could contribute to **congestion reduction** by providing a FLM solution and thus encouraging use of mass transit. They can also be used independently and in this way, reduce short vehicular trips. • Electric and autonomous shuttles have the potential to be very **efficient in terms of time and energy usage in moving people**. However, the initial capital costs of these systems may be high and it is critical to make equity a central tenet in developing and pricing or incentive schemas, to avoid systemic exclusion of any group.
(Green)	Vision Statement	This type of shuttle has the potential to provide a safe FLM connection when integrated with transit. This would encourage use of sustainable mass transportation, and contribute to an equitable system through improved access.
(Green)	Equity	EV, AV shuttles can improve low-cost and equitable access to transportation and contribute to independent mobility for persons with disabilities, the elderly and children. Additionally, these can help reduce emissions and future environmental degradation, both of which tend to impact disadvantaged communities more deeply. Both of these types of benefits can be achieved independently or in synergy with mass transit.
(Green)	Sustainability	EV, AV shuttles can contribute to a reduction in emissions in three key ways: alleviating congestion by reducing the number of vehicles on a road; increasing overall throughput for a given facility, which may reduce idling and associated pollution and; by generating little to no tail pipe emissions (depending on if the shuttle is an Electric Vehicle or a Plug-In Hybrid Electric Vehicles or PHEVs). However, it is critical to consider the source of electricity used in their charging stations to ascertain their full environmental impacts.
(Yellow)	Safety	EV, AV shuttles reduce the number of fallible human drivers on a road and contribute to optimization of travel flow. Together these factors create the potential to reduce crashes and secondary crashes. There is also the potential for AVs to automate maintenance monitoring and scheduling and thus reduce incidents that may result from component failure. However, the potential impacts of these benefits is still a subject of debate, and the technology that underpins them still faces developmental hurdles.

Evaluation of Emerging Technology: Personal AV EVs

Rating	Topic	Reasoning
 *(Yellow)*	Relevance to NVTA Responsibilities	• The prevailing edition of **TransAction** recognized the importance ad timeliness of planning for innovation, which lead to creation of the Transportation Technology Committee that was charged with development of the TTSP. In the ongoing update of TransAction, the TTSP is being used to inform scenario modeling; outreach and education efforts and; the development of the top-down project list. • AVs could contribute to **congestion reduction** by increasing carrying capacity of infrastructure and throughput of intersections through platooning. If they are shared (SAVs), there are additional opportunities to reduce congestion. However, if AVs are not shared, the convenience of travel could facilitate sprawl. • AVs have the potential to **move people efficiently**, due to their ability to communicate and optimize travel through approaches like platooning. However, private ownership of AVs may increase sprawl and create exclusionary benefits. Encouraging shared use (either for share access or shared rides, through SAVs) could address both of these potential concerns and create net positive impacts on the transportation system.
 *(Yellow)*	Vision Statement	AVs have the potential to improve the functioning of the transportation system and increase safety in Northern Virginia. Encouraging shared use (SAVs) in terms of either share access or shared rides could facilitate equitable access to this technology, help mitigate potential negative travel behavior changes and facilitate achieving the potential congestion reduction and environmental benefits of this technology.
 *(Red)*	Equity	AVs will likely be expensive to purchase, with prices high enough to exclude many from the market. Further private AVs may facilitate longer commutes and thus sprawl. However, SAVs may mitigate these concerns but it will be important to promote universal design and to encourage equitable access.
 *(Green)*	Sustainability	The environmental benefits of AVs achieved through efficiency and optimization are projected to increase as the percentage of the vehicular fleet comprised of AVs increases. These benefits could be further amplified through shared use and the fact that it is likely AVs will be powered by electricity.
 *(Yellow)*	Safety	Autonomous driving means that vehicles will no longer be reliant on fallible human drivers. This alone may yield a substantial reduction in crashes, however, the programming of AV priorities will be a key factor in maximizing safety benefits.

Updates to the TTSP

- Addition of a technology timeline
- Tweaks and updates to referenced projects

- **Discussion point:** should an additional strategy(s) be added to the TTSP? Current candidates include:
  - Autonomous Vehicles
  - Freight
  - Personal Delivery Devices (Sidewalk robots)

Year	NVTA History	Technology Milestones	
		Event	Description
2002	NVTA created by the General Assembly. Learn more here.		
2003		MySpace is launched	Learn more here.
2004		First DARPA Grand Challenge	The Defense Advanced Research Projects Agency (DARPA) issued the challenge to create a vehicle that could autonomously navigate a 142 mile course through the desert. This event is largely credited as the impetus for serious pursuit of Autonomous Vehicle technology. No vehicle finished the inaugural race, and the $1 million prize went unclaimed. Learn more here.
		Facebook is launched	The site was originally open to Ivy league students only, but expanded to anyone over the age of 13 in 2006. Learn more here.
...			
2020		The Federal government granted its first driverless car exemption	The U.S. DOT granted the first exemption of the Federal Motor Vehicle Safety Standards, for an autonomous, low-speed delivery vehicle. The exemption allows the manufacturer to produce a vehicle without rearview mirrors, a windshield, steering wheel or pedals. Due to the novelty of this design, the manufacturer will be required to conduct outreach to communities in which the vehicles are deployed, submit regular reports, and will be subject to greater-than-typical review from the National Highway Traffic Safety Administration (NHTSA). Learn more here.
		Amazon ordered 100,000 electric delivery vehicles	The purchase was made to help Amazon achieve its Climate Pledge and aim to have zero net carbon by 2040. Learn more here.
		Virgin Hyperloop completes first manned pilot test	Learn more here.
		Virginia's first on-street autonomous transit shuttle pilot begins in Mosaic District, Fairfax County	"This pilot project is a partnership between Fairfax County, Dominion Energy, EDENS (Mosaic), The Virginia Department of Rail and Public Transportation (DRPT) Virginia Department of Transportation (VDOT), Virginia Tech Transportation Institute (VTTI) and George Mason University (GMU). " Learn more here.
		Launch of iPhone 12	Learn more here.
2021	On May 13, 2021, the Authority adopted the inaugural NVTA Transportation Technology Strategic Plan's Action Plan and Eight Strategies within, that focus on mobility, accessibility, and resilience, while embracing the core values of safety, equity and sustainability. Learn more here.	Biden pushes for electric vehicles to make up half of U.S. auto sales by 2030	President Joe Bien recently issued an executive order, setting a new national target for Electric Vehicles (EVs) to comprise half of all new auto sales in the United States by 2030. Although the target is not binding, several large auto manufacturers, including General Motors, Ford Motors and Stellantis, are supportive of the concept and have set their own goals for electrification of their product lines. The timing of this announcement coincided with a separate Executive Order that directed a review and possible revision of fuel economy standards. Learn more here.
		New York requires all passenger vehicles sold in state to be emission-free by 2035.	"The law will make New York the second state after California to phase out greenhouse gas emissions in cars and light trucks. It also aims to eliminate emissions from medium- and heavy-duty vehicles by 2045, and requires the creation of a detailed plan for zero-emissions vehicle development by 2023." Learn more here.

Next Steps

- Additional Transportation technology evaluation ratings, as appropriate
- TransAction
  - Integration of technology-related strategies into the TransAction scenario analysis work
  - Public engagement under the TransAction umbrella
  - Incorporation of eligibility or scoring criteria that consider the goals of the TTSP
- 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
  - Creation of a home for TTSP content on the NVTA website
- White Paper development
  - Collaborate on a process for development of future regional transportation policies, utilizing the template developed in the first six months of implementation
  - 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)
- Consider if any additional strategies should be added to the TTSP and its Action Plan

TransAction Survey

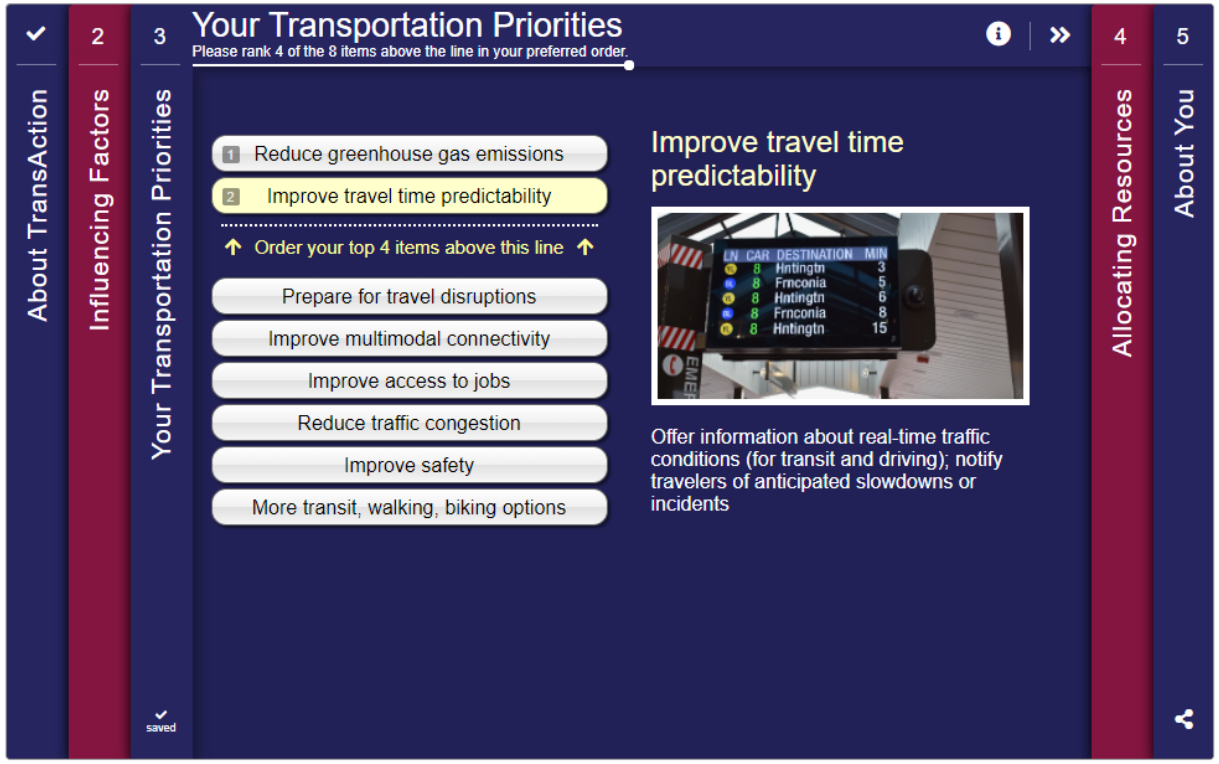
NVTA's TransAction

Transportation Action Plan for Northern Virginia

2021 TransAction Survey

- Purpose: to seek feedback on travel behaviors, transportation needs and priorities
- Format: MetroQuest platform utilizing interactive “gamified” exercises
- Available languages: English, Korean, and Spanish
- Dates: August 6th - September 19th
- Responses:
  - English: 2,164
  - Korean: 89
  - Spanish: 65*
  - TOTAL: 2,318

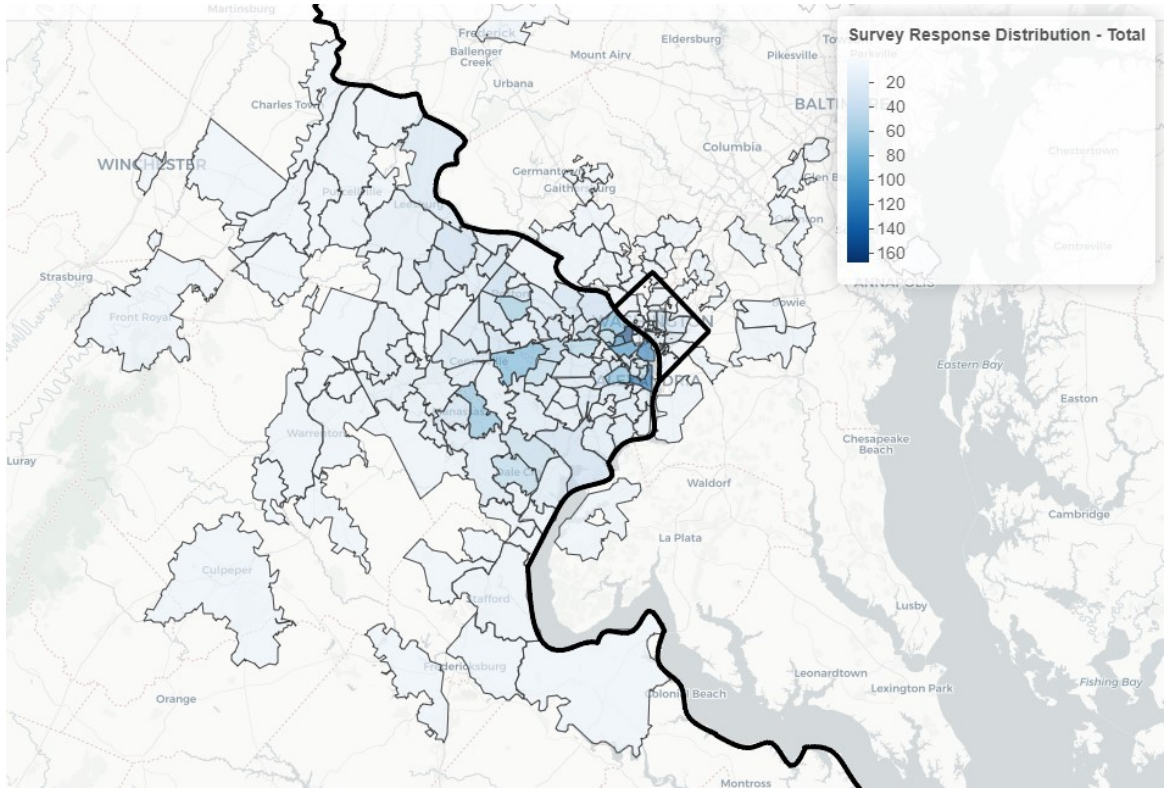
* At pop-up events, 123 Spanish speakers received assistance completing the survey in English



The survey did not apply a random sample recruitment method. Therefore, the sample does not statistically represent the population of the NVTA region.

About the Survey Respondents

- Roughly half of respondents from Arlington, Alexandria, and Falls Church
- 12% from households with less than 50k in annual income
- 31% identified as non-white or Hispanic/Latinx
- 19% were people 65 years or older



Map of Home Zip Codes of Survey Respondents

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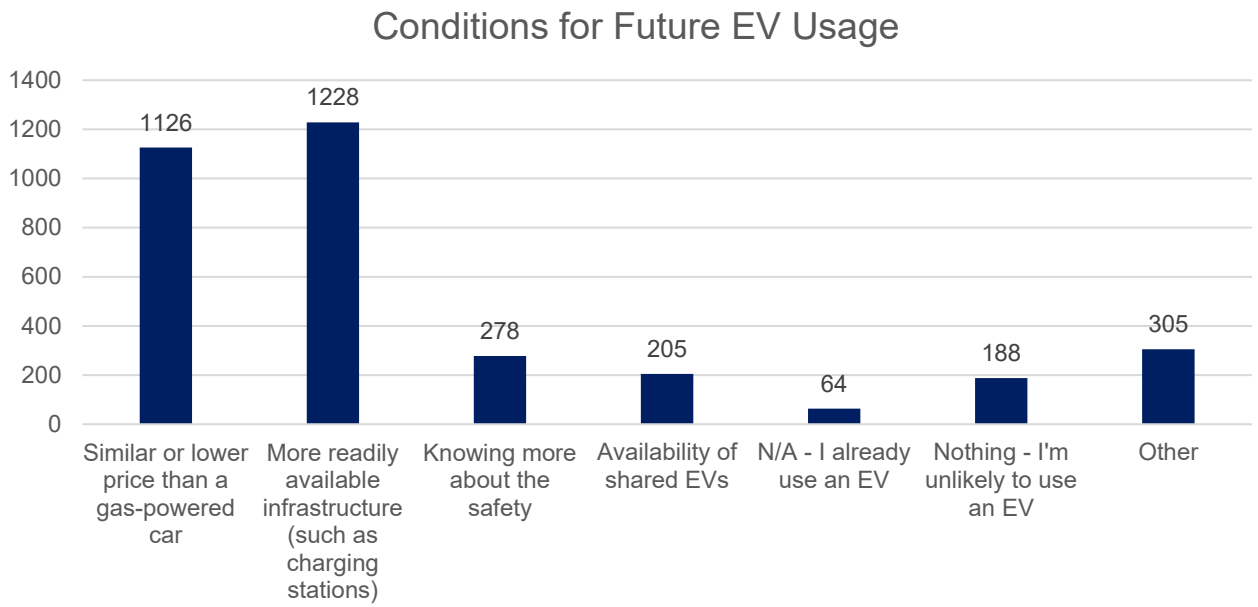
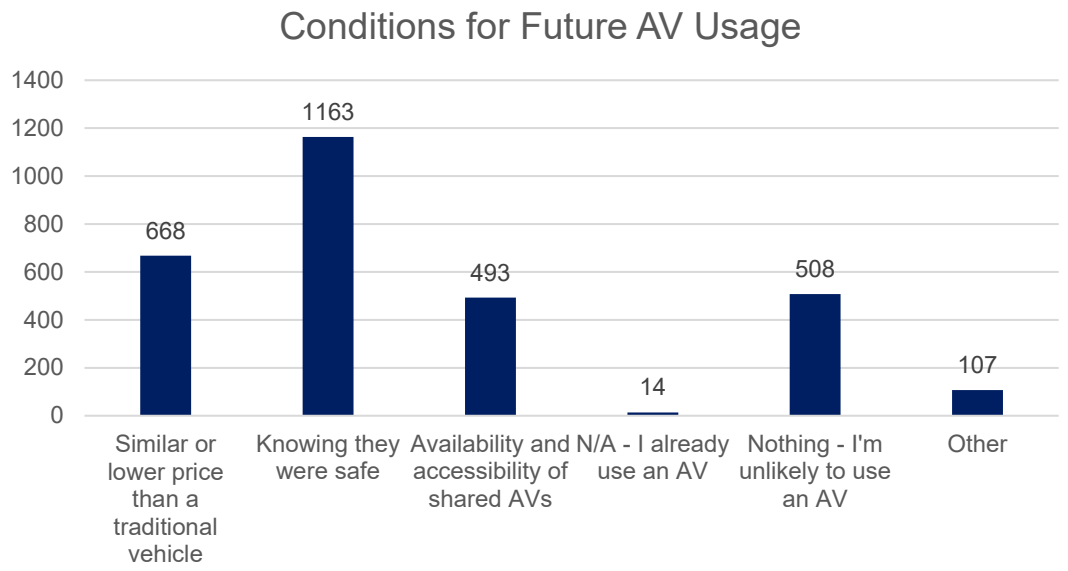
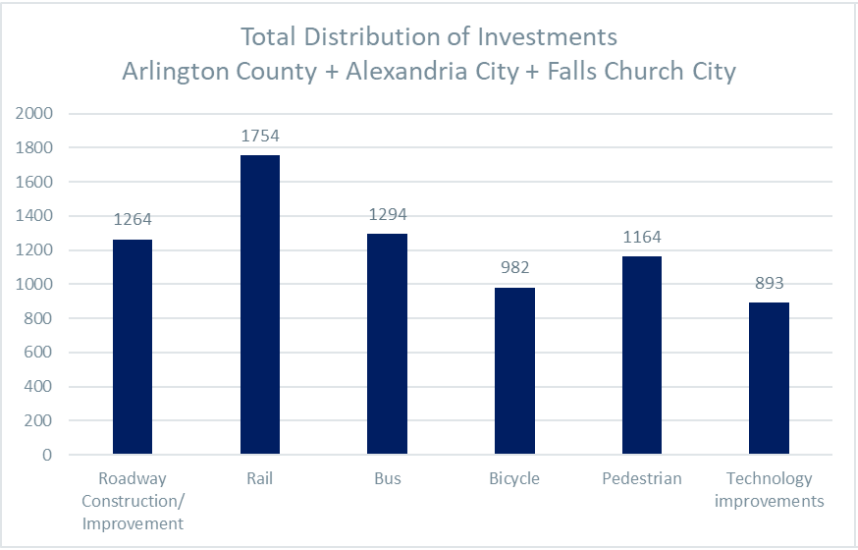
Survey Results – Emerging Technologies

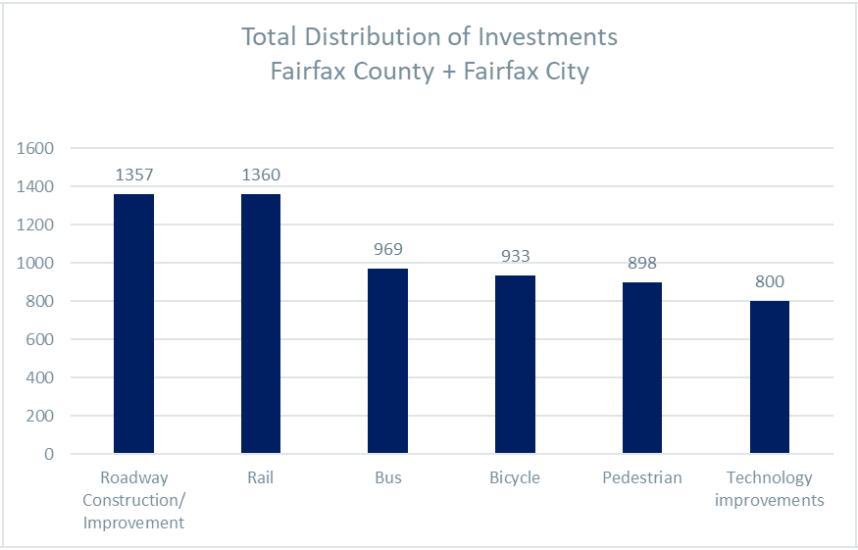


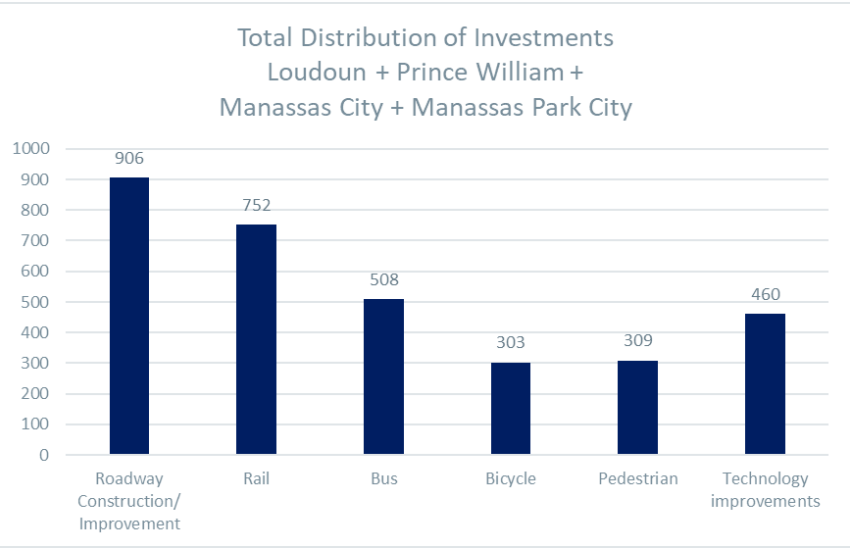


- More likely to consider using an EV once there is more readily available infrastructure (64%) and once the price is similar or lower than the price of a gasoline-powered car (58%)
- More likely to use an AV once they had confidence that AVs were safe (61%)

Survey Results – Allocating Resources







- Respondents were given 10 hypothetical coins, each representing $1 million, and asked to distribute them between six different project types
- Rail projects received the most investments (total “coins”), followed by roadway construction/improvement and bus

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Thank you!

Supplementary Slides

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
									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	●	◑			◑						

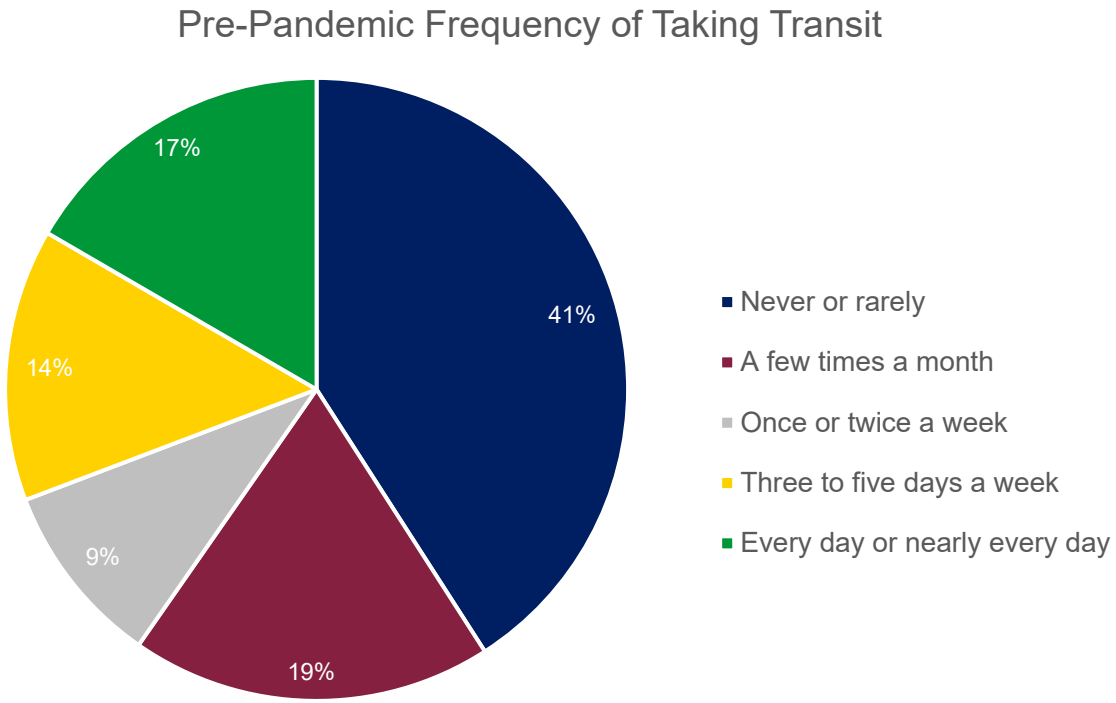
Encouraging Survey Participation

- Range of engagement activities used to “get the word out” about the survey
- Traceable links show where participants heard about the survey:

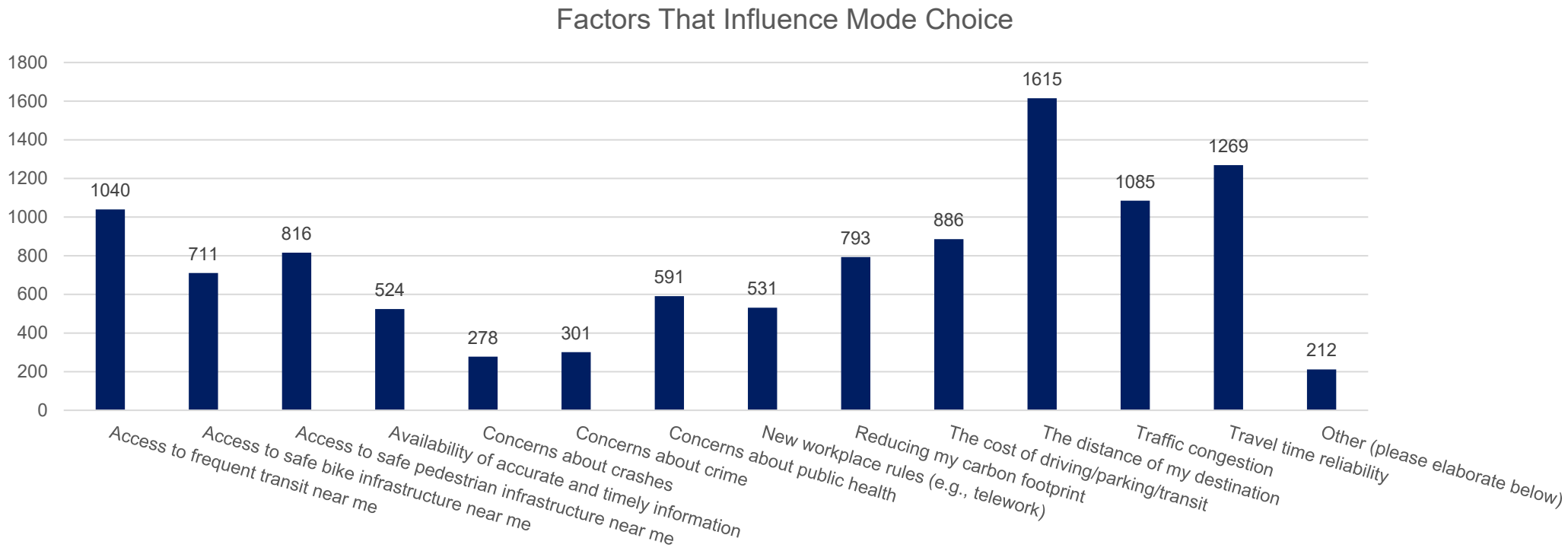
Source	Number of Responses
Website	691
Stakeholder outreach	405
Pop-up events	351
General (not traceable)	252
Paid social media	206
Newsletter	166
LinkedIn	92
Twitter	89
Facebook	65
Geofenced ads	1
Instagram	0

Survey Results – Travel Characteristics

- Pre-pandemic trips to work/school/other:
  - 31% used transit at least 3 days a week
  - 14% biked at least 3 days a week
  - 28% walked at least 3 days a week
- About a third of respondents anticipate changing their post-pandemic travel habits compared to pre-pandemic
  - 28% will reduce driving
  - 21% will reduce transit use
  - 8% will reduce biking
  - 6% will reduce walking

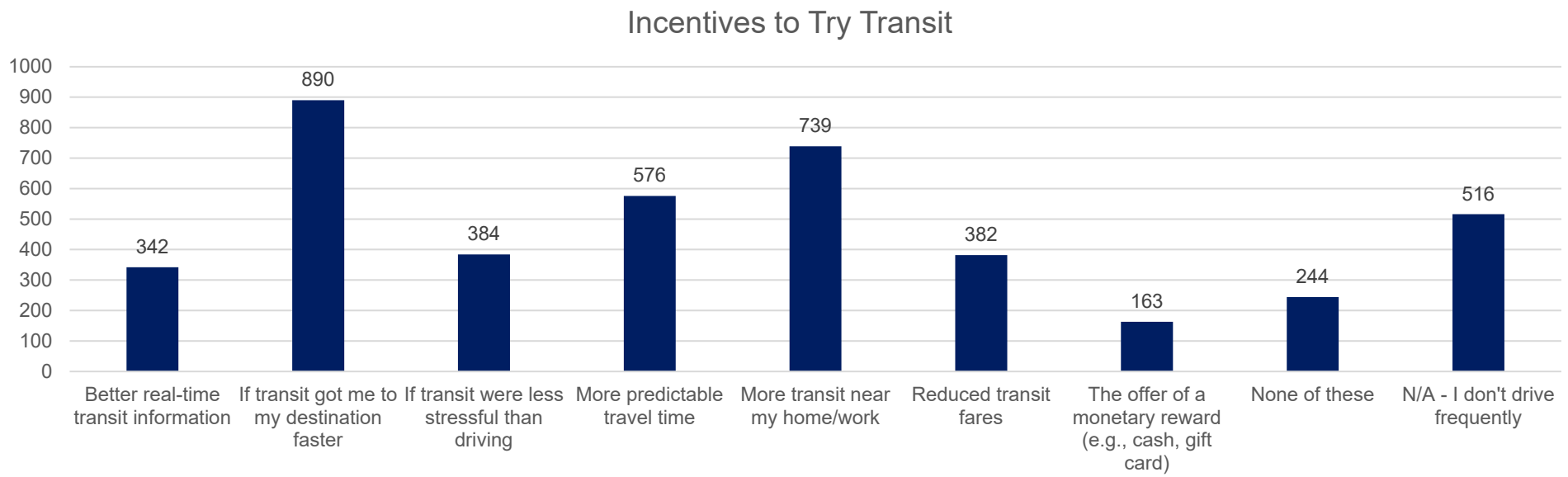


Survey Results – Influencing Factors



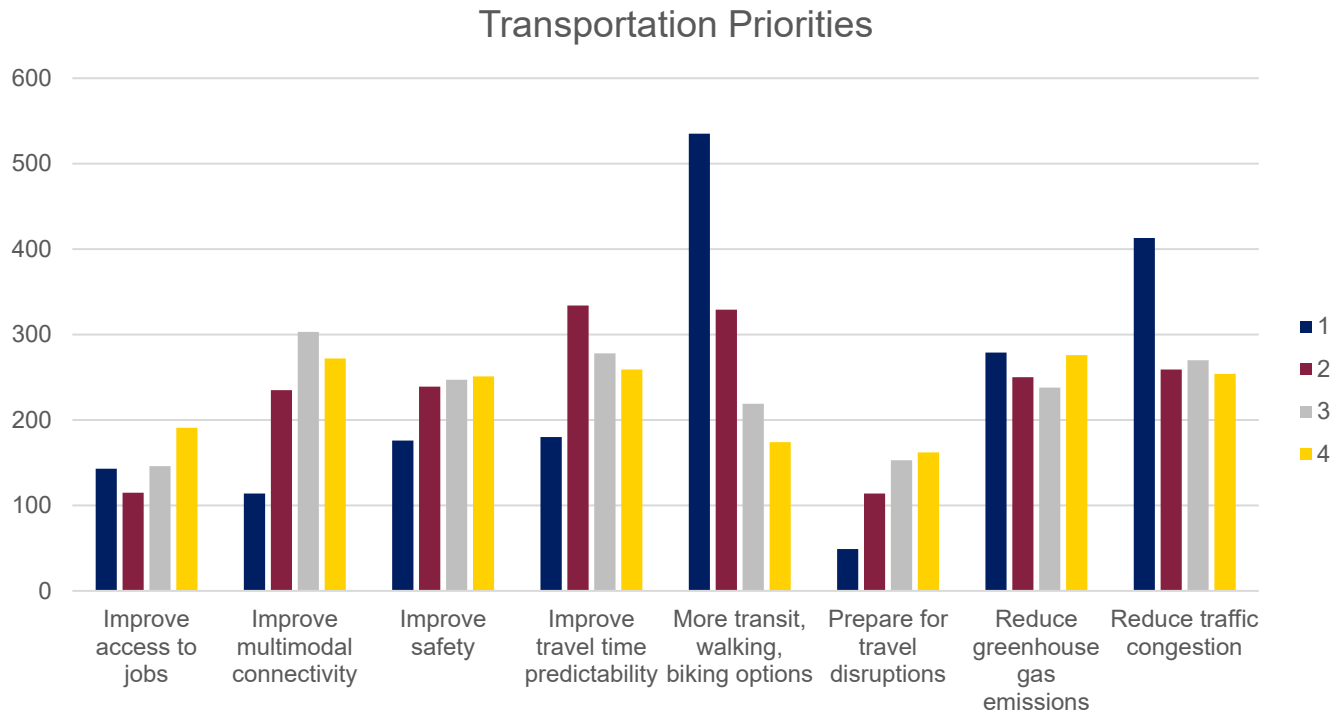
- Factors that will most affect mode choice: trip distance (76%), travel time reliability (60%), traffic congestion (51%), and access to frequent transit (49%)
- Factor least likely to affect mode choice: concerns about crashes (13%) and concerns about crime (14%).

Survey Results – Incentives to Use Transit



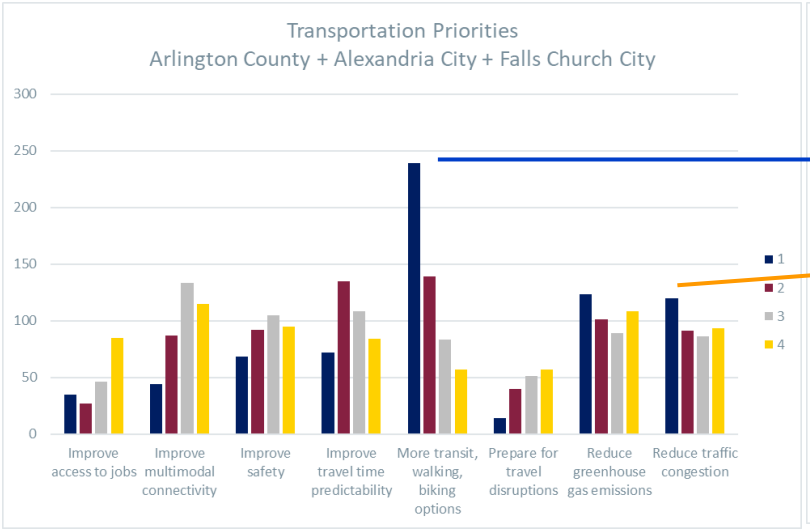
- Would be more likely to try transit if:
  - Got them to their destination faster (44%)
  - More transit near their home and/or work (36%)
  - More predictable travel time (28%)
- Only 12% of respondents reported they were not interested in trying transit

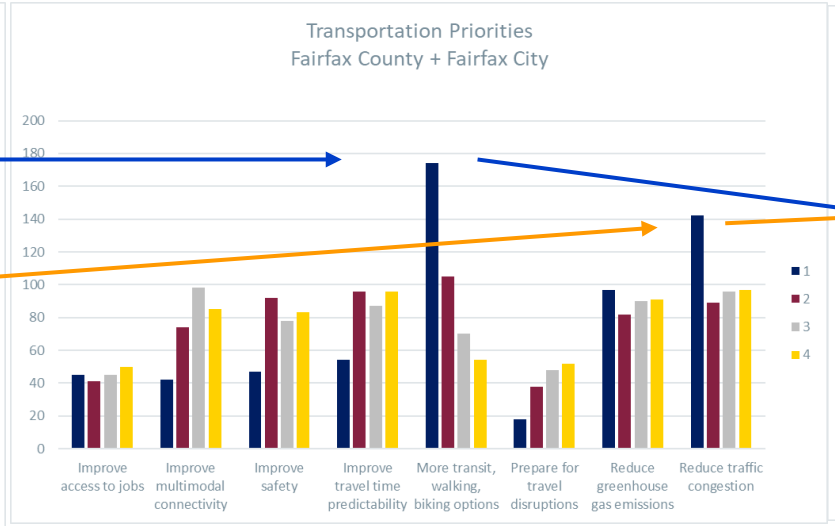
Survey Results – Transportation Priorities

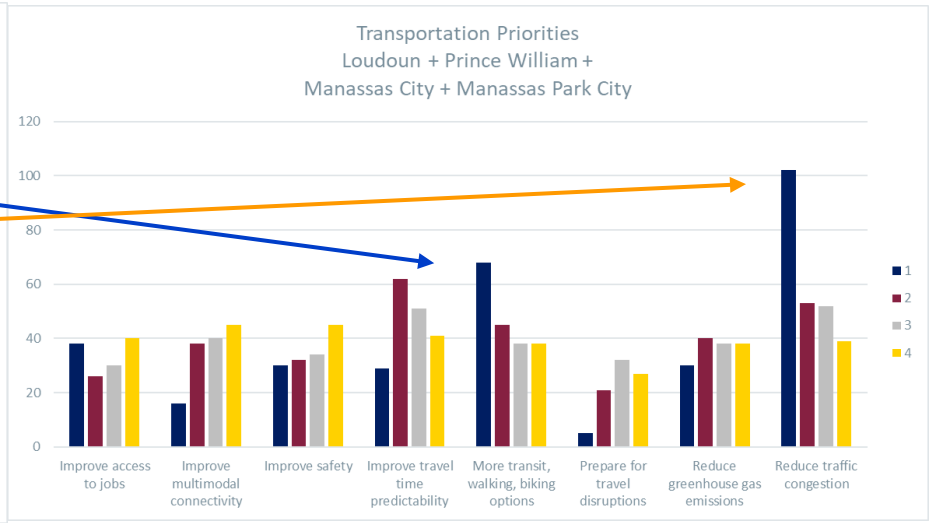


- Priority most frequently ranked 1st, was “more transit, walking, biking options”
- 2nd and 3rd most commonly selected priorities were “reduce traffic congestion” and “improve travel time predictability”

Survey Results – Transportation Priorities by Geographic Area







- Survey respondents from inner jurisdictions selected "more transit, walking, biking options" as the top priority
- Survey respondents from outer jurisdictions selected "reduce traffic congestion" as top priority
- Other objectives showed less variability between different geographic areas – "improve travel time reliability" was typically the 2nd ranked priority

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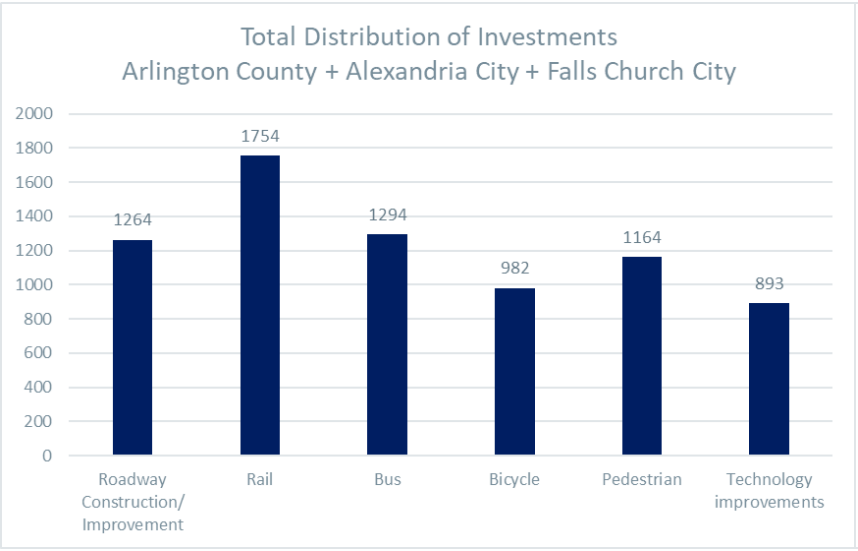
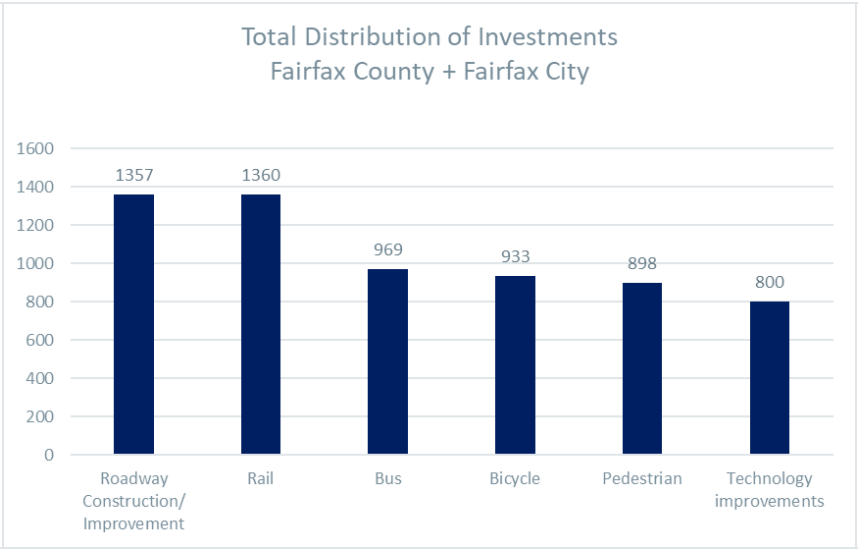
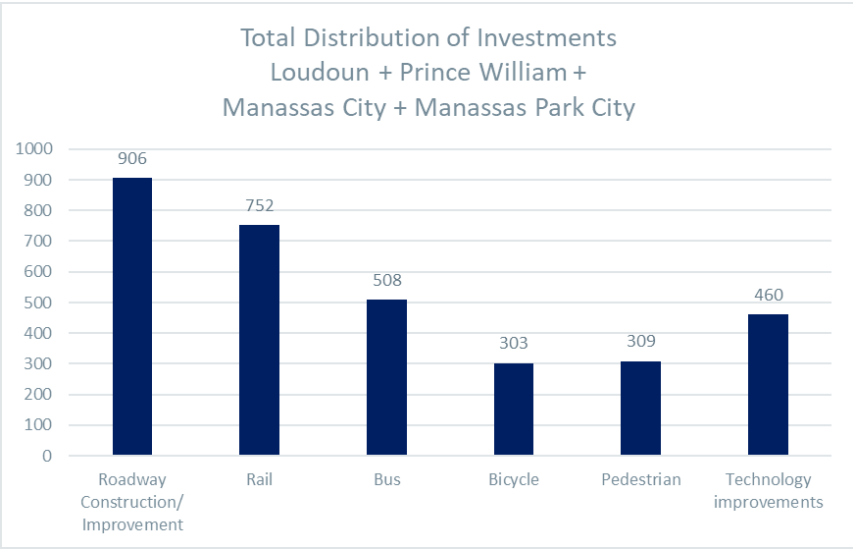
Survey Results – Transportation Priorities by Geographic Area







» Home location of respondents did influence selection of type of investments needed:

- Inner jurisdictions allocated resources to rail (1st) and bus (2nd), before roadway improvements (3rd)
- Fairfax County/City allocated resources about evenly between roadway and rail, then bus
- Outer jurisdictions allocated the most resources to roadway construction/improvement, followed by rail (2nd) and bus (3rd)

NVTA's TransAction