relay

Connected and Autonomous Vehicle Demonstration Project

Presentation to Transportation Advisory Commission
October 20, 2020

OVERVIEW

- Introduction to Relay
- Policy Framework
- Community Engagement – Creating a Coalition
- Relay Project Considerations and Lessons Learned
- Wrap Up


ELECTRIC AUTONOMOUS
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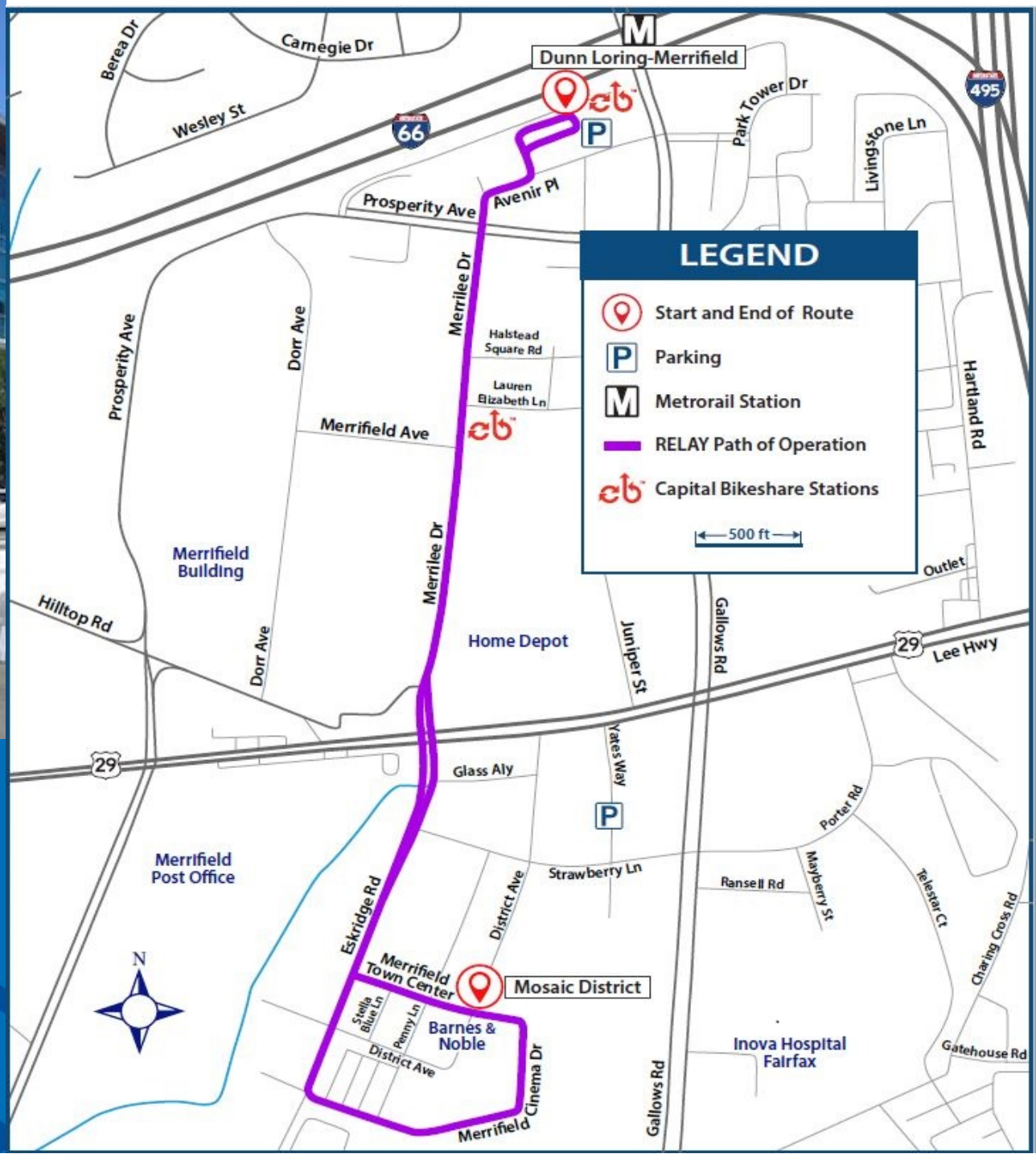

Dunn Loring-Merrifield
Berea Dr
Carnegie Dr
Wesley St
Park Tower Dr
Livingstone Ln
Prosperity Ave
Avenir Pl
Merrilee Dr
Halstead Square Rd
Lauren Elizabeth Ln
Dorr Ave
Merrifield Ave
Prosperity Ave
Hartland Rd
Merrifield Building
Hilltop Rd
Dorr Ave
Merrilee Dr
Home Depot
Juniper St
Gallows Rd
Outlet
Lee Hwy
Glass Aly
Yates Way
Porter Rd
Merrifield Post Office
Strawberry Ln
Ransell Rd
Mayberry St
Telestar Ct
Eskridge Rd
District Ave
Merrifield Town Center
Mosaic District
Stella Blue Ln
Penny Ln
Barnes & Noble
District Ave
Cinema Dr
Merrifield
Gallows Rd
Inova Hospital Fairfax
Charing Cross Rd
Gatehouse Rd
N
LEGEND
Start and End of Route
Parking
Metrorail Station
RELAY Path of Operation
Capital Bikeshare Stations
500 ft

Policy Framework

Economic Success Strategic Plan

Overarching Vision

"…No community has a preordained right to prosperity. Prosperity can only be achieved and sustained when a community's citizens, businesses and government work in concert for everyone's benefit…

…Our vision is a community where businesses, residents, and employees of a variety of ages, abilities, and experiences want to live, work, play, learn, and thrive..."

- **Goal One**
- Further Diversify Our Economy
- **Goal Two**
- Create Places Where People Want to Be
- **Goal Three**
- Improve the Speed, Consistency, and Predictability of the Development Review Process
- **Goal Four**
- Invest in Natural and Physical Infrastructure
- **Goal Five**
- Achieve Economic Success through Education and Social Equity
- **Goal Six**
- Increase Agility of County Government

Countywide Strategic Plan Priority Outcome Areas

Cultural and Recreational Opportunities Fairfax County is a place where all residents, businesses and visitors are aware of and able to participate in quality arts, sports, recreation and culturally enriching activities.	**Economic Opportunity** Fairfax County is a place where all people, businesses and places are thriving economically.	**Effective and Efficient Government** Fairfax County is a place where all people trust that their government responsibly manages resources, provides exceptional services and equitably represents them.
Empowerment and Support for Residents Facing Vulnerability Fairfax County is a place where all residents facing vulnerability are empowered and supported to live independent lives to their fullest potential.	**Health and Environment** Fairfax County is a place where all people can attain their highest level of health and well-being within a healthy sustainable environment.	**Housing and Neighborhood Livability** Fairfax County is a place where all people live in communities that foster safe, enjoyable and affordable living experiences.
Lifelong Education and Learning Fairfax County is a place where all residents at every stage of life are taking advantage of inclusive, responsive and accessible learning opportunities that enable them to grow, prosper and thrive.	**Mobility and Transportation** Fairfax County is a place where all residents, businesses, visitors and goods can move efficiently, affordably and safely throughout the county and beyond via our well-designed and maintained network of roads, sidewalks, trails and transit options.	**Safety and Security** Fairfax County is a place where all people feel safe at home, school, work and in the community.

Creating the Coalition

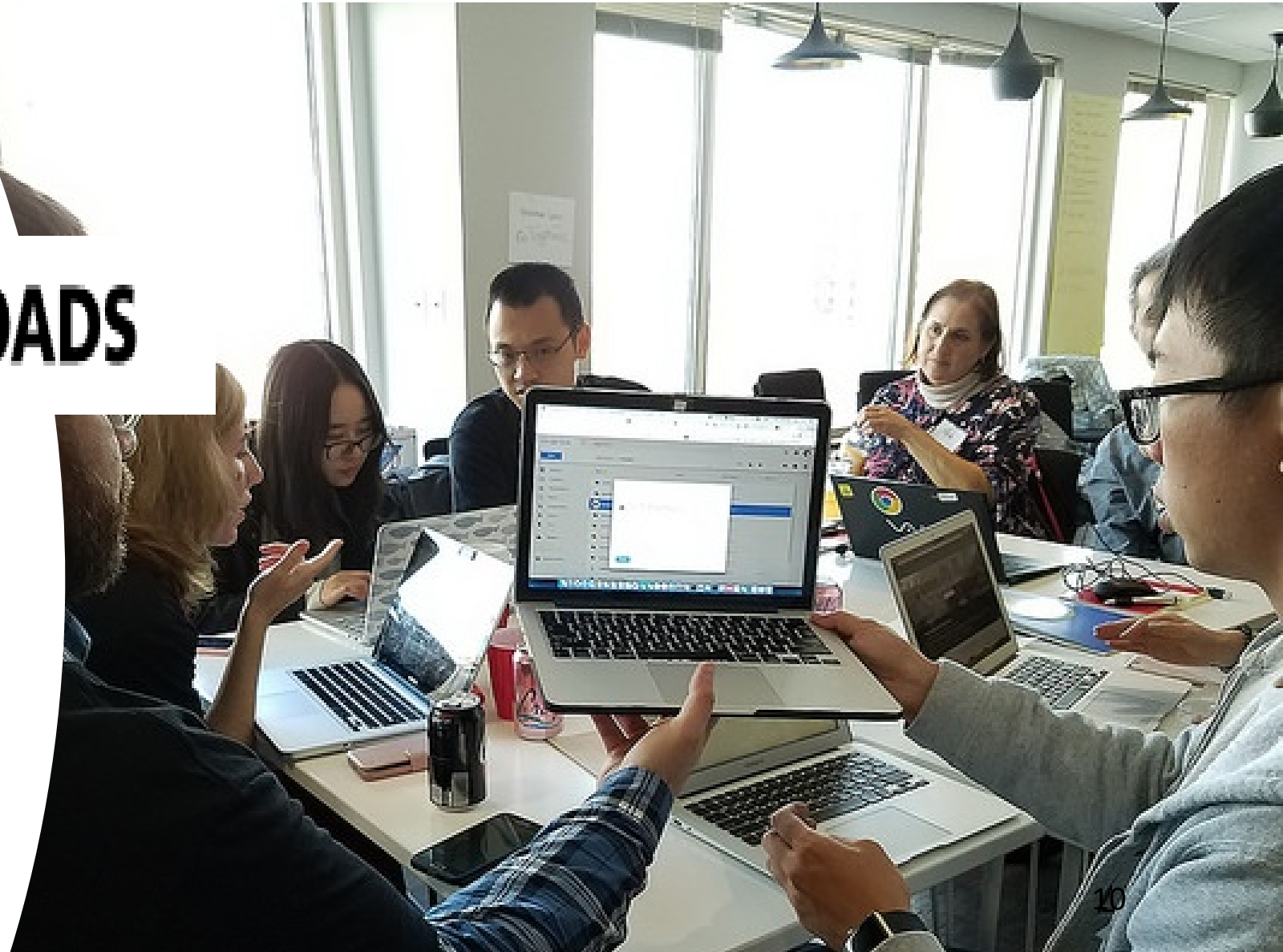
Innovation Discourse – December 2016

TEST TRACK TO THE FUTURE – MAY 2017

MOBILITY HACKATHON - NOVEMBER 2017

VDOT | SMARTERROADS

REFRACTION

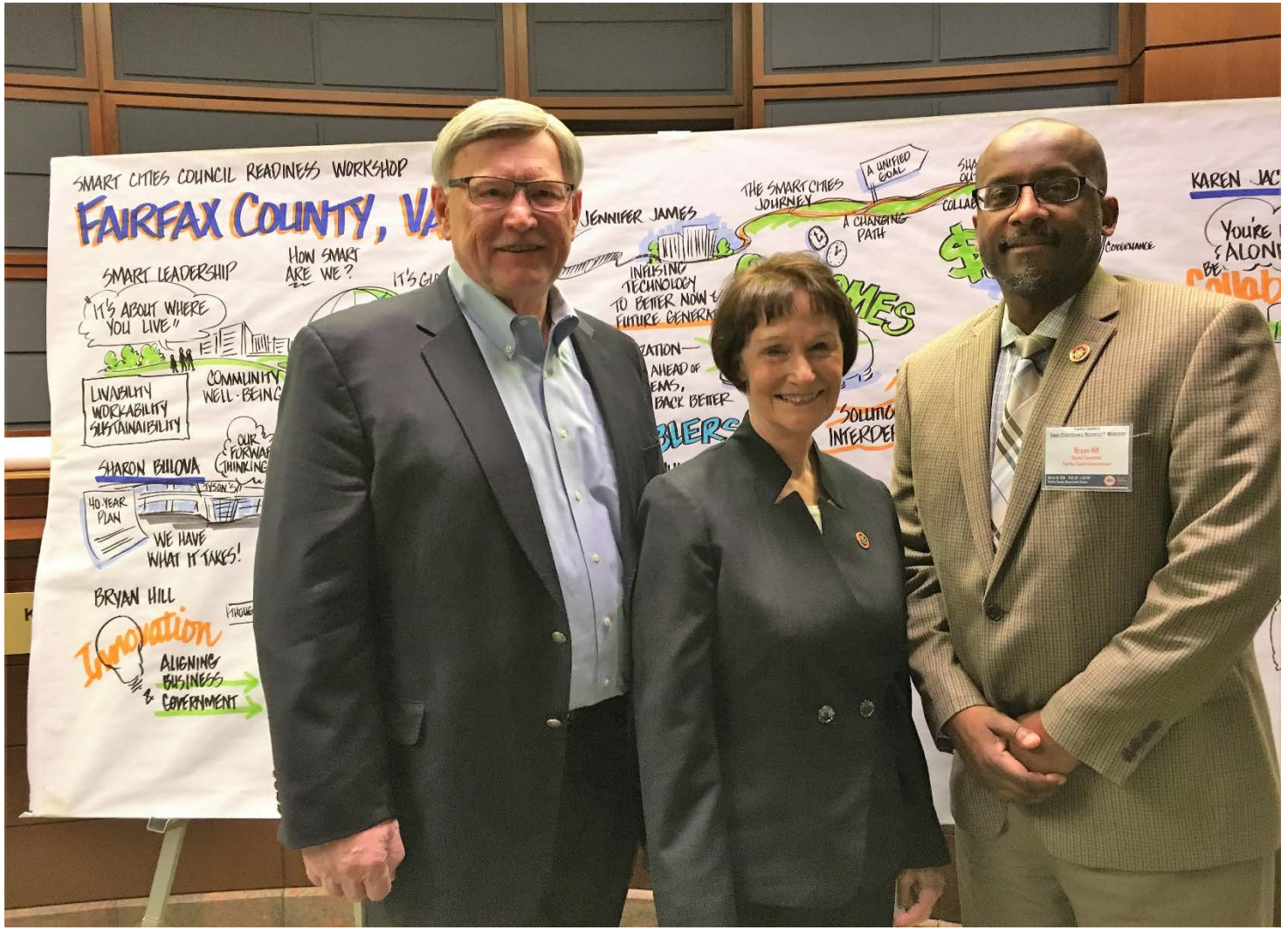


#HACKFAIRFAX
#SMARTERROADS

Smart Cities Readiness Workshop – March 2018

- **The event was designed to help us advance our work to use innovative technologies, data and analytics to better deliver services and programs.**

- The event convened more the 200 experts from county agencies, public schools, universities and colleges, nonprofits, utilities and regional transportation agencies.



Fairfax Smart Community Goals

- Leverage existing business sectors
- Spark business growth
- Nurture innovation ecosystem
- Strengthen partnerships with educational institutions
- Use technology to more effectively and efficiently provide services to residents
- Evaluate the infrastructure framework for deploying smart technology
- Partner with Community and Business on Pilot Projects
- Continue to develop partnerships with state, educational institutions, business community, public utilities

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Project Partners

1. **Fairfax County** - management and oversight of all shuttle operations
2. **Dominion Energy** - purchased the autonomous shuttle and provides project management support
3. **Virginia Department of Transportation (VDOT)** - provided vehicle to infrastructure (V2I) and route infrastructure support, including signage, lane striping, and bus stops.
    - **Virginia Transportation Research Council (VTRC)** and **Virginia Tech Transportation Institute (VTTI)** – installed additional roadside units, oversee cyber and security applications, and providing independent CAV Demonstration Project Final Report
4. **Virginia Department of Rail and Public Transportation (DRPT)** provided grant funds to cover operating expenses
5. **EDENS**, developer of the Mosaic District, provides shuttle storage and Mosaic District shuttle stop improvements. They also provide public relations opportunities for static public viewing of the vehicle
6. **EasyMile** – Shuttle manufacturer. Mapped the fixed route, ensures safe operation
7. **Transdev** – Third party operator of day-to-day operations and project management support
8. **George Mason School of Business** will conduct the human factors research for the project.

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County Goals

- Leverage regional emerging technology research
- Explore creative mobility solutions
- Understand public perception
- Utilize and test vehicle to infrastructure technology
- Expand the autonomous test network in Fairfax
- Develop strategic partnerships
- Position Fairfax as a leader in smart community initiatives

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Innovation: Automation is the future of transportation. Riders can be among the first to experience autonomous electric vehicle technology.

Convenience: The shuttle will serve as a “first and last mile” connection between the Dunn Loring Metro station and the Mosaic district, providing a convenient transit option for shoppers, visitors, residents and businesses.

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Safety: Human error causes 94 percent of car crashes, according to research by the National Highway Transportation Safety Administration. As we move toward an autonomous transportation future, autonomous vehicles can reduce traffic accidents and make the roads safer.

Reduced Emissions: Riders are reducing their environmental impact by choosing public transportation and reducing the number of vehicles on the road. By using a zero-emissions electric shuttle, riders will further reduce air pollution.

PROJECT PLANNING CONSIDERATIONS: ***VEHICLE***

- **NHTSA Regs and Oversight**

- State and local regulatory requirements (safety inspections, licensing)
- Federal Motor Vehicle Safety Standards: Compliant vs Noncompliant
- Operating capabilities - limitations
- Type and proximity of supporting smart infrastructure required - (DSRC,NRTK)
- ADA Compliant

PROJECT PLANNING CONSIDERATIONS: ***OPERATING ENVIRONMENT***

- Origin - Destination (Fixed Route vs On-Demand, First/Last Mile)
- Operating Hours (Peak vs Non-peak)
- Route - Dedicated Lane vs Mixed Traffic
- Speed -(Routes must be comprised of low speed environment)
- Prevalence of peds, bikes, on-street parking, signalized/controlled intersections, left turns, aggressive driving
- Proximity to Schools
- Stop locations - ADA access, Ease of transitioning in and out of conventional traffic

PROJECT PLANNING CONSIDERATIONS: ***OPERATING ENVIRONMENT*** (Cont.)

- Proximity of supporting smart infrastructure (TSP, DSRC, NRTK)
- Ability to deploy other infrastructure (signs, warning lights/beacons)
- Stakeholder Involvement
- Proposed route on approved TDP
- Safe and secure storage location with supporting infrastructure
- Law enforcement considerations

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Lessons Learned

- Highly regulated research environment
- Technology is highly misunderstood
- Private operating environments are much easier than public
- Technology is evolving faster than data governance .. same for privacy
- Supporting tech and infrastructure issues are unresolved
- Safety is job one, two, three, etc.
- Interest is automation is widespread among universities and government agencies
- Public transit applications are promising (ADA)
- Our public rights of way are the connective tissue for future tech deployments
- Our public rights of way are undervalued as municipal assets

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Lessons Learned

- Identify your infrastructure challenges
- Don’t do technology for tech’s sake
- Manage expectations
- Leverage partners to minimize risk
- Leverage partners to maximize your resources and your expertise

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Where do we go from here?

- Explore other vendors/partners - deploy retrofit FMVSS compliant transit vehicle
- Consider on-demand service model with Mobility Service Providers (Uber?)
- Explore paratransit service applications
- Pilot Mobility Hub(s) with CAV
- Pilot MaaS connectivity with one of these alternatives

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Project Partners

Dominion Energy®

COUNTY OF FAIRFAX 1742 VIRGINIA

EDENS

mosaic

VDOT Virginia Department of Transportation

DRPT

www.fairfaxcounty.gov/transportation/autonomous-shuttle-pilot

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Questions