

# FALLS CHURCH SMART CITIES PROGRAM 06/10/2022



### AGENDA

- About Virginia Tech Transportation Institute
- Proposed Smart City Applications
- Project Review
- Initial Priority Projects
- Current Status



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



#### VTTI FACTS ADVANCING TRANSPORTATION THROUGH INNOVATION



- Top three transportation institute globally
- Largest group of driving safety researchers worldwide
- 300 active projects and collaborations with more than 100 sponsors across the private and public sectors
- Over \$60M in externally-sponsored awards in FY20/Q1 of FY 21
- Research has <u>positively influenced</u> <u>public policies</u> for <u>driver</u>, <u>passenger</u>, <u>and pedestrian safety</u>

<u>Advanced safety of infrastructure,</u> vehicles, and <u>reduced</u> <u>environmental</u> <u>impacts</u>

# SMART CITY GRANT

- City of Falls Church and Virginia Tech awarded \$10M grant in 2021 to be administered by the Virginia Department of Transportation
- Grant will be used to:
  - Analyze needs of the community
  - Select technologies to address needs
  - Implement technologies in real-world environment
  - Evaluate resulting environment and quality of life from citizens' perspective
  - Develop foundational Smart City standards



### Proposed Smart Cities Applications

#### Smart Intersections (\$1M)

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

#### 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.

#### 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**

#### 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 Cities Data Exchange and Management System (\$2M)

 Real-time and archive data integrated from multiple city resources to support application of algorithms for active planning and decision making. This system is the common integration point for Smart City applications.

#### 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 performance analysis and audit system of the Smart City applications which will also provide data for expansion.



After a decade of trial and error, municipal leaders are realizing that smart-city strategies <u>start with people</u>, <u>not technology</u>.

"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





## PROJECT REVIEW LOCATION



# PLANNING GRANT PROJECT REVIEW APPROACH







# SMART INTERSECTIONS PROBLEM

- Community concern surrounding vulnerable road users and vehicle conflicts
- VDOT identified Broad Street (Rte 7) as a Top Pedestrian Safety Action Plan Corridor
- Traffic congestion along Broad Street
- Intersection signal timing concerns



# SMART INTERSECTIONS

### BENEFITS

- Benefits to Citizens Increased Safety and Mobility
  - Conflict detection
  - Jaywalking detection
  - Pedestrian alerting
  - Adaptive signal timing
  - Traffic signal priority



- Remote command, control and communication of traffic signals
- Information to support development of optimized timing plans
- Vehicle counting and speed per lane



SMART INTERSECTION DEPLOYMENT IN BLACKSBURG, VA



# SMART INTERSECTIONS INITIAL PRIORITIES



## ADAPTIVE LIGHTING BENEFITS



- Supports dimming the lighting system based on needs:
  - Traffic Volume
  - Weather
  - Lighting Condition
  - Pedestrian Usage
- Reduction in energy consumption (50-80%)
- Reduction in lighting maintenance costs
- Improved maintenance response times
- Potential for Emergency Response Improvements
- Reduction in skyglow, environmental impacts, and impacts on user health
- Special Events

#### COMMUNITY ENGAGEMENT PROVIDING UPDATES ABOUT THE PROJECTS AND PROGRESS

### Stage 1: Portal for Informational Updates

- Website domain purchased:
- www.fallschurchsmart.city
- Proposed content:
- About
- Roadmap
- Get Involved
- Projects
- News

Stage 2: Interactive Engagement with Community

- Build upon deployed website to gather direct feedback from community on projects
- Implementing Community Feedback

# PROGRAM ADMINISTRATION CURRENT STATUS

- VTTI has completed an initial planning project that analyzed requirements for a first phase of implementation
  - Smart Intersection and Traffic Signal Controller upgrades
  - Adaptive Lighting Solution(s)
  - Community Engagement initial information dissemination
- Grant Technicalities
  - VTTI not eligible to receive funds directly Falls Church will be recipient
  - Administered as a Local Assistance Program (LAP)
  - Federal procurement rules will apply
- Phase 1 implementation to commence Q3 '22



Advancing Transportation through Innovation

# Thank you!

## Questions?

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