

FTA RESEARCH

FEDERAL TRANSIT ADMINISTRATION

Private Providers Forum National Capital Region Transportation Planning Board

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FTA Strategic Transit Automation Research (STAR) Plan



U.S. Department of Transportation
Federal Transit Administration

Danyell Diggs

Office of Research, Demonstration, and Innovation

Automation Benefits in Public Transportation

- Improve safety
- Increase efficiency and productivity
- Potentially reduce costs
- Increase traveler convenience and comfort through improved service frequency, flexibility and reliability
- Expand service hours and area
- Increase overall customer satisfaction

Transit Automation Research Goals

- **Conduct enabling research** to achieve safe and effective transit automation deployments
- **Identify and resolve barriers** to deployment of transit automation
- **Build awareness** to socialize automation for transit stakeholder community
- **Demonstrate market-ready technologies** in real-world settings
- **Leverage technologies** from other sectors to move transit automation industry forward

STAR Plan Scope

- Transit bus operations
 - “Bus” is defined broadly
 - Passenger capacities
 - Traditional and novel vehicle designs
 - Lessons learned from automation in rail, light-duty vehicles, commercial vehicles, and aviation considered
- Full range of automation (SAE Levels 1-5)
 - Does not include driver assistance systems without an automation aspect (e.g., driver warnings and alerts)



STAR Plan

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Transit Automation Scenarios (Use Cases)

- Smooth Acceleration and Deceleration
- Automatic Emergency Braking and Pedestrian Collision Avoidance
- Curb Avoidance
- Precision Docking
- Narrow Lane/Shoulder Operations
- Platooning

- Circulator Bus Service
- Feeder Bus Service

- Precision Movement for Fueling, Service Bays, and Bus Wash
- Automated Parking and Recall

- Automated First/Last-mile
- Automated ADA Paratransit
- On-Demand Shared Ride

- Automated BRT

Transit Bus Advanced Driver Assistance System (ADAS) (L1-2)

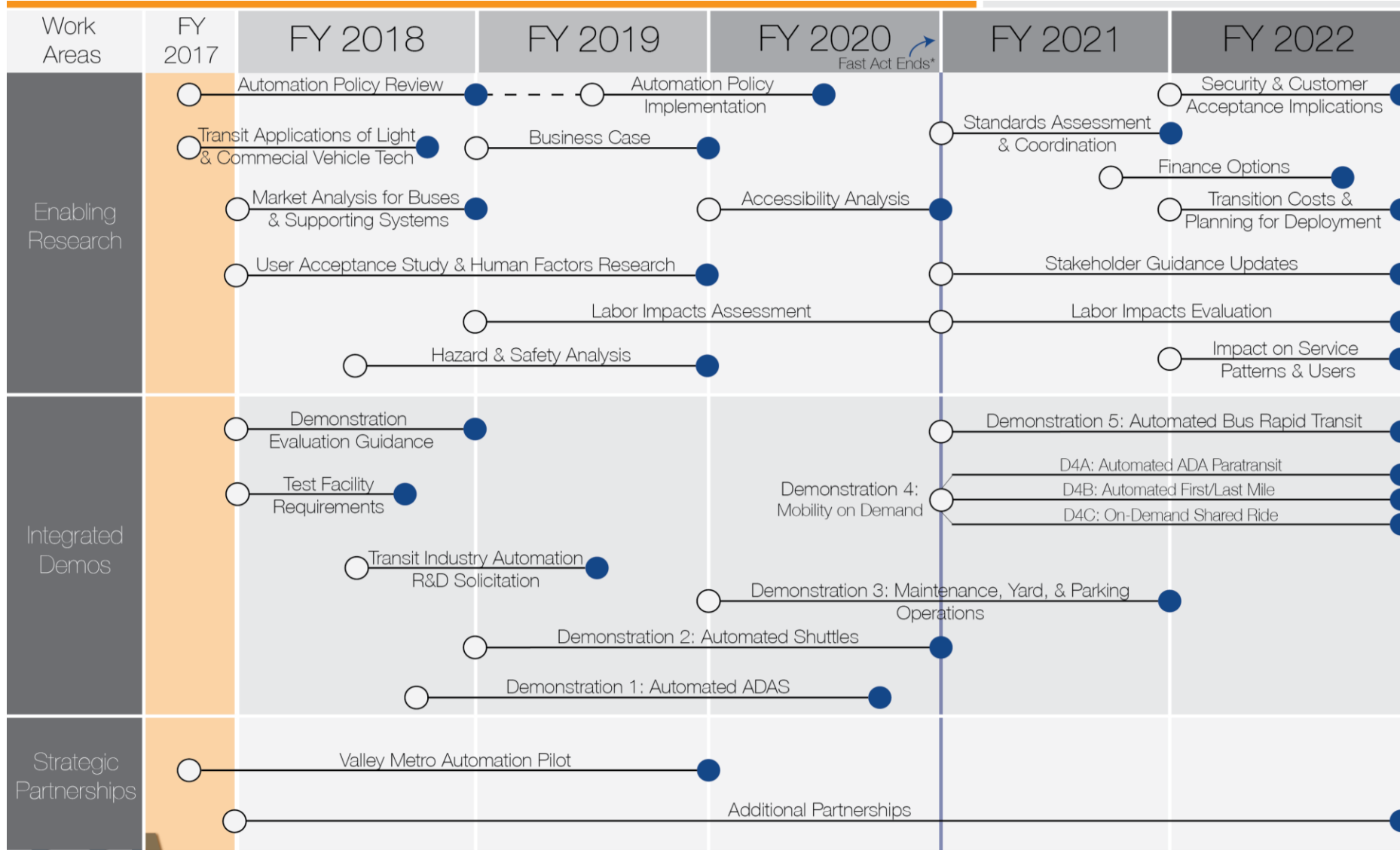
Automated Shuttle (L4)

Maintenance, Yard, Parking Operations (L4)

Mobility-on-Demand (MOD) Service (L5)

Automated Bus Rapid Transit (L4)

Strategic Transit Automation Research



Knowledge Transfer, Stakeholder Engagement, & Technical Assistance



RFC: Removing Barriers to Transit Bus Automation - Comments

- ADA and Accessibility
 - Non-driving functions must be addressed
 - Automation could improve access for seniors and persons with disabilities
- Workforce and Labor
 - Consideration for job loss and retraining
 - Could increase labor costs due to need for specialized skills
- Funding and Procurement
 - Buy America concerns
 - Useful life and spare ratio requirements questions

RFC Comments (continued)

- Equity
- Need for a human presence
- Human factors research
- Framework for collection, management, and sharing of data
- Cybersecurity
- Standards
- Definition of transit
- Impact on National Transit Database reporting
- Bus Testing

Integrated Mobility Innovation

Vision

Complete Trips for ALL users

Purpose

Integrate and Fund Mobility Innovations in:

- Mobility on Demand
- Transit Automation
- Mobility Payment Integration

Leverages

- Accessible Transportation Technologies Research Initiative
- Mobility Services for All Americans
- And much more...

IMI Demonstration Program Funding

\$15 Million total

\$8
Million

Mobility on Demand Sandbox

\$5
Million

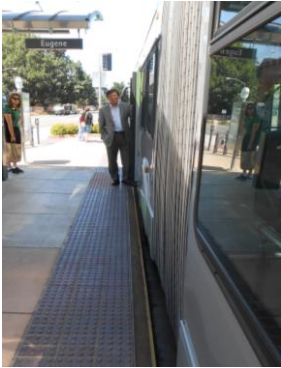
Strategic Transit Automation
Research

\$2
Million

Mobility Payment Integration

NOTE: each application should choose one or more of the above areas of inquiry

Transit Automation Demonstrations



Automated Advanced Driver Assistance Systems (ADAS) – \$3M

- Demonstrate market-ready or near market-ready advanced driver assistance technologies
- Automation SAE Levels 0-2 , partial transit automation in revenue service
- Must address human factors and bus operators experience and acceptance

Automated Shuttle - \$2M



- Automation SAE Level 4, full transit automation in complex operating environments, preferably in revenue service
- Must address human factors, compliance with ADA, on-board attendant experience and acceptance, perceptions and acceptance by other road users
- Comply with the National Highway Safety Administration (NHTSA) Federal Motor Vehicle Safety Standards (FMVSS) or operating consistent with an exemption issued by NHSTA

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