Transit Bus Automation
Federal Transit Administration (FTA)
Quarterly Update

Q1 2020 Update

This FTA document identifies and provides information on transit bus automation pilot projects, demonstrations, and tests and consists of:

1) Summaries of news items published in Q1 2020 related to automated transit buses, including both domestic and international projects.
2) Summaries of U.S.-based activities related to automated vehicle testing projects with transit agency participation. A sub-section lists projects receiving U.S. Department of Transportation (USDOT) funding.

The information in this document is gathered from publicly available sources (e.g., news articles, press releases, and government websites) and may not represent a comprehensive list of all U.S. transit agency automated vehicle activity. Information on additional projects may be sent to transitautomation@dot.gov.

1) News Items (Domestic and International)

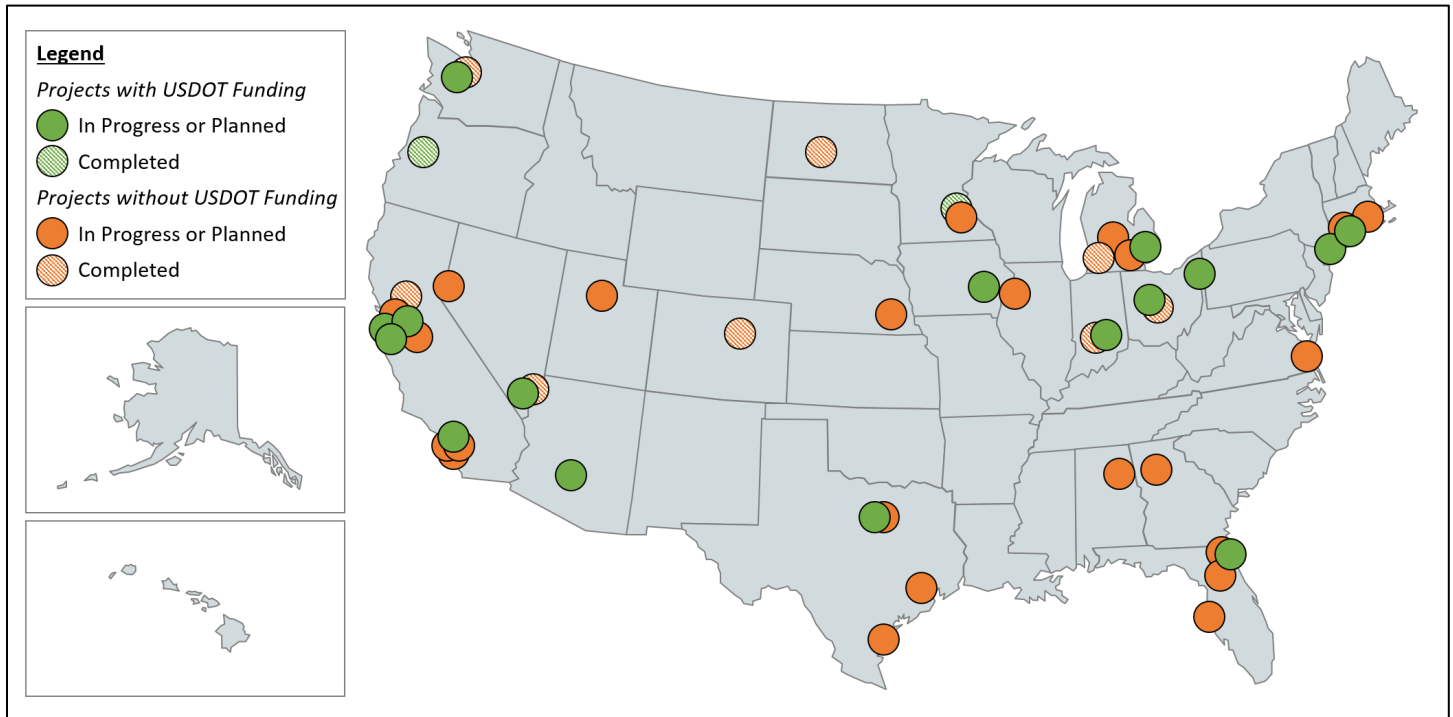Table 1 contains Q1 2020 news items related to transit bus automation.

TABLE 1: TRANSIT BUS AUTOMATION NEWS

Month	News Item
January 2020	- Automated shuttle service begins at Texas A&M University-Corpus Christi (link) - Cruise unveils "Origin" automated shuttle concept (link) - ANA starts testing autonomous bus operation at Haneda Airport in Japan (link) - UK begins testing unsupervised autonomous transport pods (link) - Germany announces the EASYRIDE pilot project, which will test two automated e.GO Mover buses at Olympiapark in Munich beginning in April 2020 (link)
February 2020	- EasyMile shuttle operations begin in Gainesville, Florida (link), at NC State University in Raleigh, North Carolina (link); and in the Linden neighborhood of Columbus, Ohio (link)—following an incident in Columbus, NHTSA suspends EasyMile passenger operations (link) - Robotic Research announces plans to test with unstaffed automated shuttles (link) - Beep announces that it will provide Navya shuttle service in Peoria, Arizona (link) - Jaguar Land Rover unveils "Project Vector" automated shuttle concept (link) - Turing Drive announces automated transit bus testing in Taipei, Taiwan (link)
March 2020	- The FABULOS project announced awards to three international consortia to pilot automated buses in five European cities between April and October 2020 (link) - The SmartBus project in Denmark begins a two-year pilot test with three Navya shuttles (link) - Perrone Robotics and GreenPower Motor Company partner to develop an automated electric shuttle bus (link) - LILEE Systems announces automated transit bus testing, which will include passenger fare collection, in Tainan City, Taiwan (link)

2) Automated Transit Bus Testing Activities in the United States

The USDOT has identified many domestic planned, in-progress, and completed automated transit bus testing activities as well as many transit agencies interested in participating in automated vehicle testing activities. In several cases, these projects have been or are being funded through USDOT programs. Some transit agencies have expressed interest in participating in test activities but do not have a formalized project, or there may be limited information available on the project. The locations of automated transit bus testing are shown in Figure 1, and additional details are contained in the tables on subsequent pages. The projects included in the map and tables focus on testing automation systems for full-size transit buses or smaller transit vehicles (e.g., low-speed automated shuttles and light-duty vehicles).

FIGURE 1: U.S. TRANSIT BUS AUTOMATION TESTING ACTIVITIES

Source: USDOT Volpe Center, April 2020

Projects with USDOT Funding

Many transit agencies have received USDOT funding for automated vehicle test activities. Some of this funding has been provided through Federal Transit Administration (FTA) programs such as:

- Congestion Mitigation and Air Quality (CMAQ) Improvement Program
- Innovative Safety, Resiliency, and All-Hazards Emergency Response and Recovery (SRER) Research Demonstrations
- Integrated Mobility Innovation (IMI) Demonstration Program
- Mobility on Demand (MOD) Sandbox Program
- Safety Research and Demonstration (SRD) Program
- Strategic Transit Automation Research (STAR)
- Vehicle Assist and Automation (VAA) Demonstration

Additional projects have been funded by other USDOT modal administrations or by departmental programs, including:

- Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Program
- Automated Driving System (ADS) Demonstration Grants
- Better Utilizing Investments to Leverage Development (BUILD) Program
- Smart City Challenge (SCC)

Table 2 lists many projects with USDOT funding that test automated transit buses and related technologies. Cells with green shading and bolded text indicate projects that have been added or updated since the previous version of this document. Note that in February 2020, NHTSA suspended EasyMile passenger operations following an incident, and in response to the COVID-19 pandemic many other automated vehicle operations, especially those with shared rides, have been suspended—as a result, many of the projects listed with an "In Progress" status may be temporarily suspended.

TABLE 2: PROJECTS WITH USDOT FUNDING

State	Transit Agency / Lead	Description	USDOT Program	Status
AZ	Valley Metro	Providing service to users of the RideChoice program via Waymo vehicles. The initial phase of testing provided rides Valley Metro employees.	MOD	In Progress
CA	Access Services	Testing automated vehicles to provide shuttle service between a light rail station and Veterans Administration (VA) hospital.	STAR (Strategic Partner)	Planned
	Contra Costa Transportation Authority (CCTA)	Testing automated vehicles through three real-world demonstration projects.	ADS	Planned
	San Francisco County Transportation Authority (SFCTA) and San Francisco Municipal Transportation Agency (SFMTA)	Testing automated shuttles to provide first-last mile circulation on Treasure and Yerba Buena Islands.	ATCMTD	Planned
	Santa Clara Valley Transportation Authority (VTA)	**Developing accessibility features for an automated Local Motors Olli shuttle and testing it at the VA Palo Alto Health Care System.**	**CMAQ**	**Planned**
CT	**Connecticut Department of Transportation**	**Testing automated, electric buses on the CTfastrack bus rapid transit corridor to improve safety for riders with disabilities.**	**IMI**	**Planned**
FL	Jacksonville Transportation Authority (JTA)	Testing 15 automated vehicles and other ITS systems along Bay Street in Jacksonville.	BUILD	Planned
IA	University of Iowa	Testing automated vehicles in a loop from Iowa City through rural areas and small towns, providing an example for how ADS can connect rural populations (focus on connecting rural transportation-challenged populations such as older adults).	ADS	Planned
IN	**City of Columbus**	**Developing an automated shuttle circulator to increase transit options and reduce wait times. The routes will mainly serve riders who are low-income, seniors, and people with disabilities.**	**IMI**	**Planned**
MI	City of Detroit	Developing a replicable safety evaluation process and deploying vehicles on test tracks and on streets in Detroit to evaluate their safety. The project will also work with older adults and persons with disabilities to better understand their mobility challenges.	ADS	Planned
MN	Minnesota Valley Transit Authority (MVTA)	Equipping buses in MVTA's express bus fleets with GPS-based technology to improve safety and bus service within narrow shoulder lanes along highly congested corridors (a non-automated system).	SRER	Completed
NY	Port Authority of New York and New Jersey	Testing lateral lane-keeping and bus platooning to improve operations and reduce headways between buses as they traverse Exclusive Bus Lane (XBL) between the Lincoln Tunnel and New Jersey Turnpike.	STAR (Strategic Partner)	Planned
NV	Regional Transportation Commission of Southern Nevada (RTCSN)	Testing an automated circulator shuttle in the Las Vegas Medical District.	BUILD	Planned

State	Transit Agency / Lead	Description	USDOT Program	Status
OH	Western Reserve Transit Authority (WRTA) - Eastgate Regional Council of Governments is the lead	Testing automated shuttles in a dedicated shuttle lane as part of the SMART^2 Network in Youngstown, Ohio.	BUILD	Planned
	Central Ohio Transit Authority (COTA) - City of Columbus is the lead	**Testing EasyMile EZ10 automated shuttles began in February 2020.**	**SCC**	**In Progress**
OR	Lane Transit District (LTD)	Testing lateral lane-keeping and precision docking on LTD's Emerald Express Bus Rapid Transit.	VAA	Completed
SC	**County of Greenville**	**Testing of automated shuttles (modified Cushman Shuttle 6 and Local Motors Olli models).**	**ATCMTD**	**Cancelled**
TX	**City of Arlington**	**Integrating autonomous vehicles into its existing on-demand system operated with the Via car-sharing service. The service will include a wheelchair accessible vehicle and allow University of Texas at Arlington students to ride fare free.**	**IMI**	**Planned**
WA	**Pierce Transit**	**Testing DCS Technologies' Pedestrian Avoidance Safety System (PASS) automated emergency braking in up to 30 buses.** **Update: This project has been rescoped to focus on driver assistance technology, but may include an automation component in the future.**	**SRD**	**In Progress**

Source: USDOT Volpe Center, April 2020

Projects without USDOT Funding

The transit agencies listed in Table 3 are currently involved in demonstration or pilot activities that are not part of a USDOT-funded program. As with the previous table, cells with green shading and bolded text indicate updates from the previous version of this document. Given the NHTSA suspension of EasyMile passenger operations and other operations being suspended due to the COVID-19 pandemic, many of the projects listed with an "In Progress" status may be temporarily suspended.

TABLE 3: PROJECTS WITHOUT USDOT FUNDING

State	Transit Agency / Lead	Description	Status
AL	New Flyer and Robotic Research LLC	Developing a 40' automated transit bus, with initial development and testing in Gaithersburg, MD, followed by additional testing and demonstration in Anniston, AL.	Planned
CA	Central Contra Costa Transit Authority (CCCTA) and Contra Costa Transportation Authority (CCTA)	Testing two EasyMile EZ10 shuttles at GoMentum Station and Bishop Ranch business park.	In Progress
	Livermore Amador Valley Transit Authority (LAVTA)	**Testing an EasyMile EZ10 automated shuttle. A previous short-term demonstration of an EasyMile EZ10 automated shuttle was conducted in 2018.**	**Planned**
	Yolo County Transit District (YCTD)	Demonstrating an EasyMile EZ10 automated shuttle.	Completed
	Foothill Transit	Participating as a member of the AECOM Automated Bus Consortium project.	Planned
	Long Beach Transit (LBT)	Participating as a member of the AECOM Automated Bus Consortium project.	Planned
	Los Angeles County Metropolitan Transportation Authority (LA Metro)	Participating as a member of the AECOM Automated Bus Consortium project.	Planned

State	Transit Agency / Lead	Description	Status
CO	Regional Transportation District (RTD) - Denver	Testing an EasyMile EZ10 automated shuttle to connect the 61st Avenue and Peña Boulevard commuter rail station to nearby areas.	Completed
CT	Connecticut Department of Transportation (CTDOT)	Participating as a member of the AECOM Automated Bus Consortium project.	Planned
FL	**Gainesville Regional Transit System (RTS)**	**Testing an EasyMile EZ10 shuttle in partnership with the City of Gainesville and Transdev. Some initial testing took place in May 2018, but the project was on hold until it launched in February 2020.**	**In Progress**
	Jacksonville Transportation Authority (JTA)	Testing multiple automated shuttle models (EasyMile EZ10, Navya Autonom Shuttle, and one other model) on a 1/3-mile track as part of a project to replace the existing Skyway monorail.	In Progress
	Pinellas Suncoast Transit Authority (PSTA)	Participating as a member of the AECOM Automated Bus Consortium project.	Planned
GA	Metropolitan Atlanta Rapid Transit Authority (MARTA)	Participating as a member of the AECOM Automated Bus Consortium project.	Planned
IL	Quad Cities MetroLINK	Participating as a member of the AECOM Automated Bus Consortium project.	Planned
IN	Bloomington Transit	Demonstrating an EasyMile EZ10 automated shuttle.	Completed
MI	Michigan Department of Transportation (MDOT) and PlanetM	Participating as a member of the AECOM Automated Bus Consortium project.	Planned
	MDOT, PlanetM, and Pratt and Miller Engineering	**Constructing and testing automated shuttles at Western Michigan University in Kalamazoo.**	**Completed**
	MDOT, PlanetM, and Ann Arbor Area Transportation Authority	**Demonstrating the Q'Straint Quantum automated wheelchair securement system in Ann Arbor.**	**In Progress**
MN	Minnesota Department of Transportation (MnDOT) and Rochester Public Transit	Participating as a member of the AECOM Automated Bus Consortium project.	Planned
ND	Capital Area Transit	Demonstrating an EasyMile EZ10 automated shuttle.	Completed
NE	**StarTran (City of Lincoln)**	**Testing an automated shuttle. A previous short-term demonstration of a Navya automated shuttle was conducted in 2018.**	**Planned**
NV	Regional Transportation Commission of Southern Nevada (RTCSN)	Testing a Navya Autonom automated shuttle in Las Vegas near the Downtown Container Park.	Completed
	Regional Transportation Commission of Washoe County (RTC)	**Testing a Proterra bus equipped with sensors as part of a larger project with Proterra and University of Nevada, Reno to develop an automated bus prototype. Update: This project has been rescoped to focus on driver assistance technology, but may include an automation component in the future.**	**In Progress**
OH	Central Ohio Transit Authority (COTA) - City of Columbus is the lead	Testing May Mobility shuttles on Scioto Mile.	Completed
RI	Rhode Island Public Transit Authority (RIPTA) - Rhode Island Department of Transportation (RIDOT) is the lead	Testing May Mobility shuttles in downtown Providence.	In Progress

State	Transit Agency / Lead	Description	Status
TX	**Corpus Christi Regional Transit Authority (CCRTA)**	**Testing EasyMile EZ10 shuttle at Texas A&M University-Corpus Christi began in January 2020. CCRTA partnered with MV Transportation to manage operations.**	**In Progress**
	Dallas Area Rapid Transit (DART)	Participating as a member of the AECOM Automated Bus Consortium project.	Planned
	Metropolitan Transit Authority of Harris County (METRO)	Participating as a member of the AECOM Automated Bus Consortium project.	Planned
UT	Utah Transit Authority (UTA) - Utah Department of Transportation (UDOT) is the lead	Testing an EasyMile EZ10 automated shuttle in different communities in Utah.	In Progress
VA	Virginia Department of Rail and Public Transportation (DRPT) and Hampton Roads Transit (HRT)	Participating as a member of the AECOM Automated Bus Consortium project.	Planned
WA	King County Metro, Kitsap Transit, Community Transit, Pierce Transit, Intercity Ctransit, C-Tran, Ben Franklin Transit, Spokane Transit Authority	Testing of driver assistance systems—Mobileye Shield+ (a non-automated collision avoidance system)—on 38 buses from several transit agencies.	Completed

Source: USDOT Volpe Center, April 2020

Contact

The information in this briefing was compiled by the John A. Volpe National Transportation Systems Center in support of the FTA's Office of Research, Demonstration and Innovation (TRI). For more information, or to provide information on transit bus automation projects that were not included in this document, send an email to transitautomation@dot.gov.