Summary of the Federal Transit Administration (FTA) Convening on Transit Bus Automation

OVERVIEW

On June 30, 2023, the Federal Transit Administration (FTA) convened U.S. Department of Transportation (USDOT) and transit agency leaders to discuss issues and challenges related to research, planning, piloting, demonstrating, or deploying automated transit buses in revenue service. FTA outlined goals for discussion related to automated transit buses:

- the state of regulations related to automated transit buses operating on public roadways for transit service;
- expected potential changes in the regulations;
- input from transit agencies, specifically their experience in planning for and using automated transit vehicles.

Danyell Diggs of FTA's Office of Research, Demonstration and Innovation moderated the session. FTA Administrator Nuria Fernandez, and USDOT Assistant Secretary for Transportation Policy Christopher Coes, the provided opening remarks and provided context for the conversation.

The session was conducted in two segments. First, subject matter experts presented on regulatory and policy topics, followed by remarks by transit providers, describing their relevant work and challenges in deploying automated transit buses. Dr. Yvette Taylor, FTA Region IV Administrator provided closing remarks and acknowledged participants. FTA closed with a commitment to continue the conversation and share a summary of the event with all attendees. This document serves as that summary.

SUMMARY OF DISCUSSION

FTA Deputy Administrator Veronica Vanterpool moderated a panel of FTA and National Highway Traffic Safety Administration (NHTSA) subject matter experts and leaders who summarized the relevant regulations and research. Presenters and topics included:

- Federal Motor Vehicle Safety Standards (FMVSS) - Andrew Magaletti, NHTSA Acting Chief, Automation Exemptions Division;
- Buy America - Dana Nifosi, FTA Deputy Chief Counsel;
- Useful Life and Spare Ratio - Alexis Fisher, FTA Transportation Program Analyst, and Anthony Carr, FTA Special Assistant to the Associate Administrator for Program Management;
- Americans with Disabilities Act (ADA) - John Day, FTA ADA Policy Lead;
- Transit Vehicle Manufacturers (TVMs) and Disadvantaged Business Enterprise (DBE) goals - Scott Pichon, FTA DBE Policy Lead;
- FTA Bus Testing - Mary Leary, Ph.D., FTA Associate Administrator for Research, Demonstration, and Innovation;

- Workforce - Mary Leary, Ph.D. FTA Associate Administrator for Research, Demonstration, and Innovation

The second segment built upon the discussion of the regulations to be considered. Transit leaders provided input from their experiences planning and implementing transit automation projects. Dr. Gwo-Wei Torng, Director for the Office of Mobility Innovation, facilitated the session. Issues and concerns expressed included:

- **FMVSS Compliance and Exemptions:** Federal motor vehicle safety standards (FMVSS) are a set of motor vehicle and motor vehicle equipment performance standards issued by NHTSA to reduce traffic crashes and the injuries or deaths resulting from crashes. Generally, all new motor vehicles, including those with varying automation capabilities, that are manufactured for sale, sold, imported, or delivered for introduction or introduced into interstate commerce (including by operation on public roads) must meet all applicable FMVSS. This discussion covered two FMVSS exemption pathways used for Automated Driving System (ADS) equipped vehicles that do not comply with FMVSS: Part 555 exemptions and Temporary Import Exemptions (also called "Box 7" exemptions). Specific points raised in this discussion included:
    - Part 555 exemptions allow a manufacturer to produce and sell up to 2,500 exempted vehicles per a 12-month period for two to three years. Transit representatives were interested in more information on the process. It was noted that the part 555 process starts with a manufacturer petitioning NHTSA for an exemption, followed by NHTSA publishing a Federal Register notice announcing receipt of the petition and seeking public comment. NHTSA may grant the petition upon finding that the exemption is consistent with public interest and objectives of the Safety Act and meets one of four statutory bases. The processing time varies widely but is generally between six months and two years. The part 555 process concludes with NHTSA publishing in the Federal Register a notice granting or denying the petition.
    - Temporary import exemptions are for importers only for specific purposes such as research, demonstration, or training. Applications for this exemption that involve vehicles equipped with an ADS and imported by an entity other than a manufacturer of certified vehicles are handled on a case-by-case basis by NHTSA's ADS Vehicle Exemption Program team. Operations on public roads may be permitted but receive a more detailed review. If approved, temporary permission (which could be as short as one week or if three years) is granted subject to conditions, such as requiring a safety operator, additional labeling, crash reporting, etc. The average processing time for these requests is about 45 days, but it can vary significantly depending on the complexity of the proposed operation.
- **Buy America Compliance:** Transit providers expressed several challenges related to Buy America for automated transit buses. Several participants sought additional guidance and understanding related to the driving automation system hardware and software, particularly with respect to applicability of FTA's microprocessor waiver to automated vehicle (AV) stacks. Feedback also noted a lack of clarity in how these rules apply to retrofitted vehicles, for example, what constitutes "final assembly." Some transit providers suggested that FTA create a Buy America guidance or frequently asked questions related to retrofitting conventional vehicles with driving automation technologies.

- **Useful Life and Spare Ratio:** Transit providers asked about useful life requirements related to sensors and other components of driving automation systems. They expressed concerns about useful life requirements when there is the potential for driving automation components (or propulsion technologies) to require more frequent updates than other parts of the underlying vehicle platform. Another concern was the potential invalidation of vehicle warranties by equipping vehicles with driving automation technologies. Participants noted FTA Circular 5010.1E does not provide guidance on the useful life of driving automation technologies. To address this, transit providers asked FTA to consider updating the circular to provide that guidance. FTA responded with information about a pending combined, updated circular that will allow opportunity for notice-and-comment. Participants also noted the difference between how the useful life (and spare ratio) rules apply to "demonstrations" and "deployments.". FTA noted the agency does not currently require that a vehicle procured for pilot or demonstration projects be included in the spare ratio calculation. However, if a vehicle is made part of fixed-route operations after a pilot or demonstration is over, then it must be included in the calculation.
- **Standards and Specifications:** Transit providers discussed the need for, and challenges related to, the development of standards (e.g., performance and safety) and specifications necessary to procure transit buses with driving automation systems, particularly at scale. There was also a discussion of whether and how industry standards should be incorporated into the FMVSS or FTA Bus Testing program. Standards discussed include UL 4600, ISO 26262, and safety of the intended functionality.
- **Knowledge Sharing:** Transit providers outlined challenges related to the availability and dissemination of accurate information and the need for technical assistance. They also noted the need for education and best practices for the transit workforce, the public, and especially other road users. Attendees asked FTA to post useful information and data through a website or other easily accessible means. It was also recommended that the USDOT convene meetings with the private sector to understand their concerns.
- **Industry Readiness and Technology Availability:** Transit providers discussed challenges related to technology maturity, vehicle availability, industry consolidation, and limited incentives for private sector firms to supply technologies and bid on procurements. Several attendees shared examples of delayed or rescoped projects due to changes in vendors between their application for funding and when they issued a request for proposals. Attendees also expressed uncertainty about what companies they are eligible to partner with and which products meet current federal regulations.
- **Data Sharing and Intellectual Property:** Transit providers also noted challenges working with private sector vendors with respect to accessing system information and data collected during operations. Vendors are often reticent to share data, either because they do not want their competitors to have access to proprietary information, or because they want to make sure that data is properly contextualized to avoid negative attention from the media or their investors. Other issues included the difficulty in developing contract language to handle these nuances and mitigate vendor concerns about proprietary data disclosure via the Freedom of Information Act (FOIA) or state sunshine laws. Participants also share the challenge of working with vendor who are new to Federally assisted procurements until those vendors understand Federal requirements.

- **Bus Testing:** Transit providers were interested in the development of protocols for testing automated vehicle technology stacks. They expressed concern that such testing could be tied to a particular facility (and therefore necessitate sending a bus far away to undergo testing). There were also questions about integrating industry standards into FTA's Bus Testing program.
- **Workforce:** Transit providers noted the need for more communication to their workforce on automation. FTA asked the attendees what message they would like to see around the workforce and if it would be helpful to have a campaign with the Transit Workforce Center on the positive benefits of automation. The audience generally agreed such a campaign would be beneficial.
- **USDOT Funding:** Transit providers also inquired about USDOT funding opportunities. Providers expressed support for additional dedicated funding for transit bus automation projects and eventual use of formula funds for transit bus automation deployments. They also expressed interest in understanding the differences in how various parts of USDOT administer funding (e.g., differences in requirements and systems between FTA, OST, and FHWA programs). Relevant to funding requirements, providers requested more flexibility and streamlining of regulatory requirements for USDOT grantees. For example, pre-award authority is available for some FTA programs but not FHWA programs; naming partners at the NOFO stage is possible for some research programs due to deviations from full and open competition allowed by statute; flexing funds from FHWA to FTA helps recipients who are familiar with FTA systems and processes (which are better suited for transit bus automation projects than FHWA's systems which are designed primarily for highway construction projects).

Other topics and concerns mentioned in this discussion included liability and shared risks, the need to demonstrate transit bus automation business cases, ADA-compliant interfaces, issues related to the handover/transition between driving systems and operators, and rural ADS-equipped vehicle operations.

NEXT STEPS

Next steps proposed by FTA at the event included:

- While FTA prepares frequently asked questions (FAQs) regarding application of FTA's Buy America requirements to vehicle retrofits, transit agencies should contact the Regional Counsel for their FTA region with specific questions.
- FTA will continue to encourage transit stakeholders to provide comments on the upcoming FTA Bus Testing notice of proposed rulemaking (NPRM) with respect to inclusion of procedures and standards for performance testing of automated transit buses.
- FTA will incorporate comments received from the Convening into the updated FTA Strategic Transit Automation Research Plan (STAR Plan 2.0), under development, to investigate and address issues, concerns, and challenges with respect to the implementation of automated transit bus operations and service.
- FTA will continue to engage organized labor representatives to obtain input on workforce issues, concerns, challenges, and opportunities relating to automation of transit bus operations and service.