

Frequently Asked Questions: Transit Bus Automation Policy

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As the transit industry begins to explore the use of automated transit buses, many stakeholders have questions about the impact of new technologies on transit agencies, employees, riders, and the general public. In response, FTA has developed frequently asked questions (FAQs) for key areas of interest, which include:

- [Transit Bus Automation in Relation to United States Department of Transportation \(DOT\) Requirements](#)
- [Transit Bus Automation in Relation to Federal Transit Administration \(FTA\) Requirements](#)
- [Transit Bus Automation in Relation to Other Considerations](#)

FTA encourages you to send your comments and questions to transitautomation@dot.gov.

Transit Bus Automation in Relation to United States Department of Transportation (U.S. DOT) Requirements

The FAQs under this section highlight transit bus automation in relation to DOT requirements, including DOT's Americans with Disabilities Act (ADA) and Title VI regulations. In addition, how transit bus automation must comply with the National Highway Traffic Safety Administration's (NHTSA) Federal Motor Vehicle Safety Standards (FMVSS) is highlighted.

Americans with Disabilities Act (ADA)

1. If an automated transit project does not use federal funding, does it still have to comply with the ADA requirements?
 - a. Yes. The ADA applies regardless of whether there is federal funding involved. The applicable requirements will depend upon the type of vehicle used and the service that will result, such as fixed route, general public demand responsive, or ADA complementary paratransit.
 - i. Under 49 CFR § 37.71, all vehicles acquired by a public entity for use on a fixed route system must be accessible to and usable by persons with disabilities, including wheelchair users. Most, if not all, AVs used in public transit will meet the definition of "bus" in 49 CFR § 37.3. To be considered accessible, buses used in fixed route service must comply with 49 CFR Part 38, Subpart B—Buses, Vans and Systems, available [here](#).
 - ii. For automated vehicles acquired for use in a demand responsive system that do not follow a fixed route, inaccessible vehicles may be acquired and the equivalent service requirements under 49 CFR § 37.77(c) would apply.

2. If a public entity contracts with a private entity for an automated transit project, what ADA requirements would apply?
 - a. Whenever a public entity enters into a contract or other arrangement or relationship with a private entity, the same requirements apply as they would if the public entity operated the service itself. This includes fixed route or demand responsive service, and applies to vehicle acquisitions and service operations.
 - b. For fixed route service, all vehicles must be accessible to and usable by persons with disabilities, including wheelchair users, according to the standards found in 49 CFR Part 38 for the type of vehicle used.
 - c. For demand responsive service, inaccessible vehicles may be used as long as the service, when viewed in its entirety, provides equivalent service to persons with disabilities, including wheelchair users, as it provides to individuals without disabilities.
 - i. The criteria for equivalent service are found in 49 CFR § 37.77(c) and § 37.105, and include such factors as response time, fares, service area, hours and days of service, availability of information and reservations capability, and any constraints on capacity or service ability.
3. A transit agency wants to implement a fixed route circulator service in a local community using automated vans. The vehicles will have no established stops, but will be “hailed” by riders through a smartphone application. Do any of these automated vans have to be accessible?
 - a. Under 49 CFR § 37.71, all vehicles used on a fixed route system operated by a public entity are required to be readily accessible to and usable by persons with disabilities, including wheelchair users.
 - b. For ADA purposes, the interaction between the passenger and the service via the smartphone application does not make this a “demand responsive” service because it is still running on fixed routes. Regulations related to fixed route services (see above) apply.
4. Which accessibility regulations apply to low-speed automated vehicles (also known as shuttles or minibuses)?
 - a. Under 49 CFR § 37.71, all vehicles acquired by a public entity for use on a fixed route system must be accessible to and usable by persons with disabilities, including wheelchair users. Most, if not all, AVs will meet the definition of “bus” in 49 CFR § 37.3. To be considered accessible, buses used in fixed route service must comply with 49 CFR Part 38, Subpart B—Buses, Vans and Systems, available [here](#).

- b. For automated vehicles acquired for use in a demand responsive system that do not follow a fixed route, inaccessible vehicles may be acquired and the equivalent service requirements under 49 CFR § 37.77(c) would apply.
- 5. Are fully automated buses (see Level 4 High Driving Automation and Level 5 Full Driving Automation in SAE J3016_201806) with no human operator or on-board attendant considered “accessible” under ADA?
 - a. Transit bus operators currently assist customers with disabilities. The ADA regulations, for example, require all transit buses and vans to be equipped with securement devices and ramps or lifts for wheelchair users, and § 37.165(f) requires that personnel assist individuals with disabilities in using these devices, when necessary. Fully automated buses are not yet publicly available, and although robotic and technologies solutions have been developed with a goal of allowing individuals with disabilities to independently access and use transit vehicles (e.g., automated securement) without assistance, more research is needed to determine whether some meet ADA standards and requirements. FTA plans to work closely with stakeholders, such as the United States Access Board, and sponsor research on this question. In the meantime, some transit agencies have discussed having a non-driving employee available for onboard assistance.
- 6. Do automated transit vehicles purchased or leased for temporary pilots and demonstrations need to be ADA-compliant?
 - a. Yes. ADA regulations apply to all transit services that are open to the public; there is no blanket exemption for temporary pilots or demonstrations. The specific ADA requirements for vehicles may depend upon the type of transit service that is offered (fixed route or demand response).

Title VI

- 7. Do Title VI requirements apply to automated transit service?
 - a. Yes. Under 49 CFR Part 21, Title VI requirements apply to recipients receiving Federal financial assistance. To the extent that transit services are modified as a result of automation, there is the potential for disparate treatment, disparate impacts, or disproportionate benefits and burdens to different communities. A transit agency is responsible for complying with Title VI and considering environmental justice as it adopts automated transit technologies.

Federal Motor Vehicle Safety Standards (FMVSS)

- 8. Do automated transit buses need to comply with the Federal Motor Vehicle Safety Standards (FMVSS)? What about novel vehicle types, such as low-speed automated shuttles?

- a. All new motor vehicles – including those with varying levels of automation – manufactured for sale, sold, introduced into interstate commerce or imported into the U.S. must meet applicable Federal Motor Vehicle Safety Standards (FMVSS), which are administered by the [National Highway Traffic Safety Administration \(NHTSA\)](#), not FTA. However, FTA coordinates with NHTSA on vehicle safety and automation, and will continue to do so as new technologies are introduced. Please see question 9 regarding information about exemptions and vehicles that are not required to meet FMVSS.
 - i. Relevant text from [FTA FAQs on FMVSS](#) states that in order to comply with FTA funding eligibility requirements, the recipient must ensure that the vehicle complies with NHTSA’s safety standards. As stated in FTA’s [Post-Delivery Review Requirements](#), the recipient must ensure that the manufacturer’s FMVSS certification label is affixed to the vehicle, complete an FMVSS certification (see [sample certification form](#) in Exhibit A-10), and file the FMVSS certification for future FTA reviews.
 - b. [Automated Driving Systems 2.0: A Vision for Safety](#) provides voluntary guidance on Automated Driving Systems (ADS) development. The purpose of this voluntary guidance is to help designers analyze, identify, and resolve safety considerations prior to deployment using their own industry, and other, best practices. The document encourages entities to have a documented process for assessment, testing, and validation of their crash avoidance capabilities and design choices to ensure safe operation. The voluntary guidance was reinforced and expanded with considerations for the public transit industry in the USDOT policy document on automation, [Preparing for the Future of Transportation: Automated Vehicles 3.0](#).
9. Is there an FMVSS exemption for automated transit buses used in demonstrations or pilots?
- a. NHTSA has two exemption processes, one of which is exclusively for manufacturers (not transit agencies) and the other is for entities that seek to import noncompliant vehicles for purposes of research, investigations, demonstrations, training, competitive racing events, show, or display. Additionally, vehicles introduced into interstate commerce (i.e., driven on public roads) solely for testing and evaluation are not required to meet FMVSS if they are manufactured by an entity that had manufactured a certified motor vehicle on or before December 4, 2015. More information on NHTSA’s exemption process for manufacturers can be found [here](#) and more information on NHTSA’s import exemption can be found [here](#).

Federal Motor Carrier Safety Regulations (FMCSR)

10. Are remote monitors and/or operators of automated vehicles considered “drivers” who require a Commercial Driver’s License (CDL)? Do Federal Motor Carrier Safety Regulations (FMCSRs) apply to these employees?

- a. The FMCSRs, which are administered by the [Federal Motor Carrier Safety Administration \(FMCSA\)](#), do not currently differentiate between a driver, a monitor, or a remote operator for the purposes of CDL requirements. However, the Department is looking at this issue and will provide more information in the future.

Transit Bus Automation in Relation to Federal Transit Administration (FTA) Requirements

The FAQs under this section highlight transit bus automation in relation to FTA requirements, including FTA's Buy America, Awards Management, and Bus Testing requirements, amongst others.

Buy America

1. Do Buy America requirements apply to automated transit vehicles, including pilot programs and testing?

- a. FTA's Buy America requirements (49 U.S.C. § 5323(j)) apply to all third-party procurements by FTA grant recipients, including rolling stock such as automated vehicles. A grantee must include in its bid or request for proposal (RFP) specification an appropriate notice of the Buy America provision and require, as a condition of responsiveness, that the bidder or offeror submit with the bid or offer a completed Buy America certificate in accordance with 49 CFR §§ 661.6 or 661.12. When using Federal funds to procure rolling stock, including rolling stock prototypes and vehicles to be used in pilot programs and demonstration projects, the cost of the components and subcomponents produced in the U.S. must be:

- i. More than 65 percent for FY2018 and FY2019.
- ii. More than 70 percent for FY2020 and beyond.

Final assembly for rolling stock also must occur in the U.S. Additionally, rolling stock procurements are subject to the pre-award and post-delivery Buy America audit provisions set forth in 49 U.S.C. § 5323(m) and 49 CFR part 663. While non-revenue vehicles are not subject to the same requirements for pre-award and post-delivery audits, they still are covered by Buy America regulations. You may find additional information [here](#).

2. Many of the top-of-the-line components that would make up an automated transit vehicle are not available from manufacturers in the United States. Will FTA grant waivers to transit agencies for procuring automated vehicle technology components during the initial launch of these types of vehicles?

- a. Under very limited circumstances, FTA may waive Buy America requirements if the agency finds that:
 - i. Application of Buy America is inconsistent with the public interest;

- ii. The steel, iron, or manufactured goods (including rolling stock) produced in the U.S. are not produced in a sufficient and reasonably available amount or are not of a satisfactory quality; or
- iii. Including domestic material will increase the cost of the overall project by more than 25 percent for rolling stock.

The process for seeking a waiver is set forth in 49 CFR Part 661. Consistent with Executive Order 13788, it is the policy of the Federal government, including U.S. Department of Transportation, to maximize the use of goods, products, and materials produced in the United States. Therefore, the Department examines all Buy America waiver requests carefully and thoroughly, and requires detailed information from the applicant regarding the need for a waiver. FTA's proposed determinations on waiver requests are published in the Federal Register for notice and comment.

Useful Life

- 3. How will useful life requirements be applied for automated vehicles?
 - a. Under FTA's Award Management Requirements Circular ([FTA C 5010.1E](#)), minimum useful life requirements for rolling stock generally are determined by vehicle type (e.g., 12 years or 500,000 miles for large, heavy-duty transit buses; 4 years or 100,000 miles for light-duty vehicles). Useful life for automated vehicles will therefore depend on the vehicle type.
 - b. FTA is aware that manufacturers are developing novel vehicle designs for which there is currently limited information on vehicle performance. Once that information is gathered, further assessment will be made. More information on overhaul and minimum useful life criteria can be found under FTA's Award Management Requirements Circular ([FTA C 5010.1E](#)).
- 4. Will automated transit vehicles be exempted from useful life requirements for automation pilots and demonstrations?
 - a. Yes. Useful life requirements do not apply to pilots and demonstrations funded through FTA's Public Transportation Innovation Program (49 U.S.C. § 5312).

Spare Ratio

- 5. What are the spare ratio requirements for automated vehicles?
 - a. Under FTA's Award Management Requirements Circular ([FTA C 5010.1E](#)), the basis for determining a reasonable spare bus ratio takes local circumstances into account. The number of spare buses in the active fleet for recipients operating 50 or more fixed route revenue vehicles should not exceed 20 percent of the number of vehicles operated in maximum fixed route service. FTA does not set a specific spare ratio for smaller operators, but expects the number of spare buses to be reasonable, taking into account

the number of vehicles and variety of vehicle types and sizes. Recipients of buses recently procured may seek approval of a short-term deviation, up to two years, from the FTA Regional Administrator, of the spare ratio requirements for small deviations.

Leasing

6. Can FTA provide flexibility for the capital lease of automated transit vehicles?
 - a. Leasing of rolling stock is permitted under FTA grant programs as a capital expense. FTA provides information about leasing [here](#).
 - b. Leasing of rolling stock is also permitted under FTA's Capital Cost of Contracting. In some instances, FTA recipients turn to an outside source to obtain public transportation service, maintenance service, or vehicles that the recipient will use in public transportation service. When a recipient enters a contract for such service, FTA will provide assistance for the capital consumed in the course of the contract. In the case of a contractor providing vehicles for public transportation service, the capital consumed is equivalent to the depreciation of the vehicles in use in the public transportation service during the contract period. For more information on capital cost of contracting see FTA's Urbanized Area Formula Program Circular ([FTA C 9030.1E](#)).

Workforce and Labor

7. Are there any Federal requirements that affect transit agencies' ability to change staffing levels as they adopt automated transit buses?
 - a. Yes. The Federal requirements addressing labor standards are set forth in 49 U.S.C. § 5333. Specifically, 49 U.S.C. § 5333(b) requires the Department of Labor (DOL) to determine whether the interests of employees affected by assistance under most FTA grant programs are protected under arrangements DOL concludes are fair and reasonable. These arrangements include the preservation of rights and benefits of employees under existing collective bargaining agreements, the continuation of collective bargaining rights, the protection of employees against a worsening of their positions in relation to their employment, assurances of employment to employees of acquired transit systems, priority of reemployment, and paid training or retraining programs. DOL information on Mass Transit Employee Protections may be found [here](#).
 - b. Transit agencies also should consider the extent to which automated transit technologies will likely create new job functions, such as maintaining automation systems or remotely monitoring vehicles, which may require new training and/or recruiting and retention efforts.

Bus Testing

8. Will FTA's New Model Bus Testing Center apply to automated vehicles?

- a. Under 49 CFR § 665.3, FTA Bus Testing applies to recipients of FTA financial assistance. In general, automated vehicles that meet FTA’s definition of a “bus” (a rubber-tired automotive vehicle used for the provision of public transportation service by or for a recipient of FTA financial assistance) and that are acquired with FTA grant funds must meet Bus Testing requirements.
 - b. Automated buses that are based on a previously-tested bus model generally will be eligible for Partial Testing procedures; only those tests in which FTA would expect to obtain significantly different data would need to be repeated. More information about Partial Testing is available [here](#).
 - c. If an automated vehicle as a whole represents a significant new technology or contains design features that have not previously been applied in the transit industry or in similar applications, AND which may be expected to require significant refinement, optimization, or operating experience before the manufacturer can reasonably commit the design feature or component to production, then up to five units of the vehicle might be eligible for a Prototype Waiver from Bus Testing. Prototype Waivers are NOT automatic, and must be requested and granted on a case-by-case basis. More information about eligibility and applying for Prototype Waivers is available [here](#).
9. Do FTA’s Bus Testing requirements apply to automated vehicle demonstrations funded by FTA’s Public Transportation Innovation Program (49 U.S.C. § 5312)? Are automated vehicles subject to bus testing prior to field demonstrations?
 - a. Yes, the current Bus Testing requirements in 49 U.S.C. § 5318 and 49 CFR Part 665 apply to ANY bus acquired with FTA funding under Chapter 53 of Title 49, United States Code.
10. Is FTA considering additional bus testing requirements for automated buses?
 - a. FTA is assessing whether additional or modified requirements would be appropriate for automated transit buses. More information, specifically related to Bus Testing, can be found [here](#).
11. How would FTA bus testing requirements apply to remanufactured vehicles equipped with certain automation capabilities?
 - a. The Bus Testing Regulation does not currently apply to remanufactured buses, except that the original vehicle must have met Bus Testing requirements at the time the original owner acquired it. FTA’s Award Management Requirements Circular ([FTA C 5010.1E](#)) provides additional information on FTA’s current policies regarding remanufactured vehicles.
 - b. FTA’s Bus Testing Program (49 U.S.C. § 5318) only requires testing of new bus models. Bus Testing is not required if a grantee rebuilds or modifies vehicles in its existing fleet.

Drug and Alcohol Testing

12. If automated public transit operations are contracted out, does the on-board safety monitor or remote operator of the automated transit vehicle have to comply with FTA's drug and alcohol testing?
 - a. Yes. Contractors performing a safety-sensitive function are required to have a drug and alcohol testing program. A contractor must have a substance abuse testing policy compliant with 49 CFR Parts 40 and 655 in place before its employees may be permitted to perform safety-sensitive functions. More information can be found [here](#) and [here](#).

Transit Asset Management

13. Will Transit Asset Management (TAM) regulations incorporate automated transit bus terminology?
 - a. TAM guidelines are written in a manner such that they apply to all forms of technology and are anticipated to change as needed.
 - b. TAM guidelines specify Useful Life Benchmarks (ULB) to track the performance of an asset, but these can be established on an agency-to-agency basis to suit their specific operating environment. The TAM ULB refers to the maximum age of the asset, or the point at which the asset enters the state of good repair backlog. The ULB is used solely for setting state of good repair performance targets for equipment and rolling stock asset categories; it does not affect funding eligibility.

National Transit Database

14. How should agencies report their automated bus transit service to the National Transit Database (NTD)? Will new definitions or categories be required?
 - a. Ridership, costs, and other statistics for automated buses should be reported to NTD under the appropriate modal category, such as Motor Bus or Demand Response. FTA is aware that some innovative services may create definitional issues, and may issue further clarification and guidance to assist with NTD reporting. Additionally, FTA is aware that automation may involve new vehicles and service models, raising a number of technical issues with regard to definitions, reporting requirements, vehicle classification, and similar issues. FTA will be conducting a policy review as part of its transit bus automation research to identify -- and where possible, resolve -- these issues.

Transit Bus Automation in Relation to Other Considerations

The FAQs under this section highlights transit bus automation in relation to other considerations, including Open Data, Cybersecurity, and Liability and Insurance, amongst others.

Data

1. Who owns the data generated by automated vehicles? How will it be stored?

- a. Regardless of the contractual relationship agencies have for automated vehicles and transit service provisioned through such vehicles, agencies should collect or have access to the data necessary to conduct oversight and management of service and operators, if applicable. The contractual relationship between agencies and suppliers can determine the data ownership issues that must be addressed. There is no “one size fits all” data ownership model, and agencies should work with their suppliers to develop mutually beneficial terms of data ownership, access, and storage.
- b. USDOT supports the “open data” concept, and encourages agencies and suppliers to develop relationships that help the transit industry as a whole benefit from testing and demonstration of automated transit vehicles. When such testing and demonstration projects receive Federal research funding, the USDOT Public Access Plan applies (<https://ntl.bts.gov/public-access>) to ensure access to Federally-funded scientific research results for both USDOT and the public, as appropriate.
- c. FTA is participating in a USDOT-wide initiative on AV data exchanges that has identified data, including standards and reporting, as an area of further research.

Cybersecurity

2. What can transit agencies do to ensure cybersecurity for automated vehicles?
 - a. USDOT encourages transit agencies to develop a comprehensive cybersecurity strategy, including cyber incident response. In addition, FTA has prepared [guidance](#) in this area. Cybersecurity training should be developed and updated for all transit agency staff, including specific training for staff responsible for critical IT assets.
 - b. FTA understands that automation will introduce new cybersecurity issues and potential vulnerabilities, and will be working with transit agencies on research in this area.
 - c. Information and intelligence should be shared with the Public Transportation Information Sharing and Analysis Center (PT-ISAC), which provides a secure, two-way reporting and analysis structure that enables the transmission of critical alerts and advisories as well as the collection, analysis and reporting of security information for transit agencies across the nation. More information can be found [here](#).
 - d. The Surface Transportation Cybersecurity Toolkit provides cyber risk management information to surface transportation operators who have less than 1,000 employees. Information on the toolkit can be found [here](#).

Standards

3. Are there any technical standards for automated transit buses?
 - a. No. There are no technical standards or widespread industry standards for automated buses and shuttles. However, FTA will be conducting research to support the

development of safety and other standards in this area as new automation technologies are developed, demonstrated and deployed. A variety of Standards Development Organizations are addressing automation in surface transportation that could be applicable to transit vehicles in the future.

Liability and Insurance

4. What are the liability and insurance requirements related to automated vehicles?
 - a. FTA does not directly regulate product liability and related insurance issues, for either conventional vehicles or automated vehicles. Automation is expected to bring changes to agency operations that may require changes to insurance coverage. Automation's impact on liability and insurance has been the subject of several research reports, but this area continues to evolve. Transit agencies, working with their insurers and state regulators, are in the best position to assess their liability exposure and insurance coverage.