

FY 2022 Competitive Funding Opportunity: Advanced Driver Assistance Systems (ADAS) for Transit Buses Demonstration and Automated Transit Bus Maintenance and Yard Operations Demonstration Notice of Funding Opportunity (NOFO)

Frequently Asked Questions

Updated: November 10, 2022

Opportunity ID: FTA-2022-015-TRI-STAR

NOTE: It is FTA's intent and expectation that the list of FAQs will evolve over time. We encourage all interested parties to revisit this FAQs posting on a periodic basis as appropriate.

Eligibility

1. Who is eligible to apply for this program?

Eligible applicants include:

- Public transit agencies;
- State/local government entities;
- Metropolitan planning organizations (MPOs);
- Federally recognized Indian tribes; and
- Institutions of higher educations, particularly those with Minority Serving Institution status

2. How are "public transit agencies" defined? Would a nonprofit organization that provides public transit service be eligible as an applicant and/or partner/subrecipient?

A public transit agency provides public transportation as defined by 49 USC 5302(14). An organization that provides public transportation as defined by 49 USC 5302(14) is eligible as an applicant and/or partner/subrecipient.

3. Do I have to be an existing FTA grantee to be eligible to apply for this NOFO?

You do not need to be an existing FTA grantee to compete for this NOFO. If you are an eligible applicant, you are eligible to apply. Please note that if you are not an existing FTA grantee, you will need to become one if selected for award and will be responsible for compliance with any applicable Federal requirements.

4. My organization is not included in the list of eligible applicants. May we partner with an eligible applicant on their application?

Yes, eligible applicants are encouraged to identify one or more project partners with a substantial interest and involvement in the project activities or objectives to participate in the implementation of the project.

Eligible project partners under this program may include, but are not limited to:

- Bus manufacturers;

- Technology system suppliers, developers, and integrators;
- Operators of transportation services, such as employee shuttle services, airport connector services, university transportation systems, or parking and tolling authorities;
- State or local government entities;
- Labor unions and other workforce representatives; and
- Other organizations, including consultants, research consortia, and not-for-profit industry organizations.

5. Must an organization competitively select partners before including them in an application? No; however, applicants are advised that any changes from the proposed partnership after selection will require FTA's written approval, must be consistent with the scope of the approved project, and may require competitive procurement unless an exception applies.

If an application that involves a partnership identified in the application is selected for funding, the competitive selection process will be deemed to satisfy the requirement for a competitive procurement under 49 U.S.C. 5325(a) for the named entities.

6. If the lead applicant has selected specific partners clearly documented in the application, are competitive procurement requirements considered met if the project is selected for funding? Yes; however, applicants are advised that any changes from the proposed partnership after selection will require FTA's written approval, must be consistent with the scope of the approved project, and may require competitive procurement unless an exception applies.

Project Types and Eligible Activities

7. What types of projects can be funded by this program?

Two types of projects are eligible:

- **Advanced Driver Assistance Systems (ADAS) for Transit Buses Demonstration:** these projects will demonstrate market-ready or near market-ready ADAS technologies for use in revenue service to assess technology readiness and effectiveness, address technical issues, identify benefits and costs, and measure impacts.
- **Automation for Maintenance and Yard Operations Demonstration (Phase 1):** these projects will include concept(s) of operations and limited proof of concept demonstrations of automation for maintenance and yard operations. Additional funding may be provided for Phase 2 operational demonstrations with additional functionality, subject to availability of funds.

8. What use cases are included in this program?

- For **ADAS for Transit Buses** demonstrations, use cases may include smooth acceleration and deceleration, automatic emergency braking and pedestrian collision avoidance, curb avoidance, precision docking, narrow lane/shoulder operations, and platooning.
- For **Automation for Maintenance & Yard Operations** demonstrations, use cases may include precision movement for fueling/recharging, maintenance, disinfection, and/or bus wash; and automated parking and recall.

These are examples of potential use cases and are not exhaustive lists.

9. What types of activities are eligible?

For both demonstration types, eligible activities include applicable systems engineering activities leading to the demonstration, such as requirements, architecture, and design development; equipment installation and integration; and testing. Workforce engagement, training, and skills development activities are also eligible.

10. What is meant by market-ready or near market-ready ADAS technologies?

FTA understands that there are commercially available advanced driver assistance systems (ADAS) technologies for other vehicle types (e.g., light-duty vehicles and heavy-duty commercial trucks), that have not yet been adapted for use in transit buses. The project is not intended to support basic research or early research and development (R&D), but rather the application and testing of components which are either currently in use in other contexts or which require only minor modification to support their intended use in transit buses.

11. Do I have to charge fares for “revenue service” included in an ADAS demonstration?

FTA’s National Transit Database (NTD) defines revenue service as the time when a vehicle is available to the general public and there is an expectation of carrying passengers. Vehicles operated in fare free service are considered in revenue service. For more information, see the [NTD Glossary](#).

12. Is there a preference for the type of service (e.g., fixed route or flexible route) for the ADAS demonstrations?

Any type of service in revenue service operations for the ADAS demonstration is an eligible project.

13. Are projects that include technologies that alert bus operators of collisions where the bus operator must take action (e.g., apply brakes, turn steering wheel) or provide situational awareness to the bus operator eligible?

No, FTA seeks projects demonstrating ADAS technologies that include automated actuation of braking, steering, or acceleration/deceleration. Systems that only provide an alert for the driver to take action are not eligible.

14. Are backup cameras or driver alerts when backing up or parking considered eligible ADAS projects for this NOFO?

These may be included as a component of a driving automation system, but the system needs to do more than provide visual or audio alerts – for example, by providing automated braking.

15. Can you elaborate on the automation levels that are eligible for the demonstration projects?

- For **ADAS for Transit Buses** demonstrations, features that include automated actuation of controls (e.g., acceleration/deceleration, braking, or steering) are eligible. Such eligible systems can include momentary automated actuation (e.g., automatic emergency braking) or sustained automated actuation (e.g., adaptive cruise control or lane centering). Eligible driving automation systems can be Level 0 (provided that they include automated actuation of controls), Level 1, or Level 2, as defined by the SAE J3016 standard (see https://www.sae.org/standards/content/j3016_202104/).
- For **Automation for Maintenance & Yard Operations** demonstrations, the STAR Plan envisions operational demonstrations to include Level 4 features, as defined by the SAE J3016 standard. FTA acknowledges, however, that Phase 1 focuses on a limited proof of concept, and the SAE

levels are meant to describe mature systems. FTA does not foresee an automated demonstration without a safety driver.

16. What is included in a “limited proof of concept” for a Phase 1 Automation for Maintenance and Yard Operations Demonstration?

The limited proof of concept should demonstrate that the concept(s) of operations are feasible. Bus movement needs to be automated; the implementation of a standard yard management system without vehicle automation is not an eligible project. Demonstrations should be conducted with vehicles that are broadly representative of those currently comprising a transit agency’s fleet in terms of size and passenger capacity.

Conducting the Phase 1 demonstration at an active bus yard is preferred, but offsite facilities and test tracks will be considered. Phase 1 will result in lessons learned and potential next steps for a possible Phase 2 if the proof of concept proves to be successful.

17. For the Automation for Maintenance and Yard Operations Demonstration, the NOFO mentions that for phase 1 proof-of-concept testing, an active bus yard is preferred but offsite facilities and test tracks will be considered. Will the decision to use offsite facilities or test tracks for a project have a negative impact on the project’s competitiveness for an award? The Automated Transit Bus Maintenance and Yard Operations Demonstration phase 1 proof of concept is preferred to be conducted in an active bus yard but offsite facilities and test tracks will be considered. FTA will review and evaluate the proposals holistically based on evaluation criteria outlined in the NOFO.

18. Is yard operations specifically tied to transit bus maintenance only? Can the demonstration project be for proving the concept using a different yard operations application (e.g., a logistic center’s truck yard operations), and then apply the same concept to transit bus operations?

The Automatic Transit Bus Maintenance and Yard Operations demonstration Phase 1 proof of concept is preferred to be conducted in an active bus yard; offsite facilities and test tracks will be considered. Demonstrations should be conducted with vehicles that are broadly representative of those currently comprising a transit agency’s fleet in terms of size and passenger capacity.

19. Could bus simulation or driver training through bus simulation be a eligible activities?

Simulations may be eligible activities as a component of either demonstration. For the ADAS for Transit Buses Demonstration, the project must include a 12-month field operational demonstration in revenue service. For the Automation for Maintenance and Yard Operations Demonstration, the project must include a limited proof of concept test either in an active bus yard, offsite facility, or test track. Operator training is an eligible expense for both demonstrations.

20. What would occur in a potential Phase 2 of an Automation for Maintenance and Yard Operations Demonstration?

Phase 2 is envisioned to result in a longer-term (12-24 month) operational demonstration on a transit property and additional functionality (for example, expanding the number of equipped vehicles, locations within the yard, or expanded automation of functions). Phase 2, if funded, should be located in an active bus yard.

21. Must applicants equip all of their revenue vehicles with the proposed technology (either for the ADAS or the Maintenance and Yard Operations demonstration)?

No, it is not required to equip 100% of a fleet. Demonstrations which equip a subset of the applicant's fleet are eligible.

Regulatory Requirements

22. Do the vehicles need to comply with the requirements in the Federal Motor Vehicle Safety Standards (FMVSS) and Federal Motor Carrier Safety Regulations (FMCSR)?

- Applicants must comply with all applicable safety requirements, including the FMVSS and FMCSR, which are administered by the National Highway Traffic Safety Administration (NHTSA) and the Federal Motor Carrier Safety Administration (FMCSA) respectively.
- If the vehicles do not comply, the application should either:
 - show that the vehicles and their proposed operations are within the scope of an exemption or waiver that has already been granted by NHTSA, FMCSA, or both agencies, or
 - directly address whether the project will require exemptions or waivers from the FMVSS, FMCSR, or any other regulation and, if the project will require exemptions or waivers, present a plan for obtaining them.

For more information, see FTA's Transit Bus Automation [Policy FAQs](#).

23. Do vehicles and services need to comply with the Americans with Disabilities Act (ADA)?

Yes, demonstration activities which are open to public ridership are subject to U.S. DOT accessibility regulations, including ADA regulations at 49 CFR Parts 27, 37, 38, and 39. For more comprehensive information on accessibility in public transportation, visit FTA's [ADA webpage](#) and FTA's Transit Bus Automation [Policy FAQs](#).

24. Do Buy America regulations apply to this program?

Yes, all capital procurements must meet FTA's Buy America requirements and the Build America, Buy America Act's domestic preference requirements for infrastructure projects, as applicable. For more information, see FTA's [Buy America webpage](#) and FTA's Transit Bus Automation [Policy FAQs](#).

Revenue service vehicles are required to complete pre-award and post-delivery auditing pursuant to 49 CFR Part 663. See, e.g., FTA's [Buy America Handbook](#) for more information.

25. We don't plan to include vehicle costs. Does the vehicle itself then have to comply with FMVSS, ADA, and Made in America requirements?

FMVSS: Applicants must comply with all applicable safety requirements, including the FMVSS. If the vehicle does not comply, the application for the FTA funding opportunity should either:

- show that the vehicle and its proposed operation is within the scope of an exemption that has already been granted by NHTSA, or
- directly address whether the project will require an exemption from the FMVSS, and if the project will require an exemption, present a plan for obtaining it.

The applicant should consult NHTSA regarding whether any changes to the vehicle will require a new petition for exemption to FMVSS requirements.

ADA: FTA requires accessible vehicles (ADA compliant) for both the ADAS for Transit Buses Demonstration and Automated Transit Bus Maintenance and Yard Operations Demonstration, as FTA remains consistent with enforcing the ADA requirements in all of its research demonstration projects.

Buy America: So long as the vehicle was originally purchased with entirely local (non-Federal funds) and not for the purpose of carrying out award activities (i.e., the purchase was not in scope of the FTA project), then Buy America will not apply to the preexisting inventory.

26. Concerning the Disadvantaged Business Enterprise (DBE) requirements outlined in section F.2.3 in the NOFO, will a “partner” organization be considered a “prime contractor”?
- Exactly how the private partner will be treated for purposes of the DBE program depends on how the partnership is structured, how much funds are involved, and how those funds are administered. FTA would need to know if the private partner is indeed/de facto a prime contractor (i.e., there is an agreement between the transit agency and the private partner that requires the former to transfer funds to the latter in exchange for something of value); how the partners are financing the local match; how much FTA funds the private entity would receive; whether any FTA funds would be awarded to third-parties; and if any third-party contracts are to be awarded, how those contracts would be administered.

Funding and Timeline

27. How much funding is available for each demonstration type?

- For **ADAS for Transit Buses** demonstrations, up to \$5 million will be awarded.
- For **Automation for Maintenance & Yard Operations** demonstrations, up to \$1.5 million will be awarded for Phase 1 activities. Additional funding may be provided for a second phase subject to availability of funds.

28. Is there a cost sharing or matching requirement?

Yes, the maximum Federal share of project costs under this program is limited to 80%. So, at least 20% of the total project cost must be provided by the applicant and its partners. The applicant must provide the non-Federal share of the net project cost in cash or in kind. Applicants must document in the application the source of the local match. The local match cannot include other Federal funding. Eligible sources of non-Federal match are detailed in [FTA Circular 6100.1E](#).

29. Can the salary of the employees working on the project be considered as in-kind contributions?

Salaries of employees working on the project may be considered as an in-kind contribution. Note however, that neither costs nor the values of third party, in-kind contributions may count toward satisfying a cost-sharing or matching requirement of a Federal or federally assisted project, if they have been or will be counted toward satisfying a cost-sharing or matching requirement of another Federal or federally assisted project, a Federal procurement contract, or any other award of Federal assistance.

30. Can an applicant apply for a Phase 2 demonstration of an Automation for Maintenance and Yard Operations project at this time?

No, funding is currently only available for Phase 1 projects.

31. Is there a minimum or maximum award size? How many awards does FTA intend to make under this program?

There is no minimum award size. The maximum award for a single project is limited to the funding available for each demonstration type (\$5 million for ADAS, \$1.5 million for Maintenance and Yard Operations). However, FTA may make multiple awards. FTA anticipates competitively selecting up to three projects for each of the two types of demonstrations.

Applicants are encouraged to identify scaled funding options in case funding is not available to fund a project at the full requested amount. If an applicant indicates that a project is scalable, the applicant must provide an appropriate minimum funding amount that will fund an eligible project that achieves the objectives of the program and meets all relevant program requirements. FTA may award a lesser amount regardless of whether a scalable option is provided.

32. When will the selected projects be announced?

FTA is targeting announcement of selected projects in spring 2023.

Applying for the Program

33. Where do I submit my application?

You must submit your application via Grants.gov. The funding opportunity ID is [FTA-2022-015-TRI-STAR](#).

34. What is the deadline to apply?

Applications must be received in the Grants.gov system by 11:59pm Eastern time on November 21, 2022.

35. What documents are required as part of my application?

You must submit:

- Form SF-424, Application for Federal Assistance. This can be filled out directly within Grants.gov.
- The Grants.gov Lobbying Form. This can be filled out directly within Grants.gov.
- The [Supplemental Form](#) for this funding opportunity, downloadable from FTA's website. This must be uploaded as an attachment to Grants.gov.
- A project approach and proposed scope of work. This document is limited to 15 pages and must be uploaded as an attachment to Grants.gov. This document should describe the following:
 - Project background;
 - Technical information including proposed impact and outcomes;
 - Project approach including major tasks and milestones/deliverables, overall workflow and timeline, roles and responsibilities, anticipated project risks and mitigation strategies, knowledge transfer activities, and proposed costs/budget; and the
 - Team organizational capacity and staff experience.

Applicants may also attach additional supporting information and other materials or information relevant to the demonstration such as letters of support from key stakeholders, which are not subject to the 15-page limit of the project approach and proposed scope of work attachment.

36. The supplemental form document does not appear to load. I have the latest version of Adobe Reader, however, and I am able to load the opportunity announcement.

On the [Supplemental Form](#) webpage, please note that you must right-click on the file hyperlink and save it (save link as) on your local drive, then open the local file through Adobe Reader application to fill out the form as indicated.

37. How will FTA evaluate my application?

A technical evaluation committee will evaluate applications based on the following criteria:

- Project Impact and Outcomes
- Project Approach
- Organizational Capacity and Staff Experience
- Technical, Legal, and Financial Capacity

Based on the review of the technical evaluation committee, the FTA Administrator will determine the final selection for program funding.

38. Can I submit more than one application?

Yes. For example, an applicant may apply for an ADAS Demonstration and submit a separate application for an Automated Transit Bus Maintenance and Yard Operations Demonstration. Other examples include an applicant teaming with different partners or an organization/partner teaming with different applicants.

39. Are applicants allowed to and/or encouraged to submit to both demonstration types?

Applicants may submit to both demonstration types. If they do, they are encouraged to submit separate applications, one for each demonstration type (as opposed to one, combined application).

Project Execution

40. How long should demonstrations funded under this program last?

- For an **ADAS for Transit Buses Demonstration**, the project must include a minimum 12-month operational demonstration in revenue service.
- For an **Automation for Maintenance & Yard Operations Demonstration**, the first phase of the project must include one or more concepts of operations and limited proof of concept demonstrations, which must be conducted within 12 months of project award. Phase 2, if funded, is envisioned to result in a longer-term (12-24 month) operational demonstration in an active bus yard.

41. For the ADAS for Transit Buses Demonstration, the NOFO states that projects will consist of a minimum 12-month operational demonstration in revenue service. If the demonstration will take 12 months, what is the time period for the design development, equipment installation, and pre-demonstration testing?

For the ADAS for Transit Buses Demonstration, there is no time requirement for completing pre-demonstration activities. In the past, FTA has applied a general rule of completing pre-demonstration activities for transit bus automation research projects within 12 months of award.

42. Does the 12-month requirement from time of award to completion of project apply to ADAS or just yard automation?

The 12-month requirement from time of award to completion of project applies to the phase 1 yard automation proof-of-concept demonstration and not the ADAS demonstration. There is no time requirement for the ADAS demonstration project except for the requirement to conduct a revenue service field demonstration for a period of no less than 12 months.

43. Does the 12-month phase 1 yard automation demonstration requirement start with the announcement of awards or when the recipient executes its cooperative agreement with FTA?

The 12-month requirement for the phase 1 yard automation proof-of-concept demonstration starts from the time that the project is awarded in TrAMS.

44. How will selected projects be evaluated?

An FTA-selected independent evaluator will produce an evaluation report. The project team is required to work with the independent evaluator to develop an evaluation plan, provide data to the independent evaluator for analysis, and review the draft evaluation report prior to publication. Project teams are not expected to conduct a self-evaluation; a self-evaluation is not an eligible project expense for this effort.

45. Could you provide more clarity on the evaluator's role during the project and at what stage will they be engaged in the project (planning, execution, testing, analysis, reporting, etc.)?

An independent evaluation (IE) is required by Federal public transportation law (49 U.S.C. § 5312(e)(4)) for demonstration projects receiving FTA Public Transportation Innovation funding. FTA will select the independent evaluator. The purpose of an independent evaluation is to identify the impacts and outcomes of the proposed research project and effectiveness of the goods, services, and products produced by the Federally-funded research project, in an unbiased manner. The independent evaluator will be engaged shortly after (a few months of) project award and will stay engaged during the duration of the project.

46. What data are required to be shared with the evaluator? Will the evaluator provide a list in advance?

The data to be shared with the evaluator will be determined during the project and be mutually agreeable among the FTA, evaluator, and project recipient (applicant) and its partners. The project recipient will be required to produce a Data Management Plan (DMP) that should adequately identify the data that will be collected, how the data will further the goals of the effort, how the data will be made accessible, and how the data will be stored. The DMP can be updated over time if the scope of the project or the type of data that will be collected changes. The evaluator will work

with FTA and the project recipient and its partners to develop a mutually agreeable evaluation plan that details the data to be collected for the evaluation. The evaluator may enter into a data agreement with the recipient and/or its partners.

47. What type of access to information and data is the evaluator expected to receive from project partners for their evaluation?

Examples of factors/metrics that may be included in an evaluation are provided in a bulleted list in section A.2 of the NOFO. The evaluator would need access to data/information to assess the factors/metrics as appropriate as agreed upon in the evaluation plan.

48. Should applications include costs related to the independent evaluation?

Applicants may include in their application costs for working with the independent evaluator. For example, this could include costs for collecting data, meeting with the independent evaluator, working with the independent evaluator on the evaluation plan, and reviewing the evaluation report.

49. Are surveys to capture user acceptance and perception of passengers, pedestrians and bicyclists an eligible expense?

Surveys would likely occur as part of the independent evaluation. Costs related to the development and administration of surveys and analysis and reporting of survey data would likely be incurred by the independent evaluator and would be part of the independent evaluator's budget. Applicants may include costs in their budget for activities associated with working with the independent evaluator on surveys.

50. Are independent evaluators suggested by the recipients or does the FTA choose them?

FTA will select the independent evaluator. FTA is not suggesting that applicants include an evaluation team in their application; in fact, it is not an eligible cost.

Other

51. Did FTA host a webinar for potential applicants?

FTA hosted a webinar for potential applicants on Thursday, October 6, 2022. You can access a recording of the webinar at <https://www.youtube.com/watch?v=tuppNZjIMfA>.

52. Are the October 6 webinar presentation slides available?

The webinar slides may be accessed at <https://www.transit.dot.gov/research-innovation/advanced-driver-assistance-systems-adas-transit-buses-demonstration-automated>.

53. We were not able to attend the webinar on October 6. Were any notes taken that could be shared with the public?

There are no notes from the webinar but the webinar was recorded and the slides are available (see FAQs above).