

Hybrid Fuel California Transit Bus Technology Research

Agency: Federal Transit Administration (FTA)

Action: Request for Proposals (RFP)

Summary:

The U.S. Department of Transportation (DOT), through the Federal Transit Administration (FTA), hereby requests proposals from public entities that will ultimately result in the award of one cooperative agreement to demonstrate, in revenue service, a small transit vehicle employing a hybrid propulsion system. For this project, small transit vehicles are defined as vehicles less than 30-feet in length. The demonstration project will support the development and analysis of advanced propulsion technologies for small transit vehicles. Due to legislative restraints the project must benefit the state of California specifically. Two of FTA's Strategic Research Goals are to protect the environment and promote energy independence. Proposals should address both objectives identified under this goal: Facilitate development of technologies to improve energy efficiency and reduce transit vehicle emissions; and identify and overcome barriers to adoption of clean technologies.

Background:

The Federal Transit Administration (FTA) provides Federal funding to support a variety of locally planned, constructed, and operated public transportation systems throughout the U.S., including buses, subways, light rail, commuter rail, streetcars, monorail, passenger ferry boats, inclined railways, and people movers. FTA's research activities are authorized by 49 U.S.C. 5312, Research, Development, Demonstration and Deployment Projects. These activities are designed to address the strategic goals of increasing transit ridership, improving safety and emergency preparedness, improving capital and operating efficiencies, and protecting the environment and promoting energy independence. Under the latter goal, FTA has identified hybrid propulsion systems as an area with potential to benefit the transit industry. Proposals responding to this request should address both objectives identified under the strategic research goal: Facilitate development of technologies to improve energy efficiency and reduce transit vehicle emissions; and identify and overcome barriers to adoption of clean technologies. Hybrid systems utilize two or more power sources to propel a vehicle. Most often, the term is used to refer to hybrid electric vehicles (HEV) which combine a traditional internal combustion engine (ICE) with one or more electric motors. These vehicles contain on-board energy storage systems (such as batteries or ultracapacitors) which can be recharged directly by the ICE or by capturing energy during braking. As these vehicles have increasingly appeared in the marketplace, recent developments have focused on plug-in hybrid electric vehicles (PHEV). These differ from traditional HEV's by the ability to recharge their on-board energy storage by connecting to an external electric power source. PHEV's generally include more energy storage on-board the vehicle to take full advantage of the plug-in capabilities, further decreasing fuel consumption. The increased focus on electrical power can also allow all-electric operation within a limited range. Another hybrid technology in development is to use hydraulic energy storage. Hydraulic hybrid systems are generally limited to launch assist applications, though can be adopted in higher capacities, up to a continuously variable transmission.

There has been significant interest in hybrid technology at Federal and local levels for several years. Many transit agencies have already purchased full-size hybrid electric transit buses. Over 1,000 diesel hybrid electric transit buses were procured between 2004 and 2008. However, there has not been much focus on deploying this new technology to small transit vehicles. These vehicles, most commonly 22 to 25-feet in length, are generally used for demand response service, and by small urban and rural agencies. Small transit vehicle designs are varied and widespread, and include small buses, cutaways and converted vans. Introducing hybrid technology to this market can improve the fuel efficiency of small transit vehicle fleets. Since hybrids still rely on ICE's for power, the maintenance and infrastructure requirements are largely the same as traditional small vehicles. Because of this, hybrid technology can be deployed to small agencies and remote areas much easier than other clean propulsion options.

Objectives:

This RFP is seeking proposals to demonstrate and evaluate a small transit vehicle employing a hybrid propulsion system in revenue service.

Description:

The project selected under this RFP should include the operation and evaluation of a 22 to 25-foot hybrid transit vehicle in revenue service, in partnership with at least one organization located in California. The project should work towards facilitating the introduction of hybrid technologies to small transit vehicles. The selected hybrid system should be innovative and work to advance the current state of the art, with a focus on commercial viability of the demonstrated technology. System development and integration costs will be allowed, but the duration of the proposed demonstration will be a review criterion. As such, it is encouraged that proposed projects are linked with existing efforts to develop innovative hybrid vehicles. The project must include a vehicle performance evaluation, based on objective data collection and analysis, including vehicle characteristics, performance and maintenance. This evaluation should be focused on data-based analysis of vehicle specifications, which can be used as objective input for the development of standard bus procurement guidelines. Ideally the analysis should be performed by an organization with experience evaluating transit vehicles, and familiar with relevant standards development organizations. FTA involvement will include approving key decisions and activities, attending review meetings, commenting on technical reports, maintaining frequent contact with the project manager and redirecting activities if needed.

Award Information:

FTA will award a cooperative agreement for the selected proposal up to \$241,065 in Federal funds. This will include all the terms of the FTA Master Agreement and FTA Circular [6100.1D](#), "[Transit Research and Technology Programs: Application Instructions and Program Management Guidelines](#)", which can be found on the FTA website (www.fta.dot.gov).

Cost Sharing or Matching:

FTA is requiring at least a 20% cost share for this project. Both quantity and quality of proposed cost share will be evaluation criteria. Extra weight will be given to projects that connect to other hybrid vehicle demonstration projects, including those supported by other Federal agencies. For project evaluation purposes, Federal sources will be eligible for cost share calculations.

Eligibility Information:

Proposed projects must include at least one partner located in the state of California. Eligible recipients include State and local government agencies, public and private transit agencies, legally constituted public agencies, operators of public transportation services, non-profit organizations, and universities.

Application Review Information:

A review panel of industry experts will be convened to review each proposal based on the following criteria:

1. Proposed research, which includes the applicability of the proposed research to the requirements, the uniqueness of the research approach or the need for the research, and the expected results. Projects should be narrowly defined to explain how a particular design, technology or system will improve hybrid approaches to increasing the fuel efficiency of small transit vehicles. The proposal must include number of vehicles, projected demonstration miles, description of demonstration miles (i.e., revenue service, test track, etc.), connection to similar projects and description of the long-term commercial viability of the proposed technology.
2. Qualifications of Key Personnel, which includes knowledge of and prior experience with transit research and hybrid vehicles.
3. Technical Management Plan, which includes the management approach for planning, scheduling, administering, coordinating and conducting the work effort.
4. Past Performance on activities related to the proposed work.
5. Cost, Cost Sharing and Industry Partnerships
6. Plan for project evaluation and data collection. The proposal must address how success will be measured (e.g., total operational miles of demonstration vehicle, fuel efficiency, etc.). The proposal must also include a plan to provide objective analysis of the vehicle performance which can be used as input for the development of ideal vehicle functional specifications.