
Office of Inspector General

Audit Report

FTA'S TRANSIT RESEARCH PROGRAM PLAN IS OUTDATED

Federal Transit Administration

Report Number: ST-2015-017

Date Issued: January 13, 2015






Memorandum

U.S. Department of
Transportation

Office of the Secretary
of Transportation
Office of Inspector General

Subject: **ACTION**: Final Report: FTA's Transit Research Program Plan Is Outdated
Federal Transit Administration
Report Number ST-2015-017

Date: January 13, 2015

From: Mitchell Behm 
Assistant Inspector General for Surface
Transportation Audits

Reply to
Attn. of: JA-30

To: Acting Federal Transit Administrator

According to six of the nine transit operators we interviewed, the identification, testing, and deployment of low and no emission transit technologies are essential to their ability to meet Federal, State, and local clean air and efficiency requirements. From fiscal years 2011 through 2014, Congress appropriated roughly \$580 million for the Federal Transit Administration (FTA) to identify and deploy this type of technology through several programs. However, only a small amount of this funding went toward new transit technology because the programs were focused on deployment, not research. In its committee report accompanying the 2014 appropriations bill,¹ the Senate Committee on Appropriations directed our office to identify ways FTA could better promote and deploy new transit technology. Committee staff requested that we collect stakeholder opinions on ways FTA could better support new transit technology research and deployment.

Accordingly, our objective was to determine whether FTA's actions to promote low or no emission technology are seen by transit operators, the industry, and research stakeholders as meeting their needs. Specifically, we (1) assessed whether FTA's Office of Research is identifying and disseminating new transit technologies and (2) determined whether stakeholders are satisfied with FTA's role in researching and developing new transit technologies.

To accomplish our objective, we selected four FTA programs funding transit technology and interviewed a selection of the programs' stakeholders. Exhibit B lists all stakeholders we interviewed. We also interviewed FTA officials and

¹ S. Rept. 113-45 (June 27, 2013).

reviewed FTA documentation on the level of support provided for identification, testing, and deployment activities. We conducted our work between March and November 2014 in accordance with generally accepted Government auditing standards. Our scope and methodology are fully described in exhibit A.

RESULTS IN BRIEF

FTA is not testing or deploying new transit technology. FTA's Office of Research has neither updated its multi-year transit research program plan nor undertaken other efforts to plan technology research programs. This research program plan is intended to provide a vision for making investments in specific technologies to reach defined transit emissions and efficiency goals. Also, FTA officials stated that FTA's Office of Research is currently limited in its ability to rebuild the Agency's role because the Office of Budget & Policy coordinates transit research funding at the direction of the Office of the Administrator, and the Office of Research lost key leaders and staff due to reassignments.

Five transit operators and one consortium said that FTA's current emphasis on deployment of low or no emission technology does not meet their needs. Two consortia, four of the nine transit agencies, and one transit organization stated that FTA should have a central role in all research phases—identification, prototype testing, promotion—and deployment of new transit technology. However, the Agency is no longer involved in significant transit technology research.² With the new and consolidated transit technology programs established by the Moving Ahead for Progress in the 21st Century Act (MAP-21),³ most of FTA's current programs focus on Federal assistance for capital funding and deployment of low-risk, proven technology. One consortium recognized the National Fuel Cell Bus Program, which was eliminated by MAP-21, as the last major effective FTA research program to identify, test, and deploy a specific technology type.

BACKGROUND

Low and no emissions transit technology may include components of buses or trains, alternative fuels, power sources for depots or stations, or initiatives to reduce commuting by car. We focused on the four FTA programs⁴ that were used to fund transit technology research and deployment over the past several years. Three of these were either eliminated in statute by MAP-21 (the National Fuel

² Federal law includes numerous activities other than transit technology prototype development and testing in the definition of research. Statutorily eligible FTA research may include transit usage studies as well as other activities as listed in 49 U.S.C. §5312(b)(2).

³ Pub. L. No. 112-141 (2012).

⁴ The four FTA programs are the National Fuel Cell Bus program, the Clean Fuels program, Transit Investments for Greenhouse Gas and Energy Reduction (TIGGER) program, and the Low and No Emissions Vehicle Deployment program.

Cell Bus program and Clean Fuels program or were not funded by Congress in appropriations (TIGGER). The National Fuel Cell Bus program was authorized in statute from 2006 to 2012 and its purpose was to identify and test new transit bus technology. It was designed to carry fuel cells for transit buses from various prototypes through testing to deployment by transit operators working with three regional consortia. It funded 35 projects in 19 States to test and/or deploy fuel cell buses. The Clean Fuels program provided grants for purchasing buses that used clean fuels or construct related facilities. TIGGER grants were for capital projects, including transit rail and depot/station projects, to reduce emissions or energy consumption using proven technology. The value of proposals TIGGER applicants were allowed to request ranged from \$1 million to \$25 million.

Through MAP-21, Congress focused FTA transit technology programs on deployment-only programs such as the Low and No Emissions Vehicle Deployment program. This newest program focuses on deploying proven technology to lower bus emissions and/or increase efficiency. It began accepting applications in January 2014 and offered a total of \$24.9 million in Federal assistance appropriated in fiscal year 2013. For all statutory research programs in fiscal year 2014, FTA was appropriated \$48 million by Congress.

FTA's Office of Research oversees three of these programs (the National Fuel Cell Bus program, TIGGER, and the Low and No Emissions Vehicle Deployment program). The Office of Program Management manages the remaining program—Clean Fuels. The Office of Budget & Policy coordinates FTA's budget execution, which includes allocations for all FTA research projects. In the past, Congress established and funded specific transit technology programs like the National Fuel Cell Bus program and Clean Fuels, which were managed by FTA officials within the Office of Research and the Office of Program Management, respectively. These officials also selected the projects funded through these programs, and the projects were administered through FTA's management processes, which include participation from its Regional Offices.

To respond to the Committee's request, we interviewed staff from 16 stakeholder entities, including the three technology consortia (CALSTART, Center for Transportation and the Environment, Northeast Advanced Vehicle Consortium) that were the partners for the National Fuel Cell Bus program projects. In addition, we interviewed staff at 12 stakeholder entities involved with the Clean Fuels and TIGGER programs. This group included nine transit authorities and three FTA regional offices. We also interviewed representatives of the American Public Transportation Association (APTA). We selected stakeholders with experience across a range of technology project types, sizes, and locations, but our results cannot be generalized. We used open-ended questions to solicit stakeholder concerns, and thus the numbers reported for a specific concern do not mean that

the remaining stakeholders agreed or disagreed with the concern. Exhibit B lists all stakeholder entities interviewed for this project.

FTA'S OFFICE OF RESEARCH IS NOT IDENTIFYING OR TESTING NEW TRANSIT TECHNOLOGIES

FTA is not identifying new transit technologies or disseminating information that could increase grantees' ability to meet emission and efficiency standards. The Office of Research has not updated its multi-year transit research plan intended to provide a vision for making investments in specific technologies to reach defined transit emissions and efficiency goals. The Office of Budget & Policy stated that it coordinates the research funding decisions made by FTA leaders per FTA's internal procedures, as the research funds are combined with other appropriations in a single budget account. These research funds are primarily used for non-transit technology research.

FTA's Office of Research Has Not Updated Its Transit Research Program Plan

The Office of Research has not updated its multi-year transit research program plan, which is intended to provide a vision for making investments in specific technologies to reach defined transit emissions and efficiency goals. In the past, FTA produced strategic plans focused both on overall research goals as well as advancing specific types of technology. The last transit research program plan was released in September 2008 and identified FTA research projects and activities for fiscal years 2009 through 2013. It also identified transit industry research needs and potential future research projects for funding consideration. One of the goals identified in this plan was to provide national transit research leadership by encouraging partnerships, defining transit research needs, and collating transit research results into bodies of knowledge the transit industry can use in decision making.

Other major entities in the emissions/efficiency arena rely heavily on multi-year strategic planning and see this as a critical activity to guiding their work and investments. CALSTART, one of the National Fuel Cell Bus Program consortia, has its own plan that extends through 2030. The American Public Transportation Association (APTA) is updating its strategic research plan. One transit organization told us that without either an overall research plan or technology-specific strategic plans, FTA's research focus and resources are diluted among too many different types of technology. In addition, a transit organization stated that without FTA planning, there is no unified leadership or direction-setting transit technology stakeholders, like CALSTART or APTA, can use to inform or coordinate their choice of technology or research goals to pursue.

According to FTA's Associate Administrator for Research, Demonstration, and Innovation, FTA's Office of Research does not have the resources needed for strategic planning that stakeholders identify as critical to providing a roadmap for future transit research and investments. The Associate and Deputy Associate Administrators and other key staff of FTA's Office of Research left or were reassigned over the past several years, but the Associate Administrator returned from his temporary reassignment late last year and is starting to fill the office's empty positions.

FTA's Research Funding Is Primarily Used for Non-Transit Technology Research

FTA's Section 5312 research funding is not programmed by the Office of Research. According to the Associate Administrator of the Office of Research and per FTA's internal policies, the Associate Administrator must request funding from the FTA Administrator through the Office of Budget & Policy to direct research funding to specific projects. According to the Office of Budget & Policy, it coordinates the allocation of available funding for transit technology research. Technology research is part of a budget account that contains appropriations for other types of research.⁵

Federal law uses "research" as a generic term to describe several activities that are not necessarily technology-focused.⁶ Funding for these broader FTA research activities are combined in a single budget account, and FTA's Administrator selects projects to address the Agency's priority research areas and statutory requirements. FTA's funding levels for each of its statutory research programs in fiscal years 2013 and 2014 are provided in table 1.

⁵ The account includes Section 5312 (Research, Development, Demonstration and Deployment Projects) and Section 5314 (National Research Programs). These two sections were consolidated into one program under Section 5312 by MAP-21. The "National Research Program" includes accounts from sections 5306, 5312-5315, 5322, 5506.

⁶ Public transportation research projects funded using section 5312 shall focus on providing more effective and efficient public transportation service for seniors, individuals with disabilities, and low-income individuals; mobility management and improvements and travel management systems; data and communication system advancements; system capacity including train control, capacity improvements, performance management; capital and operating efficiencies; planning and forecasting modeling and simulation; advanced vehicle design; advancements in vehicle technology; asset maintenance and repair systems advancement; alternative fuels; the environment and energy efficiency; safety improvements; or any other area the Secretary determines is important to advance the interests of public transportation.

Table 1. Recent Funding for Statutory FTA Research Programs

Section	Program	2013 Authorized	2013 Appropriated*	2014 Authorized	2014 Appropriated
5312	Research, Development, Demonstration & Deployment	\$70,000,000	\$33,199,000	\$70,000,000	\$40,000,000
	Low and No Emission Bus Deployment Program (% directed)	\$52,500,000	\$24,877,000	\$52,500,000	\$30,000,000
5313	Transit Cooperative Research	\$7,000,000	\$3,500,000	\$7,000,000	\$3,000,000
5314	Technical Assistance & Standards Development	\$7,000,000	\$0	\$7,000,000	\$3,000,000
5322	Human Resources & Training	\$5,000,000	\$5,000,000	\$5,000,000	\$2,000,000
TOTAL		\$89,000,000	\$41,699,000	\$89,000,000	\$48,000,000

*According to FTA, in fiscal year 2013, Congress appropriated a lump sum totaling \$8.5 million for sections 5313, 5314, and 5322. The figures in the fiscal year 2013 appropriated column reflect FTA allocations of the amount.

Source: FTA Office of Budget & Policy

Section 5312 research funding may be used, by law, for several types of eligible research activities, including transit technology research, workforce development, and transit usage studies. However, according to officials from both the Office of Research and the Office of Budget & Policy, it is rarely used for transit technology research activities unless the funds are specifically set aside for particular projects or programs. MAP-21 required that 75 percent of the Section 5312 appropriations be set aside for a non-research program, the Low or No Emission Vehicle Deployment program. Among all of FTA's statutory research programs, including section 5312, none of FTA's research funding appropriated for fiscal years 2013 or 2014 was used for transit technology research. The remaining \$16.8 million among all of FTA's statutory research program funds appropriated for fiscal year 2013 and \$18 million appropriated for fiscal year 2014 went to other eligible, non-transit technology research projects.

STAKEHOLDERS HAD CONCERNS ABOUT FTA'S LIMITED FOCUS ON DEVELOPING NEW TRANSIT TECHNOLOGIES

A transit operator, two consortia, and a transit organization told us that FTA no longer has a central role in transit technology research and development as its programs now focus on deploying proven technology. After the elimination of three of the four primary programs that fund public transportation technology research, FTA technology programs have focused mainly on proven bus and clean fuel technology over the past several years, as directed by law. Today, FTA's active transit technology programs all focus on deployment of proven technology rather than development of new prototypes. However, one of the consortia and three of the transit operators specifically commented that this approach does not meet stakeholders' needs when it comes to identifying and developing new transit technology to help transit agencies meet emissions requirements and performance goals. For example, a transit operator we interviewed purchased two hybrid buses with FTA funding. However, it stated the Agency did not purchase additional hybrid buses when local regulations prohibited use of diesel buses because research and information on maintenance of hybrid buses was insufficient to ensure the efficient maintenance of a fleet.

In addition, one consortium and two transit operator stakeholders stated that FTA should play a central role in transit technology research and deployment, as these are high-risk activities that have not been tested in an operating transit environment. According to two consortia and two transit operator stakeholders, without FTA's participation and support, neither the companies developing new transit technology nor the transit agencies seeking to use it have adequate funding or information to successfully develop, test, deploy, and maintain the technology. A consortium stakeholder told us that the National Fuel Cell Bus Program, eliminated by MAP-21, was the last major FTA research program to effectively develop, test, and deploy a specific transit technology. This stakeholder also stated that without this program, fuel cell bus technology would not be a viable option for transit agencies in 2014.

According to a consortium and FTA, Congress earmarked funds for transit technology in the past, but starting in the late 2000s, new congressional rules were put in place to significantly limit earmarks. Two consortia stakeholders stated that, as a result, transit technology funding is now awarded to projects based on program and Agency criteria. According to FTA's Office of Research, this has reduced funding for new transit technology research given the Department's focus on investing in proven, lower-risk technology.

While each of FTA's programs⁷ provides Federal assistance, they also require extensive information on technology performance and partnerships before funds are awarded. According to two consortia and three transit operator stakeholders, putting together an application for funding presents challenges and significant up-front work for transit operators. It can take several months for transit officials to find transit technology performance information and manufacturing partners by developing relationships with specific companies or research groups. One transit operator we interviewed had to rely on performance data for new technology provided solely by contractors and vendors rather than independent testers.

Finally, two transit operator stakeholders and one FTA official we interviewed stated that many U.S. companies that produce this technology are not profitable because developing new technology requires a large initial investment and may take years to deploy on a large-scale basis. For example, two transit agencies we interviewed had to stop using hybrid buses purchased with FTA funding when the manufacturers went bankrupt or left the industry and there were no other sources of expertise to maintain the new technology buses.

CONCLUSION

FTA's Office of Research and several of the stakeholders we interviewed recognized the need for national transit research leadership. While FTA planned to undertake leadership activities—such as synthesizing existing transit research, identifying new areas of inquiry, creating partnerships, and setting future research priorities—these goals are not being accomplished. Without an updated transit research program plan, the Federal role in transit research will be unclear and unresponsive to stakeholders' research-related needs.

RECOMMENDATION

We recommend that the Federal Transit Administrator direct the Associate Administrator for Research, Demonstration, and Innovation to reassess transit technology priorities and update FTA's multi-year transit research program plan.

⁷ Research, Development, Demonstration, and Deployment (includes the Low or No Emissions Vehicle Deployment program) is FTA's active mechanism for funding transit technology projects. The other FTA programs used to fund transit technology (Clean Fuels, TIGGER, and the National Fuel Cell Bus program) have a few active projects remaining, but the programs have ceased or are ending soon.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided FTA with our draft report on November 13, 2014, and received its response on December 30, 2014, which is included as an appendix to this report. FTA agreed to implement our recommendation as written by July 1, 2015. FTA's planned action to develop a multi-year strategic research program plan and its target action date are appropriate, and we consider this recommendation resolved but open pending completion of the planned actions.

We appreciate the courtesies and cooperation of officials from the Federal Transit Administration's Office of Research and Office of Budget and Policy during this audit. If you have any questions concerning this report, please call me at (202) 366-5630 or Wendy Harris, Program Director, at (202) 366-2794.

#

cc: DOT Audit Liaison, M-1
FTA Audit Liaison, TBP-30

EXHIBIT A. SCOPE AND METHODOLOGY

We conducted our work from March 2014 through November 2014 in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We reviewed regulations, guidance and reports pertaining to four FTA programs focused on funding transit technology, including the Research, Development, Demonstration, and Deployment program (includes the Low or No Emission Bus Deployment program), National Fuel Cell Bus program, Clean Fuels program, and TIGGER. We also interviewed FTA officials responsible for implementing these four programs.

In addition, we interviewed FTA officials about the processes used and level of support provided for transit technology identification, testing, and deployment activities. We reviewed, but did not verify information FTA provided on program funding and research project selection processes.

We also interviewed staff from 16 stakeholder entities. These included stakeholders participating in the National Fuel Cell Bus program, the Clean Fuels program, and TIGGER. The National Fuel Cell Bus interviewees were the three consortia (CALSTART, Center for Transportation and the Environment, Northeast Advanced Vehicle Consortium) that were responsible for the selected projects. The Clean Fuels and TIGGER stakeholders we interviewed were nine transit entities and three of ten FTA regional offices involved with 152 grants or cooperative agreements awarded. We selected stakeholders with experience across a range of project types, sizes, and locations, but our results cannot be generalized. We used open-ended questions to solicit stakeholder concerns, and thus the numbers reported for a specific concern do not mean that the remaining stakeholders agreed or disagreed with the concern. We also interviewed representatives of the American Public Transportation Association (APTA) for a broader view of FTA's role and performance in the development and deployment of new transit technology and related issues faced by transit providers. Exhibit B lists all stakeholder entities interviewed for this project.

Based on our discussions with the congressional requesters, we focused our work on promptly gathering the opinions of stakeholders regarding FTA's actions to identify, promote, test and deploy new transit technology. We verified the program requirements, grant or cooperative agreement information, and other factual

details provided by the stakeholders in interviews, but did not verify their opinion-based statements.

EXHIBIT B. STAKEHOLDER ENTITIES INTERVIEWED

We interviewed staff from several stakeholders of FTA's transit technology programs, including:

<i>National Fuel Cell Bus Program Consortia</i>	
Northeast Advanced Vehicle Consortium (NAVC)	Massachusetts
Center for Transportation and the Environment (CTE)	Georgia, California
CALSTART	California
<i>Transit Authorities</i>	
SunLine Transit	California
Metropolitan Tulsa Transit Authority	Oklahoma
Metropolitan Council	Minnesota
Nassau County Transit	New York
Connecticut Department of Transportation	Connecticut
Metropolitan Atlanta Transit Authority	Georgia
Long Beach Transit	California
Phoenix Valley Metro	Arizona
City of Phoenix	Arizona
<i>FTA Regional Offices</i>	
Region 1	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut
Region 2	New York, New Jersey
Region 6	Texas, Oklahoma, Arkansas, Louisiana, New Mexico
<i>Transit Organizations</i>	
American Public Transportation Association (APTA)	Washington, DC

EXHIBIT C. MAJOR CONTRIBUTORS TO THIS REPORT

Name	Title
Wendy M. Harris	Program Director
Regan Maund	Project Manager
Peter Barber	Analyst
Doris Kwong	Analyst
Andrea Nossaman	Senior Writer-Editor

APPENDIX. AGENCY COMMENTS



U.S. Department
of Transportation

**Federal Transit
Administration**

Memorandum

Subject: **INFORMATION: Management Comments – Office** Date:
of Inspector General (OIG) Draft Report on the
Federal Transit Research Plan

From: **Therese McMillan** Reply to
Acting Administrator Attn. of:
Federal Transit Administration

To: **Mitchell Behm**
Assistant Inspector General for Surface Transportation Audits

The Federal Transit Administration (FTA) has successfully managed its research program according to the statutory direction and appropriated funding levels provided by Congress. Currently, the Moving Ahead for Progress in the 21st Century Act (MAP-21) directs that seventy-five percent of appropriated research funds be set-aside for the Low- or No-Emission Vehicle Deployment Program. When FTA is provided with discretionary research funds, the budget allocations for these programs are coordinated, like all of FTA's discretionary funding, through the Office of Budget and Policy, along with input from the Office of Research, Demonstration, and Innovation. Final allocation decisions for any discretionary research funds are then made by FTA's Administrator.

FTA is working on a short-term, multi-year strategic research program plan. Once complete, this research plan will guide FTA in refocusing its overall role in Federal transit research and set clear goals for developing and deploying transit technologies, in accordance with stakeholder needs and available Federal funding.

Based upon our preliminary review of this draft report, we agree to implement the OIG recommendation, as written, by July 1, 2015.

FTA appreciates this opportunity to offer comments on the OIG draft report. Please contact Vincent Valdes, Associate Administrator, Office of Research, Demonstration and Innovation at (202) 366-4052 with any questions, or if the OIG would like to obtain additional detail about these comments.

12/30/2014

X

Therese W. McMillan
Acting Administrator
Signed by: THERESE WATKINS MCMILLAN

Exhibit D. Agency Comments