

February 2012

# DIESEL POLLUTION

## Fragmented Federal Programs That Reduce Mobile Source Emissions Could Be Improved



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## Why GAO Did This Study

Exhaust from diesel engines is a harmful form of air pollution. EPA has issued emissions standards for new diesel engines and vehicles, but older mobile sources of diesel emissions—such as trucks and buses—continue to emit harmful pollution. Programs at DOE, DOT, and EPA provide funding for activities that reduce diesel emissions, such as retrofitting existing diesel engines and vehicles. The existence of these programs at multiple agencies has raised questions about the potential for unnecessary duplication. In response to a mandate in the Diesel Emissions Reduction Act of 2010, GAO examined the (1) extent of duplication, overlap, fragmentation, or gaps, if any, among federal grant, rebate, and loan programs that address mobile source diesel emissions; (2) effectiveness of federal funding for activities that reduce mobile source diesel emissions; and (3) extent of collaboration among agencies that fund these activities. GAO analyzed program data, documents, and relevant laws and regulations and interviewed agency officials. GAO also reviewed three diesel-related tax expenditures.

## What GAO Recommends

GAO recommends that DOT's Federal Transit Administration develop performance measures for its two relevant strategic goals and that DOE, DOT, and EPA establish a strategy for collaboration among their programs that fund activities that reduce diesel emissions. DOE and EPA agreed with the relevant recommendation, and DOE questioned several findings. DOT questioned several findings and both recommendations and neither agreed nor disagreed with the recommendations. GAO continues to believe in the need for the performance measures and collaboration.

View [GAO-12-261](#). For more information, contact David Trimble at (202) 512-3841 or [trimbled@gao.gov](mailto:trimbled@gao.gov).

## DIESEL POLLUTION

### Fragmented Federal Programs That Reduce Mobile Source Emissions Could Be Improved

## What GAO Found

Federal grant and loan funding for activities that reduce mobile source diesel emissions is fragmented across 14 programs at the Department of Energy (DOE), the Department of Transportation (DOT), and the Environmental Protection Agency (EPA). From fiscal years 2007 through 2011, the programs obligated at least \$1.4 billion for activities that have the effect of reducing mobile source diesel emissions. The programs have varying goals and purposes; nevertheless, each program allows or requires a portion of its funding to support activities that reduce mobile source diesel emissions, such as replacing fleets of older diesel trucks or school buses with natural gas vehicles. In addition, each of the 14 programs overlaps with at least one other program in the specific activities they fund, the program goals, or the eligible recipients of funding. GAO also identified several instances of duplication where more than one program provided grant funding to the same recipient for the same type of activities. However, GAO was unable to determine whether unnecessary duplication exists because of limited information on program administrative costs, among other things. GAO did not find any gaps among the programs, such as mobile sources that are not eligible for funding.

The effectiveness of federal funding for activities that reduce mobile source diesel emissions is unknown because agencies vary in the extent to which they have established performance measures. DOE and EPA have established performance measures for the strategic goals related to their programs that reduce mobile source diesel emissions. DOT has established such measures for two of its administrations—the Federal Aviation Administration and Federal Highway Administration—but has not established such measures for the Federal Transit Administration for two of the four strategic goals that link to its programs that fund diesel emissions reduction activities. Instead, agency officials said they collect information on the current condition of the nation's transit fleet, among other things, to measure the performance of its programs. As GAO has previously reported, principles of good governance indicate that agencies should establish quantifiable performance measures to demonstrate how they intend to achieve their goals and measure the extent to which they have done so. In addition, 13 of the 14 programs have purposes other than decreasing diesel emissions, and diesel reductions are a side benefit of efforts to achieve these other goals. As a result, few programs collect diesel-related performance information. Incomplete performance information may limit the ability of agencies to assess the effectiveness of their programs and activities that reduce diesel emissions.

The programs that fund activities that reduce diesel emissions generally do not collaborate because of the differing purposes and goals of each program, according to senior DOE, DOT, and EPA officials. The officials also were sometimes unaware of other programs that fund similar activities and said that any existing collaboration was on a case-by-case basis. GAO's previous work has shown that although federal programs have been designed for different purposes, coordination among programs with related responsibilities is essential to efficiently and effectively meet national concerns. Further, without a coordinated approach, programs can waste scarce funds, confuse and frustrate program customers, and limit the overall effectiveness of the federal effort.

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**Abbreviations**

DOE	Department of Energy
DOT	Department of Transportation
EPA	Environmental Protection Agency

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**United States Government Accountability Office**  
Washington, DC 20548

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February 7, 2012

The Honorable Barbara Boxer  
Chairman  
The Honorable James M. Inhofe  
Ranking Member  
Committee on Environment and Public Works  
United States Senate

The Honorable Fred Upton  
Chairman  
The Honorable Henry A. Waxman  
Ranking Member  
Committee on Energy and Commerce  
House of Representatives

Diesel engines play a vital role in public transportation, construction, agriculture, and shipping, largely because they are more durable and reliable than gasoline-powered engines, as well as 25 to 35 percent more energy efficient. However, exhaust from diesel engines is a more pervasive and harmful form of air pollution than exhaust from gasoline-powered engines. Diesel exhaust contains air pollutants such as nitrogen oxides and particulate matter, as well as other harmful substances that affect public health and the environment.<sup>1</sup> Since 1984, the Environmental Protection Agency (EPA) has implemented standards that have progressively lowered the maximum allowable amount of certain pollutants, including nitrogen oxides and particulate matter, from new diesel engines by more than 98 percent. However, the most stringent standards generally apply to diesel engines and vehicles built after 2007, and EPA estimates that more than 20 million mobile sources of diesel emissions built before 2007—13 million on-highway vehicles, 7 million

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<sup>1</sup>Nitrogen oxides are regulated pollutants commonly known as NOx that, among other things, contribute to the formation of ozone. Particulate matter is an ubiquitous form of air pollution commonly referred to as soot.

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nonroad engines, and 47,000 locomotive and marine engines—continue to emit higher amounts of harmful pollutants than newer engines.<sup>2</sup>

Programs at the Department of Energy (DOE), the Department of Transportation (DOT), and EPA address mobile source diesel emissions by funding projects that, among other things, retrofit, rebuild, or replace existing diesel engines or vehicles; install devices that reduce idling of diesel engines; and convert diesel engines and vehicles to use cleaner fuels, such as natural gas or propane. The existence of these programs at multiple agencies has raised questions about the potential for unnecessary duplication. We have previously reported that fragmentation and overlap among government programs can lead to such duplication.<sup>3</sup> Fragmentation occurs when more than one federal agency, or more than one organization within an agency, is involved in the same broad area of national need. Overlap occurs when multiple agencies and programs have similar goals, engage in similar activities or strategies to achieve them, or target similar beneficiaries. We have also reported that federal programs contributing to the same or similar outcomes should closely coordinate to improve their overall effectiveness.<sup>4</sup>

In response to a mandate in the Diesel Emissions Reduction Act of 2010, this report examines the (1) extent to which duplication, overlap, fragmentation, or gaps, if any, exist among federal grant, rebate, and loan programs that address mobile source diesel emissions; (2) effectiveness of federal funding for activities that reduce mobile source diesel emissions; and (3) extent to which collaboration takes place among agencies that fund activities that reduce mobile source diesel emissions.<sup>5</sup>

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<sup>2</sup>Nonroad engines are those used in machines, such as construction equipment, agricultural equipment, and airport service vehicles. Also, EPA does not maintain information on the number of mobile sources of diesel emissions built after 2007.

<sup>3</sup>GAO, *Managing for Results: Using the Results Act to Address Mission Fragmentation and Program Overlap*, [GAO/AIMD-97-146](#) (Washington, D.C.: Aug. 29, 1997). For more information on fragmentation, overlap, and duplication in federal programs see GAO, *Opportunities to Reduce Potential Duplication in Government Programs, Save Tax Dollars, and Enhance Revenue*, [GAO-11-318SP](#) (Washington, D.C.: Mar. 1, 2011).

<sup>4</sup>[GAO/AIMD-97-146](#).

<sup>5</sup>Pub. L. No. 111-364 § 3(a)-(b). 124 Stat. 4060 (2011). Additionally, in this report, we use the term “diesel emissions” when referring to both diesel emissions and diesel fuel use.

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This report also provides information on tax expenditures that address mobile source diesel emissions.<sup>6</sup>

To address the first objective, we reviewed relevant statutes and regulations; conducted a literature review; analyzed agency documents; interviewed agency officials and industry stakeholders; and conducted Internet searches to identify grant, rebate, and loan programs that fund mobile source diesel emissions reduction activities. We then reviewed agency documents and conducted structured interviews of agency officials from each relevant DOE, DOT, and EPA program we identified. We conducted interviews about the program's purpose, goals, eligible activities, target beneficiaries, and types of funding to identify areas of duplication, overlap, or fragmentation. We also compared the types of eligible recipients under each program with available data on the sources of diesel emissions to identify any gaps among the programs. In addition, we obtained and analyzed funding data from the three agencies to estimate the total amount of federal funding for diesel emissions reduction projects from fiscal years 2007 through 2011. We selected this period because, by 2007, EPA had issued emissions standards for key on-road sources, such as heavy-duty trucks and buses, as well as a rule requiring refiners to reduce the sulfur content of—and therefore emissions from—certain diesel fuels. We reviewed documents about the underlying databases and interviewed knowledgeable agency officials to assess the reliability of the data for each program. We determined that the data obtained from these agencies were sufficiently reliable for the purposes of this report. To respond to the second and third objectives, we reviewed agency documents and conducted structured interviews with agency officials about program goals and performance, coordination with other programs, and assessments of diesel pollution, among other things. We then compared these programs' efforts with best practices for federal programs that contribute to the same outcome. To identify these best practices, we reviewed our prior work as well as relevant statutes, including the Government Performance and Results Act of 1993 and the Government Performance and Results Act Modernization Act of 2010.<sup>7</sup> A

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<sup>6</sup>Tax expenditures include exemptions and exclusions from taxation, deductions, credits, deferral of tax liability, and preferential tax rates. The revenue that the government forgoes in these instances may be viewed as spending channeled through the tax system.

<sup>7</sup>The Government Performance and Results Act Modernization Act of 2010, Pub. L. No. 111-352, 124 Stat. 3866 (2011), amends the Government Performance and Results Act of 1993, Pub. L. No. 103-62, 107 Stat. 285 (1993).

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more detailed description of our scope and methodology is presented in appendix I.

We conducted this performance audit from May 2011 to February 2012 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.

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## Background

Under the Clean Air Act, EPA is responsible for setting National Ambient Air Quality Standards for certain pollutants considered harmful to public health and the environment. EPA has set these standards for six such pollutants, known as criteria air pollutants: carbon monoxide, nitrogen oxides, sulfur oxides, particulate matter, ozone, and lead.<sup>8</sup> Diesel exhaust contains nitrogen oxides, particulate matter, and numerous other harmful chemicals. Exposure to nitrogen oxides can result in adverse respiratory effects, and nitrogen oxides contribute to the formation of ozone, which can cause respiratory illnesses, decreased lung function, and premature death. A large body of scientific evidence links exposure to particulate matter to serious health problems, including asthma, chronic bronchitis, heart attack, and premature death.

According to EPA documents, as of 2009, mobile diesel sources emitted about 47 percent (6.4 million tons) of the nation's nitrogen oxides and about 16 percent (300,000 tons) of its particulate matter.<sup>9</sup> EPA estimated that on-highway trucks and vehicles and nonroad sources, such as agriculture and construction equipment, contributed about 57 percent of these nitrogen oxide emissions and 58 percent of the particulate matter emissions, and marine and locomotive sources contributed the remaining

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<sup>8</sup>These standards are expressed as concentration limits in the ambient air averaged over a specific period—such as 1 hour or 8 hours—and compliance is determined through localized ground level monitoring.

<sup>9</sup>Nondiesel mobile sources, industrial processes, and power plants, among other sources, generated the remaining nitrogen oxide emissions; fossil fuel combustion, dust, and agricultural activities, among other sources, generated the remaining particulate matter emissions.



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43 percent and 42 percent of such emissions, respectively, from diesel engines.

EPA has progressively implemented more stringent diesel emissions standards to lower the amount of key pollutants from mobile diesel sources since 1984.<sup>10</sup> For example, EPA regulations for heavy-duty highway diesel engines required a 98 percent reduction from 1988 allowable levels of nitrogen oxide and particulate matter emissions for new engines built after 2009. The most recent emissions standards for construction and agricultural equipment began to take effect in 2008 and required a 95 percent reduction in nitrogen oxides and a 90 percent reduction in particulate matter from previous standards, which took effect in 2006 and 2007. In 2008, EPA issued its most recent regulations for new marine vessels and locomotives, which EPA expects will, by 2030, reduce nitrogen oxide emissions from the engines of these sources by about 80 percent and particulate matter emissions by about 90 percent compared to previous standards. Figures 1 and 2 show the effective dates of major reductions in allowable amounts of nitrogen oxide and particulate matter emissions from mobile diesel sources.

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<sup>10</sup>EPA also sets standards for new or upgraded stationary sources of diesel emissions, such as engines used to generate electricity at power and manufacturing plants. In 2008, EPA estimated that more than 900,000 stationary diesel engines were in operation.

**Figure 1: Effective Dates of Major Nitrogen Oxide Emission Limits for Newly Manufactured Mobile Sources of Diesel Emissions, by Source**

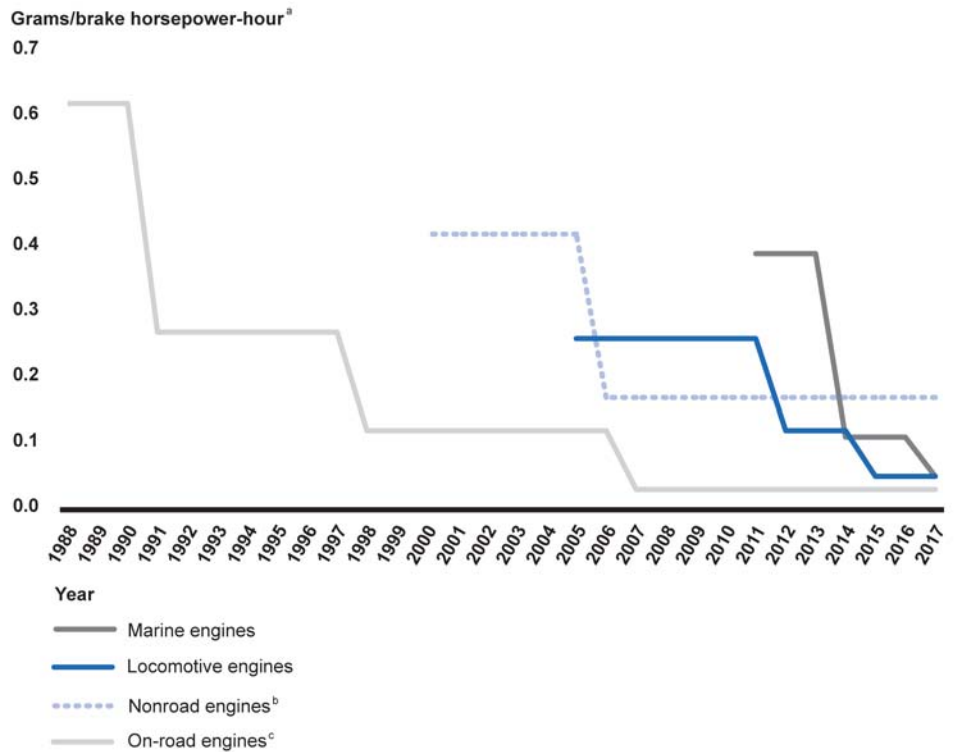


Source: GAO analysis.

<sup>a</sup>Grams per brake horsepower-hour is a measure of the grams of nitrogen oxides a vehicle or engine emits per the amount of energy the vehicle or engine uses during one hour.

<sup>b</sup>These emission limits apply to nonroad engines at or above 175 horsepower, such as a large bulldozer engine. EPA has also set nitrogen oxide emission standards for such engines below 50 horsepower, such as small tractor engines, and engines between 50 and 175 horsepower, which took effect in 2006 and 2008, respectively.

**Figure 2: Effective Dates of Major Particulate Matter Emission Limits for Newly Manufactured Mobile Sources of Diesel Emissions, by Source**



Source: GAO analysis.

<sup>a</sup>Grams per brake horsepower-hour is a measure of the grams of particulate matter a vehicle or engine emits per the amount of energy the vehicle or engine uses during one hour.

<sup>b</sup>These emission limits apply to nonroad engines at or above 175 horsepower, such as a large bulldozer engine. EPA has also set particulate matter emission standards for such nonroad engines below 50 horsepower, such as small tractor engines, which took effect in 2000 and 2006.

<sup>c</sup>The 1998 emission limit in the figure applies to urban buses. EPA also set particulate matter standards for heavy-duty trucks that took effect in 1998, which limited emissions from these engines to 0.1 grams per brake horsepower-hour.

Owners and operators of diesel engines can undertake a variety of activities to reduce diesel emissions, including retrofitting, rebuilding, or replacing existing diesel engines or vehicles; installing devices that reduce idling of diesel engines; and converting diesel engines and vehicles to use cleaner fuels. Retrofitting existing diesel engines generally involves the installation of emissions control devices, such as filters, on a vehicle's tailpipe. Rebuilding components of existing diesel engines can return engines to their original emissions levels or involve the installation of new technology that produces lower levels of emissions. Replacing

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existing diesel engines and vehicles with newer, lower emitting engines or vehicles can lead to significant emissions reductions, but because it is a costly option, it may be most appropriate for the oldest, most polluting vehicles. Devices that reduce idling of diesel engines generally allow a vehicle's heat, air conditioning, and other electrical equipment to run without operation of the vehicle's main engine. Converting diesel vehicles and engines to use cleaner fuels can also provide significant emissions reductions.

The Government Performance and Results Act, as amended, requires agencies to prepare annual performance plans that contain, among other things, a set of annual goals that establish the agencies' intended performance and measures that can be used to assess progress toward achieving those goals. DOE, DOT, and EPA establish and organize these goals and performance measures at differing agency and administrative levels. Specifically, DOE and EPA establish strategic goals and performance measures for each goal as part of their agencywide performance plans. DOT establishes strategic goals as part of its agencywide strategic plan, but the agency's administrations—the Federal Aviation Administration, Federal Highway Administration, and Federal Transit Administration, among others—generally establish their own performance measures for assessing their programs' contributions to the department's strategic goals.

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## Federal Funding for Activities That Reduce Diesel Emissions Is Fragmented across 14 Programs

Federal grant and loan funding for activities that reduce mobile source diesel emissions is fragmented across 14 programs at DOE, DOT, and EPA. Many of these programs generally target air pollution, but of the 14 programs, one—EPA's Diesel Emissions Reduction Act program—has a specific purpose of reducing mobile source diesel emissions. The remaining 13 programs focus on other goals or purposes, such as supporting energy efficiency projects or reducing petroleum use. Nevertheless, each of these programs allows or requires a portion of its funding to support activities that have the effect of reducing mobile source diesel emissions. For example, authorizing legislation for DOT's Congestion Mitigation and Air Quality Improvement program directs grant recipients to give priority to certain activities, including retrofitting diesel engines and vehicles. The 14 programs provide funding through one or more mechanisms, including competitive grants, formula grants, and

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loans.<sup>11</sup> Specifically, 13 of the programs provide funding through competitive and formula grants, and 1 program—DOT's State Infrastructure Banks program—provides loans.<sup>12</sup> We did not identify any gaps in the programs, such as mobile sources that are not eligible for funding. See appendix II for additional information about each program.

From fiscal years 2007 through 2011, these 14 programs obligated at least \$1.4 billion for activities that have the effect of reducing mobile source diesel emissions.<sup>13</sup> According to data from DOE, DOT, and EPA, the American Recovery and Reinvestment Act of 2009 provided about \$870 million of this funding. The \$1.4 billion amount is a lower bound because DOT could not determine the amount of grant and loan funding some of its programs have provided for projects that reduce mobile source diesel emissions. According to DOT officials, the agency does not track this information because statutory program requirements do not call for the agency to do so.<sup>14</sup> These activities that have the effect of reducing mobile source diesel emissions include replacing fleets of older diesel trucks or school buses with natural gas vehicles, installing particulate matter filters on construction equipment, and replacing diesel-powered

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<sup>11</sup>Competitive grant programs award funds for specific projects or activities based on eligibility and selection criteria as established by law or regulation, or on an administrative basis. Formula grant programs allocate funds to states or their subdivisions in accordance with a distribution formula prescribed in law or administrative regulation. Grant recipients may then allocate these funds to specific projects based on program eligibility guidelines.

<sup>12</sup>Under DOT's State Infrastructure Banks program, states may use allocated federal transportation funds to capitalize state infrastructure banks, which in turn provide loans and other nongrant financial assistance to eligible projects.

<sup>13</sup>All dollar amounts in this report are in nominal dollars.

<sup>14</sup>DOT's Federal Transit Administration was unable to provide this information for the Bus and Bus Facilities program; Clean Fuels Grant program; Congestion Mitigation and Air Quality Improvement program, for which the Federal Transit Administration manages grant data; the Transit in Parks program; and the Urbanized Area Formula Grants program. According to agency officials, the agency does not track which grants fund projects that reduce diesel emissions, and agency officials said that they would have to perform a labor-intensive, time-consuming review—diverting limited resources at the critical end of the fiscal year period—to estimate the amount of program funding that has reduced diesel emissions. Instead, the agency provided us with access to its grants database, from which we estimated the amount of funding provided for diesel emissions reduction projects for the Clean Fuels Grant, Congestion Mitigation and Air Quality Improvement, and Transit in Parks programs, but we were unable to estimate the amount of funding provided through the Bus and Bus Facilities or Urbanized Area Formula Grants programs due to the time frame of our review. See appendix I for additional information.

airport luggage transporters with electric vehicles. As table 1 shows, some of the programs that support these activities have broad purposes, such as increasing energy efficiency in transportation, reducing petroleum consumption, or funding public transportation projects, and other programs have narrower purposes, such as reducing emissions at airports, constructing ferry boats and related facilities, or promoting alternative transportation systems in and around national parks.

**Table 1: Estimated Federal Funds Obligated for Mobile Source Diesel Emissions Reduction Activities, by Agency and Program, Fiscal Years 2007-2011**

Dollars in millions				
Agency/program	Purpose	Grants	Loans	
<i>DOE</i>				
Clean Cities program	To advance the nation's economic, environmental, and energy security by funding projects that reduce petroleum use in transportation	\$305	—	
Energy Efficiency and Conservation Block Grant program	To support energy efficiency and conservation projects that reduce fossil fuel emissions and energy use and improve energy efficiency in the transportation and building sectors	256	—	
State Energy Program	To support state development and implementation of strategies and goals that promote energy efficiency and conservation	11	—	
<b>DOE total</b>		<b>\$572</b>	<b>—</b>	
<i>DOT</i>				
Federal Aviation Administration				
Voluntary Airport Low Emissions program	To reduce airport ground vehicle and equipment emissions at airports in air quality nonattainment and maintenance areas	18	—	
Federal Highway Administration				
Congestion Mitigation and Air Quality Improvement program	To support transportation projects that contribute to the attainment or maintenance of carbon monoxide, ozone, and particulate matter air quality standards and relieve congestion	178	—	
Ferry Boat Discretionary program	To fund the construction of ferry boats and ferry terminal facilities	26	—	
State Infrastructure Banks program	To facilitate state establishment of infrastructure banks to provide nongrant assistance for eligible transportation projects	—	\$6 <sup>a</sup>	
Federal Transit Administration				
Bus and Bus Facilities program	To replace, rehabilitate, and purchase buses and related equipment and construct or rehabilitate bus-related facilities	— <sup>b</sup>	—	
Clean Fuels Grant program	To assist achievement and maintenance of air quality standards by providing grants for clean fuel buses and facilities	17	—	
National Fuel Cell Bus Technology Development program	To develop commercially viable fuel cell bus technology and related infrastructure	11	—	
Transit in Parks program	To promote alternative transportation systems in and around national parks and other federal lands	— <sup>c</sup>	—	

Dollars in millions				
Agency/program	Purpose	Grants	Loans	
Transit Investments for Greenhouse Gas and Energy Reduction program	To reduce energy consumption or greenhouse gas emissions of public transportation systems	96	—	
Urbanized Area Formula Grants program	To support capital projects, planning, transit enhancements, and certain operating costs for public transportation in urbanized areas	— <sup>b</sup>	—	
<b>DOT total</b>		<b>\$346<sup>d</sup></b>	<b>\$6</b>	
<i>EPA</i>				
Diesel Emissions Reduction Act Program	To reduce emissions from existing diesel engines and vehicles	512	—	
<b>Estimated total federal funding</b>		<b>\$1,430<sup>d</sup></b>	<b>\$6</b>	

Source: GAO analysis of relevant laws and DOE, DOT, and EPA data and documents.

Notes: The American Recovery and Reinvestment Act of 2009 provided funding for DOE's Clean Cities, Energy Efficiency and Conservation Block Grant, and State Energy programs; DOT's Ferry Boat Discretionary, Transit Investments in Greenhouse Gas and Energy Reduction, and Urbanized Area Formula Grants programs; and EPA's Diesel Emissions Reduction Act Program.

<sup>a</sup>This amount is a lower bound because Federal Highway Administration officials do not obtain complete data from states on projects funded through the State Infrastructure Bank program.

<sup>b</sup>DOT was unable to provide information on the amount of funding this program awarded for projects that reduced mobile source diesel emissions.

<sup>c</sup>We were unable to identify any projects this program funded during fiscal years 2007-2011 that reduced mobile source diesel emissions. However, this program does allow its funding to support activities that reduce these emissions.

<sup>d</sup>This total is a lower bound because agencies were unable to determine the amount of funding that some of their programs provided for activities that reduce diesel emissions.

As table 2 shows, each of the 14 relevant programs overlaps with at least one other program in the specific types of activities they fund, the program goals, or the eligible recipients of funding. For example, 6 of the 14 programs share a broad goal of increasing energy efficiency, and local governments are eligible to receive grants under 10 of the programs. In addition, we found that 13 of the 14 programs fund activities that retrofit diesel engines or vehicles, and 11 programs fund activities that reduce diesel vehicle idling. We also identified the potential for overlap among these 11 programs and an excise tax exemption for certain vehicle idling reduction devices because the tax expenditure and the 11 programs all provide incentives to use idle reduction devices to reduce diesel emissions. Appendix III provides additional information on this and two other tax expenditures related to diesel emissions reductions.

**Table 2: Overlapping Mobile Source Diesel Emissions Reduction Activities, Goals, and Eligible Recipients, by Agency and Program**

Agency/program	Activities					Goals				Eligible recipients					
	Retrofit vehicle or engine	Rebuild vehicle or engine	Replace vehicle or engine	Reduce vehicle idling	Use cleaner fuel	Reduce emissions	Reduce pollution in areas not meeting air quality standards	Increase energy efficiency	Reduce fuel use	State governments	Local governments	Land management agencies	Transit agencies	Federally recognized tribes	Private or nonprofit organizations
<b>DOE</b>															
Clean Cities	•		•	•	•			•	•	•	•	•	•	•	•
Energy Efficiency and Conservation Block Grant	•	•	•	•	•	•		•		•	•			•	
State Energy Program	•	•	•	•	•			•	•	•					
<b>DOT</b>															
<i>Federal Aviation Administration</i>															
Voluntary Airport Low Emissions	•		•		•	•	•			•	•				
<i>Federal Highway Administration</i>															
Congestion Mitigation and Air Quality Improvement	•	•	•	•	•		•			•	•		•		
Ferry Boat Discretionary	•	•	•		•					•	•				•
State Infrastructure Banks	•	•	•	•	•					•					
<i>Federal Transit Administration</i>															
Bus and Bus Facilities	•	•	•		•				•	•	•	•	•	•	
Clean Fuels Grant	•	•	•	•	•	•	•	•	•	•	•	•			
National Fuel Cell Bus Technology Development			•	•	•	•		•	•						•
Transit in Parks	•	•	•	•	•	•				•	•	•	•	•	•
Transit Investments in Greenhouse Gas and Energy Reduction	•	•	•	•	•	•		•	•	•		•	•		
Urbanized Area Formula Grants	•	•	•	•	•				•	•	•	•			
<b>EPA</b>															
Diesel Emissions Reduction Act Program	•	•	•	•	•	•				•	•	•	•	•	•

Source: GAO analysis of relevant laws and DOE, DOT, and EPA documents and interviews.



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We also identified several instances of duplication where more than one program provided funding to the same recipient for the same type of activities. In one case, a state transportation agency received \$5.4 million from DOT's Transit Investments in Greenhouse Gas Emissions Reduction program to, among other things, upgrade 37 diesel buses to hybrid diesel-electric buses; \$3.5 million from DOT's Congestion Mitigation and Air Quality Improvement program to replace diesel buses with 4 hybrid diesel-electric buses; and \$2.3 million from DOT's Clean Fuels Grant program to replace 4 diesel buses with hybrid electric buses. In another case, a nonprofit organization received \$1.1 million from EPA's Diesel Emissions Reduction Act Program to install emission reduction and idle reduction technologies on 1,700 trucks as well as \$5.6 million from a state infrastructure bank established under DOT's program to equip trucks and truck fleets with emissions control and idle reduction devices.

Even with duplication among the programs, several factors make it difficult to precisely determine whether unnecessary duplication exists. First, when different programs fund the same diesel emissions reduction activities, it is not necessarily wasteful. For example, a transit agency could use funds from two different programs to replace two separate fleets of aging diesel buses. Second, grant recipients may leverage funding from more than one program to support the full cost of diesel emissions reduction projects. In some cases, grant recipients have used funding from multiple agencies, in addition to local matching funds, to support the cost of large projects that include multiple diesel emissions reduction activities. Third, agencies were often unable to provide information necessary to determine whether and to what extent unnecessary duplication exists among the programs. For example, several agencies reported that they do not track costs for administrative functions at the program level. Without information on these costs, it is difficult to determine whether and to what extent programs perform duplicative administrative functions that could be consolidated to provide grants and loans more efficiently.

The fragmentation, overlap, and duplication among these programs result, in part, from their legislative creation as separate programs with different purposes that fund a wide range of activities, some of which have the effect of reducing mobile source diesel emissions. We have previously reported that, as the federal government has responded over time to new needs and problems, many agencies have been given

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responsibilities for addressing the same or similar national issues.<sup>15</sup> Some of this shared responsibility was intended to recognize that addressing some issues from a national perspective would necessarily involve more than one agency or approach. However, the resulting fragmentation, overlap, and duplication may waste administrative resources and create an environment in which participants are not served as efficiently and effectively as possible. In addition, we have previously reported that fragmentation, overlap, and duplication suggest the need for further examination of programs to identify potential areas for improvement, realignment, consolidation, or elimination.<sup>16</sup>

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## The Effectiveness of Federal Funding for Diesel Emissions Reduction Activities Is Unknown

The effectiveness of federal funding for activities that reduce mobile source diesel emissions is unknown because agencies vary in the extent to which they have established performance measures. In addition, few programs collect performance information on their diesel emissions reduction activities because 13 of the 14 programs that fund these activities have purposes other than reducing diesel emissions. This incomplete performance information may limit the ability of agencies to assess the effectiveness of their programs and activities that reduce diesel emissions.

Agencies that fund activities that reduce mobile source diesel emissions have established performance measures for their strategic goals to varying degrees. DOE and EPA have established performance measures for the strategic goals related to their programs that reduce mobile source diesel emissions. For example, EPA monitors progress toward its strategic goal of reducing greenhouse gas emissions and developing adaptation strategies to protect and improve air quality by measuring, among other things, the tons of mobile source emissions its programs reduce. DOT has established such performance measures for two of its administrations—the Federal Aviation Administration and Federal Highway Administration—but has not established such measures for the Federal Transit Administration for two of the four strategic goals that link to its programs that fund diesel emissions reduction activities. Appendix

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<sup>15</sup> [GAO/AIMD-97-146](#) and GAO, *Agencies' Annual Performance Plans Under the Results Act: An Assessment Guide to Facilitate Congressional Decisionmaking*, [GAO/GGD/AIMD-10.1.18](#) (Washington, D.C.: February 1998).

<sup>16</sup> [GAO/AIMD-97-146](#).

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IV provides additional information on these agencies' strategic goals and performance measures related to programs that reduce mobile source diesel emissions.

The Government Performance and Results Act, as amended, generally requires agencies to provide a basis for comparing actual results with established goals, and as such, federal departments and agencies are to comply with Government Performance and Results Act requirements. As we have previously reported, Government Performance and Results Act requirements also can serve as leading practices at lower levels within federal agencies, such as individual divisions, programs, or initiatives.<sup>17</sup> We have also reported that principles of good governance indicate that agencies should establish quantifiable performance measures to demonstrate how they intend to achieve their goals and measure the extent to which they have done so.<sup>18</sup> The Federal Transit Administration has not established performance measures for its goals of (1) environmental sustainability—that is, advancing environmentally sustainable policies and investments that reduce carbon and other harmful emissions from transportation sources—and (2) economic competitiveness—that is, promoting transportation policies and investments that bring lasting and equitable economic benefits to the nation and its citizens. Agency officials said they generally collect information on the current condition of the nation's transit fleet, the use of public transportation, and transit fleet compliance with the Americans with Disabilities Act to measure the performance of the agency's transit programs.<sup>19</sup> However, this information will not enable the agency to determine the extent to which it has met its goals related to environmental sustainability and economic competitiveness.

At the program level, limited performance information is available about the results of activities that reduce mobile source diesel emissions. The 14 programs that fund activities that reduce diesel emissions currently

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<sup>17</sup>See GAO, *Environmental Justice: EPA Needs to Take Additional Actions to Help Ensure Effective Implementation*, [GAO-12-77](#) (Washington, D.C.: Oct. 6, 2011).

<sup>18</sup>See [GAO/IGD/AIMD-10.1.18](#) and GAO, *The Results Act: An Evaluator's Guide to Assessing Agency Annual Performance Plans*, [GAO/IGD-10.1.20](#) (Washington, D.C.: April 1998).

<sup>19</sup>Americans with Disabilities Act of 1990. Pub. L. No. 101-336, 104 Stat. 327, codified as amended at 42 U.S.C. §§ 12101 et seq.

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collect performance information on their diesel emissions reduction activities to varying degrees. According to agency documents and officials, EPA's Diesel Emissions Reduction Act Program collects performance information on the amount and type of diesel emissions reductions each project achieves; DOE's three programs collect some emissions reduction information but do not quantitatively collect diesel emissions reduction information; three of DOT's programs collect some performance information related to diesel emissions reductions; and the remaining seven DOT programs do not collect performance information related to diesel emissions. This variation in the amount of diesel-related performance information programs collect occurs partially because 13 of the 14 programs that fund these activities have purposes other than reducing diesel emissions, such as supporting energy efficiency projects or reducing petroleum use. However, without information on the results of the programs' activities that reduce mobile source diesel emissions, the overall effectiveness of federal grant and loan funding for activities that reduce diesel emissions cannot be determined.

**EPA.** EPA's Diesel Emissions Reduction Act Program collects information on the number of diesel engines it replaces, retrofits, and rebuilds as well as information on the estimated tons of particulate matter, nitrogen oxide, carbon dioxide, carbon monoxide, and hydrocarbon emissions it reduces. According to agency documents, in fiscal year 2008—the most recent year for which data were reported—the program reduced approximately 46,000 tons of nitrogen oxide emissions and 2,200 tons of particulate matter emissions.<sup>20</sup> EPA documents show that the cost for these emissions reductions ranged from \$400 to \$2,000 per ton of nitrogen oxide emissions reduced and from \$9,000 to \$27,700 per ton of particulate matter emissions reduced.

**DOE.** DOE's Clean Cities program collects information on reductions in gasoline and diesel fuel use that the program achieves to measure progress toward its program goal of reducing national petroleum use by 2.5 billion gallons by 2020. DOE's Energy Efficiency and Conservation Block Grant and State Energy programs estimate emissions reductions that result from program activities, but neither of these programs separately tracks diesel emissions from other emissions reductions.

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<sup>20</sup>EPA calculated these emissions reduction figures in tons of emissions reduced over the lifetime of each project funded. Also, EPA collects information on emissions reductions but has not reported data more current than fiscal year 2008.

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**DOT's Federal Aviation Administration.** The Federal Aviation Administration's Voluntary Airport Low Emissions program collects information on the total amount of criteria pollutant emissions each project will reduce, but it does not currently track reductions in diesel emissions.

**DOT's Federal Highway Administration.** The Federal Highway Administration's Congestion Mitigation and Air Quality Improvement program collects information from grant recipients on the type and quantity of emissions reduced through each project the program funds. However, the program does not review or compile this information at the national level. The Ferry Boat Discretionary and State Infrastructure Banks programs do not collect performance information related to diesel emissions reductions.

**DOT's Federal Transit Administration.** The Federal Transit Administration's Transit Investments for Greenhouse Gas and Energy Reduction program obtains information from grant applicants on the amount of energy use and greenhouse gas emissions each project is to reduce, but the program does not separately track reductions in diesel energy use or diesel emissions. The remaining five Federal Transit Administration programs that fund diesel emissions reduction activities—Bus and Bus Facilities, Clean Fuels Grant, National Fuel Cell Bus Technology Development, Transit in Parks, and Urbanized Area Formula Grants—do not collect performance information related to diesel emissions reductions.

Efforts to measure the effects of programs that decrease diesel emissions are also hindered by the absence of a baseline assessment of nationwide diesel emissions from which agencies could measure progress. EPA has assessed national levels of nitrogen oxide and particulate matter pollution from some mobile diesel sources, including highway vehicles and some nonroad equipment, and DOT maintains data on the number of diesel transit vehicles currently in use. However, no agency has comprehensively assessed existing diesel pollution to identify the most significant mobile sources of diesel emissions and the specific areas that face the greatest health risks from diesel pollution. Without a more comprehensive assessment, agencies cannot identify and target, within their discretion, funding toward specific sectors or geographic areas of

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greatest need.<sup>21</sup> Agencies generally provide funds to recipients based on criteria that may derive from law, agency discretion, or a combination thereof. Under some programs, agencies allocate funding based on statutory formulas or criteria. For example, DOT's Urbanized Area Formula Grants program uses a statutory formula to allocate funds on the basis of population and population density. EPA's Diesel Emissions Reduction Act program awards funds competitively but, based on statutory criteria, must prioritize projects that maximize health benefits, are the most cost-effective, and serve areas with poor air quality, among other factors. Under other programs, agencies have some discretion in awarding funds. These agencies generally consider applicant eligibility and other relevant factors, but this does not include consideration of which areas face the greatest diesel-related health risks.

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## Limited Collaboration May Hinder the Effectiveness of Federal Funding for Activities That Reduce Diesel Emissions

The federal programs that fund activities that have the effect of reducing mobile source diesel emissions generally do not collaborate. According to DOE, DOT, and EPA officials, the three agencies consult on broad issues, such as to discuss available technologies or emissions standards, but these efforts do not involve collaboration on diesel-related issues. Moreover, officials from most of the 14 programs reported that any collaboration across the programs occurs on an informal, case-by-case basis. For example, officials from EPA's Diesel Emissions Reduction Act Program said they may contact officials from the Federal Highway Administration's Congestion Mitigation and Air Quality Improvement program to discuss a specific emissions reduction technology or project that appears in a grant application but that they do not collaborate with officials from this program on a regular basis. Also, some program officials reported that enhanced collaboration could improve the effectiveness of federal funding for activities that reduce diesel emissions. For example, officials from EPA's Diesel Emissions Reduction Act Program said that diesel-related programs could share information to more efficiently award grants and to reduce duplication of agency efforts, such as researching various emissions reduction technologies.

DOE, DOT, and EPA officials generally reported that they do not collaborate on diesel emissions reduction activities with other federal

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<sup>21</sup>We have previously reported that, in general, agencies should focus their funding on areas of greatest need. See GAO, *21st Century Challenge: Reexamining the Base of the Federal Government*, [GAO-05-325SP](#) (Washington, D.C.: February 2005).

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programs because they are unaware of the other programs that fund these activities, including, in some cases, programs within their own agencies. According to agency officials, this is due to the differing purposes and goals of each program, which often do not directly relate to reducing diesel emissions. However, we have previously reported that, although federal programs have been designed for different purposes or targeted for different population groups, coordination among programs with related responsibilities is essential to efficiently and effectively meet national concerns.<sup>22</sup> We reported that uncoordinated program efforts can waste scarce funds, confuse and frustrate program customers, and limit the overall effectiveness of the federal effort. A focus on results as envisioned by the Government Performance and Results Act implies that federal programs contributing to the same or similar results should be closely coordinated to ensure that goals are consistent, and, as appropriate, program efforts are mutually reinforcing. This means that federal agencies are to look beyond their organizational boundaries and coordinate with other agencies to ensure that their efforts are aligned. Also, the Government Performance and Results Act Modernization Act of 2010 requires that agency strategic plans include a description of how the agency is working with other agencies to, among other things, achieve its goals and objectives.

In addition, we have previously reported that agencies face a range of barriers in their efforts to collaborate.<sup>23</sup> To overcome such barriers and to maximize the performance and results of federal programs that share common outcomes, we have previously identified practices that can help agencies enhance and sustain collaboration.<sup>24</sup> These practices include agreeing on agency roles and responsibilities in the collaborative effort and identifying and addressing needs by leveraging collective resources. Further, we have reported that, to the extent that federal efforts are fragmented across agency lines, developing crosscutting performance

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<sup>22</sup>GAO, *The Government Performance and Results Act: 1997 Governmentwide Implementation Will Be Uneven*, [GAO/GGD-97-109](#) (Washington, D.C.: June 2, 1997).

<sup>23</sup>GAO, *Managing For Results: Barriers to Interagency Coordination*, [GAO/GGD-00-106](#) (Washington, D.C.: Mar. 29, 2000).

<sup>24</sup>GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, [GAO-06-15](#) (Washington, D.C.: Oct. 21, 2005).

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measures through interagency coordination could ease implementation burdens while strengthening efforts to develop best practices.<sup>25</sup>

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## Conclusions

Over time, EPA has issued more stringent emissions regulations for new diesel engines and vehicles, but existing diesel trucks, buses, locomotives, ships, agriculture equipment, and construction equipment continue to emit harmful pollution. Because diesel engines are durable and energy efficient, it could take decades for these older diesel vehicles and equipment to fall out of use. As a result, federal agencies play an important role in accelerating the attrition of existing diesel engines and vehicles and the resulting reduction in diesel emissions. However, federal funding that reduces diesel emissions is fragmented across 14 programs that overlap in their activities, goals, and eligible recipients. Also, the effectiveness of this funding is unknown because agencies collect limited performance information related to these programs. Because DOT's Federal Transit Administration has not developed performance measures for its goals related to environmental sustainability and economic competitiveness, the agency is unable to fully assess the performance of programs that contribute to these goals. In addition, agencies collect limited information on the results of the diesel emissions reduction activities they fund and do not have a baseline assessment of nationwide diesel emissions, which they could use to measure progress.

Also, collaboration among the 14 programs that fund activities that reduce mobile source diesel emissions is essential to efficiently and effectively reduce diesel emissions. As the focus on results as envisioned by the Government Performance and Results Act implies, federal programs contributing to the same or similar results should be closely coordinated to ensure that goals are consistent, and, as appropriate, program efforts are mutually reinforcing. Agencies often face barriers in their efforts to collaborate, and some best practices for overcoming these barriers include identifying agency roles and responsibilities as well as identifying and leveraging collective resources. Further, when federal efforts are fragmented, this coordination can be achieved through collaboratively developing crosscutting performance measures. However, as we found, these 14 programs generally do not collaborate and collect limited information on the results of the activities they fund that reduce diesel

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<sup>25</sup>[GAO/AIMD-97-146](#).



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emissions. Without collaboration and crosscutting performance measures, agencies do not have needed information to assess the effectiveness and efficiency of their programs or identify any unnecessary duplication.

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## Recommendations for Executive Action

We are making two recommendations to help ensure effectiveness and accountability:

1. For transit grant programs, we recommend that the Secretary of Transportation require the Administrator of the Federal Transit Administration to develop quantifiable performance measures, a leading practice based in Government Performance and Results Act principles, for the agency's environmental sustainability and economic competitiveness strategic goals.
2. For federal funding that reduces diesel emissions, we recommend that the Secretary of Energy, the Secretary of Transportation, and the Administrator of the EPA, consistent with statutory obligations, establish a strategy for collaboration among their grant and loan programs in their activities that reduce mobile source diesel emissions. This strategy should help the agencies
  - identify agency roles and responsibilities for activities that reduce diesel emissions, including how a collaborative effort will be led;
  - identify and address any unnecessary duplication, as appropriate;
  - identify and leverage resources needed to support funding activities that reduce diesel emissions;
  - assess baseline levels of diesel pollution and the contributors to mobile source diesel emissions to help agencies target, within their discretion, investments and, as appropriate, inform efforts to measure program effectiveness; and
  - develop crosscutting performance measures, as appropriate, to monitor the collective results of federal funding for activities that reduce diesel emissions.

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## Agency Comments and Our Evaluation

We provided a draft of this report to the Secretary of Energy, the Secretary of Transportation, and the Administrator of EPA for their review and comment. In its written comments, EPA stated that it agreed with our

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findings and relevant recommendation. EPA's comments can be found in appendix V.

In its comments, DOE questioned several of our findings but agreed with our relevant recommendation. Specifically, DOE stated that our report mischaracterizes the agency as having a statutory responsibility for diesel emissions reductions. Our report does not contain such a statement. Rather, it identifies 14 programs, including 3 DOE programs, that fund activities with the effect of reducing diesel emissions and states that programs with related responsibilities should coordinate their efforts. Our report states that most of the programs we identified have other goals or purposes and do not focus on diesel emissions reduction; nonetheless, each of the programs does fund such activities. Our report also recognizes the varying statutory requirements for each program and recommends that the agencies establish a strategy for collaboration that is consistent with their existing statutory obligations. DOE also stated that our report mischaracterizes DOE as not collaborating with other government agencies. Our report states that DOE collaborates with other agencies on broad issues but does not collaborate on diesel-related issues. In addition, DOE stated that our report mischaracterized the agency as sharing redundant national goals with DOT and EPA. Our report does not discuss DOE's national goals, their relationship to those of other agencies, or whether they are redundant. Rather, our report (1) focuses on DOE programs that fund activities that result in diesel emissions reductions and (2) demonstrates that these programs share similar goals with DOT and EPA programs that fund the same activities. Specifically, each of these programs shares some goals, such as reducing emissions, increasing energy efficiency, and reducing fuel use. DOE also provided technical comments, which we incorporated as appropriate. DOE's comments and our response can be found in appendix VI.

DOT questioned several of this report's key findings and its recommendations. Specifically, DOT stated that we inaccurately described the Federal Transit Administration's programs as funding diesel emissions reduction activities. Our report identifies activities that reduce diesel emissions, including replacing existing diesel vehicles and installing devices that reduce idling of diesel engines, and identifies six Federal Transit Administration programs that fund these same activities. In addition, DOT questioned the evidence underlying our finding of fragmentation among the federal programs within our review. DOT stated that we identified independent programs with varying objectives that, in some cases, include similar activities. As we reported, fragmentation

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occurs when more than one federal agency, or more than one organization within an agency, is involved in the same broad area of national need. Further, our report does not state that fragmentation implies small, incomplete, or broken parts strewn across government, as DOT's comments state. Our report clearly identifies fragmentation, overlap, and duplication among the 14 federal programs that fund diesel emissions reduction activities. Consistent with our established definition of fragmentation and our evidence, we stand by our finding that federal grant and loan funding for activities that reduce diesel emissions is fragmented across 14 programs.

DOT also questioned our finding that the effectiveness of federal funding for diesel emissions reduction activities is unknown. DOT stated that we could have used available air quality data from EPA to assess the effectiveness of the programs we reviewed. We reviewed air quality data from EPA and determined that it was not possible to establish a causal link between the EPA data and the programs we reviewed. Moreover, principles of good governance indicate that agencies that use scarce federal resources should establish quantifiable performance measures for use in administering their programs. This is particularly important when multiple agencies engage in the same or similar activities, even if the activities contribute to different goals. Related to this finding, DOT questioned why the report does not include information that the Federal Transit Administration provided on its contribution to air quality improvement through replacing transit buses. We reviewed this information and found that the numbers the Federal Transit Administration provided were based on unverified assumptions and estimates rather than actual data on the number of diesel buses replaced. As such, the numbers were not reliable for the purposes of our report.

In several instances, DOT questioned our recommendation that the Federal Transit Administration should develop quantifiable performance measures for its environmental sustainability and economic competitiveness strategic goals. DOT's comments on this recommendation reflect a misinterpretation of the recommendation. Specifically, DOT incorrectly stated that our report recommended that the Federal Transit Administration develop quantifiable performance measures relating to diesel emissions reductions. Neither of our recommendations called for DOT to establish such performance measures. Instead, we recommended that (1) the Federal Transit Administration develop performance measures for two of its agencywide strategic goals and (2) DOE, DOT, and EPA establish a strategy for collaboration on diesel emissions reduction activities that, among other

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things, helps the agencies develop crosscutting performance measures, as appropriate, to assess the collective results of federal funding for activities that reduce diesel emissions. DOT also stated that it operates in full compliance with the Government Performance and Results Act. Specifically, DOT said that it has established outcome-focused performance measures that are appropriate for its programs and mission focus. Our report does not assess DOT's compliance with the Government Performance and Results Act. Rather, it identifies the Federal Transit Administration's strategic goals that relate to the agency's relevant programs and states whether the Federal Transit Administration has developed performance measures for these goals. Our report states that principles of good governance indicate that agencies should establish quantifiable performance measures to demonstrate how they intend to achieve their goals and measure the extent to which they do so. Our report also states that Government Performance and Results Act requirements for agencies to set goals for program performance and to measure results can serve as leading practices for lower levels within federal agencies. We have clarified the report language and recommendation to state that, on the basis of these leading practices, we recommend the Federal Transit Administration establish performance measures for the two agency-wide strategic goals of environmental sustainability and economic competitiveness that relate to the programs involving diesel emissions reduction activities. The Federal Transit Administration provided no evidence that it has established performance measures for these strategic goals. Importantly, the agency's fiscal year 2012 budget justification that it submitted to Congress—the document that Federal Transit Administration officials said contained the agency's goals and performance measures—did not include performance measures for its environmental sustainability and economic competitiveness strategic goals. We continue to believe that the Federal Transit Administration should establish performance measures for these goals.

Regarding our recommendation that DOE, DOT, and EPA establish a strategy for collaboration among their programs that reduce mobile source diesel emissions, DOT agreed that collaboration can be useful but questioned its usefulness in this context. Specifically, DOT stated that the report demonstrates no specific deficiency that has occurred due to the existing level of collaboration. As our report states, DOE, DOT, and EPA were generally unaware of other programs that fund activities that decrease diesel emissions. Additionally, we reported that representatives of several DOE and DOT programs were unaware of related programs within their own agencies that fund the same underlying activities. Our

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report also states that EPA officials said that enhanced collaboration could improve the effectiveness of federal funding for activities that reduce diesel emissions. In its comments, DOT stated that the report does not offer evidence to support why establishing a strategy for collaboration among entities that fund these activities should be a priority use of federal resources. While the programs we reviewed have been designed for different purposes, coordination among programs with related responsibilities and that fund the same activities is essential to the efficient and effective use of resources. Further, uncoordinated programs can waste scarce funds and limit the overall effectiveness of federal spending. We therefore continue to believe that our recommendation is warranted.

DOT also stated that the report does not effectively demonstrate that our recommended actions will produce cost-effective investments appropriate for DOT that do not potentially duplicate efforts elsewhere in the government. We believe it is entirely appropriate for the Federal Transit Administration to establish performance measures for its goals and do not see how this would duplicate other efforts within the government. We also continue to believe that establishing a strategy for collaboration is an appropriate investment that would help ensure the effectiveness and accountability of federal funding for activities that reduce diesel emissions. As we noted, such a strategy should help agencies identify and address any unnecessary duplication.

Finally, DOT's comments emphasized its view that its programs focus on their statutory mission of transit, whereas diesel emissions reduction is a corollary benefit. Our report states that most of the programs we identified have other goals or purposes and do not focus on diesel emissions reduction; nonetheless, each of the programs does fund such activities. Our report also recognizes the statutory requirements for each program and recommends that the agencies establish a strategy for collaboration that is consistent with existing statutory obligations. DOT's comments can be found in appendix VII.

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We are sending copies of this report to the Secretaries of Energy and Transportation, the Administrator of the EPA, appropriate congressional committees, and other interested parties. In addition, this report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or [trimbled@gao.gov](mailto:trimbled@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix VIII.

A handwritten signature in black ink that reads "David C. Trimble". The signature is written in a cursive style with a large initial 'D' and a distinct 'C'.

David C. Trimble  
Director, Natural Resources and Environment

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# Appendix I: Objectives, Scope, and Methodology

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This report examines the (1) extent to which duplication, overlap, fragmentation, or gaps, if any, exist among federal grant, rebate, and loan programs that address mobile source diesel emissions; (2) effectiveness of federal funding for activities that reduce mobile source diesel emissions; and (3) extent to which collaboration takes place among agencies that fund activities that reduce mobile source diesel emissions.

To address the first objective, we identified federal grant, rebate, and loan programs that address mobile source diesel emissions, and reviewed information about each program to identify duplication, overlap, fragmentation, and gaps. To identify the programs that address diesel emissions, we (1) conducted a literature review of government reports, academic materials, legislation, transcripts, appropriations, trade and industry articles, and other relevant publications; (2) interviewed agency officials and relevant industry stakeholders; and (3) reviewed agency documents, including information about activities eligible for funding. For the literature review, we searched twenty databases and websites—Article First, Congressional Research Service, Congressional Budget Office, Inspectors General, Policyfile, ProQuest, Worldcat, National Technical Information Services, Wilson’s Applied Science and Technical Abstracts, and the Catalog of Federal Domestic Assistance, among others—for materials published in the last 10 years that may identify relevant federal grant, rebate, and loan programs. Next, we interviewed agency and relevant third-party officials and analyzed agency documents to determine if the programs our searches identified could provide funding for activities that reduce diesel emissions. For this review, we identified programs that fund activities that directly reduce diesel emissions and did not include programs that fund activities, such as research and development efforts, that have the potential to reduce diesel emissions in the future. We held these interviews and conducted these searches from June 2011 to September 2011.

For each program we identified as reducing diesel emissions, we conducted structured interviews of agency officials and reviewed agency documents to determine the types of funding the program provides as well as its purpose, goals, eligible activities, and eligible applicants. We then compared each of these areas across the programs to identify areas of duplication, overlap, or fragmentation. We also compared eligible recipients under each program with available data on the sources of diesel emissions to identify any gaps among the programs, such as mobile sources of diesel emissions for which funding opportunities are not available. For the duplication, overlap, and fragmentation we found, we

interviewed agency officials and relevant industry stakeholders to determine its causes and impact.

In addition, we obtained and analyzed funding data from the Department of Energy (DOE), the Department of Transportation (DOT), and the Environmental Protection Agency (EPA) to determine the total amount of federal funding for diesel emissions reduction projects from fiscal years 2007 through 2011. We selected fiscal years 2007 through 2011 as our time period because, by 2007, EPA had issued emissions standards for key on-road sources, such as heavy-duty trucks and buses, as well as a rule requiring refiners to reduce the sulfur content—and therefore the emissions—of certain diesel fuels. We obtained these data from DOE for the Clean Cities, Energy Efficiency and Conservation Block Grant, and State Energy programs; from DOT's Federal Aviation Administration for the Voluntary Airport Low Emissions program; from DOT's Federal Highway Administration for the Ferry Boat and State Infrastructure Banks programs; from DOT's Federal Transit Administration for the National Fuel Cell Bus Technology Development and Transit Investments in Greenhouse Gas Emissions Reduction programs; and from EPA for the Diesel Emissions Reduction Act Program. However, DOT's Federal Transit Administration was unable to provide this data for the Bus and Bus Facilities, Clean Fuels Grant, Congestion Mitigation and Air Quality Improvement, Transit in Parks, and Urbanized Area Formula Grants programs.<sup>1</sup> A Federal Transit Administration official said that because the agency did not track which awards under these programs reduced diesel emissions or diesel fuel use, it was unable to identify the amount of funding each of these programs provided for activities that reduced diesel emissions. The official said that the agency did not track these data because statutory requirements do not call for such tracking. Instead, the agency provided us access to its grants management database, from which we estimated the amount of funding provided for diesel emissions reduction projects for the Clean Fuels Grant, Congestion Mitigation and Air Quality Improvement, and Transit in Parks programs, but we were unable to estimate the amount of funding provided through the Bus and Bus Facilities or Urbanized Area Formula Grants programs due to the limited timeframes of our review. We reviewed documents about the underlying databases that DOE, DOT, and EPA use to collect grant

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<sup>1</sup>DOT's Federal Highway Administration administers the Congestion Mitigation and Air Quality Improvement program, but DOT's Federal Transit Administration collects and maintains grant data for the program.



information and interviewed knowledgeable agency officials to assess the reliability of the data for each program. We determined that the data obtained from these agencies were sufficiently reliable for the purposes of this report.

In addition, the Federal Transit Administration provided estimates of the amount that its Bus and Bus Facilities, Clean Fuels Grant, Congestion Mitigation and Air Quality Improvement, Transit in Parks, and Urbanized Area Formula Grants programs awarded from fiscal years 2007 through 2011 for projects that reduced diesel emissions. The agency derived these estimates by identifying obligations made under each of these five programs from fiscal years 2007 through 2011 for purchasing replacement transit vehicles. However, the agency does not consistently collect information on the fuel-type of the vehicles it replaces; rather it collects information on the intended purchase, by fuel-type, for all obligations made in each grant by year and program. The Federal Transit Administration provided this information to GAO; however, this information does not accurately reflect the amount of funding provided for replacement vehicles that reduced diesel emissions, and we did not include the information in this report.

To address the second objective, we reviewed and analyzed agency officials' responses to structured interview questions on their program goals and performance information. We also analyzed agency strategic plans, budget documents, and other agency documentation containing performance information. We reviewed relevant provisions of the Government Performance and Results Act of 1993, as amended by the Government Performance and Results Act Modernization Act of 2010, as well as our prior work on performance measurement.

To address the third objective, we reviewed and analyzed agency officials' responses to structured interview questions on coordination with other programs and assessment of diesel pollution. We also reviewed our prior work on collaboration to compare these programs' efforts with best practices for federal programs. In addition, to identify tax expenditures that provide incentives that address mobile source diesel emissions, we reviewed tax expenditure lists produced by the U.S. Department of the Treasury and the Joint Committee on Taxation; reports by the Congressional Research Service, including the 2010 tax expenditure compendium; and a DOE list of federal incentives related to alternative

fuels, vehicles, and air quality.<sup>2</sup> We also interviewed agency officials at DOE, DOT, and EPA as well as industry stakeholders.

We conducted this performance audit from May 2011 to February 2012 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.

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<sup>2</sup>The published lists report federal income tax expenditures and also include information on excise tax revenue forgone for listed tax expenditures. The lists do not include estimates for tax provisions that result in forgone excise tax only.

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# Appendix II: Additional Information on Federal Programs That Provide Grants or Loans for Mobile Source Diesel Emissions Reduction Activities

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## Department of Energy

**Clean Cities program.** DOE's Clean Cities program, administered by the Office of Energy Efficiency and Renewable Energy, is a government-industry partnership that works to reduce America's petroleum consumption in the transportation sector. The program provides competitive grants for projects that implement a range of energy-efficient and advanced vehicle technologies, such as hybrids, electric vehicles, plug-in electric hybrids, hydraulic hybrids, and compressed natural gas vehicles, helping reduce petroleum consumption across the United States. The program also supports refueling infrastructure for various alternative fuel vehicles, as well as public education and training initiatives.

**Energy Efficiency and Conservation Block Grant program.** The Energy Efficiency and Conservation Block Grant program, administered by DOE's Office of Energy Efficiency and Renewable Energy, provides funds through competitive and formula grants to states, territories, federally-recognized Indian tribes, and local governments to develop and implement projects to improve energy efficiency and reduce energy use and fossil fuel emissions in their communities.

**State Energy Program.** The State Energy Program, administered by DOE's Office of Energy Efficiency and Renewable Energy, provides technical and financial assistance to states through formula and competitive grants. States may use such grants to develop, modify, and implement approved state energy conservation plans.

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## Department of Transportation

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### Federal Aviation Administration

**Voluntary Airport Low Emissions program.** The Voluntary Airport Low Emissions program provides funding to reduce airport ground emissions at commercial service airports in areas failing to meet or maintain National Ambient Air Quality Standards. Grant funding generally supports projects such as electrification of airport gate systems, the incremental cost of purchasing electric luggage carts, and purchasing airport shuttle buses that use alternative fuels. The Federal Aviation Administration considers applications for Voluntary Airport Low Emissions grants on a case-by-case basis based on the project's importance relative to other eligible airport activities. The agency also considers each project's cost effectiveness and reductions in air emissions.

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Federal Highway Administration

**Congestion Mitigation and Air Quality Improvement program.** Jointly administered by Federal Highway Administration and the Federal Transit Administration, the Congestion Mitigation and Air Quality Improvement program provides grants to state departments of transportation, metropolitan planning organizations, and transit agencies for a variety of transportation projects in areas that do not meet or have previously failed to meet federal air quality standards. The program distributes funding through a statutory formula primarily based on population in areas of certain air quality status. The Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users of 2005 expanded the focus of eligible projects under the program, placing more priority on diesel engine retrofits and cost-effective emission reduction and congestion mitigation projects that also provide air quality benefits.

**Ferry Boat Discretionary program.** The Intermodal Surface Transportation Efficiency Act of 1991 amended a predecessor ferry program, resulting in this program to construct ferry boats and ferry terminal facilities. Eligible projects include both ferry boats carrying passengers only and those carrying cars and passengers. In general, ferry boats and facilities must be publicly owned or operated, and the ferry facilities must provide connections on a public road, which has not been designated part of the interstate system. The program provides administrative consideration of whether the project will result in a useable facility; what other benefits exist; whether other funds, either state or local, are committed to the project; and whether the project has received program funds in the past.

**State Infrastructure Bank program.** The State Infrastructure Bank program provides the opportunity to all 50 states, Puerto Rico, the District of Columbia, American Samoa, Guam, the Virgin Islands, and the Commonwealth of the Northern Mariana Islands to establish transportation revolving loan funds. States may capitalize their revolving loan funds with federal highway funding, and states could offer a range of loans and credit options, such as low-interest loans, loan guarantees, or loans requiring repayment of interest-only in early years and delayed repayment of the loan's principal. For example, through a revolving fund, states could lend money to public or private sponsors of transportation projects, project-based or general revenues (such as tolls or dedicated taxes) could be used to repay loans with interest, and the repayments would replenish the fund so that new loans could be supported.

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Federal Transit Administration

**Bus and Bus Related Equipment and Facilities program.** DOT's Bus and Bus Facilities program provides capital assistance for new and replacement buses, related equipment, and related facilities for expansion and maintenance purposes. The projects funded by this program are generally determined by Congress. Funds can be provided only to state and local governmental authorities. The purpose of the program is to replace, rehabilitate, and purchase buses and bus-related facilities in support of FTA's goal of developing a transportation system that (1) maximizes the safe, secure, and efficient mobility of individuals; (2) minimizes environmental impacts; and (3) minimizes transportation-related fuel consumption and reliance on foreign oil.

**Clean Fuels Grant program.** This program provides competitive grants to assist areas in achieving or maintaining the National Ambient Air Quality Standards for ozone and carbon monoxide and to support emerging clean fuel and advanced propulsion technologies for transit buses and markets for those technologies. Eligible projects under the program include (1) purchasing or leasing clean fuel buses, including buses that employ a lightweight composite primary structure and vans for use in revenue service; (2) constructing or leasing clean fuel bus facilities or electrical recharging facilities and related equipment; and (3) purchasing clean fuel, biodiesel, hybrid electric, or zero emissions technology buses that exhibit equivalent or superior emissions reductions to existing clean fuel or hybrid electric technologies.

**National Fuel Cell Bus Technology Development program.** This program is a research, development, and demonstration competitive grant program established to facilitate the development of fuel cell bus technology and related infrastructure. The Federal Transit Administration may award grants for this purpose to up to three geographically diverse nonprofit organizations. The goals of the program are to (1) facilitate the development of commercially viable fuel cell bus technologies, (2) significantly improve transit bus fuel efficiency and reduce petroleum consumption, (3) reduce transit bus emissions, (4) establish a globally competitive U.S. industry for fuel cell bus technologies, and (5) increase public acceptance of the fuel cell vehicles.

**Paul S. Sarbanes Transit in Parks program.** The Transit in Parks program was established to address the challenge of increasing vehicle congestion in and around our national parks and other federal lands by providing competitive grants for capital and planning expenses for new or existing alternative transportation systems in the vicinity of federally owned or managed recreation areas. According to program documents,

alternative transportation includes transportation by bus, rail, or any other publicly available means of transportation and includes sightseeing service. It also includes nonmotorized transportation systems such as pedestrian and bicycle trails. The program seeks to conserve natural, historical, and cultural resources; reduce congestion and pollution; improve visitor mobility and accessibility; enhance visitor experience; and ensure access to all, including persons with disabilities.

**Transit Investments in Greenhouse Gas and Energy Reduction program.** The American Recovery and Reinvestment Act of 2009 authorized the Transit Investments in Greenhouse Gas and Energy Reduction program, and the program received funding through fiscal year 2011. The program did not receive funding for fiscal year 2012 in the relevant appropriations act.<sup>1</sup> This program provides competitive grants to assist public transportation agencies in implementing strategies for reducing greenhouse gas emissions and energy use in transit operations. Eligible applicants under the program include public transportation agencies, federally recognized tribes, and state departments of transportation. Two types of projects are eligible for funding under the Transit Investments in Greenhouse Gas and Energy Reduction program: capital investments that assist in reducing the energy consumption of a transit agency and capital investments that reduce greenhouse gas emissions of a transit agency. For purposes of the Transit Investments in Greenhouse Gas and Energy Reduction program, energy consumption is defined as energy purchased directly by the public transportation agency. Examples of energy include diesel fuel, compressed natural gas, and electricity purchased from power plants. Emissions are defined as those emitted directly by the assets of the public transportation agency.

**Urbanized Area Formula Grants program.** This program provides grants to urbanized areas and to states for public transportation capital projects and operating assistance for equipment and facilities in urbanized areas and for transportation-related planning.<sup>2</sup> The program allocates funds based on a multitiered formula, which separates urban areas with populations under 200,000 from those with populations of

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<sup>1</sup>See H.R. Rep. No. 112-284, at 305 (Conf. Rep.).

<sup>2</sup>An urbanized area is an area with a population of 50,000 or more that is designated as such in the 2000 Census by the U.S. Department of Commerce, Bureau of the Census.

200,000 or more. Funds are first apportioned based on a formula provided in law to designated recipients (typically metropolitan planning organizations or a state or regional authority responsible for capital projects and for financing and directly providing public transportation). Designated recipients allocate the apportionment among eligible transit service providers in the urbanized area. Eligible uses of program funds include planning, design, and evaluation of transit projects and capital investments in bus-related activities, such as replacement, overhaul, and rebuilding of buses.

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## Environmental Protection Agency

**Diesel Emissions Reduction Act Program.** This program provides grant funding to reduce emissions from existing diesel engines through engine retrofits, rebuilds, and replacements; switching to cleaner fuels; and other strategies. The program offers funding through four subprograms:

- the National Clean Diesel Funding Assistance Program awards competitive grants for projects implementing EPA verified and certified diesel emissions reduction technologies,
- the National Clean Diesel Emerging Technologies Program awards competitive grants for projects that develop and evaluate emerging diesel emissions reduction technologies,
- the SmartWay Clean Diesel Finance Program awards competitive grants to establish low-cost revolving loans or other innovative financing programs that help fleets reduce diesel emissions, and
- the State Clean Diesel Grant Program allocates funds to participating states to implement grant and loan programs for clean diesel projects.

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# Appendix III: Tax Expenditures Related to Mobile Source Diesel Emissions Reduction Activities

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## Excise Tax Exemption for Idling Reduction Devices

This tax expenditure excludes certain idling reduction devices from the federal excise tax. Under federal excise tax law, heavy truck, trailer, and tractor parts sold separately from the vehicle generally are subject to a 12 percent retail tax. The Energy Improvement and Extension Act of 2008 excludes qualified idling reduction devices from the federal retail tax on vehicle parts. EPA, in consultation with the Secretaries for the DOT and DOE, maintains a list of devices approved for the tax exemption. An idle reduction device is generally a device or system that provides services, such as heat, air conditioning, or electricity, to the vehicle or equipment without the use of the main drive engine while the vehicle or equipment is temporarily parked or remains stationary, hence reducing unnecessary idling of the vehicle or equipment. No estimate of forgone federal tax revenue for this excise tax provision is available because the Department of the Treasury reports estimates only for income tax expenditures and does not report estimates for tax provisions that result in forgone excise tax only.

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## Biodiesel and Small Agri-biodiesel Producer Tax Credits

This tax expenditure provides an income tax credit as well as an excise tax credit for the production and use of biodiesel.<sup>1</sup> The use of biodiesel instead of conventional diesel fuel significantly reduces particulate matter and hydrocarbon emissions. The biodiesel fuels income tax credit is the sum of three credits: (1) the biodiesel mixture credit, which provides \$1 for each gallon of biodiesel and agri-biodiesel used by the taxpayer in the production of a qualified biodiesel mixture; (2) the biodiesel credit, which is \$1 per gallon for each gallon of unblended biodiesel and agri-biodiesel when used as a fuel or sold at retail; and (3) the small agri-biodiesel producer credit, which is 10 cents per gallon for up to 15 million gallons of agri-biodiesel produced by small producers. The biodiesel excise tax credit provides a tax credit of \$1 for each gallon of biodiesel or agri-biodiesel a taxpayer used to produce a biodiesel mixture for sale or use in a trade or business. Renewable diesel fuel is eligible for both the income tax credit and excise tax credit at a rate of \$1 per gallon. According to Department of the Treasury estimates, in fiscal year 2010, the biodiesel income tax credits resulted in \$20 million in forgone federal income tax revenue, and the biodiesel excise tax credit resulted in \$490 million in forgone federal excise tax revenue.

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<sup>1</sup>Biodiesel fuel is an alternative to petroleum-based transportation fuel. U.S. biodiesel is made from soybeans and other plant oils, such as cottonseed and canola; animal fats, such as beef tallow, pork lard, and poultry fat; and recycled cooking oils.



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## Diesel Fuel Emulsion Tax Credit

A claim for credit or refund may be made for the nontaxable use of a diesel-water fuel emulsion—a mixture of diesel, water, and additives—and for undyed diesel fuel used to produce a diesel-water fuel emulsion. The presence of water in the emulsion reduces both nitrogen oxide and particulate matter emissions from the diesel fuel. The claim rate for nontaxable use of a diesel-water fuel emulsion taxed at 19.8 cents per gallon is 19.7 cents (if exported, the claim rate is 19.8 cents). The following are the nontaxable uses for a diesel-water fuel emulsion for which a credit or refund may be allowable to an ultimate purchaser: on a farm for farming purposes; off-highway business use; export; in a qualified local bus; in a school bus; other than as fuel in the propulsion engine of a train or diesel-powered highway vehicle, but not off-highway use; exclusive use by a qualified blood collector organization; in a highway vehicle owned by the United States that is not used on a highway; exclusive use by a nonprofit educational organization; exclusive use by a state, political subdivision of a state, or the District of Columbia; and in an aircraft or vehicle owned by an aircraft museum. No estimate of forgone federal tax revenue for this excise tax provision is available because the Department of the Treasury reports estimates only for income tax expenditures and does not report estimates for tax provisions that result in forgone excise tax only.

# Appendix IV: Strategic Goals and Establishment of Performance Measures Related to Programs That Fund Activities That Reduce Mobile Source Diesel Emissions

Agency	Strategic goal	Performance measure established	Related programs	
DOE	To catalyze the timely, material, and efficient transformation of the nation's energy system and secure U.S. leadership in clean energy technologies	Yes	Clean Cities program	
			Energy Efficiency and Conservation Block Grant program	
			State Energy Program	
DOT	To advance environmentally sustainable policies and investments that reduce carbon and other harmful emissions from transportation sources	Yes	Voluntary Airport Low Emissions program	
				To ensure the United States proactively maintains its critical transportation infrastructure in a state of good repair
				To improve public health and safety by reducing transportation-related fatalities and injuries
				To promote transportation policies and investments that bring lasting and equitable economic benefits to the nation and its citizens
Federal Highway Administration	To advance environmentally sustainable policies and investments that reduce carbon and other harmful emissions from transportation sources	Yes	Congestion Mitigation and Air Quality Improvement program	
			Ferry Boat Discretionary program	
			To ensure the United States proactively maintains its critical transportation infrastructure in a state of good repair	
			To foster livable communities through place-based policies and programs that increase transportation choices and access to transportation services	
			To improve public health and safety by reducing transportation-related fatalities and injuries	
To promote transportation policies and investments that bring lasting and equitable economic benefits to the nation and its citizens				

**Appendix IV: Strategic Goals and  
Establishment of Performance Measures  
Related to Programs That Fund Activities That  
Reduce Mobile Source Diesel Emissions**

<b>Agency</b>	<b>Strategic goal</b>	<b>Performance measure established</b>	<b>Related programs</b>
Federal Transit Administration	To advance environmentally sustainable policies and investments that reduce carbon and other harmful emissions from transportation sources	No	Transit in Parks program
	To foster livable communities through place-based policies and programs that increase transportation choices and access to transportation services	Yes	Bus and Bus Facilities program
			Clean Fuels Grant program
			Transit in Parks program
	To improve public health and safety by reducing transportation-related fatalities and injuries	Yes	Urbanized Area Formula Grants program
Bus and Bus Facilities program			
Clean Fuels Grant program			
To promote transportation policies and investments that bring lasting and equitable economic benefits to the nation and its citizens	No	Transit in Parks program	
		Urbanized Area Formula Grants program	
		Bus and Bus Facilities program	
		Clean Fuels Grant program	
<b>EPA</b>	To reduce greenhouse gas emissions and develop adaptation strategies to address climate change, and protect and improve air quality	Yes	Diesel Emissions Reduction Act Program

Source: GAO analysis of DOE, DOT, and EPA documents.

# Appendix V: Comments from the Environmental Protection Agency



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

JAN 24 2012

OFFICE OF  
AIR AND RADIATION

David C. Trimble  
United States Government Accountability Office  
Washington, D.C. 20548

Dear Mr. Trimble:

Thank you for providing the Environmental Protection Agency with the draft report entitled *Diesel Pollution: Fragmented Federal Programs that Reduce Mobile Source Emissions Could Be Improved (GAO-12-261)* for our review and comment. We appreciate the Government Accountability Office's examination of the federal programs that provide funding for activities that reduce diesel emissions, as reducing emissions from diesel engines is one of the most important air quality challenges facing the country.

We appreciate that the draft report notes our program's ongoing efforts to collect information on the number of diesel engines we replace, retrofit and rebuild as well as information on the estimated tons of particulate matter, nitrogen oxide, carbon dioxide, carbon monoxide and hydrocarbon that these projects reduce. We also acknowledge the documented results that the DERA program has achieved to date. We continue to work to ensure that we are funding projects achieving significant and effective reductions in diesel emissions.

We agree with the report's conclusion that the federal grant and loan programs identified should collaborate to a greater extent on their diesel emission reduction activities, to further strengthen the results achieved thus far, and to ensure that federal tax dollars are put to work in the most effective, efficient way possible. We will work with other Federal agencies to ensure we are working together nationwide to achieve significant reductions in diesel emissions from mobile sources.

Again, thank you for providing us with the opportunity to comment on this draft report.

Sincerely,

A handwritten signature in black ink, appearing to read "Karl Simon".

Karl Simon, Director  
Transportation and Climate Division

Internet Address (URL) • <http://www.epa.gov>

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# Appendix VI: Comments from the Department of Energy



## Department of Energy

Washington, DC 20585

January 26, 2012

Mr. Frank Rusco  
Director  
Natural Resources and Environment  
U.S. Government Accountability Office  
Washington, DC 20548

Dear Mr. Rusco:

This letter responds to the findings contained in the U.S. General Accountability Office (GAO) report, *DIESEL POLLUTION - Fragmented Federal Programs that Reduce Mobile Source Emissions Could Be Improved (GAO-12-261)*.

Specifically, the report as written does not include important information and comments that were provided to GAO by the Department of Energy (DOE) in the course of compiling the report. This additional information would help to clarify critical differences between the Federal programs of interest, explain unusual or mitigating circumstances that resulted from the implementation of the American Recovery and Reinvestment Act (ARRA), and identify collaborative efforts or best practices that are already in place.

Conclusions of the report state:

- Collaboration among the 14 programs that fund activities that reduce mobile source diesel emissions is essential to efficiently and effectively reduce diesel emissions.

The report recommends the following action:

- For Federal funding that reduces diesel emissions, we recommend that the Secretary of Energy, the Secretary of Transportation, and the Administrator of the Environmental Protection Agency, consistent with statutory obligations, establish a strategy for collaboration among their grant and loan programs which reduce mobile source diesel emissions.

Although we concur with the above recommendation to strengthen collaboration among the three agencies, DOE does not concur with the characterizations within the report which indicate that:

- DOE has a statutory responsibility for diesel emission reduction;
- DOE does not currently collaborate with other Government agencies in the performance of its mission; and
- DOE shares redundant national goals with the Environmental Protection Agency (EPA) and the Department of Transportation (DOT).



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These characterizations are inaccurate as they relate to the DOE mission and strategy. The enclosure includes details and comments relating to each of these points.

The DOE proactively collaborates with the DOT and EPA as well as other government agencies in order to leverage its efforts and effectively work in concert with policies and regulations established by other agencies to ensure the DOE goals can be achieved.

The DOE looks forward to continuing to work with the GAO on helping the Federal Government meet its energy goals.

Sincerely,



Kathleen B. Hogan  
Deputy Assistant Secretary for Energy Efficiency  
Energy Efficiency and Renewable Energy

Enclosure

Enclosure – DOE Written Comments (GA0-12-261)

See comment 1.

**Introduction page, “Why GAO Did This Study”, third sentence:** “Programs at the Department of Energy (DOE), the Department of Transportation (DOT), and the Environmental Protection Agency (EPA) provide funding for activities that reduce diesel emissions, such as retrofitting, rebuilding, or replacing existing diesel engines or vehicles.”

**Recommended Change:** “The DOE provides funding for programs and projects that improve efficiency and reduce petroleum consumption, some of which have a secondary effect of diesel emission reduction.”

See comment 2.

**Introduction page, body paragraph 2, second sentence:** The “DOE and EPA have established performance measures for the strategic goals related to their programs that reduce mobile source diesel emissions.”

**Recommended Change:** “The DOE has performance goals for improvements in efficiency and petroleum reduction and does not have performance measures specific to mobile source diesel emission reduction.”

See comment 3.

**Introduction page, body paragraph 3, first sentence:** “The programs that fund activities that reduce diesel emissions generally do not collaborate because of the differing purposes and goals of each program, according to senior DOE, DOT, and EPA officials.”

**Recommended Change:** “The DOE collaborates with programs with respect to our primary goals of efficiency improvement and petroleum reduction; as diesel emissions reduction is not a primary goal of the Department, the DOE collaborates with other agencies only to the extent possible given our primary focus.”

See comment 4.

**Page 1, last Paragraph, First sentence:** “Programs at the DOE, DOT, and EPA address mobile source diesel emissions by funding projects that, among other things, retrofit, rebuild, or replace existing diesel engines or vehicles; install devices that reduce idling of diesel engines; and convert diesel engines and vehicles to use cleaner fuels, such as natural gas or propane. The existence of these programs at multiple agencies has raised questions about the potential for unnecessary duplication. We have previously reported that fragmentation and overlap among government programs can lead to such duplication. Fragmentation occurs when more than one Federal agency, or more than one organization within an agency, is involved in the same broad area of national need. Overlap occurs when multiple agencies and programs have similar goals, engage in similar

See comment 4.

activities or strategies to achieve them, or target similar beneficiaries. We have also reported that Federal programs contributing to the same or similar outcomes should closely coordinate to improve their overall effectiveness.”

**Recommended Change:** “The DOE does not concur that there is fragmentation or overlap of programs per the definition provided in the paragraph noted above. The DOE does not have a quantifiable goal associated with diesel emission reduction.”

See comment 1.

**Page 7, Federal Funding for Activities that Reduce Diesel Emissions Is Fragmented across 14 Programs, First and second and third sentences:** “The remaining 13 programs focus on other goals or purposes, such as supporting energy efficiency projects or reducing petroleum use. Nevertheless, each of these programs allows or requires a portion of its funding to support activities that have the effect of reducing mobile source diesel emissions.”

**Recommended Change:** “The remaining 13 programs focus on other goals or purposes, such as supporting energy efficiency projects or reducing petroleum use. These projects have a secondary effect of reducing mobile source diesel emissions.”

See comment 5.

**Page 14, second paragraph, third sentence:** According to agency documents and officials, EPA’s Diesel Emissions Reduction Act program collects performance information on the amount and type of diesel emissions reductions each project achieves; DOE’s three programs and three of DOT’s programs collect some performance information related to diesel emissions reductions; and the remaining seven DOT programs do not collect performance information related to diesel emissions. This variation in the amount of diesel-related performance information programs collect occurs partially because 13 of the 14 programs that fund these activities have purposes other than reducing diesel emissions, such as supporting energy efficiency projects or reducing petroleum use. However, without information on the results of the programs’ activities that reduce mobile source diesel emissions, the overall effectiveness of Federal grant and loan funding for activities that reduce diesel emissions cannot be determined.

**Recommended Change:** According to agency documents and officials, the EPA’s Diesel Emissions Reduction Act program collects performance information on the amount and type of diesel emissions reductions each project achieves; *The DOE does not quantitatively collect diesel emission reduction information*, three of the DOT’s programs collect some performance information related to diesel emissions reductions; and the remaining seven DOT programs do not collect performance information



See comment 5.

related to diesel emissions. *This variation in the amount of diesel-related performance information programs collection occurs because programs that fund these activities have purposes other than reducing diesel emissions, such as supporting energy efficiency projects or reducing petroleum use. Therefore, the quantitative impact on diesel emission reductions is not being determined.*

See comment 3.

**Page 16: Paragraph 2:** The Federal programs that fund activities that have the effect of reducing mobile source diesel emissions generally do not collaborate.

**Comment:** The DOE does collaborate whenever possible (both internally and with other Federal agencies), but not solely on the basis of diesel emissions. The DOE's vehicle technology funding programs are focused on efforts that reduce dependence on petroleum-based fuels like diesel and gasoline. Projects are evaluated, documented, and tracked on the basis of petroleum reduction impact, use of alternative fuels, and energy efficiency. The DOE state and local energy efficiency and renewable energy funding programs provide grantees with great flexibility in project selection across a broad spectrum of technologies and sectors, and some may choose to engage in vehicle technology projects. Emissions reductions may or may not be a secondary or side benefit of these projects. It would be impractical and resource prohibitive to re-define and re-evaluate all DOE programs solely on the basis of diesel emissions. Examples of specific DOE collaborative efforts related to funding programs include utilizing technical merit reviewers from other agencies and program areas to evaluate funding proposals, interagency participation in annual project merit reviews, and even hosting employees from other agencies on work details. These ongoing efforts help to leverage program resources and effectively work in concert with policies and regulations established by other agencies to ensure the DOE goals can be achieved.

See comment 6.

**Page 17: Paragraph 2:** However, we have previously reported that, although Federal programs have been designed for different purposes or targeted for different population groups, coordination among programs with related responsibilities is essential to efficiently and effectively meet national concerns. We reported that uncoordinated program efforts can waste scarce funds, confuse and frustrate program customers, and limit the overall effectiveness of the Federal effort. A focus on results as envisioned by the Government Performance and Results Act implies that Federal programs contributing to the same or similar results should be closely coordinated to ensure that goals are consistent, and, as appropriate, program efforts are mutually reinforcing.

See comment 6.

**Comment:** The DOE does not concur that the secondary effect of diesel emissions can be considered a "DOE Responsibility". The DOE has a primary goal of efficiency improvement and petroleum reduction and diesel emission reduction is not a primary goal of the department.

See comment 3.

**Page 19: Paragraph 3:** For Federal funding that reduces diesel emissions, we recommend that the Secretary of Energy, the Secretary of Transportation, and the Administrator of the Environmental Protection Agency, consistent with statutory obligations, establish a strategy for collaboration among their grant and loan programs in their activities that reduce mobile source diesel emissions.

**Comment:** The DOE collaborates internally and across Federal agencies to advance our primary goals of improving energy efficiency, deploying renewable sources of energy and reducing the use of petroleum through its grant and loan programs, but not solely on the basis of diesel emissions. We will continue work with all Department stakeholders via an operational and adaptable framework that leverages their best wisdom and works in concert with the policies and regulations established by other agencies.

See comment 7.

**Other General Comments:**

**Impact of ARRA implementation on the programs:** The report narrative suggests that the time period for the study was selected for relevance to the implementation of new EPA emissions reduction regulations. The report should also acknowledge the ARRA impact on expansion of DOE program efforts during the reporting period. Funding directed to these programs under the ARRA during this period was extraordinary and unprecedented. (In the case of DOE's Clean Cities, funding was nearly 100 times greater than typical funding levels for these kinds of grants during non-ARRA years). Funding for these activities since this period has reverted to previous levels.

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The following are GAO's comments to the Department of Energy's letter dated January 26, 2012.

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## GAO Comments

1. We agree that the DOE programs identified in this report fund projects that have a secondary effect of reducing diesel emissions. As our report states, these programs fund activities, such as retrofitting, rebuilding, or replacing existing diesel engines or vehicles, which have the effect of reducing diesel emissions. Our report also states that these programs generally focus on goals or purposes that do not directly relate to reducing diesel emissions. We did not modify our report based on this comment.
2. Our report does not evaluate whether DOE programs have established performance measures specific to mobile source diesel emissions reductions. Rather, this report states that DOE has established performance measures for the agency's strategic goals that relate to its programs that fund diesel emissions reduction activities. We did not modify our report based on this comment.
3. Our report recognizes that DOE, DOT, and EPA consult on broad issues and states that the programs at these agencies that fund diesel emissions reduction activities generally do not collaborate. We did not review any collaboration that occurs among programs other than the 14 identified in our report or is not specifically related to diesel emissions reductions because this was outside the scope of our review. We did not modify our report based on this comment.
4. We disagree with DOE's statement that there is not fragmentation or overlap among the 14 programs identified in our report. As our report states, fragmentation occurs when more than one federal agency, or more than one organization within an agency, is involved in the same broad area of national need. We found that the 14 programs that fund activities that have the effect of reducing diesel emissions are involved in the same area of national need. Our report states that overlap occurs when multiple agencies and programs have similar goals, engage in similar activities or strategies to achieve them, or target similar beneficiaries. As our report shows, each of the 14 programs shares goals, activities, or beneficiaries with at least one other program. In addition, we agree with DOE's statement that it does not have a quantifiable goal associated with reducing diesel emissions. As we reported, DOE's 3 programs that fund diesel emissions reduction activities share one or more broad goals, such as reducing emissions, increasing energy

efficiency, and reducing fuel use, with the other 11 programs that fund these activities. We did not modify our report based on this comment.

5. We revised our report to note that DOE does not quantitatively collect information on diesel emissions reductions. We also noted that the three DOE programs collect some information related to diesel emissions reductions. For example, our report states that DOE's Clean Cities program collects information on reductions in gasoline and diesel fuel use, and the agency's Energy Efficiency and Conservation Block Grant and State Energy programs estimate emissions reductions that result from program activities. Further, we continue to believe that without information on the results of programs' activities that reduce mobile source emissions, the overall effectiveness of federal grant and loan funding for activities that reduce diesel emissions cannot be determined.

6. We do not state that the secondary effect of reducing diesel emissions is a DOE responsibility. As our report shows, each of the 3 DOE programs we identified as funding diesel emissions reduction activities has responsibilities related to those of the other 11 programs within our review because they fund similar activities and have similar goals, including increasing energy efficiency and reducing fuel use. We continue to believe, as we state in our report, that coordination among programs with related responsibilities is essential to efficiently and effectively meet national concerns. Further, our report states that the DOE programs within our review focus on purposes other than reducing diesel emissions and lists the specific purpose for each DOE program. We did not modify our report based on this comment.

7. We believe this report sufficiently acknowledges the impact of the American Recovery and Reinvestment Act of 2009 on funding for activities that reduce diesel emissions. Our report states that the American Recovery and Reinvestment Act provided \$870 million of the \$1.4 billion that DOE, DOT, and EPA programs provided for activities that reduced mobile source diesel emissions from fiscal years 2007 through 2011. We did not modify our report based on this comment.

# Appendix VII: Comments from the Department of Transportation



U.S. Department of  
Transportation  
Office of the Secretary  
of Transportation

1200 New Jersey Avenue, SE  
Washington, DC 20590

JAN 25 2012

Mr. David C. Trimble  
Director, Natural Resources and the Environment  
U.S. Government Accountability Office  
441 G Street, NW  
Washington, DC 20458

Dear Mr. Trimble:

Every day, the U.S. transportation system offers some of the most efficient capabilities in the world to move people and goods. U.S. transit systems alone now account for approximately 10 billion passenger trips per year. Most of these transit systems receive funding from the Federal Transit Administration (FTA) programs included in this report. Although transit is widely recognized as an inherently environmentally positive mode of transportation, the specific goals and measures established under these programs differ from those of the GAO report. FTA's legislation calls for it to focus on developing and improving transit capabilities, facilitating area wide public transportation needed for economical and desirable community development, assisting in the financing of these systems, and helping to achieve national goals relating to mobility of the elderly, individuals with disabilities, and economically disadvantaged individuals. In contrast, the GAO draft report focused on programs across the Federal government that "may have the effect of" reducing emissions, even where such reductions do not constitute the program's "goal." The FTA's programs fall into this latter category and while its programs may contribute to Governmentwide efforts to reduce diesel emissions, it is not appropriate for FTA to establish quantifiable performance measures for diesel emissions reductions.

#### **FTA Is Focused on Fulfilling Statutory It's Mission**

FTA explained its statutory mission during extensive meetings with GAO and provided detailed information relating to its programs, their operation, systems, goals, objectives, and results. It also made clear that none of its programs focus specifically on GAO's study mandate related to diesel emissions. As a result the GAO report is mistaken in

describing FTA's programs as funding diesel emission reduction activities; they fund transit. While these programs fully comply with environmental requirements, and have the effect of contributing to reductions in diesel emissions, their mission is focused on facilitating public transportation. While the Department does have programs, particularly beyond those covered in the GAO report, with specific environmental goals, establishing quantifiable performance measures relating to the effect that transit bus purchases by states and localities may have on reducing diesel emissions is beyond our scope.

**GAO Report Offers No Conclusion on Diesel Emissions**

The report asserts as its major finding that "The Effectiveness of Federal Funding for Diesel Emissions Reductions Activities is Unknown." It attributes this finding to variation in the extent to which agencies have available performance measures for reducing diesel emissions. However, the primary measure of the effectiveness for Federal actions to reduce diesel emissions is the quality of the air we breathe, not the existence of program-specific performance measures. Environmental Protection Agency (EPA) data shows that between 1990 and 2008, fine particulate emissions have declined by more than 50 percent. During the same period, nitrogen oxides concentrations in the air were reduced by 35 percent. The GAO report could have made use of such national air quality data, combined with an analytical approach to assess the progress made and estimate the proportion of these reductions that could be ascribed to Federal action, rather than redirecting its attention to agencies use of strategic goals and performance measures.

**FTA Offered Data and Approach for Evaluating Transit Bus Emissions Reduction**

FTA offered a reasonable method to estimate the contribution of replacement transit buses to the improvement in the Nation's air quality. During the time period covered by the GAO review, FTA provided data showing that nearly 30,000 new, cleaner-running transit buses were purchased within the 5 programs included in the report. As these newer, cleaner-running, more fuel-efficient buses displace older buses, fleets are emitting fewer diesel emissions. FTA's efforts to encourage the use of alternatively-fueled transit buses have also achieved considerable success. During the last 5 years, alternatively fueled buses contributed to an 8 percent reduction in diesel transit buses, eliminating another 3,600 diesel vehicles. It is not clear why the GAO report did not incorporate any of this information and instead focused on FTA performance measures.

Incorporating quantifiable performance measures for FTA relating to overall reductions in diesel emissions from transit bus funding is beyond its statutory mandate and offers the potential to increase duplication across government. The Department operates in full compliance with the Government Performance and Results Act and sets meaningful

and appropriate goals for its activities. It has identified strategic goals for environmental sustainability and has outcome focused performance measures that are appropriate for its programs and mission focus. For example, included in our draft strategic plan is a performance measure for further increasing the use of alternative fuel and hybrid vehicles in transit service. GAO's recommendation for FTA to develop quantifiable performance measures relating to the report's objective of diesel emissions reductions is best left to those organizations in government, such as EPA, with the appropriate mission and expertise.

**Evidence of Fragmented Programs Not Apparent**

The evidence supporting the report's argument that Federal programs with the potential to reduce diesel emissions are fragmented is not apparent. While the report asserts programs are fragmented, this would imply that there are small, incomplete or broken parts strewn across the government; however, the report identified none of those attributes. Instead, it appears to have identified independent programs with varying objectives that in some cases include similar activities. Although transportation grantees may receive funding from other programmatic sources, with other goals, that demonstrates neither duplication nor flaws in programmatic structure across government. While the report describes these sometimes overlapping activities as duplication, it also makes clear that it could not determine whether this "duplication" was unnecessary or inappropriate.

Collaboration among government agencies can be useful particularly under circumstances where interaction can result in improving programmatic efficiency and effectiveness. However, the report demonstrates no specific deficiency that has occurred due to the existing level of collaboration, nor does it offer evidence to support why establishing a strategy for collaboration among entities that fund activities that could reduce mobile source diesel emissions should be a priority use of Federal resources. Further, the report offers no convincing evidence of either fragmentation or the potential benefits to be achieved through many of the actions included in the second recommendation, such as identifying unnecessary duplication – the objective that GAO was unable to achieve with this report, and to "identify and leverage resources needed to support funding activities."

**DOT Remains Mission Focused**

DOT programs are focused on moving people and goods safely and efficiently. Throughout the Department, programs are structured to comply with all applicable requirements including environmental requirements as established by law and regulation. Environmentally related strategic goals are established with measures appropriate for the Department and its programs. As we continue to refine our data-

driven, results-oriented approaches to program implementation, it is imperative that measures focus on primary mission objectives. The Department continues to take appropriate actions that will improve mobility in America and to do so in an environmentally sustainable manner. Further, the Department has the data sets necessary to determine whether programs are achieving key performance objectives. This GAO report does not effectively demonstrate that its recommended actions will produce cost-effective investments appropriate for the agency that do not potentially duplicate efforts elsewhere in the government.

We appreciate this opportunity to offer comments on this GAO product. Please contact Martin Gertel, Director of Audit Relations with any questions, or if we can provide further information.

Sincerely,



Brodi Fontenot  
Deputy Assistant Secretary for Administration



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# Appendix VIII: GAO Contact and Staff Acknowledgments

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## GAO Contact

David C. Trimble, (202) 512-3841 or [trimbled@gao.gov](mailto:trimbled@gao.gov)

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## Staff Acknowledgments

In addition to the individual named above, Michael Hix, Assistant Director; Jennifer Beveridge; Colleen Candri; Elizabeth Curda; Cindy Gilbert; Kristin Hughes; Joah Iannotta; Terence Lam; Zina Merritt; Ray Sendejas; MaryLynn Sergent; Tina Sherman; Ben Shouse; Kiki Theodoropoulos; and Sam Wilson made key contributions to this report.

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