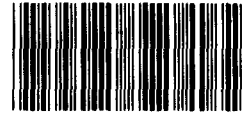


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Progress Made Implementing the Alternative
Motor Fuels Act of 1988

Statement of
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Division

Before the
Subcommittee on Energy and Power
Committee on Energy and Commerce
House of Representatives



Mr. Chairman and Members of the Subcommittee:

We are pleased to be here today to discuss the results of our review, which you and Senator Rockefeller requested, on the Department of Energy's (DOE) progress in implementing the Alternative Motor Fuels Act of 1988. Since 1988, much has happened that has heightened interest in developing alternative transportation fuels. The Clean Air Act Amendments of 1990, DOE's development of a national energy strategy, and the Persian Gulf War have all led to an increased attention to the need to promote alternative fuels.

I would like to discuss DOE's progress in implementing four of the Alternative Motor Fuels Act's major provisions: (1) the federal light-duty vehicle demonstration program, (2) the corporate average fuel economy credits for the manufacture of alternative-fueled vehicles, (3) the commercial application program to study the use of alternative fuels in heavy-duty trucks, and (4) the alternative-fueled bus testing program. I have attached to my statement a brief summary of these and other key provisions of the act, and the status of their implementation (see attachment I).

In summary, progress has been slower than anticipated since the program was initially funded in October 1989. Specifically,

-- Because of technological readiness problems, market uncertainties, and other factors, auto manufacturers have not provided DOE with the quantity, type, and size of alternative-fueled light-duty vehicles it desired. DOE has also experienced much higher than expected additional costs--\$8,300 versus \$2,500--for procuring such vehicles and problems in placing them in all planned locations. As a result, it has been delayed in collecting data on how such vehicles perform.

- The extent to which future corporate average fuel economy credits will encourage manufacturers to build alternative-fueled light-duty vehicles is uncertain, and depends on several factors such as the cost of developing such vehicles and the price of gasoline.

- DOE has also been unable to establish a commercial heavy-duty truck program or collect data to study the use of alcohol and natural gas fuel in such trucks, as envisioned by the act. It expects, however, to make progress in this regard during 1991 as a result of planned initiatives with industry.

- DOE was only able to collect performance and emissions data on a limited number of alternative-fueled buses through 1990, but it expects to place and test more buses in service during the remainder of 1991.

I will now discuss each of these issues in more detail.

BACKGROUND

The purpose of the Alternative Motor Fuels Act of 1988 is to encourage (1) the development and widespread use of methanol, ethanol, and natural gas as transportation fuels by consumers; and (2) the production of methanol-, ethanol-, and natural gas-powered motor vehicles. DOE is the lead agency responsible for implementing the act, working in conjunction with other federal agencies, and with state and local governments, and industry. The Congress authorized a total of \$18.5 million to fund this act over 4 years, from fiscal year 1990 through fiscal year 1993.

FEDERAL LIGHT-DUTY VEHICLE DEMONSTRATION PROGRAM

Under the act, DOE must work with other federal agencies to ensure that the maximum practical number of passenger automobiles and light-duty trucks acquired annually for the federal fleet be alternative-fueled vehicles. These vehicles are to include (1) alcohol-powered vehicles (that is, vehicles designed to operate exclusively on alcohol fuels, such as ethanol or methanol); (2) dual-fueled alcohol or gasoline/diesel vehicles, which are capable of operating on alcohol or on gasoline/diesel fuel; (3) natural gas-powered vehicles; and (4) dual-fueled natural gas or gasoline/diesel vehicles.¹ The act requires that the vehicles shall be supplied by original equipment manufacturers and authorizes \$12 million to implement this provision.

Data collection is an important part of this program. DOE must (1) assess how these vehicles perform in cold weather and at high altitude; (2) determine their fuel economy, safety, and emissions; and (3) compare their operation and maintenance costs with conventional gasoline and diesel passenger automobiles and light-duty trucks.

Status of Light-Duty Vehicle Demonstration Program

In May 1990, DOE, acting through the General Services Administration (GSA), issued its first solicitation to procure up to 200 compact sedan alternative-fueled vehicles, including all 4 fuel types called for under the act. The solicitation targeted 23 locations for placing the vehicles, including areas with cold weather and at high altitude.

¹The dual-fueled alcohol or gasoline/diesel vehicles and the dual-fueled natural gas or gasoline/diesel vehicles are hereafter referred to as dual-fueled alcohol and dual-fueled natural gas vehicles, respectively.

DOE, however, was only able to obtain 65 vehicles under this solicitation. Officials from the auto manufacturers that provided these vehicles stated that they could not provide more vehicles because of insufficient lead time, and DOE officials told us they could not provide more lead time because of normal delays in the appropriations process. Also, DOE was only able to buy dual-fueled alcohol vehicles. According to auto manufacturers responding to the solicitation, the technology for the other three vehicle types sought was not yet far enough along to produce such vehicles. In addition, DOE was only able to purchase mid-sized sedans, which cost more than the desired compact versions. Auto manufacturers told us that they would only produce mid-sized alternative-fueled vehicles for this contract because they already had production plans in place for producing such vehicles.

Finally, DOE was able to place the vehicles in service in only four locations, none of which are at high altitude.² According to DOE's program manager, these locations were chosen because (1) auto manufacturers have limitations on where they have mechanics skilled in alternative fuel technology who can fulfill warranty obligations in servicing the vehicles, and (2) GSA had trouble finding federal agencies willing to take the vehicles. Federal agencies were reluctant to take the vehicles, according to GSA, primarily because of a lack of fueling stations. The 65 vehicles purchased to date are just now being placed in service; thus test data are just beginning to be collected.

In December 1990, DOE, again acting through GSA, issued a second solicitation to procure up to 200 natural gas-powered or dual-fueled natural gas light-duty trucks and compact vans. According to GSA and auto manufacturers, it appears that the number of vehicles ultimately procured under this solicitation may

²The four locations were Detroit, Michigan; Los Angeles and San Diego, California; and Washington, D.C.

be substantially fewer than 200, and that they will be natural gas-powered only. According to a GSA contracting official, as of April 5, 1991, GSA had awarded a contract to Chrysler Corporation, the only auto manufacturer that bid on the solicitation, for 50 natural gas-powered vans. Although the initial bidding period has been extended to obtain another bid for additional vehicles, the GSA official was not optimistic about the success of this extension. Auto manufacturers informed us that at the present time they do not have plans to produce dual-fueled natural gas vehicles, primarily because of design problems.

Future Light-Duty Vehicle Procurement

With respect to future procurements, in May 1990, DOE informed its House Committee on Appropriations that it planned to procure 1,000 to 2,000 alternative-fueled light-duty vehicles per year after 1990, as additional alternative fuels and vehicles become available. However, the DOE program director and manager for the alternative motor fuels program told us that on the basis of current funding authorization levels, the 1,000- to 2,000-per year estimate is not realistic. This is primarily because the incremental costs and future maintenance costs for alternative fueled vehicles are much higher than expected. With current spending levels, DOE now expects to purchase only about 1,500 alternative-fueled vehicles through 1995.

Incremental costs are the difference in costs between an alternative-fueled vehicle and a comparable gasoline- or diesel-powered vehicle. According to DOE officials, DOE originally anticipated the incremental costs of procuring alternative-fueled vehicles would be about \$2,500 per vehicle because of the need for an alternative-fuel system. The estimated incremental costs for the dual-fueled alcohol vehicles purchased to date, however, have been substantially more, about \$8,300 per vehicle. The components of this difference were (1) about \$4,150 because the auto

manufacturers could only supply mid-sized vehicles without a volume discount, rather than the volume-discounted compact vehicles currently making up the bulk of GSA's purchases; (2) about \$2,250 because of costs associated with alternative-fuel components, research and development and warranty coverage; and (3) about \$1,900 in projected additional operating expenses, such as maintenance and repair costs, related to alternative-fueled vehicles. DOE is funding all of these incremental costs under the Alternative Motor Fuels Act.

At this time, uncertainties exist about the extent to which the incremental costs of purchasing alternative-fueled vehicles can be reduced in the future. For example, none of the major domestic auto manufacturers currently have plans to produce compact alternative-fueled vehicles. In addition, GSA officials told us that they do not expect to obtain volume discounts from the auto manufacturers for alternative-fueled vehicles in the near term. The auto manufacturers agreed and said that even if additional funds were made available for the federal procurement of such vehicles, at this time, it is uncertain whether volume discounts would be made available. Even if volume discounts were made available, their extent is unknown. According to GSA and the manufacturers, volume discounts depend on several factors, including the number of vehicles purchased, the vehicle model, marketing strategy of the manufacturers, and when alternative-fueled vehicles will be mass-produced.

Future spending levels are also uncertain. DOE's national energy strategy calls for the federal government to accelerate its purchase of alternative-fueled vehicles. According to DOE officials, this initiative is likely to result in a much larger number of federal alternative-fueled vehicle purchases, and such purchases will be made sooner than the Administration's proposed purchase requirements under the strategy for commercial fleet

operators.³ At this time, it is uncertain (1) whether DOE will manage this initiative under the Alternative Motor Fuels Act program and (2) how many vehicles will be procured for the federal fleet. DOE told us that, despite this uncertainty, it is in the process of developing an implementation plan and an executive order for this expanded federal alternative-fueled vehicle program.

You asked us for our views on expanding the federal fleet program under the act. We believe that an expanded federal fleet program, as envisioned by the national energy strategy and a number of legislative proposals, would demonstrate the federal government's commitment to alternative-fueled vehicles and would provide an opportunity to learn more about alternative fuel use. However, on the basis of our work, we believe that a number of questions need to be addressed in considering such an expansion. For example, to what extent should federal purchases be accelerated until planned data are collected and analyzed on the performance and emissions of alternative-fueled vehicles? In addition, can problems in placing alternative-fueled vehicles be resolved? We note that there are a limited number of fueling stations and that no funding or incentives are provided under this act or the national energy strategy for developing a fueling infrastructure. DOE assumes that the fueling infrastructure will develop once a large volume of alternative-fueled vehicles are in use. According to GSA, however, an early 1970s alternative-fueled vehicle program did not succeed, primarily because of a lack of a reasonably convenient fuel distribution and repair network.

³The national energy strategy would require that, in 1995, 10 percent of new vehicle purchases by commercial fleet operators be alternative fueled vehicles, and a steady increase in purchases of new vehicles that are capable of operating on alternative fuels.

IMPACT OF CORPORATE AVERAGE FUEL ECONOMY
CREDITS ON LIGHT-DUTY VEHICLE PRODUCTION

You also asked our views on whether the corporate average fuel economy credits provided by the act will provide an incentive for manufacturers to produce alternative-fueled vehicles, and on several other issues related to such credits. Starting with vehicles manufactured in model year 1993, the credits would allow manufacturers to increase their average fleet fuel economy ratings, which are used in meeting federal fuel economy standards, depending on how many alternative-fueled vehicles they build. Auto manufacturers indicated that the impact this incentive will have depends on several factors. If manufacturers can meet fuel economy standards without the credits, the credits may not provide as great an incentive to build alternative-fueled vehicles. If, on the other hand, manufacturers need the credits to meet the standards, or if the standards are increased, as several legislative proposals would do, the incentive may become more significant. The major domestic auto manufacturers told us, however, that the incentives offered under the act are only one of many factors they will consider when making a decision to build alternative-fueled vehicles. Other important factors include: (1) the cost of developing such vehicles, (2) the price of gasoline, (3) consumer preference and acceptance, and (4) the success of current attempts to clean up gasoline to meet increasingly stringent environmental emission standards.

Currently, there is a limit or cap on credits available for dual-fueled vehicles capable of operating on both alternative fuels or gasoline. This cap limits the benefits provided to manufacturers building vehicles that are designed to operate on alternative fuels, but that may be operated on gasoline. The act does not limit the amount of credits manufacturers can receive on dedicated alcohol- or natural gas-powered vehicles that operate only on these fuels. Auto manufacturers told us that eliminating

this cap, as proposed in the national energy strategy, would provide added incentive to build dual-fueled vehicles. But the other factors I just mentioned, such as consumer preferences and acceptance, are also important. In general, however, manufacturers said that if the fuel economy standards are raised, removal of the cap may become more important to them in meeting the higher standards. Building dual-fueled vehicles may not lessen U.S. dependence on oil, however, if gasoline is the fuel consumers use. One proposed bill would eliminate the cap only if fuel sales data indicated that alternative fuels were being used. Although we have not analyzed this proposal in detail, it would seem to make sense, if we want to encourage not only the manufacture of alternative-fueled vehicles, but also the use of alternative fuels.

COMMERCIAL TRUCK ALTERNATIVE FUEL PROGRAM

The act requires DOE, in cooperation with heavy-duty engine manufacturers and other federal agencies, to establish a commercial heavy-duty truck program to demonstrate and test the use of alcohol-, dual alcohol- or diesel-, natural gas-, and dual natural gas- or diesel-fueled truck engines. For fiscal years 1990 through 1992, the act authorizes a total of \$2 million for alcohol-powered and dual-alcohol trucks and an additional \$2 million for natural gas-powered or dual natural gas-fueled trucks.

DOE has decided to implement this program by encouraging engine manufacturers to build alternative-fueled engines, and by funding the incremental cost difference in building and operating such engines in commercial heavy-duty trucks. DOE plans call for commercial truck operators to collect performance data under a cost-share arrangement; emissions data will be collected with a DOE-funded mobile emissions testing laboratory under development at West Virginia University. DOE does not currently plan to procure alternative-fueled trucks for federal use as in its light duty-vehicle program because of the high cost of purchasing

trucks. It is unclear whether the federal heavy-duty truck fleet would be suitable for collecting data consistent with the objectives of the act. DOE and GSA are currently reviewing this issue.

To date, DOE had not been able to put any alternative-fueled trucks in operation and therefore has not collected data to study alcohol and natural gas in heavy-duty trucks as planned. According to a DOE alternative fuels program manager, DOE had been unable to obtain the cooperation of truck fleet operators or engine manufacturers who viewed alternative fuel technology as a new and still unproven technology. They therefore hesitated to incorporate alternative-fueled trucks in their fleets.

According to a DOE program manager, however, commercial truck fleet operators have recently become more receptive to participating in the truck program. This change has occurred since the Clean Air Act Amendments were enacted in November 1990. Title II of this act requires model year 1998 clean fuel truck emissions to be 50 percent less than conventional model year 1994 emissions. Alternative fuels may be one way to meet these new requirements. At the end of 1990, DOE began discussions with a commercial trucking association about the management of the heavy-duty truck program. Under this program, 76 trucks are to be operating and tested on alcohol, natural gas, and diesel fuel during the summer of 1991.

Through fiscal year 1991, DOE estimates that it will spend a total of \$4.5 million on the commercial truck program. This funding is being used to develop (1) a heavy-duty mobile emissions testing laboratory to test trucks and buses, (2) testing requirements for trucks, and (3) a national data center for alternative fuels. This center will be used to analyze and store data collected from the light-duty vehicle, truck, and bus testing programs.

DOE has alerted its congressional authorization and appropriation committees that the current \$4-million authorization for this program through fiscal year 1992 will not be adequate, given 1991 planned expenditures of \$4.5 million. In March 1991, we asked the alternative fuels program officials for their plans and anticipated funding for this program. On the basis of current spending levels, these officials estimated that a total of about \$22.5 million would be needed to carry out the truck program from fiscal years 1990 through 1997. The money will be used to continue funding the incremental cost difference in building and operating engines to use alternative fuels in commercial heavy-duty trucks and to continue data collection efforts.

BUS ALTERNATIVE FUEL PROGRAM

The act requires DOE to establish a bus testing program by assisting state and local governments to test, in urban settings, buses capable of operating on alcohol and natural gas. Tests are to include emissions, durability, safety, and fuel economy parameters, and comparisons are to be made with alcohol and natural gas buses and with comparable diesel-powered buses. The safety and emissions tests are to be conducted on alternative fueled buses that meet 1991 federal safety and environmental standards. The act authorizes a total of \$2 million for the bus program from fiscal years 1990 through 1992.

To implement this program, DOE plans to help fund and rely on the Department of Transportation's Urban Mass Transportation Administration. The Administration will collect bus performance data, since much of these data are already being collected under its Clean Air Program. This program is designed to provide information on new alternative fuel technologies in the transit industry. DOE plans to use the mobile emissions testing laboratory to collect the emissions data on buses.

Performance and emissions data were collected on a limited number of methanol buses in 1990. Performance data have been collected on 59 methanol buses, and emissions data have been collected on 6 of the 59 methanol buses. DOE expects to place and test a total of 200 methanol, ethanol, and compressed natural gas buses during 1991 that will meet the act's 1991 emission standards. Performance and safety data are currently being collected on many of these buses, and emissions testing is expected to begin in mid-1991.

Through fiscal year 1991, DOE estimated that it will spend about \$1.8 million for the bus testing program. As with the truck program, DOE alerted its authorization and appropriation committees that the current authorization of \$2 million for this program will not be adequate for the life of this program, given 1991 planned expenditures. In March 1991, we asked the DOE alternative fuels program officials for their plans and anticipated funding for this program. On the basis of current spending levels, these officials estimated that a total of about \$8 million would be needed to carry out this program from fiscal years 1990 through 1997. The money will be used to continue collecting performance and emissions data on buses to determine how the alternative-fueled engines perform over time.

OBSERVATIONS

DOE has experienced problems in procuring the quantity, types, and size of alternative-fueled vehicles it desired, and in placing them in all locations needed for testing purposes. These problems will likely persist in future years for several primary reasons: higher than anticipated vehicle costs, technological readiness problems, and lack of widespread refueling capability. As a result, DOE could be hampered in its ability to meet the

act's objective of encouraging the development, production, and widespread use of alternative-fueled vehicles.

The Administration's national energy strategy calls for the federal government to accelerate its purchase of alternative-fueled vehicles and states that large federal purchases would encourage manufacturers to produce such vehicles. A number of current legislative proposals also call for greatly expanded federal purchases of alternative-fueled vehicles. Several issues which the Congress may wish to consider in debating these proposals include:

- To what extent should federal purchases be accelerated before data are collected on the performance and emissions of alternative-fueled vehicles?
- If the federal government accelerates its purchase of alternative-fueled vehicles, how can placement problems be resolved, given the limited number of fueling and repair stations and lack of incentives to build such facilities?
- Will auto manufacturers build the types and sizes of alternative-fueled vehicles sought by the federal government, and at what cost?
- Will eliminating the cap on corporate average fuel economy credits for the manufacture of dual-fueled vehicles result in consumers actually using alternative fuels in such vehicles, particularly if gasoline prices are lower than alternative fuels?

While we agree that federal leadership in the procurement of alternative-fueled vehicles is desirable, a gradual approach, coupled with performance and emissions data collection and incentives for developing a fueling infrastructure, might provide

a more balanced and less risky strategy. In the final analysis, however, the extent to which alternative fuels are price competitive with gasoline will determine their use.

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This concludes my statement. We would be pleased to respond to any questions you or Members of the Subcommittee may have.

SUMMARY OF THE ALTERNATIVE MOTOR FUELS
ACT'S KEY PROVISIONS AND THE STATUS
OF THEIR IMPLEMENTATION AS OF MARCH 1991

LIGHT-DUTY VEHICLE

Requirement

To the maximum extent possible, acquire and study the performance of alcohol-powered, dual-fueled alcohol, natural gas-powered, and dual-fueled natural gas vehicles in federal government fleets.

Status

GSA and DOE procured 65 methanol dual-fueled vehicles in 1990.

Since the vehicles were delivered in early 1991, test data are just starting to be collected.

As of March 1991, Chrysler Corporation has reached agreement with GSA to produce 50 natural gas-powered vans to be delivered in early 1992.

COMMERCIAL TRUCK APPLICATION

Requirement

DOE is required to study the use of alcohol-powered, dual-fueled alcohol, compressed natural gas-powered, and dual-fueled natural gas in heavy-duty trucks.

Status

DOE was unable to establish truck fleets or collect data to study the use of alternative fuels in heavy duty trucks in 1990.

BUS TESTING

Requirement

The act requires DOE, in cooperation with other federal agencies, to assist state and local government agencies in the testing of alcohol and natural gas buses in urban settings.

Status

Performance data have been collected on 59 methanol buses, and emissions data have been collected on 6 of the 59 methanol buses.

STUDIES AND REPORTSRequirement

The act requires the preparation of seven studies and reports relating to alternative fuels to be submitted to the Congress.

Status

Table I.1 summarizes the studies and reports required and their status. Three of the reports have been completed and submitted to the Congress, two are past due and issuance has been delayed, and two are not due until after 1991.

TABLE I.1:
Studies and Reports Required Under the Act

<u>Studies and Reports</u> <u>(Short title)</u>	<u>Lead</u> <u>agency</u>	<u>Supporting</u> <u>agency</u>	<u>Report</u> <u>due date</u>	<u>Report</u> <u>issuance</u> <u>date</u>
Electric/solar vehicles	DOT	DOE, EPA	10/89	1/90
Residential energy prices	DOE	DOT	12/89 ^a	11/89
Natural gas-to-methanol plants	DOE	b	9/90	9/90
Environmental impact of alternative fuels	EPA	DOE, DOT	12/90 ^c	d
Light-duty vehicle disposal	GSA/DOE	b	10/90	e
Light-duty vehicle operations	DOE	EPA, DOT	1/92 ^f	g
Review of manufacturing incentives for automobiles	DOT	DOE, EPA	9/2000	g

^aAn updated report due by 12/94.

^bNo supporting agency.

^cDue 12/90 and once every 2 years thereafter.

^dExpected to be issued in April 1991.

^eExpected to be issued in May 1991.

^fReport required annually thereafter.

^gReport not yet due.

INTERAGENCY COMMISSIONRequirement

The act requires the establishment of an Interagency Commission on Alternative Motor Fuels, composed of heads of several federal agencies. The Commission's functions include the following:

- meet as needed,
- coordinate federal agency efforts to develop a national alternative fuels policy,
- develop long-term plan for commercialization of alternative fuels,
- ensure communication among federal agencies and others involved with alternative fuels,
- establish a U.S. Alternative Fuels Council, and
- submit two interim reports (September 1990 and 1991) and a final report by September 1992 to the Congress.

Status

In 1989, the Commission was established and held its first meeting. The Commission's first interim report was submitted to the Congress in January 1991 and is the first of its three measured steps to develop a national alternative fuels policy. Specifically, the report provides the status on the act's requirements and a comprehensive discussion of five alternative fuels--natural gas, methanol, ethanol, liquefied petroleum gas, and electricity. The Commission's second interim report will assess energy security and environmental implications of increased use of alternative fuels and the implications of the 1990 Clean Air Act Amendments. The Commission's third and final report will provide a long-term plan to implement a national alternative motor fuels policy.

In 1990, the Chairman of the Commission established a U.S. Alternative Fuels Council, composed of 4 Members of the Congress and 16 persons outside the federal government. The Council was established to share its expertise and advise the Interagency Commission on Alternative Motor Fuels in its efforts to develop a national energy policy. The Council held its first meeting in May 1990 and its members have met several times since, as summarized in table I.2.

TABLE I.2:
Council Meetings Held

<u>Meeting Date</u>	<u>Location</u>
May 1990	Washington, D.C.
June 1990	San Diego, California
August 1990	Dearborn, Michigan
November 1990	Philadelphia, Pennsylvania
December 1990	Denver, Colorado

MANUFACTURER CORPORATE AVERAGE
FUEL ECONOMY INCENTIVES

Requirement

The act provides auto manufacturers with corporate average fuel economy credits to encourage the production of alternative fueled vehicles.

Status

Incentives come into effect beginning with the manufacture of model year 1993 vehicles.

SUMMARY OF INCREMENTAL COSTS OF
PROCURING MID-SIZED ALTERNATIVE-FUELED
VEHICLES IN 1990

TABLE II.1
Incremental Cost Per Alternative-Fueled
Vehicle Procured in 1990

Average price of midsized alternative-fueled vehicle	\$14,130
Less: Typical price of GSA compact vehicle in 1990	<u>7,730</u>
Incremental vehicle cost	\$6,400 ^a
Plus: Additional incremental operating expenses (table II.2)	<u>1,890</u>
Total	<u>\$8,290</u>

^aThe average cost of the alternative fuel components for the Luminas and Tauruses procured in 1990 was \$2,250 and is included in the incremental vehicle cost.

TABLE II.2
Additional Incremental Costs of
Alternative-Fueled Vehicles

Fuel costs	\$1,080 ^a
Maintenance and repair	360 ^b
Disposal	<u>450^c</u>
Total	<u>\$1,890</u>

^aBased on driving 12,000 miles per year, and an additional three cents per mile fuel cost, for 3 years.

^bBased on driving 12,000 miles per year, and an additional one cent per mile for repairs over GSA fleetwide average of five cents per mile, for 3 years.

^cGSA expects to receive \$450 less when vehicle is sold.

Source: GSA.