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October 20, 2022

The Honorable Gary C. Peters
Chairman
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Carolyn B. Maloney
Chairwoman
Committee on Oversight and Reform
House of Representatives

The Honorable Gerald E. Connolly
Chairman
Subcommittee on Government Operations
Committee on Oversight and Reform
House of Representatives

Federal Vehicle Fleets: Observations on the Transition to Electric Vehicles

In fiscal year 2020, federal agencies operated and maintained around 610,000 non-tactical vehicles in their domestic fleets.¹ These fleets, ranging from sedans to ambulances to buses, traveled over 4 billion miles and consumed more than 360 million gallons of fuel to help meet a variety of government missions. In December 2021, President Biden issued Executive Order 14057 calling for all affected federal vehicle acquisitions to be zero-emission vehicles, such as electric vehicles, by 2035, including 100 percent zero-emission light-duty vehicle acquisitions beginning in 2027.² This order affects approximately 380,000 vehicles within federal fleets as they become subject to replacement.³

¹Tactical vehicles are wheeled vehicles designed to meet a variety of needs to support combat operations, such as transporting soldiers and materiel on the battlefield. This report focuses on the domestic fleet because Executive Order 14057 only expressly applies to an agency's activities within the United States, and the head of an agency has discretion to apply the order outside of the United States. Exec. Order No. 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*, 86 FR 70935 (Dec. 8, 2021).

²For the purpose of the Executive Order, the term light-duty motor vehicle means a vehicle of up to and including 8,500 pounds gross vehicle weight (i.e., the weight of the empty vehicle plus the weight of the maximum payload that the vehicle was designed to carry) and can include cars, smaller pickup trucks, minivans, vans, and smaller sport-utility vehicles. Medium-duty vehicles are of gross weight between 8,500 and 16,000 pounds, such as larger pickup trucks. Heavy-duty vehicles are a gross weight of 16,000 pounds and above. Exec. Off. of the President, M-22-06, *Catalyzing Clean Energy Industries and Jobs through Federal Sustainability* (Dec. 8, 2021) (M-22-06 is a memo accompanying Executive Order 14057).

³The Executive Order only applies to executive agencies, as defined by 5 U.S. Code §105, excluding independent regulatory agencies, as defined in 44 U.S.C. 3502(5). The U.S. Postal Service, which has a significant number of vehicles, is not subject to the Executive Order. For the purposes of our analysis, we also excluded agencies with fleets smaller than 20 vehicles.

Over the past several years, the electric vehicle market has grown significantly. In 2021, according to the Alliance for Automotive Innovation, electric vehicles made up about 4 percent of the U.S. vehicle market share. Given continued technological advancements and investments by manufacturers in the electric vehicle industry, as well as federal, state and local incentives to purchase electric vehicles, the market is expected to continue to grow. However, electrifying federal fleets represents a significant transformation in the federal government's approach to vehicle procurement and will require a shift in perceptions about their capability to adequately meet mission needs in terms of performance and driving range. Our prior work has identified factors that could affect widespread electric vehicle adoption within federal fleets, including higher up-front costs and charging infrastructure uncertainties. As agencies move forward with their transition to zero-emission vehicles, the Council on Environmental Quality, the General Services Administration (GSA), and the Department of Energy (DOE) play an integral role in providing leadership and helping agencies to meet applicable fleet energy requirements, such as those set forth in the Executive Order.

You asked us to review federal agencies' fleets and their potential to transition to electric vehicles. This report addresses:

- What is the composition, use, and location of federal fleets?
- What is the potential for federal fleets to transition to electric vehicles?

To address the first objective, we analyzed government-wide data on vehicles in federal agency fleets. We determined that these data were generally reliable for providing high-level depictions of federal fleets, such as describing their overall composition and location. However, they may not be detailed or consistent enough to provide accurate and reliable vehicle-level analyses, such as day-to-day use. To address the second objective, we analyzed GSA information on the vehicles agencies can purchase or lease through GSA, including electric vehicles, the vehicles agencies ordered in fiscal year 2021, and existing federal government electric vehicle charging infrastructure. We also interviewed GSA and DOE officials about the factors that can influence the agency transition to electric vehicles. A more detailed description of our scope and methodology is included in enclosure I.

We conducted this performance audit from January 2022 to October 2022 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.

Background

Federal agency fleets perform a variety of purposes across the country. As we reported in January 2016, fleet management is generally decentralized, as agencies are responsible for managing their vehicles in a manner that allows them to fulfill their missions.⁴ For example, agencies determine the number and type of vehicles they need and whether they want to lease or purchase them. Over the past 30 years, various statutes and executive orders have required federal agencies to reduce federal fleets' petroleum use and greenhouse gas emissions. This includes 2021 Executive Order 14057, which requires affected federal fleets to transition to

⁴GAO, *Federally Leased Vehicles: Agencies Should Strengthen Assessment Processes to Reduce Underutilized Vehicles*, [GAO-16-136](#) (Washington, D.C.: Jan. 14, 2016).

zero-emission vehicles, beginning with light-duty vehicle acquisitions in 2027.⁵ A zero-emission vehicle is any vehicle that, when operating, produces zero tailpipe exhaust emissions of certain pollutants or greenhouse gases.⁶ There are three types of vehicles that can be classified as zero-emission: (1) battery electric vehicles, which are powered solely by a battery on board; (2) plug-in hybrid electric vehicles, which are powered by a combination of a battery on board and a gasoline engine; and (3) fuel cell electric vehicles, which are powered by the conversion of hydrogen to electricity.⁷ Because battery electric and plug-in hybrid electric vehicles generally rely on batteries, infrastructure is needed to safely deliver energy from the electric grid to a vehicle's battery. For fleets adopting electric vehicles, GSA officials said that this generally starts with charging stations at fleet facilities where three options typically exist: Level 1, Level 2, and DC fast charging.⁸

Within the federal government's executive branch, GSA and DOE are responsible for providing support to federal agencies on fleet management and energy requirements, and issue related regulations, policies and guidance. Generally, GSA is the mandatory source for purchase of new vehicles for executive agencies and other eligible users. Agencies can also use GSA to acquire leased vehicles. DOE is responsible for overseeing energy goals and requirements and assists agencies in meeting federal energy requirements. GSA and DOE also administer the Federal Automotive Statistical Tool (FAST), a fleet reporting tool that agencies populate with their information annually. FAST provides the only government-wide source of fleet data. GSA uses it to publish the annual *Federal Fleet Report*, and DOE uses it to assess agencies' compliance with fleet energy requirements.

⁵Exec. Order No. 14057 (Dec. 8, 2021). Beginning in 2035, all affected vehicle acquisitions will need to be zero-emission, including medium-duty and heavy-duty vehicles.

⁶As such, we reported in 2019 that these types of vehicles are capable of significant emissions benefits over similarly-sized conventionally-fueled vehicles, although they carry their own environmental costs. For example, battery-electric and plug-in hybrid electric vehicles rely on batteries for all or some of their power, reducing or eliminating petroleum use and associated tailpipe greenhouse gas emissions. However, charging, producing, and disposing of these batteries can result in environmental effects.

⁷As of 2022, only three fuel cell vehicles are offered by automakers, and supporting infrastructure only exists in California. For the purpose of our review, we focused on battery electric and plug-in hybrid electric vehicles. The memorandum that provides direction for agency compliance with Executive Order 14057 considers plug-in hybrid vehicles as zero-emission for the purposes of meeting fleet requirements. When running only on electricity, plug-in hybrid vehicles produce zero tailpipe emissions.

⁸For the purposes of this report, a charging station is a site with one or more electric vehicle charging ports. A port is the infrastructure that provides power and can charge only one vehicle at a time, although it may have multiple connectors. A connector is what is plugged into a vehicle to charge it. According to DOE, using Level 1 charging equipment, the simplest charger that plugs into a standard outlet, provides approximately 5 miles of range per hour charged and requires no additional infrastructure. Level 2 charging equipment can provide approximately 25 miles of range per hour charged and requires the installation of additional support equipment. DC fast charging equipment can provide approximately 100 to more than 200 miles of range in 30 minutes and requires the installation of additional support equipment.

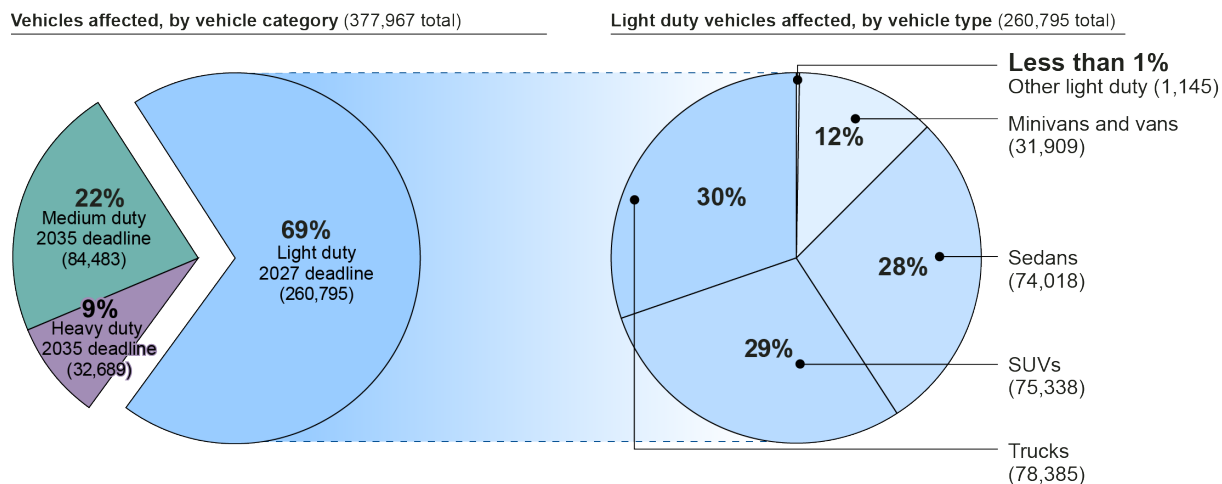
Agency Fleets Generally Consist of Geographically Dispersed Light Duty Vehicles with Low Annual Mileage

Agency Fleets Mostly Consist of Sedans, Sport Utility Vehicles, and Pick-up Trucks

We found that about 260,000 of the 380,000 total vehicles operated by agencies (approximately 69 percent) as of fiscal year 2021 are classified as light-duty—mostly sport utility vehicles (SUVs), pick-up trucks, and sedans.⁹ Further, of the about 380,000 total vehicles, less than 1 percent of vehicles, or 1,579 vehicles, are classified as zero-emission.¹⁰

Each year, agencies replace, on average, about 8 percent of their fleets, according to GSA officials. For example we found that in fiscal year 2021, agencies covered by the Executive Order ordered about 45,000 vehicles (i.e., the equivalent of replacing about 12 percent of their fleets). Of these, about 73 percent, or roughly 33,000, were considered light-duty. According to GSA's *Federal Fleet Report*, federal agencies, including those not affected by the Executive Order, acquired 257 zero-emission vehicles (138 battery electric vehicles and 119 plug-in hybrid vehicles) in fiscal year 2021.¹¹ See Figure 1 for more details on the types of vehicles in federal fleets.

Figure 1: Types of Vehicles in Federal Fleets Subject to Executive Order 14057, If Replaced after Applicable Deadlines, as of Fiscal Year 2021



Source: GAO analysis of General Services Administration data. | GAO-23-105635

Note: The figure on the left sorts vehicles by broader category. The figure on the right details the types of vehicles that make up the light duty category. Under the Executive Order, light-duty vehicle acquisitions must be zero-emission by 2027. Therefore, when light-duty vehicles are replaced in 2027 or later, they must be zero-emission. "Light-duty vehicle" means a vehicle weighing 8,500 pounds gross vehicle weight rating or less, certified for use on all public roads and highways. "Medium-duty vehicle" means a vehicle between 8,500 pounds and 16,000 pounds gross vehicle weight rating, certified for use on all public roads and highways. Percentages for the figure on the right do not total to 100 because of rounding.

⁹As previously mentioned, our analysis excludes vehicles based outside of the United States and vehicles operated by agencies not subject to Executive Order 14057. We also exclude low-speed vehicles and armored vehicles.

¹⁰Of these zero-emission vehicles, 1,178 are plug-in hybrid electric vehicles and 401 are battery electric vehicles. As of fiscal year 2021, there were no hydrogen fuel cell vehicles in federal agency fleets.

¹¹GSA's *Federal Fleet Report* summarizes FAST data to convey annual agency motor vehicle fleet inventory, cost, fuel consumption, and use data.

Figure 1 Accessible Tables

Light Duty Vehicles Affected by Category	Heavy duty	Medium duty	Light duty
Deadline	2035	2035	2027
Number of vehicles	32689	84483	260795
Percentage	9	22	69

Light Duty Vehicles Affected by Type	Other Light Duty	Minivans and Vans	Sedans	SUVs	Trucks
Number of vehicles	1145	31909	74018	75338	78385
Percentage	Less than 1	12	28	29	30

Most Federal Vehicles Report a Low Annual Mileage

We found that in 2021 agencies reported that federal vehicles travelled an average annual mileage of 6,000 miles—although this varied by type and the location of the vehicle.¹² For example, we found that federal vehicles located in rural areas were generally driven 25 percent further, or about 1,500 miles more per year, than the average. In addition, in such rural areas, non-sedans, like SUVs and pickups, drove significantly further than sedans. In more urban areas, agencies reported that sedans and non-sedans travelled similar distances. GSA officials agreed with our assessment that vehicles in federal fleets generally have low annual mileage because they generally do not travel long distances.

Agency Fleets Are Geographically Dispersed

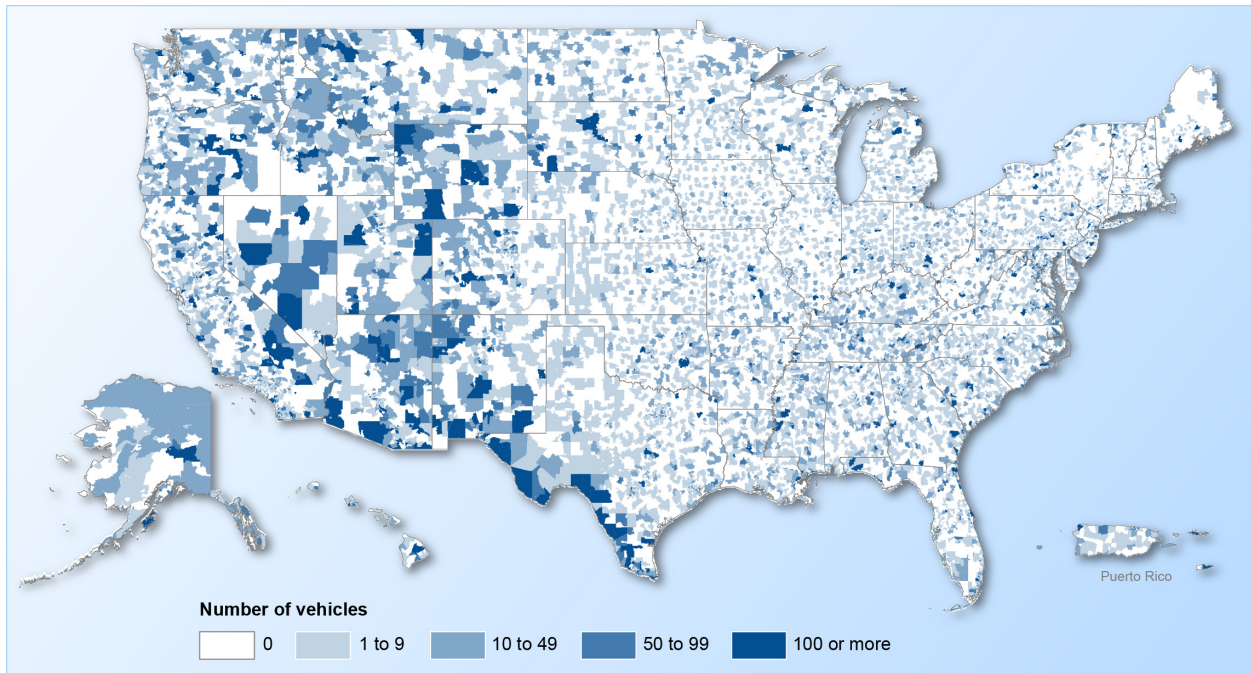
Federal fleets operate out of every state in the country, and in about one in four ZIP codes. Put another way, about 10,900 ZIP codes, have at least one federal vehicle.¹³ As a result of their geographic distribution, federal fleets operate in a wide range of climates and conditions, ranging from colder Alaska to arid Arizona.¹⁴ See figure 2 for a map of which ZIP codes contain federal vehicles.

¹²GSA officials said that the use of federal vehicles was affected by the COVID-19 pandemic, although the exact effect is uncertain since reported annual mileage was decreasing before the pandemic every year from 2017 to 2019.

¹³The United States has about 40,000 ZIP codes in total.

¹⁴In 2019, we reported that the climate in which battery-electric and plug-in electric vehicles are used can affect the life of the battery. For example, in extreme weather conditions, the range of battery-electric vehicles may be reduced. However, federal agencies do not collect the data that would allow analysis of these effects specific to the use of vehicles in federal agencies' fleets. GAO, *Federal Vehicle Fleets: Agencies Have Continued to Incorporate Alternative Fuel Vehicles into Fleets, but Challenges Remain*, [GAO-19-397](#) (Washington, D.C.: July 26, 2019).

Figure 2: Map of Federal Vehicles by ZIP Code as of Fiscal Year 2021

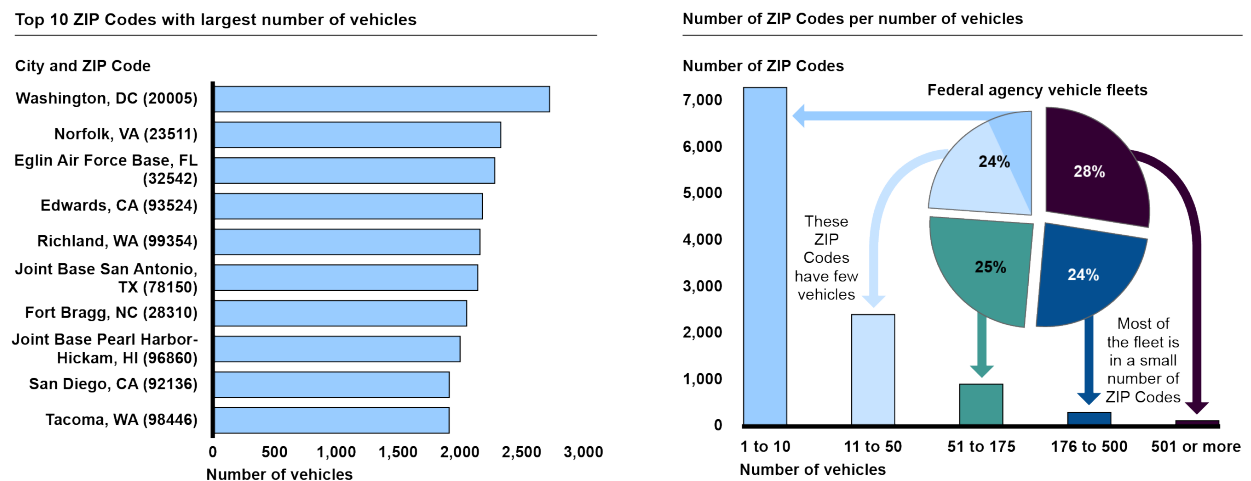


Source: GAO analysis of General Services Administration data. | GAO-23-105635

Notes: ZIP codes vary in size. Agencies may withhold the locations of vehicles when such information is considered sensitive and thus, this information may not reflect the entire fleets' locations.

However, while federal fleets are geographically dispersed, a majority of the about 10,900 ZIP codes with at least one federal vehicle contain less than 10 vehicles. Conversely, the top 300 ZIP codes contain almost half of the vehicles in federal fleets. In these ZIP codes with larger fleets, they typically contain between 175 and a few thousand vehicles. Figure 3 lists the top 10 ZIP codes by fleet size and location as well as how fleet size is distributed across ZIP codes containing federal vehicles.

Figure 3: Top 10 ZIP Codes and Number of ZIP Codes by Number of Federal Vehicles They Contain



Source: GAO analysis of General Services Administration data. | GAO-23-105635

Note: Agencies may withhold the locations of vehicles when such information is considered sensitive, and thus, this information may not reflect the entire fleets' locations.

Figure 3 Accessible Tables

Top 10 ZIP Codes with largest number of vehicles	Number of vehicles
Washington, DC (20005)	2726
Norfolk, VA (23511)	2331
Eglin Air Force Base (32542)	2282
Edwards, CA (93524)	2183
Richland, WA (99354)	2163
Joint Base San Antonio, TX (78150)	2145
Fort Bragg, NC (28310)	2055
Joint Base Pearl Harbor-Hickam, HI (96860)	2002
San Diego, CA (92136)	1914
Tacoma, WA (98446)	1913

Number of vehicles	Number of ZIP Codes
1 to 10	7272
11 to 50	2381
51 to 175	884
176 to 500	274
501+	97

Number of vehicles	Percentage
1 to 50	24
51 to 175	25
176 to 500	24
501+	28

The Federal Government Operates a Significant Number of Law Enforcement Vehicles That May Pose Unique Challenges

The federal government, excluding the United States Postal Service, has an inventory of approximately 102,000 law enforcement vehicles. These vehicles are subject to the requirements of Executive Order 14057, unless exempted by the agency head. For example, the Department of Justice and the Department of Homeland Security (DHS) operate about 35,000 light-duty sport utility vehicles designated as law enforcement vehicles, according to GSA's *Federal Fleet Report*. These vehicles may have additional performance requirements that may not be met by currently available zero-emission vehicle models. Moving forward, in cooperation with GSA, some agencies have begun providing vehicle manufacturers vehicle requirements and feedback to create suitable electric vehicles for law enforcement purposes, according to DHS officials.



Source: U.S. Customs and Border Protection. | GAO-23-105635

Approximately 70 percent, or about 230,000 federal vehicles, and 86 percent of all sedans, covered by the Executive Order are located in urban areas.¹⁵ On the other hand, about 14 percent, or about 47,000 federal vehicles, are located in the most rural areas where non-sedans, like SUVs and pickups, make-up about 94 percent of the fleets. In addition, about 30 percent of federal vehicles affected by the Executive Order operate in a ZIP code that has been identified by the Environmental Protection Agency as having air quality issues related to vehicle emissions. These areas are generally located on the West Coast and Northeast. For example, ZIP codes in urban areas, such as those in Los Angeles and in Washington, D.C.—which together contain thousands of federal vehicles—fall within the boundaries of areas with known air quality issues.¹⁶

Fleets Could Transition to Electric Vehicles, but Access to Electric Vehicle Charging Infrastructure Is Limited

Agency Fleets' Composition and Use Generally Align with the Capabilities and Availability of Electric Vehicles

Given the types of vehicles that federal fleets operate and how they are used, agencies have the potential to increase their acquisitions of zero-emission vehicles.

Composition. In general, light-duty vehicles are more likely to have a comparably-sized zero-emission vehicle model available. In our review of GSA's fiscal year 2022 vehicle offerings, we found a range of light-duty zero-emission vehicles available, including three battery electric sedans and five battery electric SUVs.¹⁷ Of the roughly 33,000 light-duty vehicles newly ordered in 2021, about half had a current electric vehicle alternative offered by GSA.¹⁸ However,

¹⁵We define urban as any contiguous built-up area of 50,000 people or more. This definition is in line with the United States Department of Agriculture's 2010 rural-urban commuting area (RUCA) codes for metropolitan areas. The RUCA codes classify U.S. census tracts using measures of population density, urbanization, and daily commuting and are based on the Office of Management and Budget and the United States Department of Census's urbanized area definitions for the 2010 Census. Agencies may withhold the locations of vehicles when such information is considered sensitive, and thus, this information may not reflect the entire fleets' locations.

¹⁶We plan to describe how agencies plan to take into account emissions and air quality when prioritizing future vehicle acquisitions as part of our ongoing work on federal fleet electrification.

¹⁷In total, for fiscal year 2022, GSA offers three battery electric sedans, five battery electric SUVs, four plug-in hybrid electric SUVs, two battery electric pick-up trucks, as well as some battery electric vans.

¹⁸Executive Order 14057 requirements only apply to vehicle acquisitions where GSA offers one or more zero-emission vehicle options for that vehicle class. Exec. Off. of the President, M-22-06, *Catalyzing Clean Energy Industries and Jobs through Federal Sustainability* (Dec. 8, 2021). In the event that a planned or targeted zero emission model is not available for a specific vehicle type and configuration, agencies must consider other vehicle types where another zero-emission model is offered that meets agency needs. Exec. Off. of the President,

GSA's past offerings generally lacked electric vehicle options for larger models of SUVs and pickup trucks. GSA officials said that they were not able to offer these larger vehicles because they were not commercially available. However, they are optimistic that there will be electric vehicle options for all vehicle types within the next five years. According to the International Energy Agency's 2022 *Global Electric Vehicle Outlook*, to meet public demand, more SUVs are expected to reach markets as manufacturers accelerate efforts to electrify larger models.¹⁹ The Ford F-150 Lightning, Chevy Silverado, and Dodge Ram (all pick-up trucks) are expected to be offered as an electric model by 2024.

Although electric vehicle models are expected to become increasingly available, agencies may need to increase their acquisition of zero-emission vehicles by about 30,000 vehicles per year to meet executive order requirements—based on fiscal year 2021 acquisition data—although that may vary based on the number of vehicles agencies acquire in a given year. The increase in zero-emission vehicle acquisitions will also likely lead to an increase in acquisition costs as zero-emission vehicles generally have higher purchase prices—although, as we reported in 2019, some of this cost can be recovered over time due to lower maintenance and fuel costs.²⁰ GSA officials agreed that vehicle costs could limit the potential of fleets to transition to electric vehicles, but they expected that the difference in purchase price of electric vehicles compared to conventional gasoline vehicles would continue to decline as production increases and manufacturing costs decline. However, according to GSA officials, pricing may not decline as rapidly as anticipated prior to the global pandemic.

Use. Agencies' typical use of their vehicles also suggests a potential to transition to electric vehicles. As discussed above, federal vehicles traveled an average of about 6,000 miles per year in 2021—if driven 5 days per week for 50 weeks per year—that means these vehicles may drive less than 25 miles per day. According to GSA officials, they generally recommend that an agency consider acquiring a plug-in hybrid electric vehicle if its projected daily use is less than 40 miles per day and a battery electric vehicle if its projected daily use is less than 200 miles per day—assuming the vehicle has an opportunity to recharge overnight—in order to avoid midday charging.²¹ While plug-in hybrid electric vehicles have a smaller battery pack than battery electric vehicles, it is possible to drive moderate distances using just electricity (about 15 to 60-plus miles in current models).

Based on our analysis of agency reported annual mileage in FAST (the only source of government-wide fleet data), there are no indications that a significant portion of federal fleets would regularly exceed these daily mileages.²² See figure 4 for more information on the

Implementing Instructions for Executive Order 14057 Catalyzing Clean Energy Industries and Jobs (August, 2022).

¹⁹International Energy Agency, *Global EV Outlook 2022*.

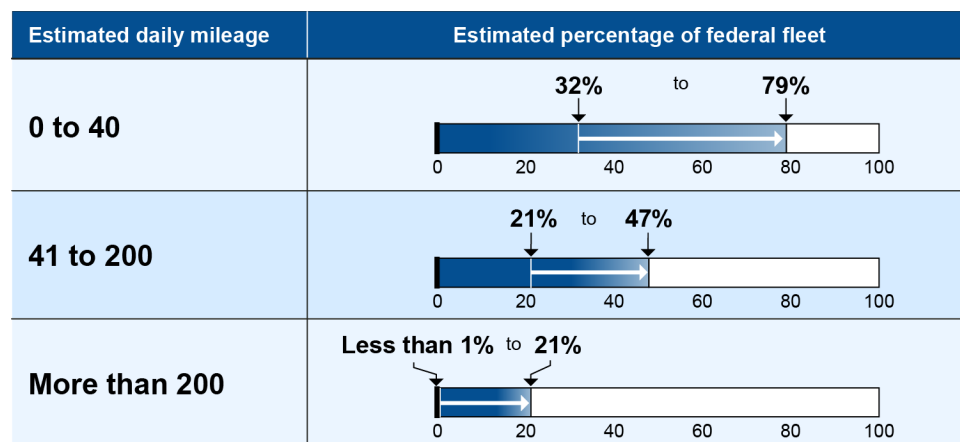
²⁰[GAO-19-397](#).

²¹Of the battery electric vehicles offered by GSA in 2022, most can drive further than 200 miles on a single charge. Further, significant improvements in battery technology and overall vehicle efficiency have led to increased driving ranges, which are expected to continue to increase. For example, the median Environmental Protection Agency estimated range for all electric vehicle models offered in the 2020 model year exceeded 250 miles.

²²Reported annual mileage is a data field that GSA and DOE have found to be of questionable accuracy in the past. GSA officials also said that the accuracy and completeness of the data is a reflection of the data provided by agencies. However, as FAST provides the only government-wide source of fleet data, we analyzed the data on annual mileage to estimate vehicle use. We also chose to assess fiscal year 2021 data because it was the most recent data source available, and according to GSA officials, likely the most accurate due to additional data validation

percentage of federal vehicles that fall into different daily mileage ranges based on different frequency-of-use scenarios. One caveat to our analysis, however, is that FAST is generally less reliable for vehicle-level analyses, especially annual mileage and fuel consumption. Accurate daily mileage may become more widely available as more agencies adopt telematics programs.

Figure 4: Percentage of Federal Vehicles Estimated to be within Daily Mileage Ranges



Source: GAO analysis of General Services Administration data. | GAO-23-105635

Note: Agencies are not required to track daily mileage. This analysis estimates daily average mileage of federal vehicles subject to the requirements of Executive Order 14057 upon replacement, assuming each vehicle is driven a certain number of days per week for 50 weeks per year. The low frequency of use scenario assumes a vehicle is driven once per week; the medium frequency of use scenario assumes a vehicle is driven three times per week; and the high frequency of use scenario assumes a vehicle is driven five times per week. One caveat to our analysis, however, is that FAST is generally less reliable for vehicle-level analyses, especially annual mileage and fuel consumption. This analysis also does not include other factors that may affect a vehicle’s range, such as climate, mission (i.e., towing or off-roading), and idling.

Figure 4 Accessible Table

Estimated daily mileage	Estimated percentage of Federal fleet
0 to 40	32 to 79
41 to 200	21 to 47
More than 200	Less than 1 to 21

As agencies look to satisfy future zero-emission fleet requirements, factors such as fleet composition and use will play a key role in how agencies allocate their resources and prioritize fleet electrification. As part of our ongoing work, we will describe how agencies plan to incorporate the various factors—as well as the potential higher upfront costs of electric vehicles—into their fleet management decision-making processes. In addition, we plan to further explore issues associated with FAST, including how agencies collect and use this data to make fleet decisions.

Access to Electric Vehicle Charging Infrastructure at Federal Locations Is Limited

Access to electric vehicle charging infrastructure is generally limited at federal facilities, and widespread fleet electrification will require a significant investment in charging infrastructure. As of March 2022, federal agencies own and operate over 4,000 charging ports—based out of

steps the agency implemented.

about 1,050 charging locations—in less than 500 cities, according to DOE’s Alternative Fueling Station Locator.²³ Existing infrastructure is also generally concentrated by location and agency. For example, California contains over 25 percent of all federally owned charging infrastructure while the District of Columbia—despite containing the ZIP code with the most federal vehicles—has 110 charging ports across 35 locations. Moreover, two agencies (the Department of the Navy and DOE) account for almost half of all federally owned charging infrastructure. The majority of federally owned charging infrastructure is Level 2 charging, which is able to fully charge a battery electric vehicle overnight. For example, standard Level 2 charging equipment can generally provide 25 miles of range per 1 hour of charging. For a plug-in hybrid this means it can take 1 to 2 hours to fully charge from empty, whereas for a battery electric vehicle, it can take 4 to 10 hours to fully charge from empty. This, according to DOE guidance, makes them a good fleet option. While they are generally not capable of charging a fully depleted battery during the workday, they can be used to “top-off” to complete a trip. For fleets to charge quickly between shifts with short dwell times, agencies will likely require DC fast charging, which can add up to 100 miles of range in 20 minutes, but are generally more costly.

To support widespread electric vehicle use, GSA has estimated that the federal government may need over 100,000 charging ports. This is, in part, because GSA expects agencies to need one charging port for every two electric vehicles acquired—although the exact number required would depend on details of vehicle use and access to public charging infrastructure.²⁴ Such infrastructure development will require a significant investment—the total price of charging stations is highly variable, from \$1,000 to over \$100,000 for the most complex situations, according to GSA officials.²⁵ GSA officials said that rural locations and other facilities that are unable to cost-effectively install charging infrastructure or to access public charging may want to acquire plug-in hybrid electric vehicles to fulfill requirements. These vehicles can run on gasoline and electricity and can be charged by an outlet or Level 1 charging equipment overnight. However, GSA offers fewer of these models and said that manufacturers may be phasing out their production over the long-term.

Agency Comments

We provided a draft of this report to GSA and DOE for review and comment. We received written comments from GSA that are reprinted in enclosure II. DOE told us that they had no comments on the draft report.

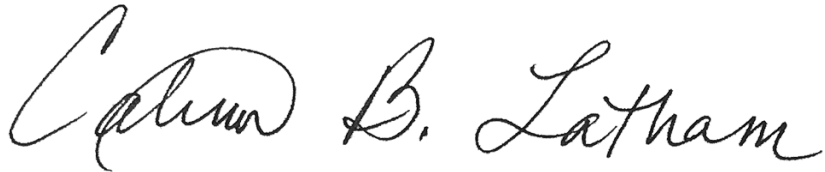
We are sending copies of this report to the appropriate congressional committees, the Administrator of the General Services Administration, the Secretary of Energy, and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

²³As discussed above, for the purposes of this report, a charging station, or charging location, is a site with one or more electric vehicle ports. Examples include a parking garage or a mall parking lot.

²⁴Our previous work identified charging infrastructure cost and installation uncertainties associated with electric vehicles. [GAO-19-397](#).

²⁵Installation costs vary by site location depending on existing wiring and required trenching and electrical upgrades, among other factors.

If you or your staff have any questions about this report, please contact me at 202-512-2834 or LathamC@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 key contributions to this report include Nancy Lueke, Assistant Director; Ross Gauthier, Analyst-in-Charge; John Mingus; Joshua Ormond; Minette Richardson; A. Maurice Robinson; Dominic Skinnion; Michelle Weathers; Alicia Wilson; and Elizabeth Wood.

A handwritten signature in black ink that reads "Catina B. Latham". The signature is written in a cursive style with a large, looping initial "C".

Catina B. Latham
Acting Director, Physical Infrastructure Issues

Enclosure(s) – #2

Enclosure I: Objectives, Scope, and Methodology

You asked us to review federal agencies' fleets and their potential to transition to electric vehicles. This report addresses: (1) the composition, location, and use of federal fleets and (2) the potential for federal fleets to transition to electric vehicles.

To determine the composition, location, and use of federal fleets we analyzed fiscal year 2021 government-wide data from General Services Administration's (GSA) Federal Automotive Statistical Tool (FAST) on the composition of federal agency fleets, the locations of vehicles in federal agency fleets, and the annual miles traveled by federal agency vehicles. For the purposes of our analysis, we excluded vehicles that were disposed of by agencies during fiscal year 2021. We also excluded vehicles operated by agencies not subject to Executive Order 14057 and those with fleets smaller than 20 vehicles.²⁶ We limited our analysis to agency's domestic fleets because Executive Order 14057 only expressly applies to an agency's activities within the United States, and the head of an agency has discretion to apply the order outside of the United States. Finally, we excluded low-speed vehicles and armored vehicles. To assess the reliability of this data, we examined the data for inconsistencies, reviewed policies and procedures used to collect and validate the data, and interviewed relevant agency officials. Through discussions with GSA officials and our own analyses we identified examples of inconsistent data submissions or mislabeling across FAST data elements, particularly with regards to agency reports of vehicle annual miles traveled. FAST data may not be detailed or consistent enough to provide accurate and reliable vehicle-level analyses, such as day-to-day use. However, FAST provides the only government-wide source of data on federal agency fleets and GSA officials stated that it is sufficiently reliable to describe the overall composition and use of agency fleets. Therefore, we found the data to have limitations, but generally reliable for our reporting purposes, and have noted specific limitations as appropriate. Based on location information in FAST we determined which vehicles were located in urban and rural areas as defined by the Rural-Urban Commuting Area Codes for 2010.

To determine the general potential for federal fleets to transition to electric vehicles we analyzed information on the vehicles GSA has available for agencies to purchase or lease. We compared the available electric vehicles to information from GSA on the vehicles that federal agencies ordered in fiscal year 2021 to determine the percentage of agency light duty acquisitions that had an electric vehicle option. We analyzed data on the distance agency vehicles traveled in fiscal year 2021 to estimate a range of possible average daily distances traveled and compared these distances to the ranges of available electric vehicles and guidance from GSA to agencies about which vehicles are good candidates for replacement with an electric vehicle. Because GSA does not track daily mileage (i.e., miles driven in a given day), we made three assumptions as part of this analysis, specifically: (1) vehicles were driven at least once every week for 50 weeks, (2) federal electric vehicles have an opportunity to charge fully between days on which they are used, and (3) federal electric vehicles achieve the range listed in GSA's alternative fuel database. Given these assumptions, we also performed a sensitivity analysis on the number of days the vehicles could be driven in a given week, ranging from once a week to five times a week. We also interviewed officials from GSA and DOE to understand the factors that can influence the agency transition to electric vehicles.

To understand the status of electric vehicle charging infrastructure available to federal agencies, we analyzed data from DOE on federally owned charging stations across the continental United

²⁶ Exec. Order No. 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*, 86 FR 70935 (Dec. 8, 2021).

States. To assess the reliability of this data, we reviewed policies and procedures used to collect and validate the data, and interviewed relevant agency officials. Finally, we interviewed GSA and DOE officials regarding the challenges agencies face with installing charging infrastructure.

Enclosure II: Comments from the General Services Administration

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The Administrator

September 30, 2022

The Honorable Gene L. Dodaro
Comptroller General of the United States
U.S. Government Accountability Office
Washington, DC 20548

Dear Comptroller General Dodaro:

The U.S. General Services Administration (GSA) appreciates your in-depth analysis of the Federal Government's transition to electric vehicles. As agencies work toward the electric vehicle acquisition goals outlined in Executive Order 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* (December 8, 2021), GSA is excited to continue partnering with agencies to accelerate the transition to a zero-emission electric fleet. GSA continues to acquire new electric vehicle models, mirroring availability in the commercial marketplace. In fiscal year 2022 alone, GSA offered 63 zero-emission vehicle models.

In April 2022, [GSA established 16 Blanket Purchase Agreements](#) (BPAs) for Electric Vehicle Supply Equipment (EVSE), including multiple types of electric vehicle (EV) charging stations, with over 30 unique brands and over 1,000 products. These BPAs ensure that agencies have access to the infrastructure required to charge their plug-in hybrid and battery-operated vehicles. GSA is in the beginning stages of working with the BPA vendors to ensure that they complete an IT security review process. While firms are currently able to sell non-networked EVSE through the GSA Multiple Award Schedule, GSA's Federal Acquisition Service is partnering with GSA's Chief Information Security Officer to support awarded firms through the review and certification process so they may begin selling their networked stations and services through the BPAs as soon as possible. These reviews reduce the need for purchasing agencies to conduct their own security certifications, eliminating redundancy. The entire security-review process is expected to take 6 to 12 months to complete.

In addition, GSA is establishing complementary General Construction with Design/Build Capabilities Indefinite Delivery, Indefinite Quantity contracts to support EVSE installation. Contracts for three of the four covered geographic zones are now awarded with the last to follow soon. These contract solutions provide a turnkey EV charging installation solution, making GSA a ["one-stop shop"](#) for meeting agencies' fleet electrification needs. GSA hopes these efforts will make acquiring and installing EV charging infrastructure easier for Federal agencies and is eager to help them meet their EV mission needs.

U.S. General Services Administration
1800 F Street NW
Washington, DC 20405
www.gsa.gov

If you have any questions or concerns, please contact me or Gianelle Rivera, Associate Administrator, Office of Congressional and Intergovernmental Affairs, at (202) 501-0563.

Sincerely,



Robin Carnahan
Administrator

Text of Enclosure II: Comments from the General Services Administration

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Sincerely,

Robin Carnahan
Administrator

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