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Department of Energy

Washington, DC 20585

March 26, 2024

Via email

RE: HQ-2024-00485-F

This is a final response to the request for information that you sent to the Department of Energy (DOE) under the Freedom of Information Act (FOIA), 5 U.S.C. § 552. You requested:

A copy of the DOE handbook called: "Comprehensive Federal Fleet Management Handbook".

Your request was assigned to DOE's Office of Federal Energy Management Program (FEMP) to conduct a search of its files for responsive documents. FEMP started its search on December 5, 2023, which is the cut-off date for responsive documents. FEMP has completed its search and identified one (1) document responsive to your request. The document is being released to you as described in the accompanying index.

Upon review, DOE has determined that the information should be released in its entirety.

The adequacy of the search may be appealed within 90 calendar days from your receipt of this letter pursuant to 10 C.F.R. § 1004.8. Appeals should be addressed to Director, Office of Hearings and Appeals, HG-1, L'Enfant Plaza, U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, D.C. 20585-1615. The written appeal, including the envelope, must clearly indicate that a FOIA appeal is being made. You may also submit your appeal to OHA.filings@hq.doe.gov, including the phrase "Freedom of Information Appeal" in the subject line (this is the preferred method by the Office of Hearings and Appeals). The appeal must contain all of the elements required by 10 C.F.R. § 1004.8, including a copy of the determination letter. Thereafter, judicial review will be available to you in the Federal District Court either: 1) in the district where you reside; 2) where you have your principal place of business; 3) where DOE's records are situated; or 4) in the District of Columbia.

You may contact DOE's FOIA Public Liaison, Alexander Morris, FOIA Officer, Office of Public Information, via email at alexander.morris@hq.doe.gov, or by mail at MA-46/Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C. 20585, for any



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The FOIA provides for the assessment of fees for the processing of requests. *See* 5 U.S.C. § 552(a)(4)(A)(i); *see also* 10 C.F.R. § 1004.9(a). Your request was placed in the “other” category for fee purposes. Requesters in this category are entitled to two (2) free hours of search time and 100 pages at no cost. DOE’s processing costs did not exceed \$15.00, the minimum amount at which DOE assesses fees. Thus, no fees will be charged for processing your request.

This is the final response that you will receive regarding your request from this office. You may contact Tavis Williams with any questions about this letter via email at tavis.williams@hq.doe.gov.

I appreciate the opportunity to assist you with this matter.

Sincerely,

**Richard G.
Hayes**

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Alexander C. Morris
FOIA Officer
Office of Public Information

U.S. DEPARTMENT OF
ENERGY

Office of
**ENERGY EFFICIENCY &
RENEWABLE ENERGY**

Comprehensive Handbook for Federal Fleet Management

March 2020



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- The U.S. General Services Administration (GSA)
- The White House Council on Environmental Quality (CEQ) Office of Federal Sustainability (OFS)
- The White House Office of Management and Budget (OMB)
- The U.S. Postal Service (USPS)
- The Environmental Protection Agency (EPA)
- Four Rivers Nuclear Partnership
- Mercury Associates
- Agency members of the Interagency Committee on Alternative Fuels and Low Emission Vehicles (INTERFUEL) working group.

Executive Summary

Executive Order (E.O.) 13834, *Efficient Federal Operations*, signed on May 17, 2018, established the following policy priorities for Federal fleets: agencies are instructed to “meet such statutory requirements [related to energy and environmental performance of executive departments and agencies] in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment”. The *Implementing Instructions for Executive Order 13834 Efficient Federal Operations*¹ states that “[a]s part of a comprehensive strategy to comply with statutory mandates while improving overall fleet efficiency, reducing costs, and meeting mission requirements, agencies should identify and implement strategies to:

- Right-size the fleet;
- Reduce vehicle miles traveled;
- Replace inefficient vehicles with more fuel-efficient vehicles; and
- Align deployment of alternative fuel vehicles with fueling infrastructure.”

Federal agencies are subject to several energy and environmental statutory and executive requirements. The overarching goal for Federal fleets is to meet or exceed the statutory requirement to reduce petroleum consumption by Federal fleet vehicles. Other statutory requirements include purchasing alternative fuel and low greenhouse gas (GHG) emitting vehicles, increasing alternative fuel use, using alternative fuel in dual-fueled vehicles, deploying alternative fuel infrastructure, and right-sizing the fleet using a vehicle allocation methodology (VAM) study. At the same time, these requirements must be harmonized with the missions of Federal fleet managers and agency leadership and the important priorities for their vehicles. DOE FEMP developed this *Comprehensive Handbook for Federal Fleet Management* [Handbook] to address these priorities and help fleet managers:

- Meet or exceed Federal fleet petroleum reduction, alternative fuel use, and alternative fuel vehicle (AFV) deployment requirements
- Develop an agency plan, collect data, and select optimal strategies for each fleet location
- Acquire appropriate vehicles while minimizing fleet size and vehicle miles traveled (VMT).

This Handbook is organized around a cyclical fleet management framework—plan, collect, strategize, and implement (see Figure ES-1). This process framework is provided as a tool for agency fleet managers to select optimal petroleum reduction strategies for each fleet location based on an evaluation of site-specific characteristics, including availability of alternative fuel, fleet size, and fleet vehicle composition.

¹ Council on Environmental Quality, *Implementing Instructions for Executive Order 13834: Efficient Federal Operations*, April 2019, https://www.sustainability.gov/pdfs/eo13834_instructions.pdf.



Figure ES-1. Fleet Strategic Planning and Implementation Process Framework for Agencies

List of Acronyms and Abbreviations

AFBS	Annual Fleet Budget Summary	FPMR	Federal Property Management Regulation
AFDC	Alternative Fuels Data Center	FSR	Fleet Service Representative
ALD	Asset level data	FY	fiscal year
AFV	alternative fuel vehicle	GGE	gasoline gallon equivalent
BEV	battery electric vehicle	GHG	greenhouse gas
BPA	blanket purchase agreement	GOCO	government-owned, contractor-operated
CAA	Clean Air Act	GPS	global positioning system
CCS	Combined Charging System	GSA	U.S. General Services Administration
CEQ	Council on Environmental Quality	GVWR	gross vehicle weight rating
CFR	Code of Federal Regulations	HDV	heavy-duty vehicle
CMSA	consolidated metropolitan statistical area	HEV	hybrid electric vehicle
CNG	compressed natural gas	LDV	light-duty vehicle
CO ₂	carbon dioxide	LE	law enforcement
CO ₂ e	carbon dioxide equivalents	LNG	liquefied natural gas
CSO	Chief Sustainability Officer	LPG	liquid petroleum gas
DC	direct current	LSEV	low-speed electric vehicle
DLA	Defense Logistics Agency	LSV	low-speed vehicle
DoD	U.S. Department of Defense	MDPV	medium-duty passenger vehicle
DOE	U.S. Department of Energy	MDV	medium-duty vehicle
E.O.	executive order	mpg	miles per gallon
ECRA	Energy Conservation Reauthorization Act	mpgge	miles per gasoline gallon equivalent
EISA	Energy Independence and Security Act	MSA	metropolitan statistical area
EPA	Environmental Protection Agency	NEV	neighborhood electric vehicle
EPAct	Energy Policy Act	NREL	National Renewable Energy Laboratory
EV	electric vehicle	OEM	original equipment manufacturer
EVEF	electric vehicle efficiency factor	OMB	Office of Management and Budget
EVSE	electric vehicle supply equipment	PHEV	plug-in hybrid electric vehicle
FAST	Federal Automotive Statistical Tool	psi	pounds per square inch
FAST Act	Fixing America's Surface Transportation Act	REC	renewable energy credit
FCEV	fuel cell electric vehicle	SUV	sport utility vehicle
FedFMS	Federal Fleet Management System	TOD	transportation on demand
FEMP	Federal Energy Management Program	U.S.C.	United States Code
FFV	flex fuel vehicle	USPS	U.S. Postal Service
FleetDASH	Fleet Sustainability Dashboard	VAC	volts alternating current
FMIS	Fleet Management Information System	VAM	vehicle allocation methodology
FMP	fleet management plan	VMT	vehicle miles travelled
FMR	Federal Management Regulation	ZEV	zero emission vehicle
FMVRS	Federal Motor Vehicle Registration System		

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1 Introduction

This *Comprehensive Handbook for Federal Fleet Management* supersedes the *Executive Order 13514 Comprehensive Federal Fleet Management Handbook*. It subsumes the *Guidance: Requirements for Installing Renewable Fuel Pumps at Federal Fleet Fueling Centers under EISA Section 246* and *Guidance for Federal Agencies on EPA Act 2005 Section 701 Alternative Fuel Use Requirements for Dual-Fueled Vehicles*. The *DOE Guidance on Nation-of-Origin Vehicle Manufacturer Procurement Requirements under 42 USC § 6347(a)(3)(G)* is included as Appendix A.

1.1 What is the Purpose of this Handbook?

This Handbook is designed to help agency fleet managers understand fleet requirements and implement optimal petroleum reduction strategies for each fleet location, including:

- Right-sizing the fleet to agency mission by implementing a vehicle allocation methodology (VAM) study
- Minimizing vehicle miles traveled (VMT)
- Increasing fleet efficiency by replacing inefficient vehicles with more fuel-efficient vehicles, maintaining vehicles, driving more efficiently, and avoiding excessive idling
- Optimizing cost-effective alternative fuel use, including maximizing utilization of existing alternative fuel infrastructure, installing alternative fuel infrastructure where practical (including electric vehicle [EV] charging stations), and aligning deployment of alternative fuel vehicles (AFVs) with fueling infrastructure.

1.2 Vision for Federal Fleet Management

Executive Order (E.O.) 13834, *Efficient Federal Operations*, signed on May 17, 2018, establishes a strategy for Federal fleets to meet or exceed the fleet energy and environmental statutory requirements. The E.O. 13834 Implementing Instructions state that these requirements should be met “in a manner that increases efficiency, optimizes performance, and reduces waste and costs”.² Employing this strategy calls for the overarching Federal fleet goal of reducing petroleum consumption while meeting mission-critical needs and complying with all Federal mandates.

The Vision

“Agencies are instructed to meet statutory requirements related to energy and environmental performance of vehicles in a manner that increases efficiency, optimizes performance, and reduces waste and costs.”
E.O.13834 Implementing Instructions

Federal fleets will be assessed on achieving this vision based on compliance with the statutory requirement to reduce petroleum consumption.

² Council on Environmental Quality, *Implementing Instructions for Executive Order 13834: Efficient Federal Operations*, April 2019, https://www.sustainability.gov/pdfs/ea13834_instructions.pdf.

1.3 Summary of Federal Fleet Requirements

Federal fleets are required to meet a range of statutory requirements related to fleet management, which include but are not limited to requirements under the following statutes and E.O. as displayed in Figure 1:

- **E.O. 13834**, Efficient Federal Operations
- **Energy Policy Act (EPAcT) of 1992 Sections 302,³ 303,⁴** as amended
- **EPAcT 2005 Section 701⁵**
- **Energy Independence and Security Act (EISA) of 2007 Sections 141,⁶ 142,⁷ and 246⁸**
- **U.S. General Services Administration’s (GSA’s) Federal Management Regulation (FMR) Part 102-34—Motor Vehicle Management.⁹**

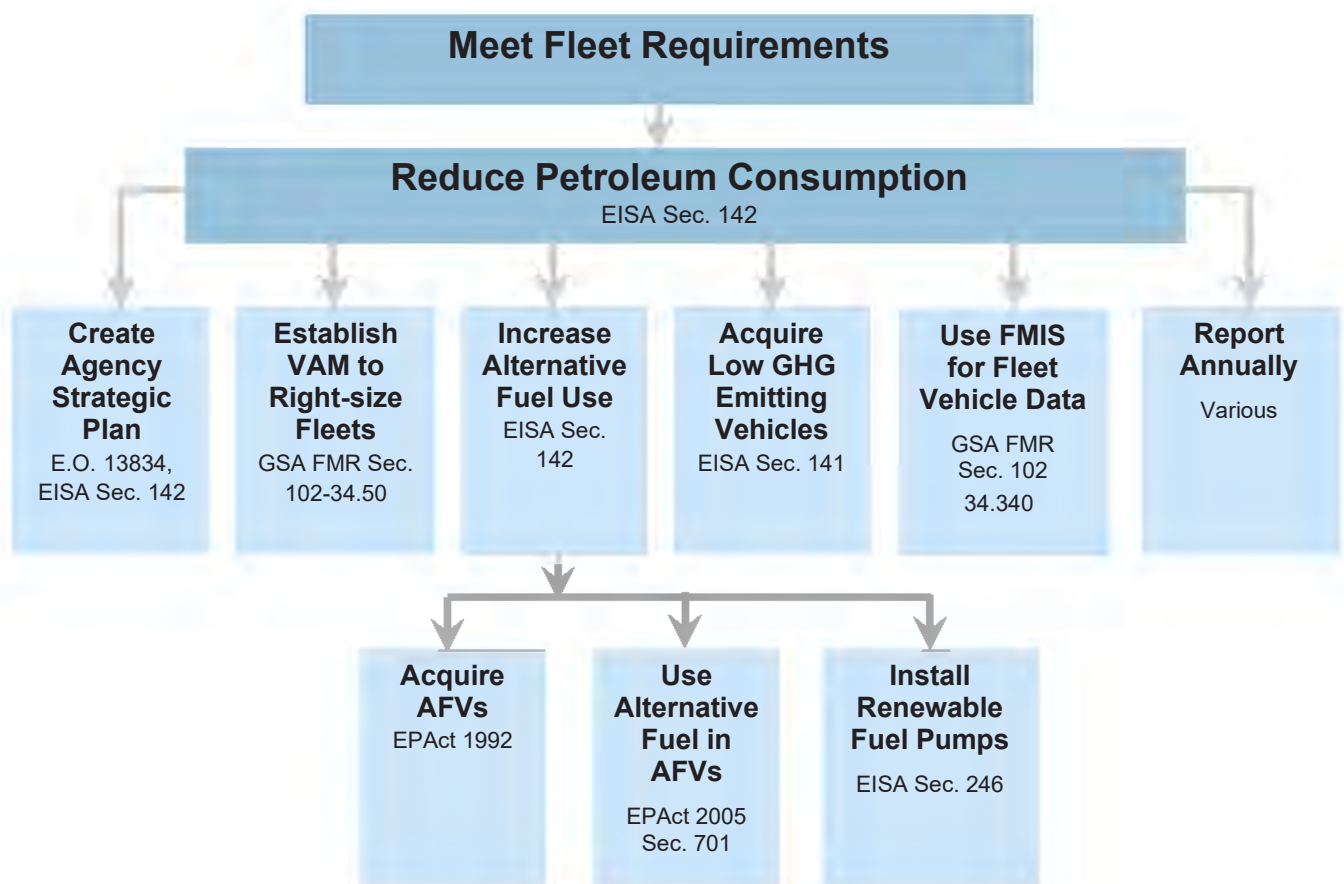


Figure 1. Summary of Federal Fleet Requirements

³ Pub. L. No. 102-486, § 302 (Oct. 24, 1992) (codified at 42 U.S.C. § 6374(a)).

⁴ Pub. L. No. 102-486, § 303 (Oct. 24, 1992) (codified at 42 U.S.C. § 13212(a)-(c), (g)).

⁵ Pub. L. No 109-58, § 701 (Aug. 8, 2005) (codified at 42 U.S.C. § 6374(a)(3)(E)).

⁶ Pub. L. No. 110-140, § 141 (Dec. 19, 2007) (codified at 42 U.S.C. § 13212(f)).

⁷ Pub. L. No. 110-140, § 142 (Dec. 19, 2007) (codified at 42 U.S.C. § 6374e).

⁸ Pub. L. No. 110-140, § 246 (Dec. 19, 2007) (codified at 42 U.S.C. § 17053).

⁹ Codified at 41 C.F.R. Part 102-34.

1.4 Federal Fleet Management Framework

Figure 2 outlines a recommended framework for fleet managers to develop an overall fleet-specific petroleum reduction strategy—while complying with all Federal goals and mandates and optimizing fleet management.

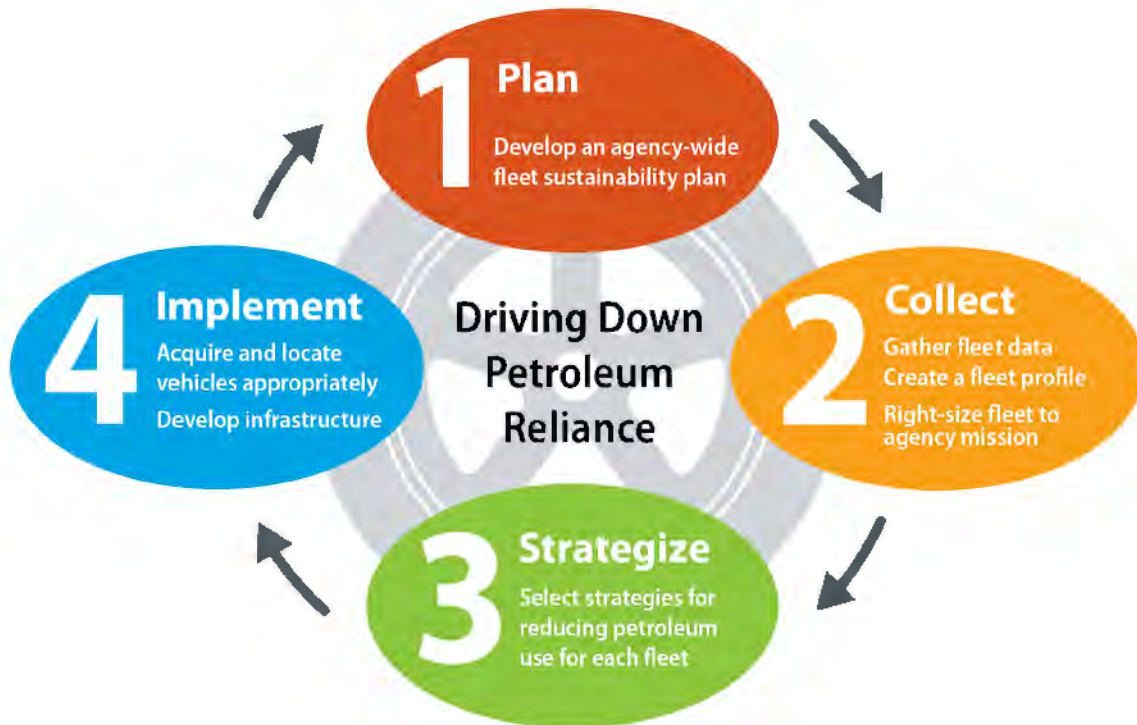


Figure 2. Fleet Strategic Planning and Implementation Process Framework for Agencies

This framework is arranged into the following four components:

1. **Plan.** Establish an overall agency integrated multi-year strategic plan to reduce petroleum consumption. The output of the planning phase includes the fleet component of the agency E.O. 13834 Sustainability Plan and EISA Section 142 Fleet Plan.
2. **Collect.** Compile and manage accurate and comprehensive asset-level vehicle data¹⁰ to enable agencies to optimize fleet decision making, establish a baseline fleet profile, and use that profile to right-size the fleet and vehicles to the agency mission. The E.O. 13834 Implementing Instructions support this by promoting improved data collection and management requirements, including vehicle telematics and asset-level data (ALD) reporting. This data will enable agencies to identify the most promising fleet strategies to reduce petroleum consumption in the third framework step, strategize.
3. **Strategize.** Evaluate strategies at each fleet location to reduce petroleum consumption, including right-sizing fleets and vehicles to missions, reducing VMT and idling, increasing fleet fuel efficiency, and increasing use of electricity (through deployment of EVs and related charging infrastructure) and other alternative fuels (including biodiesel blends).
4. **Implement.** Acquire and locate vehicles to support petroleum reduction strategies, ensure fleet and individual vehicles are right-sized to the agency mission, support alternative fuel infrastructure

¹⁰ Detailed references for reporting ALD are available at <https://fastweb.inl.gov/help/index.cfm/resources/vehicle-level-data>.

development where possible, monitor and report performance in meeting petroleum reduction targets, identify deficiencies, and refine strategy as needed. Both vehicle location and duty cycle are important factors for implementing many petroleum reduction strategies, including identifying candidate vehicles for replacement with EVs and deploying dual-fueled vehicles in locations where alternative fuel infrastructure is available.

1.5 Who are the Target Audiences?

The three primary audiences for this Handbook are:

- **Agency Chief Sustainability Officers (CSOs).** CSOs are responsible for oversight of Federal fleet sustainability management and implementation of E.O. 13834 within the agency. Section 7(a) of E.O. 13834 required the head of each agency to designate a CSO by July 1, 2018.
- **Agency headquarters fleet managers.** Agency-wide fleet managers responsible for meeting the transportation needs of the entire agency fleet, including developing agency fleet policy, acquiring vehicles, and overseeing vehicle fueling and maintenance/repair services.
- **Agency fleet location managers.** Fleet managers at each fleet location responsible for the fleet’s day-to-day operation, implementing agency fleet policy at that location, and working with the agency headquarters fleet managers in managing the acquisition of vehicles, fuel, and maintenance services to support that fleet.

Agency CSOs and headquarters fleet managers can use this Handbook to craft tailored, executable plans that achieve the vision for Federal fleet management (see Section 1.2), including identifying the strategies each agency will implement to meet or exceed its requirements. Agency headquarters fleet and agency fleet location managers can use this Handbook to develop the specifics relevant to implementing their executable plans, including selecting optimal petroleum reduction strategies for each fleet location, meeting or exceeding related fleet requirements, acquiring vehicles to support these strategies while minimizing vehicle size and fleet size, and refining strategies based on agency performance. Section 2.2 of this Handbook outlines the general responsibilities for the target audiences related to Federal fleet sustainability management. Please note that references to “fleet managers” in this Handbook refer to both agency headquarters and fleet location managers.

1.6 How is this Handbook Organized?

This Handbook is designed to assist agencies in developing the specifics relevant to implementing their overall approach for reducing petroleum consumption, improving overall fleet efficiency, reducing costs, and accomplishing the agency transportation mission requirements.

Table 1 shows where the chapters of the Handbook fit into the framework, how each chapter relates to identifying and implementing optimal petroleum reduction strategies specific to each fleet location, and where to find guidance on meeting related Federal fleet sustainability requirements. Chapter 2 provides an overview of Federal fleet sustainability management requirements, general responsibilities for each of the three target audiences, and what agencies and fleet managers need to do throughout the fiscal year (FY) for planning and reporting on fleet statutory requirements. Chapter 3 provides detailed guidance for meeting or exceeding Federal fleet sustainability requirements, helping an agency determine whether the requirements are applicable to its fleet and, if so, how to measure, reach, and exceed performance goals. The remaining chapters help agencies identify and implement the optimal petroleum reduction strategies and tactics for each fleet location, based on an evaluation of site-specific characteristics, including availability of alternative fuel, fleet size, and fleet vehicle composition.

Table 1. Fleet Requirements and Sustainability Strategies in This Document

Petroleum Reduction Plan or Strategy	Strategy Section(s)	Requirement Section	Fleet Requirement	Statute or E.O.	Requirement
Plan					
Reduce fleet petroleum consumption	5	3.4	Reduction in annual fleet petroleum use	EISA, Sec. 142	20% total reduction in annual use compared to FY 2005 baseline
Increase fleet alternative fuel consumption	5	3.5	Increase in annual fleet alternative fuel use	EISA, Sec. 142	10% total increase in annual use compared to FY 2005 baseline
Develop an agency Sustainability Plan	4.1	3.11	Agency plan to achieve Federal fleet sustainability requirements	E.O. 13834 Implementing Instructions	Include fleet petroleum reduction goals in Sustainability Plans and update annually
Collect					
Deploy vehicle telematics, use Fleet Management Information System (FMIS), and manage ALD	4.2	-	Encouraged to deploy vehicle telematics	E.O. 13834 Instructions	Agencies should deploy vehicle telematics where practicable
		3.12	Use FMIS and collect and manage ALD	GSA FMR Sec. 102-34.340	Collect and manage ALD in a formal agency fleet management system, and submit relevant data to FAST, the Federal Motor Vehicle Registration System (FMVRS), and the Fleet Sustainability Dashboard (FleetDASH)
Strategize					
Develop agency profile and right-size fleets and vehicles	5.1	3.8	Vehicle Allocation Methodology (VAM)	GSA FMR Sec. 102-34.50	Establish a structured VAM to determine the appropriate size and number of motor vehicles
Reduce VMT	5.2	3.4	Reductions in annual fleet petroleum use	See EISA Sec. 142 petroleum reduction requirements above	
Increase fleet fuel economy	5.3				
Deploy AFVs and use alternative fuel Use biodiesel blends in diesel Deploy EVs Install alternative fueling infrastructure	5.4-6	3.5	Increase in annual fleet alternative fuel use	See EISA Sec. 142 alternative fuel use increase requirements above	
		3.9	Alternative fuel use in dual-fueled AFVs	EPAct 2005, Sec. 701	All dual-fueled AFVs must use alternative fuel unless waived (subject to approval by DOE)
		3.10	Alternative fuel infrastructure	EISA, Sec. 246	Every Federal fueling center must install a renewable fuel pump
Implement					
Sustainable vehicle acquisition	7	3.6	Acquisition of AFVs	EPAct 1992	At least 75% of light-duty vehicles (LDVs) acquired in metropolitan statistical areas (MSAs) must be AFVs
		3.7	Acquisition of low GHG-emitting vehicles	EISA, Sec. 141	Prohibits agencies from acquiring vehicles that are not low-GHG emitting vehicles
Reporting and monitoring fleet performance	4.4	3.3-3.12	Reporting vehicle inventory, utilization, fuel consumption, and costs	Various	
Reevaluate strategies	4.4	3.11	Agency plans	See E.O. 13834 fleet plan requirements above	

2 Overview of Fleet Sustainability Responsibilities

This chapter provides an overview of Federal fleet sustainability management requirements for each target audience (agency CSOs, agency headquarters fleet managers, and agency fleet location managers). The chapter discusses the changes in Federal fleet requirements resulting from E.O. 13834, general responsibilities for each of the three target audiences, and what agencies and fleet managers need to do throughout the FY to meet statutory requirements.

2.1 How Have Federal Fleet Requirements Changed?

2.1.1 Federal Fleet Requirements Revoked by E.O. 13834

E.O. 13834 revoked E.O. 13693, *Planning for Federal Sustainability in the Next Decade*, which established requirements and goals for reducing GHG emissions from Federal fleets. As a result, Federal fleets are **no longer required to meet the following requirements:**

- **Reduction in fleet-wide per-mile GHG emissions.** Section 3(g)(ii) of E.O. 13693 required Federal fleets to “reduce fleet-wide per-mile greenhouse gas emissions from agency fleet vehicles, relative to a baseline of emissions in fiscal year 2014, to achieve the following percentage reductions: not less than 4 percent by the end of fiscal year 2017, not less than 15 percent by the end of fiscal year 2021, and not less than 30 percent by the end of fiscal year 2025”.
- **Acquisition of zero emission vehicles (ZEVs) and plug-in hybrid electric vehicles (PHEVs).** Section 3(g)(v) of E.O. 13693 required that ZEVs and PHEVs account for 20% of all new agency passenger vehicle acquisitions by December 31, 2020, and 50% by December 31, 2025.

2.1.2 Current Federal Fleet Requirements and Priority Strategies

The goal for Federal fleets is to **meet or exceed the fleet energy and environmental statutory requirements “in a manner that increases efficiency, optimizes performance, and reduces waste and costs”**.¹¹ Federal fleets must comply with all Federal fleet management statutes, which are summarized below.

2.1.2.1 Fuel Use Requirements

- **Reduce petroleum consumption:** *EISA Section 142* (42 U.S.C. § 6374e(a)(2)) requires Federal fleets to reduce annual petroleum consumption by a total of 20% relative to an FY 2005 baseline by FY 2015 and for each year thereafter. The E.O. Implementing Instructions requires agencies to demonstrate annual progress reducing petroleum each FY as compared to the prior year; agencies are encouraged to establish goals for annual progress equal to or greater than 1% in their Sustainability Plans.
- **Increase alternative fuel use:** *EISA Section 142* (42 U.S.C. § 6374e(a)(2)) requires Federal fleets to achieve at least a 10% increase in annual alternative fuel use relative to an FY 2005 baseline by FY 2015 and for each year thereafter.
- **Use alternative fuel in dual-fueled AFVs:** *EPAct 2005 Section 701* (42 U.S.C. § 6374(a)(3)(E)) requires Federal fleets to use only alternative fuel in all of its dual-fueled vehicles, except where the vehicles have received a waiver from DOE due to the local unavailability of alternative fuel or if the fuel is unreasonably more expensive than gasoline.

¹¹ Council on Environmental Quality, *Implementing Instructions for Executive Order 13834: Efficient Federal Operations*, April 2019, https://www.sustainability.gov/pdfs/ea13834_instructions.pdf.

- **Alternative fuel infrastructure:** *EISA Section 246* (42 U.S.C. § 17053(a)) requires Federal agencies to install at least one renewable fuel pump at each Federal fleet fueling center under their jurisdictions.

2.1.2.2 Vehicle Acquisition Requirements

- **Acquisition of alternative fuel vehicles:** *EPAct 1992 Section 303* (42 U.S.C. § 13212(b)) requires that the number of AFVs acquired each year represent at least 75% of LDV acquisitions by covered Federal fleets located in MSAs or consolidated metropolitan statistical areas (CMSAs). AFVs include flex-fuel, electric, plug-in hybrid electric, hybrid electric, compressed natural gas, low GHG-emitting (in locations that would qualify for a fuel waiver based on garage location under *EPAct 2005 Section 701*), liquefied petroleum gas (LPG), liquefied natural gas (LNG), and fuel-cell vehicles.
- **Acquisition of low-GHG emitting vehicles:** *EISA Section 141* (42 U.S.C. § 13212(f)(2)) prohibits Federal agencies from acquiring LDVs and medium-duty passenger vehicles (MDPVs) that are not low-GHG emitting vehicles, unless the vehicle qualifies for a functional needs exemption or the agency reduces emissions through alternative measures.

2.1.2.3 Operation and Management Requirements

- **Vehicle allocation methodology:** GSA's FMR § 102-34.50 requires that Federal agencies establish and document a structured VAM to determine the appropriate size and number of motor vehicles in the fleet and identify opportunities to eliminate unnecessary vehicles, right-size vehicles for their missions, and deploy AFVs effectively. GSA suggests that agencies complete a VAM at least once every 5 years. The E.O. 13834 Implementing Instructions encourage agencies to conduct a VAM study more frequently if agency missions or resources change. *See also* GSA FMR Bulletin B-43.
- **Use a fleet management information system for fleet vehicle data:** GSA's FMR § 102-34.340; Consolidated Omnibus Budget Reconciliation Act of 1985 Sections 15301-2 (40 U.S.C. § 17502) requires that each Federal agency must have a fleet management information system (FMIS) that: (1) "identifies and collects accurate inventory, cost, and use data"¹²; (2) "provides the information necessary to satisfy both internal and external reporting requirements"¹³; (3) collects all costs incurred in the operation, maintenance, acquisition, and disposition of motor vehicles used for official purposes¹⁴; and (4) is capable of providing the data required for external reporting, such as by using the Federal Automotive Statistical Tool (FAST)¹⁵. The E.O. 13834 Implementing Instructions encourage agencies that do not have an existing compliant agency FMIS to use tools developed by GSA; GSA provides agencies their Federal Fleet Management System (FedFMS) at no additional cost.

2.1.2.4 Planning and Reporting Requirements

- **Create a petroleum reduction plan:** *EISA Section 142* (42 U.S.C. § 6374e(b)) requires each federal agency to develop a plan to meet required petroleum reduction levels and alternative fuel consumption increases. The plan must "identify the measures the agency will use" and quantify projections for petroleum and alternative fuel consumption in future years.
- **Develop a Sustainability Plan addressing fleet requirements:** *E.O. 13834* and its Implementing Instructions require agencies to develop and annually update a Sustainability Plan, explaining how the agency will achieve the E.O. goals and relevant statutory requirements, including *EISA 142*. Agencies should consider submitting a single fleet plan each year as a component of the Sustainability Plan, provided the fleet portion of the plan fulfills the *EISA Section 142* requirements.

¹² GSA FMR Part 102-34.340(a)

¹³ GSA FMR Part 102-34.340(b)

¹⁴ 42 U.S.C. §17503

¹⁵ GSA FMR Part 102.340(b)

- **Prepare an agency-specific fleet management plan (FMP) and budget narrative:** *OMB Circular A-11* requires agencies to prepare an Annual Fleet Budget Summary (AFBS) that includes a fleet management plan (FMP) using data and a budget narrative submitted in FAST.¹⁶

2.1.2.5 Priority Strategies for Compliance with Requirements

The E.O. 13834 Implementing Instructions also establish priority strategies that agencies should identify and implement “as part of a comprehensive strategy to comply with statutory mandates while improving overall fleet efficiency, reducing costs, and meeting mission requirements”. These strategies, which are explained in more detail in Chapter 5 of this Handbook, include the following:

- **Right-sizing fleets and vehicles to mission:** Right-sizing is a critical element of good fleet management that helps agencies reduce fleet fuel use and operating costs. To right-size its fleet an agency must (1) compile its vehicle inventory and understand how its vehicles are used (e.g., mileage, purpose) and (2) analyze the fleets’ operational (or mission) needs, while identifying opportunities to reduce VMT. This reduction includes: (1) replacing vehicles with smaller, less costly, and more fuel-efficient ones, consistent with a continued ability to accomplish the fleet’s mission and (2) identifying vehicles without a demonstrated mission need and therefore candidates for reassignment or disposal.
- **Reducing vehicle miles traveled:** Taking actions that result in driving fewer miles can reduce petroleum use, lower vehicle operational and maintenance costs, extend vehicle life before replacement, and enable a reduction in the number of vehicles required to accomplish the fleet’s mission (as discussed above). Strategies to reduce VMT should be applied to all fleet vehicles, regardless of vehicle type (LDV, medium-duty vehicle [MDV], or heavy-duty vehicle [HDV]) or vehicle fuel type (AFV or conventional-fueled vehicle). Measures to reduce VMT include consolidating trips (e.g., carpooling), eliminating trips, using mass transportation, using agency shuttles, creating motor pools using GSA’s motor-pooling software, and improving scheduling and routing.
- **Replacing inefficient vehicles with more fuel-efficient vehicles (increase fleet fuel efficiency):** Fleet managers can reduce petroleum use by increasing the fuel economy of vehicles in their fleets. This includes replacing existing vehicles with higher fuel economy vehicles, hybrid electric vehicles (HEVs), battery electric vehicles (BEVs), and PHEVs, exchanging aging vehicles when they are eligible to be replaced, improving maintenance, and modifying driving behaviors, among other measures.
- **Aligning deployment of alternative fuel vehicles with fueling infrastructure and increasing alternative fuel use:** One effective strategy to reduce petroleum consumption (and increase alternative fuel use) is to displace petroleum use with alternative fuels, including electricity or biodiesel blends. Each gasoline gallon equivalent (GGE) of alternative fuel used in agency vehicles provides the equivalent (or higher for electricity) GGE reduction in petroleum use. As part of this strategy, fleet managers should maximize deployment of vehicles capable of using alternative fuel or biodiesel blends (AFVs and diesel vehicles) at those locations that have existing alternative fuel or biodiesel infrastructure or are candidates for new infrastructure.

¹⁶ Instructions for OMB-Circular A-11 Fleet Data Reporting in FAST available at <https://www.whitehouse.gov/wp-content/uploads/2018/06/motorvehicles.pdf>.

2.2 Federal Fleet Sustainability Responsibilities for Each Target Audience

Table 2 outlines general responsibilities related to the execution of Federal fleet sustainability requirements for each of the three target audiences introduced in Section 1.5: agency CSOs, agency headquarters fleet managers, and agency fleet location managers. Section 2.3 of this Handbook provides more detail on the responsibilities for each of the three target audiences in completing each annual Federal fleet reporting and management requirement.

Table 2. Federal Fleet Sustainability Responsibilities for Each Target Audience

Chief Sustainability Officer (CSO)	Agency Headquarters Fleet Manager	Agency Fleet Location Manager
<ul style="list-style-type: none"> • Ensure agency policies and programs reflect the Federal fleet requirements • Monitor and report (annually) conformance with the Federal fleet requirements • Prepare and submit the fleet component of the agency Sustainability Plan • Assemble the appropriate team and resources in the agency necessary to attain goals. 	<ul style="list-style-type: none"> • Facilitate the implementation of petroleum reduction strategies fleet-wide • Ensure the overall agency fleet is right-sized to the fleet’s mission • Provide support to fleet managers at each agency fleet location in selecting petroleum reduction strategies • Review and approve fleet location site-specific strategies • Consolidate individual site-specific strategies into an overall fleet petroleum reduction strategy • Regularly monitor the performance of the overall agency fleet in reducing petroleum consumption and identify corrective actions needed to improve • Ensure the overall agency fleet meets or exceeds all applicable fleet requirements, including agency-specific goals and requirements • Refine the strategy based on changes in fleet characteristics and performance. 	<ul style="list-style-type: none"> • Ensure each fleet is right-sized to that location’s mission • Determine the optimal petroleum reduction strategy for that location (based on evaluating the fleet characteristics and requirements at the site) • Implement the optimal petroleum reduction strategy at the fleet location • Monitor the performance of the fleet location in reducing petroleum consumption • Ensure the fleet location is complying with all applicable fleet requirements • Refine the strategy based on changes in fleet characteristics, performance, and location mission.

2.3 What You Need to Do to Meet Federal Fleet Sustainability Requirements

This section details what each target audience needs to do throughout the FY to meet Federal fleet statutory requirements efficiently and effectively, while meeting mission requirements, optimizing fleet performance, and reducing fleet costs. Table 3 and Figure 3 outline the annual Federal fleet planning, reporting, and management requirements in chronological order over the FY. The sections that follow provide details on each annual Federal fleet reporting and management requirement and the responsibilities for each target audience. Note that many of the annual reporting requirements use the annual inventory, cost, mileage, and fuel use data entered into FAST at the beginning of each FY.

Table 3. Annual Federal Fleet Planning, Reporting, and Management Requirements

Timeframe	Report	Statute or Executive Order	Requirement
Approximately October 1–December 15	FAST Year-End Reporting	<ul style="list-style-type: none"> EPAAct 1992 EPAAct 2005 E.O. 13834 EISA § 141 EISA § 142 EISA § 246 FAST Act 	<ul style="list-style-type: none"> Annual input of vehicle inventory, acquisition, cost, fuel use, and mileage data Annual input of EISA Section 246 alternative fuel infrastructure and Fixing America’s Surface Transportation Act (the “FAST Act” of 2015) electric vehicle supply equipment (EVSE) installation data Federal agencies identify vehicles for automatic waivers or apply for a waiver from the requirement to use alternative fuel in all agency dual-fueled vehicles
January	OMB Scorecards	E.O. 13834	Narrative explaining progress toward achieving agency goals and planned fleet sustainability actions
June 30	Fleet Component of the Agency Sustainability Plan	E.O. 13834	Plan for how the agency will achieve the E.O. 13834 fleet petroleum reduction targets
August	OMB A-11 Annual Fleet Budget Summary (AFBS)	Budget and Accounting Act	Budget estimates of current FY, as well as future fleet inventory and operating costs and FMPs

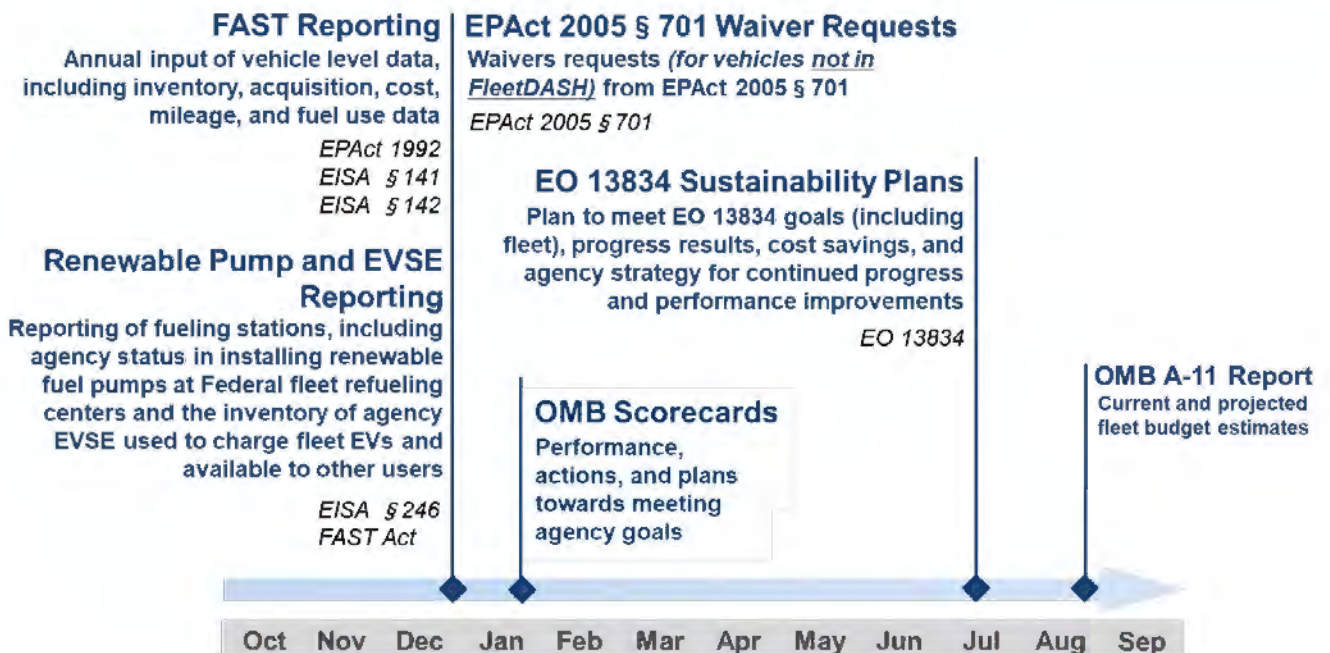


Figure 3. Annual Federal Fleet Planning, Reporting, and Management Requirements Timeline

2.3.1 October–December: Annual FAST Reporting

The FY begins with the annual input of vehicle inventory, acquisition, cost, mileage, and fuel use data for the previous FY in FAST from roughly October 1 through December 15. This allows agencies to calculate their previous FY compliance and performance for the following requirements: EISA Section 142 petroleum reduction and alternative fuel use increase; EPA 1992 AFV acquisitions; EPA 2005 alternative fuel use in dual-fueled vehicles; EISA Section 246 renewable fuel infrastructure reports; EVSE installation reports per the FAST Act¹⁷; EISA Section 141 low GHG-emitting vehicle acquisition, and progress in meeting E.O. 13834 progress metrics.

The collection, management, and analysis of comprehensive fleet data enables agencies to optimize fleet decision making in identifying the most promising fleet strategies to reduce petroleum consumption. Fleet managers can use fleet data to evaluate their performance in meeting fleet requirements and the effectiveness of petroleum reduction strategies at each fleet location. These analyses can help determine areas where the fleet has been successful as well as identifying the greatest opportunities to improve performance.

FAST reporting opens on or about October 1 each year and closes in mid-December of each year. Before the beginning of the data call, agencies should ensure that their reporting hierarchy has been established and updated as necessary, any new users should be added, and old users removed.

2.3.2 Asset-Level Data

Each agency must ensure its FMIS can support the collection and management of ALD, including importing data from vehicle telematics and exporting ALD to support government-wide reporting systems. To support ALD reporting, a vehicle-level data element reference, a vehicle-level data business rules reference, and the vehicle-level data XML schema (a structure for XML data submissions) are available for download from FAST.¹⁸ An agency's FMIS should be based at the department or agency headquarters level and include all motor vehicles within the department or agency. The system should also include reporting and accountability structures to accommodate subordinate regional and field offices.

As part of annual data reporting in FAST, agency headquarters managers upload data from the agency FMIS to FAST using a standardized file structure, which includes vehicle inventory, acquisition, disposal, cost,

Target Audience Responsibilities: Annual FAST Reporting

Agency CSOs are responsible for **stewardship and oversight** of fleet data collection and reporting each year in FAST. They are accountable for the timeliness and quality of data collection and reporting as well as the overall conformance with the federal fleet requirements.

Agency headquarter fleet managers are responsible for **completing the annual collection and reporting of fleet data in FAST**. This includes establishing a reporting structure (or reporting hierarchy) to delegate individual fleet data collection and reporting responsibilities to fleet location managers. The headquarters fleet manager is ultimately accountable for ensuring fleet data for all individual fleet locations are populated and managed in an agency FMIS, as well as reviewing data for completeness and accuracy, and correcting data as necessary in the system.

Agency fleet location managers are responsible for **providing the agency headquarters fleet manager complete and accurate data** throughout the year in support of the annual agency reporting requirements. They should focus on ensuring complete and accurate recordkeeping to support quality, accuracy, and completeness of fleet data.

¹⁷ Section 1413 of the FAST Act authorizes GSA and other Federal agencies to install battery recharging stations in their parking facilities for use by privately owned vehicles as long as Federal fleet vehicles' access is not impeded by their use. Further, GSA and Federal agencies may operate and maintain these stations by the collection of fees from its users to cover the costs related to the station. 42 U.S.C. § 6364(2). GSA must report to Congress on the installation of these stations. 42 U.S.C. § 6364(5).

¹⁸ Available at <https://fastweb.inl.gov/help/index.cfm/resources/vehicle-level-data>.

mileage, and fuel use information for each vehicle. All data fields are attributed to individual vehicles and fueling transactions for each of those vehicles. Each data field includes business rules to help identify potential errors, by either *blocking data that simply cannot be valid* or *flagging data that are outside of bounds that may be valid* for a typical Federal fleet vehicle.

Agency headquarters fleet managers, with assistance from fleet location managers, should review and correct (if necessary) data that fails FAST flagging rules in the agency FMIS and upload the corrected data set into FAST. Once the agency fleet manager is satisfied with the quality, accuracy, and completeness of fleet data uploaded into FAST, the agency fleet manager can certify the annual data reporting is complete.

Reporting ALD simplifies the annual reporting process by enabling uploads from fleet management systems directly to FAST without requiring manual data aggregation, reducing errors and drastically decreasing manual data entry. Compared to historical FAST reporting, ALD provides significantly more detailed data, allowing for improvements in fleet analysis, optimization, and management as well as compliance oversight. In the long term, this is designed to significantly reduce the reporting burden on agencies.

2.3.3 EPA Act 2005 Section 701 Waiver Requests

In compliance with Section 701 of EPA Act of 2005, Federal agencies can either (1) automate waivers and compliance for vehicles in FleetDASH or (2) request a waiver status through FAST that will determine the vehicle's status for the entire FY. Each vehicle must be reported in FAST with an attribute identifying how the agency believes the vehicle should be treated with respect to Section 701. FAST supports designations for the following: (1) FleetDASH; (2) Exempt; (3) No Waiver; and (4) Waiver Requested. See Section 3.9 for detailed guidance on the EPA Act 2005 Section 701 requirement.

2.3.4 Fueling Station Report

Each calendar year, during October-December end-of-year reporting, Federal agencies subject to EPA Act requirements must provide DOE with a list of all Federal fleet fueling centers within their jurisdiction that dispense alternative fuel or more than 100,000 gallons of gasoline or diesel annually. Each year, agencies must report agency fleet fueling stations that dispense any biodiesel, compressed natural gas (CNG), electricity, E85 (a blend of up to 85% ethanol and 15% gasoline), hydrogen, LNG, LPG, or renewable diesel and large agency fleet fueling stations that dispense more than 100,000 gallons of either gasoline or diesel annually. The report is used to determine compliance with EISA Section 246 (see Section 3.10) and help in the determination of whether alternative fuel is reasonably available for EPA Act Section 701 compliance (see Section 3.9).

Agencies are required to report information on EVSE for fleet use and employee workplace charging as part of the fueling station report. This information includes inventory, location, and costs of equipment and installation. Agencies should report on all Level 2 EVSE, all direct-current (DC) fast chargers, and any Level 1 receptacles installed primarily for charging EVs or existing Level 1 electrical outlets that have been designated for charging EVs by fleets, employees, or other authorized users. The reporting requirements vary slightly for Federal fleets and for employee workplace charging based on the requirements in Public Law No. 114-94, (the FAST Act); for employee workplace chargers, agencies must report costs of the hardware and installation, and the fee assessed to authorized users. More detailed guidance and an Excel reporting template can be found under "FAST System Help and Reference Resources."¹⁹

¹⁹ Available at <https://fastweb.inl.gov/help/index.cfm/resources/user-guides> and <https://fastweb.inl.gov/help/index.cfm/resources/import-templates>.

2.3.5 January: OMB Scorecards

OMB uses a scorecard system to track agencies' progress toward meeting their statutory mandates and E.O. 13834 requirements. Agencies are also responsible for documenting actions they intend to implement during the year to assist in meeting these mandates and requirements. OMB's goals for the scorecard system include:

- Monitoring compliance with existing statutes, requirements, and reports
- Updating agency progress biannually
- Focusing on progress and results
- Holding agencies accountable.

Progress scores are based on specific milestones that are established by CEQ and OMB. The primary E.O. 13834 performance metric is compliance with the EISA Section 142 requirement to reduce petroleum use. Other progress metrics include: (1) compliance with the EISA Section 142 requirement to increase annual alternative fuel use; (2) alternative fuel as a percentage of total subject fuel use; (3) compliance with the EPCA 1992 AFV acquisition requirement; and (4) annual progress on fleet-wide miles per GGE of petroleum fuels. OMB employs a simple stoplight grading system in the scorecards; the red, yellow, and green scores reflect how well the agencies did in meeting those milestones.²⁰

Target Audience Responsibilities: OMB Scorecards

Agency CSOs are responsible for completing the agency scorecard, including: (1) assessing the agency's compliance with federal fleet requirements; (2) determining areas where the agency's actions both succeeded and failed to meet goals; and (3) identifying actions that could improve fleet performance.

Agency headquarter fleet managers are responsible for providing the data necessary to complete the agency scorecard, help assess the effectiveness of actions agencies implement during the previous fiscal year, and identify new actions (i.e., petroleum reduction strategies) the agency should implement to improve performance for the current fiscal year. Headquarters fleet management should use fleet performance data to determine areas of weakness and opportunities for improvement.

Agency fleet location managers are responsible for evaluating the performance of petroleum reduction strategies at their fleet location and communicate best practices and opportunities to improve performance to agency fleet management.

²⁰ The scorecards and supporting data are posted publicly by CEQ at <https://www.sustainability.gov/>.

2.3.6 E.O. 13834 Sustainability Plans

Section 7(b) of E.O. 13834 requires that each agency develop, implement, and annually update Sustainability Plans. The E.O. 13834 Implementing Instructions specify that the Sustainability Plan includes how the agency will achieve the “goals of E.O. 13834, progress results, cost savings, and the agency’s strategies for continued progress and performance improvements”.

Sustainability Plans describe how the agency will implement fleet strategies to meet the petroleum reduction targets and to meet or exceed other relevant fleet requirements and progress metrics. Each agency must submit an updated Sustainability Plan annually to CEQ and OMB by June 30.

More information on agency Sustainability Plan requirements is provided by CEQ and by OMB (which annually approves agencies’ plans). CEQ issues instructions annually to agencies for completing the agency Sustainability Plan requirements.

Target Audience Responsibilities: E.O. 13834 Sustainability Plans
Agency CSOs are responsible for overseeing, submitting, and executing the annual fleet Sustainability Plan, including providing funding and operational support of the plan to meet the petroleum reduction targets and to meet or exceed other relevant fleet requirements and progress metrics.
Agency headquarter fleet managers are responsible for assessing agency performance and identifying actions (i.e., petroleum reduction strategies) to achieve fleet requirements and agency performance. This plan satisfies the annual fleet planning requirements to support fleet performance for the next fiscal year.
Agency fleet location managers should evaluate the effectiveness of petroleum reduction strategies at their fleet location and communicate best practices and opportunities for improving location-specific petroleum reduction strategies to the headquarters fleet manager.

2.3.7 August: OMB Circular A-11

All executive branch agencies are required to submit an AFBS using FAST that includes a budget narrative of current and projected fleet budget data and a FMP—describing the agency’s strategy to achieve their optimal fleet inventory and the progress toward achieving that inventory—by the end of August each year (please check the OMB website for the specific date). There is no minimum inventory or cost threshold, and there are no exclusions for any types, sources, or uses of vehicles. All vehicles owned or leased by the agency must be reported, including so-called “special purpose” vehicles and vehicles provided to contractors. Agencies should use the fleet budget narrative template provided by GSA for the OMB A-11 process, which is available in the FAST Budget Data tab.

Target Audience Responsibilities: OMB Circular A-11
Agency CSOs are responsible for overseeing completion of the OMB Circular A-11 report.
Agency headquarter fleet managers are responsible for submitting agency fleet budget data in FAST, projecting budget requirements to support changes in vehicle inventory, and coordinating with the agency’s budget office for fleet cost data and final approval prior to submission. Fleet managers are responsible for submitting FMP narratives along with the budget data.
Agency fleet location managers are responsible for estimating vehicle inventory changes at their fleet location and supporting budget data reporting associated with their fleet.

Although the submission of the fleet budget and inventory projections is not finalized until late August, the closing of the primary FAST data call in mid-December has very important ramifications for the preparation of the budget submission. Actual (previous FY) inventory and cost data are captured and frozen during the mid-December annual FAST reporting; they serve as the baseline for the OMB budget submission. Prior to the close of the FAST data call in mid-December, agencies **must** review the draft fleet budget and inventory

projections on FAST's Budget Data tab for your agency to ensure that the baseline inventory data, the baseline cost data, and the planned, projected, and forecast vehicle acquisition and disposal data are correct and complete.

2.4 Reducing Your Reporting Workload

Each agency and fleet is encouraged to evaluate its own internal systems and processes to identify opportunities to minimize the workload associated with compliance reporting. Opportunities could include reducing the number of people involved in the reporting process to a reasonable extent based on factors such as organizational structure, responsibility, authority, and access to the data involved in reporting.

Agencies are encouraged to take advantage of their FMIS to electronically transfer data between that system and FAST. FAST supports data imports for most major input sections via Microsoft Excel. FAST also supports a comprehensive data import via XML. Both of these import capabilities have tremendous potential to eliminate manual data entry, reducing time and effort involved in reporting as well as eliminating data entry errors in retyping data into FAST. The XML import, as a unified data source, has the greater potential to minimize the reporting effort based on its relatively complete coverage of the fall data call in a single import file. Agencies are encouraged to work with their FMIS vendors/support organizations to facilitate this automation; agencies may also contact the FAST management team for preliminary guidance as they evaluate such automation.

Agency input on efforts by FEMP and the FAST management team is vital, and FEMP encourages feedback on the reporting process at any time. FEMP will regularly update the agencies on the progress of FAST system enhancements through the Interagency Committee on Alternative Fuels and Low Emission Vehicles (INTERFUEL) working group and periodic emails and newsletters.

3 Federal Fleet Requirements

3.1 Overview of Fleet Requirements

Federal fleets must reduce petroleum consumption while meeting mission-critical needs and complying with all Federal goals and mandates. Congress and the White House have established Federal fleet requirements, including the following key directives. E.O. 13834 is addressed separately in Chapter 2.

- **E.O. 13834**, Efficient Federal Operations
- **EPAAct of 1992**, as amended
- **EPAAct 2005 Section 701**
- **EISA 2007 Sections 141, 142, and 246**
- **GSA's FMR Part 102-34-Motor Vehicle Management**

Table 4 below provides a summary of the key Federal fleet requirements, with the section of this chapter where fleet managers can find detailed explanations to assist them in meeting each requirement.

Table 4. Summary of Federal Fleet Requirements Detailed in this Chapter

Requirement	Statute/E.O.	Description	Section
E.O. 13834 Fleet Management	E.O. 13834	Meet statutory requirements while increasing efficiency, optimizing performance, and reducing waste and costs	3.3
Fuel Use			
Petroleum Reduction	EISA Sec. 142	20% reduction in annual petroleum use relative to FY 2005 baseline	3.4
Alternative Fuel Use Increase	EISA Sec. 142	10% increase in annual alternative fuel use relative to FY 2005 baseline	3.5
Vehicle Acquisition			
AFV Acquisition	EPAAct 1992	At least 75% of LDVs acquired in MSAs/CMSAs must be AFVs	3.6
Acquisition of Low GHG-Emitting Vehicles	EISA Sec. 141	Prohibits agencies from acquiring vehicles that are not low GHG-emitting vehicles	3.7
VAM (Right-Size)	41 C.F.R. § 102-34.50	Establish a structured VAM to determine the appropriate size and number of motor vehicles	3.8
Alternative Fuel Use			
Alternative Fuel Use in Dual-Fueled AFVs	EPAAct 2005 Sec. 701	All dual-fueled vehicles must use alternative fuel if reasonably available (i.e., unless waived)	3.9
Alternative Fuel Infrastructure	EISA Sec. 246	Every Federal fleet fueling center must install a renewable fuel pump	3.10
Planning and Reporting			
Fleet Planning	EISA Sec. 142	Develop a plan to meet required petroleum reduction levels and alternative fuel consumption increases	3.11
Federal Management Information System (FMIS)	41 C.F.R. § 102-34.340	Agencies are required to use an FMIS to identify, collect, and analyze vehicle data and capture costs	3.12

3.2 Determining Applicability of Federal Fleet Requirements

The remaining sections of this chapter are intended to assist agencies with understanding how to meet each of the Federal fleet requirements, including implementation, reporting, and compliance monitoring. This section provides more detail in determining which agencies, fleets, and vehicles are subject to each of the Federal fleet requirements.

For each Federal fleet requirement, there may be slight differences in the definition of Federal agencies and vehicles that agencies may exempt from the requirement. A summary of the different applicability definitions for each Federal fleet requirement are summarized in Table 5 and below.

Table 5. Applicability by Federal Fleet Requirement

Federal Fleet Requirement	Subject Agency Definition	Exempt Vehicle/Fuel Definition
E.O. 13834	E.O. 13834	EPAct
EISA Section 142 Petroleum Reduction	EPAct	EPAct
EISA Section 142 Alternative Fuel Use	EPAct	EPAct
EPAct 1992 AFV Acquisition	EPAct	EPAct
EISA Section 141 Acquisition of Low GHG-Emitting Vehicles	EISA § 141	EISA § 141
GSA FMR VAM	41 CFR §102-34.15	41 CFR §102-34.20
EPAct 2005 Section 701 Alternative Fuel Use in Dual-Fueled AFVs	EPAct	EPAct
EISA Section 246 Alternative Fuel Infrastructure	EPAct	EISA § 246
EISA Section 142 Fleet Planning	EPAct	EPAct
GSA FMR Federal Management Information System	41 CFR §102-34.15	41 CFR §102-34.20

3.2.1 What is a Federal Agency?

Three different definitions of agencies apply to Federal fleet requirements: E.O. 13834, EPAct 1992 (and related requirements), and EISA Section 141 definitions.

3.2.1.1 What Federal Agencies are Subject to E.O. 13834?

What is a Federal agency under E.O. 13834?

The E.O. 13834 Implementing Instructions define an “agency” as an executive agency as defined in 5 U.S.C. Section 105²¹ (excluding the Government Accountability Office). The E.O. 13834 Implementing Instructions further clarify which agencies are principal and contributing agencies as follows:

“Principal agencies include agencies subject to the Chief Financial Officers Act (Pub. L. No. 101-576) and the OMB scorecard process referenced in Section 5(b) of E.O. 13834... Additionally, the U.S. Postal Service is subject to many of the statutory requirements covered by E.O. 13834. It receives an OMB scorecard, and functions like a principal agency.”

“All other executive agencies, including Federal Boards, Commissions, and Committees, are considered contributing agencies. These agencies generally have smaller operational

²¹ 5 U.S.C. § 105 defines an executive agency as “an Executive department, a Government corporation, and an independent establishment.”

footprints and may not manage facilities or vehicle fleets, and therefore have lesser reporting requirements than principal agencies.”

Appendix B lists the agencies with fleets subject to E.O. 13834 as of FY 2019.

3.2.1.2 What Federal Agencies are Subject to EAct 1992 and Related Requirements?

What is a Federal agency under EAct 1992 and related requirements?

The EAct 1992 fleet provisions in 42 U.S.C. § 13212 (which are extended to the EAct 2005 fleet requirements in 42 U.S.C. § 6374, the EISA Section 142 provision in 42 U.S.C. § 6374E and the EISA 246 provision in 42 U.S.C. § 17053), apply to any Federal executive department, military department, Government corporation, independent establishment, executive agency, the United States Postal Service (USPS), the Congress, the courts of the United States, or the Executive Office of the President with a qualifying fleet.

How does an agency determine if it is subject to the EAct 1992 and related requirements?

Agencies are **subject to the EAct requirements** if the agency owns, operates, leases, or otherwise **controls at least one fleet** that:

- Includes **20 or more LDVs within the United States** that are **not exempt vehicles** (exempt vehicles are discussed in section 3.2.3)
- Is located in an MSA or CMSA, as established by the Bureau of the Census, with a 1980 population of more than 250,000
- Is centrally fueled or capable of being centrally fueled.

The EAct 1992 AFV acquisition, EAct 2005 alternative fuel use in dual-fueled AFVs, EISA Section 142 and EISA Section 246 Federal fleet requirements do not apply if:

- A Federal agency does not own, operate, lease, or otherwise control a fleet of 20 or more LDVs (excluding exempt vehicles) that is located in a 1980 MSA or CMSA and is centrally fueled or capable of being centrally fueled
- The fleet is not owned, operated, leased, or otherwise controlled by an agency as defined above.

A full listing of agencies with at least one EAct-covered fleet can be found in Appendix C. As of FY 2019, the list of EAct-covered agencies and agencies with fleets subject to E.O. 13834 are similar, with the exception of the National Archives and Record Administration, which is subject to E.O. 13834 but not covered under EAct 1992 and related requirements.

3.2.1.3 What Federal Agencies are Subject to EISA Section 141?

What is a Federal agency under EISA Section 141?

EISA Section 141 includes a distinct definition of Federal agency.²² EPA’s *Guidance for Implementing Section 141 of the Energy Independence and Security Act of 2007* explains that “Section 141 applies to all [F]ederal agencies, except for offices of the legislative branch, but includes the U.S. House of Representatives when vehicles are acquired using a Member’s Representational Allowance. Federal agencies include offices of the judicial branch and executive branch including executive departments, independent establishments and government corporations”.²³

3.2.2 What Vehicles May be Exempted?

With the exception of EISA Section 141 requirements, all Federal vehicles—and the fuel use and mileage associated with them—are covered unless *agencies decide to exempt* them for the reasons shown in Table 6. Exemption decisions must be consistent from year to year in order to ensure proper government accounting and compliance with Federal fleet statutes. This includes LDVs, MDVs, and HDVs, regardless of whether they are leased through GSA, agency-owned, or commercially leased. The AFV acquisition requirements in EPA’s 1992 Section 303 apply to Federal fleets as detailed in Section 3.6.2 as opposed to entire Federal agencies.

Table 6. Vehicles That May Be Exempted from Federal Fleet Requirements (Other than EISA Section 141)

Law enforcement vehicles (see Section 3.2.2.1 for further guidance)
Emergency response vehicles
Military tactical vehicles —Motor vehicles (excluding general-purpose motor vehicles) designed to military specification, or a commercially designed motor vehicle modified to military specification to provide direct transportation support of combat or tactical operations and protection of nuclear weapons. These vehicles are inherently mission critical and are used for no other purpose.
Nonroad vehicles —Vehicles that are not licensed for use on all roads and highways
Motor vehicles used for motor vehicle manufacturer product evaluations or tests
Vehicles owned and operated by the Central Intelligence Agency
Federally owned vehicles operated solely by Indian nations or state-run Fish and Wildlife services, as applicable
Vehicles operated outside of the United States

EISA Section 141 applies to all LDVs and MDPVs that are acquired by a Federal agency and manufactured for sale in the United States. However, agencies may claim functional needs exemptions or comply through alternative measures, which are discussed in Section 3.7 of this Handbook. The exemptions in Table 6 do not apply to the EISA Section 141 requirements.

Specific contractor vehicles, listed in Table 7, are not considered part of the agency fleet, and therefore not subject to Federal fleet requirements (including EISA Section 141).

²² 42 U.S.C. § 13212(f)(1)(A) states that a Federal agency “does not include any office of the legislative branch, except that it does include the House of Representatives with respect to an acquisition” if an LDV or MDV is purchased using Member’s Representational Allowance.

²³ United States Environmental Protection Agency, *Guidance for Implementing Section 141 of the Energy Independence and Security Act of 2007: Federal Vehicle Fleets and Low Greenhouse Gas-Emitting Vehicles*, Sept. 19, 2019, 2, available at <https://nepis.epa.gov/Exec/ZyPDF.cgi?Dockey=P100XI43.pdf>.

Table 7. Contractor Vehicles Exempt from Federal Fleet Requirements

Contractor-owned vehicles where the contract is less than 12 months, including options and renewals

Contractor vehicles where a central purpose of the contract is neither for providing vehicles nor for providing transportation services of people or materials on site (e.g., shuttle bus services are not exempt from Federal fleet requirements). Examples of exempt contractor vehicles include vehicles used by electricians, plumbers, and computer repair technicians.

However, agencies must ensure that all government-owned, contractor-operated (GOCO) vehicles comply with the requirements. Each agency shall ensure contracts entered into for contractor operation of government-owned facilities or vehicles require the contractor to comply with the AFV acquisition requirements with respect to such facilities or vehicles to the same extent as the agency would be required to comply if the agency operated the facilities or vehicles. See GSA’s FMR § 102-34.215 for additional details.

3.2.2.1 Policy for Exempting Law Enforcement Vehicles

Agencies should not automatically exempt any vehicle from requirements solely because it is used by law enforcement (LE) personnel, employs special equipment, or is an emergency vehicle. However, they must apply their decisions consistently from year to year. GSA FMR Bulletin B-33 provides policy to help Federal fleet managers determine whether LE and emergency vehicles should be exempt from Federal fleet requirements.

Agencies are strongly encouraged to classify the appropriate tier (i.e., LE 1, LE 2, and LE 3) for each LE vehicle and determine whether or not to exempt each from Federal fleet requirements. Agencies should classify their LE vehicles by one of the following three groupings (see GSA FMR Bulletin B-33, Motor Vehicle Management), and are strongly encouraged not to exempt LE 3 vehicles from Federal fleet requirements to expand the number of vehicles within the agency fleet for which it improves overall sustainability:

- **LE 1.** Vehicles “configured for apprehensions, arrests, LE, police activities, or dignitary protection; and assigned to pursuit, protection, or off-road duties. An LE 1 vehicle must be equipped with heavy-duty components to handle the stress of extreme maneuvers and have the horsepower required to achieve the speeds necessary to perform these functions.”
- **LE 2.** Vehicles “configured to perform intelligence, investigations, security, and surveillance activities. An LE 2 vehicle may be unmarked or marked. An LE 2 vehicle is not expected to perform pursuit or protection operations either on- or off-road and does not require the heavy-duty components found on an LE 1 vehicle.”
- **LE 3.** “Standard vehicles of any make or model that may be used for associated LE operations, including administrative functions such as courier, mail delivery, employee shuttle, or other functions not performed by LE 1- and LE 2-tiered vehicles. An LE 3 vehicle is not expected to perform pursuit or protection operations either on- or off-road.”

See GSA FMR Bulletin B-33.

3.3 E.O. 13834

E.O. 13834 defines the following policy priorities:

“[A]gencies shall meet such statutory requirements in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment. In implementing this policy, each agency shall prioritize actions that reduce waste, cut costs, enhance the resilience of Federal infrastructure and operations, and enable more effective accomplishment of its mission.”

3.3.1 Overview of Requirements

E.O. 13834 establishes performance goals based on the **implementation of statutory requirements related to energy and environmental performance** with respect to facilities, vehicles, and overall operation. The E.O. 13834 Implementing Instructions further define specific progress metrics, requirements, and priority strategies for Federal fleets. The fleet section of the Implementing Instructions is included as Appendix D.

Federal fleets must comply with all Federal fleet management statutes—detailed in Sections 3.4 through 3.12 of this Handbook. Meeting or exceeding the EISA Section 142 petroleum reduction goal is the priority for Federal fleets. Additionally, the E.O. 13834 Implementing Instructions state that:

“[A]s part of a comprehensive strategy to comply with statutory mandates while improving overall fleet efficiency, reducing costs, and meeting mission requirements, agencies should identify and implement strategies to:

- Right-size the fleets and vehicles to mission;
- Reduce vehicle miles traveled;
- Replace inefficient vehicles with more fuel-efficient vehicles [increase fleet fuel efficiency]; and,
- Align deployment of alternative fuel vehicles with fueling infrastructure [and increase alternative fuel use].”

In accordance with Section 7(b) of E.O. 13834, the E.O. 13834 Implementing Instructions require that each agency develop, implement, and annually update Sustainability Plans that include descriptions of how the agency will achieve the “goals of E.O. 13834, progress results, cost savings, and the agency’s strategies for continued progress and performance improvements.” Sustainability Plans describe how the agency will implement fleet strategies to meet the petroleum reduction targets and to meet or exceed other relevant fleet requirements and progress metrics. More information on agency Sustainability Plan requirements is provided by CEQ and OMB (which annually approves agencies’ plans).²⁴

3.3.2 Applicability

Sections 3.2.1.1 and 3.2.2 of this Handbook provide details on how to determine which agencies and vehicles are subject to the E.O. 13834 requirements.

3.3.3 Assessing Agency Progress and Performance in Achieving E.O. 13834 Goals

The E.O. 13834 Implementing Instructions establish **petroleum reduction as the priority for Federal fleets**. The other energy and environmental statutory requirements support this overarching goal. Petroleum reduction is a familiar goal to Federal fleet managers, as are the strategies to achieve petroleum reduction: right-sizing

²⁴ The Executive Order and Implementing Instructions can be found at <https://www.fedcenter.gov/programs/eo13834/>. The fleet section is excerpted in Appendix D of this document.

fleets and vehicles to mission, reducing VMT, increasing the fleet’s fuel economy, and using alternative fuels in place of petroleum.

As shown in Table 8, the primary performance measure in the E.O. 13834 Implementing Instructions is compliance with the EISA Section 142 petroleum reduction requirement. This primary performance measure is achieved by:

- Reducing annual petroleum consumption by 20% from the agency’s FY 2005 baseline annual use
- Reducing petroleum consumption from the previous FY; agencies are encouraged to establish goals in their Sustainability Plans for petroleum reduction equal to or greater than 1% from the prior year.

The E.O. 13834 Implementing Instructions also include other data points to be tracked to inform effective fleet management. These other progress metrics include:

- Compliance with the EISA Section 142 requirement to increase annual alternative fuel use
- Alternative fuel as a percentage of total subject fuel use
- Compliance with the EPA 1992 AFV acquisition requirement
- Annual progress on fleet-wide mpgge of petroleum fuels.

The E.O. 13834 Implementing Instructions define the fleet-wide mpgge of petroleum fuels as a metric to measure agency fleet efficiency. This metric is effective at evaluating “progress and compliance with key fleet management drivers, including petroleum reduction, alternative fuel use, acquisitions of AFVs and low GHG-emitting vehicles, installation of alternative fuel infrastructure, and effective implementation of Federal motor vehicle management policies contained in the Federal Management Regulation.”

Table 8. Executive Order 13834 Progress Metrics

Metric	Description	Relevant Statutory Requirement	Metric Calculation Section(s)
Primary Performance Measure			
Petroleum Reduction	<ul style="list-style-type: none"> • 20% reduction in annual petroleum use relative to FY 2005 baseline • Demonstrate annual progress each FY 	EISA Section 142	3.4
Other Progress Metrics			
Alternative Fuel Use	<ul style="list-style-type: none"> • 10% increase in annual alternative fuel use relative to FY 2005 baseline • Alternative fuel use greater than 5% of total subject fuel use 	EISA Section 142	3.3.3, 3.5
AFV Acquisition	<ul style="list-style-type: none"> • Compliance with requirement that the number of AFVs acquired each year represent at least 75% of LDV acquisitions by covered Federal fleets located in MSAs and CMSAs 	EPA 1992	3.6
Fleet-wide MPGGE of Petroleum	<ul style="list-style-type: none"> • Fleet efficiency metric that measures annual progress toward meeting transportation mission (vehicle miles) per GGE of covered petroleum use 	N/A	3.3.3

Sections 3.3.3, 3.4, 3.5, and 3.6 of this Handbook discuss how to calculate the petroleum reduction, alternative fuel use, AFV acquisition, and fleet-wide mpgge of petroleum use progress metrics, including what actions fleet managers can take to improve performance.

3.3.3.1 Calculating Performance with the EISA Section 142 Petroleum Reduction Requirement

Guidance for reporting and measuring compliance with the EISA Section 142 petroleum reduction requirement is discussed in Section 3.4 of this Handbook. In addition to a 20% petroleum reduction from the FY 2005 baseline, agencies must also demonstrate that they reduced annual petroleum consumption from the previous year. Agencies should specify the amount of petroleum they plan on reducing in the Sustainability Plan that they submit to CEQ and OMB.

3.3.3.2 Calculating Performance with the EISA Section 142 Alternative Fuel Use Requirement

Guidance for reporting and measuring compliance with the EISA Section 142 alternative fuel use requirement is discussed in Section 3.5 of this Handbook.

3.3.3.3 Calculating Percentage Alternative Fuel Use of Total Subject Fuel Use

The calculation of the percentage alternative fuel use out of total subject fuel use is as follows: the total alternative fuel use by an agency's domestic fleet in the FY divided by the sum of total FY petroleum use by subject vehicles in the domestic fleet and total alternative fuel use in the FY by all domestic fleet vehicles.

$$\text{Percentage Alternative Fuel Use of Total Subject Fuel Use} = \frac{\text{Total Alternative Fuel Use}}{\text{Total Subject Petroleum Use} + \text{Total Alternative Fuel Use}}$$

The methodology to calculate fleet subject petroleum use, including the types of fuels counted in the calculations, is detailed in Section 3.4 of this Handbook. The methodology to calculate fleet alternative fuel use, including the fuels classified as alternative fuels and counted in the calculations, is discussed in Section 3.5 of this Handbook.

3.3.3.4 Calculating Performance with the EPA Act 1992 AFV Acquisition Requirement

Guidance for reporting and measuring compliance with the EPA Act 1992 AFV acquisition requirement is discussed in Section 3.6 of this Handbook.

3.3.3.5 Calculating Fleet-Wide MPGGE of Petroleum Fuel Use

The calculation of fleet-wide mpgge of petroleum fuel use is as follows: the total FY miles driven by all subject vehicles in an agency's fleet divided by the total FY volume (in GGE) of petroleum fuel used in those vehicles.

$$\text{Fleet-wide MPGGE of Petroleum Fuel Use} = \frac{\text{Total Mileage for Subject Vehicles (Miles)}}{\text{Total Subject Petroleum Use (GGE)}}$$

The methodology to calculate fleet-wide mpgge of petroleum fuel use is summarized in Table 9.

Table 9. Steps to Calculate Fleet-Wide MPGGE of Petroleum Fuel Use

Step	Action	Recommendations
1	Calculate the annual volume (in GGE) of subject petroleum fuel consumed by type	<ul style="list-style-type: none"> • Use FY volumes of petroleum fuel in GGE by each fuel type reported in FAST (do not include alternative fuels) • Exclude fuel use by vehicles exempt from the E.O. 13834 requirement (e.g., LE, emergency vehicle, and foreign fuel use)
2	Calculate total subject mileage	<ul style="list-style-type: none"> • Use FY mileage by each vehicle type reported in FAST • Include mileage in low-speed electric vehicles (LSEVs) • Exclude vehicles exempt from the E.O. 13834 requirement (e.g., exclude LE, emergency vehicle, and foreign fuel use)
3	Calculate fleet-wide mpgge of petroleum fuel use	<ul style="list-style-type: none"> • Divide the total subject mileage calculated in step 2 by the total subject petroleum fuel use calculated in step 1

What Types of Fuels are Included in the Calculation of Subject Petroleum Fuel Use?

Fuel that is counted in calculating subject petroleum fuel use includes:

- **Gasoline** fuel consumption in subject vehicles in the United States
- **Diesel** fuel consumption in subject vehicles in the United States
- **Diesel component of biodiesel blends** (20% or greater) used in subject vehicles in the United States.

Fuel that is **not counted** in calculating subject petroleum fuel use includes:

- **Petroleum** (gasoline, diesel, and the diesel component of biodiesel blends) **used in exempt vehicles** or outside the United States
- **Alternative fuels** (see section 3.5.3.1) used in both subject and exempt vehicles
- **Biodiesel component of biodiesel blends** (20% or greater) used in both subject and exempt vehicles

3.3.4 Reporting

Each Federal agency is responsible for collecting and reporting data on its vehicle fleet. GSA's FMR § 102-34.340 requires that each Federal agency collect and organize ALD in an FMIS. Agencies must submit relevant ALD from the FMIS into the three primary Federal fleet data management systems: FAST, the FMVRS, and FleetDASH. FAST is a web-based reporting tool that collects Federal fleet data necessary to determine compliance with sustainability requirements. FMVRS contains vehicle inventory and license plate information for vehicles that the Federal government owns, commercially leases, or leases from GSA Fleet. FleetDASH is a tool that helps agencies monitor fuel use, identifying both successes and opportunities to use alternative fuel.

In accordance with Section 7(b) of E.O. 13834, the E.O. 13834 Implementing Instructions requires that each agency develop, implement, and annually update Sustainability Plans that include how the agency will achieve the "goals of E.O. 13834, progress results, cost savings, and the agency's strategies for continued progress and performance improvements." Sustainability Plans describe how the agency will implement fleet strategies to meet the petroleum reduction targets and meet or exceed other relevant fleet requirements and progress

metrics. More information on agency Sustainability Plans requirements is provided by CEQ and by OMB (which annually approves agencies' plans).

To track compliance with the Federal fleet sustainability requirements and the E.O. 13834 progress metrics, Federal agencies are required to collect accurate acquisition, inventory, cost, fuel consumption and mileage data from their fleets and report the information in FAST (progress metrics will be calculated in FAST). Agencies must input annual vehicle data into FAST each year; the reporting period begins on roughly October 1 and closes in mid-December.

Agencies are required to collect and manage annual ALD (per-vehicle data rather than aggregated fleet data) in a formal agency fleet management system, and submit relevant data managed in that system to FAST. Agencies must upload vehicle ALD from their fleet management system to FAST using a standardized file structure, which includes vehicle inventory, acquisition, cost, mileage and fuel use information for each vehicle. Agencies should ensure the required asset-level information in their fleet management system is finalized and reported to FAST well in advance of the mid-December deadline. Timely reporting will allow agency headquarters personnel ample opportunity to review the data for completeness and accuracy prior to final submission.

Agencies are also required to submit a Sustainability Plan to CEQ and OMB by June 30 of each FY. The report should describe progress in meeting the goals of E.O. 13834 and related statutory requirements. Agencies should include annual progress milestones, such as the percentage and overall amount of covered petroleum that they intend to reduce in the coming year. They should also describe whether they met their petroleum reduction goals in the prior year.

3.4 EISA Section 142 Petroleum Reduction

Section 142 of EISA (42 U.S.C. § 6374e(a)(2)), emphasis added:

“[N]ot later than October 1, 2015, and for each year thereafter, each Federal agency shall achieve **at least a 20 percent reduction in annual petroleum consumption** and a 10 percent increase in annual alternative fuel consumption, as calculated from the baseline established by the Secretary for fiscal year 2005.”

3.4.1 Overview of Requirements

Section 142 of EISA (42 U.S.C. § 6374e(a)(2)) requires Federal fleets to reduce their annual petroleum consumption by at least 20% compared to a FY 2005 baseline by FY 2015 and for each year thereafter.

3.4.2 Applicability

The applicability of Section 142 of EISA is the same as EAct 1992. Sections 3.2.1.2 and 3.2.2 of this Handbook provide details on how to determine which agencies and vehicles are subject to the EAct 1992 requirements.

3.4.3 EISA Section 142 Petroleum Reduction Requirements

3.4.3.1 Calculating Subject Petroleum Use

What types of fuels are included in the calculation of subject petroleum fuel use?

Fuel that is **counted** in calculating subject petroleum fuel use includes:

- **Gasoline** fuel consumption in subject vehicles in the United States
- **Diesel** fuel consumption in subject vehicles in the United States
- **Diesel component of biodiesel blends** (20% or greater) used in subject vehicles in the United States.

Fuel that is **not counted** in calculating subject petroleum fuel use includes:

- **Petroleum** (gasoline, diesel, and the diesel component of biodiesel blends) **used in exempt vehicles** or outside the United States
- **Alternative fuels** (see Section 3.5.3) used in both subject and exempt vehicles
- **Biodiesel component of biodiesel blends** (20% or greater) used in both subject and exempt vehicles.

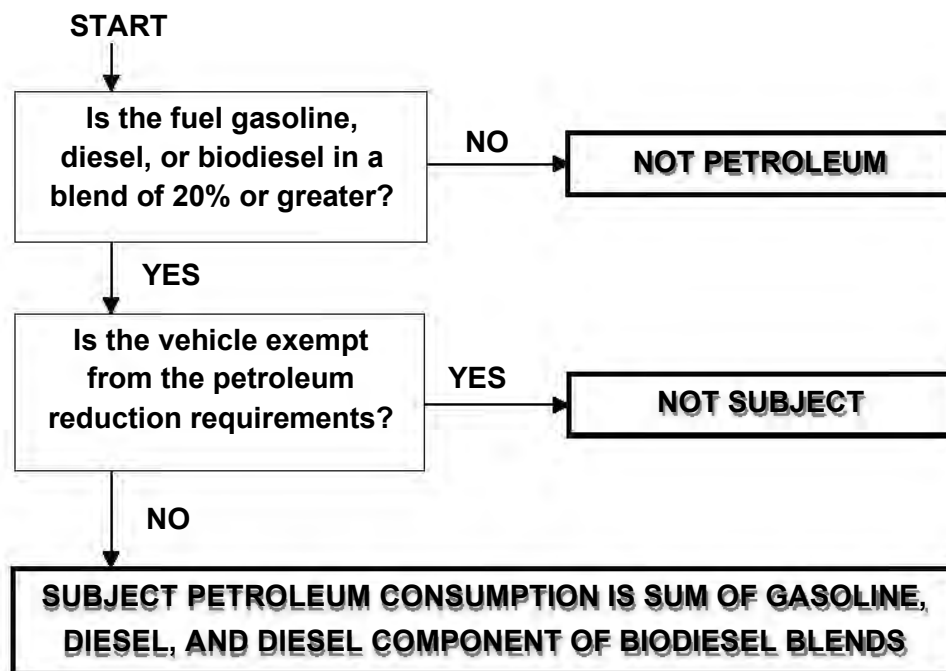


Figure 4. Determining Fuel Counted Towards Subject Petroleum Use

How do you calculate the subject diesel component of biodiesel blends?

Start with the volume of biodiesel blends used in subject vehicles. Multiply this volume by the percentage of the biodiesel blend that is diesel. For example, B20 is a blend of 80% diesel and 20% biodiesel. If a subject vehicle uses 100 gallons of B20, 80 gallons count toward subject diesel fuel consumption. The remaining 20 gallons count toward pure biodiesel consumption, an alternative fuel.

How is subject petroleum use measured?

Petroleum use is measured in GGEs, which translate the energy content of fuel into units representing the energy content of one gallon of gasoline. Table 10 presents the fuel conversion ratio table to convert subject petroleum “natural” units to GGEs.

Table 10. Subject Petroleum Conversion Ratio Table

Fuel Type	Natural Units	Conversion to GGE
B20	gallons	1.121 GGE/gallon of B20
Diesel	gallons	1.147 GGE/gallon of diesel
Gasoline	gallons	No conversion needed

3.4.3.2 Determining the FY 2005 Subject Petroleum Baseline

An agency’s FY 2005 petroleum baseline is simply the total petroleum used in all subject vehicles in an agency’s fleet as reported in FAST for FY 2005. This excludes fuel use by exempt vehicles as described in Section 3.2.2 (e.g., LE and emergency vehicles). Note that some agencies have requested and been granted changes to their baselines by FEMP. These baseline revisions were granted based on documentation submitted by agencies supporting inaccuracies with FY 2005 subject petroleum consumption figures in FAST. Each agency should review its FY 2005 subject petroleum consumption figures currently in FAST for accuracy and, if this number is found to be incorrect, work with FEMP to determine its appropriate baseline.

3.4.3.3 Determining Section 142 Subject Petroleum Reduction Compliance

To determine the subject petroleum use each year, agencies must sum together all types of petroleum fuel consumed by their subject fleet, including diesel used in blends of B20 or higher. The agency will then compare this to the subject petroleum fuel use requirement for that year to determine compliance.

Each Federal agency (subject to the petroleum reduction requirements) is in compliance if it reduces its annual subject petroleum use by at least 20% compared to a FY 2005 baseline by FY 2015 and for each year thereafter.

3.4.3.4 Example: Agency with FY 2005 Baseline of 1 Million GGE

Table 11 and Figure 5 show an example of an agency’s target subject petroleum reduction requirements relative to its FY 2005 baseline in compliance with petroleum reduction requirements of EISA Section 142.

**Table 11. Calculation of Example Subject Petroleum Reduction Requirements
Based on an FY 2005 Petroleum Baseline of 1 Million GGE**

Fiscal Year	FY 2005 Petroleum Baseline (GGE)	Annual Subject Petroleum Fuel Use Reduction Requirement (Percentage of FY 2005 Baseline)	Required Reduction in Subject Petroleum from FY 2005 Baseline (GGE)	Maximum Subject Petroleum Use (GGE)
2005 (Baseline)	1,000,000	Not Applicable (Baseline)	–	–
2015	1,000,000	20%	200,000	800,000
2016 and Onward	1,000,000	20%	200,000	800,000

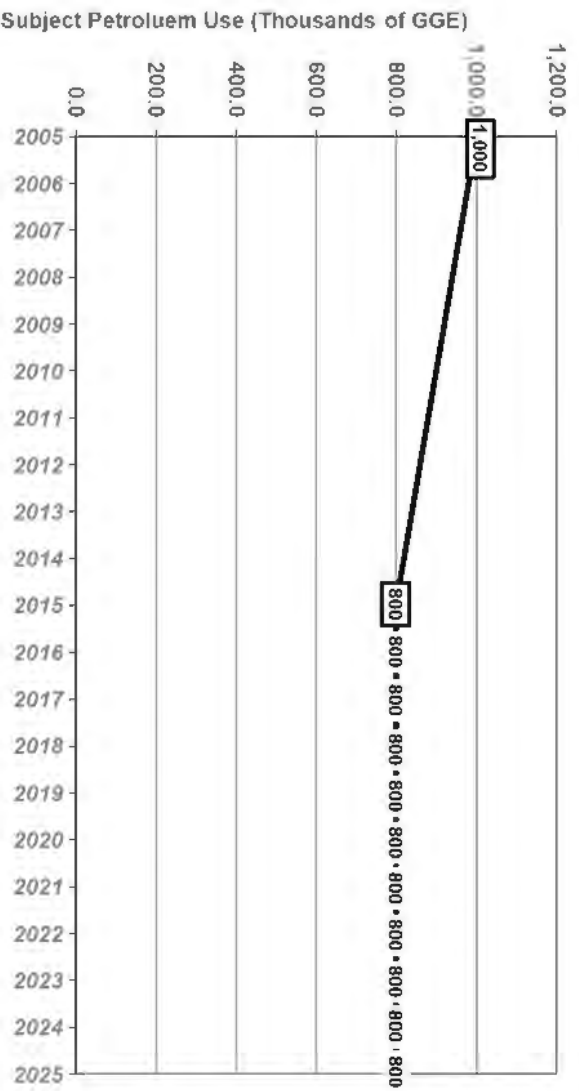


Figure 5. Example Subject Petroleum Use Requirements Based on a FY 2005 Petroleum Baseline of 1 Million GGE

However, to comply with E.O. 13834 Implementing Instructions requirements, agencies must continue to reduce petroleum consumption annually from the previous year. Agencies should specify the percentage and amount of petroleum they plan to reduce in the coming year and the percentage and amount of petroleum that they reduce in the prior year in the Sustainability Plan that they submit to CEQ and OMB.

3.4.4 Reporting

To track compliance with the EISA Section 142 petroleum reduction requirements, Federal agencies are required to collect and report accurate annual vehicle fuel use data in FAST. These data will be used in FAST to automatically calculate annual compliance with the EISA Section 142 subject petroleum reduction requirements. Fleets must input annual vehicle data into FAST each year; the reporting period begins on roughly October 1 and closes in mid-December.

Agencies are required to collect and manage annual ALD (per vehicle rather than aggregated fleet data) in a formal agency fleet management system, and submit relevant data managed in that system to FAST. Agencies must upload vehicle ALD from their fleet management system to FAST using a standardized file structure, which includes vehicle inventory, acquisition, cost, mileage, and fuel use information for each vehicle.

Agencies should ensure the required asset-level information in their fleet management system is finalized and reported to FAST well in advance of the mid-December deadline. Timely reporting will allow agency headquarters personnel ample opportunity to review the data for completeness and accuracy prior to final submission.

3.5 EISA Section 142 Alternative Fuel Consumption

Section 142 of EISA (42 U.S.C. § 6374e(a)(2)), emphasis added:

“[N]ot later than October 1, 2015, and for each year thereafter, each Federal agency shall achieve at least a 20 percent reduction in annual petroleum consumption and a **10 percent increase in annual alternative fuel consumption**, as calculated from the baseline established by the Secretary for fiscal year 2005.”

3.5.1 Overview of Requirements

Section 142 of EISA (42 U.S.C. § 6374e(a)(2)) requires Federal fleets to increase their annual alternative fuel use by at least 10% compared to a FY 2005 baseline by FY 2015 and for each year thereafter.

3.5.2 Applicability

The applicability of Section 142 of EISA is the same as EAct 1992. Sections 3.2.1.2 and 3.2.2 of this Handbook provide details on how to determine which agencies and vehicles are subject to the EAct 1992 requirements.

3.5.3 EISA Section 142 Alternative Fuel Use Requirements

3.5.3.1 Calculating Alternative Fuel Use

What fuels are classified as alternative fuels?

Alternative fuels are defined by Section 301 of EAct 1992 (42 U.S.C. 13211(2)); the Secretary of Energy may expand this definition to include other fuels by rule. As of the date of this guidance document, the following fuels are defined or designated as alternative fuels:

- Methanol, denatured ethanol, and other alcohols
- Mixtures of 85% or more of methanol (M85), denatured ethanol (E85), and other alcohols with gasoline or other fuels
- Natural gas and liquid fuels domestically produced from natural gas (e.g., CNG and LNG)
- Liquefied petroleum gas (i.e., LPG or propane)
- Coal-derived liquid fuels
- Electricity (including electricity from solar energy)
- Biodiesel (B100)
- Fuels (other than alcohol) derived from biological materials
- Hydrogen
- P-Series fuels²⁵

²⁵ Clear liquid fuels with octane ratings between 89 and 93, designed for use in flexible fuel vehicles and containing 35% natural gas liquids, 45% ethanol, and 25% biomass-derived fuel. See 64 FR 26822 (May 17, 1999).

What types of fuels are included in the calculation of alternative fuel use?

Fuel that is **counted** in calculating alternative fuel use includes:

- **All alternative fuels used in all vehicles** in the United States, including vehicles considered exempt under the alternative fuel use requirements
- **Biodiesel component of biodiesel blends** greater than 20% used in all vehicles in the United States, including vehicles considered exempt
- **All electricity used in EVs and LSEVs** in the United States.

Fuel that is **not counted** in calculating subject petroleum fuel use includes:

- **Petroleum** (gasoline, diesel, and the diesel component of biodiesel blends) **used in any vehicle.**
- Alternative fuels used in **vehicles outside the United States.**

How do you count electricity used in electric vehicles towards alternative fuel use?

All electricity used to charge EVs (from the grid, including electricity generated at the Federal site) will be counted toward agencies’ alternative fuel use requirements. Currently, all electricity consumed in BEVs and PHEVs counts toward an agency’s alternative fuel consumption. Agencies may also count all electricity consumed in an agency’s LSEVs toward meeting its alternative fuel use increase requirements.

It is important to note that electricity generated in an HEV or PHEV by the internal combustion engine or regenerative braking system, which recharges the vehicle’s battery, is not counted toward agency alternative fuel use requirements, although it does support petroleum reduction goals by improving vehicle efficiency.

How do you measure and report electric vehicle energy consumption?

To receive alternative fuel use credit for the electricity used to charge BEVs, LSEVs, and PHEVs, agencies will have to report EV electricity consumption in FAST. Reporting electricity use by EVs may be a challenge for fleet managers. Since electricity used to charge EVs is frequently reported as electricity consumed by a facility, electricity consumption for EVs should be metered separately from facility consumption. This can be done at dedicated EV charging stations through a separate utility meter or “smart” EVSE unit. If EV charging infrastructure does not exist at a particular facility, electricity consumption may be monitored on the vehicle itself and then reported in FAST. Other methodologies may also be appropriate for calculating EV electricity use if no other options exist, such as estimating electricity consumption using the vehicle fuel economy rating and electric miles traveled.

$$\text{Electricity consumption (kWh)} = \frac{\text{Fuel economy (kWh/mile)}}{\text{Electric miles traveled (miles)}}$$

Federal agencies are responsible for the accurate measurement and reporting of electricity used in BEVs, LSEVs, and PHEVs.

How are biodiesel blends counted towards alternative fuel use?

Under the Section 301 EPA Act 1992 definition of alternative fuels, biodiesel blends are not considered an alternative fuel. However, for biodiesel blends equal to or **greater than 20%**, agencies may count the pure biodiesel component of the blend toward agency alternative fuel use requirements.

How do you calculate the pure biodiesel component of biodiesel blends?

Start with the volume of biodiesel blends used in subject vehicles. Multiply this volume by the percentage of the biodiesel blend that is biodiesel. For example, B20 is a blend of 20% biodiesel and 80% diesel. If a vehicle uses 100 gallons of B20, 20 gallons count as pure biodiesel consumption toward agency alternative fuel use requirements.

How is alternative fuel use measured?

Alternative fuel use is measured in GGEs, which translate the energy content of fuel into units representing the energy content of one gallon of gasoline. Table 12 presents the fuel conversion ratio table to convert alternative fuel “natural” units to GGEs.

Table 12. Alternative Fuel Use Conversion Ratio Table

Fuel Type	Natural Units	Conversion to GGE
B20	gallons	1.121 GGE/gallon of B20
B100	gallons	1.015 GGE/gallon of B100
CNG	gallons at 2,400 psi	0.18 GGE/gallon of CNG at 2,400 psi
	gallons at 3,000 psi	0.225 GGE/gallon of CNG at 3,000 psi
	gallons at 3,600 psi	0.27 GGE/gallon of CNG at 3,600 psi
	hundred cubic feet	0.83 GGE/ft ³ of CNG
E85	gallons	0.72 GGE/gallon of E85
Electricity	kWh	0.03 GGE/kWh of electricity
Hydrogen	kg	1.0 GGE/kg of hydrogen
LNG	gallons @ 14.7 psi and -234°F	0.66 GGE/gallon of LNG
LPG	gallons	0.74 GGE/gallon of LPG
R100	gallons	1.015 GGE/gallon of R100

3.5.3.2 Determining the FY 2005 Alternative Fuel Use Baseline

For most agencies, the FY 2005 alternative fuel baseline is simply the sum of total alternative fuel and the biodiesel component of biodiesel blends (20% and greater) used in all domestic vehicles in an agency’s fleet as reported in FAST for FY 2005.

Federal agencies with extremely low alternative fuel use in FY 2005 (less than 5% of the agency’s total fuel consumption) **must use a minimum alternative fuel baseline**. The minimum baseline is the lesser of (1) 5% of total subject fuel (petroleum and alternative fuel) consumption or (2) the greater of 500,000 GGE or the amount of alternative fuel consumed in FY 2005.

The FY 2005 alternative fuel baseline for agencies with FY 2005 alternative fuel usage greater than the minimum baseline will be the FY 2005 level (see Table 13 and Figure 6). This approach is being taken to encourage those Federal agencies that have not been aggressive in substituting alternative fuel for petroleum to begin doing so, and to bring these agencies up to levels similar to other subject Federal agencies.

Table 13. Methodology for Establishing the FY 2005 Alternative Fuel Baseline

- The alternative fuel baseline will be the actual FY 2005 alternative fuel consumption if it exceeds the minimum alternative fuel baseline.
- If not, the minimum alternative fuel baseline will be the baseline.
- The minimum alternative fuel baseline is the lesser of:
 - 5% of total subject fuel use (subject petroleum and alternative fuel usage)
 - 500,000 GGE or the FY 2005 alternative fuel usage (whichever is greater)

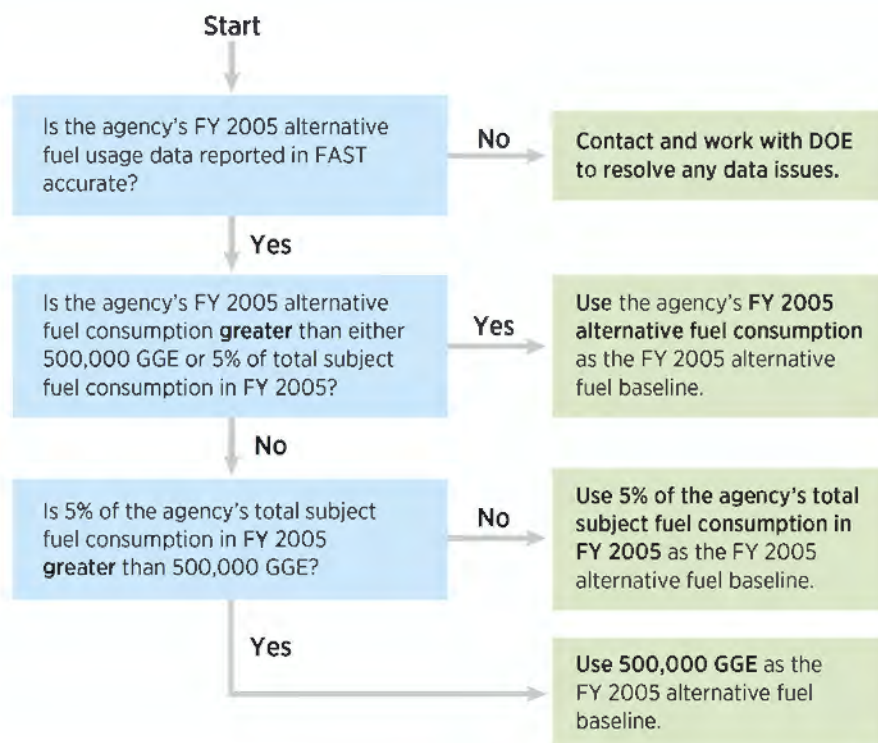


Figure 6. Determining the FY 2005 Alternative Fuel Baseline for an Agency

Table 14 presents some example alternative fuel baseline calculations to assist agencies in determining their FY 2005 alternative fuel baseline.

Table 14. Example Alternative Fuel Baseline Calculations (GGEs)

Total Subject Fuel Use	5% of Total Subject Fuel Use	Minimum GGE Level (Lesser of 5% or 500,000 GGE)	Actual FY 2005 Alternative Fuel Consumption	Resulting FY 2005 Alternative Fuel Baseline	Method of Resulting
18,000,000	900,000	500,000	800,000	800,000	FY 2005 alternative fuel consumption
16,250,000	812,500	500,000	400,000	500,000	Minimum GGE level
18,000,000	900,000	500,000	4,500,000	4,500,000	FY 2005 alternative fuel consumption
5,000,000	250,000	250,000	100,000	250,000	5% of total subject fuel consumption
5,000,000	250,000	250,000	400,000	400,000	FY 2005 alternative fuel consumption

Note that some agencies have requested and been granted changes to their baselines by FEMP. These baseline revisions were granted based on documentation submitted by agencies supporting inaccuracies with FY 2005 subject petroleum consumption figures in FAST. Each agency should review its FY 2005 alternative fuel consumption figures currently in FAST for accuracy and, if this number is found to be incorrect, work with FEMP to determine its appropriate baseline.

3.5.3.3 Determining Section 142 Alternative Fuel Use Compliance

To determine the alternative fuel consumption each year, agencies must sum together all types of alternative fuel consumed by their subject fleet, including biodiesel used in blends of B20 or higher. The agency will then compare this to the alternative fuel consumption requirement for that year to determine compliance.

Each Federal agency (subject to the alternative fuel use increase requirements) complies if it increases its annual alternative fuel use by at least 10% compared to a FY 2005 baseline by FY 2015 and for each year thereafter.

3.5.3.4 Example: Agency with FY 2005 Baseline of 100,000 GGE

Table 15 and Figure 7 show an example of an agency's target alternative fuel use increase requirements relative to its FY 2005 baseline.

Table 15. Calculation of Example Alternative Fuel Use Increase Requirements Based on a FY 2005 Alternative Fuel Baseline of 100,000 GGE

Fiscal Year	FY 2005 Alternative Fuel Baseline (GGE)	Annual Alternative Fuel Use Increase Requirement (Percentage of FY 2005 Baseline)	Required Increase in Alternative Fuel Use from FY 2005 Baseline (GGE)	Minimum Alternative Fuel Use (GGE)
2005 (Baseline)	100,000	Not Applicable (Baseline)	–	–
2015	100,000	10%	10,000	110,000
2016 and onwards	100,000	10%	10,000	110,000

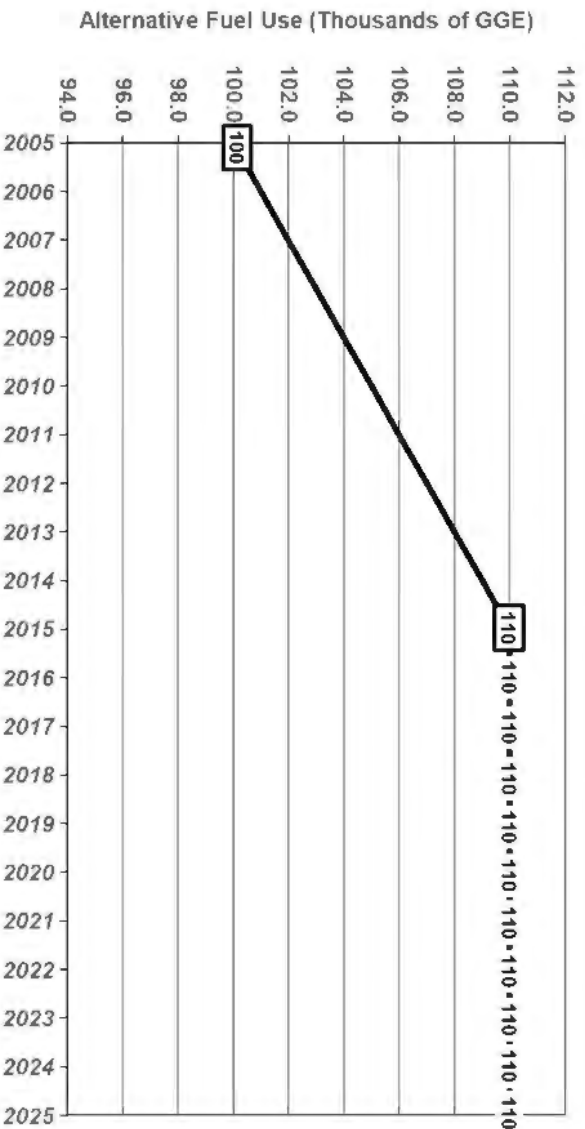


Figure 7. Example Alternative Fuel Use Increase Requirements Based on a FY 2005 Alternative Fuel Baseline of 100,000 GGE

3.5.4 Reporting

To track compliance with the EISA Section 142 alternative fuel use increase requirements, Federal agencies are required to collect and report accurate annual vehicle fuel use data in FAST. These data will be used in FAST to automatically calculate annual compliance with the EISA Section 142 alternative fuel use increase requirements. Fleets must input annual vehicle data into FAST each year; the reporting period begins on roughly October 1 and closes in mid-December 15.

Agencies are required to collect and manage annual ALD (per vehicle rather than aggregated fleet data) in a formal agency fleet management system, and submit relevant data managed in that system to FAST. Agencies must upload vehicle ALD from their fleet management system to FAST using a standardized file structure, which includes vehicle inventory, acquisition, cost, mileage and fuel use information for each vehicle. Agencies should ensure the required asset-level information in their fleet management system is finalized and

reported to FAST well in advance of the mid-December deadline. Timely reporting will allow agency headquarters personnel ample opportunity to review the data for completeness and accuracy prior to final submission.

3.6 EAct 1992 Alternative Fuel Vehicle Acquisition

Section 303 of EAct 1992 (42 U.S.C. 13212(b)), emphasis added:

“(b) Percentage Requirements

(1) Of the total number of vehicles acquired by a Federal fleet, at least—

- (A) 25 percent in fiscal year 1996;
- (B) 33 percent in fiscal year 1997;
- (C) 50 percent in fiscal year 1998; and
- (D) **75 percent in fiscal year 1999 and thereafter,**

shall be alternative fueled vehicles.”

(2) The Secretary, in consultation with the Administrator of General Services where appropriate, may permit a Federal fleet to acquire a smaller percentage than is required in paragraph (1), so long as the aggregate percentage acquired by all Federal fleets is at least equal to the required percentage.

(3) For purposes of this subsection, the term “Federal fleet” means 20 or more light duty motor vehicles, located in a metropolitan statistical area or consolidated metropolitan statistical area, as established by the Bureau of the Census, with a 1980 population of more than 250,000, that are centrally fueled or capable of being centrally fueled and are owned, operated, leased, or otherwise controlled by or assigned to any Federal executive department, military department, Government corporation, independent establishment, or executive agency, the United States Postal Service, the Congress, the courts of the United States, or the Executive Office of the President. Such term does not include—

- (A) motor vehicles held for lease or rental to the general public;
- (B) motor vehicles used for motor vehicle manufacturer product evaluations or tests;
- (C) law enforcement vehicles;
- (D) emergency vehicles;
- (E) motor vehicles acquired and used for military purposes that the Secretary of Defense has certified to the Secretary must be exempt for national security reasons; or
- (F) nonroad vehicles, including farm and construction vehicles.”

3.6.1 Overview of Requirements

Section 303 of EAct 1992 requires that at least 75% of covered LDV acquisitions by Federal agencies be AFVs. These requirements apply to agency fleets of 20 or more LDVs that are centrally fueled and operated in an MSA/CMSA.

Federal law, established under the Alternative Motor Fuels Act of 1988 as amended by EPAct 1992, requires Federal agencies to acquire AFVs, including dedicated vehicles and dual-fueled vehicles, to the maximum extent practicable, in accordance with the following provisions:

- **Agencies should consider as a factor AFVs that yield the greatest reduction in pollutants emitted per dollar spent and operate on alternative fuels derived from domestic sources.**²⁶
- **Federal agencies should not consider initial cost a factor** in determining the practicality of an AFV acquisition unless it “exceeds the initial cost of a comparable gasoline or diesel fueled vehicle by at least 5 percent.”²⁷
- **AFVs should be acquired from original equipment manufacturers (OEMs).** If a type of AFV is not available from an OEM, agencies may acquire vehicles converted to use alternative fuels, as long as the OEM warranty continues to apply.²⁸
- **“At least 50 percent of the alternative fuels used in AFVs shall be derived from domestic feedstocks,** except to the extent inconsistent with the multilateral trade agreements.”²⁹
- **AFVs acquired by Federal agencies shall be manufactured in the United States or Canada,** except to the extent inconsistent with the multilateral trade agreements.³⁰ Full guidance on the nation-of-origin requirement is included as Appendix A.

3.6.2 Applicability

What is a Federal agency under the EPAct 1992 AFV acquisition requirements?

Section 3.2.1.2 of this Handbook provides details on how to determine which agencies are subject to the EPAct 1992 requirements.

What vehicles are covered by the EPAct 1992 AFV acquisition requirements?

The AFV acquisition requirements only apply to **LDVs acquired each year** by an agency (whether GSA-leased, agency-owned, or independently leased) **that are not exempt vehicles** (exempt vehicles are discussed in Section 3.2.2 of this Handbook) **and operated in covered fleet locations** (agency fleets of 20 or more LDVs that are centrally fueled or capable of being centrally fueled and are primarily operated in an MSA/CMSA).

In determining the number of vehicles within a fleet, FEMP considers all covered LDVs operated within a specific MSA to be part of the same fleet. For example, a single agency owns less than 20 covered LDVs at each of several sites within DC, in northern Virginia, and in southern Maryland. If the sum of covered LDVs owned by the agency in the 1980 “Washington, DC-MD-VA MSA” is more than 20, then they comprise a covered fleet under EPAct 1992. FEMP uses the vehicle’s reported location to determine whether it is garaged in an MSA and whether there are 20 or more covered LDVs within a particular MSA.

Additionally, agencies must ensure that all GOCO vehicles and facilities comply with the AFV acquisition requirements. Each agency shall ensure contracts entered into for contractor operation of government-owned facilities or vehicles require the contractor to comply with the AFV acquisition requirements with respect to such facilities or vehicles to the same extent as the agency would be required to comply if the agency operated

²⁶ See Pub. L. No. 102-486, § 302 (Oct. 24, 1992) (codified at 42 U.S.C. § 6374(a)(3)(D)).

²⁷ See Pub. L. No. 100-494, § 4(a) (Oct. 14, 1988) (codified at 42 U.S.C. § 6374(a)(2)).

²⁸ See Pub. L. No. 102-486, § 302 (Oct. 24, 1992) (codified at 42 U.S.C. § 6374(a)(3)(B)).

²⁹ See Pub. L. No. 102-486, § 302 (Oct. 24, 1992) (codified at 42 U.S.C. § 6374(a)(3)(F)) as amended by Pub. L. No. 106-36 § 1102(h) (June 25, 1999).

³⁰ See Pub. L. No. 102-486, § 302 (Oct. 24, 1992) (codified at 42 U.S.C. § 6374(a)(3)(G)) as amended by Pub. L. No. 106-36 § 1102(h) (June 25, 1999).

the facilities or vehicles. Specific contractor vehicles, discussed in 3.2.2.1 of this Handbook, are not considered part of the agency fleet, and therefore not subject to Federal fleet requirements.

3.6.3 Agency Alternative Fuel Vehicle Acquisition Requirements

Each FY, the number of AFVs (or AFV credits) that each agency (i.e., those agencies subject to the EPAct 1992 AFV requirements) acquires must represent at least 75% of new non-exempt LDV acquisitions in covered fleet locations during that FY.

3.6.4 Measuring Compliance with EPAct 1992 Alternative Fuel Vehicle Acquisition Requirements

Compliance with the EPAct 1992 AFV acquisition requirements is measured based on AFV acquisition credits, which are earned based on the acquisition of any non-exempt light-, medium-, or heavy-duty AFV or quantity of biodiesel used by the agency during that FY. Agencies must accumulate 75 credits per 100 covered vehicles acquired within each FY to comply. Covered vehicle acquisitions include the total annual acquisition of LDVs deployed and operated in covered fleet locations (i.e., agency fleets of 20 or more LDVs that are centrally fueled or capable of being centrally fueled and are primarily operated in an MSA/CMSA) that the agency has not exempted from the E.O. (e.g., LE or emergency response vehicles).

FAST Vehicle Classifications

Light-duty vehicles (LDVs) include both passenger cars and light-duty trucks at or under 8,500 lbs GVWR.

Medium-duty vehicles (MDVs) include all vehicles between 8,501 lbs and 16,000 lbs GVWR.

Heavy-duty vehicles (HDVs) include all vehicles over 16,000 lbs GVWR.

3.6.4.1 Vehicles Defined as Alternative Fuel Vehicles Under EPAct 1992

EPAct 1992 defined AFVs as any dedicated vehicle or dual-fueled vehicle designed to run on at least one alternative fuel. Section 2862 of the National Defense Authorization Act for FY 2008 (NDAA 2008) amended EPAct 1992 by adding the following new vehicles to the definition of AFV (as that definition applied to Federal fleets):

- A new qualified fuel cell motor vehicle
- A new advanced lean burn technology motor vehicle
- A new qualified hybrid motor vehicle
- Any other type of vehicle that the Administrator of the EPA demonstrates to the Secretary of Energy would achieve a significant reduction in petroleum consumption.

In accordance with Section 2862 of NDAA 2008, EPA demonstrated to DOE in December 2008 that operating a low GHG-emitting vehicle, as defined in EPA's EISA Section 141 guidance document,³¹ would achieve a significant reduction in petroleum consumption similar to or greater than the other newly defined AFVs that are commercially available (i.e., advanced lean burn and hybrid vehicles), and a significant reduction in petroleum consumption compared to existing flexible fuel vehicles (FFVs) operating on gasoline.

Based on the demonstration EPA made to DOE and the objectives of EPAct 1992, **any low GHG-emitting vehicle acquired in a location that would qualify for an EPAct 2005 Section 701 fuel waiver based on garage location is included in the expanded definition of an AFV and can count toward an agency's EPAct 1992 AFV acquisition credits.** Each agency head, or his or her designee(s), determines if the agency's FFVs at that location would qualify for a fuel waiver based on the criteria established by DOE. Unless an

³¹ Available at <https://www.epa.gov/regulations-emissions-vehicles-and-engines/federal-fleets-using-low-greenhouse-gas-emitting-vehicles>.

exception to EISA Section 141 is utilized (as described in Section 3.7 of this Handbook), all FFVs acquired must be low GHG-emitting vehicles.

Table 16 lists the current vehicles defined as AFVs in the Federal fleet that can earn EAct 1992 AFV acquisition credits. Agencies do not receive AFV acquisition credits for vehicles exempt from the EAct 1992 AFV acquisition requirements (discussed in Section 3.2.2 of this Handbook), such as LE and emergency vehicles.

Table 16. Vehicles Currently Defined as Alternative Fuel Vehicles in the Federal Fleet

Vehicle Type
E85 FFVs
CNG vehicles
LNG vehicles
LPG or propane vehicles
BEVs
PHEVs
HEVs
Hydrogen fuel cell electric vehicles (FCEVs)
Lean burn technology vehicles
Low GHG-emitting vehicles (only in locations that would qualify for a fuel waiver based on garage location under EAct 2005 Section 701—see Section 3.7)
Other vehicles achieving significant reduction in petroleum consumption

3.6.4.2 Calculating Compliance

Figure 8 below outlines the process for determining compliance with the EAct AFV acquisition requirements. The requirement for AFV acquisition credits that agencies must accumulate each FY is based on the number of covered vehicles acquired during that FY. To comply, agencies must accumulate 75 credits per 100 covered vehicles acquired within each FY. The sections below detail the calculation of agency covered vehicle acquisitions and agency AFV acquisition credits.

Calculating agency covered vehicle acquisitions

Calculating the number of covered vehicle acquisitions starts with summing all agency domestic LDV acquisitions during the FY. Agencies then subtract all non-covered acquisitions, which include vehicles that are: (1) deployed and operated in agency fleets of less than 20 LDVs; (2) not primarily operated in an MSA/CMSA based on garage location or vehicle operation, or are not centrally fueled or capable of being centrally fueled; (3) considered exempt from the EAct 1992 AFV acquisition requirements (exempt vehicles are discussed in Section 3.2.2 of this Handbook). The calculation is automatically completed for each agency in FAST.

Calculating agency AFV acquisition credits

Agencies accumulate AFV acquisition credits based on the acquisition of AFVs or quantity of biodiesel used by the agency during that FY. **Agencies receive one acquisition credit for each non-exempt AFV they**

acquire each FY, which includes all domestic light-, medium-, or heavy-duty AFVs (listed in Table 16). Agencies do not receive AFV acquisition credits for vehicles exempt from the EPAct 1992 AFV acquisition requirements (discussed in Section 3.2.2 of this Handbook), such as LE and emergency vehicles.

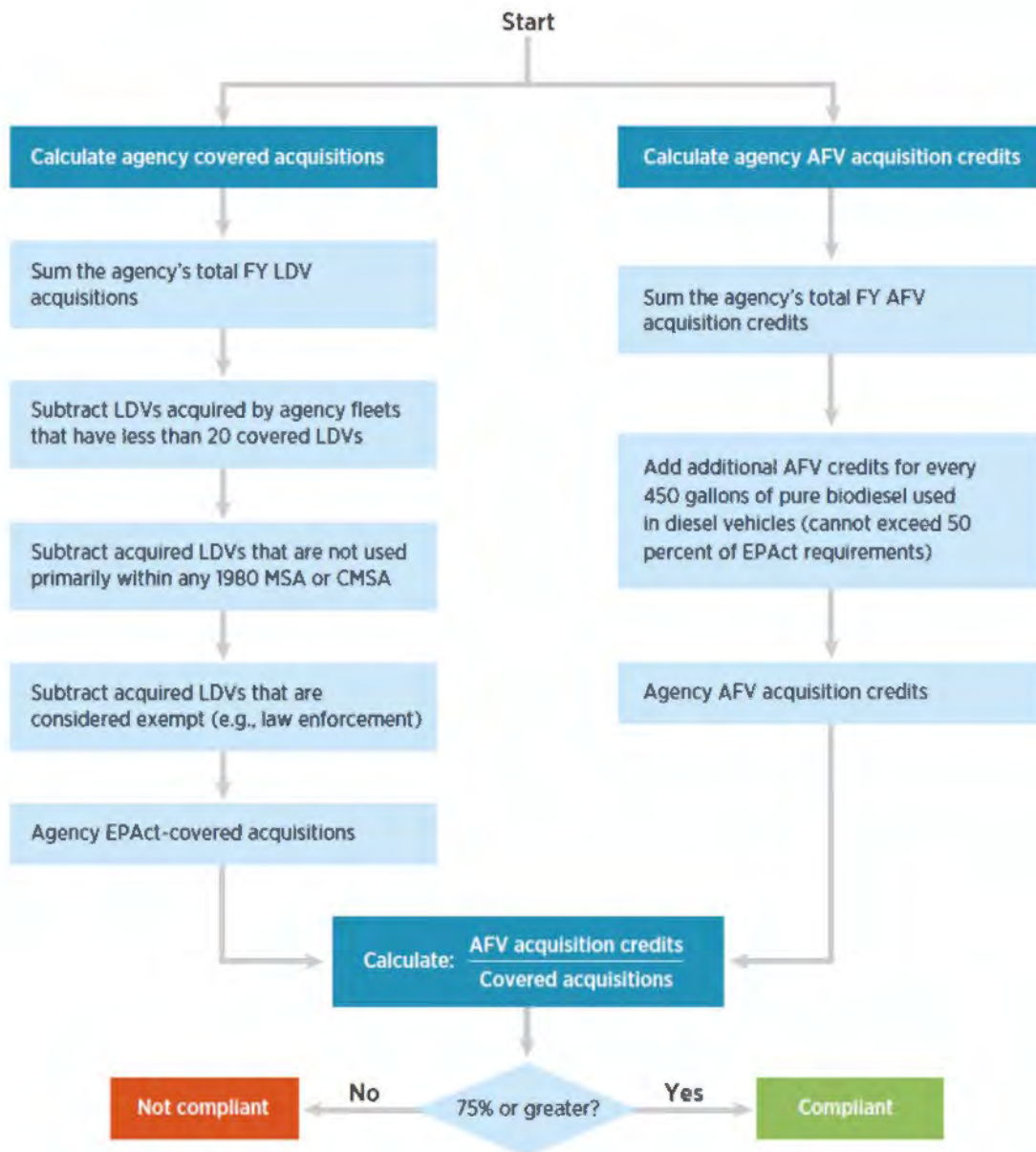


Figure 8. Determining Compliance with EPAct 1992 Alternative Fuel Vehicle Acquisition Requirements

Federal agencies do not receive EPAct 1992 AFV acquisition credits for LSEVs because they do not meet the definition of “motor vehicle” in 42 U.S.C. § 7550.

The Energy Conservation Reauthorization Act of 1998 (ECRA)³² amended EPAct 1992 by **allocating one acquisition credit to Federal agencies for every 450 gallons of pure biodiesel or renewable diesel**

³² Pub. L. No. 105-388, §7 (Nov. 13, 1998) (codified at 42 U.S.C. §13220).

(equivalent to 2,250 gallons of B20 or R20) used in fleet vehicles. The biodiesel and renewable diesel counted only includes the biodiesel or renewable diesel component of blends greater than 20% used in non-exempt vehicles in the United States. **Biodiesel fuel use credits may account for no more than 50% of a fleet's annual AFV acquisition requirements** (i.e., 37.5% of covered acquisitions).

Calculating agency EAct AFV acquisition compliance

Compliance with the EAct 1992 AFV acquisition requirement is determined using total AFV credits as a percentage of covered acquisitions, calculated by dividing the total number of AFV acquisition credits accumulated by the number of covered acquisitions by the agency during the FY. **Agencies are in compliance if the number of AFV acquisition credits divided by covered acquisitions is 75% or greater.** In other words, agencies must accumulate 75 AFV acquisition credits per 100 covered vehicles acquired within each FY to comply.

FAST includes EAct AFV acquisition compliance reports under the “Reports” tab for authorized users. Note that FAST rounds AFV acquisition compliance to the nearest whole percentage. More detail about how FAST calculates EAct AFV acquisition compliance is available in the FAST General Frequently Asked Questions page.³³

3.6.5 Reporting

To track compliance with the EAct 1992 AFV acquisition requirements, Federal agencies are required to collect and report accurate annual vehicle acquisition and inventory data in FAST. This data will be used in FAST to automatically calculate annual compliance with the EAct 1992 AFV acquisition requirements. Fleets must input annual vehicle acquisition and inventory data into FAST each year; the reporting period begins on roughly October 1 and closes in mid-December.

Agencies are required to collect and manage annual ALD (per vehicle rather than aggregated fleet data) in a formal agency fleet management system, and submit relevant data managed in that system to FAST. Agencies must upload vehicle ALD from their fleet management system to FAST using a standardized file structure, which includes vehicle inventory, acquisition, cost, mileage and fuel use information for each vehicle. Agencies should ensure the required asset-level information in their fleet management system is finalized and reported to FAST well in advance of the mid-December deadline. Timely reporting will allow agency headquarters personnel ample opportunity to review the data for completeness and accuracy prior to final submission.

3.7 EISA Section 141 Acquisition of Low Greenhouse Gas-Emitting Vehicles

Section 141 of EISA (42 U.S.C. § 13212(f)(2)), emphasis added:

“(A) In general

Except as provided in subparagraph (B), no Federal agency shall acquire a light duty motor vehicle or medium duty passenger vehicle that is not a low greenhouse gas emitting vehicle.

(B) Exception

The prohibition in subparagraph (A) shall not apply to acquisition of a vehicle if the head of the agency certifies in writing, in a separate certification for each individual vehicle purchased, either—

³³ Available at <https://fastweb.inl.gov/help/index.cfm/faqs/general-faqa>.

(i) that no low greenhouse gas emitting vehicle is available to meet the functional needs of the agency and details in writing the functional needs that could not be met with a low greenhouse gas emitting vehicle; or

(ii) that the agency has taken specific alternative more cost-effective measures to reduce petroleum consumption that—

(I) have reduced a measured and verified quantity of greenhouse gas emissions equal to or greater than the quantity of greenhouse gas reductions that would have been achieved through acquisition of a low greenhouse gas emitting vehicle over the lifetime of the vehicle; or

(II) will reduce each year a measured and verified quantity of greenhouse gas emissions equal to or greater than the quantity of greenhouse gas reductions that would have been achieved each year through acquisition of a low greenhouse gas emitting vehicle.”

3.7.1 Overview of Requirements

Section 141 of EISA (42 U.S.C. § 13212(f)(2)) prohibits, with certain exceptions, Federal agencies from acquiring LDVs and MDPVs that are not low GHG-emitting vehicles. To assist Federal agencies in the purchase of low GHG-emitting vehicles, EISA Section 141 directs the EPA Administrator to define what a low GHG-emitting vehicle is and to identify annually the makes and models of such vehicles. EPA lists vehicles that comply with EISA Section 141 low GHG emission requirements, along with Federal agency EISA Section 141 compliance levels and statutory guidance.³⁴

3.7.2 Applicability

Section 3.2.1.1 of this Handbook provides details on how to determine which agencies are subject to the EISA Section 141 requirements.

Vehicles subject to the EISA Section 141 low GHG-emitting vehicle acquisition requirements include **all LDVs and MDPVs** within an agency’s fleet (including GSA or agency owned or leased vehicles) that are:

- **Acquired** by a Federal agency and
- **Manufactured to be sold in the United States**, including territories and possessions of the United States, and those shipped overseas for operation.

LDVs include passenger cars, pickup trucks, minivans, passenger vans, and sport-utility vehicles with a GVWR less than 8,500 lbs.

MDPVs include vehicles with a GVWR between 8,500 and 10,000 lbs designed primarily to transport persons.

Table 17 lists the vehicles not subject to the EISA Section 141 low GHG-emitting vehicle acquisition reduction requirements.

³⁴ Available at <https://www.epa.gov/regulations-emissions-vehicles-and-engines/federal-fleets-using-low-greenhouse-gas-emitting-vehicles>.

Table 17. Vehicles Not Subject to the Low Greenhouse Gas–Emitting Vehicle Acquisition Requirements

All motor vehicles with a gross vehicle weight rating (GVWR) greater than 10,000 lbs
Pickup trucks and non-passenger vans over 8,500 lbs GVWR
MDVs designed to transport either 12 or more passengers or 9 or more passengers rearward of the driver’s seat or with an open cargo area of 72 inches in interior length or more
Contractor- or subcontractor-owned vehicles
Low-speed vehicles, including neighborhood electric vehicles (NEVs)
Vehicles manufactured for sale outside the United States
Vehicles forfeited to or confiscated by LE agencies

No acquisitions of LDVs or MDPVs that are manufactured to be sold in the United States may be exempted from the EISA Section 141 requirements (e.g., LE or emergency response vehicles).

3.7.3 EISA Section 141 Acquisition of Low Greenhouse Gas–Emitting Vehicles Requirements

EPA’s *Guidance for Implementing Section 141 of the Energy Independence and Security Act of 2007* explains the criteria EPA uses to identify low GHG-emitting vehicles and provides the necessary information and resources for Federal agencies to implement EISA Section 141. This section provides an overview of the EISA Section 141 requirement, which ultimately supports the goal of reducing Federal fleet petroleum use.

Section 141 of EISA amends the Federal fleet vehicle acquisition requirements of EPAAct 1992 by **prohibiting Federal agencies from acquiring LDVs and MDPVs that are not low GHG-emitting vehicles**. EISA Section 141 allows for two exceptions to the prohibition, which are further described below.

3.7.3.1 How is a Low GHG-emitting Vehicle Defined?

Section 141 of EISA directs EPA to define “low GHG-emitting vehicle” and to annually identify the makes and models of such vehicles. For model year 2013 vehicles and later, EISA Section 141 compliance levels are based on maximum gallon-per-mile CO₂ emissions levels for each model year. EPA establishes the CO₂ emissions level thresholds for any given model year as the levels where the (approximate) top 25% lowest GHG-emitting cars, light-duty trucks, and MDPVs are EISA Section 141 compliant (based on analysis of the previous model year vehicle data).

EPA’s Federal Fleets website³⁵ provides the EISA Section 141 maximum CO₂ emissions levels for passenger cars, light-duty trucks, and MDPVs. The website also provides the official lists of low GHG-emitting vehicles for each model year. For model year 2012 and earlier, EISA Section 141 compliance was based on GHG scores (EPA GHG emissions ratings for cars and trucks on a scale of 1 to 10).

³⁵ Available at <https://www.epa.gov/regulations-emissions-vehicles-and-engines/federal-fleets-using-low-greenhouse-gas-emitting-vehicles>.

3.7.3.2 *Complying with Section 141 Low Greenhouse Gas–Emitting Vehicles Acquisition Requirements*

Section 141 specifically prohibits the acquisition of LDVs and MDPVs that are not low GHG-emitting vehicles as defined by EPA. Recognizing that Federal agencies need some flexibility to acquire vehicles for diverse applications, Section 141 of EISA allows for two exceptions to the prohibition:

- **Functional needs exception.** Exempts individual purchases from the requirement to procure low GHG-emitting vehicles if no low GHG-emitting vehicle is available to meet the functional needs of the agency. These vehicles may include LE motor vehicles, emergency motor vehicles, motor vehicles acquired for military purposes, and vehicles used for protective services provided that no low GHG-emitting vehicle is available that meets those functions.
- **Alternative measures exception.** Allows an agency to acquire vehicles that are not low GHG-emitting provided the agency implements measures to offset the incremental increase in GHG emissions and petroleum consumption. A range of offsetting reduction strategies are available to agency fleet managers, such as reducing VMT, reducing the number of vehicles owned and operated, or acquiring LSEVs to replace conventional vehicles. To use this exception an agency must not exceed its EISA GHG emissions limit. This limit is calculated as the total agency CO₂e (carbon dioxide equivalents) emissions if all vehicles acquired equaled the applicable maximum CO₂e emissions thresholds for EISA Section 141 compliance.

3.7.3.3 *Federal Vehicle Greenhouse Gas Emissions Assessment Tool for Alternative Measures Exception*

To help Federal agencies quantify and verify the aggregate GHG emissions as required by the alternative measures exception, EPA developed the GHG Assessment Tool, also available on EPA's Federal Fleets website. The Assessment Tool is a spreadsheet-based calculator that helps Federal agencies track, quantify, and verify the GHG emissions associated with the vehicles they acquire or plan to acquire. If an agency utilizes this tool for the alternative measures exception, the head of an agency, or his or her designee(s), should certify that the Assessment Tool properly and accurately accounts for all applicable motor vehicle acquisitions completed in a FY or other acquisition cycle specified by the agency.

3.7.4 Reporting

Federal agencies are required to include information regarding the acquisition of low GHG-emitting vehicles in the designated field in FAST. Fleet managers must input annual vehicle data into FAST each year; the reporting period begins on roughly October 1 and closes in mid-December. GSA prefills the low GHG-emitting vehicle designation in Reports Carryout on the Fleet Drive-thru application for GSA-leased vehicles. EPA reviews the information annually to evaluate implementation of EISA Section 141 and assess the use of the exceptions described above.

When an agency utilizes an exception, EISA Section 141 requires that the head of the agency, or his or her designee, certify in writing that either a specific functional need cannot be met by a low GHG-emitting vehicle or that the agency has implemented cost-effective alternative measures that result in an equivalent amount of petroleum and GHG emission reductions.

EPA recommends that each Federal agency establish an agency-wide method for documenting its determinations and maintain records of such determinations for at least 5 years and/or in accordance with agency-specific record-keeping requirements. It also recommends that each agency consolidate the responsibility for the EISA Section 141 certifications in one office to maintain consistency and facilitate program oversight and record keeping.

3.8 GSA Vehicle Asset Methodology

GSA FMR Part 102-34.50, emphasis added:

“What size motor vehicles may we obtain?

- (a) You may only obtain the minimum size of motor vehicle necessary to fulfill your agency’s mission in accordance with the following considerations:
- (1) You must obtain motor vehicles that achieve maximum fuel efficiency.
 - (2) Limit motor vehicle body size, engine size and optional equipment to what is essential to meet your agency’s mission.
 - (3) With the exception of motor vehicles used by the President and Vice President and motor vehicles for security and highly essential needs, you must obtain midsize (class III) or smaller sedans.
 - (4) Obtain large (class IV) sedans only when such motor vehicles are essential to your agency’s mission.
- (b) **Agencies must establish and document a structured vehicle allocation methodology to determine the appropriate size and number of motor vehicles** (see FMR Bulletin B-9, located at <http://www.gsa.gov/bulletins>).”

Note: FMR Bulletin B-9 has been superseded, first by FMR Bulletin B-30 in 2011, and then by FMR Bulletin B-43 in 2017. FMR Bulletin B-43 is currently in effect.³⁶

3.8.1 Overview of Requirements

GSA’s FMR § 102-34.50 requires agencies to implement a VAM to determine the optimum fleet profile to determine the appropriate size and number of motor vehicles in the fleet and identify opportunities to eliminate unnecessary vehicles, right-size vehicles for their mission, and deploy AFVs effectively. GSA recommends that agencies complete a VAM at least once every 5 years. The E.O. 13834 Implementing Instructions encourage agencies to conduct a VAM study more frequently if agency missions or resources change. Additionally, the VAM should help agencies identify opportunities to promote the cost-effective operation and maintenance of the fleet throughout the life cycle of fleet vehicles.

3.8.2 Applicability

Executive agencies should be aware that the requirement to conduct a VAM study contained in GSA’s FMR Part 102-34 applies to all Federal agency fleets (including foreign, LE, and emergency response fleets), even if the agency is not subject to the E.O. 13834, EAct 1992, and EISA Section 141 fleet requirements.

3.8.3 Agency Vehicle Allocation Methodology Requirements

Section 102-34.50 of the GSA FMR requires all Federal executive agencies operating domestic fleets to establish and document a structured VAM to determine the appropriate size and number of motor vehicles (i.e., optimize fleets to agency mission).

A structured VAM process provides a framework for right-sizing an agency’s fleet. GSA recommends that agencies complete a VAM study at least every 5 years. The E.O. 13834 Implementing Instructions encourage agencies to conduct a VAM study more frequently if the agency’s mission or resource requirements

³⁶ Available at https://www.gsa.gov/cdnstatic/FMR_Bulletin_B-43.pdf.

change. A VAM study will help your agency determine its optimum fleet profile and reduce agency vehicle fleet costs, ensuring fleets are correctly sized in terms of numbers and that the vehicles are of the appropriate type and size for accomplishing agency missions. It also assists your agency in developing a vehicle acquisition and management plan that supports petroleum reduction through the appropriate acquisition, placement, and use of higher efficiency and alternative fuel vehicles. This plan should include an optimal fleet inventory size projection (by vehicle class and fuel type), such that fleet size satisfies agency mission requirements. **A VAM helps agencies determine the optimum fleet inventory to ensure that agency vehicle fleets are not over-costly, are correctly sized in terms of numbers, and are of the appropriate type for accomplishing agency missions.**

GSA FMR Bulletin B-43 provides guidance to assist agencies in establishing and documenting a structured VAM. Development of a VAM provides agency fleet managers with a standard way to document the objective characteristics of a vehicle fleet for (1) a specific bureau or department and/or (2) a generic (where there are common characteristics) office/facility, program, occupational group, or other entity within an agency.

Section 5.1 of this Handbook details the VAM process, which consists of the following three components:

- **Conduct a VAM study.** Agencies should conduct a new VAM study at least once every five years, or more frequently if the agency's mission or resource requirements change. A VAM study is a critical element of fleet management. It will help your agency develop a vehicle acquisition and management strategy that supports petroleum reductions through the acquisition and appropriate deployment of more efficient vehicles as well as AFVs. The VAM study also helps to identify vehicles that lack a demonstrated mission need and therefore, are candidates for reassignment or disposal. The requirement to conduct a VAM study covers an agency's entire global fleet, encompassing all vehicle types, including LE and emergency response vehicles.
- **Determine the optimum fleet profile.** Based on the VAM study, each agency should produce a profile of its optimum fleet, which summarizes the numbers and most appropriate types of vehicles required to meet mission requirements, and produces optimum compliance with relevant mandates (petroleum reduction, alternative fuel use, AFV acquisition, low GHG-emitting vehicle acquisition, telematics, etc.). The optimum fleet profile is the agency's target fleet inventory, toward which progress is measured. Once identified, agencies should upload their optimal fleet profiles into FAST. Instructions and the optimal fleet profile template can be found in FAST through the "VAM Optimal Fleet Reporting" link under the "Admin Tools" tab.
- **Acquire and dispose of vehicles to achieve the optimum fleet inventory.** Each agency should develop a vehicle acquisition and disposal strategy that establishes a path toward achieving the optimum fleet profile. This strategy should be continuously pursued and evaluated, with the agency focusing on eliminating unnecessary or nonessential vehicles, identifying new vehicle needs, and acquiring more fuel efficient vehicles that meet mission requirements, while ensuring compliance with AFV as well as low GHG-emitting vehicle acquisition requirements.

3.8.4 Reporting

Actual inventories, as well as planned inventories for the coming year, are reported through annual FAST vehicle data reporting. Actual results are compared to, and progress is measured against, the agency's VAM optimal fleet profile. Discrepancies should be noted in the annual agency FMP. The FMP provides each agency the opportunity to discuss inventory results that differ from the VAM optimal fleet profile. The FMP template is posted on the FAST website. Specific instructions on FAST submissions are communicated to agencies annually through FAST.

3.9 EAct 2005 Section 701 Alternative Fuel Use in Dual-Fueled Vehicles

Section 701 of EAct 2005 (42 U.S.C. § 6374(a)(3)(E)), emphasis added:

(i) **“Dual fueled vehicles acquired pursuant to this section shall be operated on alternative fuels unless the Secretary determines that an agency qualifies for a waiver of such requirement for vehicles operated by the agency in a particular geographic area in which—**

(I) the alternative fuel otherwise required to be used in the vehicle is not reasonably available to retail purchasers of the fuel, as certified to the Secretary by the head of the agency; or

(II) the cost of the alternative fuel otherwise required to be used in the vehicle is unreasonably more expensive compared to gasoline, as certified to the Secretary by the head of the agency.

(ii) The Secretary shall monitor compliance with this subparagraph by all such fleets and shall report annually to Congress on the extent to which the requirements of this subparagraph are being achieved. The report shall include information on annual reductions achieved from the use of petroleum-based fuels and the problems, if any, encountered in acquiring alternative fuels.”

3.9.1 Overview of Requirements

Section 701 of EAct 2005 requires Federal agencies to use alternative fuel in dual-fueled vehicles when it is reasonably available and not unreasonably more expensive than gasoline. Since 2007, Federal agencies have requested waivers for vehicles from the EAct Section 701 requirements as part of a June data call for the subsequent FY. DOE has reviewed those waiver requests and granted or denied them prior to the subsequent FY. At the end of each FY, DOE has reviewed each Federal agency’s covered alternative fuel use and compared it to total fuel use in non-waivered vehicles to determine compliance.

There are two different processes through which DOE will begin evaluating waiver requests for FY 2021 (beginning with the FY 2020 data call):

- **Automated reporting in FleetDASH:** For vehicles with fueling transaction data in FleetDASH, agencies may note in their FAST submissions that they request waivers be processed through FleetDASH. In this case, fuel purchase transactions are automatically evaluated for proximity to alternative fuel, starting at the beginning of FY 2021. As described below, the new process combines and automates the waiver and compliance calculations for vehicles loaded into FleetDASH.
- **Waiver requests in FAST:** For individual vehicles not captured in FleetDASH, agencies may request waivers based on garage location in FAST. For these vehicles, agencies note in their end-of-year reporting (starting in FY 2020) whether they believe dual-fueled vehicles should receive waivers from the alternative-fuel-use requirements (for FY 2021 and subsequent years) in lieu of a separate Section 701 data call.

The purpose of this change in the Section 701 of EAct 2005 reporting process is to streamline reporting and compliance requirements while encouraging improved Federal fleet performance. This section explains the requirements of Section 701 of EAct 2005, how Federal agencies can request waivers, the grounds by which DOE will approve or deny waivers, and how DOE assesses compliance. It also describes information that DOE requires from Federal agencies applying for waivers.

3.9.2 Applicability

What is a Federal agency under the EPOA 2005 Section 701 requirements?

The applicability of EPOA 2005 Section 701 is described in Section 3.2.1.2 of this Handbook.

What vehicles are covered by the EPOA 2005 Section 701 requirements?

All dual-fueled vehicles in covered Federal agencies are subject to this requirement except those specifically exempted (exempt vehicles are discussed in Section 3.2.2 of this Handbook). This includes LDVs, MDVs, and HDVs, regardless of whether they are agency-owned, commercially leased, or leased from GSA. Additionally, GOCO vehicles are considered government motor vehicles and are therefore subject to these requirements, consistent with existing reporting requirements in FAST. (See GSA's FMR § 102-34.215)

A dual-fueled vehicle is defined as "a dual fueled automobile, as such term is defined in section 32901(a)([9]) of title 49" or "a motor vehicle, other than an automobile, that is capable of operating on alternative fuel and is capable of operating on gasoline or diesel fuel." 42 U.S.C. § 6374(g)(5). This includes E85 FFVs, bi-fuel LPG vehicles, bi-fuel natural gas vehicles, and PHEVs. DOE does not consider diesel vehicles capable of operating on biodiesel, including renewable diesel (designated as B20, B100, or R100), to be dual-fueled vehicles for Section 701 compliance purposes nor AFVs for the EPOA 1992 AFV acquisition requirements. Instead, biodiesel fuel use in Federal fleets is assessed separately as bonus credit for EPOA 1992 AFV acquisitions. See 42 U.S.C. §§ 13212(b)(1)(D) and 13220. Table 18 lists all dual-fueled vehicle fuel configurations that agencies can report in FAST.

Table 18. Dual-Fueled Vehicle Fuel Configurations

Vehicle Type
E85 FFVs
CNG bi-fuel vehicles
LNG bi-fuel vehicles
LPG or propane bi-fuel vehicles
PHEVs

3.9.3 EPOA 2005 Section 701 Requirements

Section 701 of EPOA 2005 requires Federal agencies to use alternative fuel in dual-fueled vehicles when it is reasonably available and not unreasonably more expensive than gasoline. Generally, for the purpose of the Section 701 requirement, vehicles may qualify for a waiver by DOE if:

1. **Alternative fuel is not reasonably available.** "Not reasonably available" means that alternative fuel cannot be obtained within 3 miles (one way) from the vehicle's:
 - a. Refueling location if displayed in FleetDASH (see Section 3.9.3.2); or
 - b. Garaged location if the refueling location is not displayed in FleetDASH (see Section 3.9.3.3).
2. **Alternative fuel is unreasonably expensive.** "Unreasonably expensive" means that the standard marketed price (as defined herein) for alternative fuel is more than gasoline at the same station. For the liquid fuels E85, LPG, and LNG, the marketed price is expressed in gallons. For CNG, the marketed price is GGEs. For electricity, the marketed price is GGEs adjusted for the EV efficiency

factor (EVEF) because PHEVs operate more efficiently on electricity than gasoline. See Appendix E for the EVEF.

Fleets can use the Alternative Fuel Data Center (AFDC) Station Locator³⁷ to find fuel in their area or along a route that they are traveling. The Station Locator can be filtered to include specific fuels, private stations by owner type, and payment types accepted. Select “Advanced Filters,” filter the details appropriately, and click “Map Results” to view the data in the tool or “Download Results” to view the results in a .csv file format that can be opened in Excel as shown in Figure 9.

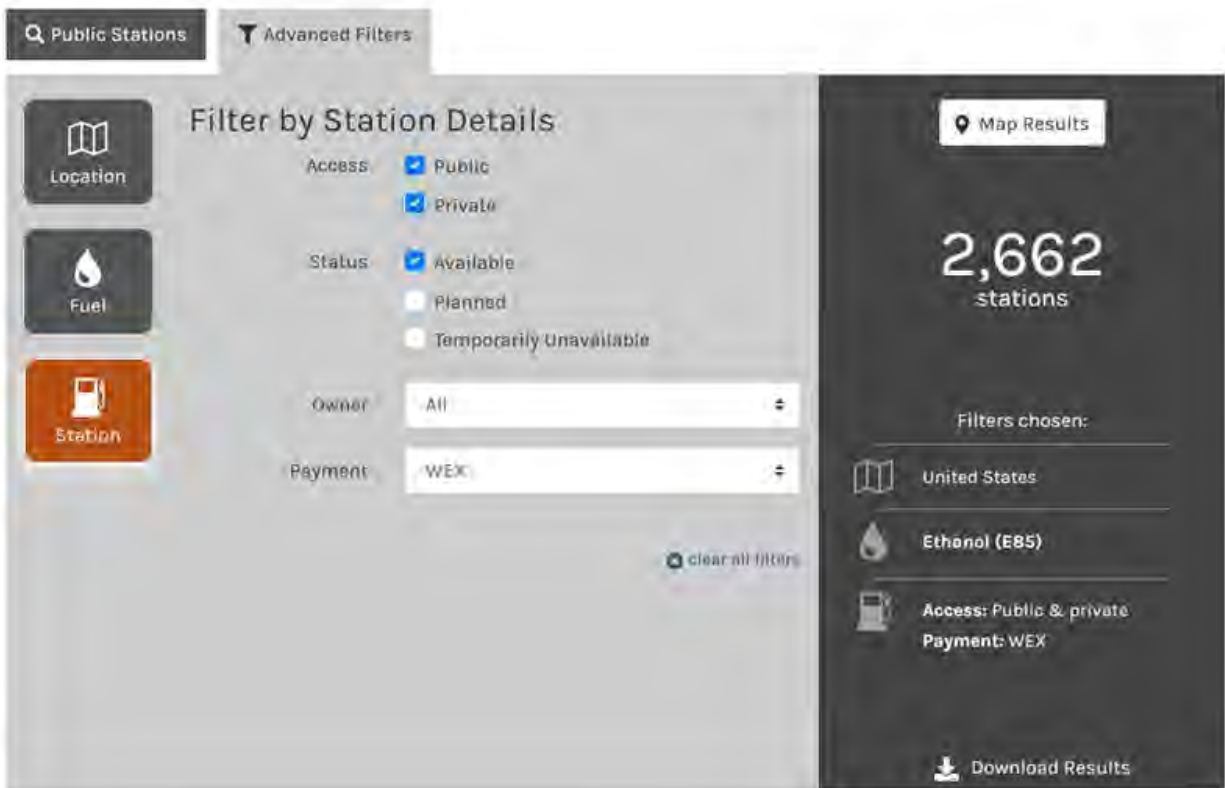


Figure 9. Advanced Filter in AFDC Station Locator

If no fuel is available publicly or through sharing infrastructure with another governmental or private entity, agencies can contact the Defense Logistics Agency (DLA) Energy Division. DLA Energy assists military and civilian agencies in contracting for alternative fuel in many fleet locations in the United States. DLA Energy contracts include standards to ensure the quality of the delivered fuel. Through its large purchase volume, DLA Energy is typically able to provide these fuels to agencies at a reasonable cost. If no alternative fuel is available and DLA Energy cannot service an area, agencies should consider installing alternative fuel infrastructure or acquiring low-GHG emitting vehicles.

3.9.3.1 Compliance with EPC Act 2005 Section 701 Requirements

DOE determines compliance using two methods, which are discussed in more detail below:

- **Automated waivers in FleetDASH (preferred).** FleetDASH measures fuel availability each time that the vehicle is fueled based on whether alternative fuel is available within three miles of each fuel purchase transaction. Since vehicles can operate well beyond the immediate vicinity of their reported garage location, the transaction location provides a much more accurate measure of whether alternative

³⁷ Available at <https://www.afdc.energy.gov/stations/#/find/nearest>.

fuel is “reasonably available” in the geographic area in which the vehicle is operated. Therefore, this is the preferred method to assess compliance with EPart 2005 Section 701.

- **Annual waiver requests in FAST.** Only for those vehicles with fueling transactions not captured in FleetDASH, agencies can request an EPart 2005 Section 701 waiver through FAST for the entire FY. Each vehicle must be reported during the year-end Federal fleet reporting of ALD in FAST with an attribute identifying how the agency believes the vehicle should be treated with respect to Section 701 for the following FY.

3.9.3.2 Automated Vehicle Waivers and Compliance in FleetDASH

DOE uses FleetDASH to assess compliance on the fuel transaction level. If a dual-fueled vehicle is operating in an area where alternative fuel is available at a reasonable cost, the vehicle must use the alternative fuel instead of gasoline or diesel.

FleetDASH compares the location of fueling transactions for dual-fueled vehicles with alternative fuel stations listed in the AFDC Station Locator, as shown in Figure 10. The Station Locator includes public stations as well as private stations owned by Federal agencies, local governments, and private companies. FleetDASH can designate those stations as available or unavailable to a given agency or to the Federal government more generally. Users can flag stations as available or unavailable in order to improve the accuracy of this designation. In addition, users can flag stations in FleetDASH as unreasonably more expensive than gasoline for two-month periods as described below.

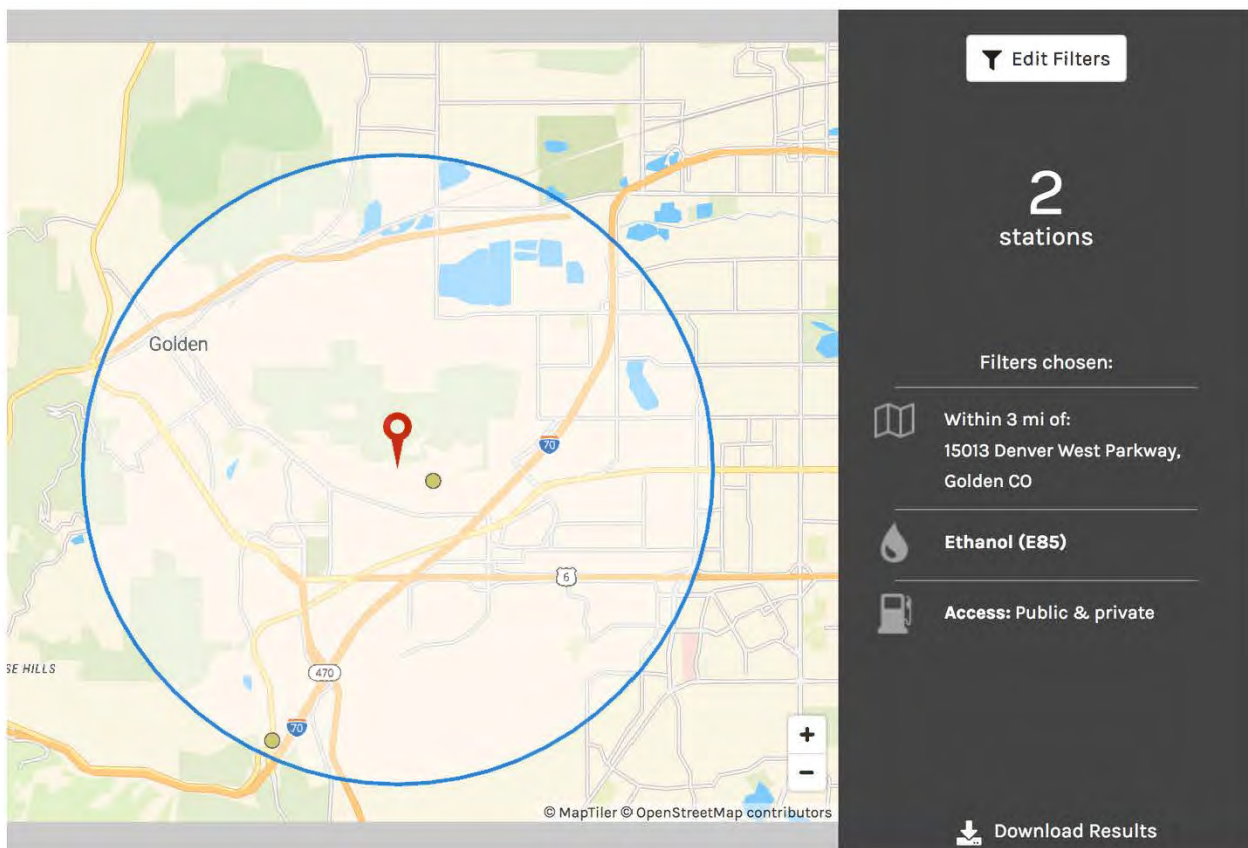


Figure 10. FleetDASH Comparison of Fueling Transaction and Nearby Alternative Fuel Stations

The compliance assessment in FleetDASH waives a fueling transaction from the requirement to use alternative fuel if the transaction does not occur within 3 miles of an available alternative fuel station. Distance is measured as a straight line between the actual fueling transaction and the alternative fuel station (i.e., as the crow flies). Driving time is not considered. Stations will be designated as unavailable in any of the three following situations:

- **The station does not allow access to a particular agency or agencies or to the Federal government more generally.** FleetDASH users may flag a particular station as inaccessible. After the user notes an issue accessing a particular station, DOE confirms whether the station owner does not support fueling Federal vehicles at all or only supports fueling of vehicles for certain agencies or fleets. Users may send supporting documentation including images to the NREL Federal Fleet Project Leader at federal.fleets@nrel.gov. If the station does not sell fuel to any Federal vehicles, then that station is considered unavailable to all agencies. If the station owner clarifies that the station is available to some agencies but not others, it is considered available only to those agencies. For an example of the latter situation, a co-located U.S. Army and U.S. Air Force base may have a station that dispenses fuel to both agencies on base or to all U.S. Department of Defense agencies, but the fuel might not be available to civilian agencies.
- **The station does not accept the fueling card used by an agency.** Stations that do not accept the fueling card used by an agency will be designated as unavailable to that agency. For example, if USPS uses only the Voyager credit card and a given station does not accept Voyager, that station will be designated as unavailable to USPS.
- **Unreasonably expensive fueling stations** can be flagged in FleetDASH as **temporarily unavailable**. FleetDASH users can flag a single transaction at a station if the alternative fuel costs are unreasonably expensive. DOE classifies unreasonable expense based on how the fuel is marketed so that drivers can make purchase decisions based on posted prices.
 - **Liquid fuels (E85, LPG, and LNG)** are commonly sold by the gallon. Led by E85, liquid fuels comprised 100% of price-based waiver requests and 99% of all waiver requests overall in FY 2019. E85, LPG, and LNG are considered unreasonably expensive if the fuel costs more on a per-gallon basis than gasoline because they have less energy than gasoline on a per gallon basis. If the alternative fuel costs more on a per-gallon basis than gasoline in addition to having less energy than gasoline, then it is be considered unreasonably expensive. Given the relative ease for fleets to rely on posted per-gallon prices, DOE relies on per-gallon costs to define whether a cost is reasonable for liquid fuels.
 - **CNG is a gaseous fuel** often sold in units of GGEs and since 2000 has consistently been less expensive than gasoline on a GGE basis. Therefore, DOE determines the price reasonableness of CNG based on whether the fuel is less expensive than gasoline on a GGE basis.
 - **Electricity** is generally sold by the kWh, and vehicles driven by electric motors use energy much more efficiently than vehicles driven by internal combustion engines. Therefore, when comparing a PHEV's quantity of electricity used to the PHEV's quantity of petroleum used, the electricity use—measured in GGEs—is multiplied by the EVEF. See Appendix E for the EVEF. The EVEF allows the comparison of fuel quantities to more accurately reflect the percentage of miles a PHEV has driven on electricity.

All covered PHEVs are considered non-waivered dual-fueled vehicles for Section 701 compliance. Accounting for the EVEF, electricity is consistently less expensive than gasoline. Furthermore, because PHEVs are assumed to be charged at the garage location, there is no requirement to check for available electricity infrastructure near the transaction location. DOE uses the following formula to calculate Section 701 compliance for PHEVs:

$$\frac{EVEF \times \text{total electricity use by covered PHEVs}}{\text{total petroleum use by covered PHEVs} + EVEF \times \text{total electricity use by covered PHEVs}}$$

DOE verifies the accuracy of unreasonably expensive flags by contacting the station owner. If the price is confirmed as unreasonably expensive, DOE considers that station to be unavailable for all Federal fleet vehicles for 2 months. During the month that the high fuel cost is noted and the following month, that high-cost station is excluded from compliance for the entire Federal government (i.e., no Federal vehicles are required to fuel there).

Compliance for FleetDASH vehicles is measured on an annual basis at the fleet and agency levels. Compliance is calculated by dividing the amount of alternative fuel used in covered dual-fueled vehicles by the total quantity of fuel consumed by those vehicles within 3 miles of available alternative fuel stations. Below is the formula for assessing compliance for dual-fueled vehicles in FleetDASH except for PHEVs:

$$\frac{\text{FleetDASH alternative fuel use by covered dual-fueled vehicles}}{\text{FleetDASH fuel use by covered dual-fueled vehicles within 3 miles of available alternative fuel}}$$

Agencies can view performance in FleetDASH over any month in the past year at the vehicle level for the percentage of time that drivers used alternative fuel in that vehicle when it was available within 3 miles. They can then use that information to alter driver behavior and increase refueling with alternative fuel. If electricity charging is not captured for a particular PHEV in FleetDASH, the dashboard will note that performance cannot be calculated for that vehicle; DOE completes the annual compliance calculations for such vehicles using electricity consumption reported in FAST.

3.9.3.3 Waivers and Compliance in FAST for Vehicles Not Present in FleetDASH

Agencies are encouraged to include their vehicles in FleetDASH for Section 701 compliance when possible. FleetDASH automates the waiver process and applies station accessibility and unreasonable cost flags across the entire Federal government—which can save agencies significant amounts of time—and it more accurately measures where vehicles are operating for the determination of compliance by using fuel transaction locations instead of garage locations. Nevertheless, DOE FEMP continues to support Section 701 waivers and compliance determinations in FAST for the remaining vehicles not included in FleetDASH.

If part or all of an agency's fleet is not present in FleetDASH, then DOE follows a process using FAST data submissions. During the annual fleet FAST data call, an agency may request waivers based on a lack of available (and not unreasonably expensive) alternative fuel stations near their vehicle garage locations for the coming FY.

DOE reviews those requests and determines whether fuel is reasonably available or unreasonably more expensive than gasoline and assigns a waiver status to each vehicle (i.e., “Waiver Granted,” “No Waiver,” “Exempt”). At the end of the FY, DOE assesses Section 701 compliance by calculating the percentage of alternative fuel out of total fuel use in non-waivered dual-fueled vehicles. Agencies can only request waivers in FAST for vehicles with fueling transactions not captured in FleetDASH. FleetDASH is more accurate and less time-intensive on the agency's part. Generally, waivers are requested at the end of one year for the coming year (e.g., FY 2021 waivers are requested through the FY 2020 data call). For vehicles reported at the end of the FY without waiver requests from the prior year's report (such as new vehicle acquisitions), DOE applies the prospective year waiver status to the prior year. For example, if an agency acquires a new vehicle in FY

2021, the fleet manager would not have reported the vehicle in FY 2020 and therefore not have requested a waiver for FY 2021. In this example, when the agency reports the vehicle at the end of 2021 with the appropriate waiver request status, DOE determines whether a waiver for that vehicle is merited at that time and applies that waiver status to the vehicle request as the FY 2021 waiver status for that vehicle as well.

For agencies to qualify for full-year waivers, they must show that fuel is not reasonably available within 3 miles from the relevant vehicle's garage location. Driving time is not assessed.

Before submitting waiver requests in FAST, agencies must identify what portion of their fleet is not present in FleetDASH. Agencies can confirm what segments of their fleet are present in FleetDASH with the NREL Federal Fleet Project Leader at federal.fleets@nrel.gov. If fleet vehicles are not in FleetDASH, agencies can work with NREL to add these vehicles to FleetDASH which will streamline Section 701 reporting in future years and improve identification of missed fueling opportunities.

Then, agencies should identify single-fuel vehicles or those designated as foreign, LE, emergency response, or any other exemption status listed in Table 6. These vehicles are exempt from Section 701 requirements and may be marked "Exempt."

For the remaining vehicles, agencies should use the AFDC Station Locator to determine the availability of the appropriate alternative fuel or contact DLA, as described in Section 3.9.3. If no fuel is available for purchase within 3 miles of the vehicle garage location or if the fuel is consistently too expensive, fleet managers should submit waiver requests in FAST. For leased vehicles, GSA Fleet provides an annual list of dual-fuel vehicles that may qualify for waivers based on their reported garage location. Please reach out to GSA Fleet's Alternative Fuel Vehicle Team for more information (gsafleetfvteam@gsa.gov).

How are Waiver Requests Submitted in FAST?

To streamline reporting for Federal fleet managers, DOE has aligned the remaining Section 701 waiver request/review process with year-end Federal fleet reporting of ALD in FAST. Each vehicle must be reported with an attribute identifying how the agency believes the vehicle should be treated with respect to Section 701. Beginning with the FY 2020 data call, FAST will support designations for the following:

- **FleetDASH:** Vehicle is present in FleetDASH and the agency selects FleetDASH as the sole basis for determining the waiver standing of the vehicle with respect to Section 701, as well as the vehicle's compliance to the extent applicable with that requirement.
- **Exempt:** Vehicle is not subject to Section 701 requirements based on any combination of:
 - The owning/operating agency's designation as EPA-exempt (see Appendix C)
 - The vehicle being located in an area considered foreign for FAST reporting
 - The vehicle's fuel type/configuration not being subject to Section 701's alternative fuel consumption requirement (i.e., it is not a dual-fueled vehicle)
 - The vehicle's status as exempt (see Table 6).
- **No Waiver:** Vehicle is subject to Section 701 requirements and does not require a waiver
- **Waiver Requested - Distance:** Alternative fuel is not available within a 3-mile radius of the garage location
- **Waiver Requested - No Access:** Nearby fuel station(s) does not provide access to agency drivers (additional documentation required)

- **Waiver Requested - Fuel Card:** Nearby fuel station(s) does not accept fuel payments using agency fuel card
- **Waiver Requested - Cost:** Alternative fuel is unreasonably more expensive at nearby fuel station(s) than gasoline (additional documentation required).

The designations “Exempt,” “No Waiver,” and the “Waiver Requested” variations should only be used by agencies for vehicles not tracked in FleetDASH. DOE may analyze non-exempt vehicles that are present in the FleetDASH data set using FleetDASH even if miscategorized by agencies.

Waivers based on distance or driving time may not be requested for covered vehicles designated as “location withheld” in FAST. FAST will validate that each vehicle’s Section 701 designation is consistent with the vehicle’s other reported attributes (e.g., foreign vehicles and vehicles in non-EPA-act-covered agencies cannot be designated as “No Waiver” or with one of the “Waiver Requested” variations).

For vehicles reported to FAST without the corresponding Section 701 designation (i.e., the designation is omitted), FAST provides a default value based on other reported vehicle attributes.

- Any such vehicles in non-EPA-act-covered agencies, foreign vehicles, LE vehicles, emergency response vehicles, and vehicles with fuel type/configurations not subject to Section 701 will be treated as if they were reported with the “Exempt” designation described above.
- All other such vehicles are treated as if they are reported with the “No Waiver” designation described above.

Agency fleet managers should review the relevant entries in the FAST data element and business rules reference documents for additional details on the reporting and validation of this vehicle attribute.³⁸

Agency fleet managers may review waiver determinations from the prior year in FAST prior to submitting waiver requests for the coming year. This information can be used to inform waiver requests for the coming year, although availability and costs of alternative fueling stations may change.

In all cases where additional documentation is required, that documentation should be emailed to the DOE Federal Fleet Program Manager at federal_fleets@ee.doe.gov and the NREL Federal Fleet Project Leader at federal.fleets@nrel.gov. **All documentation must list the vehicle identifiers used in FAST in order to correlate the documentation to the waiver request.** Documentation may include images and should include the following information as well:

- Denied access documentation should include the email exchange with the station owner denying access or the phone number and name for the station owner if the conversation took place by phone.
- Unreasonable expense documentation should include the fuel price for gasoline and the fuel price per gallon for the alternative fuel on a weekly basis over five consecutive weeks in the preceding year. DOE uses the same criteria for determining unreasonable expense in FAST as FleetDASH for the various fuels as described above.

How Does DOE Determine Waivers in FAST?

DOE imports waiver determinations into FAST and notifies agencies as quickly as possible following agency data submissions. DOE may designate Section 701 waiver requests as granted (“Waiver Granted”), denied (“No Waiver”), exempt from the requirements on other grounds such as LE or emergency response (“Exempt”), or FleetDASH-covered (“FleetDASH”) in FAST. Waiver requests for vehicles in FleetDASH are

³⁸ Available at <https://fastweb.inl.gov/help/index.cfm/resources/vehicle-level-data>.

automatically reviewed in FleetDASH and not in FAST. DOE grants waivers if any of the waiver reasons described above are confirmed as accurate. If documentation is required but not provided, waivers are denied automatically.

Agencies may appeal DOE waiver decisions within 30 days of notification. Appeals listing the vehicle identifier used in FAST and accompanying documentation should be emailed to the DOE Federal Fleet Program Manager at federal_fleets@ee.doe.gov and the NREL Federal Fleet Project Leader at federal.fleets@nrel.gov.

How is Compliance Assessed in FAST?

After each FY ends, DOE assesses Section 701 compliance for vehicles in FAST. Vehicles that do not receive a waiver in FAST (and which are not captured in FleetDASH) are designated as having reasonable access to alternative fuel 100% of the time. DOE assesses Section 701 compliance using the percentage of alternative fuel compared to total fuel use in non-waivered dual-fueled vehicles (calculated by dividing the amount of alternative fuel used in covered dual-fueled vehicles by the total amount of fuel consumed in covered, non-waivered dual-fueled vehicles). This gives agencies bonus credit for fuel used by waived dual-fueled vehicles that still use alternative fuel where available. Below is the formula for assessing compliance for dual-fueled vehicles found only in FAST except for PHEVs:

$$\frac{\text{FAST-only alternative fuel use by covered dual-fueled vehicles}}{\text{FAST-only fuel use by covered, non-waivered dual-fueled vehicles}}$$

Similar to FleetDASH, FAST compliance determinations are made using GGEs for all vehicles except that PHEV electricity use is multiplied by the EVEF described in Section 3.9.3.2.

$$\frac{\text{EVEF} \times \text{total electricity use by all PHEVs}}{\text{total petroleum use by covered PHEVs} + \text{EVEF} \times \text{total electricity use by covered PHEVs}}$$

3.9.3.4 Determining Agency-wide Compliance

Because an agency may have some vehicles in FleetDASH and others in FAST, DOE combines the results from both systems into a single compliance percentage for each agency. DOE divides the number of GGEs used in dual-fueled vehicles by the total applicable fuel consumption, which is the number of GGEs consumed by covered, dual-fueled vehicles in non-waivered transactions (i.e., transactions within 3 miles of available fuel for vehicles in FleetDASH and all transactions for non-waivered vehicles found only in FAST). In both FAST and FleetDASH, electricity consumption in PHEVs includes the EVEF, as described above, to account for electric motor efficiency.

$$\begin{aligned}
 & \text{Annual agency-wide compliance percentage} = \\
 & \left(\frac{\text{EVEF} \times \text{total electricity use by covered PHEVs}}{\text{total petroleum use by covered PHEVs} + \text{EVEF} \times \text{total electricity use by covered PHEVs}} \right) \\
 & \quad \times (\text{PHEV fuel consumption \% of applicable fuel consumption}^{39}) \\
 & \quad + \\
 & \left(\frac{\text{FleetDASH alternative fuel use by other}^{40} \text{ covered dual-fueled vehicles}}{\text{FleetDASH fuel use by other covered dual-fueled vehicles within 3 miles of available alternative fuel}} \right) \\
 & \quad \times (\text{FleetDASH other dual-fueled vehicle fuel consumption \% of applicable fuel consumption}) \\
 & \quad + \\
 & \left(\frac{\text{FAST-only alternative fuel use by other covered dual-fueled vehicles}}{\text{FAST-only fuel use by other covered, non-waivered dual-fueled vehicles}} \right) \\
 & \quad \times (\text{FAST only other dual-fueled vehicle fuel consumption \% of applicable fuel consumption})
 \end{aligned}$$

3.10 EISA Section 246 Alternative Fuel Infrastructure

Section 246 of EISA (42 U.S.C. § 17053(a)), emphasis added:

“Not later than January 1, 2010, the head of each Federal agency shall install at least **1 renewable fuel pump at each Federal fleet fueling center** in the United States under the jurisdiction of the head of the Federal agency.”

3.10.1 Overview of Requirements

Section 246 of EISA (42 U.S.C. § 17053(a)) directs Federal agencies to install at least one renewable fuel pump (E85, biodiesel, or electricity derived from a renewable source of energy) at each Federal fleet fueling center.

3.10.2 Applicability

Sections 3.2.1.2 of this Handbook provides details on how to determine which agencies are subject to the EISA 1992 requirements. EISA Section 246 requirements only apply to Federal fueling centers located in the United States that meet **all** of the following criteria:

- **Provides central refueling of Federal fleets.** EISA Section 246 only applies to existing Federally owned or contracted refueling sites located in an MSA or CMSA where Federal fleets of 20 or more LDVs are centrally refueled. Fueling centers not located in a covered MSA or CMSA are exempt from these requirements. Vehicles heavier than 8,500 pounds GVWR and LE, emergency, and military tactical vehicles are not counted in the size of the fleet served by the fueling center.

³⁹ Applicable fuel consumption is the non-waivered fuel consumed by covered, dual-fueled vehicles.

⁴⁰ Other represents all non-PHEV dual-fueled vehicles.

- **Achieves 100,000 gallons or greater annual fuel turnover rate.** EISA Section 246 (42 USC § 17053(c)) specifies that renewable fuel pump installation requirements do not apply to any U.S. Department of Defense (DoD) refueling center with a “fuel turnover rate of less than 100,000 gallons of fuel per year.” DOE has excluded from the definition of “Federal fleet fueling center,” any center with a fuel turnover rate of less than 100,000 gallons of each conventional fuel type (i.e., gasoline or diesel) per year. DOE has determined that this minimum threshold should apply to all Federal agencies because at levels below this threshold:
 - Installation of renewable fuel infrastructure is not cost-effective and cannot justify a private sector investment
 - Cost-effective procurement of alternative fuel cannot be ensured
 - Product quality deteriorates
 - Seasonal fuel specification changes cannot be met.

For these reasons, EISA Section 246 applies only to existing Federally owned or contracted refueling sites with an annual fuel turnover rate of 100,000 gallons or greater of one conventional fuel type (i.e., gasoline or diesel).

- **Lacks an existing renewable fuel pump on site.** Federal fleet fueling centers with existing renewable pumps already meet the EISA Section 246 requirements.
- **Lacks a local renewable fueling source.** Agencies are not required to install a renewable pump at Federal fleet fueling centers in locations where renewable fuel is reasonably available at a nearby retail station (or other accessible fueling center). The criteria for availability of renewable fuel are the same as applicable to Section 701 of EPAAct 2005—alternative fuel is reasonably available if it can be obtained within 3 miles (one way) from the Federal fleet fueling center.⁴¹

At Federal fleet fueling centers that are not subject to EISA Section 246 requirements, Federal agencies are encouraged to install renewable fuel infrastructure when practical and/or cost-effective. For example, converting existing gasoline or diesel infrastructure to renewable fuels may be more cost-effective than installing new renewable fuel infrastructure. Additionally, skid-mounted turnkey fueling stations can cost-effectively refuel smaller fleets.

3.10.3 EISA Section 246 Alternative Fuel Infrastructure Requirements

Section 246 of EISA (42 U.S.C. § 17053(a)) requires the installation of renewable fuel pumps, providing access to renewable fuel at Federal fleet fueling centers. As such, if a Federal fleet fueling center does not currently have a renewable fuel pump, or a renewable fuel pump is not readily accessible to a Federal fleet that uses an existing Federal fleet fueling center,⁴² a renewable fuel pump must be installed.

3.10.3.1 Renewable Fuel Pump Installation Requirements

Federal agencies must install at least one renewable fuel pump at each Federal fleet fueling center (meeting the definition in Section 3.10.2) under their jurisdiction subject to the EISA Section 246 requirement. At these fueling centers, agencies must install either an E85 refueling pump, biodiesel (B20 or greater) refueling pump, or electric charging station (subject to conditions provided in Section 3.10.3.2).

⁴¹ For more information please refer to Section 3.9 of the Handbook.

⁴² Agencies are not required to install renewable fuel pumps at federal fleet fueling centers where fleets already have access to renewable fuel, including access through publicly available infrastructure. Requiring duplicative renewable fuel pumps would not increase the number of AFVs with access to alternative fuel and is therefore not cost-effective. Additionally, excluding consideration of publicly available infrastructure would be counterproductive to other ongoing efforts encouraging the private sector to develop renewable fuel infrastructure near federal fleets that do not have access to renewable fuel.

3.10.3.2 *Electricity as a Renewable Fuel*

Agencies may satisfy EISA Section 246 requirements by installing electric recharging stations at Federal fleet fueling centers, provided the following:

- The electricity used to charge the vehicle(s) is from a renewable source (wind- or solar-generated, for example), or non-renewable generated electricity if agencies have purchased renewable energy credits (RECs) equal to or greater than the amount of electricity used to charge the vehicles at the fueling center. Agencies must certify the purchase of RECs in their annual EISA Section 246 data supplied to DOE, and the RECs must be purchased specifically for meeting EISA Section 246 renewable fuel pump installation requirements. In other words, there can be no double-counting of REC purchases—the REC purchases that cover the electricity used to charge vehicles can be counted as meeting EISA Section 246 requirements only if they are not counted toward meeting other mandates as well. REC purchases that exceed vehicle electricity use may be counted toward meeting other mandates.
- The electric charging station and/or the vehicles being charged have a metering device that measures the amount of electricity used to charge the vehicles, and these data are recorded and maintained by the agency and provided to DOE as part of the annual EISA Section 246 submission process.

3.10.3.3 *Implementation*

Each agency should identify the locations of all fueling centers that meet the definition of Federal fleet fueling centers under their jurisdiction. These fueling centers are required to install at least one renewable fuel pump. New infrastructure installed to meet this requirement need not be co-located with existing fueling centers, but it must be accessible to those vehicles that would have otherwise accessed the original fueling station.

Agencies should use the following methodology in meeting the EISA Section 246 requirements:

- **Determine renewable fuel pump requirements for each site.** Agencies should determine the most appropriate renewable fuel type for each Federal fleet fueling center lacking a renewable fuel pump, or lacking access to a renewable fuel pump. This determination should be made based upon existing and planned fleet characteristics. More detail on identifying the optimal E85, B20, and electricity strategies for each fleet location is provided in Section 5.4.
- **Consider and address installation and operation issues.** After selecting the renewable fuel type(s), the agency should assess the equipment, supply, storage, operational, and maintenance requirements to ensure operation of the installation. Agencies should evaluate the compatibility of existing refueling infrastructure for the renewable fuel and determine whether new infrastructure is required. Sections 6.1, 6.2 and 6.3 provide more detail on installing E85, B20, and electricity infrastructure at Federal fleet locations.
- **Procure renewable fuel.** Federal agencies should consider procuring renewable fuel either through DLA Energy or directly from ethanol or biodiesel suppliers. For renewable electricity, agencies must either ensure electricity is generated solely from a renewable source, or purchase RECs equal to or greater than the amount of electricity used to charge the vehicles at the fueling center.

3.10.4 **Reporting**

Federal agencies subject to EPOA requirements must report data on their Federal fleet fueling centers via FAST not later than mid-December of each calendar year. Agencies must complete all fields in the report, including the Federal fleet fueling center name, its location, and fuel types available at that station. Agencies should report all of their stations in existence at the end of the preceding FY and note if the station is temporarily unavailable.

Agencies may download a Microsoft Excel template from FAST. Beginning in 2021, the template will contain information about an agency’s previously reported fueling centers. That template can be filled with updated information about those fueling centers, along with the required information for any new fueling centers or fueling centers not previously reported. Once filled in, the agency can reload this template into FAST. Also, the Excel template has a second tab dedicated to EVSE. For more detailed guidance on FAST reporting, please refer to INL’s FAST Fueling Infrastructure Reporting FAQs.⁴³

Each year, FEMP compiles this information on the status of agency performance in complying with the renewable fuel pump installation requirements. FEMP uses the EVSE portion of the report to determine compliance with the FAST Act requirements for employees to reimburse agencies for EV workplace charging. The information is also populated in the AFDC Station Locator⁴⁴ database to identify alternative fuel availability for the Section 701 alternative fuel use requirements.

3.11 EISA Section 142 Fleet Planning

Section 142 of EISA (42 U.S.C. § 6374e(b)), emphasis added:

“(1) Requirement

(A) In general

The regulations under subsection (a) shall require **each Federal agency to develop a plan, and implement the measures specified in the plan by dates specified in the plan, to meet the required petroleum reduction levels and the alternative fuel consumption increases**, including the milestones specified by the Secretary.

(B) Inclusions

The plan shall—

- (i) identify the specific measures the agency will use to meet the requirements of subsection (a)(2); and
- (ii) quantify the reductions in petroleum consumption or increases in alternative fuel consumption projected to be achieved by each measure each year.

(2) Measures

The plan may allow an agency to meet the required petroleum reduction level through—

- (A) the use of alternative fuels;
- (B) the acquisition of vehicles with higher fuel economy, including hybrid vehicles, neighborhood electric vehicles, electric vehicles, and plug-in hybrid vehicles if the vehicles are commercially available;
- (C) the substitution of cars for light trucks;
- (D) an increase in vehicle load factors;
- (E) a decrease in vehicle miles traveled;
- (F) a decrease in fleet size; and
- (G) other measures.”

⁴³ Available at <https://fastweb.inl.gov/help/index.cfm/faqs>.

⁴⁴ Available at <https://afdc.energy.gov/stations>.

3.11.1 Overview of Requirements

Section 142 of EISA (42 U.S.C. § 6374e(b)) requires each agency to develop a plan to meet required petroleum reduction levels and alternative fuel consumption increases. The plan must “identify the measures the agency will use and quantify projections for petroleum and alternative fuel consumption in future years.”

3.11.2 Applicability

The applicability of Section 142 of EISA is the same as EAct 1992. Section 3.2.1.2 of this Handbook provides details on how to determine which agencies are subject to the EAct 1992 requirements.

3.11.3 EISA Section 142 Fleet Planning Requirements

EISA Section 142 requires agencies to develop a written plan, including implementation dates, to meet the required petroleum reduction and alternative fuel increase levels. The plan must “identify the specific measures the Federal agency will use to meet [the consumption goals]; and quantify the reductions in petroleum consumption and increases in alternative fuel consumption projected to be achieved by each measure each year.” 42 U.S.C. § 6374e(b)(1)(B).

3.11.3.1 *Aligning Fleet Planning Requirements in EISA Section 142 and E.O. 13834*

The plan required under EISA Section 142 is similar to the fleet component of an agency’s Sustainability Plan, addressing how the agency plans to meet the Federal fleet requirements associated with E.O. 13834. E.O. 13834 Implementing Instructions require agencies to meet or exceed the fleet energy and environmental statutory requirements (including the EISA Section 142 alternative fuel use increase requirements) and establish petroleum reduction (mandated by EISA Section 142) as the priority for Federal fleets.

“Pursuant to section 7(b) of E.O. 13834, agencies are required to report to the Chairman of CEQ and the Director of OMB regarding agency implementation and progress toward the goals of E.O. 13834 and relevant statutory requirements.

Pursuant to Section 2(h) and 7(b) of E.O. 13834, principal agencies are instructed to develop and submit an annual Sustainability Plan that summarizes actions implemented to meet the goals of E.O. 13834, progress results, cost savings, and the agency’s strategies for continued progress and performance improvements. Agencies will also identify yearly progress milestones in their Sustainability Plans, as indicated in these Instructions, as well as factors that have a material impact on agency implementation and progress, such as mission requirements or organizational changes.”

Agencies should consider submitting a single plan each year as a component of the Sustainability Plan (which is due earlier in the year), provided the fleet portion of this plan fulfills the EISA Section 142 requirements as those requirements are finalized. Details on Sustainability Plan reporting requirements will be provided by CEQ.

3.11.3.2 *Developing an Agency-Specific Fleet Plan*

In developing a plan for reducing petroleum and increasing alternative fuel use for an agency fleet, the first step is to establish the overall fleet component goals and align those goals with the agency’s Sustainability Plan. As described in the E.O. Implementing Instructions, agency fleet goals should focus on meeting or exceeding fleet requirements—with the focus on petroleum reduction—“in a manner that increases efficiency, optimizes performance, and reduces waste and costs.” Once set, these overarching goals must be aligned with existing regulatory requirements, and the agency should set quantifiable annual targets for fleet petroleum reduction, alternative fuel use, AFV acquisition (including EVs), alternative fuel infrastructure (including EV charging infrastructure) development, as well as other targets that the agency may require of itself.

Once an agency has identified its primary goals and annual targets, the agency should determine the appropriate combination of the core principles of sustainable fleet management and corresponding implementation strategies: right-sizing fleets and vehicles to mission, reducing VMT, increasing fleet efficiency, and using alternative fuels to displace petroleum use. These principles and strategies should help the agency achieve both petroleum reduction and alternative fuel use increase targets and are described in Chapter 6 of this document.

3.11.3.3 *Required Plan Components*

Each Federal agency subject to fleet planning requirements must develop a written plan, including implementation dates, to meet or exceed the required petroleum reduction and alternative fuel use increase target levels as well as other fleet requirements. This section describes the plan components needed to satisfy both the EISA Section 142 and E.O. 13834 fleet planning requirements in a single annual plan (or contained within the agency's annual Sustainability Plan).

The objective of the agency fleet sustainability planning process is for each agency to determine the most effective combination of specific measures it will implement to achieve the petroleum reduction and alternative fuel use increase target levels while meeting or exceeding other relevant fleet requirements. At the completion of the planning process, agencies will specify these strategies and project reductions in petroleum use and increases in alternative fuel use to be achieved through implementation of those measures. Recommended outputs from the planning process are outlined below.

1. **Fleet Inventory Projections.** Projections should illustrate how the agency will reach or maintain a “right-sized” fleet. In other words, the agency should identify and create a plan for reaching the minimum number of the most fuel-efficient vehicles required to meet its mission, including identifying opportunities to eliminate vehicles that exceed requirements. Federal agencies should identify opportunities to decrease fleet size—including reductions from minimizing VMT—and utilize their VAM⁴⁵ to: (1) ensure that AFVs are acquired and located where alternative fuel is available; (2) reduce petroleum use through the acquisition of smaller-sized and hybrid vehicles; (3) reduce petroleum use and increase alternative fuel use through the acquisition of AFVs, including EVs, and; (4) ensure that the most fuel-efficient vehicle is used for the required task. Sections 3.8 and 5.1 of this Handbook provides more detailed guidance on how to right-size fleets to agency mission. Sections 5.2, 5.3, and 5.4 discuss strategies to reduce VMT, increase fleet fuel economy, and increase use of alternative fuels (including electricity) respectively.
2. **Petroleum Reduction Projections.** Agencies should identify the specific measures they will implement to reduce petroleum use and project the amount by which they expect each measure to decrease their petroleum use each FY. The core principles of petroleum reduction—right-size fleets and vehicles to mission, reduce VMT, increase fleet fuel efficiency, and use alternative fuels including electricity—are detailed in Chapter 5 of this Handbook.
3. **Alternative Fuel Use Increase Projections.** Within their fleet plans, agencies must identify the specific measures they will implement to increase alternative fuel use and project the amount by which they expect each measure to increase their alternative fuel use each year. Section 5.4 of this Handbook is designed to assist agencies in evaluating and selecting strategies to increase alternative fuel use and meet or exceed regulatory requirements. Agencies should use this analysis to: (1) align deployment of AFVs with fueling infrastructure, including reducing deployment of AFVs in locations where the appropriate alternative fuel is not available and (2) create and describe their alternative fueling infrastructure

⁴⁵ The VAM process is described in Sections 3.8 and 6.1 and required by GSA FMR §102-34.50.

development plans and actions, including collaboration with other Federal, state, and local agencies and other entities.

4. **EPAAct 1992 AFV Acquisition Projections.** Agencies should also ensure that the annual number of AFV acquisitions in their fleet inventory projections meet or exceed the annual EPAAct 1992 AFV acquisition requirements.

The planning process should also address the agency’s process for effective implementation of the fleet goals. This includes the following fleet-specific Sustainability Plan requirements:

1. **Leadership and Accountability.** Agencies should identify the agency lead(s) for meeting fleet goals, with responsibility for fleet implementation and oversight.
2. **Implementation Methods.** Agencies should identify the method for implementation of the cost, schedule, and performance toward achieving the fleet goals. This should include implementation in both the central office and in the field, including the workforce training and education.

All analyses used in an agency’s fleet sustainability planning process should match the data reported in the FAST fleet data system.⁴⁶ Senior agency management should oversee and approve the agency fleet sustainability planning process, and clearly assign responsibility for implementation and address resource requirements necessary for success. CEQ may issue additional instructions for agencies’ Sustainability Plans, and fleet managers should seek and refer to any CEQ guidance on E.O. 13834 Sustainability Plans.

3.11.4 Developing and Submitting EISA Section 142 Fleet Plans

Table 19 provides the required procedures for developing and submitting EISA Section 142 fleet plans. Agencies subject to the fleet planning requirements are required to develop initial plans and update and resubmit plans as necessary each year, as outlined below.

Table 19. Procedures for Developing and Submitting Fleet Plans

<p>Federal agencies subject to the EISA Section 142 and E.O. 13834 requirements must:</p> <ul style="list-style-type: none"> • Update and submit an annual Sustainability Plan • Include in the Sustainability Plan how the agency will achieve E.O. 13834 fleet sustainability goals, including EISA Section 142 petroleum reduction and alternative fuel use targets • Describe the specific measures the agency will implement to achieve the EISA Section 142 petroleum reduction and alternative fuel use targets and other relevant fleet requirements 	<p>Due Date: June 30 each year</p>
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⁴⁶ Available at <https://fastweb.inl.gov>.

3.12 GSA FMR Federal Management Information System

40 U.S.C. §§ 17502 and 17503 require that each Federal agency must have a FMIS. GSA's FMR § 102-34.340 provides more specifics on what should be included in an FMIS including that it: (1) "identifies and collects accurate inventory, cost, and use data"; (2) "provides the information necessary to satisfy both internal and external reporting requirements"; (3) collects all costs incurred in the operation, maintenance, acquisition, and disposition of motor vehicles used for official purposes; and (4) is capable of providing the data required for external reporting, such as FAST. More detailed discussion of this requirement is available in GSA's FMR Bulletin B-15.

The E.O. 13834 Implementing Instructions requires agencies to ensure all ALD collected through the agency FMIS is accurate and complete. Agencies that do not have an FMIS for owned vehicles are encouraged to use GSA Fleet's Federal Fleet Management System (FedFMS), for no additional cost.

4 Federal Fleet Management Framework

Section 1.4 of this Handbook introduced a recommended **framework for fleet managers to develop, implement, and execute an overall fleet-specific petroleum reduction strategy**—while complying with all Federal goals and mandates and optimizing fleet management. This framework is arranged into the following four components, which are discussed in more detail in the remaining sections of this chapter:

1. **Plan.** Establish an overall agency integrated multi-year strategic plan to reduce petroleum consumption. The output of the planning phase includes the fleet component of the agency E.O. 13834 Sustainability Plan and Section 142 Fleet Plan.
2. **Collect.** Compile and manage accurate and comprehensive ALD to enable agencies to optimize fleet decision making, establish a baseline fleet profile, and use that profile to right-size the fleet and vehicles to the agency mission. E.O. 13834 supports this by promoting improved data collection and management requirements, including vehicle telematics and ALD reporting. This data will enable agencies to support identifying the most promising fleet strategies to reduce petroleum consumption in the third framework step, strategize.
3. **Strategize.** Evaluate strategies at each fleet location to reduce petroleum consumption, including right-sizing fleets and vehicles to missions, reducing VMT and idling, increasing fleet fuel efficiency, and increasing use of alternative fuels (including biodiesel blends) and electricity (through deployment of EVs and related charging infrastructure).
4. **Implement.** Acquire and locate vehicles to support petroleum reduction strategies, ensure fleet and individual vehicles are right-sized to the agency mission, support alternative fuel infrastructure development where possible, monitor and report performance in meeting petroleum reduction targets, identify deficiencies, and refine strategy as needed. Both vehicle location and duty cycle are important factors for implementing many petroleum reduction strategies, including identifying candidate vehicles for replacement with EVs and deploying dual-fueled vehicles in locations where alternative fuel infrastructure is available.

4.1 Plan

The first step in developing a framework for creating and implementing a fleet-specific petroleum reduction strategy for Federal fleet managers is developing an agency-specific fleet plan. This process typically includes the steps and components detailed below:

1. **Establish an overall fleet management strategy.** The first step in crafting a fleet plan is to define the overarching fleet management vision and goals. At the minimum, the fleet must comply with all Federal fleet management statutes, with meeting or exceeding the EISA Section 142 petroleum reduction goal as the priority for fleet performance. Other goals may include reducing fleet costs, improving fleet fuel efficiency, getting to green on the annual OMB scorecard, transforming existing the fleet composition to new vehicle types or capabilities, investing in agency fleet or infrastructure, or a combination of any of these.
2. **Align strategy with fleet regulatory requirements.** After setting an overarching fleet management vision and goals, the agency should establish quantifiable annual targets for fleet petroleum reduction, alternative fuel use increases, AFV and low-GHG emitting vehicle acquisition, renewable fuel infrastructure development, as well as other targets that may be required of or important to the agency. The agency can then use these targets to evaluate whether petroleum reduction strategies both achieve the overall fleet management strategy and comply with statutory mandates.

3. **Determine the appropriate mix of the core principles and their corresponding implementing strategies for each fleet location.** In order to achieve the vision of E.O. 13834, meet mission-critical needs, and comply with all Federal goals and mandates, an agency can reduce petroleum use through the appropriate combination of the four core principles introduced below and detailed in Chapter 5:
- **Right-sizing** the fleet to agency mission by implementing a VAM study
 - **Minimizing VMT**
 - **Increasing fleet efficiency** by replacing inefficient vehicles with more fuel-efficient vehicles, maintaining vehicles, driving more efficiently, and avoiding excessive idling
 - **Optimizing cost-effective alternative fuel use**, including maximizing utilization of existing alternative fuel infrastructure, installing alternative fuel infrastructure where practical (including EV charging stations), and aligning deployment of AFVs with fueling infrastructure.

Agency fleet managers should evaluate petroleum reduction strategies and tactics for each fleet location based on an evaluation of site-specific characteristics, including availability of alternative fuel, fleet size, and fleet vehicle composition.

4. **Create a written fleet-specific multi-year strategic plan to reduce petroleum use.** As required by E.O. 13834 and EISA Section 142, each Federal agency subject to the fleet planning requirements (see section 3.11 of this Handbook) must develop a written plan, including implementation dates, to meet the required petroleum reduction and alternative fuel increase levels, and other relevant Federal fleet requirements. As discussed in Section 3.11.3.1, agencies may submit a single plan each year as a component of the Sustainability Plan. The agency plan will list the planned petroleum reduction strategies and tactics for each fleet location and project estimated reductions in petroleum consumption and increases in alternative fuel consumption to be achieved by each specific measure.⁴⁷ Chapter 5 provides detailed information to support the fleet planning process.

4.2 Collect

4.2.1 Collecting and Managing ALD

Collecting and managing high-quality data are critical elements to effective fleet management and are necessary prerequisites to developing strategies to comply with Federal fleet requirements. The importance of collecting and managing comprehensive and accurate fleet data cannot be overstated. Top-down support for data collection and management is vital to communicate the importance of data quality through all levels of an organization.

Each Federal agency is responsible for collecting and reporting ALD on its vehicle fleet. As summarized in Section 3.12 and detailed in GSA Bulletin B-15, each Federal agency must have an FMIS that: (1) identifies and collects accurate inventory, cost, and use data; (2) provides the information necessary to satisfy both internal and external reporting requirements; (3) collects all costs incurred in the operation, maintenance, acquisition, and disposition of motor vehicles used for official purposes; and (4) is capable of providing the data required for external reporting, such as FAST.

Agencies must ensure their FMIS can support the collection and management of data at the asset level and support internal and external reporting requirements. This includes feeding relevant ALD to each of the three primary Federal fleet data management systems—FMVRS, FAST, and FleetDASH. An overview of each of these systems and the relevant ALD in the FMIS are provided in the sections below.

⁴⁷ See 42 U.S.C. § 6374e(b)(1)(B).

4.2.1.1 *Fleet Management Information System*

Section 102-34.340 of the GSA FMR requires agencies to implement a comprehensive FMIS. An FMIS serves as a centralized system to identify, collect, and analyze ALD and enables agencies to report all costs incurred for the operation, maintenance, acquisition, and disposal of its vehicles. For GSA-leased vehicles, GSA provides Fleet Drive-thru as a comprehensive solution. GSA Fleet Drive-thru⁴⁸ is an innovative mileage reporting and fleet analysis tool that provides important applications, including reports for inventory, fuel use, mileage data, and accidents. Agencies that do not have an FMIS for owned vehicles are encouraged to use GSA Fleet's FedFMS, for no additional cost. GSA's Office of Governmentwide Policy offers guidance and suggestions for developing and implementing an FMIS in FMR Bulletin B-15.⁴⁹ Many agencies have employed such a system that manages some combination of their agency owned, commercially leased, and GSA leased vehicles. Table 20 is a sample FMIS checklist.

⁴⁸ Available at www.gsa.gov/fleetdrivethru.

⁴⁹ Available at https://www.gsa.gov/cdnstatic/GSAFMRBulletinB15_92107.doc.

Table 20. Fleet Management Information System Data Fields Checklist

<p>Data: Vehicle Identification and Configuration</p> <ul style="list-style-type: none"> <input type="checkbox"/> Vehicle Identification Number (VIN) <input type="checkbox"/> Year <input type="checkbox"/> Make <input type="checkbox"/> Model <input type="checkbox"/> Color <input type="checkbox"/> Engine configuration (dedicated, flex-fuel, bi-fuel) <input type="checkbox"/> Fuel type(s) <input type="checkbox"/> Gross Vehicle Weight Rating (GVWR) <input type="checkbox"/> License plate number(s) <input type="checkbox"/> FAST vehicle type (may be derived from other attributes) <input type="checkbox"/> Fuel economy rating(s) <input type="checkbox"/> GHG score(s) <input type="checkbox"/> Vehicle drive train type (2WD/4WD/Other) <input type="checkbox"/> Armor level <input type="checkbox"/> Vehicle mission/purpose/role <p>Data: Vehicle Utilization</p> <ul style="list-style-type: none"> <input type="checkbox"/> Fleet/motor pool assignment <input type="checkbox"/> Vehicle Point of Contact (POC) information <input type="checkbox"/> Location (latitude/longitude or detailed street address) <input type="checkbox"/> Assignment status (assigned, unassigned, awaiting maintenance, awaiting disposal) <input type="checkbox"/> Vehicle mileage <input type="checkbox"/> Fuel consumption (date, cost, quantity, type, location) <p>Data: Vehicle Compliance Attributes</p> <ul style="list-style-type: none"> <input type="checkbox"/> EPA Act Law Enforcement vehicle designation <input type="checkbox"/> EPA Act Emergency/Emergency Response vehicle designation <input type="checkbox"/> EPA Act non-MSA operation designation <input type="checkbox"/> EPA Act Sec 701 waiver and reason <input type="checkbox"/> EISA Sec 141 designation at time of acquisition <p>Data: Vehicle Acquisition and Disposal</p> <ul style="list-style-type: none"> <input type="checkbox"/> Acquisition date <input type="checkbox"/> Acquisition method/source, relevant details (e.g., lease type) <input type="checkbox"/> Acquisition costs <input type="checkbox"/> Vehicle age at acquisition <input type="checkbox"/> Planned disposal date 	<ul style="list-style-type: none"> <input type="checkbox"/> Disposal date <input type="checkbox"/> Disposal method <input type="checkbox"/> Disposal costs <input type="checkbox"/> Disposal proceeds <input type="checkbox"/> Fair market value at time of disposal (primarily owned vehicles) <p>Data: Vehicle Repairs and Servicing</p> <ul style="list-style-type: none"> <input type="checkbox"/> Repair history <input type="checkbox"/> Maintenance history (unscheduled repairs, preventive maintenance, accident repairs) <input type="checkbox"/> Out-of-service dates <input type="checkbox"/> Schedule/notification of preventive maintenance <p>Data: Vehicle Accident Reporting</p> <ul style="list-style-type: none"> <input type="checkbox"/> Accident date/time <input type="checkbox"/> Vehicles involved <input type="checkbox"/> Operator <input type="checkbox"/> Third-party information <input type="checkbox"/> Vehicle downtime <input type="checkbox"/> Cost and nature of vehicle repairs <p>Data: Vehicle Cost Data (Direct Costs)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Capitalized value <input type="checkbox"/> Depreciation <input type="checkbox"/> Amortization <input type="checkbox"/> Disposal proceeds <input type="checkbox"/> Vehicle modifications and accessory equipment <input type="checkbox"/> Fuel cost and consumption (date, quantity, fuel type, location of purchase) <input type="checkbox"/> Repair and unscheduled maintenance costs <input type="checkbox"/> Preventive maintenance costs <input type="checkbox"/> Commercial or GSA Fleet lease costs <p>Data: Organizational Cost Data (Indirect Costs)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Facility costs (e.g., building purchase/lease, utilities, maintenance) <input type="checkbox"/> Equipment costs (e.g., office and shop equipment, tools) <input type="checkbox"/> Staffing costs (e.g., headquarters, field and shop personnel) <input type="checkbox"/> Staffing overhead costs (e.g., training, staff support offices) <input type="checkbox"/> Administrative costs 	<p>Capabilities:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Automated interface to GSA Automotive Division system(s) for vehicle ordering, and tracking vehicles through ordering process <input type="checkbox"/> Ability to review vehicle repair history prior to authorizing repair <input type="checkbox"/> Ability to schedule and notify vehicle POCs/users of preventive maintenance services <input type="checkbox"/> Facilitate preparation of accident tracking and frequency reports <input type="checkbox"/> Ability to generate exception reports to identify vehicles and/or operators deemed to be requiring attention <input type="checkbox"/> Retain complete vehicle records for minimum of one year following disposal <input type="checkbox"/> Ability to generate monthly, quarterly, annual financial reports <input type="checkbox"/> Ability to generate cost/financial reports to identify costs outside of industry norms <input type="checkbox"/> Analytic tools and query capabilities to support data analysis <input type="checkbox"/> Ability to automate reporting to FAST <input type="checkbox"/> Automated interface to GSA Fleet systems, as appropriate, for leased vehicle inventory and leased vehicle operational data (e.g., costs, mileage, fuel consumption) <input type="checkbox"/> Automated interface to GSA FMVRS as part of vehicle acquisition and license plate management processes <input type="checkbox"/> Automated interface to other GSA Automotive Division systems, as appropriate <input type="checkbox"/> Capable of interfacing with internal agency information systems (e.g., property management/accountability systems, financial systems) <input type="checkbox"/> Ability to automate or facilitate EPA Act Sec 701 waiver request process <input type="checkbox"/> Ability to facilitate management/assignment of approved EPA Act Sec 701 waivers <input type="checkbox"/> Ability to review current year-to-date progress relative to legislative and E.O. compliance benchmarks <input type="checkbox"/> Ability to review vehicle utilization data and identify vehicles outside of fleet and industry norms
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4.2.1.2 Federal Motor Vehicle Registration System

Agencies must register any motor vehicles owned or leased by Federal agencies that display U.S. Government license plates within the FMVRS per GSA's FMR § 102-34.120. Federal fleets use the FMVRS to enter, query and update vehicle and license plate information for their vehicles.⁵⁰ Each agency should ensure its capability to provide and update FMVRS data on a regular basis from its FMIS. Vehicles leased through GSA Fleet are automatically registered in FMVRS.

Agency fleet managers use FMVRS to ensure that requested license plates are appropriately managed and assigned to a government vehicle for official use. It is the responsibility of each fleet manager to update and maintain agency and license plate records in FMVRS, including:

- Managing tag status, including acknowledging receipt of all tags, in FMVRS (within 30 days after shipment from the manufacturer), tags attached to vehicles, tags lost or stolen (in accordance with GSA's FMR § 102-34.135), or tags returned to the manufacturer for destruction.
- Properly associating and disassociating tags with VINs as needed
- Verifying accuracy of vehicle information
- Entering and updating contact information for each vehicle.

4.2.1.3 Federal Automotive Statistical Tool

Federal agencies are required to collect and report accurate fuel consumption, mileage, cost, inventory, and acquisition, and mileage data into FAST⁵¹ for each FY. Entering the information into the FAST reporting tool allows DOE to determine whether the fleet has complied with a variety of sustainability regulatory obligations, including: (1) EISA Section 142 petroleum reduction requirements; (2) EISA Section 142 alternative fuel use increase requirements; (3) EPA 1992 AFV acquisition requirements; and (4) Section 701 of EPA 2005 requirements regarding alternative fuel use in dual-fueled vehicles. Fleet data reporting requirements in FAST are summarized in Table 21.

⁵⁰ FMVRS can be accessed at <https://fmvrs.fas.gsa.gov/>.

⁵¹ Available at <https://fastweb.inl.gov>.

Table 21. Timeline and Procedures for Developing and Submitting Fleet Plans

Data Requirement	Federal Fleet Requirement	Due Date
Actual fuel cost and consumption by fuel type	EISA Section 142: Evaluate compliance with petroleum reduction and alternative fuel use increase requirements EPA 2005 Section 701: Evaluate compliance with alternative fuel use in dual-fueled vehicles OMB Circular A-11: Development of AFBS	Mid-December each year
Vehicle inventory, acquisition, and disposal data	EPA 1992: Evaluate compliance with AFV acquisition requirements EISA Section 141: Report on compliance with acquisition of low GHG-emitting vehicles OMB Circular A-11: Development of AFBS	Mid-December each year
Vehicle cost and mileage data by vehicle type	E.O. 13834: Evaluate performance on fleet-wide mpgge of petroleum fuel progress metric OMB Circular A-11: Development of AFBS	Mid-December each year
EVSE Inventory	FAST Act of 2015 (Public Law No. 114-94): Requirement to report information about EVSE supporting the motor vehicle fleet as well as any EVSE available to support workplace charging programs	Mid-December each year
Optimal fleet inventory	GSA FMR § 102-34.50: Data supports the VAM process to right-size the fleet and vehicles to the agency mission.	June 30 each year
EPA 2005 Section 701 waiver requests	EPA 2005 Section 701: Request waivers for individual vehicles from requirement to use alternative fuel in dual-fueled vehicles	June 30 each year
Federal fleet fueling centers	EISA Section 246: Federal fleet fueling center throughput and renewable fuel pump data; evaluate compliance with requirement to install renewable fuel pumps	June 30 each year

4.2.1.4 *FleetDASH*

FleetDASH⁵² is an online tool that provides Federal fleets with the capacity to track—at the asset level and at regular intervals—agency fleet fuel consumption, vehicle usage patterns, and vehicle inventories. FleetDASH users can view national summaries or drill down through agency organization levels to view individual vehicle operational patterns and fuel transactions relative to the location of existing alternative fuel infrastructure. FleetDASH allows agency users to evaluate progress in meeting petroleum reduction, alternative fuel use increase, and other sustainability efforts and identify opportunities for improvement.

Specifically, the tool uses geographic analysis to identify “missed opportunities,” or instances in which conventional fuel was used when alternative fuel was available for refueling of fleet dual-fueled vehicles. An alternative fuel is determined to be available if a station known to sell the fuel is accessible by the fleet, accepts the appropriate fueling card used by GSA-leased or agency-owned vehicles, and is within 53 miles of the station where petroleum was purchased.

Section 3.9 explains how FleetDASH is used to automate the process to grant waivers and calculate compliance for Section 701 of EPA Act 2005. FleetDASH automates these processes for vehicles with fueling transaction data captured in the tool. Data required to support FleetDASH include vehicle attribute and vehicle-level fuel use transaction data. Required vehicle attribute data include:

- Unique vehicle identifier (preferably VIN)
- Organization assignment of each vehicle
- Fuel types on which each vehicle is capable of operating
- Law enforcement designation
- Emergency response designation
- Vehicle class and other descriptive information
- Garage location and point of contact information
- Vehicle utilization metrics, such as vehicle mileage.

Required fuel-transaction data include:

- Specific vehicle fueled
- Fuel quantity purchased
- Date of fuel purchase
- Fuel type purchased
- Fueling location

4.2.2 **Using Fleet Data to Implement a VAM**

After establishing accurate and comprehensive ALD in an FMIS, agencies can use that data to develop an optimal fleet profile and implement a VAM to right-size the fleet and vehicles to the agency mission. Typically, the first step in developing an optimal fleet profile begins with gathering fleet data managed in an

⁵² Available at <https://federalfleets.energy.gov/FleetDASH/>.

agency's FMIS. Once the data is collected, the agency can begin conducting a detailed fleet utilization study, which entails identifying agency mission tasks and vehicle assets assigned to those tasks and allows each agency to establish a baseline fleet profile. Agency fleet managers can then use the results of the baseline fleet profile to create a list of vehicles approved for each organization that meets the agency mission and establish policies and procedures for the allocation of fleet vehicles. Ultimately, the VAM will guide the agency's vehicle acquisition and replacement plan to ensure the fleet is correctly sized and mission appropriate—the optimal fleet.

4.2.3 Using Fleet Data to Identify Opportunities to Optimize Fleet Performance

The collection, management, and analysis of comprehensive fleet ALD will enable agencies to optimize fleet decision-making in identifying the most promising fleet strategies to reduce petroleum consumption in the third framework step, strategize. Fleet managers can use fleet data to evaluate the historical effectiveness of petroleum reduction strategies at each fleet location. These analyses can help determine areas where the fleet has been successful as well as identifying the greatest opportunities to improve performance.

Evaluating ALD allows agencies to assess the suitability and performance of each vehicle at each fleet location. Fleet managers can identify vehicles that are underutilized, inefficient, costly, or misaligned with available fueling infrastructure within the operating location. Analyzing these data allows fleet managers to identify and target underperforming fleet vehicles and locations, and tailor petroleum reduction strategies for each fleet location that are most effective at impacting performance on petroleum consumption and fleet costs.

4.3 Strategize

In the second framework step, collect, agency fleet managers evaluated ALD to help identify the most promising opportunities to reduce petroleum consumption at each fleet location. Agencies can then craft the most effective petroleum reduction strategies at each fleet location by evaluating the most appropriate combination of the four core principles of petroleum reduction. These principles, which are detailed in Chapter 5 of this Handbook, are summarized in the sections below.

4.3.1 Principle I—Right-Size Fleets and Vehicles to Mission

Agencies can use right-sizing to identify and eliminate inefficient vehicles and replace them, if necessary, with vehicles that use less petroleum per mile (i.e., more fuel efficient vehicles). Right-sizing enables agencies to determine the optimum fleet inventory at each fleet location that supports the overall fleet petroleum reduction strategy. Using this principle will help fleets identify opportunities to eliminate unnecessary vehicles, deploy more efficient vehicles, reduce fuel usage and miles driven, and promote the deployment and use of AFVs. Additionally, right-sizing should help agencies identify opportunities to promote the cost-effective operation and maintenance of the fleet throughout the life cycle of fleet vehicles.

4.3.2 Principle II—Reduce Vehicle Miles Travelled

Agency fleets can reduce their fuel consumption by implementing tactics to reduce VMT and avoid unnecessary transportation, including:

- **Eliminating vehicle trips.** Use telephone, video, and web conferencing tools for meetings, work from home when practical, and walk or bike as appropriate.
- **Consolidating trips.** Consolidate routes and carpool to eliminate duplication of trips.
- **Providing agency shuttles.** Provide a shuttle service for high-use routes to consolidate trips.
- **Using mass transportation.** Use mass transportation alternatives to eliminate fleet vehicle transportation needs.

- **Improving scheduling and routing.** Optimize travel time and distance for delivery of services by using telematics and global positioning system (GPS) technology to improve routing and efficiency of fleet vehicles.
- **Implement transportation on demand (TOD).** Use demand-responsive systems to offer shuttle, bus, or carpooling service to employees.

4.3.3 Principle III—Increase Fleet Fuel Efficiency

Encouraging agency fleet fuel efficiency is one of the key goals of the E.O. 13834 and other Federal fleet requirements. Fleet managers can increase vehicle fuel efficiency by:

- **Acquiring fuel-efficient vehicles.** Agencies should deploy the smallest, most fuel-efficient vehicles appropriate for the vehicle's mission.
- **Acquiring HEVs.** HEVs often top their vehicle classes in fuel economy. At the same time, they do not require alternative fueling infrastructure.
- **Maintaining vehicles to improve fuel economy.** Implement best practices such as maintaining recommended tire pressure and performing scheduled maintenance to keep vehicles in proper working order.
- **Driving more efficiently.** Drive sensibly, observe the speed limit, remove excess weight, use cruise control, and map more efficient, fuel-saving routes.
- **Avoiding excessive idling.** Implement best practices such as turning off engines when vehicles are idle to eliminate unneeded fuel use, and adding idling mitigation systems to power the vehicle's onboard systems or equipment without using the engine.

Fleet managers should also note that they can maximize overall fleet fuel efficiency gains and petroleum reductions by applying the measures above to increase the fuel efficiency of their least-efficient vehicles (e.g., MDVs and HDVs).

4.3.4 Principle IV—Optimize Cost-Effective Alternative Fuel Use

This principle focuses on maximizing the displacement of petroleum with alternative fuels. Alternative fuels include (but are not limited to): E85 (a blend of 85% ethanol and gasoline), neat (100%) biodiesel,⁵³ neat (100%) renewable diesel (R100), hydrogen, CNG, LNG, and LPG. Agencies should consider using alternative fuels whenever possible and should decide on the type of AFV and infrastructure based on the fleet location characteristics:

- **EVs, including BEVs and PHEVs, and their charging infrastructure** are suitable for most fleet locations, especially those without access to other alternative fuels.
- **AFVs that use E85, CNG, hydrogen, and other alternative fuels that require dedicated infrastructure** should be placed at fleet locations where alternative fuel is available or at high-use locations where alternative fuel sites are planned in the near-term. In order to promote increased alternative fuel consumption by AFVs in the Federal fleet, Section 701 of EPOA 2005 requires Federal agencies to use only alternative fuel in its dual-fueled AFVs, except where the vehicles have received a waiver from DOE due to the local unavailability of alternative fuel or fuel that is unreasonably more expensive than gasoline. This means, for example, that if E85 infrastructure is available at or near a fleet

⁵³ The definition of alternative fuels (42 U.S.C. 13211(2), Section 301(2) of EPOA 1992) includes pure biodiesel (B100) but not biodiesel blends. However, agencies may count the pure biodiesel component of biodiesel blends greater than 20% (B20 or greater) toward the reduction target for fleet GHG emissions.

location, fleet E85 FFVs operating at that location are required to refuel solely with E85 using that infrastructure.

- **Biodiesel blends, which require dedicated infrastructure but can be used in conventional diesel vehicles**, are ideal for locations with high diesel fuel use.

To maximize petroleum reduction, agencies should support strategies to increase alternative fuel use by:

- **Acquiring AFVs**, including BEVs and PHEVs, and placing them in or near areas with existing or planned alternative refueling sites (agencies should ensure alternative fuel infrastructure, including charging infrastructure and the associated fuel necessary to support dedicated AFVs, is in place before accepting delivery of vehicles), and by running dual-fueled vehicles on alternative fuel
- **Installing alternative fuel infrastructure (including charging infrastructure)** in fleet locations with the highest AFV concentrations that use that fuel type
- **Communicating and coordinating with nearby fleets** (both public and private sector) to aggregate demand for alternative fuel.

4.4 Implement

The final framework step is to implement the fleet- and location-specific petroleum reduction strategies identified in the strategize framework step, in a manner that most effectively achieves the overarching fleet management vision and annual targets for fleet petroleum reduction, alternative fuel use increase, AFV and low-GHG emitting vehicle acquisition, renewable fuel infrastructure development, as well as other targets that may be required of or important to the agency.

Implementation of petroleum reduction strategies at each fleet location includes five components, which are discussed in more detail below: (1) acquisition of fleet vehicles, (2) improving fleet operation and maintenance, (3) deploying alternative fuel infrastructure; (4) monitoring performance and meeting targets; and (5) refining to meet compliance and fleet objectives and goals.

4.4.1 Acquisition of Fleet Vehicles

Federal fleet managers can use vehicle acquisition (as identified in the VAM) to implement the agency's optimal petroleum reduction strategy selected for each fleet location. Acquisition plans should reflect the numbers and types of vehicles required to accomplish the fleet's mission and ensure fleet and individual vehicles are right-sized to the agency mission. In developing vehicle acquisition plans, fleet managers should look broadly at the costs and benefits of different vehicle types, including the driving environment for which they are best suited. Agencies should acquire:

- **Vehicles right-sized to the mission** by employing the most fuel-efficient vehicle for the required task, such as low GHG-emitting LDVs and MDPVs
- **AFVs** for locations with access to alternative fuel
- **Biodiesel-capable vehicles** for locations with access to biodiesel blends (most diesel vehicles can operate on B20).

Vehicle acquisition supports the key strategies to achieve GHG emission and petroleum reduction targets as follows:

- **Increasing fleet fuel efficiency.** Integral to reducing petroleum use is the acquisition of higher fuel economy vehicles. Agencies should identify through the VAM process the smallest, most fuel-efficient vehicles appropriate for the vehicle's mission, and deploy those vehicles through their vehicle

acquisition cycle. In most cases, a successful implementation of this strategy can be achieved through acquisition of low GHG-emitting vehicles, which are fundamentally the most fuel-efficient vehicles in their class, and through acquisition of devices that improve vehicle fuel economy, such as idling-reduction devices and telematics. Often the most cost-effective way to achieve petroleum reduction through improved fuel efficiency is by focusing on increasing the fuel efficiency of the least-efficient vehicles.

- **Implementing alternative fuel, biodiesel blend, and renewable diesel blend strategies.** Success in achieving and exceeding alternative fuel use mandates depends not only on fuel availability but also on vehicles that can use the fuels.
- **Implementing EV strategies.** EVs are extremely fuel efficient and operate on electricity, an alternative fuel. EVs are both low GHG-emitting vehicles and AFVs.

4.4.2 Improving Fleet Operation and Maintenance

Strategies to reduce VMT and increase fuel efficiency include the following implementation opportunities that should be evaluated for each fleet location:

- **Deploy shuttle services where practical.** Guidance for Federal agencies for providing transportation and shuttle services for Federal employees is provided in GSA FMR Bulletin B-28, Federal Employee Transportation and Shuttle Services. This bulletin establishes employee transportation policies, including shuttle policies, that “maximize the use of public transportation and sharing of Federal transportation among agencies.” Operational recommendations include making agency shuttle routes available to other agencies where feasible, consolidating overlapping shuttle services, incorporating AFVs in shuttles services, and enhancing the use of public transportation by Federal employees.
- **Establish vehicle pools or car-sharing programs at larger fleet locations.** One way for Federal fleets to increase vehicle utilization and reduce vehicle counts (and associated costs) is to establish motor vehicle pools at larger fleet locations. Creating a vehicle pool allows a fleet location to remove underutilized vehicles while still providing access to services that meet the transportation mission need.
- **Launch transportation-on-demand (TOD) services.** TOD services allow users to request transportation services when needed, rather than rely on an assigned fleet vehicle or vehicle pool. This includes establishing a system to schedule and deliver the following transportation services: (1) ride-sharing by booking a specific ride from one location to another; (2) car rental from hours to a few weeks; and (3) station-based mobility that allows drivers to share a trip to the same location.
- **Improve vehicle preventative maintenance programs.** A comprehensive vehicle maintenance strategy can help fleet managers and drivers reduce fuel use. Regular engine tune-ups ensure that vehicles operate efficiently and can increase fuel economy. Using the manufacturer's recommended grade of motor oil in an engine can improve fuel economy by up to 2%. Properly inflated tires last longer, increase fuel economy, and are safer. Every decrease in pressure by 1 pound per square inch for 4 tires can decrease fuel economy by 0.2% (keeping tires properly inflated can improve fuel efficiency by 0.6% on average, and up to 3%).
- **Purchase low-rolling-resistance tires.** While new cars are generally equipped with low-rolling-resistance tires, replacement tire efficiency varies significantly. Estimates from Bridgestone indicate that a 5% reduction in rolling resistance can increase overall vehicle efficiency by 1.3–1.7%.
- **Install anti-idling devices and policies where appropriate.** When idling, vehicles typically burn from 0.25 to 1 gallon of fuel per hour. Unnecessary idling pollutes the air, wastes fuel, and causes excess engine wear—and reducing idle time is a simple policy to implement. Establishing anti-idling policies, such as requiring drivers to turn off engines when parked or stopped for longer than a minute, is effective

at helping to reduce unnecessary vehicle idling. Ambient temperature may be considered in an idling policy (such as permitting vehicles to idle if the outside temperature is below 32 degrees Fahrenheit). Additionally, a variety of technologies are available to reduce idling. These include onboard equipment such as automatic engine stop-start controls and auxiliary power units as well as technologies to keep the cabin warm when the engine is off (coolant heaters, air heaters, and energy recovery systems).

- **Use telematics to assess and improve routing, scheduling, and driving behavior.** Fleets can use telematics data to identify driving inefficiencies and reduce VMT and fuel use. Telematics solutions can help fleets optimize vehicle routes and schedules or provide geofencing to alert the fleet manager when drivers are traveling outside of their assigned routes. Telematics also can alert fleet managers and drivers to driving behaviors that impact the fuel efficiency of their vehicles. Research by NREL shows that improving driving behavior can reduce vehicle fuel use 5% to up to 20% for aggressive drivers.

4.4.3 Deploying Alternative Fuel Infrastructure

To ensure effective implementation of strategies to displace petroleum by using alternative fuels, fleet managers must evaluate for each fleet location the availability of existing alternative fuel infrastructure, determine where new infrastructure is required, and procure the alternative fuel. The following section provides an overview to assist in deploying E85, biodiesel blend, and electric vehicle strategies.

E85 Infrastructure

Federal agencies wishing to install E85 fueling infrastructure can either convert an existing tank system or install a new tank system. At refueling sites with more than one available gasoline or diesel tank, Federal agencies can convert one of the tank systems to E85. This typically costs much less than installing a new tank system. The conversion process includes cleaning the tank and lines, ensuring fuel lines and dispenser components are compatible with E85, and calibrating the fuel metering system. At Federal fleet refueling centers without tanks that can be converted to E85, Federal agencies must install a new E85 tank. Typically, this is the costliest alternative, involving installation of a new storage tank and associated equipment, as well as related excavation, concrete, and electrical work, if necessary. Options available include installing a new underground storage tank, a new aboveground storage tank, or an aboveground turnkey E85 refueling system.

Biodiesel and Biodiesel Blend Infrastructure

Most refueling systems designed to handle diesel fuel will handle biodiesel and biodiesel blends with no problem. B20 or lower blends minimize most issues associated with materials compatibility. At refueling sites with more than one available diesel tank, Federal agencies can convert one of the tank systems to B20. Similar to conversion of E85 refueling infrastructure, the costs for this alternative are typically much less than installing a new tank system. Conversion of existing tank systems typically only includes cleaning the tank and lines. The process for installing a new B20 refueling system is similar to the process for E85 discussed above.

Procuring E85 and Biodiesel

Federal agencies should consider procuring E85 and biodiesel and biodiesel blends either through DLA Energy or directly from ethanol or biodiesel suppliers. By consolidating requirements for DoD and other Federal agencies, DLA Energy often may be the lowest cost provider of renewable fuel.

Electric Vehicle Charging Infrastructure⁵⁴

All BEVs, PHEVs, and LSEVs require EVSE to operate. EVSE may be as simple as connecting the adaptor cord that comes standard with most EVs to a 120-volt outlet rated for at least 15 amps. Alternatively, a

⁵⁴ More information on choosing and installing EVSE may be found in NREL's "Electric Vehicle Supply Equipment Tiger Team Site Assessment Findings from Army Facilities. Bennett et al. 2019. "Electric Vehicle Supply Equipment Tiger Team Site Assessment Findings from Army Facilities", available at <https://www.nrel.gov/docs/fy20osti/74538.pdf>.

dedicated 208- or 240-volt charging station may be able to provide four times more power to an EV for a quicker charge. The primary EVSE for refueling EVs should be located at the fleet facility where the vehicle is garaged. Additional EVSE may be available locally at commercial sites or other Federal fleet locations.

Before procuring and installing EVSE, fleet managers should first determine how many and what type of charging stations to acquire. After determining EVSE needs, the next step is to prepare for the placement of EVSE at the site. The siting analysis focuses on choosing a charging station location and design, deciding on the EVSE model, evaluating power requirements, and selecting data collection needs. After completing a siting analysis, the fleet manager will be ready to procure the EVSE, develop a statement of work, and contract for installation.

GSA has a pre-negotiated, multi-award blank purchase agreement (BPA) for Level 1, Level 2 and DC fast charging stations. The contract includes products from different manufacturers and data network plans but does not include installation services.⁵⁵ Agencies should coordinate EVSE procurement through GSA in order to realize savings through volume discount pricing.

4.4.4 Monitoring Performance and Meeting Targets

At the end of each FY, agencies can use fleet data to evaluate the effectiveness of the petroleum reduction strategies implemented at each fleet location. At minimum, fleets must evaluate their performance based on compliance with Federal fleet requirements, including petroleum reduction, alternative fuel use increases, AFV and low-GHG emitting vehicle acquisition, and renewable fuel infrastructure development. Agencies may also measure performance compared to the overarching fleet management vision and goals established in the agency fleet plan. Furthermore, fleet managers can compare actual performance at each fleet location against the projected estimated reductions in petroleum consumption and increases in alternative fuel consumption to be achieved by each specific measure in the fleet plan.

In those fleet locations and areas where performance met or exceeded targets, agencies can identify best practices and effective petroleum reduction strategies. Similarly, at fleet locations and areas that failed to meet performance targets, agencies can identify areas of weakness and opportunities for improvement.

4.4.5 Refining

After evaluating the effectiveness of their petroleum reduction strategies to determine successes, barriers, and opportunities for improvement, agencies should revisit their planning process for the development of future petroleum reduction strategies. What works one year for a fleet may not work the next year, as the opportunities to improve Federal fleet petroleum reduction strategies increase with each new technology and expanding infrastructure. This is the point at which the fleet management process comes full circle and the planning process begins anew.

⁵⁵ More information on acquiring EVSE through GSA's BPA is available through GSA's Electric Vehicle Charging Stations website at <http://gsa.gov/evse>.

5 Core Principles of Sustainable Fleet Management

To achieve the vision of E.O. 13834, meet mission-critical needs, and comply with all Federal fleet sustainability goals and mandates, an agency can reduce its fleet's petroleum consumption through the appropriate combination of the four core principles of sustainable fleet management: (1) right-sizing fleets and vehicles to missions; (2) reducing VMT and idling; (3) increasing fleet fuel efficiency; and (4) increasing use of alternative fuels (including biodiesel blends) and electricity (through deployment of EVs and related charging infrastructure).

Sections 5.1 through 5.4 of this chapter provide greater detail on the core principles to help agency fleet managers develop a strategic plan for their fleet. Agency fleet managers should evaluate petroleum reduction strategies and tactics for each fleet location based on an evaluation of site-specific characteristics, including availability of alternative fuel, fleet size, and fleet vehicle composition.



Figure 11. Core Principles of Sustainable Fleet Management

5.1 Right- Sizing Fleets and Vehicles to Mission with a Vehicle Allocation Methodology

Agencies should right-size fleets to identify and eliminate unnecessary or inefficient vehicles and replace them, if necessary, with more efficient vehicles as well as AFVs. To right-size its fleet an agency must (1) compile its vehicle inventory and understand how its vehicles are used (e.g., mileage, purpose, etc.); and (2) analyze the fleets' operational (or mission) needs, while identifying opportunities to eliminate unnecessary, inefficient, and/or nonessential vehicles from the agency's fleet inventory.

A structured VAM process provides a framework for right-sizing an agency's fleet. GSA's FMR § 102-34.50 requires that federal agencies establish and document a structured VAM to determine the appropriate size and number of motor vehicles in the fleet and identify opportunities to eliminate unnecessary vehicles, right-size vehicles for their missions, and deploy AFVs effectively. GSA suggests that agencies complete a VAM at least once every 5 years. The E.O. 13834 Implementing Instructions encourage agencies to conduct a VAM study more frequently if agency missions or resources change. A VAM study can help your agency determine its optimum fleet inventory and reduce fleet costs. It can also support an FMP through the appropriate acquisition, placement, and use of higher efficiency vehicles and AFVs. This plan should include an optimal fleet inventory size projection (by vehicle class and fuel type) to meet mission needs and sustainability requirements.

Right-Sizing Fleets

Right-sizing means matching an agency's vehicle needs to its mission requirements.

5.1.1 Characteristics of a Vehicle Allocation Methodology

GSA FMR Bulletin B-43 provides guidance to assist agencies in establishing and documenting a structured VAM. Development of a VAM provides agency fleet managers with a standard way to document the objective characteristics of a vehicle fleet for (1) a specific bureau or department and/or (2) a generic (where there are common characteristics) office/facility, program, occupational group, or other entity within an agency.

Objective characteristics should include, but are not limited to:

- Number of vehicle users at a given site
- User to vehicle ratios (where applicable)
- Per-vehicle mileage
- Trips per vehicle
- Vehicle mission
- Terrain and climate
- Fleet condition and down time

Vehicle Allocation Methodology

Section 102-34.50 of the GSA FMR requires all Federal executive agencies operating domestic or foreign fleets to establish and document a structured VAM to determine the appropriate size and number of motor vehicles (i.e., optimize fleets to agency mission).

The data for the VAM is typically obtained by surveys and/or in-person interviews of stakeholders. However, much of this data could be collected and maintained while an agency is collecting vehicle inventory data for its annual data submission requirements.

5.1.2 Overview of the Vehicle Allocation Methodology Process

Typically, the first step in implementing a VAM is completing a detailed vehicle utilization study to establish a baseline fleet profile. Agency fleet managers can use the results of the baseline fleet profile to create a list of vehicles approved for each organization. GSA Fleet can help your agency throughout this process and should be consulted when assessing the need for GSA leased vehicles. Table 22 outlines the general VAM process, and the sections that follow describe each step in detail.

Table 22. General Vehicle Allocation Methodology Process

Step	Summary	Actions	Purpose
1	Create baseline fleet profile	<ul style="list-style-type: none"> Identify agency mission tasks and vehicle assets assigned to those tasks Complete an annual review of each fleet vehicle and collect data on utilization, down-time, age, maintenance, acquisition cost, number of users, per-vehicle mileage, trips per vehicle, mission, terrain, climate, fleet condition, number of passengers, and cargo capacity. 	Perform a fleet utilization study to identify current vehicle assets and how they match with agency mission needs
2	Develop minimum vehicle utilization criteria	<ul style="list-style-type: none"> Determine vehicle assets required to complete necessary mission tasks Identify any critical missions that require vehicle retention no matter the utilization Establish minimum utilization criteria to be used in validating the need for vehicles based on their missions, such as mileage requirements, hours used, utilization (daily percentage), passengers carried, number of trips, and user/vehicle ratio. 	Establish a baseline of fleet assets required to complete necessary mission tasks
3	Compare existing fleet composition to mission task needs	<ul style="list-style-type: none"> Determine if vehicles meet minimum requirements needed to accomplish mission tasks Evaluate alternatives, including mass transportation or contract shuttle services Determine vehicles that are mission essential Identify vehicles below minimum utilization or mileage requirements and dispose or reassign as needed. 	Complete gap analysis of current vehicle assets and required mission needs and eliminate or replace vehicles that do not meet required mission needs
4	Develop a vehicle acquisition plan to support VAM results	<ul style="list-style-type: none"> Create a 5-year vehicle acquisition and replacement plan, with recommended vehicles (type and size) for each mission as determined by the VAM Create a list of vehicles approved for each organization that meets the agency mission. 	Establish clearly defined policy to ensure fleet and vehicles are correctly sized and appropriate for the agency mission
5	Review and update VAM	<ul style="list-style-type: none"> Complete an FMP, which includes the agency strategy to achieve their optimal fleet inventory and annual progress toward achieving that inventory Review and update the agency VAM annually or sooner as agency mission needs change. 	Revise VAM based on changes in vehicle solutions or agency mission needs

5.1.3 Creating a Baseline Fleet Profile

Prior to selecting petroleum reduction strategies, agency fleet managers should work with their regional and local fleet managers to create a baseline fleet profile. Typically, the first step in developing a fleet profile begins with gathering fleet data managed in an agency's FMIS. Some data may also be available in GSA's FMVRS and in FAST. Once the data is collected, the agency can begin conducting a detailed fleet utilization study, which entails identifying agency mission tasks and vehicle assets assigned to those tasks.

A complete utilization study should include an annual review of each fleet vehicle and annual collection of data on:

- VIN or serial number
- License plate number
- Vehicle make and model
- Model year
- Vehicle type and weight class
- Acquisition cost
- Vehicle ownership
- Utilization
- Periodic (weekly, monthly, or annual) miles per vehicle
- Periodic hours of use per vehicle
- Periodic number of trips per vehicle
- Maximum miles per trip
- Lifetime mileage
- Vehicle in-service date
- Fuel type
- Fuel use by type
- Fuel economy rating
- GHG emission rating
- EISA 141 compliance
- Vehicle function
- Fleet mission
- Required employee response times
- Number of users
- Ratio of employees to vehicles
- Periodic (weekly, monthly, or annual) downtime
- Maintenance
- Vehicle condition
- When vehicle is scheduled for replacement
- Suitability for replacement with different vehicle type or fuel type
- Needed passenger and cargo capacity
- Installed aftermarket equipment
- Vehicle's garage location by address and latitude/longitude (at least to fourth decimal)
- Frequency vehicle is parked overnight away from garage location
- Whether vehicle is shared with other organizations
- Terrain
- Climate

Fleets may collect this information through user surveys. Typical questions include:

- What tasks do you accomplish with the vehicle? Describe how those tasks support the agency's mission.
- Does the vehicle need special equipment (aftermarket equipment not standard to commercial vehicles and trucks) to accomplish the tasks?
- How important is the vehicle to accomplishing the mission? Describe the critical mission need.
- How many people will be transported per trip on a regular basis?
- How much and what type of cargo will the vehicle haul on a regular basis?

- Is the vehicle shared with other employees or other agency organizations?
- Is there access to alternative fuel within 3 miles of the vehicle's garaged location? If so, where is the fueling station located and what type of alternative fuel is available?
- If the vehicle is an AFV, does it have an approved waiver from the use of alternative fuel?
- In what type of driving conditions will the vehicle operate (exclusively on campus setting, city, highway, off road, weather, etc.)?
- Can the work be done via alternatives to owning or leasing a vehicle such as shuttle bus services, motor pool vehicles, sharing vehicles with other offices/agencies, public transportation, or short-term rentals when needed?

Next, agency fleet managers should compile the detailed fleet utilization study data to document a full description of an agency's fleet composition together with its unique mission requirements. This profile, preferably managed in a database, provides a snapshot of each vehicle asset in the fleet. Typical data includes everything captured in the questionnaire as described above.

The ultimate goals of this profile are (1) to assist the fleet manager in evaluating whether the characteristics and utilization of each vehicle is best aligned with the agency mission requirements and (2) to determine opportunities for optimizing the utilization of each vehicle, including replacement, acquisition, or disposal based on mission needs.

The basic framework for this fleet profile should identify the following components on a site-by-site basis and should be supported by average utilization rates: **mission requirements, the right-size vehicles for the tasks at hand, and fuel use needs.** Utilization rates change regularly, and fleet profiles should be updated on an ongoing basis to reflect changes in mission requirements and the regulatory climate as well as vehicle and fuel availability.

5.1.4 Developing Minimum Vehicle Utilization Criteria

Quality data collection and management is critical to effective fleet management; the process to establish vehicle utilization criteria is no different. The objective of this step is to determine the minimum vehicle requirements required to complete each mission task. These requirements, or minimum vehicle utilization criteria, may be expressed in per-vehicle mileage, hours in service, user/vehicle ratios, trips per vehicle, utilization (daily percent), or passengers carried.

Vehicle utilization is most easily measured in terms of mileage or hours in service, although which utilization criteria you choose will depend on your agency fleet needs.

- **Mileage is most typically used to measure utilization of passenger or cargo transportation vehicles where the vehicle's primary purpose involves travel.** Mileage can be collected manually from the odometer or automatically through on-board vehicle monitoring systems or telematics. Odometer readings can be included with the driver's report (if used), telematics dashboards, input when refueling, or collected as a separate task. Mileage data should be collected at regular intervals over a long period of time to be most effective in determining vehicle utilization. The collection of mileage data over time should also allow agencies to identify slower and busier periods of usage as well as time needed for maintenance and repairs. For passenger or cargo transportation vehicles, it may also be useful to collect data on the volume of passengers or cargo transported.
- **Hours in service is most typically used to measure utilization of vehicles for tradesmen, utility repair, or emergency response** where the vehicle supports a mission while remaining mostly stationary (such as for plumbers, electricians, high voltage linemen, and fire fighters). Utilization should be

measured by the hours the vehicle is in service supporting the mission, which can be determined from the driver's labor reports (where used), dispatch records, and automatically from on-board vehicle monitoring systems. Utilization of fire apparatus and other vehicles that stand by waiting for an emergency response are in service whenever they are available for use. For example, a plumber's vehicle is in service from the time the plumber has left the shop to perform mission work until returning to the shop, while a fire truck in a fire station is in service whenever it is manned and ready for dispatch. Spare vehicles are not in service. A telematics geofence around a motor pool can identify the minimum number of spare vehicles in the pool at any given time.

Once an accurate measure of vehicle utilization has been made for all vehicles in the fleet, vehicles with similar missions should be compared and an average utilization calculated. Vehicles falling far below average should be examined to determine the reason(s) for underutilization. In time, the lowest acceptable utilization rate for vehicles completing a particular mission will become apparent, but even this baseline should be continuously reviewed and steps should be taken to move the utilization rate higher. **Vehicles with the lowest average utilization rate should be considered for disposal as appropriate.** Short-term leases and rentals, while more expensive up front than other options, may be cost-effective replacements for vehicles needed only during certain portions of the year. In 2011, GSA amended the FMR § 102-34.35 to enable agencies to rent vehicles for up to 120 consecutive days (originally at 60 consecutive days). This policy enables agencies to consider replacing underutilized vehicles in their inventory by renting vehicles for seasonal and temporary usage.

Other utilization metrics could be:

- Vehicle down time
- Hours spent on call or stand-by ready to go
- Whether the vehicle can achieve required mission response times
- Vehicle age and/or condition
- Number of trips per day, week, or month

5.1.5 Comparing Existing Fleet Composition to Mission Task Needs

Once an agency has completed a utilization study, created a baseline fleet profile, and established minimum vehicle utilization criteria, it should compare its existing fleet composition to its mission task needs. The purpose of this step in the VAM process is to determine which vehicles in the current fleet are well suited to their current assignment—and which ones are not—as a precursor to the vehicle acquisition, disposal, and reassignment process. Some of the questions that should be asked during this process include:

- Is the vehicle mission critical or essential?
- Does the vehicle meet the minimum requirements needed to accomplish mission tasks?
- Can an existing asset fulfill new mission requirements?
- Is the vehicle utilization below the minimum baseline?
- Can an alternative form of transportation such as mass transportation or shuttle services be used instead?
- What vehicles can be disposed of or reassigned (work with GSA Fleet for GSA leased vehicles)?

The fleet manager's challenge is to determine the correct vehicle for each mission. The following information may be helpful in this process:

- **Employee transportation.** Vehicles used to transport a single person should be the smallest possible size sedan. Pickup trucks and sport utility vehicles (SUVs) are not the most cost-effective means to transport a single passenger but might be needed for rough terrain. Agencies should also consider the use of public transportation or the consolidation of transportation options with other agencies, such as car sharing or shuttles, to form a single cost-saving solution.
- **Cargo vehicles.** The transportation of cargo should also use the smallest possible vehicle to accomplish the mission, especially where the existing vehicle is never operated at full capacity. Acquiring a single larger vehicle when it could replace several smaller vehicles may also increase vehicle efficiency.
- **Seasonal vehicles.** For vehicles used seasonally (e.g., snow removal equipment, brush-fire-fighting vehicles, etc.) and for vehicles with a single purpose that is not also a regular need (e.g., trucks with a mounted crane, water distributors, equipment transporters, etc.), the use of multipurpose vehicles, vehicles equipped with quick change bodies, short-term leased vehicles, vehicles used jointly by more than one agency—or even contracting out the service—could provide savings while still meeting mission needs.
- **Spare vehicles.** Some of the most expensive, least fuel-efficient, and most unsuitable vehicles for the mission can be “free” vehicles picked up as surplus and maintained as “spares.” However, spare vehicles significantly increase maintenance cost, redirecting maintenance that should be invested in first line vehicles, and often do not perform well when needed. A well-maintained fleet will have few requirements for spares that cannot be met through redistribution of existing assets or a short-term rental. Fleets with more than a couple spares should be avoided.
- **Law enforcement and emergency response vehicles.** Though agencies may exempt these vehicles from Federal fleet requirements, agencies should make every effort to ensure that the most efficient vehicles are used to meet their LE and emergency response needs. Perhaps the easiest way to improve the efficiency of these vehicles without compromising their mission is to replace older vehicles with newer vehicles, which tend to be more efficient.
- **Vehicle assignment.** Drivers often have vacation, sick, and other days off the job equal to one month or more per year, meaning that many vehicles assigned to a single driver will sit idle at least one month per year. Avoiding the assignment of a single driver to a vehicle whenever possible will improve fleet vehicle utilization, reduce costs, and decrease vehicle requirements. Pooling vehicles or using assigned vehicles for other uses when the driver is absent will increase utilization and reduce the total number of vehicles needed to accomplish the same mission. Effective vehicle pooling can be accomplished using dispatching/reservation software or a car sharing service provider.

Vehicle Pools

Maximize vehicle utilization by pooling vehicles or assigning multiple drivers per vehicle where possible.

At the completion of this analysis, the agency will be able to determine the optimal fleet inventory that meets the agency mission task needs. The agency should:

- Create a **list of vehicle types approved for each organization and mission requirement** (vehicles selected should be the most efficient possible)
- Identify **vehicles that are essential to the mission**, regardless of utilization (determine the most efficient vehicle type to provide that mission)

- Identify all **vehicles that fall below the pre-established minimum utilization criteria** and plan for the disposal or reassignment of those vehicles as necessary
- Evaluate **transportation alternatives**, such as public transportation, contract shuttle services, or rental vehicles.

5.1.6 Developing a Vehicle Acquisition Plan to Support the Vehicle Allocation Methodology

The purpose of these VAM steps is to develop a standardized methodology by which an agency's fleet is evaluated each year. As a result, agencies should establish clearly defined policies and procedures to ensure that the entire fleet is correctly sized and each vehicle is appropriately assigned based on mission needs. This may include creating a list of vehicles that are approved for each organization within an agency and are critical to meeting that organization's mission. **At the end of the VAM process, agencies should create a 5-year vehicle acquisition and replacement plan with recommended vehicles (type and size) for each mission as determined by the VAM.** This plan should be clearly communicated through all levels of the agency and address the following items:

- The agency's planned **schedule** to achieve its optimal inventory
- Plans for **locating AFVs near alternative fueling stations**
- **Vehicle sourcing decisions**, including comparing costs for purchasing vehicles rather than leasing vehicles through GSA Fleet or commercially.

Actual fleet inventory results each year are compared to and measured against the agency's optimal fleet inventory. Agencies should create an FMP describing the agency's strategy to achieve their optimal fleet inventory and the progress toward achieving that inventory. Discrepancies should be noted, including a discussion of factors that may be hindering attainment of your optimal fleet. For more detail on vehicle acquisitions, see Chapter 6 of this Handbook.

5.1.7 Optimizing Fleets and Vehicles to the Agency Mission

A recurring objective of Federal fleet management is to align (or optimize) the composition of an agency's fleet with its mission. In the end, this means more than simply right-sizing a fleet/vehicle or selecting a set of GHG emission reduction strategies. In the planning phase of the fleet management cycle, agencies should have developed a clear set of goals and objectives for the management of their fleets.

The goal for agencies in optimizing their fleets is to ensure every vehicle (1) is as fuel efficient and cost-effective as possible, (2) meets the mission to which it is assigned, and (3) allows the agency to meet regulatory requirements and achieve its overarching fleet management goals. Evolving missions, vehicle funding shortfalls, and better automotive technology make this an ever-changing target, which means that every possible cost-/fuel-saving solution must remain on the table for consideration whenever that solution could meet actual mission needs. The challenge for the fleet manager is to regularly compare the existing fleet to the optimal fleet and ensure that the agency is working to acquire and utilize the best possible vehicles.

5.2 Reducing Vehicle Miles Travelled

One of the first steps in developing an agency-wide petroleum reduction strategy is to evaluate opportunities to reduce the miles your fleet travels. Reducing fleet VMT decreases fleet petroleum use and fleet costs, including reduced vehicle operational and maintenance costs and longer vehicle life before replacement. Further, reducing VMT can enable a reduction in the number (and cost) of vehicles required to accomplish the fleet's mission, and therefore is directly related to actions taken to right-size fleets. Fleet managers should always try to minimize VMT even while increasing fleet efficiency and alternative fuel use (including electricity).

There are no specific mandates to reduce VMT. However, success in doing so contributes to achieving EISA Section 142 petroleum reduction requirements. The significant benefit of this approach, relative to other petroleum reduction strategies, is the opportunity for immediate and sustained reduction of total fleet management costs.

The strategies to reduce VMT discussed in this chapter should be applied to all fleet vehicles, regardless of vehicle type (light-duty, medium-duty, or heavy-duty) or vehicle fuel type (AFV, EV, or conventional-fueled vehicle). A variety of options for VMT reduction are available for consideration and implementation. Fleet managers can implement some of these measures independently while collaboration with facility or agency management may be necessary in other cases. Measures to reduce VMT include the following:

- **Eliminating vehicle trips.** Use telephone, video, and web conferencing tools for meetings, work from home when practical, and walk or bike as appropriate.
- **Consolidating trips.** Consolidate routes and carpool to eliminate duplication of trips.
- **Providing agency shuttles.** Provide a shuttle service for high-use routes to consolidate trips.
- **Using mass transportation.** Use mass transportation alternatives to eliminate fleet vehicle transportation needs.
- **Improving scheduling and routing.** Optimize travel time and distance for delivery of services by using telematics and GPS technology to improve routing and efficiency of fleet vehicles.
- **Implement transportation on demand.** Use demand-responsive systems to offer shuttle, bus, or carpooling service to employees.

5.2.1 Eliminating Trips

Fleet managers may need to collaborate with individual employees, agency leadership, or facility management to eliminate trips. In many cases, employees determine whether to teleconference to meetings, work from home, or walk to a nearby meeting instead of driving. However, agency leadership may be able to promote that behavior. Technology such as video and web conferencing allows personnel to participate in meetings remotely while sharing information as if they were present in person. Similarly, telecommuting has become more popular as more employees can perform their work at any location where they have a computer and a telephone. Finally, agencies can eliminate using a vehicle for a trip by walking and biking. Designating a safe place for bicycles or identifying safe pathways for walking enable employees to travel without using motorized vehicles.

5.2.2 Consolidating Trips

Fleet managers can reduce trips and therefore VMT by consolidating trips. This may be accomplished by either (1) combining multiple operations into a single trip and/or (2) carpooling.

Fleet managers can combine trips by identifying regular or occasional trips that involve similar routes. They may accomplish this by evaluating trip scheduling and by seeking fleet operators' input and collaboration. Fleet managers and operators should determine if trips on multiple days or times can be consolidated into a single day or time.

Carpooling is similar to combining trips, but instead of evaluating similar routes, fleet managers and operators should evaluate opportunities for staff with similar destinations and schedules to share fleet vehicles and combine their individual trips into a single vehicle trip. Fleets may promote carpooling through formalized ride share boards (physical or virtual) or through informal networking. Trip consolidation and scheduling can significantly decrease the number of trips and associated fuel consumption.

5.2.3 Providing Agency Shuttles

When agencies have multiple locations or buildings within relatively close proximity to one another and a high demand for trips, agency shuttles can be an effective and efficient way to reduce VMT and fuel consumption.

GSA's FMR Bulletin B-28 provides guidance to agencies regarding Federal shuttle policies, shuttle routes supported by multiple Federal agencies, and use of AFVs in Federal shuttle bus fleets. Pursuant to the bulletin, Federal agencies should use AFVs for shuttle services whenever possible. They should also monitor shuttle utilization, survey employees, and coordinate with other Federal agencies to share, and otherwise avoid duplication of, shuttle services.

5.2.4 Using Mass Transportation

Federal agencies should investigate the availability, suitability, and cost of public transportation before acquiring vehicles from any other source. In many urban and suburban areas, use of mass transportation is an effective method to eliminate fleet vehicle trips as well as, in most cases, reduce cost and time associated with fleet vehicle use. Agencies can encourage employee use of public transportation by subsidizing the cost of bus or subway passes, perhaps using the savings realized through eliminated fleet vehicle trips.

5.2.5 Improving Scheduling and Routing

Efficient fleet operation is an integral part of fleet management that can save time and taxpayer dollars. Agencies are encouraged to explore both internal and external options to track and manage vehicle usage through scheduling and optimal routing. Numerous private companies offer telematics, software, and consulting services to help government entities with route and scheduling assets. Telematics solutions can include GPS directions for the driver and geofencing to alert the fleet manager when drivers are traveling outside of their assigned routes. By monitoring driver schedules and vehicle activity, agencies can:

- Create and maintain optimized master schedules for recurring tasks
- Reduce expensive fuel costs by eliminating unnecessary travel and lost time
- Increase driver/worker productivity
- Eliminate unauthorized use of vehicles, routes, or stops
- Manage employee schedules by better anticipating departure and arrival times
- Respond to emergencies with accuracy and efficiency
- Schedule preventive maintenance during low-usage days
- Provide documentation of department activity
- Do more work with the same or fewer resources.

5.2.6 Implementing Transportation on Demand

TOD involves transporting passengers or goods at the request of users rather than following pre-set schedules. Agencies may use TOD in a few ways. One option is to aggregate individual transportation requests and service them by shuttle or bus as needed rather than drive a loop on a set schedule. Another option is to employ a carpooling service to aggregate multiple employees into a single vehicle rather than allowing each to drive individually. TOD can also be used beyond VMT elimination to reduce the number of vehicles in an agency's fleet.

5.3 Increasing Fuel Efficiency

Increasing fleet fuel efficiency is a simple, low-cost, and effective method to comply with statutory mandates and reduce fleet petroleum use. This section provides an overview of the following five tactics to increase fleet fuel efficiency. Agencies should implement these strategies regardless of vehicle size or fuel type.

1. **Acquire fuel-efficient vehicles.** Agencies should deploy the smallest, most fuel-efficient vehicles appropriate for the vehicle's mission.
2. **Acquire HEVs.** HEVs often top their vehicle classes in fuel economy. At the same time, they do not require alternative fueling infrastructure. Deploying HEVs can save agencies money without complications.
3. **Maintain vehicles to improve fuel economy.** Implement best practices such as maintaining recommended tire pressure and performing scheduled maintenance to keep vehicles in proper working order.
4. **Drive more efficiently.** Drive sensibly, observe the speed limit, remove excess weight, and use cruise control.
5. **Avoid excessive idling.** Turn off engines when vehicles are sitting stationary for more than a minute.

5.3.1 Acquire Fuel Efficient Vehicles

Acquiring vehicles that burn less fuel per mile (higher fuel economy) will reduce overall fleet petroleum use to complete the same agency transportation mission. Agency fleets will likely achieve some fuel efficiency improvements just through the normal replacement cycle for fleet vehicles. In 2012, EPA and the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) issued final rules extending the National Program for GHG emissions and fuel economy standards for model years (MYs) 2017 through 2025 light-duty passenger cars, light-duty trucks, and MDPVs.⁵⁶ In 2016, EPA and NHTSA issued vehicle and engine performance standards for MDVs and HDVs designed to improve fuel efficiency.⁵⁷ These standards apply to MY 2018 to MY 2027 for certain trailers and MY 2021 to MY 2027 for semi-trucks, large pickup trucks, vans, buses, and work trucks.

5.3.1.1 *Selecting Higher Fuel Economy Vehicles in Fleet Replacement Plans*

Chapter 7 of this Handbook guides agencies through the Federal vehicle acquisition process. Fuel economy is a major component of replacement plans for fleet vehicles. When ordering vehicles, agencies should answer the following questions:

- Will a smaller vehicle get the job done?
- Is there a more fuel-efficient vehicle that would meet my needs?
- Do I have access to alternative fuels?

Federal fleet managers should use GSA's online ordering system, AutoChoice,⁵⁸ to help choose the most fuel-efficient vehicle when ordering through GSA. AutoChoice allows users to compare vehicles by fuel economy and GHG emission scores, choose equipment and color options, and compare vehicles side by side.

⁵⁶ EPA, Final Rule for Model Year 2017 and Later Light – Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-model-year-2017-and-later-light-duty-vehicle>

⁵⁷ EPA, Final Rule for Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium – and Heavy- Duty Engines and Vehicles – Phase 2, <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-greenhouse-gas-emissions-and-fuel-efficiency>

⁵⁸ Available at www.gsa.gov/autochoice.

The DOE and EPA Fuel Economy website⁵⁹ is another excellent interactive resource where users can compare cars and trucks based on emissions and fuel efficiency. Fleet managers can search the site's database and compare the environmental performance and fuel economy of most light-duty models and types, including cars, SUVs, pick-up trucks, and vans. To support compliance with the EISA Section 141 low GHG-emitting vehicle acquisition requirements, the guide also compares vehicle emissions using both GHG scores and amount of CO₂ emitted from the vehicle's tailpipe (GHG scores are used to rate the amount of smog-producing pollutants and carbon dioxide emissions, respectively, on a scale of 0–10, with 10 representing the lowest-emission vehicle in each case).

Since the adoption of the national program for GHG emissions and fuel economy standards, average fuel economy for new vehicles has risen quickly. Replacing older vehicles with new vehicles, even of the same make and model, can significantly improve fuel economy. As the bar gets raised, fleet managers should continue to seek the highest efficiency vehicles that meet their agency's needs.

5.3.1.2 Focusing on Increasing the Fuel Economy of the Least Efficient Vehicles

As shown in Figure 12, lower fuel economy vehicles use far more fuel than high fuel economy vehicles for similar missions and annual mileage. Potential petroleum reductions from improving fleet vehicle fuel economy increase exponentially as the gas mileage (miles per gallon [mpg]) of the replaced vehicle decreases. Therefore, agencies should focus on opportunities to improve the fuel efficiency of the lowest fuel economy vehicles in their fleets.

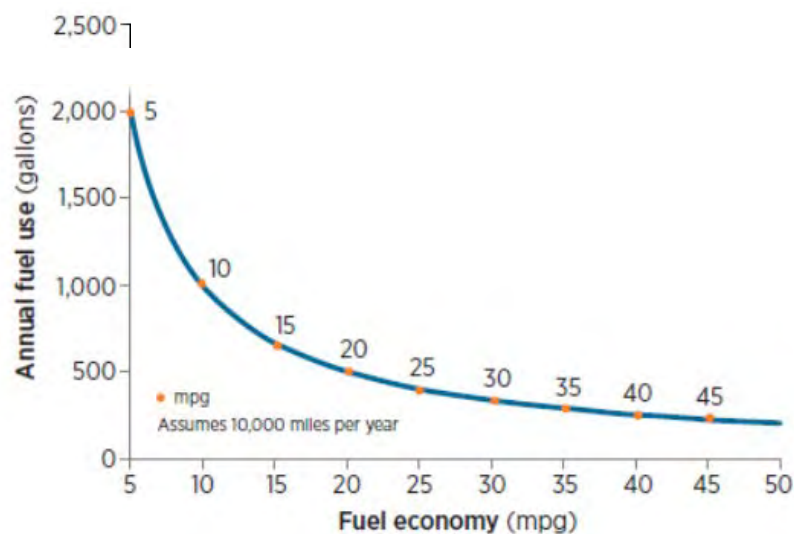


Figure 12. Annual Fuel Use by Fuel Economy

Table 23 provides an example that illustrates the benefits of focusing on improving the fuel efficiency of the lowest fuel economy vehicles. This is clearly demonstrated by the four-fold increase in fuel reduction by replacing a 5-mpg vehicle with a 6.25-mpg vehicle (25% increase in fuel economy) compared to replacing an existing 20-mpg vehicle with a 25-mpg vehicle (25% increase in fuel economy).

⁵⁹ Available at www.fueleconomy.gov.

Table 23. Example Annual Fuel Reductions from Improving Fuel Economy

Current mpg	Current fuel use (gallons)	Replacement mpg	Replacement fuel use (gallons)	Percent improvement in fuel economy	Fuel reduction (gallons)
5 mpg	2,000	10 mpg	1,000	100%	1,000
5 mpg	2,000	6.25 mpg	1,600	25%	400
20 mpg	500	40 mpg	250	100%	250
20 mpg	500	25 mpg	400	25%	10

5.3.2 Acquisition of Hybrid Electric Vehicles

HEVs are defined by the Internal Revenue Code (*see* 26 U.S.C. § 30B(d)(3)). HEVs combine the internal combustion engine of a conventional vehicle with a rechargeable energy storage system such as the battery and electric motor of an electric vehicle. The combination can increase fuel economy and reduce emissions while maintaining the power, range, and convenient fueling of conventional vehicles. HEV batteries are recharged by the internal combustion engine and recovery of energy ordinarily lost while braking. **They do not recharge by plugging into an external source of electricity (such vehicles are referred to as PHEVs).** While their efficiency gains can contribute to petroleum reduction targets, their electricity use cannot be counted toward alternative fuel use requirements.

5.3.2.1 Benefits of Hybrid Electric Vehicles

Acquisition of an HEV to replace a conventional-fueled vehicle may provide a reduction of more than 30% in petroleum use as illustrated by the example in Table 24. Efficiency gains from HEVs also depend upon the type of driving (drive cycle) done by the vehicle. Typically, HEVs are best used in urban environments, driving cycles with many starts/stops, or when driven on hilly or mountainous roads. Fuel reduction benefits of HEVs are typically lower when used mostly for driving on highways. A low GHG-emitting vehicle with a standard engine may be a more cost-effective option for replacing a vehicle that primarily does highway driving.

Table 24. Estimated Fuel Economy Improvement for Hybrid Version of 2019 Chevrolet Malibu

	Fuel economy (miles per gallon)
2019 Chevrolet Malibu Base	32
2019 Chevrolet Malibu Hybrid	46
Percent improvement	44%

5.3.2.2 Locations Suited for Hybrid Electric Vehicles

Acquiring HEVs is an effective measure to reduce petroleum use in **locations where alternative fuel is unavailable**. Because Federal agencies receive AFV acquisition credits for HEVs, acquiring HEVs in these fleet locations (in lieu of E85 FFVs or other dual-fueled vehicles) may also help agencies reduce the number of

waivers submitted under Section 701 of EPOA 2005.⁶⁰ However, in fleet locations with reasonable and affordable access to alternative fuel, acquisition of AFVs will provide greater petroleum reductions—alternative fuel used by an AFV displaces the petroleum that would be used in a conventional-fueled vehicle.

5.3.2.3 *Hybrid Electric Vehicles Receive Credits Toward EPOA 1992 Alternative Fuel Vehicle Acquisition Requirements*

The NDAA of 2008 expanded the definition of an AFV to include qualified hybrid electric, lean burn technology, and fuel cell vehicles, as well as any other type of vehicle that can reduce petroleum consumption as demonstrated by the EPA to the Secretary of Energy.

Agencies receive one EPOA 1992 AFV acquisition credit for each qualifying HEV acquired regardless of weight class (see Section 3.6 for more information on EPOA 1992 AFV acquisition requirements and credits). Federal agencies are responsible for ensuring that acquired HEVs meet the definitions and requirements at Section 30B(d)(3) of the Internal Revenue Code of 1986 to obtain EPOA 1992 AFV acquisition credit.

5.3.3 **Maintaining Vehicles to Improve Vehicle Fuel Economy**

In addition to choosing fuel-efficient vehicles, fleet managers and drivers can keep fleet vehicles properly maintained to improve fuel economy. GSA FMR Bulletin B-19 encourages agency fleet managers to incorporate the following recommendations into preventive maintenance programs and driver inspections:

- **“Keep your vehicle engines properly tuned.** Always check the vehicle owner’s manual for proper maintenance and follow your agency’s internal procedures for obtaining services on your vehicle. Fixing a serious maintenance problem, such as a faulty oxygen sensor, can improve your mileage by as much as 40 percent.”⁶¹
- **“Keep tires properly inflated to the recommended tire pressure.** Under-inflated tires increase rolling resistance, reduce fuel economy, and cause tires to wear more rapidly.”
- **“Check and replace air filters regularly.** Replacing a clogged air filter protects the engine and may increase your fuel economy.”
- **“Use the recommended grade of motor oil for your vehicle to increase fuel economy.** Also, look for motor oil that says ‘Energy Conserving’ on the [American Petroleum Institute] performance symbol to be sure it contains friction-reducing additives.”

Agency fleet managers can use telematics to create preventive maintenance schedules and proactively address fault codes. Telematics collect data to support condition-based maintenance to both ensure the vehicle is operating efficiently and reduce unnecessary maintenance costs. Additionally, telematics provides access to diagnostic trouble codes that can help fleets identify vehicle problems early and reduce downtime.

⁶⁰ Section 701 of EPOA 2005 requires federal agencies to use alternative fuel in their dual-fueled vehicles except where the vehicles have received a waiver from DOE.

⁶¹ U.S. Department of Energy and U.S. Environmental Protection Agency: Keeping Your Vehicle in Shape, available at <https://www.fueleconomy.gov/feg/maintain.jsp>.

5.3.4 Driving More Efficiently

Federal fleet vehicle drivers can help improve fuel economy and reduce petroleum use by driving more efficiently. GSA FMR Bulletin B-19 recommends that agency fleet managers “develop and implement a communication plan to ensure that strategies for improving fleet fuel efficiencies are disseminated agency-wide and that all drivers are aware of fuel efficiencies gained by driving more efficiently.” The communication plan should include the following:

- **“Drive at speeds that conserve fuel.** EPA estimates a 7–23% improvement in fuel economy by keeping your speed under 60 miles per hour (mph).
- **Use cruise control, when appropriate, on the highway to maintain a constant speed.** Cruise control should not be used in mountainous terrains as it increases fuel usage.
- **Drive safely and responsibly.** Accelerating smoothly from a stop and braking softly helps conserve fuel. Fast starts and hard braking waste fuel. This type of driving also wears out car components, such as brakes and tires. Drivers should maintain a safe distance between vehicles to allow more time to brake and accelerate gradually.
- **Remove excess weight such as unnecessary items in the trunk.** Carrying extra weight makes the engine work harder thus consuming more fuel. DOE estimates that an extra 100 pounds in the trunk reduces a typical car’s fuel economy by 1–2%.”

Fleet managers can also use vehicle telematics to help support driving behaviors that improve fuel efficiency. For example, telematics data can be used to identify speeding and rapid acceleration, and opportunities to coach drivers in driving more efficiently.

5.3.5 Avoid Excessive Idling

When idling, vehicles typically burn from 0.25 to 1 gallon of fuel per hour.⁶² Unnecessary idling pollutes the air, wastes fuel, and causes excess engine wear, and reducing idle time is a simple policy to implement.

Idle reduction is commonly used with HDVs like semi-tractors and buses. However, LDVs and MDVs can benefit from idle reduction strategies as well. Typically, the following actions can help reduce unnecessary vehicle idling:

- Turn off your engine when you are parked or stopped (except in traffic) for more than 1 minute
- Avoid using a remote vehicle starter, which encourages unnecessary idling
- Avoid drive-through windows; walk inside instead.

For HDVs a variety of technologies are available to reduce idling. Onboard equipment such as automatic engine stop-start controls and auxiliary power units can be used anywhere. Truck stop electrification enables trucks to hook up to stations that provide power and other amenities.

For LDVs and MDVs, three types of idle reduction technologies are available to keep vehicles warm: coolant heaters, air heaters, and energy recovery systems. Coolant heaters keep the engine warm by using fuel from the vehicle to pump heated coolant through the engine, radiator, and heater box. To provide passenger compartment warmth, air heaters are separate, self-contained units that directly blow hot air into the vehicle interior using fuel from the vehicle. Energy recovery systems use electric pumps connected to the water line to

⁶² Argonne National Laboratory, Center for Transportation Research, Paper No. 06-2567, January 2006.

keep the car's cooling system and heater operating after the engine is turned off, using engine heat that would otherwise dissipate.

EPA has evaluated the fuel saving benefits of various idling reduction technologies through grants, cooperative agreements, emissions and fuel economy testing, demonstration projects, and technical literature reviews.⁶³

Many states and localities have passed legislation limiting idling, which often apply to different vehicle types (i.e., weight classes) depending on the location. The AFDC maintains a list of current incentives and laws related to idle reduction.⁶⁴

5.4 Use Alternative Fuels to Displace Petroleum Use

One effective strategy to reduce petroleum use is to displace it with alternative fuels, including electricity, biodiesel blends, and renewable diesel blends.⁶⁵ Alternative fuels have additional advantages as well. Most are produced domestically, benefitting the national economy, and oftentimes they are more affordable than gasoline or diesel. Agencies should decide on the type of AFV and infrastructure based on fleet location characteristics.

To promote increased alternative fuel consumption by AFVs in the Federal fleet, Section 701 of EPAAct 2005 requires Federal agencies to use only alternative fuel in its dual-fueled vehicles, except where the vehicles have received a waiver from DOE due to the local unavailability of alternative fuel or fuel that is unreasonably more expensive than gasoline. This means, for example, that if E85 infrastructure is available at or near a fleet location, all fleet E85 FFVs operating at that location are required to refuel solely with E85 using that infrastructure. Agencies are encouraged to focus on deploying dual-fueled AFVs in locations with existing or planned alternative fuel infrastructure and deploying new alternative fuel infrastructure near high concentrations of dual-fueled vehicles waived due to the unavailability of fuel.

Alternative fuels include but are not limited to electricity, E85 (a blend of 85% ethanol and 15% gasoline), neat (100%) biodiesel⁶⁶ (B100), neat (100%) renewable diesel,⁶⁷ CNG, LNG, hydrogen, and LPG or propane.

- **Electricity.** Electricity use requires both EVs, which include BEVs, LSEVs, and PHEVs, and dedicated charging infrastructure.
- **E85, CNG, LNG, and LPG.** The use of these alternative fuels requires both AFVs and dedicated refueling infrastructure. These alternative fuels are best used at fleet locations where alternative fuel is currently available or expected to become available (i.e., emerging markets) or at high-use locations where alternative fuel sites are planned in the near term.
- **Neat biodiesel and biodiesel blends.** Neat biodiesel and biodiesel blends require dedicated refueling infrastructure but can be used in conventional diesel vehicles. Biodiesel strategies are ideal for locations with high diesel fuel use.
- **Neat renewable diesel and renewable diesel blends.** Neat renewable diesel and renewable diesel blends are “drop-in” replacement fuels for diesel; renewable diesel is fully compatible with existing

⁶³ Available at <https://www.epa.gov/verified-diesel-tech/learn-about-idling-reduction-technologies-irts-trucks-and-school-buses>.

⁶⁴ Available at www.afdc.energy.gov/laws/.

⁶⁵ Biodiesel blends refer to blends of greater than 20% biodiesel with diesel (e.g., B20). Renewable diesel blends refer to blends of greater than 20% renewable diesel with diesel (e.g., R20).

⁶⁶ Biodiesel blends are not alternative fuels. However, the neat biodiesel component of biodiesel blends greater than 20% is counted as biodiesel in calculating fleet GHG emissions.

⁶⁷ Renewable diesel blends are not alternative fuels. However, the neat renewable diesel component of biodiesel blends greater than 20% is counted as renewable diesel in calculating fleet GHG emissions.

diesel refueling infrastructure and engines. Substituting diesel fuel with renewable diesel is an effective petroleum reduction strategy at most fleet locations with diesel vehicles.

To maximize alternative fuel use increases and petroleum reductions, agencies should support strategies to increase alternative fuel use by:

- Acquiring AFVs, including BEVs and PHEVs, and placing them in or near areas with existing or planned alternative refueling sites (agencies should ensure alternative fuel infrastructure, including charging infrastructure and the associated fuel necessary to support dedicated AFVs, is in place before accepting delivery of vehicles); and by running dual-fueled vehicles on alternative fuel
- Installing alternative fuel infrastructure (including charging infrastructure) in fleet locations with the highest AFV concentrations that use that fuel type
- Communicating and coordinating with nearby fleets (both public and private sector) to aggregate demand for alternative fuel.

5.4.1 Basics of Using Alternative Fuels in Fleet Vehicles

5.4.1.1 E85 Use in E85 FFVs

Ethanol is a renewable fuel made from various plant materials collectively known as "biomass." Most ethanol fuel today is produced using corn and is blended into U.S. gasoline as E10 (a blend of 10% ethanol and 90% gasoline) or E15 (a blend of 15% ethanol and 85% gasoline) to oxygenate the fuel, which reduces air pollution. Ethanol blended as E10 and E15, however, is not classified as an alternative fuel.

Only ethanol in E85 blends (or flex fuel) meets the EPA 1992 alternative fuel definition. E85 (or flex fuel) is an ethanol-gasoline blend containing 51–83% ethanol, depending on geography and season. E85 can only be used in FFVs, which have an internal combustion engine and are designed to run on E85, gasoline, or any blend of gasoline and ethanol up to 83%. E85 is not approved for use in conventional gasoline-powered vehicles. Thousands of fueling stations offer E85 in the United States, and can be found on the AFDC alternative fueling station locator.

It is important to note that a gallon of ethanol contains less energy than a gallon of gasoline, resulting in lower fuel economy when operating your vehicle. For the Federal fleet, the fuel conversion factor used in FAST assumes that, on average, E85 blends contain about 72% of the energy content of gasoline.

5.4.1.2 Biodiesel and Renewable Diesel Use in Diesel Vehicles

Biodiesel is a renewable, biodegradable fuel manufactured domestically from vegetable oils, primarily from soybeans. For the Federal fleet, only pure (neat) biodiesel (B100) and the biodiesel component of blends greater than 20% (B20 and higher) are counted towards agency alternative fuel use.

B20 is the most common biodiesel blend, and offers a good balance of cost, emissions, cold-weather performance, materials compatibility, and ability to act as a solvent. B20 must meet prescribed quality standards as specified by ASTM D7467 and can be used in current engines without modifications. Engines operating on B20 have similar fuel consumption, horsepower, and torque to engines running on petroleum diesel. B20 has 1–2% less energy per gallon than petroleum diesel, but many B20 users report no noticeable difference in performance or fuel economy. Hundreds of fueling stations offer B20 in the United States, and can be found on the AFDC alternative fueling station locator.

Renewable diesel is a “drop-in” replacement for diesel—it is produced from biomass but also meets the petroleum diesel fuel specification (ASTM D975) requirements. Renewable diesel uses similar renewable feedstocks as biodiesel, but the production process is different, typically through the same processes used to produce petroleum-based diesel. As a result, renewable diesel typically meets the specification for diesel (has

same chemical structure as diesel) and can serve as a drop-in replacement to petroleum diesel in diesel vehicles.

5.4.1.3 *Electricity Use in Plug-in Electric Vehicles*

Electricity is considered an alternative fuel under EPC Act 1992. Electricity can be produced from a variety of energy sources, including oil, coal, nuclear energy, hydropower, natural gas, wind energy, solar energy, and stored hydrogen. Plug-in EVs are capable of drawing electricity from off-board electrical power sources (generally the electricity grid) and storing it in batteries.

EVs are vehicles that use electric motors powered by onboard sources of stored energy for propulsion. This definition includes the following general types of EVs:

- **Battery-electric vehicles.** BEVs or “all electric vehicles” are powered by an electric motor drawing current from rechargeable batteries or other portable sources of electrical current. Commercial availability of light-, medium-, or heavy-duty BEVs is expected to continue to increase in coming model years.
- **Low-speed electric vehicles.** LSEVs are electric-powered low-speed vehicles (LSVs). LSEVs are also referred to as neighborhood electric vehicles (NEVs). LSEVs are four-wheeled vehicles weighing less than 3,000 pounds with top speeds of 20–25 mph. It is important to note that LSEVs are not classified as “motor vehicles” for purposes of the EPC Act 1992 AFV acquisition requirements.
- **Plug-in hybrid electric vehicles.** PHEVs are propelled by both an internal combustion and heat engine and to a significant extent by an electric motor that draws electricity from a battery (with a capacity of at least 4 kWh) that can be recharged from the grid.

HEVs, which draw propulsion energy from onboard sources of stored energy that are both an internal combustion and heat engine using consumable fuel and a rechargeable energy storage system, often a chemical battery, are also classified as EVs. However, these vehicles differ from the other EVs in that they do NOT consume electricity.

EVs are “fueled” with electricity by plugging into an electric vehicle charging station powered from the grid or directly from a generation source. The type of charging infrastructure varies based on the type of EV and charging characteristics (frequency, length, etc.). Most charging will occur at charging stations at the fleet sites, with some additional charging at publicly accessible locations.

5.4.1.4 *Hydrogen Fuel Use in Fuel Cell Electric Vehicles*

Hydrogen (H₂) is the lightest element and is found primarily stored in water (H₂O), hydrocarbons including methane (CH₄), and other organic matter on Earth. Steam reforming natural gas is the most common way to produce hydrogen in the United States, but electrolysis can also remove hydrogen from water. Electrolysis can be powered through renewable energy, reducing emissions associated with hydrogen production.

Hydrogen is stored in high-pressure tanks on vehicles (typically 10,000 psi) and fueling stations to enable greater driving range and storage capacity. Hydrogen is used to power FCEVs that use fuel cells to convert hydrogen to electricity, producing only water and heat as byproducts. FCEVs use electric motors for propulsion and may be considered a type of EV, although hydrogen is listed as a separate alternative fuel in statute (42 U.S.C. § 13211). There are more than public 40 hydrogen fueling stations in the United States, most of which are in California.

5.4.1.5 *Natural Gas and Renewable Gas Use in CNG and LNG Vehicles*

Natural gas is an odorless, gaseous mixture of hydrocarbons—predominantly made up of methane. Most natural gas in the United States is considered a fossil fuel. A small portion is defined as renewable natural gas (RNG), also known as biomethane, which is a pipeline-quality vehicle fuel produced from organic materials—such as waste from landfills and livestock—through anaerobic digestion.

Two forms of natural gas, which are also defined as alternative fuels under EPA Act 1992, are currently used in vehicles: CNG and LNG. CNG is compressed to less than 1% of its volume at standard atmospheric pressure and stored onboard a vehicle in a compressed gaseous state at a pressure of up to 3,600 psi. A CNG-powered vehicle gets about the same fuel economy as a conventional gasoline vehicle on a GGE basis.

LNG is natural gas in its liquid form, produced by purifying natural gas and super-cooling it to -260°F to turn it into a liquid. LNG must be kept at cold temperatures and is stored in double-walled, vacuum-insulated pressure vessels. LNG is suitable for trucks that require longer ranges because liquid is denser than gas and, therefore, more energy can be stored by volume. LNG is typically used in MDVs and HDVs. One GGE equals about 1.5 gallons of LNG.

CNG and LNG can only be used in vehicles designed for its use. There are three types of natural gas vehicles:

- **Dedicated:** These vehicles are designed to run only on natural gas.
- **Bi-fuel:** These vehicles have two separate fueling systems that enable them to run on either natural gas or gasoline.
- **Dual-fuel:** These vehicles have fuel systems that run on natural gas but use diesel fuel for ignition assistance. This configuration is traditionally limited to HDVs.

CNG vehicles store natural gas in tanks where it remains in the gaseous state. More fuel can be stored onboard a vehicle using LNG because the fuel is stored as a liquid, therefore making its energy density greater than that of CNG.

There are roughly 1,000 publicly accessible CNG fueling stations in the United States and less than 100 publicly accessible LNG fueling stations. Most CNG and LNG refueling occurs at private stations at fleet locations.

5.4.1.6 *LPG Use in LPG Vehicles*

LPG⁶⁸, or propane, is a three-carbon alkane gas (C₃H₈) stored under pressure inside a tank as a colorless, odorless liquid. LPG used in vehicles is specified as HD-5 propane (a mixture of propane with no more than 5% propylene and 5% other gases, primarily butane and butylene). LPG is stored onboard a vehicle in a tank pressurized to about 150 psi. The energy content of LPG is reduced from that of gasoline (74%) on a volume basis, so it takes more fuel by volume to drive the same distance.

There are two types of LPG vehicles: dedicated and bi-fuel. Dedicated LPG vehicles are designed to run only on propane, while bi-fuel LPG vehicles have two separate fueling systems that enable the vehicle to use either LPG or gasoline. Many fleets purchase LPG vehicles, such as trucks and buses, to reduce maintenance costs and avoid cold-start issues associated with using liquid fuels in colder climates. Thousands of fueling stations offer LPG in the United States, and can be found on the AFDC alternative fueling station locator.

⁶⁸ LPG is considered an alternative fuel under Section 301 EPA Act 1992.

5.4.2 Identifying Optimal Electric Vehicle Strategies

5.4.2.1 Petroleum Reduction Opportunities from Electric Vehicles

Replacing petroleum vehicles with EVs is an effective strategy to reduce fleet-petroleum use. Electricity used in EVs displaces the petroleum that would have been used to support that transportation mission. EVs may have higher up-front acquisition costs, but have the potential to significantly reduce an agency's petroleum use and operating costs. The primary benefits for each type of EV are as follows:

- **BEVs.** Replacing a conventional-fueled vehicle with a BEV provides a 100% reduction in that vehicle's petroleum use. BEVs also reduce fleet operating costs since electricity and maintenance costs are typically far less than for comparable conventional-fueled vehicles.
- **LSEVs.** LSEVs have the potential to significantly reduce an agency's petroleum use and fleet operating costs in locations where fleet vehicles are used primarily to support campus-type operations, have low daily VMT, and have daily (or overnight) access to electricity for recharging. Although LSEVs are not classified as light-, medium-, or heavy-duty vehicles within the Federal fleet program, inventory, mileage, and electricity use data for those vehicles should be reported in FAST in order to receive credit for electricity use towards the EISA Section 142 alternative fuel use increase targets.
- **PHEVs.** Acquisition of a PHEV to replace a conventional-fueled vehicle is expected to provide substantial reductions in petroleum use, depending on the amount of electricity as well as the amount and type of conventional or alternative fuel used. PHEVs also allow drivers to switch to gasoline after depleting the electricity in their batteries.

Agencies should evaluate these potential EV benefits together with any potential drawbacks to determine when use of EVs makes sense for reducing petroleum use. Potential drawbacks of EVs compared to conventional-fueled vehicles may include higher incremental acquisition costs, longer refueling time (charge time), range constraints (primarily for BEVs and LSEVs), and for LSEVs, limitation to campus use.

5.4.2.2 Framework for Identifying Optimal Electric Vehicle Strategies

Strategies to acquire EVs to reduce fleet petroleum use can be effective at any fleet location, regardless of number of vehicles or alternative fuel availability. Generally, EV deployment is most effective at smaller fuel use⁶⁹ locations without access to other alternative fuels, biodiesel blends, or renewable diesel blends. Fleet managers should evaluate fleet location and vehicle operating characteristics in deploying EVs, including vehicle duty cycle (i.e., how the vehicle is used and typical driving range) and availability of EVSE, or charging infrastructure, to refuel EVs. Table 25 provides Federal fleet managers with a recommended framework for identifying optimal EV strategies at each fleet location based on fleet characteristics.

5.4.2.3 Planning for Electric Vehicle Charging Infrastructure

After deciding to pursue an EV strategy, it is now necessary to consider the infrastructure needed to “fuel” or power the vehicles. Agencies should evaluate and procure the most appropriate charging station—also referred to as EVSE—that meets the unique characteristics of the fleet and facility. Agency planning should focus on ensuring that the EVSE will be operational once the EV enters service at the fleet location.

The type of infrastructure needed depends on the types of EV procured and the charging characteristics (frequency, length, etc.). BEVs, PHEVs, and LSEVs all require EVSE to charge. However, EVSE needs are different for each of these vehicle types. Some BEVs, which usually have larger batteries, may require higher level EVSE (e.g., Level 2 [240-V charging stations]) than LSEVs (e.g., Level 1 [120-V electrical outlets]). Charging equipment for PHEVs varies based on operating characteristics, size of batteries, and charging cycle.

⁶⁹ “Smaller use” refers to locations with an annual fuel turnover rate of less than 100,000 gallons of both conventional fuel types (i.e., gasoline or diesel).

Table 25. Recommended Framework for Identifying Optimal Electric Vehicle Strategies

Step	Summary	Actions	Purpose
1	Identify conventional-fueled vehicles at fleet locations with existing charging stations	<ul style="list-style-type: none"> • Determine if existing charging infrastructure has the capacity to handle additional fleet EVs, or if the fleet can cost-effectively install additional charging stations using the existing infrastructure 	Locations with existing charging infrastructure may offer the most cost-effective opportunity to replace conventional vehicles with EVs
2	Identify conventional-fueled vehicles that are not candidates to be replaced with AFVs or use biodiesel or renewable diesel	<ul style="list-style-type: none"> • Determine if the fleet location will have accessibility to alternative fuel, biodiesel blends, or renewable diesel blends (see Sections 5.4.3 and 5.4.4) • Evaluate vehicles that are not candidates to be replaced with AFVs or diesel vehicles 	At locations that have or will have access to alternative fuel, biodiesel blends, or renewable diesel blends, fleet managers should prioritize acquisition of vehicles capable of using the alternative fuel, biodiesel, or renewable diesel
3	Identify optimal EV strategies based on fleet operational and location characteristics	<ul style="list-style-type: none"> • Evaluate operating characteristics for each candidate vehicle, including average and maximum daily driving range, route, and driving cycle, to determine whether an EV can meet the vehicle mission needs • Identify opportunities to replace LDVs that operate solely within campus with LSEVs 	Select optimal EV strategies
4	Evaluate availability of EVs to replace conventional-fueled vehicles	<ul style="list-style-type: none"> • Determine availability of BEVs, LSEVs, or PHEVs to replace conventional-fueled vehicles that are not candidates to be replaced with AFVs or use biodiesel or renewable diesel blends • Ensure that EVs meet minimum requirements needed to accomplish mission tasks 	Identify EVs available to complete necessary mission tasks
5	Evaluate life-cycle costs for acquisition of EVs and supporting charging infrastructure	<ul style="list-style-type: none"> • Determine whether EVs that match fleet requirements can be acquired at a reasonable and competitive life-cycle cost relative to competing vehicles (include costs for supporting charging infrastructure) • If not cost competitive, investigate whether funds can be made available based on compliance with fleet requirements • Ensure that acquisition of EVs supports compliance with EPC Act 1992 AFV and EISA Section 141 low-GHG emitting vehicle acquisition requirements (see Sections 3.6 and 3.7) 	Ensure that acquisition of EVs aligns with fleet resources

5.4.3 Identifying Optimal Renewable Diesel Strategies

Renewable diesel is a “drop-in” replacement for diesel—it is produced from biomass but also meets the petroleum diesel fuel specification (ASTM D975) requirements. Therefore, renewable diesel and renewable diesel blends are fully compatible with existing diesel vehicles⁷⁰ and existing refueling and distribution infrastructure. Federal fleets can **effectively reduce fleet-wide per-mile GHG emissions by displacing diesel with renewable diesel and renewable diesel blend use** at any fleet location with existing diesel infrastructure or where renewable diesel is available at local commercial or private fleet stations.

Renewable diesel is chemically different from biodiesel. Biodiesel contains fatty acid methyl esters and, therefore, cannot be transported through the diesel supply chain (including pipelines) and requires dedicated refueling infrastructure.

Renewable diesel meets the requirements for use in a diesel engine and is produced from nonpetroleum, renewable, predominantly hydrocarbon feedstock (rather than oxygenates). Renewable diesel can be produced through multiple processes and goes by various names, including hydrogenated esters and fatty acid diesel and hydrogenation derived renewable diesel. As those names suggest, it is typically produced through hydrogenation on a commercial scale. Renewable diesel’s similar chemical composition to diesel may create fewer issues in cold weather (lower cloud point) and improve storage stability and performance compared to biodiesel blends. This means that properly tuned renewable diesel can be used as a drop-in fuel blend component in an unmodified diesel motor vehicle engine and fuel injection system.

In evaluating opportunities to use renewable diesel or renewable diesel blends at a fleet location, fleet managers should first determine the number of diesel vehicles in their existing and projected vehicle inventory, as well as identify available fueling options at each fleet location. If the location has an existing diesel fueling infrastructure, the fleet manager should assess the potential to convert that fueling system to a renewable diesel or renewable diesel blends. As explained earlier, the conversion will likely be seamless since the fuel meets the diesel fuel standard. However, the availability and cost of the fuel may raise issues until the commercial-scale production of renewable diesel fuel expands. If renewable diesel or renewable diesel blends are available locally, the fleet manager should maximize the use of that infrastructure by fleet diesel vehicles.

After deciding on implementing renewable diesel and renewable diesel blend, fleet managers should maximize the acquisition of diesel vehicles capable of using the fuel. Since renewable diesel is managed the same as other diesel fuels, the only operator training should be to ensure all drivers use the available renewable diesel fuel rather than conventional diesel, whenever possible.

Does renewable diesel qualify as alternative fuel under EPA Act 1992?

EPA Act 1992 Section 301 defines alternative fuels, but this definition does not specify biodiesel or renewable diesel. However, the definition includes “fuels (other than alcohol) derived from biological materials” such that neat biodiesel (100% biodiesel or B100) is considered an alternative fuel. Biodiesel itself is defined in EPA Act Section 312, as amended through ECRA:

“‘Biodiesel’ means a diesel fuel substitute produced from nonpetroleum renewable resources that meets the registration requirements for fuels and fuel additives established by the Environmental Protection Agency under [Section 211 of the Clean Air Act]”.

To qualify renewable diesel fuel as biodiesel and therefore an alternative fuel, the fuel in question must (1) be produced from nonpetroleum renewable resources; and (2) be registered pursuant to EPA’s registration framework under section 211 of the Clean Air Act (CAA).

⁷⁰ Since renewable diesel meets or exceeds the petroleum diesel standard, using the fuel will not void any manufacturer’s engine warranty.

If the renewable diesel in question is produced from nonpetroleum renewable resources, then the fuel meets the first requirement. If the fuel also is registered with EPA under CAA Section 211, then it would meet the definition of biodiesel, and therefore the fleet may count the renewable diesel used as alternative fuel.

For blends of biodiesel, only that portion of the fuel that is biodiesel may be counted as alternative fuel. In other words, a biodiesel blend such as B20 (a mixture of 20% neat biodiesel and 80% conventional diesel) is not considered an alternative fuel, but the 20% biodiesel portion of B20 is considered an alternative fuel.

If renewable diesel qualifies under EPA Act 1992 and is used as R100, then all of that renewable diesel would be counted as alternative fuel. As with biodiesel, only the neat renewable diesel portion of a renewable diesel blend greater than 20% is considered alternative fuel. For example, if a fleet uses R20, 20% of the mixture qualifies as alternative fuel, and the other 80% does not.

5.4.4 Identifying Optimal Alternative Fuel and Biodiesel Blend Strategies

Alternative fuel and biodiesel blend strategies are ideally implemented at fleet locations with existing access to alternative fuel or high-use⁷¹ locations where alternative fuel, biodiesel blends, or renewable diesel blends are not currently available. At smaller use facilities without access to alternative fuel, biodiesel, or renewable diesel, fleets should focus on other petroleum reduction strategies such as acquisition of EVs (as discussed in Section 5.4.2), increasing fleet fuel efficiency (Section 5.3) or, if favorable, facilitate conversion of conventional gasoline tanks and/or development of alternative fuel, biodiesel, or renewable diesel infrastructure at local commercial or private fleet stations.

Fleet managers can identify the optimal alternative fuel and biodiesel blend strategies for each fleet location by using the flow chart in Figure 13 and alternative fuel and biodiesel blend strategy descriptions in Table 26. To start, fleet managers should evaluate their existing and projected vehicle inventory as well as identify available fueling options at each fleet location. The AFDC has various tools available to provide locations of alternative fuel pumps, including TransAtlas⁷² and the Alternative Fueling Station Locator.⁷³

Having determined the availability of alternative fuels, including biodiesel blends, fleet managers should next determine which alternative fuels could be used at the location and to what extent. Fleet managers should first consider the FFVs—including E85 FFVs—and biodiesel-capable diesel vehicles that are already located at the site, and then consider planned vehicle acquisitions. Fleet managers can then estimate the maximum alternative fuel use for the fleet location using the following methodology:

- **Inventory of vehicles.** Use the most recent VAM list by type and size at the fleet location.
- **Potential maximum number of AFVs.** Estimate the potential number of AFVs and diesel vehicles (including biodiesel-capable diesel vehicles) by fuel type at the fleet location for each of the next 3 FYs. First, project the number of vehicles, by size, required at the fleet location for each of the next 3 FYs. Then, determine how many of these vehicles can be AFVs or biodiesel-capable diesel vehicles, assuming maximum replacement of gasoline vehicles with AFVs and accelerated replacement, if possible.
- **Theoretical maximum alternative fuel use.** For each fuel type, multiply the potential maximum number of vehicles capable of using that fuel (AFVs or diesel vehicles) by the average fuel use of that vehicle type at the fleet location.

⁷¹ High-use refers to locations with an annual fuel turnover rate of 100,000 gallons or greater of one conventional fuel type (i.e., gasoline or diesel).

⁷² Available at <http://maps.nrel.gov/transatlas>.

⁷³ Available at <https://afdc.energy.gov/stations/>.

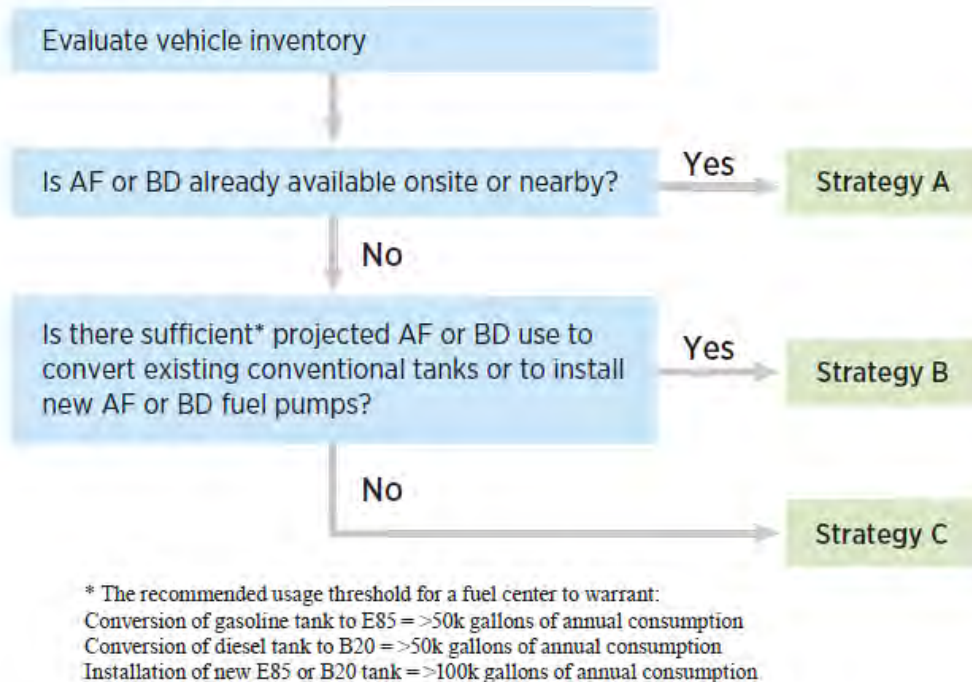


Figure 13. Determining Alternative Fuel and Biodiesel Strategies

Success in implementing alternative fuel and biodiesel blend strategies depends not only on fuel availability, but also on vehicles that can use the fuels and drivers who consistently refuel with alternative fuel. Fleet managers should maximize the number of vehicles capable of using alternative fuel or biodiesel blends (AFVs and diesel vehicles) at those locations that have existing alternative fuel or biodiesel infrastructure or are candidates for new infrastructure. Fleet managers at both headquarters and fleet location levels should work with GSA and GSA Fleet Service Representatives (FSRs) to ensure that vehicle acquisition plans support alternative fuel and biodiesel blend strategies.

Table 26. Descriptions of Alternative Fuel and Biodiesel Blend Strategies

Alternative Fuel and Biodiesel Strategy	Summary	Infrastructure Strategy	Vehicle Acquisition Strategy	Fuel Use Strategy
A	<ul style="list-style-type: none"> • Optimize use of existing on-site infrastructure • Optimize use of nearby retail station(s) • Obtain access to nearby private fleet fueling center 	<ul style="list-style-type: none"> • Maximize use of existing on-site/ nearby alternative fuel or biodiesel infrastructure • Use AFDC or the Federal Highway Administration Alternative Fuel Corridors to locate options 	Focus on acquisition of vehicles capable of using the existing alternative fuel or biodiesel infrastructure	Implement measures such as operator training to locate existing alternative fuel and biodiesel pumps and monitoring to limit conventional fuel use by dual-fueled AFVs or diesel vehicles
B	<ul style="list-style-type: none"> • Convert conventional fuel tank to E85 or biodiesel • Install new alternative fuel or biodiesel infrastructure 	<ul style="list-style-type: none"> • Convert existing gasoline fueling system to E85 or diesel fueling system to biodiesel • Install new ethanol, biodiesel, or CNG pumps 	Focus on acquisition of E85 FFVs (for E85) and diesel vehicles (for biodiesel)	Implement measures such as operator training to locate existing alternative fuel and biodiesel pumps and monitoring to limit conventional fuel use by dual-fueled AFVs or diesel vehicles
C	<ul style="list-style-type: none"> • Promote development of local alternative fuel or biodiesel infrastructure 	<ul style="list-style-type: none"> • Work with local retail stations, the Clean Cities program, and other fleets to install alternative fuel or biodiesel infrastructure 	Acquire AFVs or diesel vehicles if alternative fuel or biodiesel infrastructure is conveniently available	Ensure AFVs or diesel vehicles use new retail or private stations through operator training and monitoring

6 Deployment of Alternative Fuel Infrastructure

6.1 Installing Electric Vehicle Charging Systems at Federal Facilities

All BEVs, PHEVs, and LSEVs require charging stations—also referred to as EVSE—to operate. The primary EVSE for refueling EVs should be located at the fleet facility where the vehicle is garaged. Additional EVSE may be available locally at commercial or other Federal fleet locations.

The following sections provide a step-by-step process to guide Federal fleet managers and Federal facility managers in the selection, siting, and installation of EVSE at Federal facilities. Agencies may also consult materials developed by DOE FEMP and Vehicle Technologies Office.⁷⁴

6.1.1 Overview of Electric Vehicle Charging Infrastructure

EVSE ensures the safe transfer of electricity between the power source and the EV. EVSE is only one component of an EV charging system. The two other components are the power source to deliver electricity to the EVSE and the EV itself to control charging of the vehicle batteries from the EVSE.

- **Power source.** The power source should be connected to the EVSE through a dedicated circuit correctly sized to the power requirements.
- **EVSE.** The EVSE is a set of components that link the power source to the vehicle: (1) the interface to the power source, (2) the cord, and (3) connector to the vehicle. The connector, once inserted into the EV inlet, creates an electrical connection for charging the batteries and communicating charging-related information.
- **EV.** Once the EV inlet and EVSE are coupled, power is delivered via a rectifier and charger to the batteries.

Three charging levels were defined by the Electric Power Research Institute and codified in the National Electrical Code, along with corresponding functionality requirements and safety systems. The three basic charge levels (Level 1, Level 2, and Level 3 or DC [direct current] fast charging), classified by the rate at which the batteries are charged, are explained below. Low-level chargers provide electricity at slower speeds but are the easiest and least costly to install and maintain. Higher-level chargers can charge EVs more quickly; however, they are generally more expensive and require more robust power sources. Table 27 provides a summary of charging levels, which are summarized below:

- **Level 1 charging.** Level 1 EVSE provides charging through a standard 120 volts alternating current (VAC), 15-amp (12-amp usable) or 20-amp (16-amp usable) branch circuit. 120 VAC is the lowest common voltage level found in both residential and commercial buildings in the United States. Level 1 and does not require installation of additional charging equipment and most, if not all, EVs come with a Level 1 EVSE cord set (J1772 standard). Because Level 1 only provides a small amount of power (maximum of 1.44 kW) and can result in prolonged charge times, it is not recommended for primary charging stations for BEVs. However, Level 1 charging may be appropriate for PHEVs with smaller battery sizes (and driving ranges). Level 1 delivers between 2 and 5 miles of range per hour of charging.
- **Level 2 charging.** Level 2 provides charging through a 240 VAC single-phase or 208 VAC three-phase electric service with a 40-amp branch circuit and requires installation of additional charging equipment. Level 2 charging equipment is compatible with all EVs and PHEVs. Level 2 EVSE typically includes the

⁷⁴ General EVSE informational materials are available at https://afdc.energy.gov/fuels/electricity_infrastructure.html, and a specific report about installing EVSE at Army facilities is available at <https://www.nrel.gov/docs/fy20osti/74538.pdf>.

same J1772 standard cord that plugs into the same connector input in the vehicle as for Level 1. Level 2 charging delivers between 10 and 25 miles of range per hour of charging.

- **DC fast charging (Level 3).** DC fast charging equipment (typically 480 VAC input) enables rapid charging along heavy traffic corridors and at public stations. A DC fast charger can add 60–150 miles of range to a BEV in 20 minutes, depending on the charging power. Typically, only BEVs have DC fast charging ports, and there are three different types of vehicle connectors. Most American and European auto manufacturers use the Combined Charging System (CCS) connector; Nissan and Mitsubishi use the CHAdeMO connector; and Tesla uses their own Supercharger connector. Without specialty adapters, vehicles can only use connectors that are specific to their own model.

Table 27. Comparison of Electric Vehicle Charging Levels

	Level 1	Level 2	DC Fast Charging
Summary of Features	<ul style="list-style-type: none"> • Small units that plug into a standard 120V outlet • Simplest and most available solution • No permit needed • Long recharge times • Little or no data collection 	<ul style="list-style-type: none"> • Dedicated 208/240V circuit • Requires charging station (EVSE) • Permit needed; installed to code by electrician • Faster recharge times • Data management 	<ul style="list-style-type: none"> • Provides gas station experience • More expensive • High power requirements • Very fast recharge times • Data management
Electric Circuit	Standard 120 VAC circuits	208/240 VAC circuit	208/480 VAC three-phase input
Circuit Breaker	15 or 20-amp single-pole breaker	30 or 40-amp two-pole breaker	As required
EVSE	Use 20-amp standard ground fault circuit interrupter wall receptacle	EVSE is permanently wired to the electrical supply circuit	Permanently wired EVSE, similar to fuel pumps
Cord Set	<ul style="list-style-type: none"> • Standard three-prong with charge current interrupting device • J1772 vehicle connector at the other end of the cord 	Cord from EVSE with J1772 vehicle connector	Varies (no current standards)
Power	1.4–1.9 kW	3.3–7.7 kW	50–350 kW
Charge Times (full battery)	PHEVs: 7–13 hours BEVs (200 miles): 40-50 hours	PHEVs: 2–4 hours BEVs (200 miles): 8–20 hours	BEVs: 30–60 minutes
Optimal Use	LSEVs PHEVs with lower pure electric ranges	BEVs PHEVs with higher pure electric ranges	Quick charge needs

6.1.2 Coordinating Charging Station Deployment at a Fleet Location

Successful deployment of charging stations, or EVSE, requires coordination between the location's facility manager and fleet manager. The facility manager is typically responsible for both real property and utility management at the location, and may be integral in the siting, procurement, installation, operation, and maintenance decisions and management for the EVSE. DOE recommends developing a charging station deployment team that may include the following stakeholders:

- Fleet managers
- Sustainability officer or coordinator
- Advocate or proponent for the project
- Facilities manager
- Power utility and/or electrician
- Decision maker to authorize and prioritize EVSE and allocate funds as needed.

6.1.3 Identifying Electric Vehicle Supply Equipment Needs

Before procuring and installing EVSE, fleet managers should first determine how many and what type of charging stations to acquire. This analysis can be broken down into the following seven steps:

- **Are there other existing EV charging stations that the fleet can use?** Determine if any EVSE nearby could support your needs, including existing Level 1 outlets. Using existing EVSE eliminates the cost of procuring and installing your own EVSE.
- **What are the plans for deployment of EVs—where and how many?** Fleet and facility managers should develop an EVSE strategy that will support the needs of the EVs currently within their fleet and any future expansions to the fleet at their location.
- **What charging speed best meets your needs?** The speed at which your EVs need to charge will determine both how many charging stations you need and their type.
- **When will vehicles be charging?** Will charging be opportunistic or scheduled? How many EVs will be charging simultaneously? The greater the frequency and length of charging, the more chargers will be required. Charging frequency and length depends on three factors: the type of EV, the EV's daily mileage use, and the EVSE's charging level.
- **Who will have access to the EVSE at each site (fleet, employees, public, other authorized users)?** Agencies are strongly encouraged to provide Federal employees with access to fleet EVSE. Access differs based on who can use the EVSE and how payment will be collected, as necessary. Section 6.1.6 below discusses policies for employee personal use of Federal fleet charging stations.
- **What is the payment process for fleet and non-fleet (employee, public, other authorized users) vehicles? What are the data collection needs?** Agencies are required to track the electricity used to charge fleet EVs for annual reporting in FAST. Optimally, you will be able to collect data on each recharging transaction by each EV that uses your EVSE. Agencies may also need to determine how they will collect payments from employees who charge non-fleet vehicles (see Section 6.1.6 below), and how to control access to EVSE.

- **Based on this information, how many and what type of EVSE are needed?** Based upon the number of EVs, the best charging level(s) to use, data considerations and requirements, and the frequency and scheduling of EV charging, determine the characteristics of the EVSE that you need for your site.

6.1.4 Electric Vehicle Supply Equipment Siting Analysis

After determining your EVSE needs, the next step is to prepare for the placement of EVSE at the site. The siting analysis focuses on choosing a charging station location and design, deciding on the EVSE model, evaluating power requirements, and selecting data collection needs. While there are a number of factors and criteria to consider, the following steps are a useful place to begin:

- **Where will you locate the EVSE and parking spaces for charging?** How many spaces are needed? The location should be suitable for the needs of the fleet EVs, in terms of ease of access and frequency of use. If possible, keep the EVSE sheltered from the elements. Rain, sunlight, and extreme temperatures can slowly have deleterious effects on the EVSE.
- **What is the availability of power and electrical resources?** Installing EVSE on spaces that are closer to electrical sources (e.g., transformers or an electrical closet) will reduce installation costs (less trenching and cables).
- **How will you design charging spaces to manage cords and walkways?** Cords can be a tripping hazard. Install EVSE such that cords do not cross busy walkways. Different EVs have charging ports in different locations. Review the types of EVs you will need to support, and where they need to be charged when determining where to install chargers.
- **What EVSE type best meets your needs?** You should choose EVSE based on four criteria: payment and data requirements, charging speed, mounting type, and cost. Charging stations are available through GSA's pre-negotiated, multi-award BPA for Level 1, Level 2 and DC fast charging stations. The contract includes products from different manufacturers and data network plans but does not include installation services.⁷⁵ .. GSA provides additional stations and services, including basic installation, through the GSA Schedule.⁷⁶
- **What are the costs?** When deciding which EVSE technology to install, identify the costs. The cost of implementing EVSE can be broken down into three main categories: purchase price or leasing cost, installation costs, and maintenance and support costs.
- **What types of signage and policies will be necessary to effectively communicate and reserve any parking spaces served by EVSE?** Signage can help direct EV drivers to the charging station location and inform them of any parking restrictions.

6.1.5 Procuring and Installing Electric Vehicle Supply Equipment

After completing a siting analysis, you will be ready to procure the EVSE, develop a statement of work, and contract for installation. GSA provides a BPA for Level 1, Level 2 and DC fast charging stations and has additional stations and services available through the GSA Schedule. Agencies should coordinate EVSE procurement through GSA in order to realize savings through volume discount pricing.

Before procuring EVSE, it is important to answer the following questions: (1) who is responsible for procurement; (2) who is responsible for managing installation; and (3) who pays for procurement/installation? These answers may vary across fleets. Generally, either the fleet or facilities offices will be responsible for

⁷⁵ More information on acquiring EVSE through GSA's BPA is available through GSA's Electric Vehicle Charging Stations website at <http://gsa.gov/evse>.

⁷⁶ GSA Schedule products and services can be found at https://www.gsaadvantage.gov/advantage/main/start_page.do.

procurement and installation. Procurement of charging equipment may have implications for both fleet and facilities, so coordination may be necessary to ensure proper preparation for installation.

6.1.6 Employee Personal Use of Charging Stations at Federal Facilities

Section 1413(c) of the FAST Act, Public Law 114-94, codified at 42 U.S.C. § 6364 authorizes GSA and other Federal agencies to install, operate, and maintain charging stations for use by Federal employees and authorized users on a reimbursable basis, allowing for and requiring the collection of fees to recover these costs. The FAST Act permits Federal employees to use Federal fleet charging stations, as long as they do not interfere with Federal fleet vehicle use.

CEQ has issued *Guidance for Federal Agency Implementation of Workplace Charging Pursuant to the Fixing America's Surface Transportation Act* in two parts.⁷⁷ The first part outlines how Federal agencies can take advantage of workplace charging opportunities under the FAST Act and provides an approach for a uniform fee for Level 1 charging receptacles (i.e., wall outlets) for the purposes of seeking reimbursement under the FAST Act. The second part addresses the provision of EVSE with cordsets, including Level 1, Level 2, and DC fast charging for use by employees and authorized users. The document also describes how agency CSOs should coordinate with agency fleet managers to report annually on the implementation of workplace charging in FAST. Please note that this guidance applies to Federal buildings under the administrative jurisdiction, custody, or control of agencies other than GSA. GSA has separately issued guidance—*GSA Order 5605.1: Electric Vehicle Supply Equipment Infrastructure Management*—on the use of and financial accountability for EVSE infrastructure at facilities under GSA jurisdiction, custody, or control.⁷⁸

6.2 Installing E85 Infrastructure at Federal Facilities

Certain materials commonly used with gasoline are totally incompatible with alcohols. When these materials (such as aluminum) come in contact with ethanol, they may dissolve in the fuel, which may damage engine parts and result in poor vehicle performance. Therefore, use of E85 requires fueling infrastructure that includes only E85-compatible materials.

Federal agencies wishing to install E85 fueling infrastructure can either convert an existing tank system or install a new tank system. Each choice has its own costs and benefits as described in the following sections. More detail to assist Federal fleet managers in evaluating E85 refueling installation requirements at Federal fleet refueling centers is provided in the *Handbook for Handling, Storing, and Dispensing E85* produced by DOE Clean Cities.⁷⁹

6.2.1 Converting Existing Fueling Systems to E85

At refueling sites with more than one available gasoline or diesel tank, Federal agencies can convert one of the tank systems to E85. This typically costs much less than installing a new tank system. The conversion process includes cleaning the tank and lines, ensuring fuel lines and dispenser components are compatible with E85, and calibrating the fuel metering system.

Most metal underground storage tanks that meet EPA December 1998 codes can be used to store E85. Many underground fiberglass tanks that meet EPA standards may also be used to store E85. However, fiberglass storage tanks manufactured prior to 1992 **may not** be able to handle E85.

⁷⁷ Available at https://www.sustainability.gov/pdfs/guidance_fed_workplace_charging.pdf and https://obamawhitehouse.archives.gov/sites/default/files/guidance_for_federal_agency_implementation_of_workplace_charging_electric_vehicle_supply_equipment.pdf.

⁷⁸ Available at <https://www.gsa.gov/directives-library/electric-vehicle-supply-equipment-infrastructure-management-56051-pbs>.

⁷⁹ Available at https://afdc.energy.gov/files/u/publication/ethanol_handbook.pdf.

6.2.2 Installing New E85 Fueling Stations

Unless existing tanks can be converted to E85, a new E85 fueling station will require installation of a new E85 tank. Typically, this is the costliest alternative, involving installation of a new storage tank and associated equipment, as well as related excavation, concrete, and electrical work, if necessary. Options available include installing a new underground storage tank, a new aboveground storage tank, or an aboveground turnkey E85 refueling system.

6.2.3 Procuring E85

Federal agencies should consider procuring E85 either through DLA Energy or directly from ethanol suppliers. By consolidating requirements for DoD and other Federal agencies, DLA Energy often may be the lowest cost provider for E85.

6.3 Installing Biodiesel and Biodiesel Blend Infrastructure at Federal Facilities

Most refueling systems designed to handle diesel fuel will also handle biodiesel and biodiesel blends with no problem. B20 or lower blends minimize most issues associated with materials compatibility. Experiences over the last 20 years indicate compatibility with all elastomers in diesel fuel systems, even those such as nitrile rubber that are sensitive to higher blends.

Federal agencies wishing to install B20 fueling infrastructure can either convert an existing tank system or install a new tank system. Each choice has its own costs and benefits as described in the following sections. Each choice has its own costs and benefits as described in the following sections. More detail to assist Federal fleet managers in evaluating biodiesel refueling installation requirements at Federal fleet fueling centers is provided in NREL's *Biodiesel Handling and Use Guide, Fourth Edition*.⁸⁰

6.3.1 Converting Existing Fueling Systems to B20

At refueling sites with more than one available diesel tank, Federal agencies can convert one of the tank systems to B20. Similar to conversion of E85 refueling infrastructure, the costs for this alternative are typically much less than installing a new tank system. Conversion of existing tank systems typically only includes cleaning the tank and lines.

6.3.2 Installing New B20 Fueling Stations

At Federal fleet refueling centers without tanks that can be converted to B20, a new B20 fueling station would require installation of a new B20 tank. Typically, this is the costliest alternative, involving installation of a new storage tank and associated equipment, as well as related excavation, concrete, and electrical work, if necessary. The process for installing a new B20 refueling system is similar to the process for E85 discussed above.

6.3.3 Procuring B20

Federal agencies should consider procuring E85 either through DLA Energy or directly from biodiesel suppliers. By consolidating requirements for DoD and other Federal agencies, DLA Energy often may be the lowest cost provider for B20.

⁸⁰ Available at <https://www.nrel.gov/docs/fy09osti/43672.pdf>.

7 Acquiring Fleet Vehicles

This chapter discusses how Federal fleet managers can use vehicle acquisition (as identified in the VAM) to implement agencies' optimal petroleum reduction strategies. Agencies should acquire:

- **Vehicles right-sized to the mission** by employing the most fuel-efficient vehicle for the required task.
- **Plug-in electric vehicles, including BEVs and PHEVs**, increasing the number of acquisitions as costs fall and as manufacturer offerings grow more abundant.
- **Other AFVs** (including flex-fuel E85, natural gas, and propane vehicles) at locations with access to the alternative fuel in question.
- **Low GHG-emitting vehicles** as defined by EPA each model year.
- **Diesel vehicles** at locations with access to biodiesel blends.
- **Hybrid vehicles** where alternative fuel is not available.

Agencies should ensure vehicle acquisitions comply with EISA Section 141, which prohibits (with certain exceptions) Federal agencies from acquiring LDVs and MDPVs that are not low GHG-emitting vehicles, and EPCA 1992, which requires that at least 75% of covered LDV acquisitions by Federal agencies be AFVs.

Vehicle acquisition supports the key strategies to achieve petroleum reduction targets as follows:

- **Increasing fleet fuel efficiency.** Integral to reducing petroleum use is the acquisition of higher fuel economy vehicles. In most cases, a successful implementation of this strategy can be achieved through acquisition of low GHG-emitting vehicles, which are fundamentally the most fuel-efficient vehicles in their class, and through acquisition of devices that improve vehicle fuel economy, such as idling-reduction devices and telematics.
- **Implementing alternative fuel, biodiesel blend, and renewable diesel blend strategies.** Success in achieving and exceeding alternative fuel use mandates depends not only on fuel availability but also on vehicles that can use the fuels.
- **Implementing electric vehicle strategies.** At the core of this petroleum reduction strategy is the acquisition of BEVs, LSEVs, and PHEVs.

To develop a vehicle acquisition strategy, fleet managers should look broadly at the costs and benefits of different vehicle types, including the driving environment for which they are best suited.

Biodiesel capable vehicles are more commonly available in larger vehicles sizes. They generally have slightly higher fuel economy than gasoline vehicles (in part because diesel and biodiesel are more energy-dense). Because biodiesel use requires dedicated infrastructure, it is often ideal for either centrally refueled vehicles, or ones with set routes that pass by a biodiesel station. Biodiesel is a good alternative fuel to use for any diesel vehicle that meets these criteria.

CNG is typically less expensive on an energy content basis than gasoline or diesel and may require less maintenance than diesel vehicles. However, the vehicle fuel tanks and the fueling infrastructure are more expensive than diesel or gasoline fueling systems. In order to capitalize on the lower operational costs and achieve a good return on investment on high initial capital costs, CNG is best suited for larger, high utilization vehicles.

E85 FFVs generally have a lower fuel economy than gasoline vehicles, because E85 is less energy-dense than gasoline. E85 vehicles are appropriate for nearly any drive cycle as long as they are either centrally refueled or have a set route that passes by an E85 station. E85 is a good acquisition strategy wherever the fuel exists or can be developed.

Propane fuel is often less expensive than gasoline and diesel but often more expensive than CNG. Similar to CNG, propane vehicles avoid certain maintenance issues associated with diesel after treatment systems and may have lower maintenance costs. Propane is less pressurized than CNG, and the on-vehicle fuel tanks as well as the fueling stations are less expensive as a result. Propane vehicles tend to be more expensive than gasoline or diesel vehicles but less than CNG. Therefore, there are certain use cases such as buses for troop transport where operating propane buses may be a cost-effective petroleum reduction strategy.

HEVs generally have higher fuel economy than conventional gasoline vehicles and achieve the greatest efficiency gains in a stop and go environment through regenerative braking, such as cities. They are a good choice for LDVs and especially fleets with no current or anticipated alternative fueling stations as well as for smaller fleets that cannot aggregate sufficient demand for alternative fuel to be cost effective.

PHEVs can substantially increase fuel economy in a fleet and have a much lower operating costs but come with a higher initial price tag. These vehicles are good options for fleets that lack access to traditional alternative fuels but may have access to Level 1 charging via a wall outlet. They are mostly available in light-duty options.

BEVs are efficient and inexpensive to operate, eliminate a lot of maintenance associated with gasoline vehicles, but fully depend upon charging infrastructure and are more expensive to purchase than gasoline vehicles or HEVs. BEVs are ideal for fleets with set routes that can be accommodated by the BEV driving range.

Table 28 lists fuel types, fuel prices at a snapshot in time, and vehicle type availability.

Table 28. Vehicle Acquisition Strategy Considerations

Fuel Type	Fuel Price/GGE (January 2020)	Vehicle Type Availability
Gasoline	\$2.59	Light and medium duty
B20	\$2.60	Medium and heavy duty
B100	\$3.65	Medium and heavy duty
CNG	\$2.18	Medium and heavy duty
Diesel	\$2.71	Medium and heavy duty
E85	\$2.96	Light and medium duty
Propane	\$3.82 ⁸¹	Light, medium, and heavy duty

Because electric drive vehicles (HEVs, PHEVs, and BEVs) operate more efficiently on a GGE basis than the vehicles listed in Table 28, Table 29 lists operating costs per mile and the optimal driving conditions for each electric drive vehicle.

Table 29. Operating Costs for Electric Drive Vehicles

Electric Drive Type	Operating Costs	Optimal Driving Conditions
HEV	9 cents a mile	Less annual use than PHEVs or BEVs; longer driving distances
PHEV	<6 cents a mile	High annual use; longer driving distances (>200 miles a day)
BEV	<3 cents a mile	High annual use; shorter driving distances (<200 miles a day)

⁸¹ Average retail price at propane stations dedicated to motor vehicle traffic.

7.1 Framework for Identifying Optimal Vehicle Acquisition Strategies

The steps described in Table 30 can assist in identifying optimal vehicle acquisition strategies to support the petroleum reduction strategies selected for each fleet location.

Table 30. DOE's Recommended Framework for Identifying Optimal Vehicle Acquisition Strategies

Step	Summary	Purpose
PLAN and COLLECT		
1	Determine vehicle acquisition requirements	<ul style="list-style-type: none"> Establish a structured VAM to determine the numbers and types of vehicles required to accomplish your fleet's mission (see Section 5.1) Cross-reference AFV inventory with existing fueling locations to determine opportunities to transfer vehicle locations Estimate vehicle acquisition requirements to replace, add, and dispose of fleet vehicles
2	Incorporate impacts of VMT reduction at each fleet location	<ul style="list-style-type: none"> Refine the numbers of vehicles required to accomplish your fleet's mission at each fleet location based on opportunities to reduce VMT (see Section 5.2)
STRATEGIZE		
3	Establish vehicle acquisition strategies	<ul style="list-style-type: none"> Identify available AFVs that meet agency mission needs, qualify as low GHG-emitting vehicles, and provide the highest fuel economy Consider whether EVs could meet your fleet's needs Ensure proper fueling infrastructure is conveniently available for any acquired AFVs Identify low GHG-emitting vehicles available for each type of vehicle required to accomplish your fleet's mission at each fleet location⁸² Identify the most fuel-efficient vehicle to accomplish your mission, including HEVs
IMPLEMENT		
4	Acquire vehicles through GSA	<ul style="list-style-type: none"> Incorporate low GHG-emitting vehicle, fuel-efficient vehicle, AFV, diesel vehicle, and EV acquisition plans—as well as car-sharing options—for each fleet location For leased vehicles, work with GSA Fleet and its FSRs to finalize vehicle acquisition plans
5	Monitor performance	<ul style="list-style-type: none"> Determine compliance with the EPA 1992 AFV and EISA Section 141 low GHG-emitting vehicle acquisition requirements
6	Refine vehicle acquisition plans to meet compliance requirements	<ul style="list-style-type: none"> If EPA 1992 AFV or EISA Section 141 low GHG-emitting vehicle acquisition requirements cannot be met, determine what actions are needed to achieve compliance

⁸² If low GHG-emitting vehicles are not available to meet mission needs, agency may self-certify (provided by agency head or delegated authority) that they qualify for a functional needs exemption from EISA Section 141 requirements (see Section 3.7).

7.2 Implementing Vehicle Acquisition Strategies

Overall, agencies meet their employee surface transportation needs through:

- **Alternative transportation sources**, including the use of public transportation and reimbursement of Federal employees for use of their privately owned vehicle (more appropriately phrased “personally provided vehicle,” because leasing is common)
- **Existing fleet vehicles**, including the transfer of excess, seized, or forfeited vehicles and use of existing vehicles in motor pools
- **Acquisition of Federal fleet vehicles**, including the purchase through GSA Fleet Purchasing, GSA Fleet Leasing, commercial lease, or rental through the GSA Fleet Short-Term Rental Program or Multiple Award Schedule.

The primary objective when selecting among these available options is to satisfy agency needs for transportation services at the least cost to the Federal government while still supporting petroleum reduction strategies and meeting the mission requirements of the agency.

Having developed a fleet profile and VAM (as discussed in Section 5.1), selected other petroleum reduction strategies (as discussed in Sections 5.2 through 5.4), and identified acquisition requirements, fleet managers can now begin the acquisition process.

7.3 Acquisition of Federal Fleet Vehicles

GSA is a mandatory source for Federal vehicle acquisition. This section provides an overview of how to acquire vehicles from GSA, including AFVs, electric vehicles, low GHG-emitting vehicles, and other vehicles that assist agencies in implementing GHG emission and petroleum reduction strategies.

GSA leverages the government’s buying power to purchase vehicles and automotive products at significant savings for Federal agencies. GSA purchases vehicles directly through the OEMs at prices below invoice. In addition, GSA also has contracts with the OEMs’ representative dealers with a variety of makes and models at competitive pricing.

To compare vehicles that comply with EPC Act 1992 as amended and EISA 141, GSA Fleet has developed an Alternative Fuel Vehicle Acquisition Guide.⁸³ The Guide lists the vehicles by the relevant requirement along with information about vehicle type, motor, incremental costs, fuel economy, and mileage rates.

Federal agencies acquire vehicles through one of three methods:

- Purchase through GSA Fleet
- Lease through GSA Fleet
- Lease commercially or through Multiple Award Schedule
- Rent through the GSA Fleet Short-Term Rental Program or Multiple Award Schedule.

⁸³ Available at <http://www.gsa.gov/portal/content/104224>.

7.3.1 Purchase through GSA Fleet

GSA is a mandatory source under Federal Property Management Regulation (FPMR) (41 CFR § 101-26.501-1) for purchases of all new non-tactical vehicles for DoD, Federal executive agencies, and other eligible users.⁸⁴ GSA's Office of Fleet Management makes vehicles and related products and services available for purchase by customer agencies.

Agencies primarily order vehicles for purchase using GSA's online tool, AutoChoice. AutoChoice allows an agency to compare contractors, configure vehicles, choose equipment and color options, and view side-by-side comparisons of vehicle models from manufacturers. Agencies can also use AutoChoice to check on order status, get mpg fuel ratings, select dealerships, run reports, and more. All commercially available non-tactical motor vehicle types are available through AutoChoice.

Agencies requiring something more customized or with more immediate needs can use GSA's Non-Standards Program, Express Desk, or Automotive Superstore Schedules. A description of these options can be found below; however, for more details, please contact GSA's Customer CARE team at its CARS line, 703-605-CARS (2277) or by email at vehicle.buying@gsa.gov.

7.3.1.1 Non-Standards Program

GSA Automotive can help agencies customize any non-tactical vehicle need and can provide design/build services to include project planning, design, build, and project management through delivery of a customized vehicle. Contact GSA Automotive's Engineering Division for additional details.

7.3.1.2 Express Desk

Sometimes agencies have an urgent need for a vehicle solution. Express Desk⁸⁵ can help agencies purchase off-the-lot vehicle solutions for delivery within 30 days or less with the proper justifications.

7.3.1.3 Automotive Superstore

GSA has two Federal Supply Schedule solutions that can also fulfill agency vehicle needs. When using the schedules, agencies can access vendors directly to place an order for vehicles or accessories, or they can contact GSA to place the order on their behalf.

7.3.1.4 Schedule 23V

This schedule offers a wide variety of specialty vehicles and accessories, such as:

- Firefighting apparatus and attachments
- LE vehicles and attachments
- Special vocational vehicles
- Aircraft ground support vehicles
- Emergency response vehicles
- Construction and road maintenance equipment
- Upfitting services

⁸⁴ More information on eligible users is available at www.gsa.gov/portal/content/104212.

⁸⁵ Available at www.gsa.gov/portal/content/100720.

- Medium- and heavy-duty trucks
- Low-speed vehicles
- Trailers
- Tires
- Leasing of specialty vehicles.

7.3.2 Lease through GSA Fleet

GSA Fleet's leasing program provides customers with vehicle management support for the life cycle of the vehicle. This support includes vehicle acquisition and disposal, asset management, maintenance and repair, fuel, accident management, and vehicle remarketing. Leasing vehicles from GSA Fleet may reduce your agency's administrative, management, and functional burdens.

GSA Fleet is supported by a national network of Fleet Management Centers staffed by managers and Fleet Service Representatives, who are responsible for assigning GSA Fleet vehicles and providing administrative support. Additionally, the National Maintenance Control Center, which supports preventive maintenance and repairs, and the National Accident Management Center, which ensures best value accident management services.

7.3.3 Lease Commercially or through a Multiple Award Schedule

Federal agencies may use GSA Schedule 751 to commercially lease sedans, SUVs, and light-duty trucks. GSA Schedule 751 includes current model year vehicles with 12, 18, 24, 30, and 36-month lease terms. Delivery is 90 to 120 days after receipt of order. Vehicle maintenance is not included on leases. All vehicles meet Federal Vehicle Standards 122 and 307.

7.3.4 Rent through GSA Fleet Short-Term Rental or Multiple Award Schedule

GSA's short-term rental program streamlines the procurement and offers negotiated pricing for vehicle and equipment rental. Vehicles can be rented for up to 120 days, and equipment for up to 365 days. A fuel card is provided with each rental. Vehicles may also be rented through Multiple Award Schedule 48.

7.3.5 Federal Vehicle Standards

The Federal Vehicle Standards classifies various types and sizes of commercially available vehicles, and establishes minimum technical, quality, and optional equipment specifications.

The standards ensure federal vehicles are:

- Safe
- Durable
- Economical
- Provide uniformity in the acquisition process.

These standards are developed by GSA and are published annually to cover current model year vehicles.

The Federal Vehicle Standards are publicly posted for comments from interested parties for approximately 45 days during certain parts of the year as part of the annual development, coordination, and maintenance of the standards.

7.3.6 Vehicle Replacement Standards

GSA's FMR establishes vehicle replacement standards. Agencies acquiring replacement vehicles must follow the fuel-economy criteria. Steps in determining fleet vehicle replacements on a FY basis include:

- Establishing and justifying requirements for all vehicle users
- Establishing a system for assigning relative priorities between competing requirements for replacement funding
- Assigning priorities
- Determining which priorities receive funding and fine-tuning as necessary.

Motor vehicle replacement standards prescribed in FMR 102-34.270 are minimum requirements all agencies evaluating unit replacement should use. Agencies may replace owned vehicles more frequently as needed.

For vehicles leased through GSA Fleet, each vehicle is measured against GSA Fleet's motor vehicle replacement standards⁸⁶ to determine eligibility for replacement. However, the ultimate decision to replace or retain any given GSA leased vehicle lies with the customer's local FSR. The FSR's decision is based on a variety of factors, including the vehicle's age, mileage, condition, and repair history.

7.3.7 Analysis of Leasing Versus Owning

Completion of a lease/purchase analysis is a good business practice to identify whether leasing or purchasing is in the best interest of the Federal government. Leasing from GSA Fleet provides standardization, economies of scale, and the tools necessary for the effective and efficient management of the Federal fleet. By leveraging a shared-service model, GSA Fleet eliminates redundant operations and programs in the Federal government and provides a unified way of conducting business. Agencies that own their fleets may be constrained by the decentralization. Decentralization can be an obstacle to standardization, encourages duplication, increases cost, and encourages waste. In addition, it can result in failures implementing post-action review programs, identifying errors, and adhering to agency policy. GSA Fleet leasing is a leader in cost per mile, vehicle utilization, compliance with environmental policies and regulations, and cost of operations per vehicle. In addition, GSA Fleet better defines roles and responsibilities and monitors activities to ensure compliance with policy—enabling GSA Fleet to enhance effective and efficient management across the GSA leased fleet. All of these factors should be evaluated prior to an agency purchasing and owning a vehicle.

7.3.8 Leasing AFVs from GSA Fleet

EPAct 2005 requires GSA Fleet to spread the incremental cost of AFVs across the entire fleet. These AFV surcharges are assessed by GSA Fleet at the agency level depending on agency-specific AFV needs. This practice funds the incremental cost of AFVs that are purchased for the customer agency throughout the current fiscal year by adding a surcharge to all inventory vehicles each month. Agencies must generate enough surcharge funding to cover the incremental costs of all AFV orders in the current FY. For more information, please contact GSA Fleet's AFV Team at gsafleetafvteam@gsa.gov.

The monthly lease rate of an AFV varies by vehicle type. For this reason, GSA Fleet publishes new AFV lease information at the beginning of each FY. GSA Fleet's most recent AFV leasing guide, which provides pricing information, is available on its AFV Guides and Manuals web page.⁸⁷

⁸⁶ Available at <https://www.gsa.gov/buying-selling/products-services/transportation-logistics-services/vehicle-leasing/important-fleet-publications>.

⁸⁷ Available at www.gsa.gov/portal/content/104224.

General AFV surcharge information:

- Appears as a separate line item on GSA Fleet bill
- Is set annually by GSA Central Office and Agency Headquarter Fleet Manager
- Is added as additional monthly cost to all vehicles in an agencies' inventory to cover current FY incremental costs and applied to a vehicle once the vehicle is in use and incurring monthly bills
- Is set based on what the agency anticipates spending on AFV incremental costs throughout the fiscal year

At any time throughout the year, an agency may increase, decrease, or turn off its AFV surcharge in accordance with anticipated AFV orders. This is coordinated through the agency headquarters fleet manager.

7.3.8.1 How GSA Calculates AFV Incremental Costs

AFV incremental costs are provided in GSA Fleet's annual AFV Guide.⁸⁸ The following calculation is used to determine vehicle incremental costs:

$$\text{AFV Incremental Cost} = \text{Cost of AFV} - \text{Cost of lowest priced comparable gasoline vehicle}$$

Example: AFV minivan =	\$22,000
Lowest bid minivan =	\$20,000
Incremental cost =	\$2,000

7.3.9 Timeline for Ordering New Vehicles for Lease from GSA

The process below outlines the general timeline for LDVs. While the process for leasing new vehicles generally follows the schedule outlined, agencies can purchase and lease vehicles through GSA Fleet throughout the year.

<i>August–September</i>	GSA Fleet meets with agency fleet managers to gather vehicle policies and goals for the next FY.
<i>September–October</i>	Vehicle contracts are awarded.
<i>October–April</i>	GSA Fleet submits orders to vehicle manufacturers.
<i>April–October</i>	New vehicles are delivered.

Disposal best practices ensure vehicle replacement at a point that minimizes life-cycle costs and in a manner that maximizes residual value. For more information contact GSA Fleet at gsafleet@gsa.gov.

⁸⁸ Available at <https://www.gsa.gov/afv>.

Glossary

Acquisition – A vehicle acquired for a Federal fleet that is a (1) new purchase; (2) newly leased vehicle, whether leased through GSA or commercially; or a (3) leased vehicle that replaces an existing leased vehicle. Leased acquisitions are counted in the FY in which they are ordered. For example, a vehicle that was ordered in FY 2019 (prior to September 30), but is delivered after October 1, 2019 (the start of FY 2020), will count as a FY 2020 acquisition. Similar/identical vehicles that are swapped within the same agency do not count as acquisitions (e.g. at GSA request, to insure uniform vehicle usage across their fleet).

Agency owned vehicle – A vehicle purchased by a Federal agency.

Alternative fuel (AF) – “Methanol, denatured ethanol, and other alcohols; mixtures containing 85% or more (or such other percentage, but not less than 70%, as determined by the Secretary, by rule, to provide for requirements relating to cold start, safety, or vehicle functions) by volume of methanol, denatured ethanol, and other alcohols with gasoline or other fuels; natural gas, including liquid fuels domestically produced from natural gas; liquefied petroleum gas; hydrogen; coal-derived liquid fuels; fuels (other than alcohol) derived from biological materials; electricity (including electricity from solar energy); and any other fuel the Secretary determines, by rule, is substantially not petroleum and would yield substantial energy security benefits and substantial environmental benefits.” *42 U.S.C. § 13211(2)*

Alternative fuel vehicle (AFV) – A vehicle that either operates solely on alternative fuel or that is capable of operating on both alternative fuel and gasoline or diesel fuel. This includes: “a new qualified fuel cell motor vehicle (as defined in section 30B(b)(3) of Title 26); a new advanced lean burn technology motor vehicle (as defined in section 30B(c)(3) of that title); a new qualified hybrid motor vehicle (as defined in section 30B(d)(3) of that title); and any other type of vehicle that the EPA Administrator demonstrates to the [DOE] Secretary would achieve a significant reduction in petroleum consumption.” *42 U.S.C. § 13211(3)*

Bi-fuel vehicle – A vehicle with two separate fuel systems designed to run on either an alternative fuel, or gasoline or diesel, using only one fuel at a time. Bi-fuel vehicles are sometimes referred to as dual-fueled vehicles, including in the Clean Air Act Amendments and Energy Policy Act.

Biodiesel – “A diesel fuel substitute produced from nonpetroleum renewable resources that meets the registration requirements for fuels and fuel additives established by the Environmental Protection Agency under Section 7545 of [U.S.C. Title 42]; includes biodiesel derived from animal wastes, including poultry fats and poultry wastes, and other waste materials; or municipal solid waste and sludges and oils derived from wastewater and the treatment of wastewater.” *42 U.S.C. § 13220(f)(1)*

Compressed natural gas – Natural gas that has been compressed under high pressures, typically 2,000 to 3,600 psi, held in a container. The gas expands when used as a fuel.

Conventional fuel vehicle – A vehicle that is powered by an internal combustion engine that utilizes gasoline, reformulated gasoline, diesel fuel, or a biodiesel blend as its fuel source.

Dedicated alternative fuel vehicle – A motor vehicle that is designed to operate solely on alternative fuel.

Dual-fueled alternative fuel vehicle – Vehicle designed to operate on a combination of an alternative fuel and a conventional fuel. This includes (a) vehicles that use a mixture of gasoline or diesel and an alternative fuel in one fuel tank, commonly called flexible-fuel vehicles; and (b) vehicles capable of operating either on an alternative fuel, a conventional fuel, or both, simultaneously using two fuel systems. They are commonly called bi-fuel vehicles. *See 42 U.S.C. § 13211(8).*

Electric vehicle (EV) – A vehicle primarily powered by an electric motor that draws current from rechargeable storage batteries, fuel cells, photovoltaic arrays, or other sources of electric current. *See* 42 U.S.C. § 17011(3).

Emergency vehicle – Any vehicle that is legally authorized by a government authority to exceed the speed limit to transport people and equipment to and from situations in which speed is required to save lives or property, such as a rescue vehicle, fire truck or ambulance. This includes vehicles directly used in the emergency repair of transmission lines and in the restoration of electricity service following power outages that are used in this capacity for more than 75% of the year. It also includes those vehicles that are used in an emergency capacity, by the agency, for more than 75% of the year.

Ethanol – A fuel that can be produced chemically from ethylene or biologically from the fermentation of various sugars from carbohydrates.

Federal fleet fueling centers – An existing Federally owned or contracted refueling site that is located on Federal property and primarily used to fuel Federal fleets—including those operating on appropriated or working capital funds—and that dispenses gasoline, diesel, and/or alternative fuels. Excluded from the definition of “Federal fleet fueling center” are refueling centers with a fuel turnover rate of less than 100,000 gallons per year of at least one fuel type. EISA Section 246 specifies that the renewable fuel pump installation requirements do not apply to any DoD refueling center with a fuel turnover rate of less than 100,000 gallons per year of at least one fuel type. 42 U.S.C. § 17503(c). The statute is silent as to whether a turnover rate threshold applies to fueling centers of other agencies. DOE interprets this minimum threshold definition of 100,000 gallons as applying to all Federal agencies, and not just DoD refueling centers.

Flex-fuel (or flexible-fuel) vehicle (FFV) – A vehicle with a common fuel tank designed to run on varying blends of unleaded gasoline with either ethanol or methanol.

Fiscal year – For a given year, the 12-month period running from October 1 of the prior calendar year through September 30 of the given calendar year. For example, FY 2020 means October 1, 2019, through September 30, 2020.

Fuel cell – An electrochemical engine with no moving parts that converts the chemical energy of a fuel, such as hydrogen, and an oxidant, such as oxygen, directly to electricity. The principal components of a fuel cell are catalytically activated electrodes for the fuel (anode) and the oxidant (cathode) and an electrolyte to conduct ions between the two electrodes.

Fuel economy – The average number of miles traveled by an automobile for each gallon of gasoline (or equivalent amount of other fuel) used.

Gasoline gallon equivalent (GGE) - A unit for measuring alternative fuels so that they can be compared with gasoline on an energy equivalent basis. This is required because the different fuels have different energy densities.

Greenhouse gas (GHG) – Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF₃).

Gross vehicle weight rating (GVWR) – The value specified by the manufacturer as the maximum design loaded weight of a single vehicle consistent with good engineering judgment. *See* 40 CFR Sec. 86.1803.

Heavy-duty vehicle (HDV) – Generally, a vehicle that a) is rated at more than 8,500 pounds gross vehicle weight; b) has a curb weight of more than 6,000 pounds; OR has a basic vehicle frontal area in excess of 45 square feet.

Hybrid electric vehicle (HEV) – A vehicle powered by two or more energy sources, one of which is electricity. HEVs draw propulsion energy from onboard sources of stored energy which are both an internal combustion or heat engine using consumable fuel, and a rechargeable energy storage system – as defined in Section 30B(d)(3) of the Internal Revenue Code of 1986 as cited in EISA 2007. *See* 26 U.S.C. 30B(d)(3).

Incremental cost – The additional cost of acquiring an AFV over a comparable conventionally fueled vehicle.

Law enforcement (LE) vehicle – A vehicle which is primarily owned, operated or controlled by Federal LE or protective services, AND which is primarily used for the purpose of LE activities such as (a) chase, apprehension, and surveillance of people engaged in or potentially engaged in unlawful activities, or (b) for site protection services. Typically, LE vehicles include those that are authorized to exceed speed limits and/or ignore other traffic laws, are used for chasing suspects, have flashing red and/or blue lights (mounted in either a marked or unmarked configuration), are used for detaining suspects or transporting prisoners, and/or are used to monitor and protect a Federal site's perimeter, equipment, personnel, and/or entrance.

Light-duty vehicle (LDV) – Passenger cars and trucks with a gross vehicle weight rating of 8,500 pounds or less. *See* 42 U.S.C. § 13211(11).

Liquefied natural gas (LNG) – Compressed natural gas that is cryogenically stored in its liquid state.

Liquefied petroleum gas (LPG) – A mixture of hydrocarbons found in natural gas and produced from crude oil, used principally as a feedstock for the chemical industry, home heating fuel, and motor vehicle fuel. Also known by the principal constituent propane.

Low-speed electric vehicle – A 4-wheeled on-road or non-road vehicle that (1) has a top attainable speed in 1 mile of more than 20 mph and not more than 25 mph on a paved level surface; and (2) is propelled by an electric motor and an on-board, rechargeable energy storage system that is rechargeable using an off-board source of electricity.

Medium-duty vehicle (MDV) – A motor vehicle of more than 8,500 pounds and less than or equal to 16,000 pounds GVWR. Definitions vary by organization.

Methanol – A liquid fuel formed by catalytically combining carbon monoxide (CO) with hydrogen in a 1 to 2 ratio under high temperature and pressure. Commercially, it is typically manufactured by steam reforming natural gas. Also formed in the destructive distillation of wood.

Metropolitan statistical area (MSA)/consolidated metropolitan statistical area (CMSA) – An area qualifies for recognition as an MSA if it includes a city of at least 50,000 in population or an urbanized area of at least 50,000 with a total metropolitan area population of at least 100,000. Consolidated metropolitan statistical areas are defined similarly but have populations of 1 million or more and include within them separate metropolitan statistical areas. For purposes of EPAct, covered MSA and CMSA areas include those that had a 1980 U.S. Census population figure of more than 250,000.

Military tactical vehicles – A motor vehicle designed or modified to military specification and used for the purpose of providing direct transportation support of combat or tactical operations or the protection of nuclear weapons, and which is not used for any other purpose.

Motor Vehicle – A self-propelled vehicle that meets the definition of Section 215(2) of the Clean Air Act (42 U.S.C. 7550(2)) and is fully Federal Motor Vehicle Safety Standards certified for operation on all public roads and highways, designed for transporting persons or property. (**Automobile** means a 4-wheeled vehicle propelled by conventional fuel, or by alternative fuel, manufactured primarily for use on public streets, roads, and highways.)

Neighborhood electric vehicle (NEV) – “A four-wheeled on-road or non-road vehicle that (1) has a top attainable speed in 1 mile of more than 20 mph and not more than 25 mph on a paved level surface and (2) is propelled by an electric motor and on-board, rechargeable energy storage system that is rechargeable using an off-board source of electricity.” *42 U.S.C. § 13258(a)(4)*

Petroleum fuel – Gasoline or diesel fuel.

Renewable fuel – A fuel that is:

- At least 85% ethanol (E85),
- A mixture of biodiesel and diesel or renewable diesel fuel (as that term is defined under Section 211(o) of the Clean Air Act), containing at least 20% biodiesel (B20) or renewable diesel, or
- Electricity derived from a renewable source of energy (e.g., solar or wind-generated electricity) or non-renewably generated electricity RECs equal to or greater than the electricity used are purchased.

Renewable diesel – A diesel alternative produced from nonpetroleum renewable resources that serves as a drop-in substitute for petroleum diesel. To qualify as an alternative fuel, renewable diesel must be registered with EPA under CAA Section 211.

Renewable fuel pump – A device that delivers renewable fuel (including electricity) to Federal vehicles.

Appendix A: DOE Guidance on Nation-of-Origin Vehicle Manufacturer Procurement Requirements under 42 U.S.C. § 6374(a)(3)(G)

Introduction

The Federal government is subject to manufacturer nation-of-origin requirements in its procurement of vehicles. First, section 6374 of title 42 of the U.S. Code requires that the maximum number practicable of the vehicles acquired annually for use by the Federal government must be alternative fueled vehicles. See 42 U.S.C. § 6374(a)(1). Among other requirements, these motor vehicles must be manufactured in the United States or Canada, except to the extent inconsistent with certain multilateral trade agreements. The Buy American Act of 1933, as amended, also requires the Federal government to prefer American-made products in its purchases. See 41 U.S.C. §§ 8301-8305; 49 C.F.R. part 661.

Analysis

Government agencies should consult their legal counsel to ensure compliance with the nation-of-origin manufacturing Federal vehicle requirements of 42 U.S.C. § 6374(a)(3)(G), keeping in mind the following guidance. When determining whether a proposed Federal vehicle acquisition is “manufactured in the United States” for purposes of compliance with this section, government agencies should undertake the same analysis of determining whether a proposed vehicle acquisition is manufactured in the United States for purposes of the Buy American Act. It is thus the position of the Federal Energy Management Program that a government agency’s analysis of whether a motor vehicle is “manufactured in the United States” for purposes of compliance with 42 U.S.C. § 6374(a)(3)(G) is the same as the analysis of the domestic end product requirements under the Buy American Act. Government agencies also should undertake an equivalent analysis in determining whether a motor vehicle is manufactured in Canada for purposes of compliance with 42 U.S.C. § 6374(a)(3)(G). Accordingly, the manufacturer nation-of-origin analysis under section 6374(a)(3)(G) is complementary and consistent with the manufacturer nation-of-origin analysis under the Buy American Act, and government agencies should seek the assistance of their own legal counsel in determining whether a vehicle is manufactured in the United States or Canada in accordance with both statutes. In addition, government agencies should consult their own legal counsel in cooperation with the U.S. Trade Representative, as necessary, to ensure that the procurement of any motor vehicle is not inconsistent with any of the multilateral trade agreements set forth under 19 U.S.C. § 3501(4).

Appendix B: E.O. 13834 Subject Agencies (2019)

Agency Name	References and Abbreviations
Court Services and Offender Supervision	CSOS
Defense Agencies	
General Services Administration	GSA
National Archives and Records Administration	NARA
National Aeronautics and Space Administration	NASA
National Science Foundation	NSF
Nuclear Regulatory Commission	NRC
Office of Personnel Management	OPM
Smithsonian Institute	Smithsonian
Social Security Administration	SSA
Tennessee Valley Authority	TVA
U.S. Army Corps of Engineers	Corps of Engineers, USACE
U.S. Department of Agriculture	Agriculture, USDA
U.S. Department of Air Force	Air Force, USAF
U.S. Department of Army	Army
U.S. Department of Commerce	Commerce, DOC
U.S. Department of Defense*	DoD
U.S. Department of Education	Education
U.S. Department of Energy	DOE
U.S. Department of Health and Human Services	HHS
U.S. Department of Homeland Security	DHS
U.S. Department of Housing and Urban Development	HUD
U.S. Department of the Interior	Interior, DOI
U.S. Department of Justice	Justice, DOJ
U.S. Department of Labor	Labor, DOL
U.S. Department of Navy	Navy
U.S. Department of State	State, DOS
U.S. Department of Transportation	Transportation, DOT
U.S. Department of Treasury	Treasury
U.S. Department of Veterans Affairs	VA
U.S. Environmental Protection Agency	EPA
U.S. Marine Corps	USMC

"[T]he U.S. Postal Service is subject to many of the statutory requirements covered by E.O. 13834. It receives an OMB scorecard, and functions like a principal agency."

* The U.S. Department of Defense fleet is comprised of the following five agencies: Defense Agencies, U.S. Department of Air Force, U.S. Department of Army, U.S. Department of Navy, and U.S. Marine Corps.

Appendix C: Agencies with EPOA-Covered Fleets (2019)

Agency Name	References and Abbreviations
Court Services and Offender Supervision	CSOS
Defense Agencies	
General Services Administration	GSA
National Aeronautics and Space Administration	NASA
National Science Foundation	NSF
Nuclear Regulatory Commission	NRC
Office of Personnel Management	OPM
Smithsonian Institute	Smithsonian
Social Security Administration	SSA
Tennessee Valley Authority	TVA
U.S. Army Corps of Engineers	Corps of Engineers, USACE
U.S. Department of Agriculture	Agriculture, USDA
U.S. Department of Air Force	Air Force, USAF
U.S. Department of Army	Army
U.S. Department of Commerce	Commerce, DOC
U.S. Department of Defense*	DoD
U.S. Department of Education	Education
U.S. Department of Energy	DOE
U.S. Department of Health and Human Services	HHS
U.S. Department of Homeland Security	DHS
U.S. Department of Housing and Urban Development	HUD
U.S. Department of the Interior	Interior, DOI
U.S. Department of Justice	Justice, DOJ
U.S. Department of Labor	Labor, DOL
U.S. Department of Navy	Navy
U.S. Department of State	State, DOS
U.S. Department of Transportation	Transportation, DOT
U.S. Department of Treasury	Treasury
U.S. Department of Veterans Affairs	VA
U.S. Environmental Protection Agency	EPA
U.S. Marine Corps	USMC
U.S. Postal Service	USPS

* The U.S. Department of Defense fleet is comprised of the following five agencies: Defense Agencies, U.S. Department of Air Force, U.S. Department of Army, U.S. Department of Navy, and U.S. Marine Corps.

Appendix D: E.O. 13834 Implementing Instructions

Section B. Fleet Management

“In accordance with E.O. 13834 Section 1, agencies are instructed to meet statutory requirements related to energy and environmental performance of vehicles in a manner that increases efficiency, optimizes performance, and reduces waste and costs.

Progress Metrics:

Metrics:	Reduction in petroleum consumption; and Increase in alternative fuel consumption.
Performance Measures:	Achieved 20 percent petroleum reduction relative to FY 2005 and demonstrate annual progress each fiscal year.
Progress Milestones:	Agencies will identify targets for petroleum reduction and alternative fuel increase for the next fiscal year in annual Sustainability Plans.

Requirements and Priority Strategies:

Agencies are required to meet a range of statutory requirements related to fleet management, summarized below. As part of a comprehensive strategy to comply with statutory mandates while improving overall fleet efficiency, reducing costs, and meeting mission requirements, agencies should identify and implement strategies to:

1. Right-size the fleet;
2. Reduce vehicle miles traveled;
3. Replace inefficient vehicles with more fuel efficient vehicles; and
4. Align deployment of alternative fuel vehicles with fueling infrastructure.

Vehicle Acquisition:

- *Acquisition of alternative fuel vehicles (AFVs):* At least 75 percent of light-duty vehicle (LDV) acquisitions by covered Federal fleets located in metropolitan statistical areas⁸⁹ must be AFVs, which include flex-fuel, electric, plug-in hybrid electric, compressed natural gas, low GHG-emitting, liquefied petroleum gas, liquefied natural gas, and fuel-cell vehicles (42 U.S.C. § 13212).
- *Acquisition of low greenhouse gas (GHG) emitting vehicles:* All light-duty vehicles and medium-duty passenger vehicles acquired by agencies must be low GHG-emitting vehicles unless they qualify for a functional needs exemption or the agency reduces emissions through alternative measures (42 U.S.C. § 13212(f)).

Fuel:

- *Reduce petroleum consumption and increase alternative fuel use:* Agencies must reduce annual petroleum consumption by 20 percent by 2015 and increase alternative fuel use by 10 percent annually, relative to a FY 2005 baseline (42 U.S.C. § 6374e(a)(2)).

⁸⁹ As defined in 42 U.S.C. § 13212.

- *Use alternative fuel in dual-fueled AFVs:* All Federal fleet dual-fueled AFVs must use alternative fuel only, unless granted a waiver by DOE (referred to as “Section 701” waiver under EPCA 2005) (42 U.S.C. § 6374(a)(3)(E)).
- *Alternative fuel infrastructure:* Every Federal fueling center without renewable fuel availability must install a renewable fuel pump (42 U.S.C. § 17053).

Operation and Management:

- *Vehicle allocation methodology (VAM):* Agencies are required to conduct a study of all their fleet vehicles (vehicle allocation methodology or VAM) at least once every five years to identify opportunities to eliminate unnecessary vehicles, right-size vehicles for their mission, and deploy AFVs effectively (GSA FMR Bulletin B-43). Agencies are encouraged to conduct a VAM study more frequently if the agency’s mission or resource requirements change.
- *Vehicle Classifications:* Agencies should ensure that their law enforcement (LE) and emergency vehicles are the smallest, most fuel efficient, and least GHG-emitting vehicles necessary to execute mission requirements (GSA FMR Bulletin B-33).

To measure performance on efficient fleet management, agency progress will be assessed based on the statutory requirement for petroleum reduction. Data points to be tracked to inform effective management currently include percentage increase in alternative fuel, alternative fuel as a percentage of total covered fuel consumption, compliance with statutory minimums for alternative fuel vehicle acquisitions, and annual progress on fleet-wide miles per gasoline gallon equivalent (GGE) of petroleum fuels. Data for these indicators are obtained through FAST and require no additional reporting.⁹⁰

Fleet-wide mpgge of petroleum fuels considers progress and compliance with key fleet management drivers, including petroleum reduction, alternative fuel use, acquisitions of AFVs and low GHG-emitting vehicles, installation of alternative fuel infrastructure, and effective implementation of Federal motor vehicle management policies contained in the FMR.⁹¹

Use of Federal Fleet Management Information Systems ([GSA FMR Bulletin B-15](#)): Agencies are required to use a fleet management information system (FMIS) (40 U.S.C. §§17502 and 17503), which provides agencies the ability to identify, collect, and analyze motor vehicle data and capture all costs incurred during the motor vehicle life cycle. FMIS also facilitates asset-level data (ALD) management and serves as a critical tool for controlling costs, establishing utilization criteria, and ensuring effective fleet resource management.

Agencies should ensure all ALD collected through the agency FMIS is accurate and complete. Agencies that do not have an existing, compliant agency FMIS or motor pool management tool should use tools developed by GSA.⁹²

Telematics: To the maximum extent practicable, and where lifecycle cost-effective, agencies should adopt technology-based hardware tools to collect and record vehicle operational data. Agencies should use telematics to promote efficient driving, automate reporting to FMIS, assist in mandatory FAST reporting, and factor geolocation data into their vehicle allocation methodology (VAM) processes. Adoption of telematics will increase savings by providing information to reduce fleet size, fuel use, misuse of vehicles, and unnecessary or insufficient maintenance.

⁹⁰ Includes the percentage of diesel used in B20 or any renewable diesel blends.

⁹¹ See GSA’s FMR [Motor Vehicle Management Advisory Bulletins](#).

⁹² See GSA’s [Federal Fleet Management System](#) (FedFMS) website

Tracking and Reporting:

Agencies will annually report vehicle and fleet data through FAST and will identify yearly targets for progress on petroleum reduction and alternative fuel use in their Sustainability Plans, in accordance with annual instructions.

To assist with effective program management, data points tracked as indicators currently include:

- Alternative fuel increase: 10 percent annual increase from FY 2005 baseline.
- Alternative fuel as a percentage of total covered fuel consumption.
- AFV acquisitions as a percentage of vehicle acquisitions.
- Fleet-wide miles per gasoline gallon equivalent (GGE) of petroleum fuels.

Guidance and Resources:

- [DOE's] [Alternative Fuels Data Center station finder](#) assists agencies in identifying and using alternative fuel.
- EPA's [Green Vehicle Guide](#) provides information on fuel efficient and alternative fuel vehicles.
- FEMP's [Federal Fleet Management](#) website helps agencies access the latest information, applications, and resources related to fleet efficiency.
- GSA's [Motor Vehicle Management Policy Overview](#) provides information on Federal motor vehicle policies, guidance, and data to improve management and enhance the performance of the motor vehicle fleets operated by Federal agencies.
- GSA's [Office of Fleet Management](#) website provides information on the identification and acquisition of Federal vehicles.

Implementation Actions:

- FEMP will consolidate resources to replace existing fleet guidance, and establish a single webpage of resources on agency fleet planning, data management, reporting, fuel use, and AFV purchasing.
- FEMP will streamline and automate the Section 701 waiver process utilizing DOE's [Fleet Sustainability Dashboard \(FleetDASH\)](#) system.
- GSA should review and, as appropriate, update its [FMR Motor Vehicle Management advisory bulletins](#) to provide any necessary clarifications, promote compliance, and facilitate achievement of E.O. 13834 goals and objectives, including:
 - [FMR Bulletin B-43](#): Vehicle Allocation Methodology for Agency Fleets;
 - [FMR Bulletin B-33](#): Alternative Fuel Vehicle Guidance for Law Enforcement and Emergency Vehicle Fleets;
 - [FMR Bulletin B-35](#): Home to Work Transportation; and
 - [FMR Bulletin B-28](#): Federal Employee Transportation and Shuttle Services.”⁹³

⁹³ E.O. 13834 Implementing Instructions available at https://www.sustainability.gov/pdfs/eo13834_instructions.pdf.

Appendix E: Electric Vehicle Efficiency Factor

Electric Vehicle Efficiency Factor

2.75⁹⁴

⁹⁴ The EVEF is determined by standards developed in the GREET Model (<https://greet.es.anl.gov/afleet>) and is subject to future updates. Updates to the EVEF will be posted on FAST FAQ: Fuel Conversion Factors (<https://fastweb.inl.gov/help/index.cfm/faqs/faq-fuel-conversion-factors>).

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