Description of document:	Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) three reports by contractor Mercury Associates Inc. related to Contract AG1A23D170151 (also referenced as GS10F0026T): NRCS vehicle fleet, NRCS Vehicle Allocation Methodology and Fleet Optimum Replacement, 2015-2016
Requested date:	17-December-2018
Release date:	02-July-2019
Posted date:	20-January-2020
Source of document:	FOIA Request Departmental FOIA Officer 1400 Independence Avenue, SW South Building Room 4104 Washington, DC 20250-0706 Email: USDAFOIA@ocio.usda.gov

July 02, 2019

Delivered via email

This is a final response letter to your Freedom of Information Act (FOIA) request dated December 17, 2018, to the Department of Agriculture (USDA) Farm Production and Conservation Business Center (FPAC-BC). Your request was received in this office on December 26, 2018, and you requested the following:

> *I request a digital/electronic copy of the final report/presentation produced by the contractor Mercury Associates Inc. under Contract AG1A23D170151 (also referenced as GS10F0026T). The subject is the NRCS vehicle fleet.*
> *I also request a digital/electronic copy of the final report/presentation produced by the contractor Mercury Associates Inc. under Contract G3A75D140013 (also referenced as GS33F0022U) and under Contract AG3A75D150021 (also referenced as GS33F0022U). The subject is the NRCS vehicle fleet, NRCS Vehicle Allocation Methodology and Fleet Optimum Replacement.*

Your FOIA request number is 2019-FPAC-BC-01573-F.

After a thorough review of our records, I have determined that three documents totaling 74 pages are appropriate for release. These three documents are being released to you in full and are listed below. One document, 25 pages, is being withheld in full since it is still in draft form and the contract hasn't been closed yet. This document is being withheld pursuant to Exemption (b)(5) of the FOIA, 5 U.S.C. §552(b), which pertains to **Exemption 5 - Deliberative Process Privilege** – applies to certain inter- and intra-agency communications protected by the deliberative process privilege.

Released: *G3A75D140013 – NRCS Flee Management Plan – Chief's Brief, March 2015*

AG3A75D150021 – NRCS Fleet Replacement Study – Final Report, March 2016

NRCS Alternative Financing Study, September 2016

Withheld: *AG1A23D170151 – FPAC-VAM 2018- Final Report – DRAFT Withheld in Full (25 pages)*

You may contact Philip Buchan, FOIA Public Liaison, at (301) 504-1701 or nrcs.foia@nrcs.usda.gov, for any further assistance and to discuss any aspect of your request.

Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows:

Office of Government Information Services
National Archives and Records Administration
8601 Adelphi Road
College Park, MD 20740-6001
Email: ogis@nara.gov
Telephone: (202) 741-5770; toll free at 1-877-684-6448
Fax: (202) 741-5769
https://ogis.archives.gov

If you are not satisfied with the FPAC-BC's determination in response to this request, you may administratively appeal this determination. The appeal must be received by FPAC-BC within 90 days of the date of the denial letter. Your appeal should include a copy of the original request, the response to the request, and a statement of your reason for the appeal. To facilitate the processing of an appeal, the phrase "FOIA APPEAL" or "PRIVACY ACT APPEAL" in capital letters should be placed on the front of the envelope or in the subject line of an email and send to the following:

Farm Production and Conservation Business Center
Attention: Appeals and Litigation Division
1400 Independence Avenue SW, Room 5971-S
Washington, D.C. 20250-0570
Telephone: (202) 690-3297
FSAFOIAappeal@wdc.usda.gov

If you have any questions pertaining to this action, you can direct them to me via telephone at (202) 590-6168, or via email at Patrick.mcloughlin@usda.gov.

Sincerely,

Patrick McLoughlin

Patrick McLoughlin
FOIA Officer

Enclosures:

Responsive Records:

- Total Number of Pages: 74

Exemption(s) Applied:

- Redacted Pages by Code and Description:
    - Number of Fully Redacted Pages: 0
    - Number of Non-Redacted Pages: 74
    - Number of Partially Redacted Pages: 0
    - Number of pages withheld in Full: 25

Natural Resource Conservation Service

Fleet Management Plan

March 31, 2015

United States Department of Agriculture

Table of Contents

Executive Summary

This 2015 Natural Resource Conservation Service (NRCS) Fleet Management Plan (FMP) reflects changes to the NRCS vehicle fleet since the 2014 NRCS FMP was released in March of 2014. New information obtained from a vehicle utilization study has provided NRCS with information which will improve fleet asset allocation and inventory.

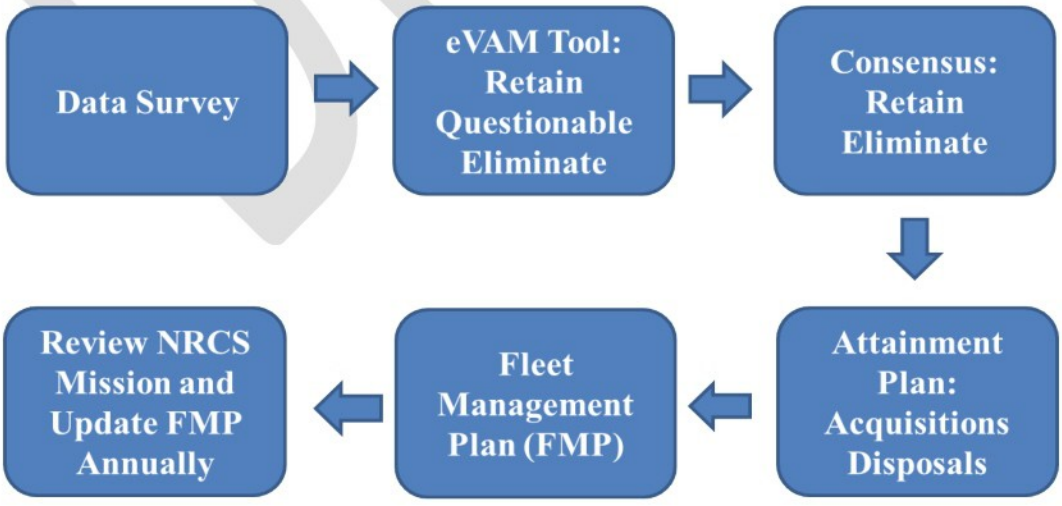
Vehicle Allocation Methodology Study

On May 24, 2011, the President issued *Presidential Memorandum—Federal Fleet Performance*, directing the General Services Administration (GSA) to develop and distribute to agencies a Vehicle Allocation Methodology (VAM) within 90 days of the date of the memorandum. On August 22, 2011, GSA released Bulletin Federal Management Regulations (FMR) B-30, *Motor Vehicle Management*. The purpose of the Bulletin was to ensure that agencies "satisfy the requirements of the Presidential Memorandum." The Bulletin requires three actions:

(1) Annual Implementation of the VAM: The purpose of the VAM is to identify the optimum fleet inventory "that is most efficient to meet the agency's mission and the identification of resources necessary to operate that fleet effectively and efficiently."
(2) Report the VAM Results within the Federal Automotive Statistical Tool (FAST) portal.
(3) Annual Submission of a FMP: Develop a FMP that describes the program for achieving the optimum fleet inventory by December 31, 2015. NRCS submits its annual FMP to the United States Department of Agriculture (USDA) Fleet Manager.

The NRCS VAM study in 2015 followed Bulletin B-30 guidance, as required. Moreover, NRCS developed a detailed FMP that followed the 2015 template available on the FAST portal. Graphic 1 displays the NRCS process:

Graphic 1: VAM and Fleet Management Plan Process Overview



Data Survey

NRCS exported its fleet inventory from their Property Management System (PROP) and the General Services Administration (GSA), Federal Motor Vehicle Registration System (FMVRS), to establish a baseline fleet inventory profile that tracked vehicles individually. The vehicle-by-vehicle inventory data fields included all information specified in B-30, as available.

A draft survey was developed with questions tailored to NRCS. The questions incorporated all B-30 requirements as well as additional questions to ensure that not only utilization information, but also mission criticality and vehicle type information was obtained. The surveys were tested on-line before being opened to NRCS Headquarters, Centers, State, Area, Field and Soils Offices for responses. Requirements for responding to the survey were developed and communicated to all NRCS activities. Motor vehicle users then completed the survey. NRCS originally sent out 9,006 surveys. During the VAM survey, 46 of the surveys were identified as belonging to assets that were not FAST reportable. The remaining 8,960 surveys that were sent to motor vehicle users resulted in a 97.6 percent response rate.

eVAM Tool

The NRCS VAM study methodology uses an electronic VAM data-call tool called eVAM[1] to provide users with a structured approach for determining the need for vehicles, and if a need exists, what type of vehicles are appropriate for a given mission. It is automated to enable the efficient processing of vehicle justifications for the entire NRCS fleet.

eVAM was built using MS Excel spreadsheets and consists of two components:

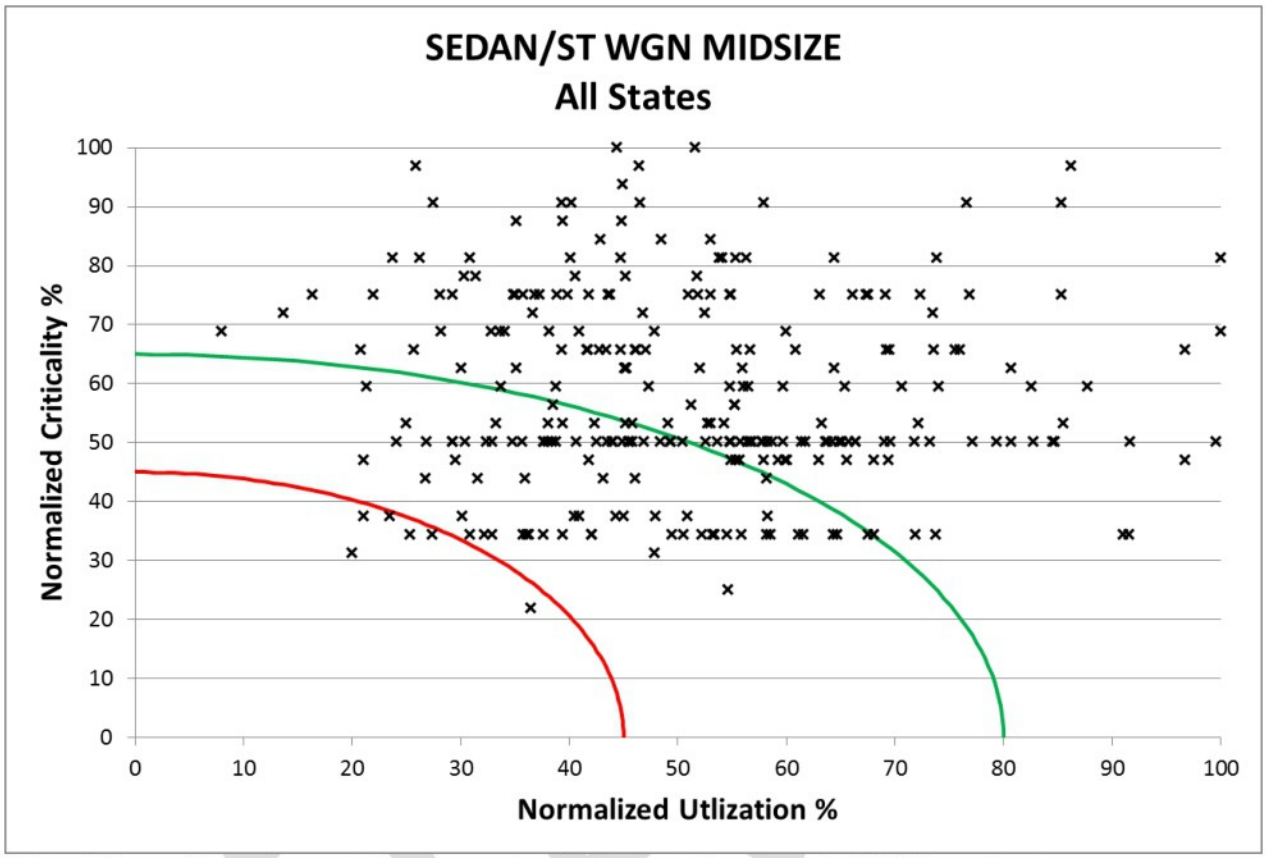
(1) *Determination of Need* (i.e., how badly is the vehicle needed). Need is ascertained by addressing:
   (a) The *criticality* of the work or mission being performed;
   (b) The *utilization* of a vehicle or group of vehicles.

(2) *Determination of Type* (i.e., if a vehicle is needed, what type should be provided).

NRCS weighted the parameters to reflect the relative importance of the need and type questions and pass/fail parameter adjustments. Regarding determination of need, the NRCS VAM study process views the VAM approach as two dimensional. eVAM outputs a graphic for every vehicle surveyed. In summary, eVAM is an automated vehicle justification protocol that applies utilization (defined as miles, hours in use, and trips taken) and data call responses to make recommendations for vehicle actions automatically.

[1] eVAM is a Mercury Associates Inc. Proprietary electronic tool designed for VAM studies that conform to B-30 standards and requirements. It applies algorithms that yield recommendations. The next step in the process is for the organization to review the recommendations for reasonableness prior to action.

Graphic 2: eVAM Output Example for a Vehicle Type



**Note: This graph is a representation of example eVAM outputs from example VAM Survey inputs.*

Graphic 2 displays a curved red line below which a vehicle fails (i.e., recommended for Elimination), an area between the red and a green line for a vehicle that requires further review and discussion (i.e., labeled as Questionable), and above the curved green line is for a vehicle that is deemed justified (i.e., recommended for Retention).

The survey gathered information that included: per-vehicle mileage; trips per vehicle; mission requirements; operational terrain/environment; and extensive additional documentation. When the data-call information was imported into eVAM, the tool applied algorithms based upon the vehicles mission criticality and utilization provided by the vehicle operator and NRCS set parameters embedded in the spreadsheet to arrive at a recommended action for each vehicle (i.e., Retain, Eliminate, or Questionable).

Consensus

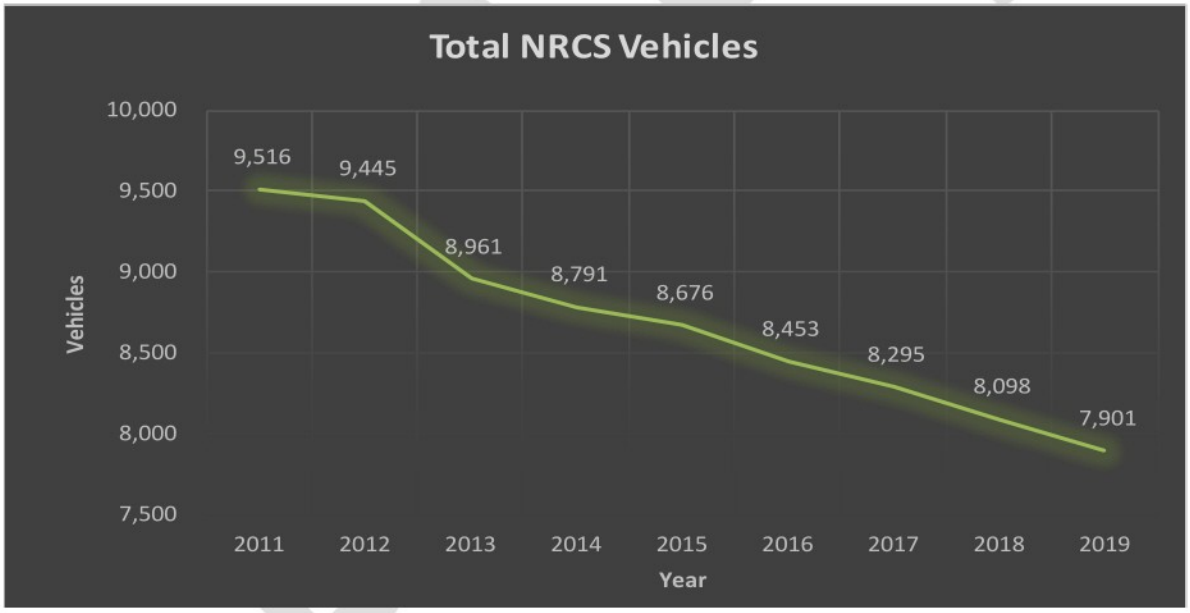
Each NRCS State and Field Office is in the process of reviewing the vehicle-by-vehicle recommendations to reach consensus on the respective action to take. During this process, utilization and mission criticality survey responses are reviewed, as well as information on location, alternative fuel availability, current vehicle type, and vehicle fuel-type.

Attainment Plan

After arriving at final recommendations through the consensus process, the eVAM tool exports the statistical information into the Fleet Attainment Plan spreadsheet. The spreadsheet furnishes the fleet optimization plan by year, which NRCS will use for its current FAST submission and for future submissions. The Fleet Attainment Plan shows acquisitions and disposals by vehicle type and by fuel type (conventional vs. alternative) through calendar year 2015. If there is a change in mission, or change in fleet requirements, NRCS will revise its plan annually as needed.

As a result of the VAM study, barring unforeseen changes in mission, NRCS intends to have an optimum fleet size of 8,676 vehicles by December 31, 2015, which is a total drop in fleet size of 840 or 8.8 percent, from the 2011 baseline. NRCS will continue to meet or exceed its expectations outlined in its Fleet Attainment Plan. Graphic 3 illustrates NRCS's efforts and successes toward fleet reduction from its 2011 baseline as illustrated by the forecast of 7901 vehicles by 2019, or a 17% decrease from the 2011 baseline.

Graphic 3: Total NRCS Vehicles, 2011-2019 (projected)



Fleet Management Plan

The following FMP addresses all questions detailed in the Calendar Year (CY) 2015 GSA-provided template on the FAST portal. Key information covered in detail in the full FMP below includes:

(1) NRCS has approximately 10,000 employees, other USDA agencies, as well as partners and affiliates across all NRCS interests that utilize NRCS fleet assets.
(2) NRCS had an annual FAST reported fleet budget of more than $17,281,100 million for fiscal year 2014 (the 2015 budget report for FAST was not yet finalized at the time this was written).
(3) NRCS motor vehicle fleet is highly decentralized with almost 2,500 offices across the United States to include the Pacific and Caribbean regions.

(4) The NRCS fleet largely consists of vehicle types with configurations suited to their mission to improve the health of our Nation's natural resources while sustaining and enhancing the productivity of American agriculture. To accomplish this mission, the NRCS must ensure its operations are performed as efficiently as possible with the proper equipment necessary to carry out all of the duties required.
(5) In December 2014, the NRCS reported at total fleet size of 8,791 in FAST. The FAST number is a snapshot in time as fleet inventory's increase and decrease as vehicles are eliminated and new acquisitions occur. The total fleet included in the VAM study is 8,960 (a pre-optimization number), which is a decline of 5.84 percent from 2011 when the fleet size was 9,516.
(6) NRCS has fleet vehicles allocated to support delivery of all NRCS programs.

NRCS is in the final development phase of a new initiative called the Conservation Delivery Streamlining Initiative (CDSI). Implementation is expected to be time phased over a 3 year fleet management timeline. Initial implementation may reduce vehicle utilization as customers will have the ability to sign NRCS documents online using the "Client Gateway" feature of CDSI. This will reduce the utilization of vehicles used to drive to land owners locations to have them physically sign documents. The "Conservation Desktop" will lead to increased vehicle utilization in that this feature allows for NRCS employees to conduct conservation work in the field, away from a desk. This initiative will ultimately enhance NRCS productivity and levels of service to private land owners and will take our field and program staff out of the office and give them the capability to perform their mission out in the field.

Currently, field staff and programs staff spend only 20-40% of their time in the field providing conservation assistance to private land owners. CDSI, over time, will give them the ability to perform their duties from a laptop in the field as opposed to sitting at a desk, on the network, in an NRCS field office. It is expected that this new initiative will eventually increase fleet utilization as employees will be spending up to 75% of their time in the field, away from the office.

All NRCS employees are responsible for providing transportation to the work place. No Home-To-Work (HTW) transportation request has been authorized. Only the USDA Secretary, or those designated by the Secretary can approve HTW transportation for NRCS employees. This includes any approvals that may be set forth in law.

NRCS currently does not envision any major obstacles in attaining its optimum fleet size. The main factors that may hinder attainment of our VAM target is:

(1) Change of mission, for program offices.
(2) Insufficient appropriated funds for acquiring replacement vehicles for the aging fleet. As the owned fleet ages, maintenance and repair costs, along with downtime, inevitably increase.
(3) Organizational cultural issues like always having a vehicle available, regardless of utilization.

NRCS is undertaking a comprehensive approach to controlling its fleet size and costs as shown in the following seven-step plan:

(1) **Right-size the Fleet** – The 2015 VAM study identified a potential reduction in the NRCS fleet **(pre-consensus)** of 992 vehicles, representing an 11.5% reduction in the

fleet for an estimated annual savings of $5,781,966. The NRCS is estimating the ***(post-consensus after all vehicles identified for elimination are reviewed)*** actual reduction to be around 496 vehicles representing a 5.75% reduction with an estimated annual savings of $2,891,000. Any fleet reductions will be time phased over a three year period.

(2) **Right-type Fleet** – The 2015 VAM study identified 3,556 vehicles that could be right-typed **(at time of replacement)** with less expensive vehicles with a potential savings of $2,277,057.

(3) **Perform Lease vs. Buy Analysis for Key Vehicle Types** – NRCS developed a Lease vs. Buy electronic analysis tool in late 2014 to be used as part of the vehicle acquisition process. All requests for vehicles will use the tool to determine which method of acquisition is most financially beneficial for the NRCS Program offices.

(4) **Optimize Replacement Cycles for Owned Vehicles** – NRCS is planning on conducted an in-depth study of its three most common vehicle types in the fleet to determine the optimum replacement cycles to minimize their life-cycle costs.

(5) **Develop a Capital Funding Plan** – For those vehicles that will be purchased, NRCS will develop an 8-year budget forecast for vehicle replacement based upon the optimum replacement cycles, to help establish and justify future funding requirements.

(6) **Provide Fleet Management Training** – NRCS is currently reviewing the new National Property Management Association (NPMA), Federal Fleet Training/Certification Program for their employees that are involved in day to day management of their motor vehicle fleet. This new program enables employees to be trained in the various aspects of Federal fleet management and eventually become certified up to four progressive levels dependent upon their area of responsibility.

(7) **Personal Property Services Branch** – Aligning with the USDA's Blue Print for Stronger Service, NRCS's Administrative Transformation project has organized a team of personal property specialists who will provide fleet services to customers across NRCS. This new centralized team will provide consistent and efficient fleet related services that will reduce costs and inefficiencies that result from a decentralized fleet services program.

The NRCS fleet at present is 97 percent owned. A key cost driver for this procurement method has been vehicles that require upfitting. The upfit cost for a soils truck averages $11,000 per vehicle and takes 30-45 days to complete. Upfitting costs for a typical truck that requires a hitch, ball, toolbox or bed cover can range from $350 - $2000 per truck. Historically, GSA Fleet leasing had not been considered because of this upfitting requirement and expenditure, but with recent declines in upfitting costs, and the new NRCS Lease vs. Buy tool, all future acquisitions will be reviewed to determine which procurement method is most cost-effective. The goal is to move vehicles, as replaced, from ownership to GSA Fleet leasing where cost-effective and practical.

A. Introduction: Mission, Organization, Fleet Role Overview

(1) Briefly, what is the primary/core mission and how is the fleet configured to support it?

The mission of the Natural Resources Conservation Service (NRCS) is to improve the health of our Nation's natural resources while sustaining and enhancing the productivity of American agriculture. The NRCS achieves this by providing voluntary assistance through strong partnerships with private landowners, managers, and communities to protect, restore, and enhance the lands and waters upon which people and the environment depend. To accomplish this mission, the NRCS must ensure its operations are performed as efficiently as possible with the proper equipment necessary to carry out all of the duties required. The NRCS is decentralized with almost 2,500 offices.

A fleet inventory is a snapshot in time; consequently, fleet size and vehicle types will vary from month to month for many reasons. Initial inventory of the NRCS fleet for the 2014 Vehicle Allocation Methodology (VAM) study was 8,960 vehicles. Final inventory reported in the Federal Automotive Statistical Tool (FAST) in December, 2014 was for a total of 8,791 vehicles with the primary difference being vehicles scheduled for disposal were not off of the inventory records while new replacement vehicles had already been added.

(2) Describe the organizational structure and geographic dispersion of your fleet.

The NRCS fleet is operationally decentralized, with nearly 2,500 field offices disbursed around the Continental United States to include, Hawaii and the Pacific area, and Puerto Rico and the Caribbean area. Vehicle missions range from providing administrative support, pickup trucks with utility boxes, to trucks upfitted with augers for taking soil samples. Management of this geographically dispersed and diverse fleet operation is an ongoing challenge.

(3) What are the ancillary missions, such as administrative functions, and how are they supported?

Vehicle missions range from using trucks to carry field equipment off road to inventory natural resources or layout conservation practices to using sedans or vans to meet with partners to organize large-scale conservation efforts. Critical to the success of the NRCS fulfilling its mission is meeting with its customers on their farms and ranches to inventory and assess the natural resources, survey, design, and help them implement conservation practices.

(4) How are vehicles primarily used, and how do mission requirements translate into the need for particular vehicle quantities and types?

All vehicles in the NRCS fleet are subject to the VAM study protocol. Therefore, vehicle use/mission, utilization, and criticality of need are correlated with vehicle type to ensure that the fleet is, or will be right-sized and right-typed. The VAM survey database statistically documents the answer to this question for each vehicle.

Vehicle quantities, types and use correspond to the programs listed below. The NRCS vehicle fleet operates in direct support of its primary mission to improve the health of our Nation's natural resources while sustaining and enhancing the productivity of American agriculture. Currently the NRCS fleet is comprised of over 8,900 vehicles of which approximately 76% are in the truck category supporting all NRCS programs.

NRCS is in the final development phase of a new initiative called the Conservation Delivery Streamlining Initiative (CDSI). Implementation is expected to be time phased over a 3 year fleet management timeline. Initial implementation may reduce vehicle utilization as customers will have the ability to sign NRCS documents online using the "Client Gateway" feature of CDSI. The "Conservation Desktop" will lead to increased vehicle utilization in that this feature allows for NRCS employees to conduct conservation work in the field, away from a desk. This initiative will ultimately enhance NRCS productivity and levels of service to private land owners and will take our field and program staff out of the office and give them the capability to perform their mission out in the field. Currently, field staff and programs staff spend only 20-40% of their time in the field providing conservation assistance to private land owners. CDSI, over time, will give them the ability to perform their duties from a laptop in the field as opposed to sitting at a desk, on the network, in an NRCS field office. It is expected that this new initiative will eventually increase fleet utilization as employees will be spending up to 75% of their time in the field, away from the office.

The NRCS has a Personal Property Services Branch (PPSB) that serves as its fleet management council. The team meets at least once a week via phone teleconference as they progress through their motor vehicle fleet administrative transformation. The team is currently comprised of 28 members who are on management details and when fully operational is expected to have 33-35 permanent members whose position descriptions (PDs) will specify fleet as an official duty. The PPSB enables NRCS leadership to coordinate efforts to improve fleet management through agreed-upon initiatives, to enhance communication across dispersed fleet organizations within the CONUS, Pacific, and Caribbean, and to respond to regulatory requirements more efficiently and effectively. Through shared membership, the PPSB is linked to NRCS's Senior Sustainability Officer. The PPSB has enhanced centralized management to include a plan for improved and centralized data gathering and a regular review of policies that allows for effective updates. All fleet related decisions are debated/discussed within the team. Any decisions that affect customers directly or anything above a simple Standard Operating Procedure (SOP) change is forwarded to senior management for approval.

B. Criteria for Justifying and Assigning Vehicles (including HTW)

(1) What are the factors and considerations used for assigning vehicles?

NRCS will incorporate the following compliance review acquisition checklist as its justification protocol, which includes the following questions that must be answered. The completed checklist is submitted to NRCS for vehicle acquisition approval.

Have you created a thorough, written, standard justification that documents the need to add this vehicle to the fleet and do you have such justification on file if needed for audit purposes?
Why is this vehicle being requested?
Have you assessed all other means of transportation such as use of a motor pool, rental, taxi, bus,

POV or other transportation alternatives to determine if the vehicle is still needed?
Will this vehicle be used regularly by more than one person (excluding only drivers or work shifts) - i.e. multiple drivers, a work crew, or transporting several people? (answer No if used primarily by one person)
Will this vehicle be used at least five days per week, every week (except holidays)?
Is the requested vehicle any type of vehicle OTHER THAN an SUV? (answer No if the request is for an SUV)
Is the requested vehicle any type of vehicle OTHER THAN a Special Purpose? (answer No if the request is for a Special Purpose)
Will this vehicle be garaged within a Metropolitan Statistical Area (MSA)?
Can this vehicle be an AFV or hybrid vehicle?
If an AFV, will this vehicle have reasonable access to alternative fuels such as E85, Biodiesel, or CNG (i.e. within 5 miles or 15 minutes)? Documentation may be required.
Have you confirmed that a Low Speed Electric Vehicle (LSEV) cannot perform this mission?
Does the requested vehicle have the minimum Greenhouse Gas rating required by EISA Section 141 Guidance?
Have you used the EISA Section 141 Vehicle GHG Assessment Tool to confirm that the average GHG Score?
Was the cumulative score greater than 7?
Is this vehicle the smallest and most fuel efficient type that will perform the mission?
Have you submitted written justification for any sedan/station wagon larger than Class III (Midsize) to the NRCS Fleet Manager?
What is the estimated minimum annual miles (and/or hours) this vehicle will be operated (enter mileage and/or hours figure(s))?
Have you reviewed projected utilization for the requested vehicle to confirm it will meet minimum usage and eventual replacement requirements as set by the Component and NRCS (Motor Vehicle Fleet Handbook)?
If this vehicle is expected to travel more than 8,000 miles per year, can it be leased from GSA, rather than purchased?
Have you completed a lease vs. own cost comparison, as required for all new vehicles?

No NRCS vehicles are assigned to individuals; rather, they are assigned to positions, offices and job classifications. For NRCS fleet programs that provide essential vehicle services work with their customers to define their transportation needs, set expected service levels and determine appropriate performance measures. Factors include but are not limited to:

- The number of each vehicle-type needed to meet mission demands and NRCS, and State and Field Office performance objectives.
- The number of each vehicle-type required to meet environmental and socioeconomic goals established in Federal law, regulation and policy guidance. A key factor is the number of Alternative Fueled Vehicles (AFVs) needed, with the goal of operating a 100% AFV fleet after December 31, 2015, as stipulated in the May 24, 2011, Presidential Memorandum on Federal Fleet Performance and FMR Bulletin B-30.
- NRCS fleet policy states: NRCS State and Field Offices shall adhere to the following management practices to ensure maximum vehicle use without impairing an organization's operating efficiency:

- ✓ Share motor vehicles with other NRCS offices whenever possible. Offices located in close proximity to each other can share motor vehicles when feasible.
- ✓ Assign vehicles based on position responsibilities, not the convenience of the employee, in accordance with procedures established by this directive, the estimated annual use (days/trips/hours/miles per year), and the need for an assigned vehicle to perform the duties.
- ✓ Rotate vehicles in high mileage assignments with those in low mileage assignments to ensure maximum use. Normally, vehicles should not leave the assigned vehicle area.
- ✓ Ensure that assigned vehicles meet the utilization requirements described in the Federal Management Regulation (FMR). An underused vehicle may be an indication that the vehicle is not needed.

(2) Are vehicles assigned to individuals, offices, job classifications?

No NRCS vehicles are assigned to individuals; rather, they are assigned to positions, offices and job classifications. Vehicles used by administrative personnel are assigned to an office and generally constitute either a formal or informal motor pool.

NRCS fleet vehicles are also operated by NRCS partners. NRCS has established Memorandum of Agreements or Cooperative Working Agreements with their partners that authorizes the use of, and documents terms of use. Some partner examples are:

- ➢ State Government Employees—the NRCS cooperates with State Departments of Agriculture and other State Environmental Agencies. Since the mission of the NRCS and such state agencies are so similar, State employees work out of our offices and work alongside NRCS employees. These State employees drive NRCS vehicles in assisting the NRCS in accomplishing its mission.
- ➢ Soil and Water Conservation District Employees—by statute, the NRCS is tasked with cooperating with local units of government known as Soil and Water Conservation Districts (SWCD). SWCD employees work in NRCS offices and cooperate with NRCS employees in protecting natural resources within the district. As such, SWCD employees drive NRCS vehicles to accomplish the NRCS mission.
- ➢ Non-Governmental Organizations (NGOs)—There are many NGOs that share common interests with the NRCS. Two examples would be Pheasants Forever and The Nature Conservancy. These organizations work in our offices and share our vehicle resources to assist the NRCS in accomplishing its mission.
- ➢ Volunteers—The Earth team Volunteer Program allows citizens to work in NRCS offices to help NRCS employees. These volunteers drive NRCS vehicles to meet NRCS mission needs.

(3) What alternatives are considered to meet mission requirements before adding a vehicle or vehicles to the fleet?

As the acquisition checklist questions above indicate, NRCS considers "all other means of transportation such as use of a motor pool, rental, taxi, bus, POV or other transportation alternatives to determine if the vehicle is still needed." The VAM study questions also gathered information on whether other means of transportation could meet mission needs rather than retaining the vehicle.

In some cases, low-utilization vehicles are re-located to meet transportation needs rather than adding to the fleet.

(4) How are home-to-work vehicles justified, assigned, and what steps are taken to limit HTW use?

The NRCS does not have any vehicles that are used for home-to-work (HTW).

NRCS does permit employees who are on official travel orders to take a vehicle home the night prior to the start of travel when it is in the best interest of the Government and NRCS. Authorization for vehicle use during temporary duty assignments must be annotated on the employees official travel orders and approved by the senior person in the State or Field Office.

C. VAM Target Development, Explanation of Reported Fleet Size and Cost Changes, Not Meeting Target Projections

(1) Describe the method used to produce your VAM (fleet optimization) targets:

(a) From most recent VAM study, what was the specific utilization criteria used to determine whether to retain or dispose of a vehicle? Document the miles, hours, vehicle age or other means used to make this determination. Document different criteria used in sub-components, if applicable.

(b) What were the questions used in the VAM survey or data call? If questions vary by sub-component(s), document those questions.

NRCS has just completed a full VAM on its fleet vehicles and is in the process of performing consensus based upon the results of the VAM with State and Field Offices. A draft Fleet Attainment Plan has been completed and statistically details the NRCS plan for its fleet based upon currently available information. The draft Fleet Attainment Plan shows acquisitions and disposals by vehicle type and by fuel type (conventional vs. alternative) through 2015. NRCS will revise its plan annually, if necessary.
For the 2015 VAM, NRCS:

- Established a baseline fleet inventory profile to track all vehicles individually.
- Developed utilization criteria to justify mission-essential vehicles. The criteria for determining vehicle elimination or retention included three utilization measures: miles/engine hours, hours of use, and number of trips. The utilization metrics were weighted by vehicle class and calculations were performed to yield a combined utilization score. Average annual miles reported by vehicle class for the three asset types that comprise 80% of the NRCS Fast reportable motor vehicles are:

Vehicle Type	Average Annual Mileage
✓ 4X2 Light Duty Trucks	6,488
✓ 4X4 Light Duty Trucks	7,619
✓ 4X4 Light Duty Sport Utility Vehicles	8,623

- Developed survey questions to document mission criticality. The combined utilization score and criticality score for each vehicle is compared to pass/fail parameters set by class to determine a vehicle's VAM status as eliminate or retain. For example, a soil truck with an auger may have extremely low mileage "utilization" but high criticality for the mission, and therefore retained. The algorithms used for the VAM determination are complex and proprietary to the contractor that conducted the survey.
- Conducted an on-line utilization and mission-criticality survey that included questions covering these factors:
- Applied utilization criteria to each vehicle;
- Collected additional information about each vehicle through user surveys;
- Determined whether the vehicle needed special equipment (aftermarket equipment not standard to commercial vehicles and trucks) to accomplish the tasks;
- Determined how important the vehicle is to accomplishing the mission;
- Determined how many people are regularly transported per trip;
- Determined how much and what type of cargo the vehicle hauls regularly;
- Determined whether the vehicle is shared with other employees or other agency organizations;
- Determined whether there is access to alternative fuel within 5 miles or 15 minutes of the vehicle's garaged location, and if so, where is it located and what type of alternative fuel is available;
- Determined type of driving conditions in which the vehicle is used (exclusively on-campus setting, city, highway, off road, weather, etc.);
- Determined whether the work being done can be accomplished 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, etc.;
- Identified vehicles that fell below the pre-established minimum utilization criteria by license plate (tag) and Vehicle Identification;
- Compared existing fleet composition to mission task needs;
- Identified vehicles that are mission-essential regardless of utilization; and
- Evaluated alternatives such as public transportation, contract shuttle services, or rental vehicles.

Survey questions covered each of the considerations above and addressed all requirements specified in FMR Bulletin B-30. However, parameter weights assigned to the utilization metrics and core mission criticality questions can be adjusted by NRCS to recognize differing missions.

The NRCS is working to established how it will achieve the required fleet size by the necessary deadline.

(2) Explain any measurable change in fleet size and/or cost or if you are not meeting your annual VAM projection targets.

The NRCS is meeting its VAM projection targets.

(3) What are the plans to correct any deficiencies, and indicate factors that hinder attainment of your annual VAM targets (e.g., budgetary, other resource issues, mission changes)?

NRCS currently does not have any deficiencies nor envision any obstacles to attaining its optimum fleet size. However, the primary factor that may hinder attainment of our VAM target is change of mission, particularly for State and Field offices. A secondary factor is insufficient appropriated funds for acquiring replacement vehicles for the aging fleet. As the owned fleet ages, maintenance and repair costs inevitably increase. And last is the lack of a centralized FMIS.

D. Initiatives to Control Fleet Size and Cost

(1) How and why have the fleet size, composition, and associated costs changed, and how are they planned to change in the future?

As noted above, fleet size has decreased from the 2011 baseline. This is largely due to improved management of fleet operations and adherence to Federal laws and regulations, such as the VAM study process. NRCS plans to reduce its fleet size and costs significantly.

NRCS is undertaking a comprehensive approach to controlling its fleet size and costs as shown in the following seven step plan:

- **Right-size the Fleet** – The 2015 VAM study identified a potential reduction in the NRCS fleet (***pre-consensus***) of 992 vehicles, representing an 11.5% reduction in the fleet. The NRCS believes the ***(post-consensus after all vehicles identified for elimination are reviewed)*** actual reduction will result in a 496 vehicle fleet reduction with an estimated annual savings of $2,891,000. Any fleet reductions will be time phased over a three year period.
- **Right-type Fleet** – The 2015 VAM study identified (***pre-consensus***) 3,556 vehicles that could be right-typed (at time of replacement) with smaller, less expensive vehicles with a potential savings of $2,277,057. The NRCS believes they will be able to right-type and right-size their fleet over a period of four years as identified vehicles is replaced during the acquisition process.
- **Perform Lease vs. Buy for Key Vehicle Types** – NRCS developed a Lease vs. Buy electronic analysis tool in late 2014 to be used as part of the vehicle acquisition process. All requests for vehicles will use the tool to determine which method of acquisition is most financially beneficial for NRCS. NRCS currently has 270 GSA Fleet leased vehicles in its 2014 FAST reported inventory.
- **Optimize Replacement Cycles for Owned Vehicles** – NRCS is exploring an in-depth study of its three most common vehicle types in the fleet to determine the optimum replacement cycles for the vehicles to minimize their life-cycle costs.
- **Develop a Capital Funding Plan** – For those vehicles that will be purchased, NRCS will develop an 8-year budget forecast for vehicle replacement based upon the optimum replacement cycles, to help establish future funding requirements.
- **Provide Fleet Management Training** – NRCS is exploring the National Property Management Association; Federal Fleet Management Certification Program to acquire training for their Headquarters, State and Field Office employees who have fleet related duties.
- **Personal Property Services Branch** – Aligning with the USDA's Blue Print for Stronger Service, NRCS's Administrative Transformation project has organized a

team of personal property specialists who will provide fleet services to customers across NRCS. This new centralized team will provide consistent and efficient fleet related services that will reduce costs and inefficiencies that result from a decentralized fleet services program.

(2) Do you ever acquire vehicles from other than the most cost-effective source and, if so, why?

All new vehicles are acquired through GSA's AutoChoice, which is the most cost-effective source for owned vehicles within the Federal government. As noted previously, steps are being taken to evaluate leasing from GSA to determine when it would be more cost-effective.

(3) Discuss any trends toward larger, less fuel-efficient vehicles and the justifications for such moves.

No such trend exists within NRCS. The 2015 VAM study process included assessment of vehicle type for every vehicle in the fleet. Over the next several years, right-typing of all vehicles being replaced will be a standard consideration. Wherever possible, smaller, more fuel-efficient vehicles will be acquired.

(4) Finally, discuss the basis used for your reported future cost projections (published inflation estimates, historical trends, flat across-the-board percentage increases, mission changes, etc.)

By December 31, 2015, barring unforeseen changes in mission, NRCS intends to have an optimum fleet size of 8,676 vehicles, which is a total drop in fleet size of 840, or a 8.8 percent reduction, from the 2011 baseline of 9,516. Due to the age of the fleet and to better service the mission; NRCS is in the initial stages of developing a Fleet Capital Investment Plan to address future cost projections. This will enable NRCS to make better fiscal plans for fleet acquisitions.

Future cost projections are forecasted using a flat 3% per year projected inflation rate increase in cost based on a zero growth in fleet size.

E. Categorization of Law Enforcement Vehicles

(1) Do you use the law enforcement (LE) vehicle classification system described in GSA Bulletin FMR B-33?

The NRCS does not have any Law Enforcement Vehicles.

F. Justification for Restricted Vehicles

(1) If your organization uses larger than class III (midsize) vehicles, is the justification for each one documented?

As documented above, NRCS uses an acquisition protocol to justify its vehicles. Additionally, the VAM study process yields documentation that further justifies those vehicles retained in the fleet program. Where possible, smaller vehicles are being acquired as replacement occurs.

(2) Are your organization's executive fleet vehicles posted on your agency's website as required by the Presidential Memorandum of May 2011?

The NRCS does not have any executive fleet vehicles.

(3) If your organization or your agency reports limousines in its inventory, do they comply with the definition in GSA Bulletin FMR B-29?

The NRCS does not have any limousines.

(4) For armored vehicles, do you use the ballistic resistance classification system of National Institute of Justice (NIJ) Standard 0108.01, and restrict armor to the defined types?

The NRCS does not have any armored vehicles.

(5) Are armored vehicles authorized by appropriation?

Non Applicable.

G. Vehicle Replacement Strategy and Results

(1) Describe the schedule your organization will follow to achieve its optimal fleet inventory, including plans for acquiring all Alternative Fueled Vehicles (AFVs) by December 31, 2015.

NRCS believes it may well attain its optimal fleet inventory in early 2015, well in advance of the December 31, 2015 deadline. Many NRCS State and Program Offices have already removed vehicles and optimized their fleets and do not plan to add vehicles.

NRCS orders AFV and low greenhouse gas replacement vehicles to the extent they are available and of the appropriate type to meet mission needs as described above. As documented above, the NRCS acquisition protocol covers AFVs.

(2) Your plans and schedules for locating AFVs in proximity to AFV fueling stations.

During the acquisition process, the NRCS access's the Department of Energy, Alternative Fuels Data Center, Alternative Fueling Station Locator to determine if alternative fuel infrastructure is available within range (up to 5 miles or less than 15 minutes) of the office requesting a replacement vehicle. If no alternative fuel is available, a low greenhouse gas **(**LGHG**)** emitting vehicle is recommended to meet NRCS AFV requirements.

(3) What is your approach in areas where alternative fuels are not available?

NRCS will seek to replace vehicles with low GHG emitting vehicles that meet mission requirements. If low GHG emitting vehicles are unavailable, the NRCS seeks waivers as appropriate.

(4) Are AFVs that are not dependent on infrastructure, such as electric vehicles and qualifying low greenhouse gas (LGHG) vehicles, being placed in such areas?

NRCS strives to acquire vehicles that emit low greenhouse gases. Electric vehicles are not viable in most locations because of the NRCS mission, distances traveled, terrain encountered, etc.

(5) Vehicle sourcing decision(s) for purchasing/owning vehicles compared with leasing vehicles through GSA Fleet or commercially.

NRCS is considering GSA Fleet leases at their State and Field offices, but primarily for those vehicles that require little or no upfitting. Special purpose vehicles such as soil sample trucks that are fitted with auxiliary gas powered self-contained power units will not be considered for GSA lease. A key reason has been the $11,000 upfit cost per vehicle for the auxiliary power unit, auger and additional storage boxes for probes, shovels, etc. and the associated cost for de-commissioning at the end of the vehicle's life.

During FY 2015, NRCS developed a lease vs. own cost comparison analysis tool for vehicle class and varying missions. The goal is to move vehicles, as replaced, from ownership to GSA Fleet leasing where cost-effective and practical.

(a) When comparing cost of owned vehicles to leased vehicles, compare all direct and indirect costs projected for the lifecycle of owned vehicles to the total lease costs over an identical lifecycle.

During FY 2014, NRCS developed a Lease vs. Buy cost comparison analysis tool for vehicle class and varying missions. The goal is to move vehicles, as replaced, from ownership to GSA Fleet leasing where cost-effective and practical.

(b) What is the rationale for acquiring vehicles from other than the most cost effective source?

NRCS acquires all new vehicle acquisitions through GSA's AutoChoice, which is the most cost-effective source for owned vehicles.

H. Vehicle Management Information System Description
(Note: FMR 102-34.340 and see FMR Bulletin B-15)

(1) Does your organization, your component or the department have a vehicle management information system? Is it fleet-dedicated (not a generic property system), comprehensive (capturing all transactions and costs), integrated with other agency systems and with external compliance reporting systems?

NRCS uses their Property Management System (PROP) as a means of managing/tracking their motor vehicle fleet. They use Wright Express (WEX) fleet cards to capture fuel and maintenance data. The NRCS expects to deploy FedFMS across the Agency during 2015 – 2016. This will enable NRCS to capture all acquisition and operational data for their owned fleet that can then be imported for management and FAST reporting.

If yes, does it:

(a) Identify and collect accurate inventory, cost, and use data that covers the complete lifecycle of each motor vehicle (acquisition, operation, maintenance, and disposal)?
(b) Provide the information necessary to satisfy both internal and external reporting requirements, including:
- ***Cost per mile;***
- ***Fuel costs for each motor vehicle; and***
- ***Data required for FAST reporting (see FMR 102-34.355.)***

Not applicable. NRCS does not have a FMIS. However, their PROP system and WEX fleet service cards mentioned above will yield some operational and tracking data.

(2) If the agency does not have such a system, what does your organization use to capture vehicle information, or is there no MIS at all?

As mentioned above, NRCS uses their PROP system as a means of managing/tracking their motor vehicle fleet. They use Wright Express (WEX) fleet cards to capture fuel and maintenance data. Additionally, the NRCS expects to deploy GSA's FedFMS across the Agency during 2015 – 2016.

(3) If there is no MIS, what obstacles have prevented implementation and compliance with 102-34.340?

NRCS expects to be in full compliance with 102-34.340 after deployment of FedFMS.

I. Vehicle Sharing Practices and Plans

(1) Describe efforts to share vehicles internally or with other Federal activities.

The NRCS shares vehicles with other United States Department of Agriculture (USDA) agencies such as the Farm Service Agency (FSA), and Rural Development (RD) when they are co-located in the same office or locality.

(2) Describe pooling, car sharing, and shuttle bus consolidation initiatives.

The NRCS currently has established motor pools at locations that have large area offices. Vehicles are available for employee use on an as-needed basis. The NRCS expects to use the new Dispatch Module in FedFMS to expand motor pools at other locations.

(3) Describe efforts to reduce vehicles assigned to a single person.

No NRCS vehicles are assigned to a single person; rather, they are assigned to positions, offices and job classifications.

J. Impediments to Optimal Fleet Management

(1) What obstacles does NRCS and your organization face in optimizing its fleet?
NRCS work is seasonal—vehicles may get heavy use for half the year but infrequent use for the other half.

Fleet management analysis resources are lacking.

NRCS culture needs to be addressed as we seek to transition employees to smaller, more fuel efficient vehicles.

The NRCS needs a motor pool reservation system to track and ensure vehicle availability, utilization, and to prevent fleet creep.

(2) In what ways is it hard to make the fleet what it should be, operating at maximum efficiency?

The NRCS motor vehicle fleet is highly decentralized with almost 2,500 offices across the United States to include the Pacific and Caribbean regions and is an ongoing challenge.

Lack of sufficient appropriated funds to replace owned vehicles results in an older fleet.

An older fleet demands more maintenance, is less fuel efficient, and emits more greenhouse gases. These realities increase costs.

Breaking down past expectations and changing the culture of the organization is a long-term goal.

(3) If additional resources are needed, have they been documented and requested?

Yes.

(4) If you feel hampered by specific laws, Executive Orders, GSA or internal agency regulations, budget issues, organizational obstacles, what exactly are they and how do they constrain you?

Sufficient appropriated funds for replacement of the owned and aging fleet is a consistent challenge.

(5) Be specific and include examples. If you have a solution, describe it and whether the solution can be shared as a potential best practice.

See above. In particular, NRCS is taking steps to optimize replacement cycles to lower total cost of ownership (TCO) and to use the improved cycles to build a long range capital replacement plan, thus improving the business case for increased funding for vehicle replacement. For additional details, see the six step plan in section D 1.

K. Anomalies and Possible Errors

(1) Explain any real or apparent problems with NRCS or your organization's data reported for input into FAST (the Federal Automotive Statistical Tool).

As mentioned above, the NRCS does not have a FMIS. They use their Property Management System (PROP) as a means of managing/tracking their motor vehicle fleet. They use Wright Express (WEX) fleet cards to capture fuel and maintenance data.

As such, anomalies may be identified once FedFMS is fully deployed during the 2015 – 2016 timeframe and reported in future FAST sessions.

(2) Discuss any data fields reported for FAST that you choose to override (replacing current actual) to conform to previously reported data rather than correct? Examples would be extremely high annual operating costs or an abnormal change in inventory that FAST considers outside the normal range, or erroneous data in prior years causing an apparent discrepancy in the current year.

Not Applicable.

(3) Any flagged, highlighted, or unusual-appearing FAST data that should be explained?

Not Applicable.

L. Summary and Contact Information

(1) Who should be contacted with questions about your organization's fleet?

(a) Provide the name and contact information for the organization's fleet manager.

NRCS Fleet Manager: William Reni Singletary at william.singletary@wdc.usda.gov

(b) Provide the name and contact information for the budget office reviewing official. Indicate whether the budget officer participated in the VAM and A-11 processes.

NRCS Budget Office: Margaret Sneed at Margaret.sneed@wdc.usda.gov

Final Report on a

FLEET REPLACEMENT STUDY

for the

Natural Resources Conservation Service

March 2016

MERCURY ASSOCIATES, INC.

March 4, 2016

Michael Maloney
Director, Business Services Division
USDA/Natural Resources Conservation Service
1400 Independence Avenue, SW
Room 6218-S
Washington, DC 20550
202-720-9034

Dear Mr. Maloney:

Mercury Associates, Inc. is pleased to submit this report on our study of fleet replacement practices and costs at the Natural Resources Conservation Service. We would like to express our appreciation for your cooperation and assistance to our project team.

We appreciate having been given the opportunity to assist NRCS in this endeavor and look forward to continuing to work with the agency to improve its fleet management practices and the performance and cost effectiveness of its fleet operations.

Very truly yours,

Scott Conlon
Manager

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EXECUTIVE SUMMARY

BACKGROUND AND OBJECTIVES

Mercury Associates has performed a series of interrelated fleet analyses to evaluate and optimize the capital and operating costs of the Natural Resources Conservation Service's (NRCS) fleet. We analyzed the capital and operating costs of the three largest classes of vehicles, as well as one composite class of vehicles that make up the remainder of the fleet, in order to determine the frequency with which those vehicles should be replaced to minimize lifecycle costs. Using the results of this analysis, we developed replacement plans to identify the extent to which a backlog of fleet replacement exists, to address the fleet replacement backlog over the next few budget cycles, to show the effects of not addressing the issue now, and the costs of modernizing the fleet. Next, we showed how the increase in vehicle replacement spending would affect the costs associated with operating an older fleet. We analyzed opportunities to replace vehicles using GSA Fleet leasing in support of the Department of Agriculture's Strategic Sourcing Initiative, and prepared replacement plans and total cost of ownership analyses. This report contains a summary of the steps taken during these analyses, along with conclusions about the steps required to optimize the total cost of ownership of the NRCS fleet.

SCOPE

This study identifies the optimal replacement cycles for the following four fleet segments:

1. Light Duty 4X2 Trucks
2. Light Duty 4X4 Trucks
3. Light Duty 4X4 Sport Utility Vehicles (SUVs)
4. Other

The replacement plans developed for the fleet include all Federal Automotive Statistical Tool (FAST) reportable motor vehicles for which we were able to determine vehicle classification and in-service dates. There were 110 assets excluded from the analysis, as we could not make a recommendation for replacement timing due to lack of enough information to approximate in-service dates.

KEY RESULTS

- On paper, current replacement cycles are more frequent than optimal, but due to insufficient funding, replacement cycles are actually longer than optimal.
- Fleet replacement spending, currently at $13.2 million, needs to increase to $25.8 million annually in order to eliminate the backlog of $84.6 million by end-FY 2025.
- Increasing replacement spending to $25.8 million will increase costs (by $44 million over ten years) in *fiscal* terms; however, NRCS will be better off in *economic* terms, which will be discussed later in the report. GSA Fleet leasing can help remove the *fiscal* barriers to fleet modernization so that NRCS can realize the *economic* benefits of fleet modernization.

INTRODUCTION

An effective fleet replacement program is essential for controlling fleet performance and total cost of ownership. Fleet performance is typically evaluated in terms of vehicle suitability, availability, reliability, safety, and associated environmental impacts.

Before discussing our evaluation of NRCS' fleet replacement practices and recommendations for improving them, it is useful to review the major components of an effective fleet replacement program. These components provide the philosophical and analytical framework that our project team used as the point of departure for conducting this evaluation.

There are five key components of an effective fleet replacement program. They are:

1. Empirically validated *vehicle replacement cycle guidelines* that identify when specific types of fleet assets generally should be replaced to minimize their life cycle costs (i.e., total cost of ownership).
2. A long-term fleet *replacement plan* that pinpoints anticipated replacement dates and costs of individual assets based on the application of recommended replacement cycles and that quantifies annual, fleet-wide replacement costs and future variations therein.
3. A *capital financing* approach that facilitates securing sufficient funds each year to acquire replacement vehicles by making such funding requirements smooth, predictable, and, to the fullest extent possible, invulnerable to competition from other competing capital funding requests.
4. A short-term *replacement prioritization and earmarking process* for designating specific vehicles and pieces of equipment to be replaced in the coming fiscal year.
5. A *budgeting and funding* process that enables fleet user organizations to secure the amount of funds needed each year to execute the replacement plan based on the selected financing approach.

The purpose of this report is to analyze the first and second elements of the above list, as well as provide supporting analysis to show the implications of fleet replacement spending levels on the total cost of ownership of the fleet.

PROJECT APPROACH AND METHODOLOGY

The following key steps were undertaken to perform this study:

- **Submitted written information request.** Mercury submitted a formal information request to NRCS to obtain the information needed to conduct the study.
- **Conducted a project kick-off meeting with NRCS representatives.** On September 29, 2015, members of our project team met at the NRCS headquarters to review key study parameters, including the project goals and objectives, scope, timeline, critical success factors, and deliverables.

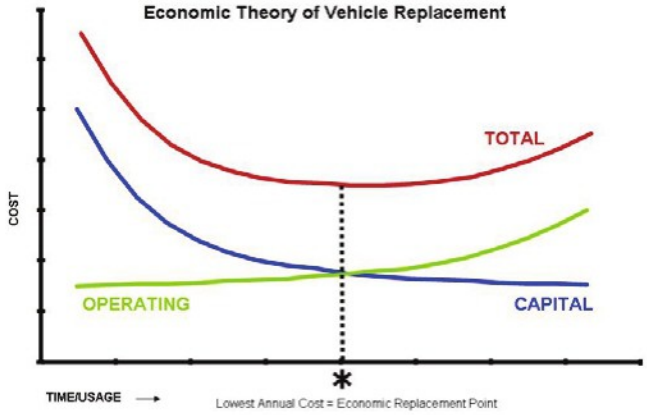
- **Determined optimal replacement cycles.** Based upon information provided by NRCS, we analyzed the relationship between capital and operating costs for the four fleet segments to determine the replacement cycles where the total costs of ownership are minimized.
- **Developed replacement plans for various scenarios.** We developed a variety of multi-year replacement plans in order to evaluate current and updated replacement cycles. Using NRCS' current replacement cycles, we developed a *Current Baseline Replacement Plan* in order to show the timing and costs of fleet replacement if the backlog of vehicles overdue for replacement were to be eliminated in the first year of the plan. As eliminating the replacement backlog in year one would most likely not prove to be feasible for financial and operational reasons, we calculated a constant funding level that would eliminate the backlog over several years, and used it to develop the *Current Smoothed Replacement Plan*. In order to show the effects of maintaining current funding levels, we developed the *Current Status Quo Replacement Plan*, which shows the consequences of continuing to defer fleet replacement due to current funding levels. In contrast, we used our recommended replacement cycles to develop three more plans; *Updated Baseline, Updated Smoothed,* and *Updated Status Quo*. The *Updated Smoothed Replacement Plan* that was developed using our recommended replacement cycles, which we will call the *Modernization Replacement Plan* hereafter, would be the plan to adopt if NRCS were not considering GSA Fleet leasing. We compared these plans to show timing and costs of fleet replacement under the various scenarios.
- **Calculated total costs of ownership for various scenarios.** In order to demonstrate the value of increasing capital funding for fleet replacement, we estimated the reductions in operating costs that will result from the adoption of the Modernization Replacement Plan.
- **Identified opportunities to optimize fleet through sourcing decisions.** We analyzed the three primary classes of vehicles in the NRCS-owned fleet to identify the vehicles that would be more advantageous to lease through GSA Fleet leasing, and analyzed the leased fleet to identify vehicles that NRCS would derive an advantage from owning.
- **Developed *Phase 1 Replacement Plan* and quantified total cost ownership.** Using the 732 vehicles identified for leasing under Phase 1 of the Strategic Sourcing Initiative, we developed a replacement plan that shows the timing and costs of fleet replacement, then modeled the total cost of ownership. We compared these results with the results from the *Modernization Replacement Plan*.

For all discount and inflation rates applied to capital budgeting and analysis, we used a three percent rate of inflation and a six percent nominal discount rate.

In cases where there was uncertainty surrounding any of the values that were used in our analyses, we conducted sensitivity analyses to determine the extent to which changes in the value affected the overall analysis.

DETERMINATION OF OPTIMAL VEHICLE REPLACEMENT CYCLES

Vehicle replacement guidelines should be based on the economic theory of optimal vehicle replacement, which is illustrated graphically here. As a vehicle ages, its capital cost diminishes[1] and its operating costs (e.g., maintenance, repair, and fuel) increase. The combination of these two costs produces a U-shaped total cost curve that reflects the total cost of ownership of the asset. Ideally, a vehicle or piece of equipment should be replaced around the time the rise in annual operating costs begin to outweigh the decline in annual capital costs – that is, when the two cost curves intersect and the total cost of ownership begins to increase.



The total cost curve is different for every type of vehicle and, indeed, for every individual vehicle of a given type. This variability is caused by differences in the design and engineering of different types of vehicles, in operating environments, in the quality of care vehicles receive, and a variety of other factors. In recognition of this fact, most organizations develop *recommended* replacement cycles for classes or type of vehicles, which will approximate the optimal replacement cycle for most of the units in each particular class. Historically, this was most often accomplished in an informal manner based on discussions with mechanics and drivers, and a comparison of replacement cycles with peer organizations.

Best practice fleet organizations develop these cycles empirically using optimal replacement cycle analysis techniques. This analytical approach involves modeling the stream of costs associated with acquiring, operating, and disposing of select classes of vehicles or equipment over a range of potential ages or replacement cycles, and identifying the cycles that will result in the lowest total cost of ownership. The simplest way to identify these cycles is with a metric called equivalent annual cost (EAC).

What is most important about an empirical approach to determining optimal vehicle replacement cycles is that it provides a quantitative *foundation* for planning and making replacement decisions based on objective information as opposed to opinion, subjective judgment, or past practice. In our experience, even the best-educated or well-intentioned individuals in an organization may believe cost savings or avoidance opportunities exist where they do not. Moreover, biases against a particular replacement philosophy or approach may lead some stakeholders to promote suboptimal strategies or decisions. In the absence of hard data, it is not difficult to make almost any approach *sound* more cost effective.

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1 The capital cost referred to here is the annual change in fair market value of the vehicle as it ages and accumulates mileage. This is similar, but distinct from the annual depreciation of a vehicle, in that the former is based upon the resale value of the vehicle and the latter is a value used for accounting purposes.

Optimal replacement cycle analyses are valuable for examining the "hard" capital and operating costs associated with alternative replacement cycles for a given type of vehicle. It is important to note, however, that there often are other costs, some more easily measured than others, which are also impacted by an organization's replacement cycle decisions. These include items such as:

- Unmanageability of repair costs;
- Increasing vehicle downtime and its impact on fleet size;
- Service disruptions;
- Reduced employee productivity;
- Reduced employee and public safety; and
- Higher greenhouse gas emissions.

Decision makers who assume that cutting replacement purchases is a good way to help balance the budget need to understand that while such cuts reduce capital costs in the short-term, offsetting increases in operating costs actually increase the total cost of ownership of the fleet over the long term. Regardless of its net effect on current fleet costs, the deferral of replacement purchases on a regular basis unquestionably leads to an older fleet with increasing downtime at best, and at worst, the inability to provide services due to unreliable transportation. Delaying replacement increases future replacement spending needs, often resulting in growing and increasingly unmanageable fleet replacement backlogs.

OPTIMAL REPLACEMENT CYCLE ANALYSES

Methodology

A key metric we use in identifying optimal replacement cycles is equivalent annual cost (EAC). The EAC of a capital asset is a uniform dollar amount, the net present value of payments for which, over a given period of time (i.e., replacement cycle), is equivalent to the net present value costs of owning and operating that asset over the course of that period. It is a useful metric for comparing the costs of alternative replacement cycles (i.e., streams of future costs of different durations) for an asset in order to determine which cycle results in the lowest total cost of ownership.

There were three key asset types that were included in the optimal replacement cycle analysis component of this study: light-duty 4x2 pickups, light duty 4x4 pickups, and light duty 4x4 sport utility vehicles (SUVs). We conducted an analysis on the remainder of the fleet in order to provide a recommendation about replacement for other classes not specifically listed. The quantity of each type used in our analysis is shown in Figure 1.

Figure 1: Asset Types and Quantities Used in Analysis

Asset Type	Number of Units
LD Pickup 4x2	2,299
LD Pickup 4x4	4,243
LD SUV 4x4	1,051
Other	1,252
Total	**8,845**

We selected specific elements of historical asset data to include in our analysis. These data items pertained to the principal direct costs associated with owning and operating each of the asset types such as original purchase prices and in-service dates; and miles driven and maintenance, repair, and fuel costs for the past year.

For each type of asset identified above, we conducted a life cycle cost analysis using a proprietary software program called *ORCA*™ (*Optimal Replacement Cycle Analysis*), which was developed by Mercury Associates for this purpose. We used this program to calculate the equivalent annual cost (EAC) associated with keeping each type of asset in service for periods ranging from 1 to as many as 20 years, and identified the replacement cycle that would result in the lowest EAC. We made a final replacement cycle recommendation based on review of the EAC calculations, especially relative differences between the EAC under the lowest-cost replacement cycle and under replacement cycles that are one or two years shorter or longer than it. We also took into account other "soft cost" considerations such as those discussed above (e.g., reliability, predictability of repair costs, parts availability, and technological obsolescence).

For each group of assets examined, we performed a statistical analysis of the historical asset usage, and maintenance and repair cost data in order to 1) determine the average annual level of usage during the primary period of use for each asset type during its service life; and 2) develop regression equations for estimating annual asset maintenance and repair costs and accumulated usage. Information regarding the residual values of vehicles was derived from a comparison between acquisition costs and NRCS' used asset sales proceeds at various ages.

We gathered fuel price information from the Energy Information Agency (EIA) website and found that the price of gasoline for November 2015 was $2.19/gallon which was also inflated annually at a rate of three percent. We also included a fuel efficiency opportunity cost factor of three percent per year to account for the opportunity cost of retaining older vehicles relative to their new, more efficient replacements. When vehicles are replaced more frequently, fleet owners realize the gains in new vehicle fuel efficiency associated with advances in vehicle engineering and increasingly stringent fuel economy standards.

Results

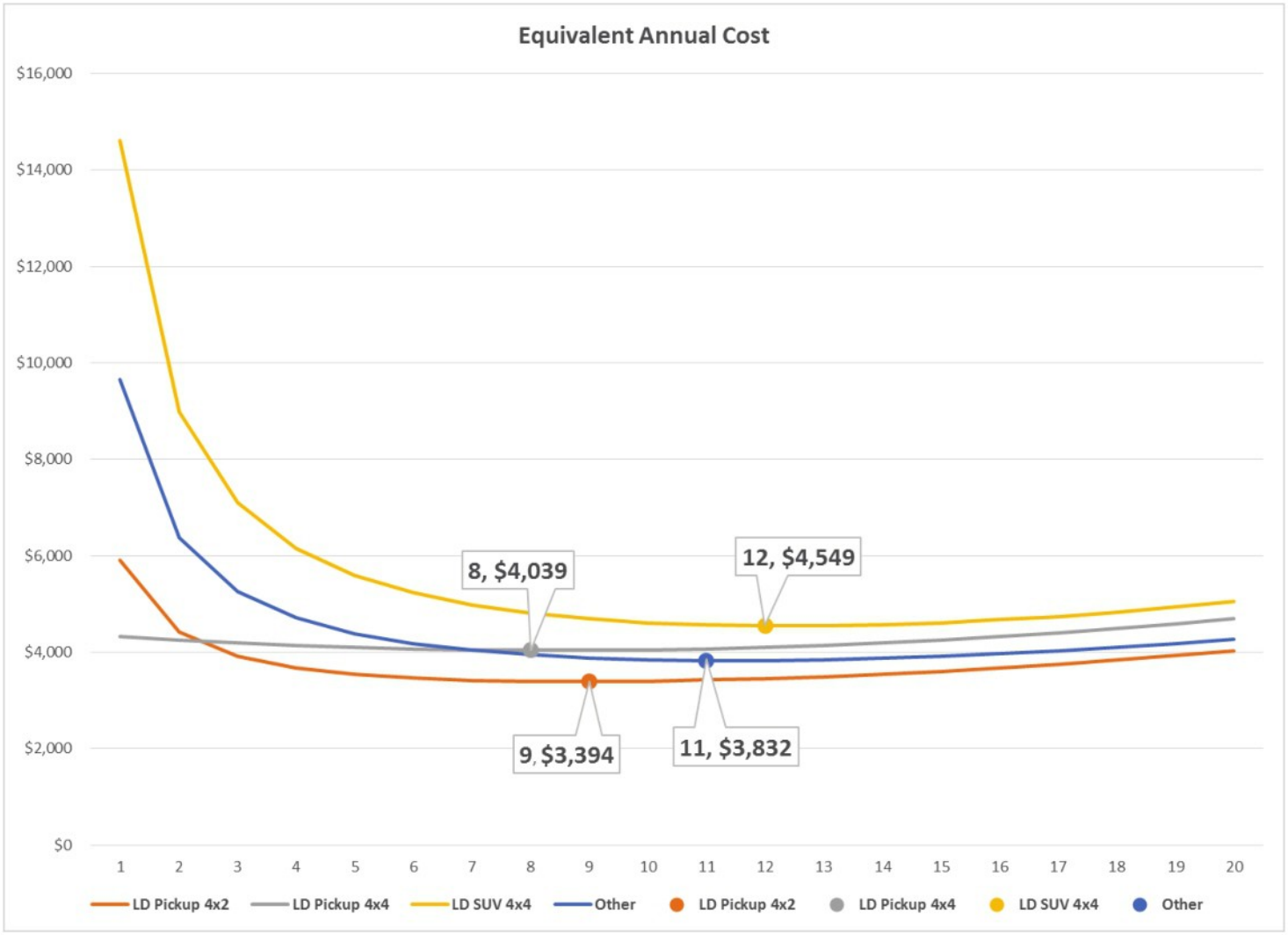
When discussing fleet replacement cycles, it is important to first point out the difference between *current* replacement cycles and *de facto* replacement cycles; without sufficient funding for fleet replacement, NRCS is experiencing actual replacement cycles that are much longer than intended. The de facto replacement cycles, which are shown in Figure 2, are calculated by adding two standard deviations to the mean asset age. By using this method, we find the age at which the majority of vehicles end up being replaced rather than simply taking the oldest vehicles in the fleet. To use the oldest vehicles in the fleet as the point from which we calculate the savings of adopting the recommended replacement cycles would likely overstate the savings, which we have sought to avoid in our analyses. Figure 2 also shows the EAC that corresponds to each vehicle replacement under current cycles and the optimum cycles that we found during our analyses.

Figure 2: Optimum Replacement Cycles

Asset Type	Number of Units	Current Average Age (Years)	Replacement Cycles (Years)		Equivalent Annual Cost			Total Annual Savings
			De Facto	Optimum	De Facto	Optimum	Change	
LD Pickup 4x2	2,299	8.5	15	9	$3,607	$3,394	$213	$490,031
LD Pickup 4x4	4,243	6.6	14	8	$4,191	$4,039	$153	$648,246
LD SUV 4x4	1,051	6.1	13	12	$4,551	$4,549	$2	$2,428
Other	1,252	6.8	13	11	$3,847	$3,832	$15	$18,642
Total	**8,845**	**7.1**	**14**	**9**	**$4,034**	**$3,903**	**$131**	**$1,159,403**

Once we produced quantitative results, we interpreted the information and took into consideration other relevant factors before concluding that NRCS should adopt a ten year replacement cycle for its owned assets for two reasons. First, as can be seen in Figure 3, the minimum EAC values are clustered around a ten year replacement cycle. Given the relative flatness of the EAC curves around year ten, there is not much difference in economic benefit or cost between years eight and twelve. Second, the residual value equations that were produced during the regression analysis yielded markedly different residual value curves; although these were derived directly from NRCS data, we believe that the "LD SUV 4X4" and "Other" analyses yielded results that, when compared to the other two classes, show capital costs that are heavily front-loaded. This results in replacement cycles that are longer than average (and vice versa). Ten years appears to be the "happy medium" between these four EAC curves.

Figure 3: Equivalent Annual Costs



The economic savings of adopting a ten year replacement cycle are shown in Figure 4.

Figure 4: Recommended Replacement Cycles

Asset Type	Number of Units	Current Average Age (Years)	Replacement Cycles (Years)		Equivalent Annual Cost			Total Annual Savings
			Status Quo	Recomm.	Status Quo	Recomm.	Change	
LD Pickup 4x2	2,299	8.5	15	10	$3,607	$3,403	$204	$468,957
LD Pickup 4x4	4,243	6.6	14	10	$4,191	$4,050	$141	$600,257
LD SUV 4x4	1,051	6.1	13	10	$4,551	$4,616	($65)	($67,916)
Other	1,252	6.8	13	10	$3,847	$3,849	($2)	($2,128)
Total	**8,845**	**7.1**	**14**	**10**	**$4,034**	**$3,921**	**$113**	**$999,131**

As can be seen from comparing Figure 2 and Figure 4, both sets of replacement cycles will result in economic savings, with the optimum replacement cycles (if fully adhered to) resulting in approximately $160K more in savings per year. Additionally it is worth noting the significant difference in price between the pickup trucks and SUVs, which would tend to favor using pickup trucks wherever either vehicle would fulfill end user requirements.

Figure 5 shows the side-by-side comparison of the current, de facto, optimal, and recommended replacement cycles that we have discussed above, with both age and mileage values given. NRCS' current replacement cycles were found to be much lower than we would recommend; however in practice, the de facto replacement cycles are higher than we would recommend, with the optimal and recommended replacement cycles falling in between. If NRCS were to increase replacement funding to the levels that would be needed to accomplish the *current* replacement cycles (those that are too quick), it would shift costs from maintenance and repair to capital spending without decreasing the total cost of ownership to its optimal point. As such, the *execution* of a replacement strategy that optimizes the total cost of ownership of the fleet hinges on a clear understanding of the level of fleet replacement spending that will allow NRCS to achieve the recommended replacement cycles. The sections of analysis described below will illustrate the implications of various spending levels on gross replacement costs, used asset sales proceeds, and asset ages, which will later be used to calculate the total cost of ownership of the fleet under the various scenarios described above under *Project Approach and Methodology.*

Figure 5: Current, Status Quo, Optimal, and Recommended Replacement Cycles

Asset Class Code	Replacement Cycles							
	Current		De Facto		Optimal		Recomm.	
	Years	Miles (000s)	Year	Miles (000s)	Years	Miles (000s)	Years	Miles (000s
LD PICKUP 4X2	6	50	15	95	9	57	10	65
LD PICKUP 4X4	6	50	14	90	8	51	10	65
LD SUV 4X4	6	50	13	96	12	88	10	75
LD SUV 4X2	6	50	15	111	11	82	10	75
LD VAN 4X2 (PASSENGER)	6	50						
SEDAN/ST WGN COMPACT	3	60						
SEDAN/ST WGN MIDSIZE	3	60						
MD PICKUP	6	50						
HD	9	80						
LD MINIVAN 4X4 (PASSENGER)	6	50						
LD VAN 4X2 (CARGO)	6	50						
MD SUV	6	50						
SEDAN/ST WGN LARGE	3	60						

FLEET REPLACEMENT PLANS

INTRODUCTION

Item 2 from the list of key components of an effective fleet replacement program calls for the development of a long-term fleet replacement plan that projects future vehicle replacement dates and purchase costs. By using the various sets of replacement cycles discussed above, we will quantify year-to-year, fleet-wide replacement costs and future variations therein, allowing for effective long-term planning and budgeting.

A key benefit of a long-term replacement plan is its ability to help fleet managers illustrate the magnitude of fleet replacement costs and the inherent annual peaks and valleys in such costs over time. The replacement plan specifically helps address two common misconceptions that factor heavily in an organization's failure to devote enough funds to fleet replacement. The first misconception is the belief that fleet replacement costs are quasi-discretionary and that there is no compelling reason to fill 100 percent of the requests for fleet replacement funds that organizations make each year. The other misconception is the belief that it is not necessary to vary to any significant degree the amount of funds devoted to fleet replacement spending from year to year.

A good fleet replacement planning process not only quantifies the costs of replacing the fleet over the long term so that stakeholders in the budgeting process can see that this is a significant, recurring cost of doing business. It also illustrates the consequences of under-funding replacement expenditures by translating spending shortfalls into future spikes in, and backlogs of, replacement spending needs.

DEVELOPMENT OF REPLACEMENT PLANS

Determining the costs and benefits of modernizing NRCS' fleet entailed developing six long-term fleet replacement plans that project the future replacement dates and costs by asset over a 20-year period. The replacement plans that we developed represent the fleet as of the end of FY 2015, with the exception being that we had to remove assets from our analysis due to lack of having the information necessary to approximate in-service dates. Additionally, all of the GSA leased assets were removed from the analysis due to the alternate source of replacement funding. The remaining fleet inventory, along with the replacement cycles that were discussed previously were used as inputs in the replacement planning process.

We used a proprietary computer program called *CARCAP™* (*Capital Asset Replacement Cost Analysis Program™*) to develop fleet replacement plans and analyze various fleet asset costs and other outcomes associated with their implementation. This program allows us to project the remaining life, and future replacement dates, replacement costs, residual values, ages, book and fair market values, book and effective depreciation costs of each individual *asset* in a fleet, which can then be rolled up into class, state, and nation-wide totals for fleet cost analysis purposes.

CARCAP generates a replacement plan by: 1) comparing the current age and meter reading of each individual asset against its respective recommended replacement criteria, which are loaded into the program's *Planning Parameter Table*; 2) projecting when each asset will reach each applicable threshold for replacement; and 3) estimating the purchase price of the asset in the year in which it will reach whichever threshold (age or accumulated usage) first. We used this program to develop six different replacement plans for NRCS' fleet.

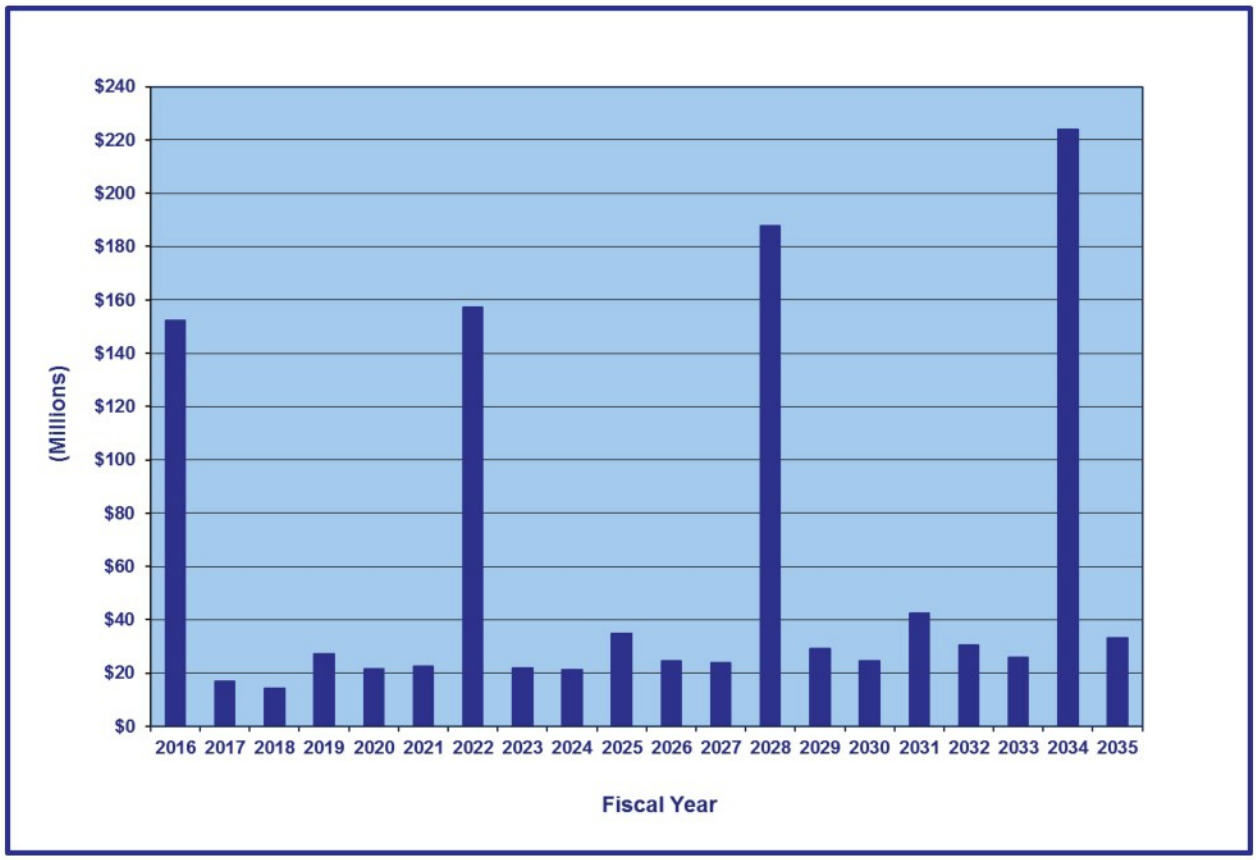
CURRENT BASELINE REPLACEMENT PLAN

We refer to the first plan that we developed for NRCS' fleet as a Baseline Replacement Plan. It is for a fleet of 8,605[2] vehicles and projects future fleet replacement costs, beginning in 2016, based on the application of the current replacement cycles shown above in Figure 5. Employing these guidelines, which range for individual asset classes from 3 to 9 years, would result in a weighted average replacement cycle for all the assets in the fleet of 5.5 years.

2 This is the number of assets that remained after starting with an inventory of 9020, first removing assets that were duplicates, assets that lacked VIN or in-service date information, and assets with no class information, along with another 272 GSA lease vehicles.

Our analysis indicates that the estimated replacement cost of NRCS' fleet, in today's dollars, is $207.8 million[3]. The future costs of replacing the assets in the NRCS' fleet in strict adherence to NRCS' current replacement cycles are shown below in Figure 6.

Figure 6: Current Baseline Fleet Replacement Costs



As can be seen above in Figure 6, current replacement cycles result in a large number of vehicles being considered overdue for replacement by age, mileage, or both. As it would be both operationally and financially impractical and implausible to replace over $150 million in fleet assets in the first year of the plan, the development of this type of replacement plan serves primarily as a point of departure for evaluating the alternatives. The first alternative that we will evaluate is the development of a replacement plan using the same current replacement cycles, but with an annual spending level that aims to buy out the backlog over a longer period of time rather than in year one.

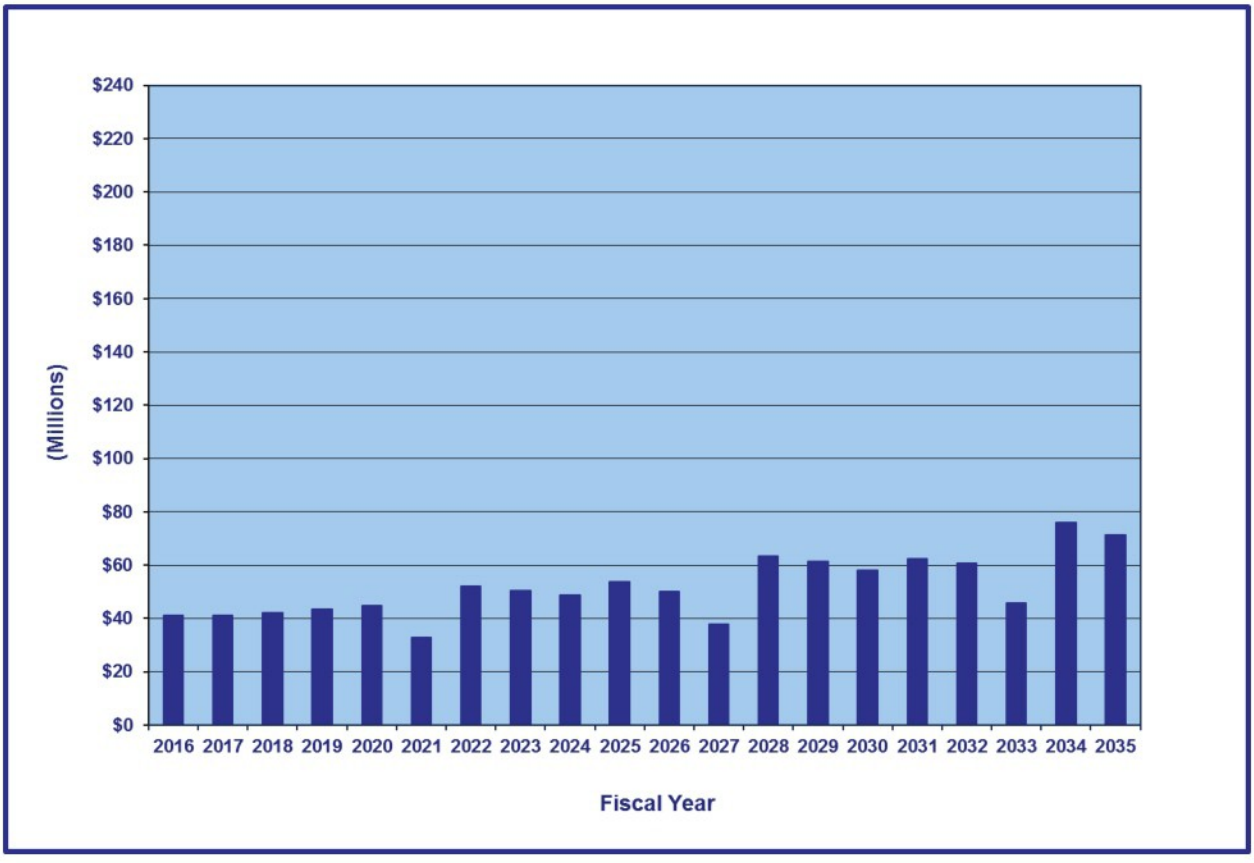
3 This figure is for the 8,605 vehicles covered in this section of the report.

CURRENT SMOOTHED REPLACEMENT PLAN

Using the same fleet inventory, replacement cycles, and costs, we have prepared a replacement plan that shows what replacement spending would look like if we attempt to eliminate the backlog over six years. To reduce the type of spending volatility that was seen in the baseline plan, we calculated the annual spending level that will get the fleet "healthy". This was accomplished by taking the average of the present value of the first six years of fleet replacement spending, and using that as the spending cap for the first year of the plan. In the five subsequent years, the spending cap increases by the rate of inflation. By doing this, we are deferring assets from year one to year two using a ranking algorithm that defers assets of lower age and mileage until the spending cap is met. *CARCAP* then cycles through the next fiscal year doing the same, and so on.

In Figure 7, $41 million in spending will eliminate the backlog by end-FY 2021, which will yield fleet ages that stay within the current replacement parameters. As shown in the *ORCA* results, the current replacement parameters will result in a fleet that is, on average, too young; this shifts the balance from maintenance and repair spending towards capital spending, but doesn't necessarily reduce the total cost of ownership. Essentially, the pendulum would swing too far in the opposite direction instead of reaching a balance.

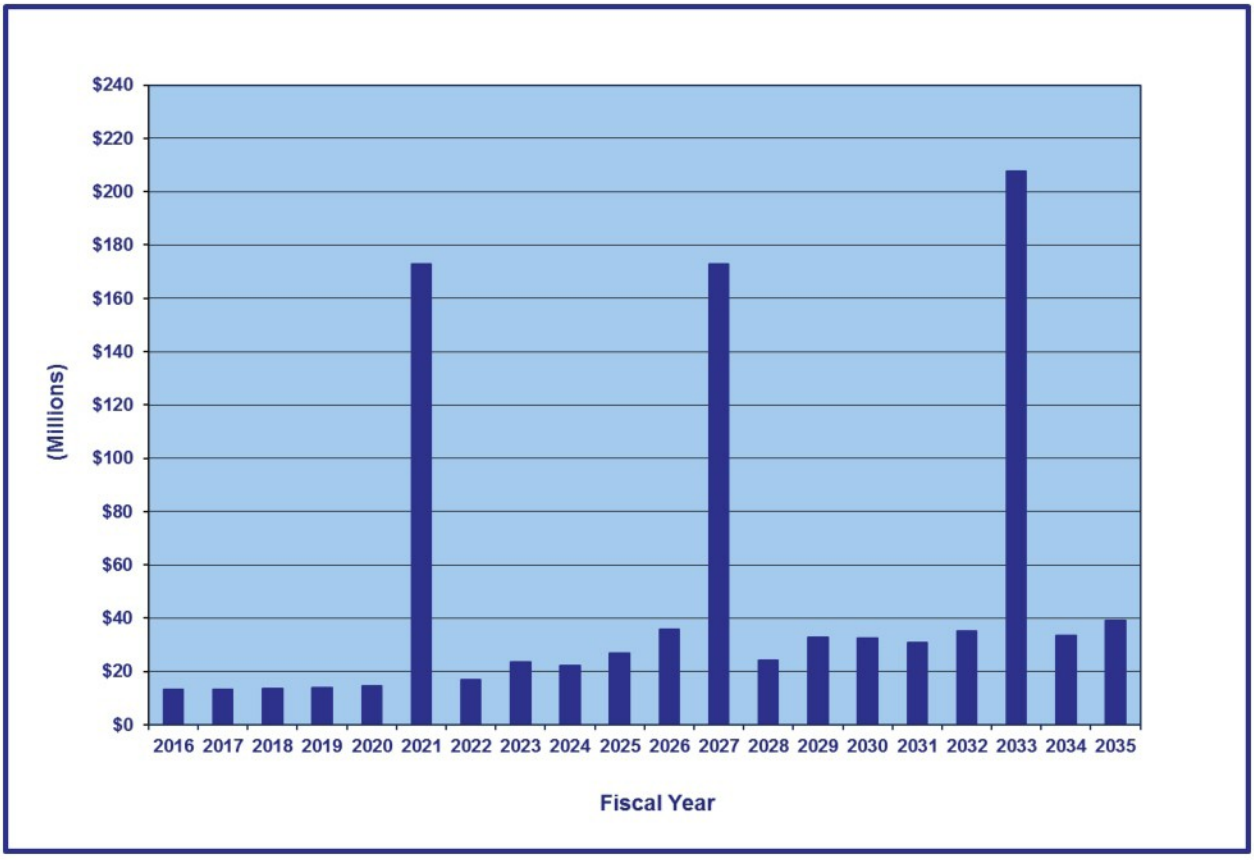
Figure 7: Current Smoothed Fleet Replacement Costs



CURRENT STATUS QUO REPLACEMENT PLAN

In order to get a complete picture of NRCS' current replacement practices, we have developed a third replacement plan that shows the timing and replacement costs of maintaining fleet replacement spending at current levels (as measured by taking the present value average of the last five years' spending). As shown in Figure 8, the application of $13.2 million, inflated annually for five additional years, towards fleet replacement is inadequate in terms of addressing the backlog. As shown in the Smoothed Replacement Plan, approximately $41 million would be needed to eliminate the current backlog by end-FY 2021, while here in the Status Quo Replacement Plan, we are showing that the backlog will increase to $173 million over the same time period unless there is a significant change in replacement spending. To continue spending at $13.2 million (on average) is, in our opinion, unsustainable.

Figure 8: Current Status Quo Fleet Replacement Costs

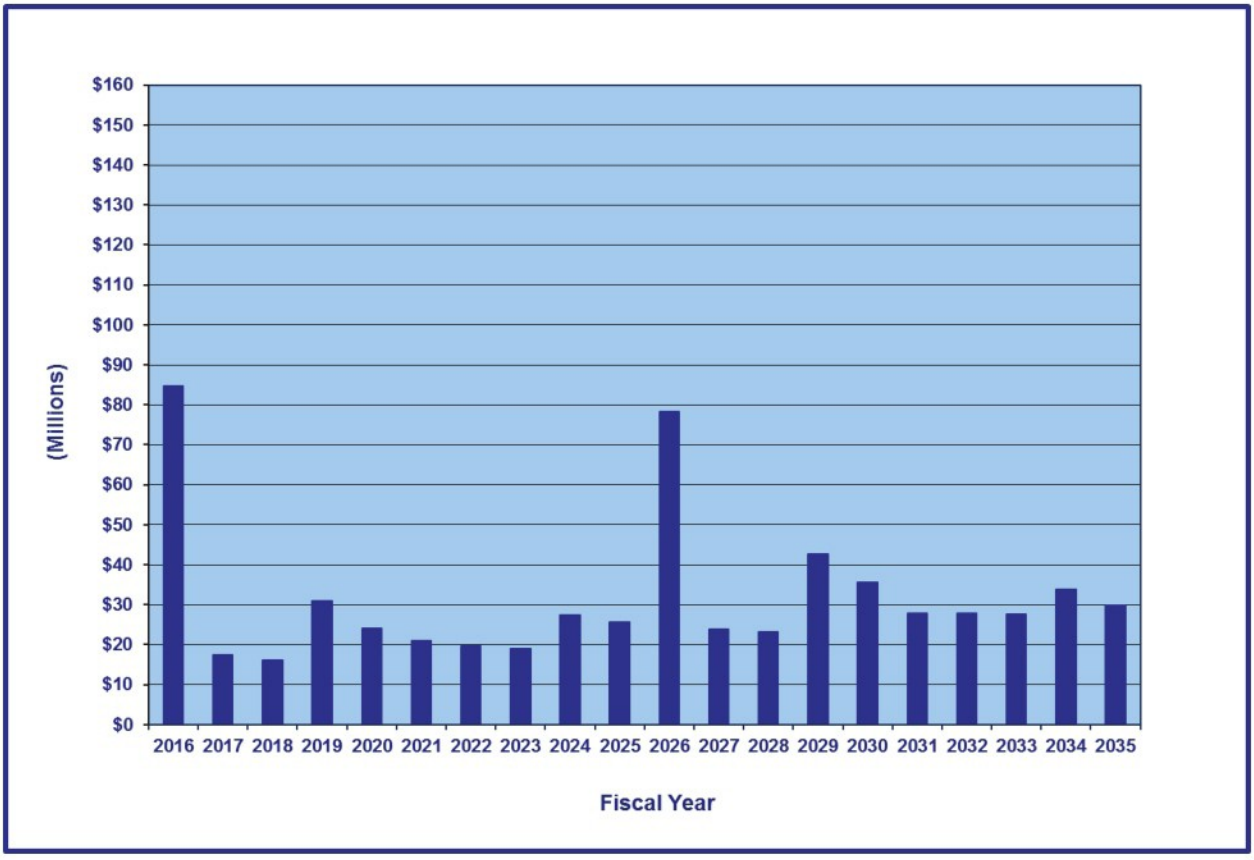


During the next sections of the report, we will shift our focus from the timing and costs of fleet replacement using NRCS' current replacement cycles to the timing and costs of fleet replacement under our updated replacement cycles.

UPDATED BASELINE REPLACEMENT PLAN

Using the updated replacement cycles that were generated from our analyses of optimal replacement cycles, we have developed a second set of fleet replacement plans. In these three plans, the replacement cycles for both 4X2 and 4X4 LD Pickups are ten years or 65,000 miles; the replacement cycles for all other assets are 10 years or 75,000 miles. Figure 9 shows a similar pattern to that shown in the previous Baseline Replacement Plan in Figure 6, however the backlog in the first year is not as large (note the difference in scale on the Y-axis), nor are the residual spikes in replacement spending in future years as frequent.

Figure 9: Updated Baseline Fleet Replacement Costs



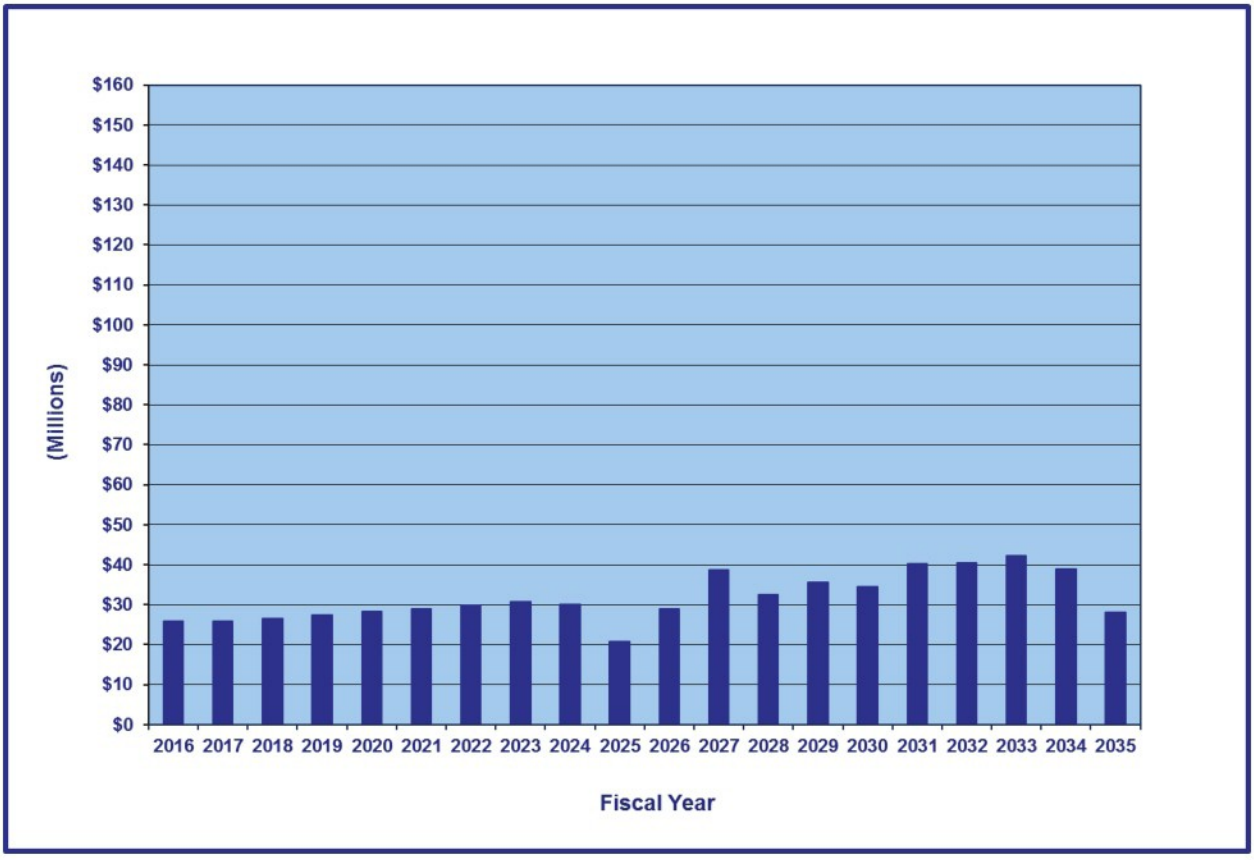
Using the updated replacement cycles, the weighted average replacement cycle becomes 9.1 years, as compared to the 5.5 years under the current replacement cycles.

Again, it would be both impractical and implausible to replace nearly $85 million in assets in the beginning year of the plan both for financial and operational reasons. As such, we have developed the Modernization Replacement Plan that shows a more reasonable and sustainable path towards eliminating the backlog.

MODERNIZATION REPLACEMENT PLAN

Using the same methodology as the Smoothed Replacement Plan, the Modernization Replacement Plan features an initial budget constraint of the average of the present values of the first ten years of fleet replacement. At $25.8 million, replacement spending would start off at a significantly more achievable number than the $84.6 million that would be required to buy out the backlog in year one as shown in the Updated Baseline Replacement Plan. As can be seen in Figure 10 the volatility that was present in Figure 9 has been reduced so that the backlog can be eliminated with an even and predictable spending level.

Figure 10: Modernization Fleet Replacement Costs

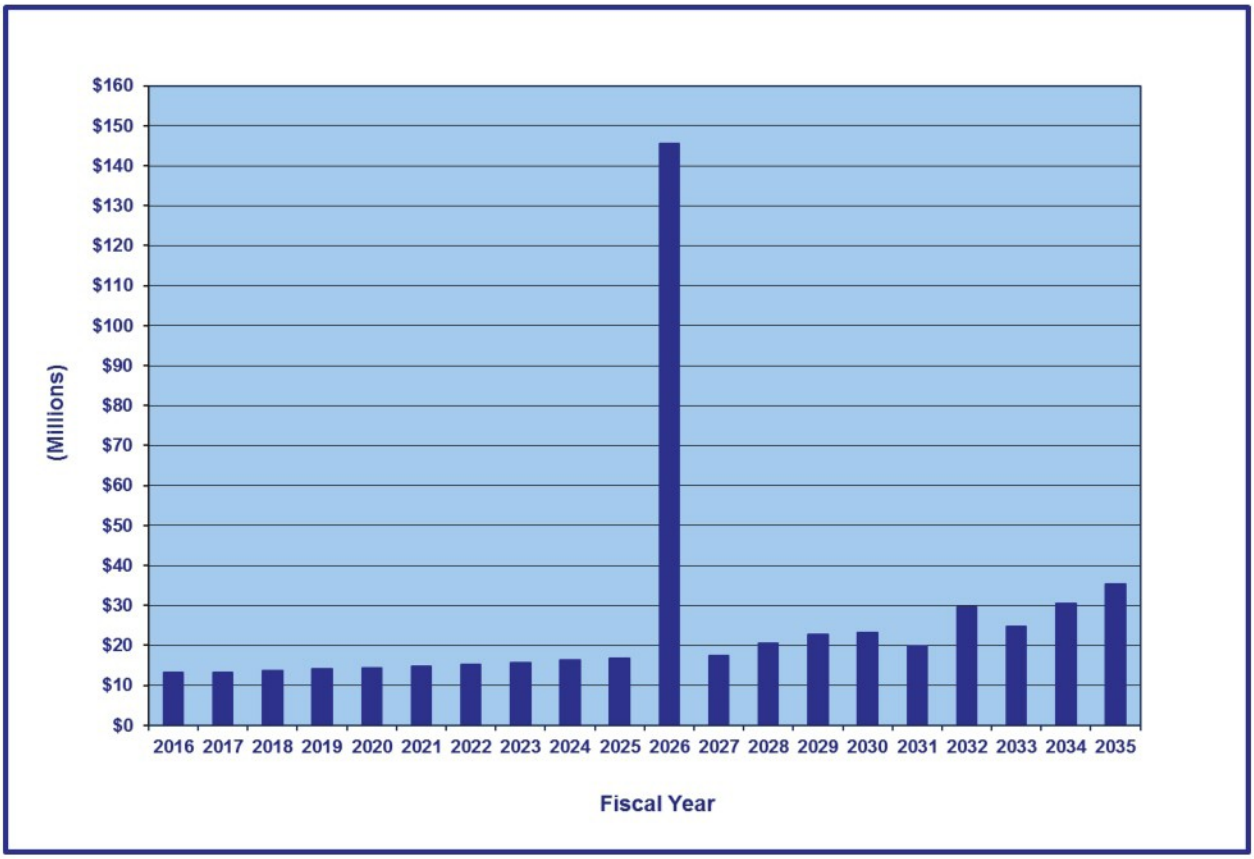


As we will show later on in the total cost of ownership analysis, this approach to fleet replacement spending will achieve the appropriate balance between maintenance and repair costs and capital costs and will result in lower total cost of ownership. But first, we will show the Updated Status Quo Replacement Plan under recommended replacement cycles.

UPDATED STATUS QUO PLAN

In this scenario, we have constrained spending at $13.2 million, as was done in the Current Status Quo Replacement Plan. Again, spending that starts off at $13.2 million and grows at the rate of inflation for ten years will be inadequate for addressing the backlog of fleet replacement. In this instance, the fleet replacement backlog that starts off at $84.6 million will grow to $145.5 million (in nominal terms) after ten years.

Figure 11: Updated Status Quo Fleet Replacement Costs



Average asset age will increase continuously through 2025 as well, with average asset age moving from 7.5 years to 8.8, with the oldest assets reaching 19 years. This is in contrast to the Modernization Replacement Plan, in which assets will be, on average, 4.2 years old, with the oldest assets in the fleet being 9 years old. The reason for focusing in on ages at this point is to highlight that total cost of ownership is predominantly a function of asset age. As assets increase in age, their maintenance and repair costs increase. We will discuss the relationship between the asset ages (and by extension, maintenance and repair costs) in further detail in the following sections.

MODERNIZED FLEET TOTAL COST OF OWNERSHIP ANALYSIS

The next step in forming the rationale for fleet replacement spending is to conduct a fiscal and economic analysis that blends the results of the optimal replacement cycle analyses, which describe savings or costs without stating when they will occur, and the replacement plans, which show the timing of fleet capital costs only.

PROJECTING FUTURE COSTS

We used the Updated Status Quo Replacement and Modernization Replacement Plans as the foundation for an analysis of the potential cost savings associated with modernizing NRCS' fleet and maintaining an effective fleet replacement program in the future. The goal of this analysis was to determine whether or not the total cost of ownership of the fleet could be reduced by replacing assets in accordance with the updated replacement cycles, which would require a substantial increase in replacement spending, rather than with the replacement cycles NRCS currently uses. Based on the principles of optimal vehicle replacement discussed earlier in this report, we have reason to believe that when all significant vehicle costs are taken into account, the total cost of the NRCS fleet can indeed be reduced by replacing assets more frequently.

In order to test this hypothesis, we estimated future fleet capital and operating costs under the two replacement strategies and compared them with one another. Making this comparison entailed estimating the three major components of any fleet's *direct* total cost of ownership (TCO): vehicle capital, maintenance and repair, and fuel costs.

We estimated the TCO over a 10-year period of each fleet component under both fleet replacement strategies in both *economic* and *fiscal* terms. For the purposes of the *economic* analysis, the annual capital cost of a vehicle is defined as the change in its fair market value (FMV) from one year to the next. Many people use the term "depreciation" to describe this cost as a vehicle ages, although depreciation, technically speaking, is an accounting activity, not a type of cost. Another way to think of a vehicle's capital cost is in terms of the diminishment of its tangible value as an asset that can be sold over time. We used regression equations developed for four categories of assets in the NRCS fleet to estimate the capital cost of each asset in the fleet in each year of the 10-year analysis period.

For the *fiscal* impact analyses performed in this study, we define an asset's capital cost as the amount of cash that needs to be spent to acquire it minus the amount of cash received when it is sold, usually many years later.[4] We estimated asset purchase prices using the asset class-based replacement planning parameters described earlier and an annual purchase price inflation factor of three percent. We estimated used asset sales proceeds using different fair market value regression equations for the different types of assets in the fleet.

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4 Obviously, this definition of asset capital cost presumes that these costs are financed through the outright purchase of asset with cash paid up front. It is important to note that this type of capital financing method produces fiscal impacts that are far different in each year of an asset's life than those associated with some other capital financing methods, such as leasing through GSA.

As discussed previously, we performed extensive statistical analysis of NRCS' asset maintenance and repair cost data in order to develop regression equations for predicting changes in annual vehicle maintenance and repair costs as a function of changes in vehicle age for four fleet segments.

To estimate the cost of fueling assets under the alternative replacement strategies, we used the fueling costs from both fleet cards systems (WEX and CitiBank) and totaled the fuel transaction amounts for each vehicle. There were vehicles for which we did not have any fueling transaction data, and others that had fueling transaction data that was inordinately high. In order to compensate for either the lack of data or the presence of outlier data, we analyzed the fleet to generate five descriptive statistics, including minimum, first quartile, median, third quartile, and maximum values. For vehicles with no transaction data, we assumed the vehicles were in use, and assigned them the median fuel cost for FY15 of $691.73. To screen the remainder of the data for outliers, we used the first and third quartile values ($393.42 and $1,077.91, respectively), the difference of these values being the *interquartile range* ($684.49). Next we multiplied the interquartile range by 1.5 ($1,026.74) and added this to the median value to get $1,718.47. Any vehicles with FY15 fuel costs above this amount were considered to be *weak outliers*, which is a generally accepted terminology in statistics (to identify *strong outliers*, use three times the interquartile range instead of 1.5). To diminish the effect of these vehicles on the overall analysis, we took their fuel costs as $1,718.47 for the purposes of calculating future fuel expenditures. These values were then increased by the rate of inflation to 2016 dollars, and were used as the basis for calculating fuel costs moving forward.

Once we had initial fuel costs, we had to account for the increases in fuel economy that new vehicles achieve relative to their older counterparts. Recently promulgated corporate average fuel economy (CAFE) standards require that vehicle manufacturers produce more fuel-efficient models over time at a more rapidly increasing rate than in the past. Keeping vehicles in a fleet for a long time deprives fleet owners of these gains in fuel efficiency. Accordingly, we used a fuel efficiency improvement factor of 3 percent per year, to be realized in each year that individual assets are replaced. We added an annual fuel price inflation rate of 3 percent to the base year fuel costs to arrive at the final fuel cost estimates for the fleet under each replacement plan.

In the next section, we utilize the *Status Quo* and *Modernization Replacement Plans* discussed earlier to illustrate how we compared the total cost of ownership under these two alternative replacement strategies. As with the replacement plan details themselves, the comparative TCO analysis results for the NRCS fleet has been provided in *Excel* workbook files under separate cover and also are summarized in the appendix.

MODERNIZATION FLEET COSTS VERSUS STATUS QUO

Figure 12 and Figure 13 provide a detailed view of the total cost of ownership of NRCS' fleet over the next 10 years under the Status Quo and Modernization Replacement Plans, respectively. Figure 14 and Figure 15 summarize the savings and costs of switching from the Status Quo to the Modernization Replacement Plans in economic and fiscal terms, respectively.

The economic TCO, shown in present value terms in Row 14 of Figure 12, is $216 million under the Status Quo plan and $223 million under the Modernization plan. To fairly compare the two plans, the fair market value of the fleet (row 12) at the end of Year 10 must also be considered. Specifically, the FMV of the fleet at the end of Year 10 (again, row 12) is subtracted from the economic TCO (row 14) to calculate the 10 Year Economic Net TCO (row 15), which is $147 million under the Status Quo plan and $130 million under the Modernization plan. Thus, in economic terms, the Modernization strategy produces net savings in the total cost of ownership of the NRCS fleet of $17 million in the first 10 years as shown in Figure 14.

Other key information shown in Figure 12 and Figure 13 includes the following:

- 4,648 more assets are replaced under the Modernization plan than under the Status Quo Replacement plan.
- The average age (shown in Row 3 of each exhibit) of the assets in the Modernization plan is 4.2 years by 2025; under Status Quo replacement the average age is 110 percent greater than this (8.8 years).
- In each year, both maintenance and repair costs (Row 10) and fuel costs (Row 11) are lower under the Modernization plan.
- The net asset purchase costs (replacement cost less sales proceeds, as displayed in Row 7) and the asset capital costs (change in FMV from previous year, shown in Row 8) are higher under the Modernization Plan, due to the significantly greater number of assets purchased.

Rows 16-18 in Figure 12 and Figure 13, shaded in gray, show the fiscal impacts of each scenario. The sum of net purchase, maintenance, and fuel costs that must be expended in each year– the *fiscal* TCO of the fleet – is displayed in present value dollars in Row 16 of each of these tables. Even when the FMV of the fleet is taken into consideration, net fiscal TCO is higher (at $201 million) under the Modernization Plan than under the Status Quo scenario ($154 million). This can best be seen in Figure 15 which indicates that the fiscal impacts of modernizing the NRCS fleet are an additional $47 million over a 10-year period.

Figure 12: Total Cost of Ownership under Status Quo Replacement Plan (Millions)

Row		Fiscal Year										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total/Avg
1	Number of Assets Owned	8,605	8,605	8,605	8,605	8,605	8,605	8,605	8,605	8,605	8,605	
2	Number of Assets Replaced	559	568	532	583	555	558	537	566	522	566	5,546
3	Average Asset Age (Years)	7.3	7.4	7.6	7.7	7.8	8.0	8.1	8.3	8.6	8.8	8.0
4	Replacement Backlog in 2026										$146	
5	Gross Replacement Costs (2016$)	$13	$13	$13	$13	$13	$13	$13	$13	$13	$13	$129
6	Net Used Asset Sales Proceeds (2016$)	$2	$2	$2	$1	$2	$2	$2	$2	$2	$2	$17
7	Net Asset Capital Costs (Gross less Proceeds)(2016$)	$12	$11	$11	$11	$11	$11	$11	$11	$11	$11	$112
8	Asset Capital Costs (change in FMV from prior year)(2016$)	$9	$9	$8	$11	$8	$10	$8	$10	$8	$10	$91
9	Owned Asset Management and Overhead (2016$)	$2	$2	$2	$2	$2	$3	$3	$3	$3	$3	$25
10	Asset Maintenance and Repair Costs (2016$)	$3	$3	$3	$3	$3	$4	$4	$4	$4	$5	$37
11	Asset Fuel Costs (2016$)	$7	$7	$7	$7	$6	$6	$6	$6	$6	$6	$63
12	**Ending Asset FMV (2016$)**	**$74**	**$74**	**$74**	**$73**	**$73**	**$72**	**$72**	**$71**	**$70**	**$69**	
13	Economic Asset TCO (Row 8+9+10+11) (2016$)	$22	$22	$20	$23	$20	$23	$21	$22	$21	$22	$216
14	**Economic NPV TCO**	**$22**	**$43**	**$64**	**$87**	**$107**	**$130**	**$150**	**$173**	**$194**	**$216**	
15	**10 Year Economic Net TCO**											**$147**
16	Fiscal Asset TCO* (Row 7+9+10) (2016$)	$24	$23	$23	$23	$22	$22	$22	$22	$21	$21	$223
17	**Fiscal NPV TCO**	**$24**	**$47**	**$70**	**$93**	**$115**	**$137**	**$159**	**$181**	**$202**	**$223**	
18	**10 Year Fiscal Net TCO (2016$)**											**$154**

*Assumes replacement vehicles are purchased outright with cash.

Figure 13: Total Cost of Ownership under Modernization Replacement Plan (Millions)

Row		Fiscal Year										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total/Avg
1	Number of Assets Owned	8,605	8,605	8,605	8,605	8,605	8,605	8,605	8,605	8,605	8,605	
2	Number of Assets Replaced	1119	1089	1083	1076	1060	1042	1028	1049	990	658	10,194
3	Average Asset Age	6.5	6.0	5.5	5.0	4.7	4.4	4.1	3.9	3.8	4.2	4.8
4	Replacement Backlog in 2026										$29	
5	Gross Replacement Costs (2016$)	$26	$25	$25	$25	$25	$25	$25	$25	$24	$16	$241
6	Net Used Asset Sales Proceeds (2016$)	$3	$3	$4	$4	$4	$4	$4	$5	$5	$4	$39
7	Net Asset Capital Costs (Gross less Proceeds)(2016$)	$23	$22	$21	$21	$21	$21	$21	$20	$19	$12	$202
8	Asset Capital Costs (change in FMV from prior year)(2016$)	$10	$12	$12	$12	$14	$13	$15	$14	$14	$14	$131
9	Owned Asset Management and Overhead (2016$)	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$23
10	Asset Maintenance and Repair Costs (2016$)	$3	$3	$3	$3	$3	$2	$2	$2	$2	$2	$25
11	Asset Fuel Costs (2016$)	$7	$7	$6	$6	$6	$6	$5	$5	$5	$5	$58
12	**Ending Asset FMV (2016$)**	**$83**	**$90**	**$96**	**$102**	**$105**	**$108**	**$110**	**$112**	**$113**	**$107**	
13	Economic Asset TCO (Row 8+9+10+11) (2016$)	$22	$24	$23	$23	$25	$24	$25	$24	$23	$23	$237
14	**Economic NPV TCO**	**$22**	**$46**	**$69**	**$93**	**$118**	**$142**	**$167**	**$191**	**$214**	**$237**	
15	**10 Year Economic Net TCO**											**$130**
16	Fiscal Asset TCO* (Row 7+9+10) (2016$)	$35	$34	$33	$32	$32	$31	$31	$30	$28	$22	$308
17	**Fiscal NPV TCO**	**$35**	**$68**	**$101**	**$133**	**$165**	**$197**	**$228**	**$258**	**$286**	**$308**	
18	**10 Year Fiscal Net TCO (2016$)**											**$201**

*Assumes replacement vehicles are purchased outright with cash.

Figure 14: Savings (Costs) of Change to Modernization Replacement Plan in Economic Terms (Millions)(2016$)

	Fiscal Year									
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
NPV Savings/(Costs) in Gross TCO from Modernization Plan	($1)	($3)	($6)	($6)	($11)	($12)	($17)	($18)	($20)	($21)
PV Savings/(Costs) in FMV from Modernization Plan	$9	$17	$22	$29	$31	$36	$38	$41	$42	$38
NPV Savings/(Costs) in Net TCO from Modernization Plan	**$9**	**$14**	**$16**	**$23**	**$20**	**$24**	**$21**	**$23**	**$22**	**$17**

Figure 15: Savings (Costs) of Change to Modernization Replacement Plan in Fiscal Terms (Millions)(2016$)

	Fiscal Year									
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
NPV Savings/(Costs) in Gross TCO from Modernization Plan	($11)	($21)	($31)	($40)	($50)	($59)	($69)	($77)	($84)	($85)
PV Savings/(Costs) in FMV from Modernization Plan	$9	$17	$22	$29	$31	$36	$38	$41	$42	$38
NPV Savings/(Costs) in Net TCO from Modernization Plan	**($1)**	**($4)**	**($9)**	**($11)**	**($19)**	**($23)**	**($31)**	**($36)**	**($42)**	**($47)**

While fiscal TCO analysis represents the fiscal reality that NRCS faces *if it continues to finance the replacement costs of its fleet through the outright purchase of assets with cash*, it does not provide a true apples-to-apples comparison of the costs of owning and operating the NRCS fleet under the two replacement scenarios. We have shown clearly in the optimal fleet replacement plan section and our economic impact analysis above, that the long run costs associated with modernization are less than those of the status quo. The negative result produced by the fiscal impact perspective is due to the fact that asset replacement costs are *misaligned* with the economic benefits they produce. This is because cash purchase financing requires that fleet assets be paid for (in fiscal terms) before they are used, while the operating cost savings (again, in fiscal terms) of modernizing these assets are only realized over a period of several years. In addition, the 10-year view depicts the costs of moving from an old to a new fleet, which requires replacing a large number of vehicles due to the current backlog.

Under the most conservative of capital financing approaches (outright cash purchase), eliminating the backlog and modernizing the fleet presents a significant budgetary challenge. In

fiscal terms, NRCS could modernize its fleet by spending an additional 38 percent more than it is projected to spend under the Status Quo scenario (increasing from $223 million in direct cash expenditures to $308 million in ten years). Perhaps most importantly, part of the additional $85 million cost of modernizing the fleet is to *eliminate* the current backlog rather that leaving it for future decision makers to deal with.

Finally it is important to note that the Modernization plan results in a fleet that is younger, cheaper to operate, worth more, and requires less employee productive time to manage and operate. In the next section we will evaluate the possibility of using GSA leasing to mitigate some of the fiscal barriers that are preventing NRCS from managing an optimized fleet.

MODERNIZATION THROUGH GSA LEASING

While the previous sections of our analysis focused on determining the appropriate *level* of fleet replacement funding, the following sections of the analysis will focus on the appropriate *type* of fleet replacement funding, namely cash financing and GSA Fleet leasing. As discussed earlier, the barriers to modernizing the fleet lie in the misalignment of fiscal and economic costs; with leasing, the fiscal costs of fleet replacement (i.e., the monthly lease payments) are more closely aligned with the economic costs (i.e., the changes in fair market values of individual assets as they age). Other factors that dictate whether a vehicle should be leased or purchased include:

- The method by which capital costs are calculated, and the timing of those costs for individual assets;
- Whether or not the agency retains the used asset sales proceeds during resale, or rather, if the vehicles go through the GSA Fleet leasing "conversion" process;
- The cost of remarketing assets, whether that be done in-house or through GSA Fleet;
- Whether or not the agency is likely to be charged for vehicle reconditioning when returning leased vehicles to GSA;
- Maintenance, repair, and fuel costs paid by the agency relative to mileage-based usage charges; and
- Asset utilization.

We will evaluate the effects of converting some part of the fleet to GSA leasing in order to identify costs or benefits of relative to Status Quo Replacement and Modernization Replacement.

BACKGROUND

The Department of Agriculture's Strategic Sourcing Initiative has identified the use of GSA Fleet leasing as a possible method for reducing the total cost of ownership of the fleet, and as such, NRCS has been tasked with providing recommendations for vehicles that are suitable for leasing. Under our original work plan, the evaluation of leasing was to be conducted subsequent to the Optimal Replacement Cycle Analyses. The objective of sequencing these tasks in this particular order was to have a full understanding of vehicle costs under continued ownership

before drawing conclusions about suitability for leasing. In November, however, NRCS was tasked with providing recommendations to the Department by mid-December. In light of this request, we provided recommendations based on our preliminary analysis of the NRCS fleet, prior to fully evaluating the various life cycle costs. Due to some assumptions that we had to make in the interest of providing preliminary results on a short deadline, there are some vehicles that were previously identified as suitable candidates for leasing that now, given the benefit of evolving analysis, would appear to be better to own.

During the preliminary (economic) analysis, our analysis parameters required that vehicles had to be replacement eligible by the end of FY 2016 (by GSA minimum replacement criteria guidelines). Furthermore, vehicles needed to be *identified* in FY 2016, with replacement or conversion happening some time thereafter. Some vehicles would be switched over to leasing in FY 2017 and FY 2018. As there have been further revisions to the quantities and timing of vehicle lease commitments, the results of our preliminary economic analysis have necessarily changed to take into consideration the cash flows (fiscal impacts) associated with different leasing scenarios. First, we will show the fiscal impacts on total cost of ownership for the conversion of the 732 assets previously identified. Second, we will discuss the differences between our preliminary and updated results, which will be provided under separate cover in spreadsheet format.

TOTAL COSTS OF OWNERSHIP FOR PHASE 1 (732 ASSETS)

In order to compare the costs of leasing assets to the costs of continued ownership, we used *CARCAP* to develop the Phase 1 Replacement Plan (to align with the costs and benefits of the first phase of the Strategic Sourcing Initiative's vehicle replacement requirements).The plan incorporates four key changes from the Modernization Replacement Plan that are outlined below.

First, assets that were identified for conversion remained in the replacement plan, but were flagged as "Do Not Replace". The proceeds from the sale of those used assets were assumed to route back to GSA rather then NRCS. Through the conversion process, GSA would assume ownership of NRCS fleet assets. This is similar to a sale-leaseback process in commercial leasing, however in this case, the assets are being "given" to GSA in exchange for GSA assuming the financial burden of replacing the assets as they are due for replacement.

Second, mileage data was normalized relative to fuel consumption data. In order to account for missing or erroneous mileage data, which did not play as large of a role in the previous owned fleet cost models, we used the fuel consumption by asset, along with class average fuel economies from the ORCA analysis and a consistent per gallon fuel cost ($2.19) to substitute in a normalized mileage for the purposes of calculating predicted GSA mileage-based charges.

Third, in our economic analysis of the fleet last November, we used straight line depreciation for vehicle capital costs for the owned fleet, whereas now, we are using market depreciation (based on the residual value equations from the ORCA) for our economic analysis, as well as net capital costs (replacement expenditures less used asset sales proceeds and remarketing fees for owned

vehicles). As this is a fiscal analysis, the streams of costs are shown in the fiscal year in which they occur, with inflation being applied annually. The results in Figure 16 are shown in real dollars.

Fourth, in order to smooth out the capital costs of the owned fleet (row 5 of Figure 16), replacement spending was capped by approximating the budget amount that would be required to approximately match the replacement quantities from the Modernization Replacement Plan in the first year (row 2 of Figure 13). This was done by subtracting the number of lease conversions from the FY 2016 replacement quantity and multiplying by the average asset replacement cost to arrive at a gross replacement spending cap. The spending caps for each subsequent fiscal year are lower than those of the Modernization Replacement Plan, with the replacement backlog ultimately being eliminated.

Figure 16: Total Cost of Ownership under Phase 1 Replacement Plan (Millions)

Row		Fiscal Year										
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total/Avg
1	Number of Assets Owned	8605	8605	7873	7873	7873	7873	7873	7873	7873	7873	
2	Number of Assets Replaced or Converted	1128	954	1002	993	951	907	948	921	945	941	9,690
3	Average Asset Age	7.5	6.7	6.1	5.6	5.2	4.9	4.5	4.2	4.0	3.9	5.3
4	Replacement Backlog in 2026										$19	
5	Gross Replacement Costs (2016$)	$9	$23	$23	$23	$23	$23	$23	$23	$23	$23	$213
6	Net Used Asset Sales Proceeds (2016$)	$1	$3	$3	$3	$4	$3	$3	$4	$4	$4	$32
7	Net Asset Capital Costs (Gross less Proceeds)(2016$)	$8	$20	$20	$20	$19	$19	$19	$19	$19	$18	$181
8	Asset Capital Costs (change in FMV from prior year)(2016$)	$12	$9	$11	$12	$12	$13	$12	$13	$12	$13	$119
9	Owned Asset Management and Overhead (2016$)	$2	$2	$2	$2	$2	$2	$2	$2	$2	$2	$22
10	Asset Maintenance and Repair Costs (2016$)	$3	$3	$3	$3	$2	$2	$2	$2	$2	$2	$24
11	Asset Fuel Costs (2016$)	$7	$6	$6	$6	$5	$5	$5	$5	$5	$4	$54
12	**Ending Asset FMV (2016$)**	**$71**	**$76**	**$82**	**$87**	**$91**	**$94**	**$97**	**$100**	**$102**	**$104**	
13	Lease Cost (2016$)	$0	$3	$3	$3	$3	$3	$3	$3	$3	$3	$25
14	Economic Asset TCO (Row 8+9+10+11+13) (2016$)	$25	$23	$24	$25	$25	$25	$24	$25	$24	$24	$243
15	**Economic NPV TCO**	**$25**	**$48**	**$72**	**$97**	**$121**	**$146**	**$171**	**$195**	**$219**	**$243**	
16	**10 Year Economic Net TCO**											**$140**
17	Fiscal Asset TCO (Row 7+9+10+11+13) (2016$)	$21	$34	$33	$33	$32	$32	$31	$31	$30	$29	$306
18	**Fiscal NPV TCO**	**$21**	**$54**	**$88**	**$120**	**$152**	**$184**	**$215**	**$246**	**$276**	**$306**	
19	**10 Year Fiscal Net TCO (2016$)**											**$202**

As can be seen in Figure 17, the Phase 1 Replacement Plan shows an economic benefit as compared to the Baseline Replacement Plan, while Figure 18 shows there are still fiscal barriers to achieving fleet ages similar to what was found in the Modernization Replacement Plan. One issue to remember when evaluating the economic costs is that NRCS is, in effect, selling part of the fleet to GSA for free. Therefore, the market value of those vehicles becomes zero, which in economic terms, is a cost when compared to selling the vehicles at fair market value.

Figure 17: Savings (Costs) of Change to Phase 1 Replacement Plan in Economic Terms (Millions)(2016$)

	Fiscal Year									
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
NPV Savings/(Costs) in Gross TCO from Phase 1 Plan	($3)	($4)	($8)	($10)	($14)	($17)	($20)	($23)	($25)	($27)
PV Savings/(Costs) in FMV from Phase 1 Plan	($3)	$2	$8	$14	$18	$22	$26	$29	$32	$34
NPV Savings/(Costs) in Net TCO from Phase 1 Plan	**($5)**	**($2)**	**($0)**	**$4**	**$3**	**$5**	**$5**	**$7**	**$6**	**$7**

Figure 18 shows the fiscal costs of the Phase 1 Replacement Plan, with the owned fleet capital costs being recorded as net replacement costs. As discussed earlier, using cash to finance fleet replacement is a pay-before-you-go approach, and typically presents a barrier to realizing long-term economic benefits. In the Phase 1 Replacement Plan, the primary method of financing fleet replacement in FY 2016 is through GSA conversion, and as Figure 18 shows, the net present value savings are three million. As fleet replacement shifts back towards cash purchasing in FY 2017 and beyond, the fiscal barriers to fleet replacement reappear. Note that the number of assets replaced (or converted) from row 2 from Figure 16 (1,128) compared to the number of assets converted in the Status Quo (559) and Modernization (1,119), all while spending three million less on net asset capital costs than under Status Quo.

Figure 18: Savings (Costs) of Change to Phase 1 Replacement Plan in Fiscal Terms (Millions)(2016$)

	Fiscal Year									
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
NPV Savings/(Costs) in Gross TCO from Phase 1 Plan	$3	($7)	($17)	($27)	($37)	($47)	($56)	($65)	($74)	($83)
PV Savings/(Costs) in FMV from Phase 1 Plan	($3)	$2	$8	$14	$18	$22	$26	$29	$32	$34
NPV Savings/(Costs) in Net TCO from Phase 1 Plan	**$1**	**($5)**	**($10)**	**($13)**	**($19)**	**($24)**	**($31)**	**($36)**	**($42)**	**($48)**

UPDATED LEASE VERSUS BUY ANALYSIS RESULTS

As previously discussed, we have refined our lease versus buy recommendations from the initial analysis, with the updated results taking more detailed information into consideration. The differences between the two methodologies are summarized below:

- For capital costs, we previously used straight line depreciation, which was calculated as the difference between the average purchase price for each class less the fleet-wide average of net used asset sales proceeds, which included both the asset sale price and the disposal charge that would be assessed by GSA for remarketing the vehicle. In the updated model, we used the residual value equations from the ORCA for the three key classes of vehicles and a blended equation for the remainder of the fleet. Instead of straight-line depreciation, we used market depreciation, and used the asset-specific residual value and GSA's remarketing rate table to calculate the disposal charges.
- For operating costs, we had previously used stock maintenance and repair cost equations that were developed over years of performing regression analyses on mixed light-duty fleets. The maintenance and repair costs were calculated using the average mileage for each class of vehicles, before the mileages went through various validation checks and normalizing procedures that we used to mitigate or eliminate the effects of erroneously entered mileages in the data set. In the updated model, the mileages were screened for outliers and normalized relative to average fuel economy (miles per gallon) and fuel cost transaction data. This was done in order to provide a better comparison between GSA maintenance, repair, and fuel costs, which are assessed by the mile, and the maintenance, repair, and fuel costs under an owned fleet scenario, which are charges that are broken in their component parts. Due to erratic and/or missing mileage data for some assets, we used this approach to substitute median mileages and fuel costs in cases where mileage data appeared to be inaccurate.

We developed an alternate replacement plan, the All Replacement Plan, which had every vehicle in the fleet converting to lease, and compared the owned fleet costs to the leased fleet costs. The lease fleet costs were subtracted from the owned fleet costs, with a positive total indicating vehicles that are more advantageous to lease. As can be seen from Figure 19, there did not appear to be any consistent rules of thumb for determining when a vehicle would be more advantageous to lease versus own.

Figure 19: Quantities of Replacement Recommendations by Class

Row Labels	Buy	Lease	Not Rated[5]
HD			4
LD MINIVAN 4X4 (PASSENGER)			1
LD PICKUP 4X2	1,039	989	6
LD PICKUP 4X2 LEASE CONVERSION	97	157	
LD PICKUP 4X4	2,675	1,109	91
LD PICKUP 4X4 LEASE CONVERSION	153	141	
LD SUV 4X2	187	55	5
LD SUV 4X2 LEASE CONVERSION	9	18	
LD SUV 4X4	697	157	59
LD SUV 4X4 LEASE CONVERSION	43	22	
LD VAN 4X2 (CARGO)			16
LD VAN 4X2 (PASSENGER)	103	43	1
LD VAN 4X2 (PASSENGER) LEASE CONVERSION	16	8	
MD PICKUP			57
MD SUV			17
SEDAN/ST WGN COMPACT	75	51	
SEDAN/ST WGN COMPACT LEASE CONVERSION	11	12	
SEDAN/ST WGN LARGE			11
SEDAN/ST WGN MIDSIZE	404	17	4
SEDAN/ST WGN MIDSIZE LEASE CONVERSION	44	1	
Grand Total	5,553	2,780	272

The apparent inconsistencies in determinations are the result of a variety of factors that have to be considered at the vehicle level when making replacement decisions. One general trend that was observed was the tendency for vehicles that are currently in the 10 to 12 year old range (as opposed to younger vehicles) to be slanted more heavily towards leasing. The capital outlay to replace these vehicles would occur more immediately, and would therefore be more prohibitive in consideration of the time-value-of-money (i.e., the money spent in the near future is worth more than money spent in, say, five years). Again, this is a pattern, but not a rule that can be used for making across-the-board determinations. The detailed results of this analysis have been provided under separate cover in spreadsheet format, and can be sorted and filtered by various parameters.

5 The scope of the project included the evaluation of three primary classes of vehicles for lease versus buy determination. Some secondary classes were evaluated, which was above and beyond the scope, but there were some tertiary classes that were excluded completely. Within the primary and secondary classes, some specific vehicles were excluded in cases where they lacked enough information to provide a recommendation.

CONCLUSION

Our analysis of replacement practices at NRCS has uncovered the following:

- Replacement cycles are currently too short on paper, but are too long in practice.
- The average replacement funding for the last five years, if continued into the future, will result in a fleet that is significantly older and less reliable.
- NRCS would need to increase replacement funding from $13.2 million to approximately $26 million if it were to eliminate the backlog of replacement in ten years using cash as the method of financing.
- There are economic benefits to increasing replacement funding and modernizing the fleet, but from a fiscal perspective, there are significant barriers to modernization. NRCS would be required to spend more money, and would realize some offsetting savings from reduced operating costs, the largest area where NRCS would derive an economic benefit would be a more valuable fleet. While this is a positive thing, in most fleets, the market value of the fleet is of little consequence to spending prioritization.
- Under Phase 1 of the Strategic Sourcing Initiative, there are 738 vehicles that have been slated for GSA conversion. The use of GSA leasing for the replacement of these vehicles will allow NRCS to pursue some degree of modernization for minimal up-front cost.
- There are at least 2,000 more vehicles in the fleet that are suitable candidates for conversion to GSA leasing.

OTHER ISSUES

During the course of our analysis, we identified some other areas where NRCS could improve the management and administration of the fleet, which include:

- Management of operational information: the primary data source for operational data came from the WEX fleet card system. While the fleet card system is useful for warehousing fuel card transactional data, it lacks some of the basic features of a fleet management information system that enable users to validate the reasonableness of fuel and maintenance transaction data.
- Management of asset information: basic asset information should also be maintained in a fleet management information system, whereby key information for the management if life cycle costs, (e.g., acquisition and disposal costs, dates, and mileages) can be recorded in one place.
- Fleet utilization management: there are a large number of vehicles with low utilization that should be evaluated for elimination. A thorough utilization review would include a rating of multiple measures of utilization (e.g., mileage, trips, hours of use) and criticality (e.g., the centrality of the vehicle to the job that it supports, the consequences of unavailability, etc.). Underutilized and unimportant vehicles expose NRCS to depreciation without contributing to the accomplishment of the overall mission.

NEXT STEPS

During the next phase of our study and policy and procedure development for the NRCS fleet, we will be evaluating alternative financing scenarios whereby the agency would establish some internal chargeback mechanisms for financing fleet costs. We will also provide draft policy and procedure documentation.

Final Report on

ALTERNATIVE CAPITAL FINANCING APPROACHES

for the

Natural Resources Conservation Service

September 2016

MERCURY ASSOCIATES, INC.

MERCURY

September 29, 2016

Michael Maloney
Director, Business Services Division
USDA/Natural Resources Conservation Service
1400 Independence Avenue, SW
Room 6218-S
Washington, DC 20550
202-720-9034

Dear Mr. Maloney:

Mercury Associates, Inc. is pleased to submit this final report on alternative capital financing approaches at the Natural Resources Conservation Service. We would like to express our appreciation for your cooperation and assistance to our project team.

We appreciate having been given the opportunity to assist NRCS in this endeavor and look forward to continuing to work with the agency to improve its fleet management practices and the performance and cost effectiveness of its fleet operations.

Very truly yours,

Scott Conlon
Manager

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INTRODUCTION

BACKGROUND AND OBJECTIVES

In the previous report, we compared the benefits and costs of financing fleet replacement through outright cash purchases and the use of General Services Administration (GSA) Fleet leasing. In this report, we will evaluate the use of a fleet customer charge-back system as an alternative methodology for financing fleet replacement, as well as customer charge-back systems for funding the operation and maintenance of fleet vehicles. In this report, the "fleet customers" that we are referring to are the end users of the NRCS fleet. These customers (or rather the offices or programs to which they are assigned) would be billed for their usage of the NRCS fleet by the Personal Property Services Branch (PPSB). Those funds collected from this billing process would be transferred into a working capital fund (WCF), which would be used to pay for vehicles and other operating expenses.

As part of the process of evaluating replacement through the use of a working capital fund, we developed an updated fleet replacement plan that identifies the timing and costs of fleet replacement for agency owned vehicles. The development of this replacement plan is timely, as it can be used by the Personal Property Services Branch as an organizing document for the fiscal year (FY) 2017 agency-owned vehicle replacement planning process and to assist with developing projections of future acquisitions and disposals as required by the Office of Management and Budget (OMB).

SCOPE

The NRCS-owned FAST-reportable[1] vehicles that were in the NRCS' FMVRS[2] inventory as of July 21, 2016 were included in this analysis.

KEY RESULTS

- The benefits of adopting a working capital fund as mechanism for financing fleet replacement are outweighed by the cash requirements to establish a working fund balance, the lack of an agency fleet management information system (FMIS) that can support replacement and operating charge-backs, the other competing demands being placed on the PPSB in fiscal year 2017, and the possibility that the benefits of establishing the fund will be undercut by improvements in GSA Fleet leasing rate setting policies.
- For the above stated reasons, our recommendations include:
    - NRCS should utilize the replacement plan developed for this report as an organizing document for the FY 2017 vehicle replacement process;
    - The PPSB and the national headquarters fleet manager should utilize the cost projections contained in this report and its supporting documentation to assist allowance holders in budgeting for fleet replacement;

1 FAST – the Federal Automotive Statistical Tool, which is a required report for on-highway vehicles.
2 FMVRS – the Federal Motor Vehicle Registration System – which shows all of the vehicles that are officially registered to the agency.

- NRCS should not adopt a charge-back system to finance the cost of replacing or operating fleet assets; and
- The NRCS should adopt the indirect cost figure in Figure 5 for FAST indirect cost reporting purposes.

PROJECT APPROACH AND METHODOLOGY

The preliminary step in analyzing the merits of a vehicle replacement chargeback system was the development of a fleet replacement plan. We had previously developed a plan for the purposes of evaluating the total cost of ownership under various funding and leasing scenarios, but we felt it best to update the plan to reflect the 2,000+ GSA Fleet-leasing conversions in the new analysis.

Once the replacement plan was developed, there were several additional detailed steps carried out during each phase of the analysis that are covered in further detail within each section below.

DEVELOPMENT OF FY 2017 REPLACEMENT PLAN

We obtained the FMVRS inventory from July 21, 2016 and tracking spreadsheets containing vehicles that were acquired, disposed, or identified for conversion to GSA Fleet-leased vehicles as part of either Phase I or Phase II of the Agriculture Strategic Sourcing Initiative. Using this information, we developed a replacement plan for the agency-owned fleet, then adjusted the funding level until the backlog of fleet replacement would be eliminated by the tenth year of the fleet replacement plan (under the assumption that no other vehicles are changed from agency-owned to GSA Fleet-leased).

FY 2017 BASELINE REPLACEMENT PLAN

We developed an FY 2017 baseline plan for the fleet of 8,928[3] vehicles which projects future fleet replacement costs, beginning in October of 2017, based on the application of the replacement cycles shown below in Figure 1.

Figure 1: Recommended Replacement Cycles

Asset Class Code	Years	Miles (000s
LD PICKUP 4X2	10	65
LD PICKUP 4X4	10	65
ALL OTHER CLASSES	10	75

3 This is the number of assets that remained after starting with an FMVRS inventory of 10,475, then removing GSA Fleet-leased, non-FAST-reportable assets, and disposed assets.

Our analysis indicates that the estimated replacement backlog of NRCS' fleet, in today's dollars, is $49.9 million[4]. This is a $35 million reduction in backlog in comparison with the nearly $85 million backlog that existed prior to designating vehicles for Phase I and Phase II conversion to GSA Fleet lease. The future costs of replacing the assets in the NRCS' fleet in strict adherence to NRCS' current replacement cycles are shown as blue columns below in Figure 2.

FY 2017 SMOOTHED REPLACEMENT PLAN

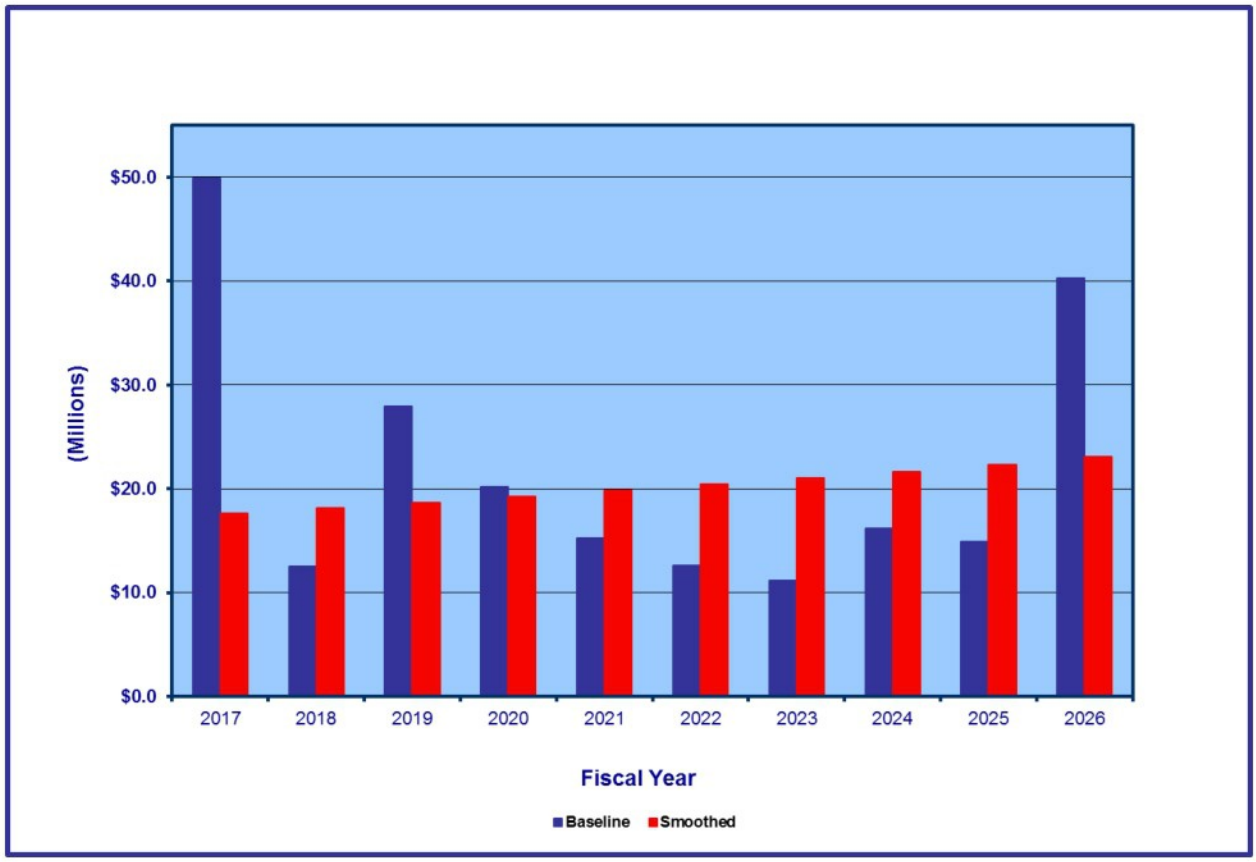
As was the case with the previous replacement plans created for NRCS, we would not recommend trying to buy out the remainder of the backlog in a single year, even if the funds were available. As such, we have developed a smoothed replacement plan (shown in red in Figure 2) that is based upon the funding level that would be needed to buy out the majority of the backlog by FY 2026 (assuming no other vehicles are converted to lease). This smoothed plan calls for $17.6 million to be spent on fleet replacement in FY 2017 (as opposed to $25.8 million if the fleet were to remain agency-owned), with that budget number increasing by three percent per year to keep up with the rate of increase in new vehicle purchase prices.

EXCHANGE SALE AS A MEANS TO FUND FLEET REPLACEMENT

The replacement plan that we developed for FY 2017 includes the use of exchange sale proceeds for vehicles that are slated to be replaced during FY 2017 and later, either by GSA Fleet-leased vehicles or by agency-owned vehicles. The figures that we used for exchange-sale proceeds were developed using the regression equations developed during the optimal replacement cycle analysis portion of the Fleet Replacement Study. The sale of used vehicles represents a significant source of income for the fleet replacement program, with an average of $4.5 million in proceeds per year between FY 2017 and FY 2026. Detailed exchange sale proceeds have been provided under separate cover in spreadsheet format.

4 This figure is for the 8,928 vehicles covered in this section of the report.

Figure 2: Baseline vs. Smoothed Replacement Costs



The details of the replacement plan shown above will be provided under separate cover in spreadsheet format, as there is more information than can be adequately covered here; however, we have provided a listing of recommended replacement quantities and costs by office code in Figure 6 of the Appendix. This spreadsheet version of the replacement plan is also designed to serve as the owned vehicle replacement spreadsheet that is referenced in the draft NRCS National Fleet Replacement Planning Handbook, which was submitted under Task 2 of this project.

REPLACEMENT CHARGE-BACK SYSTEMS

The largest example of a replacement charge-back system for fleet management in the Federal Government is GSA Fleet vehicle leasing. GSA charges monthly fees to account for fixed costs, such as vehicle depreciation, anticipated inflation, and the cost of GSA facilities, equipment, and personnel (to include fleet management information system support). These rates are re-calculated annually for each class of domestic vehicles with separate rates calculated for foreign vehicles. Because GSA uses a working capital fund (WCF) to accomplish this, the funding for vehicle replacement is safeguarded from competing interests. Fleets that are composed of vehicles leased from GSA Fleet are, on average, newer and more fuel efficient than those that are composed of agency-owned vehicles.

Not all vehicles in the fleet were found to be suitable candidates for conversion though. Here are the two primary reasons why: first, GSA Fleet uses one monthly rate for each class of vehicles; and second, GSA may charge agency-incurred expenses for vehicles that were modified or upfit to accommodate vocation-specific equipment. We will cover the significance of these two factors in further detail below.

CALCULATION OF MONTHLY RATES

GSA Fleet has established a replacement cycle for each class of vehicles based on the economics of fleet replacement for that particular class. This process is similar to the optimal replacement cycle analysis for three key class of vehicles in the NRCS fleet that was conducted under task 1 of our fleet replacement study. The underlying economic of fleet replacement, which are based heavily on the type of vehicle and the amount of annual usage it receives, are relatively consistent from year-to-year. However, if utilization levels increase or decrease, or capital or operating costs change significantly, it may be necessary to periodically recalculate optimal replacement cycles.

Using those replacement cycles, the current inventory of vehicles, and updated forecasts of acquisition costs and disposal proceeds, an updated fleet replacement plan would need to be created annually to determine the timing and costs of fleet replacement for each vehicle. Once these are determined, it is then possible to calculate the depreciation-based charge for each vehicle, and by extension, each vehicle class. This forms part of the monthly rate.

The second component of the monthly rate is the asset management fee, which comes from the allocation of the indirect costs (of managing the fleet replacement process) across the fleet. This is calculated by multiplying the percentage of time spent on fleet replacement activities by the salary and fringe benefit cost of those employees[5] who are providing those fleet replacement services. This total cost is then divided by the number of active agency-owned vehicles in the fleet, then divided by 12 months in to arrive at a monthly, per-vehicle asset management fee that should be added to the depreciation-based charge. When we conducted this analysis for NRCS, the personnel overhead costs that were allocable to asset management was $1.2 million, which, given the 6,880 non-leased vehicles in the fleet, would yield a $14.60 asset management fee per vehicle, per month.

The third component of the monthly rate is the replacement surcharge, which would be calculated to cover the *actual* costs of replacement with a new vehicle, which includes inflation and maintenance of the target fund balance. The replacement surcharge is added to the replacement rate and the asset management fee to form the monthly rate. As can be seen in the "Monthly Rate" column in Figure 3, the internal rates would be consistently lower than those currently offered by GSA Fleet.

5 We used a generic organization chart to estimate the salary midpoint for the pay grades assigned to the PPSB instead of actual employee data. If this were an internal analysis, actual employee data should be used.

Figure 3: Monthly Rate Comparison

Class	Owned Rates		GSA Fleet Rates	
	Repl. Rate and Surcharge	Monthly Rate[1]	Low	High
Owned - SEDAN/ST WGN MIDSIZE	$99.54	$110.79	$229.00	
Owned - LD PICKUP 4X2	$105.19	$116.44	$162.00	$240.00
Owned - LD VAN 4X2 (CARGO)	$114.47	$125.72	$168.00	$276.00
Owned - SEDAN/ST WGN COMPACT	$140.89	$152.14	$177.00	
Owned - LD PICKUP 4X4	$151.84	$163.09	$200.00	$365.00
Owned - SEDAN/ST WGN LARGE	$155.82	$167.07	$341.00	
Owned - LD VAN 4X2 (PASSENGER)	$155.94	$167.19	$198.00	$236.00
Owned - LD SUV 4X2	$179.19	$190.44	$197.00	$264.00
Owned - LD SUV 4X4	$193.44	$204.69	$253.00	$327.00
Owned - MD SUV	$234.09	$245.34	$344.00	
Owned - LD MINIVAN 4X4 (PASSENGER)	$267.80	$279.05	$231.00	
Owned - MD PICKUP	$317.96	$329.21	$247.00	
Owned - HD	$715.69	$726.94		

1. Monthly rate includes the replacement rate and surcharge, and the asset management fee.

Keeping in mind that the "optimum" replacement cycle is calculated for the "average" average vehicle in each class, there can be some variation in what is considered optimum for vehicles that are used either well above or below the class average annual mileage. For many vehicles that travel near the class average annual mileage, this is not significant enough to make a difference in whether it is better to lease or continue owning; but for many vehicles, it can be. This variation in annual mileage between vehicles in the same class explains the rationale for conducting a Lease vs. Buy Analysis for each vehicle during the replacement process, and is the reason why there are vehicles in the fleet that were found to be more advantageous to lease, while others are more advantageous to own.

AGENCY-INCURRED EXPENSES

Since the revenue that GSA generates from the proceeds of used vehicles sales is a significant factor in the establishment of the depreciation-based rates, GSA must ensure that the vehicles sent out for auction are sold for close to their predicted value. Vehicles that have damage beyond normal wear and tear typically sell for less at auction, especially if those vehicles have holes in them that have been drilled for the installation of light bars or other equipment. In order to safeguard against this unanticipated drop in revenue from vehicle damage, GSA has instituted the agency-incurred expense program, also known as "bill back."

For vehicles that will likely be subject to agency-incurred expenses due to installed equipment damage, it can shift the outcome of the Lease vs. Buy Analysis to ownership for vehicles that NRCS would anticipate having end-of-life agency–incurred expenses.

One of the detractors of using the agency-incurred expense strategy is in its unpredictability and inconsistency. According to GAO 14-443: *GSA Has Opportunities to Further Encourage Cost Savings for Lease Vehicles,* ". . . lack of clear GSA guidance on what constitutes excessive wear and tear of leased vehicles can limit the ability of agencies to determine whether it is less expensive to lease or own vehicles. GSA just developed this guidance and is taking steps to implement it." Basically, agencies need to scrutinize the agency-incurred expenses to ensure that they are being applied reasonably and consistently.

RECAP OF INTERNAL REPLACEMENT CHARGEBACK SYSTEMS

Because of the two factors mentioned above (monthly rates and agency-incurred expenses), NRCS may find it advantageous to pursue the middle path between the current method of funding fleet replacement (at the allowance holder level) and the method of funding vehicle replacement through GSA Fleet leasing. The primary advantage of developing its own internal charge-back rate structure would be in using the most economically advantageous replacement cycles, i.e. those found during the optimal replacement cycle analysis in task 1 of the replacement study. By using a depreciation schedule of ten years, the monthly depreciation-based charges would be significantly lower, thus bringing down the internal lease rates. In Figure 3 above, we have provided a comparison of the average monthly rate for each class of vehicles with the GSA Fleet lease rates for the Standard Item Number (SINs) types within that class. In each instance, it is evident that the longer depreciation schedules for NRCS vehicles cause the replacement rates to be lower than those of the GSA Fleet-leased vehicles.

However, Figure 3 above does indicate that the lower costs in the "Monthly Rates" column are only achievable through the establishment of a working capital fund. If allowance holders commit the same level of funding over the long term to fleet replacement as they would pay in monthly rate, then they would achieve similar costs (albeit in lump sum figures).

OPERATING CHARGE-BACK SYSTEMS

Much in the same way that charge-back systems can be used to manage replacement costs, a WCF can be used to implement a charge-back system for operations and maintenance. While the fund balance for the operating component of the WCF is also carried over from year to year, this is not one of the principal reasons for establishing a charge-back system.

Charge-back systems for operating and maintenance costs are developed for two principal reasons. First, they are used to facilitate the distribution of indirect (e.g. enterprise-wide overhead) costs of providing goods or services to the organizations that utilize them, but who otherwise might not bear a portion of those costs. An example of this would be the cost of management, administration, and reporting that is carried out at the headquarters and Personal Property Services Branch levels. These costs are part of the ownership costs of the fleet, but without a charge-back system in place, they are often ignored.

Second, operating cost charge-back systems are developed to promote the efficient management of resources. Charge-back systems, when properly designed and implemented, provide motivation to fleet managers to provide, and fleet users to utilize, vehicles and related services efficiently and effectively. This is accomplished my making both fleet users and fleet

management personnel *aware* of the costs of such resources. More precisely, a good chargeback system illustrates the *linkage* between an organization's behavior and its costs. In NRCS' case, the user agencies would be the state and regional offices that use the vehicles.

The principal steps comprising the charge-back rate development process are the following:

1. Assemble Data
2. Define Rate Structure
3. Develop Allocation Statistics
4. Develop Rate Base
5. Allocate Costs
6. Calculate Rates
7. Calculate Budget Requirements for User Agencies

DATA REQUIREMENTS

Recently, NRCS has initiated a reorganization to streamline the provision of administrative services. This review of operating rate structures is timely, as the personnel associated with this consolidation had previously been funded by their regional or state offices, but are now funded at the headquarters level. The types of information that are required to develop a cost charge-back system include the projected personnel roster of the fleet management office (with salary and fringe benefits), the dollar value of vehicle maintenance and repair services projected to be purchased from outside vendors, and an inventory of vehicles in the active fleet with class information.

OPERATING RATE STRUCTURE DEVELOPMENT

There are two basic types of operating charge-back rates; mileage-based and service-based. Each type has its own benefits and detractors. In fact, an agency can utilize more than one of the types simultaneously. Since NRCS does not perform any maintenance and repair in-house, we have omitted an explanation of the development of these types of charge back rates.

Mileage-Based Operating Charge-Back Rates

Mileage-based charge-back rates are calculated by taking the estimated total annual costs of providing a good or service and dividing it by the estimated number of total miles driven by the fleet during that time period. The prime example of this in the Federal government is the mileage charge that is assessed on GSA lease vehicles. The fuel, maintenance, and the associated management and administration costs for each class of vehicles are recouped by GSA each month.

In order to calculate these rates for NRCS, we first calculated the rate to cover fuel and maintenance expenditures, then added a mileage-based indirect cost surcharge for the salaries and fringe benefits of the personnel at the national headquarters and PPSB levels.

Using the projected maintenance and fuel costs of $3.0 million per year and $6.9 million per year, respectively[6], we calculated the class-based mileage rates in Figure 4 below. The figures in

the "Cost per Mile" column indicate the rates necessary to cover the direct expenditures of maintaining and fueling the fleet. The "Mileage" rate includes the mileage-based indirect cost surcharge of $0.027 per mile. The two right-most columns in the table indicate the low and high end of the rates that GSA Fleet charges for SINs within each vehicle class. The rates shown below indicate that in some cases, the mileage rate for GSA Fleet vehicle is higher, in other cases is lower, and for a few, the SIN of the vehicle would have to be determined in order to know which specific GSA rate to use for the comparison.

Figure 4: Mileage-Based Rate Comparison

Class	Annual Class Operating Cost	Annual Class Mileage	Cost per Mile	Mileage Rate*	GSA Rates	GSA Rates
HD	$6,864	30,976	$0.222	$0.257	$0.595	$0.760
LD MINIVAN 4X4 (PASSENGER)	$828	5,815	$0.142	$0.178	$0.190	$0.250
LD PICKUP 4X2	$2,283,138	10,299,908	$0.222	$0.257	$0.195	$0.276
LD PICKUP 4X4	$5,072,778	23,019,906	$0.220	$0.256	$0.264	$0.400
LD SUV 4X2	$309,695	1,779,353	$0.174	$0.209	$0.175	$0.277
LD SUV 4X4	$1,351,966	6,482,368	$0.209	$0.244	$0.200	$0.316
LD VAN 4X2 (CARGO)	$17,774	95,902	$0.185	$0.221	$0.214	$0.314
LD VAN 4X2 (PASSENGER)	$178,190	949,281	$0.188	$0.223	$0.190	$0.250
MD PICKUP	$90,657	421,130	$0.215	$0.251	$0.422	
MD SUV	$30,529	164,169	$0.186	$0.221	$0.316	
SEDAN/ST WGN COMPACT	$135,483	750,795	$0.180	$0.216	$0.140	
SEDAN/ST WGN LARGE	$10,718	61,391	$0.175	$0.210	$0.250	
SEDAN/ST WGN MIDSIZE	$489,034	2,609,657	$0.187	$0.223	$0.178	

*Includes $0.027 per mile fee for PPSB and NHQ fleet card management overhead costs.

One of the detractors of using mileage-based rates, however, is that it can mask inefficiencies at the individual level. According to GAO 14-443: *GSA Has Opportunities to Further Encourage Cost Savings for Lease Vehicles,* ". . . under GSA's leasing-rate structure, fuel costs are covered by a monthly fee based on miles traveled, among other things, but not on actual fuel used. This rate structure does not provide incentives for agencies to reduce some fuel costs that may not be fully reflected by miles travelled, such as costs associated with idling or speeding. Principles for designing government fees suggest that having each agency pay for the fuel it actually uses could increase incentives to reduce fuel costs."

Service-Based Operating Charge-Back Rates

Service-based charge-back rates represent a method of allocating the indirect costs of managing fleet card expenditures while still avoiding the unintended consequences that were discussed in the previous paragraph. Service-based charge-back rates are calculated first by summing the fleet card transaction to be "passed through", and the costs of managing those transactions. By

6 These figures were taken from the total cost of ownership analysis from the Fleet Replacement Study.

dividing the costs of the pass-through from the costs of management and overhead, a mark-up can be developed. In the activity-based costs analysis that we conducted, the national headquarters and PPSB level employees have $1.3 million in indirect costs that they can allocate to the management of operating expenditures. Given our estimate of $7.7 million in fleet card transaction costs (for only non-leased vehicles), there would need to be a 17.2 percent markup on all fleet card transaction to cover the costs of managing those transactions. The detailed calculations have been provided under separate cover in spreadsheet format.

OTHER CONSIDERATIONS FOR CHARGE-BACK SYSTEMS

REPORTING OF INDIRECT COSTS IN FAST

Regardless of whether NRCS chooses to adopt a charge-back system or not, NRCS must develop a methodology for identifying, categorizing, estimating, and reporting fleet indirect costs. While this is inherently a part of the charge-back system rate calculation process, it is an often-overlooked area in Federal fleet cost reporting. According to GAO 13-659: *Federal Vehicle Fleet: Adopting Leading Practices Could Improve Management,* "None of the agencies GAO reviewed capture in their FMISs all of the data elements recommended by GSA. The types of data missing most frequently are data on fleet costs, including indirect costs, such as salaries of personnel with fleet-related duties." As a result of this GAO finding, GSA published guidance on indirect cost reporting in the form of GSA FMR Bulletin B-38: *Indirect Costs of Motor Vehicle Fleet Operations*. This guidance contained within this document is very general, but the key takeaway is that agencies should use the Federal standard estimate indirect cost rate of either $468 per vehicle per year, or 7.5 percent of direct fleet costs, or use their own calculated value for indirect costs. In Figure 5 below, we have a recap of the different values used in our analysis and in row M specifically, have included NRCS annual indirect costs per vehicle of $274.43.

Figure 5: Calculation of Mileage- and Service-Based Fees

Row	Description	Value
A	Personnel Costs Allocable to Asset Management	$1,205,494
B	Personnel Costs Allocable to Fleet Card Management	$1,321,418
C	Personnel Costs Allocable to Other PPSB Activities	$974,201
D	Total Personnel Costs to Allocate (A+B+C)	$3,501,113
E	Number of Owned Assets	6,880
F	Number of Leased Assets	2,328
G	Asset Mgmt. Cost per Owned Asset per Month (A/E/12)	$14.60
H	Average Annual Mileage per Vehicle	5,424
I	Forecasted Non-Leased Fleet Mileage (E*H)	37,314,827
J	Fleet Card Mgmt. Cost per Mile (B/I)	$0.035
K	Total Annual Charges to Fleet Cards	$7,688,873
L	Fleet Card Transaction Markup Percentage (B/J)	17.2%
M	Annual Indirect Cost per Vehicle ((A+B)/(E+F))	$274.43

NRCS' indirect costs are relatively low, most likely as the result of having a mostly homogenous fleet with outsourced repairs and fueling. If this were compared to an agency that had a lot of

specialized equipment, its own repair facilities, fueling facilities, parts store rooms, and its own FMIS, these costs would be significantly higher.

AUTHORITY TO ESTABLISH A WORKING CAPITAL FUND

The establishment of a working capital fund would require legislation, as it inherently delegates spending authority to the agency that it currently does not have, i.e., the ability to carry "no-year" funds that can be spent outside of the normal appropriations process. For example, the US Forest Service (USFS) and the Department of State (DOS) operate working capital fund charge-back systems. The authority for establishing the Forest Service Working Capital Fund (WCF) is in the Working Capital Fund enabling legislation, the Act of August 3, 1956, as amended (16 U.S.C. §579b). At DOS, the International Cooperative Administrative Support **S**ervices (ICASS) system is the principal means by which DOS provides and shares the cost of common administrative support at its more than 250 diplomatic and consular posts overseas. DOS is the primary service provider and it offers these administrative support services to other agencies using a working capital fund under authorities contained in 22 U.S.C. §2695 and §2684.

While it is clear that congressional authorization is required for the use of a working capital fund, it is not clear whether the NRCS can use the authority granted under 7 U.S.C. §2235, or whether that authority only applies to the USDA. That section of the code states:

> A working capital fund of $400,000 is established without fiscal year limitation, for the payment of salaries and other expenses necessary to the maintenance and operation of . . . (2) a central motor-transport service for the maintenance, repair, and operation of motor-transport vehicles and other equipment, . . . and (4) such other services as the Secretary, with the approval of the Director of the Office of Management and Budget, determines may be performed more advantageously as central services; said fund to be credited with advances or reimbursements from applicable funds of bureaus, offices, and agencies for which services are performed on the basis of rates which shall include estimated or actual charges for personal services, materials, equipment (including maintenance, repairs, and depreciation) and other expenses: Provided, That such advances shall not be available for any period beyond that provided by the Act appropriating the funds: Provided further, That such central services shall, to the fullest extent practicable, be used to make unnecessary the maintenance of separate like services in the bureaus, offices, and agencies of the department.

Given that the above statement references only "maintenance, repair, and operation of motor-transport vehicles" it is unclear whether the intent of the statement is for the establishment of a motor pool or whether could be construed as allowing something much broader, i.e. a fleet replacement and operating charge-back system. Also given the USFS received authorization to establish a working capital fund for fleet replacement under a completely different section of the U.S. code, we would be extremely hesitant to draw a conclusion on this issue and would encourage the agency to consult its legal counsel for an interpretation of referenced sections of the U.S. code if it were to consider establishing a working capital fund.

Additionally, the amount of working capital that would be required to operate the working capital fund should be significantly higher than what is stated in the passage above. According to Chapter 6580 of the Forest Service Manual 6500: *Finance and Accounting*, the "Planned operating cash levels for this WCF program area should fall between 25 percent to 45 percent of the average total outlay for each fiscal year. Operating cash levels are based on annual analysis of cash needs and are reviewed annually and updated accordingly to minimize any excess cash balances."

While it is important to minimize excess cash balances, there may be some years where a higher balance is preferable. Spikes in fleet replacement spending could cause a sharp increase in reserve fund rates from one year to the next, therefore it may be better to take a longer view and accumulate capital earlier to offset these single year runs on the fund balance. As such, we have projected that the fund would drop into the negative in 2027 as a large number of vehicles are due for replacement. For this reason, a fund balance of above 45% of outlays would be warranted in the one or two years prior to this spike in replacement. Another approach would be to develop an updated smoothed replacement plan every two to three years to hone the plan to fit evolving conditions.

Additionally, if NRCS adopted the working capital fund approach, there would have to be an accumulation of capital in the fund starting around $3.7 million in FY 2017 and reaching $11.7 million by FY 2026. Developing this fund balance in the initial years is accomplished in part through the replacement surcharge that was discussed above. For several years, the contributions into the fund have to be significantly higher than expenditures from the fund in order to ramp up the fund balance to sustainable levels. This presents a barrier to implementation when taking these cash requirements into consideration.

WORKING CAPITAL FUND DATA REQUIREMENTS

The second factor is whether the agency has the technical capacity; more specifically, whether the agency has the software and system support to run a working capital fund. As the use of a working capital fund would increase the amount of transactional data that NRCS has to manage, it would be essential to have an FMIS that has the inherent functionality to support rate collection and billing processes. NRCS is currently transitioning towards FedFMS as its fleet FMIS, which does not have the functionality to support a replacement charge-back system[7]. Given the impending deadline to input asset-level transactional data into FedFMS so that it can be reported at the end of FY 2017, we would not recommend changing course towards a different FMIS during this period of transition. Any benefits of changing to a replacement charge-back system would have to be considered against the risks that the agency would fail to meet the mandates of Executive Order 13693 because it tried to evolve its fleet information management strategy too quickly to a point beyond what is necessary.

7 In other agencies like the U.S. Forest Service and the Department of State, their working capital funds are managed in an agency-developed FMIS and a commercial off-the-shelf (COTS) FMIS, respectively.

TIERED GSA FLEET RATE STRUCTURE

One further argument that we will offer against the establishment of a working capital fund is in the possibility that GSA may institute a tiered rate structure for each class in the future. Earlier in FY 2016, GSA issued a solicitation that sought information about firms that could provide optimal replacement cycle analysis for the GSA leased fleet to "Establish varying levels of replacement criteria, including its minimum, optimal, and maximum replacement criteria." By indicating that there is a need for three sets of replacement criteria for each class, it is possible that a tiered replacement rate approach is under consideration. If that is the case, then GSA would begin offering rates for lower-utilization vehicles that would undercut the benefits of a working capital fund. NRCS could obtain low rates, would no longer need working capital fund authority, and would gain all of the systems support and other benefits that go along with GSA fleet leasing. The dynamics of the Lease vs. Buy Analysis would slant more heavily towards leased vehicles.

CONCLUSIONS

Our analysis of alternative financing approaches at NRCS have uncovered the following:

- The development of an annual fleet replacement plan for agency-owned vehicles, such as the one used to calculate replacement rates, can help the agency develop a budget for fleet replacement that eliminates the backlog and keeps fleet ages within the optimum replacement cycle guidelines.
- The establishment of a charge-back system that utilizes a working capital fund could be a useful tool for safeguarding a dedicated stream of fleet replacement funding, but is not a necessary condition for reducing fleet age to the appropriate level.
- The allocation of indirect costs through a charge-back system would improve cost transparency.
- The legality of using 7 U.S.C. §2235 to establish a charge-back system for fleet expenditures is questionable, and should be referred to counsel if the agency decides to pursue that strategy.
- The development of the working fund balance would require an extra $3.7 million in the first year of the plan, rendering those funds unusable for purchasing vehicles in the short term.
- The fleet management information system that NRCS uses (FedFMS) does not provide the functionality needed to support the use of a working capital fund.
- The fleet information reporting requirements placed on NRCS by Executive Order 13693 will likely preclude the PPSB and the agency fleet manager from considering a change from FedFMS to a system that does have the functionality to run a charge-back system.
- The benefits of transitioning to a working capital fund could possibly be undercut by efforts at GSA to develop tiered replacement cycles, which would allow NRCS to use GSA Fleet instead of developing its own agency WCF.

APPENDIX

Figure 6: FY 2017 Replacement Recommendations by Office Code

Office Code	Qty.	Cost
TX	73	$1,582,427
IL	56	$1,201,859
CA	44	$1,091,108
KY	40	$890,682
MN	33	$820,897
MT	29	$742,635
CO	29	$704,856
ID	22	$672,585
LA	23	$556,310
MO	22	$552,618
HI	17	$483,356
GA	17	$445,500
OK	20	$438,160
MI	20	$410,135
AK	14	$392,046
AR	12	$384,704
WA	15	$358,420
SC	13	$331,292
UT	12	$319,550
OR	8	$317,635
AZ	11	$302,094
NJ	10	$296,068
MD	7	$270,379
S04	10	$254,840
S08	9	$251,126
S01	9	$245,166
PA	12	$237,838
S05	9	$229,356
IA	9	$219,148
TN	9	$211,476
S10	7	$200,158
WY	8	$184,824
S11	6	$172,604

Office Code	Qty.	Cost
NCS	6	$157,395
NV	5	$149,190
NC	5	$131,312
NM	5	$123,826
NY	5	$121,460
AL	5	$110,291
WI	4	$101,936
S06	4	$101,936
KS	4	$95,976
FL	3	$85,129
MS	4	$84,056
S09	3	$76,452
S07	3	$70,492
ND	2	$66,778
OH	2	$54,860
S02	2	$50,968
S12	2	$50,968
NE	1	$29,376
VT	1	$25,484
VA	1	$25,484
ME	1	$25,484
S03	1	$25,484
WV	1	$25,484
IN	1	$19,524
0	1	$19,524
CT	0	$0
SD	0	$0
DC	0	$0
MA	0	$0
DE	0	$0
PR	0	$0
RI	0	$0
NH	0	$0