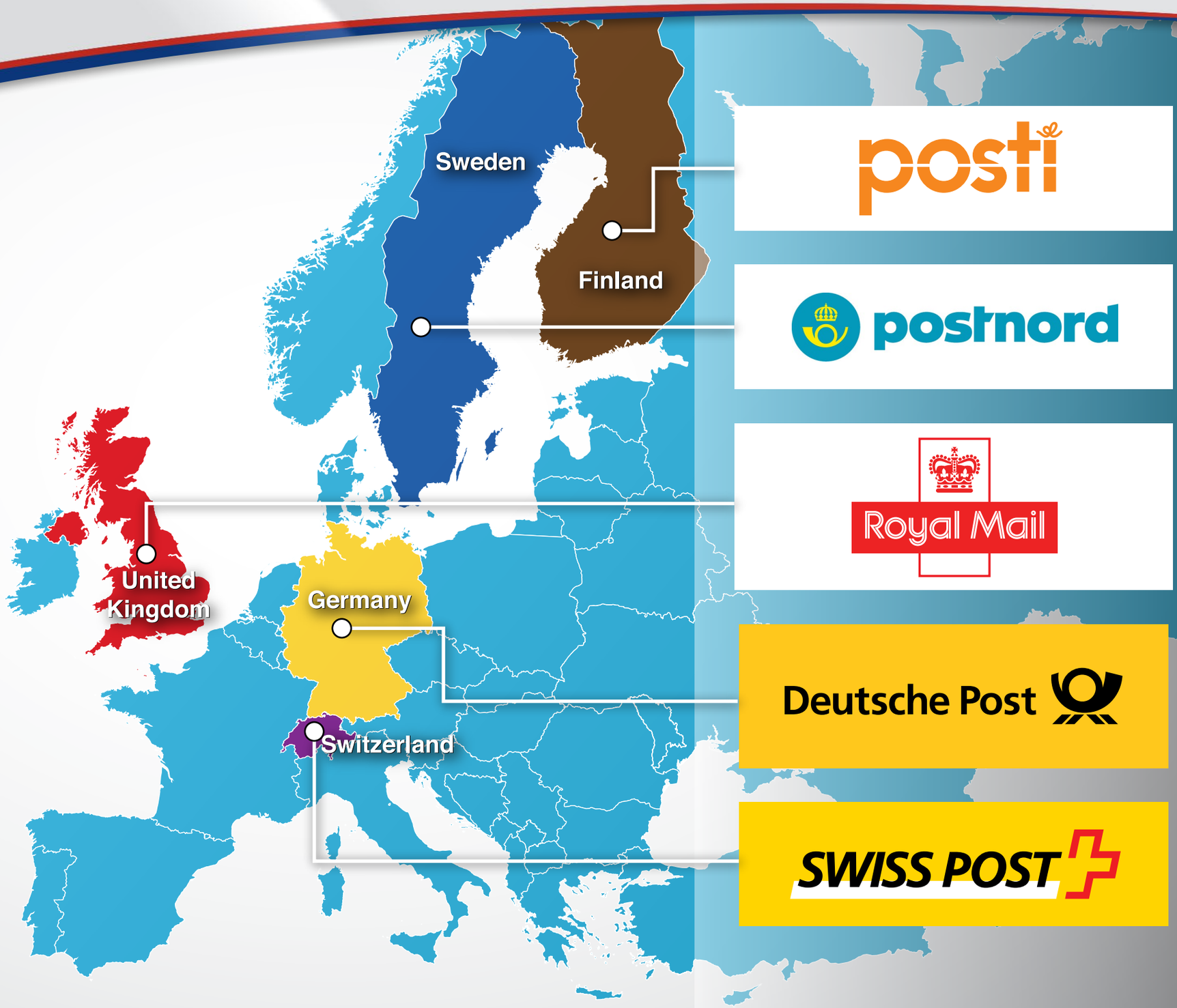
OFFICE OF INSPECTOR GENERAL
UNITED STATES POSTAL SERVICE

Benchmarking of Delivery Fleet Replacement Strategies

Management Advisory Report

Report Number
DR-MA-15-002

August 18, 2015



OFFICE OF INSPECTOR GENERAL
UNITED STATES POSTAL SERVICE

Highlights

Generally, we found Postal Service fleet replacement strategies were either consistent with or as compelling as the best practices and strategies used by foreign posts.

Background

The U.S. Postal Service operates one of the largest vehicle fleets in the U.S., with almost 190,000 vehicles used for collecting and delivering mail. The Postal Service recently developed a plan to replace the vast majority of this fleet over 12 years, beginning in fiscal year 2015. Fleet replacement is not a challenge unique to the Postal Service, as many foreign postal operators (foreign posts) are acquiring vehicles to modernize their delivery fleets.

Our objective was to identify foreign posts' best practices for delivery fleet replacement strategies that could help the Postal Service develop and acquire the next generation of collection and delivery vehicles.

What The OIG Found

Generally, we found Postal Service delivery fleet replacement strategies were either consistent with or as compelling as the best practices and strategies used by foreign posts. However, the survey responses from the foreign posts disclosed four best practices and strategies used by the foreign posts that might be useful for the Postal Service to consider as it plans to acquire new vehicles. Specifically, the foreign posts primarily:

- Purchased/leased vehicles annually within a 3- to 9-year replacement cycle.
- Operated their vehicles primarily on diesel/bio-diesel fuels, with limited investments in other green technologies.
- Outsourced vehicle maintenance and repair as part of a vehicle lease agreement.
- Acquired alternative delivery vehicles for letter and small parcel distribution in urban areas.

On the other hand, the Postal Service plans to purchase custom-built and some commercially available vehicles over a 12-year period. These vehicles will have an estimated useful life of 18 to 20 years, with an as-yet determined alternative fueled powertrain. Also, the Postal Service uses primarily in-house vehicle maintenance facilities. Finally, the Postal Service has no specific plans to invest in alternative delivery vehicles such as ebikes and etrikes because its pilot programs showed these vehicles do not fully meet Postal Service delivery needs and cannot be used effectively on most routes.

These four best practices of foreign posts offer the Postal Service supplementary information as it finalizes its strategy for future vehicle acquisitions to ensure an efficient, cost effective, and sustainable delivery fleet. Therefore, we are not making any recommendations on these issues.

Transmittal Letter

OFFICE OF INSPECTOR GENERAL
UNITED STATES POSTAL SERVICE

August 18, 2015

MEMORANDUM FOR: EDWARD F. PHELAN, JR.
VICE PRESIDENT, DELIVERY OPERATIONS

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FROM: for Robert J. Batta
Deputy Assistant Inspector General
for Mission Operations

SUBJECT: Management Advisory Report – Benchmarking of Delivery Fleet Replacement Strategies (Report Number DR-MA-15-002)

This report presents the results of our review of Benchmarking of Delivery Fleet Replacement Strategies (Project Number 14XG027DR000).

We appreciate the cooperation and courtesies provided by your staff. If you have any questions or need additional information, please contact Rita F. Oliver, director, Delivery, or me at 703-248-2100.

Attachment

cc: Corporate Audit and Response Management

Highlights

Table of Contents

Findings

Recommendations

Appendices

Table of Contents

Cover
Highlights 1
Background 1
What The OIG Found 1
Transmittal Letter 2
Findings 4
Introduction 4
Conclusion 4
Fleet Replacement and New Vehicle Acquisition Strategies 5
Vehicle Acquisition Strategy 5
Vehicle Replacement Strategy 6
Fleet Management Structure 7
Vehicle Requirements and Specifications 8
Requirements and Specification Development Process 8
Vehicle Design Options 8
Safety and Ergonomic Features 10
Innovative Tracking Tools 12
Green Technologies 14
Powertrains and Green Technologies 14
Alternative Delivery Vehicles 17
Recommendations 19
Management's Comments 19
Evaluation of Management's Comments 19
Appendices 20
Appendix A: Additional Information 21
Background 21
Objective, Scope, and Methodology 21
Prior Audit Coverage 23
Appendix B: Comparison of Foreign Posts and Postal Service Delivery Area and Fleets 24
Appendix C: Comparison of Foreign Post and Postal Service Delivery Fleet Strategies and Best Practices 25
Appendix D: Management's Comments 26
Contact Information 27

Findings

The survey responses from the foreign posts disclosed four best practices and strategies used that might be helpful for the Postal Service to consider as it plans to acquire new vehicles.

Introduction

This report presents the results of our self-initiated review[1] of Benchmarking of Delivery Fleet Replacement Strategies (Project Number 14XG027DR000). Our objective was to identify foreign postal operators' (foreign posts')[2] strategies and best practices for delivery fleet replacement that could help the U.S. Postal Service as it develops and acquires the next generation of collection and delivery vehicles. See Appendix A for additional information about this review.

The Postal Service operates one of the largest vehicle fleets in the U.S. At the end of fiscal year (FY) 2014, the Postal Service owned over 211,000 vehicles, and used nearly 190,000 of them to collect and deliver mail. Most of these delivery vehicles are nearing or exceeding their expected service life and the Postal Service has developed plans to replace the majority of this fleet over the next 12 years. The strategy is to purchase over 20,000 commercially available delivery vehicles over the next 5 years and an additional 163,000 custom built long life delivery vehicles beginning FY 2018. Delivery fleet replacement is not a challenge unique to the Postal Service. In recent years many foreign posts have been acquiring vehicles to modernize their delivery fleets. The Postal Service can learn from the experiences of these foreign posts to improve its acquisition strategies and vehicle design for the next generation collection and delivery vehicle. See Appendix B for additional information on foreign posts' delivery areas and fleets.

Conclusion

Generally, we found Postal Service delivery fleet replacement strategies were either consistent with or as compelling as the best practices and strategies used by foreign posts. However, the survey responses from the foreign posts disclosed four best practices and strategies used that might be helpful for the Postal Service to consider as it plans to acquire new vehicles. Specifically, the foreign posts primarily:

- Purchased/leased vehicles annually within a 3- to 9-year replacement cycle.
- Operated their vehicles primarily on diesel/bio-diesel fuels, with limited investments in other green technologies.
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These four best practices of foreign posts offer the Postal Service supplementary information as it finalizes its strategy for future vehicle acquisitions to ensure an efficient, cost effective, and sustainable delivery fleet. Therefore, we are not making any recommendation on these issues.

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1 This review is the second in a series on replacing the Postal Service's delivery and collection vehicle fleet.
2 The five foreign posts we benchmarked against were Deutsche Post, Posti, PostNord, Royal Mail, and Swiss Post.

See Appendix C for a comparison of foreign posts' and the Postal Service's delivery fleet strategies and best practices.

Fleet Replacement and New Vehicle Acquisition Strategies

We identified several acquisition and fleet replacement strategies used by the foreign posts and by the Postal Service to replace its fleet of long-life vehicles (LLV) and minivans. The common strategies are:

- Acquisition strategy driven primarily by operational requirements.
- Vehicle purchases/leases staggered annually, using total cost of ownership (TCO) models for fleet replacement/acquisition decisions.
- A centralized fleet management structure.

Vehicle Acquisition Strategy

We found foreign posts' acquisition strategies are driven primarily by operational requirements, such as increasing volume capacity, lowering acquisition or operational costs, and improving operations. Sustainability and moving to green vehicles are secondary considerations. In general, special safety features are not a priority because standard vehicle specifications meet most safety needs. See Figure 1 for a ranking of vehicle acquisition factors foreign posts consider most important.

Figure 1. Ranking of Factors[3] Considered in Vehicle Acquisition

	Deutsche Post	posti	postnord	Royal Mail	SWISS POST
Reduce Operational Costs	2	1	2	3	1
Improve Operations	3	2	1	2	2
Add Vehicles due to Additional Routes	1	0	5	1	2
Improve Safety	4	1	4	4	3
Improve Sustainability	5	2	3	5	3
Government Mandates	6	3	6	6	6

Source: Strategia Group.

The Postal Service vehicle acquisition strategy, which was updated in January 2015, is also driven primarily by operational requirements, such as increasing volume capacity for package delivery growth, right hand drive (RHD) vehicles for curbside routes, and lowering operational and maintenance costs.

3 Foreign posts ranked the factors from 1 to 6, with 1 being the most important factor and 6 being the least important factor. A zero indicates the factor was not a consideration.

Vehicle Replacement Strategy

Foreign posts staggered their purchases/leases annually, and usually set aside an annual budget to replace vehicles. The primary criterion used by foreign posts for vehicle replacement is the economically viable age of the vehicle as determined by a TCO model. Each post has developed its own TCO model that includes evaluating vehicle acquisition costs, resale values (if applicable), and costs related to maintenance and fuel. As a result, the foreign posts have an overall planned fleet replacement strategy that includes renewing their fleets over a 3- to 9-year cycle. Cost of maintenance is the critical determinant of when replacement occurs within the cycle. In practice, age, maintenance, and lease expiration are highly intertwined. See Figure 2 for factors driving vehicle replacement.

Figure 2. Factors[4] Driving Vehicle Replacement

	Deutsche Post	posti	postnord	Royal Mail	SWISS POST
Cost of Maintenance	2	1	1	1	2
Vehicle Age	2	2	2	0	1
Lease Expiration	0	2	3	0	1
Vehicle Acquisition	0	0	4	0	0

Source: Strategia Group.

Historically, the Postal Service has not staggered its vehicle purchases annually or set aside an annual budget to acquire replacement vehicles. Due to its financial condition over the last several years, the Postal Service has delayed replacing the entire delivery vehicle fleet, while many of its vehicles have reached or exceeded their end of life.[5] However, the long-term next generation delivery vehicle acquisition strategy calls for replacing the aging fleet over time, based on factors such as maintenance expense, age, and mileage.

The Postal Service intends to stagger its purchase of more than 160,000 custom built RHD vehicles over a 9 year period beginning in FY 2018. However, due to the expected 18-20 year lifespan of the planned fleet, it is possible there will be several years when the Postal Service is not acquiring any new vehicles, after all of the new vehicles have been deployed. The Postal Service said this would free up capital funding for other investments, such as new mail processing equipment or replacement of other vehicle types (service vehicles, tractors, and mixed collection and delivery vehicles). The Postal Service also indicated it uses a variety of analyses and costing models, including TCO, to make acquisition and replacement decisions. The Decision Analysis Report (DAR) process used by the Postal Service for acquiring new vehicles relies primarily on a 10 year return on investment analysis, which includes acquisition, maintenance, and fuel costs.

4 Foreign posts ranked the factors from zero to four, with one being the most important factor and four being the least important factor. A zero indicates the factor was not a consideration.

5 In January 2015, the Investment Review Committee approved almost $500 million to purchase more than 12,000 replacement delivery vehicles in FY 2015.

In a prior U.S. Postal Service Office of Inspector General (OIG) report[6] we recommended the Postal Service establish an annual new vehicle strategy. Management agreed with this recommendation. The report stated that an annual new vehicle replacement strategy would evenly spread out the expenditures over time, ensure functional viability and the overall operational health of the fleet, and avoid the future financial burden of replacing a large number of vehicles at once. A percentage replacement strategy will stabilize acquisition and maintenance costs and allow for valuable relationships with suppliers. When suppliers can expect annual business – a steady flow of revenue is highly valued – the customer has an advantage in terms of quality and negotiating cost and timeframe requirements.

Fleet Management Structure

Foreign posts centralized fleet management functions either in headquarters departments or in separate subsidiaries working as internal leasing companies. Royal Mail and Posti have centralized their functions within a headquarters fleet management division. This division develops technical and commercial specifications and negotiates purchases/leases with an approved supplier. Deutsche Post, PostNord, and Swiss Post, however, have established independent subsidiaries that acquire their vehicles and provide full leasing service to their operating divisions. The trend is also to allocate vehicle costs to operating units to drive responsible behavior with local front line management.

In addition, the majority of foreign posts do not operate their own garages and have outsourced maintenance and repairs to the vehicle manufacturer. Deutsche Post, Posti, and PostNord outsource vehicle maintenance and repair by incorporating maintenance into their lease agreements. PostNord indicated in the survey that contract maintenance is a very effective cost cutting driver. It creates certainty and minimizes the impact of rapidly increasing maintenance costs over a specified period of time. Swiss Post creates service level agreements with manufactures that cover maintenance at time of acquisition.

In contrast, Royal Mail, which has the largest of the five surveyed fleets, principally purchases its fleet vehicles and manages its own vehicle maintenance facilities. Royal Mail indicated in the survey we conducted that its vehicle mechanics are trained by the manufacturer. In this way, the warranty is certified with numerous vehicle manufacturers.

The Postal Service also takes a centralized approach to fleet management. In May 2015 it reorganized to centralize all fleet management functions in headquarters departments. Previously, while Postal Service acquisition and replacement strategies were located in headquarters departments, maintenance[7] and support operations were allocated to Postal Service areas and districts.[8] By moving these functions back under centralized management, the Postal Service hopes to standardize its fleet operations and align and optimize operational, commercial, and technical objectives.

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6 *Delivery Fleet Strategies*, (Report Number CI-AR-12-006, dated August 14, 2012).
7 The Postal Service's vehicle fleet is primarily maintained using 316 Postal Service vehicle maintenance facilities that service 211,264 vehicles. The Postal Service also contracts with commercial garages throughout the country for some maintenance and repair. In FY 2014 the Postal Service vehicle maintenance expenses totaled $1.1 billion of which $237 million was for commercial maintenance.
8 The OIG plans to conduct an audit on the Postal Service's use of vehicle maintenance outsourcing.

Vehicle Requirements and Specifications

Our benchmarking efforts identified several trends in the requirements and specifications of the delivery vehicles purchased by foreign posts. They are:

- Operational departments led the process to define vehicle requirements.
- Standard commercial vehicles, with minimal customization, were acquired.
- Vehicles had few non-standard safety features or unique driver ergonomic requirements.

Requirements and Specification Development Process

For the foreign posts we examined, operational departments generally lead the process of defining requirements for new vehicles. Other stakeholders, such as unions, mail carriers, and procurement departments, participate in the development process. Vehicle sourcing entities lead the commercial negotiations with suppliers. Formal evaluation criteria and trials are used to decide on specifications.

The Postal Service has a similar process, with the headquarters Delivery Operations program office primarily responsible for determining requirements and specifications for additions to the fleet. It also uses a consultative process, requesting and evaluating input from delivery, engineering, supply management, and sustainability groups. A package delivery team, with members from these groups, was also used to identify future package needs that would influence the design of the next generation delivery vehicle. In addition, labor unions were informed of the development process and vehicle maintenance facilities and carriers were surveyed for their opinions on requirements. The Executive Leadership Team/Investment Review Committee maintains overall responsibility for approving any vehicle acquisition decision.

Vehicle Design Options

The basic approach of all foreign posts is to acquire standard commercial vehicles that best meet their requirements with minimal need to customize the vehicle design. Non-standard features are strongly evaluated, usually through an analysis and testing. One foreign post is interested in building customized vehicles to address unique delivery operational needs like high start/stop rate and low top speeds and mileage per day.

The foreign posts use a range of vehicles with different capacities and body types based on the types of routes the vehicles will be used on. Many of their delivery vehicles are about the same size as the current Postal Service LLV, but foreign posts also use smaller electric bicycles (e-bikes), tricycles (e-trikes), and scooters for urban and semi suburban locations. Range and volumetric capacity are increasingly important considerations as foreign posts' vehicle fleets are in transition, with larger cargo volume space becoming more important while payload capacity[9] becomes less important.

In addition, automated mail sequencing reduces carrier office time, which leads to longer and more motorized routes. Vehicle specifications must be understood in the context of the delivery methods used and each foreign post plans for a wider redesign of mail/package delivery methods. The challenge is to develop a fleet that maximizes efficient operational performance. See Figure 3 for vehicles in the Royal Mail fleet.

9 Payload capacity is defined as the cargo-carrying weight capacity of the vehicle in kilograms (or pounds) evenly distributed over the cargo compartment floor area.

Figure 3. Royal Mail Vehicle Fleet

Source: Royal Mail Group Limited.

The Postal Service has taken a different approach. Failing to obtain the necessary funding in 2006 to replace its LLV fleet, the Postal Service developed a shorter term strategy to acquire commercially available left hand drive (LHD) minivans to meet its delivery needs while delaying, until recently, its long-term strategy to acquire a fully customized RHD vehicle that can be used on 99 percent of its delivery routes.

In developing this strategy, the Postal Service reviewed several different delivery options, including refurbishing existing delivery vehicles, purchasing custom vehicles, and using commercially available vehicles (both foreign manufactured RHD vehicles[10] and domestic manufactured vehicles with RHD conversion). The Postal Service conducted a life-cycle-costs evaluation for each option and determined that a custom vehicle would cost less and better meet its operational needs.

Postal Service management stated that by designing one customized vehicle that can be used on most routes, it can keep acquisition costs down. In addition, customization allows the Postal Service to design a vehicle that is optimized for mail delivery. For example, many commercial vehicles have smaller front windows, or do not have sliding doors and higher cargo headroom to facilitate efficient loading and mail delivery. Optimal design features could save up to 30 minutes on a route, which would significantly affect labor and vehicle costs.

10 Foreign manufactured RHD vehicles would need to be certified/re-engineered to bring them up to Federal Motor Vehicle Safety Standards (FMVSS) and Environmental Protection Agency (EPA) standards.

The Postal Service indicated in testimony on May 21, 2015, that it has not decided on the specific vehicle or vehicles to replace its aging fleet, that it is open to more than one design, and that it will be evaluating this issue over the next year.[11] In a previous OIG report[12] looking at industry best practice we stated that, from an operations point of view, a variety of sizes may be desirable. Vehicles that must operate in highly congested cities should be smaller and easier to maneuver than those that operate in more suburban areas. It would be reasonable for the Postal Service to have a small portfolio of vehicle types and sizes to meet varying needs (often termed a vehicle selector list). At the same time, the Postal Service should make every effort to standardize vehicle size, type, and brand because this increases the opportunity for volume discounts and makes it easier to train maintenance staff and stock parts.

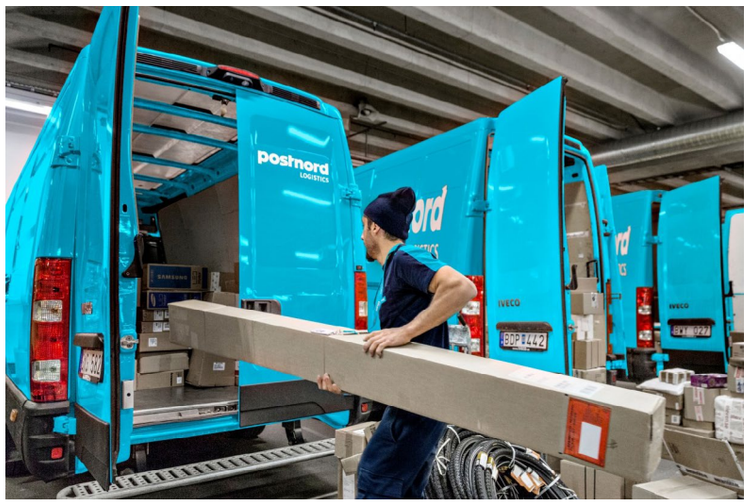
While the Postal Service may be able to realize economies of scale by purchasing one vehicle design to meet the operational needs of 99 percent of its delivery routes, a range of vehicles may offer other savings to the Postal Service, such as increased fuel savings or lower acquisition costs for a portion of the fleet.

Safety and Ergonomic Features

The foreign posts generally did not include specific vehicle safety features or unique driver ergonomic[13] requirements in their vehicle specifications, and considered standard features to be adequate. They are trending toward using back-up cameras, as many have done accident analyses that identify this as a valuable feature. Based on such an analysis, Royal Mail also introduced some additional alarm systems to support drivers/delivery workers, such as a hand brake warning system,[14] and is currently conducting trials on a number of other safety features.

Ergonomic issues are of growing importance to foreign posts, but the majority of ergonomic concerns can be met through standard vehicle features. PostNord has placed the most emphasis on developing specific ergonomic features because of changes to its delivery methods and extreme operating climates. See Figure 4 for a picture of a PostNord delivery vehicle.

Figure 4. PostNord Delivery Vehicles



Source: PostNord.

11 Testimony provided by Mr. Joseph Corbett, chief financial officer for the Postal Service before the U.S. House of Representatives Subcommittee on Government Operations on May 21, 2015.
12 *Delivery Vehicle Fleet Replacement*, (Report Number DR-MA-14-005, dated June 10, 2014).
13 Ergonomics is the science of refining the design of products to optimize them for human use. Human characteristics, such as height, weight, and proportions are considered, as well as information about human hearing, sight, temperature preferences, and so on.
14 Sounds a warning if the driver's side door is opened when the hand brakes have not been activated.

See Figure 5 and Figure 6 for specific safety and ergonomic features adopted or being considered by foreign posts.

Figure 5. Development of Safety Features[15]

Hover over post names to see more information	Deutsche Post	posti	postnord	Royal Mail	SWISS POST
Backup Cameras/Sensors	Established	Established	Possibility of trial in medium term	Established	Established
Anti-Slide	Established	Established	Established	Established	Established
Parking Sensors	Established	No current plans	No current plans	Trialing	Possibility of trial in medium term
Tracking Tools and Technologies (Telematics)	No current plans	Established	No current plans	Trialing	Possibility of trial in medium term
Hand Brake Alarm	No current plans	No current plans	No current plans	Established	No current plans
Side Air-Bags	Established	No current plans	No current plans	No current plans	Possibility of trial in medium term
Automatic Locking	No current plans	No current plans	No current plans	Trialing	No current plans
Forward Cameras	No current plans	No current plans	No current plans	Trialing	No current plans
Stop/Start Electronic	No current plans	No current plans	No current plans	Trialing	No current plans
Raised Suspension	No current plans	No current plans	No current plans	Trialing	No current plans
Collision Systems	Rejected	No current plans	No current plans	No current plans	Possibility of trial in medium term
Emergency Calls	Rejected	No current plans	No current plans	No current plans	Possibility of trial in medium term
Departure Indicators	Rejected	No current plans	No current plans	No current plans	Possibility of trial in medium term

Established Trialing Possibility of trial in medium term No current plans Rejected

Hover over categories to see just these selections and reset the table.

Source: Strategia Group.

15 Due to the variety of vehicle models in each foreign post's fleet, features are not consistent across the fleet, but denote current development direction.

Figure 6. Development of Ergonomic Features

Hover over post names to see more information

	Deutsche Post	posti	postnord	Royal Mail	SWISS POST
Chair Adjustability	●	●	●	●	●
Deliver from Car	●	●	●	●	●
Table beside Driver	●	●	●	●	●
Heating Systems	●	●	●	●	●
Seating Material	●	●	●	●	●
3 Point Seat Belt	●	●	●	●	●
Head Rests	●	●	●	●	●

● Established ● Trialing ● Possibility of trial in medium term ● No current plans ● Rejected

Hover over categories to see just these selections and reset the table.

Source: Strategia Group.

The Postal Service also felt the standard safety features required by FMVSS were generally adequate and only plans to incorporate a few additional safety features. Specifically, the Postal Service plans to include back-up cameras on its next generation delivery vehicle, as well as front bumper sensors and an automatic parking brake. Because it plans to acquire customized vehicles, the Postal Service said it can incorporate numerous additional safety and ergonomic features into the vehicle design at a minimal cost. Options include visibility improvements to help avoid accidents and ergonomic improvements for carrier comfort and to facilitate efficient delivery of mail from the vehicle. If new safety technologies emerge during the expected 18-20 year service life of the next generation delivery vehicle, they can be evaluated and added to the vehicles during production or through aftermarket additions.

Innovative Tracking Tools

Foreign posts primarily used tracking tools and technologies (telematics) on their heavy goods vehicle[16] (HGV) fleet to create valuable data to improve drivers' performance. But these improvements require extensive support. Posti was the only foreign post that has extensively deployed telematics in delivery vehicles. The other four foreign posts have strong reservations about the ability of telematics to improve mail delivery and/or reduce maintenance costs and improve the economics of vehicle use. Dynamic routing has been established for dedicated parcel delivery routes, but is seen as less valuable for combined mail/parcel delivery. In addition, there are some significant union reservations about these systems; therefore, the technology is being deployed slowly and carefully. See Figure 7 for specific telematics technologies adopted or being considered by the foreign posts.

16 A large vehicle with a cargo capacity of at least 3.5 tons. The Postal Service delivery fleet consists of vehicles of 2.5 tons or less.

Figure 7. Development of Telematics[17]

Hover over post names to see more information	Deutsche Post	posti	postnord	Royal Mail	SWISS POST
Improved Maintenance	Possibility of trial in medium term	Trialing	Established	Established	Established
Vehicle Utilization	Possibility of trial in medium term	Trialing	Possibility of trial in medium term	No current plans	Trialing
Safety in Operation	No current plans	Trialing	Possibility of trial in medium term	Established	Established
Vehicle Operation	No current plans	Trialing	Possibility of trial in medium term	No current plans	Trialing
Vehicle Tracking	No current plans	Trialing	Possibility of trial in medium term	No current plans	No current plans
Package Tracking	No current plans	No current plans	Possibility of trial in medium term	No current plans	No current plans
Geo-Fencing	No current plans	No current plans	Established	No current plans	No current plans
Dynamic Routing	No current plans	Possibility of trial in medium term	Established	No current plans	Trialing

Established · Trialing · Possibility of trial in medium term · No current plans · Rejected

Source: Strategia Group.

One foreign post we reviewed, Posti, has deployed a telematics system across all vehicles in its fleet. This system is primarily intended to improve fuel efficiency, reduce carbon dioxide (CO_2), optimize the fleet, control speed, and analyze accidents. In addition, the system supports efficiency by monitoring fuel use and driving style. Posti indicated that fleet average fuel consumption has been reduced by 6 percent since the telematics system was deployed in the spring of 2014. See Figure 8 for a picture of a Posti delivery vehicle.

17 This chart includes telematics used on HGVs for Swiss Post. HGVs are not considered part of the Postal Services delivery fleet. Posti includes primarily delivery vehicles.

Figure 8. Posti Delivery Vehicle

Source: Posti.

The Postal Service has not made a final determination to incorporate telematics in the next generation delivery vehicle. However, it plans to use a new mobile delivery device (MDD)[18] to give delivery vehicles tracking capability. These devices provide Global Positioning System tracking and dynamic routing to carriers delivering packages. With future software updates, MDDs could also provide some automated vehicle utilization data. Currently that data is entered manually by the carrier and is, therefore, prone to errors. The Postal Service is not currently considering additional telematics features such as engine and vehicle error message monitoring to improve vehicle maintenance services or driver behavior monitoring (idling, speeding, and so forth). However, the Postal Service may want to consider incorporating telematics in future vehicles and design specifications as these technologies continue to expand and mature.

Green Technologies

Our review of foreign posts identified several trends in the use of green technologies. Specifically:

- Vehicle fleets primarily operate on diesel/bio-diesel, with limited investments in other green technologies.
- Alternative delivery vehicles are used extensively for urban letter and small parcel distribution.

Powertrains and Green Technologies

All of the foreign posts we reviewed have invested in alternative fuel vehicles (AFVs) and green technologies, with most of the fleet vehicles developed to use either diesel or bio-diesel fuel, or both. Use of gasoline for fleet vehicles is declining. Other fuel sources such as natural gas and propane have been tested but, generally, have not been found to be as effective as diesel and bio-diesel for meeting operational requirements.

18 The MDD is a handheld device the carrier uses to document package activities in real time (as performed). It provides an improved last-mile interface for the carrier to efficiently meet customer requirements.

From efficiency and ecological perspectives, type of fuel continues to be a major factor European posts must consider and alternate vehicles will continue to be a major trend. While there are no government mandates requiring foreign posts to buy AFVs, local governments are pressuring them to use emission-free vehicles and this pressure will likely increase in the next few years. See Figure 9 for specific alternative fuel technologies adopted or being considered by the foreign posts.

Figure 9. Development in Green Fleets[19]

	Deutsche Post	posti	postnord	Royal Mail	SWISS POST
Gasoline/Ethanol Blend E-85	●	●	●	●	●
Biodiesel	●	●	●	●	●
Gas/Electric Hybrid	●	○	○	○	●
Plug in Gas/Electric Hybrid	●	○	○	○	●
Electric Vehicles	●	○	●	○	●
Propane	○	○	○	○	○
Natural Gas	○	●	○	○	○

● Established ○ Trialing ○ Possibility of trial in medium term ○ No current plans ● Rejected

Source: Strategia Group.

Electric vehicles have great potential and are generally perceived as vehicles of choice in the future. But they still have issues around climate,[20] range, and charging infrastructure. Foreign posts have not invested heavily in electric vehicles other than e-bikes and e-trikes for urban letter and small parcel delivery. For example, Swiss Post has already invested significantly in e-trikes and Deutsche Post plans a major deployment of its electric Street Scooter over the next several years (see Figure 10).

In addition, all of the foreign posts are testing the viability of using electric vehicles. Shorter urban routes are moving to various forms of electric vehicles (determined by charging infrastructure, TCO, capacity, and range) while rural/suburban routes are increasingly being serviced by bio-diesel vehicles. However, higher costs identified through TCO modeling are slowing down electric vehicle deployment. The transition to electric vehicles is also curtailed because they do not have the range or volumetric capacity of vehicles that use other types of fuel.

19 This chart depicts all fuel sources; they are not necessarily primary fuel sources.
20 Climate refers to the vehicle driving environment. For example, batteries work much less productively in cold temperatures.

Figure 10. Deutsche Post Electric Vehicles

Source: Deutsche Post AG.

The Postal Service has tested use of green technologies through various pilot programs over the years. As required under government statute,[21] the Postal Service plans to replace the bulk of its delivery fleet beginning in FY 2018 with AFVs, either dedicated or dual fueled. However, the specific AFV has not yet been determined. Initial Postal Service vehicle cost projections indicate that a dual fueled gasoline/ethanol vehicle would have the lowest acquisition costs; however, it may not adequately address Postal Service fuel reduction goals. Diesel and bio-diesel vehicles traditionally have lower maintenance and fuel costs over the life of the vehicle, which may offset the higher acquisition costs when the long expected lifespan of the next generation delivery vehicle is considered.

While the Postal Service has not made any decisions on incorporating green technologies in the next generation delivery vehicle, a prior OIG report[22] on vehicle fleet best practices stated that green technologies should be strategically deployed. For example, electric vehicles should be used in urban areas, because they are considered best suited for shorter routes due to battery limitations. The report also stated companies should collaborate with suppliers to develop green technologies that are best suited for business operations. As electric vehicle technologies continue to mature and become more affordable, they may become a viable technology to incorporate into the Postal Service delivery fleet on suitable routes.

21 The EPAct of 1992 requires 75 percent of light duty vehicles acquired by a federal fleet to be alternative fuel vehicles.
22 *Delivery Fleet Strategies*, (Report Number CI-AR-12-006, dated August 14, 2012).

Alternative Delivery Vehicles

Three of the five surveyed foreign posts have made extensive use of alternative delivery vehicles, such as e-bikes and e-trikes for urban letter and small parcel distribution. They indicated the CO_2 benefit is tangible and they perceive use of these types of vehicles provides significant brand advantages. Foreign posts appear likely to use more electric vehicles such as small electric bikes, trikes, mopeds, scooters, and vans.

- Deutsche Post has purchased over 6,000 e-bikes and approximately 1,700 e-trikes.
- Swiss Post is also a leader in this area, with almost 1,000 e-bikes and approximately 4,500 e-trikes (see Figure 11).
- Posti has more than 500 e-bikes and expects to replace all manual bicycles with e-bikes by 2020.

Conversely, Royal Mail has moved away from bicycle delivery by introducing a new “park and loop” delivery model in urban areas, whereby two carriers travel together in one vehicle, drive to the mail route, then walk the route, each using a push cart.

Figure 11. Swiss Post e-trike

Source: SwissPost.

The Postal Service has 67 traditional bicycle routes, and has also tested smaller short range electric alternative delivery vehicles such as Segways, Neighborhood Electric Vehicles (NEVs), and T3s (see Figure 12), but has not expanded the use of these vehicles beyond pilot programs. According to management, these vehicles have not proven to be fully capable of meeting delivery needs and can be used effectively on very few routes. Known issues with these alternative vehicles include mail security concerns, mail and carrier exposure to inclement weather, lack of capacity for packages and mail during the peak delivery season, and the logistics of deploying them from the Post Office to the route.

The Postal Service stated that it is difficult to compare it to foreign posts with regard to these types of short-range electric vehicles because of differences in delivery operations, the mix of mail and packages, and, most importantly, the road infrastructure in cities and towns (European cities have many old narrow streets).

Figure 12. Postal Service T3

Source: OIG photograph taken at the Phoenix, AZ, Vehicle Maintenance Facility, January 14, 2015, at 9 a.m.

While the Postal Service continues to focus on replacing 190,000 delivery fleet vehicles with a next generation fleet, it has no specific plans to invest in alternative delivery vehicles because of its concerns about these vehicles failing to meet delivery needs and being ineffective on most routes.

Foreign posts' best practices that differ from those of the Postal Service offer supplementary information the Postal Service can use as it finalizes its strategy for future vehicle acquisitions to ensure an efficient, cost effective, and sustainable delivery fleet. Therefore, we are not making any recommendations on these issues.

Recommendations

We are not making any recommendations.

Management's Comments

Management was pleased that the Postal Service delivery fleet replacement strategies were either consistent with or as compelling as the best practices and strategies used by foreign posts. They further indicated the Postal Service already uses a combination of in-house and outsourced vehicle maintenance and when leasing vehicles, maintenance of the vehicle is the responsibility of the leased provider. Also, management indicated they are open to all alternative practices and look forward to the industry's response to the next generation delivery vehicle request for proposal for prototype development.

See Appendix D for management's comments, in their entirety.

Evaluation of Management's Comments

The OIG considers management's comments responsive to the report.

Appendices

Click on the appendix title to the right to navigate to the section content.

Appendix A: Additional Information 21
Background 21
Objective, Scope, and Methodology.....21
Prior Audit Coverage 23
Appendix B: Comparison of Foreign Posts and Postal Service Delivery Area and Fleets.....24
Appendix C: Comparison of Foreign Post and Postal Service Delivery Fleet Strategies and Best Practices.....25
Appendix D: Management's Comments 26

Appendix A: Additional Information

Background

The Postal Service operates one of the largest vehicle fleets in the U.S. At the end of FY 2014, the Postal Service owned nearly 211,000 vehicles and used almost 190,000 of them to collect and deliver mail. This fleet consists of approximately 20,000 minivans, 7,000 cargo vans, 21,000 flex fuel vehicles, and 142,000 LLVs. The expected service life of the LLVs is 24 years, and they are now between 21 and 28 years old. As the Postal Service fleet ages, maintenance costs will increase. Older models will, by necessity, continue to be retired due to the high costs to repair them or the unavailability of replacement parts.

The Postal Service presented the current state of its vehicle fleet and its proposed vehicle replacement strategy to the Investment Review Committee during a meeting in January 2015. The strategy is to purchase over 20,000 commercially available delivery vehicles over the next 5 years and an additional 163,000 custom built long life delivery vehicles beginning in FY 2018. The Postal Service also held a supplier conference in February 2015 and invited suppliers to develop bids and prototypes for the Next Generation Delivery Vehicle (NGDV). It expanded its strategy to include acquisition of up to 180,000 vehicles. The NGDV will be a custom-built RHD vehicle with a service life of 18-20 years. In preparation for the supplier meeting, the Postal Service also developed vehicle design specifications.

The Postal Service plans to begin replacing the LLVs in FY 2018. Delivery fleet replacement is not a challenge unique to the Postal Service, as in recent years many foreign posts have been acquiring vehicles to modernize their delivery fleets. The Postal Service can use the best practices of these foreign posts to enhance the acquisition and design of its next generation collection and delivery vehicle.

Objective, Scope, and Methodology

Our objective was to identify foreign posts' strategies and best practices for delivery fleet replacement that could help the Postal Service as it develops and acquires the next generation of collection and delivery vehicles. To accomplish our objectives, we engaged a contractor with knowledge of European posts and their delivery operations to help us benchmark the Postal Service against five foreign posts and identify vehicle acquisition and replacement best practices. Specifically, we sought to understand how other foreign posts:

- Manage their fleet replacement and new vehicle acquisition.
- Develop new vehicle requirements and specifications.
- Incorporate and use green technologies and innovative tracking tools in their vehicle acquisition.
- Determine the appropriate vehicle replacement cycle and lifespan of acquired vehicles.

We provided guidance to the contractor and reviewed its work to accomplish our review objective. The benchmarking study encompassed five European foreign postal operators that were judgmentally selected based on their modern delivery fleets, size, and willingness to participate in the benchmarking study. The five participating foreign posts were:

- Deutsche Post, Germany's designated postal operator.
- Posti, Norway's designated postal operator.

- PostNord Sweden, Sweden's designated postal operator.
- Royal Mail, the United Kingdom's designated postal operator.
- Swiss Post, Switzerland's designated postal operator.

We prepared questionnaires, which the contractor used to interview the benchmarked partners. Through the questionnaire responses and the contractor's summary analysis, we obtained an understanding of strategies that comparable posts in foreign countries use to acquire and replace delivery vehicles. We evaluated the information gathered from the benchmarked partners and compared and contrasted their strategies with those of the Postal Service.

We interviewed Postal Service Headquarters officials about their current and future vehicle acquisition and replacement strategies and reviewed delivery fleet strategy and acquisition plans for the current Postal Service delivery fleet and the next generation delivery vehicle.

We conducted this review from March 2014 through August 2015 in accordance with the Council of the Inspectors General on Integrity and Efficiency, *Quality Standards for Inspection and Evaluation.* We discussed our observations and conclusions with management on July 16, 2015, and included their comments where appropriate.

We did not assess the reliability of any computer-generated data for the purposes of this report.

Prior Audit Coverage

Report Title	Report Number	Final Report Date	Monetary Impact (in millions)
Delivery Vehicle Fleet Replacement	DR-MA-14-005	6/10/2014	None

Report Results: The Postal Service has an acquisition strategy, but, due to financial constraints, has not fully developed or implemented it. Our analysis of the delivery vehicle inventory and motorized routes showed the Postal Service could sustain delivery operations nationwide until FY 2017, but it also could experience vehicle shortfalls if there are unexpected decreases in vehicle inventory or increases in motorized routes. In addition, aging vehicles are typically repaired when they break down, even though it would sometimes be more cost effective to replace them. In designing new delivery vehicles, management must consider federal fleet regulations, emerging vehicle technologies, and fleet best practices. For example, growth in the package market could help dictate the design and technologies selected for a new vehicle. Moreover, replacing vehicles could take more than 10 years. Thus, the Postal Service should act quickly to implement a plan to meet operational needs, achieve sustainability goals, and reduce maintenance costs. We recommended that management continue to pursue short-term annual vehicle acquisitions and formalize a long-term plan to replace the fleet that includes requirements and specifications for the next generation of delivery vehicles. Management agreed with the findings and recommendations.

Delivery Fleet Strategies	CI-AR-12-006	8/14/2012	None

Report Results: The Postal Service does not have a comprehensive fleet management strategy but has some elements of a strategy in place to operate, sustain, and renew its delivery fleet. In June 2011, management developed a plan to purchase new vehicles; however, the Postal Service's continuing financial situation prevented the plan's implementation. We recommended that management develop and implement a comprehensive fleet management strategy that is managed from headquarters by a dedicated team of specialists whose primary focus is to use identified best practices for the management of the Postal Service's vehicle fleet. Management disagreed with our first finding and recommendation stating the Postal Service's fleet strategy is not contained in one department, but is a cooperative venture among various departments. We also recommended that management establish an annual new vehicle replacement strategy, as part of a comprehensive fleet management strategy, to replace part of the fleet each year, spread out the expenditures over time, and ensure the overall operational functionality of the fleet. Management agreed to incorporate the concept of yearly replacement of portions of the fleet rather than a massive purchase prior to the next significant vehicle acquisition.

Appendix B: Comparison of Foreign Posts and Postal Service Delivery Area and Fleets

Postal Operator	Country	Land Area (Square Miles)	Population (Estimated)	Delivery Fleet Size (Approximate)
USPS	USA	3,717,813	320,000,000	190,000
Deutsche Post	Germany	137,847	80,822,000	42,000
posti	Finland	130,128	5,408,000	3,000
postnord	Sweden	173,732	9,490,000	8,000
Royal Mail	United Kingdom	94,526	64,100,000	46,700
SWISS POST	Switzerland	15,942	7,952,000	9,000

Source: OIG analysis.

Appendix C: Comparison of Foreign Post and Postal Service Delivery Fleet Strategies and Best Practices

Fleet Strategies and Best Practices	USPS	Deutsche Post	posti	postnord	Royal Mail	SWISS POST
Fleet Replacement and New Vehicle Acquisition Strategies						
Primary Acquisition Factor	Reduce operational costs	Add vehicles due to motorization	Reduce operational costs	Improve Operations	Add vehicles due to motorization	Reduce operational costs
Primary Replacement Factor	Cost of Maintenance	Cost of Maintenance	Cost of Maintenance	Cost of Maintenance	Cost of Maintenance	Lease Expiration
Purchase Cycle	Staggered	Annual	Undetermined	Annual	Annual	Annual
Fleet Management Structure[23]	Central Function	Subsidiary	Central Function	Subsidiary	Central Function	Subsidiary
In-house Maintenance Facilities	Yes	No	No	No	Yes	No
Vehicle Requirements and Specifications						
Development Process Leader	Operations	Procurement	Operations	Operations	Technical Team	Operations
Vehicle Design	Custom	Standard	Standard	Standard	Standard	Standard
Safety and Ergonomic Features[24]	5 of 9	5 of 9	5 of 9	4 of 9	3 of 9	3 of 9
Innovative Tracking Tools						
Tracking and Telematics Features[25]	No	No	Yes	No	No	No
Green Technologies						
Primary Powertrains	Gas/Ethanol	Diesel	Diesel	Diesel/ Biodiesel	Diesel/ Biodiesel	Diesel/ Biodiesel
Alternative Delivery Vehicles	Limited Pilots	e-bike/e-trike	e-bike	Moped/Club Car	No	e-trike

Source: OIG analysis.

23 Central Function designates that a fleet management department within the foreign post manages vehicle acquisitions and maintenance. Subsidiary designates that a separate unit acquires vehicles and contracts maintenance on behalf of the foreign post.
24 Each foreign post was asked to identify whether any of nine specific safety and ergonomic features were included in its vehicle specifications.
25 Does not include features installed on heavy goods vehicles.

Appendix D: Management's Comments

EDWARD F. PHELAN, JR
VICE PRESIDENT, DELIVERY OPERATIONS

UNITED STATES POSTAL SERVICE

August 7, 2015

LORI DILLARD LAU
DIRECTOR, AUDIT OPERATIONS

SUBJECT: Draft Management Advisory Report – Benchmarking of Delivery Fleet Replacement Strategies (Report Number DR-MA-15-DRAFT)

Thank you for providing the US Postal Service (USPS) with the opportunity to review and comment on the draft management advisory report titled Benchmarking of Delivery Fleet Replacement Strategies. While no recommendations were made in this report, it was comforting to learn that the USPS delivery fleet replacement strategies were either consistent with or as compelling as the best practices and strategies used by foreign posts.

The report did indicate four best practices and strategies used by the foreign posts that might be useful for the USPS to consider as it plans to acquire new vehicles. Regarding the Outsourcing best practice, it should be noted that the USPS already uses a combination of in-house and outsourced vehicle maintenance and when leasing vehicles, maintenance of the vehicle is the responsibility of the leased provider.

Regarding the other best practices mentioned for possible consideration by the USPS, the OIG correctly points out that it is difficult to compare the USPS with foreign post because of the differences in delivery operations, mix of mail and packages and the road infrastructure in cities and towns. The USPS has an open mind towards all alternative practices and looks forward to the industry's response to the next generation delivery vehicle request for proposal for prototype development.

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