FLEET ASSET MANAGEMENT STRATEGY PLAN
FY 2017 through FY 2030

Fleet Management

Anytime, Anywhere, we keep BPA Rolling

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EXECUTIVE SUMMARY

The goal of any Fleet Asset Management process is to use a system-wide approach in order to improve operations and make the organization more effective by considering the full investment and life cycle of assets. The Fleet Management Department (FMD) is committed to managing its fleet assets in a manner that is sustainable and economical, in unison, to ensure the agency is equipped with the vehicles and equipment it requires to perform mission-critical assignments.

In October 2011, the inception of the centralized FMD emerged as a result of two independent studies, conducted by KEMA and Fleet Counselor Services (FCS). It became apparent that significant changes in the current decentralized management practices for fleet assets required prompt attention, and the majority of maintenance infrastructures entailed refurbishment to meet their recommended functionality rating. This dictated the need for improvements in managing and maintaining a sizeable fleet of vehicles/equipment and facility enhancements.

Therefore, the objective of this Fleet Asset Management Strategy Plan is to identify past, current/future operations and maintenance practices focusing on the strategic processes required, enabling the FMD to continue to provide effective and efficient services to all its internal customers.

The fleet is comprised of approximately 2200 assets ranging from light to heavy duty vehicles, construction/mobile and material handling equipment, of which approximately 1300 are BPA owned, and approximately 900 are GSA leased. The net value of these owned assets is approximately $80 million. Currently, the annual operations and maintenance expenses for owned assets are budgeted at $10.5 million. Recently, annual capital replacements have averaged $5.5 - $7 million. GSA lease expenses add an additional $6.5 million.

With this large inventory, FMD will work towards right-sizing its fleet and optimizing the life cycle of the various vehicles and equipment to ensure proper fleet management responsibilities. Replacing vehicles at the optimal time, planning proper maintenance, reducing downtime and unplanned repairs, disposing of assets that are under-utilized, reducing annual rental rates and ensuring proper fiscal management are paramount to providing effective Fleet management. Additionally, FMD will continue to work closely with its customers to understand their needs and assure effective, timely communication and service.

Some major hurdles for the FMD in supporting its customer base have been the lack of a dedicated Fleet Management System capable of supporting the unique needs associated with managing and maintaining mobile (non-fixed) assets. Where facilities are inadequate and not capable of supporting efficient fleet maintenance practices, BPA has

prioritized and is replacing and upgrading these facilities to improve safety and provide timely maintenance and efficient use of mechanic resources. By fixing these two main items along with technician training and standardization, Fleet management will dramatically improve equipment availability and quality as well as overall asset management.

The FMD will continue to improve to ensure operational requirements are met, Governmental mandates are adhered to, risks are minimized, reliability is increased and costs are reduced. Through planning and proper project management, the FMD is confident in making this transition a success.

Fleet Asset Management Strategy
FY 2017 through FY 2022

1. Introduction

The Bonneville Power Administration's Fleet Management Department (FMD) is committed to managing its fleet assets in a manner that is sustainable and economical, in unison with ensuring the agency is equipped with the vehicles and equipment it requires to perform mission-critical assignments.

As a result of two independent reviews, conducted by KEMA and Fleet Counselor Services (FCS), it was apparent that significant changes in the management practices for fleet assets needed to be addressed. The first study was conducted in 2006 by KEMA which found that fleet management at BPA was highly fragmented, resulting in differing and conflicting priorities. In addition, KEMA determined that maintenance practices were not standardized, and that replacement criteria were not in place to optimize vehicle purchases. The Heavy Mobile Equipment Mechanic (HMEM) staff operations were largely reactive and emergency response-driven, rather than proactive and preventive maintenance strategy-driven.

The second study performed in 2009 by FCS assessed BPA's current state of operations against 20 categories of basic fleet management best practices. As illustrated below, BPA scored poorly, passing only three of the 20 categories; Contract Work, Policies and Procedures and Parts Inventory. In the future BPA's FMD plans to utilize this industry standard criteria in order to gain Fleet Certification through the Government Fleet Certification program highlighting expertise in the realm of Fleet Management.

Measurements and Standards Categories	**FSC Standard**	**BPA's Score**	**Result**
1. Employee Goals, Mission Statement and Business Plan (Foundation Category)	8	0	Not Pass
2. Facilities	7	0	Not Pass
3. Computer Systems	7	6	Not Pass
4. Shop Equipment	7	3	Not Pass
5. Staffing and Qualifications (Foundation Category)	8	0	Not Pass
6. Activity Based Costing and Productivity Analysis	8	0	Not Pass
7. Contract Work	6	8	**Pass**
8. Policies and Procedures (Foundation Category)	8	9	**Pass**
9. PM Program (Foundation Category)	8	2	Not Pass
10. Predictive Maintenance	8	0	Not Pass
11. Work Flow and Communication	6	4	Not Pass
12. Utilization Management (Foundation Category)	8	2	Not Pass
13. Replacement Program (Foundation Category)	8	0	Not Pass
14. Accounting and Billing	7	3	Not Pass
15. Customer Service Downtime and Performance Contract (Foundation Category)	8	0	Not Pass
16. Parts Inventory (Foundation Category)	8	10	**Pass**
17. Fuel Management and Alternative Fuel	8	6	Not Pass
18. Vehicle Procurement	8	7	Not Pass
19. Emergency Management and Disaster Preparedness	7	1	Not Pass
20. Safety and Environmental Policy	9	8	Not Pass
PERFORMANCE SCORE	**153 = 76%**	**69 = 35%**	**Not Pass**

It was these two studies, coupled with an internal agency analysis, that piloted the centralization of BPA's Fleet Management functions and the industrious effort to mold BPA's Fleet Management practices into a group focused on industry best practices. These recent efforts have laid the groundwork for fleet asset management. Accountability has been established through the centralization of fleet related procurement, analysis, licensing, maintenance, rentals, loan pool operations and reporting.

This newly formed FMD has been focused on implementing a number of the KEMA and FCS recommendations, as well as identifying industry best practices that pertain to BPA's specific, yet unique operational requirements. The FMD will continue to improve to ensure operational requirements are met, Governmental mandates are adhered to, risks are minimized, reliability is increased and costs are minimized.

1.1 Purpose

With the assistance of both KEMA and FCS reviews, BPA conducted a detailed analysis of its fleet operations and evaluated them against industry best practices Upon completion of these reviews it was decided that in order to maximize the efficient use of the agency's fleet and personnel assets, BPA's fleet-related functions should be centralized into one FMD. Therefore, the inception of the centralized FMD emerged in October 2011.

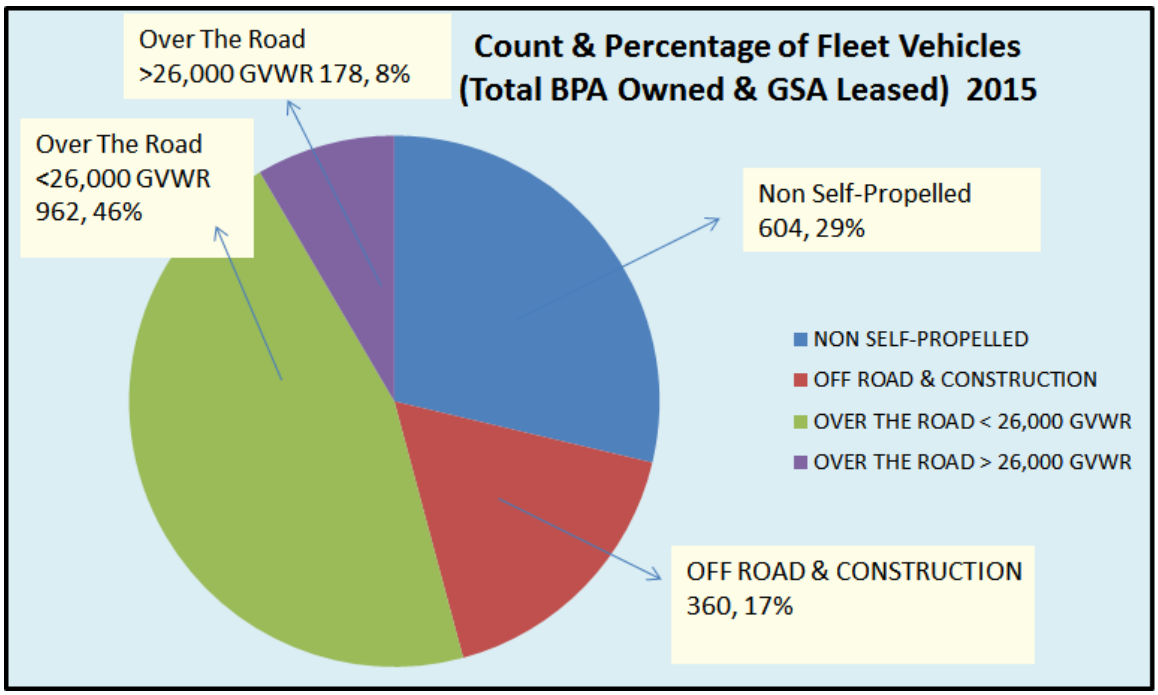
1.2 Scope

The FMD is responsible for the acquisition, maintenance, and overall asset management of BPA's mobile equipment fleet and the engine generators that support unmanned substation maintenance facilities and system protection/communications functions. BPA owns, operates and maintains a wide variety of vehicles and equipment. The owned assets are comprised of trailers and mobile equipment such as cranes, man-lifts of various sizes (from 33' up to and including 180'), digger derrick trucks, pole trucks, substation maintenance route vans, small boom trucks, and man-lifts, along with other specialized equipment for stringing of conductor and overall maintenance of the transmission system. Other equipment consists of bulldozers, backhoes and snow cats.

Additionally, BPA leases GSA vehicles that range from sedans used by the agency's management and finance/support staff, to heavy duty pickups utilized by the agency's electrical, construction and field crews.

The fleet consists of approximately 2200 assets, of which approximately 1300 are BPA owned, and 900 are GSA leased. Of these assets, the mission critical equipment are the majority of BPA owned man-lifts, cranes, derricks, wire stringing equipment, work/crew trucks, pole trucks, and equipment/material hauling trucks (semi trucks/flatbed trucks) for maintaining and restoring BPA's electrical systems. The less critical, but still necessary support equipment, which becomes mission-critical and is dependent on inclement weather, are the snow cats, mobile generator, dozers, excavators, backhoes, and other specialized equipment.

Currently, the annual operations and maintenance expenses for owned assets are budgeted at approximately $10.5 million. Recently, annual capital replacements have averaged $5.5 - $7 million. GSA lease expenses add an additional $6.5 million.



2. Fleet Management Objectives and Strategies

The asset management objectives and strategies for fleet equipment are:

Reduce use of fossil fuels by right-sizing the fleet through a systematic analysis identifying compulsory requirements to conduct the agency's mission. Evaluate the business case of each asset to determine whether reassigning, replacing, or eliminating the vehicle would reduce fossil fuel usage and costs without compromising fleet activities. Right-sizing the fleet will allow for more efficient operations practices by reducing GHG and related pollutant emissions, fossil fuel consumption and operating costs, freeing up capital funds. This effort is ongoing and requires continuous analysis and updating.

Establish policy on the types of equipment that should be agency-owned versus locally rented, while leveraging the use of local rental sources. Routinely review the percentage of usage of BPA assets to determine retention, cost comparison, as well as assess local rentals to determine proper mix and best value to BPA and the FMD. The use of Asset Suite as the agency's Fleet Management System (FMS) has made this task daunting and labor intensive with incomplete but actionable results. Continual review will generate the proper mix and realization of cost savings. This strategy, which is ongoing and under

continuous scrutiny, will provide significantly better results with the recent implementation (April 2016) of the FleetWorX FMS.

Focus on preventive/predictive maintenance to reduce the amount of emergency response and corrective maintenance. Ensure scheduled maintenance is in accordance with manufacturer's recommended intervals and identify those predictive assets that require additional review due to high usage. Adhering to a focus on preventive/predictive maintenance will ensure equipment availability and reduce downtime. This approach is continual and specific to the asset being maintained.

Develop and implement a professional training and certification program for the FMD maintenance technicians. Identify gaps and determine/establish a training plan to meet maintenance technicians' required skill sets. Dedicated funding will determine success and deliverable of this objective. Instituting a professional training/certification program will enhance maintenance skill sets, promote awareness of maintenance issues and help implement solutions to ever-changing technologies.

Standardize to reduce acquisition, maintenance and inventory costs, and thereby make available additional funds for recruitment/training. Conduct right-sizing review to determine minimum level of assets required to meet mission needs and standardize assets performing the same trade by numbers and types. Establishing standardization will lead to reduced inventory, acquisition, maintenance and costs, thus allowing additional allocation of funds for improvements and training. This process is recurring.

Develop competency to prepare a life cycle analysis considering vehicle usage, condition, failure rates, maintenance costs, overall costs, etc. Determine net acquisition costs, establish estimated depreciation rates, identify other fixed costs, calculate estimated lifetime operating costs and add the estimated lifetime holding/operating costs to arrive at the estimated life cycle. Ongoing analysis of key factors that drive efficiency – maintenance, downtime, and fuel efficiency trends – is a must to uncover cost savings/carbon reduction and create a concrete life cycle analysis. Fleet's new FleetWorX system has capabilities to facilitate life cycle analysis requirements. This method of analysis is quarterly and consistent.

Improve tracking and reporting of expenditures. Assess the progress, set specific targets and monitor the sustainability performance over a monthly, quarterly and annual basis. Tracking and reporting provides regular scrutiny of FMD's success toward the goal of improving expenditures. This process is a daily function of the FMD.

Enhance data quality associated with vehicle cost and maintenance. Examine effects of asset component selection to determine cost and cost triggers, and then

visually graph to depict "cradle to grave" history to determine optimal retention. The new FleetWorx FMS will enhance data quality, allowing for efficient and effective management of fleet assets and justifying decision-based actions regarding vehicle cost and maintenance. This task is a daily undertaking.

Improve capabilities for emergency response, while reducing frequency through implementation of a planned maintenance strategy. Schedule maintenance as recommended by the manufacturer, and target those assets that are historically known to require additional maintenance due to volume of usage. Additional funding will be required to develop and implement a professional training/certification program for the FMD maintenance technicians to augment the required skill sets. Together with FleetWorX FMS, the improved capabilities will ensure asset availability for emergency responses that have been implemented by an effective maintenance strategy. This effort has been successful in improving compliance and equipment quality, and this process will continue to be revisited as technology changes.

Enhance internal and external reporting capability. Identify reporting deficiencies between input versus output and label shortfalls to improve reporting function. The new FleetWorX system will dramatically improve this area, allowing for industry standard reports to be automated and easily developed. The foundation of a sound FMD is the ability to produce reports that provide value and assist with business decisions.

Foster business-driven decisions using analytics and metrics, measured against risk, to ensure agency needs are met in a cost-effective manner. Track and align core strategies and processes of transportation activities and metrics with business goals by creating a metrics framework to monitor and then develop/utilize the balance scorecard to manage/gauge performance to maximize effectiveness and optimize the return on investment for the FMD. Promoting business-driven decisions using analytics and metrics to mitigate risk provides actionable business insights to improve Transportation's effectiveness and efficiency. This enables the FMD to justify budgets based on returns and to drive organizational growth and innovation. This objective has commenced and will continue to evolve.

3. Key Factors for Agency Fleet Requirements

Key factors in the agency's fleet requirements are primarily centered on transmission system maintenance and reliability. However, when practical, secondary elements that aid these decisions are environmental stewardship and the assurance that the FMD has the necessary assets at the lowest life cycle cost.

Specific key factors are:

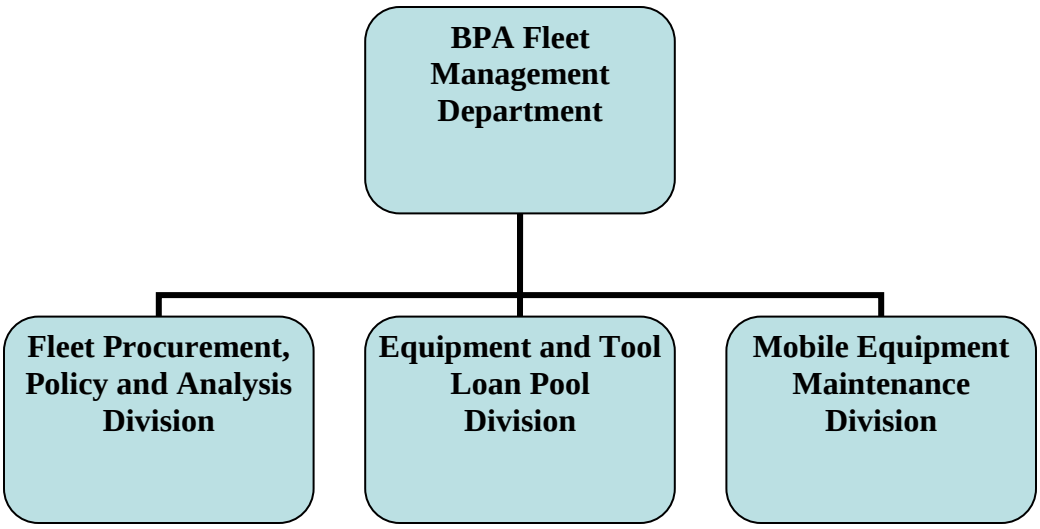
- The necessity to manage the mobile equipment and EG maintenance workload systemwide
- The necessity to ensure the agency's maintenance technicians are a workforce comprised of highly skilled and trained technicians that possess a directed focus and skill set designed to work on the myriad of equipment types the agency operates
- The necessity to right-size the fleet to ensure appropriate mix and quantity
- The necessity for a strategic plan, from a business and risk perspective, whereby equipment is rented as warranted, versus identification of assets in the best interest of BPA that should be retained on hand either by GSA-leased or owned assets
- The necessity to develop a life cycle analysis and optimal replacement criterion in order to construct comprehensive and detailed capital purchase plans

To achieve these key factors, the FMD must operate in accordance with a well-defined, proactive strategic workload management plan. Additionally, a concentrated effort on the development and execution of a robust continual training curriculum/program must materialize to ensure BPA HMEM technicians have the skill sets and tools to perform work on BPA's mobile equipment assets in improved and properly equipped HMEM facilities, as well as field locations.

4. Fleet Management Department Organizational Structure

In October 2011, BPA consolidated fleet operations into one organization designed to support, manage and oversee the agency's fleet requirements. This organization is located in the Supply Chain portion of the Office of the Chief Administrative Officer. Major elements of the new FMD are the Fleet Analysis and Policy Division, the Equipment and Tool Loan Pool Division and the Mobile Equipment Maintenance Division.

BPA's Fleet Management Department
Organization Chart



4.1 The Fleet Procurement, Policy and Analysis Division is responsible for the acquisition of owned assets, as well as GSA-leased vehicles. This includes data management and analysis, licensing and registration of BPA vehicles, the development and documentation of policies related to motor vehicles and equipment, the development and submission of reports and the basic life cycle analysis essential to execute Fleet Management.

4.2 The Equipment and Tool Loan Pool Division is responsible for meeting the equipment shortfall needs of the agency. This is accomplished by utilizing centrally managed assets that are operated, tracked and controlled by the loan pool personnel, or through the use of third party rentals. The loan pool ensures that the agency's field personnel have the tools and motor equipment necessary to perform the tasks at hand. Before the development of this centralized office, agency equipment rentals were not centrally captured; consequently little historical data on the quantities and types of previous rentals are accessible. In 2015 BPA's rentals exceeded $1.2 million, highlighting the agencywide rental costs for BPA for the first time. It is believed that these numbers will continue to grow as work becomes more complex and federal mandates increase to reduce fleet sizes.

The goals of the FMD, through means of annual agreements and more efficient use of local assets, are to reduce the average price and annual cost of agency's rentals. Notable success has materialized in this area with the establishment of standardized rental agreements equating to approximately a 20% savings with three major equipment providers.

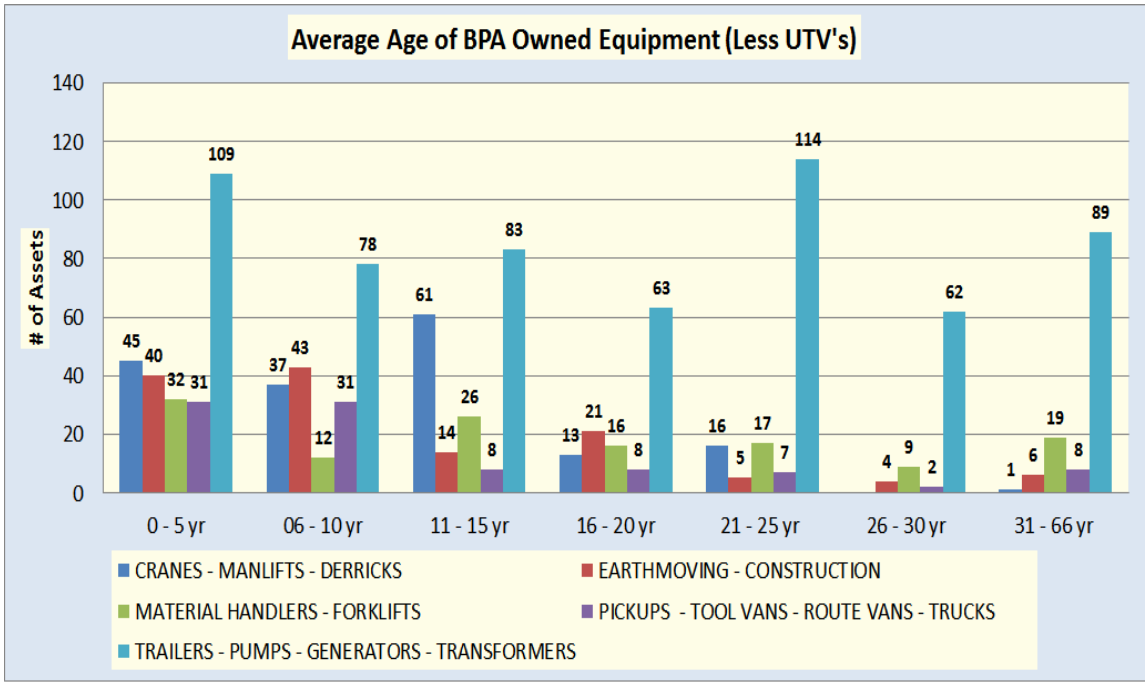
4.3 The Mobile Equipment Maintenance Division is responsible for the maintenance and repairs of the agency's fleet assets and the engine generators. These technicians support the agency's operations by managing outsourced activities along with mobile and in-shop maintenance. Maintenance levels range from basic lube and oil filter work to major overhauls performed on chassis and aerial equipment/cranes.

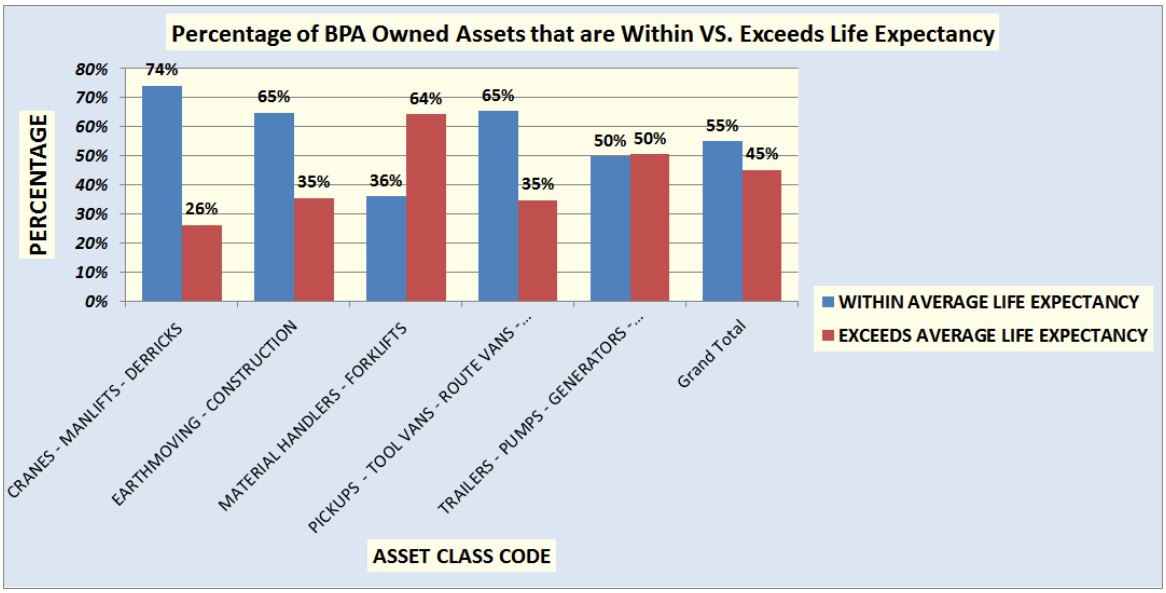
These technicians are also responsible for providing subject matter expertise related to GSA vehicle maintenance and vehicle up-fitting requirements, as well as damage assessments. In addition to vehicle maintenance, these technicians service the agency's 150-plus engine generators, some of which provide critical power needs at remote sites, ensuring substation and communication network systems remain operational year-round.

5. Age and Condition Assessment of BPA-Owned Fleet

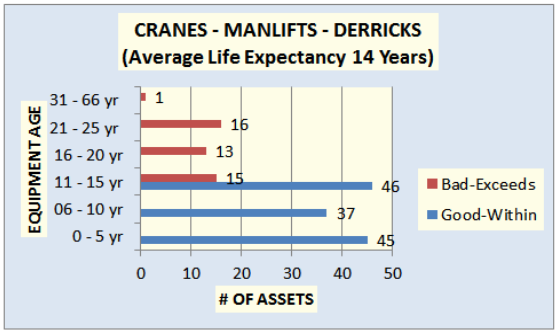
BPA's average fleet age ranges from approximately five to ten years for owned pickups, to approximately 15 years for the cranes, man-lifts and digger derricks. In comparison, the average age of the aerial equipment supporting the utility industry is approximately ten years. The average age of earthmoving and construction equipment is 10-15 years. This has improved significantly with the recent updating of approximately half the fleet of backhoes, material handlers and bulldozers that until recently averaged 25-30 years. In comparison, the average age for bulldozers and backhoes in the construction industry is ten years or less. The trend appears to be that BPA assets are five years older than the utility and construction industries. As for BPA's fleet of trailers, these assets average well over 20 years and in some cases over 40 years.

The graph below reflects the average age of BPA-owned assets by class code. The second graph illustrates the overall percentage of BPA-owned assets that are within, versus those that exceed, average life expectancy. The remaining five charts are broken out by class code and compare the current equipment age against the average life expectancy by quantities.

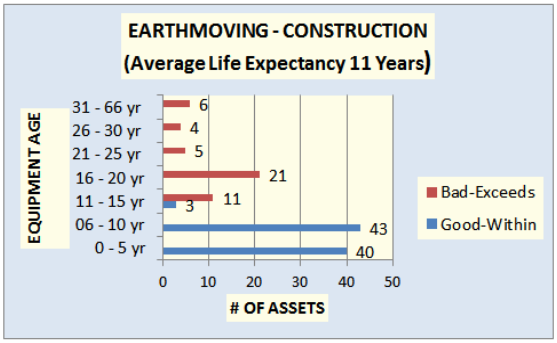




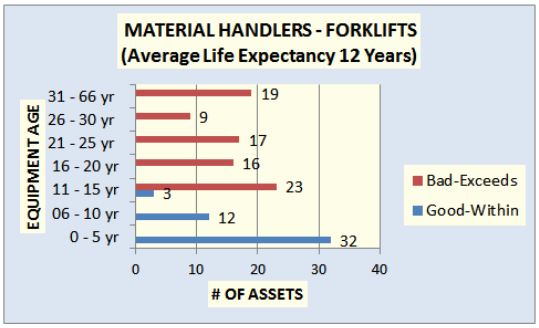
CRANES - MANLIFTS - DERRICKS (Average Life Expectancy 14 Years)		
ASSET AGE	Good-Within	Bad-Exceeds
0 - 5 yr	45	
06 - 10 yr	37	
11 - 15 yr	46	15
16 - 20 yr		13
21 - 25 yr		16
31 - 66 yr		1



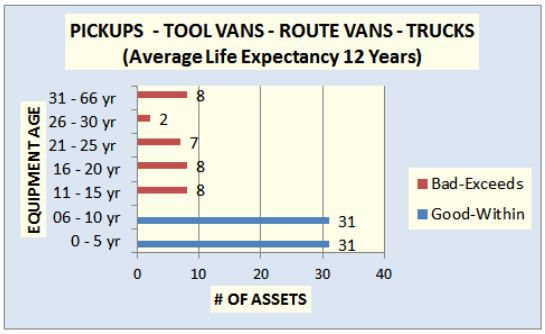
EARTHMOVING - CONSTRUCTION (Average Life Expectancy 11 Years)		
ASSET AGE	Good-Within	Bad-Exceeds
0 - 5 yr	40	
06 - 10 yr	43	
11 - 15 yr	3	11
16 - 20 yr		21
21 - 25 yr		5
26 - 30 yr		4
31 - 66 yr		6



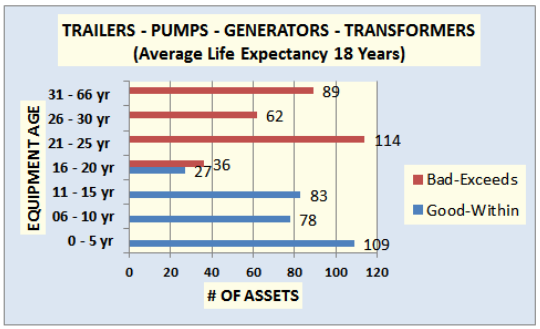
MATERIAL HANDLERS - FORKLIFTS (Average Life Expectancy 12 Years)		
ASSET AGE	Good-Within	Bad-Exceeds
0 - 5 yr	32	
06 - 10 yr	12	
11 - 15 yr	3	23
16 - 20 yr		16
21 - 25 yr		17
26 - 30 yr		9
31 - 66 yr		19



PICKUPS - TOOL VANS - ROUTE VANS - TRUCKS (Average Life Expectancy 12 Years)		
ASSET AGE	Good-Within	Bad-Exceeds
0 - 5 yr	31	
06 - 10 yr	31	
11 - 15 yr		8
16 - 20 yr		8
21 - 25 yr		7
26 - 30 yr		2
31 - 66 yr		8



TRAILERS - PUMPS - GENERATORS - TRANSFORMERS (Average Life Expectancy 18 Years)		
ASSET AGE	Good-Within	Bad-Exceeds
0 - 5 yr	109	
06 - 10 yr	78	
11 - 15 yr	83	
16 - 20 yr	27	36
21 - 25 yr		114
26 - 30 yr		62
31 - 66 yr		89



Furthermore, most of this equipment is utilized off-road in rough terrains/conditions that are more austere than the majority of the nation's utilities environment, which contributes to the acceleration of failure. The equipment age averages are significantly lower than in 2009 due to the efforts of the FMD to construct a proactive life cycle replacement plan that differs significantly from the previously decentralized management structure primarily based on the end-user's desires.

Consequently, this recent focus on capital investment has increased the reliability of equipment utilized by the crews in their daily/emergency work, and has reduced the risk of delayed outage and/or negative impacts to daily work schedules. Fleet Management's objective is to develop a long-term systematic procurement effort that is projected to

stabilize the procurement funding required to maintain an efficient and effective fleet. As the FMD has worked toward a long-term systematic procurement plan, these efforts have produced a more level spending trend, as seen in the 15-year capital procurement projection table in section 9.2 of this document. This long-term spending strategy will allow BPA to operate and maintain an updated and efficient fleet of vehicles. This effort will continue to enable the FMD to successfully forecast upcoming replacement costs, while reducing maintenance costs long-term.

As stated above, in regards to BPA's owned assets, the FMD is working diligently to develop and refine an effective vehicle replacement plan that is based on functional need and best cost/return, thereby optimizing the value of these assets. However, it continues to be a challenge due to the lack of accurate fleet management data, historically inaccurate reporting, as well as a historically inefficient FMS which was unable to provide accurate and easily retrievable maintenance trends and costs. This analysis will be significantly improved with the recent implementation of FleetWorX.

Although these constraints exist, it is apparent that numerous assets are either approaching the end of their useful life, or have surpassed it. It is evident that the FMD needs to determine what avenues to pursue, and the impact of these decisions. These considerations include whether it is more cost-effective to replace the assets, continue to operate and maintain an aging fleet, or dispose of and not replace under-utilized assets. These decisions will depend on impacts to the agency's mission. The criteria for earmarking an asset for replacement will be: unreliable for routine or emergency response; difficult to operate due to lack of operator proficiency (caused by equipment age and lack of standardization); or difficult to maintain due to obsolete parts and a gap in employee skill sets.

A key component of developing and executing an effective fleet replacement plan is the need for an extensive "right-sizing" analysis. Right-sizing is a management practice that builds and maintains a sustainable, fuel-efficient fleet by optimizing fleet size and composition. As such, the FMD can minimize vehicle use, conserve fuel, save money and ensure the proper equipment replacement.

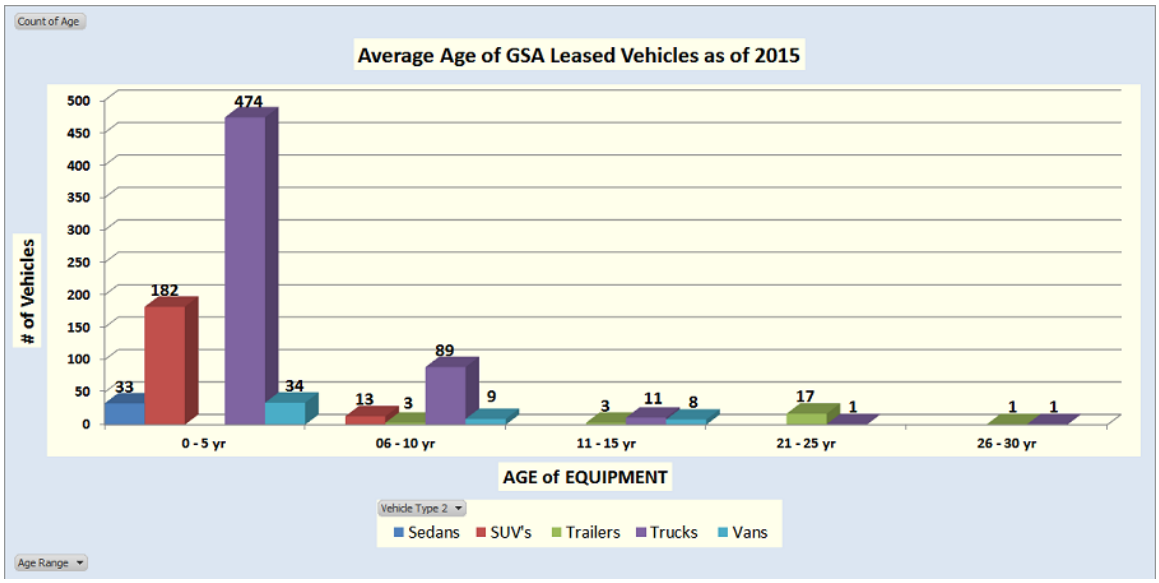
Three major components have driven this need to right-size BPA's fleet. One is the direction from the Secretary of Energy to reduce the Department of Energy's fleet of over-the-road vehicles by 35%. Secondly, Executive Order 13514 and its subsequent replacement, E.O. 13693 "Planning for Federal Sustainability in the Next Decade, state, "It …continues to be the policy of the United States that agencies shall increase efficiency and improve their environmental performance." It also establishes an integrated strategy toward sustainability in the federal government and reductions of greenhouse gas emissions. And thirdly, and most importantly, are BPA's business goals, regulatory requirements and the functional needs of the agency's maintenance crews.

The focus of this right-sizing initiative is two-fold. One is the development of vehicle standards, ensuring that the limited number of agency vehicular assets are appropriately allocated and outfitted to support BPA's current and future business requirements.

Secondly, the assurance that vehicles meet the functional needs of the associated work centers, while identifying reductions and reassignments of under-utilized assets.

5.1 BPA GSA-Leased Fleet

The average age of BPA's GSA-leased fleet is significantly less than that of BPA's owned fleet because it is based on detailed nationwide replacement criteria established by GSA. As seen in the graph below, the vast majority of the GSA-leased fleet operates with an average age of less than five years. These leased vehicles, though they cost the agency significantly less than owned assets, often require up-fitting to meet the functional needs of the field operations groups, resulting in significant costs to expense budgets. However, with the progressive efforts of the FMD to right-size the fleet, the development of a proactive procurement plan, and the development of craft-specific standard vehicle configurations, the agency has reduced the average upfit costs for our large service trucks by 25-35% (approximately $15,000) for the initial upfit and an estimated $35,000 per truck in subsequent replacements/upfits that recur every five to seven years. The current strategy to reutilize previously used up-fittings and track/inventory attachments in the FMS has proven to be successful, resulting in significant savings for the agency's 70 TLM work trucks and 20 HMEM service bodies. It is estimated that we will see an even greater savings, in the hundreds of thousands of expense dollars, as we continue to refine and manage this program. This would primarily impact Transmission.



5.2 Average Cost per Class Code for Over-The-Road Assets

The below table exhibits the **2015** calendar year's average cost per mile/vehicle (maintenance, fuel and lease cost) per class code for over-the road for both BPA-owned and GSA-leased assets.

Class Code	Description	Count	Cost Per Mile	Cost Per Vehicle
3.2	Mid-Size Car	33	$0.36	$3,609.59
7	Light Duty Pickup	209	$1.43	$5,678.31
8	Medium Duty Pickup	220	$1.99	$6,714.85
9	Heavy Duty Pickup	139	$1.20	$7,347.04
10.1	Compact SUV	13	$0.70	$5,194.20
10.2	Mid-Size SUV	16	$0.57	$6,266.41
10.3	Full-Size SUV	166	$0.73	$6,842.05
11	Van-Passenger	28	$1.00	$4,160.16
11.1	Van-Mini Cargo	5	$1.88	$3,415.62
11.2	Van-Cargo150	7	$1.00	$5,479.01
11.3	Van-Cargo250	9	$3.70	$4,410.20
11.4	Van-Cargo350	2	$0.77	$3,793.30
11.5	Van-Cargo450	2	$4.48	$4,441.51
12	Van-Cube/Walk-in etc.	16	$0.98	$3,329.22
13.1	Dump-Single Axle Truck	8	$1.59	$11,814.02
13.2	Dump-Tandem Axle Truck	4	$3.52	$13,496.30
14.1	Light Duty Service Truck	71	$42.45	$7,883.42
14.2	Medium Duty Service Truck	8	$7.71	$11,823.29
15	Stake Truck	19	$4.20	$7,468.93
16	Light Duty Aerial	28	$4.40	$12,915.65
17	Medium Duty Aerial	21	$7.21	$15,846.48
18	Heavy Duty Aerial	3	$14.34	$31,026.19
19	Digger Derrick	32	$12.05	$12,156.81
19.1	Super HD Diggers	4	$9.59	$12,692.30
20	Tankers	1	$6.79	$5,189.51
21	Semi-Tractor	14	$72.47	$28,445.46
22	Mobile Crane	11	$11.84	$22,272.81
99.1	Misc Vehicle	3	$14.20	$7,936.73
	Total	1092		

6. Heavy Mobile Equipment Maintenance Facilities

In general, the newly formed FMD has a proactive maintenance program focused on fleet asset preventive/corrective maintenance, as well as stationary engine generator repairs. Work such as vehicle modifications, temporary workload spikes and overly complex repairs are typically sent to vendors for maintenance support.

BPA's fleet mobile technicians operate out of 15 separate Heavy Mobile Equipment Maintenance (HMEM) facilities with varied capabilities that either support basic preventive and corrective maintenance tasks, as in the case of one-man shops; to major overhauls, at Vancouver and Spokane maintenance headquarters. The HMEM facilities range from relatively new and capable facilities to a number of drastically inefficient and antiquated infrastructures that lack the production capability required for today's larger, more complex utility equipment. In some instances, it is more efficient to perform vehicle maintenance external to the dedicated maintenance facility, utilizing the technician's service truck rather than the antiquated and/or inadequate facility.

The FCS study included an analysis of the capabilities and limitations of BPA HMEM facilities. As illustrated in the graph below (Section 6.1), the majority of BPA's facilities are below accepted industry standards and in some cases well below the threshold of functional efficiency required to perform sound operations. Although the report truly calls for the upgrade or replacement of a number of facilities, it specifically addresses the need to "remodel the Ross facility, to accommodate major work and inspections on most of the bucket trucks in the area." The FCS conclusion: With the combination of its centralized location and the Portland/Vancouver metro area's strong vendor support, the Ross facility upgrade will have the single biggest impact on an improved mobile fleet equipment maintenance capability. Our internal functional assessments concur with FCS findings.

6.1 Maintenance Infrastructure Functionality Ratings

The below graph reflects FCS's rating of BPA's maintenance facilities. Only five (now seven since the completion of the new Bell HMEM facility in 2011 and the Pasco facility in 2015) of the agency's 16 infrastructures (6 of the remaining 15 maintenance facilities) meet their recommended functionality rating. Four facilities (shaded in gray) have been identified as requiring immediate replacement or refurbishment.

The professional, yet subjective criterion, used to develop these ratings is designed to allow a direct comparison of each BPA Fleet maintenance facility and includes: size, condition, age, and the ability to meet current maintenance needs and functionality.

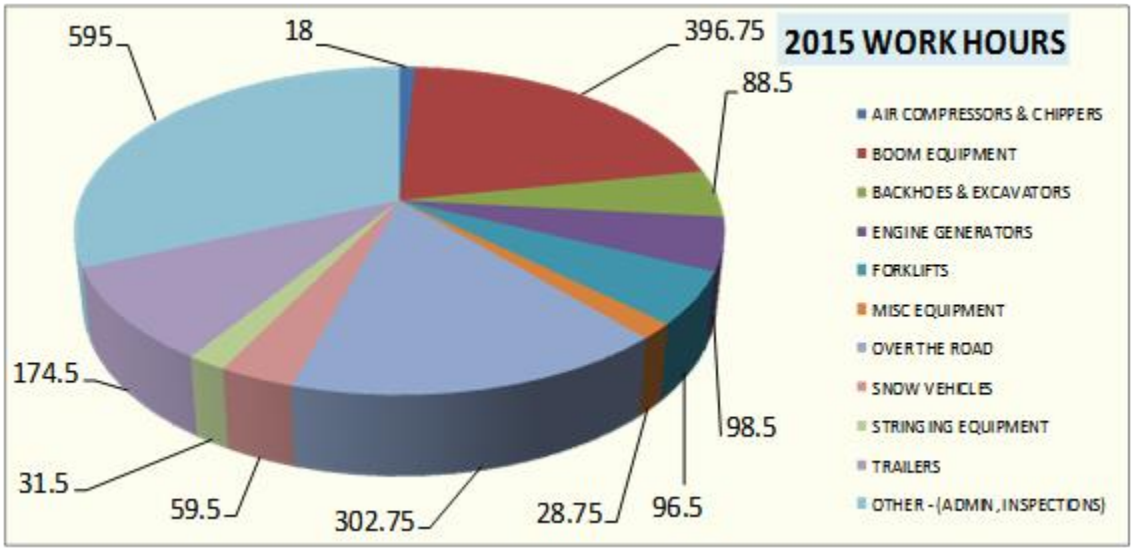
Location	FCS Rating
Idaho Falls, ID 83042	3
North Bend, OR 97459	6
Keizer, OR 97303 (Chemawa)	7
Ellensburg, WA 98926	10
Redmond, OR 97756	6
Malin, OR 97632	8
Olympia, WA 98512	8
Kent, WA 98042 (Covington)	4
Snohomish, WA 98290	7
Kalispell, MT 59901	7
Grand Coulee, WA 99133	4
Pasco, WA 99301	6
Eugene, OR 97405 (Alve)	8
The Dalles, OR 97058	8
Vancouver, WA 98666 (Ross) See note 1 below.	4
Spokane, WA (Mead or Bell)	3
Average Rating	6.2
FCS's Recommended Rating	8

Note: The Bell facility, replaced in 2011, and the Pasco facility, replaced in 2015, would now rate a 9-10.

The most obvious concerns were with facilities whose design and functional capability were built around the agency's needs in the 1940s and 1950s. Deficiencies included items such as not having sufficient overhead crane capabilities and overhead height in the shops to deal with today's man-lifts, dump trucks, cranes, etc. Also, rudimentary work-based efficiency items such as drive-through bays, overhead lube racks and vehicle lifts are generally the exception versus the rule. Although great improvements have been realized over the last few years with newer facilities in Bell (Spokane), Pasco, Ellensburg and The Dalles, internal expertise as well as this third-party consultant review, have deemed facilities in Vancouver, Covington, Idaho Falls and Grand Coulee to be at a minimum a hindrance to effective productivity, with the Ross facility identified as the most critical. In addition, these reviews found a number of the agency's facilities lack the tools, training and systems necessary to fully perform the task of heavy vehicle maintenance. However these have been areas of focus for the FMD and dramatic improvement has occurred in both shop tooling, shop safety, shop functionality and training. Yet major gaps in both tooling and training still must be addressed as well as the obvious issues associated with working out of facilities designed for jeeps and small pickups versus man-lift and crane vehicle maintenance. To understand the varying types

of maintenance BPA equipment technicians must perform, the graph below depicts the complexity and variety of jobs executed by the average HMEM facility.

DESCRIPTION	WORK HOURS	PERCENTAGE
AIR COMPRESSORS & CHIPPERS	18	0.95%
BOOM EQUIPMENT	396.75	20.99%
BACKHOES & EXCAVATORS	88.5	4.68%
ENGINE GENERATORS	98.5	5.21%
FORKLIFTS	96.5	5.11%
MISC EQUIPMENT	28.75	1.52%
OVER THE ROAD	302.75	16.02%
SNOW VEHICLES	59.5	3.15%
STRINGING EQUIPMENT	31.5	1.67%
TRAILERS	174.5	9.23%
OTHER - (ADMIN, INSPECTIONS)	595	31.48%
Grand Total	**1890.25**	**100.00%**



BPA's Fleet Management strategy regarding facilities and tools continues to be focused on identifying, refining and building on its core maintenance responsibilities for the agency's mechanics and continuing to address any emerging tool shortfalls, as well as mitigating and ultimately addressing our facility needs. BPA Fleet Management has been

working with Facility Asset Management to develop and execute a feasibility study on a new Ross HMEM facility. Recently this effort has been given approval to develop a detailed cost and construction plan that will move forward for approval in 2016. Subsequently, an analysis of BPA's maintenance facility needs regarding quantity and location will identify whether to recommend to Facility Asset Management the need to upgrade the Covington, Idaho Falls and Grand Coulee locations (and others), or to pursue other alternatives for either facilities or vehicle maintenance.

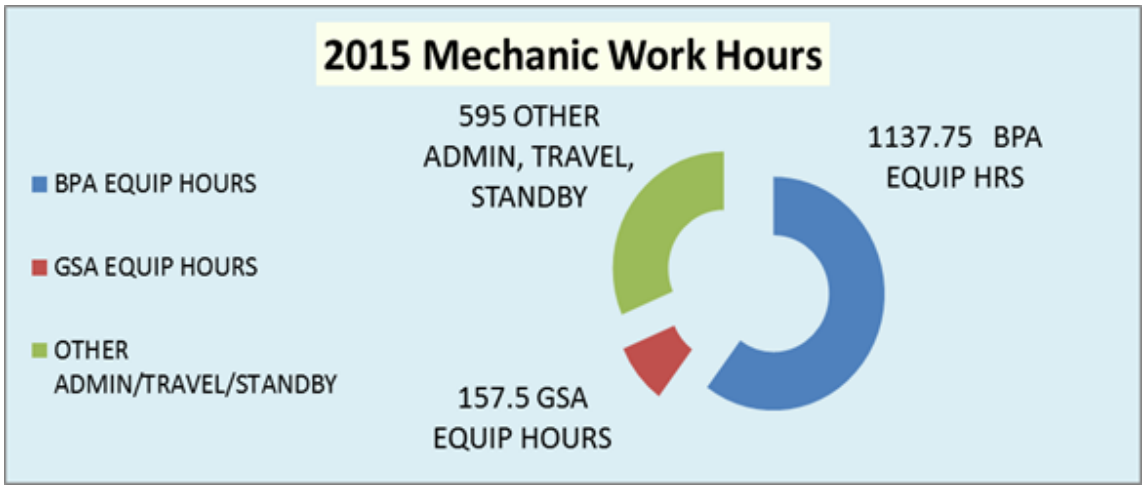
In regard to tools used in these facilities, an analysis of shortfalls and capability gaps has been conducted and Fleet Management has taken aggressive steps to ensure each shop has the tools required to perform its function. In addition, progress has been made on the development of a sustainable tool replacement program that ensures shop tools at all locations are being replaced when no longer functional.

6.2 Maintenance Capabilities and Priorities

BPA's HMEMs are a group of (government and contractor) highly experienced technicians who until recently lacked a systematic focus on technician training, maintenance priorities, maintenance practices and desired efforts. The FMD is now equipped to identify which maintenance tasks should be performed by BPA technicians, and in general what work should be contracted out to third-party vendors. This committed focus will successively provide a transparent path for technician training, manpower decisions and workload.

Currently the maintenance emphasis continues to be on improved workload scheduling and leveraging the entire cadre of mechanics into one group of HMEM technicians. BPA's FMD now has the improved visibility of systemwide maintenance requirements as well as the flexibility to move technicians to where the workload is, independent of their duty station. This improves the FMD's ability to support agencywide vehicle maintenance needs. These efforts continue to improve system reliability through a reduction of past due/overdue maintenance and also reduce costs related to outsourcing preventive and corrective maintenance. It is still believed that the use of vendors should only be considered during unforeseeable surges in workload and when vehicle modifications/specialized maintenance needs are well outside the technical scope of the technicians.

Below is the average workload breakdown of BPA's technicians with the "Other" category accounting for employee breaks, job briefings and other tasks that were difficult to break out due to previous data capturing practices.



As can be seen in the graph above, BPA technicians spend approximately 1295 hours a year, or just under 70% of their time, performing work directly attributed to mobile equipment, as well as engine generators. The remaining 30% of their time was executing the "other" tasks required to do their jobs. As provided through recent benchmarking efforts, BPA technicians' direct work compares to the utility industries' estimated average of 1382 hours.

7. Key Fleet Management Department Accomplishments

The KEMA and FCS studies concluded that there were significant opportunities to improve BPA fleet management operations. Thus far, a number of moves have been made to lay the foundation for a BPA FMD built on industry best practices and the ability to capitalize on these opportunities.

A. Effective October 1, 2011, BPA's Fleet Operations (that include Procurement, Analysis, Licensing, Maintenance, Rentals and Loan Pool operations) consolidated into a centralized department focused on managing fleet personnel and equipment as systematic assets. Led by the Fleet Manager, the FMD oversees vehicle maintenance and technicians, Loan Pool, as well as management/administrative staff throughout the agency's service region. The maintenance group works, in unison with the administrative staff, to manage the procurement of owned/leased equipment, ensure regulatory compliance, administer data needs and conduct the mandatory/discretionary reporting requirements of the agency. Additionally, there are five personnel who support the agency's temporary equipment requests through internal asset availability, or through third-party rentals.

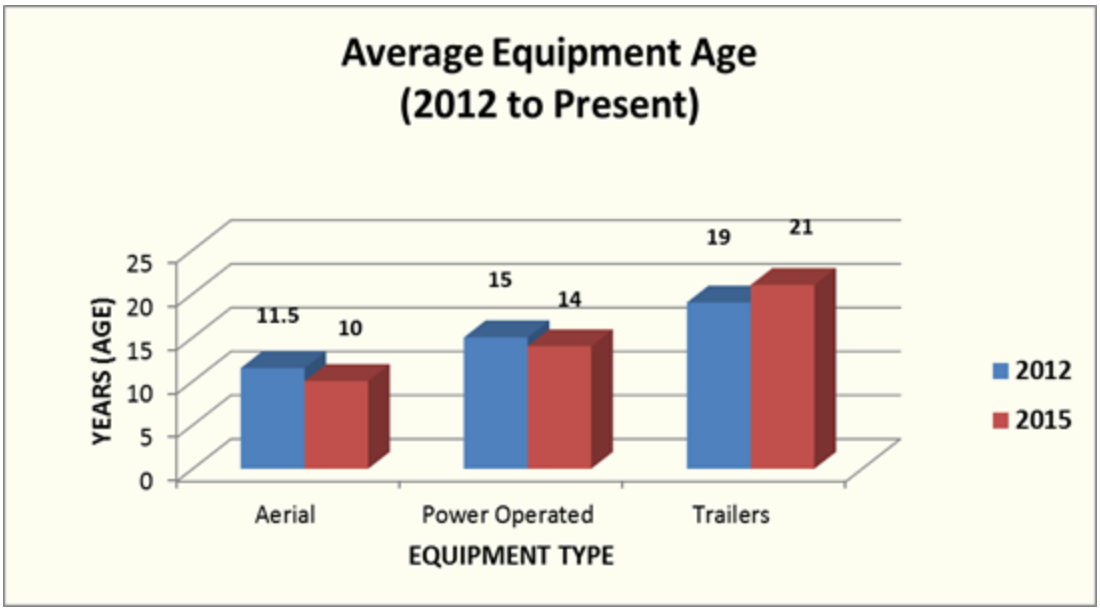
B. In 2015 BPA purchased the Asset Works Fleet Management Software system (referred to as FleetWorX) to function as the Fleet Management system. After a go-live in April of 2016, BPA's Fleet Management organization is able to manage its fleet through more accurate and relevant information.

C. Over the last two years, BPA's FMD has transitioned from a solely time-based maintenance model to a predominantly Use Based Maintenance model that takes into account the unique expectations associated with electric utility equipment as well as ensuring regulatory compliance. This effort is expected to result in improved equipment compliance, reliability and overall equipment condition while reducing BPA services by an estimated 400 service orders annually. It also reduces costs and compensates for the maintenance hours needed to perform increased inspections and standardized maintenance procedures to ensure equipment compliance.

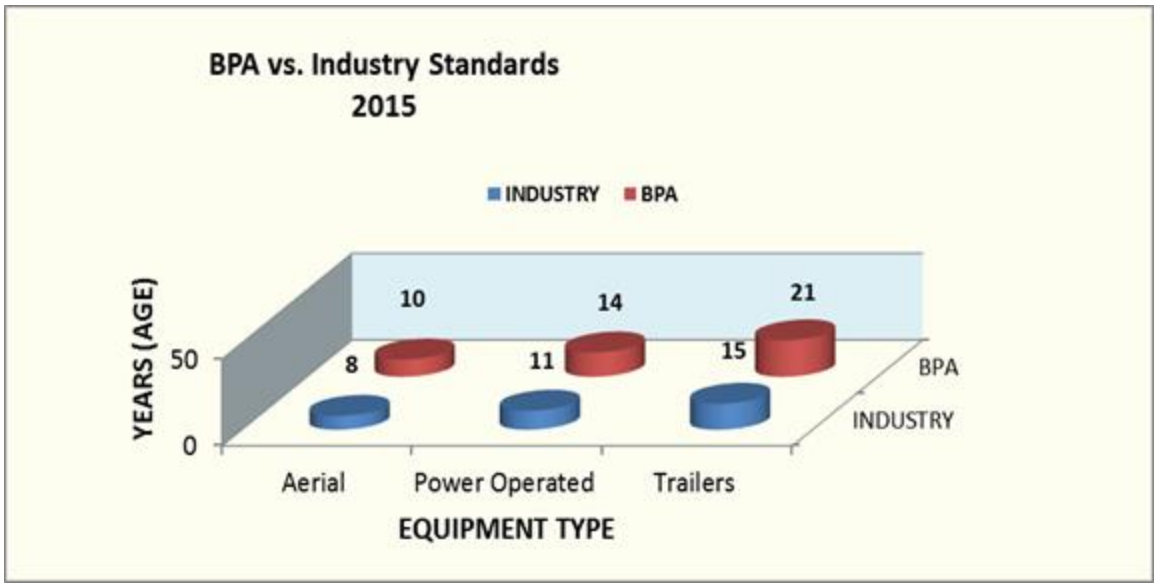
D. From 2013-2015, the FMD was able to work with BPA's Transmission organization in the development of a standardized Line Maintenance 1-ton work rig. This effort has resulted in reduced average upfit costs for these large service trucks by 25-35% (approximately $15,000) for the initial upfit and an estimated $35,000 per truck in subsequent replacements/upfits. For these 70 vehicles, BPA will look to save an estimated $1 million for the initial upfits (previously expense, now capital) and an estimated $2.5 - $3 million for the subsequent upfits.

E. Recent procurement efforts have been geared toward the replacement of aging aerial devices ranging from small manlifts, digger derricks and heavy cranes to transportation tractors and line stringing equipment. The substantial investments over the past three years, coupled with the procurement expenditures of 2013-2015, have worked to transition BPA's fleet out of a backlogged replacement cycle for aging and obsolete equipment, to a significantly improved operationally efficient, effective and reliable one. These newer assets will result in reduced operational costs when considering the full life-cycle cost of ownership and operations. Furthermore, the new assets should significantly reduce the greenhouse gas emissions/carbon footprint, thereby facilitating BPA's ability to achieve targeted governmental compliance goals.

F. These advancements allow for further concentration to be placed on vehicle technician training, diagnostic equipment upgrades, and tool purchases as the FMD works toward standardizing its fleet. Moreover, it will eliminate the skill-level and technology gap that exists between our 1970s, '80s and '90s vintage vehicles when compared to the improvements in equipment technology over the last 20-plus years.



As previously discussed, BPA's FMD has recently made significant efforts to improve the material condition of the agency's Fleet/Mobile Equipment assets. In the recent past, BPA has replaced a significant number of legacy vehicles in excess of 20-30 years in age, in poor condition and cost prohibitive to operate/maintain. BPA's efforts to improve the agency's mobile equipment capability and reliability have reduced the average age of the approximately 150 vehicles, as well as aerial equipment, cranes and trucks, from 16 years in 2010 to 11.5 years in 2012, and now to an average age of 10 years old. These efforts have also reduced the average age of power-operated equipment (dozers, backhoes, snow cats, skid steer loaders, etc.) from 25 to 14 years and trailers down to 21 from an estimated average of 25 years old. In comparison, utility industry averages for aerial equipment are approximately 7.5 years, approximately 11 years for power-operated equipment and about 15 years for trailers. This does not take into account approximately 900 GSA-leased vehicles in the BPA fleet, which average about three to four years old due to GSA's robust lease rotation cycle.



The expectation of the FMD continues to be to develop standards, as well as life cycle analysis, that will enhance managing the fleet based on asset management principles and treat the fleet as a "Systematic Asset" as opposed to over 2,000 individual items. This will entail identifying optimum replacement windows for equipment based on operational and maintenance costs, working with end-user groups to develop vehicle standards to maximize the efficient use of existing assets, capitalizing on the usage of the current fleet inventory and right-sizing where feasible. This asset management approach will launch the creation of a leaner, safer, more cost-effective and efficient fleet of vehicles and mobile equipment.

8. Risk Management

There are numerous risks that impact the implementation of the Fleet Asset Management Strategy. These management risks center around BPA's aging fleet, increased operational timelines/maintenance costs realized, antiquated facilities and/or tools, ineffective utilization of the FleetWorX Fleet Management Software system, limited access to short-term rentals and long-term leases or purchases, inconsistency of vehicle maintenance and process standardization, lack of adequate staffing, limited funding allocated for procurement plan, right-sizing issues and the ability to meet government mandates of greenhouse gas (GHG) emission, vehicle reporting, vehicle tracking and fossil fuel reductions.

All these risks will be identified, including their source, elements and consequences/likelihood, with recommendations for mitigating these issues:

- **Ineffective utilization of the FleetWorX Fleet Management Software system**

- **Risk Identification:** There is a risk that after the implementation of FleetWorX the Fleet Management Department will not utilize the system correctly or effectively and will have poor user adoption.

- **Source of Risk:** BPA has had challenges in its history of software system adoption. If FMD employees do not utilize the system as designed, results will be suboptimal.

- **Elements of Risk:** Fleet employees are geographically dispersed, which makes assurance of uniform system utilization difficult. User adoption is key to ensure full utilization of FleetWorX and associated processes.
- **Consequences:** If FleetWorX is ineffectively utilized the expected savings and improves will be suboptimal.

- **Likelihood:** The FMD has a high level of confidence that through the addition of key personnel, shifting organizational charts to allow for more effective supervisor-to-employee ratios, as well as transparent and continuous training, the system will prove to be fully functional as planned.

- **Mitigation:** Through a transparent and collaborative system rollout we believe that the acceptance and full utilization of the FleetWorX system will materialize. We also believe that the transparency of the system for all users will make incorrect usage and opportunities for training more evident. The system rollout has been applauded by the vendor as one of the most effective and deliberate rollouts he has seen, a testament to our dedication to ensuring FleetWorX is correctly implemented.

- **BPA's Aging Fleet**

  - **Risk Identification**: Not meeting agency's mission and needs of its customers in a timely manner.

  - **Source of Risk**: BPA's fleet is over age in many categories, resulting in frequent breakdowns, excessive repairs, and increased costs that could delay scheduled and/or unscheduled work requests.

  - **Elements of Risk**: The lack of reliable assets, along with frequent breakdowns due to aging assets, directly impact the ability of the agency's field electric crews (as well as their support group) to ensure the transmission of safe and reliable power to its customer base.

- **Consequences**: Response time to a line outage for BPA customers is delayed significantly due to the unexpected breakdown of a BPA asset.

- **Likelihood**: Although less than in the past due to our procurement efforts of the last 5 years, the potential for this scenario is still very real. As BPA's fleet continues to age, the likelihood of increased breakdowns will contribute to further potential delays in the field, impacting Transmission reliability and cost.
  - **Mitigation**: To lessen or eliminate this risk, begin to renew the fleet by developing an empirically validated vehicle replacement cycle with a sound 15 year procurement plan and a three year budgeted procurement cycle, identifying critical priority assets with the most impact on the agency's mission.

- **Increased Operational Timelines and Maintenance Costs Realized**

  - **Risk Identification:** Significant increases to operational timelines and increased maintenance costs.

  - **Source of Risk:** The FMD is operating with inefficient assets that have exceeded their useful life.

  - **Elements of Risk**: This deficiency contributes to substantial operational, fuel and maintenance costs in continuing to maintain this aging fleet, which in some instances requires obsolete parts.

  - **Consequences:** Asset availability and maintenance downtime will continue to increase, as well as operational and rental costs, directly impacting the agency mission capability.

  - **Likelihood:** The probability of this risk is already apparent and is continuing to hinder Fleet Management's ability to provide reliable, fuel-efficient assets to its customers and field crews.

  - **Mitigation:** Eradicating this known risk requires beginning to renew the fleet, reducing operational, rental, fuel and maintenance costs by constructing a sound 15 year procurement plan, with a three year funded procurement cycle, that identifies critical priority assets that have the most impact to the agency's mission. This will enable the FMD to provide reliable, fuel-efficient assets at reduced rental rates.

- **Antiquated Facilities and/or Tools**

  - **Risk Identification: I**nhibiting the timely completion of equipment maintenance as well as increased costs, either through labor hours or

vendor maintenance requirements.

- **Source of Risk:** Mobile equipment maintenance is being performed in numerous antiquated facilities, with inadequate tools that contribute to some vendor repairs. These deficiencies include insufficient facility size, roof heights, tools, overhead cranes, layouts, etc.

- **Element of Risk:** These challenges impede the FMD's ability to transition toward a more modernized operation founded on industry and mobile equipment maintenance best practices.

- **Consequences:** If funding is not provided to improve mobile equipment maintenance infrastructure and updating of tools, the issues identified under "Risk Identification" will remain.

- **Likelihood:** The odds of this risk have been documented by an independent study performed by FCS.

- **Mitigation:** Eliminating this risk will not be an effortless task. Funding availability will be the key component in order to raise BPA HMEM facilities to accepted industry standards, which subsequently will reduce associated maintenance cost.

- **Limited Access to Short-Term Rentals and Long-Term Leases or Purchases**

  - **Risk Identification: N**ot having the means to acquire equipment either by short-term rentals, long-term leases or immediate purchases to support BPA's Transmission organization's daily crew work or major damage/unforeseen repairs.

  - **Source of Risk:** Limited loan pool assets, the absence of pre-existing vehicle/equipment contracts, a shortage of local outside sources and inadequate procurement funds are all key components contributing to the struggles faced by the FMD to supply BPA's Transmission crews with the vehicles/equipment required to support their mission, as well as BPA customers.

  - **Elements of Risk:** The limitations addressed under "Source of Risk" section impede the FMD's ability to expeditiously provide desired replacement assets when major equipment damage occurs, resulting in extensive downtime or unanticipated repairs.

  - **Consequences:** If these major concerns are not remedied, they would affect the ability of the BPA Transmission organization to perform scheduled and unscheduled work.

- **Likelihood:** The chance of significant work delays occurring due to the lack of alternative means of acquiring assets is plausible.

- **Mitigation:** Resolving this predicament will necessitate right-sizing the loan pool, drafting concrete vehicle/equipment contracts with vendors in the best interest of BPA, and budgeting appropriately for procurement to support these unforeseen contingencies. The FMD will be set up to rent, but historical data will primarily dictate owned assets. At this time, the limited availability of local outside sources is beyond our control, and will be researched further.

- **Inconsistency of Vehicle Maintenance and Process Standardization**

  - **Risk Identification: I**nconsistency in vehicle maintenance, process standardization, and fleet technician skill sets, which collectively have a profound impact on vehicle maintenance.

  - **Source of Risk:** Conflicting maintenance priorities and localized procedures throughout 15 maintenance facilities, non-existent Standard Operating Procedures (SOPs), and historically low technical training result in maintenance repair not being performed, and/or not being performed correctly. This contributes to excessive vendor use, rework and additional downtime.

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  - **Elements of Risk:** These disparities show a need for systemic focus on maintenance priorities, practices and the desired concentration of effort. In their absence, consequences may be poor maintenance planning, equipment failure, delayed turnaround time and possible harm to employees or property.

  - **Consequences:** These inconsistencies among the 15 maintenance facilities, the absence of SOPs, and limited technical training will foster a cycle of discrepancies that result in additional costs for BPA and potential effects on customers.

  - **Likelihood:** This risk is low due to the formation of the centralized FMD as well as the development of visible and consistent maintenance procedures and the procurement of a dedicated Fleet Management Software system.

  - **Mitigation:** The FMD emphasis is to continue to ensure the accuracy of standardized maintenance practices/procedures and to develop SOPs that clearly identify performance processes to improve visibility of systemwide maintenance needs, in tandem with the flexibility to relocate maintenance technicians where workload dictates. Furthermore, the FMD will continue to develop a robust training plan

that will provide BPA's technicians the skill sets necessary to effectively and efficiently perform work on the agency's varied fleet assets. These efforts will enhance system reliability through a reduction in past due and/overdue maintenance, as well as reduce overall maintenance costs, limit vendor usage and please FMD customers.

- **Lack of Adequate Staffing**

  - **Risk Identification:** **N**ot achieving the milestones of FMD Strategy Plan due to the lack of dedicated resources for leading implementation charters and steering change-based results. Staffing requirements and skill sets now may differ once the FMD is well established.

  - **Source of Risk:** Undefined FMD organizational staffing requirements for the short and long term are the consequence of an organization that has undergone significant change the last 5 years and has had limited ability to hire. Combined with a new Fleet Management System, the FMD's ability to clarify the appropriate staffing level proves more difficult than anticipated. Resource funding constraints and the lack of the required skill sets could continue to impact some performance indicator goals of the strategic plan, reflecting the optimal number of technicians needed to maintain BPA equipment.

  - **Elements of Risk:** These challenges place restraints on the FMD in its ability to fully execute an efficient and effective FMD Strategy Plan when adequate staffing level requirements are not yet determined, desired skill-set resources and additional funding for current/future staffing levels are unknown.

  - **Consequences:** If staffing and skilled resources are not defined for the short/long term and billet funding is not pre-determined, the FMD Strategy Plan will struggle to achieve all its intended milestones.

  - **Likelihood:** The prospect of this risk materializing is favorable if these issues are not addressed promptly.

  - **Mitigation: In FY16 the FMD began to implement a reorganization to improve effectiveness and efficiency. The reorganization will span FY16 and FY17. In the spirit of continuous improvement FMD will assess** the potential for improvement in certain phases of the long-term FMD Strategy Plan by conducting a staffing study to determine appropriate levels of personnel required (short and long term), performing desk audits on each position, and identifying candidates with the desired skill sets. Foremost, compiling and documenting all phases of these processes to

justify funding for additional resources, if required, would be advantageous to the success of all phases of the FMD Strategy Plan.

- **Right-Sizing Issues**

  - **Risk Identification:** **N**ot possessing the appropriate standardization, configurations and size of fleet assets to meet the compilation of tasks being accomplished on a regular basis.

  - **Source of Risk:** The lack of a comprehensive transportation review with all end-users to fully understand their mission and properly identify vehicle/equipment requirements. And, the dilemmas of investigating ways to address vehicle shortfalls and fleet downsizing that achieve a transformation of behavior within the organization.

  - **Elements of Risk:** These issues impede the FMD from optimizing its assets for building and maintaining a sustainable, fuel-efficient fleet. The retention of aged assets, specialized units that are rarely utilized and improper asset assignments all contribute to inefficient operating practices, increased maintenance and fuel costs, in conjunction with the inability to meet governmental alternative fuel mandates.

  - **Consequences:** If an across-the-board transportation review is not performed, and concurrence of all participants on the recommended changes is not achieved, the attempt to right-size the fleet will not evolve.

  - **Likelihood:** The possibility of right-sizing failure is dependent upon the methods of choice used to determine data collection for changing fleet makeup. If a comprehensive transportation review is performed the likelihood of an ideal fleet is achievable.

  - **Mitigation:** Right-sizing must be fact-based, rational and defensible to all parties. This process involves analyzing and understanding the collection of tasks that the agency needs the fleet to accomplish. Conducting a thorough transportation review, with concurrence from all customers/in-house personnel, will mitigate right-sizing efforts. This review should account for the daily needs of the agency's personnel and mission, and should also drive the replacement or disposal of assets that are technologically obsolete, have un-necessarily low utilization or can be more effectively sourced through third-party rentals. The benefits of vehicle and fleet right-sizing include: more efficient operating practices, standardization, reduced fuel consumption and operating costs, and more available expense and capital funds.

- **Meeting Government Mandates of GHG Emission Reductions and Fossil Fuel Reductions**

  - **Risk Identification: T**he ability to meet federal regulations, to include EO 13693 mandating GHG emission and fossil fuel reductions.

  - **Source of Risk:** With the absence of a sound right-sizing plan, a strategic emission/fossil fuel reduction plan and limited AFV infrastructures, the GHG target and fossil fuel reductions may not be realized. This could require the FMD to weigh the potential impact on BPA's missions, considering available technology and the timeframe needed for complying. Conflicting priorities may emerge in implementing the goals of the executive order.

  - **Elements of Risk:** These setbacks inhibit the FMD in meeting EO 13693 requiring federal agencies to set GHG emissions reduction targets, increase energy efficiency, and reduce fleet petroleum consumption 30% by 2025 from a 2014 baseline. This EO also calls for 50% of an agency's passenger vehicles to be zero emission or plug-in hybrid by 2025.

  - **Consequences:** If a right-sizing, GHG emission/fossil fuel reduction plan is not implemented, then all efforts in meeting federal regulations and EO 13693 are unattainable.

  - **Likelihood:** Portions of this risk are unlikely to materialize. The FMD continuously works to address the right-sizing issue and EO 13693 by developing a plan of action. Recently, the FMD has modernized some of its older fleet, thereby reducing GHG emissions and petroleum usage. However, the availability of AFV infrastructures will continue to be an issue and the compatibility of the BPA mission with zero-emission and plug-in hybrid vehicles is a concern.

  - **Mitigation**: Right-sizing the fleet and a strategy for meeting EO 13693 must be executed. Fleet right-sizing will reduce the amount of capital investment in vehicles and lower GHG emissions. Alternative-fuel and fuel-efficient advanced vehicles will reduce petroleum use and can be economical options for the FMD. Cost savings from vehicle maintenance, operations, and fuel use typically offset higher purchase prices.

9. Prioritization of Repairs/Refurbishment vs. Replacement

Life cycle costing plays a huge role when determining whether to maintain and repair or replace an asset. Seldom is it more economical to replace an asset before its life expectancy, unless it has failed or additional capacity or capability is required. In general, it is more economical to maintain and repair an asset in order to extend the life

cycle where feasible. The criteria listed below are designed to facilitate sound repair versus replace decisions.

It is BPA's policy that assets be considered for replacement when:

- An asset is near or beyond its expected life;
- The asset reliability and the consequences of failure poses an unacceptable risk;
- The repair/refurbishment costs exceed the life cycle cost of an asset replacement;
- The asset's performance has been unacceptable and corrective maintenance measures will not lead to acceptable performance;
- Additional asset capability is required and the replacement equipment provides that additional capability while improving operations, reducing costs, and making it easier to maintain;
- The existing equipment is technologically obsolete, spare parts are expensive or hard to get, and skill requirements to properly repair and maintain are difficult to find;
- The existing equipment poses an unacceptable security risk, health and safety risk, or environmental risk, and the cost to mitigate the risk exceeds the asset life cycle replacement cost.

Due to limitations associated with BPA's informational resources and the previous FMS shortfalls, priority repair/refurbish vs. replacement management decisions are based upon the following estimates: cost information, age, estimates on efficiency gained with new equipment, ease of maintenance, parts availability, and anticipated future maintenance costs. In general, the majority of equipment replaced over the last two years and planned for the next several years have exceeded optimal life cycle for reliable and cost-effective operations. Efforts are underway to justify the need for improving the fleet management tracking system, develop utilization standards, benchmark with like utilities (through nationally recognized organizations such as Utilimarc), and build the capability to execute a robust vehicle life cycle analysis.

9.1 Prioritization of Capital Replacements

As for prioritization of capital replacements, the FMD usually places the first priority on those operational assets necessary to maintain system reliability and maintenance, or equipment required for regulatory compliance. Difficult to rent items such as man-lifts, digger derricks and cranes get first priority, followed by other mission essential items such as tool vans and line stringing equipment that are needed to maintain the systems operating during normal time, in addition to emergencies.

The second capital replacement priority is on assets essential for operational support functions such as Fleet Management, Transportation, Transmission Engineering, Facilities Management, etc. Introduction of decisions that pertain to new capability to the FMD fleet are vetted through BPA's Fleet Council for review and approval to ensure agency fleet assets only increase due to changes in mission or agency direction.

9.2 Fleet Capital Replacement Costs

The fleet budget is comprised of capital for equipment replacements and operations support, as well as expense dollars for maintaining/operating and supporting fleet assets needs. In regards to capital replacement, recent FMD efforts are keenly focused on updating BPA's fleet to approach utility industry standards which have evaluated life cycles and costs. Through these efforts, combined with the introduction of a fleet-wide life cycle analysis capability, the FMD foresees a reduction in annual capital expenditures for vehicle replacement. The projected end results are the stabilization of expenditures/ replacement, in concert with an evenly distributed replacement program for the long-term.

These numbers will account for the sizeable costs of up-fitting both the line patrol and mobile technician vehicles that were previously charged to the Transmission Field District expense budgets with vast variances in dollars and capability between locations. The efforts of the FMD have reduced overall agencywide fleet costs by approximately $15,000 per vehicle for the initial upfit (savings of approximately $750,000 - $1 million) and we expect to see a savings of $35,000 for up to two subsequent replacement upfits per vehicle, an estimated savings of $3.5 million. These savings are directly associated with standardizing costs, ensuring multiple uses of the equipment being installed and managing the installation process.

2017-2022 Fleet Capital Replacement Plan

	FY 14	FY 15
Capital Replacement Actuals	$1,112,780.83	$2,185,628.62

	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30

Capital funds	$6.2 M	$6.7 M	$7.2 M	$7.5 M	$8.0 M	$8.2 M	$8.5 M	$9.0 M	$9.2 M	$9.5 M	$9.8 M	$9.8 M	$10.0 M	$10.0 M
# units	55	46	55	43	57	60	55	55	55	55	55	55	55	55

The fleet replacement forecast, and associated capital cost estimates, are based upon actual costs to replace aerial and boom equipment prior to any expected major costs. Other equipment replacements are based upon estimated end-of-life decisions determined by age and obsolescence. As the centralized FMD matures and proceeds with the implementation of new vehicle and maintenance standard processes, a more comprehensive, transparent and robust vehicle replacement/acquisition plan will emerge.

9.3 Other Capital Costs

Other Capital is defined as operational costs, primarily travel, labor and vehicle use rate charges that are incurred by the Loan Pool support personnel and vehicle technicians/mechanics while supporting specific capital projects not associated with a specific vehicle, i.e. supporting a TLM crew on a wood replacement project.

	FY 14	FY 15
Other Capital actuals	$ 995,585.63	$ 1,011,501.06

	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30
Other Capital Forecast	$1.6M	$1.7M	$1.8M	$1.9M	$2.0M	$2.1M	$2.2M	$2.3M	$2.4M	$2.5M	$2.6M	$2.7M	$2.8M	$2.9M

9.4 Fleet Management Expense Forecast

Assumptions in Fleet Management Expense forecast: The Fleet Management budget includes costs for personnel, travel and training costs for 53 employees (43 BFTE and 10 CFTE), the management of the equipment and Tool Loan Pools, as well as the functional costs associated with vehicle maintenance.

2015-2022 Fleet management – Expense

2015-2016 Actuals

	Loan Pool	Vehicle Maintenance	Procurement, Policy, Analysis	Total
FY 14	$1.77M	$8.02M	$844,054	$9.55M

FY 15	$1.72M	$6.94M	$598,496	$10.34M

2017-2030 Forecast

	Loan Pool	Vehicle Maintenance	Procurement, Policy, Analysis	Total
FY 17	$1.85M	$7.75M	$0.85M	$10.45M
FY 18	$1.9M	$7.9M	$0.9M	$10.7M
FY 19	$1.9M	$8.1M	$0.95M	$10.95M
FY 20	$1.95M	$8.25M	$1.0M	$11.25M
FY 21	$1.95M	$8.4M	$1.0M	$11.35M
FY 22	$1.95M	$8.55M	$1.05M	$11.55M
FY 23	$2 M	$8.7M	$1.05M	$11.75M
FY 24	$2 M	$8.85M	$1.1M	$11.95M
FY 25	$2.05M	$9 M	$1.1M	$12.15M
FY 26	$2.05M	$9.15M	$1.15M	$12.35M
FY 27	$2.1M	$9.3M	$1.15M	$12.55M
FY 28	$2.1M	$9.45M	$1.2M	$12.75M
FY 29	$2.1M	$9.6M	$1.2M	$12.9M
FY 30	$2.1M	$9.75M	$1.25M	$13.1M

Assumptions employed to develop capital and expense cost forecast were based on historical experience and anticipated savings attained through the centralization of fleet operations. The expenses associated with vehicle maintenance include major overhaul services of the agency's aerial and boom equipment, a cost we have seen reduced over time due to our move to Use Based Maintenance. Cost to perform these overhauls is highly variable (estimated range of $100,000 to $200,000) due to limited historical data and the unpredictability of each unit's overhaul requirements, adding risk to the accuracy of any forecast.

These cost estimates do not capture GSA lease and fuel costs associated with assets that are not assigned to the FMD. These costs are captured in monthly charges and use rates collected from the user group's individual department budget.

10. Alternative Strategies/Scenarios Considered and Business Model Strategy Chosen

To determine the best avenue for managing BPA's fleet assets long-term, three alternatives were examined with one being adopted: 1) Status Quo; 2) Outsourcing of Fleet Operation; and 3) Centralize Fleet Operations.

The Status Quo alternative was to remain a decentralized fleet department. As a result of two recent independent studies conducted by KEMA and FCS, it was apparent that

BPA's fleet management practices were not in compliance with industry best practices. Moreover, internally, it was evident that BPA's fleet was being replaced in a manner that did not take into consideration analysis of operational needs, coupled with lack of focus on life cycle analysis or current/future maintenance capabilities. After analysis, it was determined that continuing these practices would have negative consequences on BPA policy and regulatory compliance, equipment reliability and financial efficiency. Therefore, in the best interest of BPA's mission and its fleet, this alternative was not chosen.

The second alternative was to outsource the entire BPA Fleet function. The risk of turning over fleet management to a third party was a real concern, and whether the transportation business would meet BPA's productivity and quality goals was uncertain. Two contributing factors in eliminating this alternative were the A-76 study that concluded the agency should retain the maintenance function in-house, and the recognition that outsourcing BPA fleet function would cost approximately $1 million more annually than retaining the entire transportation function in-house.

Another factor was that the internally resourced transportation model generally tends to be more efficient and reliable. Nonetheless, the major component for eliminating this alternative was the notion that if Fleet Management were managed efficiently and effectively, focusing efforts on performing core work, then BPA maintenance technicians would be more cost-effective and responsive. Though, BPA maintenance technician hourly wages are at the upper end of current market trends compared to other corporations, this is quickly offset by benefits loading and corporate profit margins. It takes subject matter expertise and unique skill sets, which demand competitive wages, in order to maintain equipment ranging from stationary engine generators to bulldozers and man-lifts.

These technical skill sets and subject matter expertise, as highlighted by the FCS study, are diminishing commercially due to retirements. And, the current industry trend is to retain heavy equipment maintenance in-house. Finally, the increased reliability afforded by internally managed and systematically focused technicians reduces the agency's risks associated with downtime of equipment. Therefore outsourcing the transportation function was rejected.

The third BPA business model alternative was to retain in-house transportation functions by centralizing fleet operations. This alternative, which was adopted, was deemed to be consistent with industry best practice and more efficient than a decentralized approach.

10.1 Key Factors that Showcase the Chosen BPA Business Model

A few key success factors that are believed to showcase this centralized BPA business model and have proven to be successful are: reduction in vehicle modification costs; reductions in corrective maintenance actions and costs; and a by-asset life cycle analysis that predicts vehicle replacement years in advance and reduces vehicle downtime as

technicians become more knowledgeable and trained in the variable equipment types BPA operates.

As expected by centralizing the FMD, the risk level associated with equipment maintenance and the compliance requirements associated with vehicle maintenance have been significantly reduced. However, the original business case expectation that a new BPA Fleet Management business model would reduce total agency fleet costs associated with Fleet Management operations (GSA leases, contracted maintenance, fleet right-sizing, fuel use reductions, and other efficiency measures) by approximately $1 million in annual expense, as well as capital savings, has not been verified. This is primarily because of the inability to capture quality cost/benefit information to substantiate valid benefits. Newly deployed systems and processes will better facilitate benefits capture in out years. Some of the targeted savings have been offset by improved reliability and compliance, although we continue to expect to see major savings baselined off of our now-compliant maintenance practices.

10.2 FMDs Asset Strategies

Below is a synopsis of the FMD's asset strategies that have been addressed and elaborated on in Sections Two and Eight of this strategic plan:

- Develop a pragmatic validated vehicle replacement cycle with a sound 15 year procurement plan, by means of a three year budgeted procurement cycle;
- Right-size through a systematic analysis in conjunction with reducing fossil fuel use;
- Establish policy on the types of equipment that should be agency-owned versus locally rented;
- Focus on preventive/predictive maintenance;
- Develop and implement a professional training and certification program;
- Standardize to reduce acquisition, maintenance and inventory costs;
- Develop competency to prepare an asset life cycle;
- Improve tracking and reporting of expenditures;
- Enhance data quality associated with vehicle cost and maintenance;
- Improve capabilities for emergency response through implementation of a planned maintenance strategy;
- Enhance internal and external reporting capability;
- Foster business-driven decisions using analytics and metrics, measured against risk;
- Achieve funding to raise BPA HMEM facilities to accepted industry standards;
- Limit access to short-term rentals and long-term leases/purchases;
- Standardize maintenance practices/procedures and develop SOPs;
- Conduct staffing study;
- Strive to meet government mandates of GHG emission/fossil fuel reductions without compromising our customers and BPA's mission.

11. Summary

Overall, FMD's strategic goal is to increase reliability and equipment availability, as well as standardize and right-size the fleet, in conjunction with reducing operational and capital costs. Furthermore, we intend to address facility requirements in order to meet recommended functionality ratings while enhancing the skill sets of HMEM technicians. Efforts are underway to achieve these goals, and the entire FMD staff is confident that this transition will be successful.

Financial Disclosure

This information has been made publicly available on June 10, 2016 and contains information not sourced directly from BPA financial statements.