2020 FLEET SAMP

Fleet Management

Strategic Asset Management Plan: This document provides the Strategy focus for FY 20 thru FY 30 in regards to lifecycle management of fleet assets.

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1.0 EXECUTIVE SUMMARY

Fleet management was added as an asset category in 2019, this is the first strategic asset management plan under the new format initiated in 2018. Fleet Management consists of three departments, NSFE Procurement, Policy and Analysis; NSFP Loan Pool and NSFM Heavy Mobile Equipment Maintenance. Fleet consists of 41 personnel located in 15 locations throughout BPA's service territory and is the asset center representative for all owned and leased mobile equipment assets to include railcars and the maintenance of stationary generators. The asset make up consists of 1400 owned assets, 865 leased assets, 150 stationary generators and 700 components that require some level of maintenance. The age of these assets range from 1 to 66 years with a total non-depreciated investment of $213M, including procurement, up-fitting, modifications, damage and normal operations and maintenance costs.

Fleet Management, in its current configuration was created during the 2009-2010 time frame based on multiple external studies that indicated a centrally managed Fleet organization would be more efficient, more compliant and would more effectively ensure the safety and serviceability of BPA's fleet inventory.

2011 was a period of great change, as the Fleet Management organization assessed the state of assets, policies and processes. Risks were identified regarding standardized assets and maintenance practices, data validity, infrastructure, tooling and equipment and process development. Over the past 8 years constant changes to maintenance requirements, operational processes and training have had positive impacts on safety and availability however, more work is needed. We are still saddled with a fleet that has significantly passed the useful lifecycle and a replacement pace that will take 45 years to rotate out aging equipment (our oldest asset still in service is 66 years old). In addition, the nationwide shortage of qualified fleet personnel has created staffing challenges, while increasing pressure at the federal level has placed an emphasis on lowering greenhouse gas emissions by improving fuel efficiency and optimizing the size and scope of fleets.

This strategy addresses the risks while remaining cognizant of FTE and O&M limitations. The main focus however, is to address the aging fleet, improve safety, and fuel efficiency by moving from a 45 year replacement cycle to a more manageable 20 year cycle. In the simplest terms, the older the asset the more costly it is to maintain and the more labor hours needed to perform maintenance. Aged assets indubitably will have longer downtimes or lack of availability, which will impact already flat expense budgets and will more than likely cause project and outage restoration delays. These aged assets will not be privy to enhanced safety features such as outrigger interlocks which could have prevented the bucket truck roll over that occurred in 2018.

At current Capital, O&M, and FTE levels we cannot continue to traverse the path we're on, something must change. O&M and FTE level adjustments will only address short term risks without dealing with the heart of the issue; a more robust capital replacement program is needed. This document will lay out, in detail, the current cost and trajectory as well as a path forward. As mentioned this is the first evolution of the Fleet SAMP, I have identified areas that will require additional work prior to the next evolution as well as initiatives that are already underway.

2.0 ACKNOWLEDGEMENTS

The vision of the executive team and the asset management council has provided a singular roadmap to how we manage resources at the BPA. Although the process of creating this document was laborious, the end result will pay dividends year after year. Note: no animals were harmed in the creation of this document.

2.1 Senior ownership

Our mission in the Supply Chain organization is to deliver best value through collaborative partnerships utilizing effective and efficient processes. We ensure investments in fleet and the delivery of business services are aligned with BPA's strategic business objectives and support the safe performance of core business activities across the organization. We will demonstrate our commitment to asset management principles in the following ways:

- Align asset investments in accordance with organizational objectives to support BPA's core business;
- Make risk-informed decisions to maximize the value of our people and Fleet assets while improving safety and environmental stewardship; and
- Continuously improve awareness of asset management activities in order to execute day-to-day operations in a cost effective manner.

The future holds incredible opportunities with change as the only constant. We look forward to these opportunities and will continue to find ways to improve the service we provide by tempering change with fiscal restraints. As electric and autonomous vehicles become the norm, the adaptability of our organization will continue to post positive results.

Shana L. Kuhn
Chief Supply Chain Officer

Robin R. Furrer
Chief Administrative Officer

2.2 Strategy Development Approach

2.2.1 Key Contributors

Key contributors to this document were internal to Fleet Management and Supply Chain, due to time constraints involvement of business partners was not possible although the overall intent of the strategy was communicated to the Fleet Council which consists of members from Transmission Field Services, Engineering and Technical Services, Chief Administrative Office and the Safety Organization. Key business partners will be presented this document by EOY 2020.

2.2.2 Key Activities

- Development of six point procurement strategy
- Development of optimization process
- Development of metrics

- Cost per mile study
- Age and usage analysis
- Labor hours required versus labor hours available analysis

3.0 STRATEGIC BUSINESS CONTEXT

3.1 Alignment of SAMP with Agency Strategic Plan

This SAMP conforms to the format required by the Agency Strategic Plan by defining the strategic direction for the ownership, lease and rental of mobile equipment. The SAMP also outlines factors used to optimize the fleet, as well as data elements that identify capital replacements. Although this SAMP supports modernization of assets, it is more closely aligned with strengthening financial health by having the right assets on hand, at a reasonable cost, and replacing these assets at the optimum time before maintenance costs rise to an unsustainable level. It also impacts whether BPA should own (highest overall cost), lease, or rent (lowest overall cost) by defining the criticality of each asset.

3.2 Scope

This SAMP covers the vehicle and equipment assets that are owned, operated, and maintained by the agency. The owned assets include heavy-duty trucks, trailers, transportation equipment and off-road mobile equipment such as power-operated equipment, forklifts, and material handling equipment, along with other specialized equipment for stringing of conductor and overall maintenance of the transmission system. Additionally, BPA leases vehicles through the General Services Administration (GSA) that range from sedans, used by the agency's management and finance/support staff, to heavy duty pickups used by the agency's electrical, construction and field crews.

The fleet consists of approximately 2272 assets and 700 components, of which approximately 1400 are BPA owned, and 865 are GSA leased (see table 3.3.1 below). Of these, the majority of BPA-owned assets are mission critical equipment such as 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 snow cats, mobile generators, dozers, excavators, backhoes, railcars and other specialized equipment. Fleet Management does not oversee the maintenance or replacement of aircraft to include, helicopters, airplanes or drones.

3.3 Asset Description and Delivered Services

Fleet Management is responsible for the acquisition, maintenance, and overall asset management of BPA's Fleet, the owned assets provide BPA the ability to construct and maintain transmission lines and transformers, as well as patrol vehicles to conduct inspections throughout the system. Fleet provides support equipment to virtually every craft, to include environmental, safety, realty, electricians, riggers, etc. Fleet Management maintains the engine generators that support unmanned sub-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, cranes, man-lifts of various size, digger derricks, pole trucks, substation maintenance route vans, small boom trucks, and man-lifts, along with other more specialized equipment for stringing of conductor

and overall maintenance of the transmission system, this includes construction and snow equipment. Leased equipment is primarily service trucks, motor pool fleet and other passenger type vehicles. Fleet management's strategic direction is to increase reliability, standardize and right size the fleet, in conjunction with reducing operational and capital costs.

Table 3.3-1 Summary of Assets

SYSTEM GROUPING	Count(EQUIP NO)
AERIAL CART	27
BOOM EQUIPMENT	66
CAB AND CHASSIS	65
CARGO TRUCK	1
CLASS 5-7 TRUCK	3
CLASS 8 TRACTOR	16
CONSTRUCTION EQ	79
DUMP TRUCK	25
EG	137
FORKLIFT	132
LIGHT TOWER	17
MAINTENANCE BODY	1
MANLIFT 55-75	5
MANLIFT 75-125	13
MANLIFT < 55	63
MANLIFT > 125	4
MISC	9
MOBILE GENERATOR	29
PICKUP	367
PLATFORM 55-75	12
PLATFORM < 55	20
PLATFORM > 75	2
POLE TRUCK	13
ROUTE VAN	45
SEDAN	26
SEMI TRUCK	2
SMALL ELECTRIC VEHICLE	63
SMALL GAS VEHICLE	65
SNOW EQ	34
STAKE BED	69
STRINGING EQ	14

SUV	232
TRAILER	593
UTILITY BODY	83
UTILITY TRACTOR < 30 HP	4
UTILITY TRACTOR > 30 HP	3
VAN	38
WINCH TRUCK	14
	2,391

Table 3.3-2, Asset Types (does not include components)

FLEET EQUIPMENT SYSTEM GROUPINGS WITH ASSOCIATED STANDARDS CLASS

Note: Does not include the following System Groupings: LOAN POOL RENTAL, PORTABLE FUEL TANK, SHOP SUPPLIES, TOOLBOX, UNLICENSED FUEL, VEHICLE LIFT, VERTICAL PERSON LIFT

AERIAL CART
- AERIAL CART

BOOM EQUIPMENT
- CRANE - OFF ROAD
- CRANE - ON ROAD
- DIGGER DERRICK
- DIGGER DERRICK TRACKED
- SUB DERRICK

CAB AND CHASSIS
- CUSTOM FLATBED
- CUSTOM SERVICE BODY
- HMEM SERVICE TRUCK
- SEMI-TRACTOR
- SERVICE BODY TRUCK
- STAKE BED TRUCK
- TLM SERVICE TRUCK

CARGO TRUCK
- BOX TRUCK

CLASS 5-7 TRUCK
- CLASS 5-7 FLATBED
- CLASS 5-7 FUEL TRUCK
- CLASS 5-7 SERVICE TRUCK

CLASS 8 TRACTOR
- CLASS 8 TRACTOR
- HOOK TRUCK
- WATER TRUCK

CONSTRUCTION EQ
- BACKHOE
- DOZER
- EXCAVATOR - LIGHT
- EXCAVATOR - MEDIUM
- EXCAVATOR - MINI
- LOADER
- SKID STEER

DUMP TRUCK
- DUMP TRUCK

EG
- EG

FORKLIFT
- ELECTRIC RIDER
- ELECTRIC RIDER TURRET
- ELECTRIC STAND UP
- ELECTRIC STAND UP REACH
- ELECTRIC WALKIE PALLET JACK
- NON ELECTRIC RIDER
- NON ELECTRIC RIDER REACH
- NON ELECTRIC RIDER TELESC BOOM

LIGHT TOWER
- LIGHT TOWER

MAINTENANCE BODY
- SEMI-TRACTOR

MANLIFT < 55
- MANLIFT < 55

MANLIFT > 125
- MANLIFT > 125

MANLIFT 55-75
- MANLIFT 55-75

MANLIFT 75-125
- MANLIFT 75-125

MISC
- AIR COMPRESSOR
- AVIATION TUG
- BOAT
- BRUSH CHIPPER
- SWEEPER

MOBILE GENERATOR
- MOBILE GENERATOR < 50
- MOBILE GENERATOR > 50

PICKUP
- PICKUP CREW CAB
- PICKUP EXT CAB
- PICKUP REG CAB

PLATFORM < 55
- BOOM PLATFORM < 55
- SCISSOR LIFT

PLATFORM > 75
- BOOM PLATFORM > 75

PLATFORM 55-75
- BOOM PLATFORM 55-75

POLE TRUCK
- POLE TRUCK

ROUTE VAN
- ROUTE VAN

SEDAN
- SEDAN COMPACT
- SEDAN HYBRID
- SEDAN MIDSIZE

SEMI TRUCK
- SEMI-TRACTOR

SMALL ELECTRIC VEHICLE
- ELECTRIC SEDAN
- UCV ELECTRIC
- UTV 4X4 ELECTRIC

SMALL GAS VEHICLE
- UTV 4X4 GAS
- UTV 6X6 GAS

SNOW EQ
- SNOWCAT TRACKED STANDARD
- SNOWCAT TRACKED XL

STAKE BED
- HMEM SERVICE TRUCK
- STAKE BED TRUCK
- TLM SERVICE TRUCK

STRINGING EQ
- PULLER
- PULLER/TENSIONER
- TENSIONER

SUV
- SUV COMPACT
- SUV FULLSIZE
- SUV MIDSIZE

UTILITY BODY
- HMEM SERVICE TRUCK
- SERVICE BODY TRUCK
- TLM SERVICE TRUCK

UTILITY TRACTOR < 30 HP
- UTILITY TRACTOR < 30 HP

UTILITY TRACTOR > 30 HP
- UTILITY TRACTOR > 30 HP
- UTILITY TRACTOR > 30 HP ARTIC

VAN
- VAN CARGO
- VAN PASSENGER

WINCH TRUCK
- WINCH TRUCK

TRAILER

- AERIAL CART TRAILER
- BOAT TRAILER
- BOOSTER TRAILER
- COFFIN TRAILER
- CONVERTER DOLLY TRAILER
- DETACHABLE GOOSENECK TRAILER
- DOUBLE DROP TRAILER
- DUMP TRAILER
- FILTER PRESS TRAILER
- FLATBED BEAVERTAIL TRAILER
- FLATBED DROP DECK TRAILER
- FLATBED TANKER TRAILER
- FLATBED TILT TRAILER
- FLATBED TRAILER
- FOLDING GOOSENECK TRAILER
- GOOSENECK TRAILER
- JEEP TRAILER
- MOBILE TEST LAB TRAILER
- OFFICE CREW TRAILER
- OFFICE TRAILER
- OIL PURIFICATION TRAILER
- POLE STEERABLE TRAILER
- POLE TRAILER
- PRESSURE WASHER HEATED
- RADIO TOWER TRAILER
- SANDING TRAILER
- SECURITY CAMERA TRAILER
- SHIELDED TEST LAB TRAILER
- TANK BODY LOGGER/FIRE TRAILER
- TANK BODY OIL TRAILER
- TANK BODY TRAILER
- TANK BODY WATER TRAILER
- TBD
- TILT BED TRAILER
- TRANSFORMER - MOBILE TRAILER
- TRANSFORMER TRANSPORT TRAILER
- UTILITY TRAILER
- VAN BODY SF6 CART TRAILER
- VAN BODY TRAILER
- WAGON TRAILER

3.4 Demand Forecast for Services

The Fleet assets are used by multiple programs of the agency for operational, emergency, and project-specific needs. Future demand will likely correlate to the size of BPA's service territory and scope of construction and sustain programs. Optimizing fleet assets to ensure we have the correct assets to meet mission needs is always our first priority. Most heavy equipment is on a 20 year life cycle, a minimum of 5% of our equipment will need to be replaced per year to ensure the safety of the user and preserve repair maintenance at a sustainable level given FTE allocations. Trailers are the exception, due to the large number and variety, large trailers (40ft and above) are on a 30 year replacement cycle, while many small utility trailers are 10 years or as needed.

Market factors affecting the delivery of Fleet services include the following:

- Manufacturer lead times for procurement of replacement assets have a large impact on Fleet's ability to deliver high quality assets in a timely manner.

- High demand for skilled technicians across the country creates additional challenges, primarily due to the salary and incentive offers made in private industry.
- Data integrity remains a concern due to the limited (3 years) data available. This will self-correct over the next few years.

3.5 Strategy Duration

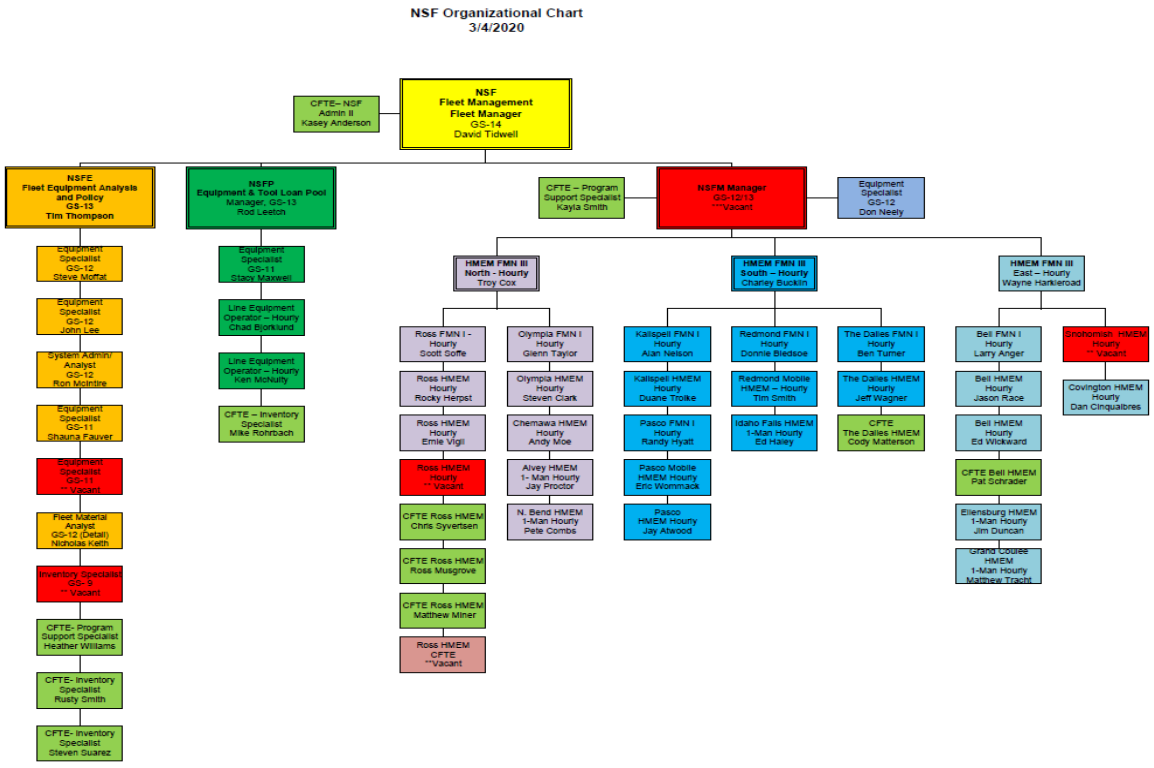
This is a ten-year strategy with a bi-annual review. This plan is to be published every 2 years or upon any significant change through the annual review.

4.0 STAKEHOLDERS

4.1 Asset Owner and Operators

Fleet Management is the designated owner/asset center representative (ACR) of all mobile equipment to include railcars and provides maintenance support for stationary generators.

The Fleet Management organization (FM)) supports, manages, and oversees the agency's fleet requirements. This organization is a Tier-III division of NS, which is the Supply Chain portion of the Office of the Chief Administrative Officer. Major elements of the FM are the Fleet Analysis and Policy Division, the Equipment and Tool Loan Pool Division and the Mobile Equipment Maintenance Division.



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, capital procurement planning, optimization of fleet asset size and scope, development of rotation plans, development of utilization targets, 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 strategies

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 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 required tasks

The Mobile Equipment Maintenance Division is responsible for the maintenance and repairs of the agency's fleet assets and engine generators. These technicians support the agency's operations by managing preventative maintenance, compliance inspections, mobile maintenance (in field) and vended services. Maintenance levels range from basic lube and oil filter work to major overhauls performed on chassis and aerial equipment/cranes and corrective repairs ranging from parts failure, damage repair, factory recalls, as well as facilitation of warranty repairs and equipment modifications. Preventative maintenance falls within the categories listed below:

- A-Service--Routine preventative maintenance includes but is not limited to filter and fluid changes, lubrication, adjustments and inspection of all safety related components
- AI- Annual Inspections—primarily for equipment that doesn't obtain enough usage to trigger an A-Service or there are not meters (i.e. trailers)
- C-Service—a 5 year inspection or as required by the manufacturer. Includes but is not limited to wheel bearing repack, critical fastener inspections, winch tests etc.)
- D-Service—Major over haul, includes but is not limited to, boom tear down, hydraulic line replacements, hydrostatic testing etc.
- SI—Special Inspections, may be initiated by Fleet Manager whenever the potential for systemic failure of a component is indicated, may also be used for recalls or other manufacturer specific inspections as required.
- Compliance—any of the above preventative maintenance or inspection may be compliance driven as required by the manufacturer (C, D, AI, SI's are typically compliance driven). Compliance is also determined by OSHA, ANSE and ASME guidance.

Technicians are also responsible for providing subject matter expertise related to GSA vehicle maintenance and vehicle up-fitting requirements, and damage assessments. In addition to vehicle maintenance, 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 which remain operational year-round.

4.2 Stakeholders and Expectations

The following table lists the customer and stakeholders served and their expectations or what they require from BPA. *Table 4.2-1, Stakeholders*

Stakeholders	Expectations	Current Data Sources	Measures
Customers	Fair Price	Fleet program budget, financial system actuals	Cost per mile
	Reliability	Rental pool records	Request to rental time/rental cost/rental usage/ cost per hour
		Service records	Availability/out of service time
	Communications	Fleet Council meetings	Customer satisfaction
Regulators	Regulatory compliance	DOT and traffic laws	Enforcement incidences
		DOE requirements and Executive Order	Compliance reporting
Staff	Health and Safety	Safety database	Incident statistics
	Job Security and Satisfaction	Administrative database	FEVS survey results, turnover figures
	Training	Administrative database	Agreed professional development
	Safety	Industry regulations and standards	Incident report statistics and non-compliances

5.0 EXTERNAL AND INTERNAL INFLUENCES

The table below summarizes the influences on the management of Fleet assets. Internally, the program's operation depends on staffing and funding, which are necessary to the ability to perform analysis, make strategic decisions, and improve condition of aged equipment. The needs of internal business partners are the substantial determinant for the allocation and deployment of assets. Externally, the job market may limit availability of skilled mechanics, which in turn forces the FM to utilize a more costly outsourcing of service. And the regulatory landscape, especially DOE mandates in response to Executive Orders, dictates the types of replacements that the program implements.

Table 5.0-1, External and Internal Influences

External Influences	Effects and Actions
Department of Energy Mandates (electric vehicles and lower emissions). Size limitations	Replace certain items with pre-determined items (i.e. gas-fueled vehicle with electric vehicle). DOE limits fleet asset expansion to established numbers.
Availability of skilled heavy mobile equipment mechanics	Increased external service requirements. Development of internal training program to allow lesser skilled technicians to reach the journeyman level.
Internal Influences	**Effects and Actions**
Needs of business partners.	Dictates what is needed, where and when.
Staffing constraints	Inability to analyze data trends, reducing ability to make strategic, equipment/location-specific recommendations
Limited capital funds	Retain aged equipment, increasing maintenance costs and labor resources

5.1 SWOT Analysis

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

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. Evaluation of needs versus wants, multi-use versus single use/function, rent as needed versus own with low utilization should continue to drive decision making.

Table 5.1-1: SWOT

Favorable	***Unfavorable***
Strengths	***Weaknesses***
• Well-developed tool replacement program • Ability to focus on best cost method for 3rd – party outsourcing of services • Long-term procurement plan stabilizes funding	• Age and condition of BPA Fleet assets • Outdated facility design and tooling • Training • Lack of telematics • Asset information • Nationwide shortage of qualified technicians
Opportunities	***Threats***
• Craft-specific standard vehicle configurations can reduce up-fit costs • Upgrades to sites and construction of new Ross HMEM facility	• DOE orders to reduce fleet size

This is a strategic description of the Fleet program's strengths, weaknesses, opportunities and threats

Strengths:

- 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 technicians 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 in the construction of a new Fleet Services Building (FSB) scheduled to open in March of 2020. An analysis of all 15 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. FM technicians were the only craft at BPA required to supply personal tools at the technician's expense, in 2018 Fleet Management determined that this was a detriment to recruiting and ended the practice. All tools are now supplied for each technician by means of individual tool kits and consolidated tool kits. All tools are inventoried annually by the Foreman III responsible for each location.

- 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 FM 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 FM now has the improved visibility of system wide maintenance requirements as well as the flexibility to move technicians to where the workload is, independent of their duty station. This improves the FM's ability to support agency wide 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.

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.

Weaknesses:

- A significant weakness exists in asset information. We're unable to manage fleet according to usage because of lack of real-time data and, for certain assets, lack of runtime-based data. The Maintenance Repair Unit information is unformatted, meaning; the raw data is available but needs to be converted to a usable format, given the complexity of this conversion, it is recommended that using industry experts to perform the task is the best approach. Lack of MRU data also impacts fleet's ability to assign complexity grading to each piece of equipment, which is critical to informing replacement and staffing decisions.

- There are weaknesses presented by the age and condition of the BPA-owned Fleet assets, which are explained more fully under 8.2

Opportunities:

- 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 FM 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.

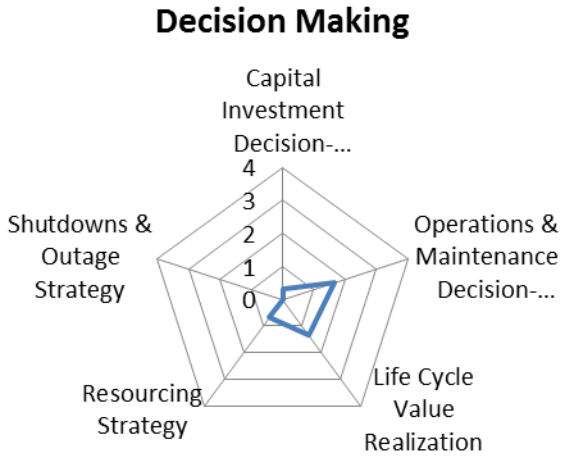
Threats:

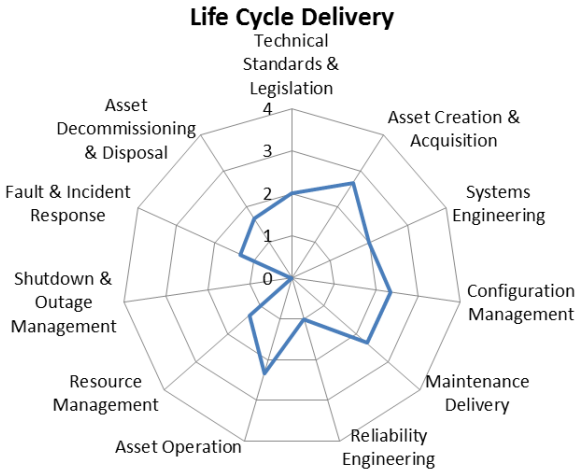
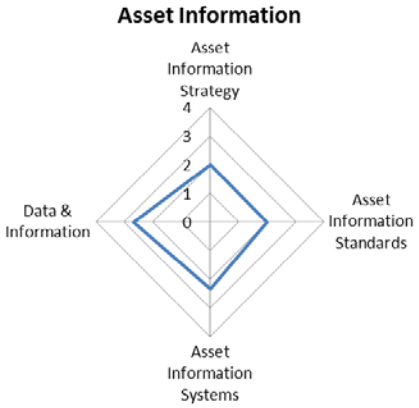
- Three major components have driven the need to right-size BPA's fleet. One is the direction from the Secretary of Energy to reduce the Department of Energy's fleet of over-the-road vehicles by 35%. Secondly, Executive Order 13514 and its subsequent replacement, E.O. 13693 "Planning for Federal Sustainability 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.

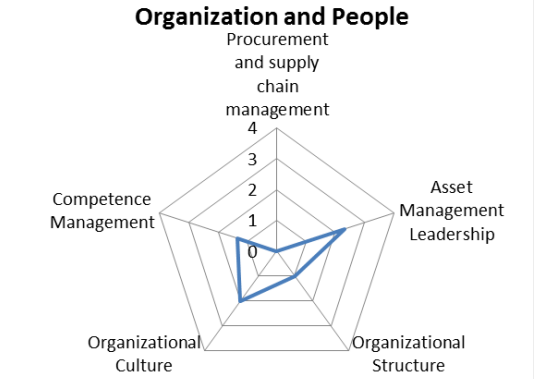
6.0 ASSET MANAGEMENT CAPABILITIES AND SYSTEM

6.1-1 Table: Maturity Level

6.1-1 Maturity Level

Subject Area	Maturity Level	
Strategy & Planning		**Strengths:** Information about demand is available. **Weaknesses:** Until now, the organization has not developed a Fleet Strategic Asset Management Plan.
Decision Making		Strengths: The organization has defined models for evaluating capital decision-making. Weaknesses: The evaluation models have not been implemented, so it's difficult to understand whether they're accurate or properly scoped.
Life Cycle Delivery	**Strengths:** The process for decommissioning vehicles and equipment is effective and efficient. Process and tracking are in place for asset acquisition, asset decommissioning, and maintenance activities.	

	Weaknesses: Designs of individual programs do not visibly attempt to balance life cycle costs. 
Asset Information	**Strengths:** The asset information is based in a robust system (Asset Works) that will facilitate advancements in maintenance programming and asset usage and optimization decisions. Information owners from Asset Suite, Cascade, Sunflower and EAM conduct monthly team meetings to capitalize on strengths and eliminate duplication of efforts across the four systems. **Weaknesses:** Analytics of asset information is limited due to vacancies, Maintenance Repair Units are not developed which impacts work planning and overall organization structure. A single point of failure exist in the administration of the EAM application. 
Organization & People	**Strengths:** Organization leadership is committed to life-cycle management and optimizing the balance of reliability and cost. **Weaknesses:** An assessment of the organizational structure has not been done; a redesign or reorganization may be needed. Also, there's no structured training program for developing personnel skills and competencies.



Risk & Review

Strengths: The Fleet Council provides opportunity for internal customers to share risk concerns and to receive information about changes and corrective actions.
Weaknesses: There is no process for routine review of program risks, nor is there a process for assessing risk associated with individual decisions.

6.1 Long Term Objectives

Strategy and Planning

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 FM. We will conduct analysis of the entire fleet to drive optimization efforts; the study will be concluded by the end of 2021. In conjunction with the optimization study, we will develop a 10 year replacement program by the end of 2022. The results of each of these initiatives will address the following:

- Determine the amount of acceptable risk, i.e. own, rent or lease,
- Evaluate multi-use versus singular use equipment
- Regional pooling of assets (potential)
- Equipment standards (needs versus wants)
- Maintenance standards (maintenance intervals)

As well, we will continue to push for a telematics system to allow for more efficient tracking of assets (COOP), automated meter readings, fuel reduction (sustainability) and remote diagnostic capability. We will present an updated business case for

approval by the end of 2024. Telematics is a device installed on mobile equipment that allows for remote access to the on-board computer systems data cache which contains odometer or engine hours, diagnostic issues, location data and fuel mileage thorough a wireless interface, this is standard practice in government and commercial fleets.

Decision Making

Develop analytics and metrics capabilities to support optimization. Develop Enterprise Asset Management (EAM) reporting capabilities to inform management decisions. Enhance internal and external reporting capability. Identify reporting deficiencies between input versus output and label shortfalls to improve reporting function. The new EAM system will dramatically improve this area, allowing for industry standard reports to be automated and easily developed. The foundation of a sound FM 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. 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 FM to justify budgets based on returns and to drive organizational growth and innovation. This objective has commenced and will continue to evolve.

Life Cycle Delivery

Improve expenditure tracking; develop competency and method for life-cycle cost model for each asset; apply data to inform acquisition, retention, and maintenance decisions. Plan maintenance strategy using manufacturer recommendations but targeting high usage assets. 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 FM's success toward the goal of improving expenditures. 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 EAM FMS will enhance data quality, allowing for efficient and effective management of fleet assets and justifying decision-based actions regarding vehicle cost and maintenance. 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 EAM system has capabilities to facilitate life cycle analysis requirements.

Asset Information

Improve cost and maintenance data quality; use that to help determine optimal retention and the quality of component selection decisions. In addition, we'll continue to seek to acquire a telematics system that will provide real-time information of asset performance and possible causes of failures. Conversion to Maintenance Repair Units (MRU) needs to be completed in FY 20, MRU's allow for a better understanding of work load by addressing the complexity of each asset, to include maintenance spend and the environment in which the equipment is operated. MRU's are a crucial piece in determining facility and personnel requirements in a given location.

Organization and People

Develop and implement a professional training and certification program for the FM 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. MRU's will aid in this process by helping determine where workload is the highest and where limited FTE should be positioned. In

addition; a training program will be developed to address the national shortage of qualified technicians. We will develop requirements to support the hiring of lessor skilled technicians that will involve in-house training and monitoring as well as commercial training as available. A draft plan that consists of timelines and requirements will be drafted by 2022.

Risk and Review

Define usage and reliability standards; based on risk profile, reduce program costs by optimizing the number of assets to meet agency needs. 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 FM. 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 EAM FMS as consistent data becomes available to accomplish trend analysis.

Conduct optimization 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. A plan to optimize BPA's fleet will be developed by the Fleet Council and delivered to the executive sponsors for approval. Change management will be a large factor in the process and craft functional team sub-committees may be required as a project plan is developed.

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.

Balance cost and risk with a focus on preventive/predictive 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.

6.2 Current Strategies and Initiatives

Strategy and Planning

Currently Fleet is piloting an optimization initiative to ensure we have the correct asset types, at the correct locations. In this first year, the process for determining optimal levels is being developed, and this process will be applied to newly requested items and items for replacement using the factors listed in this document. While optimization often translates to reductions, this is not necessarily our primary objective. Low utilization rates for some equipment types are likely due to the asset being the wrong equipment type for the application. By September 2021 we will have conducted interviews with all users groups to validate needs based on mission objectives and update equipment standards as needed to ensure future procurements meet future demands.

Asset Information

- Asset information has become complex and sophisticated, the need to have clean, usable data which was once a "nice to have" option, is now an absolute must for Fleet Management and the users of the products we provide. In 2016 we began with basic asset information i.e., make, model, vehicle identification number. As we become more and more mature as an organization we are constantly adding data fields to our asset information model. This will be an on-going

effort however; updating of preventative maintenance and compliance inspection data will be completed by September 2020.

- Upon completion we will be able to more accurately forecast preventative maintenance and compliance needs as well as providing the end user of the asset with an accurate projection that will allow for more efficient work planning. By September 2021 we will have completed the additional data field population which will allow for consistent trend, cost per mile and use rate analysis, using these tools will lead to greater efficiencies for the end user and better maintenance planning.
- Establishing life cycles is part judgement, prediction, forecasts and assumptions on one hand and data analysis on the other. A six point strategy has been developed to determine replacement priorities
    - Age
    - Usage
        - Cost per mile
        - Minimum use criteria
    - Criticality level
        - 1-Critical
        - 2-Seasonal Critical
        - 3-Non-critical
    - Cost threshold
        - Still being developed, depending on asset type and value the cost threshold may be up to 125% of original purchase price.
    - Depreciation
        - Typically 5% per year
    - Economic life cycle analysis
        - Total cost of ownership
        - Total operating costs

  Note: Condition assessments have been developed to ascertain actual condition. This become important when determining which specific assets within the asset types are replaced when all other factors are relatively equal. Example: 10 man- lifts meet the criteria for replacement, capital restraints allow us to replace 5, conditions assessment will then be accomplished on all 10 to determine which 5 are replaced based on actual condition.

Organization and People

- A fundamental part of the fleet asset information is the Maintenance Repair Units (MRU), which defines the key variables related to each asset's maintenance requirements.
- MRU's account for the complexity of each asset and the environment in which it operates, for example: a two door sedan requires less maintenance than Bronto Sky-lift.
- MRU's are the industry standard in determining facility size, personnel levels and budgetary requirements. An initiative has been planned to develop the existing MRU data in FY20.
- In FY 20 we will coordinate with HCM to review the NSF organizational structure, to determine if we are aligned correctly to support our internal customers as well as to help develop staffing plans and requirements to address retirements and the overall lack of skill sets available in today's job market.

7.0 ASSET CRITICALITY

7.1 Criteria

Fleet asset criticality was developed to further understand the needs of the end user as well as to ascertain maintenance priorities. The primary factors used to determine criticality levels are as follows:

1. The impact that the asset has on BPA's ability to restore power during outages or other emergency situations.
2. The availability of the asset on the open market whether it be through, lease, rental or available for purchase.
3. Assets that may be critical during specific times during the year, i.e. snow removal.
4. The availability of adequate maintenance services available commercially or internally.

The criticality levels were determined in a joint effort between Transmission Field Service (the largest asset user group) and Fleet Management. Collectively we developed a three tier system with the following definitions:

1. Level 01-Mission critical assets that are not readily available for lease or rental, when these assets are unavailable, it would significantly impede BPA's mission.
2. Level 02- Seasonal assets that are critical during specific time of year and less critical at other times. An example of this would be Sno-Cat's; which are the only means of reaching some locations during winter months and are therefore essential to BPA's mission and they are not available on the rental market. During the summer months these assets are non-critical to BPA's mission.
3. Level 03- Assets that are easily available for rent, lease or purchase as needed and are considered non-critical to BPA's mission.

The breakout of asset and component criticality is shown in the table below. More specific details are located in appendix 7.1.1

Asset Type	Priority Code	Count(EQ Equip No)
ASSET(Mobile equipment and stationary generators)	01	131
ASSET	02	142
ASSET	03	2,037
COMPONENT (equipment that is transferable from one asset to another i.e. truck mounted plow)	01	219
COMPONENT	02	90
COMPONENT	03	724
		3,343

7.2 Usage of Criticality Model

Criticality is one of six factors used during replacement and optimization analysis; others include age, usage, cost threshold, depreciation and conditions assessments as needed, it allows us to complete a deep data dive into our most critical assets, to ensure limited capital dollars are spent where they are most needed. The criticality codes are part of the electronic record of each asset, this allows for prioritization of maintenance activities as well as how maintenance is performed i.e. vended services versus internal services based on the number of critical assets down for maintenance. In this scenario critical assets take internal priority over less critical assets, those deemed less critical may be vended while those assets that are deemed critical are typically repaired internally so long as they are within internal capabilities.

8.0 CURRENT STATE

8.1 Historical Costs

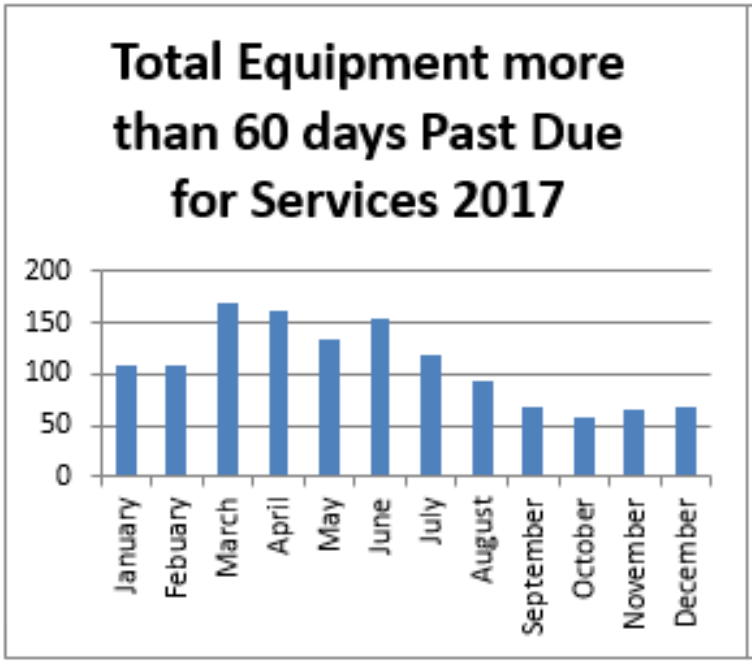
Historical cost have not been calculated between expand and sustain. This is something we will begin tracking in FY 21.

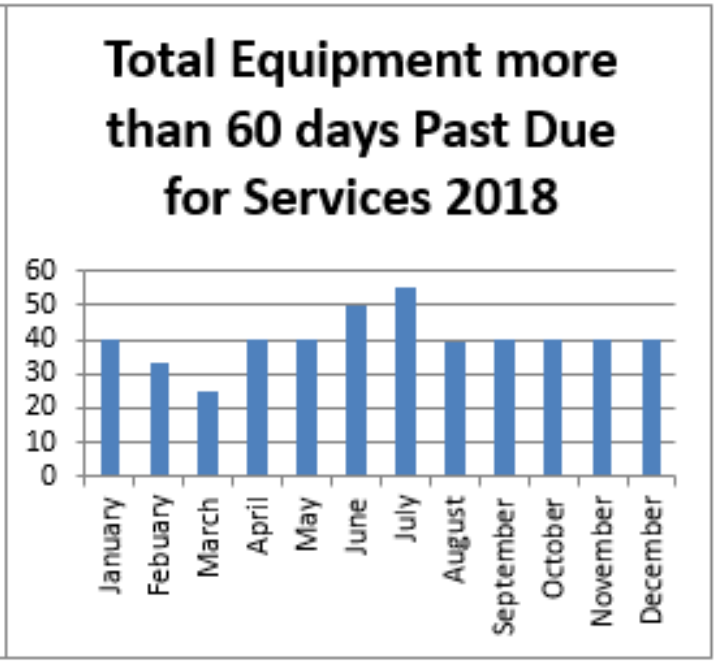
- Primary funding for maintenance and repair is through a monthly rental cost charged to the using organization of the assets; this is referred to as the “use rate”. Use rates cover preventative maintenance and repairs that are necessary due to normal wear and tear. The exception to this rule is in regards to stationary generators; all materials and parts associated with maintaining stationary generators are billed to the custodian’s organization, labor cost are absorbed by Fleet Management unless work is completed through a third party source, in which case labor hours are also billed to the using organization.
- Use rates do not cover the cost of modifications and/or damage. Given that modifications and/or damage cannot be forecasted and thus are not calculated into use rates, all of these costs are billed back to the using organization.
- If more money is collected through use rates than was necessary, the overage is returned to Transmission; conversely if maintenance and repair costs exceed the amount charged through use rates, Transmission must cover the additional costs. Use rates have been a flat adjustment across the entire fleet, while this method made sense in the early years of Fleet Management it is no longer the case.
- Use rates should be at the lowest point when the asset is new, as the asset ages the use rate should gradually increase to cover the cost of increased maintenance needs. When the asset has reached the end of its useful lifecycle the use rates would be at the highest point, this has two impacts. First, it ensures the increased maintenance cost are covered and secondly, it encourages both fleet and the end user to fully understand the financial impacts of keeping the asset in service. This process will be developed and vetted through the Fleet Council and the Executive sponsor team in FY 2022.

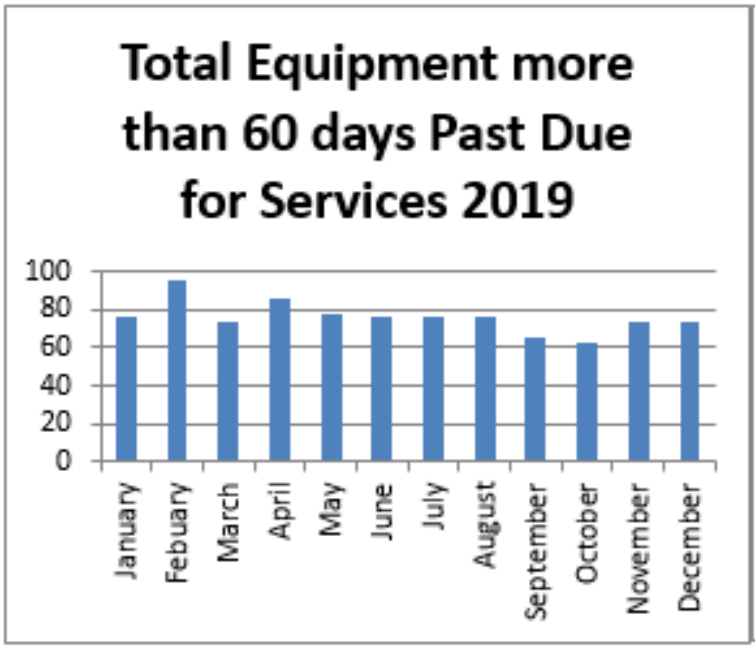
o Backlog- In 2011, an estimated 1/3 of BPA’s vehicle and equipment fleet should have been red tagged due to neglect and failure to meet compliance standards. Much work has been done over the past 8 years to address this situation to include strategic use of overtime and use of commercial vendors to help with

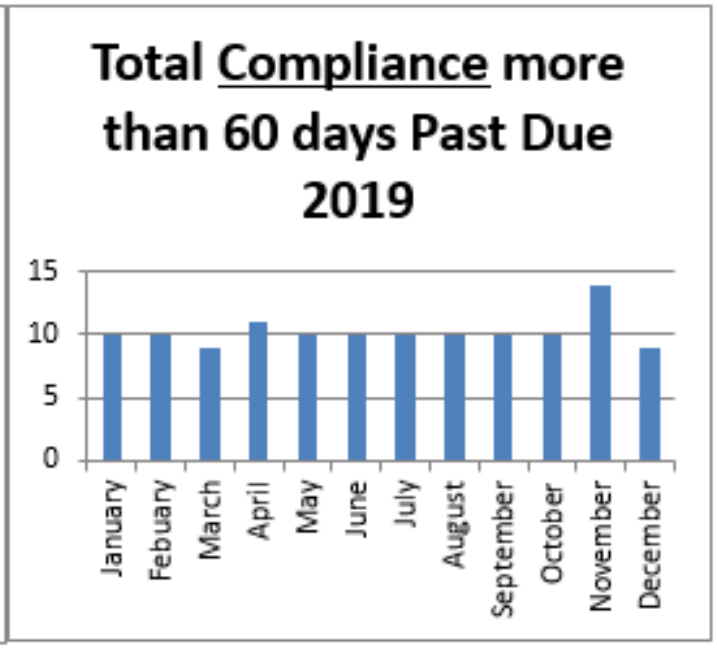
workload. The charts below indicate a month by month, year by year depiction of assets past due for preventative maintenance:

- Compliance Inspections have been tracked and monitored separately since mid-2018, 2019 is shown below as the first full year of data.









Section 8.1 Required Items: **Required Table 8.1-1 Historical Spend.** Display your historical costs along with the current approved rate case costs (in thousands) in the table below. (Transmission may do by funding source, Power by strategic class, others asset type. This will differ by asset category).

Table 8.1-1 Historical Spend

Program	Historical Spend (in thousands) With Current Rate Case						
Capital Expand (CapEx)	2015	2016	2017	2018	2019	2020 Current Forecast or rate case	2021
Total Capital Expand, Sustain	2193	6026	5456	7026	5844	5600	5325
Expense (OpEx)							
O&M	10000	10000	10300	11100	11100	11300	11300
Total Expense							

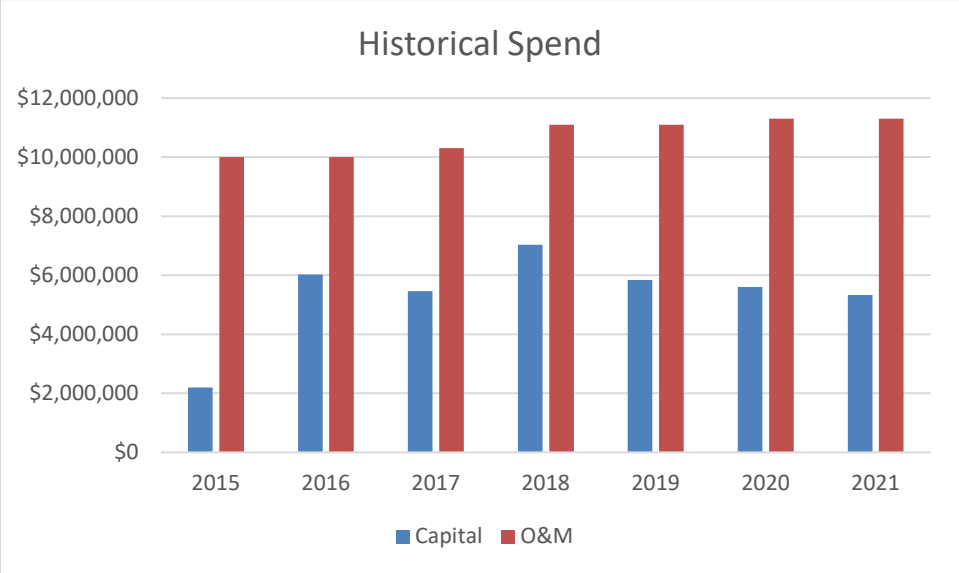


Figure 8.1-1 Historical Expenditures

- Capital spend has fluctuated with extreme lows in 2009, 2014 (not shown) and 2015. The highest level of capital spend was in 2011 (8M), the primary reasons for these fluctuations has been personnel, lack of replacement methodology and limited data availability; however with the implementation of a new Fleet Management software system in 2016, in conjunction with a more clearly defined replacement strategy, capital spend has been more consistent over the past four years. There is an additional risk, when considering the optimal percentage of assets replaced per year should be roughly 5%, over the past four years we have replaced 2.4% of total assets per year. The current trajectory indicates it would take roughly 45 years to replace the entire fleet versus the established goal of 20 years. Keeping equipment much longer that it's usable lifecycle will continue to drive higher maintenance cost and/or more personnel to maintain the assets.

The below table exhibits the 2016-2019 average cost per mile (maintenance, fuel and lease cost) per class code for both BPA-owned and GSA-leased assets. We have chosen this specific metric for the ease of calculation and comparison with the utility fleet industry. Bar graphs for each class are located in appendix 8.1.1

DESCRIPTION	2016	2017	2018	2019
CLASS 5-7 FLATBED	$3.67	$3.07	$2.63	$3.16
CLASS 5-7 SERVICE TRUCK	$25.26	$161.26	$7.89	$19.37
CLASS 8 FLATBED	$3.86	$4.33	$12.87	$8.05
CLASS 8 TOOL TRUCK	$1.73	$2.23	$2.44	$3.19

CLASS 8 TRACTOR	$1.41	$1.39	$1.74	$1.46
CRANE - ON ROAD	$2.80	$6.45	$8.21	$1.47
CUSTOM FLATBED CREW CAB	$0.05	$0.48	$1.13	$0.98
CUSTOM FLATBED EXT CAB	$0.43	$0.52	$0.55	$0.43
DIGGER DERRICK	$15.71	$17.43	$17.57	$15.26
DUMP TRUCK 6X4	$0.23	$2.61	$2.91	$2.46
DUMP TRUCK 6X6	$0.69	$3.11	$2.44	$1.95
HMEM SERVICE TRUCK EXT CAB	$0.27	$1.42	$0.87	$0.21
HMEM SERVICE TRUCK REG CAB	$0.34	$0.54	$0.91	$0.97
MANLIFT < 55	$6.57	$6.84	$6.58	$7.11
MANLIFT > 125	$25.36	$22.73	$19.24	$28.03
MANLIFT 55-75	$14.27	$14.16	$7.23	$8.87
MANLIFT 75-125	$7.44	$8.90	$9.94	$0.67
PICKUP CREW CAB	$0.18	$0.42	$0.39	$0.37
PICKUP EXT CAB	$0.11	$0.49	$0.45	$0.48
PICKUP REG CAB	$0.07	$0.25	$0.53	$1.01
POLE TRUCK	$10.50	$10.44	$12.71	$9.61
ROUTE VAN	$1.77	$3.26	$3.02	$3.50
SEDAN COMPACT	$0.35	$0.43	$0.54	$1.33
SEDAN HYBRID	$0.15	$0.18	$0.23	$0.26
SEMI-TRACTOR	$0.09	$0.58	$0.60	$0.90
SERVICE BODY TRUCK EXT CAB	$0.06	$0.28	$0.40	$0.30
SERVICE TRUCK CREW CAB	$0.16	$0.57	$0.47	$0.63
SERVICE TRUCK EXT CAB	$0.13	$0.58	$0.90	$0.53
SERVICE TRUCK REG CAB	$0.08	$0.39	$0.47	$0.45
STAKE BED TRUCK 4X2	$0.21	$0.69	$1.11	$1.46
STAKE BED TRUCK CREW CAB	$0.17	$0.63	$0.71	$0.51
STAKE BED TRUCK EXT CAB	$0.17	$0.66	$0.77	$0.74
STAKE BED TRUCK HD	$0.82	$0.51	$4.41	$4.17
STAKE BED TRUCK REG CAB	$0.45	$0.36	$0.70	$0.46
SUB DERRICK	$29.88	$25.67	$23.67	$23.44
SUV COMPACT	$1.27	$0.63	$2.33	$1.02
SUV FULLSIZE	$0.25	$0.52	$0.47	$0.49
SUV MIDSIZE	$0.29	$0.42	$0.42	$0.35
TLM FLATBED CREW CAB	$13.47	$0.99	$0.70	$0.31
TLM FLATBED EXT CAB	$0.53	$1.45	$1.17	$0.44
TLM LD SERVICE EXT CAB	$0.17	$0.62	$0.56	$0.27
TLM SERVICE CREW CAB	$0.18	$1.06	$0.78	$0.46

TLM SERVICE EXT CAB	$0.17	$0.88	$0.92	$0.46
TLM SERVICE REG CAB	$0.09	$1.13	$0.63	$0.48
VAN CARGO	$0.18	$1.11	$0.86	$0.64
VAN PASSENGER	$0.16	$0.47	$0.58	$0.71

8.2 Asset Condition and Trends

Asset Condition and trends are not holistically available; by 2021 enough data will be available to conduct this analysis.

Figure 8.2-1 Asset Age by Classification and other associated costs

Summary	Owned Asset Count	Leased Asset Count	
	1408	879	
Awaiting turn in/evaluation/on order	0	15	
Actual count	1408	864	
GSA leased asset cost for current inventory	$28,016,715.74	(Lease rate and mileage paid to date)	
Owned asset Original cost	$87,918,950.41	(Non-depreciated value of owned assets)	
Owned M&R	$42,434,074.54		
Total BPA investment in Fleet Assets	$158,369,740.69	(Current inventory)	
Total investment in Fleet assets including modifications/bill backs through life cycle (to date)	$213,257,403.07		

Note: does not include trailers, trailers have no meters to gauge usage.

Use criteria met	Less than 100%	Less than 50%	Less than 25%
by Hours	217	130	50
by Miles	85	35	11
	302	165	61

Age in years	1-5	6-10	11-15	16-20	21-25	26-30	30+
Count	828	602	193	201	118	133	155

Figure 8.2-2 Asset age by Asset type.

LEVEL 3	Count	Average age	Span in years
AERIAL CART	27	17	10 - 29
BOOM EQUIPMENT	66	14	1 - 40
CAB AND CHASSIS	65	5	2 - 12
CLASS 5-7 TRUCK	3	13	2 - 26
CLASS 8 TRACTOR	16	15	2 - 34
CONSTRUCTION EQ	79	12	1 - 31
DUMP TRUCK	25	12	2 - 28
FORKLIFT	132	16	1 - 41
LIGHT TOWER	17	8	6 - 13
MANLIFT < 55	63	13	2 - 25
MANLIFT > 125	4	12	1 - 21
MANLIFT 55-75	5	11	8 - 12
MANLIFT 75-125	13	14	4 - 20
MOBILE GENERATOR	29	20	3 - 36
PICKUP	364	4	1 - 9
PLATFORM < 55	20	16	3 - 26
PLATFORM > 75	2	16	12 - 19
PLATFORM 55-75	12	8	1 - 18
POLE TRUCK	13	18	9 - 25
ROUTE VAN	45	10	4 - 20

SEDAN	26	4	2 - 9
SEMI TRUCK	2	13	12 - 13
SMALL ELECTRIC VEHICLE	63	9	5 - 22
SMALL GAS VEHICLE	65	5	1 - 12
SNOW EQ	34	11	1 - 20
STAKE BED	70	6	1 - 12
STRINGING EQ	14	21	1 - 50
SUV	232	4	1 - 10
TRAILER	591	20	1 - 66
UTILITY BODY	83	6	2 - 19
UTILITY TRACTOR < 30 HP	8	29	21 - 37
VAN	38	5	1 - 9
VERTICAL PERSON LIFT	7	unk	unk
WINCH TRUCK	14	28	9 - 48

Figure 8.2-1, Current Asset Age by Type

- BPA's average fleet age ranges from approximately five to ten years for leased pickups, to approximately 20 years for BPA-owned 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 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. 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 FM 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 up fit costs for our large service trucks by 25-35% (approximately $15,000) for the initial up fit and an estimated

$35,000 per truck in subsequent replacements/up fits 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.

- 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 FM 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 FM 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 FM to successfully forecast upcoming replacement costs, while reducing maintenance costs long-term.
- As stated above, in regards to BPA's owned assets, the FM 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 has significantly improved with the recent implementation of Asset Works/EAM.
- 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 FM 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.
- In general, FM has a proactive maintenance program focused on fleet asset preventive/corrective maintenance, as well as stationary engine generator repairs. Work such as vehicle modifications, 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.

8.3 Asset Performance

- Asset performance has been out of reach for fleet until the recent development of the Fleet procurement strategy however we have not matured enough in this area to provide adequate analysis.
- Due to the unique nature of BPA's service territory and the lack of a telematics solution, performance metrics availability is limited. We have begun tracking cost per mile as one of the few metrics available that we can benchmark in the future.
- We are in the process of entering into a contract agreement with Utilimarc to evaluate our data points and provide guidance regarding measuring fleet performance without the use of telematics.
- The contract will be in place in May of 2020 and results should be available within 60 days from contract start date.

We can determine based on data in appendix 8.1, that when assets exceed the usable life expectancy, maintenance cost per mile dramatically increases. We can reasonably conclude that equipment down time will be greater, availability to the asset user will be lower; as well, the costs of rental equipment will likely increase and personnel cost/vended maintenance cost will rise significantly. The abbreviated description is: higher capital spend ensures higher asset up time and lower maintenance costs. Lower capital spend equates to higher down time and higher maintenance costs.

Additional performance indicators will be available by August 2020.

Section 8.3 Required Item: Table 8.3-1 Historical Asset Performance Summary (This data is not currently available and will be update during the next schedule SAMP update.

8.4 Performance and Practices Benchmarking

We are just reaching a high enough maturity level in regards to data integrity to begin bench marking, as mentioned above this will take place in FY 20 with results being available in August 2020.

9.0 RISK ASSESSMENT

- Lack of confidence in data set-FM only has three full years of data in most areas and as few as one year in others. The lack of a full five year data set is a limiting factor in performing adequate trend analysis.
- Although age is only a single factor in life cycle analysis it is indicative of more costly maintenance requirements and increased costs to retrofit aged equipment with current safety features and functionality.
- Work load versus available labor hours, analysis indicates a substantial deficit in available labor hours, at times requiring 40% of required workload to be commercially sourced. Vended services is part of the workload mitigation plan however 15%-20% is the target range.
- Safety and reliability risks increase as equipment ages and parts availability becomes less prevalent

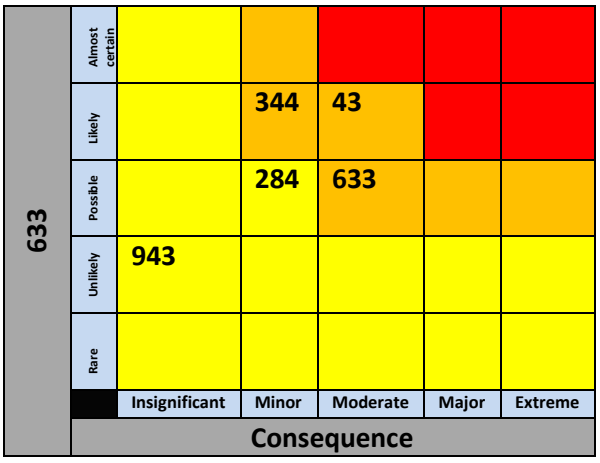
- Aged equipment emits more GHG emissions that updated equipment, we do not currently have a method of monitoring GHG emissions however we can surmise that as technology changes are implemented within the industry, increased focus on GHG reductions it will correlate to lower emissions over all.

- Facts regarding technician to equipment ratios
  - BPA has 2436 assets and components that are maintained internally
  - At an average of 20 hours of required maintenance per year=**48,720** needed labor hours, this doesn't count modifications, damage or repairs.
  - Adding in repair hours average of the past 3 years at 14.1 hours (34347) per asset=**83067** needed technician hours for preventative maintenance and repairs.
  - BPA has 26 BFTE and 6 CFTE technicians=**48,000** available labor hours
  - In rough numbers this equals 76 assets per technician, 76:1
  - Industry average: there are many variables when calculating the number of technicians required per number of trucks, normally this is a 12.6:1 ration for over-the-road equipment
  - Utility industry ratios (without construction equipment) are 55:1
  - The need to have a consultant convert our asset and component numbers to maintenance repair units (MRU) has already been identified in 6.2 of this document. Maintenance repair units take into consideration the complexity and environment in which equipment operates. As an example: a sedan may equate to 1 repair unit, while a man lift may equate to 7, the more complex the equipment is, the higher the rating.

Likelihood Scale		
Level	**Descriptor**	**Frequency**
5	Almost Certain	This event could happen quarterly or more frequently
4	Likely	The event will probably happen in most conditions (once per year)
3	Possible	The event should happened at some time (once per 3 years)
2	Unlikely	The event could happen at some time (once per 5 years)
1	Rare	This event could happen once every 10 years

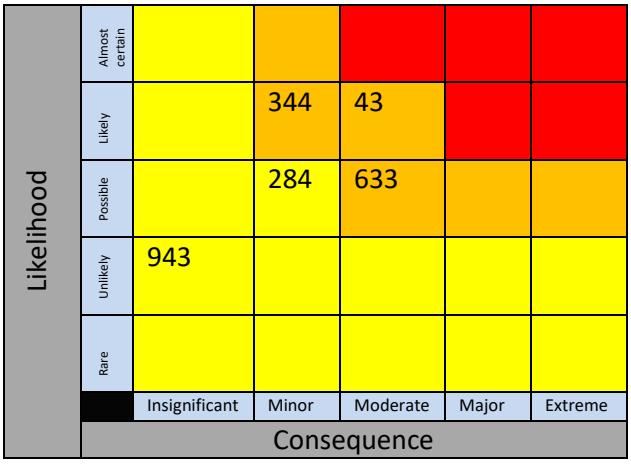
Risk Category	Risk Name: Risk Description, Mitigation	Likelihood	Impact
Safety	**Functionality:** As equipment ages, it results in outdated safety functionality as improved technology is implemented in industry. **Accidents:** As equipment ages, it becomes more prone to breakdowns which results in increased likelihood of accidents.	5	Best case: asset is removed from service Worst case: injury or fatality
Reliability	**Labor:** As equipment ages, the required maintenance and upkeep of the equipment results in increased labor and longer downtimes. **Parts:** As equipment ages, replacement parts become sparse which results in decreased reliability and equipment availability.	4	Best case: extended downtime for maintenance, increased rental costs Worst case: asset is removed from service with a 12-18 month lead time for replacement
Financial	**Financial Costs**: As equipment ages, it becomes more expensive to maintain.	4	Best case: Increased down time leads to project delays/O&M exceeds flat line projection Worst case: asset is removed from service until the next budget cycle
Environment/ Stewardship	**Environment Hazards**: As equipment ages, the gap widens between the greenhouse gas emissions standards when the equipment was built and what the current standards are which results in higher pollution. **Size**: The larger the equipment/greater the capacity, the less efficient the fuel economy is which results in a greater environmental footprint.	3	Best case: less fuel efficient, fuel cost increase Worst case: EPA fines, increased program scrutiny from DOE
Compliance	**Program Compliance**: As equipment ages, the more difficult it is to achieve and maintain compliance with applicable OSHA, etc., regulations which results in increased hazards to operating personnel.	3	Best case: increased vendor reliance, longer downtime, OSHA oversight, increased program scrutiny from DOE Worst case: injury or fatality

Figure 9.0-1, Risk Assessment, Safety



There are currently 977 assets that are at or nearing their replacement window within the next 7 years. 43 asset have exceeded their replacement window significantly and pose an increased risk each year they are kept in service. Below are the asset types and count that are at, nearing or exceeded life expectancy.

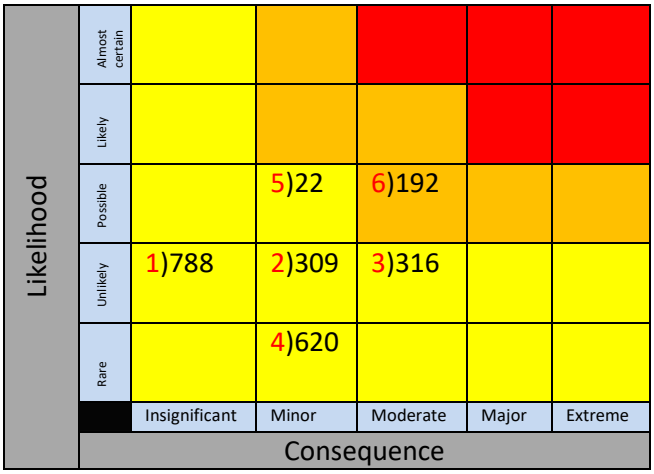
Figure 9.0-2, Risk Assessment, Reliability



CLASS 5-7 TRUCK	3	FORKLIFT	132	TRAILER	591
MANLIFT < 55	63	PLATFORM < 55	20	STRINGING EQ	14
SEMI TRUCK	2	PLATFORM > 75	2	WINCH TRUCK	14
BOOM EQUIPMENT	66	AERIAL CART	27	UTILITY TRACTOR < 30 HP	8
MANLIFT 75-125	13	POLE TRUCK	13	VERTICAL PERSON LIFT	7
CLASS 8 TRACTOR	16	MOBILE GENERATOR	29		

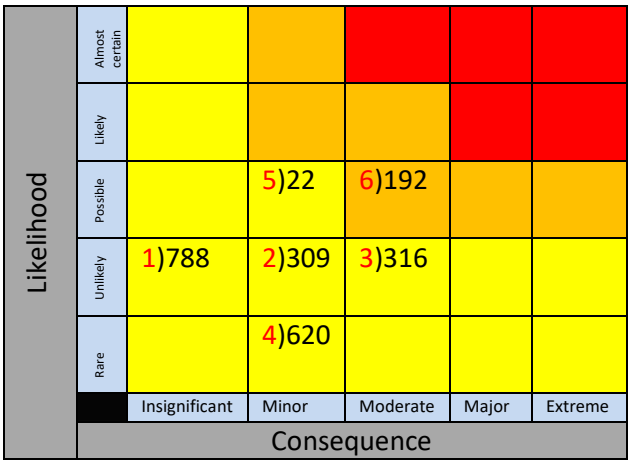
As with Safety, reliability represents a moderate risk as assets age. Increased maintenance requires more labor hours and parts become either difficult to find or must be custom made. This equates to longer down time and higher risks of project and outage restoration delays.

Figure 9.0-3 Risk Assessment, Financial



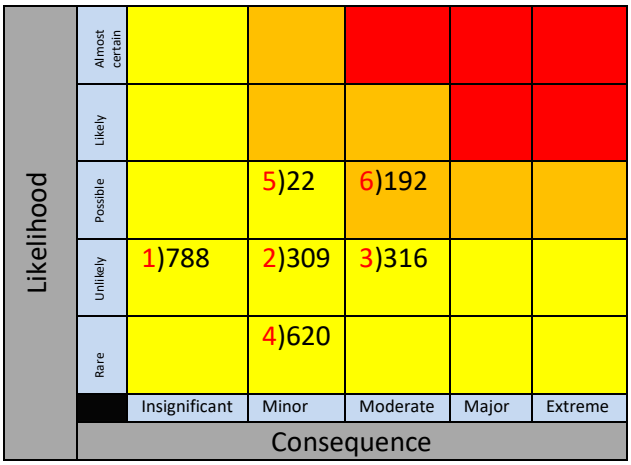
Financial risk centers on the complexity of equipment and the dependency to own specialized heavy equipment and the impacts if that equipment is unavailable. As assets reach the end of their useful lifecycle, cost to maintain this equipment rises dramatically. The table shown here depicts the number of assets, the likelihood of failure that would have financial impacts and the consequence categorization. (See figure 9.0-6 below additional factors)

Figure 9.0-4, Risk Assessment, Environment/Trustworthy/Stewardship



Environmental risks factor age and complexity. The older the asset is the less fuel efficient it becomes, we can surmise that less fuel efficiency equates to higher GHG emissions. The table shown here depicts the number of assets, the likelihood of failure that would have environmental impacts and the consequence categorization. (See figure 9.0-6 below additional factors)

Figure 9.0-5, Risk Assessment, Compliance



As with Financial and Environmental risks as assets age it becomes much more difficult to maintain compliance standards, this is especially the case for insulated boom equipment used for live line work. Compliance inspections and maintenance are driven by The Occupational Safety and Health Administration (OSHA), American National Standards institute (ANSI) and The American Society of Mechanical Engineers (ASME). The table shown here depicts the number of assets, the likelihood of failure that would have compliance impacts and the consequence categorization. (See figure 9.0-6 below additional factors)

Figure 9.0-6, Additional risk scale

Due to the diversity and complexity of BPA's fleet in conjunction with the enormity of the BPA service territory it is necessary to rate equipment types based on their impact to BPA's mission. A scale of 1-6 has been developed, 1 indicating the least amount of impact if equipment is unavailable and 6 indicating the largest impact if the equipment is unavailable. The risk factors listed here correlate with the Red numbers embedded in the charts above. If the minimum level of any asset type is not met, the risk factor would likely increase, work will be done in FY 22 to establish these minimum essential levels.

Asset type	Count	Risk factor		Asset type	Count	Risk factor
PICKUP	364	1		FORKLIFT	132	3
SEDAN	26	1		POLE TRUCK	13	3
SUV	232	1		PLATFORM 55-75	12	3
SMALL GAS VEHICLE	65	1		CONSTRUCTION EQ	79	3
VAN	38	1		WINCH TRUCK	14	3
SMALL ELECTRIC VEHICLE	63	1		SNOW EQ	34	3
UTILITY TRACTOR < 30 HP	8	2		VERTICAL PERSON LIFT	7	3
CAB AND CHASSIS	65	2		DUMP TRUCK	25	3
STAKE BED	70	2		MOBILE GENERATOR	29	4
UTILITY BODY	83	2		TRAILER	591	4
LIGHT TOWER	17	2		PLATFORM < 55	20	5
ROUTE VAN	45	2		PLATFORM > 75	2	5
CLASS 5-7 TRUCK	3	2		MANLIFT 55-75	5	6
SEMI TRUCK	2	2		MANLIFT > 125	4	6
CLASS 8 TRACTOR	16	2		MANLIFT < 55	63	6
				BOOM EQUIPMENT	66	6
				MANLIFT 75-125	13	6
				AERIAL CART	27	6
				STRINGING EQ	14	6

10.0 STRATEGY AND FUTURE STATE

The overarching strategy developed in this document is to serve a single purpose of providing the right equipment at the right time for the right cost in support of BPA's mission. We will accomplish this through a 20 year procurement strategy versus the current 45 year trajectory. We will work hand in hand with our customers to optimize the fleet in both size and capacity to ensure needs are met through lease, rental or procurement of heavy mobile equipment assets. In addition, we will continue working with sustainability to convert 70% of motor pool vehicles to all electric vehicles (EV) by 2025. We will develop an in-house training program to address technician shortages and will convert asset data to maintenance repair units to allow for benchmarking in the utility industry and assist with accurate staffing needs identification. As well we will use "down time" and "cost per mile" metrics to evaluate our performance in meeting the strategy laid out in this document.

10.1 Future State Asset Performance

Future state will see an increase in capital spend and a decrease in O&M. We will strive to provide an 85% in-service rate (availability) and lower the cost per mile by 10% by 2025, while meeting the intent of the current staffing plan. As the

aging Fleet is replaced at a more reasonable pace, less technicians hours will be needed and/or fewer, more costly vended services will be required.

Required Table 10.1-1 Future Asset Performance Objectives

Objective	This Year	Year +1	+2	+3	+4	+5	+6	+7	+8	+9	+10
Availability	Baseline	Goal setting	Monitor	Monitor	Monitor	Develop action plan as needed	Implement action plan as needed	Monitor	Monitor	Monitor	
Cost per mile	Baseline	Benchmarking	Goal setting	Monitor	Monitor	Develop action plan as needed	Implement action plan as needed	Monitor	Monitor	Monitor	

10.2 Strategy

Asset performance strategy will initially consist of measuring availability, Transmission Field Services defines this as "not in field (NIF)" whereas FM defines lack of availability as "down for maintenance". Since FM cannot consistently know when an asset is not available unless the asset is down for maintenance, we will use this as a starting point. Additionally we have base lined a second measure as "cost per mile (CPM)" which will be benchmarked as mention earlier in this document. CPM is an industry standard benchmark, a higher CPM, would indicate less availability and a trend of increased maintenance costs. By increasing the rate of replacement the CPM trend should decrease thus availability will increase.

- Increase capital spend to accommodate 5% fleet replacement annually, roughly 14M per year
  - Newer equipment requires fewer maintenance actions=increased up time
  - Fewer personnel required=lower expense
  - Increased parts availability=increased up time=fewer rentals=lower expense cost
  - Increased availability=fewer capital project delays
  - Increased safety functionality=less potential for catastrophic failure=less risk to personnel and environment
  - Increased capital spend=lower risk=lower overall programmatic costs
  - **Advantage=new equipment, increase safety features, less down time, lower expense costs, ability to enter into longer term contracts (5-10 years) will reduce lead times drastically by allowing the contract officer to "cut a release" versus establishing a new contract for each procurement cycle.**
  - **Disadvantage=Increased capital spend**
- Bench Marking
  - Convert existing fleet data to MRU's
- Detailed evaluation of assets, needs and optimization with each customer organization by the end of 2021

10.2.1 Sustainment Strategy

The crucial piece of the strategy revolves around an increase in capital spend in an effort to move from a 45 year replacement cycle to a 20 year replacement cycle. If approved, longer term procurement contracts will be put in place where applicable to decrease lead times and standardized assets based on agreed upon standards with each user group. Fleet optimization (the right amount of assets for the mission), asset appropriateness (the right type of asset for the mission) and a procurement plan built on multiple data points (equipment at the right time & cost) will be improved. Options outside of this plan do exist but would require additional FTE and/or additional O&M costs.

10.2.2 Growth (Expand) Strategy

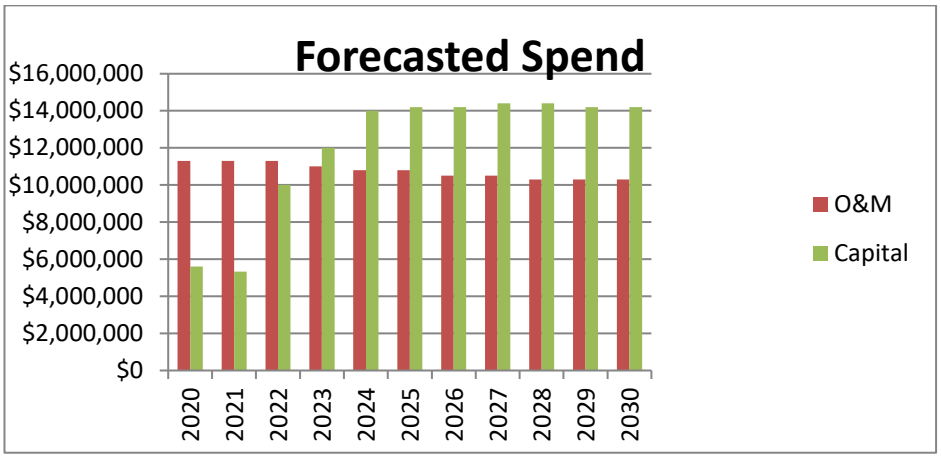
Fleet asset numbers are limited by DOE, increases to the size and scope of fleet must have agency level approval. As missions change and different asset types are needed, we must do so within the limitations established. Any increases to fleet size and scope must be accompanied by adequate FTE count to prevent additional delays and downtime. Current staffing levels cannot support an expansion to current inventory levels.

10.2.3 Strategy for Managing Technological Change and Resiliency

Technology needs will continue to evolve, diagnostic capabilities change often however with the exception of a telematics solution (currently on hold), and improvements/updates/upgrades needed can be accomplished within the O&M dollars projected. A technology roadmap specific to Fleet Management has not yet been built however it will be included in the next evolution of the Fleet SAMP.

A Resiliency plan has not been developed yet, this piece will be updated during the next evolution.

10.3 Planned Future Investments/Spend Levels



10.3-1

10.3-1 Required Items: Required Table 10.3-1 Future Expenditures by Category. Using a similar table used in section 8, illustrate planned costs for the next five to ten years for O&M, replacements, system expansion and upgrades. (Transmission may do by funding source, Power by strategic class, others asset type. This will differ by asset category).

Table 10.3-1 Future Expenditures (in thousands)

Program	Rate Case FY's		Future Fiscal Years							
Capital Expand (CapEx)	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Total Capital Expand & Sustain	10000	12000	14000	14200	14200	14400	14400	14200	14200	14200
Expense (OpEx)										
O&M Expense	11300	11000	10800	10800	10500	10500	10300	10300	10300	10300
Total Expense										

10.4 Implementation Risks

Implementation of this strategy has varying risks. Lack of capital funding will be a significant risk; with flat O&M and FTE counts the likelihood of triggering the risks indicated in section 9 of this document will be more than likely. Significant personnel loses or increased asset count will negatively impact the success of this strategy.

Table 10.4-1, Implementation Risks

Risk	Impact	Mitigation Plan
Lack of capital funding	Negative impact on ability to decrease life cycle cost, CPM, Overtime and Vended services	Accept actualized risks, longer downtime, project delays, outage restoration delays, and lack of availability
Staffing loses	More than 10% staffing loses/reductions will negatively impact service provided and response time	Consolidation of services to fewer locations
Increased asset count	Negative impact on our ability to provide service, longer down time, project delays	Current labor hour availability is less than current labor hours required. An increase in fleet size will continue to strain resources and we will have to accept actualized risks.

10.5 Asset Condition and Trends

The expectation of this strategy is to reduce asset replacement from 45 years to 20 years to ensure the reliability and safety of heavy mobile equipment. As well reduction of cost per mile averages by 10% and increase availability for the end user will be realized. A secondary benefit will be a reduction in vended services from 35% to 15%, vended service typically cost 2-3 times the cost of in-house work by task (doesn't include overhead). By 2030 roughly 50% of fleet assets will have been replaced, with more fuel efficient equipment and enhanced safety features we will meet compliance standards while also ensuring the safety and reliability the end user requires to meet business objectives.

Figure 10.5-1 Future Asset Age by Classification, Figure 10.5-2 Future Asset age by Asset type

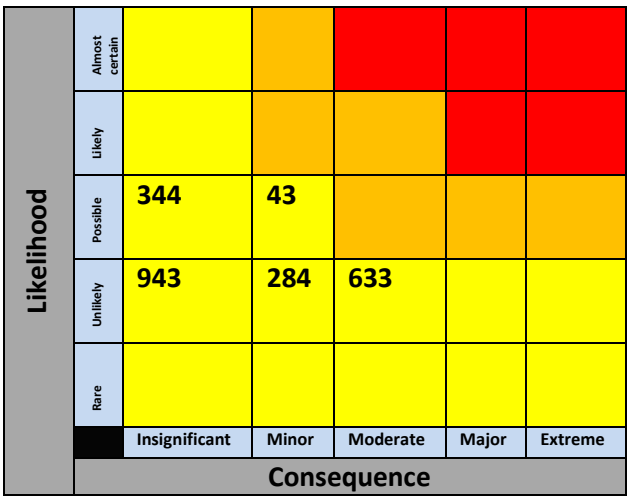
Type	Count	Average age	Average age Difference + or -
AERIAL CART	27	10	-7
BOOM EQUIPMENT	66	14	0
CAB AND CHASSIS	65	5	0
CLASS 5-7 TRUCK	3	13	0
CLASS 8 TRACTOR	16	15	-5
CONSTRUCTION EQ	79	12	-12
DUMP TRUCK	25	14	+2
FORKLIFT	132	16	0
LIGHT TOWER	17	8	0
MANLIFT < 55	63	10	-3
MANLIFT > 125	4	10	-2
MANLIFT 55-75	5	11	0
MANLIFT 75-125	13	12	-2
MOBILE GENERATOR	29	17	-3
PICKUP	364	4	0
PLATFORM < 55	20	14	-2
PLATFORM > 75	2	14	-2
PLATFORM 55-75	12	8	0
POLE TRUCK	13	15	-3
ROUTE VAN	45	10	0
SEDAN	26	4	0
SEMI TRUCK	2	13	0
SMALL ELECTRIC VEHICLE	63	5	-4

SMALL GAS VEHICLE	65	5	0
SNOW EQ	34	11	0
STAKE BED	70	6	0
STRINGING EQ	14	15	-6
SUV	232	4	0
TRAILER	591	15	-5
UTILITY BODY	83	6	0
UTILITY TRACTOR < 30 HP	8	18	-11
VAN	38	5	0
VERTICAL PERSON LIFT	7	5	-5
WINCH TRUCK	14	15	-13

• Backlog should be less than 10% by 2030, Compliance inspection backlog will be maintained at less than 1%. The strategy provides a positive impact on asset maintenance which will required less labor hours while maintaining a consistent level of labor hours available. Decrease in vended services and thereby reducing O&M cost and risks.

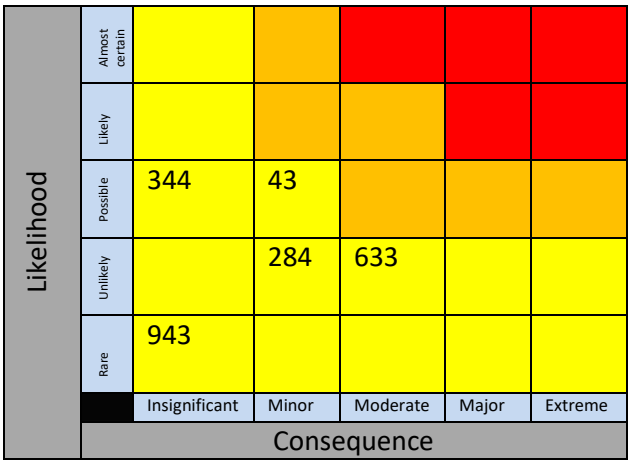
10.6 Performance and Risk Impact

Figure 10.6-1, Strategy, Risk Assessment Safety



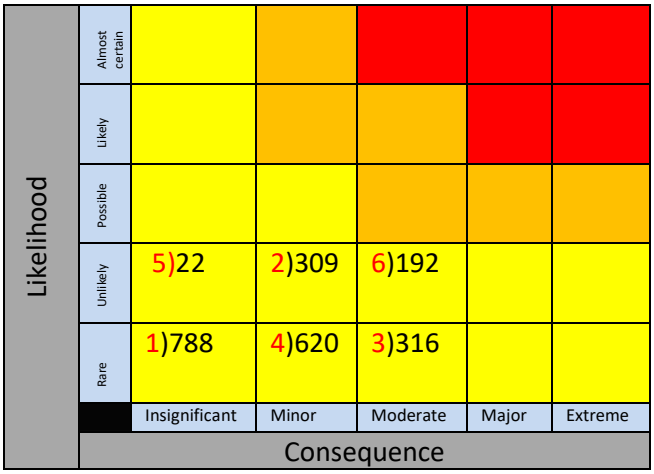
By 2030 less than 45% of fleet assets will be at or nearing their replacement window. 15-25% will have exceeded their replacement window. Increased safety functionality and standardization along with the completed optimization process will likely move the number of asset types to the lower left quadrant and will pose only insignificant to minor risk. By 2040, less than 5% of assets will be at or nearing their replacement window. No assets will have exceeded the replacement window.

Figure 10.6-2, Strategy, Assessment Reliability



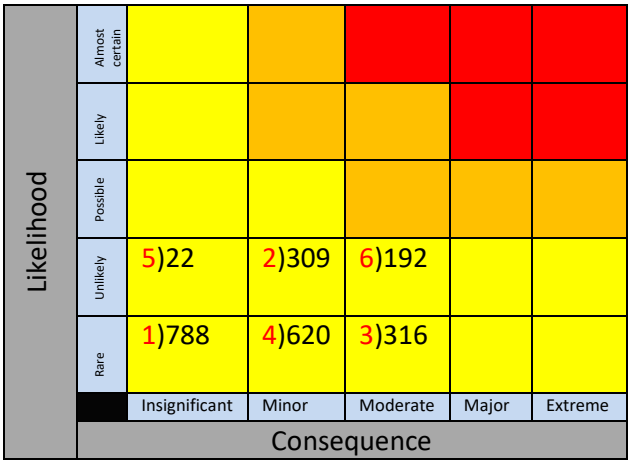
As with Safety, reliability represents a moderate risk as assets age. Increased maintenance requires more labor hours and parts become either difficult to find or must be custom made. This equates to longer down time and higher risks of project and outage restoration delays. By 2030, reliability will represent insignificant to minor risks as 50% of current assets will have been replaced. Increased availability to end users will reduce rental cost ($1.7M per year currently) by 40%. By 2040 reliability will represent insignificant risk with a total rental cost reduction of 80%.

Figure 10.6-3, Strategy, Risk Assessment Financial



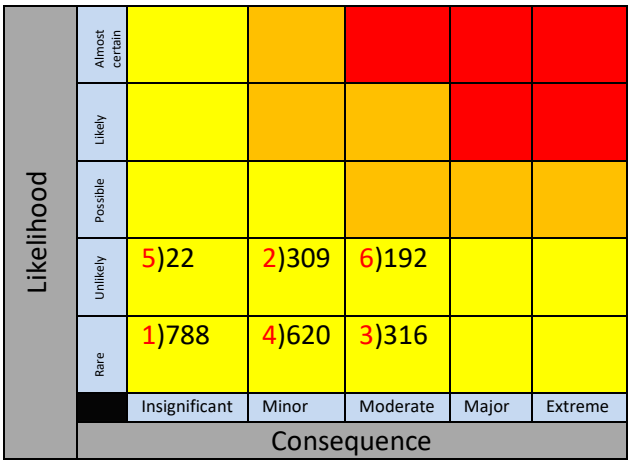
Financial risk centers on the complexity of equipment and the dependency to own specialized heavy equipment and the impacts if that equipment is unavailable. As assets reach the end of their useful lifecycle, cost to maintain this equipment rises dramatically. The table shown here depicts the number of assets, the likelihood of failure that would have financial impacts and the consequence categorization. By 2030, financial risks will represent insignificant to moderate risks consequences. By 2040 these risks will be further reduced to insignificant to minor.

Figure 10.6-4, Strategy, Risk Assessment Environment/Trustworthy/Stewardship



Environmental risks factor age and complexity. The older the asset is the less fuel efficient it becomes, we can surmise that less fuel efficiency equates to higher GHG emissions. The table shown here depicts the number of assets, the likelihood of failure that would have environmental impacts and the consequence categorization. While future GHG restrictions are unknown, if regulations remain status quo we can conclude a drop in our environmental foot print as equipment is replace with more fuel efficient options. By 2030 environmental impact potential will represent insignificant to moderate risks. By 2040 expectations are the impact potential will be insignificant.

Figure 10.6-5, Strategy Risk Assessment Compliance



As with Financial and Environmental risks as assets age it becomes much more difficult to maintain compliance standards, this is especially the case for insulated boom equipment used for live line work. Compliance inspections and maintenance are driven by The Occupational Safety and Health Administration (OSHA), American National Standards institute (ANSI) and The American Society of Mechanical Engineers (ASME). The table shown here depicts the number of assets, the likelihood of failure that would have compliance impacts and the consequence categorization. By 2030, 50% of assets will have been replaced, requiring fewer maintenance actions. As we realize increased labor hour availability and more modern equipment, we expect compliance impacts to lesson to the insignificant to moderate level. By 2040 the expectation is that compliance will range in the insignificant to minor range.

(Additional risk factors from 9.0-6)

Asset type	Count	Risk factor		Asset type	Count	Risk factor
PICKUP	364	1		FORKLIFT	132	3
SEDAN	26	1		POLE TRUCK	13	3
SUV	232	1		PLATFORM 55-75	12	3
SMALL GAS VEHICLE	65	1		CONSTRUCTION EQ	79	3
VAN	38	1		WINCH TRUCK	14	3
SMALL ELECTRIC VEHICLE	63	1		SNOW EQ	34	3
UTILITY TRACTOR < 30 HP	8	2		VERTICAL PERSON LIFT	7	3
CAB AND CHASSIS	65	2		DUMP TRUCK	25	3
STAKE BED	70	2		MOBILE GENERATOR	29	4
UTILITY BODY	83	2		TRAILER	591	4
LIGHT TOWER	17	2		PLATFORM < 55	20	5
ROUTE VAN	45	2		PLATFORM > 75	2	5
CLASS 5-7 TRUCK	3	2		MANLIFT 55-75	5	6
SEMI TRUCK	2	2		MANLIFT > 125	4	6
CLASS 8 TRACTOR	16	2		MANLIFT < 55	63	6
				BOOM EQUIPMENT	66	6
				MANLIFT 75-125	13	6
				AERIAL CART	27	6
				STRINGING EQ	14	6

11.0 *Barriers to optimal performance*

The primary barrier to optimal performance is availability of capital dollars to replace aging assets at a more manageable rate. The availability of skilled fleet personnel, lack of a full 5 year compliment of data for analysis and the lack of a telematics solution are additional barriers.

Table 11.0-1 Barrier to Optimal Performance

Barrier to Optimal Performance	Responsible Org.	Mitigation (short term)	Mitigation (long term)
Age and condition of BPA Fleet assets	NSF	Examine maintenance intervals, use vended services when applicable, implement fleet wide optimization process	Decrease replacement interval from 45 years to 20 years.
Training-skill availability	NSF	use commercial training resources, develop internal training program	Implement training program (similar to apprenticeship program)
Lack of telematics	NSF	Install hub meters on BPA's 600 trailers, continue to use manual processes to record usage.	Implement a telematics solution
Asset information	NSF	only 3 years of data available, continue to refine data points, will rectify itself over time	When 5 year data milestone is accomplished, analyize trends to determine fleet size and scope

END